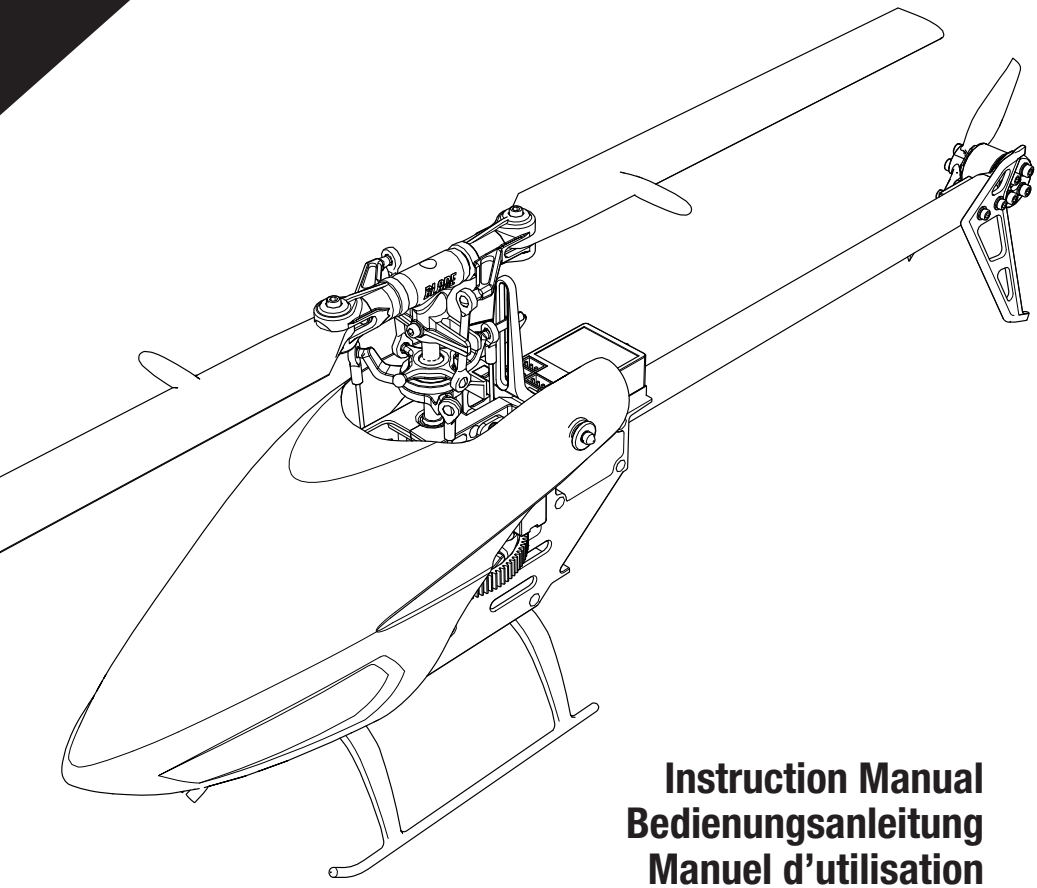
BLH01600, BLH01650

REVOLUTION™ 155 CP



Instruction Manual
Bedienungsanleitung
Manuel d'utilisation
Manuale di Istruzioni

Scan the QR code and select the Parts and Support tab from the product page for the most up-to-date manual information.

Scannen Sie den QR-Code und wählen Sie auf der Produktseite den Reiter „Parts and Support“ (Teile und Hilfre), um die aktuellste Bedienungsanleitung zu erhalten.

Scannez le code QR et sélectionnez l'onglet Parts and Support sur la page du produit pour obtenir les informations les plus récentes sur le manuel.

Leggere il codice QR e nella pagina del prodotto selezionare la scheda “parti e supporto” per ottenere le informazioni più aggiornate.

BNF® BASIC

RTF READY-TO-FLY

1031842.1
Updated 5/26

NOTICE

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, LLC. For up-to-date product literature, visit horizonhobby.com or towerhobbies.com and click on the support or resources tab for this product.

MEANING OF SPECIAL LANGUAGE

The following terms are used throughout the product literature to indicate various levels of potential harm when operating this product:
WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage, and serious injury OR create a high probability of superficial injury.
CAUTION: Procedures, which if not properly followed, create the probability of physical property damage AND a possibility of serious injury.
NOTICE: Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.

WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.
This is a sophisticated hobby product. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision. Do not use with incompatible components or alter this product in any way outside of the instructions provided by Horizon Hobby, LLC. This manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or serious injury.

Age Recommendation: Not for children under 14 years. This is not a toy.

Safety Precautions and Warnings

- Always keep a safe distance in all directions around your model to avoid collisions or injury. This model is controlled by a radio signal subject to interference from many sources outside your control. Interference can cause momentary loss of control.
- Always operate your model in open spaces away from full-size vehicles, traffic and people.
- Always carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.).
- Always keep all chemicals, small parts and anything electrical out of the reach of children.
- Always avoid water exposure to all equipment not specifically designed and protected for this purpose. Moisture causes damage to electronics.
- Never place any portion of the model in your mouth as it could cause serious injury or even death.
- Never operate your model with low transmitter batteries.
- Always keep aircraft in sight and under control.
- Always move the throttle fully down at rotor strike.
- Always use fully charged batteries.
- Always keep transmitter powered on while aircraft is powered.
- Always remove batteries before disassembly.
- Always keep moving parts clean.
- Always keep parts dry.
- Always let parts cool after use before touching.
- Always remove batteries after use.
- Never operate aircraft with damaged wiring.
- Never touch moving parts.

WARNING AGAINST COUNTERFEIT PRODUCTS: If you ever need to replace your Spektrum receiver found in a Horizon Hobby product, always purchase from Horizon Hobby, LLC or a Horizon Hobby authorized dealer to ensure authentic high-quality Spektrum product. Horizon Hobby, LLC disclaims all support and warranty with regards, but not limited to, compatibility and performance of counterfeit products or products claiming compatibility with DSM or Spektrum technology.

Table of Contents

Specifications	
Length	13.54 in (344mm)
Height	4.88 in (124mm)
Main Rotor Diameter	14.17 in (360mm)
Tail Rotor Diameter	2.60 in (66.0mm)
Weight*	Without Battery: 5.54 oz (157g) With Recommended 3S 450mAh Flight Battery: 6.98 oz (198g)

Ready-to-Fly Included Equipment	
Main Motor	Brushless 2017-5800Kv 6-Pole (BLH3417)
Tail Motor	Brushless 1104–3450Kv (SPMX-1147)
Flight Control	Spektrum Flight Control with Receiver (SPMAR6250MHXG)
ESC	Brushless ESC (SPMXAE2020A)
Battery	11.1V 450mAh 3S 50C LiPo Battery: IC2 (SPMX4503SIC2)
Transmitter	Spektrum DXS 2.4GHz (SPMR1010)
Charger	S20 USB-C 3S LiPo Charger (SPMXC0050)
Transmitter Batteries	4 AA Alkaline

BNF-Basic Required Equipment	
Battery	11.1V 450mAh 3S 50C LiPo Battery: IC2 (SPMX4503SIC2)
Charger	S20 USB-C 3S LiPo Charger (SPMXC0050)
Transmitter	Full-Range 6+ Channel Spektrum DSMX/ DSM2 Compatible Transmitter (Programmable for Helicopters)
Adapter	IC2 to IC3 charge adapter (SPMXCA320)

* The weight provided is for the aircraft and flight control components. No additional payload is allowed. MTOM is weight with recommended battery.

This product is a class C4 UAS as defined by the European Union Aviation Safety Agency (EASA).

Smart Transmitter File (STF) Loading Option

The included SPMAR6250MHXG flight controller is programmed with AS3X/SAFE. This includes a Smart Transmitter File, with the setup developed specifically for the Revolution 155 CP. This allows you to quickly import the settings for your transmitter if desired, directly from the receiver, during the binding process.

Supported Transmitters and Firmware Requirements:

- All NX Transmitters (with firmware version 4.0.11+)
- iX14 (with app version 2.0.9+)
- iX20 (with app version 2.0.9+)

IMPORTANT: iX12 and DX transmitters do not support Smart Transmitter File transfers at this time.

To Load the Smart Transmitter Files:

1. Power ON the transmitter.
2. Create a new blank model file on your transmitter.
3. Power ON the receiver.
4. Press the bind button on the receiver. The orange LED on the receiver flashes when the receiver is in bind mode.
5. Put the transmitter into bind mode. The model will bind normally.
6. Once binding is complete the download screen will appear as shown at the right.
7. Select **LOAD** to continue.

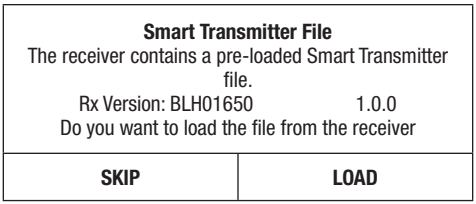
The **NOTICE** screen, as shown at the right, is a warning that downloading will overwrite all the information of the current model. If this a new "blank" model it will simply populate the transmitter parameters of the Revolution 155 CP into the selected model and rename it "Revolution 155 CP BLH01650".

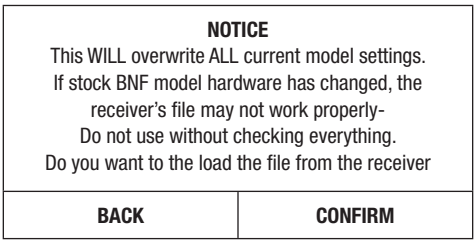
NOTICE: Confirming will override any previously saved transmitter setups.

8. Select **CONFIRM** to continue.
9. Once the download is complete the file will be installed on your transmitter and the telemetry information will be loaded automatically.

Once loading is complete the radio will return to the home screen, and you will see "Revolution 155CP BLH01650".

Transmitter setup is now complete.





Smart Transmitter File Operation Notes

Flight Timer

There is no flight timer loaded in the transmitter setup file. The voltage monitor provides alerts when battery voltage has dropped to just above the LVC, indicating it is time to land. This system only functions when using Smart batteries. Set up a flight timer separately, as needed.

iX Series

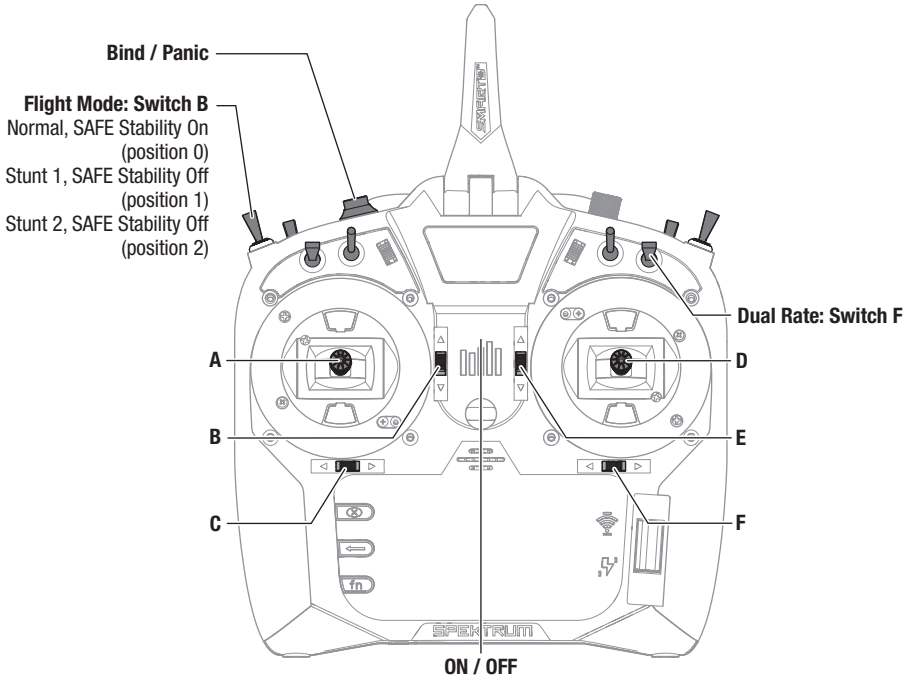
The photo imported for the iX series is a representation of a helicopter. See your transmitter manual for instructions to change the photo, if desired.

NX7e/NX7e+

The Smart Transmitter file imports with telemetry warnings set to Vibe/Voice. For NX7e/NX7e+ radios, change this to Tone to receive the low battery telemetry warning.

STF and Manual Transmitter Setup Switch Layout

The following illustration shows the switch layout and functions on a typical Spektrum transmitter when programmed per the manual transmitter setup tables or utilizing the Smart transmitter file installed on the aircraft receiver.



	A	B	C	D	E	F
Mode 1	**Rudder** *(Left/Right)* **Elevator** *(Up/Down)*	**Elevator Trim***	**Rudder Trim***	**Aileron** *(Left/Right)* **Throttle** *(Up/Down)*	**Throttle Trim***	**Aileron Trim***
Mode 2	**Rudder** *(Left/Right)* **Throttle** *(Up/Down)*	**Throttle Trim***	**Rudder Trim***	**Aileron** *(Left/Right)* **Elevator** *(Up/Down)*	**Elevator Trim***	**Aileron Trim***

*Trims are unused for the Revolution 155 CP, and they are not active in the STF.

1. Power ON your transmitter, click on scroll wheel, roll to **System Setup**, and click the scroll wheel. Select ***YES***.
2. Go to **Model Select** and choose <Add New Model> at the bottom of the list. The system asks if you want to create a new model, select ***Create***.
3. Set **Model Type:** Select Helicopter Model Type by choosing the Helicopter. The system asks you to confirm model type, data will be reset. Select ***YES***.
4. Scroll down and select **Model Name:** Input a name for your model file Scroll up to **BACK**, and press the scroll wheel to return to **System Setup**.
5. Scroll down and select ***F-Mode Setup***. Set to: Switch 1: Switch B Hold Switch: Switch H
   Scroll up to **LIST**, and press the scroll wheel to return to **System Setup**.
6. For all DX series transmitters and NX series transmitters with firmware before version 4.01:
   Scroll down and select ***Channel Assign***. Scroll down on the **Channel Input Config** screen, and set Ch 5 Gear to ***F-Mode***. Scroll down to **Ch/Prt (Bold), Aux 5** and select ***B*** as the input.
   OR
   For NX series transmitters with firmware version 4.01 and later:
   Scroll down and select ***Channel Assignment***. Scroll down to **CH/PRT 5**, highlight and select **FMode**.
7. Select <Main Screen>. Click the scroll wheel to enter the **Function List**.
8. Scroll down to **Rates and Expo**, and press the scroll wheel. Scroll down to **Channel** and select ***Aileron***.
   Set Switch: ***Switch F***
   Move Switch F to the 0 position > Set High Rate %: 100 / 100; Expo %: 35 / 35
   Move Switch F to the 1 position > Set High Rate %: 100 / 100; Expo %: 35 / 35
   Move Switch F to the 2 position > Set Low Rate %: 75 / 75; Expo %: 35 / 35
9. Scroll up to **Channel** and select ***Elevator***. Set Switch: ***Switch F***
   Move Switch F to the 0 position > Set High Rate %: 100 / 100; Expo %: 35 / 35
   Move Switch F to the 1 position > Set High Rate %: 100 / 100; Expo %: 35 / 35
   Move Switch F to the 2 position > Set Low Rate %: 75 / 75; Expo %: 35 / 35
10. Scroll up to **Channel** and select ***Rudder***. Set Switch: ***Switch F***
    Move Switch F to the 0 position > Set High Rate %: 100 / 100; Expo %: 45 / 45
    Move Switch F to the 1 position > Set High Rate %: 100 / 100; Expo %: 45 / 45
    Move Switch F to the 2 position > Set Low Rate %: 75 / 75; Expo %: 45 / 45
11. Scroll up to **LIST**, and press the scroll wheel to return to the **Function List**.
12. Scroll down to **Throttle Curve**, and press the scroll wheel.
    Scroll to the **N** box for curve selection, and press the scroll wheel to select the ***Normal*** curve.
    Set the **Curve Values** to:

1	2	3	4	5
0	65	65	65	65

13. Scroll to the **#1** box for curve selection and press the scroll wheel to select the ***Stunt #1*** curve.
    Set the **Curve Values** to:

1	2	3	4	5
80	80	80	80	80

14. Scroll to the **#2** box for curve selection, and press the scroll wheel to select the ***Stunt #2*** curve.
    Set the **Curve Values** to:

1	2	3	4	5
100	100	100	100	100

15. Scroll to the **H** box for curve selection, and press the scroll wheel to select the ***Hold*** curve.
    Set the **Curve Values** to:

1	2	3	4	5
0	0	0	0	0

16. Scroll up to **LIST**, and press the scroll wheel to return to the **Function List**.
17. Scroll down to **Pitch** curve, and press the scroll wheel. Scroll to the **N** box for curve selection, and press the scroll wheel to select the ***Normal*** curve. Set the **Curve Values** to:

1	2	3	4	5
25	37	50	75	100

18. Scroll to the **#1** box for curve selection and press the scroll wheel to select the ***Stunt #1*** curve.
Set the **Curve Values** to:

1	2	3	4	5
0	25	50	75	100

19. Scroll to the **#2** box for curve selection, and press the scroll wheel to select the ***Stunt #2*** curve.
Set the **Curve Values** to:

1	2	3	4	5
0	25	50	75	100

20. Scroll to the **H** box for curve selection and press the scroll wheel to select the ***Hold*** curve.
Set the **Curve Values** to:

1	2	3	4	5
25	37	50	75	100

21. Scroll up to **LIST**, and press the scroll wheel to return to the **Function List**.

22. Scroll down to **Mixing**, and press the scroll wheel Select ***Mix 1***. Select ***Normal***.
Select the first ***INH***, and select the ***I Switch***.
Select the second ***INH***, and select ***A5***.
Set the First Rate Value to: ***0%*** the Second Rate Value to: ***-125%***.
Set the **Offset** to ***100***. Set the **Switch** to the ***I button***.

23. Scroll up to **Back**, and press the scroll wheel to return to the **Function List**.

24. Scroll down to **Timer**, and press the scroll wheel. Set to:
Mode: Count Down
Time: 5:00
Start: Throttle Out
Over: 25%
One Time: Inhibit

25. Scroll up to **LIST**, and press the scroll wheel to return to the **Function List**.

26. Scroll up to <Main Screen>, and press the scroll wheel.

See the Smart Throttle section for telemetry setup information.

iX Series Transmitter Setup

1. Power ON your transmitter and begin once the Spektrum AirWare app is open. Tap the ***orange pen*** icon in the screen's upper left corner. The system asks for permission to **Turn Off RF**, select ***PROCEED***.
2. Select the three dots in the upper right corner of the screen, select ***Add a New Model***.
3. Select **Model Option**, choose ***DEFAULT***, select ***Helicopter***.
The system asks if you want to create a new heli model, select ***Create***.
4. Select the last model on the list: **Heli**. Tap on ***Heli***, and rename the model to a name of your choice.
5. Tap and hold the **back *arrow* icon** in the upper left corner of the screen to return to the main screen.
6. Tap on the ***Model Setup*** button.
7. Set **Flight Mode Setup**. **Switch 1: *Switch B***. **Hold Switch: *Switch H***.
Tap on the **arrow** in the upper left corner to return to the **Model Setup** menu.
8. Set **Channel Assign**. Set CH/Port 5 to ***Aux 5*** for Output and ***FMode*** for Input.
Tap on the ***arrow*** in the upper left corner to return to the **Model Setup** menu.
Tap on the ***arrow*** in the upper left corner to return to the main screen.
9. Tap on the ***Model Adjust*** button.
10. Tap on ***Dual Rates and Exponential***. Tap on the pull down tab at Channel and select ***Aileron***. Set Switch: ***Switch F***
Move Switch F to the 0 position > Set High Rate %: 100 / 100; Expo %: 35 / 35
Move Switch F to the 1 position > Set High Rate %: 100 / 100; Expo %: 35 / 35
Move Switch F to the 2 position > Set Low Rate %: 75 / 75; Expo %: 35 / 35
11. Tap on the pull down tab at Channel and select ***Elevator***. Set Switch: ***Switch F***
Move Switch F to the 0 position > Set High Rate %: 100 / 100; Expo %: 35 / 35
Move Switch F to the 1 position > Set High Rate %: 100 / 100; Expo %: 35 / 35
Move Switch F to the 2 position > Set Low Rate %: 75 / 75; Expo %: 35 / 35

12. Tap on the pull down tab at Channel and select ***Rudder***. Set Switch: ***Switch F***
Move Switch F to the 0 position > Set High Rate %: 100 / 100; Expo %: 45 / 45
Move Switch F to the 1 position > Set High Rate %: 100 / 100; Expo %: 45 / 45
Move Switch F to the 2 position > Set Low Rate %: 75 / 75; Expo %: 45 / 45

13. Tap on the ***arrow*** in the upper left corner to return to the **Model Adjust** menu.

14. Tap on ***Throttle Curve***. Ensure **H Switch** is set to the 0 position. Set the **B Switch** to the 0 position to select the Normal Curve. Set the **Curve Values** to:

1	2	3	4	5
0	65	65	65	65

15. Set the **B Switch** to the 1 position to select the Stunt #1 curve. Set the **Curve Values** to:

1	2	3	4	5
80	80	80	80	80

16. Set the **B Switch** to the 2 position to select the Stunt #2 curve. Set the **Curve Values** to:

1	2	3	4	5
100	100	100	100	100

17. Set the **H Switch** to the 1 position to select the Hold curve. Set the **Curve Values** to:

1	2	3	4	5
0	0	0	0	0

18. Tap on the ***arrow*** in the upper left corner to return to the Model Adjust menu.

19. Tap on Pitch Curve. Ensure Switch H is set to the 0 position.
Set the **B Switch** to the 0 position to select the Normal curve. Set the **Curve Values** to:

1	2	3	4	5
25	37	50	75	100

20. Set the **B Switch** to the 1 position to select the Stunt #1 curve. Set the **Curve Values** to:

1	2	3	4	5
0	25	50	75	100

21. Set the **B Switch** to the 2 position to select the Stunt #2 curve. Set the **Curve Values** to:

1	2	3	4	5
0	25	50	75	100

22. Set the **H Switch** to the 1 position to select the Hold curve. Set the **Curve Values** to:

1	2	3	4	5
25	37	50	75	100

23. Tap on the ***arrow*** in the upper left corner to return to the **Model Adjust** menu.

24. Tap on ***Mixing***. Select ***P-Mix 1***. Select ***Normal***.
Select the first ***INH***, and select the ***I Switch***.
Select the second ***INH***, and select ***A5***.
Set the First Rate Value to: ***0%*** the Second Rate Value to: ***-125%***.
Set the **Offset** to ***100***. Set the **Switch** to the ***I button***.

25. Tap on ***Back*** in the upper right corner to return to the **Mixing** menu.

26. Tap on the ***arrow*** in the upper left corner to return to the **Model Adjust** menu.

27. Tap on the ***arrow*** in the upper left corner to return to the main screen.

28. Tap on the ***clock*** icon in the **Timer 1** box. Set to:
Mode: Count Down
Time: 5:00
Switch: Throttle Out
Over Under Trigger: 25%
Over Under: Over
One Time: Toggle to activate

29. Tap on the ***arrow*** in the upper left corner to return to the main screen.

See the Smart Throttle section for telemetry setup information.

Charging Warnings

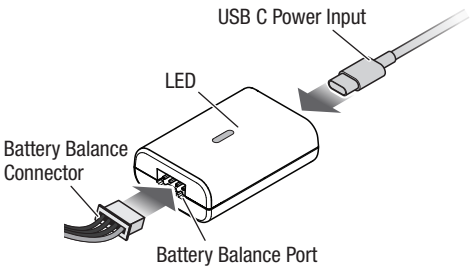
WARNING: Failure to exercise caution while using this product and comply with the following warnings could result in product malfunction, electrical issues, excessive heat, FIRE, and ultimately injury and property damage.

- **NEVER LEAVE CHARGING BATTERIES UNATTENDED.**
- **NEVER CHARGE BATTERIES OVERNIGHT.**
- Never attempt to charge dead, damaged or wet battery packs.
- Never attempt to charge a battery pack containing different types of batteries.
- Never allow children under 14 years of age to charge battery packs.
- Never charge batteries in extremely hot or cold places or place in direct sunlight.
- Never charge a battery if the cable has been pinched or shorted.
- Never connect the charger if the power cable has been pinched or shorted.
- Never attempt to dismantle the charger or use a damaged charger.
- Always use only rechargeable batteries designed for use with this type of charger.
- Always inspect the battery before charging.
- Always keep the battery away from any material that could be affected by heat.
- Always monitor the charging area and have a fire extinguisher available at all times.
- Always end the charging process if the battery becomes hot to the touch or starts to change form (swell) during the charge process.
- Always connect the positive leads (+) and negative leads (–) correctly.
- Always disconnect the battery after charging, and let the charger cool between charges.
- Always charge in a well-ventilated area.
- Always terminate all processes and contact Horizon Hobby if the product malfunctions.
- Charge only rechargeable batteries. Charging non-rechargeable batteries may cause the batteries to burst, resulting in injury to persons and/or damage to property.
- The USB outlet shall be installed near the equipment and shall be easily accessible.

CAUTION: Always ensure the battery you are charging meets the specifications of this charger. Not doing so can result in excessive heat and other related product malfunctions, which can lead to user injury or property damage.

CAUTION: If at any time during the charging process the battery pack becomes hot or begins to puff, disconnect the battery immediately and discontinue the charge process as batteries can cause fire, collateral damage and injuries.

Operating the Charger



1. Plug the USB-C connector into the charger power port and an appropriate 5V, 3.0A max power supply (not included). The LED on the charger will flash red / green to indicate the charger is ready.
2. Plug the battery balance lead into the charge port.
   - The LED flashes green while charging.
   - The LED glows solid green to indicate charging is complete.
3. Disconnect the battery from the charger.

Stopping the Charging Cycle

WARNING: Always stop the charging cycle or remove power supplied to the charger if you notice any irregularities (like a swollen battery) during charging.

To stop the charging cycle, disconnect the battery from the charger.

Charger Specifications

S20 USB-C 3S LiPo Charger	
Output Port Connector	IC2
Power Supply Input Voltage (not included)	DC 5.0V (3.0A Max)
Charge Current	1-8.4V (1.5A Max)
Supported Battery Type	LiPo 3S
Related Battery Capacity (Max.)	450–5300mAh
Display	LED
Operating Temperature	0–40°C (32–104°F)
Storage Temperature	-20~60°C (-4–140°F)
Length	44mm
Width	24mm
Height	14.5mm
Weight	25g

Charger LED Indicator	
Solid Red*	Charging error; ensure battery is healthy and properly connected to the charger
Green Flashing	Charging in progress
Solid Green	Charging complete
Red/Green Flashing	Charger is ready to charge

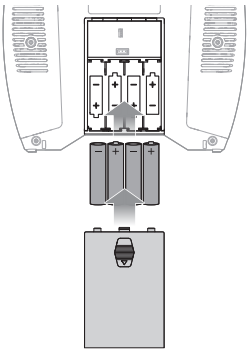
*A solid red LED indicates a charging error. Make the necessary changes, and restart the charger to clear the error.

Installing the DXS Transmitter Batteries (RTF)

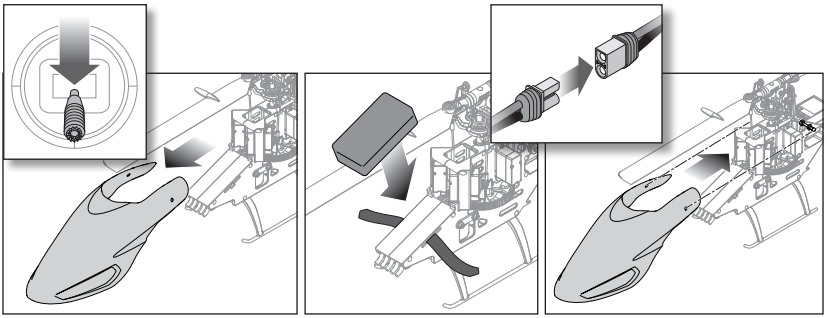
The LED indicator flashes and the transmitter beeps progressively faster as the battery voltage drops.
Replace the transmitter batteries when the transmitter begins to beep.

CAUTION: NEVER remove the transmitter batteries while the model is powered on. Loss of model control, damage or injury may occur.

CAUTION: Risk of explosion if battery is replaced with an incorrect type. Dispose of used batteries according to national regulations.



Installing the Flight Battery



1. Lower the throttle.
2. Power on the transmitter.
3. To allow the ESC to arm and prevent the rotors from initiating at startup, turn on throttle hold before connecting the flight battery.
4. Attach hook material to the helicopter frame and loop material to the battery.
5. Install the flight battery on the helicopter frame. Secure the flight battery with the hook and loop straps.

CAUTION: Verify the flight battery, wire and connector do not come into contact with the motor. Failure to do so will cause the motor, ESC and battery to overheat, resulting in a crash causing property damage and injury.

6. Bind the transmitter to the helicopter to establish a connection. See the Binding section below for more information.
7. Connect the battery cable to the ESC. The swashplate will center, indicating that the unit is ready. The flight controller status LED will display a slow green flash when initialization is complete.
8. The helicopter motor will emit a series of tones, indicating the ESC is armed.

CAUTION: Always disconnect the LiPo battery from the ESC power lead when not flying to avoid over-discharging the battery. Batteries discharged below the lowest approved voltage may become damaged, resulting in loss of performance and potential fire when batteries are charged.

Binding the Transmitter and Receiver

Binding is the process of programming the receiver to recognize the GUID (Globally Unique Identifier) code of a single specific transmitter.

If you encounter problems, repeat the binding procedure, refer to the transmitter troubleshooting guide, or contact the appropriate Horizon Product Support office.

This product requires an approved Spektrum DSM2®/DSMX® compatible transmitter. Visit *www.bindnfly.com* for a complete list of approved transmitters.

General Binding Procedure
1. Refer to the **Transmitter Setup** table to correctly set up your transmitter.
2. Lower the throttle stick to the lowest position. Set all trims to the center position.
3. Power off the transmitter and move all switches to the 0 position.
4. Install the bind plug in the receiver BIND/PROG port.
5. Connect the flight battery to the ESC.
6. Put the transmitter into bind mode while powering on the transmitter.
7. Release the bind switch after 2–3 seconds. The helicopter is bound when the receiver LED turns solid.
8. Disconnect the flight battery and power off the transmitter.

RTF The RTF transmitter comes prebound to the model. If you need to re-bind, follow this procedure:

1. Lower the throttle stick to the lowest position. Set all trims to the center position.
2. Power off the transmitter.
3. Install the bind plug in the receiver BIND/PROG port.
4. Connect the flight battery to the ESC.
5. Press and hold the transmitter bind switch while powering on the transmitter.
6. The transmitter beeps, and the LED blinks. Release the bind switch.
7. The helicopter is bound when the LED on the receiver control unit is solid and the transmitter emits 3 rapid, high-pitch tones. If the transmitter emits 2 low-pitch tones, the binding procedure was not successful. Repeat the binding procedure.
8. Disconnect the flight battery and power off the transmitter.

Flight Controller LED Indicator

LED Indicator on FC	Indicator Description
Red Solid	AR6250MHXG awaiting receiver connection, system will not initialize until connected
Yellow Flashing	Calibrating
Slow Green Flashing	Ready to Fly
Slow Red Flashing	Failsafe Active
Red Solid and Yellow Flashing	Calibration Error, AR6250MHXG not level or moved during calibration

Smart Throttle

The ESC in this helicopter paired with the Spektrum™ AR6250MHXG flight controller and SPMXAE2020 ESC enables the use of Smart technology. This system provides a variety of real-time power system related telemetry data while you fly, including motor RPM, current, battery voltage and more to compatible Spektrum AirWare™ equipped transmitters.

During binding the transmitter performs an auto configuration which will populate the telemetry page. You may need to change the telemetry values to suit this aircraft and your needs.

To enter the telemetry values:

(For iX series transmitters, select Save on each page.)

1. Power on the transmitter.
2. Set the throttle hold to on.
3. Power on the aircraft and allow it to initialize.
4. In the transmitter, go to the **Function List** (**Model Setup** in iX series transmitters).
5. Select the **Telemetry** menu option.
6. Go to the **Smart Battery** menu option.
7. Scroll down to **Startup Volts**, enter **4.0V/Cell**.
8. Return to the **Telemetry** menu.
9. Go to the **Smart ESC** menu option.
10. Scroll down to **Total Cells**, enter **3**.
11. Scroll down to **Low Voltage Alarm**, enter **3.45V/Cell** and set to **Voice**.
12. Scroll down to **Poles**, enter **6**.
13. Scroll down to **Ratio**, enter **9.45:1**.
14. Return to the main screen.

SAFE® Technology

Revolutionary SAFE® (Sensor Assisted Flight Envelope) technology uses an innovative combination of multi-axis sensors and software that allows model aircraft to perceive its position relative to the horizon. This spatial awareness is utilized to create a controlled flight envelope the aircraft can use to maintain a safe region of bank and pitch angles so you can fly more safely. Far beyond stability, this level of protection offers multiple modes so the pilot can choose to develop his or her skills with a greater degree of security and flight control that always feels crisp and responsive.

SAFE technology delivers:

- Flight envelope protection you can enable at the flip of a switch.
- Multiple modes let you adapt SAFE technology to your skill level instantly.

Best of all, sophisticated SAFE technology doesn't require any work to enjoy. Every aircraft with SAFE installed is ready to use and optimized to offer the best possible flight experience.

Flight Mode and Rate Selection

In **Normal/Beginner Mode** the bank angle is limited. When the cyclic stick is released the model will return to level.

In **Stunt 1 Mode** the bank angle is not limited. When the cyclic stick is released the model will not return to level. This mode is great for learning forward flight and basic aerobatics such as stall turns and loops.

In **Stunt 2 Mode** the bank angle is not limited. When the cyclic stick is released the model will not return to level. This mode is great for 3D aerobatics such as stationary flips and tic tocs.

Change rates in any mode by moving the two-position dual rate switch.

- Low rate reduces the control rates, providing an easier to fly model. Beginners should use low rate for initial flights.
- High rate provides full control and should be used by intermediate and experience pilots.

Throttle Hold

Throttle hold is used to prevent the motor from powering on inadvertently. For safety, turn throttle hold ON any time you need to touch the helicopter or check the direction controls.

Throttle hold is also used to turn off the motor quickly if the helicopter is out of control, in danger of crashing, or both. The blades will continue to spin briefly when throttle hold is activated.

Panic Recovery

If you encounter distress while flying in any mode, activate the Panic Recovery function. Move the control sticks to neutral (50%), press and hold the Bind/Panic button until the model is upright. SAFE technology will immediately return the aircraft to an upright level attitude, if the aircraft is at a sufficient height with no obstacles in its path. Return the collective stick to 50% and deactivate the Panic Recovery Function to return to the current flight mode.

NOTICE: Before deactivating Panic Recovery, make sure the collective stick has been returned to the 50% position. Once the Panic Recovery has been deactivated, full negative collective becomes available, which could cause the helicopter to descend rapidly.

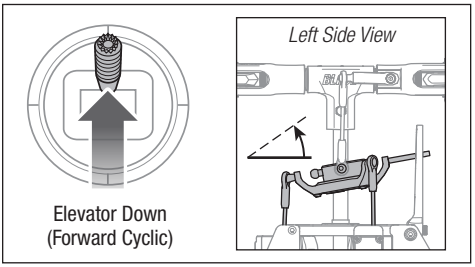
- This mode is intended to provide the pilot with the confidence to continue to improve their flight skills.
- Move the collective stick to 50% and return all other transmitter controls to neutral for the quickest recovery.
- Once the model has reached a level upright attitude, the negative collective is reduced to prevent the user from pushing the model into the ground.

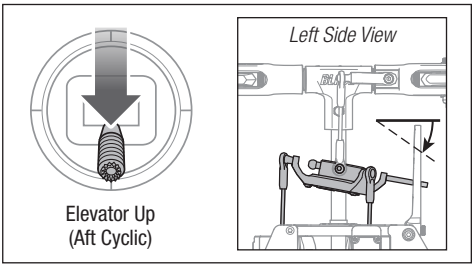
Control Tests

Ensure the throttle hold is ON when doing the direction control tests. Test the controls prior to the first flight to ensure the servos, linkages and parts operate correctly.

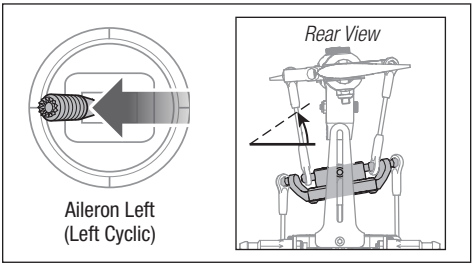
If the controls do not react as shown in the illustrations below, confirm the transmitter is programmed correctly before continuing on to the Motor test.

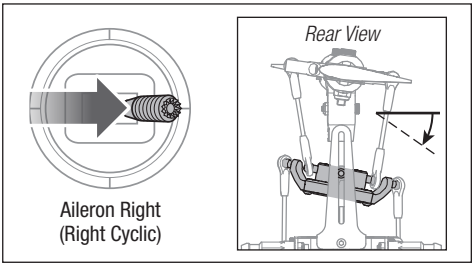
Elevator



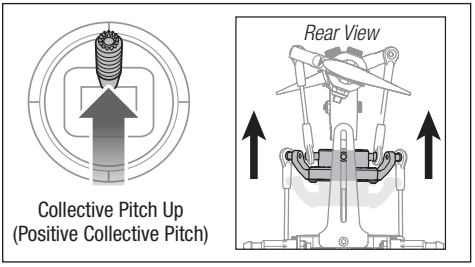


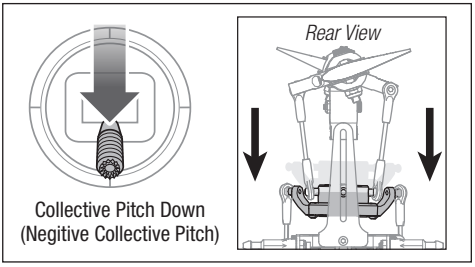
Aileron





Collective Pitch





Motor Test

Place the helicopter outdoors on a clean, flat, level surface (concrete or asphalt) free from obstruction. Always stay clear of moving rotor blades.

CAUTION: Keep pets and other animals away from the helicopter. Animals may injure themselves if they attack or run toward the helicopter.

1. Confirm that throttle is at full low position.
2. Turn Throttle Hold OFF.

WARNING: Stay at least 30 feet (10 meters) away from the helicopter when the motor is running. Do not attempt to fly the helicopter at this time.

3. Slowly increase the throttle until the blades begin to spin. The main blades should spin clockwise when viewing the helicopter from the top. The tail rotor blades should spin counterclockwise when viewing the helicopter from the right side.

NOTICE: If the main rotor blades are spinning counterclockwise, reduce the throttle to low immediately. Disconnect the battery from the helicopter and reverse any two motor wire connections to the ESC and repeat the motor control test.

Low Voltage Cutoff (LVC)

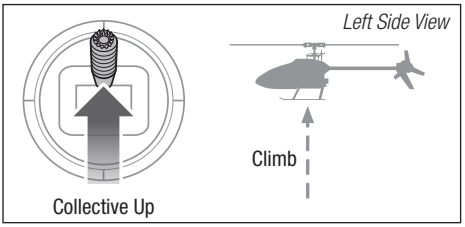
The ESC will continuously lower power to the motor until complete shutdown when the battery reaches 9V under load. This helps prevent over-discharge of the LiPo battery. Land immediately when the ESC activates LVC. Continuing to fly after LVC can damage the battery, cause a crash or both. Crash damage and batteries damaged due to over-discharge are not covered under warranty.

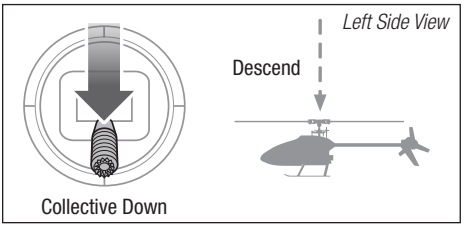
Repeatedly flying the helicopter until LVC activates will damage the helicopter battery.
Disconnect and remove the LiPo battery from the aircraft after use to prevent trickle discharge. During storage, make sure the battery charge does not fall below 3V per cell.

Understanding the Primary Flight Controls

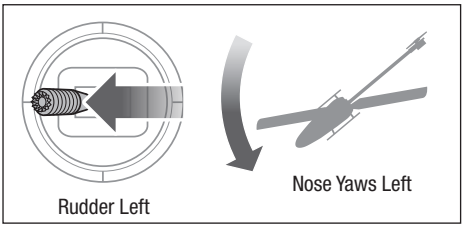
If you are not familiar with the controls of your aircraft, take a few minutes to familiarize yourself with them before attempting your first flight.

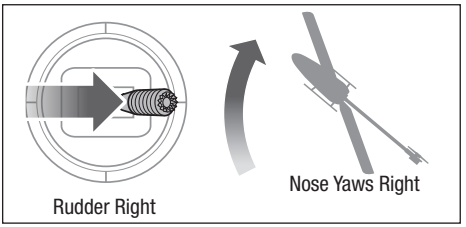
Collective



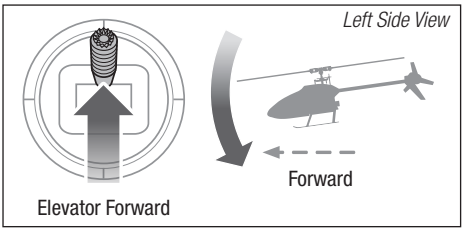


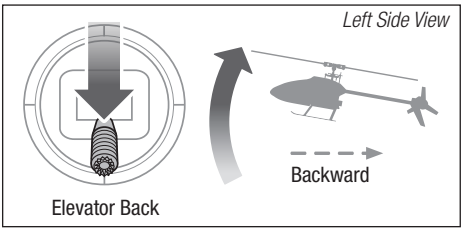
Rudder



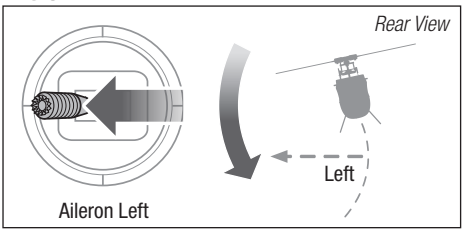


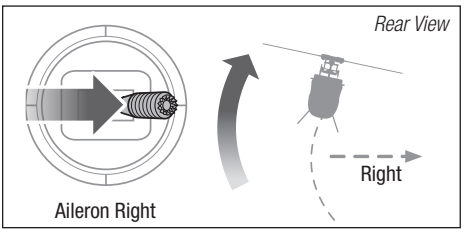
Elevator





Aileron





Before Your First Flight

Before attempting to fly this aircraft for the first time, we strongly recommend using the RealFlight Trainer Edition RC Flight Simulator, included with the RTF Basic version (see the section below on how to use the DXS transmitter to control RealFlight) or available separately for the BNF Basic version. Featuring Virtual Flight Instructor lessons, many of the most popular trainer airplane and helicopter models – including the Revolution 155 CP – plus unlockable reward content including "Next Step" models and fields, RealFlight Trainer Edition is the perfect tool new RC pilots can use to learn to fly in less time and with fewer crashes of their "real" models by practicing on a Microsoft Windows®-equipped PC at home or on a laptop just about anywhere else!

We also encourage you to connect with experienced RC pilots in your area through hobby shops or at designated flying fields. And for those located in the United States, we recommend joining a national organization such as the Academy of Model Aeronautics (AMA). The AMA can provide information on local clubs, instructors and established flying sites in your area in addition to insurance coverage. Visit www.modelaircraft.org for more information.

Scan to buy RealFlight Trainer Edition or visit: horizonhobby.cc/buyrfte

Scan to find a PC for RealFlight or visit: horizonhobby.cc/findapcforrf

Connecting the Included DXS Transmitter To RealFlight (RTF Basic Only)

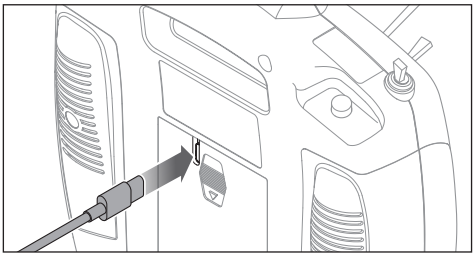
The Spektrum DXS transmitter included with the Ready To Fly version of this aircraft can be used as the controller for the RealFlight RC flight simulator.

TIP: The transmitter can be used with or without batteries when connected to your computer via the included USB adapter cable.

IMPORTANT: Do not power on the DXS prior to or while connected to the PC for use with RealFlight. The transmitter automatically draws power through the USB connection. Powering on the DXS prevents RealFlight from recognizing the transmitter.

To connect the DXS transmitter to the PC and RealFlight via USB:

1. Power **OFF** the DXS.
2. Disconnect any other game controllers from the computer.
3. Insert the USB-C end of the adapter cable into the port in the back of the transmitter.
4. Connect the USB-A end of the adapter to your computer. The DXS automatically powers on.
5. Start RealFlight. RealFlight should recognize the connected DXS controller and be ready for use.



Scan for help using the DXS (or other radios/transmitters/controllers) with RealFlight or visit: horizonhobby.cc/rfcontrollers

Pre-Flight Checklist

- ❏ Check all screws and ensure that they are tight
- ❏ Check main and tail blades to ensure they are not damaged
- ❏ Check all links and make sure they move freely but do not pop off easily
- ❏ Check that flight battery and transmitter battery are fully charged
- ❏ Check all wires to ensure that they are not cut, pinched, or chaffed and are properly secured
- ❏ Check all wire connections
- ❏ Check gears and make sure no teeth are missing
- ❏ Do a complete control test
- ❏ Verify the receiver sensor is correcting in the proper directions
- ❏ Check that servos are functioning properly
- ❏ Check to make sure the flight battery is properly secured
- ❏ Check to make sure all electronic components are properly secured

Flying Checklist

- ❏ Always turn the transmitter on first
- ❏ Plug the flight battery into the lead from the ESC
- ❏ Allow the ESC to initialize and arm properly
- ❏ Fly the model
- ❏ Land the model
- ❏ Unplug the flight battery from the ESC
- ❏ Always turn the transmitter off last

Flying the Revolution 155 CP

Consult your local laws and ordinances before choosing a location to fly your aircraft.
We recommend flying your aircraft outside in calm winds or inside a large gymnasium. Always avoid flying near houses, trees, wires and buildings. You should also be careful to avoid flying in areas where there are many people, such as busy parks, schoolyards or soccer fields. It is best to fly from a smooth flat surface as this will allow the model to slide without tipping over. Keep the helicopter approximately 2 ft (600mm) above the ground. Keep the nose pointed away you during initial flights to keep the control orientation consistent. Releasing the stick in Stability Mode will allow the helicopter to level itself. Activating the Panic Recovery button will level the helicopter quickly. If you become disoriented while in Stability Mode, slowly lower the throttle stick to land softly.
During initial flights, only attempt takeoff, landing and hovering in one spot.

Takeoff

NOTICE: If the main motor or tail motor do not start up properly when throttle is first applied, immediately return the throttle to the low position and try again. If the problem persists, disconnect the flight battery, check for binding in the gear train and ensure no wires have become entangled within the gears.

Place the model onto a flat, level surface free of obstacles and walk back 30 feet (10 meters). Slowly increase the throttle until the model is approximately 2 ft. (600mm) off the ground and begin flying the model.

Hovering

Making small corrections on the transmitter, try to hold the helicopter in one spot. If flying in calm winds, the model should require almost no corrective inputs. After moving the cyclic stick and returning it to center, the model should level itself. The model may continue to move due to inertia. Move the cycle stick in the opposite direction to stop the movement.
After you become comfortable hovering, you can progress toward flying the model to different locations, keeping the nose pointed away from you at all times. You can also ascend and descend using the throttle stick. Once you're comfortable with these maneuvers, you can attempt flying with the nose in different orientations. The flight control inputs rotate with the helicopter, so imagine the control inputs relative to the nose of the helicopter. For example, forward will always drop the nose of the helicopter.

Low Voltage Cutoff (LVC)

LVC decreases the power to the motors when the battery voltage gets low. When the motor power decreases and the red LED on the ESC flashes, land the aircraft immediately and recharge the flight battery.
LVC does not prevent the battery from over-discharge during storage.

NOTICE: Repeated flying to LVC will damage the battery.

Landing

To land, slowly decrease the throttle while in a low-level hover. After landing, disconnect and remove the battery from the aircraft after use to prevent trickle discharge. Review your manufacturers provided LiPo guidelines for charging and storage information.

Post-Flight Inspections and Maintenance

Ball Links	Make sure the plastic ball link holds the control ball, but is not tight (binding) on the ball. When a link is too loose on the ball, it can separate from the ball during flight and cause a crash. Replace worn ball links before they fail.
Cleaning	Make sure the battery is not connected before cleaning. Remove dust and debris with a soft brush or a dry lint free cloth.
Bearings	Replace bearings when they become damaged.
Wiring	Make sure wiring does not block moving parts. Replace damaged wiring and loose connectors.
Fasteners	Make sure there are no loose screws, other fasteners or connectors. Do not over tighten metal screws in plastic parts. Tighten screw so parts are mated together, then turn screw only 1/8th of a turn more.
Rotors	Make sure there is no damage to rotor blades and other parts which move at high speed. Damage to these parts includes cracks, burrs, chips or scratches. Replace damaged parts before flying.
Tail	Inspect the tail rotor for damage and replace if necessary. Verify the tail motor bolts, tail rotor adapter bolts and tail motor mount bolts are properly tightened. Inspect the tail boom for any damage and replace if necessary.
Mechanics	Inspect the main frame and landing gear for damage and replace if necessary. Check the mainshaft for vertical play and adjust the locking collar if necessary. Verify that the main gear mesh is correct and that no tight spots exist in the 360 degree rotation. Inspect all wires for damage and replace as necessary.
Flight Controller	Make sure the flight controller is securely attached to the frame. Replace the double-sided tape when necessary. The helicopter will crash if the flight controller separates from the helicopter frame.

Advanced Tuning (Forward Programming)

The following applies to forward programming capable Spektrum transmitters. Consult your transmitter manual or visit SpektrumRC.com for a complete list of forward programming capable transmitters.

The Revolution 155 CP default settings are appropriate for most users. We recommend flying with the default parameters before making any adjustments.

The Revolution 155 CP BNF flight controller can be programmed from any compatible Spektrum Smart transmitter (visit SpektrumRC.com for more information).

The flight controller shipped with the Revolution 155 CP has a range of adjustable parameters suitable for the helicopter and is not intended for use in other aircraft. It is important to use the included servos with the BNF flight controller because the adjustable parameters available for the SPMAR6250MHXG are designed around the recommended servos. It is possible there may not be enough range for the helicopter to be tuned when using alternative servos.

Entering the Advanced Parameters Menu

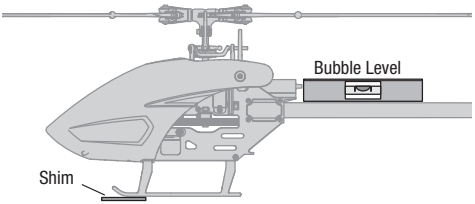
With the helicopter bound to the transmitter and powered on, enter the Function List and select Forward Programming. A list of adjustable parameters and the range of values available for tuning have been tailored for this helicopter. Make small changes to one parameter at a time, and test fly the changes before modifying those parameters further.

Calibration Procedure

If the helicopter is experiencing drift, perform the following calibration. When necessary, recalibrate the helicopter following crash repairs.

WARNING: Before beginning the calibration procedure, disconnect the main motor and tail motor leads to prevent accidental motor startup during calibration.

1. Ensure the calibration surface is level.
2. Power on the transmitter.
3. Activate throttle hold.
4. Connect the flight battery to the ESC, and allow the helicopter to initialize.
5. Using a bubble level (as shown), level the helicopter by placing a shim under the landing skid.
6. Enter the **Function List** on the transmitter.
7. Select **Forward Programming**.
8. Select **System Setup**.



9. Select **Calibration**.
10. Select **Apply** to begin calibration. The LED flashes yellow, indicating the calibration is proceeding normally. If the LED flashes red, the model is not level or the model has moved. In this case, calibration restarts.
11. After successful calibration, the receiver LED slowly flashes green.
12. Proceed to the pre-flight checklist before flying the model.

Factory Reset

If the process of tuning the helicopter results in undesirable flight performance, you can reset to factory defaults by selecting the Factory Reset option in Forward Programming.

1. Enter the **Function List**.
2. Select **Forward Programming**.
3. Select **System Setup**.
4. Select **Factory Reset**.
5. Select **Apply**.
6. Perform the Setup > Swashplate > Sub Trim function, and ensure the servos are properly trimmed.
7. Proceed with the pre-flight check list before flying the model.

Advanced Tuning (Non-Forward Programming)

Applies to Spektrum transmitters not capable of forward programing including DX6i, DX6e, DX7s DX8, and DX8e.

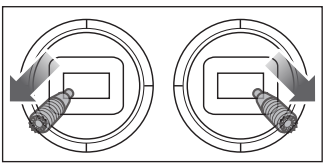
The helicopter was programmed and test flown at the factory. Servo adjustment might be necessary after a crash or after servo / linkage replacement.

For pilots flying with a non-forward programming transmitter, follow these steps to make servo adjustments and calibrate the helicopter.

The advanced tuning options must be entered within 30 seconds after initialization completes. In addition, the combination of dual rates and travel adjustments must result in a throw greater than 65% in order to enter the tuning modes.

Entering Servo Adjustment Mode

1. Lower the throttle stick.
2. Power on the transmitter, and activate throttle hold.
3. Install the flight battery, securing it with the hook and loop strap.
4. Connect the battery to the ESC.
5. After initialization is complete (indicated by a slow green flash), hold the left stick to the bottom left corner and the right stick to the bottom right corner as shown.



Servo Adjustment Mode is indicated by the swashplate servos jumping and then slowly moving back to center.

6. Release the sticks, and proceed to the next step.

Adjusting the Servo Neutral Position

With the model in Servo Adjustment Mode, the control stick and gyro inputs are disabled and the servos are held in the neutral position. Check the position of the servo arms to verify they are perpendicular to the servos.

- If the arms are perpendicular to the servos, no adjustment is necessary. Exit **Servo Adjustment Mode**.
- If one or more servo arm is not perpendicular to the servos, continue the servo adjustment process.

While watching the swashplate servos, apply fore or aft cyclic and release. One of the servos will jump, indicating the selected servo. Apply fore or aft cyclic and release until the servo that needs to be adjusted is selected.

Once the servo you wish to adjust is selected, move the cyclic stick left or right to adjust the servo neutral position in the desired direction.

To reset the current servo to the default neutral position, hold the rudder stick full right for two seconds.

The range of adjustment is limited. If you are unable to adjust the servo arm perpendicular to the servo, you must reset the servo to the default, neutral position, remove the servo arm, and place it back onto the servo as close to perpendicular as possible. Adjust the servo neutral position using the left or right cyclic stick.

Swashplate Leveling

Before saving the adjustments and exiting Servo Adjustment Mode, verify the swashplate is level and both main rotor blades are at 0 degrees pitch.

If they are not, adjust the linkages as necessary.

Saving the Servo Adjustments

1. Lower the throttle stick to the lowest position and release the sticks.
2. Move the tail rotor stick to the left and hold for four seconds to exit **Servo Adjustment Mode**. The servos will jump indicating a return to normal operation.
3. Release the tail rotor stick.
4. Perform the pre-flight checklist procedure before flying your model.

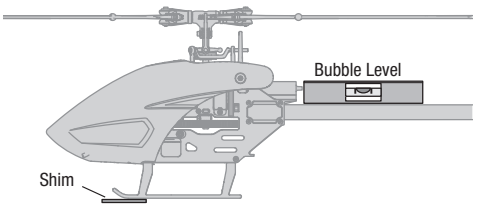
Control Input in Servo Adjustment Mode	Action in Servo Adjustment Mode
Fore/Aft Cyclic	Select Previous or Next Servo
Right/Left Cyclic	Increase or Decrease Sub Trim Adjustment
Right Tailrotor	Hold for Two Seconds; Neutral Position is Reset on Selected Servo
Left Tailrotor and Low Throttle	Hold for Four Seconds; Exit Servo Adjustment Mode

Calibration Procedure DXS (RTF)

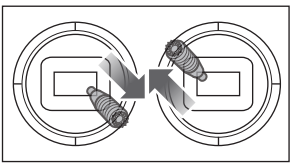
If the helicopter is experiencing drift, perform the following calibration. When necessary, recalibrate the helicopter following crash repairs.

WARNING: Before beginning the calibration procedure, disconnect the main motor and tail motor leads to prevent accidental motor startup during calibration.

1. Ensure the calibration surface is level.
2. Power on the transmitter and helicopter, allowing them to initialize.
3. Activate throttle hold.
4. Ensure the main motor and tail motor leads are disconnected.
5. Using a bubble level (as shown), level the helicopter by placing a shim under the landing skid.



6. Hold the left stick to the bottom right corner, the right stick to the upper left corner, and activate **Panic Recovery** until the receiver LED flashes once.



7. Release both sticks and deactivate **Panic Recovery**.
8. The receiver LED remains solid for 1–2 minutes while the calibration takes place.

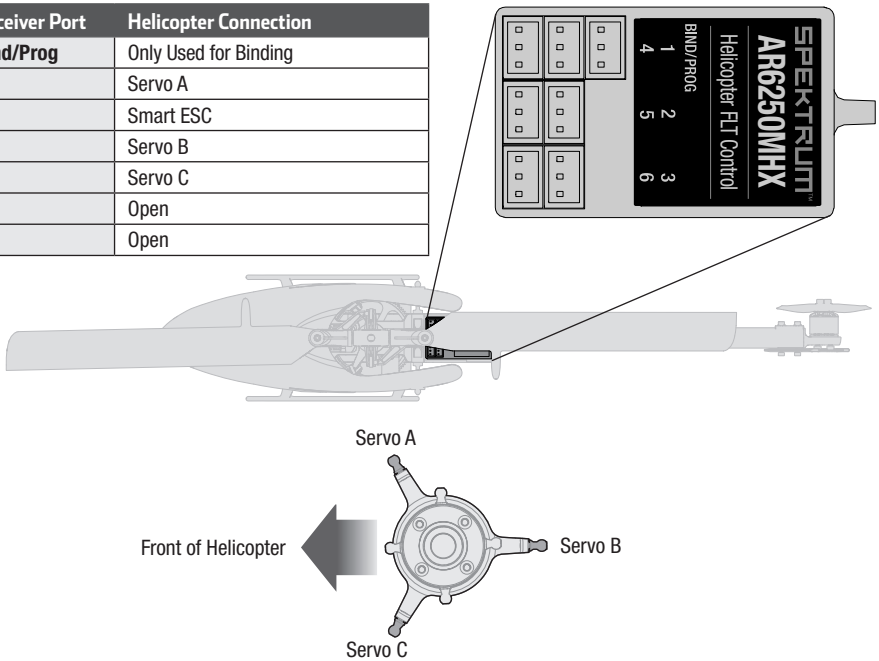
IMPORTANT: Do not move the helicopter during calibration. If the LED blinks rapidly, an error has occurred. Repeat the calibration procedure.

9. After successful calibration, the receiver LED slowly flashes green.
10. Power off the helicopter.
11. Reconnect the main motor and tail motor wires.
12. Perform the trim flight procedure.In subsequent flights, the helicopter will return to within 5 degrees of level consistently.

Swashplate Setup and Receiver Layout

Use the following diagram for correct component connection to the flight controller. Install the receiver label-side up.

Receiver Port	Helicopter Connection
Bind/Prog	Only Used for Binding
1	Servo A
2	Smart ESC
3	Servo B
4	Servo C
5	Open
6	Open

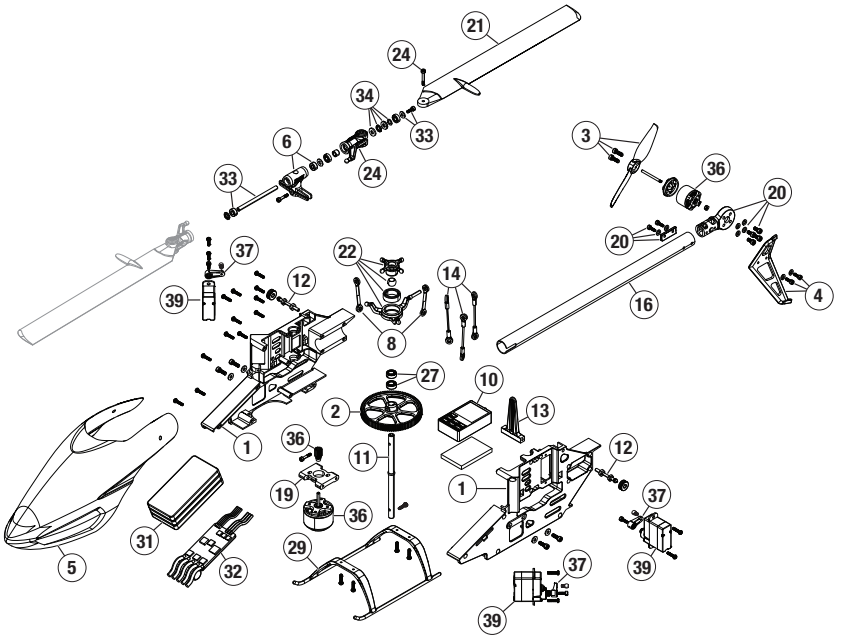


Troubleshooting Guide

Problem	Possible Cause	Solution
Aircraft control response is inconsistent or requires extra trim to neutralize movement	Aircraft was not properly initialized or a vibration is interfering with the sensor operation	Disconnect the flight battery, center the control trim, and re-initialize the aircraft
Aircraft does not respond to throttle	Throttle is too high and/or throttle trim is too high	Disconnect the flight battery, place the throttle stick in the lowest position, and move the throttle trim to the center position. Connect the flight battery, and allow the aircraft to initialize
	Aircraft moved during initialization	Disconnect the flight battery, and re-initialize the aircraft while keeping it from moving
Aircraft has reduced flight time or is under-powered	Flight battery charge is too low	Recharge the flight battery
	Flight battery is damaged	Replace the flight battery, and follow the flight battery instructions
	Flight conditions are too cold	Verify the battery is warm (room temperature) before use
Receiver LED flashes rapidly / helicopter does not respond to the transmitter (during binding)	Transmitter too near aircraft during binding process	Power off the transmitter. Move the transmitter further from the aircraft. Disconnect and reconnect the flight battery to the aircraft. Follow the binding instructions
	Bind switch or button was not held while transmitter was powered on	Power off the transmitter and repeat the bind process
	Aircraft or transmitter are too close to large metal object, wireless source or another transmitter	Move aircraft and transmitter to another location and reattempt binding

Problem	Possible Cause	Solution
Receiver LED flashes rapidly / helicopter does not respond to the transmitter (after binding)	Bind plug was not removed from receiver after binding	Disconnect the flight battery, remove the bind plug from the receiver, and reconnect the flight battery
	Less than a 5-second wait between powering on the transmitter and connecting the flight battery	Leave the transmitter powered on. Disconnect and reconnect the flight battery
	Aircraft is bound to a different model memory (ModelMatch™ transmitters only)	Select the correct model memory on the transmitter. Disconnect and reconnect the flight battery to the helicopter
	Flight battery or transmitter battery charge is too low	Replace or recharge batteries
	Aircraft or transmitter is too close to a large metal object, wireless source or another transmitter	Move aircraft and transmitter to another location and attempt reconnecting
Helicopter vibrates or shakes in flight	Damaged rotor blades, spindle or blade grips	Check main rotor blades and blade grips for cracks or chips. Replace damaged parts. Replace bent spindle
Random movements in flight	Vibration	Verify the receiver is properly attached to the aircraft
		Inspect mounting tape for damage
		Verify that no wires are contacting the receiver
		Inspect and balance all rotating components
		Verify the main shaft and tail rotor adapter are not damaged or bent
		Inspect mechanics for broken or damaged parts and replace as necessary
Tail oscillation/wag or poor performance	Damaged tail rotor, main gear mesh, loose bolts, vibration	Inspect the tail rotor for damage
		Verify all bolts on the tail assembly are tightened
		Verify main gear mesh and ensure no tight spots in the mesh through full rotation
		Replace damaged or worn components
Drift in calm winds	Vibration, damaged linkage, damaged servo	Verify the balance of all rotating components, ensure the linkages are not damaged, and verify the servos are in proper working condition
Return to Level does not level the aircraft	Aircraft did not initialize on a still, level surface	Re-initialize the aircraft on a still, level surface
	Aircraft did not take off from a level surface	Always lift off from a level surface
Severe vibration	Battery strapped too tightly to the aircraft	Loosen the battery strap
	A rotating component is out of balance	Check the following for damage and replace if necessary: • main shaft • tail rotor • main rotor blades • main frame Minimize vibration for Panic Recovery and Return to Level functions to work properly

Exploded View



Parts Listings

	Part #	Description
1	BLH-4224	Main Frame
2	BLH3408	Main Gear
3	BLH-4236	Tail Rotor
4	BLH-4225	Vertical Tail Fin
5	BLH-4229	Canopy, Blue
6	BLH3404	Main Rotor Head Block
8	BLH3405	Rotor Head Linkage Set
10	SPMAR6250MHXG	Flight Control
11	BLH3407	Main Shaft Set
12	BLH-4232	Canopy Post
13	BLH-4233	Anti-Rotation Bracket
14	BLH-4226	Swashplate Linkage Set
16	BLH-4227	Tail Boom
19	BLH-4231	Main Motor Mount
20	BLH-4234	Tail Motor Mount
21	BLH3402	Main Blades
22	BLH3406	Swashplate
24	BLH3401	Main Blade Grips

	Part #	Description
29	BLH3419	Landing Gear
31	SPMX4503SIC2	11.1V 450mAh 3S 50C LiPo Battery: IC2
32	SPMXAE2020A	Dual Brushless ESC
33	BLH3403	Feathering Spindle Set
34	BLH3438	2.5 x 6 x 2.8mm Thrust Bearing
35	SPMX-1147	Brushless Outrunner Motor, 1104–3450Kv
36	BLH3417	Brushless Main Motor
37	BLH-4230	Servo Arm Set
38	BLH-4235	Ball Bearing, 4 x 7 x 2mm
39	SPMSH2090	H2090 Nanolite 4 g High Speed Servo
	SPMR1010	DXS Transmitter Only
	SPMXC0050	S20 USB-C 3S LiPo Charger JST-XH 4-Pin

Optional Parts

Part #	Description
BLH-4228	Canopy, Yellow
SPMR7110	NX7e+ 7 Channel Transmitter Only

Part #	Description
SPMXBC200	XBC200 Smart Battery Checker & Servo Tester
SPMXC2050	S155 55W AC G2 Smart Charger

Important Federal Aviation Administration (FAA) Information

Recreational UAS Safety Test

Use the QR code to learn more about the Recreational UAS Safety Test (TRUST), as was introduced by the 2018 FAA Reauthorization Bill. This free test is required by the FAA for all recreational flyers in the United States. The completed certificate must be presented upon request by any FAA or law enforcement official.

FAA DroneZone

If your model aircraft weighs more than .55lbs or 250 grams, you are required by the FAA to register as a recreational flyer and apply your registration number to the outside of your aircraft. To learn more about registering with the FAA, use the QR code.

Remote ID Regulations

According to FAA regulation, all unmanned aircraft over .55lbs (250 grams), flying in United States airspace are required to either fly within an FAA-Recognized Identification Area (FRIA) or continually transmit an FAA-registered remote identification from a Remote ID broadcast module, such as the Spektrum™ Sky™ Remote ID module (SPMA9500). Use the QR code to learn more about the FAA Remote ID regulations.

AMA National Model Aircraft Safety Code

Effective January 1, 2018

A model aircraft is a non-human-carrying device capable of sustained flight within visual line of sight of the pilot or spotter(s). It may not exceed limitations of this code and is intended exclusively for sport, recreation, education and/or competition. All model flights must be conducted in accordance with this safety code and related AMA guidelines, any additional rules specific to the flying site, as well as all applicable laws and regulations.
As an AMA member I agree:

- I will not fly a model aircraft in a careless or reckless manner.
- I will not interfere with and will yield the right of way to all human-carrying aircraftusing AMA's See and Avoid Guidance and a spotter when appropriate.
- I will not operate any model aircraft while I am under the influence of alcohol or any drug that could adversely affect my ability to safely control the model.
- I will avoid flying directly over unprotected people, moving vehicles, and occupied structures.
- I will fly Free Flight (FF) and Control Line (CL) models in compliance with AMA's safety programming.
- I will maintain visual contact of an RC model aircraft without enhancement other than corrective lenses prescribed to me. When using an advanced flight system, such as an autopilot, or flying First-Person View (FPV), I will comply with AMA's Advanced Flight System programming.
- I will only fly models weighing more than 55 pounds, including fuel, if certified through AMA's Large Model Airplane Program.
- I will only fly a turbine-powered model aircraft in compliance with AMA's Gas Turbine Program.
- I will not fly a powered model outdoors closer than 25 feet to any individual, except for myself or my helper(s) located at the flightline, unless I am taking off and landing, or as otherwise provided in AMA's Competition Regulation.
- I will use an established safety line to separate all model aircraft operations from spectators and bystanders.

Limited Warranty

What this Warranty Covers
Horizon Hobby, LLC, (Horizon) warrants to the original purchaser that the product purchased (the "Product") will be free from defects in materials and workmanship at the date of purchase.

What is Not Covered
This warranty is not transferable and does not cover (i) cosmetic damage, (ii) damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance, (iii) modification of or to any part of the Product, (iv) attempted service by anyone other than a Horizon Hobby authorized service center, (v) Product not purchased from an authorized Horizon dealer, (vi) Product not compliant with applicable technical regulations, or (vii) use that violates any applicable laws, rules, or regulations.
OTHER THAN THE EXPRESS WARRANTY ABOVE, HORIZON MAKES NO OTHER WARRANTY OR REPRESENTATION, AND HEREBY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

Purchaser's Remedy
Horizon's sole obligation and purchaser's sole and exclusive remedy shall be that Horizon will, at its option, either (i) service, or (ii) replace, any Product determined by Horizon to be defective. Horizon reserves the right to inspect any and all Product(s) involved in a warranty claim. Service or replacement decisions are at the sole discretion of Horizon. Proof of purchase is required for all warranty claims. SERVICE OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY.

Limitation of Liability
HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY, REGARDLESS OF WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR ANY OTHER THEORY OF LIABILITY, EVEN IF HORIZON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability. If you as the purchaser or user are not prepared to accept the liability associated with the use of the Product, purchaser is advised to return the Product immediately in new and unused condition to the place of purchase.

Law
These terms are governed by Illinois law (without regard to conflict of law principals). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Horizon reserves the right to change or modify this warranty at any time without notice.

WARRANTY SERVICES

Questions, Assistance, and Services
Your local hobby store and/or place of purchase cannot provide warranty support or service. Once assembly, setup or use of the Product has been started, you must contact your local distributor or Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please visit our website at www.horizonhobby.com, submit a Product Support Inquiry, or call the toll free telephone number referenced in the Warranty and Service Contact Information section to speak with a Product Support representative.

Inspection or Services
If this Product needs to be inspected or serviced and is compliant in the country you live and use the Product in, please use the Horizon Online Service Request submission process found on our website or call Horizon to obtain a Return Merchandise Authorization (RMA) number. Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon is not responsible for merchandise until it arrives and is accepted at our facility. An Online Service Request is available at http://www.horizonhobby.com/content/service-center_render-service-center. If you do not have internet access, please contact Horizon Product Support to obtain a RMA number along with instructions for submitting your product for service. When calling Horizon, you will be asked to provide your complete name, street address, email address and phone number where you can be reached during business hours. When sending product into Horizon, please include your RMA number, a list of the included items, and a brief summary of the problem. A copy of your original sales receipt must be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

NOTICE: Do not ship LiPo batteries to Horizon. If you have any issue with a LiPo battery, please contact the appropriate Horizon Product Support office.

Warranty Requirements
For Warranty consideration, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be serviced or replaced free of charge. Service or replacement decisions are at the sole discretion of Horizon.

Non-Warranty Service

Should your service not be covered by warranty, service will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for service you are agreeing to payment of the service without notification. Service estimates are available upon request. You must include this request with your item submitted for service. Non-warranty service estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Horizon accepts money orders and cashier's checks, as well as Visa, MasterCard, American Express, and Discover cards. By submitting any item to Horizon for service, you are agreeing to Horizon's Terms and Conditions found on our website http://www.horizonhobby.com/content/service-center_render-service-center.

ATTENTION: Horizon service is limited to Product compliant in the country of use and ownership. If received, a non-compliant Product will not be serviced. Further, the sender will be responsible for arranging return shipment of the un-serviced Product, through a carrier of the sender's choice and at the sender's expense. Horizon will hold non-compliant Product for a period of 60 days from notification, after which it will be discarded.

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Warranty and Service Contact Information

Country of Purchase	Horizon Hobby	Contact Information	Address
United States of America	Horizon Service Center (Repairs and Repair Requests)	servicecenter.horizonhobby.com/RequestForm/	2904 Reasearch Rd Champaign, Illinois, 61822 USA
	Horizon Product Support (Product Technical Assistance)	productsupport@horizonhobby.com 800-338-4639	
	Sales	websales@horizonhobby.com 800-338-4639	
European Union	Horizon Technischer Service	service@horizonhobby.de	Hanskampring 9 D 22885 Barsbüttel, Germany
	Sales: Horizon Hobby GmbH	+49 (0) 4121 2655 100	

FCC Information

Contains FCC ID: BRWKATY1T
Contains FCC ID: BRWWACO1T

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and/or antenna and your body (excluding fingers, hands, wrists, ankles and feet). This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Supplier's Declaration of Conformity

BLH Revolution 155 RTF (BLH01600) and BNF Basic (BLH01650)

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.

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

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Horizon Hobby, LLC
2904 Research Rd.,
Champaign, IL 61822
Email: compliance@horizonhobby.com
Web: HorizonHobby.com

IC Information

CAN ICES-3 (B)/NMB-3(B)
Contains IC: 6157A-KATY1T
Contains IC: 6157A-WAC01T

This device contains license-exempt transmitter(s)/ receivers(s) that comply with Innovation, Science, and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following 2 conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Compliance Information for the European Union

EU Compliance Statement:
BLH Revolution 155 CP RTF (BLH01600): Hereby, Horizon Hobby, LLC declares that the device is in compliance with the following: EU Low Voltage Directive 2014/35/EU, EU EMC Directive 2014/30/EU, EU Radio Equipment Dircetive 2014/53/EU, RoHS 2 Directive 2011/65/EU, RoHS 3 Directive - Amending 2011/65/EU Annex II 2015/863.

BLH Revolution 155 CP BNF Basic (BLH01650): Hereby, Horizon Hobby, LLC declares that the device is in compliance with the following: EU Radio Equipment Directive 2014/53/EU, RoHS 2 Directive 2011/65/EU, RoHS 3 Directive - Amending 2011/65/EU Annex II 2015/863.

The full text of the EU declaration of conformity is available at the following internet address: https://www.horizonhobby.com/content/support-render-compliance.

NOTE: This product contains batteries that are covered under the 2006/66/EC European Directive, which cannot be disposed of with normal household waste. Please follow local regulations.

Wireless Frequency Range and Wireless Output Power:
6157A-KATY1T:
2402 – 2478 MHz
17.7dBm

6157A-WAC01T:
2402 – 2478 MHz
1.43dBm

E328 UKCA

EU Manufacturer of Record:
Horizon Hobby, LLC
2904 Research Road
Champaign, IL 61822 USA

EU Importer of Record:
Horizon Hobby, GmbH
Hanskampring 9
22885 Barsbüttel Germany

WEEE NOTICE:

This appliance is labeled in accordance with European Directive 2012/19/EU concerning waste of electrical and electronic equipment (WEEE). This label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.

Updated 05/26 1031842.1 BLH1600, BLH1650