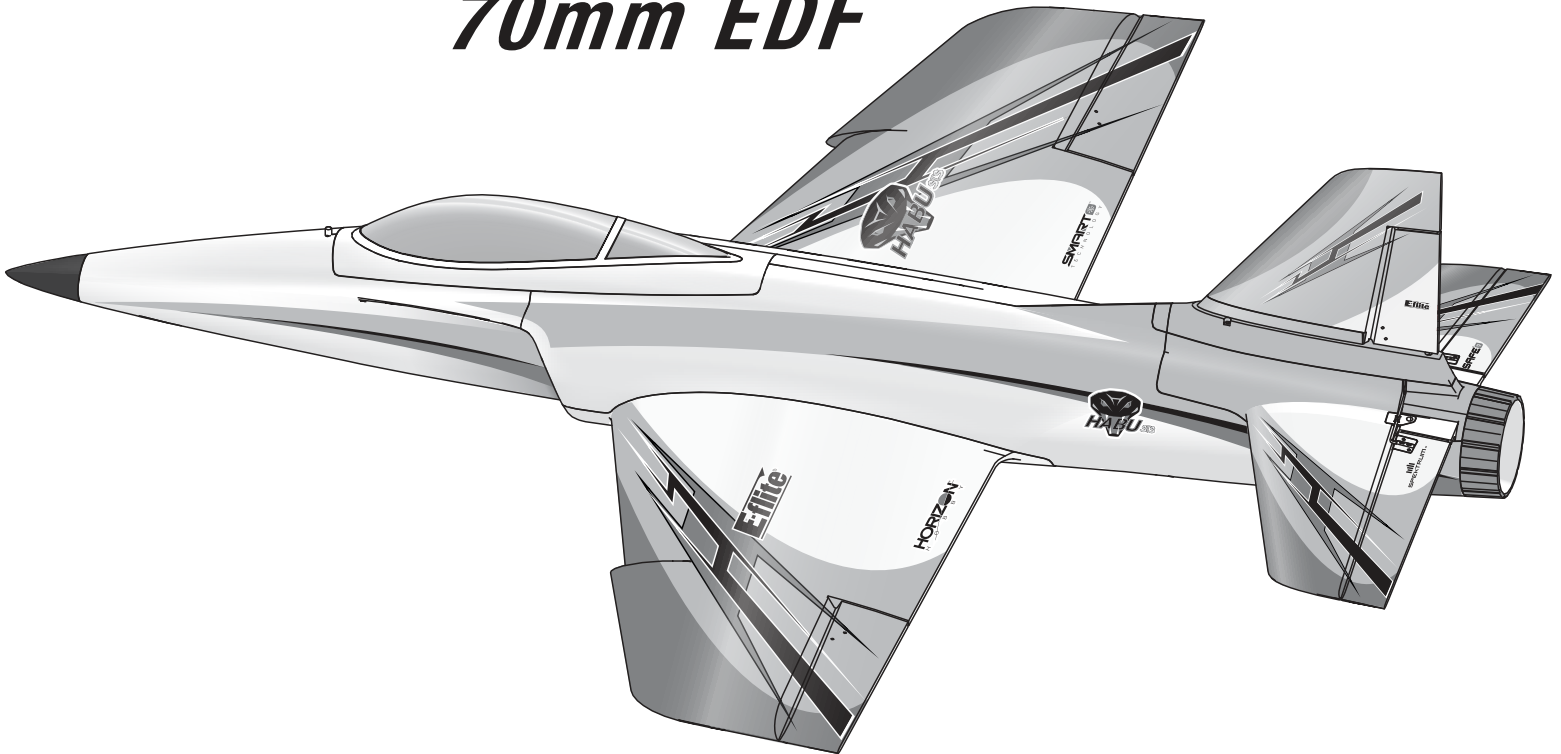


E-flite[®]
ADVANCING ELECTRIC FLIGHT

HABU^{SS}

70mm EDF



Scan the QR code and select the Manuals and Support quick links from the product page for the most up-to-date manual information.

Scannen Sie den QR-Code und wählen Sie auf der Produktseite die Quicklinks Handbücher und Unterstützung, um die aktuellsten Informationen zu Handbücher.

Scannez le code QR et sélectionnez les liens rapides Manuals and Support sur la page du produit pour obtenir les informations les plus récentes sur le manuel.

Scannerizzare il codice QR e selezionare i Link veloci Manuali e Supporto dalla pagina del prodotto per le informazioni manuali più aggiornate.



EFL0950



EFL0975

Instruction Manual
Bedienungsanleitung
Manuel d'utilisation
Manuale di Istruzioni

HORIZON[®]
H O B B Y

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 www.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 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.

14+ AGE RECOMMENDATION: Not for children under 14 years. This is not a toy.

Safety Precautions and Warnings

As the user of this product, you are solely responsible for operating in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

- 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 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.
- Always ensure failsafe is properly set before flying.
- 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.

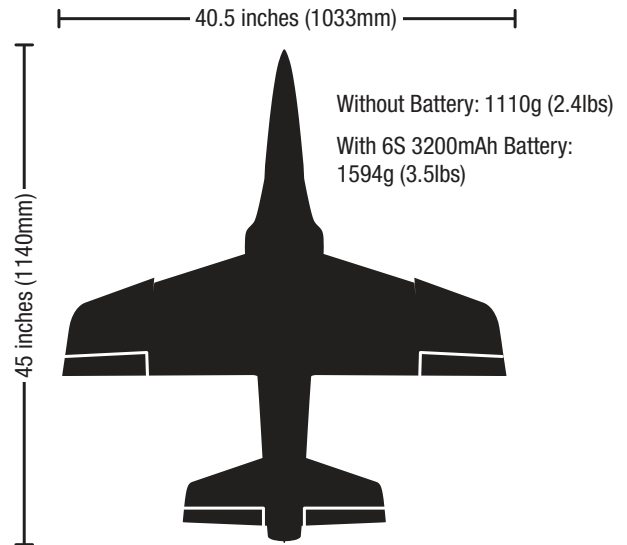
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Included / Recommended Equipment

	BNF BASIC	PNP PLUG-N-PLAY™
Motor: 2847–2400Kv 6-Pole Brushless Motor (SPMXAM2200)	Installed	Installed
Fan Unit: 70mm Ducted Fan Unit (EFL0955)	Installed	Installed
ESC: 70-Amp 3S/6S ESC w/Telemetry (SPMXAE70A)	Installed	Installed
Servos: (2) 9g Mini Servo (SPMSA381) (3) 13g Digital MG Micro Servo (SPMSA382)	Installed	Installed
Receiver: Spektrum™ AR631 Receiver (SPMAR631)	Installed	Required
Recommended Battery: 22.2V 3200mAh 6S 30C Smart LiPo, IC5® (SPMX32006S30)	Required	Required
Recommended Battery Charger: S1200 Smart, 1x200 W (SPMXC2020)	Required	Required
Recommended Transmitter: Full-Range 2.4GHz with Spektrum™ DSM2®/DSMX® technology with programmable mixing and adjustable dual rates	Required	Required

Receiver Bind Information	
Channels	6
Frequency	2404 – 2476 MHz
Compatibility	DSM2 and DSMX



If you own this product, you may be required to register with the FAA. For up-to-date information on how to register with the FAA, please visit <https://registermyuas.faa.gov/>. For additional assistance on regulations and guidance on UAS usage, visit knowbeforeyoufly.org/.

Transmitter Setup *BNF*

IMPORTANT: After you set up your model, always rebind the transmitter and receiver to set the desired failsafe positions.

Dual Rates

Make your first flights in low rate. For landings, use high rate elevator.

NOTICE: To ensure AS3X technology functions properly, do not lower rate values below 50%. If less control deflection is desired, manually adjust the position of the pushrods on the servo arm

NOTICE: If oscillation occurs at high speed, refer to the Troubleshooting Guide for more information.

Exponential (Expo)

After first flights, you may adjust expo in your transmitter.

† Some of the terminology and function locations used in the iX12 and iX20 programming may be slightly different than other Spektrum AirWare™ radios. The names given in parentheses correspond to the iX12 and iX20 programming terminology. Consult your transmitter manual for specific information about programming your transmitter.

Computerized Transmitter Setup

Start all transmitter programming with a blank ACRO model (perform a model reset), then name the model.		
Set Dual Rates to	HIGH 100%	LOW 70%
Set Servo Travel to	100%	
Set Throttle Cut to	-100%	
Set Aileron Expo to	High Rate 15%	Low Rate 5%
Set Elevator Expo to	High Rate 10%	Low Rate 5%
Set Rudder Expo to	High Rate 10%	Low Rate 5%
DXe	Refer to spektrumrc.com for the appropriate download setup.	
DX7S DX8	1. Go to the SYSTEM SETUP	
	2. Set MODEL TYPE: AIRPLANE	
	3. Set WING TYPE: 1 AIL	
DX6e DX6 (Gen2) DX7 (Gen2) DX8e DX8 (Gen2)	1. Go to the SYSTEM SETUP (Model Utilities)†	
	2. Set MODEL TYPE: AIRPLANE	
DX9 DX10t DX18 DX20 iX12 iX20 NX6 NX8 NX10	3. Set AIRCRAFT TYPE (Model Setup, Aircraft Type)†: WING: 1 AIL	

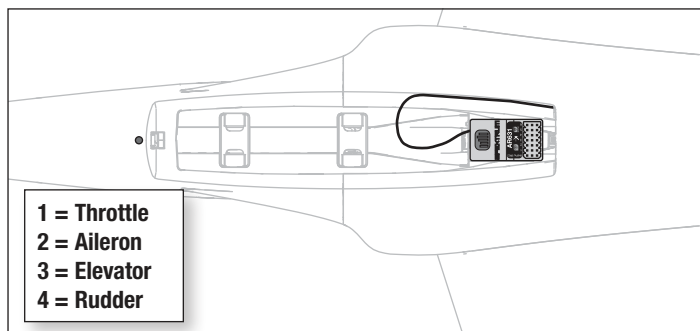
Receiver Selection and Installation *PNP*

The recommended receiver for this aircraft is the Spektrum AR631.

If you choose to install a different receiver, it needs to be a 4-channel or more full range (sport) receiver. Refer to the manual of your chosen receiver for correct installation and operation instructions.

AR631 Installation

1. Press the latch button and remove the canopy.
2. Attach the appropriate control surfaces to their respective ports on the receiver using the table at the right.
3. Using double-sided servo tape, mount the receiver to the flat area behind the ESC, as shown. The receiver should be mounted in the orientation shown, parallel to the length of the fuselage, with the label facing up and the servo ports facing the rear of the aircraft. The orientation of the receiver is critical for all AS3X® and SAFE® technology setups.

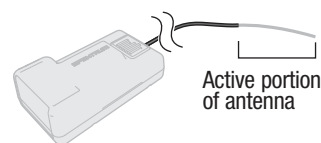


CAUTION: Incorrect installation of the receiver could cause a crash.

ANTENNA INSTALLATION

The AR631 receiver has a coaxial style antenna. We recommend installing the antenna as far as possible from metal, batteries, or carbon fiber to maximize signal reception performance.

NOTICE: Do not cut, kink, or modify the antenna. Damage to the coaxial portion of an antenna will reduce the performance of the antenna. Shortening or cutting off the 31mm tip will reduce the range.

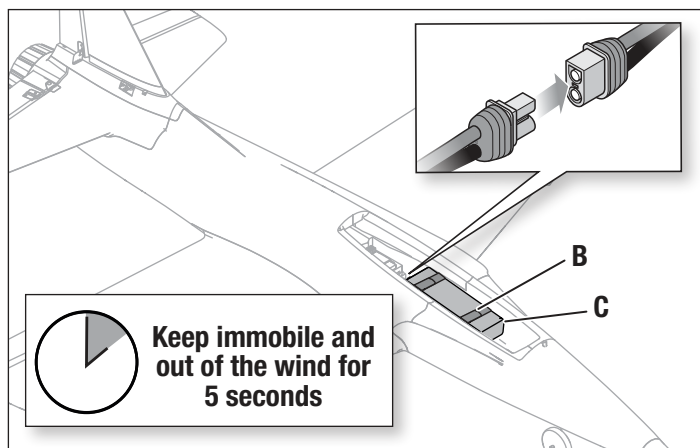
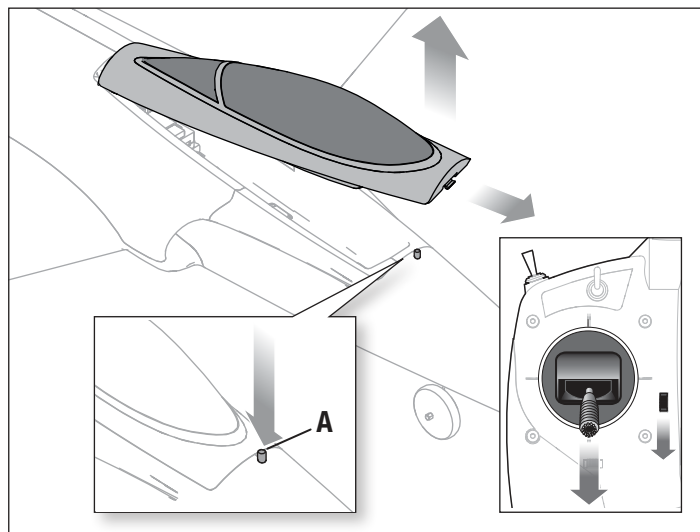


Flight Battery Installation and Electronic Speed Control (ESC) Arming

1. Rest the aircraft on its landing gear on a flat surface.
2. Lower the throttle and turn on the throttle hold switch, then power on the transmitter for at least 5 seconds.
3. Press the latch button (A) and remove the canopy.
4. Secure the flight battery (B) in the battery compartment using the hook and loop straps (C) so that the aircraft has a balanced Center of Gravity (CG).
5. Connect the flight battery to the ESC.

IMPORTANT: Before flying, refer to the “Verifying Your Aircraft’s Center of Gravity (CG)” section for details about final battery placement.

6. Replace the canopy.



General Binding Tips and Failsafe *BNF*

- The included receiver has been specifically programmed for operation of this aircraft. Refer to the receiver manual for correct setup if the receiver is replaced.
- Keep away from large metal objects while binding.
- Do not point the transmitter's antenna directly at the receiver while binding.
- The orange LED on the receiver will flash rapidly when the receiver enters bind mode.
- Once bound, the receiver will retain its bind settings for that transmitter until you re-bind.
- If the receiver loses transmitter communication, the failsafe will activate. Failsafe moves the throttle channel to low throttle. Pitch and roll channels move to actively stabilize the aircraft in a descending turn.
- If problems occur, refer to the troubleshooting guide or if needed, contact the appropriate Horizon Product Support office.

Transmitter and Receiver Binding / Enabling and Disabling SAFE Select *BNF*

The BNF Basic version of this airplane includes SAFE Select technology, enabling you to choose the level of flight protection. SAFE mode includes angle limits and automatic self leveling. AS3X mode provides the pilot with a direct response to the control sticks. SAFE Select is enabled or disabled during the bind process. With SAFE Select disabled the aircraft is always in AS3X mode. With SAFE Select enabled the aircraft will be in SAFE Select mode all the time, or you can assign a switch to toggle between SAFE Select and AS3X modes.

Thanks to SAFE Select technology, this aircraft can be configured for full-time SAFE mode, full-time AS3X mode, or mode selection can be assigned to a switch.

IMPORTANT: Before binding, read the transmitter setup section in this manual and complete the transmitter setup table to ensure your transmitter is properly programmed for this aircraft.

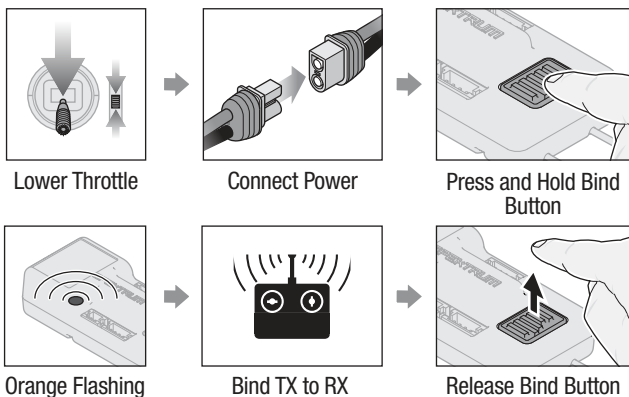
IMPORTANT: Move the transmitter flight controls (rudder, elevators, and ailerons) and the throttle trim to neutral. Move the throttle to low before and during binding. This process defines the failsafe settings.

You can use either the bind button on the receiver case or the conventional bind plug to complete the binding and SAFE Select process.

SAFE Select can also be activated via Forward Programming in compatible transmitters.

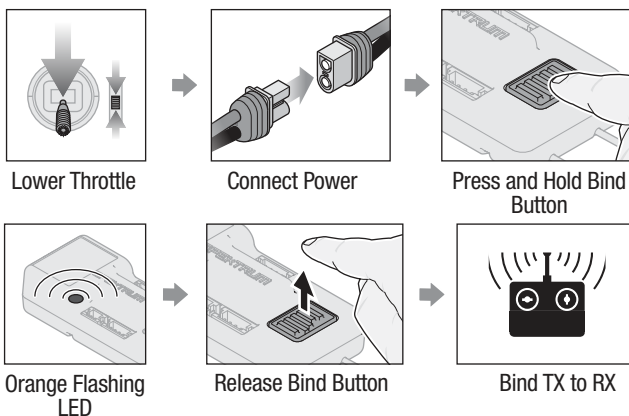
Using The Bind Button...

To Enable SAFE Select



SAFE SELECT ENABLED: The control surfaces cycle back and forth **twice** with a slight pause at neutral every time the receiver is powered on.

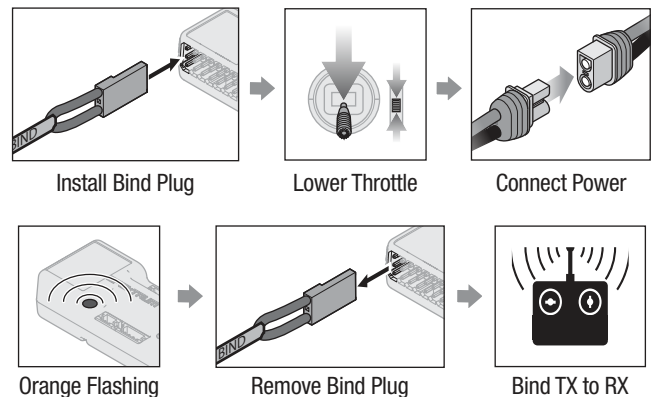
To Disable SAFE Select



SAFE SELECT DISABLED: The control surfaces cycle back and forth **once** every time the receiver is powered on.

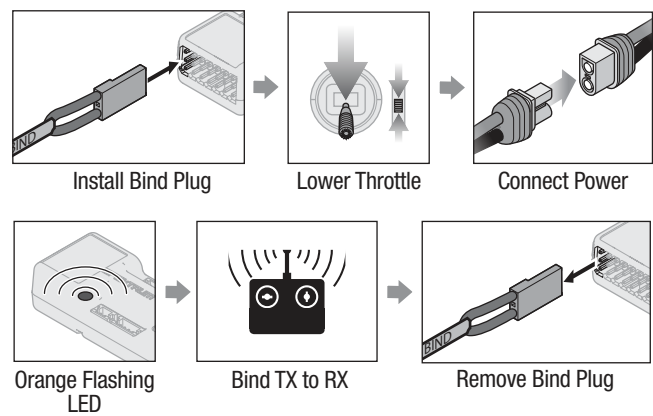
Using The Bind Plug...

To Enable SAFE Select



SAFE SELECT ENABLED: The control surfaces cycle back and forth **twice** with a slight pause at neutral every time the receiver is powered on.

To Disable SAFE Select



SAFE SELECT DISABLED: The control surfaces cycle back and forth **once** every time the receiver is powered on.

SAFE® Select Switch Designation *BNF*

Once SAFE Select is enabled, you can choose to fly in SAFE mode full-time, or assign a switch. Any switch on any channel between 5 and 9 can be used on your transmitter. If the aircraft is bound with SAFE Select disabled, the aircraft will be in AS3X mode exclusively.

⚠ CAUTION: Keep all body parts well clear of the propeller and keep the aircraft securely restrained in case of accidental throttle activation.

IMPORTANT: To be able to assign a switch, first verify:

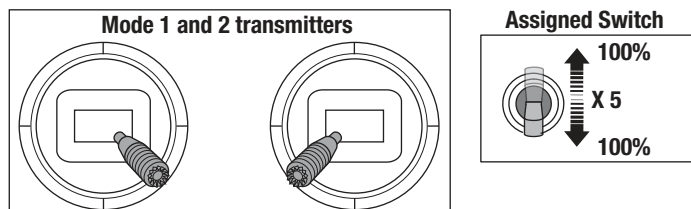
- The aircraft was bound with SAFE Select enabled.
- Your choice for the SAFE Select switch is assigned to a channel between 5 and 9 (Gear, Aux1-4), and travel is set at 100% in each direction.
- The aileron, elevator, rudder and throttle direction are set to normal, not reverse.
- The aileron, elevator, rudder and throttle are set to 100% travel. If dual rates are in use, the switches need to be in the 100% position.

See your transmitter manual for more information about assigning a switch to a channel.

Assigning a Switch

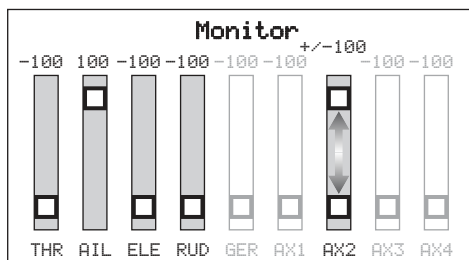
1. Power on the transmitter.
2. Power on the aircraft.
3. Hold both transmitter sticks to the inside bottom corners, and toggle the desired switch 5 times quickly (1 toggle = full up and down).
4. The control surfaces of the aircraft will move, indicating the switch has been selected.

Repeat the process to assign a different switch or to deactivate the current switch.



TIP: Use the channel monitor to verify channel movement.*

* This example of the channel monitor shows the stick positions for assigning a switch, the switch selection on Aux2, and +/- 100% travel on the switch.



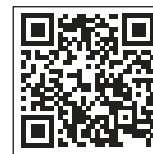
Forward Programming

Assign the SAFE Select channel through forward programming on your compatible Spektrum transmitter.

Forward Programming SAFE Select Setup	
DX series, NX series, iX series	1. Begin with the transmitter bound to the receiver.
	2. Power ON the transmitter.
	3. Assign a switch for SAFE Select that is not already in use for another function. Use any open channel between 5 and 9 (Gear, Aux1-4).
	4. Set switch H (throttle cut) to prevent accidental motor operation.
	5. Power ON the aircraft. A signal bar appears on your transmitter's main screen when the telemetry information is being received.
	6. Go to the FUNCTION LIST (Model Setup)
	7. Select Forward Programming; Select Gyro Settings; Choose SAFE Select to enter the menu.
	8. Set SAFE Select Ch: To the channel you have chosen for SAFE Select.
	9. Set AS3X and SAFE On or Off as desired for each switch position.

For more information about setting SAFE Select and using Forward Programming, please refer to the following link for a detailed video:

<https://www.youtube.com/watch?v=o-46P066cik>



Integrated ESC Telemetry

BNF: This aircraft includes telemetry between the ESC and receiver, which can provide information including RPM, voltage, motor current, throttle setting (%), and FET (speed controller) temperature.

PNP: The ESC in this aircraft is capable of delivering telemetry information over the throttle connection when paired with a Smart compatible Spektrum telemetry receiver. It will function with a normal PWM servo signal for common radio control systems.

For more information about compatible transmitters, firmware updates, and how to use the telemetry technology on your transmitter, visit www.SpektrumRC.com.

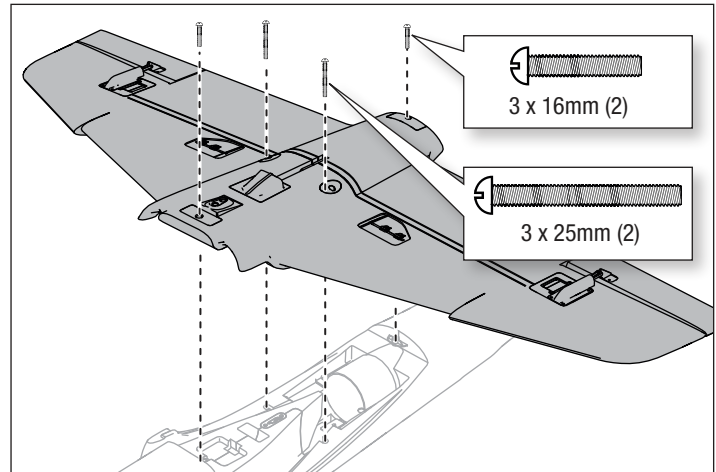
Telemetry Setup	
DX series, NX series, iX series	1. Begin with the transmitter bound to the receiver.
	2. Power ON the transmitter.
	3. Set switch H (throttle cut) to prevent accidental motor operation.
	4. Power ON the aircraft. A signal bar appears on your transmitter's main screen when the telemetry information is being received.
	5. Go to the FUNCTION LIST (Model Setup)
	6. Select TELEMETRY; Smart ESC
	7. Set Total Cells: 4 or 6 cells, depending on the battery
	8. Set LVC Alarm: 3.4V Set Alarm; Voice/Vibe
	9. Set pole count; 6 pole

Assemble the Aircraft

Wing Installation

1. Position the wing and fuselage with the bottom side facing up.
2. Align and attach the wing to the fuselage.
3. Secure the wing to the fuselage using the 4 screws. Use two screws (M3 x 16mm) for the front and rear holes. Use two screws (3mm x 25mm) for the side holes.

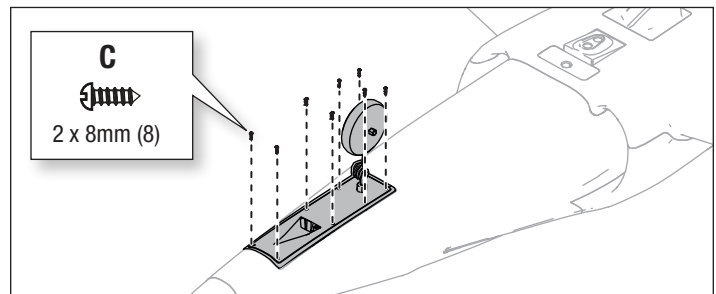
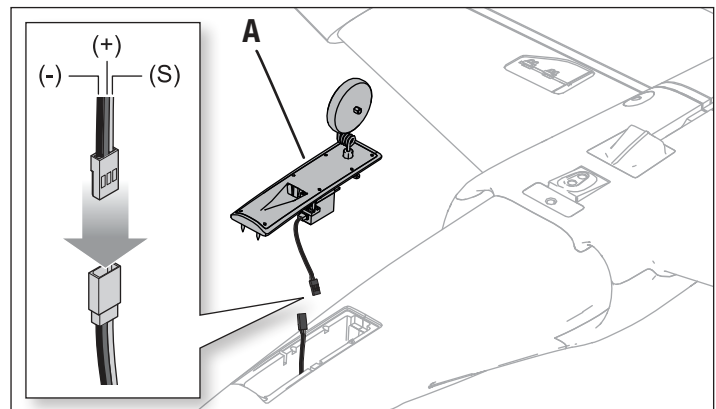
Disassemble in reverse order.



Nose Gear Installation

1. Connect the nose gear assembly servo connector to the nose gear servo extension in the fuselage. When connecting the servo connectors match the colored wires when inserting the male servo plug in the female. Orange is the signal wire (S), red is positive (+), brown is negative (-).
2. Install the nose gear assembly (A) into the fuselage with the air inlet facing forward.
3. Secure the nose gear assembly using eight 2mm x 8mm screws (C).

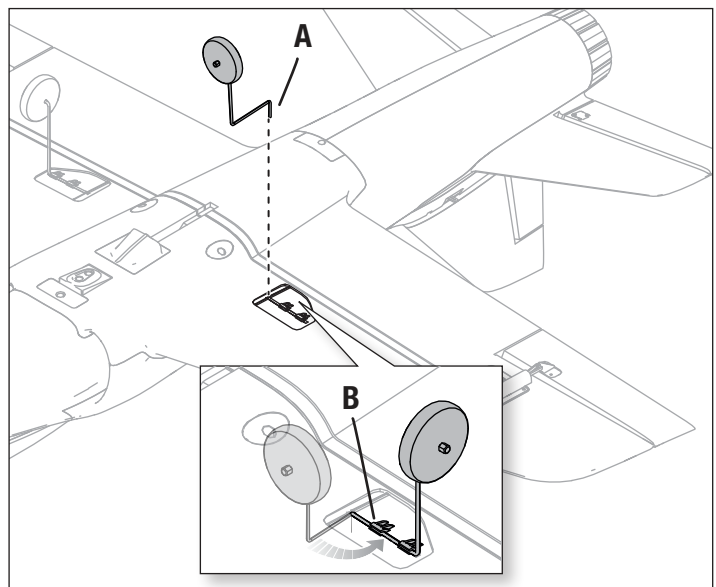
Disassemble in reverse order.



Main Gear Installation

1. Place the aircraft inverted.
2. Insert the main gear strut (A) into the landing gear plate hole located on the wing.
3. Carefully turn each strut in the landing gear plate until the horizontal section (B) of the strut gently snaps into place.

Where needed, disassemble in reverse order.

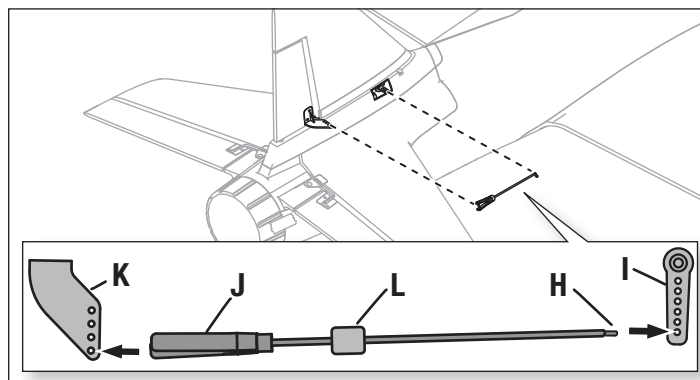
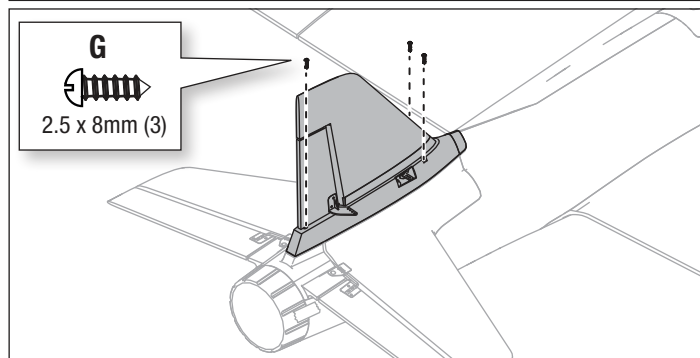
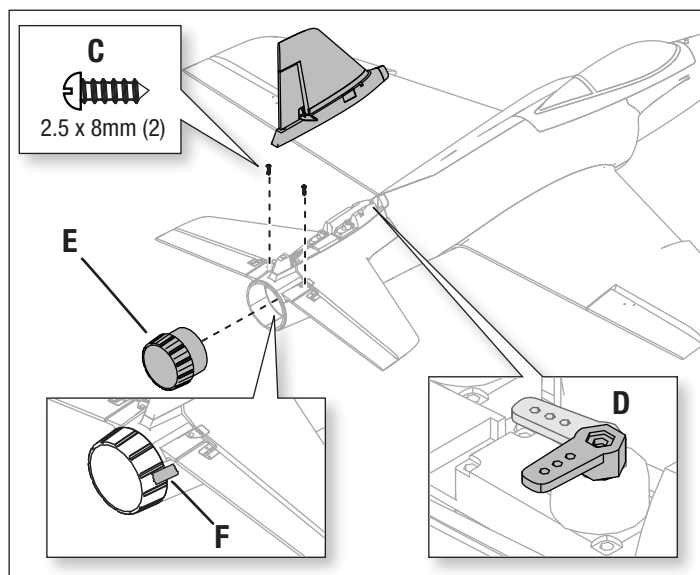
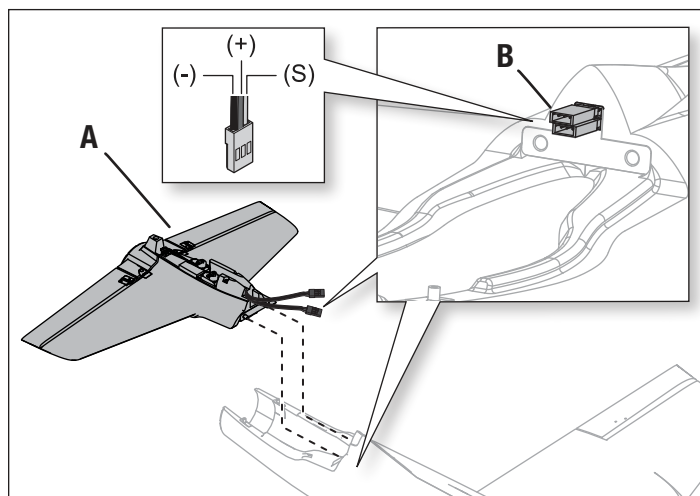


Assemble the Aircraft

Tail Installation

1. Loosely align the horizontal stabilizer assembly (A) on the rear of the fuselage.
 2. Correctly connect the rudder and elevator servo connectors (B) to the marked connectors in the fuselage. Orange is the signal wire (S), red is positive (+), brown is negative (-).
- IMPORTANT:** Ensure no wires are pinched or damaged when the tail unit is attached to the fuselage.
3. Install and secure the tail assembly on the top of the rear fuselage using two screws (C).
 4. Manually position the rudder servo arm as shown (D).
 5. Align the vertical fin with the fuselage and guide the rudder servo arm through the hole of the vertical fin base.
 6. Secure the vertical fin to the fuselage with three 2.5mm x 8mm screws (G).
 7. Attach the Z-bend of the linkage (H) in the outer hole of the rudder servo arm (I).
 8. Attach the linkage clevis (J) to the outer hole of the rudder control horn (K). Ensure the tube (L) tightens the clevis on the control horn.
 9. Align and press the tail cone (E) on the rear of the fuselage and secure the cone in place with included tape (F).

When needed, disassemble in reverse order.



Center of Gravity (CG)

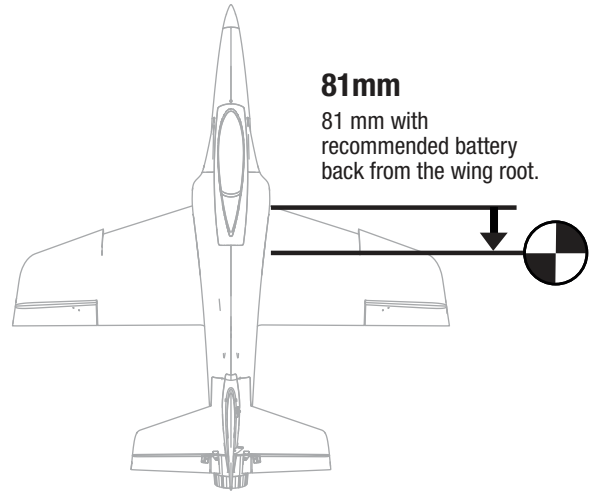
After installing the battery (in the recommended position) and before powering on the ESC, verify the CG. The CG location starting point is 81mm (range: 70mm–105mm) behind the leading edge, as shown.

4S 3200mAh Smart battery CG position – The battery is installed all the way forward in battery compartment. Only the front battery strap will be used.

6S 3200mAh Smart battery CG position – The battery is installed centered in the battery tray, using both front and rear battery straps.

Balance the aircraft inverted on your fingertips adjacent to the fuselage under the wings.

- If the nose goes down, move the flight battery back until the aircraft balances.
- If the nose goes up, move the flight battery forward until the aircraft balances.



Control Direction Test

WARNING: Do not perform this or any other equipment test with the propeller installed on the aircraft. Serious injury or property damage could result from the motor starting inadvertently.

1. Set the flight mode switch to **AS3X**.
2. Keep the throttle at zero and place the model on level ground away from obstacles.
3. Move the sticks on the transmitter as described in the table to ensure the aircraft control surfaces respond as shown.

If the control surfaces do not respond as shown, **DO NOT FLY**. Refer to the *Troubleshooting Guide* for more information. If you need more assistance, contact the appropriate Horizon Hobby Product Support department.

If the aircraft responds as shown, continue on to the Flight Control section.

	Transmitter Command	Control Surface Response
Elevator		
Aileron		
Rudder		

Choose a Flying Field

Consult local laws and ordinances before choosing a location to fly your aircraft.

In order to have the most success and to protect your property and aircraft, it is very important to select a place to fly that is very open.

Remember, your aircraft can reach significant speeds when flying and can cover ground quickly. Plan on flying in an area that gives you more space than you think you need, especially with first flights.

The flying site should:

- Have a minimum of approximately 1300 feet (400m) of clear space in all directions.
- Be clear of people and pets.
- Be free of trees, buildings, cars, power lines or anything that could entangle your aircraft or interfere with your line of sight.

AS3X Control Response Test *BNF*


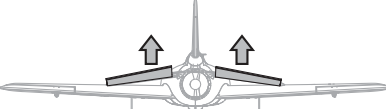







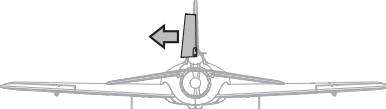

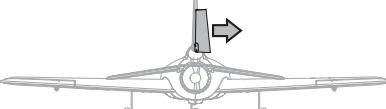
This test ensures that the AS3X control system is functioning properly. Assemble the aircraft and bind your transmitter to the receiver before performing this test.

1. Raise the throttle to any setting above 25%, then lower the throttle to activate AS3X technology.

CAUTION: Keep all body parts, hair and loose clothing away from the intake ducts as these items could become entangled.

2. Move the entire aircraft as shown and ensure the control surfaces move in the direction indicated in the graphic. If the control surfaces do not respond as shown, do not fly the aircraft. Refer to the receiver manual for more information or visit www.SpektrumRC.com.

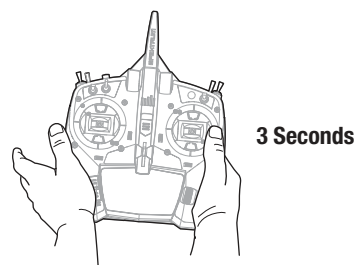
Once the AS3X system is active, control surfaces may move rapidly. This is normal. AS3X remains active until the battery is disconnected.

	Aircraft Movement	AS3X Reaction
Pitch		
		
Roll		
		
Yaw		
		

In Flight Trimming *BNF*

During your first flight, trim the aircraft for your flying style in AS3X flight mode. Flight trim is usually performed between 70–100% power setting, per your preference. Make small trim adjustments with your transmitter's trim switches to straighten the aircraft's flight path.

After adjusting the trim, do not touch the control sticks for 3 seconds. This allows the receiver to learn the correct settings to optimize AS3X performance. Failure to do so could affect flight performance.



Dual Rates and Control Throws

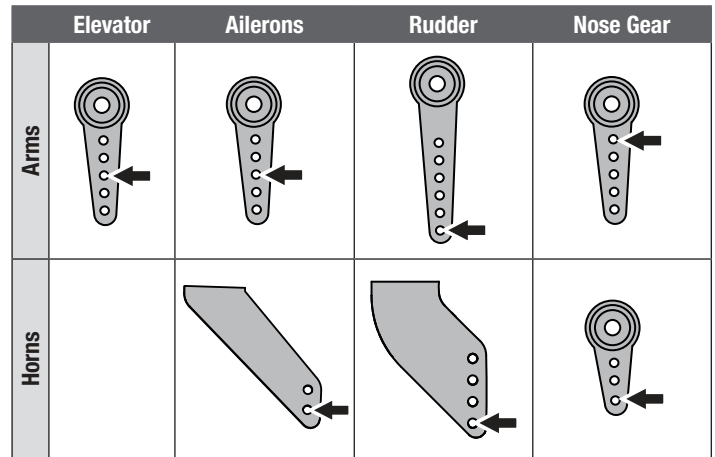
Program your transmitter to set the rates and control throws based on your experience level. These values have been tested and are a good starting point to achieve a successful first flight.

After flying, you may choose to adjust the values for the desired control response.

	Low Rate	High Rate
Aileron	15mm	20mm
Elevator	10mm ▲ / 7mm ▼	13mm ▲ / 10mm ▼
Rudder	18mm	22mm

Factory Settings for the Control Horns and Servo Arms

The illustration shows recommended hole settings in the servo arms and control horns.



Post Flight

1	Disconnect the flight battery from the ESC (Required for Safety and battery life).
2	Power OFF the transmitter.
3	Remove the flight battery from the aircraft.
4	Recharge the flight battery.

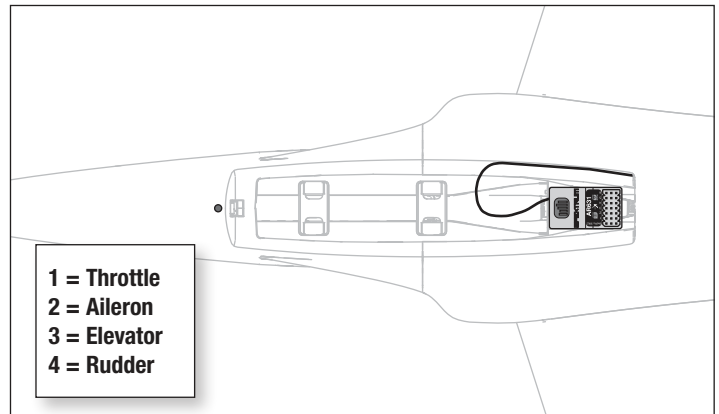
5	Repair or replace all damaged parts.
6	Store the flight battery apart from the aircraft and monitor the battery charge.
7	Make note of the flight conditions and flight plan results, planning for future flights.

Service and Repairs

NOTICE: After any impact or replacement, always ensure the receiver is secure in the fuselage. If you replace the receiver, install the new receiver in the same orientation and manner as the original receiver or damage may result.

Repairs to the wings and fuselage of this aircraft can be made easily using virtually any adhesive (hot glue, regular CA [cyanoacrylate adhesive], epoxy, etc).

When parts are not repairable, see the Replacement Parts List for ordering by item number. For a listing of all replacement and optional parts, refer to the list at the back of this manual.



Service and Repairs

Power Components Service

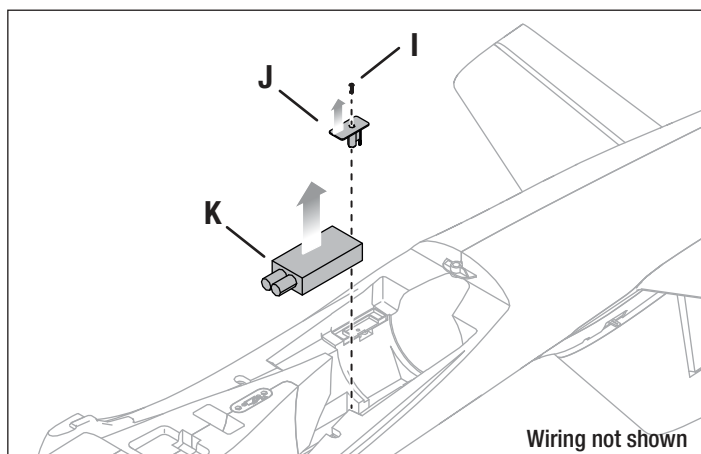
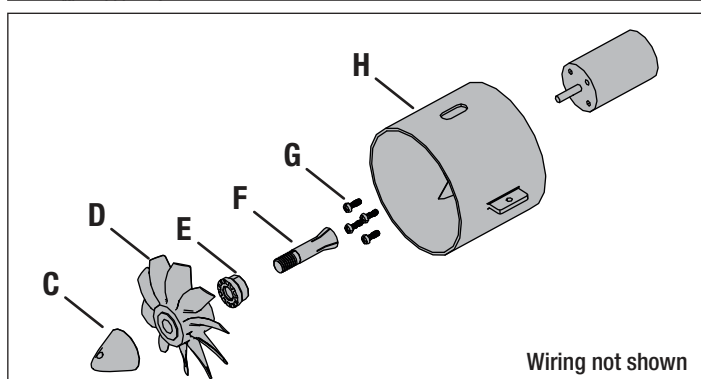
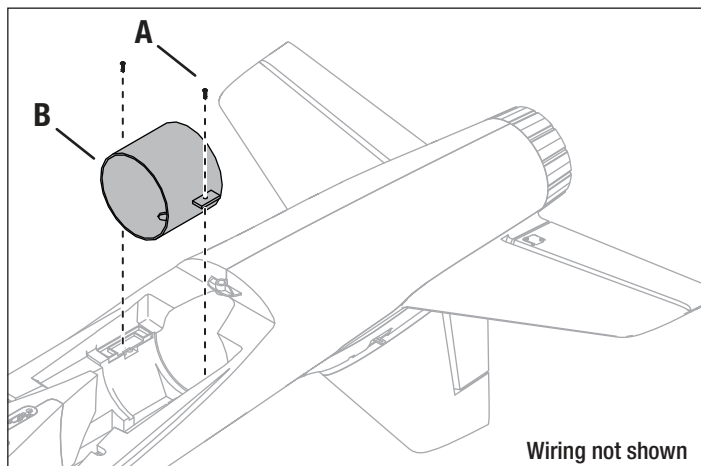
Disassembly

1. Remove the four screws and carefully remove the wing.
2. Remove the two screws (A) from the fan unit mounting tabs.
3. Pull the fan unit (B) out of the fuselage and disconnect the motor leads from the ESC.
4. Remove the spinner (C) from the rotor by using a hex wrench inserted through the spinner holes. and turning the spinner from the motor shaft adapter.
5. Remove the rotor (D), rotor backplate (E) and motor shaft adapter (F).
6. Remove the four screws (G) to remove the motor from the fan shroud (H).
7. Remove the screw (I) and plastic ESC clip (J) .
8. Disconnect the throttle lead from the receiver and pull the ESC (K) from the fuselage, taking note of the routing of the power and throttle leads through the fuselage.

Assembly

Assemble in reverse order.

- Assemble in reverse order.
- Correctly align and connect the motor wire colors with the ESC wires.
- Ensure the ESC is installed correctly and secured to the fuselage using clip and screw.
- Ensure the front of the rotor is installed facing the nose of the aircraft.
- Use a hex wrench to tighten the spinner on the rotor and collet.
- Ensure the spinner is fully connected for safe operation.
- Ensure no wiring is pinched by any of the power components.
- Correctly align and install wing to fuselage using 4 wing screws.



AS3X® System Trouble Shooting Guide

Problem	Possible Cause	Solution
Trim change when flight mode is switched	Trim is not at neutral	If you need to adjust the trim more than 8 clicks, return the trim to neutral and manually adjust the clevis to center the trim
	Sub-Trim is not at neutral	Do not use Sub-Trim. Adjust the servo arm or the clevis

Troubleshooting Guide

Problem	Possible Cause	Solution
Aircraft does not operate	No link between the transmitter and receiver	Re-Bind the system following directions in this manual
	Transmitter AA batteries are depleted or installed incorrectly as indicated by a dim or unlit LED on the transmitter or the low battery alarm	Check polarity installation or replace with fresh AA batteries
	No electrical connection	Push connectors together until they are secure
	Flight battery is not charged	Fully charge the battery
	Crash has damaged the radio inside the fuselage	Replace the fuselage or receiver
Aircraft keeps turning in one direction	Rudder or rudder trim is not adjusted correctly	Adjust stick trims, then land and manually adjust aileron and/or rudder linkages so no transmitter trim is required
	Aileron or aileron trim is not adjusted correctly	Adjust stick trims or manually adjust aileron positions
Aircraft is difficult to control	Wing or tail is damaged	Replace damaged part
	Damaged Rotor	Land immediately and replace damaged Rotor
	Center of gravity is behind the recommended location	Shift battery forward, do not fly until correct Center of Gravity location is achieved
Aircraft nose rises steeply at half throttle	Wind is too gusty or strong	Postpone flying until the wind calms down
	Elevator is trimmed 'up' too much	If trim must be adjusted more than 4 clicks when pushing the trim button, adjust push rod length
	Battery is not installed in the correct position.	Move forward approximately 1/2"
Aircraft will not climb	Battery is not fully charged	Fully charge battery before flying
	Elevator may be trimmed 'down'	Adjust elevator trim 'up'
	Rotor damaged	Land immediately, replace Rotor
Aircraft is difficult to launch in the wind	Launching the aircraft down wind or into a cross wind	Always launch the aircraft directly into the wind
Flight time is too short	Battery is not fully charged	Recharge battery
	Flying at full throttle for the entire flight	Fly at just above half throttle to increase flying time
	Wind speed too fast for safe flight	Fly on a calmer day
	Rotor damaged	Replace Rotor
Aircraft vibrates	Rotor, spinner or motor damaged	Tighten or replace parts
Rudder, ailerons or elevator do not move freely	Damaged or blocked push rods or hinges	Repair damage or blockage
Aircraft will not Bind (during binding) to transmitter	Transmitter is too near aircraft during binding process	Move powered transmitter a few feet from aircraft, disconnect and reconnect battery to aircraft
	Aircraft or transmitter is too near a large metal object, wireless source or another transmitter	Move the aircraft and transmitter to another location and attempt binding again
	Flight battery/transmitter battery charge is too low	Replace/recharge batteries
Aircraft will not connect (after binding) to transmitter	Transmitter is too near aircraft during connecting process	Move powered transmitter a few feet from aircraft, disconnect and reconnect battery to aircraft
	Aircraft or transmitter is too near a large metal object, wireless source or another transmitter	Move the aircraft and transmitter to another location and attempt connecting again
	Aircraft battery/Transmitter battery charge is too low	Replace/recharge batteries
	Transmitter may have been bound to a different model (using different DSM Protocol)	Bind aircraft to transmitter
After being properly adjusted, aileron and/or rudder are not in neutral position when battery is plugged in	Model was moved during initial power on	Unplug flight battery and reconnect, keeping model immobile for at least 5 seconds

Replacement Parts

Part #	Description
EFL0951	Fuselage, Painted
EFL0952	Wing, Painted
EFL0953	Horizontal Stabilizer
EFL0954	Decal Sheet
EFL0955	70mm EDF Unit w/Motor
EFL0956	Fin Assembly
EFL0957	Tail Cone
EFL0958	Screw and Bolt Set
EFL0959	Landing Gear Set
EFL0960	Shielded Servo Extension, 400mm
EFL0961	Hatch
EFL01557	Pushrod Set, Servo Covers
EFL01559	70mm Ducted Fan
EFL01561	Hands-Free Connector
EFL01563	Control Horn Set
SPMAR631	AR631 6 CH AS3X/SAFE Receiver
SPMSA381	9g Mini Servo: 400mm Lead
SPMSA382	14g Sub-Micro MG Servo, 240mm Lead
SPMXAE70A	Smart Lite 70-Amp ESC
SPMXAM2200	2847–2400 6-Pole Motor

Recommended Parts

Part #	Description
SPMR6655	DX6e 6CH Transmitter Only
SPMX32006S30	3200mAh 6S 22.2V Smart 30C: IC5
SPMXC2020	Smart S1200 G2 AC Charger, 1x200
SPMXCA508	Adapter: IC5 Battery/IC3 Device

Optional Parts

Part #	Description
EFLAEC510	Adapter: EC3 Device / EC5 Battery with 1.5" Wire, 12 AWG
SPMR6775	NX6 6 CH Transmitter Only
SPMR8200	NX8 8 CH Transmitter Only
SPMX326S30	3200mAh 6S 22.2V Smart G2 30C: IC5
SPMX32006S50	3200mAh 6S 22.2V Smart 50C: IC5
SPMX40004S30	4000mAh 4S 14.8V Smart 30C: IC3
SPMX40006S30	4000mAh 6S 22.2V Smart 30C: IC5
SPMXBC100	Smart Battery & Servo Tester
SPMXC1050	Smart S1500 DC Charger, 1x500W
SPMXC2010	Smart S2200 G2 AC Charger, 2x200
SPMXC2040	Smart S1400 G2 AC Charger, 1x400

Hardware

Location	Description	Quantity
Motor Mounting Bolts	M3 x 8mm Machine Screw	4
ESC Mount	2.5mm x 8mm Self-Tapping Screw	1
Tail Mount Screw	2.5mm x 8mm Self-Tapping Screw	5
Servo Cover Screw	2.5mm x 8mm Self-Tapping Screw	8
Nose Gear Servo Mount Screw	2.5mm x 8mm Self-Tapping Screw	4
Hands-Free Mount (Female)	2.5mm x 8mm Self-Tapping Screw	2
Hands-Free Servo Plug Screw	2mm x 4mm	1
EDF Mounting Screw	3mm x 8mm Self-Tapping Screw	2
Hands-Free Mounting Screw (Male)	2.5mm x 8mm Self-Tapping Screw	2
Control Horn Mounting Screw	2mm x 15mm	4
Elevator Control Horn Mounting Screw	2mm x 10mm	4
Rudder Control Horn Mounting Screw	2mm x 12mm	2
Nose Gear Collar Screw	3mm x 2.5mm	1
Nose Gear Steering Arm Screw	2mm x 8mm	1
Landing Gear Collar Screw	2.5mm x 4mm	3
Front/Rear Wing Mounting Bolts	3mm x 16mm Machine Screw	2
Left/Right Wing Mounting Bolts	3mm x 25mm Machine Screw	2
Nose Gear Cover Screw	2mm x 8mm Self-Tapping Screw	8

Important Federal Aviation Administration (FAA) Information

Use the QR code below 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.



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 below.



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 aircraft using 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.

10/15

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 Research Rd Champaign, Illinois, 61822 USA
	Horizon Product Support (Product Technical Assistance)	productsupport@horizonhobby.com 877-504-0233	
	Sales	websales@horizonhobby.com 800-338-4639	
European Union	Horizon Technischer Service Sales: Horizon Hobby GmbH	service@horizonhobby.eu +49 (0) 4121 2655 100	Hanskampring 9 D 22885 Barsbüttel, Germany

FCC Information

FCC ID: BRWSPMSR6200A

Supplier's Declaration of Conformity

FC EFL Habu SS EDF BNF Basic (EFL0950)
EFL Habu SS EDF PNP (EFL0975)

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)
IC: 6157A-SPMSR6200A

This device contains license-exempt transmitter(s)/receiver(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

CE EU Compliance Statement:
EFL Habu SS EDF BNF Basic (EFL0950): 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.

EFL Habu SS EDF PNP (EFL0975): Hereby, Horizon Hobby, LLC declares that the device is in compliance with the following: EU EMC Directive 2014/30/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>.

Receiver:
2404–2476MHz
5.58dBm

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.



E328



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US 8,672,726 US 9,056,667 US 9,753,457. US 10,078,329. US 9,930,567. US 10,419,970. Other patents pending.

<http://www.horizonhobby.com/>