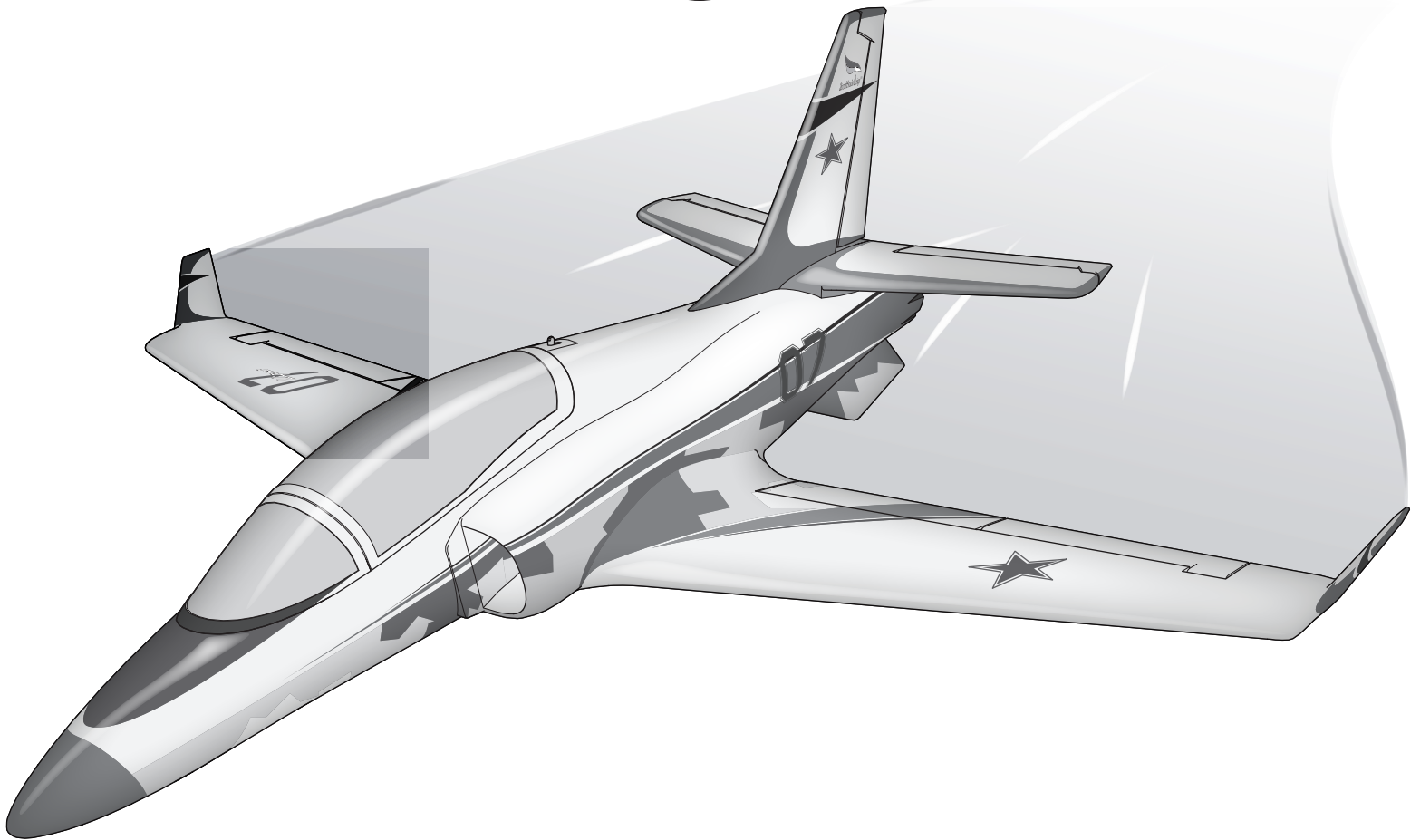


HORIZON[®]
H O B B Y

Eflite[®]
ADVANCING ELECTRIC FLIGHT

Viper 70mm EDF



Instruction Manual
Bedienungsanleitung
Manuel d'utilisation
Manuale di Istruzioni

SAFE[®] 

SAFE[®] Select Technology, Optional Flight Envelope Protection

Plug-N-Play[®]

BNF[®]
BASIC

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 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.

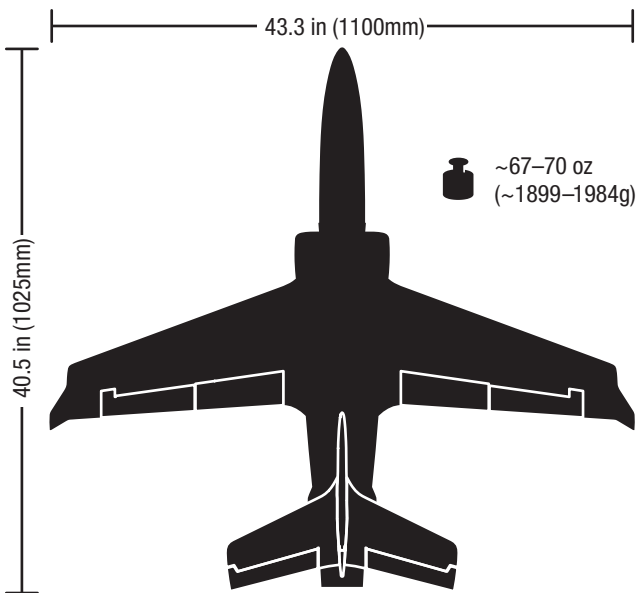
 **WARNING AGAINST COUNTERFEIT PRODUCTS:** If you ever need to replace your Spektrum receiver found in a Horizon Hobby product, always purchase from Horizon Hobby, LLC or a Horizon Hobby authorized dealer to ensure authentic high-quality Spektrum product. Horizon Hobby, LLC disclaims all support and warranty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

Quick Start Information			
Transmitter Setup	1. Blank (Acro) Model		
	2. Wing Type: 1 Aileron, 1 Flap		
	3. Servo Reversing: Gear Reversed, All Others Normal		
	4. Travel Adjust (All Surfaces): 100%		
Dual Rates*		High Rate	Low Rate
	Aileron	▲ = 10mm ▼ = 10mm	▲ = 8mm ▼ = 8mm
	Elevator	▲ = 12mm ▼ = 12mm	▲ = 8mm ▼ = 8mm
	Rudder	▶ = 14mm ◀ = 14mm	▶ = 8mm ◀ = 8mm
Flap Travel	Half ▼ = 15mm	Full ▼ = 45mm	
EXPO (Soft center)		High Rate	Low Rate
	Aileron	10%	0%
	Elevator	10%	0%
	Rudder	10%	0%
Center of Gravity (CG)	80–90mm back from the leading edge, measured at the wing root		
Flight Timer Setting	4 minutes		

* The dual rates values given are intended for first time electric ducted fan pilots through intermediate level pilots. For advanced settings options, see the *Dual Rates and Control Throws* section of the manual.

Specifications

	BNF[®] BASIC	PNP PLUG-N-PLAY [™]
Motor: Motor 1850Kv (EFLM1850)	Installed	Installed
Fan Unit: 70mm Ducted Fan Unit (EFLA7012DF)	Installed	Installed
ESC: 70A Brushless Switch Mode (EFLA1070EC5)	Installed	Installed
Servos: (8) (SPMA380, SPMA380R)	Installed	Installed
Retracts: Main and Nose Gear (EFLG130, EFLG131)	Installed	Installed
Receiver: Spektrum™ AR631 6-Channel Sport Receiver (SPMAR631)	Installed	Required to Complete
Recommended Battery: 22.2V 3300–4800mAh 30C 6S LiPo with EC5™ Connector	Required to Complete	Required to Complete
Recommended Battery Charger: 6-cell Li-Po Battery Balancing Charger	Required to Complete	Required to Complete
Recommended Transmitter: Full-Range 2.4GHz with Spektrum™ DSM2®/DSMX® Technology and Adjustable Dual Rates	Required to Complete	Required to Complete



Box Contents

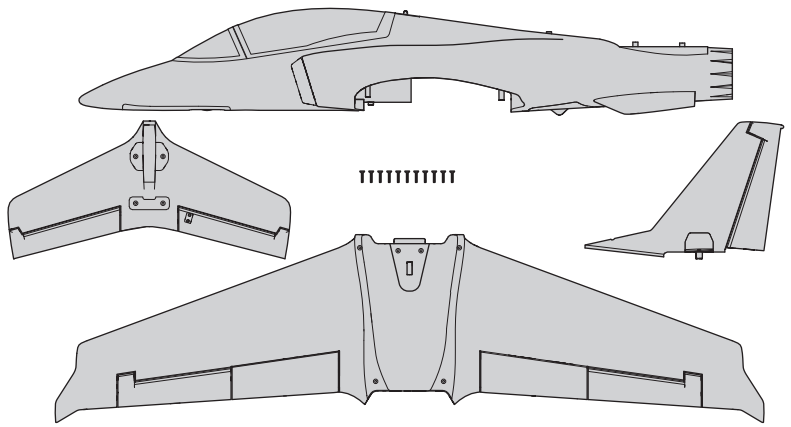


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If you own this product, you may be required to register with the FAA. For up-to-date information on how to register with the FAA, please visit <https://registermyuas.faa.gov/>. For additional assistance on regulations and guidance on UAS usage, visit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

Preflight

1	Remove and inspect contents.
2	Read this instruction manual thoroughly.
3	Charge the flight battery.
4	Fully assemble the aircraft.
5	Install the flight battery in the aircraft (once it has been fully charged).
6	Check the Center of Gravity (CG).
7	Bind the aircraft to your transmitter.

8	Make sure all linkages move freely.
9	Perform the control direction test with the transmitter.
10	Adjust the flight controls and transmitter as needed.
11	Perform a radio system range test.
12	Find a safe open area to fly.
13	Plan flight for flying field conditions.

Transmitter Setup (BNF)

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

If your transmitter allows it, enable the throttle cut feature. Always engage throttle cut before approaching the aircraft.

Dual Rates

Low rate is recommended for the initial flights.

NOTICE: To ensure AS3X® technology functions properly, do not lower rate values below 50%. If lower rates are 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.

Expo

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

Computerized Transmitter Setup (DX6i, DX6e†, DX6‡, DX7, DX7S, DX8, DX9, DX10t, DX18, DX20 and iX12)	
Start all transmitter programming with a blank ACRO model (do a model reset), then name the model.	
Set Dual Rates to:	HIGH 100% LOW 70%
Set Servo Travel to:	100%
DX6i	1. Go to the SETUP LIST MENU
	2. Set MODEL TYPE: ACRO
	3. Go to ADJUST LIST MENU
	4. Set FLAPS: Norm ↑100 Flap* LAND ↓-50 Flap*
DX7S DX8	1. Go to the SYSTEM SETUP
	2. Set MODEL TYPE: AIRPLANE
	3. Set WING TYPE: 1 AIL 1 FLAP
	4. Go to the FUNCTION LIST
	5. Set SERVO SETUP: Reverse GEAR
	6. Set FLAP SYSTEM: Choose Flap NORM: -100% FLAP* MID: -45% FLAP* LAND: 50% FLAP* SPEED 2.0S: SWITCH = FLAP
DX6e† DX6 (Gen2)‡ DX7 (Gen2) DX8 (Gen2) DX9 DX10t DX18 DX20 iX12† iX20 NX6 NX8 NX10	1. Go to the SYSTEM SETUP (Model Utilities)†
	2. Set MODEL TYPE: AIRPLANE
	3. Set AIRCRAFT TYPE (Model Setup, Aircraft Type)†: WING: 1 AIL 1 FLAP
	4. Go to the FUNCTION LIST (Model Adjust)†
	5. Set SERVO SETUP: Reverse GEAR
	6. Set FLAP SYSTEM: SELECT SWITCH D: POS 0: -100% FLAP* POS 1: -45% FLAP* POS 2: 50% FLAP* SPEED 2.0

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

* Flap programming values may vary slightly. For your initial flights use the recommended flap travel settings provided in the Flaps section and adjust the flap travel to your preference on subsequent flights.

‡ The settings provided above for the DX6 and DX6e do not allow for the use of a SAFE Select switch. To use a SAFE Select switch on these systems see the section below for transmitter setup and operation information.

SAFE® Select Switch Designation

SAFE® Select technology can be easily assigned to any open switch (2 or 3 position) on your transmitter. With this feature, you have the flexibility to enable or disable the technology while in flight.

IMPORTANT: Before assigning your desired switch, ensure that the travel for that channel is set at 100% in both directions and the aileron, elevator, rudder and throttle are all on high rate with the travel at 100%. Turn throttle hold OFF if it is programmed in the transmitter.

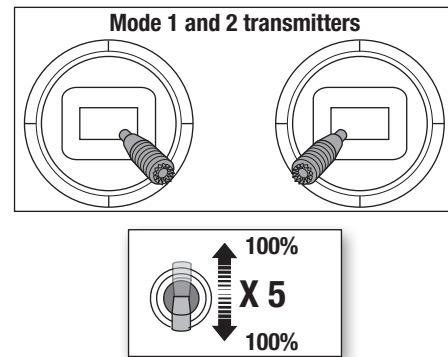
CAUTION: Keep all body parts well clear of the rotor, intakes and exhaust tube and keep the aircraft securely restrained in case of accidental throttle activation.

Assigning a switch

1. Bind the aircraft correctly to activate SAFE Select. This will allow the system to be assigned to a switch.
2. Hold both transmitter sticks to the inside bottom corners and toggle the desired switch 5 times (1 toggle = full up and down) to assign that switch. 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 if desired.

TIP: SAFE Select is assignable on any unused Channels 5–9.



Using SAFE® Select With the DX6 and DX6e Transmitters With a 6 Channel Aircraft

The SAFE Select switch must be assigned to the Flap switch (switch D) **BEFORE** proceeding to the Transmitter Setup and should start from a blank (reset) model. Failure to assign the SAFE switch prior to programming the other model functions may prevent the SAFE switch from assigning correctly. Users of the DX6 and DX6e will have the SAFE Select functionality linked to the flaps. The values given in the Transmitter Setup table turn SAFE on when the flaps are fully deployed. SAFE is off when the flaps are not fully deployed.

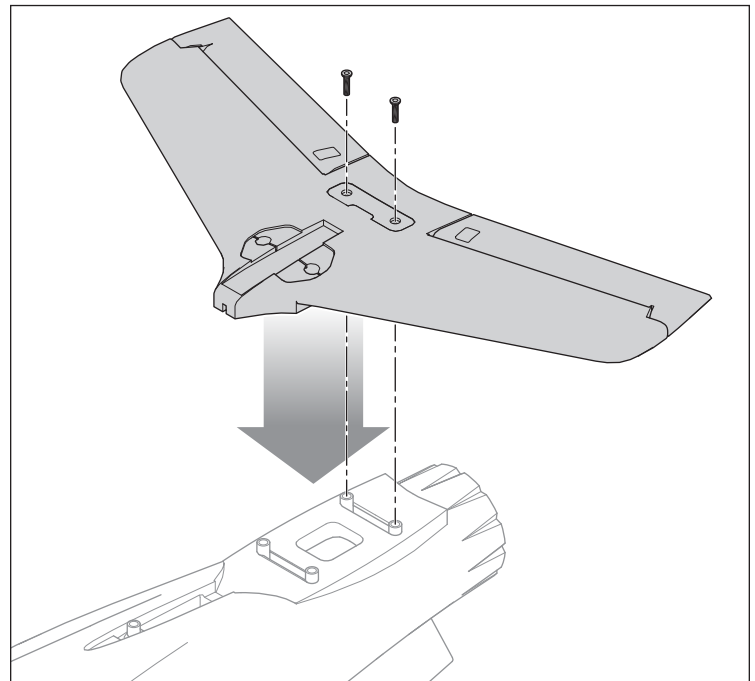
IMPORTANT: When programming the Flap System function in the transmitter setup of the DX6 and DX6e, set the Speed value to Norm. Adding any delay to the deployment of the flaps will also delay the activation of SAFE.

DX6 and DX6e Transmitter Setup for SAFE® Select Operation	
Start all transmitter programming with a blank ACRO model (do a model reset), then name the model.	
Set Dual Rates to:	HIGH 100% LOW 70%
Set Servo Travel to:	100%
DX6e DX6 (Gen2)	1. Go to the SYSTEM SETUP
	2. Set MODEL TYPE: AIRPLANE
	3. Set AIRCRAFT TYPE: WING: 1 AIL 1 FLAP
	4. Go to the FUNCTION LIST
	5. Set SERVO SETUP: Reverse GEAR
	6. Set FLAP SYSTEM: SELECT SWITCH D: POS 0: -100% FLAP* POS 1: -45% FLAP* POS 2: 50% FLAP* SPEED: Norm

Model Assembly

Horizontal Tail Installation

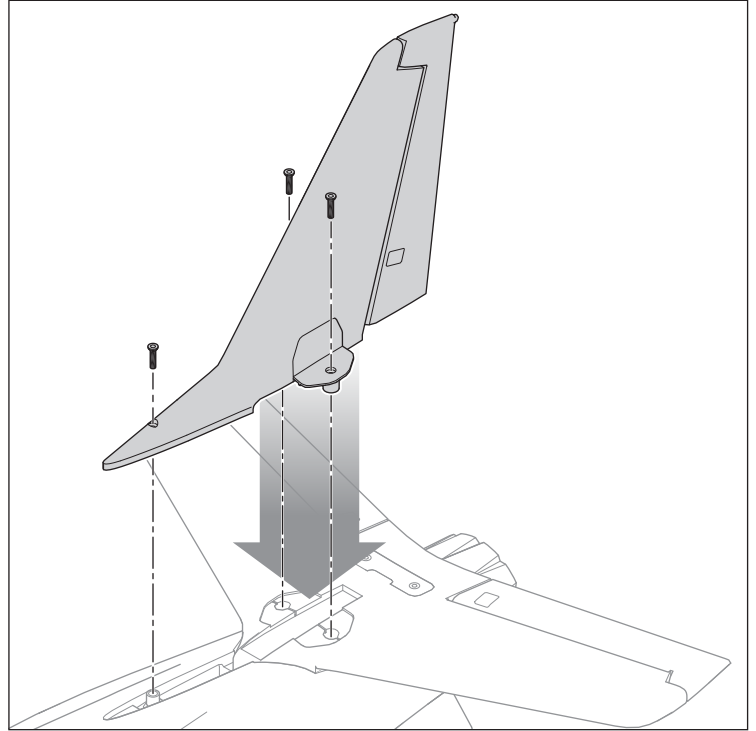
1. Connect both elevator servo connectors to the extensions in the fuselage labeled ELEV. Feed the excess servo wire into the fuselage.
2. Press the horizontal tail onto the fuselage, ensuring the alignment tab on the tail fits into the hole in the fuselage and no servo wires are pinched.
3. Insert two 3 x 16 mm screws through the horizontal surface and into the rear holes in the fuselage. Do not over tighten the screws.



Model Assembly (Continued)

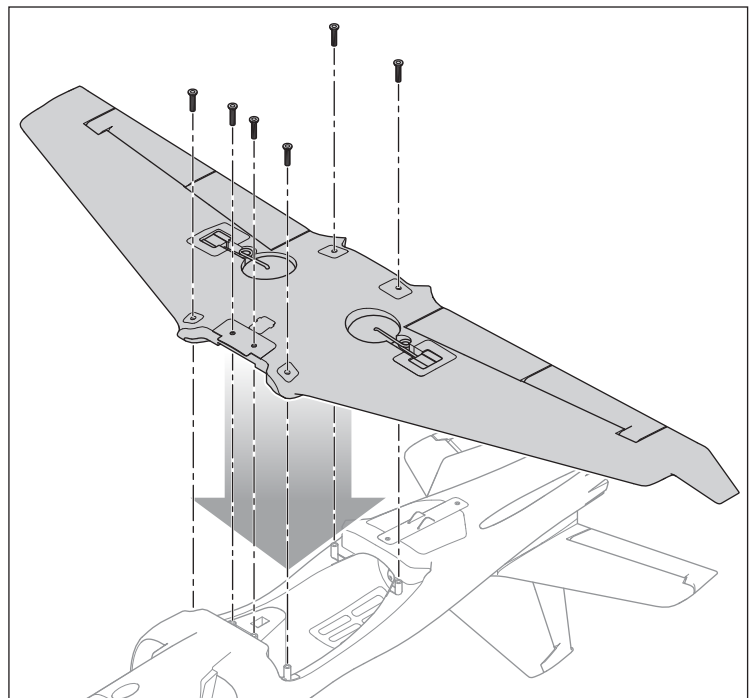
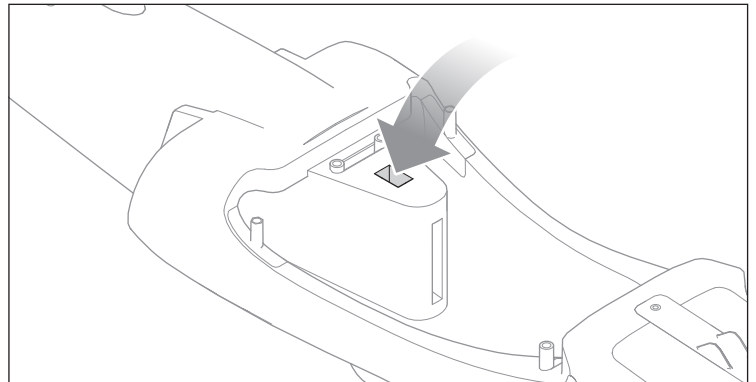
Vertical Tail Installation

1. Connect the rudder servo connector to the extension in the fuselage labeled RUDD. Feed the excess servo wire into the fuselage.
2. Press the vertical tail into the slot in the horizontal tail and the fuselage, ensuring no servo wires are pinched.
3. Insert three 3 x 16 mm screws through the vertical tail and into the fuselage. Do not over tighten the screws.



Wing Installation

1. Find the y-harnesses included in the accessory bag.
2. Connect the y-harness marked AILE to both aileron servos.
3. Connect the y-harness marked FLAP to both flap servos.
4. Connect the y-harness marked GEAR to both main gear retracts.
5. Feed the y-harness leads from the aileron and flap servos and the retracts through the hole in the bottom of the fuselage as shown.
6. Slide the wing into place, ensuring not to pinch any of the servo wires.
7. Attach the wing to the fuselage with six 3 x 16 mm screws. Do not over tighten the screws.



Flaps

Flexing the Flap Hinges

To ensure the flaps have full travel without binding at the hinges, the hinge material needs to be loosened up by flexing the material by hand.

1. With the receiver powered off, carefully flex the flap down by hand until resistance is felt.
2. Repeat this process 5 or 6 times, until the hinge material loosens and the flap moves without resistance to a minimum of 45mm measured at the inboard end as shown.
3. Repeat the above steps on the other wing.

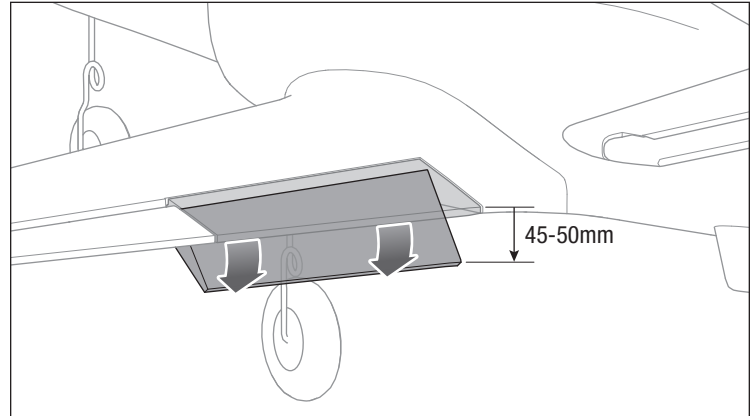
Flap Travel Settings

After further testing, the original values given in the manual for flap travel have been updated to the following:

Half flap (takeoff): 15mm

Full flap (landing): 45mm

Confirm these values by measuring the inboard end of the flap as illustrated at right. These settings improve lift and create less drag during takeoff and offer increased elevator authority during landing.



PNP Receiver Selection and Installation

The recommended receiver for this aircraft is the Spektrum AR631.

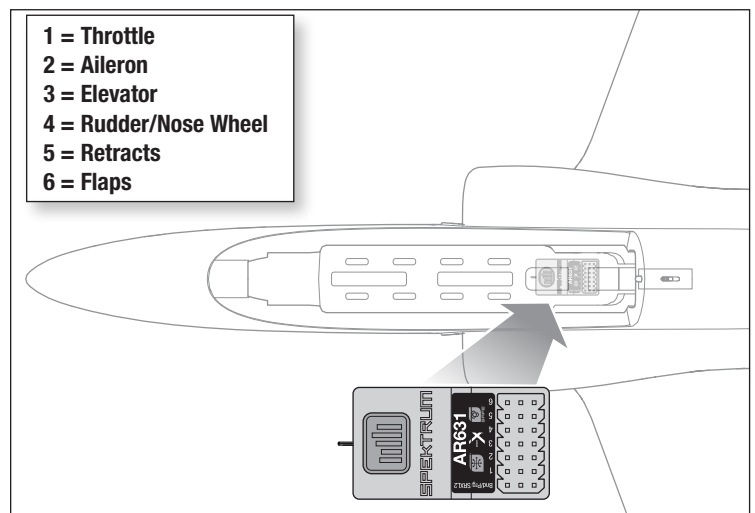
If you choose to install a different receiver, ensure that it is at least a 6-channel full range (sport) receiver. Refer to the manual of your chosen receiver for correct installation and operation instructions.

AR631 Installation

1. Slide the canopy latch back and lift the back of the canopy to remove the canopy from the fuselage.
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 as far back in the battery compartment as possible. The receiver should be mounted parallel to the length of the fuselage, with the label facing up and the servo ports facing the rear of the aircraft, as shown. The orientation of the receiver is critical for all AS3X® and SAFE® technology setups.



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



Battery Installation and ESC Arming

Battery Selection

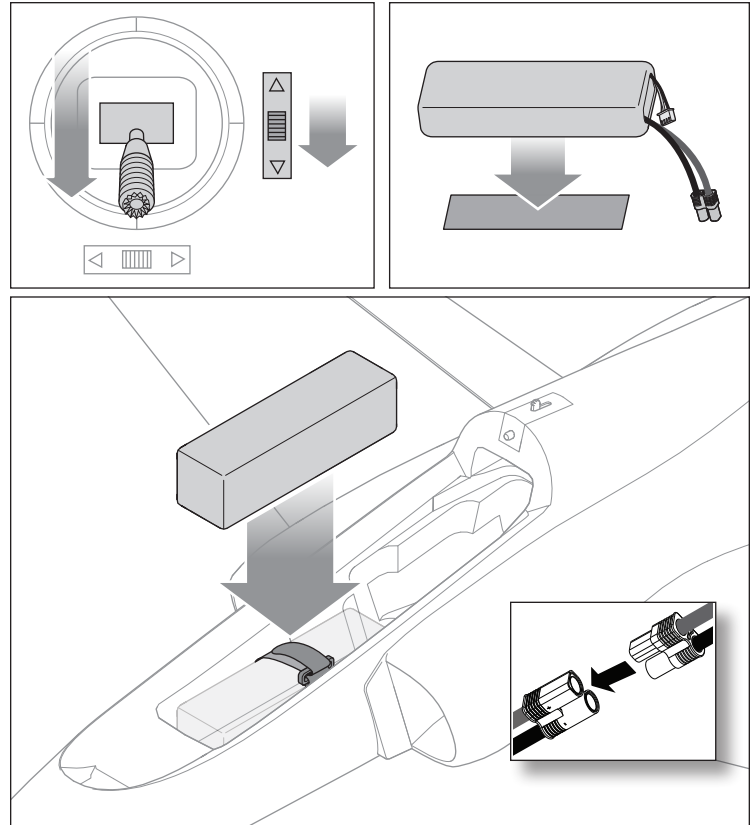
We recommend a 22.2V 3200–4000mAh 30C 6S LiPo battery with EC5™/ IC5 connector for standard operation. If using a different battery, the battery should be of similar capacity, dimensions and weight to fit in the fuselage. Always be sure the model balances at the recommended CG with the battery chosen.

1. Lower the throttle to the lowest setting.
2. Power on the transmitter and wait 5 seconds.
3. Apply the loop side (soft side) of the hook and loop tape to the bottom of your battery.
4. Slide the canopy latch back and lift the back of the canopy to remove.
5. Install the fully charged battery in the battery compartment as shown. See the *Adjusting the Center of Gravity* instructions for more information.
6. Secure the flight battery with the hook and loop strap.
7. Connect the ESC to the battery power lead EC5 connector, noting the correct polarity. The ESC will emit two sets of audible tones in succession indicating the programming status.
 - The first set of tones indicates the number of cells in the connected LiPo battery pack. 6 rapid tones = 6
 - The second set of tones indicates the brake status. One tone indicates brake "ON" and two tones indicates brake "OFF".

NOTICE: Connecting the battery to the ESC with incorrect polarity will damage the ESC and void the warranty.

8. The ESC is now ready for use.*
9. Reinstall the canopy hatch.

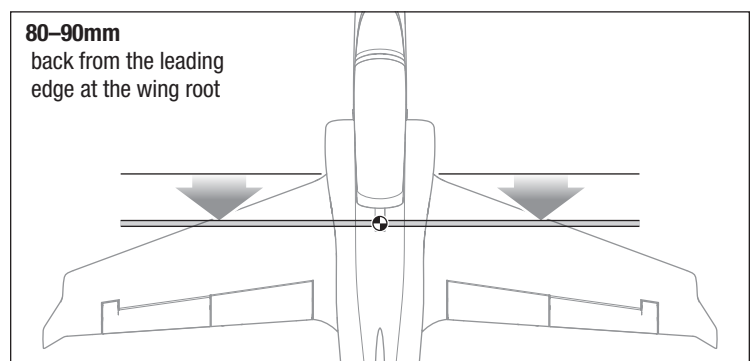
* While additional programming of the ESC is not necessary to operate your aircraft, programming options are available. Visit www.horizonhobby.com for complete instructions on programming the included ESC.



Center of Gravity (CG)

The center of gravity location is measured from the leading edge of the wing at the root with the landing gear down. The CG location is adjusted by moving the battery pack forward or backward in the battery compartment.

NOTICE: Install the battery in the aircraft and install the canopy, but **do not arm the ESC** while checking the CG. Personal injury may result.

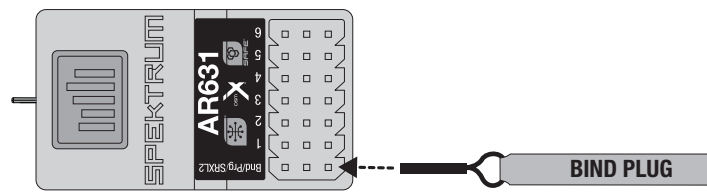


Transmitter and Receiver Binding / Switching ON and OFF SAFE Select

This product requires an approved Spektrum™ DSM2®/DSMX® compatible transmitter. Visit www.bindnfly.com for a complete list of approved transmitters. The aircraft has an optional SAFE Select feature, which can be switched ON or OFF easily by binding in a specific manner as described below.

IMPORTANT: Before binding a transmitter, read the Transmitter Setup section of this manual to ensure that your transmitter is properly programmed for this aircraft.

Bind Plug Installation



Binding Procedure / Switching ON SAFE Select

IMPORTANT: The included AR631 receiver has been programmed for operation specifically for this aircraft. Refer to the receiver manual for correct setup if the receiver is replaced or is used in another aircraft.

CAUTION: When using a Futaba® transmitter with a Spektrum DSM® module, you must reverse the throttle channel and rebind. Refer to your Spektrum module manual for binding and failsafe instructions. Refer to your Futaba transmitter manual for instructions on reversing the throttle channel.

1. Make sure the transmitter is powered off.
2. Move the transmitter controls to neutral (flight controls: rudder, elevators and ailerons) or to low positions (throttle, throttle trim).*
3. Install a bind plug in the receiver bind port.
4. Place the aircraft level on its wheels, then connect the flight battery to the ESC. The ESC will produce a series of sounds. Six flat tones followed immediately by two ascending tones confirm that the LVC is set correctly for the ESC. The orange bind LED on the receiver will begin to flash rapidly.
5. **Remove the bind plug from the bind port.**
6. Take three steps away from the aircraft /receiver and then power ON the transmitter while holding the transmitter bind button or switch. Refer to your transmitter's manual for specific binding instructions.
IMPORTANT: Do not to point the transmitter's antenna directly at the receiver while binding.
IMPORTANT: Keep away from large metal objects while binding.
7. The receiver is bound to the transmitter when the orange bind light on the receiver stays orange. The ESC will produce a series of sounds. Six flat tones followed immediately by two ascending tones. The tones indicate the ESC is armed, provided the throttle stick and throttle trim are low enough to trigger arming.

IMPORTANT: Once bound, the receiver will retain its bind settings for that transmitter until it has been intentionally changed, even when power is cycled ON and OFF. Repeat the binding process as necessary.

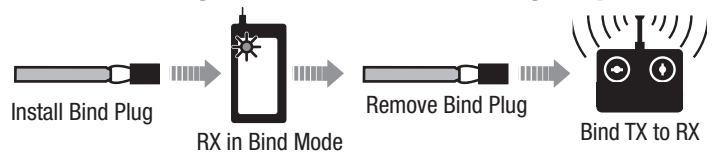
SAFE Select ON Indication

Every time the receiver is powered ON the surfaces will cycle back and forth **twice** with a slight pause at neutral position to indicate that SAFE Select is switched ON.

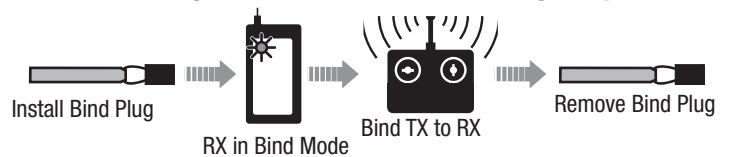
The throttle will not arm if the transmitter's throttle control is not put at the lowest position. If problems are encountered, follow the binding instructions and refer to the transmitter troubleshooting guide for other instructions. If needed, contact the appropriate Horizon Product Support office.

***Failsafe:** If the receiver loses transmitter communication, the failsafe will activate. When activated, failsafe moves the throttle channel to its preset failsafe position (low throttle) that was set during binding. All other channels move to actively level the aircraft in flight.

Switching ON SAFE Select Binding Sequence



Switching OFF SAFE Select Binding Sequence



Binding Procedure / Switching OFF SAFE Select

IMPORTANT: The included AR631 receiver has been programmed for operation specifically for this aircraft. Refer to the receiver manual for correct setup if the receiver is replaced or is used in another aircraft.

CAUTION: When using a Futaba® transmitter with a Spektrum DSM® module, you must reverse the throttle channel and rebind. Refer to your Spektrum module manual for binding and failsafe instructions. Refer to your Futaba transmitter manual for instructions on reversing the throttle channel.

1. Make sure the transmitter is powered off.
2. Move the transmitter controls to neutral (flight controls: rudder, elevators and ailerons) or to low positions (throttle, throttle trim).*
3. Install a bind plug in the receiver bind port.
4. Place the aircraft level on its wheels, then connect the flight battery to the ESC. The ESC will produce a series of sounds. Three flat tones followed immediately by two ascending tones confirm that the LVC is set correctly for the ESC.
The orange bind LED on the receiver will begin to flash rapidly. DO NOT remove the bind plug at this time.
5. Take three steps away from the aircraft /receiver and then power ON the transmitter while holding the transmitter bind button or switch. Refer to your transmitter's manual for specific binding instructions.
IMPORTANT: Do not to point the transmitter's antenna directly at the receiver while binding.
IMPORTANT: Keep away from large metal objects while binding.
6. The receiver is bound to the transmitter when the orange bind light on the receiver stays orange. The ESC will produce a series of sounds. Six flat tones followed immediately by two ascending tones. The tones indicate the ESC is armed, provided the throttle stick and throttle trim are low enough to trigger arming.
7. **Remove the bind plug from the bind port.**

IMPORTANT: Once bound, the receiver will retain its bind settings for that transmitter until it has been intentionally changed, even when power is cycled ON and OFF. Repeat the binding process as necessary.

SAFE Select OFF Indication

Every time the receiver is powered ON the surfaces will cycle back and forth **once** to indicate that SAFE Select has been switched OFF.

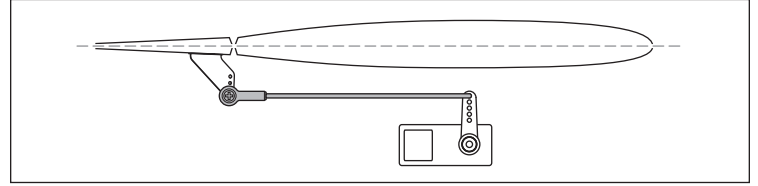
The throttle will not arm if the transmitter's throttle control is not put at the lowest position. If problems are encountered, follow the binding instructions and refer to the transmitter troubleshooting guide for other instructions. If needed, contact the appropriate Horizon Product Support office.

Control Surface Centering

After assembly and transmitter setup, confirm that the control surfaces are centered. If the control surfaces are not centered, mechanically center the control surfaces by adjusting the linkages.

If adjustment is required, turn the clevis on the linkage to change the length of the linkage between the servo arm and the control horn.

After binding a transmitter to the aircraft receiver, set the trims and sub-trims to 0, then adjust the clevises to center the control surfaces.



Control Surface Direction

Switch on the transmitter and connect the battery. Use the transmitter to operate the aileron and elevator controls. View the aircraft from the rear when checking the control directions.

Ailerons

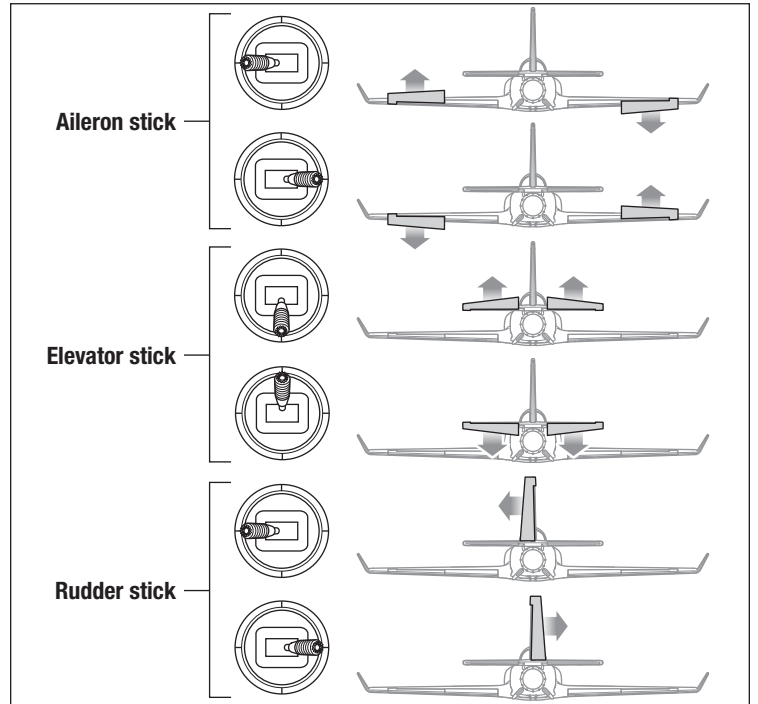
1. Move the aileron stick to the left. The right aileron should move down and the left aileron up, which will cause the aircraft to bank left.
2. Move the aileron stick to the right. The right aileron should move up and the left aileron down, which will cause the aircraft to bank right.

Elevators

3. Pull the elevator stick back. The elevators should move up, which will cause the aircraft to pitch up.
4. Push the elevator stick forward. The elevators should move down, which will cause the aircraft to pitch down.

Rudder

5. Move the rudder stick to the left. The rudder should move to the left, which will cause the aircraft to yaw left.
6. Move the rudder stick to the right. The rudder should move to the right, which will cause the aircraft to yaw right.



Dual Rates and Control Throws

Depending on your experience level with electric ducted fan (EDF) jets, program your transmitter to set the rates and control throws to the values given. These values have been tested and are a good starting point to achieve successful flight.

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

	First Time EDF Jet Pilots	Intermediate Pilots	Advanced Pilots	
	Low Rate	High Rate	Low Rate	High Rate
Aileron	▲ = 8mm ▼ = 8mm	▲ = 10mm ▼ = 10mm	▲ = 10mm ▼ = 10mm	▲ = 14mm ▼ = 14mm
Elevator	▲ = 8mm ▼ = 8mm	▲ = 12mm ▼ = 12mm	▲ = 12mm ▼ = 12mm	▲ = 16mm ▼ = 16mm
Rudder	▶ = 8mm ◀ = 8mm	▶ = 14mm ◀ = 14mm	▶ = 16mm ◀ = 16mm	▶ = 21mm ◀ = 21mm
Flap Travel	Half ▼ = 15mm Full ▼ = 45mm			

Control Horn and Servo Arm Settings

The table to the right shows the factory settings for the control horns and servo arms. These settings, in conjunction with the low rate transmitter settings, are intended for the first time electric ducted fan (EDF) jet pilot through the intermediate level pilot to help ensure a successful flight.

Fly the aircraft at these factory settings before making changes.

After flying, or for advanced level pilots with EDF jet experience, you may choose to adjust the linkage positions as shown to increase control response.

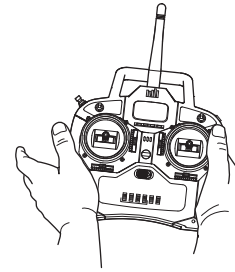
First Time EDF Jet Through Intermediate Level Pilots		
	Horns	Arms
Aileron		
Elevator		
Rudder		
Advanced Level Pilots		
	Horns	Arms
All Surfaces		

In Flight Trimming

During your first flight, trim the aircraft for level flight at 3/4 throttle with flaps and gear up. Make small trim adjustments with your transmitter's trim switches to straighten the aircraft's flight path.

After adjusting 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.



3 Seconds

Flying Tips and Repairs

Consult local laws and ordinances before choosing a flying location.

Range Check your Radio System

Before you fly, range check the radio system. Refer to your specific transmitter instruction manual for range test information.

Oscillation

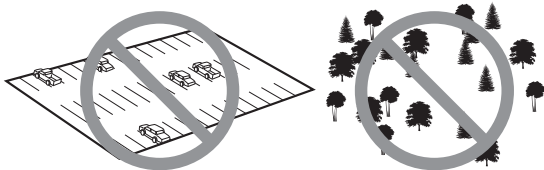
Once the AS3X system is active (after advancing the throttle for the first time), the control surfaces will react to aircraft movement. In some flight conditions oscillation may occur (the aircraft rocks back and forth on one axis due to overcontrol). If oscillation occurs, refer to the Troubleshooting Guide for more information.

Takeoff

Place the aircraft in position for takeoff (facing into the wind). Select low rates for first takeoff and gradually increase the throttle to full and steer with the nose wheel. Allow the model to accelerate to flying speed, then pull back gently on the elevator and climb to a comfortable altitude.

Flying

Always choose a wide-open space for flying. Due to the higher speeds of this aircraft, it does require more room to fly than average foam models. It is ideal for you to fly at a sanctioned flying field. If you are not flying at an approved site, 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.



In flight trimming

During your first flight, trim the aircraft for level flight at 3/4 throttle. Make small trim adjustments with your transmitter's trim switches to straighten the aircraft's flight path. After landing, adjust the linkages mechanically to account for trim changes and then reset the trims to neutral. Ensure the aircraft will fly straight and level with no trim or sub-trim.

Landing

For your first flights with the recommended battery pack (SPMX32006S30), set your transmitter timer or a stopwatch to 4 minutes. After 4 minutes, land the aircraft. Adjust your timer for longer or shorter flights once you have flown the model. **If at any time the motor pulses, land the aircraft immediately and recharge the flight battery.** See the Low Voltage Cutoff (LVC) section for more details on maximizing battery health and run time.

Turn the aircraft into the wind and reduce the throttle. Extend the landing gear and flaps. The flaps will allow the aircraft to slow to a more manageable landing speed while still maintaining lift. Elevator trim may be necessary to maintain level flight with the addition of flaps. Use the throttle during the landing approach to control the rate of descent. Keep the wings level and the aircraft pointed into the wind. As you approach the threshold of the runway and approximately 1 meter altitude, decrease the throttle and begin your flare by easing back on the elevator. Continue back pressure on the elevator to bring the aircraft down gently on the runway.

NOTICE: If a crash is imminent, reduce the throttle and trim fully. Failure to do so could result in extra damage to the airframe, as well as damage to the ESC and motor.

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

NOTICE: Crash damage is not covered under warranty.

NOTICE: When you are finished flying, never leave the aircraft in direct sunlight or in a hot, enclosed area such as a car. Doing so can damage the aircraft.

Low Voltage Cutoff (LVC)

When a Li-Po battery is discharged below 3V per cell, it will not hold a charge. The ESC protects the flight battery from over-discharge using Low Voltage Cutoff (LVC). Before the battery charge decreases too much, LVC removes power supplied to the motor. Power to the motor pulses, showing that some battery power is reserved for flight control and safe landing.

Disconnect and remove the Li-Po battery from the aircraft after use to prevent trickle discharge. Charge your Li-Po battery to about half capacity before storage. During storage, make sure the battery charge does not fall below 3V per cell. LVC does not prevent the battery from over-discharge during storage.

NOTICE: Repeated flying to LVC will damage the battery.

Tip: Monitor your aircraft battery's voltage before and after flying by using a Li-Po cell voltage checker (SPMXBC100, sold separately).

Repairs

Thanks to the EPO foam material in this aircraft, repairs to the foam can be made using virtually any adhesive (hot glue, regular CA, epoxy, etc). When parts are not repairable, see the Replacement Parts List for ordering by item number .

NOTICE: Use of CA accelerator on your aircraft can damage paint. DO NOT handle the aircraft until accelerator fully dries.

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.

Power Components Service



CAUTION: Always disconnect the flight battery before performing service on any of the power system components.

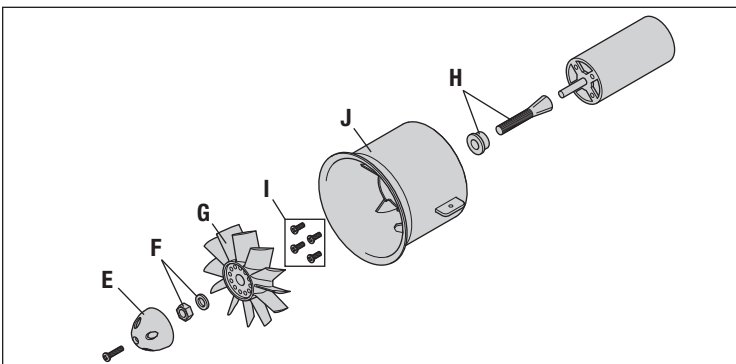
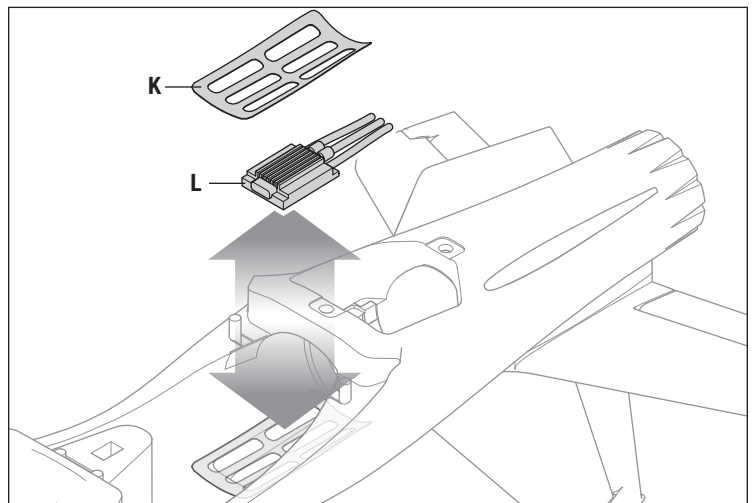
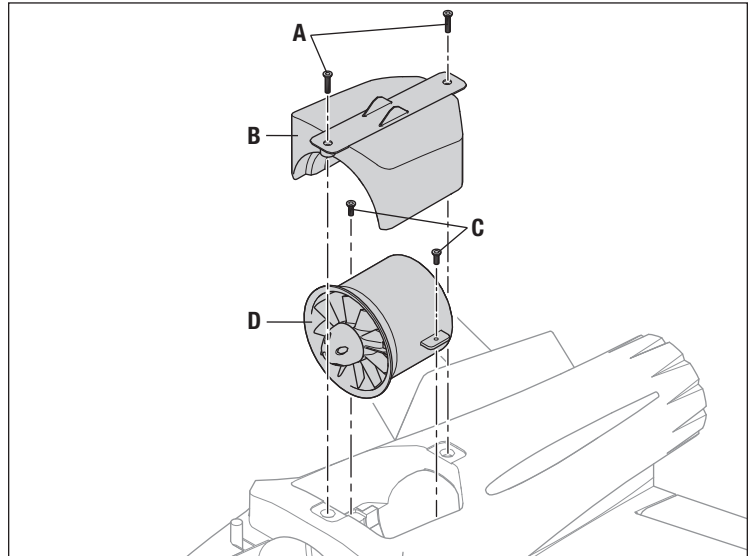
Disassembly

The wing is removed in the illustrations for clarity. It is possible to access all of the power system components without removal of the wing.

1. Remove the two screws (A) from the fan unit cover (B) and pull the cover out of the fuselage.
2. Remove the two screws (C) from the fan unit tabs.
3. Pull the fan unit (D) out of the fuselage and disconnect the motor leads from the ESC.
4. Remove the spinner (E) from the fan by removing the screw from the motor shaft adapter.
5. Remove the nut and washer (F) to remove the fan (G) and motor shaft adapter (H).
6. Remove the four screws (I) to remove the motor from the fan shroud (J).
7. Carefully remove the plastic ESC cover (K). The cover is glued to the fuselage.
8. Disconnect the throttle lead from the receiver and lift the ESC (L) from the fuselage, taking note of the routing of the power and throttle leads through the upper fuselage.

Assembly

- Assemble in reverse order.
- Correctly align and connect the motor wire colors with the ESC wires.
- Ensure the front of the rotor is installed facing the nose of the aircraft.
- A tool is required to tighten the nut on the rotor and collet.
- Ensure no wiring is pinched by any of the power components.
- Ensure the ESC cover is securely glued to the fuselage.
- Ensure the spinner is fully connected for safe operation.



Troubleshooting Guide AS3X

Problem	Possible Cause	Solution
Oscillation	Damaged rotor or spinner	Replace rotor or spinner
	Imbalanced rotor	Balance the rotor. For more information, view John Redman's rotor balancing video at www.horizonhobby.com
	Motor vibration	Replace parts or correctly align all parts and tighten fasteners as needed
	Loose receiver	Align and secure receiver in fuselage
	Loose aircraft controls	Tighten or otherwise secure parts (servo, arm, linkage, horn and control surface)
	Worn parts	Replace worn parts (especially propeller, spinner or servo)
	Irregular servo movement	Replace servo
Inconsistent flight performance	Trim is not at neutral	If you adjust trim more than 8 clicks, adjust the clevis to remove trim
	Sub-Trim is not at neutral	No Sub-Trim is allowed. Adjust the servo linkage
	Aircraft was not kept immobile for 5 seconds after battery connection	With the throttle stick in lowest position. Disconnect battery, then reconnect battery and keep the aircraft still for 5 seconds
Incorrect response to the AS3X Control Direction Test	Incorrect direction settings in the receiver, which can cause a crash	DO NOT fly. Correct the direction settings (refer to the receiver manual), then fly

Troubleshooting Guide

Problem	Possible Cause	Solution
Aircraft will not respond to throttle but responds to other controls	Throttle not at idle and/or throttle trim too high	Reset controls with throttle stick and throttle trim at lowest setting
	Throttle servo travel is lower than 100%	Make sure throttle servo travel is 100% or greater
	Throttle channel is reversed	Reverse throttle channel on transmitter
	Motor disconnected from ESC	Make sure motor is connected to the ESC
Extra rotor noise or extra vibration	Damaged rotor and spinner, collet or motor	Replace damaged parts
	Rotor is out of balance	Balance or replace rotor
	Rotor nut is too loose	Tighten the rotor nut
Reduced flight time or aircraft underpowered	Flight battery charge is low	Completely recharge flight battery
	Flight battery damaged	Replace flight battery and follow flight battery instructions
	Flight conditions may be too cold	Make sure battery is warm before use
	Battery capacity too low for flight conditions	Replace battery or use a larger capacity battery
Aircraft will not Bind (during binding) to transmitter	Transmitter too near aircraft during binding process	Move powered transmitter a few feet from aircraft, disconnect and reconnect flight battery to aircraft
	Aircraft or transmitter is too close to large metal object, wireless source or another transmitter	Move aircraft and transmitter to another location and attempt binding again
	The bind plug is not installed correctly in the bind port	Install bind plug in bind port and bind the aircraft to the transmitter
	Flight battery/transmitter battery charge is too low	Replace/recharge batteries
	Bind switch or button not held long enough during bind process	Power off transmitter and repeat bind process. Hold transmitter bind button or switch until receiver is bound
Aircraft will not connect (after binding) to transmitter	Transmitter too near aircraft during connecting process	Move powered transmitter a few feet from aircraft, disconnect and reconnect flight battery to aircraft
	Aircraft or transmitter is too close to large metal object, wireless source or another transmitter	Move aircraft and transmitter to another location and attempt connecting again
	Bind plug left installed in bind port	Rebind transmitter to the aircraft and remove the bind plug before cycling power
	Aircraft bound to different model memory (ModelMatch™ radios only)	Select correct model memory on transmitter
	Flight battery/Transmitter battery charge is too low	Replace/recharge batteries
	Transmitter may have been bound to a different aircraft using different DSM protocol	Bind aircraft to transmitter

Troubleshooting Guide

Problem	Possible Cause	Solution
Control surface does not move	Control surface, control horn, linkage or servo damage	Replace or repair damaged parts and adjust controls
	Wire damaged or connections loose	Do a check of wires and connections, connect or replace as needed
	Transmitter is not bound correctly or the incorrect airplanes was selected	Re-bind or select correct airplanes in transmitter
	Flight battery charge is low	Fully recharge flight battery
Controls reversed	BEC (Battery Elimination Circuit) of the ESC is damaged	Replace ESC
	Transmitter settings are reversed	Perform the Control Direction Test and adjust the controls on transmitter appropriately
Motor power pulses then motor loses power	ESC uses default soft Low Voltage Cutoff (LVC)	Recharge flight battery or replace battery that is no longer performing
	Weather conditions might be too cold	Postpone flight until weather is warmer
	Battery is old, worn out, or damaged	Replace battery
	Battery C rating might be too small	Use recommended battery

Replacement Parts

Part #	Description
EFL77500	Viper 70mm EDF BNF Basic
EFL7775	Viper 70mm EDF PnP
EFL7701	Fuselage: Viper 70mm
EFL7702	Main Wing Set: Viper 70mm
EFL7703	Vertical Stabilizer: Viper 70mm
EFL7704	Horizontal Stabilizer: Viper 70mm
EFL7705	Cockpit: Viper 70mm
EFL7706	Front Landing Gear Set: Viper 70mm
EFL7707	Main Landing Gear Set: Viper 70mm
EFLG7708	Front Landing Gear System: Viper 70mm
EFLG7709	Main Landing Gear System: Viper 70mm
EFL7710	Landing Gear Cover: Viper 70mm
EFL7711	Linkage Rod: Viper 70mm
EFL7712	Control Horns: Viper 70mm
EFL7713	Wheel Set: Viper 70mm
EFL7714	Screw Set: Viper 70mm
EFL7715	Decal Sheet: Viper 70mm
SPMA380	Servo: 9g digital metal gear
SPMA380R	Servo: 9g digital metal gear
EFLA1070EC5	70A ESC, EC5
EFLA7012DF	70mm Ducted Fan Unit
EFLM1850	Motor 1850Kv
EFLG130	Nose Gear Retract Mechanism
EFLG131	Main Gear Retract Mechanism

Optional Parts

Part #	Description
SPMAR631	AR631 6-Ch AS3X Sport Receiver
SPMR12000	iX12 12 Channel Transmitter Only
SPMR6750	DX6 Transmitter Only MD2 G3
SPMR8000	DX8 Transmitter Only MD2
SPMR8100	DX8e 8CH Transmitter Only
SPMR9910	DX9 Black Transmitter Only MD2
SPMXC1010	Spektrum Smart S2100 AC Charger 2 x 100W
SPMXC1080	Spektrum Smart S1100 AC Charger 1 x 100W
SPMX32006S30	Spektrum 22.2V 3200mAh 6S 30C Smart Li-Po Battery
SPMX32006S50	Spektrum 22.2V 3200mAh 6S 50C Smart Li-Po Battery
SPMX40006S30	Spektrum 22.2V 4000mAh 6S 30C Smart Li-Po Battery
SPMX40006S50	Spektrum 22.2V 4000mAh 6S 50C Smart Li-Po Battery

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

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

FCC Information



FCC ID: BRWSPMSR6200A
Supplier's Declaration of Conformity
Viper 70mm EDF Jet PNP, BNF Basic (EFL7775, EFL77500)

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

IC: 6157A-SPMSR6200A
CAN ICES-3 (B)/NMB-3(B)

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:
Viper 70mm EDF Jet PNP (EFL7775): Hereby, Horizon Hobby, LLC declares that the device is in compliance with the following:
 EU EMC Directive 2014/30/EU.

Viper 70mm EDF Jet BNF Basic (EFL7750): Hereby, Horizon Hobby, LLC declares that the device is in compliance with the following:
 EU Radio Equipment Directive 2014/53/EU.

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

Wireless Frequency Range and Wireless Output Power:

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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E-flite, Plug-N-Play, Bind-N-Fly, BNF, the BNF logo, DSM, DSM2, DSMX, Spektrum AirWare, EC5, AS3X, SAFE, the SAFE logo and the Horizon Hobby logo are trademarks or registered trademarks of Horizon Hobby, LLC.

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Futaba is a registered trademark of Futaba Denshi Kogyo Kabushiki Kaisha Corporation of Japan.

All other trademarks, service marks and logos are property of their respective owners.

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

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