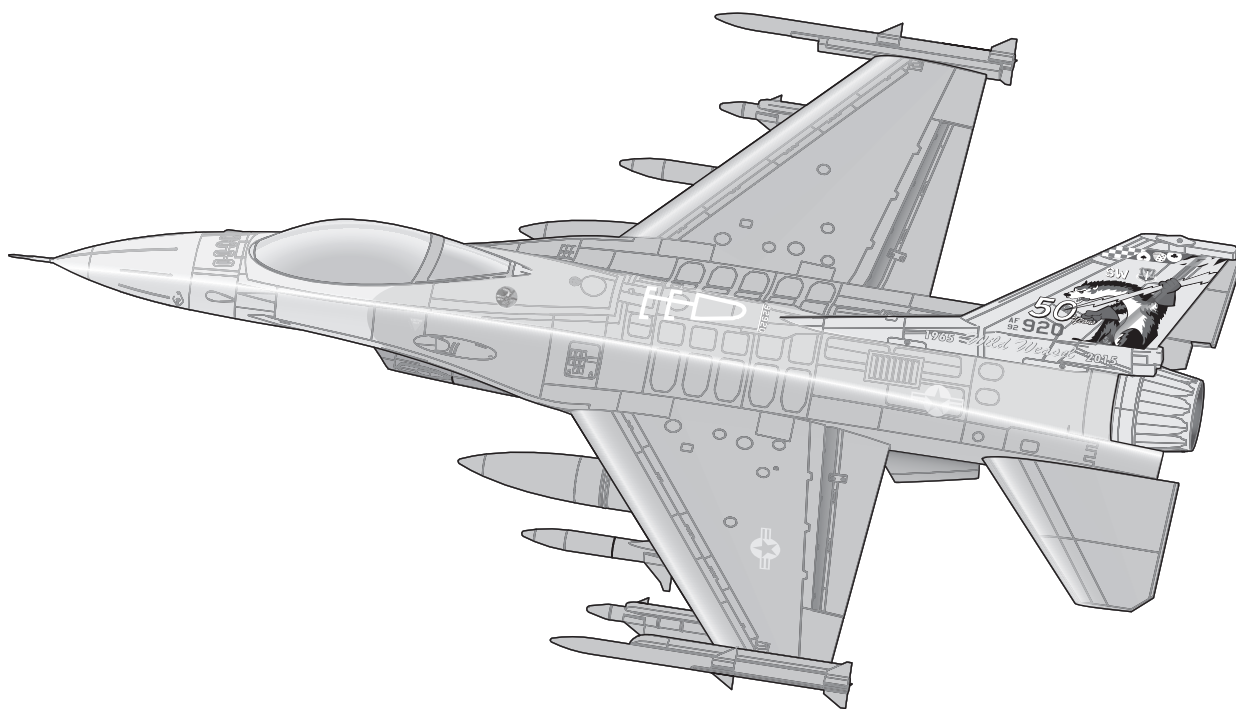


FMS F-16 Falcon 80mm EDF



Manual

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.

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.



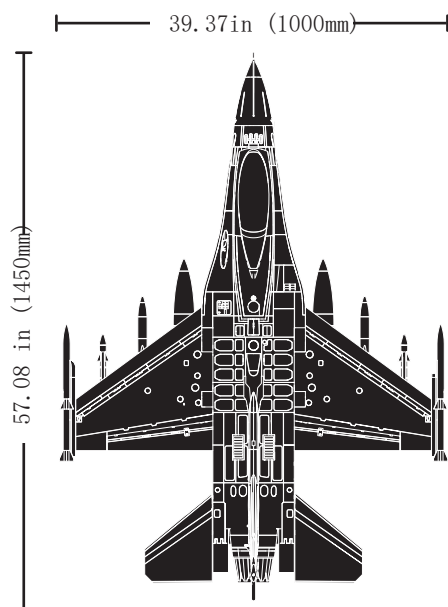
WARNING AGAINST COUNTERFEIT PRODUCTS: If you ever need to replace your Spektrum receiver found in a Horizon Hobby product, always purchase from Horizon Hobby, LLC or a Horizon Hobby authorized dealer to ensure authentic high-quality Spektrum product. Horizon Hobby, LLC disclaims all support and warranty 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	Set up your transmitter using the transmitter setup chart		
Dual Rates*		High Rate	Low Rate
	Aileron: Measured at the root of the aileron.	▲ = 15mm ▼ = 15mm	▲ = 11mm ▼ = 11mm
	Elevator: Measured at the root of the trailing edge of the stabilator.	▲ = 32mm ▼ = 27mm	▲ = 25mm ▼ = 21mm
	Rudder: Measured at the base of the rudder.	► = 21mm ◄ = 21mm	► = 16mm ◄ = 16mm
Center of Gravity (CG)	95mm (+/- 5mm) behind the leading edge of the wing at the fuselage		
Flight Timer Setting	3.5 minutes		

Specifications

	PNP ^{BASIC}	ARF Plus
Motor: 3280-2100Kv Brushless In-Runner 4-pole (SPMXAM1500)	Installed	Required
ESC: 100-Amp Pro Switch-Mode BEC Brushless ESC (SPMXAE1100A)	Installed	Required
Servos: Aileron: (2) Spektrum SPMSA335; 65mm Lead Left Stabilator: (1) Spektrum SPMSA450; 460mm Lead Right Stabilator: (1) Spektrum SPMSA450R; 460mm Lead Rudder: (1) Spektrum SPMSA335R; 150mm Lead Landing Gear Doors: (3) Spektrum SPMSA335; 65mm Lead Nose Wheel Steering: (1) Spektrum SPMSA335; 65mm Lead	Installed	Installed
Receiver: Spektrum AR637TA 6-Channel AS3X/SAFE Telemetry Receiver (SPMAR637T)	Required	Required
Recommended Battery: 22.2V 6S 5000mAh 30C	Required	Required
Recommended Battery Charger: 6-cell Li-Po battery balancing charger	Required	Required
Recommended Transmitter: Full range 6-channel 2.4GHz with Spektrum DSM technology with adjustable Dual Rates.	Required	Required



-  Without Battery
- Without Armament
5.88lb (2665)
- With Armament
6.28lb (2847g)
- With 6S 5000mAh Battery:
- Without Armament
7.44lb (3375g)
- With Armament
7.84lb (3557g)

Box Contents

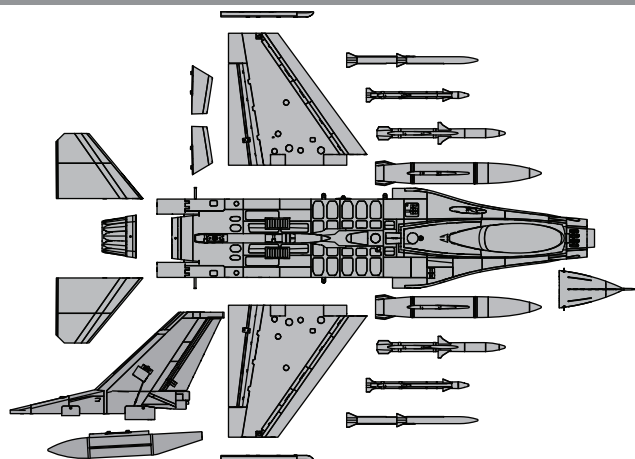


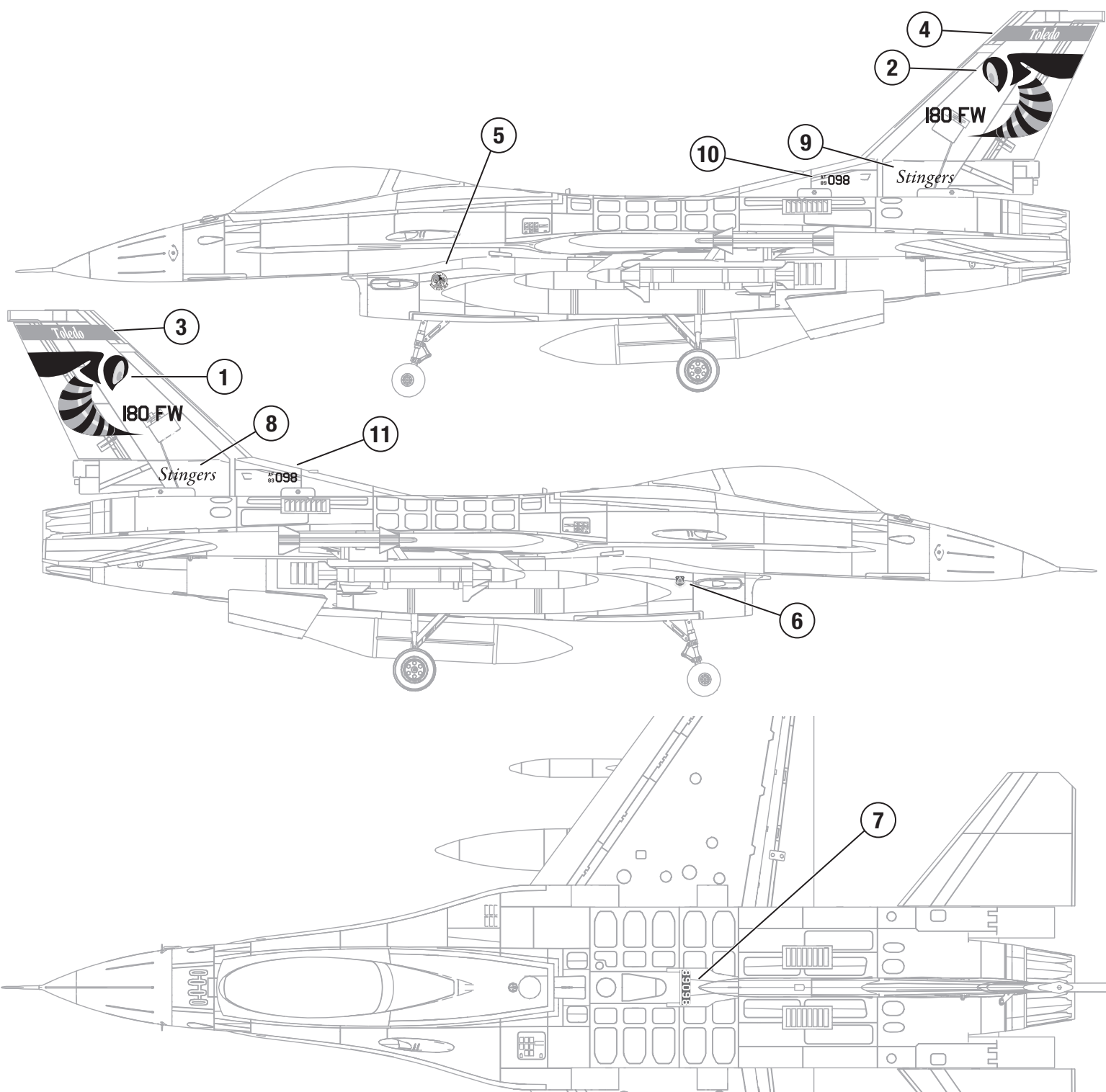
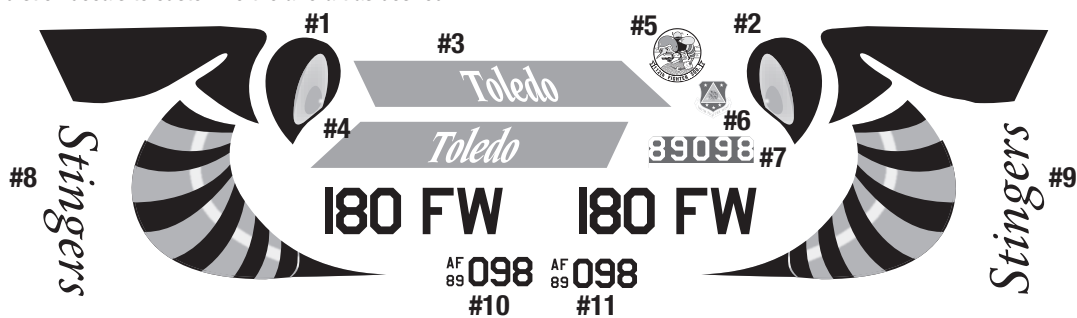
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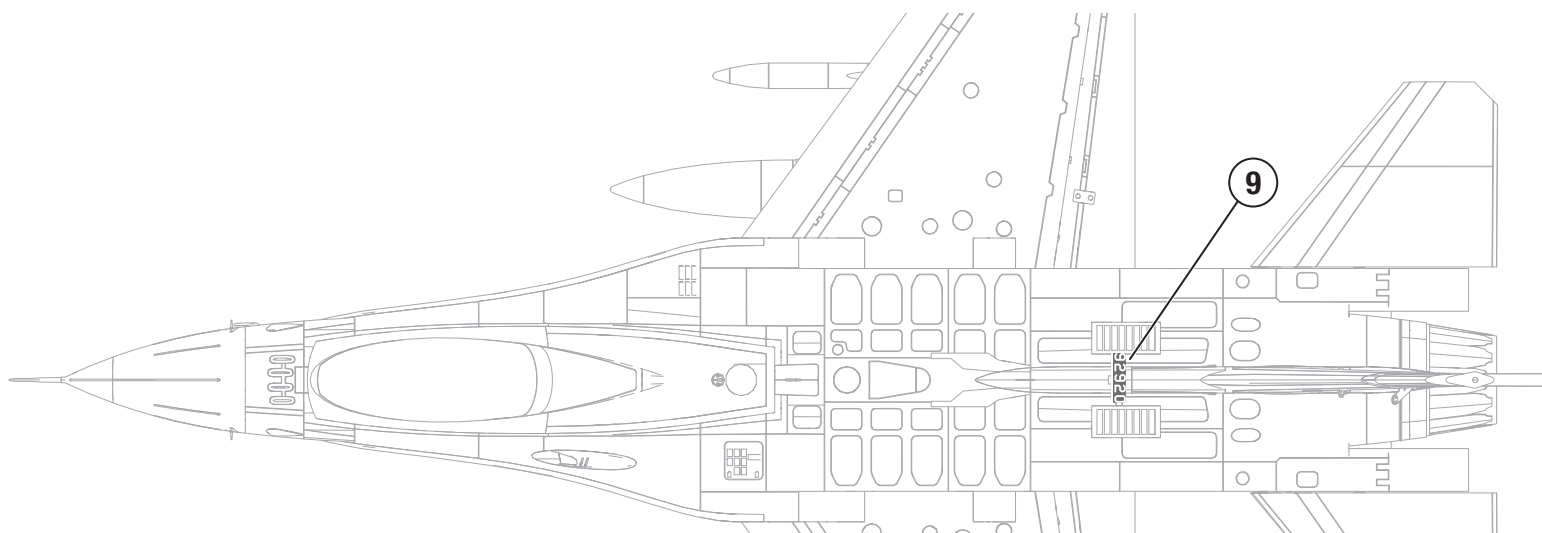
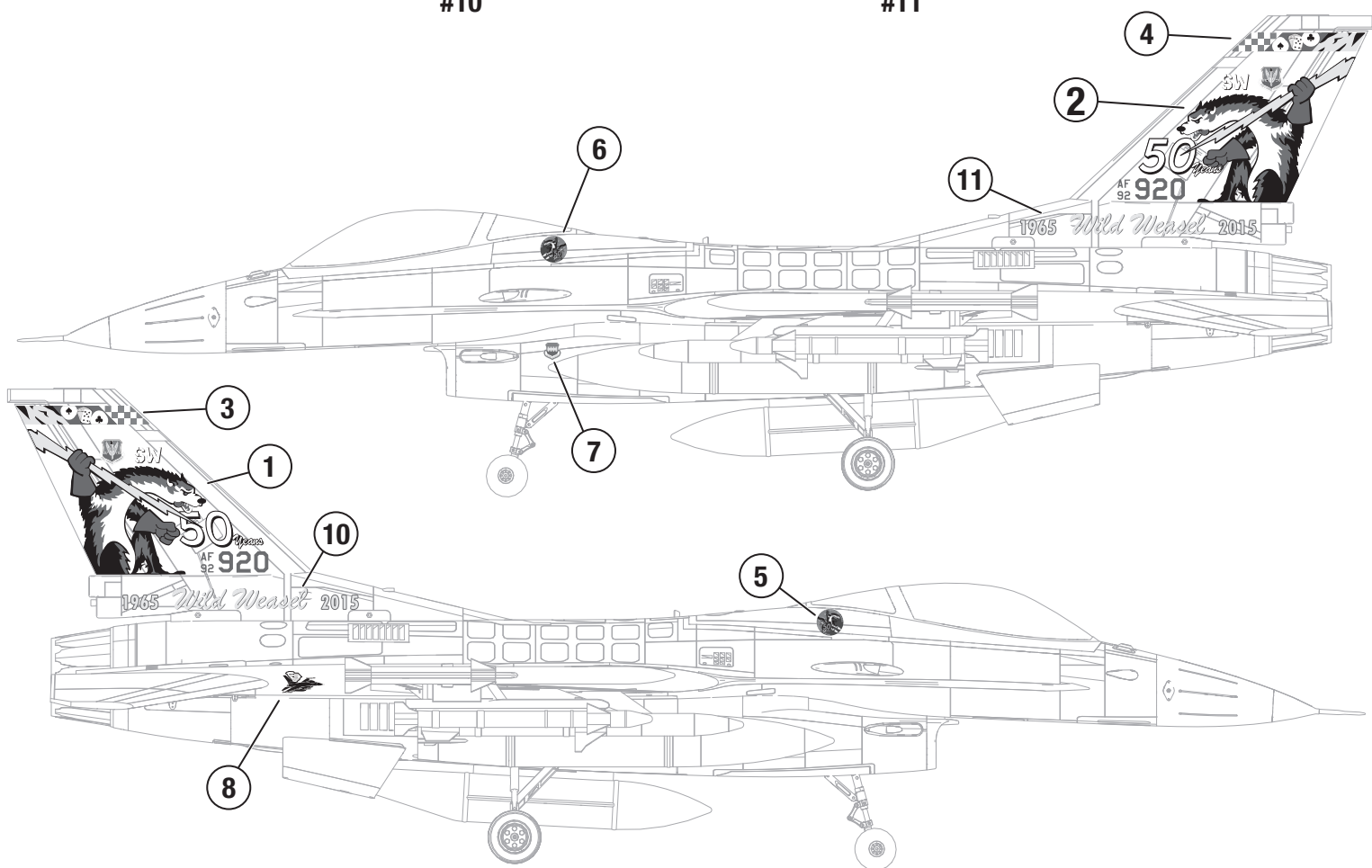
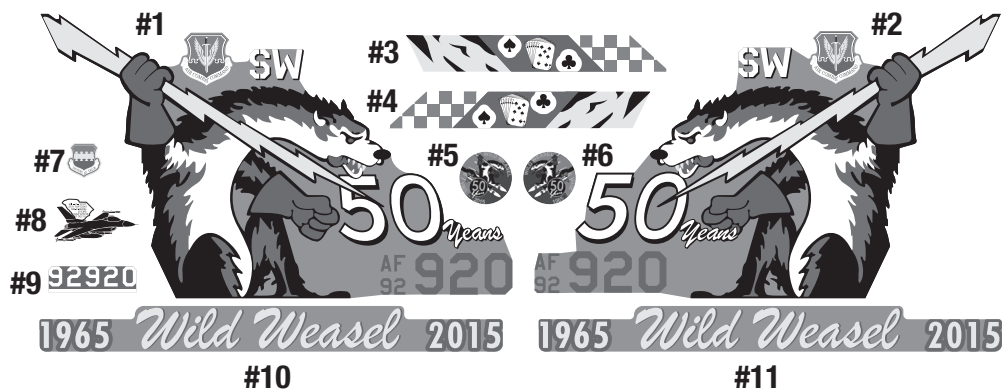
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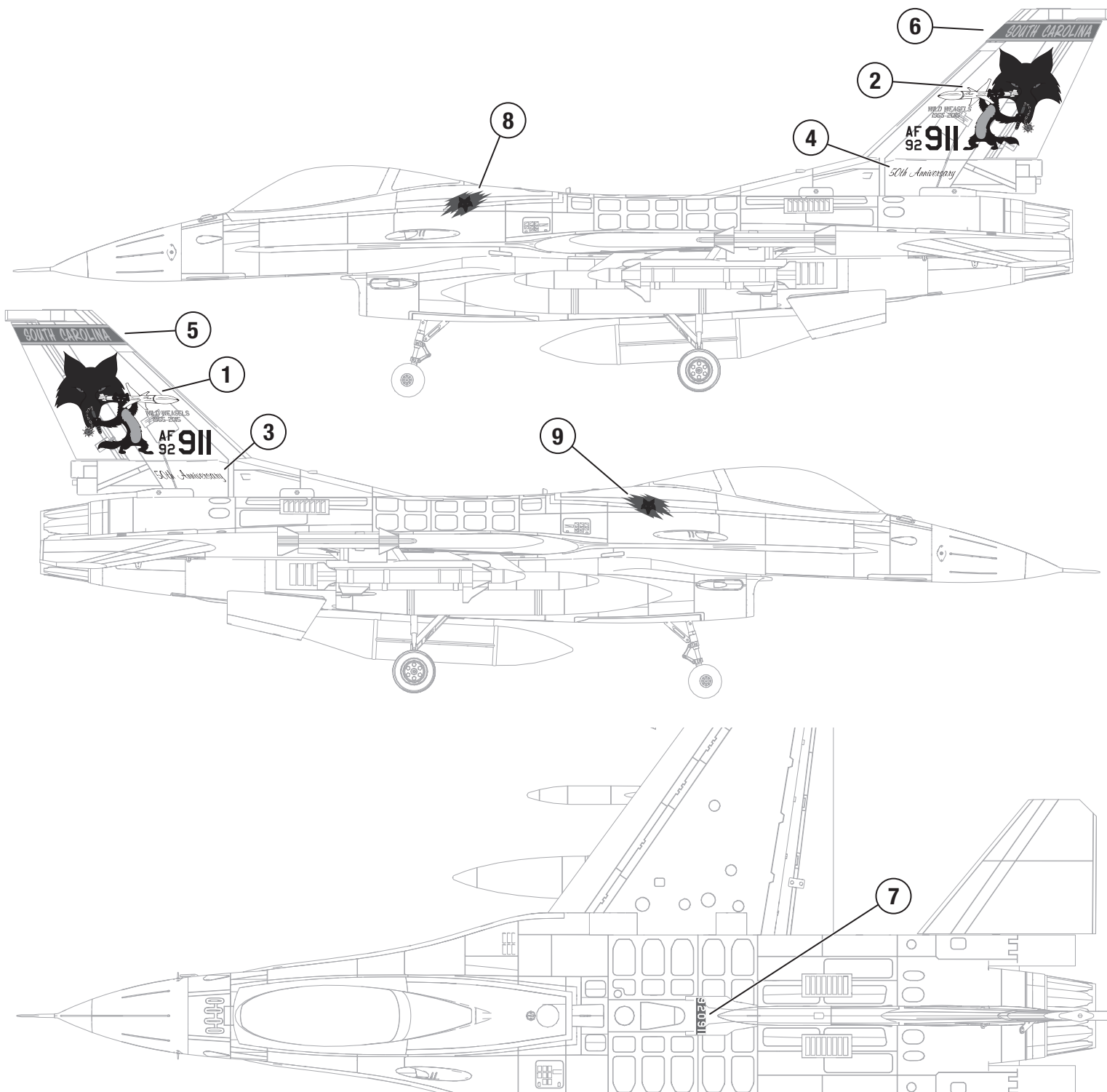
If you own this product, you may be required to register with the FAA. For up-to-date information on how to register with the FAA, please visit <https://registermyuas.faa.gov/>. For additional assistance on regulations and guidance on UAS usage, visit knowbeforeyoufly.org/.

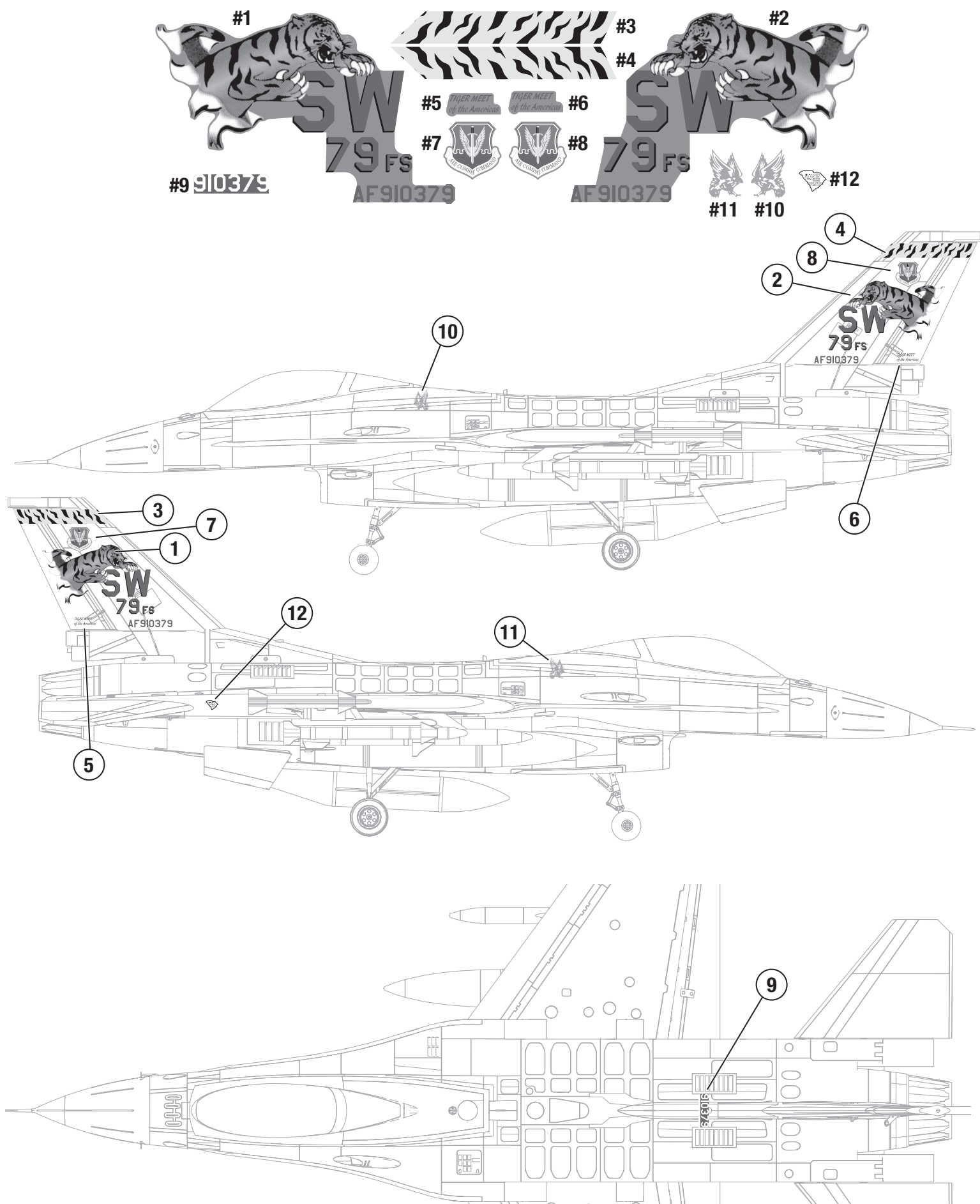
Decal Application

Apply the included peel and stick decals to customize the aircraft as desired.









SAFE® Select Technology (BNF Basic)

The BNF Basic version of this airplane includes SAFE Select technology which can offer an extra level of protection in flight. Use the following instructions to make the SAFE Select system active and assign it to a switch. When enabled, SAFE Select prevents the airplane from banking or pitching past predetermined limits, and automatic self-leveling keeps the airplane flying in a straight and level attitude when the aileron, elevator and rudder sticks are at neutral.

SAFE Select is enabled or disabled during the bind process. When the airplane is bound with SAFE Select enabled, a switch can be assigned to toggle between SAFE Select mode and AS3X mode. AS3X® technology remains active with no banking limits or self leveling any time SAFE Select is disabled or OFF.

SAFE Select can be configured three ways;

- SAFE Select Off: Always in AS3X mode
- SAFE Select On with no switch assigned: Always in SAFE Select mode
- SAFE Select On with a switch assigned: switch toggles between SAFE Select mode and AS3X mode

Preflight

1. Remove and inspect contents.

2. Read this instruction manual thoroughly.

3. Charge the flight battery.

4. Setup Transmitter using transmitter setup chart.

5. Fully assemble the airplane.

6. Install the flight battery in the aircraft (once it has been fully charged).

7. Check the Center of Gravity (CG).

8. Bind the aircraft to your transmitter.

9. Make sure linkages move freely.

10. Test the flap and retract operation.

11. Perform the Control Direction Test with the transmitter.

12. Perform the AS3X Control Direction Test with the aircraft.

13. Adjust flight controls and transmitter.

14. Perform a radio system Range Test.

15. Find a safe open area to fly.

16. Plan flight for flying field conditions.

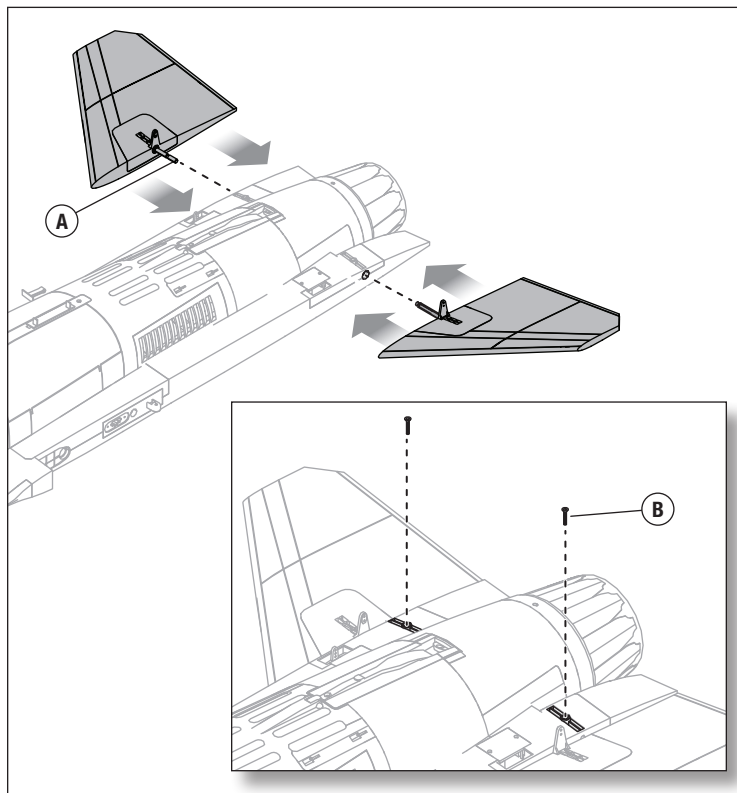
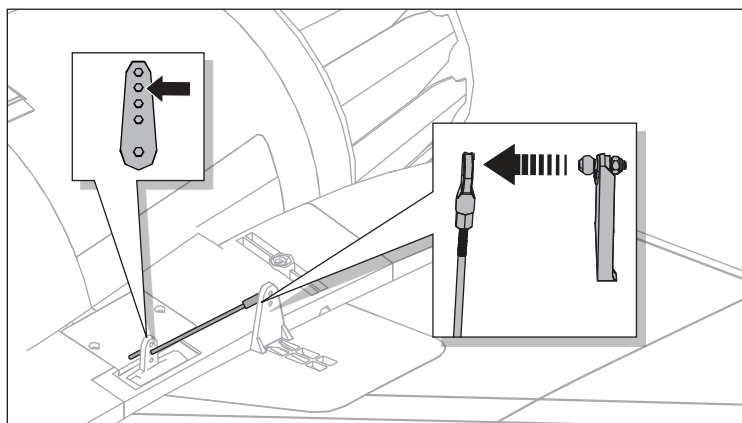
Model Assembly

Horizontal Stabilator Installation

1. Invert the fuselage and slide the stabilator rod (A) into the mount on the fuselage.

IMPORTANT: Care must be taken when inverting the fuselage.

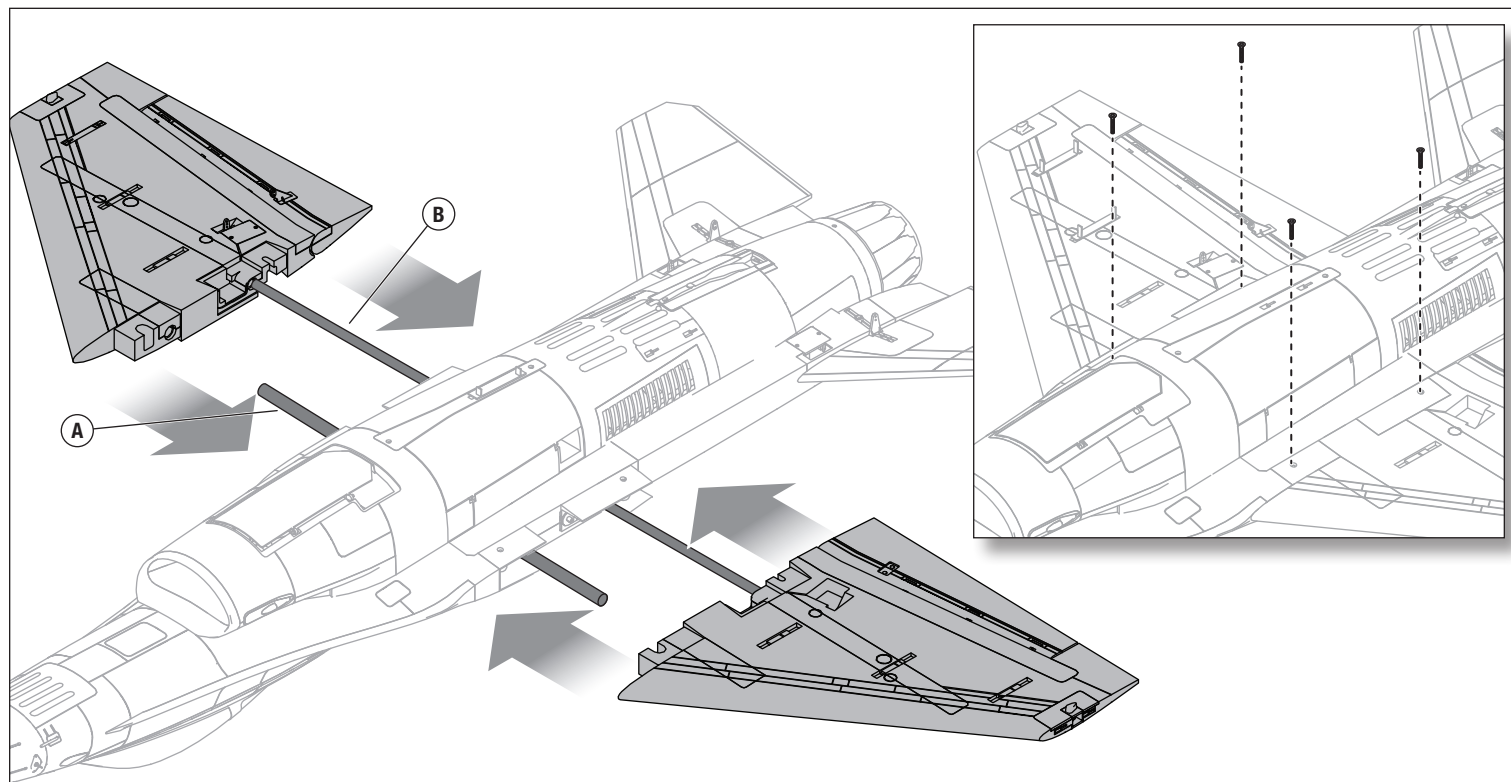
2. Secure the stabilator rod in the fuselage with the included M3x10mm countersunk machine screw (B) (2mm hex driver required). Tighten the screw until the screw head reaches the countersink of the fuselage.
3. Ensure the screw captures the groove on the stabilator rod.
4. Insert the Z-bend into the 3rd hole from the output shaft of the servo arm. The pushrod should be inserted from the outside of the arm and then snap the ball link onto the ball mounted on the control horn.
5. Repeat the process for the other stabilizer half.



Wing Installation

1. Slide the short large diameter wing tube (10 x 420mm) (A) into the front hole in the fuselage.
2. Slide the long, small diameter wing tube (7.75 x 750mm) (B) into the rear hole in the fuselage.
3. Slide each wing on to the tubes until it fully mates with the fuselage, paying close attention to make sure the hands free connector aligns and engages.
4. Secure the wing halves into position from the bottom using the four included M3x20mm countersunk machine screws (2mm hex driver required).

Disassemble in reverse order.



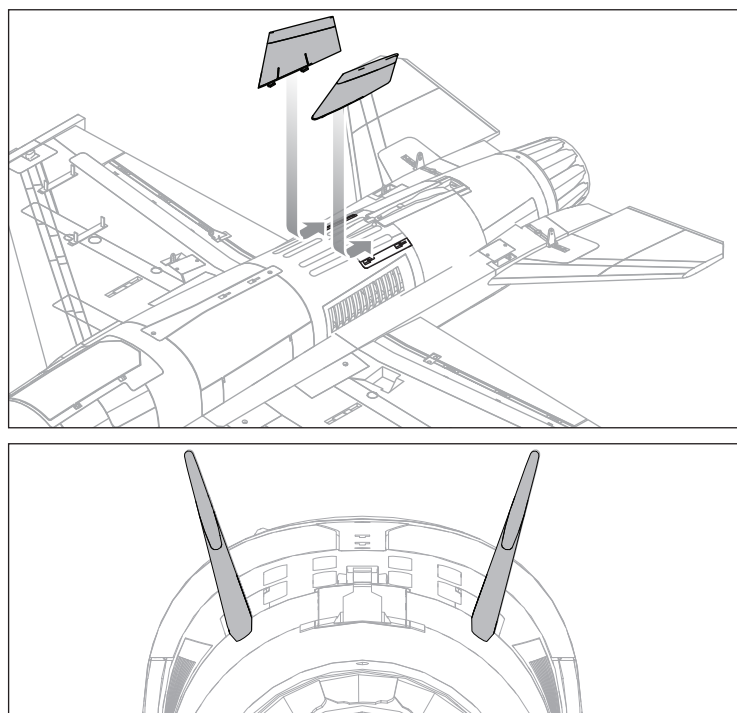
Ventral Fin Installation

1. Insert the mounting tab into the mounting bracket.

IMPORTANT: There is a left and right ventral fin. Refer to the illustration for proper angle of the installed fins.

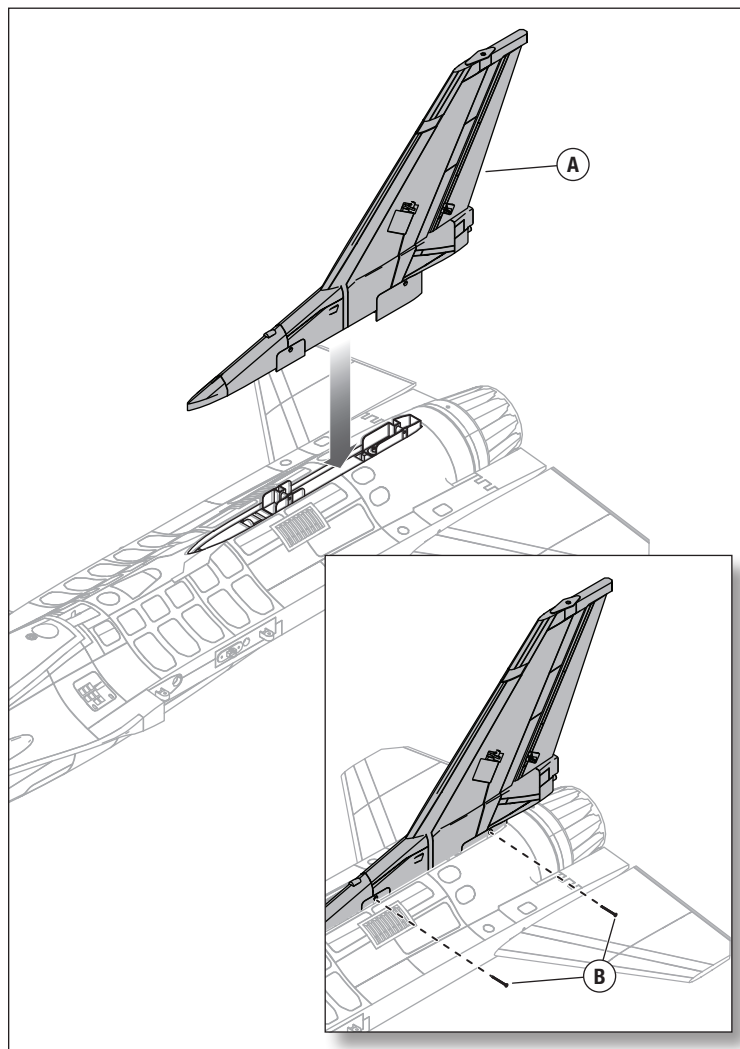
2. Slide the ventral fins to the rear to lock the tabs in place.

Disassemble in reverse order.



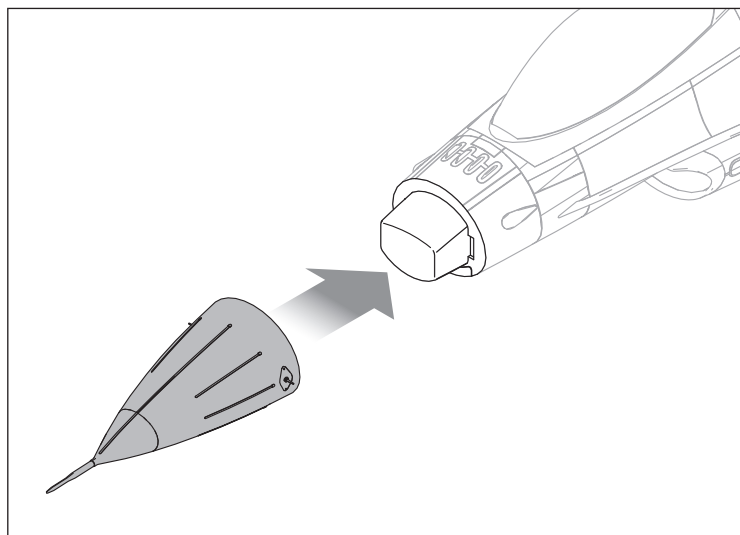
Vertical Stabilizer Installation

1. Slide the vertical stabilizer (A) in the fuselage vertical stabilizer pocket.
2. Secure the vertical stabilizer with two M3x26mm countersunk machine screws (B) (2mm hex driver required).



Nose Cone Installation

1. Align and attach the nose cone to the fuselage. Magnets will secure the nose cone in place.



Scale Accessories *Optional*

Armament Installation

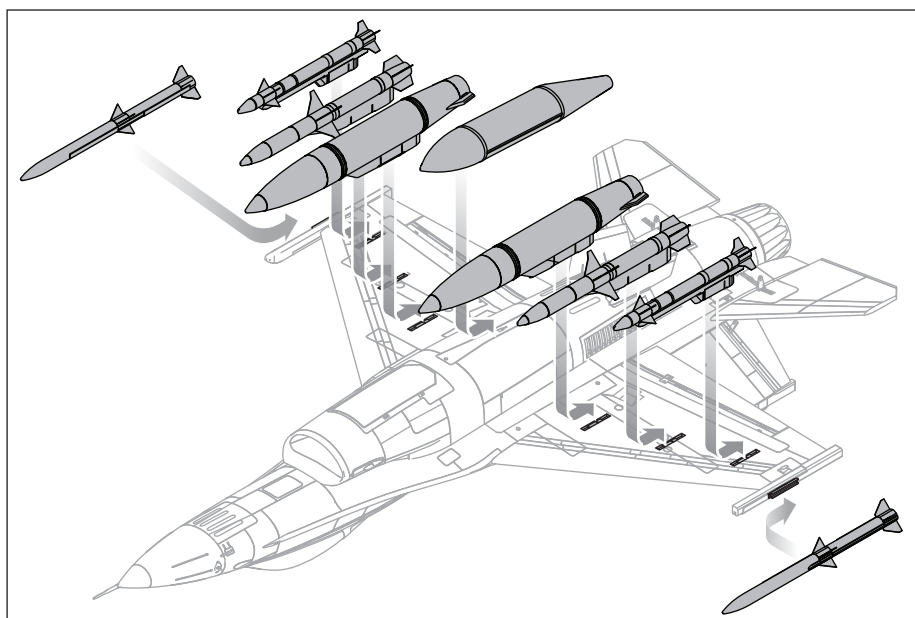
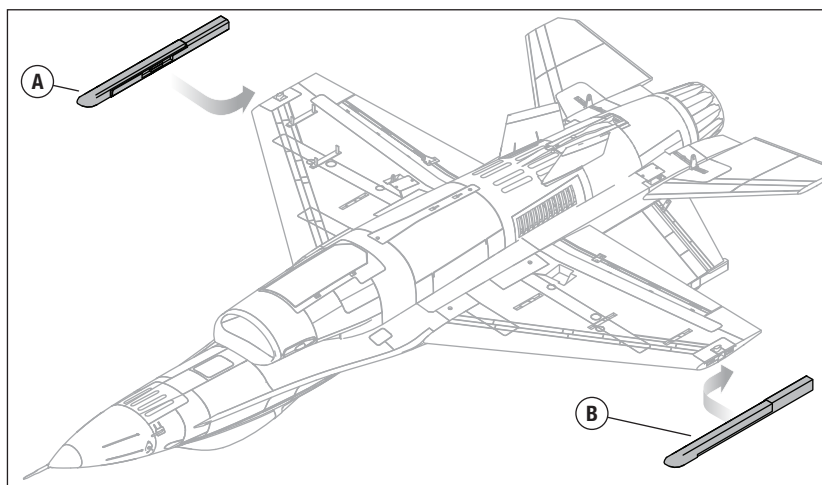
The dummy missile and drop tank stores may be installed for flight or removed as desired.

1. Insert the mounting tabs, of the wing tip missile rails (**A and B**), into the bracket on each wing tip, noting that the beveled side is facing to the outside.
2. Install the dummy missiles and drop tank stores, according to the illustration below, by inserting the mounting tabs into the mounting brackets on the wing.
3. Slide each store backward to lock the tabs in place.

Disassemble in reverse order.

IMPORTANT: The F-16 should always be flown with the wing tip missile rails (A and B) installed to protect the wing tips from damage.

IMPORTANT: There are left and right wing tip missile rails. The smooth plastic side should be facing down.



Receiver Installation (*ARF Plus*)

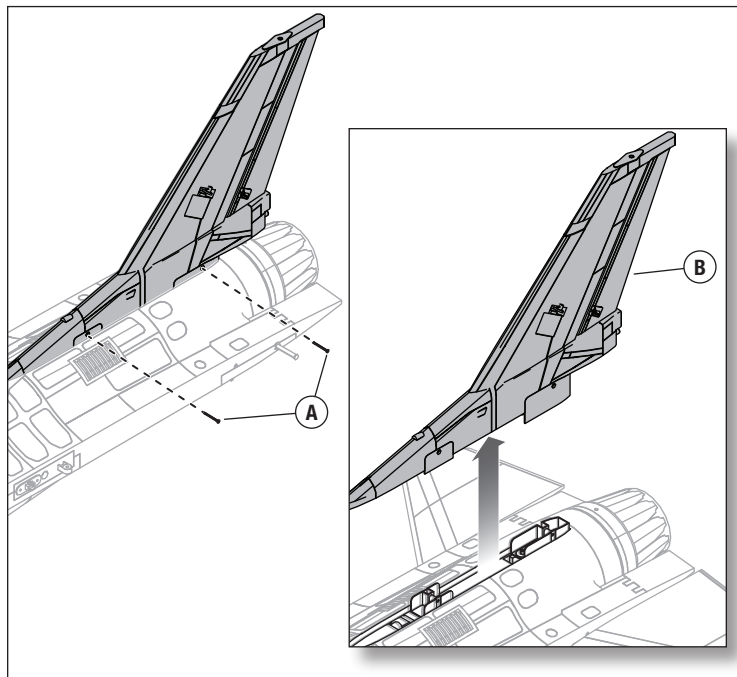
Afterburner Ring Installation (Sold Separately)

To add the optional Afterburner Ring.

An extension lead is already installed in the fuselage for the afterburner ring. The end of the lead is taped under the vertical stabilizer mounting structure inside the fuselage. It may be easier to locate and connect the lead by removing the EDF unit.

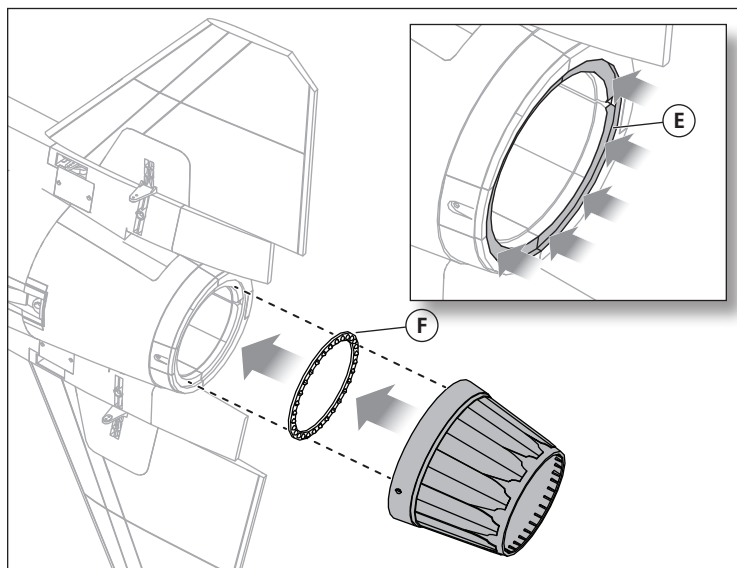
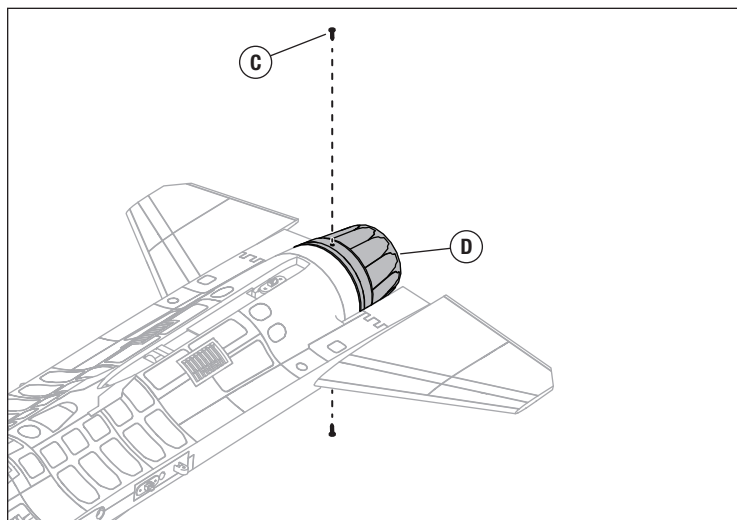
1. Remove the 2 screws (A) securing the vertical stabilizer (B) and remove the vertical stabilizer.
2. Remove the 2 screws (C) holding the tailcone (D) and remove the cone.
3. Connect the afterburner connector to the preinstalled servo lead found under the vertical stabilizer.
4. Apply contact cement (E) to the mating surface of the fuselage where the afterburner ring (F) will fit.
5. Fit the ring to the fuselage.
6. Reinstall the tailcone and the vertical stabilizer.
7. Remove the battery hatch and locate the loose "LED" afterburner extension plug, close to the receiver, and plug it into the other end of Y-Harness that is plugged into channel 6.

The afterburner ring cannot be Y-Harnessed with the ESC (throttle channel). The serial data stream will not allow the afterburner ring to operate correctly.



Transmitter Setup for Afterburner Ring	
DX6e	1. Go to the SYSTEM SETUP (Model Utilities) [†]
DX6 (Gen2)	2. Set CHANNEL ASSIGN (Model Setup, Channel Assign) [†] :
DX7 (Gen2)	
DX8e	3. Select: RX PORT ASSIGNMENT
DX8 (Gen2)	
DX9	4. Select the drop down: 6 AUX1:
DX10t	
DX18	5. Change to: Throttle
DX20	
iX12	
iX20	
NX6	
NX8	
NX10	

[†] 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.



Receiver Installation (*ARF Plus*)

The Spektrum AR637T receiver is recommended for this airplane. If you choose to install another receiver, ensure that it is at least a 6-channel full range (sport) receiver. Refer to your receiver manual for correct installation and operation instructions.

Installation (AR637T shown)

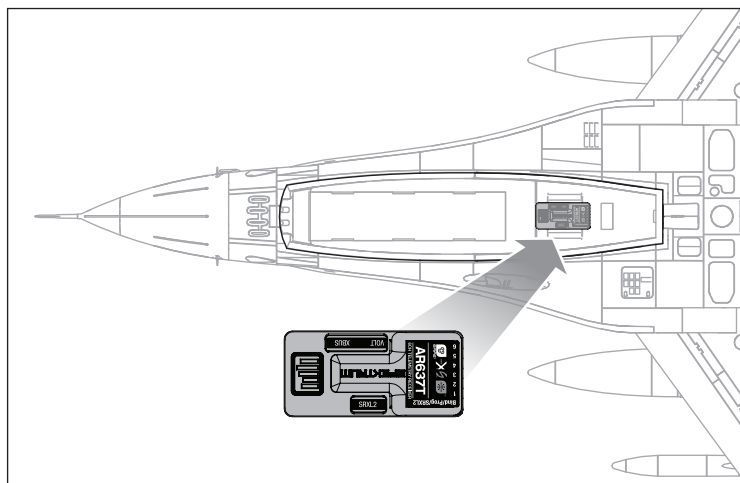
1. Mount the receiver parallel to the length of the fuselage as shown. Use heavy duty double-sided servo tape.

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

2. Attach the appropriate control surfaces to their respective ports on the receiver using the chart.

AR637T Port Assignments

BND/PRG = BIND	4 = Rudder
1 = Throttle	5 = Retracts
2 = Ailerons	6 = Afterburner
3 = Elevator	Ring (optional)



Transmitter Setup (*BNF Basic*)

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

The GEAR Channel (CH 5) controls the retractable landing gear. If you are using a 6 channel transmitter, The FLAP Channel (CH 6) can be used to toggle SAFE Select. With the values listed below it will turn SAFE on for half and full flap positions and AS3X will be on for no flaps position.

To use the flap channel for the SAFE Select switch the values must be set to +100 and -100 and the speed set to 0 temporarily to assign the safe switch in the flap system menu. Then change the flap systems values back to the listing in the TX setup. See the SAFE Select Switch Designation section of this manual to assign the switch for SAFE Select.

Dual Rates

Attempt 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.

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 Retract Channel to	Reverse	
Set Aileron Expo to	High Rate 10%	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	1. Go to the SYSTEM SETUP	
DX8	2. Set MODEL TYPE: AIRPLANE	
	3. Set WING TYPE: 1 AIL	
DX6e	1. Go to the SYSTEM SETUP (Model Utilities) [†]	
DX6 (Gen2)	2. Set MODEL TYPE: AIRPLANE	
DX7 (Gen2)		
DX8e		
DX8 (Gen2)	3. Set AIRCRAFT TYPE (Model Setup, Aircraft Type) [†] :	
DX9	WING: 1 AIL (Normal)	
DX10t		
DX18		
DX20		
iX12	4. Set CHANNEL ASSIGN (Model Setup, Channel Assign) [†] :	
iX20	(Default switch assignments with a new model setup)	
NX6	Gear (CH5): SWITCH A	
NX8		
NX10		

[†] 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.

Thrust Reversing

Motor reversing is not enabled when this aircraft is new. See the *Thrust Reversing* section of this manual for information about setting up and using the motor reversing function in the ESC.

Transmitter Telemetry Setup

See the Telemetry Setup table after binding. In order for the ESC and battery information to auto-populate in your transmitter's telemetry menu, you must begin telemetry setup with the aircraft bound and connected.

Battery Installation and ESC Arming

Battery Selection

A 6S 4000-7000mAh LiPo battery is required. The Spektrum 5000mAh 22.2V 6S 30C LiPo battery (SPMX50006S30) is recommended. Refer to the Optional Parts List for other recommended batteries. If using a battery other than those listed, the battery should be within the range of capacity, dimensions and weight of the Spektrum LiPo battery packs to fit in the fuselage. Be sure the model balances at the recommended CG before flying.

1. Lower the throttle and throttle trim to the lowest settings. Power on the transmitter, then wait 5 seconds.
2. Remove the battery hatch.
3. For added security, apply the loop side (soft side) of the optional hook and loop tape to the bottom of your battery, and the hook side to the battery tray.
4. Install the fully charged battery in the center of the battery compartment as shown. Secure using the hook and loop straps.
5. Connect the battery to the ESC. If you have not completed the bind sequence, do so at this time as outlined in this manual.

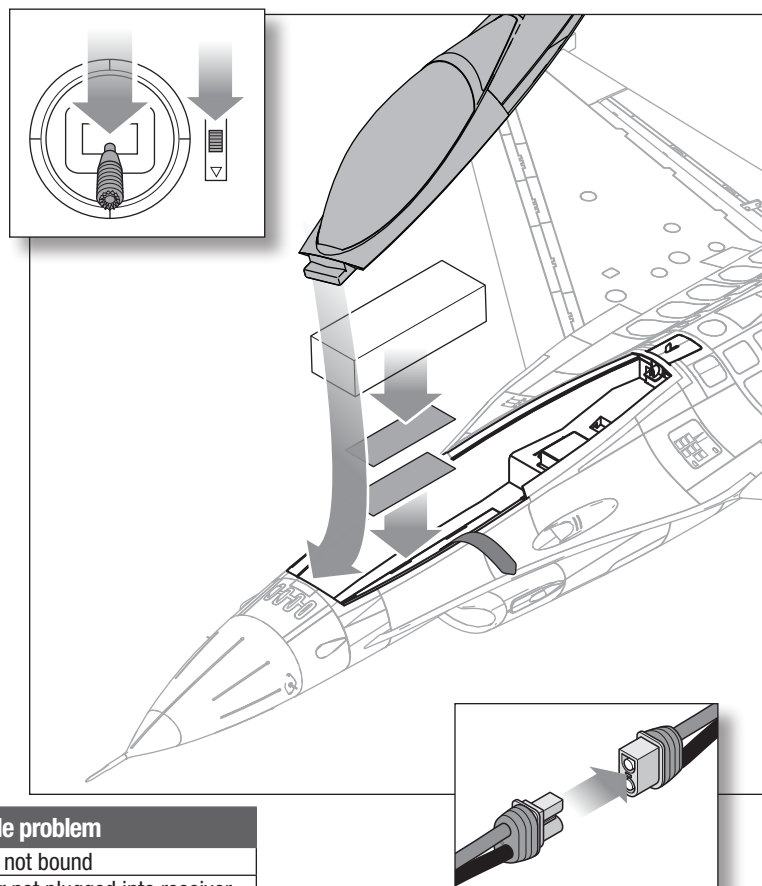
CAUTION: Always keep hands away from the fan intake. When armed, the motor will turn the rotor in response to any throttle movement.

6. Keep the aircraft immobile and away from wind or the system will not initialize.
 - The motor will emit a series of rising tones when the battery is connected, and then 6 even tones indicating the number of cells connected.
 - An LED will light on the receiver when it is initialized
7. Reinstall the battery hatch.

ESC Tones

If the ESC sounds a continuous double beep after the flight battery is connected, recharge or replace the battery.

ESC Error Tones	Tone Meaning	Possible problem
Continuous slow single tones	Abnormal throttle signal	Transmitter and receiver not bound
		Throttle lead damaged or not plugged into receiver
		Throttle lead plugged into receiver backward
Continuous rapid single tones	Throttle signal not at low position	Throttle stick not at low position
		Throttle travel reduced below 100%
		Throttle reversed
		Throttle trim raised
Continuous double tones	Battery voltage is beyond acceptable range	Verify battery is a 22.2V 6-cell LiPo
		Verify battery is fully charged

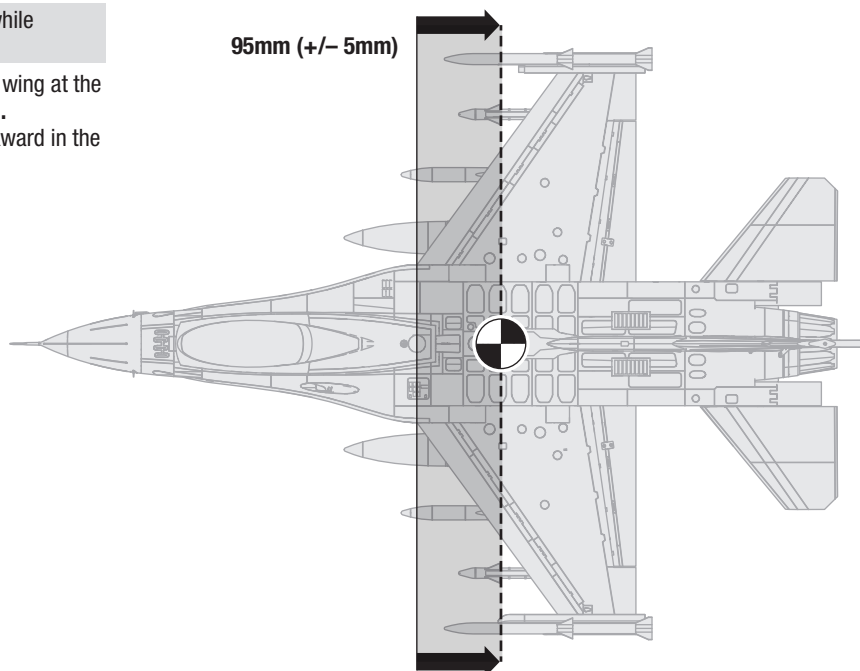


Center of Gravity

WARNING: Install the battery but do not connect it to the ESC while checking the CG. Personal injury may result.

The CG location is 95mm (+/- 5mm) back from the leading edge of the wing at the fuselage. **Always check the CG location with the landing gear down.**

The CG location is adjusted by moving the battery pack forward or backward in the battery compartment.



Transmitter and Receiver Binding (*BNF Basic*)

General Binding Tips

- 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.

Enabling or Disabling SAFE Select

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.

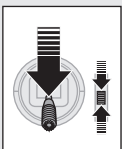
IMPORTANT: Move the transmitter flight controls (rudder, elevators, and ailerons) and the throttle trim to neutral. Move the throttle to low before and during binding.

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

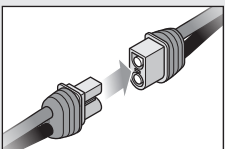
When using the auxiliary BEC from an ESC installed in the bind port of the receiver, unplug it to use bind plug.

Using Bind Button

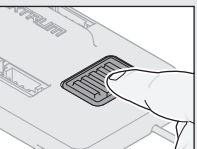
SAFE Select Enabled



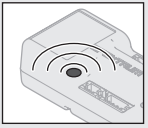
Lower Throttle



Connect Power



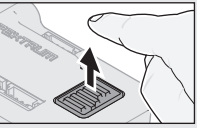
Press and hold Bind Button



Orange Flashing LED



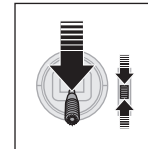
Bind TX to RX



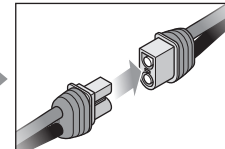
Release Bind Button

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

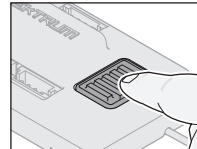
SAFE Select Disabled



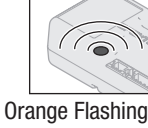
Lower Throttle



Connect Power



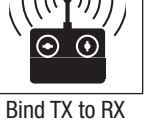
Press Bind Button



Orange Flashing LED



Release Bind Button

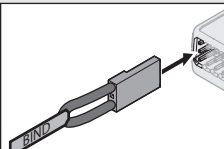


Bind TX to RX

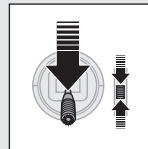
SAFE Select Disabled: The control surfaces cycle back and forth **once** every time the receiver is powered on.

Using Bind Plug

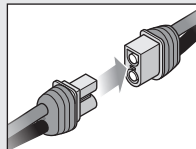
SAFE Select Enabled



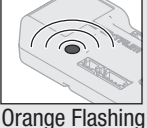
Install Bind Plug



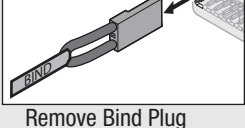
Lower Throttle



Connect Power



Orange Flashing LED



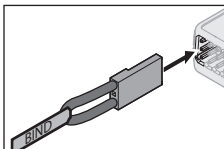
Remove Bind Plug



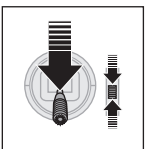
Bind TX to RX

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

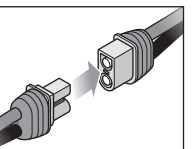
SAFE Select Disabled



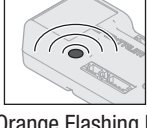
Install Bind Plug



Lower Throttle



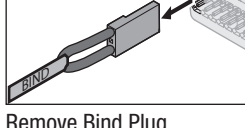
Connect Power



Orange Flashing LED



Bind TX to RX



Remove Bind Plug

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

SAFE® Select Switch Designation

SAFE® Select technology can be assigned to any open switch (2 or 3 position) controlling a channel (5–9) on your transmitter. Once assigned to a switch, SAFE select ON gives you the flexibility to choose SAFE technology or AS3X mode while in flight. If the aircraft is bound with SAFE select OFF, the aircraft will be in AS3X mode exclusively.

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%.

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

TIP: SAFE Select is assignable on any unused channels 5–9. See your transmitter manual for more information about assigning a switch to a channel.

TIP: Use your radio channel monitor to confirm that the four primary channels are showing 100% travel while assigning the switch.

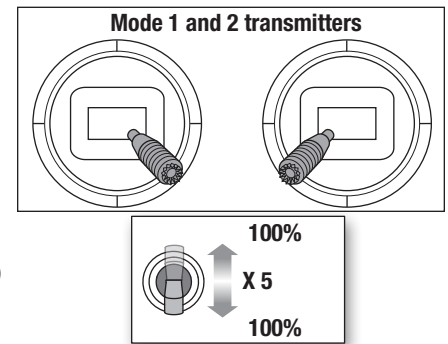
TIP: Use the channel monitor to make sure the switch you are assigning for SAFE Select is active and driving a channel between 5-9 and that it is traveling 100% in each direction.

TIP: Make sure your four primary channels are not reversed if you are having trouble assigning a SAFE Select switch.

Assigning a switch

1. Bind the aircraft to choose SAFE Select ON. 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.



Control Surface Centering

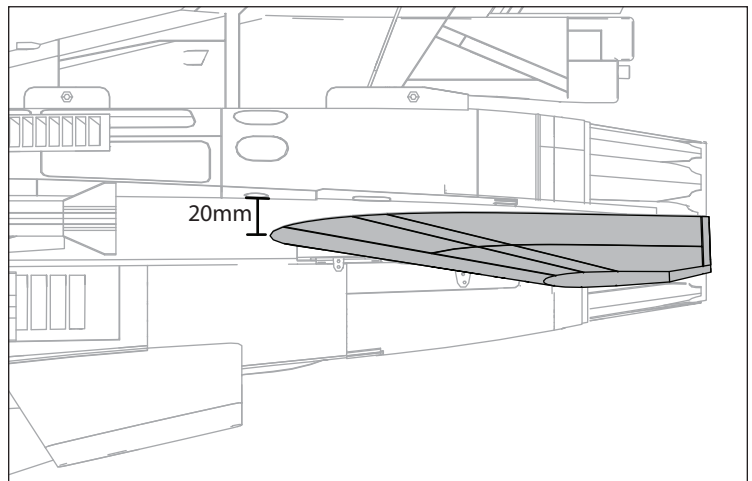
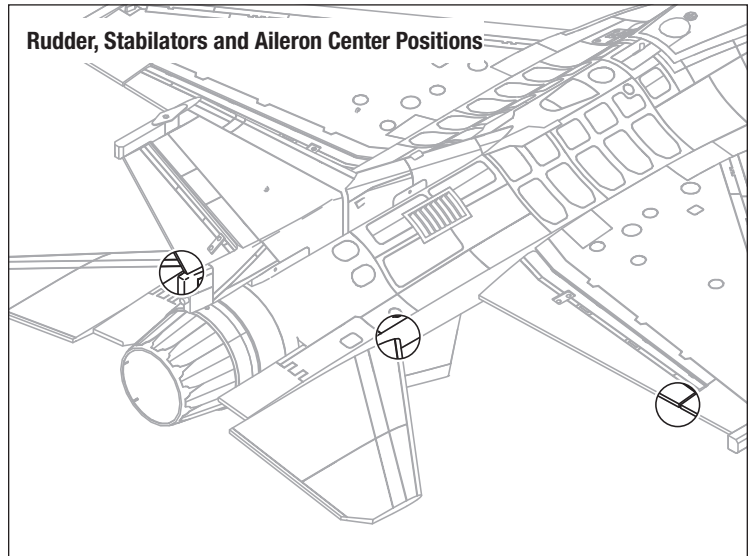
After assembly and transmitter setup, confirm that the control surfaces are centered. The model must be powered up and bound to the transmitter in AS3X mode, with the throttle left at zero. When enabled, SAFE mode is active at power up. AS3X mode is activated when the throttle is raised above 25% for the first time after being powered on. It is normal for the control surfaces to respond to aircraft movement if the aircraft is in AS3X or SAFE modes.

1. Verify the trims and subtrims on your transmitter are zero
2. Power up the model in AS3X mode and leave the throttle at zero

NOTICE: Be aware of the pushrod bottoming out in the ball linkage. Do not thread the pushrod too far into the ball link or the pushrod will damage the ball link and protrude into the area needed for the control ball.

3. Center the rudder with the bottom of the vertical stabilizer. If adjustment is required, turn the ball link on the linkage to change the length between the servo arm and the control horn until the rudder is straight.
4. Center the ailerons by aligning the outboard end of the aileron with the trailing edge of the wing. Adjust the linkage length as in step 3 as necessary.
5. The full flying stabilators need to be aligned with each other and centered. At neutral, the leading edge of the full flying stabilators should be 20mm below the top edge of the fuselage as shown.

Rudder, Stabilators and Aileron Center Positions



Control Surface Direction

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

Ailerons

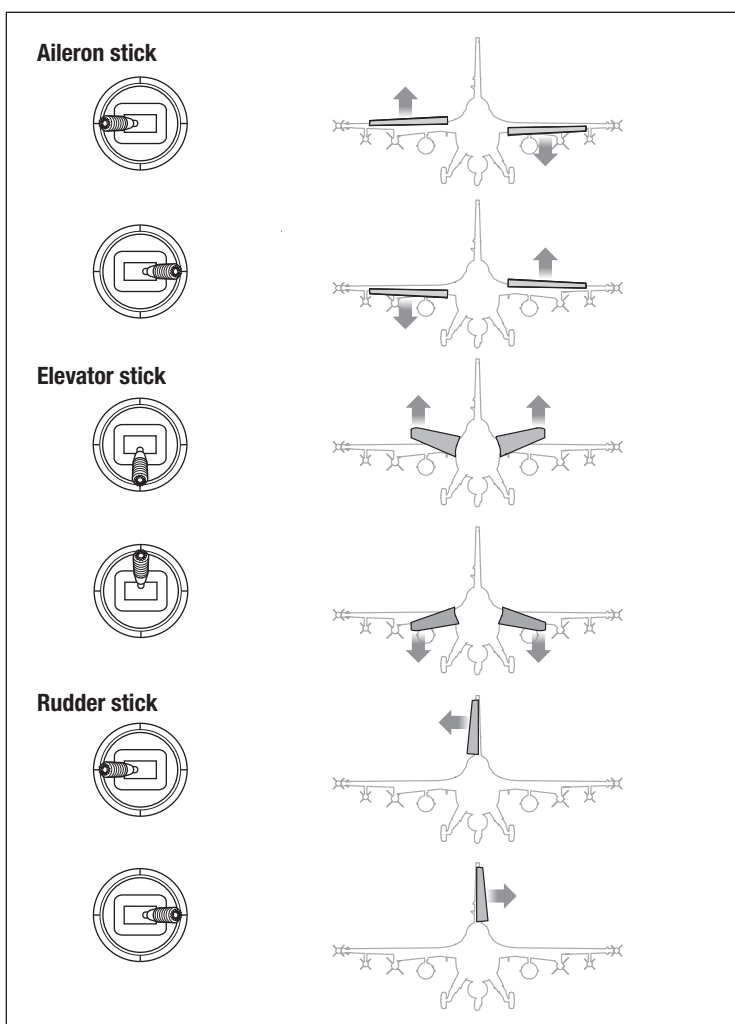
1. Move the aileron stick to the left. The right aileron should move down and the left aileron up, which will cause the aircraft to bank left.
2. Move the aileron stick to the right. The right aileron should move up and the left aileron down, which will cause the aircraft to bank right.

Elevators

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

Rudder

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



Control Horn and Servo Arm Settings

The table to the right shows the factory settings for the control horns and servo arms. Fly the aircraft at factory settings before making changes.

NOTICE: If control throws are changed from the factory settings, the AR637 gain values may need to be adjusted. Refer to the Spektrum AR637 manual for adjustment of gain values.

After flying, you may choose to adjust the linkage positions for the desired control response. See the table to the right.

Factory Setting	Control Horns	Servo Arms
Elevator		
Rudder		
Aileron		

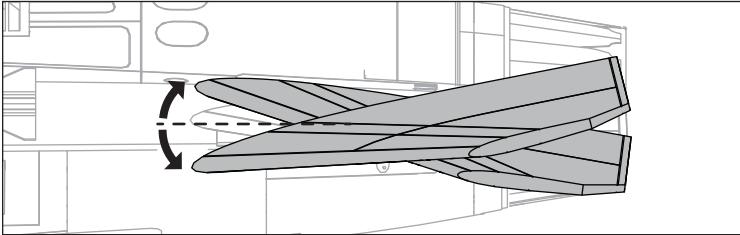
Tuning	Control Horns	Servo Arms
More control throw		
Less control throw		

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.

Horizontal Stabilator Control Throw Measurement

Measure the control throw for the horizontal stabilator at the leading edge, inboard end of the stabilator.



	Low Rate	High Rate
Aileron	11mm (7/16") ▲ 11mm (7/16") ▼	15mm (9/16") ▲ 15mm (9/16") ▼
Stabilator	25mm (1") ▲ 21mm (13/16") ▼	32mm (1-1/4") ▲ 27mm (1-1/16") ▼
Rudder	16mm (5/8") ◀ ▶	21mm (13/16") ◀ ▶

AS3X Control Response Test (BNF Basic)

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 fan intake, 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.

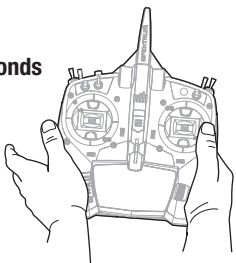
Once the AS3X system is active, control surfaces may move rapidly. This is normal. AS3X remains active until the battery is disconnected.

	Aircraft movement	AS3X Reaction
Pitch		
Roll		
Yaw		

In Flight Trimming (BNF Basic)

During your first flight, trim the aircraft for level flight. 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.

3 Seconds



Flying Tips and Repairs

Consult local laws and ordinances before choosing a flying location.

Getting Started

Before you fly, range check the radio system. Refer to your specific transmitter instruction manual for range test information. When you first connect the battery to the airplane AS3X will not be active. After advancing the throttle the first time, the AS3X system will be active and it is normal to see the control surfaces react to aircraft movement. For your first flights set your transmitter timer or a stopwatch to 3.5 minutes. Adjust your timer for longer or shorter flights once you have flown the model.

Takeoff

Face the aircraft into the wind for takeoff. Set your transmitter to low rates and gradually increase the throttle to full, and steer on the ground with rudder as necessary to keep the aircraft rolling straight. Be aware the nose wheel will become more sensitive as speed increases. Leave the elevator at neutral and allow the aircraft to accelerate up to speed on the ground, then pull up gently on the elevator to rotate for takeoff. When airborne, climb to a comfortable altitude, retract the landing gear.

Flying

For your first flights climb to a moderate altitude and get comfortable with the aircraft while the battery is fresh. Get a feel for the aircraft's low speed performance at a safe altitude (approximately 100 feet or more) before being required to make your first landing attempt. Land the aircraft when the timer expires. If at any time the motor power reduces, land the aircraft immediately to recharge the flight battery. See the Low Voltage Cutoff (LVC) section for more details on maximizing battery health and run time.

Landing

Plan to land the aircraft into the wind when possible. Fly downwind and turn into the wind to begin the approach. Extend the landing gear, lower the throttle. During the approach and descent, keep the wings level and the aircraft pointed into the wind. The angle of attack (the angle between the aircraft's pitch attitude and the horizon) should remain consistent and slightly nose high during the decent. With the angle of attack maintained during the descent, the speed and descent rate is mostly controlled with small throttle changes. Stay into the throttle to maintain speed and control during decent until the aircraft is ready to flare. As the airplane descends into ground effect, fully lower the throttle, pull the nose up more to bleed off airspeed (flare), and the aircraft will settle on its wheels.

If landing on grass, it is best to hold full up elevator after touchdown and when taxiing to prevent the nose from digging in. Once on the ground, avoid sharp turns until the plane has slowed enough to prevent scraping the wingtips.

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 reduces, 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).

Oscillation

For most flight maneuvers the aircraft should fly smoothly and normal, but it is possible in some flight conditions you may see oscillation (the aircraft rocks back and forth on one axis due to overcontrol). If oscillation occurs, refer to the Troubleshooting Guide for more information.

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. For a listing of all replacement and optional parts, refer to the list at the end of this manual.

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

SAFE Select Flying Tips

When flying in SAFE Select mode the aircraft will return to level flight any time the aileron and elevator controls are at neutral. Applying aileron or elevator control will cause the airplane to bank, climb or dive, and the amount the stick is moved will determine the attitude the airplane flies. Holding full control will push the aircraft to the pre-determined bank and roll limits but it will not go past those angles. When flying with SAFE Select it is normal to hold the control stick deflected with moderate aileron input when flying through a turn. To fly smoothly with SAFE Select avoid making frequent control changes and don't attempt to correct for minor deviations. With SAFE Select, holding deliberate control inputs will command the aircraft to fly at a specific angle and the model will make all corrections to maintain that flight attitude.

Return the elevator and aileron controls to neutral before switching from SAFE Select mode to AS3X mode. If you do not neutralize controls when switching into AS3X mode, the control inputs used for SAFE Select mode will be excessive for AS3X mode and the aircraft will react immediately.

Differences between SAFE Select and AS3X modes

This section is generally accurate but does not take into account flight speed, battery charge status, and many other limiting factors.

- In SAFE Select mode the aircraft will self level when the control stick is neutralized. In AS3X mode the aircraft will continue to fly at its present attitude when the control stick is neutralized.
- In SAFE Select mode holding a small amount of control will result in the model banking or pitching to a moderate angle and remaining at that angle as long as the control stick doesn't move. In AS3X mode holding a small amount of control will result in the model continuing to pitch or roll at a slow rate as long as the control stick doesn't move.
- In SAFE Select mode holding full control will result in the airplane banking or pitching to the predetermined limits and the aircraft will keep flying at that attitude as long as the control stick is fully deflected. In AS3X mode holding full control will result in the aircraft pitching or rolling as fast as possible, and it will continue to rapidly change attitude as long as the control stick is fully deflected.

Thrust Reversing (Optional)

The Avian™ Smart ESC in this aircraft is equipped with thrust reversing, but it must be enabled before it will function. Reversing the motor can be helpful when taxiing, or for shortening the ground roll after a landing. Activating the designated switch reverses motor rotation, throttle will still control motor speed.

**CAUTION:** Never attempt to use thrust reversing in flight. Applying reverse thrust while in flight will result in loss of control and possibly a crash. Crash damage is not covered under warranty.

IMPORTANT: Thrust reversing requires a Spektrum receiver with Smart Throttle (including the AR637TA and AR631) and a Spektrum transmitter with a minimum of 7 channels. The Avian ESC is backwards compatible with conventional receivers (PWM output signal) for normal operation, but reversing functions are only available with Smart Throttle technology.

Thrust Reversing Setup

Transmitter

On the transmitter, select an open channel (not already in use), and assign it to an open switch, or button. Use different channels for thrust reversing and SAFE Select. Motor reversing is assigned to Aux 2/Channel 7, by default, in the Smart ESC. If SAFE Select and the ESC are assigned to the same channel, the motor will reverse in flight.

**CAUTION:** Do not assign thrust reversing and SAFE Select to the same channel. Doing so will reverse the motor when SAFE Select is enabled during flight, resulting in a crash.

ESC

Set up the transmitter according to the setup chart, and bind your transmitter to the airplane. The airplane must be powered on and bound to the transmitter to access the Smart ESC programming.

As an alternative, it is possible to program the ESC with the Smart ESC Programming Box (SPMXCA200, optional, not included).

ESC Reversing 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. Set elevator and aileron to high rate.
	5. Set Flight Mode to AS3X (The menu will not open if the Flight Mode is set to SAFE).
	6. Power ON the aircraft. A signal bar appears on the transmitter main screen when the telemetry information is being received.
	7. From the main screen navigate to the last screen past the telemetry screens, the Avian Programming menu (Avian Prog).
	8. All configuration in the Avian Programming menu is done by moving the elevator and aileron stick. Follow the on-screen prompts to access the menu. Move the stick up or down to move the cursor, left or right to select a value or return to the cursor, and up or down to change a value when it is selected.
	9. Set BRAKE TYPE: Reverse
	10. Set BRAKE FORCE: 7
	11. Set THRUST REV: Select the channel you designated for thrust reversing in your transmitter. CH7 is the selection by default, but do not use this default option if you are using Aux2/Ch7 for SAFE Select.
	12. Select EXIT W/ SAVE to save your selections

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 to storage voltage level.

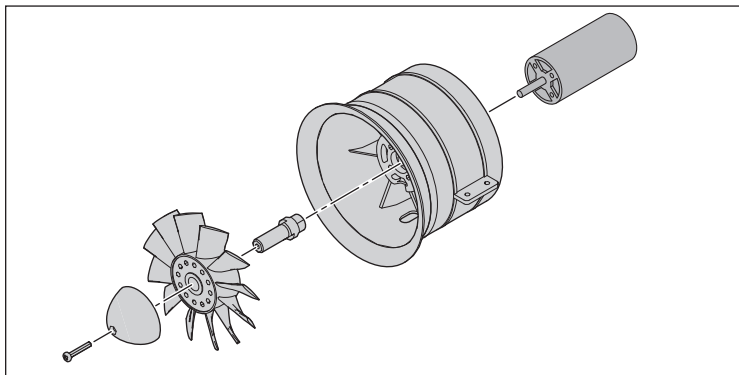
5. Repair or replace all damaged parts.
6. Store the flight battery apart from the aircraft and monitor the battery charge.
7. Make note of the flight conditions and flight plan results, planning for future flights.

Power System Installation and Service

Installing the Power System (ARF Plus)

The recommended power system components are given in the Specifications table at the beginning of this manual.

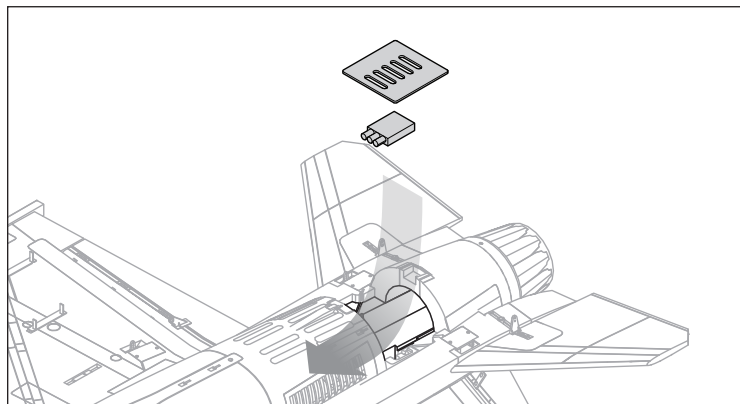
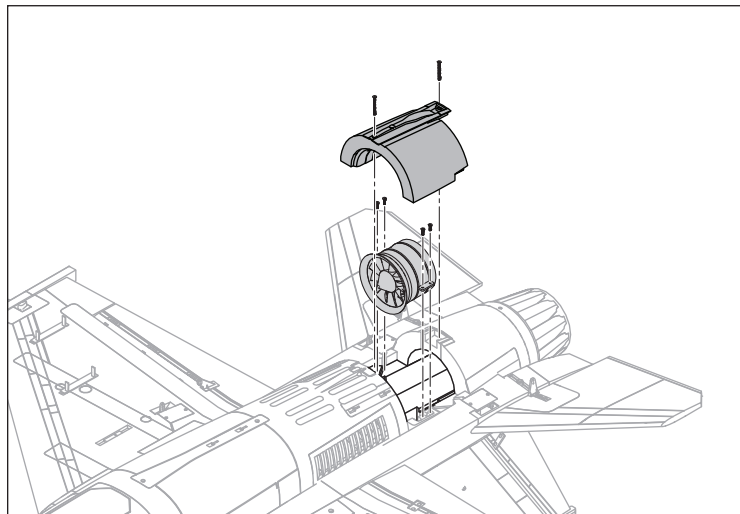
1. Remove the two screws from the fan unit cover and pull the cover out of the fuselage.
2. Feed the ESC battery and throttle leads through the small hole at the front of the ESC compartment and into the battery compartment.
3. Feed the motor leads through the trough under the fan shroud location.
4. Install the ESC in the fuselage.
5. Use adhesive to install the cover over the ESC, gluing the cover to the foam around the ESC.
6. Assemble motor to the fan housing.
7. Install the rotor adapter to the motor shaft.
8. Install the rotor to the rotor adapter with the rotor nut, nose cone and nose cone screw. Ensure the rotor nut is tightened securely before installing the nose cone.
9. Connect the motor wires to the ESC motor leads.
10. Install the fan unit into the fuselage using four screws through the fan unit tabs.
11. Install the fan unit cover with the two screws removed in step 1.
12. Connect the throttle lead to the aircraft receiver.



CAUTION: Always disconnect the flight battery before performing motor service.

Disassembly

1. Remove the two screws from the fan unit cover and pull the cover off the fuselage.
2. Remove the four screws from the fan unit tabs.
3. Pull the fan unit out of the fuselage, take note of the wiring order, and disconnect the motor leads from the ESC.
4. Remove the rotor cone screw, rotor cone and rotor nut from the rotor adapter.
5. Remove the rotor by pulling it off the rotor adapter.
6. Remove the rotor adapter from the motor shaft.
7. Remove the four 3mm hex head screws that hold the motor in the fan housing.



Assembly

Assemble in reverse order.

- Correctly align and connect the motor wire colors with the ESC wires.
- Install the rotor as shown.
- Tighten the nut on the motor adapter to secure the rotor into place.

Troubleshooting Guide AS3X

Problem	Possible Cause	Solution
Oscillation	Damaged rotor or nose cone	Replace rotor or nose cone
	Imbalanced rotor	Balance the rotor
	Motor vibration	Replace parts or correctly align fan unit or other 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 rotor, nose cone, 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 ball link 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
Excessive impeller noise or Excessive vibration	Damaged impeller, nose cone, collet or motor	Replace damaged parts
	Impeller is out of balance	Balance or replace impeller
	Impeller nut is too loose	Tighten the impeller 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 not cold before use (Do not apply heat to the battery)
	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
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
	BEC (Battery Elimination Circuit) of the ESC is damaged	Replace ESC
Controls reversed	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
	Landing gear sequencer: SU-30 and F-16
	Fuselage: F-16 Falcon 80mm EDF
	Wing Set: F-16 Falcon 80mm EDF
	Vertical Stabilizer: F-16 Falcon 80mm EDF
	Stabilator Set: F-16 80mm EDF
	Canopy: F-16 Falcon 80mm EDF
	Nose Cone: F-16 Falcon 80mm EDF
	Ventral Fin Set: F-16 80mm EDF
	Gear Door Set: F-16 80mm EDF
	Decal Set: F-16 Falcon 80mm EDF
	Wing Tip Missiles: F-16 80mm EDF
	Wing Missiles: F-16 80mm EDF
	Wing Fuel Tanks: F-16 80mm EDF
	Screw Set: F-16 Falcon 80mm EDF
	Wing Tubes: F-16 Falcon 80mm EDF
	Wheel Set: F-16 Falcon 80mm EDF
	Linkage Set: F-16 80mm EDF
	LED Set: F-16 Falcon 80mm EDF
	Pitot Tube: F-16 Falcon 80mm EDF
	Stabilator Rods: F-16 80mm EDF
	Center Tank: F-16 80mm EDF
	Tail Cone: F-16 80mm EDF
	Ducted Fan Unit: 80mm, V2
	Ducted Fan Rotor: 80mm, V2
	Nose Gear Strut: F-16 80mm EDF
	Main Gear L Strut: F-16 80mm EDF
	Main Gear R Strut: F-16 80mm EDF
	E-retract Nose: F-16 80mm EDF
	E-retract Main-L: F-16 80mm EDF
	E-retract Main-R: F-16 80mm EDF
	AR637T 6CH SAFE and AS3X TelemRX
	A335 Sub-Micro Digital 9g Servo
	A335R Sub-Micro Digital 9g Servo Reverse
	A450 Servo: 13g Digital Metal Gear
	A450R Servo: 13g Digital Metal Gear Reverse
	Avian 100 Amp Brushless Smart ESC, 3S-6S 80mm EDF version
	Motor: 3280-2100kV BL Inrunner

Optional Parts

Part #	Description
	Park Flyer Tool Assortment, 5 pc
	SMART Battery Checker and Servo Driver (IC3 - use SPMXCA507)
	Li-Po Charge Protection Bag, Large
	iX12 12 Channel Transmitter Only
	DX8e 8CH Transmitter Only
	22.2V 5000mAh 6S 30C Smart LiPo, IC5
	22.2V 7000mAh 6S 30C Smart LiPo, IC5
	Smart S1200 DC Charger, 1x200W (IC3 - use SPMXCA507)
	Smart S2100 AC Charger, 2x100W (IC3 - use SPMXCA507)
	Spektrum IC3 Battery to IC5 Device
	Afterburner LED Ring: F-16 Falcon 80mm EDF.

Recommended Receivers (ARF Plus)

Part Number	Description
Telemetry Equipped Receivers	
	AR620 6-Channel Sport Air Receiver
	AR6610T 6-Channel Air Integrated Telemetry Receiver
	AR8020T 8-Channel Air Integrated Telemetry Receiver
AS3X and Telemetry Equipped Receivers	
	AR637T DSMX 6-Channel AS3X Telemetry Receiver
	AR9350 8-Channel SAFE AS3X Receiver with Integrated Telemetry
Telemetry Sensors*	
	Aircraft Telemetry Airspeed Indicator
	Aircraft Telemetry Altitude and Variometer Sensor
	Brushless RPM Sensor
	Aircraft Telemetry Flight Pack Battery Energy Sensor
	Aircraft Telemetry GPS Sensor

*Not compatible with BNF, Telemetry receiver required

