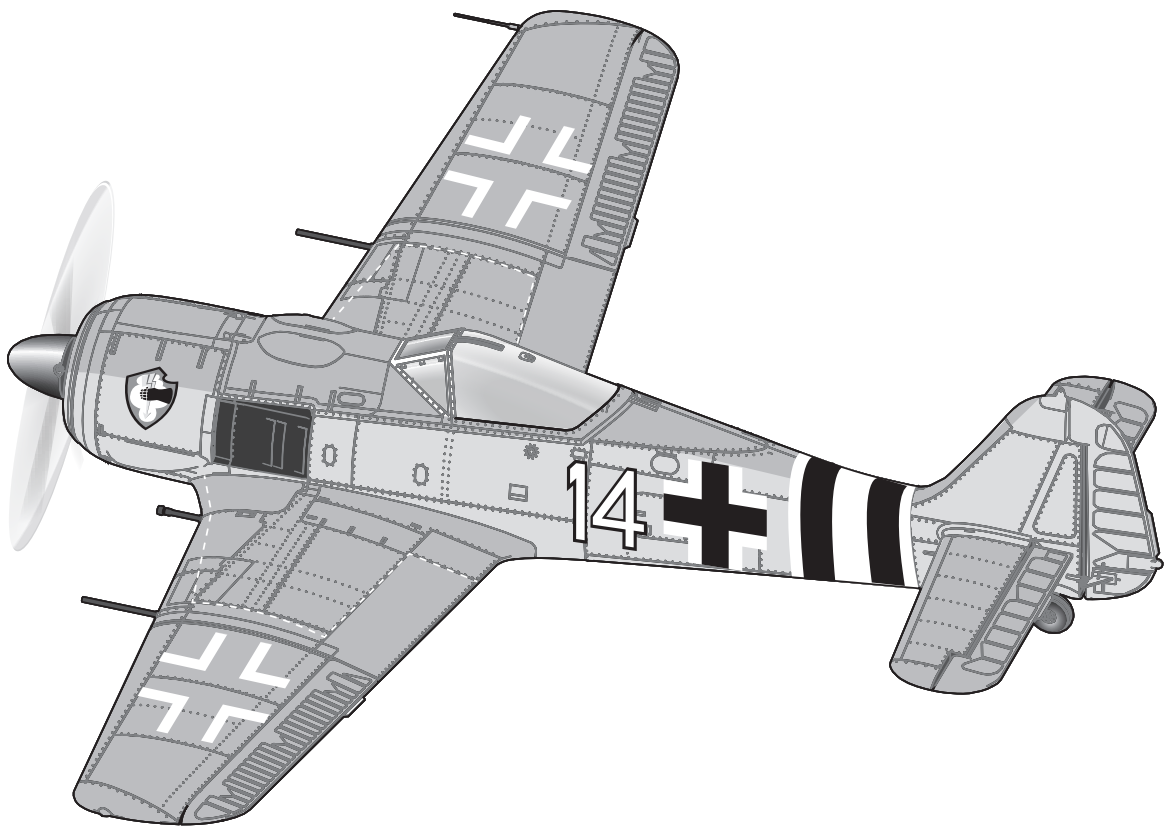


**HORIZON**<sup>®</sup>  
H O B B Y

**Eflite**<sup>®</sup>  
ADVANCING ELECTRIC FLIGHT

# Fw 190A 1.5m



**Instruction Manual**  
**Bedienungsanleitung**  
**Manuel d'utilisation**  
**Manuale di Istruzioni**

**SAFE**<sup>®</sup> 

SAFE<sup>®</sup> Select Technology, Optional Flight Envelope Protection

**SMART**<sup>™</sup>  
TECHNOLOGY 

**Plug-N-Play**<sup>®</sup>

**Bind-N-Fly**<sup>®</sup>  
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.

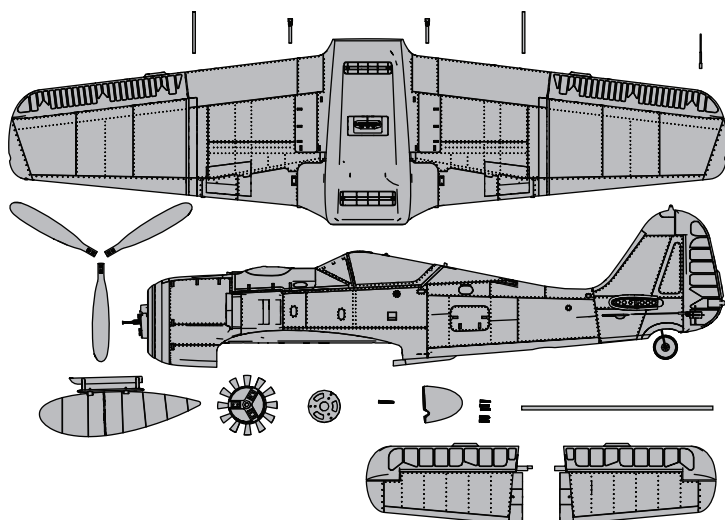
- Always keep a safe distance in all directions around your model to avoid collisions or injury. This model is controlled by a radio signal subject to interference from many sources outside your control. Interference can cause momentary loss of control.
- Always operate your model in open spaces away 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.

## Box Contents

Quick Start Information			
Transmitter Setup	1. Blank (Acro) Model		
	2. Servo Reversing: Reverse GEAR		
	3. Travel Adjust (All Surfaces): 100%		
Dual Rates*		<b>High Rate</b>	<b>Low Rate</b>
	Aileron	▲ = 13mm ▼ = 13mm	▲ = 10mm ▼ = 10mm
	Elevator	▲ = 10mm ▼ = 7mm	▲ = 7mm ▼ = 5mm
	Rudder	▶ = 25mm ◀ = 25mm	▶ = 18mm ◀ = 18mm
Flap Control Throw		<b>Half (Take-off)</b>	<b>Full (Landing)</b>
		▼ = 15mm	▼ = 30mm
Flap to Elevator Mix		8% down elevator	15% down elevator
Exponential		<b>High Rate</b>	<b>Low Rate</b>
	Aileron	10%	5%
	Elevator	10%	5%
	Rudder	10%	5%
Center of Gravity (CG)	105-120mm back from the inner gun mount on the leading edge with aircraft inverted.		
Flight Timer Setting	For first flight, set timer to 3 minutes. Adjust time depending on battery condition and flying style.		



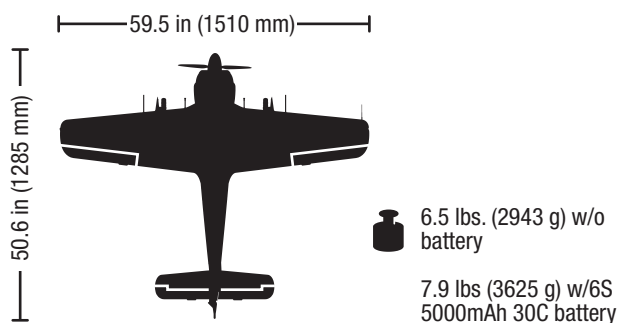
## Specifications

	<b>BNP</b> BASIC	<b>PNP</b> PLUG-N-PLAY
<b>Motor:</b> 4258-460kV 14-pole BL Motor (SPMXAM1000)	Installed	Installed
<b>ESC:</b> Avian 100-Amp Smart ESC 6S (SPMXAE1100)	Installed	Installed
<b>Servos:</b> Aileron: (2) Spektrum A430; 150mm Lead Elevator: (1) Spektrum A430; 150mm Lead Rudder: (1) Spektrum A430; 150mm Lead Flaps: (2) Spektrum A430; 330mm Lead	Installed	Installed
<b>Receiver:</b> Spektrum™ AR637TA 6-Channel AS3X/SAFE Telemetry Receiver (SPMAR637T)	Installed	Required to Complete
<b>Recommended Battery:</b> 5000mAh 6S 22.2V Smart 30C IC5 LiPo (SPMX50006S30)	Required to Complete	Required to Complete
<b>Recommended Battery Charger:</b> 6 cell Li-Po battery balancing charger	Required to Complete	Required to Complete
<b>Recommended Transmitter:</b> Full-Range 2.4GHz with Spektrum™ DSM2®/DSMX® technology with programmable mixing and adjustable dual rates	Required to Complete	Required to Complete

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RECEIVER BIND INFORMATION	
Channels	6
Frequency	2402 – 2478 MHz
Compatibility	DSM2 and DSMX



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

## 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	Perform the Control Direction Test with the transmitter.
11	Perform the AS3X Control Direction Test with the aircraft.
12	Adjust flight controls and transmitter.
13	Perform a radio system Range Test.
14	Find a safe open area to fly.
15	Plan flight for flying field conditions.

## Transmitter Setup

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

**IMPORTANT:** Flap to elevator mix values, control throws, dual rates, exponential, CG range are recommended as STARTING POINTS and should be adjusted for personal preference as/f needed after making initial flights.

**IMPORTANT:** The included receiver has been programmed specifically for operation in this aircraft. If you desire to use the AR637T receiver in a different aircraft visit spektrumrc.com for reprogramming instructions.

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.

### Exponential

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

### Transmitter Telemetry Setup

If the transmitter that you intend to use with this aircraft is not displaying telemetry data, visit Spektrumrc.com and update your firmware. With the latest firmware installed on your transmitter the telemetry option should now be functional on your transmitter.

#### Computerized Transmitter Setup

(DX6e<sup>‡</sup>, DX6<sup>‡</sup>, DX7, DX7S, DX8, DX8e, DX9, DX10t, DX18, DX20, iX12, iX20, NX6, NX8, and NX10)

Start all transmitter programming with a blank ACRO model (do a model reset), then name the model.	
Set Aileron, Elevator and Rudder Dual Rates to:	HIGH 100% LOW 70%
Set Servo Travel to:	100%
Set Throttle Cut to	-100%
<b>DX7S DX8</b>	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*      0% Elevator MID: +20% FLAP*      8% Elevator LAND: +100% FLAP*      15% Elevator SPEED 2.0S: SWITCH = FLAP
<b>DX6e<sup>‡</sup> DX6 (Gen2)<sup>‡</sup> DX7 (Gen2) DX8 (Gen2) DX8e DX9 DX10t DX18 DX20 iX12<sup>†</sup> iX20<sup>†</sup> NX6 NX8 NX10</b>	1. Go to the SYSTEM SETUP (Model Utilities) <sup>†</sup>
	2. Set MODEL TYPE: AIRPLANE
	3. Set AIRCRAFT TYPE (Model Setup, Aircraft Type) <sup>†</sup> : WING: 1 AIL 1 FLAP
	4. Go to the FUNCTION LIST (Model Adjust) <sup>†</sup>
	5. Set SERVO SETUP: Reverse GEAR
	6. Set FLAP SYSTEM: SELECT SWITCH D: POS 0: -100% FLAP*      0% Elevator POS 1: +20% FLAP*      8% Elevator POS 2: +100% FLAP*      15% Elevator SPEED 2.0

<sup>†</sup> 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 parenthesis correspond to the iX12 and iX20 programming terminology. Consult your transmitter manual for specific information about programming your transmitter.

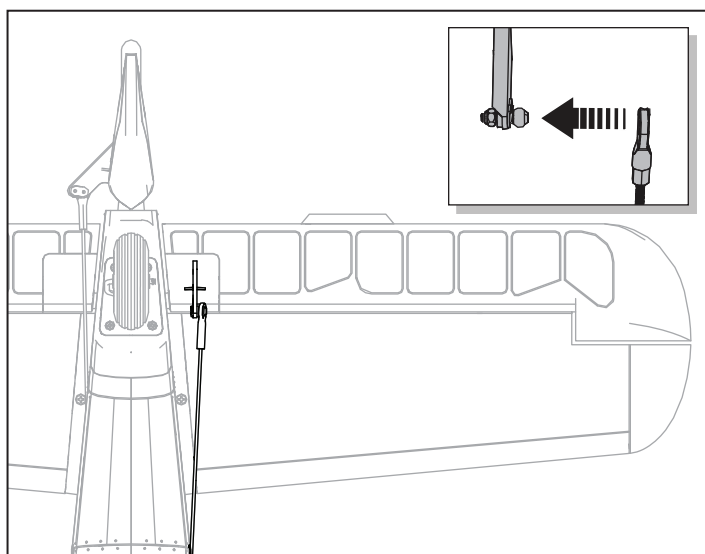
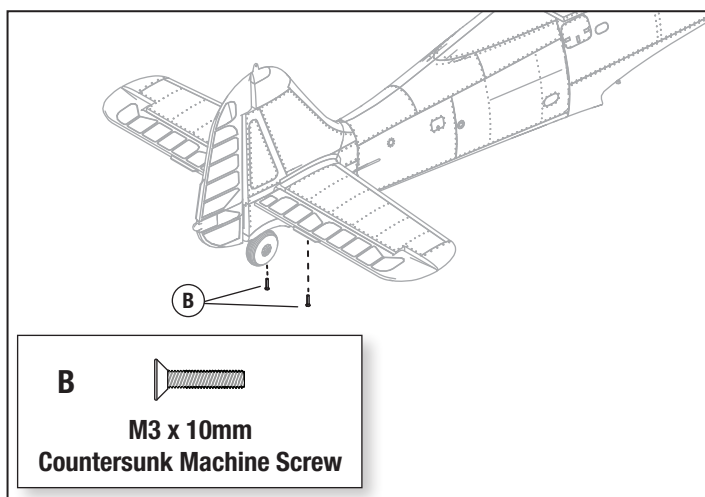
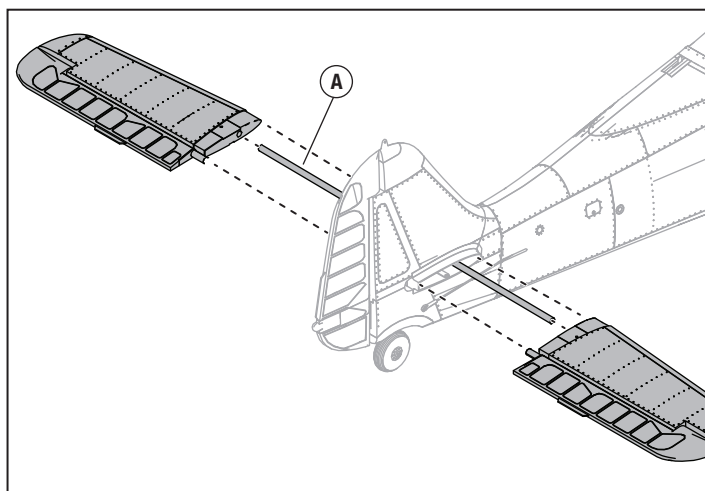
<sup>‡</sup> The settings provided above for the DX6 and DX6e do not allow for the use of a SAFE Select switch. To use a SAFE Select switch on these systems see the section below for transmitter setup and operation information.

## Model Assembly

### Horizontal Stabilizer Installation

1. Slide the horizontal tail tube (A) into the hole in the rear of the fuselage.
2. Install the 2 piece (left and right) horizontal tail as shown. Ensure the control horn faces down.
3. Secure the 2 piece horizontal tail in place with 2 screws (M3 x 10mm) (B) included.
4. Press the control linkage ball link on the ball attached to the control horn.
5. Ensure the elevator and rudder servo arms are in the correct position, then adjust the linkage to center them.

Disassemble in reverse order.



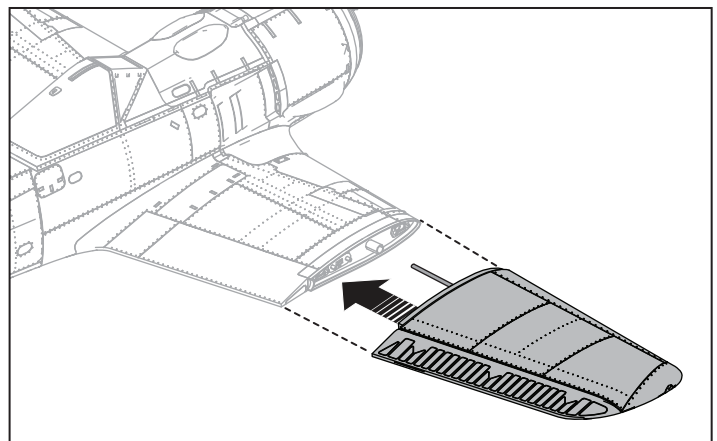
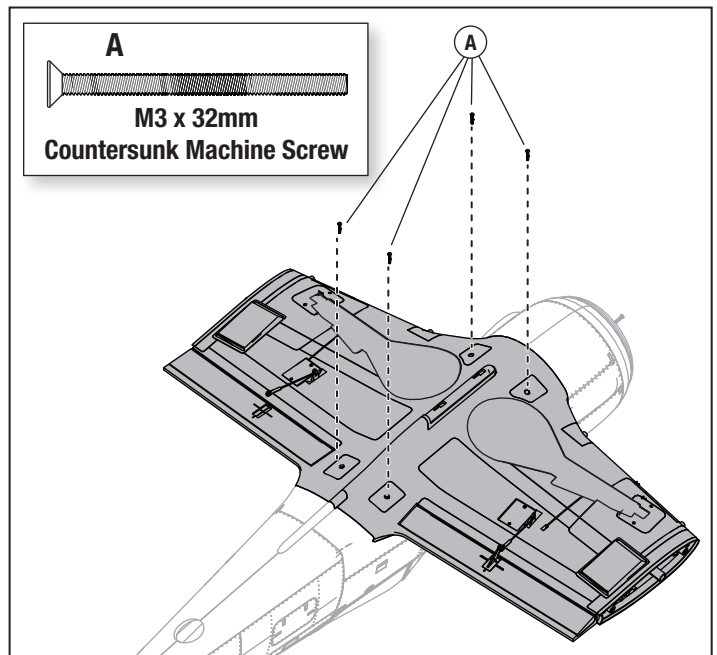
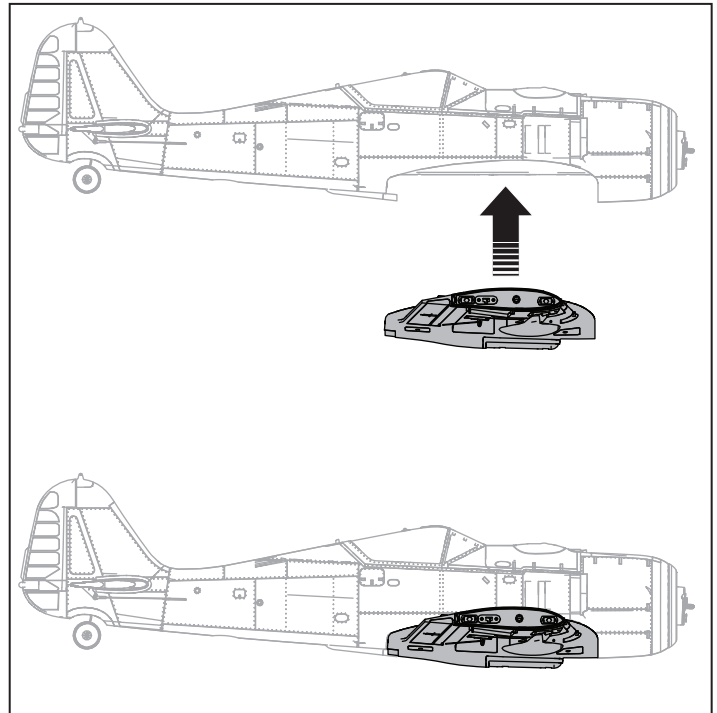
Screw Chart		
Location	Size	Screw Quantity
Elevator ball link screw	M2 x 8mm	1
Wing screw	M3 x 32mm	4
Horizontal stabilizer screws	M3 x 10mm	2
Spinner screw	M3 x 32mm	1
Propeller screws	M3 x 16mm	6
Tail wheel mount screws	2.0 x 8	4
Hands free servo plugs screws	2.0 x 8	8
Servo cover screws	2.0 x 8	8
Landing gear door cover screws (inside)	2.0 x 12	16
Landing gear door cover screws (outside)	2.0 x 6	2
Retract cover mount screws	2.0 x 8	4
Wheel axle hub screws	4.0 x 25	2
Retract motor mount screws	3.0 x 16	8
Wing plug screws	2.0 x 8	16
X Mount screws	3.0 x 16	4
Motor mount screws	4.0 x 10	4
Ball link screws	2.0 x 8	6

## Model Assembly *Continued*

### Wing Installation

1. Align the hands-free servo connector and press the wing into the wing saddle.
2. Secure the wing into position using the included four screws (M3 x 32mm) (A). Use a 2mm hex driver to tighten the screws.
3. Align the wing tip with the wing center panel and press them together until they click. Simply pull them OFF the wing to remove.

Disassemble in reverse order.

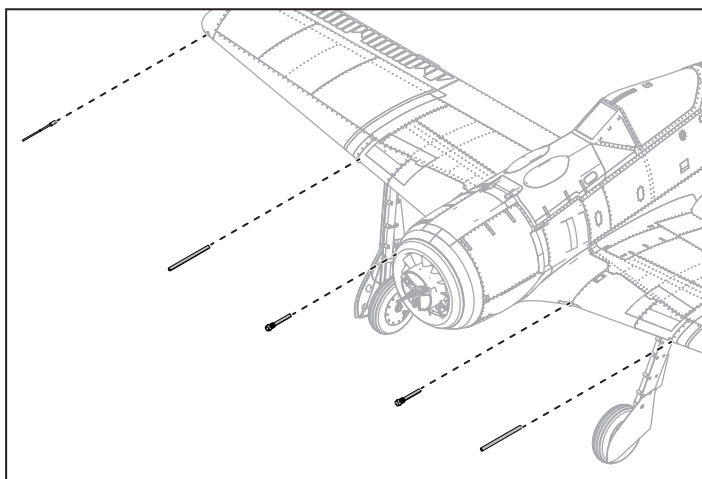


## Model Assembly *Continued*

### Cannons, Guns, and Pitot Tube Installation

1. Install the cannons, guns and pitot tube on the wing by screwing them into their locations as shown.

Disassemble in reverse order.



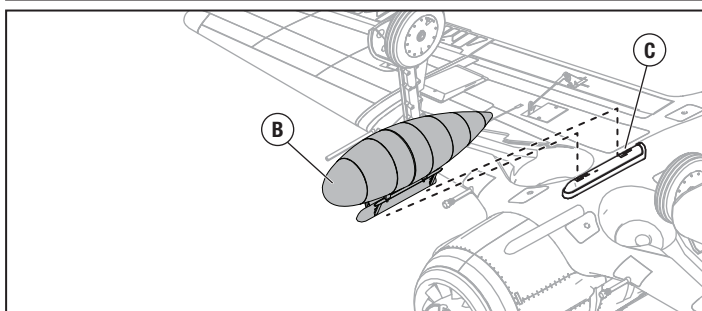
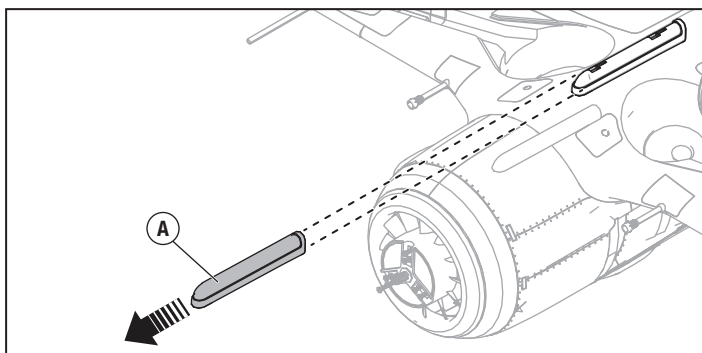
### Optional Drop Tank Installation

1. Remove the drop tank mount cover (A) from the mount by sliding the cover forward.
2. Slide the optional drop tank (B) into the rail (C) on the bottom of the fuselage.

Check the Center of Gravity with the drop tank installed.

See the *Adjusting the Center of Gravity* instructions for more information.

Disassemble in reverse order.



### Propeller Installation

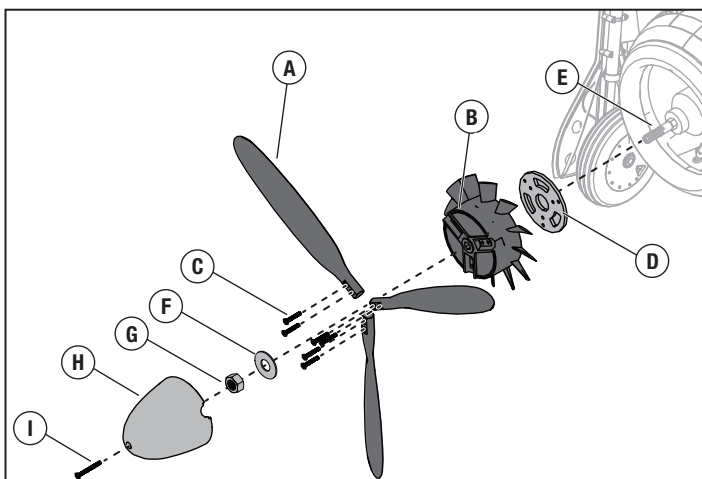
**WARNING:** Do not install the propeller until all system setups are complete. Failure to heed this warning could result in severe personal injury.


1. Install the aluminum backplate (D) into the back of the cooling fan hub (B).
2. Install the 3 propeller blades (A) onto the cooling fan hub using 6 screws (M3 x 16mm) (C).

**TIP:** The propeller's beveled screw holes must face out from the cooling fan hub for correct operation.

**TIP:** Before installing the cooling fan hub, be sure the ESC wires do not interfere with the cooling fan blades. Tuck the ESC wires into the ESC opening away from the cooling fan blades.

3. Slide the propeller cooling fan hub assembly onto the propeller shaft (E). Make sure the hex of the cooling fan hub properly seats on the hex of the prop shaft.
4. Install the propeller washer (F) and propeller nut (G) onto the propeller shaft. Secure the propeller cooling fan hub assembly to the prop shaft with wrench. Important to seat the propeller cooling fan hub assembly on the hex of the propeller shaft.
5. Align the spinner (H) on the propeller cooling fan assembly. Secure with screw (M3 x 32) (I). Note; take care not to overtighten the spinner screw and deform the spinner.



**C**   
M3 x 16mm  
Countersunk Machine Screw

**I**   
M3 x 32mm  
Countersunk Machine Screw

## PNP Receiver Selection and Installation

The recommended receiver for this aircraft is the Spektrum AR637T. If you choose to install a different receiver, ensure that it is at least a 6-channel full range receiver. Refer to the manual of your chosen receiver for correct installation and operation instructions.

### AR637T Installation

1. Slide the canopy latch (A) 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 (not included), mount the receiver to the flat area behind the battery compartment, as shown. The receiver should be mounted in the orientation shown, parallel to the length of the fuselage, with the label facing up and the servo ports facing the front of the aircraft. The orientation of the receiver is critical for all AS3X® and SAFE® technology setups.



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

### AR637T Port Assignments

**BND/PRG = BIND**

**1 = Throttle**

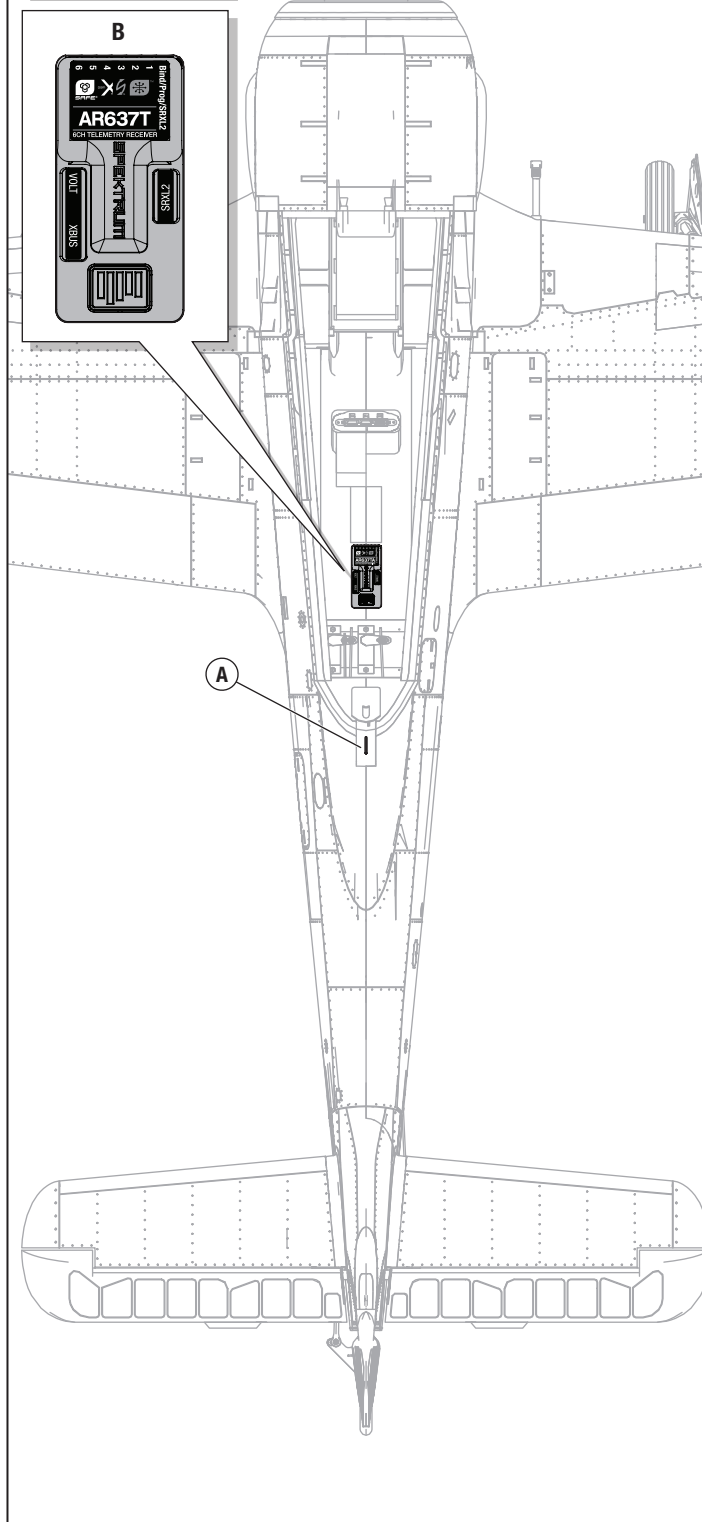
**2 = Aileron**

**3 = Elevator**

**4 = Rudder**

**5 = Retracts**

**6 = Flaps**





## Battery Installation and ESC Arming

### Battery Selection

We recommend the 5000mAh 22.2V 6S 30C Li-Po battery (SPMX50006S30). 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 Smart Li-Po battery packs to fit in the fuselage. Be sure the model balances at the recommended CG.

1. Lower the throttle to the lowest settings. Power on the Transmitter, then wait 5 seconds.
2. Slide the canopy latch back and lift the back of the canopy (A) to remove.
3. Slide the battery tray (B) out of the battery compartment.
4. For added security apply the loop side (soft side) of the optional hook and loop tape (C) to the bottom of your battery and the hook side to the battery tray.
5. Install a fully charged battery (D) on the front edge of the battery tray as shown and secure it using the hook and loop straps (E).

**TIP:** With most 6S 5000mAh 30C LiPo battery packs, install the battery far forward in the battery tray. The battery will over-hang the front of battery tray and be near the back face of the firewall.

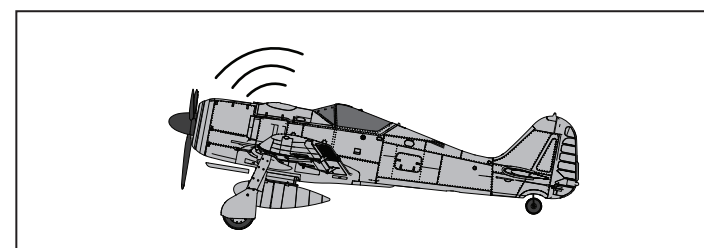
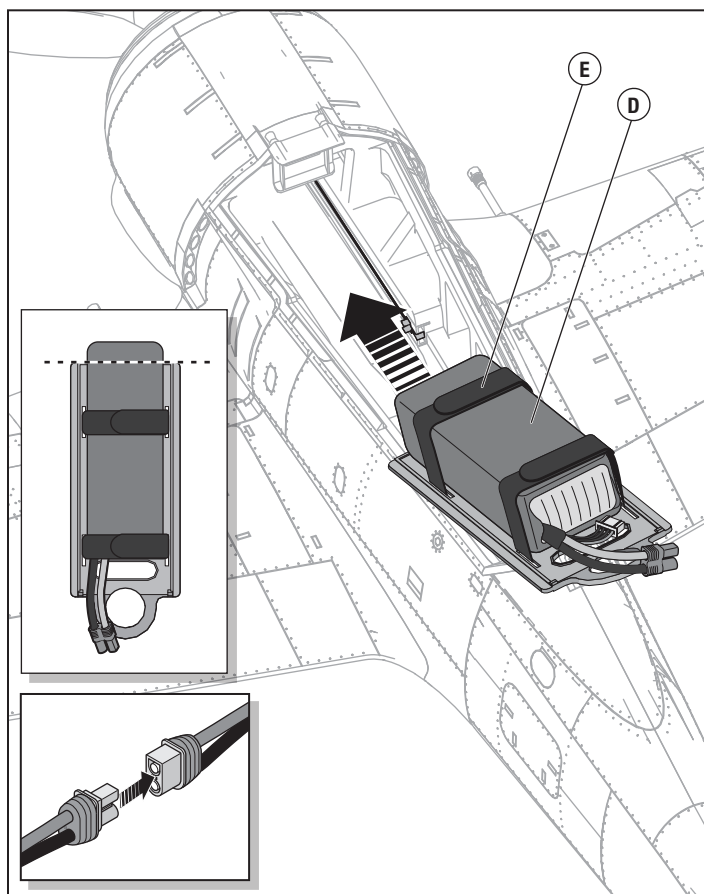
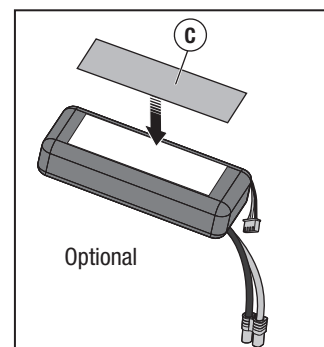
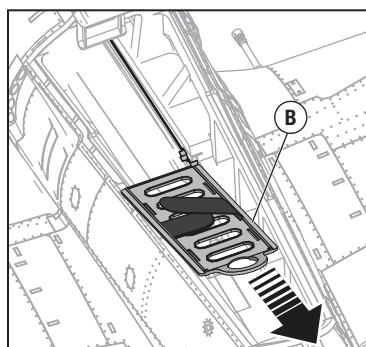
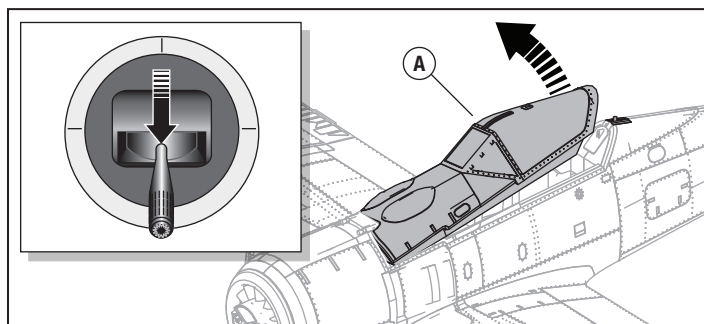
6. Align the battery tray with the tracks in the battery compartment and slide the tray all the way forward until the tray locks.
7. Connect the battery to the ESC (the ESC is now armed).
8. Keep the aircraft immobile and away from wind or the system will not initialize.
  - The ESC will sound a series of tones (refer to step 6 of the binding instructions for more information).
  - An LED will light on the receiver.

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

9. Reinstall the canopy hatch.

**WARNING:** Always keep hands away from the propeller. When armed, the motor will turn the propeller in response to any throttle movement.

**WARNING:** If your transmitter supports it, always engage throttle cut before approaching the aircraft any time a battery is connected.



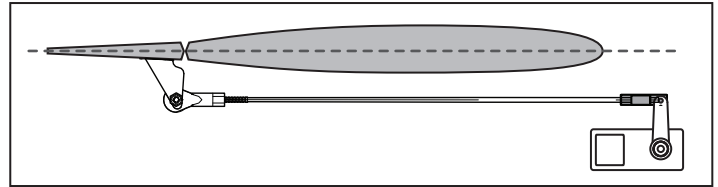
## Control Surface Centering and Adjusting a Ball Link

**IMPORTANT:** Perform the Control Direction Test before performing control surface centering.

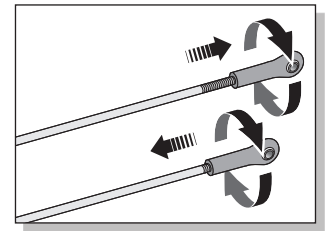
While SAFE is inactive, mechanically center the control surfaces.

**IMPORTANT:** Correct operation of the SAFE system requires sub-trim and trim at 0.

After binding a transmitter to the airplanes receiver, set the trims and sub-trims to 0, ensure the servo arms are in the correct positions, then adjust the linkages to center the control surfaces.



- Turn the linkage clockwise or counterclockwise until the control surface is centered.
- Attach the linkage to the servo arm or control horn after adjustment



## 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 AR637T gain values may need to be adjusted. Refer to the Spektrum AR637T 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.

	Horns	Arms
Elevator		
Ailerons		
Rudder		Tail Wheel
Flaps		

More control throw	Less control throw

## Binding

### 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.

### SAFE Select Technology, Optional Flight Envelope Protection

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 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.

#### \*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 collectively and actively to place the aircraft in a slow descending turn.

## SAFE® Select Switch Designation

Once SAFE Select is enabled, you can choose to fly in SAFE mode full-time, or assign a switch. Any switch on any channel between 5 and 9 can be used on your transmitter.

**TIP:** If model has a reversing ESC feature, Aux2 is not available for safe select.

If the aircraft is bound with SAFE Select disabled, the aircraft will be in AS3X mode exclusively.

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

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

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

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

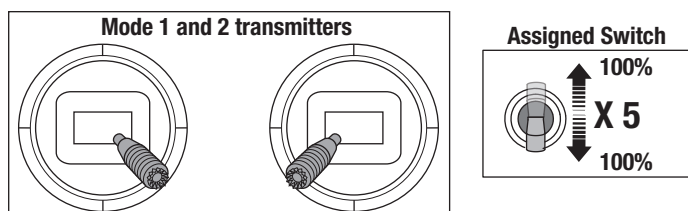
**TIP:** If a SAFE Select switch is desired for your 6 function aircraft, and you are using a 6 channel transmitter, the SAFE Select switch channel will have to be shared with either channel 5 or 6 of the transmitter. This does not apply to the NX6. Please refer to your NX6 instruction manual for further details.

## Assigning a Switch

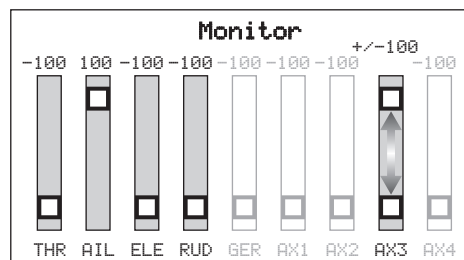
1. Power on the transmitter.
2. Power on the aircraft.
3. Hold both transmitter sticks to the inside bottom corners, and toggle the desired switch 5 times quickly (1 toggle = full up and down).
4. The control surfaces of the aircraft will move, indicating the switch has been selected.

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

## SAFE Select Switch Assignment Stick Positions



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



This example of the channel monitor shows the stick positions for assigning a switch, the switch selection on Aux3, and +/- 100% travel on the switch.

## Smart Technology™ Telemetry

This aircraft includes Spektrum Smart Technology in the ESC and receiver, which can provide telemetry information like battery voltage and ESC temperature. To take advantage of Smart Technology, you will need a compatible transmitter. A firmware update for your transmitter may be required.

To access all of the available features of Smart Technology, use Spektrum Smart batteries to power this aircraft. In addition to ESC data, Spektrum Smart batteries can communicate detailed battery data through the Smart Technology system.

## To View Smart Telemetry:

1. Begin with the transmitter bound to the receiver
2. Power on the transmitter.
3. Power on the aircraft.
4. The Smart Logo appears under the battery logo on the home page. A signal bar appears in the top left corner of the screen.\*
5. Scroll past the servo monitor to view Smart technology screens.

\* If the transmitter that you intend to use with this aircraft is not displaying telemetry data, visit [spektrumrc.com](http://spektrumrc.com) and update your firmware. With the latest firmware installed on your transmitter the telemetry option should now be functional on your transmitter.

For more information about compatible transmitters, firmware updates, and how to use the Smart Technology on your transmitter, visit [spektrumrc.com](http://spektrumrc.com).

ESC Status			
RPM:	0		
Volts:	0.0V		
Motor:	0.0A	0% Output	
Throttle:	0%		
Fet Temp:	0.0C		
BEC:	0.0C	0.0A	0.0V

## Control Direction Test

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.

### Elevator

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

### Ailerons


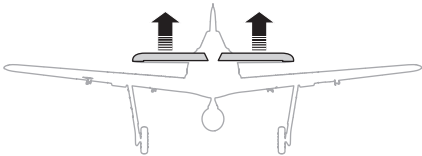

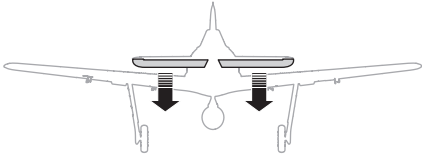
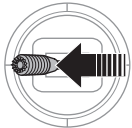

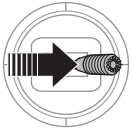

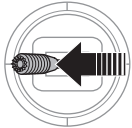
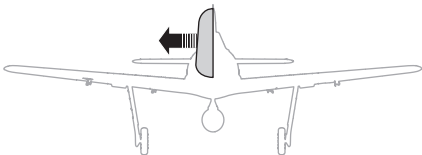
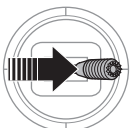
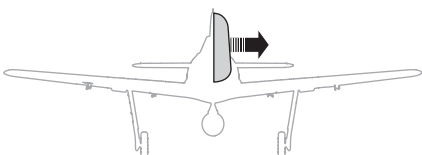
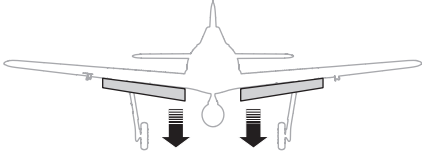
1. Move the aileron stick to the left. The left aileron should move up and the right aileron down, which will cause the aircraft to bank left.
2. Move the aileron stick to the right. The right aileron should move up and the left aileron down, which will cause the aircraft to bank right.

### Rudder

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

### Flaps

1. Move your flap control switch down to the "half flaps" position.
2. Confirm that the wing flaps move down.
3. Move flap control switch to the "full flaps" position.
4. Confirm the flaps move farther down than in step two.

	Transmitter command	Control Surface Response
Elevator		
		
Aileron		
		
Rudder		
		
Flaps		

## AS3X Control Direction Test

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 just above 25%, then lower the throttle to activate AS3X.



**CAUTION:** Keep all body parts, hair and loose clothing away from a moving propeller, 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.

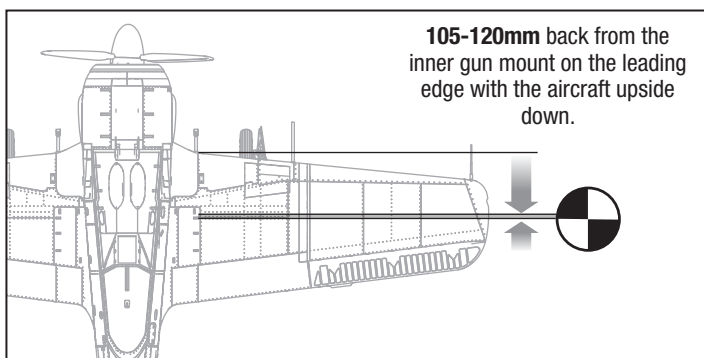
	Aircraft movement	AS3X Reaction
Elevator		
Aileron		
Rudder		

## Center of Gravity (CG)

The CG location is measured back from the inner gun mount on the leading edge with the aircraft upside down. This CG location has been determined with the recommended Li-Po battery (SPMX50006S30) installed all the way forward in the battery tray. The battery will overhang the front of the battery tray and be near the back face of the firewall.



**CAUTION:** Install the battery but do not arm the ESC while checking the CG. Personal injury may result.

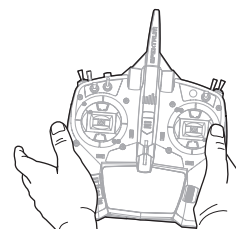


## In-Flight Trimming

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 achieve straight and level flight.

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), you will normally see the control surfaces react to aircraft movement. 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.

### Takeoff

Place the aircraft facing into the wind. Set your transmitter in low rate and use your flaps switch to drop the flaps to takeoff or "half position". Gradually increase the throttle to  $\frac{3}{4}$  and steer with the rudder. **Flaps make takeoffs shorter.** As the tail comes off the ground, pull back gently on the elevator. When airborne, flip your gear switch to raise your landing gear. Climb to a comfortable altitude and then flip your flaps switch to level the flaps.

### Flying

For your first flights with the recommended battery pack (SPMX50006S30), set your transmitter timer or a stopwatch to 3 minutes. After three 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 to recharge the flight battery. See the Low Voltage Cutoff (LVC) section for more details on maximizing battery health and run time.

### Landing

Land the aircraft into the wind. Use high rate Elevator for landings. Use a small amount of throttle for the entire descent. Lower the throttle to  $\frac{1}{4}$  and flip your flaps switch to deploy the flaps to the landing or "full down position". **Flaps will make the landing approach steeper and slower, and allow for a smoother landing.** Flip your gear switch to lower your landing gear. This will slow the aircraft further.

Keep the throttle on until the aircraft is ready to flare. During flare, keep the wings level and the aircraft pointed into the wind. Gently lower the throttle while pulling back on the elevator to bring the aircraft down on its wheels.

If landing on grass, it is best to hold full up elevator after touchdown and when taxiing to prevent nosing over.

Once on the ground, avoid sharp turns until the plane has slowed enough to prevent scraping the wingtips.

**Tip:** The included tires installed on the Fw 190A are made for hard paved surfaces. The tires are specially made to allow the tires to "drift" on the runway and not grab the surface.

## 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. 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. 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.

When flying with SAFE Select, throttle will make the aircraft climb or descend. Full throttle will cause the aircraft to pitch up and climb slightly. Mid throttle will keep the airplane flying level. Low throttle will cause the airplane to descend slightly nose-down.

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.

Soft tires (EFL01377) are available and work well for grass and dirt surfaces. To change tires, the wheel hub easily slides apart after removing the tire from the axle. Insert new tires on the wheel hub.



**WARNING:** Always decrease throttle at propeller strike.

**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. 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.

## Differences between SAFE Select and AS3X modes

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

		SAFE Select	AS3X
Control Input	Control stick is neutralized	Aircraft will self level	Aircraft will continue to fly at its present attitude
	Holding a small amount of control	Aircraft will bank or pitch to a moderate angle and maintain the attitude	Aircraft will continue to pitch or roll slowly
	Holding full control	Aircraft will bank or pitch to the predetermined limits and maintain the attitude	Aircraft will continue to roll or pitch rapidly
	Throttle	Full throttle: Climb Neutral: Level flight Low throttle: Descend nose-down	Throttle will not affect flight response.

## 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.

## Motor Service

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

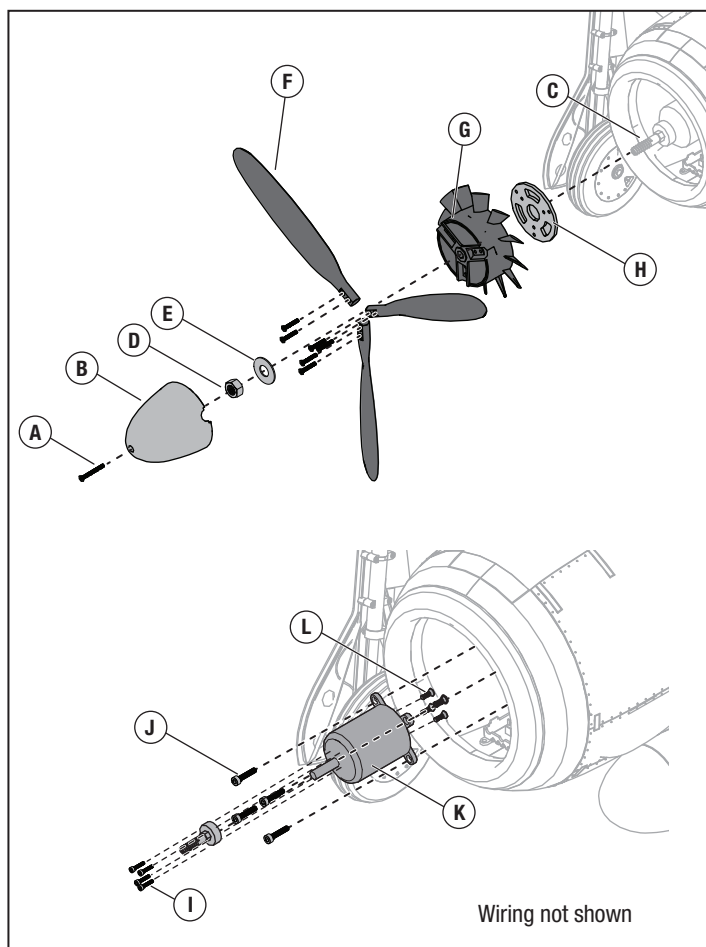
### Disassembly

1. Remove the screw (A) and spinner (B) from the prop shaft (C).
2. Remove the prop nut (D) and prop washer (E).
3. Remove the propellers (F), cooling fan (G) backplate (H) from the prop shaft.
4. Remove the 4 screws (I) from the prop shaft and remove from motor shaft.
5. Disconnect the motor wires from the ESC wires.
6. Remove the 4 screws (J) and motor (K) from the motor mount.
7. Remove the 4 screws (L) from the motor to remove the X-mount.

### Assembly

Assemble in reverse order.

- Correctly align and connect the motor wire colors with the ESC wires.
- Tighten the prop nut by using a wrench



## Troubleshooting Guide AS3X

Problem	Possible Cause	Solution
Oscillation	Damaged propeller or spinner	Replace propeller or spinner
	Imbalanced propeller	Balance the propeller.
	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 propeller noise or extra vibration	Damaged propeller and spinner, collet or motor	Replace damaged parts
	Propeller is out of balance	Balance or replace propeller
	Prop nut is too loose	Tighten the prop nut
Reduced flight time or aircraft underpowered	Flight battery charge is low	Completely recharge flight battery
	Propeller installed backwards	Install propeller with numbers facing forward
	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
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
EFL01255	Batt Tray w/Straps: P-51D 1.5m
EFL01351	Canopy w/Pilot; Fw 190A 1.5m
EFL01352	Fuselage Hatch Pin; Fw 190A 1.5m
EFL01353	Fuselage; Fw 190A 1.5m
EFL01354	Horizontal Tail; Fw 190A 1.5m
EFL01355	Horizontal Tail Spar; Fw 190A
EFL01357	Spinner w/Backplate; Fw 190A
EFL01358	Prop Set; Fw 190A 1.5m
EFL01359	Center Main Wing; Fw 190A 1.5m
EFL01360	Right Wing Panel; Fw 190A 1.5m
EFL01361	Left Wing Panel; Fw 190A 1.5m
EFL01362	Screw Set; Fw 190A 1.5m
EFL01363	Main Wheel Set; Fw 190A 1.5m
EFL01364	Retract C-Clips/Pins; Fw 190A
EFL01365	Landing Gear Doors; Fw 190A
EFL01366	Scale Accessories; Fw 190A
EFL01367	Pushrod Set; Fw 190A 1.5m
EFL01368	Servo Covers; Fw 190A 1.5m
EFL01369	Decal Set; Fw 190A 1.5m
EFL01370	Motor Prop Adaptor; Fw 190A
EFL01371	Motor Mount Set; Fw 190A 1.5m
EFL01372	Wing Panel Plugs; Fw 190A 1.5m
EFL01373	Hands Free Plugs; Fw 190A 1.5m
EFL01374	Tailwheel Assembly; Fw 190A
EFL01376	Wheel Axles; Fw 190A 1.5m
EFLG01376	Retract Set; Fw 190A 1.5m
EFLG01377	Retract Strut Pins; Fw 190A 1.5m
EFLG01378	Left Strut Assembly; Fw 190A
EFLG01379	Right Strut Assembly; Fw 190A
EFLG01380	Retract Motor Unit; Fw 190A 1.5m
SPMAR637T	AR637T 6 CH AS3X Telemetry RX
SPMSA430	17g Micro Servo
SPMXAE1100	Avian 100Amp Brushless Smart ESC 6S
SPMXAM1000	4258-460kV 14-Pole BL Motor

## Recommended Parts

Part #	Description
SPMR6775	NX6 6 Ch DSMX Transmitter Only
SPMX50006S30	5000mAh 6S 22.2V Smart 30C; IC5
SPMXC1080	Smart S1100 AC Charger, 1x100W
SPMXCA507	Adapter: IC3 Battery/IC5 Device

## Optional Parts

Part #	Description
EFL01377	Soft Main Tires
SPMXBC100	Smart Battery Checker
SPM6722	Spektrum Single Aircraft TX Case
SPMXC1000	Smart S1200 DC Charger, 1x200W
SPMXC10201	30A 540W Power Supply
SPMA3032	Spektrum Foam Tape
SPMR8200	NX8 8 Ch DSMX Transmitter Only
SPMR8105	DX8e 8 Ch DSMX Transmitter Only

# AMA National Model Aircraft Safety Code

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## Academy of Model Aeronautics 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, or (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](http://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](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](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.**

10/2015

## Contact Information

Country of Purchase	Horizon Hobby	Phone Number/Email Address	Address
United States of America	Horizon Service Center (Repairs and Repair Requests)	<a href="http://servicecenter.horizonhobby.com/RequestForm/">servicecenter.horizonhobby.com/ RequestForm/</a>	2904 Research Rd Champaign, Illinois, 61822 USA
	Horizon Product Support (Product Technical Assistance)	<a href="mailto:productsupport@horizonhobby.com">productsupport@horizonhobby.com</a> 877-504-0233	
	Sales	<a href="mailto:websales@horizonhobby.com">websales@horizonhobby.com</a> 800-338-4639	
European Union	Horizon Technischer Service Sales: Horizon Hobby GmbH	<a href="mailto:service@horizonhobby.eu">service@horizonhobby.eu</a> +49 (0) 4121 2655 100	Hanskampring 9 D 22885 Barsbüttel, Germany

## FCC Information

### FCC ID: BRWTIARLGTNG1

This product contains a radio transmitter with wireless technology which has been tested and found to be compliant with the applicable regulations governing a radio transmitter in the 2.400GHz to 2.4835GHz frequency range.

### Supplier's Declaration of Conformity

#### EFL FW 190A 1.5m BNF Basic and PNP (EFL01375 and EFL01350)

**FC** 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](mailto:compliance@horizonhobby.com)  
Web: [HorizonHobby.com](http://HorizonHobby.com)

## IC Information

### CAN ICES-3 (B)/NMB-3(B)

#### IC: 6157A-TIARLGTNG1

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

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

## Compliance Information for the European Union

### EU Compliance Statement:

**EFL FW 190A 1.5m BNF Basic (EFL01350);** Hereby, Horizon Hobby, LLC declares that the device is in compliance with the following: EU Radio Equipment Directive 2014/53/EU, RoHS 2 Directive 2011/65/EU, RoHS 3 Directive - Amending 2011/65/EU Annex II 2015/863

**EFL FW 190A 1.5m PNP (EFL01375);** Hereby, Horizon Hobby, LLC declares that the device is in compliance with the following: EU EMC Directive 2014/30/EU, RoHS 2 Directive 2011/65/EU, RoHS 3 Directive - Amending 2011/65/EU Annex II 2015/863

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

#### Wireless Frequency Range and Wireless Output Power:

2402 – 2478 MHz  
19.95dBm

#### 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.

#### 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

Australia/New Zealand:



E328



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Other patents pending.  
<http://www.horizonhobby.com/>