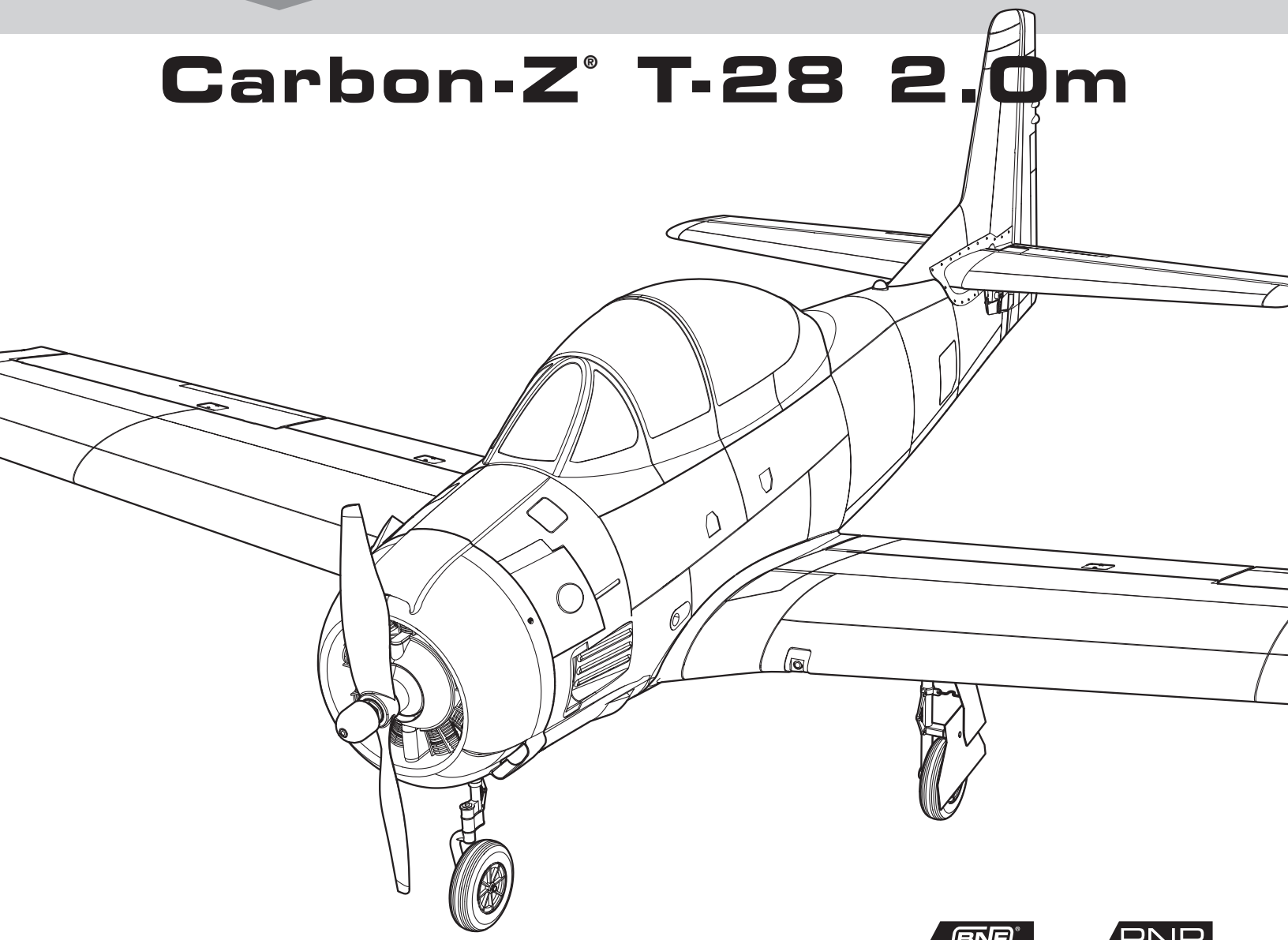
E-flite®
ADVANCING ELECTRIC FLIGHT

Carbon-Z® T-28 2.0m



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BNF® BASIC

EFL013550

PNP® PLUG-N-PLAY®

EFL013575

Instruction Manual
Bedienungsanleitung
Manuel d'utilisation
Manuale di Istruzioni

163032
Created 10/22

HORIZON® HOBBY

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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.

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Registration

Register your product today to join our mailing list and keep up to date with product updates, offers and E-flite® news.

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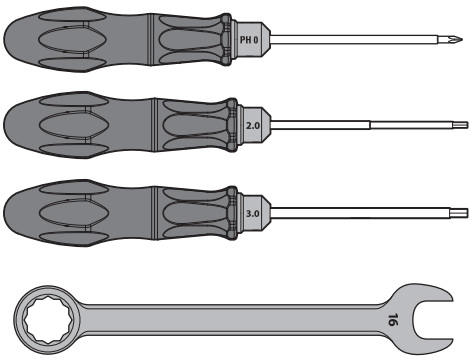
Specifications	
Wingspan	78" (1980mm)
Length	63" (1620mm)
Weight	Without Battery: 10.4lbs (4729g) With Recommended 6S 5000mAh Flight Battery: 12.0lbs (5463g)

Included Equipment	
Receiver	Spektrum™ AR637TA 6CH SAFE® and AS3X® Telemetry Receiver
ESC	Avian Smart Lite 70-Amp Brushless Smart® ESC, 3S-6S IC5 (SPMXAE70C)
Motor	5040-500Kv Brushless Outrunner 14 pole Motor (EFLM1315)
Propeller	14.75 x 10, 2-Blade (EFLP1475102E)
Servos	(6) A500 25g Metal Gear Servo (SPMSA500) (1) A320 16g Metal Gear Servo (SPMSA320B)

Recommended Equipment	
Transmitter	NX8 8 Ch DSMX Transmitter Only (SPMR8200)
Flight Battery	5000mAh 6S 22.2V Smart G2 30C (SPMX56S30)
Battery Charger	Smart S1200 G2 AC Charger; 1x200 (SPMXC2020)

Optional Accessories	
EFL013562	Soft Tire Set: Carbon-Z T-28
SPMR10100	NX10 10-Channel DSMX Transmitter
SPMX56S50	5000mAh 6S 22.2V Smart G2 50C
SPMX76S30	7000mAh 6S 22.2V Smart G2 30C

Required Tools



- Phillips Screwdriver (PH#0)
- Hex Drivers (2mm and 3mm)
- 16mm or Adjustable Wrench

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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/if needed after making initial flights.

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 exponential 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‡, DX6‡, DX7, DX7S, DX8, DX8e, DX9, DX10t, DX18, DX20, iX12, iX14, 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%	Expo 10%
	LOW 70%	Expo 5%
Set Servo Travel to:	100%	
DX7S **DX8**	1. Go to the SYSTEM SETUP	
	2. Set MODEL TYPE: AIRPLANE	
	3. Set AIRCRAFT 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: 0% FLAP 10% Elevator LAND: +100% FLAP 18% Elevator SPEED 2.0S: SWITCH = FLAP	
DX6e‡ **DX6** (Gen2)‡ **DX7** (Gen2) **DX8** (Gen2) **DX8e** **DX9** **DX10t** **DX18** **DX20** **iX12†** **iX14†** **iX20†** **NX6** **NX8** **NX10**	1. Go to the SYSTEM SETUP (Model Utilities)†	
	2. Set MODEL TYPE: AIRPLANE	
	3. Set AIRCRAFT TYPE (Model Setup, Aircraft Type)†: WING: 1 AIL 1 FLAP	
	4. Go to the FUNCTION LIST (Model Adjust)†	
	5. Set SERVO SETUP: Reverse GEAR	
	6. Set FLAP SYSTEM: SELECT SWITCH D: POS 0: -100% FLAP 0% Elevator POS 1: 0% FLAP 10% Elevator POS 2: +100% FLAP 18% Elevator SPEED 2.0	

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

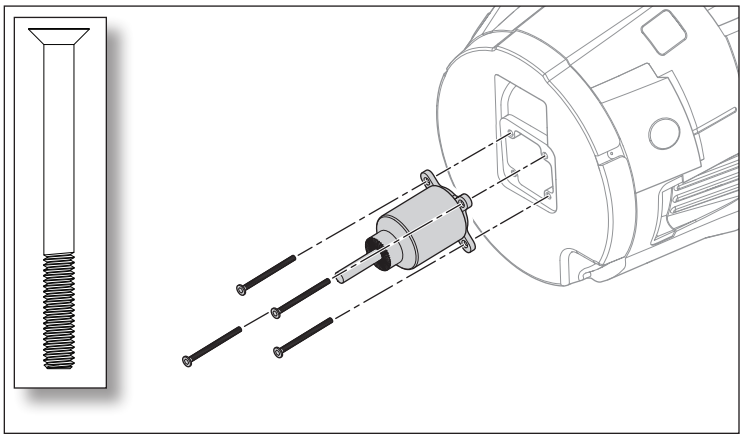
‡ The settings provided above for the DX6 and DX6e do not allow for the use of a SAFE® Select switch. To use a SAFE Select switch on these systems see the *SAFE Select Switch Designation* section for transmitter setup and operation information.

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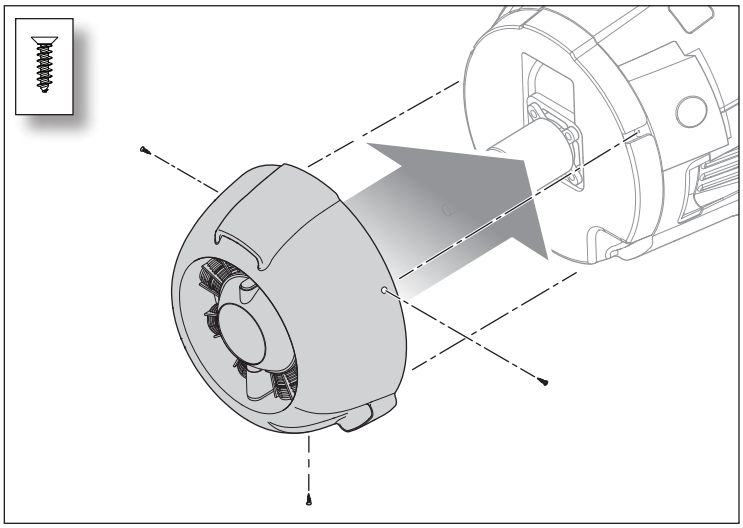
Aircraft Assembly

Motor and Propeller Installation

1. Using a 3mm hex driver, install the motor on the fuselage using four M4 x 45mm flat head screws.
2. Correctly align and connect the motor wire colors with the ESC wires.



3. Using a PH#0 Phillips screwdriver, install the cowling on the fuselage using three M2 x 8mm flat head screws.

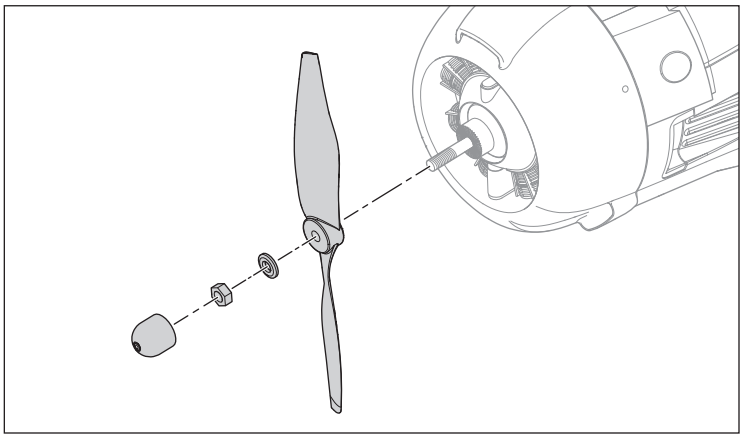


4. Install the propeller, washer, and propeller nut on the prop shaft, using a 16mm box end or adjustable wrench to tighten the nut.

IMPORTANT: The propeller size numbers (14.75 x 10) must face forward for correct propeller operation. Ensure the nut holds the propeller tightly without damaging the propeller.

NOTICE: Remove the propeller before transmitter setup or accidental injury may occur.

5. Install the spinner nut on the prop shaft. Tighten the spinner nut only by hand. Do not over tighten.



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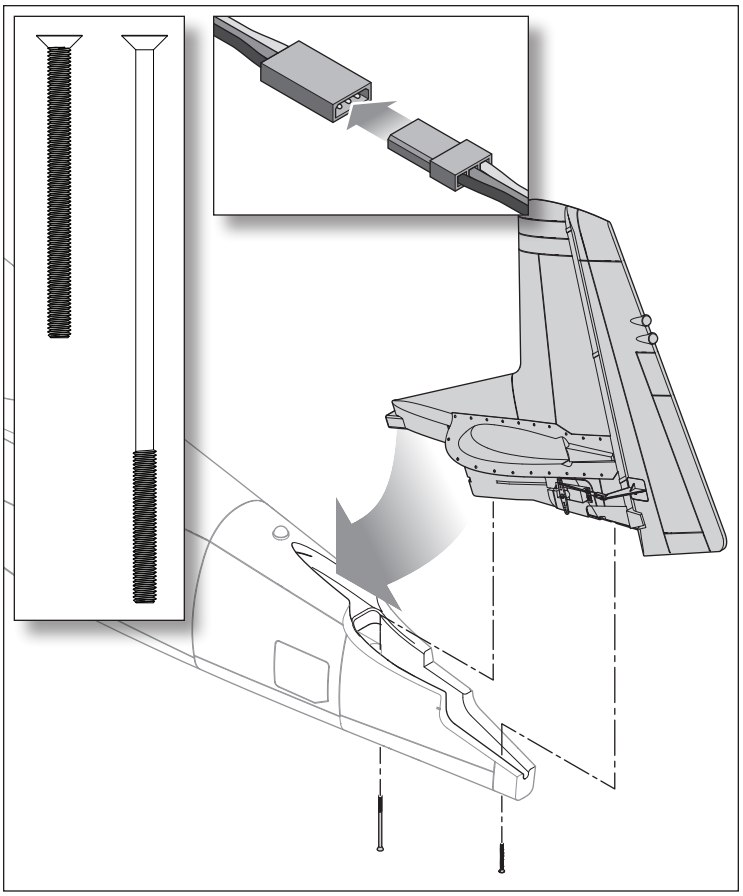
Vertical Stabilizer Installation

1. Connect the rudder and elevator servo connectors to the servo extensions in the fuselage.
2. Slide the vertical stabilizer assembly into the slot in the fuselage.

CAUTION: DO NOT crush or damage the wiring when attaching the vertical stabilizer assembly to the fuselage.

3. Secure the assembly to the fuselage using a 2mm hex driver, an M3 X 75mm flat head screw and M3 X 40mm flat head screw. Install the 75mm screw in the front hole, and the 40mm screw in the rear hole.

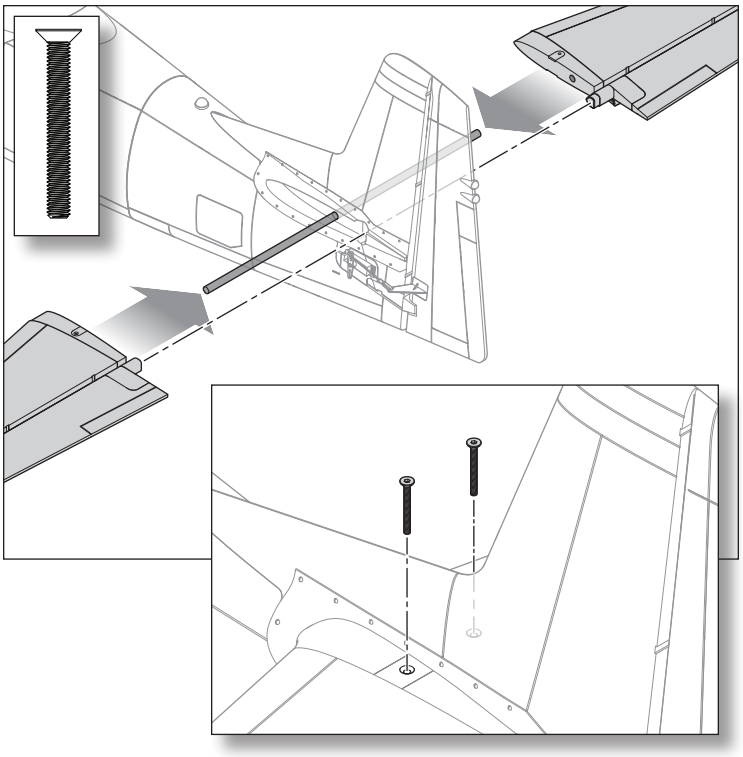
IMPORTANT: DO NOT overtighten the screws. Over-tightening the screws will result in distorting the shape of the fuselage.



Horizontal Stabilizer Installation

1. Slide the horizontal stabilizer tube through the hole in the rear of the fuselage, centering the tube in the fuselage.
2. Install the left and right horizontal stabilizers over the tube and into the pocket in the fuselage. Ensure the control horn on the right elevator is facing toward the bottom of the aircraft, and the elevator torque tube aligns correctly. The right side of the torque tube slips into the left side, ensuring the elevator halves move in unison.
3. Secure the horizontal stabilizer halves in place with a 2mm hex driver and two M3 X 25mm flat head screws.

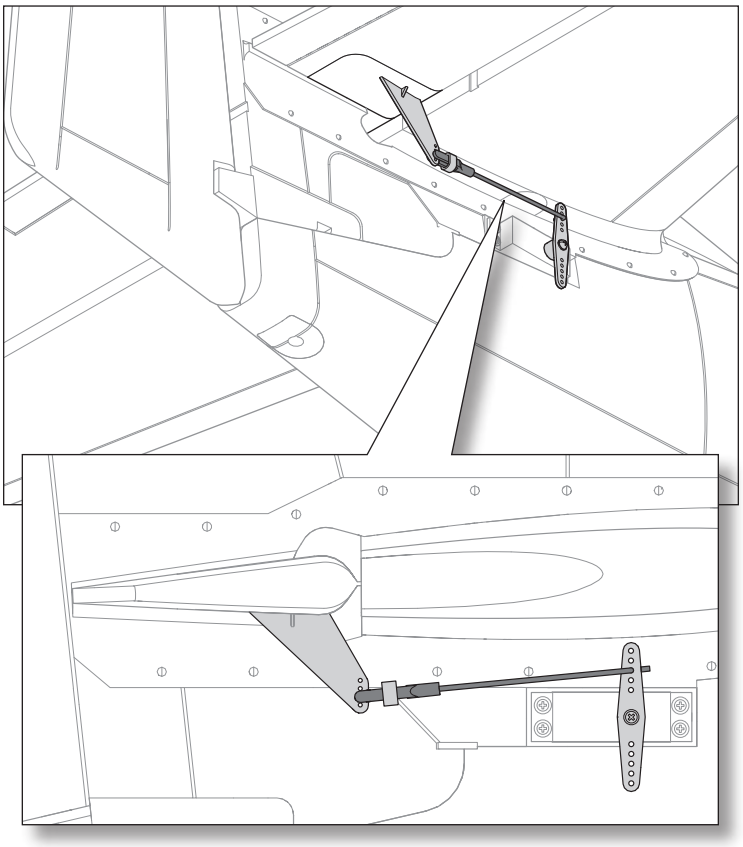
IMPORTANT: DO NOT overtighten the screws.



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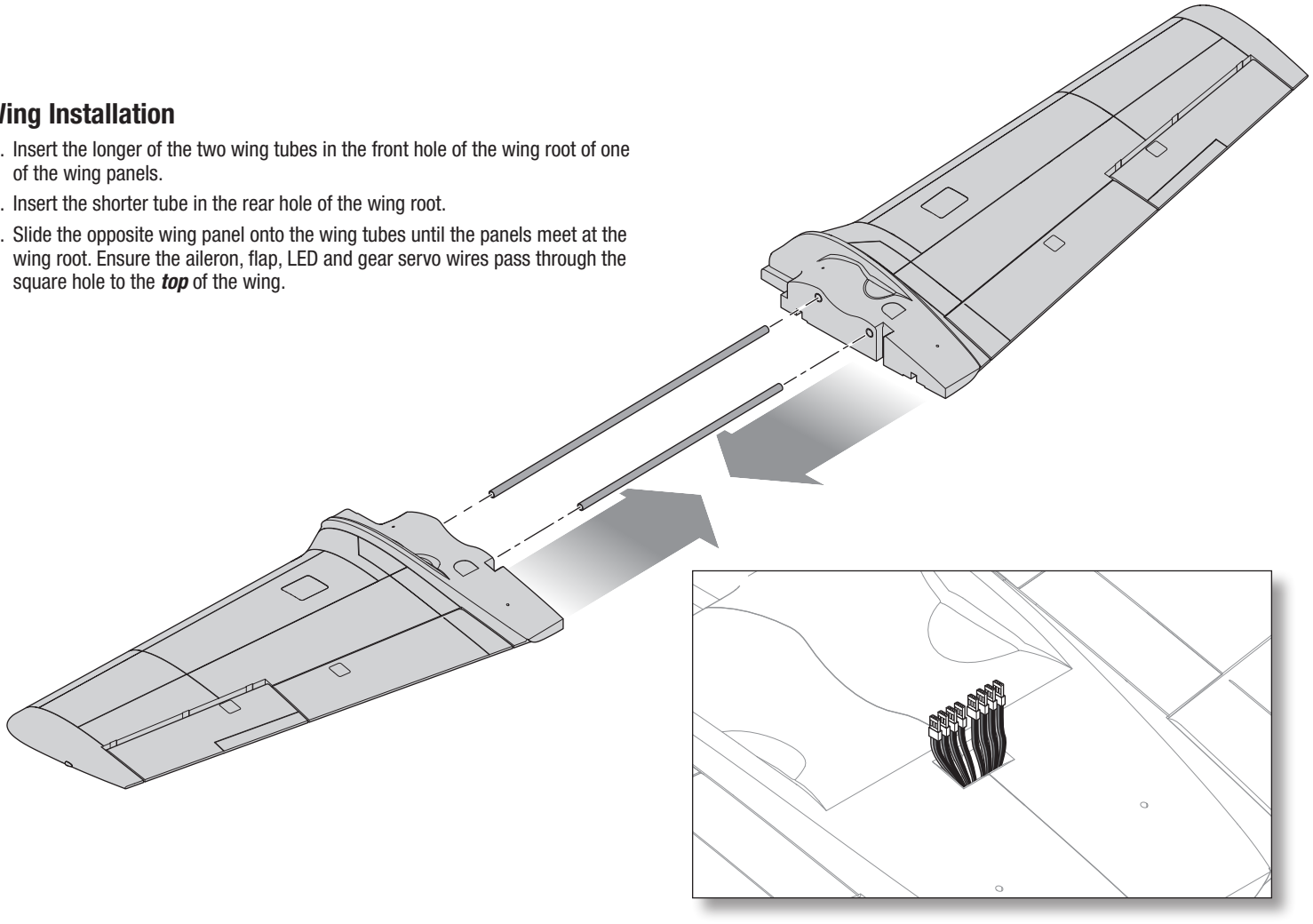
4. Insert the Z-bend end of the elevator push rod in the middle hole of the elevator servo arm, as shown.
5. Attach the clevis end to the second outermost hole of the elevator control horn.

CAUTION: Ensure the rubber retention sleeve is properly installed on the clevis. Failure to properly install the sleeve may allow the clevis to open in flight, causing a loss of control of the aircraft



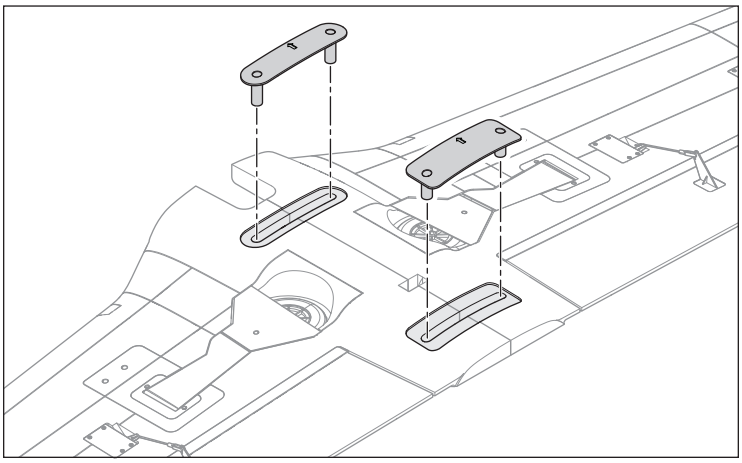
Wing Installation

1. Insert the longer of the two wing tubes in the front hole of the wing root of one of the wing panels.
2. Insert the shorter tube in the rear hole of the wing root.
3. Slide the opposite wing panel onto the wing tubes until the panels meet at the wing root. Ensure the aileron, flap, LED and gear servo wires pass through the square hole to the ***top*** of the wing.

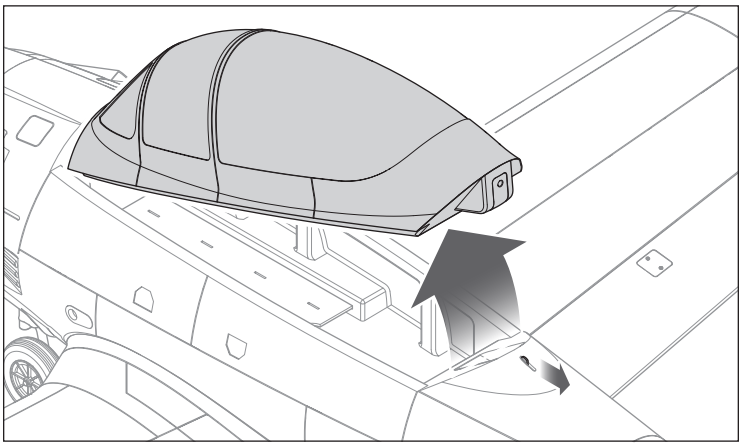


4. Install two wing joiner brackets in the bottom of the wing as shown to secure the wing panels together.

   TIP: The wing joiner brackets have an arrow molded in the bottom surface. The arrow should face the front of the wing.



5. Remove the canopy hatch from the fuselage by pulling back the latch and lifting on the back of the canopy.



6. With the fuselage inverted, feed the wiring from the wing through the hole in the fuselage, into the receiver compartment.
7. Align the wing with the recess of the fuselage and fit the wing to the fuselage.

CAUTION: DO NOT crush or otherwise damage the wiring when attaching the wing to the fuselage.

8. Secure the wing in place using a 3mm hex driver and four M5 x 60mm flat head screws through the wing brackets and into the fuselage.

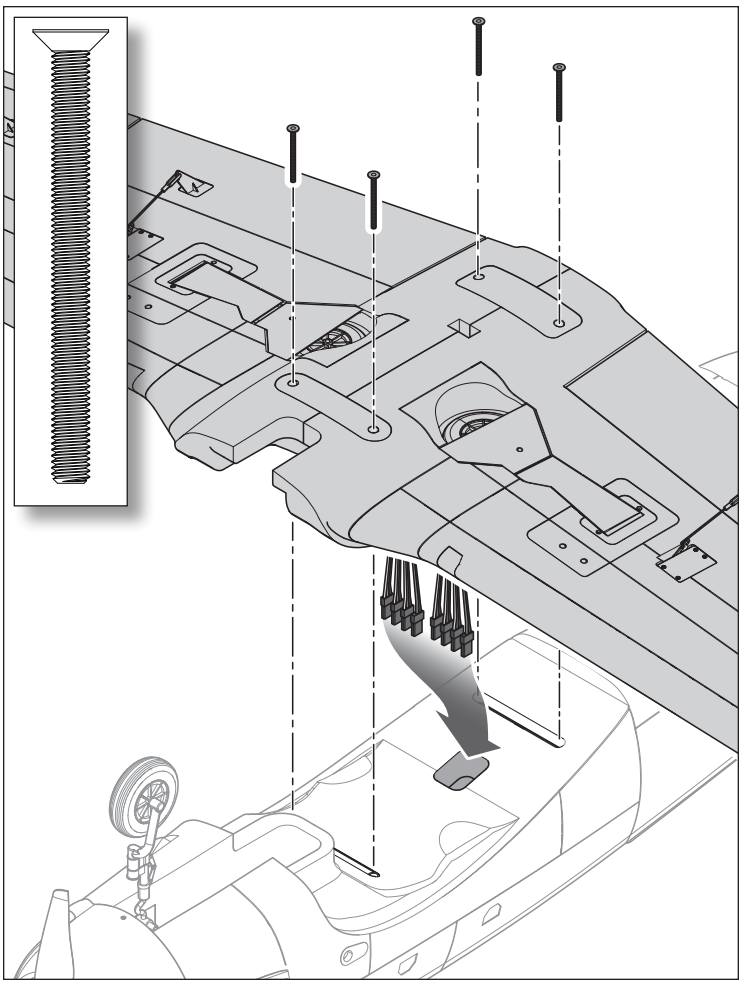
IMPORTANT: Do not overtighten the screws in the wing.

9. Set the aircraft upright.
10. Connect the LED, servo and gear leads from the wing to the receiver using the chart below for reference.

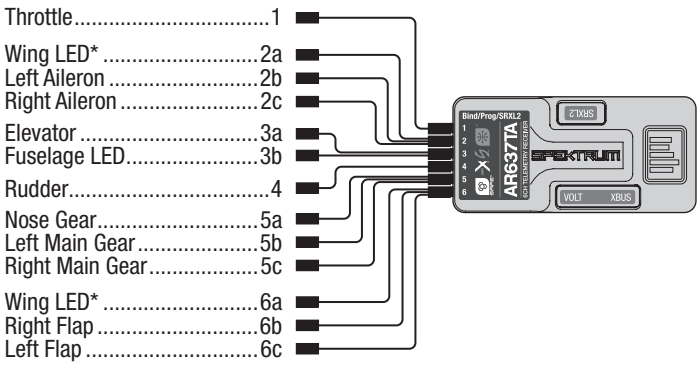
TIP: The servo and gear leads are labeled.* Match the connections to the labeled harnesses installed in the receiver, making sure to connect the leads with the correct polarity.

IMPORTANT: Ensure the LED connectors are plugged into the power side of the harness connectors. The red and black wires from the LEDs should connect to the red and brown wires of the harness respectively.

11. Reinstall the canopy hatch.



Receiver Connections



* The LED leads from the wing are not labeled. Connect one lead to the aileron 3-way harness and the other to the flap 3-way harness. The LEDs may be plugged into either harness, as they are not channel dependent and only draw power from the receiver.

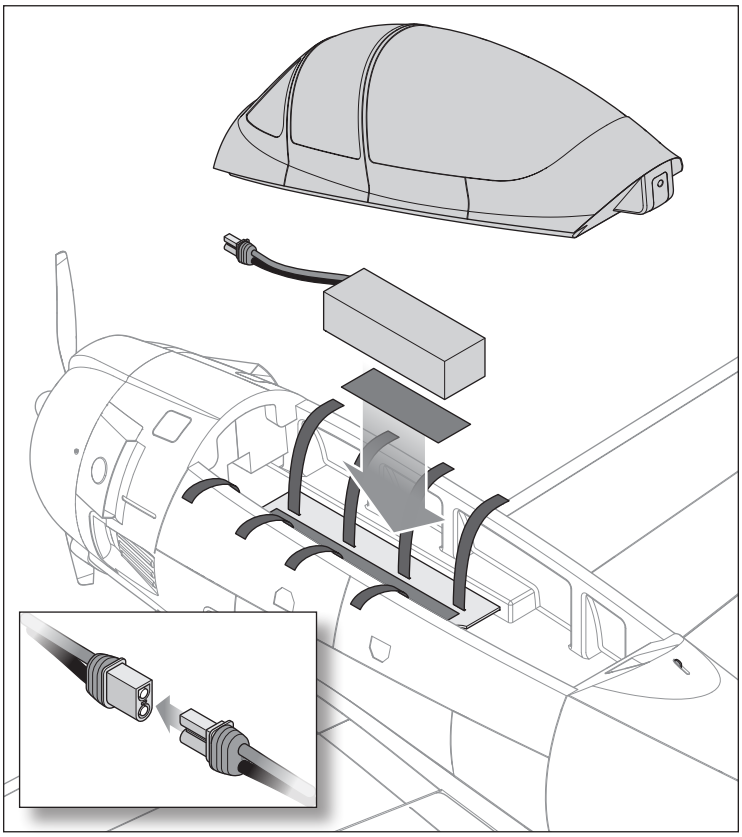
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Battery Installation and ESC Arming

We recommend the Spektrum™ 5000mAh 6S 22.2V Smart G2 30C (SPMX56S30). Refer to the Optional Parts List for additional recommended batteries. If using a battery other than those listed, the battery should be within the range of capacity, dimensions and weight of the recommended battery packs to fit in the fuselage. Ensure the model balances at the recommended CG.

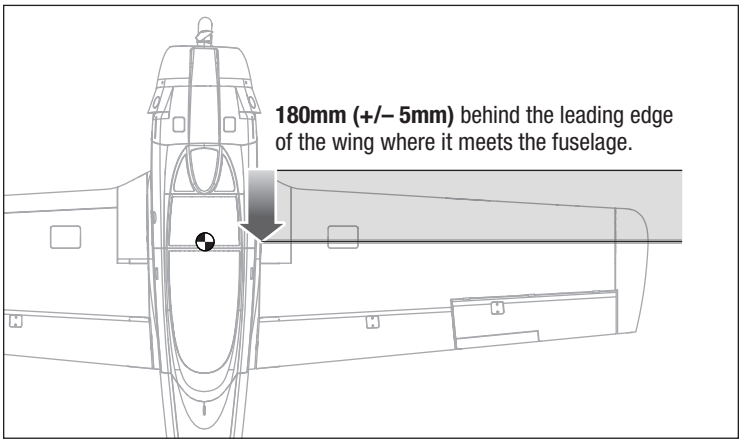
CAUTION: Always keep hands away from the propeller. When armed, the motor will turn the propeller in response to any throttle movement.

1. Lower the throttle and throttle trim on the transmitter to the lowest settings. Power on the transmitter, then wait 5 seconds.
2. Apply the loop side of hook and loop tape to the bottom of your battery. The hook material is pre-installed in the battery compartment.
3. Pull back on the release button and remove the battery hatch.
4. Install the fully charged battery in the battery compartment as shown. See the Center of Gravity section for how to achieve proper balance of the aircraft.
5. Make sure the flight battery is secured using the included hook and loop straps.
6. Connect the battery to the ESC (the ESC is now armed).
7. Keep the aircraft immobile and away from wind or the system will not initialize.
   - The ESC will sound a series of tones.
   - An LED will light on the receiver.
8. Reinstall the canopy hatch.



Center of Gravity (CG)

The CG location is measured from the leading edge of the wing, where the wing meets the fuselage. Measure the CG location with the recommended battery (SPMX56S30) installed, with the model balanced inverted and the landing gear extended. Adjust the battery forward or aft as needed to achieve the proper CG location.



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General Binding Tips and Failsafe

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

Transmitter and Receiver Binding / Switching ON and OFF 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.

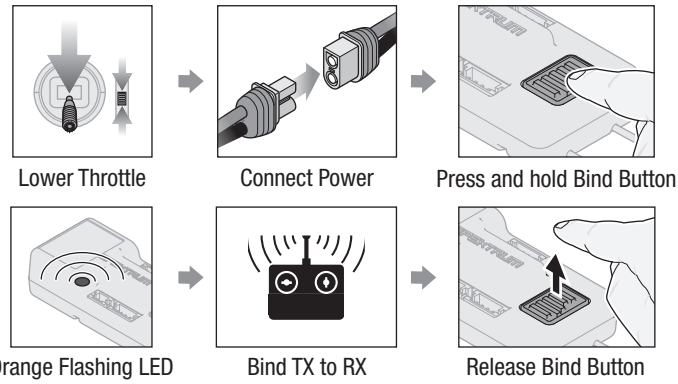
IMPORTANT: Before binding, read the transmitter setup section in this manual and complete the transmitter setup table to ensure your transmitter is properly programmed for this aircraft.

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. This process defines the failsafe settings.

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

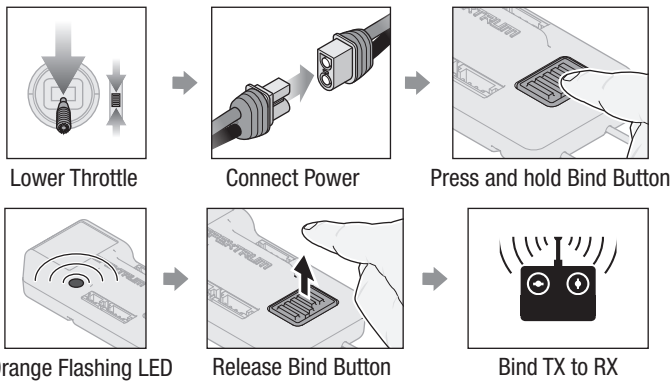
Using The Bind Button...

To Enable SAFE Select



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

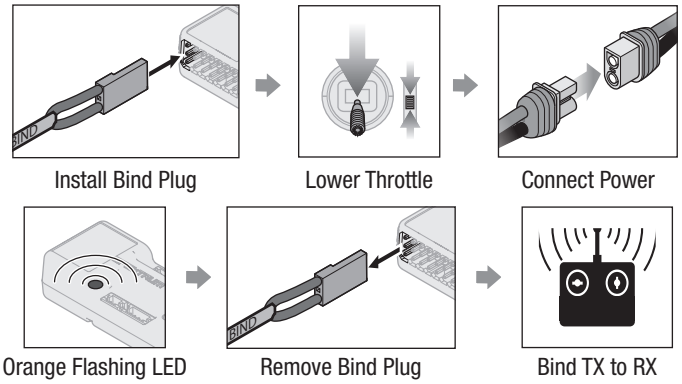
To Disable SAFE Select



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

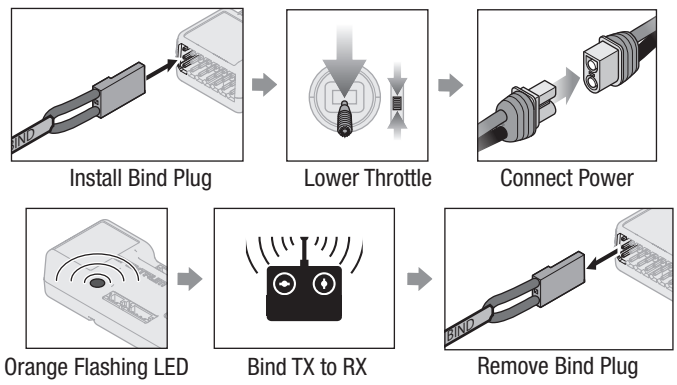
Using The Bind Plug...

To Enable SAFE Select



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

To Disable SAFE Select



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

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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.

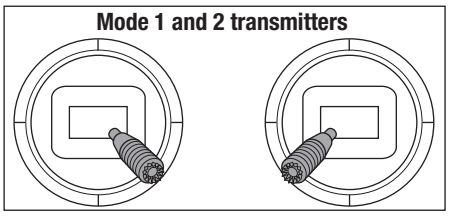
TIP: If a SAFE Select switch is desired for your 6 function aircraft, and you are using a 6 channel transmitter, the SAFE Select switch channel will have to be shared with either channel 5 or 6 of the transmitter. This does not apply to the NX6. Please refer to your NX6 instruction manual for further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

Assigning a Switch

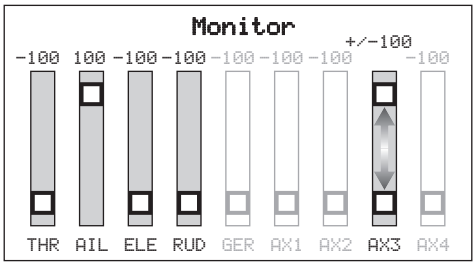
1. Power on the transmitter.
2. Power on the aircraft.
3. Hold both transmitter sticks to the inside bottom corners, and toggle the desired switch 5 times quickly (1 toggle = full up and down).
4. The control surfaces of the aircraft will move, indicating the switch has been selected.

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.

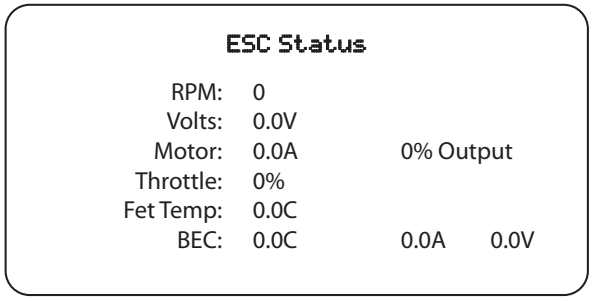
Smart™ Technology Telemetry

Smart Technology Electronic Speed Control (ESC)

This aircraft is equipped with an exclusive Smart technology electronic speed control that can provide a variety of real-time power system related telemetry data while you fly, including motor RPM, current, battery voltage and more to compatible Spektrum AirWare™ equipped transmitters.

When powered on, the ESC will send the below information to the flight control and the information will be displayed on the transmitter telemetry screen.

- RPM*
- Voltage
- Current
- Throttle
- FET Temperature
- BEC Temperature



* For the RPM telemetry information to display correctly, you must program the motor pole count into the Telemetry settings of your transmitter. The Carbon-Z T-28 2.0M uses a 14-pole motor.

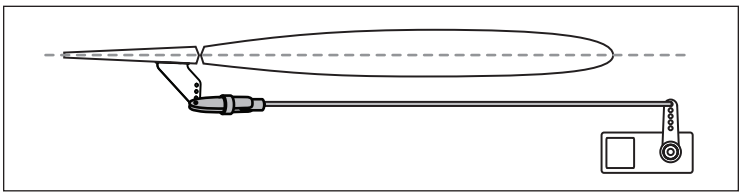
To program the motor pole count information:

1. Power on your transmitter.
2. Set the throttle cut to on.
3. Power on the aircraft and allow it to initialize.
4. In your transmitter, go to the **Function List** (**Model Setup** in iX series transmitters).
5. Select the **Telemetry** menu option.
6. Go to the **ESC** menu option.
7. Scroll down to **Poles**.
8. Enter **14** (for iX series transmitters, you must click save to save your changes).
9. Return to the main screen.

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Control Surface Centering

After assembly and transmitter setup, confirm that the control surfaces are centered. If the control surfaces are not centered, mechanically center the control surfaces by adjusting the linkages.
After binding a transmitter to the aircraft receiver, set the trims and sub-trims to 0, then adjust the linkages to center the control surfaces.



Control Direction Test

Switch on the transmitter and connect the battery. Use the transmitter to operate the aileron, elevator, rudder and flap 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

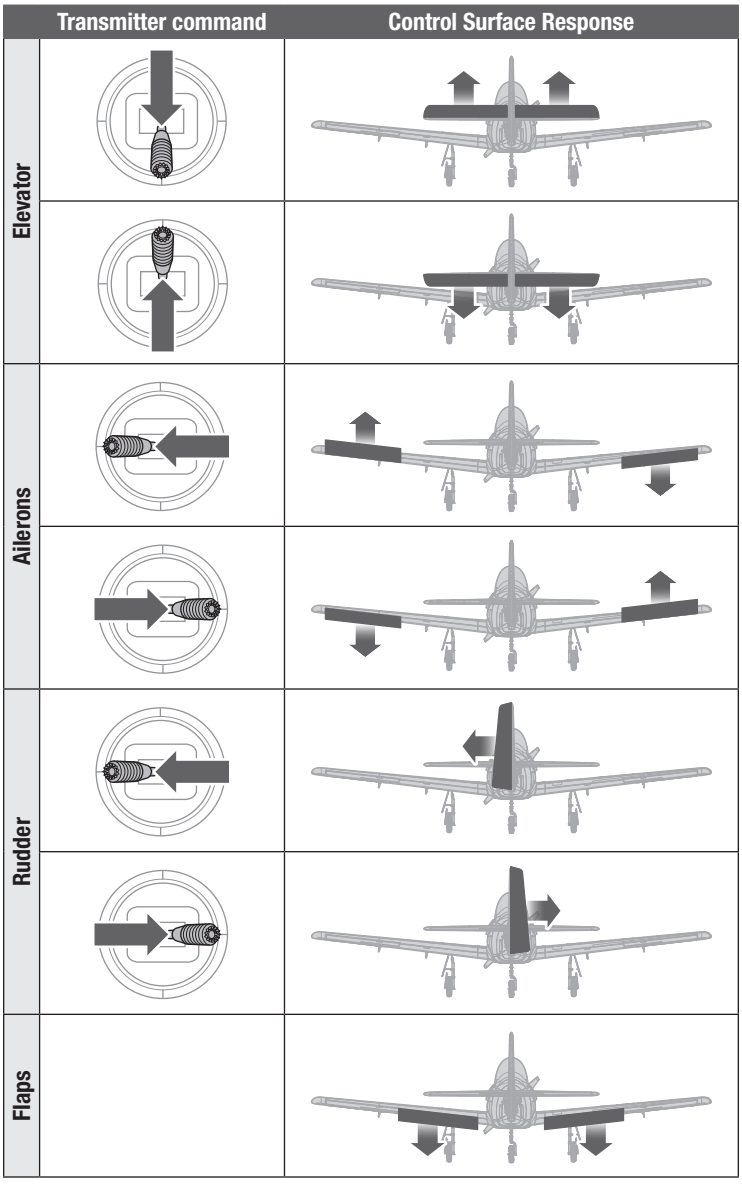
1. Move the aileron stick to the left. The left aileron should move up and the right aileron down, which will cause the aircraft to bank left.
2. Move the aileron stick to the right. The right aileron should move up and the left aileron down, which will cause the aircraft to bank right.

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



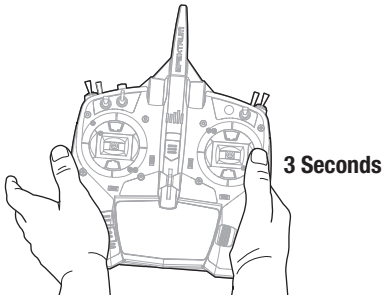
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In Flight Trimming

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

After 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.



Flying Tips and Repairs

Consult local laws and ordinances before choosing a flying location.

Flying Field

Always choose a wide-open space for flying your aircraft. It is recommended that you fly at a designated RC flying field. Always avoid flying near houses, trees, wires and buildings. Avoid flying in areas where there are many people, such as parks, schoolyards, or soccer fields.

Range Check your Radio System

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

Understanding 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 will see oscillation. If oscillation occurs, decrease airspeed. If oscillation persists, refer to the Troubleshooting Guide for more information.

Takeoff

Place the aircraft in position for takeoff (facing into the wind). Set your transmitter in low rate and gradually increase the throttle from ¾ to full and steer with the rudder. As the airplane gains speed, gently pull back on the elevator and climb to a comfortable altitude. You may also set flaps to half travel for shorter takeoffs.

Flying

Fly the airplane and trim it for level flight at ¾ throttle with flaps up. After adjusting trim in flight do not touch the control sticks for 3 seconds. This allows the receiver to learn the correct settings to optimize AS3X performance.

Landing

TIP: To prevent damage to the landing gear doors, it is recommended to remove them when landing in tall grass.

Make sure to land the aircraft into the wind. Start to slow the model down to an approach speed and set the flaps to half travel. If landing in windy conditions, land at half flap travel. If flying in light winds, set flaps to full for final approach. With flaps and retracts extended, fly the aircraft to approximately 36 inches (90 cm) or less above the runway, using a small amount of throttle for the entire descent. 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.

Refer to the Dual Rates and expo chart for proper flap to elevator mix to help reduce the pitching tendency from flaps.

NOTICE: When using flaps with this airplane, down elevator to flap mixing is required. Failure to do so may result in loss of control or a crash.

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 airplane in direct sunlight or a hot, enclosed area such as a car. Doing so can damage the foam.

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 Smart LiPo Battery Checker and Servo Driver (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 accelerator on your aircraft can damage paint. DO NOT handle the aircraft until accelerator fully dries.

Post Flight Checklist

Disconnect the flight battery from the ESC
Power OFF the transmitter
Remove the flight battery from the aircraft
Recharge the flight battery

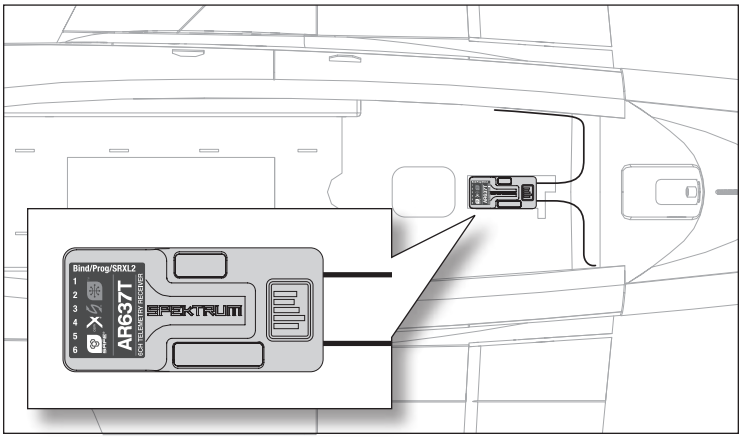
Repair or replace all damaged parts
Store the flight battery apart from the aircraft and monitor the battery charge
Make note of the flight conditions and flight plan results, planning for future flights

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Plug and Play (PNP) Receiver Selection and Installation

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 receiver. Refer to your receiver manual for correct installation and operation instructions.

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

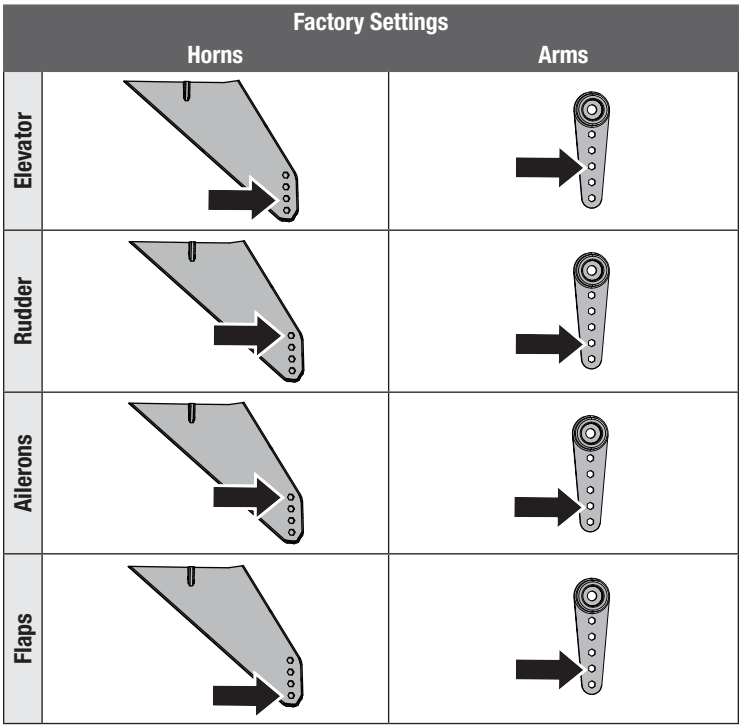


Installation (AR637T shown)

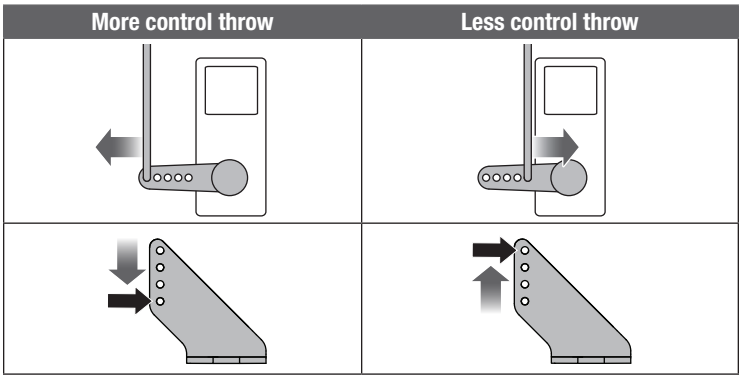
1. Remove the battery hatch from the fuselage.
2. Using double sided servo mounting tape, mount the receiver upright and parallel to the length of the fuselage, with the servo ports facing forward, as shown.
3. Route the antennas to opposite sides of the fuselage, keeping the ends perpendicular to eachother. Attach the antennas to the fuselage with clear tape.
4. Refer to the Wing Installation section of Aircraft Assembly to connect the control surface servos and LEDs to the appropriate receiver ports. The required Y- and 3-way harnesses are included for installation of a 6-channel receiver.

Control Horn and Servo Arm Factory 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.



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



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AS3X Troubleshooting Guide

Problem	Possible Cause	Solution
Oscillation	Flying over recommended airspeed	Reduce air speed
	Damaged propeller or spinner	Replace propeller or spinner
	Imbalanced propeller	Balance the propeller.
	Flight condition variations	Adjust gain to current flight conditions (wind, updrafts, local conditions [elevation, humidity, temperature, etc.])
	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	Adjust gain to compensate for parts wear or replace worn parts (especially propeller, pivot points or servo)
	Irregular servo rotation	Replace servo
	Gain too high	Decrease gain (refer to receiver manual)
Inconsistent flight performance	During in flight trimming, the user did not wait the required 3 seconds for new trim settings to be learned by the AS3X system	After adjusting trim in flight do not touch the control sticks for 3 seconds. Allow for the new trim settings to be learned by the AS3X system
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
	Spinner is not tight or fully seated in place	Tighten the spinner or remove the spinner and turn it 180 degrees
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 airplane was selected	Re-bind or select correct airplane in transmitter
	Flight battery charge is low	Fully recharge flight battery
	BEC (Battery Elimination Circuit) of the ESC is damaged	Replace ESC
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

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Replacement Parts

Part #	Description
EFL013551	Cowling
EFL013552	Hardware Set
EFL013553	Horizontal Stab Set
EFL013554	Vertical Stabilizer
EFL013555	Left Wing
EFL013556	Right Wing
EFL013557	Canopy Hatch With Pilot
EFL013558	Lower Main Door Set
EFL013559	Fuselage
EFL013560	Upper Main Door Set
EFL013561	Decal Sheet
EFL1301	Spinner Nut
EFL1304	Prop Adapter
EFL1305	Wingtube Set
EFL1306	Pilot
EFL1310	Wheel Set (3)
EFL1315	StrtWrsW/Nose Gear Steering Arm and Hardware
EFL1322	Pushrod Set
EFL1328	Motor X-Mount
EFLG365	Retract Unit; Main
EFLG366	Retract Unit; Nose

Part #	Description
EFLM1315	5040-500Kv Brushless Outrunner Motor, 14-Pole
EFLP1475102E	Propeller,14.75x10 2 Blade
SPMAR637T	AR637T 6CH SAFE and AS3X Telemetry Receiver
SPMSA320B	A320 16g Metal Gear Servo
SPMSA500	A500 25g Metal Gear Servo
SPMXAE70C	Avian Smart Lite 70-Amp Brushless Smart ESC, 3S-6S IC5

Recommended Parts

Part #	Description
SPMR8200	NX8 8 Ch DSMX Transmitter Only
SPMX56S30	5000mAh 6S 22.2V Smart G2 30C;
SPMXC2020	Smart S1200 G2 AC Charger; 1x200

Optional Parts

Part #	Description
EFL013562	Soft Tire Set: Carbon-Z T-28
SPMX56S100	5000mAh 6S 22.2V SmartG2100C IC
SPMX56S50	5000mAh 6S 22.2V Smart G2 50C
SPMX76S30	7000mAh 6S 22.2V Smart G2 30C

Important Federal Aviation Administration (FAA) Information

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

Recreational UAS Safety Test

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

FAA DroneZone

AMA National Model Aircraft Safety Code

Effective January 1, 2018

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

As an AMA member I agree:

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

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Limited Warranty

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

What is Not Covered—This warranty is not transferable and does not cover (i) cosmetic damage, (ii) damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance, (iii) modification of or to any part of the Product, (iv) attempted service by anyone other than a Horizon Hobby authorized service center, (v) Product not purchased from an authorized Horizon dealer, (vi) Product not compliant with applicable technical regulations, or (vii) use that violates any applicable laws, rules, or regulations.

OTHER THAN THE EXPRESS WARRANTY ABOVE, HORIZON MAKES NO OTHER WARRANTY OR REPRESENTATION, AND HEREBY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

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

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

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

WARRANTY SERVICES

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

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

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

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

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

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

10/15

Contact Information

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

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FCC Information

FCC ID: BRWTIARLGTNG1

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

Supplier's Declaration of Conformity

EFL CZ T28 BNF Basic (EFL013550):
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

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

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

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

IC Information

CAN ICES-3 (B)/NMB-3(B)
IC: 6157A-TIARLGTNG1

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

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

Compliance Information for the European Union

EU Compliance Statement:
EFL CZ T28 BNF Basic (EFL013550): 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 CZ T28 PNP (EFL013575): 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 and output:
Receiver:
2402-2478 MHz
19.95dBm

E328

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

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

WEEE NOTICE:

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

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