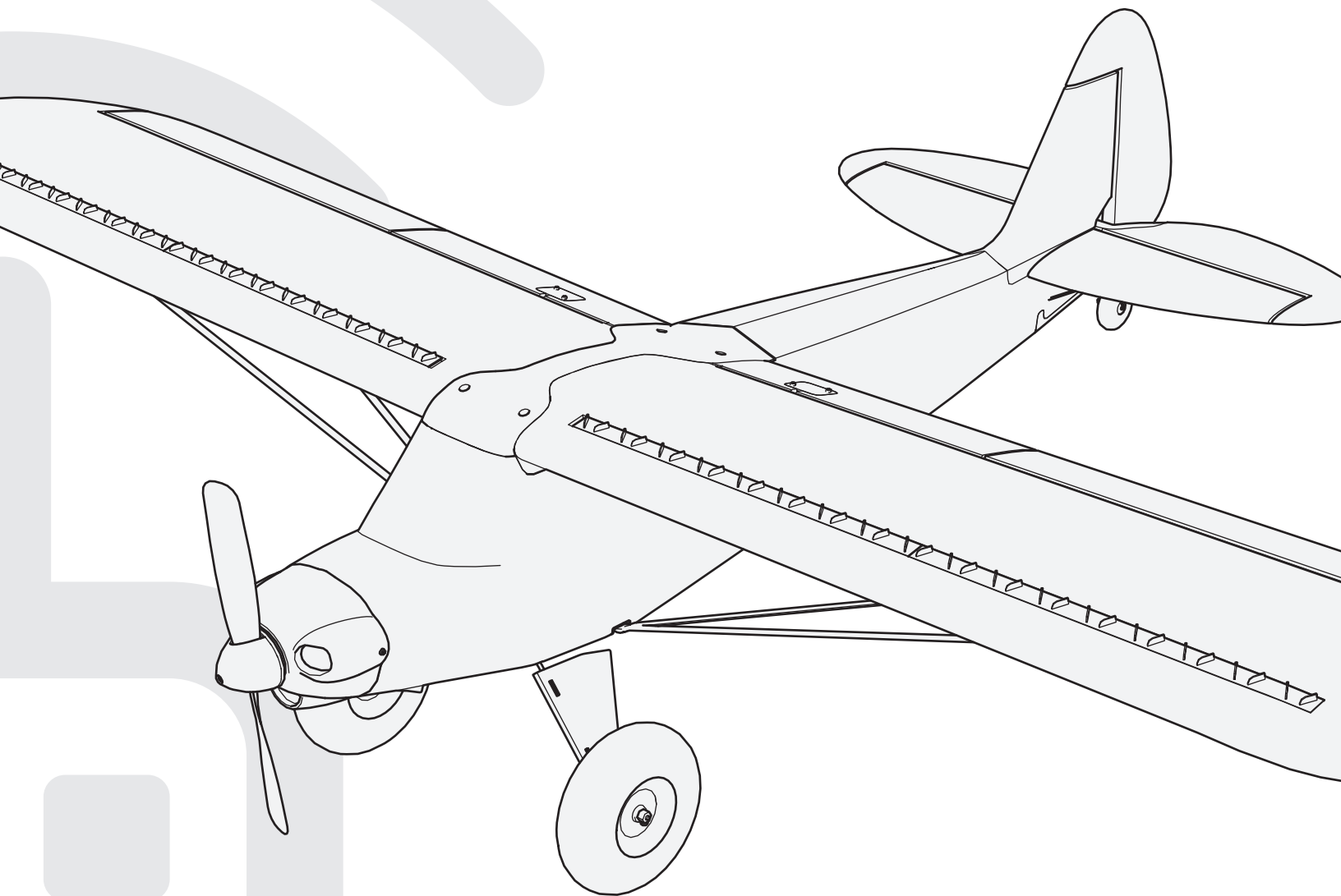


hobbyzone®

Carbon Cub S2

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



HORIZON®
H O B B Y

NOTICE

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, LLC. For up-to-date product literature, visit 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.



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.

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.

Charging Warnings

 **CAUTION:** All instructions and warnings must be followed exactly. Mishandling of Li-Po batteries can result in a fire, personal injury, and/or property damage.

- **NEVER LEAVE CHARGING BATTERIES UNATTENDED.**
- **NEVER CHARGE BATTERIES OVERNIGHT.**
- By handling, charging or using the included Li-Po battery, you assume all risks associated with lithium batteries.
- If at any time the battery begins to balloon or swell, discontinue use immediately. If charging or discharging, disconnect and disconnect. Continuing to use, charge or discharge a battery that is ballooning or swelling can result in fire.
- Always store the battery at room temperature in a dry area for best results.
- Always transport or temporarily store the battery in a temperature range of 40–120° F (5–49° C). Do not store battery or aircraft in a car or direct sunlight. If stored in a hot car, the battery can be damaged or even catch fire.
- Always charge batteries away from flammable materials.
- Always inspect the battery before charging and never charge dead or damaged batteries.
- Always disconnect the battery after charging, and let the charger cool between charges.
- Always constantly monitor the temperature of the battery pack while charging.
- **ONLY USE A CHARGER SPECIFICALLY DESIGNED TO CHARGE LI-PO BATTERIES.** Failure to charge the battery with a compatible charger may cause fire resulting in personal injury and/or property damage.
- Never discharge Li-Po cells to below 3V under load.
- Never cover warning labels with hook and loop strips.
- Never charge batteries outside recommended levels.
- Never attempt to dismantle or alter the charger.
- Never allow minors under the age of 14 to charge battery packs.
- Never charge batteries in extremely hot or cold places (recommended between 40–120° F or 5–49° C) or place in direct sunlight.

Box Contents

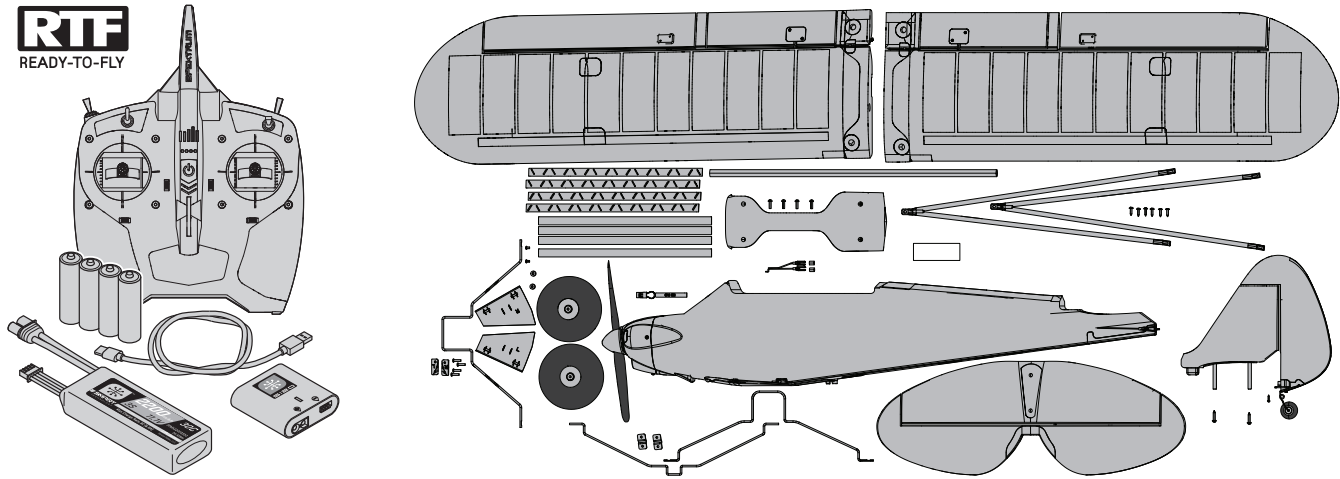
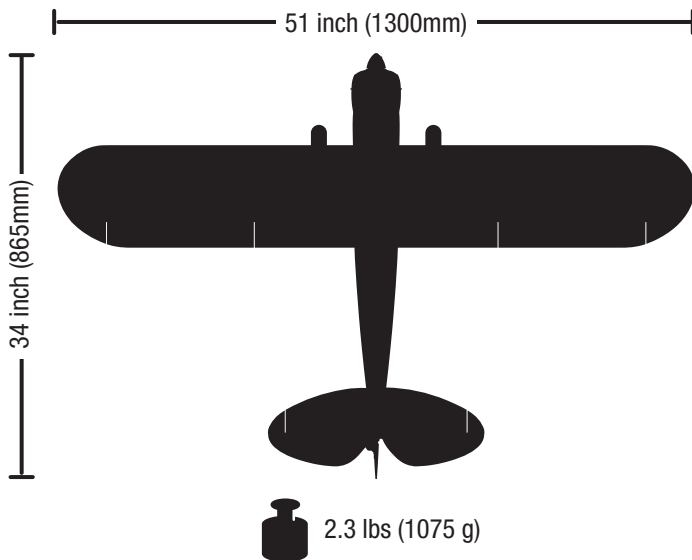


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Specifications



For more information and to register your product online, visit www.hobbyzonerc.com

		RTF READY-TO-FLY	BNF BASIC
	Motor: 480 Brushless Outrunner, 960Kv 14 Pole	Installed	Installed
	ESC: 30A	Installed	Installed
	Servos: 2 Aileron Servos, 1 Elevator Servo and 1 Rudder Servo	Installed	Installed
	Receiver: SPM4650C Flight Controller: SPMA3232	Installed	Installed
	GPS Module: SPMA3173	Optional	Optional
	Battery: 3S 2200mAh Li-Po (SPMX22003S30)	Included	Required to Complete
	Battery Charger: DC powered 3S balancing fast charger (SPMXC1020)	Included	Optional
	Transmitter: Spektrum™ DXS (SPMR1010)	Included	Optional
	LAS Unit (SPMA3180)	Optional	Optional

Optional Upgrades *(not included)*

Landing Assist Sensor (LAS)	GPS Module
When added, the LAS module will work hand-in-hand with the AutoLand feature for a picture perfect landing every time. When the aircraft is on approach and approximately 1m from the ground, the LAS module will level out the aircraft, adjust throttle if needed, and then flare the aircraft just before touchdown.	When added, advanced SAFE+ features can keep the aircraft within a given distance to the pilot (Virtual Fence), can return the model to home at the press of a button (Holding Pattern), can return home automatically if the controller signal is lost (Failsafe), and can land itself when commanded (AutoLand).

From the Box to the Air *(No LAS or GPS Module)*

✓
1. Remove and inspect contents.
2. Read this instruction manual thoroughly.
3. Charge the flight battery.
4. Fully assemble the aircraft
5. Make sure all linkages move freely.
6. Install a fully charged flight battery in the aircraft.
7. Check the Center of Gravity (CG).
8. Set up your transmitter (BNF only)
9. Bind the aircraft to your transmitter (BNF only)
10. Place the aircraft into Experienced Mode (Mode switch position 2) for the Control Direction Test. Place the aircraft on the ground facing away from you.
11. Perform the control direction test with the transmitter
12. Adjust the flight controls and transmitter as needed.
13. Place the aircraft into Beginner Mode (Mode switch position 0) for the SAFE Control Direction Test and takeoff.
14. Perform SAFE Control Direction Test
15. Find a safe open area to fly.
16. Perform a radio system range test.
17. Plan flight for flying field conditions.
18. Set flight time for 8 minutes.

Charge the Flight Battery

The recommended battery for the E-flite Carbon Club S2 aircraft, included with the RTF version, is an 11.1V, 2200mAh 3S 30C Smart Technology LiPo battery with an IC3™ connector (SPMX22003S30). If using a different battery, the battery should be of similar capacity, dimensions and weight to fit in the fuselage. The aircraft electronic speed control is equipped with an IC3 device connector. Ensure the battery chosen is compatible. Always ensure the model balances at the recommended center of gravity (CG) with the chosen battery. Follow your chosen battery and battery charger instructions to charge the flight battery.

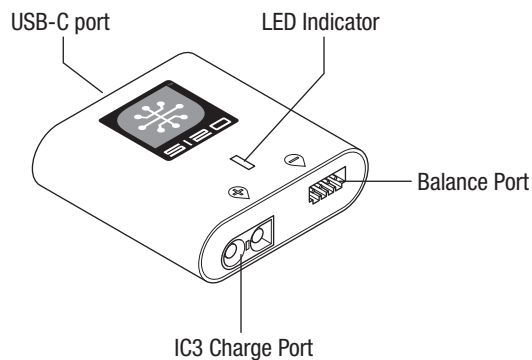
RTF Smart Technology Battery and S120 Charger, Specifications and Operation

The Spektrum S120 SMART Technology battery charger included with the RTF version of the aircraft is compatible only with Spektrum SMART 2-3 cell LiPo batteries or 6-7 cell NiMH batteries. It is not compatible with any other battery chemistries or non-SMART batteries.

A USB power supply is required for use. A USB-C QC type power supply is recommended for the fastest charge times.

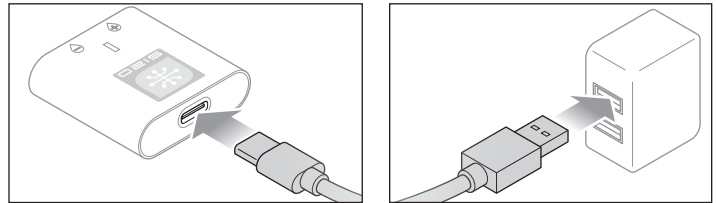
S120 Specifications

S120 Specifications	
Input	USB Type C, power supply not included
Input Voltage	5V-12V
Charge Power	18W max (dependant on power supply)
Compatible USB Power Adaptor	5V/1A, 5V/2A, USB Quick Charge (QC) 2.0/3.0
Battery Connector	IC3™ and balance connector
Battery Types	LiPo, NiMH (<i>Spektrum SMART Batteries only</i>)
Cell Count	2-3 cell LiPo, 6-7 cell NiMH
Max Output Voltage	13.05V
Max Output Current	Up to 2A

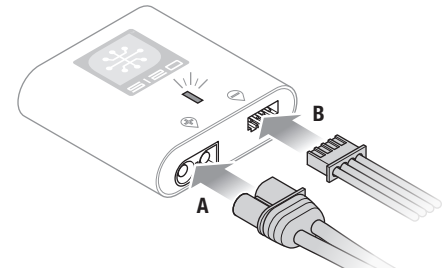


To charge the included flight battery:

1. Using the supplied Type-C USB cable, connect the S120 charger to a USB power supply (*not included*).



2. Insert the Spektrum SMART Battery IC3 connector (A) into the charger IC3 port, and insert the battery balance lead (B) into the charger balance port. Both the IC3 and balance connectors must be connected for the charging process to begin. The battery may be disconnected from the charger at any time to stop the charging process.



IMPORTANT: SMART NiMH batteries do not have a balance connector.

3. Disconnect the IC3 and balance connectors when the charge and balance cycles are complete, as indicated by the LED.
4. The LED indicator will glow solid red to indicate a charging error. Follow the operation steps to ensure proper connection is used to charge the battery.

Refer to the LED indicator table for charger status.

IMPORTANT: Connecting a non-SMART battery will cause a charge error and the S120 will not recognize or charge the battery.

LED Indicator

LED Indicator		
Power On	USB 5V: White LED	
	USB Quick Charge 2.0/3.0: Blue LED	
LiPo: Purple LED NiMH: Yellow LED	Battery Capacity	
	Less Than 25%	Single Flash
	25% – 75%	Double Flash
	76% – 99%	Triple Flash
Charge Complete	Green LED (Solid)	
Error	Red LED (Solid)	

RTF Transmitter

READY-TO-FLY

Installing the Transmitter Batteries

Remove the battery cover, install the four included batteries (noting proper polarity) and reinstall the battery cover.

Low Battery Alarm

The LED indicator flashes and the transmitter beeps progressively faster as the battery voltage drops. Replace the transmitter batteries when the transmitter begins to beep.

CAUTION: If using rechargeable batteries, charge only rechargeable batteries. Charging non-rechargeable batteries may cause the batteries to burst, resulting in injury to persons and/or damage to property.

WARNING: Do not pick up the transmitter by the antenna. Do not alter or put weight on the antenna. Damage to antenna parts can decrease transmitter signal strength, which can result in loss of model control, injury or property damage.

For complete transmitter instructions and features, visit horizonhobby.com.

Battery Voltage Level

The included DXS transmitter includes a new flight battery voltage level indicator feature.

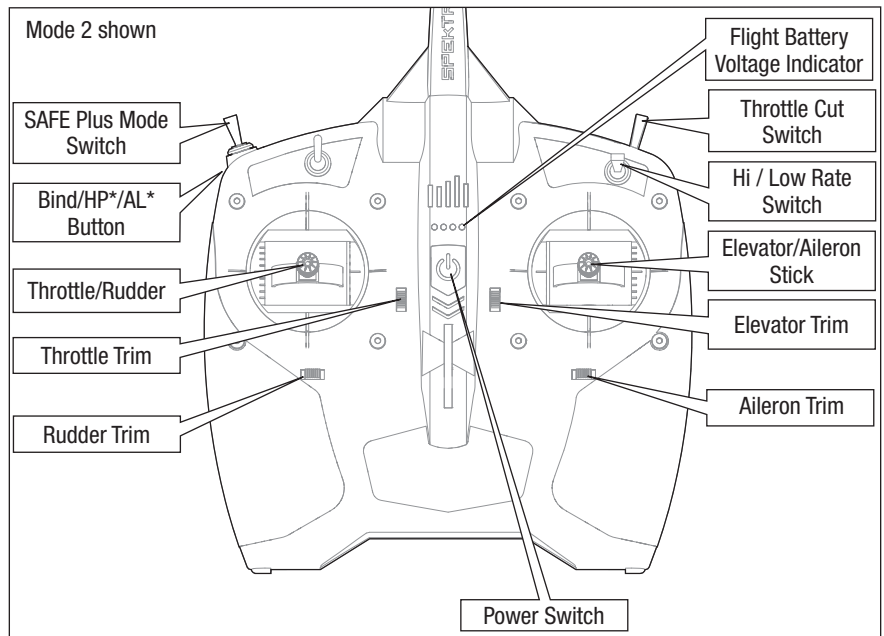
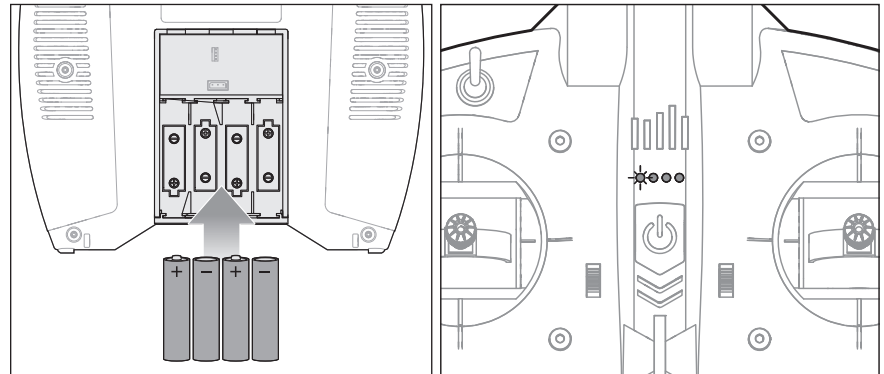
LED SMART Battery voltage indication is based on current voltage and will change with throttle/power usage. When throttle is increased, voltage drops, causing the bars to indicate lower power (e.g., fewer LEDs solid or flashing.) When the throttle is lowered to idle/off, the bars recover (e.g., more LEDs solid or flashing). LED bars will rise and lower depending on throttle/power usage.

The SMART Battery low voltage alarm sounds when the ESCs are close to reaching low voltage cutoff. The alarm will sound for 25 seconds. If the throttle is lowered to allow voltage recovery, the alarm will stop early.

Land the aircraft when the alarm sounds.

After landing, reset the SMART Battery low voltage warning by either (1) powering cycling the DXS transmitter, or (2) disconnecting the battery from the aircraft for more than 15 seconds or until the LED voltage indication bars go out.

Connect a fully charged battery to the aircraft, which will ensure the SMART Battery low voltage warning resets prior to the next flight.



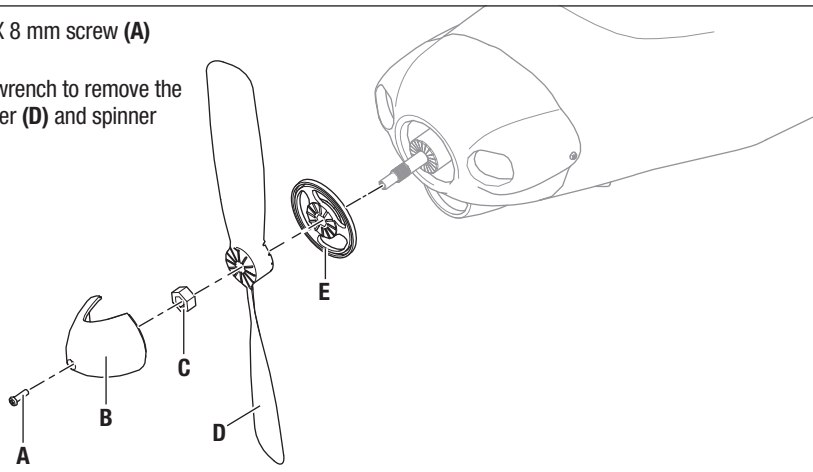
*(HP)= Holding Pattern

*(AL) = AutoLand



WARNING: Before proceeding further, remove the propeller and spinner from the motor shaft. Never attempt to program the radio components, assemble the aircraft or perform maintenance of any kind without removing the propeller. Serious injury could result if the motor starts inadvertently with the propeller still attached.

1. Remove the M2.5 X 8 mm screw (A) and spinner (B).
2. Use an adjustable wrench to remove the hex nut (C), propeller (D) and spinner backplate (E).



BNF Transmitter Setup

IMPORTANT: The included flight controller has been programmed for operation specifically in this aircraft. The programming in this flight controller cannot be changed by the user.

To operate the SAFE® or optional SAFE Plus system in this aircraft, set up your optional DSM2®/DSMX® transmitter* using the chart.

- SAFE Plus Flight modes are selected using Channel 5 signal (high, middle, low)

IMPORTANT: A transmitter with a 2-position Channel 5 switch will only allow the use of position 0 or position 2 flight modes. If possible (refer to your transmitter manual), assign Channel 5 in your transmitter to a 3-position switch to operate all 3 flight modes.

Refer to your transmitter manual for more information about transmitter setup.

*The Carbon Cub S2 aircraft is not compatible with DX4e or DX5e transmitters.

Computerized Transmitter Setup

(DX6 Gen2, DX6e, DX7 Gen2, DX8 Gen2, DX9, DX18 and DX20)

Start all transmitter programming with a blank model (do a model reset), then name the model.	
Set Aileron, Elevator, and Rudder Rates to:	HIGH 100% LOW 70%
DX6 DX6e DX8 DX9 DX18 DX20	1. Go to the SYSTEM SETUP
	2. Set MODEL TYPE: AIRPLANE
	3. Go to CHANNEL ASSIGN: click NEXT to go to Channel Input Config: GEAR: B, AUX1: I
	4. Go to the FUNCTION LIST
	5. Go to Throttle Cut: set to Switch H, Position: -130
Resulting in:	Switch H operates Throttle Cut, position 0 is normal and position 1 cuts power to the throttle. Switch B operates the 3 SAFE modes (0 beginner/1 intermediate/2 experienced) Button I operates PANIC mode when pressed

Confirm AUX1 is not reversed. If AUX1 is reversed, the ESC and the GPS system will not arm, indicated by full down elevator.

Hi/Low Rate Switch (Dual Rates)

The included DSMX® full range transmitter features dual rates to allow you to select the amount of travel that you want from the control surfaces.

Dual Rate	High Rate	Low Rate
Aileron	100%	70%
Elevator	100%	70%
Rudder	100%	70%

Transmitter and Receiver Binding



CAUTION: Connecting the battery to the ESC with reversed polarity will cause damage to the ESC, the battery or both. Damage caused by incorrectly connecting the battery is not covered under warranty.

IMPORTANT: The included flight controller has been programmed for operation specifically in this aircraft. The programming in this flight controller cannot be changed by the user.

An extension is installed in the flight controller bind port so binding may be done through the battery door in the bottom of the aircraft without having to remove the wing assembly. Simply insert the bind plug in the open end of the extension marked "bind" to enter bind mode.

The included RTF transmitter is bound to the aircraft at the factory. If you need to re-bind for any reason, follow the binding procedure as shown.

You need to 'bind' your chosen Spektrum™ DSM2®/DSMX® technology equipped aircraft transmitter to the receiver for proper operation. Please refer to the optional parts list in this manual or visit www.bindnfly.com for a list of compatible transmitters.

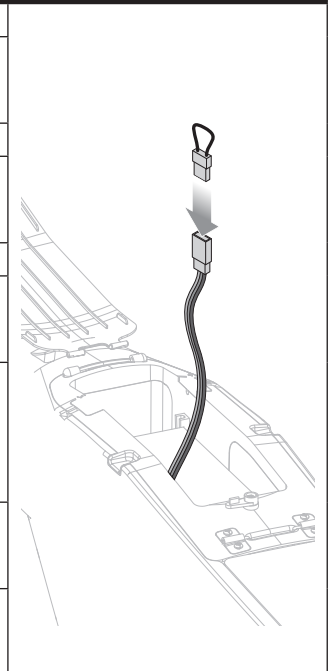
Refer to your transmitter instructions for binding to a receiver.

The throttle will not arm if the transmitter's throttle stick is not put at the lowest position and the throttle trim centered or lower.

If you encounter problems, follow the binding instructions and refer to the transmitter troubleshooting guide for other instructions. If needed, contact the appropriate Horizon Product Support office.

Binding Procedure Reference Table

1. Make sure the transmitter is powered off.
2. Make sure the transmitter controls are neutral, the throttle is at the lowest position*, the throttle trim is centered and the aircraft is immobile.
3. Install a bind plug in the bind port extension.
4. Connect the flight battery to the ESC. The ESC will produce a long tone followed by a series of additional short tones.
5. The status LED will begin to flash rapidly.
6. Power on the transmitter while holding the transmitter bind button or switch. Refer to your transmitter's manual for specific binding instructions.
7. When the receiver binds to the transmitter, the orange bind light on the receiver will turn solid and the ESC will produce ascending tones. The tones indicate the ESC is armed, provided the throttle stick and throttle trim are low enough to trigger arming.
8. Remove the bind plug from the bind port. The receiver should retain the binding instructions received from the transmitter until another binding is done.
9. Safely store the bind plug (some owners attach the bind plug to their transmitter using two-part loops and clips).



*The throttle will not arm if the transmitter's throttle stick is not put at the lowest position. The aircraft will not arm when it is upside down.

GPS

Applies only when the optional GPS module is installed

GPS

IMPORTANT: IF THE OPTIONAL GPS MODULE IS INSTALLED the aircraft will not respond to transmitter commands after binding if it cannot acquire a GPS signal.

Binding: After binding with the GPS module installed, the aircraft will search for a GPS lock, indicated by the elevator slowly cycling up and down. After acquiring a GPS lock, all flight controls will respond normally except throttle. The throttle will be limited, allowing the aircraft to be taxied out to takeoff position on the runway. Set the home position to regain full functioning throttle. See the Powering On With GPS section of this manual for further details.

Compass calibration: After binding the first time with the GPS module installed in the aircraft, compass calibration is required. The aircraft will automatically enter the compass calibration sequence after installing the GPS for the first time. This is indicated by the ailerons slowly cycling up and down. The aircraft will not respond to transmitter commands with the GPS module installed until calibration has been completed. See the Compass Calibration section of this manual for further details.

Subsequent binding with the GPS module will not require compass calibration.

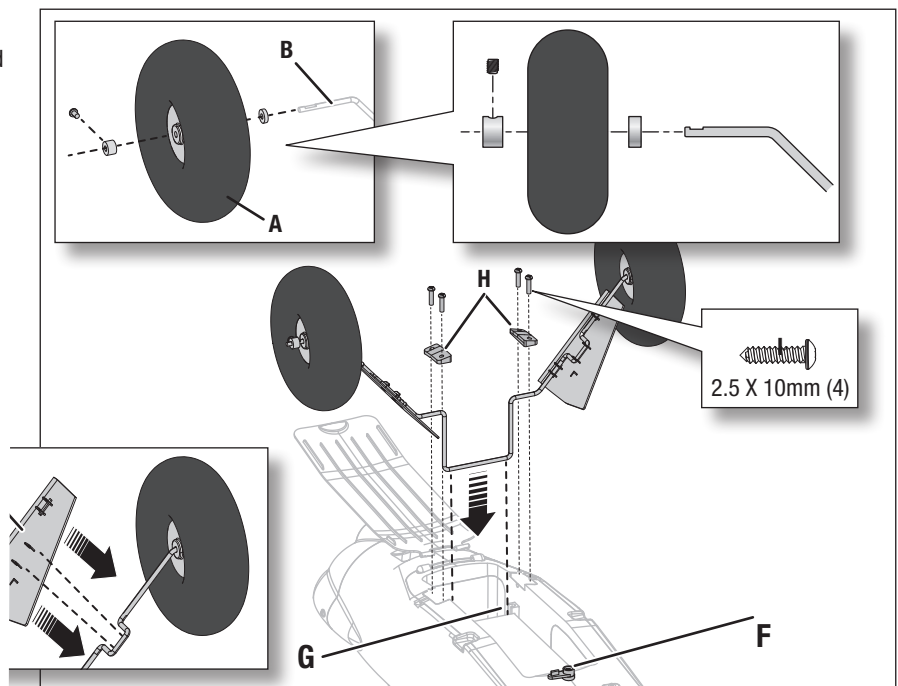
GPS

GPS

Assembly

Install the Main Landing Gear

1. Install 2 wheels (**A**) on the strut (**B**) using wheel collars and spacers. Only the outer wheel collars require a set screw. Tighten the set screws on the flat spots of the strut.
 - TIP:** Threadlock may be required to keep the collar on the strut.
 2. Install the left and right fairings (**E**) (marked L and R) on the respective sides of the strut.
 3. Turn the latch (**F**) and open the battery hatch.
 4. Install the strut in the channels (**G**) in the fuselage as shown.
 5. Install the left and right strut brackets (**H**) (marked L and R) in the respective slots on the bottom of the fuselage using 4 screws (**I**).
 6. Replace the battery hatch and turn the latch.
- Disassemble in reverse order.



Install the Tail

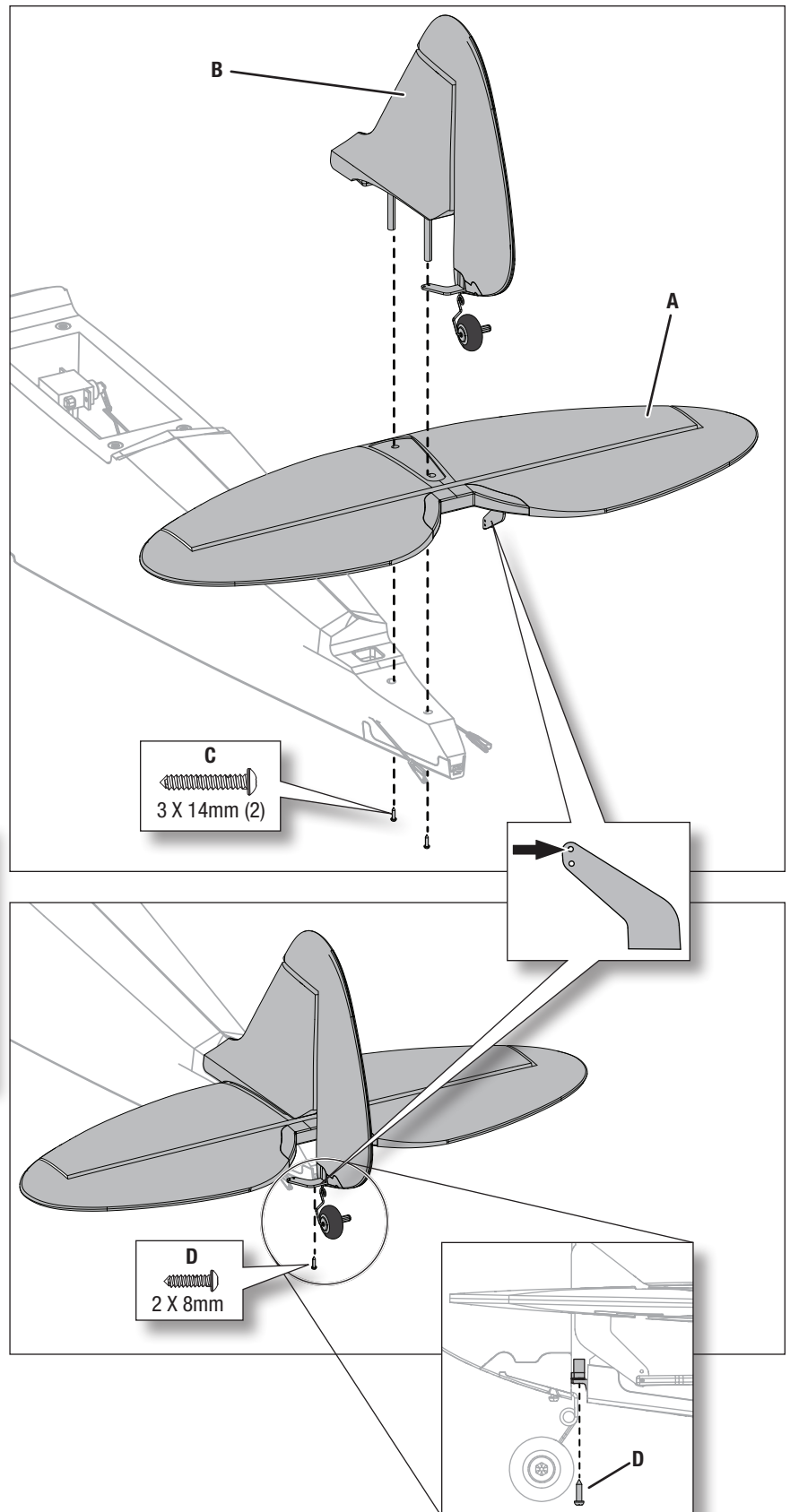
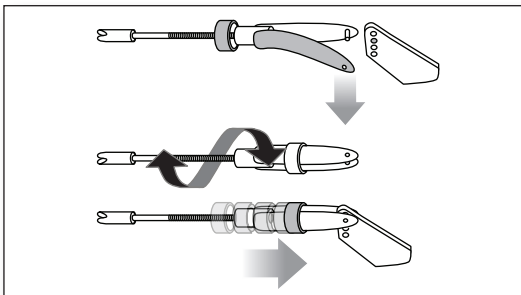
1. Install the horizontal tail **(A)** on the fuselage as shown.
 2. Carefully insert the 2 pins of the vertical fin **(B)** through the horizontal tail holes and the fuselage holes. Turn the rudder so the control horn is under the horizontal tail.
 3. Under the fuselage, install the 2 screws **(C)** into the fuselage and the vertical fin pins. Tighten the screws, but do not break the plastic.
 4. Install the rudder hinge screw **(D)** as shown. Tighten the screw, then loosen it one half of a turn so the rudder turns freely.
 5. Connect the respective clevises in the outermost holes in the rudder and elevator control horns. Refer to the clevis adjustment instructions to center the rudder and elevators.
- Disassemble in reverse order.

Adjusting the Clevis at the Control Horn

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

Turn the clevis on the linkage to change the length of the linkage between the servo arm and the control horn.

1. Pull the tube from the clevis to the linkage.
2. Carefully spread the clevis and insert the clevis pin into the desired hole in the control horn.
3. Close the open clevis side over the pin.
4. Move the tube to hold the clevis on the control horn. Ensure the tube does not interfere with the movement of the control horn anywhere throughout the control surface range of motion.



Install the Wing

Assembly

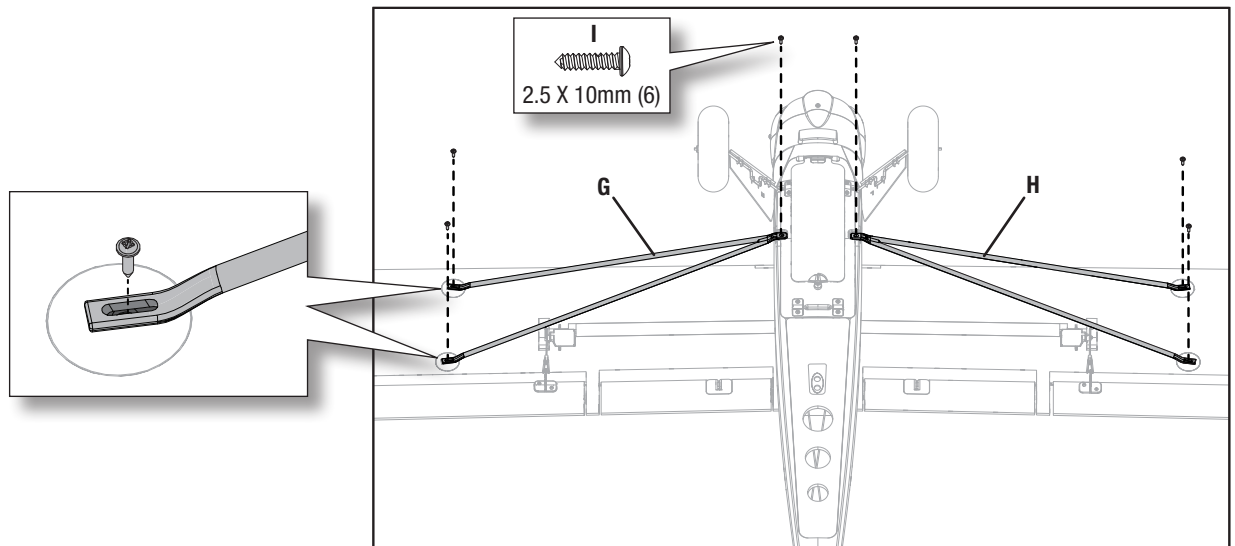
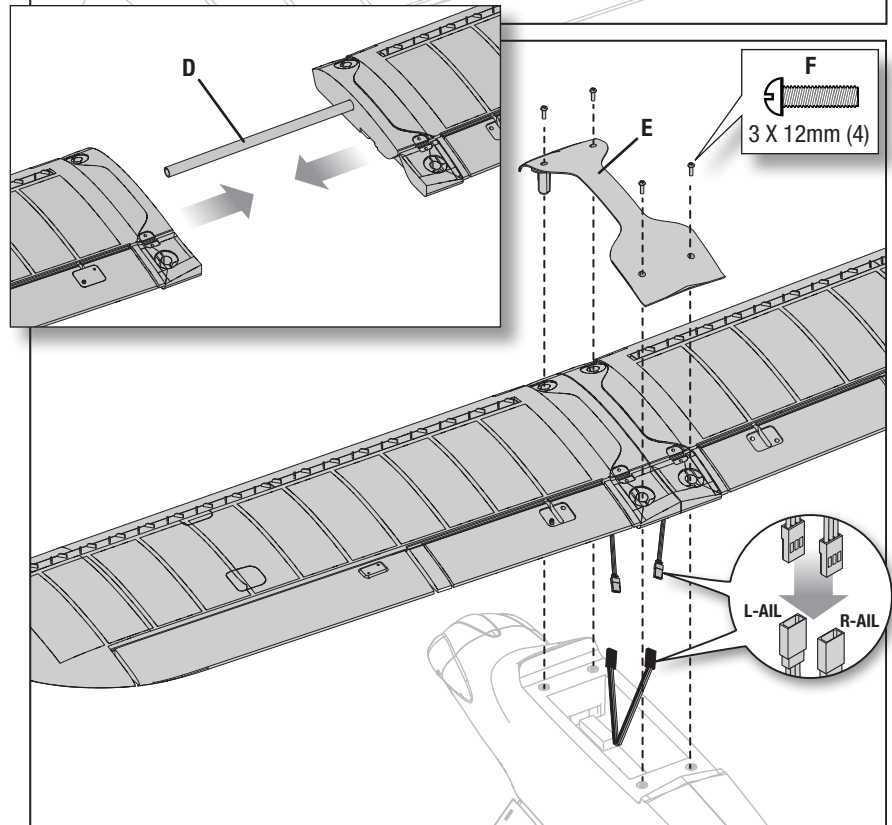
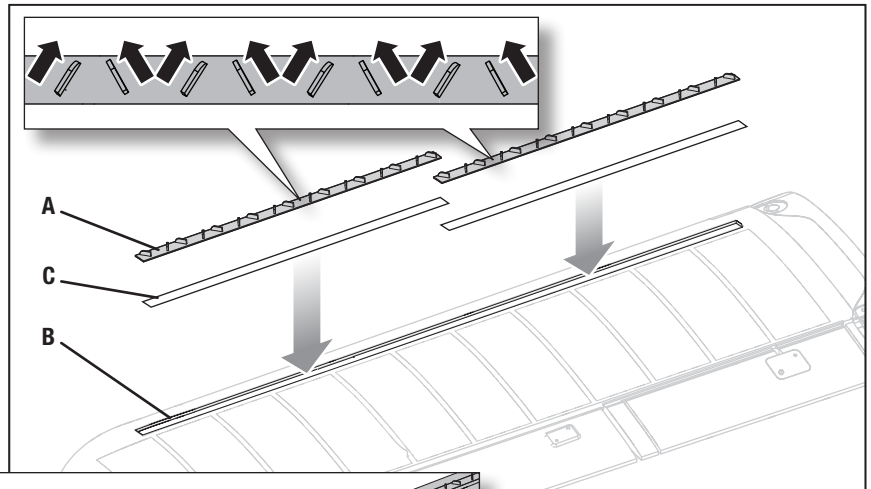
1. Install the vortex generators (A) in the wing channels (B) by using double-sided tape (C).
2. Slide the wing tube (D) in the hole in the left wing.
3. Slide the other end of the wing tube into the hole in the right wing until both wings meet.
4. Install the wing cover (E) on the top of the wing, aligning the 4 holes as shown.

Installation

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

1. Connect the left aileron servo connector to the servo extension labeled "AIL-L", and connect the right aileron servo connector to the servo extension labeled "AIL-R".
2. Attach the assembled wing and wing cover (E) to the fuselage using 4 screws (F).
3. Attach the right (G) and left (H) struts (marked R and L) under the wing and fuselage using 6 screws (I). Adjust the position of the 4 screws in the top of the strut slots so the wings are not flexed down or twisted.

Disassemble in reverse order.



Factory Settings for the Control Horns and Servo Arms

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

	Elevator	Ailerons	Rudder
Arms			
Horns			

Flight Control

For smooth control of your aircraft, always make small corrections. All directions are described as if you were sitting in the aircraft.

- **Flying faster or slower:** When your aircraft is stable in the air, push the throttle stick up to make the aircraft go faster. Pull the throttle stick back to slow down. The aircraft will climb when the throttle is increased.
- **Elevator up and down:** Push the elevator stick forward to make the aircraft go down. Pull the elevator stick back to go up.
- **Aileron right and left:** Move the aileron stick right to make the aircraft roll or “bank” right. Move the aileron stick left to bank left.

TIP: Always picture yourself in the aircraft when determining which way to bank the aircraft wings. When the aircraft is flying away from you, banking the aircraft right or left appears normal. When flying toward you, the aircraft will appear to bank the opposite direction to the control input given. This will become more instinctual with experience.

- **Rudder left and right:** Push the rudder stick left or right to yaw or point the nose of the aircraft left or right. The rudder stick is also used to steer the aircraft left and right while taxiing on the ground.

TIP: Similar to the tip given for the aileron control, picture yourself in the aircraft to determine which direction to point the nose depending on whether you are flying away from yourself or toward yourself.

For first flights, set the SAFE® flight mode switch to **Beginner Mode** (position 0).

IMPORTANT: Even though SAFE technology is a very helpful tool, the aircraft still needs to be flown manually. If incorrect input is given at lower altitudes or at slower speeds, the aircraft can crash. Study these control inputs and the aircraft response to each carefully before attempting your first flight.

	Transmitter command	Aircraft Response
Elevator		
Aileron		
Rudder		

Install the Flight Battery

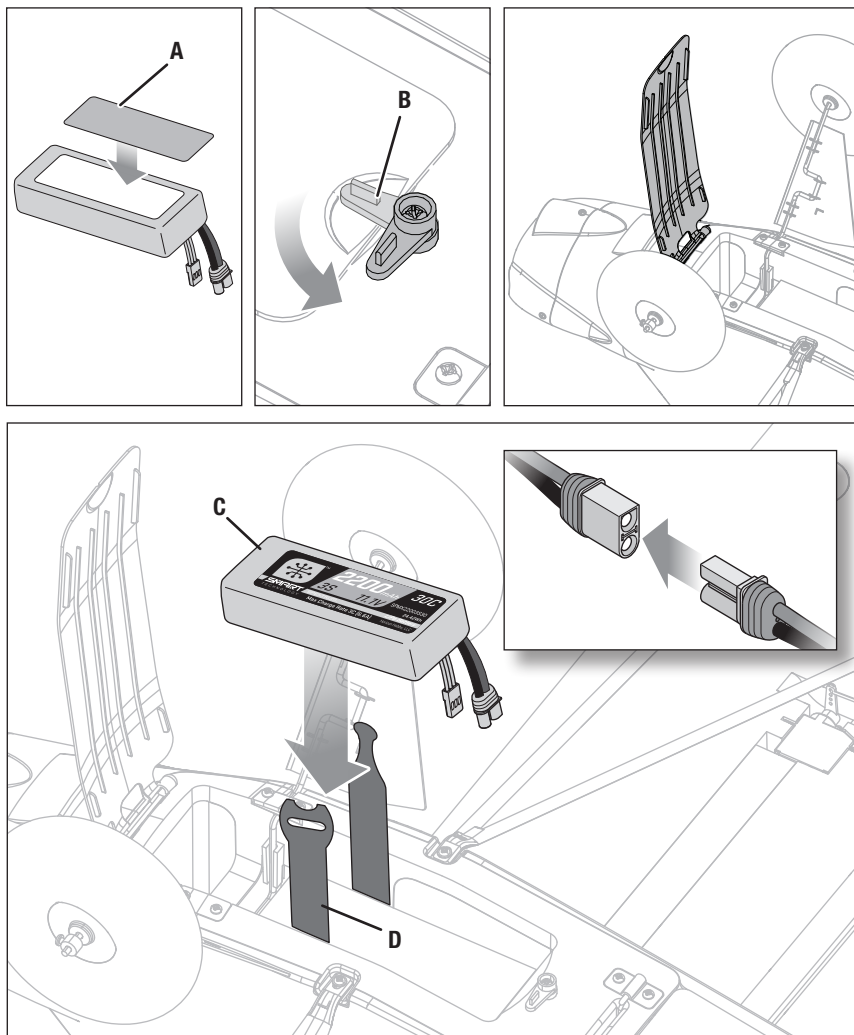
Battery Selection

- We recommend the E-flite® 2200mAh 11.1V 3S 30C Li-Po (SPMX22003S30).
- If using another battery, the battery must be at least a 2200mAh battery.
- The battery should be approximately the same capacity, dimensions and weight as the E-flite Li-Po battery to fit in the fuselage without changing the center of gravity a large amount.

1. Lower the throttle stick to the lowest setting and center the throttle trim. Power on the transmitter, then wait 5 seconds.
2. Apply a strip of hook tape (A) to the bottom the battery near the end opposite the battery wires.
3. Turn the latch (B) and open the battery hatch.
4. Install the flight battery as shown. See the Adjusting the Center of Gravity instructions for more information.
5. Make sure the flight battery is secured using the hook and loop strap (D).
6. Connect the battery to the ESC. Close the hatch and turn the aircraft over and place it on its wheels. Keep the aircraft immobile and away from wind for 5 seconds.
7. Keep the aircraft immobile for 30+ seconds until GPS lock is established as described in the Flying section.

CAUTION: Always disconnect the Li-Po flight battery from the aircraft when not flying to avoid over-discharging the battery. Batteries discharged to a voltage lower than the lowest approved voltage may become damaged, resulting in loss of performance and potential fire when batteries are charged.

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



Center of Gravity (CG)

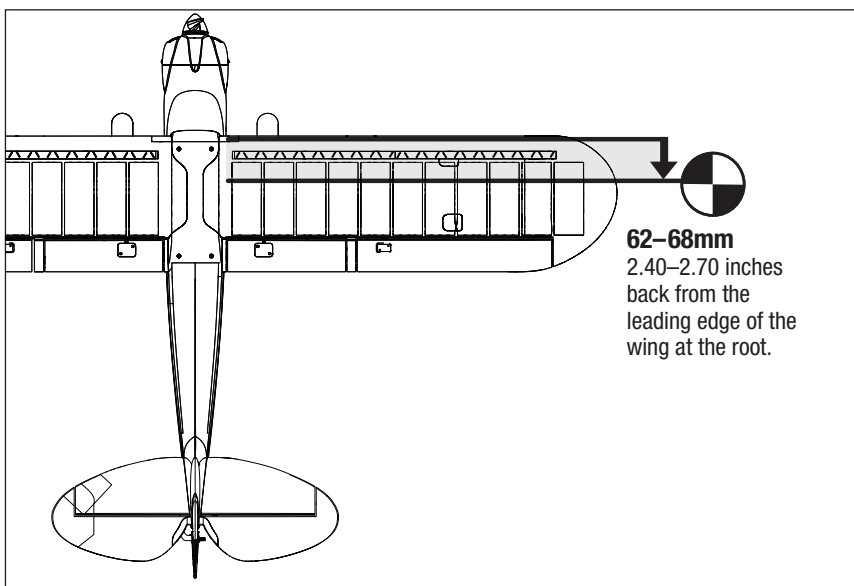
An aircraft with the correct CG has its weight balanced on the center of the aircraft for safe, stable flight. The aircraft CG and weight are based on an E-flite 11.1V 2200mAh 30C battery (SPMX22003S30) installed. Make sure the flight battery is secured using the hook and loop strap.

The CG location is 62-68mm back from the leading edge of the wing at the root. Balance the aircraft on your fingertips near the fuselage under the wings.

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

When in intermediate and experienced modes, if the aircraft CG is too far forward (nose heavy), up elevator is required to fly level at 50%–60% power. If the aircraft CG is too far aft (tail heavy), down elevator is required to fly level. In Beginner mode the aircraft is not affected. The SAFE system controls the aircraft's attitude.

Adjust the battery position as needed.



Control Direction Test

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

If performing the control direction test indoors, disable GPS as shown in *Deactivating GPS* before performing the control direction test.

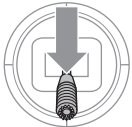


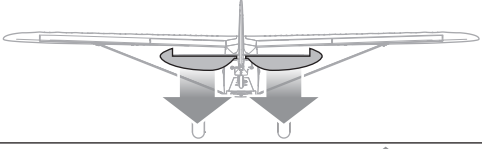
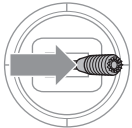

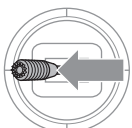

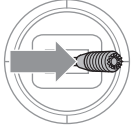
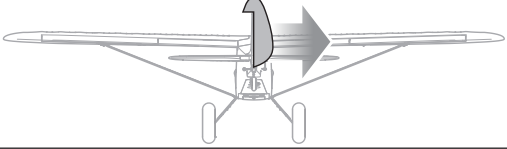
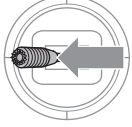
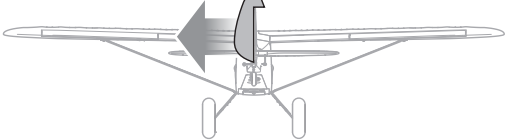
Set the SAFE flight mode switch to **Experienced mode** (position 2).

Keep the throttle at zero and place the model on level ground away from obstacles.

Move the sticks on the transmitter as described in the table to ensure the aircraft control surfaces respond as shown.

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

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

	Transmitter command	Control Surface Response
Elevator		
		
Aileron		
		
Rudder		
		

Range Test

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

WARNING: While holding the aircraft during the range test, always keep body parts and loose items away from the motor. Failure to do so could cause personal injury.

Before each flying session, and especially with a new model, you should perform a range check. If you have the BNF aircraft, refer to your transmitter manual to perform a range check of your system.

The included transmitter incorporates a range check mode to reduce the output power of the transmitter. Follow the directions below to enter range check mode for the transmitter:

1. Power on the transmitter for 5 seconds or more with the throttle stick low and throttle trim centered.
2. Power on the aircraft, keeping it immobile for 5 seconds. The elevator will slowly move up and down, indicating the aircraft is searching for GPS lock.
3. Turn the GPS function off by pressing and holding the bind button and fully cycling the flight mode switch 3 times. The elevator movement will stop and the rudder will wag, indicating GPS is off.
4. Release the bind button.
5. Face the model with the transmitter in your normal flying position.
6. **Toggle the HI/LO Rate switch rapidly 4 times and then press and hold the bind button.** The transmitter LEDs will flash and the alarm will sound. The system is in range check mode. Do not let go of the bind button until you are finished with the range check.

IMPORTANT: You must hold the BIND button during the entire range check process. Releasing the button will immediately exit the range check mode and you will need to start again.

7. With the radio system powered on and the model safely restrained on the ground, stand 28 meters (90 feet) away from the model.

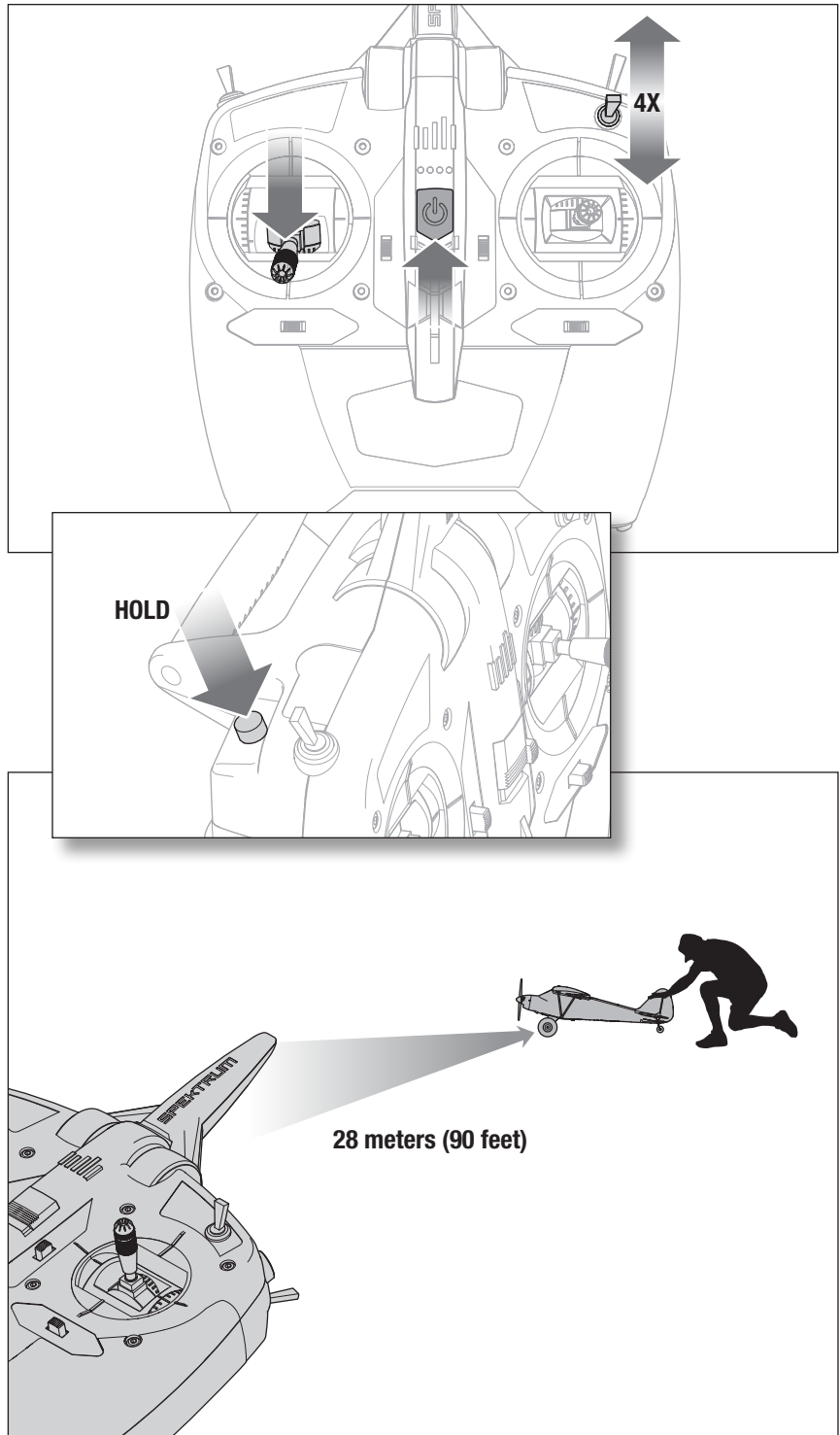
TIP: In some aircraft, when the model is placed on the ground, the antenna(s) can be within inches of the ground. Close proximity of the antenna(s) to the ground can reduce the effectiveness of the range check. If you experience issues during the range check, restrain the model on a non-conductive stand or table up to 2ft (60cm) above the ground, then range check the system again.

8. Move the transmitter rudder, elevator, aileron and throttle controls to ensure they operate smoothly at 28 meters (90 feet).

9. If control issues exist, do not attempt to fly. Refer to the contact table at the end of this manual to contact Horizon Hobby product support. Also, see the Spektrum website for more information.

10. When the range check is successfully completed, release the bind button to exit range check mode.

CAUTION: Never attempt to fly while the transmitter is in range check mode due to reduced output power of the transmitter. Loss of control will occur.



Compass Calibration Procedure

Perform the compass calibration before the first flight or to correct the heading during auto landing if it varies significantly from the heading set during takeoff.

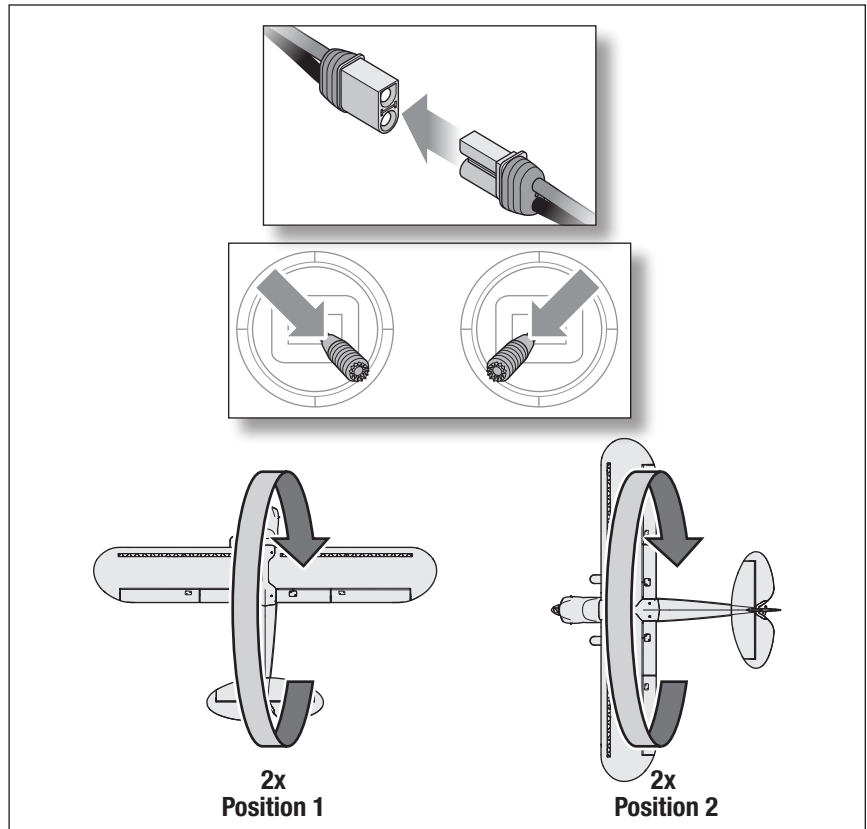
1. Remove the propeller if it is installed or activate throttle cut.
2. Power on the receiver and set the model on the ground on its wheels.
3. With the transmitter trims centered, power on the transmitter and the aircraft while holding the transmitter sticks as shown. The aircraft will indicate the GPS is searching for satellites by cycling the elevator up and down.
4. After satellites are acquired, the aircraft will signal it has entered compass calibration mode by the following:

Wings on: The ailerons will cycle left and right slowly.

Wings off: The red and blue LEDs on the flight controller will flash alternately.

Once in calibration mode, the throttle is not active and the transmitter sticks can be released. The transmitter must remain powered on.

5. Once in calibration mode, rotate the aircraft twice in position 1.
6. Turn the aircraft 90 degrees and rotate it twice in position 2.
7. Turn off the transmitter.
8. Wait 3 seconds and disconnect the flight battery.



Choose a Flying Field

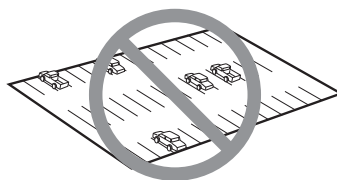
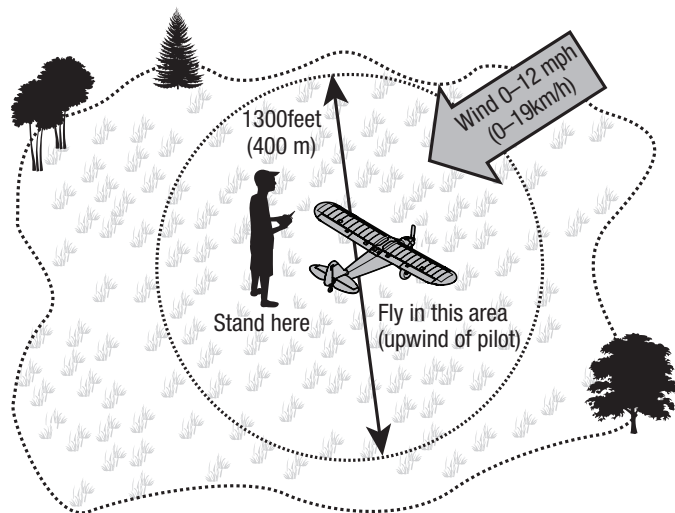
Consult local laws and ordinances before choosing a location to fly your aircraft.

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

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

The site should:

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

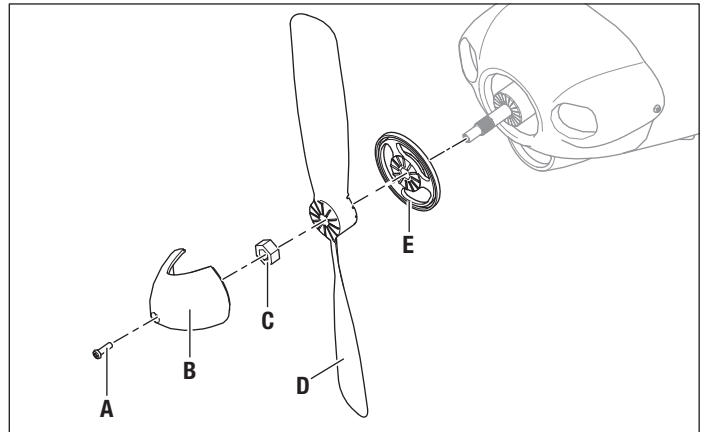


Install the Propeller

WARNING: Do not install the propeller until the aircraft has been completely assembled, all systems have been checked thoroughly and you are located at a suitable flying site.

Follow the instructions below to install the propeller and spinner:

1. Install the spinner backplate (**E**) over the motor shaft, making sure the notched outer ring is facing forward.
2. Install the propeller (**D**) against the spinner backplate, lining up the notches in the propeller with the ribs on the backplate. The numbers on the propeller should face forward.
3. Using an adjustable wrench, tighten the propeller nut (**C**) against the propeller. The nut should be tightened enough to not allow the propeller to loosen during flight, but not so tight as to damage the propeller or motor shaft.
4. Line the spinner (**B**) up and fit against the backplate, making sure to fit the lip of the spinner into the notch in the backplate.
5. Install the M2.5 X 8 mm screw (**A**) in the front of the spinner, threading it into the end of the motor shaft, securing the spinner to the backplate.



Preflight Checklist

	1. Find a safe and open flying area
	2. Charge flight battery
	3. Install fully charged flight battery in aircraft
	4. Make sure linkages move freely
	5. Perform control direction test
	6. Perform a range check
	7. Perform the compass calibration
	8. Plan flight for flying field conditions
	9. Set a flight timer for 6–8 min.
	10. Install the propeller
	11. Have fun!

Trimming the Aircraft

Adjusting Trim in Flight

The SAFE flight mode switch should be set to **Experienced mode** (position 2) before adjusting the trims. Trimming is best done in calm wind conditions.

If your aircraft does not fly straight and level at half throttle with the sticks at neutral, fly into the wind and adjust the trim sliders as indicated in the table until the aircraft maintains a reasonably straight and level flight path.

After the aircraft is trimmed in flight, land the aircraft and proceed to the *Manually Adjusting Trim* section to set the trim mechanically.

The included transmitter features electronic trim buttons. The transmitter emits a faint beep with each click of the trim buttons in either direction. Holding the button in either direction quickly adjusts the trim several steps until the button is released or until the trim reaches the end of its travel. If the trim button does not beep when clicked, the trim is at the far end of its travel. Center trim is indicated by a slightly louder beep.

	Aircraft Drift	Trim Required
Elevator		
Aileron		
Rudder		

Manually Adjusting Trim



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

The SAFE flight mode switch should be set to **Experienced mode** (position 2) before manually adjusting the trim settings.

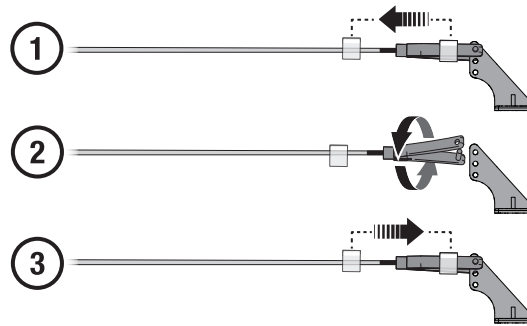
The aircraft should be kept still while performing manual adjustment of trim.

With the trim settings from the trim flight still set in the transmitter, take note of the positions of each of the control surfaces, one at a time.

Adjust the clevis on each control surface to position the surface the same as it was with the trim offset.

1. Remove the clevis from the control horn.
2. Turn the clevis (as shown) to lengthen or shorten the pushrod.
3. Close the clevis onto the control horn and slide the tube towards the horn to secure the clevis.
4. Move to the next control surface.

When you have all of the surface trims centered, return the trim settings on the transmitter to neutral by pushing the trim buttons for each surface until the transmitter emits a loud beep indicating center trim.



Flying

SAFE+ Technology Flight Modes

Change between SAFE flight modes by changing the flight mode switch position.

Beginner Mode (Position 0):

- Below approx. 50 feet (15m), pitch (nose up and down) and roll (wing tips up and down) angles are limited to help you keep the aircraft airborne.
- Above approximately 50 feet (15m), pitch and roll control are increased slightly.
- At any time release both sticks to activate panic recovery mode for self-leveling.
- Altitude limit of 400 feet.

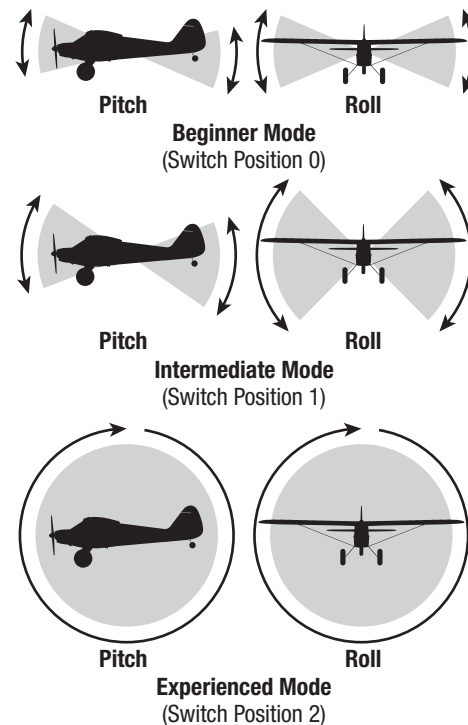
Intermediate Mode (Position 1):

- Same as beginner mode, with greater pitch control above approximately 50 feet (15m).
- Above 50 feet (15m) self leveling is not active.
- Self-leveling is active below 50 feet.
- Altitude limit of 400 feet.

Experienced Mode (Position 2):

- Unlimited Flight Envelope.
- Switch to beginner mode at any time and release the control sticks for self-leveling.

NOTICE: If the aircraft is upside down when the self leveling is applied, sufficient altitude is required for the aircraft to return to straight and level flight.



Takeoff

Set the flight mode switch to Beginner Mode (position 0) for your first flights.

Set a flight timer for 6–8 minutes.

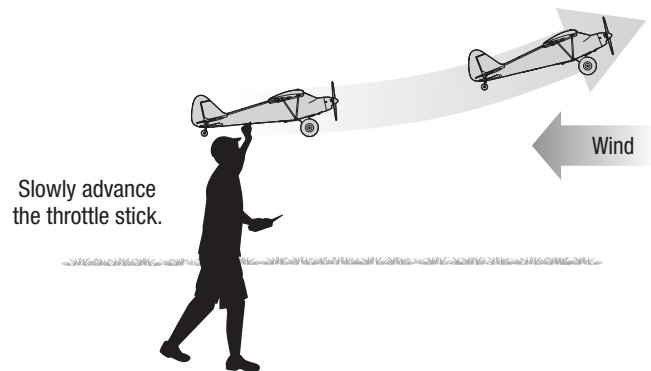
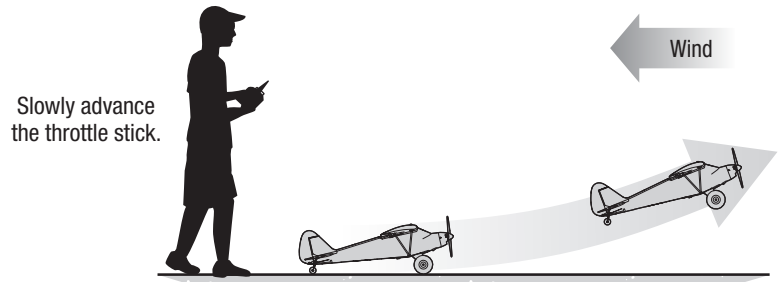
Ground Launch

Once you have established a home position and the aircraft is ready for flight, slowly advance the throttle to start the takeoff roll into the wind. Small rudder inputs may be required for heading correction as the aircraft will begin a slow climb out as the throttle is advanced.

Hand Launch

Once you have established a home position and the aircraft is ready for flight, use the following steps.

1. Grip the aircraft under the fuselage, behind the wing struts.
2. Slowly advance the throttle to 100%.
3. Throw the aircraft slightly nose up and directly into the wind (less than 5–7 mph [8–11 km/h]).



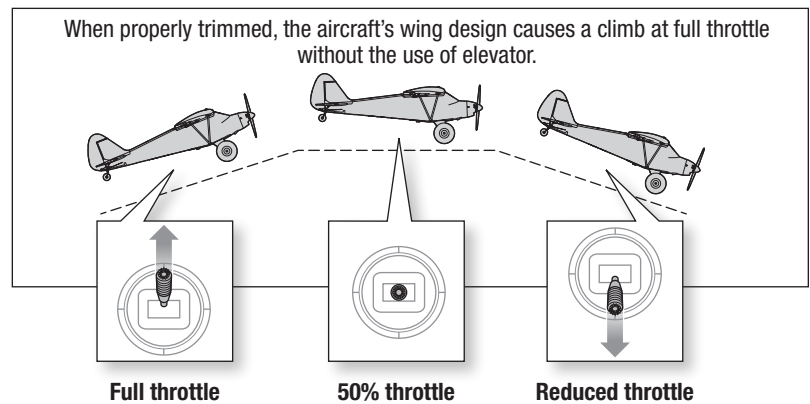
In Flight

Let the aircraft climb at full throttle, into the wind, until the aircraft gets about 300 feet (91 m) above the ground, then decrease the throttle to half (50%).

Make small and gentle stick movements to see how the aircraft responds.

Flying with the nose pointed toward you is one of the hardest things to do when learning to fly. Practice flying in large circles high off the ground.

If you lose orientation of the aircraft, release both sticks and the aircraft will return to level flight. If in Intermediate or Experienced Mode, switch to Beginner Mode and then release both sticks.

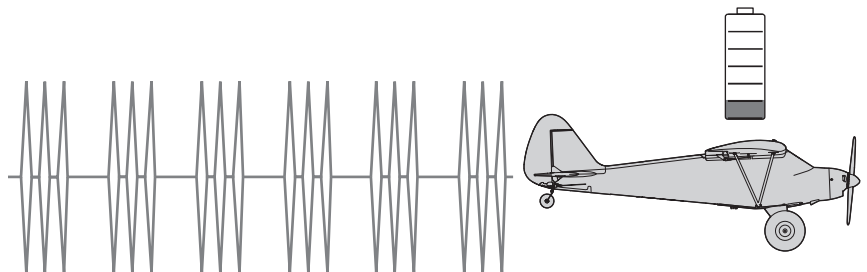


Low Voltage Cutoff (LVC)

LVC is a function built into your ESC to protect the battery from over-discharge. When the battery charge is low, LVC limits power supplied to the motor. The aircraft will begin to slow and you will hear the motor pulse. When the motor power decreases, land the aircraft immediately and recharge the flight battery.

NOTICE: Repeated flying to LVC will damage the battery.

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.



Landing

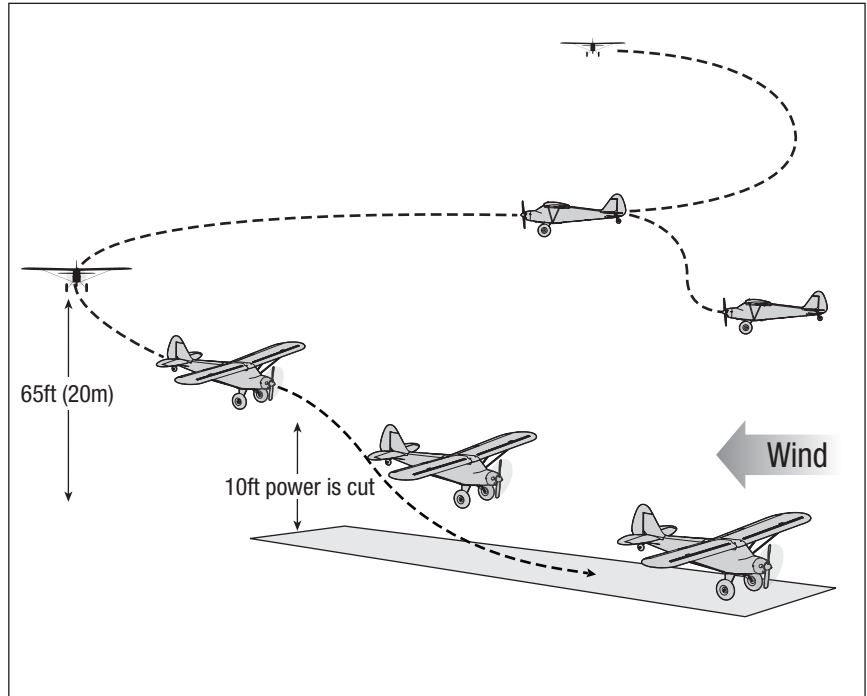
Landing Manually

If it is necessary to land the aircraft manually:

1. Reduce the throttle to around 50% to slow the airspeed.
2. Fly the aircraft downwind past the end of the runway.
3. Turn the aircraft into the wind and line the aircraft up with the runway center line.
4. Decrease the throttle further and begin descending towards the runway, keeping the wings level during approach. Try to have the aircraft at 10ft altitude as it passes over the threshold of the runway.
5. As the aircraft passes over the threshold of the runway decrease the throttle fully.
6. Just as the aircraft is about to touch down, gently pull back on the elevator to raise the nose and flair for a gentle landing.

NOTICE: If a crash is imminent, activate throttle hold or quickly lower the throttle and throttle trim. Failure to do so could result in extra damage to the airframe, as well as damage to the ESC and motor.

IMPORTANT: When finished flying, never keep the aircraft in the sun. Do not store the aircraft in a hot, enclosed area such as a car. Doing so can damage the foam.



Post Flight Checklist

- | | |
|----|--|
| 1. | Activate Throttle Cut |
| 2. | While avoiding the area of the propeller and prop arc, disconnect the flight battery from the aircraft (Required for Safety) |
| 3. | Remove the flight battery from the aircraft |
| 4. | Power off the transmitter |
| 5. | Recharge the flight battery |
| 6. | Inspect the airframe for loose or damaged parts |
| 7. | Repair or replace all damaged parts |
| 8. | Store flight battery apart from aircraft and monitor the battery charge |
| 9. | Make note of flight conditions and flight plan results, planning for future flights |

Installing Optional Flaps

IMPORTANT: The optional flaps for this aircraft require a computer transmitter with at least 7 channels*. The RTF DXS transmitter is not compatible with the optional flaps.

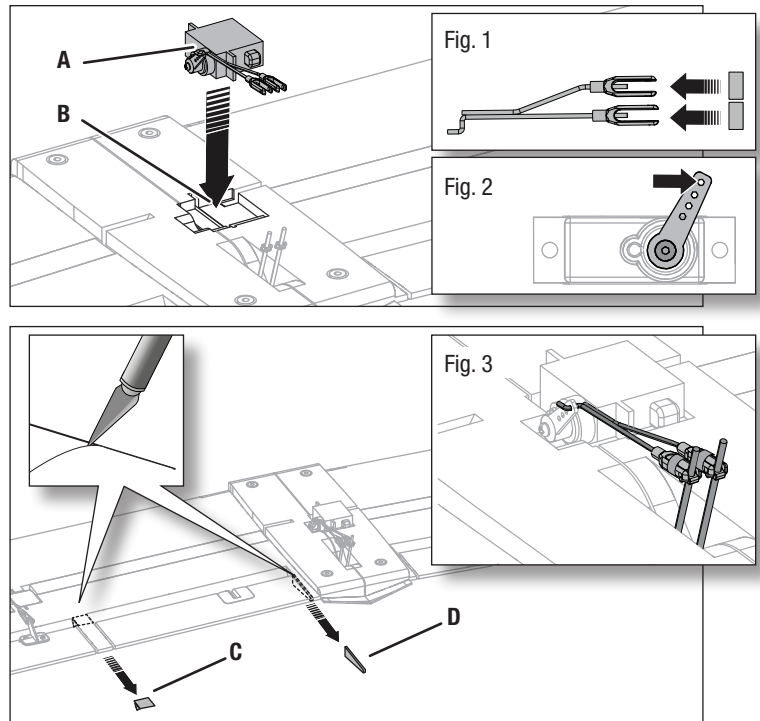
The optional flaps should be installed before installing the wing.

1. Slide a silicone tube on each clevis (Fig. 1).
2. Connect the flap servo (PKZ1090, sold separately) to a servo extension (PKZ5403, sold separately).
3. Connect the servo extension to the AUX2 port of the flight controller.
4. Install the flap servo (**A**) in the pocket (**B**) using hot glue or double-sided tape.
5. Power on the transmitter.
6. In the Channel Input Configuration menu of the Channel Assign section of the System Setup list of your computer radio, assign AUX2 to an available 3-position switch, usually switch D.
7. Move the assigned flap switch to the up position.
8. Install the servo arm on the servo at the angle shown (Fig. 2).
9. Install the flap linkage in the outermost hole of the flap servo arm (Fig. B).
10. Attach the clevises to the flap torque rods as shown (Fig. 3).
11. On both flaps, carefully cut a small amount of foam at the flap hinge (**C**) and wing root (**D**) so the flaps move freely (see illustration).
12. Do a control test of the flaps using your aircraft and transmitter. Make sure both flaps are symmetrical while they are retracted and extended.

See the table below for the required flap throws:

	1/2 or Takeoff	Full
Flap Down	12mm down	25mm down

See the Spektrum RC website (www.spektrumrc.com) for available flap TX download.



The RTF DXS transmitter is not compatible with the optional flaps. The optional flaps for this aircraft require a computer transmitter with at least 7 channels.

PNP Receiver Selection and Installation

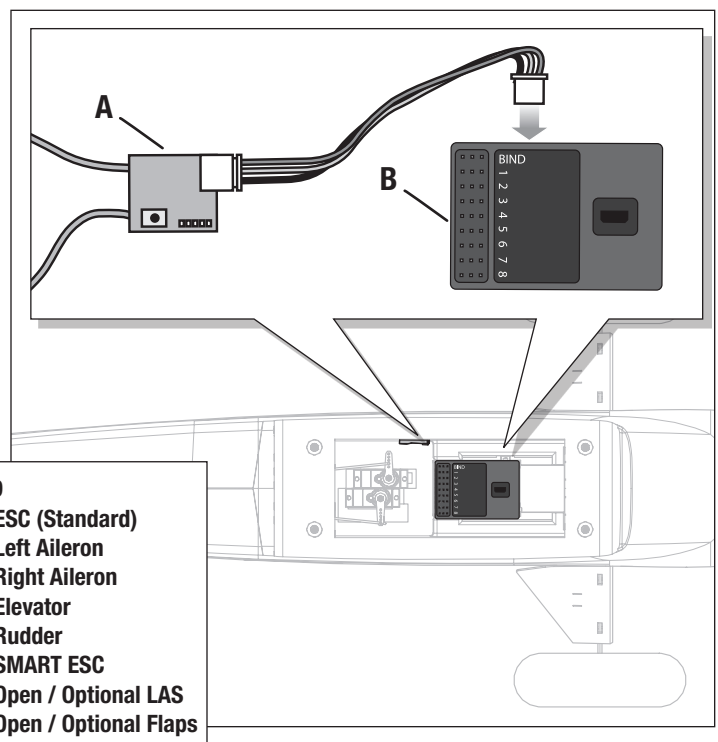
SRLX DSMX Receiver and Flight Controller Installation

Install the Spektrum SRLX DSMX receiver and flight controller combination to experience the Carbon Cub S2 with SMART Technology.

1. Using double-sided servo tape, (not included) mount the SRLX DSMX receiver (**A**) to the interior side panel of the receiver compartment.
2. Connect the SRLX DSMX receiver to the flight controller (**B**).
3. Attach the appropriate control surfaces to their respective ports on the flight controller using the table at the right.
4. Using double-sided servo tape, (not included) attach the flight controller to the platform at the rear of the receiver compartment as shown.

Mount the flight controller in the orientation shown, parallel to the length of the fuselage, with the label facing up and the servo ports facing the rear of the aircraft. The orientation of the flight controller is critical for all AS3X® and SAFE® technology setups.

CAUTION: Incorrect installation of the flight controller could cause a crash.



Flying With the Optional Float Set (HBZ7390)

To fly this aircraft off water, install the optional HobbyZone® Float Set (HBZ7390, sold separately). Float struts, strut brackets and 4 screws are included with the aircraft. Rear bracket screws are included with the floats. Follow the instructions included with the optional float set to install them to the aircraft.

Only install the floats if you are comfortable flying your aircraft and have repeatedly taken off, flown and landed with success. Flying off water poses a higher risk to the aircraft because the electronics can fail if fully immersed in water.

Always ensure the floats are correctly secured to the fuselage prior to taxiing or attempting takeoff.

To take off from water, steer with the rudder to turn into the wind and slowly increase the throttle. Keep the wings level on takeoff. Hold a small amount (1/4–1/3) of up elevator and the aircraft will lift off once flying speed is reached.

To land this aircraft on water, fly to a couple of feet off the surface of the water. Reduce throttle and add up elevator to flare the aircraft.

When taxiing, you must use throttle to move the aircraft forward, but steer with the rudder stick.

Avoid taxiing cross wind if there is a breeze, as this can cause the aircraft to flip over if wind gets under the upwind wing. Taxi 45 degrees into the direction of the wind (not perpendicular to the wind) and use aileron to hold the upwind wing down. The aircraft will naturally try to face into the wind when taxiing.

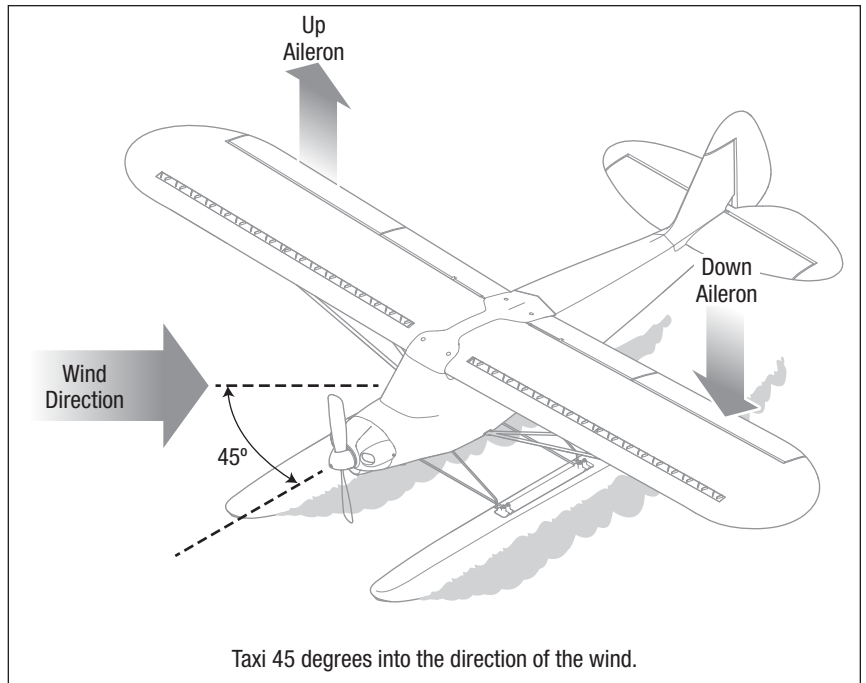
Always fully dry the aircraft after landing on water.



CAUTION: Never go alone to get a downed model in the water.



CAUTION: If at any time water splashes in the fuselage while flying from water, bring the airplane to shore, open the battery hatch and immediately remove any water that may have gotten in the fuselage. Leave the battery hatch open overnight to let the inside dry and to prevent moisture damage to the electronic components. Failure to do so could cause the electronic components to fail, which could result in a crash.



Service and Repairs



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

NOTICE: Crash damage is not covered under warranty.

NOTICE: After any impact or replacement always ensure the flight controller/GPS module is secure in the fuselage. If you replace the flight controller, install the new flight controller in the same location and orientation as the original or damage may result.

Thanks to the Z-Foam™ material in your aircraft, repairs to the foam can be made using virtually any adhesive (hot glue, regular CA [cyanoacrylate adhesive], epoxy, etc).

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

When parts are not repairable, see the *Replacement Parts* list for ordering by item number.

Service of Power Components

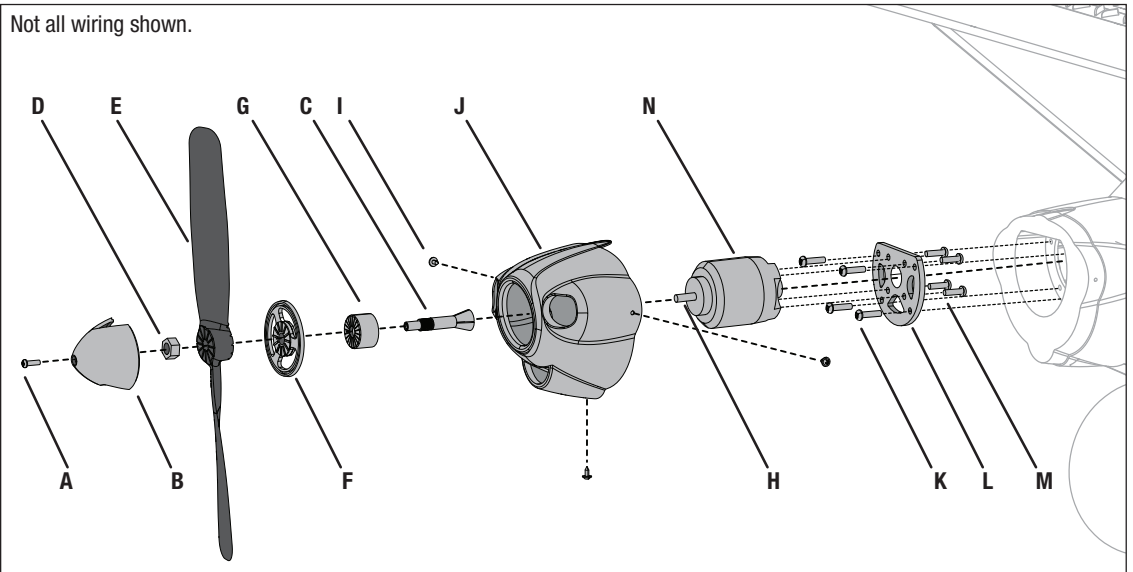


WARNING: Always disconnect the flight battery from the model before removing the propeller.

Disassembly

1. Remove the screw (A) and spinner (B).
2. Use an adjustable wrench to remove the hex nut (D), propeller (E), spinner backplate (F), thrust plate (G) and collet (C) from the motor shaft (H).
3. Remove the 3 screws (I) from the cowl (J). Carefully remove the cowl from the fuselage.
4. Remove the 4 screws (K) holding the motor mount (L) to the fuselage.
5. Disconnect the motor wires from the ESC wires.
6. Remove the 4 screws (M) holding the motor (N) to the motor mount.

Not all wiring shown.



Assemble in reverse order.

Assembly Tips

- Correctly align and connect the motor wire colors with the ESC wires.
- The propeller size numbers (9 x 6) must face forward from the motor for correct propeller operation.
- Ensure the lip of the spinner fits completely into the notch of the spinner backplate for safe operation.

LAS

LAS

Optional Landing Assist Sensor (LAS) Upgrade

The Carbon Cub S2 is upgradable with the addition of the optional LAS module (SPMA3180 not included) this allows the advanced SAFE features to be combined with an Landing Assist Sensor (LAS) for smoother gentler landings.

IMPORTANT: For best results when using LAS, land on grass surfaces or a light colored surface, such as light colored concrete. Black surfaces or water normally do not have enough reflection for the sensor to receive accurate readings.

Installation of the LAS module

1. Remove the wing to gain access to the flight controller compartment.
2. Rotate the aircraft to access the bottom of the fuselage.
3. Press the factory installed plug **(A)** to release it. Then removed it from the LAS pocket. Save the plug for flights without LAS module.
4. Feed the LAS connector through the channel in the base of the LAS pocket.
5. Align the LAS module with the wires facing the back of the aircraft. Place the LAS module into the pocket and press it to secure it into place with a click.
6. Place the aircraft on its landing gear and connect LAS connector to **Channel 7** on the flight controller. For correct polarity of the plug ensure that the orange (not brown) signal wire **(B)** is facing towards the front of the aircraft when plugged into the flight controller.

Landing with LAS

Reduce throttle, keep the wings level and slowly reduce the altitude of the aircraft. When the aircraft's landing approach reaches an altitude of roughly 1m the LAS will level off the aircraft, manage the throttle and then flare the aircraft for touchdown.

IMPORTANT: LAS is functional for all SAFE flight modes except for Experienced Mode. When the flight mode is switched to Experienced mode the LAS is deactivated and the pilot will have zero assistance on landing, a traditional manual landing of the aircraft is necessary.

IMPORTANT: Installation of the LAS module is not auto land. The aircraft must be guided and aligned with the landing strip for landing.

LED Indicator

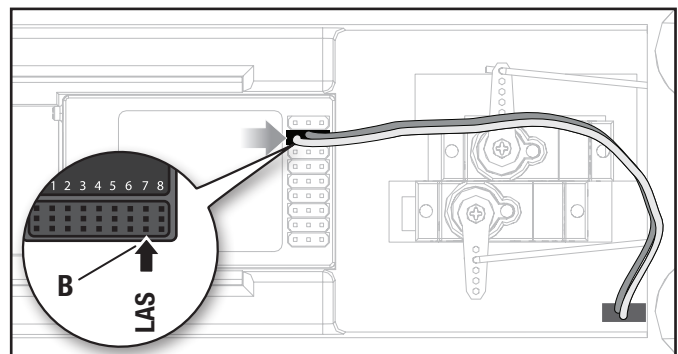
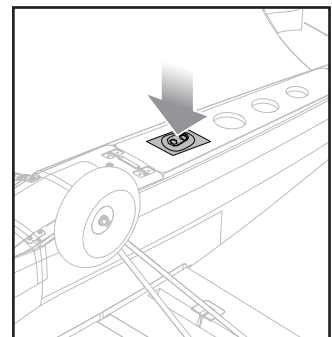
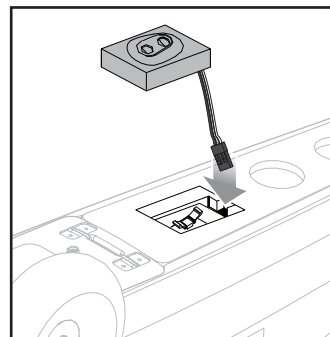
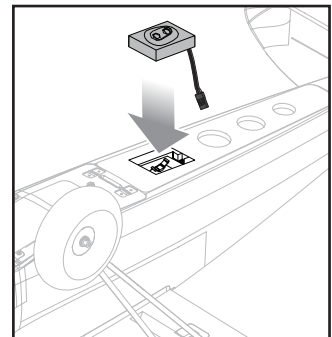
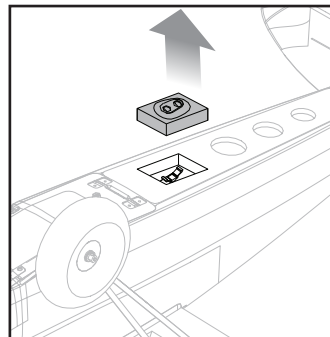
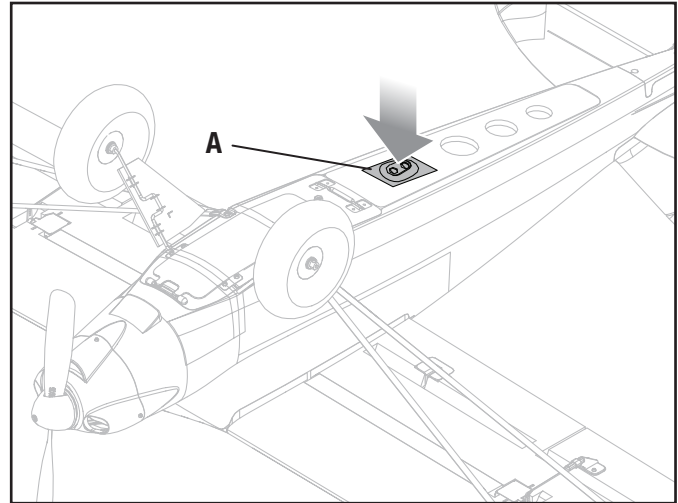
When the LAS module is installed the aircraft's LED indicator for beginner and intermediate flight modes will be followed with a purple flash to indicate that the LAS System is active.

LAS with GPS

With GPS installed LAS will assist the Auto Land mode during landing of the aircraft. When the aircraft's landing approach reaches an altitude of roughly 1m the LAS will level off the aircraft, manage the throttle and then flare the aircraft for touchdown.

TIP: If the speed of aircraft is too fast for landing or above 20% throttle setting, LAS is not effective.

TIP: LAS is not active in Experienced mode.



LAS

LAS

Optional SAFE+ GPS Upgrade

SAFE+[®]

From the Box to the Air Adding the SAFE+ GPS Module

The Carbon Cub S2 flight controller includes SAFE technology out of the box.

The Carbon Cub S2 flight controller is upgradable with the addition of the optional SPMA3173 GPS module (not included) which enables advanced SAFE+ features. With SAFE+, the aircraft can fly a holding pattern on its own, return home and land by itself, and prevent the model from flying too far from the pilot.

IMPORTANT: Read the information in this manual covering the optional SAFE+ GPS upgrades, and learn the use of Holding Pattern and Autoland modes before flying with GPS. SAFE+ features are only available with the SAFE+ module installed and properly calibrated.

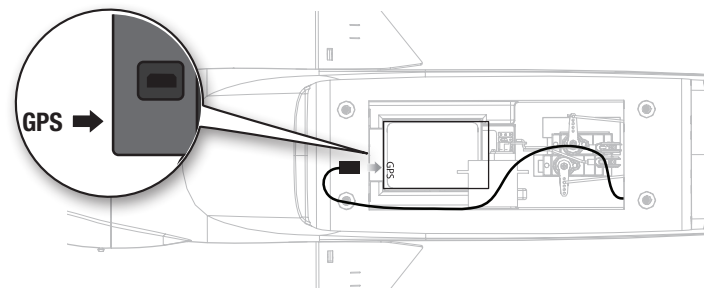
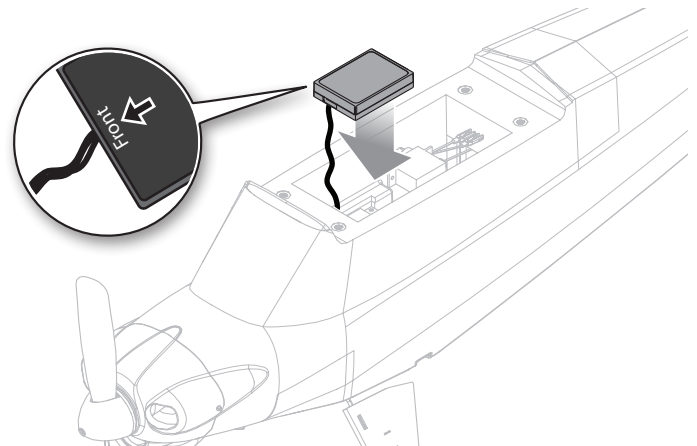
Follow the steps to add SAFE+ functions to your aircraft.

GPS Module Installation

1. Verify the battery is not connected or installed in the aircraft.
2. Open the lid of the GPS pocket and feed the cable from the GPS module through the hole in the base of the GPS pocket.
3. Install the GPS module in the pocket with the label facing up and the arrow pointing forward.
4. Close the pocket door securing the GPS module in to place.
5. Pull the connector across the electronic compartment and connect it to the port labeled GPS on the front side of the flight controller. Prevent the cables from interfering with the servos.

IMPORTANT: Do not kink or cut the GPS antenna cable. Kinks or cuts will degrade performance.

✓	
1.	Charge the flight battery.
2.	Set up your transmitter (BNF only).
3.	Install the GPS module.*
4.	Find a safe and open area.
5.	Power the model on outdoors and perform the compass calibration.
6.	Unplug the battery after the compass calibration is complete.
7.	Power the model on and allow it to acquire a GPS lock. The elevator will move up and down until GPS lock is acquired, and then re-center.
8.	Set the home position (and flying field location for flying field mode). IMPORTANT: Do not fly at this time.
9.	Place the aircraft into Experienced mode (Mode switch position 2) for the control direction test. Place the aircraft on the ground facing away from you.
10.	Perform Control Direction Test.
11.	Place the aircraft into Beginner mode (Mode switch position 0) and cycle the throttle to activate SAFE.
12.	Perform SAFE Control Direction Test.
13.	Plan flight for flying field conditions.
14.	Set a flight timer for 8-10 minutes.
15.	Have fun!



GPS

GPS

Compass Calibration

Compass calibration might be required after installing the GPS module, before flight. The aircraft will automatically enter compass calibration on the first power up after the GPS module is installed, after binding.

IMPORTANT: The aircraft must be outside and needs to acquire a GPS lock in order to begin compass calibration. The aircraft will not enter compass calibration mode until the GPS lock is established.

Perform the compass calibration before the first flight or to correct the heading during auto landing if it varies significantly from the heading set during takeoff.

Before calibration GPS lock must be established for your location:

1. Remove the propeller if it is installed or activate throttle cut.
2. Power ON the transmitter and receiver and set the model on the ground on its wheels. The aircraft's elevator will slowly move up and down until GPS lock is established. When finished the elevator will move up and down once quickly and center.
3. Power OFF the receiver and then the transmitter.

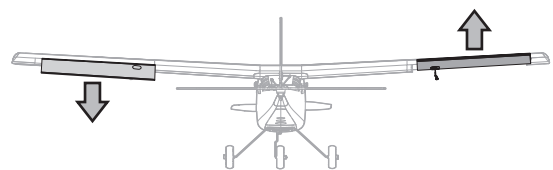
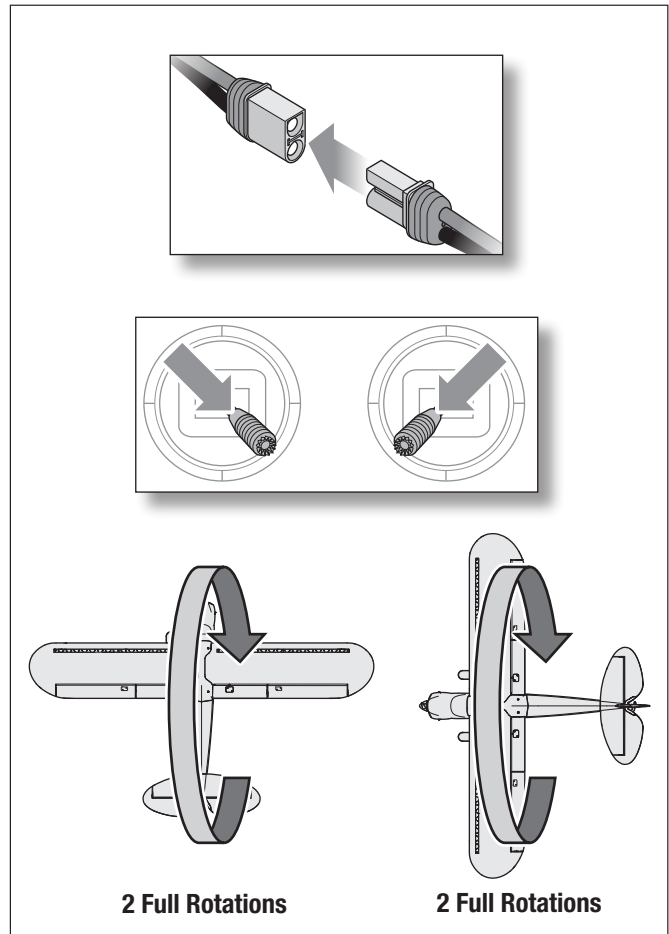
Once initial GPS lock is established Compass Calibration can be performed.

1. With the transmitter trims centered, power ON the transmitter and the aircraft while holding the transmitter sticks as shown. The aircraft will indicate the GPS is searching for satellites by cycling the elevator up and down. Continue to hold the transmitter sticks as shown.
2. After satellites are acquired, the aircraft will signal it has entered compass calibration mode by the following:
 - The ailerons will cycle left and right slowly.
 - The LED will flash red and blue.
3. Once in calibration mode, the throttle is not active and the transmitter sticks can be released. The transmitter must remain powered ON.
4. Flip the aircraft twice nose over tail as shown.
5. Turn the aircraft 90 degrees and roll the aircraft twice, as shown.
6. Turn off the transmitter.
7. Wait 3 seconds and turn OFF the aircraft.

CAUTION: Keep aircraft away from magnetic sources such as cameras, camera mounts, speakers etc. These may interfere with the GPS system and loss of control may result.

Compass Error (LED Flashing Red and Blue)

If at any time you experience no throttle response after power up and the ailerons are deflected full right and the LED is flashing red and blue, the aircraft is indicating a compass error. This may be due to a lost GPS signal or from powering on the aircraft at a new flying location. Disconnect the flight battery and perform the compass calibration procedure.



GPS

GPS

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GPS

Powering ON, GPS Initialization and Establishing Home Location

CAUTION: Keep aircraft away from magnetic sources such as cameras, camera mounts, speakers etc. These may interfere with the GPS system and loss of control may result.

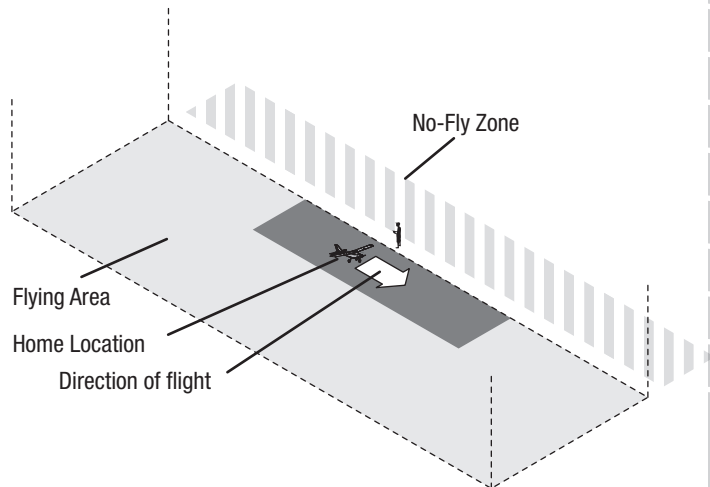
1. Power on the transmitter.
 2. Install a fully charged flight battery, following the instructions in the *Install the Flight Battery* section.
 3. Plug the battery into the aircraft. The elevator will move up and down slowly, indicating the the GPS is searching for satellites. When GPS is acquired, the elevator will move quickly and then center.
 - If you want to change the virtual fence mode, input the transmitter stick commands as described in the *Virtual Fence Mode and GPS* section of the manual. The fence can be changed at any time before the home point is set.
- IMPORTANT:** The throttle is active but only slowly pulses the motor, allowing you to taxi the aircraft. Either taxi to or place the aircraft in the desired home location, pointing the nose of the aircraft into the wind and the desired takeoff direction.
4. Once the aircraft is on the ground at the desired home location, and pointed into the wind, press and hold the HP/AL (bind) button.
 - If either of the circle Virtual Fence modes are active or if virtual fence is off, all control surfaces will wag and the throttle will now operate, indicating the aircraft is ready for flight.
 - If the Airfield Virtual Fence mode is active, only the ailerons will wag left and right. Release the HP/AL (bind) button. After setting the home location you must then indicate where the flying side of the airfield is in relation to the home location. The throttle will be inactive until the flying side direction is set. Set the flying side direction by moving the aileron stick either left or right in the direction of the flying area:
 - If the flying side is off the right wing of the aircraft as it sits in the home location, push the aileron stick right to the stop and release (as shown in the example). The right aileron will move up and down indicating right direction has been set.
 - If the flying side is off the left wing as the aircraft sits in the home location, push the aileron stick left to the stop and release. The left aileron will move up and down indicating left direction has been set.

Once the home location and flying location is set, all surfaces will wag, indicating the aircraft is ready for flight.

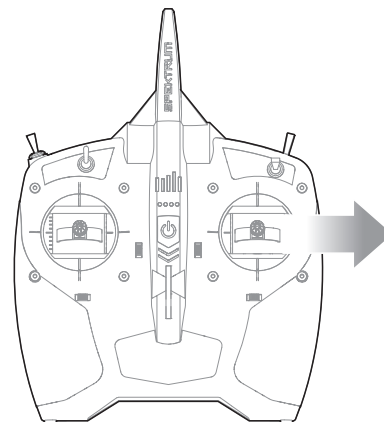
CAUTION: If the aircraft is in Airfield mode, the line that defines the no fly zone will be aligned with the center line of the aircraft, and approximately 10 meters behind you to ensure the fence does not interfere with take-offs or landings. Make sure the aircraft is point directly down the runway in one direction or the other to correctly set the Airfield mode. If the aircraft is not aligned with the runway, the no fly zone will not be set in the correct location.

Airfield Virtual Fence:

Set the home location and aircraft heading



In this example *right aileron* would be applied to set the flying field side.



GPS

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GPS

Flight Modes

Beginner, Intermediate and Experienced modes still operate the same with SAFE+ as they did with SAFE. With SAFE+, The Holding Pattern (HP) and AutoLand (AL) modes may be used as well.

Holding Pattern and AutoLand Trigger

Holding Pattern: Press and release the HP/AL (Bind) button. Press and release the HP/AL (Bind) button again to exit.

AutoLand: Press and hold the HP/AL (Bind) button for 3 seconds. Press and release the HP/AL (Bind) button again to abort AutoLand.

Changing the flight mode will exit Holding Pattern or AutoLand and resume manual control in the selected flight mode.

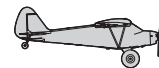
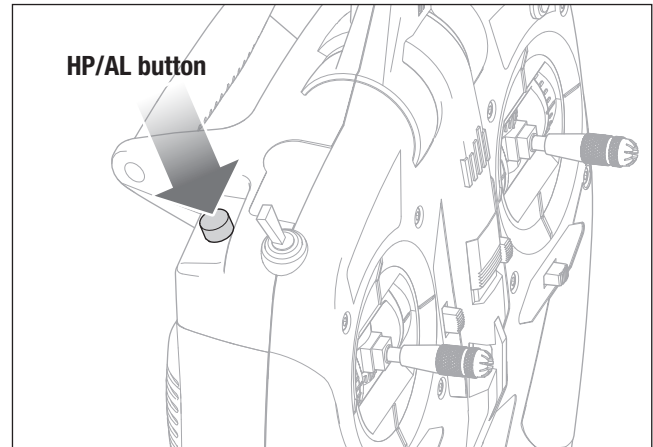
The "I" button is used for these features on BNF models when using the recommended transmitter setup.

IMPORTANT: LAS is functional for all SAFE flight modes except for Expert Mode. When the flight mode is switched to Expert mode the LAS is deactivated and the pilot will have zero assistance on landing, a traditional manual landing of the aircraft is necessary.

Flying the Carbon Cub S2

- Sensor Assisted Flight Envelope (SAFE® Plus) technology is designed as flight assistance, not an autopilot. The pilot should fly the aircraft at all times.
- Start in Beginner mode (Flight Mode switch position 0). As you learn and become more confident, change modes to advance your flying skills.
- Fly your aircraft outside in no greater than winds up to 12 mph (16 km/h).
- Always launch your aircraft directly into the wind if possible.
- When flying in Autoland mode, the aircraft flight path may be adjusted with the transmitter controls, release the controls to let the GPS system resume command.
- The Carbon Cub S (V2) with SAFE+ technology added does not have obstacle avoidance technology, be prepared to guide the aircraft if it is headed toward a tree or other object.

IMPORTANT: A very large flying area is required for GPS assisted aircraft. 400 meters by 400 meters minimum. (1200' x 1200')



GPS

GPS

Virtual Fence Mode and GPS

CAUTION: Keep aircraft away from magnetic sources such as cameras, camera mounts, speakers etc. These may interfere with the GPS system and loss of control may result.

Your aircraft uses GPS to establish a home location and a virtual fence to keep the aircraft within a given distance from the home location. While flying, the aircraft will automatically turn around and fly back towards the home location if it approaches the edge of the virtual fence. Once back inside the fence, the aircraft will “wag” its wings, indicating full control has been given back to the pilot.

The Virtual Fence feature is active in all SAFE flight modes, provided the GPS function is active. There are 4 variations of Virtual Fence mode, which are selectable from the transmitter while the aircraft GPS system initializes.

Virtual Fence Off: turns off the Virtual Fence function.

Circle Virtual Fence, Small (Default): sets the virtual fence in a circle with a radius of approximately 175 meter from the home location.

Circle Virtual Fence, Large: sets the virtual fence in a circle with a radius of approximately 225 meters from the home location.

Airfield Virtual Fence: sets the virtual fence in a rectangle of approximately 400m long x 200m wide and establishes a “no fly zone” approximately 10m (about 30 feet) inside of the center line.

LED Indication

Virtual Fence Off: Slow yellow flash until home point is set. Once home point and direction is set, a solid LED (without LAS installed).

Circle Virtual Fence, Small (Default): 1 Red, 1 yellow flash until home point is set. Once home point and direction set, a solid LED (without LAS installed).

Circle Virtual Fence, Large: 2 Red, 1 yellow flash until home point set. Once home point and direction is set, solid LED (without LAS installed).

Airfield Virtual Fence 3 Red, 1 yellow flash Set home, slow yellow flash. Set direction, right or left aileron depending on direction of flying field. Home point and direction set, solid LED without LAS.

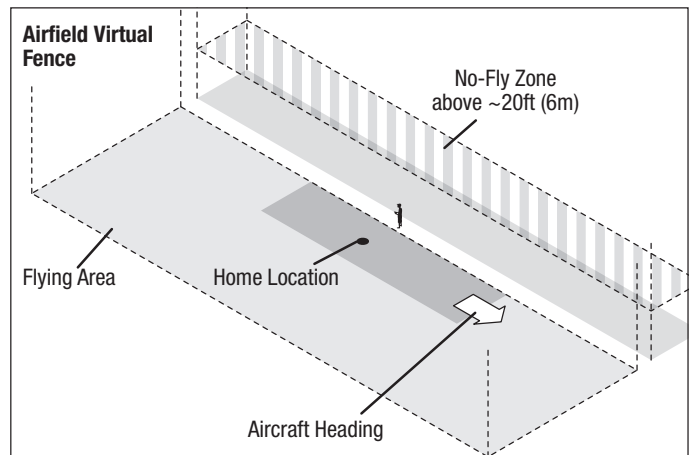
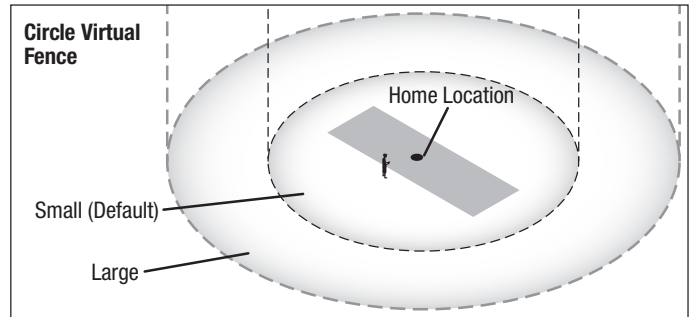
*A purple flash will follow all mode indicators to indicate LAS is installed.

Once a Virtual Fence mode is chosen, the aircraft will remember that mode until another mode is chosen. It is not necessary to select the Virtual Fence mode every time the aircraft is powered on.

WARNING: Never attempt to fly under the no fly zone. The bottom of the no fly zone is elevated to only allow for taxiing of the aircraft in the pit area of the airfield. Due to variances in the barometric sensor, attempting to fly in this area may cause the aircraft to suddenly fly back toward the home location, during which time the pilot will have no control over the aircraft until the aircraft reaches the home location. The pilot will have no way to avoid any obstacles between the no fly zone and the home location.

Virtual Fence Mode	Transmitter Stick Position
Virtual Fence OFF <ul style="list-style-type: none"> • Low throttle • Full right aileron • Full up elevator • LED Indication: Slow Yellow flash until home point is set.* 	
Circle Virtual Fence, Small (Default) <ul style="list-style-type: none"> • Low throttle • Full left aileron • Full up elevator • LED Indication: Slow yellow flash with 1 Red flash.* 	
Circle Virtual Fence, Large <ul style="list-style-type: none"> • Low throttle • Full left aileron • Full down elevator • LED Indication: Slow yellow flash with 2 Red flash* 	
Airfield Virtual Fence <ul style="list-style-type: none"> • Low throttle • Full right aileron • Full down elevator • LED Indication: Slow Yellow flash with 3 red flash* 	

LEDs are located in the center of the front windshield of the aircraft.
*A purple flash will follow all mode indicators to indicate LAS is installed.



GPS

GPS

Holding Pattern (HP) Mode

If at anytime the aircraft seems too far away, press and release the HP/AL (bind) button on the transmitter.

The aircraft will maneuver to an altitude of approximately 120 feet (36m) and begin to fly a circular pattern over the home location.

If Airfield Virtual Fence mode is active, the aircraft will fly to approximately 120 ft (36m) altitude and fly a circular pattern about 100 ft (30m) in front of the home location.

The aircraft flies fully autonomously when HP mode is active. The transmitter sticks have no control.

NOTICE: As a safety precaution, Holding Pattern mode will not function when your aircraft is below an altitude of approximately 20 ft (6m).

To deactivate HP mode and regain control, press and release the HP/AL button again or change flight modes.

IMPORTANT: When the HP feature is activated, the aircraft should immediately respond to the command. If the aircraft does not respond immediately, GPS signal may have been lost. In this case, the aircraft will have to be flown back to the home location manually.

Failsafe (LED: RED SLOW FLASHING)

If at anytime the aircraft loses radio connection, the aircraft will activate Holding Pattern mode until it re-establishes radio connection. If radio connection is not regained, the aircraft will land near the takeoff location as in AutoLand mode.

If radio connection is lost while the aircraft is already in Holding Pattern Mode, the aircraft will circle for approximately 35 seconds and then set up to land as in AutoLand mode.

NOTICE: If a crash is imminent, activate throttle hold or quickly lower the throttle and throttle trim. Failure to do so could result in extra damage to the airframe, as well as damage to the ESC and motor.

Deactivating GPS in Flight

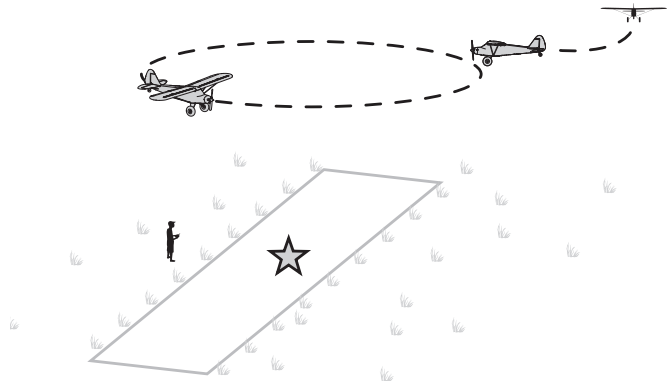
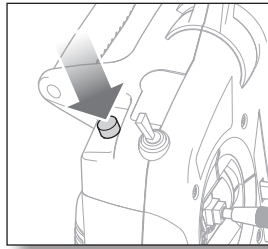
If the GPS system malfunctions while in flight, deactivate it to regain full manual control.

To deactivate the GPS in flight:

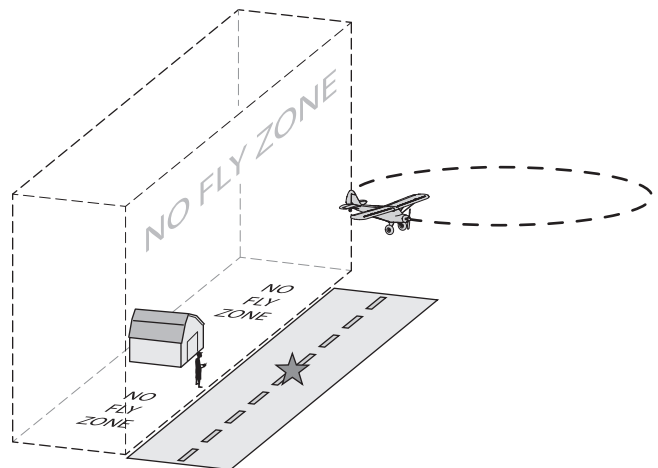
1. Press and hold the HP/AL (bind) button down and fully cycle the flight mode switch 3 times. The rudder will wag to indicate GPS is deactivated.
2. Set the flight mode switch to beginner mode for full SAFE Plus function. The GPS system will remain off until the aircraft is landed and the flight battery is unplugged and reconnected.

NOTICE: If GPS is deactivated, none of the Virtual Fence modes, Hold Position mode or Auto Land mode will function. The pilot will have to manually fly the aircraft back to a safe landing.

Holding Pattern Mode



Holding Pattern Mode, Airfield Virtual Fence Active



GPS

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GPS

GPS

AutoLand Mode

To activate AutoLand mode, press and hold the HP/AL (bind) button for 3 seconds. The aircraft will immediately turn to align itself for an upwind approach and maneuver to an altitude of approximately 65 ft (20m) and 295 ft (90m) downwind from the takeoff point. The aircraft will then turn into the wind and begin the final approach.

NOTICE: As a safety precaution, AutoLand mode will not initiate when the aircraft is below an altitude of approximately 20ft (6m).

IMPORTANT: When the AutoLand feature is activated, the aircraft will immediately respond to the command. If your aircraft does not respond immediately, GPS signal may have been lost. In this case, the aircraft will have to be flown back and landed manually.

The aircraft will land into the wind near your takeoff point and come to a complete stop.

Press and release the HP/AL (bind) button or change flight modes at anytime to abort the AutoLand approach.

IMPORTANT: AutoLand mode does not have the ability to avoid obstacles. Ensure that your flying location is free of obstacles (trees, buildings, etc) before you start flying. Remain alert during the AutoLand process in the event it becomes necessary to assist during or abort the landing approach.

CAUTION: Never attempt to catch a flying aircraft in your hands. Doing so could cause severe personal injury and damage to the aircraft.

Assisting AutoLand Mode

No stick inputs are required when AutoLand is activated. However, stick inputs can be used at anytime during AutoLand to avoid an obstacle, lengthen the landing or smooth the final flare on landing.

Aileron stick:

Use the aileron stick to steer left or right to avoid an obstacle or make slight heading adjustments when on final approach. When aileron is given, the throttle will automatically advance slightly. Release the aileron stick and the system will take over full control.

Throttle stick:

Use the throttle stick to set a throttle max point. When elevator stick input is given, the throttle will go to the max point.

Elevator stick:

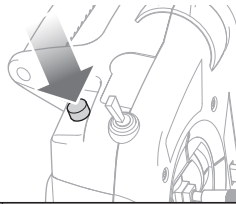
Up elevator: Allows the aircraft to stretch its approach by gaining altitude. When up elevator is applied the throttle increases to the throttle max point that you have established with the throttle stick.

As the aircraft passes over the runway threshold, pull the throttle stick fully back and use up elevator to flare the aircraft to a soft touch down on the runway. This is the best practice for landings and will help prevent accidental propeller strikes.

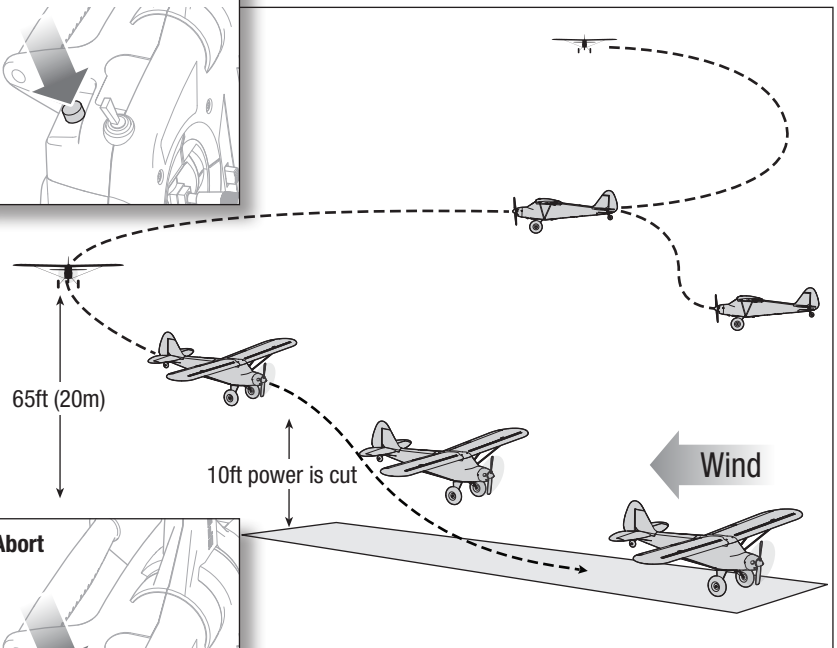
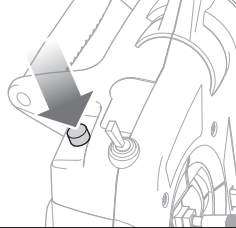
Down elevator: Allows the aircraft to stretch its approach without gaining or losing altitude. When down elevator is applied, the throttle increases to the throttle max point that you have established with the throttle stick without gaining or losing altitude. As soon as the right stick is centered, the system will take over full control again.

Example: When landing into a headwind, set the throttle stick to approximately 3/4 power. When the elevator stick is moved to extend the landing approach, the power will only progress to 3/4 power. Set to a higher throttle point in stronger wind or lower throttle point in low wind.

Hold for 3 sec. to activate
AutoLand mode



Abort



GPS

GPS

Deactivating GPS

Deactivating GPS in the Air

If for any reason you wish to deactivate the GPS system while the aircraft is airborne, such as if the GPS system is not calibrated correctly or is not responding as expected, follow the directions below:

1. Press and hold the HP/AL (bind) button and cycle the flight mode switch fully 3 times. The rudder will wag, indicating the GPS system is deactivated.
2. Maintain control of the aircraft and return to the runway to land manually.

To reactivate the GPS system, power cycle the aircraft.

IMPORTANT: When the GPS system is deactivated, the aircraft's Holding Pattern, AutoLand and Virtual Fence modes will not function.

Deactivating GPS on the Ground



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

The GPS system is activated when the aircraft is powered ON. If for any reason you wish to deactivate the GPS system, such as to perform a control direction test indoors or to simply enjoy the aircraft without GPS features, follow the directions below:

1. Ensure that your transmitter is bound to the aircraft. If necessary, refer to the *Transmitter and Receiver Binding* section.
2. Power on the transmitter.
3. Power on the aircraft. After the aircraft finds the RF signal, the elevator will start to move up and down slowly, indicating the GPS system is searching for satellites.
4. Press and hold the HP/AL (bind) button and cycle the flight mode switch fully 3 times. The elevator will stop moving and the rudder will wag, indicating the GPS system is deactivated.

To reactivate the GPS system, power cycle the aircraft.

IMPORTANT: When the GPS system is deactivated, the aircraft's Holding Pattern, AutoLand and Virtual Fence modes will not function.

IMPORTANT: When GPS is deactivated from transmitter, LED will flash red slowly. No other LED indicators will function.

To have LED indicators, unplug GPS from flight controller.

Troubleshooting Guide (SAFE+ GPS Upgrade)

Problem	Possible Cause	Solution
Aircraft will not respond to throttle but responds to other controls	AutoLand was not deactivated after landing	Deactivate AutoLand by pressing the AL/HP button or changing flight modes and lower throttle
	Home location has not been set	Set the home location
	Direction of Airfield fence has not been set	Use aileron command to set the fence location
Ailerons go up aircraft will not bind to transmitter (during binding)	Transmitter too near aircraft during binding process	Power off transmitter, move transmitter a larger distance from aircraft, disconnect and reconnect flight battery to aircraft and follow binding instructions
	Bind switch or button not held long enough during bind process	Power off transmitter and repeat bind process
	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
	Aircraft was not placed upright	Place aircraft upright after powering up
Ailerons go up and aircraft will not respond to transmitter (after binding)	Less than a 90-second wait between first powering on transmitter and connecting flight battery to aircraft	Leaving transmitter on, disconnect and reconnect flight battery to aircraft
	Aircraft was not upright, level or motionless	Leaving transmitter on, disconnect and reconnect flight battery to aircraft assuring that the aircraft is upright, level and motionless
	Aircraft cannot acquire a GPS signal	Turn off GPS Move to an outdoor location away from metal or concrete and try again
	Aux1 (CH 6) reversed	Reverse Aux1
Aircraft will not enter compass calibration	Aircraft cannot acquire a GPS signal	Move to an outdoor location away from metal or concrete and try again
Motor does not respond after landing	Over Current Protection (OCP) stops the motor when the transmitter throttle is set high and the propeller cannot turn	Fully lower throttle and throttle trim to arm ESC
	AutoLand has not been deactivated	Press and release HP/AL button to deactivate AutoLand feature
Motor pulses but battery is fully charged, not an LVC motor pulse	Lost GPS Signal	Turn off the GPS functions
		Try flying at a different location

AS3X® System Troubleshooting Guide

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

Troubleshooting Guide

Problem	Possible Cause	Solution
Aircraft does not operate	There is no link between the transmitter and receiver	Re-Bind the system following directions in this manual
	No GPS lock (or operating indoor without disabling GPS)	Move to outside and power on aircraft or disable GPS in the aircraft
	Transmitter AA batteries are depleted or installed incorrectly as indicated by a dim or unlit LED on the transmitter or the low battery alarm	Check polarity installation or replace with fresh AA batteries
	No electrical connection	Push connectors together until they are secure
	Flight battery is not charged	Fully charge the battery
	Crash has damaged the radio inside the fuselage	Replace the fuselage or receiver
Aircraft keeps turning in one direction	Rudder or rudder trim is not adjusted correctly	Adjust stick trims, then land and manually adjust aileron and/or rudder linkages so no transmitter trim is required
	Aileron or aileron trim is not adjusted correctly	Adjust stick trims or manually adjust aileron positions
Aircraft does not land on heading set on initial takeoff	Compass is out of calibration	Calibrate the compass using the "Compass Calibration Procedure" located in this manual
GPS Function not operating properly	The compass has been exposed to a magnetic source	Deactivate GPS system while in flight and land the aircraft. Remove any possible magnetic sources such as cameras, camera mounts, speakers ect. Unplug and reconnect flight battery to reactivate GPS system for next flight. Perform compass calibration before flying again.
Aircraft is difficult to control	Wing or tail is damaged	Replace damaged part
	Damaged propeller	Land immediately and replace damaged propeller
	Center of Gravity is behind the recommended location	Shift battery forward, do not fly until correct Center of Gravity location is achieved
Aircraft nose rises steeply at half throttle	Wind is too gusty or strong	Postpone flying until the wind calms down
	Elevator is trimmed 'up' too much	If trim must be adjusted more than 4 clicks when pushing the trim button, adjust push rod length
	Battery is not installed in the correct position	Move forward approximately 1/2"
Aircraft will not climb	Battery is not fully charged	Fully charge battery before flying
	Elevator may be trimmed 'down'	Adjust elevator trim 'up'
	Propeller damaged or installed incorrectly	Land immediately, replace or install propeller correctly
Aircraft difficult to launch in the wind	Launching the aircraft down wind or into a cross wind	Always launch the aircraft directly into the wind
Flight time is too short	Battery is not fully charged	Recharge battery
	Flying at full throttle for the entire flight	Fly at just above half throttle to increase flying time
	Wind speed too fast for safe flight	Fly on a calmer day
	Propeller damaged	Replace propeller
Aircraft vibrates	Propeller, spinner or motor damaged	Tighten or replace parts
Rudder, ailerons or elevator do not move freely	Damaged or blocked push rods or hinges	Repair damage or blockage
Aircraft will not Bind (during binding) to transmitter	Transmitter is too near aircraft during binding process	Move powered transmitter a few feet from aircraft, disconnect and reconnect battery to aircraft
	Aircraft or transmitter is too near a large metal object, wireless source or another transmitter	Move the aircraft and transmitter to another location and attempt binding again
	Bind plug is not installed correctly	Install bind plug and bind aircraft to transmitter
	Flight battery/Transmitter battery charge is too low	Replace/recharge batteries
Aircraft will not connect (after binding) to transmitter	Transmitter is too near aircraft during connecting process	Move powered transmitter a few feet from aircraft, disconnect and reconnect battery to aircraft
	Aircraft or transmitter is too near a large metal object, wireless source or another transmitter	Move the aircraft and transmitter to another location and attempt connecting again
	Bind plug is left installed	Rebind transmitter to aircraft and remove bind plug before cycling power
	Aircraft battery/Transmitter battery charge is too low	Replace/recharge batteries
	Transmitter may have been bound to a different model (using different DSM Protocol)	Bind aircraft to transmitter
After being properly adjusted, aileron and/or rudder are not in neutral position when battery is plugged in	Model was moved during initial power on	Unplug flight battery and reconnect, keeping model immobile for at least 5 seconds
Virtual Fence modes will not change between modes correctly	Dual rates set incorrectly in transmitter setup	The dual rates should not be set lower than 70% for low rate. Set all low rates to 70% or higher.

AMA National Model Aircraft Safety Code

Effective January 1, 2014

A. GENERAL

A model aircraft is a non-human-carrying aircraft capable of sustained flight in the atmosphere. 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 any additional rules specific to the flying site.

1. Model aircraft will not be flown:
 - (a) In a careless or reckless manner.
 - (b) At a location where model aircraft activities are prohibited.
2. Model aircraft pilots will:
 - (a) Yield the right of way to all man carrying aircraft.
 - (b) See and avoid all aircraft and a spotter must be used when appropriate. (AMA Document #540-D.)
 - (c) Not fly higher than approximately 400 feet above ground level within three (3) miles of an airport, without notifying the airport operator.
 - (d) Not interfere with operations and traffic patterns at any airport, heliport or seaplane base except where there is a mixed use agreement.
 - (e) Not exceed a takeoff weight, including fuel, of 55 pounds unless in compliance with the AMA Large Model Aircraft program. (AMA Document 520-A.)
 - (f) Ensure the aircraft is identified with the name and address or AMA number of the owner on the inside or affixed to the outside of the model aircraft. (This does not apply to model aircraft flown indoors).
 - (g) Not operate aircraft with metal-blade propellers or with gaseous boosts except for helicopters operated under the provisions of AMA Document #555.
 - (h) Not operate model aircraft while under the influence of alcohol or while using any drug which could adversely affect the pilot's ability to safely control the model.
 - (i) Not operate model aircraft carrying pyrotechnic devices which explode or burn, or any device which propels a projectile or drops any object that creates a hazard to persons or property.

Exceptions:

 - Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight.
 - Rocket motors (using solid propellant) up to a G-series size may be used provided they remain attached to the model during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code but may not be launched from model aircraft.
 - Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined within the Team AMA Program Document (AMA Document #718).
 - (j) Not operate a turbine-powered aircraft, unless in compliance with the AMA turbine regulations. (AMA Document #510-A).
3. Model aircraft will not be flown in AMA sanctioned events, air shows or model demonstrations unless:
 - (a) The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipated prior to the specific event.
 - (b) An inexperienced pilot is assisted by an experienced pilot.
4. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.

B. RADIO CONTROL

1. All pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others.
2. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.
3. At all flying sites a safety line(s) must be established in front of which all flying takes place (AMA Document #706.)
 - (a) Only personnel associated with flying the model aircraft are allowed at or in front of the safety line.
 - (b) At air shows or demonstrations, a straight safety line must be established.
 - (c) An area away from the safety line must be maintained for spectators.
 - (d) Intentional flying behind the safety line is prohibited.
4. RC model aircraft must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
5. RC model aircraft will not operate within three (3) miles of any pre-existing flying site without a frequency-management agreement (AMA Documents #922 and #923.)
6. With the exception of events flown under official AMA Competition Regulations, excluding takeoff and landing, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and the pilot's helper(s) located at the flight line.
7. Under no circumstances may a pilot or other person touch a model aircraft in flight while it is still under power, except to divert it from striking an individual.
8. RC night flying requires a lighting system providing the pilot with a clear view of the model's attitude and orientation at all times. Hand-held illumination systems are inadequate for night flying operations.
9. The pilot of a RC model aircraft shall:
 - (a) Maintain control during the entire flight, maintaining visual contact without enhancement other than by corrective lenses prescribed for the pilot.
 - (b) Fly using the assistance of a camera or First-Person View (FPV) only in accordance with the procedures outlined in AMA Document #550.
 - (c) Fly using the assistance of autopilot or stabilization system only in accordance with the procedures outlined in AMA Document #560.

Please see your local or regional modeling association's guidelines for proper, safe operation of your model aircraft.

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, 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.

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	

FCC Information

Contains FCC ID: BRWKATY1T

Contains FCC ID: BRWSRLRR2

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.

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

HBZ Carbon Cub S2 | HBZ32000

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

Contains IC: 6157A-KATY1T

Contains IC: 6157A-SRLRR2

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Compliance Information for the European Union

 **Carbon Cub S2 RTF (HBZ32000)**
EU Compliance Statement: Horizon Hobby, LLC hereby declares

that this product is in compliance with the essential requirements

and other relevant provisions of the RED, EMC, and LVD Directives.

A copy of the EU Declaration of Conformity is available online at: <http://www.horizonhobby.com/content/support-render-compliance>.



Instructions for disposal of WEEE by users in the European Union

This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collections point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal

Carbon Cub S2 BNF Basic (HBZ32500)

EU Compliance Statement: Horizon Hobby, LLC hereby declares that this product is in compliance with the essential requirements and other relevant provisions of the RED Directive.

will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.



Replacement Parts • Ersatzteile • Pièces de rechange • Pezzi di ricambio

Part # Nummer Numéro Codice	Description	Beschreibung	Description	Descrizione
	30A SMART ESC	30A SMART Geschwindigkeitsregler	Régulateur de vitesse électronique SMART 30A	Regolatore elettronico SMART 30A
	SV80 Short Lead 3-Wire Servo	SV80 3-draht Servo (kurzes Kabel)	Servo à 3 fils, délai court, SV80	Servocomando SV80 con cavo corto a 3 fili
	SV80 Long Lead 3-Wire Servo	SV80 3-draht Servo (langes Kabel)	Servo à 3 fils, délai long, SV80	Servocomando SV80 con cavo lungo a 3 fili
	DSV130 3Wire Digital Servo Met Gear	DSV130 3-draht digitaler Servo Metallgetriebe	DSV130, Servo numérique à 3 fils et à engrenages métalliques	Servocomando digitale DSV130 a 3 fili con ingranaggi in metallo
	480 BL Outrunner Motor	480 BL Außenläufer-Motor	Moteur à cage tournante 480 BL	Motore 480 BL Outrunner
EFL310017	LAS Cover	Landing Assist Sensor Fachabdeckel	Couvercle du capteur d'aide à l'atterrissage	Copertura di sensore per atterraggio assistito
HBZ3220	Fuselage	Rumpf	Fuselage	Fusoliera
HBZ3221	Main Wing	Hauptflügel	Aile principale	Ala principale
HBZ3222	Tail Set	Leitwerksatz	Empennage	Set coda
HBZ3223	Landing Gear Set	Fahrwerksatz	Ensemble de train d'atterrissage	Set carrello atterraggio
HBZ3224	Cowl	Motorhaube	Capot	Cappottatura
HBZ3225	Spinner 40mm	Spinner 40 mm	Cône 40 mm	Ogiva 40 mm
HBZ3226	Wing Struts	Flügelstreben	Haubans de l'aile	Montanti ala
HBZ3227	Motor Mount w/ Screws 3	Motorhalterung mit Schrauben 3	Support moteur sans vis 3	Supporto motore con 3 viti
HBZ3228	Battery Hatch	Akku-Abdeckung	Trappe de la batterie	Sportello batteria
HBZ3229	Decal Sheet	Decalsatz	Feuillet d'autocollants	Set decalcomanie
HBZ3230	Vortex Generators	Wirbelgeneratoren	Générateurs de tourbillons	Generatori di vortice
PKZ1019	Propeller 9 x 6	Propeller, 9 x 6	Hélice, 9 x 6	Elica 9 x 6
PKZ6621	Wing Tube	Steckungsrohr	Tubes d'ailes	Tubo ala
PKZ6803	Prop Adapter	Propeller-Adapter	Adaptateur d'hélice	Adattatore elica
PKZ6805	Pushrod Set	Gestängesatz	Ensemble de barres de liaison	Set aste di comando
SPMA3173	GPS Module	GPS-Modul	Module GPS	Modulo GPS
SPMX22003S30	11.1V 2200mAh 3S 30C Smart LiPo Battery: IC3	2200mAh 3S 30C LiPo 11,1V	Batterie Li-Po 2200 mAh 3S 11,1 V 30C	2200 mAh 3S 11,1V 30C Li-Po

Optional Parts • Optionale Bauteile • Pièces optionnelles • Pezzi opzionali

Part # Nummer Numéro Codice	Description	Beschreibung	Description	Descrizione
DYN1400	LiPo Charge Protection Bag, Small	LiPo Ladeschutztasche, klein	Sac de protection du chargeur de batterie Li-Po, petit	Borsa di protezione per ricarica batterie Li-Po, piccola
DYNG2040	Prophet Sport4X50W AC/DC Charger	Prophet Sport4X50W AC/DC Ladegerät	Chargeur de batterie CA/CC 4 X 50 W Prophet Sport	Prophet Sport 4X50W Caricabatteria AC/DC
EFLA111	LiPo Cell Voltage Checker	LiPo-Zelle Spannungsprüfer	Contrôleur de tension pour batterie Li-Po	Tester per batterie Li-Po
EFLA250	Park Flyer Tool Asst, 5 pc	Park Flyer Tool-Asst., 5-teilig	Assortiment d'outils Park Flyer 5 pièces	Assortimento strumenti Park Flyer, 5 pz
EFLAEC302	EC3 Battery Connector (2)	EC3 Akku-Anschluss (2)	Connecteur de la batterie EC3 (2)	Connettore batteria EC3 (2)
EFLAEC303	EC3 Device & Battery Connector	EC3 Gerät- und Akku-Anschluss	Connecteur de la batterie et dispositif EC3	Dispositivo EC3 e connettore batteria
EFLB18003S30	1800mAh 3S 11.1V 30C LiPo 13AWG EC3	1800mAh 3S 11,1V 30C LiPo 13AWG EC3	Batterie Li-Po 1800 mAh 3S 11,1 V 30C, 13AWG EC3	EC3 1800mAh 3S 11,1V 30C Li-Po 13AWG
EFLB22003S30	2200mAh 3S 11.1V 30C LiPo 13AWG EC3	2200mAh 3S 11,1V 30C LiPo 13AWG EC3	Batterie Li-Po 2200 mAh 3S 11,1 V 30C, 13AWG EC3	EC3 2200mAh 3S 11,1V 30C Li-Po 13AWG
HBZ7390	Float Set	Schwimmersatz	Ensemble de flotteurs	Set galleggianti
PKZ1090	DSV130 3Wire Digital Servo Met Gear	DSV130 3-draht digitaler Servo Metallgetriebe	DSV130, Servo numérique à 3 fils et à engrenages métalliques	Servocomando digitale DSV130 a 3 fili con ingranaggi in metallo
PKZ5403	Aileron Sx Extension	Querruder Sx Verlängerung	Rallonge Sx de l'aileron	Estensione alettone sx
SPMR6650	DX6e 6CH Transmitter Only	Nur DX6e 6CH-Sender	Émetteur DX6e uniquement 6CH	Solo trasmittente DX6e 6CH
SPMR6750	DX6 Transmitter Only MD2	Nur MD2 DX6-Sender	Émetteur DX6 uniquement MD2	Solo trasmittente DX6 MD2
SPMR8000	DX8 Transmitter Only	Nur DX8-Sender	Émetteur DX8 uniquement	Solo trasmittente DX8
SPMR9910	DX9 Transmitter Only	Nur DX9-Sender	Émetteur DX9 uniquement	Solo trasmittente DX9
SPM18100	DX18 Transmitter Only	Nur DX18-Sender	Émetteur DX18 uniquement	Solo trasmittente DX18
SPM20000	DX20 Transmitter Only	Nur DX20-Sender	Émetteur DX20 uniquement	Solo trasmittente DX20



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US 9,056,667. US 9,753,457. US 10,078,329. US 8,672,726. US 9,930,567. US 10,419,970. CN201721563463.4. Other patents pending.

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