

# Pulse XT 25e ARF



**E-flite**<sup>®</sup>  
ADVANCING ELECTRIC FLIGHT

Assembly Manual

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## Introduction

E-flite's Pulse™ XT 25e is a 25-size electric version of the classic Hangar 9® Pulse 40 XT. This is a great flying sport ARF that's perfect for intermediate pilots and sport fliers who want to fly an airplane that's more aerobatic than high-wing airplanes. Based on the original Mike McConville design, the Pulse XT 25e offers excellent features such as its lightweight laser-cut balsa construction and bolt-together wing and tail assembly.

The Pulse XT 25e is easy to maintain and quick to assemble. The wing bolts in place, making it easy to transport. The aluminum landing gear comes already painted along with factory-painted fiberglass cowling and wheel pants. All control surfaces are pre-hinged, control horns are installed, and wheels and axles are mounted on the landing gear.

Depending on your performance desires, you can select from an E-flite Power 25 or Power 32 motor. The Pulse can also be flown from the water by adding the optional E-flite fiberglass .25 size floats (EFLA500) and utilizing the included aft float mount.

## Specifications

Wingspan	52 in (1335mm)
Length	44 in (1115mm)
Wing Area	495 sq in (31.9 sq dm)
Weight (with battery)	3.7 - 4.2 lb (1.7 - 1.9 kg)
Radio	4-channel with 4 mini servos
Power System	Power 25 Brushless Outrunner with 3S LiPo or Power 32 Brushless Outrunner with 4S LiPo

## Using This Manual

This manual is divided into sections to make assembly of the model easier to understand and to provide breaks between each major section.

In addition, check boxes have been placed next to each step to keep track of each step completed. Steps with a single circle (O) are performed once, while steps with two circles (O O) indicate that the step will require repeating, such as for a right or left wing panel, two servos, etc.

We recommend reading through the entire manual before beginning assembly in order to familiarize yourself with the model and its assembly.

## Preparation

Your Pulse XT 25e arrives prefinished and it is recommended that you take time to properly prepare your work area. Clean off your work surface and lay down a foam pad or blanket to protect the finish of your model.

This is also a good time to check through the list of required parts and tools and obtain any items not on hand that you may need to complete the model.

## Inspection

Before beginning assembly of your Pulse XT 25e, inspect the kit contents and take an inventory of the parts. If any parts are missing, defective or damaged, contact Horizon Hobby, Inc. for assistance.

Direct your email to: [productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com) or call 877-504-0233 toll-free to speak to a service technician.

## Kit Contents



- |                          |   |
|--------------------------|---|
| 1. Left wing panel       | 7. Cowling                              |
| 2. Right wing panel      | 8. Spinner                              |
| 3. Fuselage              | 9. Forward and aft (float) landing gear |
| 4. Horizontal stabilizer | 10. Wheel pants                         |
| 5. Vertical stabilizer   | 11. Pushrod set                         |
| 6. Canopy                |   |

### Not pictured:

- Accessory bag (cooling scoop, control hardware, hook and loop material)
- Wing parts bag (dihedral joiners, wing dowels and aileron pushrods)
- Hardware bag (bolts, screws, washers, spacers)
- Float mount spacers (4)

## Product Registration

Register your product online at: [www.e-fliterc.com/register/](http://www.e-fliterc.com/register/)

## Required Equipment

### **Radio**

You will need a minimum of a 4-channel radio for this model. A complete radio system can be purchased or, if you have a suitable transmitter, just the airborne components will be required.

### **Complete System**

Spektrum DX6i 2.4GHz DSM2 radio system	SPM6600
(4) JR SPORT™ MN48 mini servos	JSP20040
(2) JR SPORT 6" servo extension leads	JSP98110
(2) JR SPORT 3" servo extension leads	JSP98100
-or (1) Y-harness (JSP98020) if not using the dual aileron function	

### **Airborne Components**

Spektrum AR6200 DSM2 2.4GHz receiver	SPMAR6200
(4) JR SPORT MN48 mini servos	JSP20040
(2) JR SPORT 6" servo extension leads	JSP98110
(2) JR SPORT 3" servo extension leads	JSP98100
-or (1) y-harness (JSP98020) if not using the dual aileron function	

### **Motor**

The Pulse XT 25e is designed to accept either the E-flite Power 25 or Power 32 Brushless Outrunner motors and comes complete with the hardware for either installation.

### **Sport Motor Setup**

E-flite Power 25 brushless outrunner motor	EFLM4025A
E-flite 40-Amp Pro Brushless ESC	EFLA1040
E-flite 3200mAh 3S LiPo battery pack	EFLB32003S
APC 12 x 8E propeller	APC12080E

### **High Power Motor Setup**

E-flite Power 32 brushless outrunner motor	EFLM4032A
E-flite 60-Amp Pro Brushless ESC	EFLA1060
E-flite 3200mAh 4s LiPo battery pack	EFLB32004S
APC 13 x 6.5E propeller	APC13065E

## Required Tools and Adhesives

E-flite parkflyer tool assortment	1/16 (1.5mm) in drill bit
E-flite 1/4" nut driver	5/64 in (2mm) drill bit
7/64" balldriver	Dremel rotary tool
12 minute epoxy	High speed cutoff wheel
Thin CA (cyanoacrylate)	High speed rotary cutter
Canopy glue	Low-tack tape
Pin drill	Clear tape
Tapered reamer	Felt-tip pen
3/32" ball driver	Tongue depressors
#0 Philips screwdriver	Mixing sticks
#1 Philips screwdriver	Dental floss
Threadlock	

## For Float installation

11/64 in (4.5mm) drill bit
Flat file
Drill
Ruler
1.5mm Allen wrench (included with EFLA500)

## Optional Accessories

E-flite 25-size Float Set	EFLA500
E-flite 1 - 5 cell LiPo charger with balancer	EFLC505
Power Meter	EFLA110
LiPo Charge Safe Charging Bag	KSJ1821
JR MatchMaker™	JRPA915
36" flex cable (required for float installation)	SUL508

## Landing Gear Assembly and Installation

### Required parts:

Fuselage  
Main landing gear (wheels installed)  
Wheel pants  
(2) 6-32 x 1/2" socket head bolts  
(2) #6 steel washers  
(4) #2 x 3/8" sheet metal screws

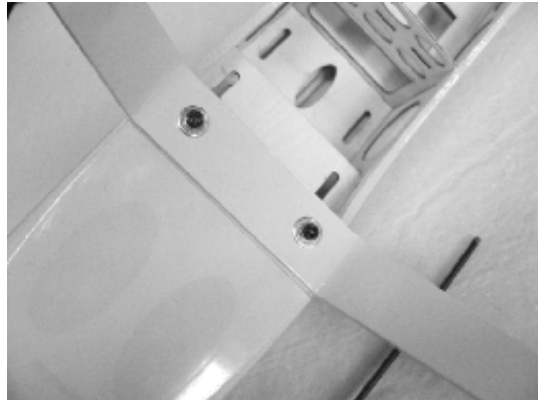
### Required tools and adhesives:

7/64" balldriver	Thin CA
Dremel rotary tool w/ cutoff wheel	#0 Philips screwdriver
1/16 in (1.5mm) drill bit	Threadlock
Pin drill	Felt-tip pen

0 0 1. The axles as supplied are suitable for the optional float kit installation (EFLA500) and require trimming for use with wheel pants. Cut off the exposed portion of the axle leaving approximately 1/4" protruding from the wheel collar. Approximately 1" total axle length is the longest that will fit within the wheel pant. A cutoff wheel in a rotary tool works well for this. Do this for both main axles.



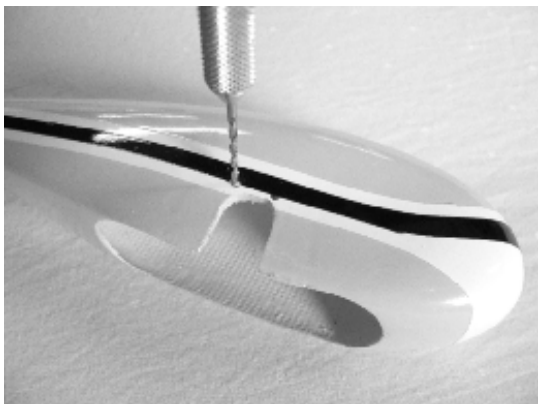
0 2. Use a 7/64" balldriver to install the landing gear on the fuselage with two 6-32" x 1/2" socket head bolts and #6 steel washers. The landing gear has a slight sweep and it should be installed on the model angled forward. Threadlock may be used to prevent the bolts from loosening in flight.



0 0 3. Locate the wheel pant on the landing gear and mark the hole locations with a felt-tip pen. The trim lines on the wheel pant and fuselage can be used to align the parts to each other. For another method see the E-tip on page 6.



○ ○ 4. Using a 1/16 in (1.5mm) drill bit in a pin drill, drill two holes where marked on the wheel pant. Apply a drop of thin CA in each hole to strengthen the wood.



○ ○ 5. Using a #0 Philips screwdriver, install the wheel pant on the landing gear with two #2 x 1/2" sheet metal screws.

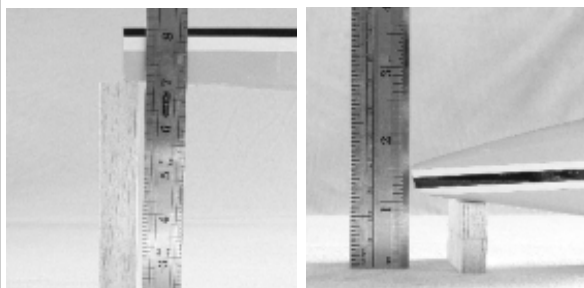


○ 6. Now install the opposite wheel pant following steps 3 - 5.

## ***E-tips***

An accurate method of aligning the wheel pants to the fuselage is to level the fuselage with a block under the rear end, then support the wheel pant with another block while marking the location holes for the attachment screws with a felt-tip marker.

Dimensions of 6-7/8" (175mm) under the rearmost point of the fuselage, and 1-1/2" (38mm) to the upper aft corner of the wheel pant work well.



## **Tail Installation**

### Required Parts

Fuselage  
Vertical stabilizer  
Horizontal stabilizer  
(2) 4-40 x 1/4" locknuts  
(2) #4 steel washers

### Required Tools

1/4" nut driver or wrench

○ 1. Place the horizontal stabilizer on the aft fuselage. Its leading edge needs to locate under the tab on the rear turtledeck former as shown.



○ 2. Slide the vertical stabilizer into place. It will be necessary to deflect the rudder to the right in order for the rudder horn to clear the elevator. The 4-40 rods will pass through the horizontal stabilizer and the fuselage. The forward end of the vertical stabilizer assembly will slide over the turtledeck tab, and the fin post will slide between the aft fuselage sides.



○ 3. Install the two washers and retaining nuts with a 1/4" nut driver or wrench. Tighten them enough that the tail assembly is seated fully and is not loose.



## Fuselage Servo Installation

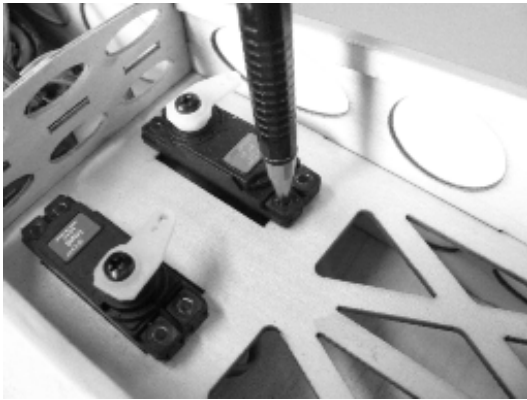
### Required Items

(2) Servos and hardware  
(2) 23 5/8" rudder and elevator pushrods  
(2) nylon clevises and silicone keepers  
(2) pushrod keepers  
Fuselage  
Radio system (Tx, Rx, battery)  
JR MatchMaker (optional)

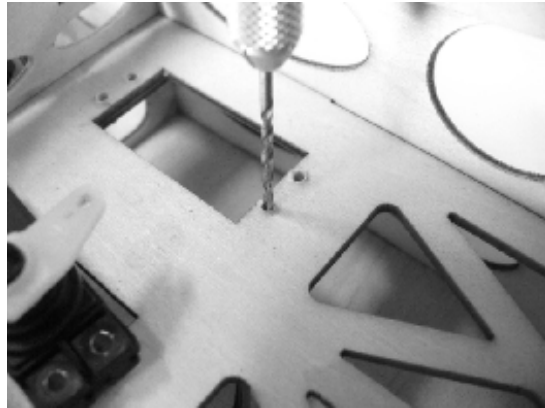
### Required Tools

1/16 in (1.5mm) drill bit	#1 Philips screwdriver
Pin drill	Low-tack tape
5/64 in (2mm) drill bit	Tongue depressors/popsicle sticks
#0 Philips screwdriver	Clothespins
Thin CA	Felt-tip pen
Sidcutters	

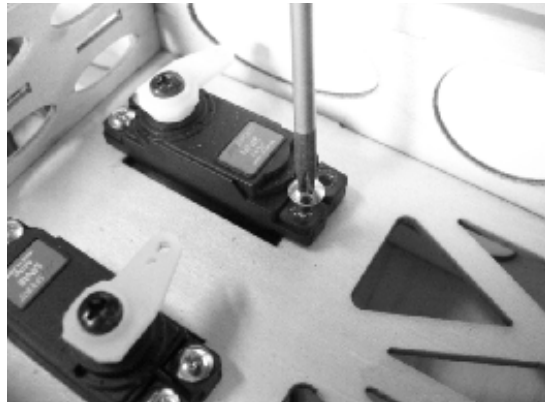
0 0 1. Prepare the fuselage servos by installing the rubber grommets and brass bushings in the mounting lugs. Place the servos in the fuselage and mark the screw hole locations using a felt-tip pen.



0 0 2. Using a 1/16 in (1.5mm) drill bit in a pin drill, drill the four mounting holes for the rudder and elevator servos. Apply a small drop of thin CA to each hole after drilling to strengthen the wood.

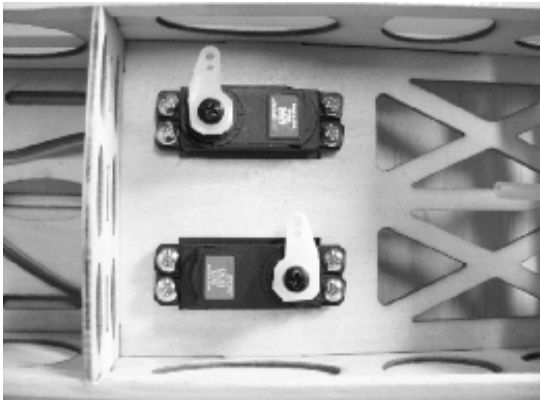


0 0 3. Using a #0 Philips screwdriver, and the screws provided with the servos, install the rudder and elevator servos in the fuselage mounting tray as shown. In this view, the front of the fuselage is to the left.

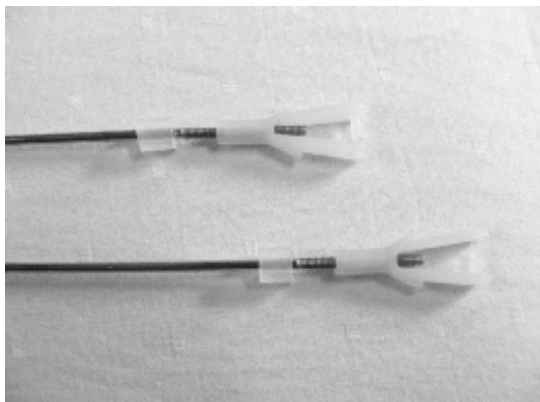




OO 4. Remove the servo arm using a #1 philips screwdriver. Using sidecutters, trim three of the arms from a standard four arm servo horn, leaving one long arm. Drill a 5/64 in (2mm) hole in the outermost hole using a pin drill. Center the servo using a JR MatchMaker or your radio system, and install the arm as shown using a #1 Philips screwdriver.



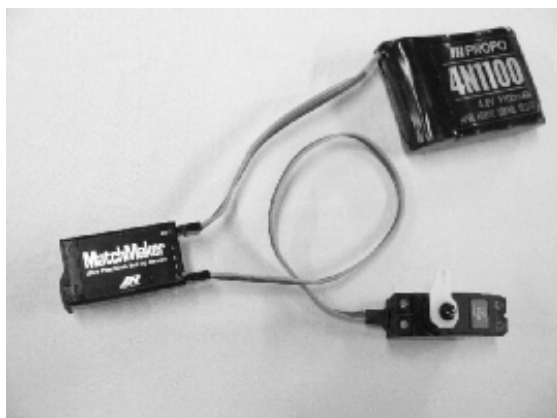
OO 5. Install the clevises and silicone keepers on the pushrods as shown, then install the pushrods in the fuselage from their openings in the rear fuselage sides.



## *tips*

JR's MatchMaker is a great tool for setting up a model because it allows you to center and cycle servos without the need for a transmitter and receiver.

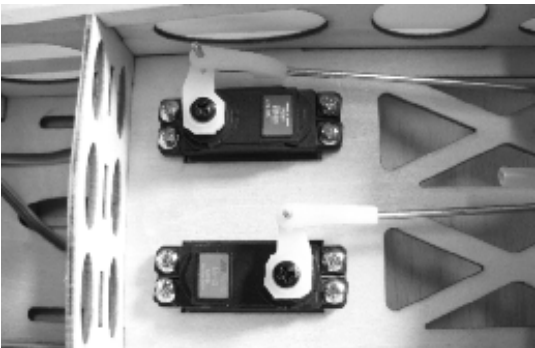
It will accurately center two servos simultaneously, and also cycle them at various speeds, allowing you to evaluate end points and control surface travels right on the workbench.



0 0 6. Attach the clevises to the control horn on the elevator at the third hole from the mounting surface, and on the rudder at the second hole from the mounting surface. Do not install the silicone keepers at this time. We will do that later in construction on Page 27.



0 0 7. With the control surfaces and servos in their neutral positions, mark the location of the pushrod at the servo arm hole using a felt-tip pen. Place a 90-degree bend (towards the bottom of the fuselage) in each of the pushrods in this location. Install the nylon keepers on the pushrods at the servo arms. Trim the remaining wire using sidecutters.

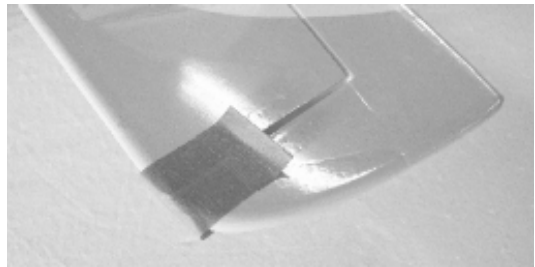
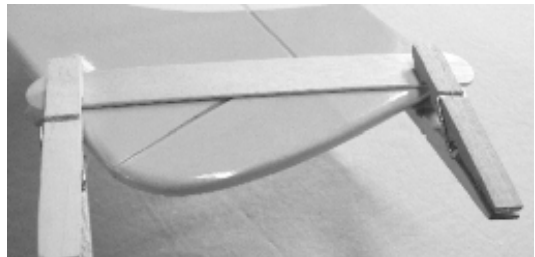


0 8. Repeat steps 1 - 7 to install the second servo and pushrod. Note that step 6 dictates which hole to hook the clevis to for both the rudder and elevator.

## **E-tips**

Here are a couple of methods that work well to center the control surfaces for setup.

One technique is to use a pair of tongue depressors and clothespins. Another is to use low-tack tape. Fold a tab in the end of the tape for easy removal

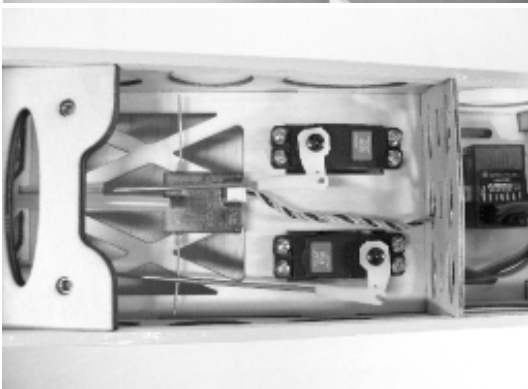
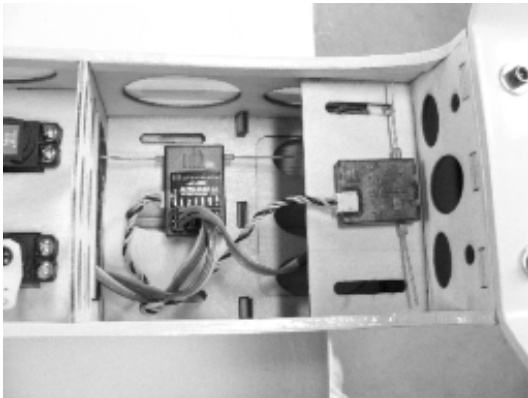


## Receiver Installation

### Required Parts

Fuselage  
Spektrum AR6200 Receiver  
Adhesive backed hook and loop tape

0 1. Install the main and satellite receiver in the fuselage as shown with adhesive backed hook and loop tape. An alternate location for the satellite receiver is also shown. The rudder and elevator servos can be plugged in at this time.



## Motor and Battery Installation E-flite Power 25

### Required Parts

E-flite Power 25 Motor with hardware  
E-flite 40A ESC  
E-flite Battery  
Propeller  
(4) 4-40 x 1/2" socket head bolts  
Adhesive backed hook and loop tape  
(2) Hook and loop straps

### Required Tools

3/32" balldriver  
#1 Philips screwdriver  
Threadlock

**Note:** Your E-flite Pulse XT 25e has been designed to accept the Power 25 and Power 32 motors. We have flown the model on wheels and floats with both motors. The Power 25 delivers adequate power to fly the model on floats but for extreme power you may opt for the Power 32 and 4S battery combination.

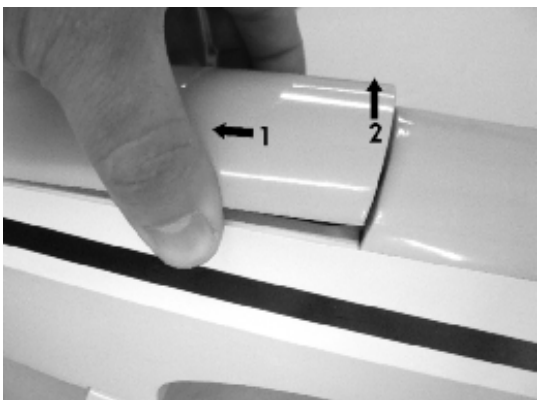
0 1. Using a #1 Philips screwdriver, install the mount on the rear of the motor using the countersunk Philips head screws included with the motor. You may use threadlock to prevent these screws vibrating loose during flight.



O 2. Using a 3/32" balldriver, install the motor on the firewall with four 4-40 x 1/2" socket head bolts. The motor wires should exit towards the bottom of the fuselage. You may use threadlock to prevent these screws from vibrating loose in flight.



O 3. Remove the battery hatch by sliding it forward to disengage the magnets, and lifting at the rear. It can then be pulled rearwards and off the model.



O 4. Install the battery with two hook and loop straps. Slots are provided on the floor of the battery compartment for the straps to pass through. The natural curl of the straps will allow them to be fed down one slot, under the battery compartment floor, then up through the opposite slot.



O 5. Install the ESC on the right-hand side of the battery compartment with hook and loop tape. The battery leads, switch leads and throttle leads will be towards the rear of the model. Connect the ESC to the motor.



## **Motor and Battery Installation** **E-flite Power 32**

### Required Parts

E-flite Power 32 Motor with hardware  
E-flite 60A ESC  
E-flite Battery  
Propeller  
(4) 4-40 x 3/4" socket head bolts  
Adhesive backed hook and loop tape  
(2) Hook and loop straps  
(4) 4mm aluminum motor mount spacers

### Required Tools

3/32" balldriver  
#1 Philips screwdriver  
Threadlock

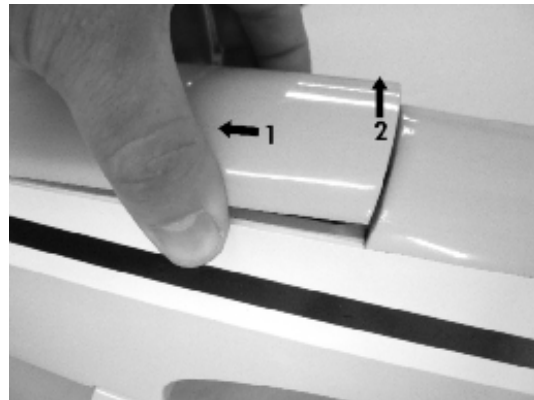
O 1. Using a #1 Philips screwdriver, install the mount on the rear of the motor using the countersunk Philips head screws included with the motor. You may use threadlock to prevent these screws vibrating loose during flight.



O 2.. Using a 3/32" balldriver, install the motor on the firewall with four 4-40 x 3/4" socket head bolts and four 4mm aluminum spacers. The motor wires should exit towards the bottom of the fuselage. You may use threadlock to prevent these screws from vibrating loose in flight.



O 3. Remove the battery hatch by sliding it forward to disengage the magnets, and lifting at the rear. It can then be pulled rearwards and off the model.



O 4. Install the battery with two hook and loop straps. Slots are provided on the floor of the battery compartment for the straps to pass through. The natural curl of the straps will allow them to be fed down one slot, under the battery compartment floor, then up through the opposite slot.



O 5. Install the ESC on the right-hand side of the battery compartment with hook and loop tape. The battery leads, switch leads and throttle leads will be towards the rear of the model. Connect the ESC to the motor.

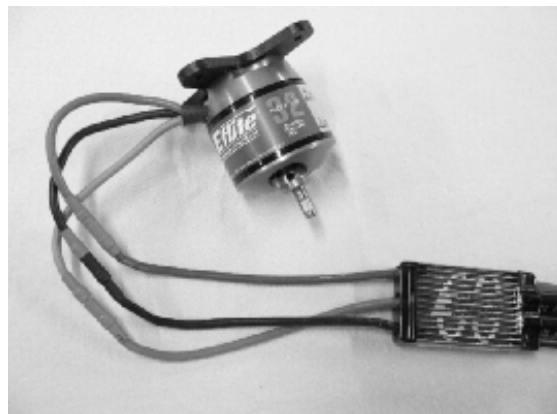


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## **E-tips**

Should you find that the rotation direction of your E-flite Power Brushless Outrunner is opposite to that needed, reversing it is just a matter of switching any two of the motor wires.

E-flite's Power series brushless motors and Pro series controllers are outfitted with red, blue and black power wires. Matching the color is not critical to their operation, it only affects the direction of rotation.



## **Cowling, Propeller and Spinner Installation**

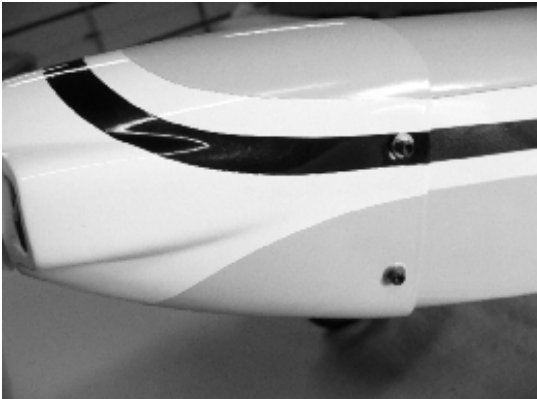
### Required Parts

- Fuselage
- Cowling
- (4) 4-40 x 1/4" socket head bolts
- (4) #4 steel washers
- Spinner with screws
- Propeller
- Propeller adapter (supplied with motor)

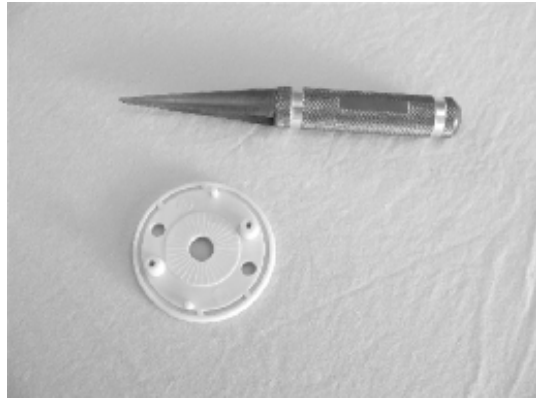
### Required Tools

- 3/32" balldriver
- #1 Philips screwdriver
- Tapered reamer
- Dremel rotary tool with high speed cutter

O 1. Using a 3/32" balldriver, install the cowling with four 4-40 x 1/4" socket head bolts and four #4 steel washers.



O 2. The spinner backplate requires the hole to be enlarged to suit the propeller adapter. For a snug fit on the prop adapter the hole should be approximately 9.5mm diameter. This is best done with a tapered reamer. Proceed carefully and check the fit on the shaft as you enlarge the hole.



O 3. Install the propeller adapter, spinner backplate and propeller. Tighten the propeller nut with a suitably sized screwdriver or Allen wrench shaft.

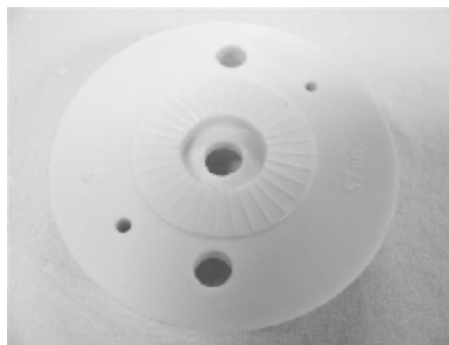
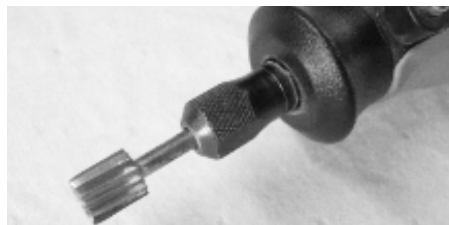


O 4. Install the spinner cone using a #1 Philips screwdriver and the supplied Philips head screws.



## ***E-tips***

An alternate method to drilling completely through the spinner backplate is to grind only the relief necessary to clear the propeller adapter hub. This can be done by hand using a straight cutter in a Dremel rotary tool. The remainder of the hole can be left at its original size and will be a good fit on the propeller shaft.





## Wing Joining

### Required Parts

- Wing halves (L and R)
- (2) dihedral joiners
- (2) leading edge dowels
- (2) 6-32 x 1" socket head bolts
- (2) #6 steel washers

### Required Tools and Adhesives

- Low-tack tape
- 12-minute epoxy
- Clear tape
- 7/64" balldriver
- Mixing cups
- Mixing sticks
- Rubbing alcohol
- Paper towels

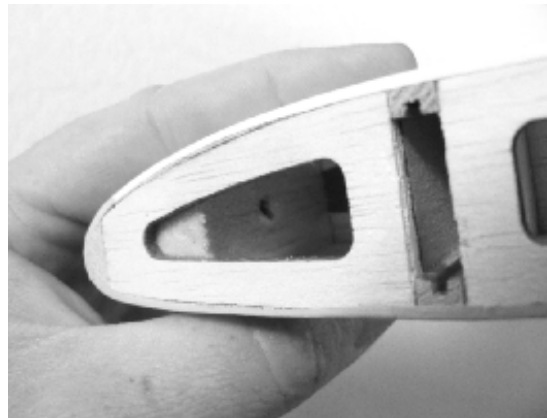
0 0 1. Install the leading edge dowels in the wing panels with 12-minute epoxy. Use paper towels and rubbing alcohol to clean any epoxy that squeezes out onto the wing.



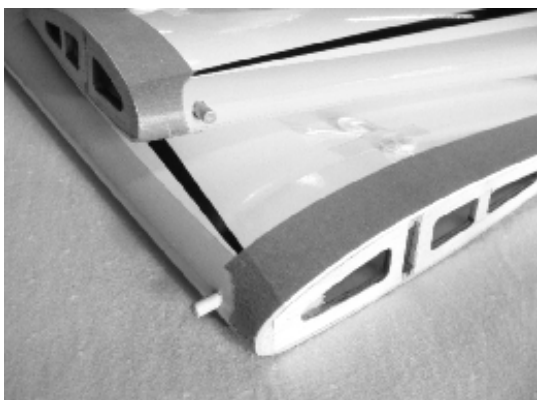
0 0 2.. Upon installation, approximately 5/16" to 3/8" of the dowel should protrude from the leading edge of the wing.



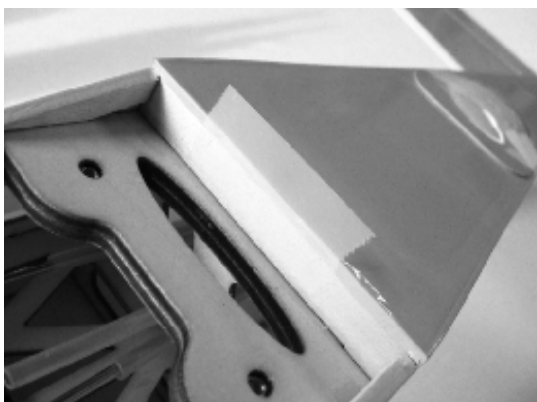
0 0 3. The rear side of the dowel is accessible through the wing root rib and a small amount of epoxy can be added here to secure its installation.



O 4. Apply low-tack tape to the upper and lower surfaces of the center of the wing panels as shown. This will allow for easy clean up of any excess glue and make for a clean joint.



O 5. Apply a piece of clear tape to the front and rear wing saddle area where the wing leading and trailing edges will come in contact with the fuselage.



O 6. 12-minute epoxy is used to install the dihedral joiners and join the wing. Glue the two dihedral joiners to each other.

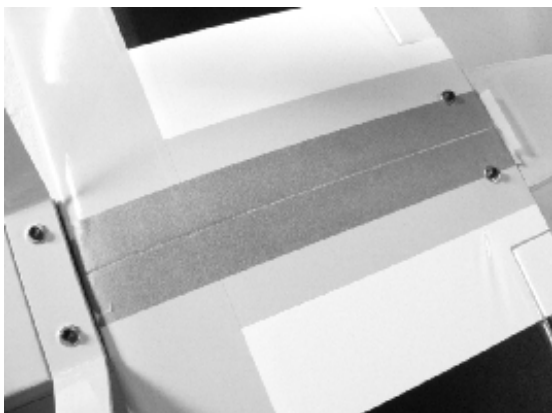


O 7. Using a mixing stick, apply epoxy to the dihedral joiner slot in each wing panel, and to the exposed root rib of one wing panel.



O 8. Install the dihedral joiners in one wing slot and slide the other wing panel onto the joiner. Wipe off any excess epoxy that squeezes out of the joint with rubbing alcohol and a paper towel.

Using a 7/64" balldriver, install the wing on the fuselage with two 6-32" x 1" socket head bolts. Tighten the bolts just enough that the wing sits snugly in the wing saddle, and that the two wing panels are exactly aligned with each other along their bottom surface. Wipe off any excess glue from the wing joint with a paper towel.



9. Allow the glue to dry then remove the wing from the fuselage. Remove the tape from the wing and fuselage.

### **Aileron Servo Installation.**

#### Required Parts

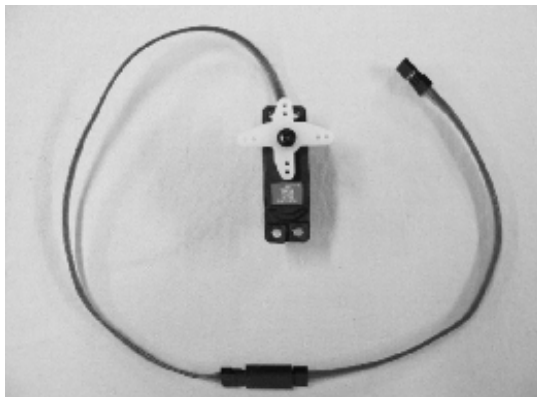
- (2) servos and hardware
- (2) 6" servo extension leads
- (2) 4-3/4" aileron pushrods
- (2) nylon clevises and silicone keepers
- (2) pushrod keepers
- Radio system (Tx, Rx, battery)
- JR MatchMaker (optional)

#### Required Tools and Adhesives

- 1/16 in (1.5mm) drill bit
- Pin drill
- 5/64 in (2mm) drill bit
- #0 Philips screwdriver
- Tape/heat-shrink tubing/dental floss

- Sidecutters
- Felt-tip pen
- Thin CA

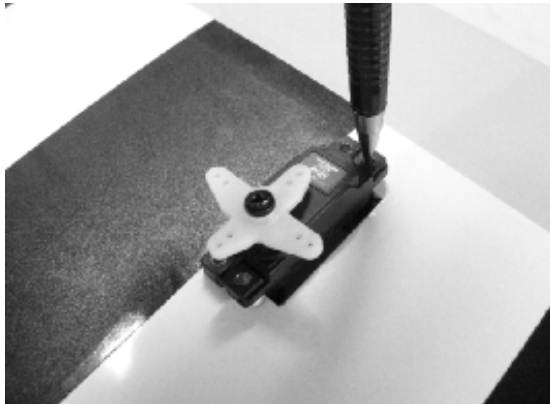
O 1. Install the rubber grommets and brass bushings in each aileron servo. Attach a 6" servo extension lead to each servo and secure it with tape, heat shrink tubing or dental floss.



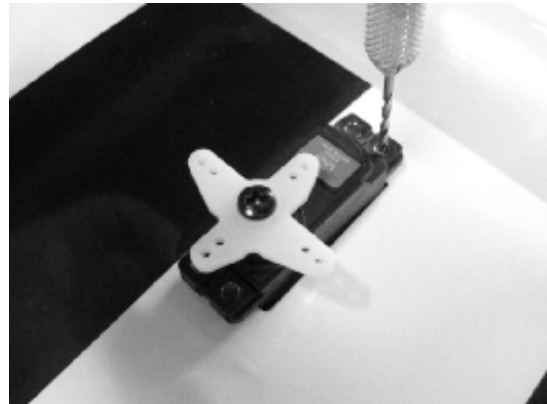
O 2. A string is provided in each wing half to draw the aileron lead through the wing. Attach the end of the string to the aileron servo lead and pull it carefully through the wing to the center. Once both leads have been pulled through, they can be secured to each other with tape to prevent them falling back into the wing.



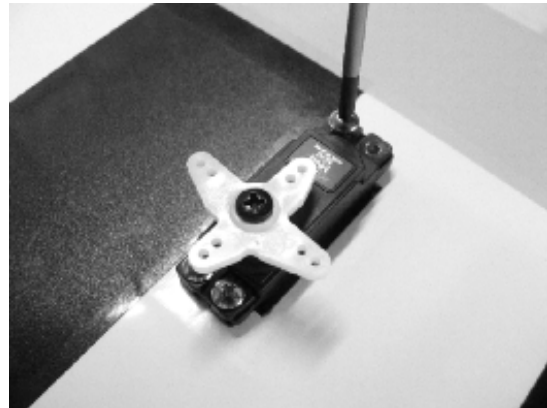
O O 3. Place the servos in the wing openings and mark the screw hole locations with a felt-tip pen.



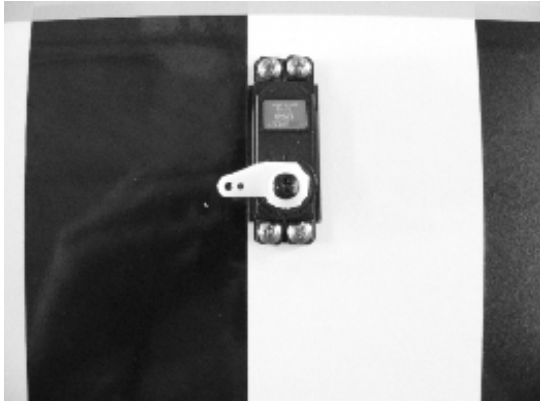
O O 4. Using a 1/16 in (1.5mm) drill bit in a pin drill, drill the four mounting holes for each aileron servo. After drilling, apply a small drop of thin CA to each hole to strengthen the wood.



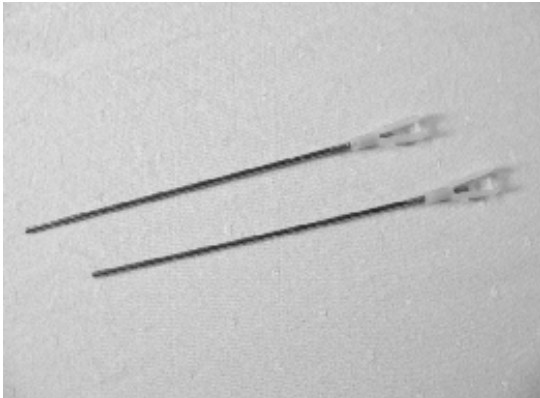
O O 5. Using a #0 Philips screwdriver, and the screws provided with the servos, install the aileron servos with the output shaft towards the trailing edge of the wing.



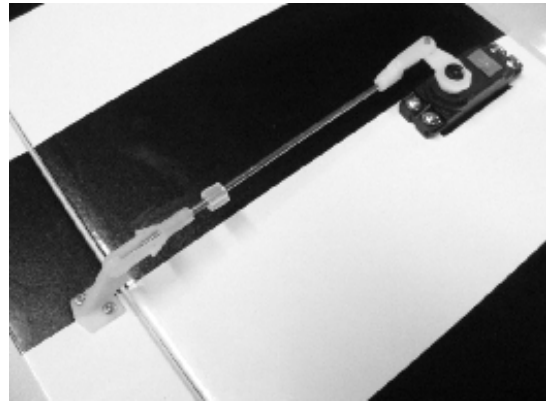
0 0 6. Using a #1 Philips screwdriver remove the servo horn. Using sidecutters remove three of the four arms, leaving one long arm. Using a pin drill, enlarge the outermost hole to 5/64 in (2mm) to accept the pushrod. Center the servo and install the arm towards the wing tip as shown.



0 0 7. Prepare each of the 4-3/4" long aileron pushrods with a clevis and silicone keeper.



0 0 8. Center the aileron servo using your radio or JR MatchMaker. Attach the clevis to the aileron horn at the third hole from the surface and mark the length at the servo arm. Bend the pushrod up (away from the wing surface) at this location and install it on the servo arm with a pushrod keeper.



9. Follow steps 3 through 8 to install the opposite aileron servo.

## Canopy and Cooling Exit Scoop

### Required Parts

Fuselage  
Canopy  
Cooling Exit Scoop

### Required Tools and Adhesives

Low-tack tape  
Canopy Glue

○ 1. Trial fit the canopy on the fuselage. Once satisfied with its location, apply glue to the inside of the canopy at the areas of the painted frame, and install on the fuselage. Tape can be used to hold it in place while the glue dries. Allow the glue to dry completely before removing the tape.



○ 2. Follow the same procedure to attach the cooling exit scoop on the lower fuselage behind the wing in the location shown. Note that the opening faces towards the rear of the model.



**Note:** If you opt to fly from land please proceed to the Flight Preparation section on page 27. If you are installing floats, please proceed to the next page.

## Optional Float Installation.

### Required parts:

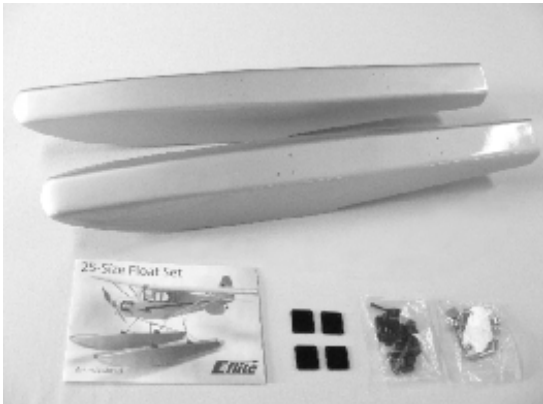
E-flite fiberglass 25-size Float Set  
Sullivan 36" flex cable  
Pulse XT 25e (assembled)  
(4) 1/8" float mount spacers (included in Pulse kit)

### Required tools and adhesives:

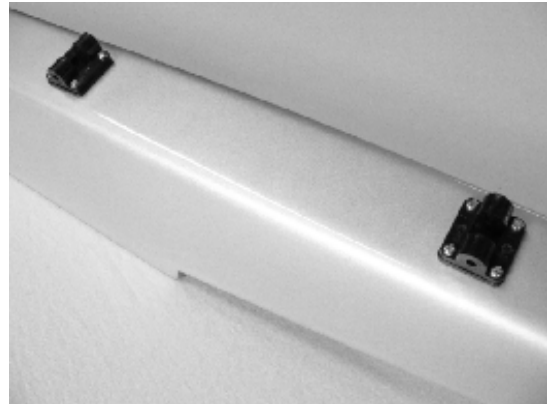
#1 Philips screwdriver	Sidecutters
7/64 in balldriver	5/64 in (2mm) drill bit
1.5mm Allen wrench	11/64 in (4.5mm) drill bit
1/16 in (1.5mm) drill bit	Thin CA
Pin drill	Flat file
Felt-tip pen	Drill
Threadlock	Ruler

O 1. Locate the parts from the float set as shown below, plus the four float mount spacers from your Pulse kit. Not required for float installation on the Pulse are the wire float mount, the sub-fin and the water rudder pushrod.

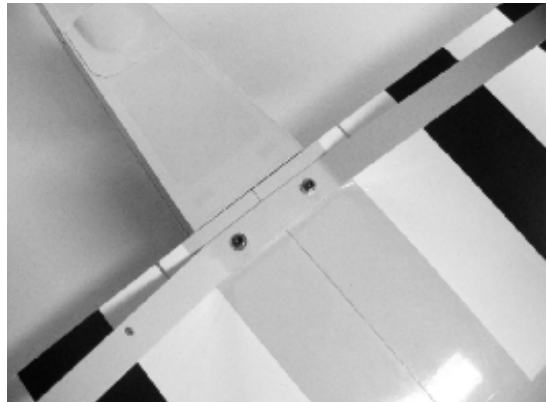
Refer to the Float Set assembly manual in addition to these instructions for reference when assembling the floats.



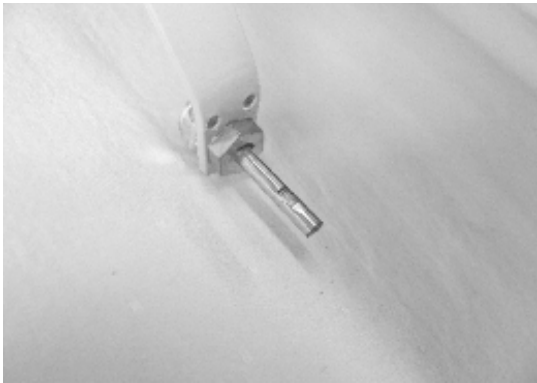
O O 2. Using a #1 Philips screwdriver, attach two of the mounting brackets and spacers to each of the floats with 3mm x 12mm sheet metal screws. For the two floats a total of four brackets, four spacers and sixteen screws are required.



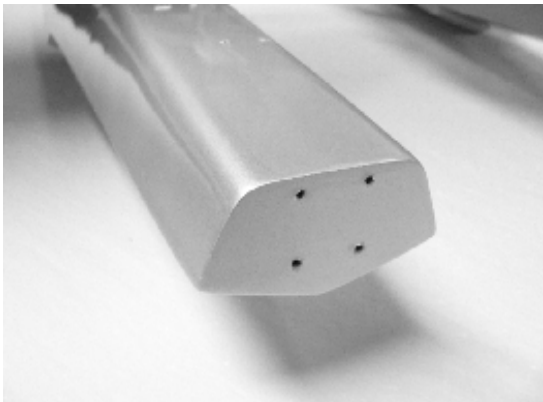
O O 3. Remove the wheel pants and wheels from the main landing gear on your Pulse. The 1.5mm Allen wrench in the Float Set hardware bag will fit the Pulse wheel collars. Install the aft float mount landing gear using the wing attach bolts. When correctly installed the gear will angle forward and the hole for the water rudder cable will be on the left.



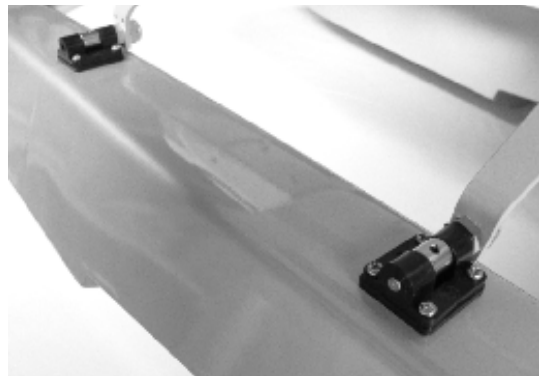
O O 4. Use a file or rotary tool to make a 1/4" wide flat on the top of each of the four axles. The flat should be located approximately 9/16" (14mm) outboard of the hexagonal axle base.



Note: One of the floats has holes drilled in the aft end for the water rudder bracket. This float will get mounted on the left side of your Pulse XT 25e.



O O 5. Attach the floats using four 5/32" wheel collars and four 3mm setscrews using the 1.5mm Allen wrench provided in the float kit. Make sure to use threadlock when installing the setscrews in the flats made previously.



O 6. Attach a nylon bracket to the aft end of the left float with four 3mm x 12mm sheet metal screws. Using a drill and 11/64 in (4.5mm) drill bit, enlarge the hole through the mounting bracket.

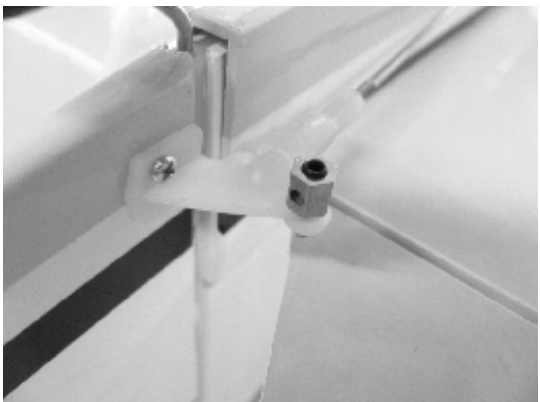




O 7. Install the rudder assembly, steering arm and pushrod connector on the nylon bracket. Refer to pages 12 and 13 in the Float Set assembly manual for guidance. The pushrod connector will go in the hole closest to the rudder post.

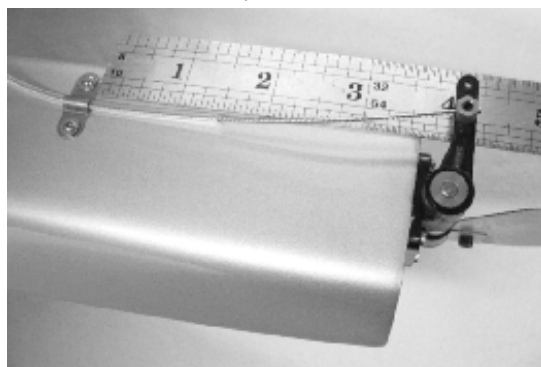


O 8. Install a pushrod connector on the outermost hole in the rudder horn as shown. Refer to page 13 of the Float Set assembly manual for guidance.

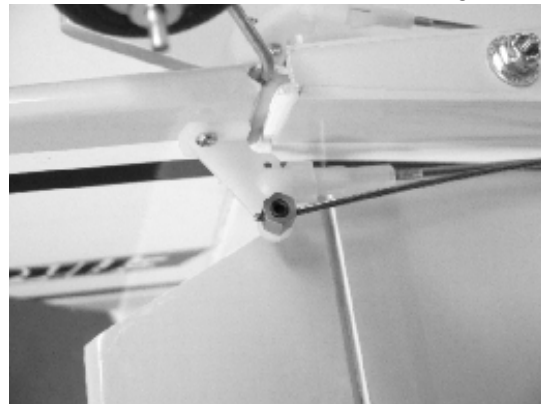


O 9. The Sullivan flex cable and tube need to be cut to length prior to installation. The cable length will be approximately 31.5 in and the tube length approximately 26.5 in.

With the pushrod cable inside the pushrod tube, attach the tube to the float with a full brass strap and two 2mm x 10mm sheet metal screws. The end of the pushrod tube will be approximately 1.5" behind the brass strap. The cable can now be installed in the pushrod connector with a 3mm setscrew as shown.



O 10. Install the other end of the cable in the pushrod connector on the rudder horn as shown and secure with a 3mm setscrew using a 1.5mm Allen wrench.



O 11. Use the two remaining full brass straps to attach the pushrod tube to the left side of the Pulse fuselage. Locate the straps as shown in the picture below using the following dimensions as a guide. There are fuselage frames at these locations; ensure that the screws are located in the center of the frame and will not interfere with any internal items such as pushrods.

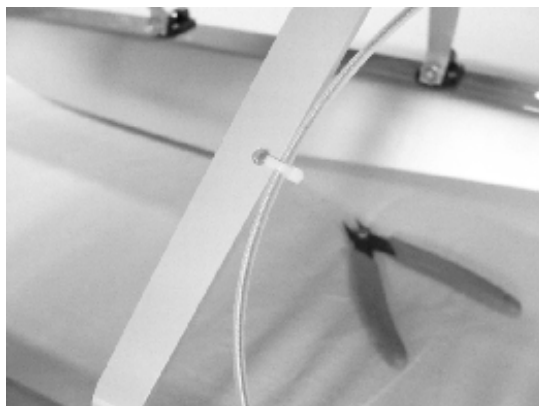
Aft strap: approximately 3/8" forward of stabilizer leading edge, and centered 9/16" up from bottom of fuselage.

Forward strap: approximately 6-1/2" forward of stabilizer leading edge, and 5/8" up from bottom of fuselage.

Use a 1/16" drill bit and pin drill to make the holes for the 2mm x 10mm screws. Strengthen each hole with a small drop of thin CA and allow to cure. Using a #0 Philips screwdriver, attach the straps over the pushrod tube with both the air and water rudders centered.



O 12. Attach the water rudder cable housing to the left float mount strut using the cable tie provided in the Float Set hardware bag. Trim the excess tie material using cutters or a blade.



13. Refer to page 16 in the Float Set assembly manual to finalize the installation of the floats. This will involve final adjustment of linkages to ensure that the rudder is aligned and operates correctly.

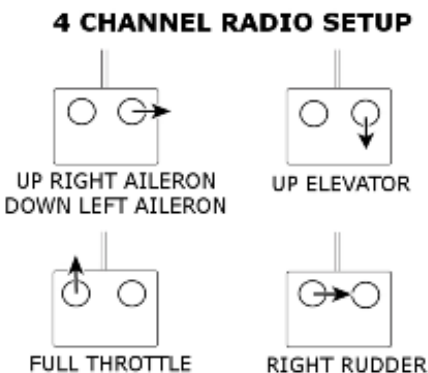
It is extremely important that you verify the center of gravity is still correct with the floats installed. It will be more accurate to check the CG of your float equipped Pulse with the model **right side up**, as opposed to inverted when the wheels are installed.

Pages 26 and 27 of your Float Set assembly manual include some tips for flying from floats. If you are a first-time water flier, please take the time to read these pages before heading out to the lake.

## Flight Preparation

### Control Directions

1. Connect the throttle lead from the ESC to the receiver.
2. Connect the wing servos to the receiver with two 3" extension leads (JSP98100) if using the dual aileron function in your transmitter, otherwise use a Y-harness (JSP98020). Attach the wing to the model.
3. Connect battery power to the ESC and using your radio verify the correct rotation of the motor. Viewed in the direction of flight, the propeller should rotate clockwise. We have printed an E-tip regarding the switching direction of your motor on page 15 for reference.
4. Center the trims on your transmitter and check that the control surfaces are neutral. Large adjustments should be made at the control surface by adjusting the clevis, fine-tuning can be done using the transmitter subtrim function.
5. Verify that the control surfaces operate in the correct direction using the following diagram. Use the servo reversing function in your transmitter as necessary to correct the direction of motion.



### Control Throws

Use a ruler to set the control throws for the ailerons, rudder and elevator. The position of the pushrod can be altered at either the servo or control surface to adjust the amount of control throw. Moving the pushrod closer to the center of the servo, or further from the control surface, will have the effect of reducing surface travel, and vice versa.

These measurements are taken at the widest part of the control surface. They are a general guide from our own flight testing and you can experiment with more or less throw to suit your preferred flying style.

#### Low Rate

Aileron	3/8"	(10mm) up and down
Elevator	7/8"	(22mm) up and down
Rudder	2"	(50mm) left and right

#### High Rate

Aileron	5/8"	(16mm) up and down
Elevator	1-1/8"	(29mm) up and down
Rudder	2-1/2"	(64mm) left and right

Once you have set the control throws, install the silicone keepers on all the clevises. This will prevent any possible failure in flight of a clevis popping loose.



### Center of Gravity (CG)

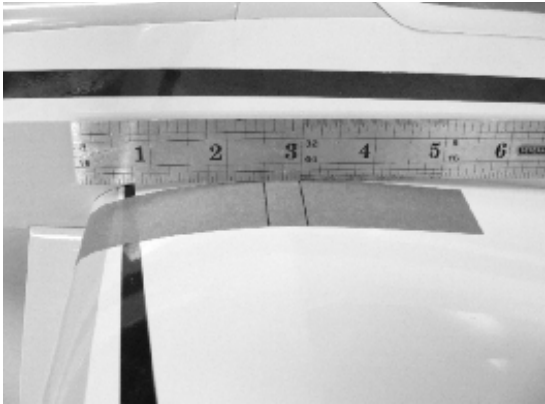
The recommended center of gravity range for the Pulse XT 25e is 2.5 - 3.0" (63 - 76mm) behind the leading edge of the wing. Before making this measurement ensure that the model is in a ready-to-fly state, with all components in place including batteries, hatches and radio equipment.

Place a piece of tape on the upper surface of each wing beside the fuselage and mark the center of gravity location with a felt-tip marker. Suspend the model **inverted** at the measured points on a commercial CG measuring device, or it can be lifted with a finger at each of those points.

**Note:** If flying with floats please check the CG with model right side up.

The model should hang level when suspended at the desired point. The battery pack can be moved forward or aft to correct any tendency for the model to balance nose or tail heavy. Stick-on lead weights can also be used for this purpose.

After the model is flown you may wish to adjust the center of gravity slightly to suit your flying style. Use caution if moving the CG further aft as it will decrease the stability of the model, and increase control sensitivity, particularly the elevator. Moving the CG forward will have the opposite effect.



## Preflight

### Battery Charging

Use the recommended charger for the batteries being used in your radio and model, and follow the charging instructions.

If using Lithium Polymer (LiPo) batteries be aware that they are significantly more volatile than alkaline, Nickel Cadmium or Nickel Metal Hydride batteries used in other RC applications. Follow the battery manufacturer's instructions and warnings closely. Mishandling or incorrect handling of LiPo batteries can result in fire. Do not charge LiPo batteries unattended.

Refer to page 31 for more detailed information on handling LiPo batteries.

### Range Testing your Radio

Be sure to range test your radio before each flying session, or when you have made any repairs or changes to the model. Follow the instructions provided with your radio to perform the range check, which usually involves limiting the output power of the transmitter while checking model function at a prescribed distance.

### Final Checks

Before flying, make a last check of the model and it's functions, especially if you have made any setup or programming changes.

- confirm that all control surfaces move in the correct direction
- check the radio installation for security
- check motor installation and correct direction of rotation
- check the integrity of control surfaces and hinges
- check pushrods and control horns for security of attachment

## Optional Items

### 25-Size Float Set

E-flite quick-mount floats are designed specifically for 25-size airplanes that are float-ready out of the box, so you can go from pavement to pond in just minutes. These floats are constructed of durable fiberglass, and are pre-painted. A pre-assembled water rudder and all mounting hardware is included (EFLA500).



### E-flite 1-5 Cell LiPo Charger with Balancer

An Intelligent Balance Charger for 1-5 cell LiPo or Li-Ion batteries. Features a large 2-line backlit LCD display, polarity protection and a safety timer. Charge rate is adjustable from 100mAh to 5000mAh. To protect your valuable LiPo packs the charger also has alarm warning and auto shut-off for conditions such as charge time over limit, charge capacity over limit, reverse voltage connection, input voltage error, connection breakdown, short circuit, and voltage differences during charge (EFLC505).



### E-flite Power Meter

The E-flite Power Meter is designed for inline monitoring of Volts, Amps, Watts, and Capacity, based on the mode you select to display on the digital LCD screen. For pilots who fly any electric airplanes and desire to accurately set up their airplanes for maximum performance, the Power Meter does not include connectors so you can customize it to fit your needs (EFLA110).



### DX6i 6-Channel Radio by Spektrum

The 6-channel DX6i uses the same DSM2™ technology found in the Spektrum™ DX7 and includes an impressive list of programming features for both airplanes and helicopters that are both simple to access and use. It comes with the new AR6200 DSM2 6-channel receiver that is robust enough to use in large models yet compact enough to fit in many parkflyers. The DX6i is also compatible with all existing Spektrum aircraft receivers. Whatever kind of flying you do, the DX6i can be adapted to most any model in your existing collection that requires 6 channels or less (SPM6600).



## **Lithium Polymer Battery Pack Information**

Lithium Polymer (LiPo) batteries are significantly more volatile than other rechargeable batteries used in RC applications. Failure to read and follow these instructions and safety precautions may result in fire, personal injury and damage to property.

E-flite, Horizon Hobby, Inc., its retailers, and any other representatives, assume absolutely no liability for use of these products or failure to comply with the associated instructions and precautions.

***Never ship batteries without the express permission of the recipient. Batteries containing 25% or more charge cannot be shipped safely. Batteries which are damaged cannot be shipped safely. Damage or loss due to unsafe shipping is the legal responsibility of the person who shipped the product.***

***CAUTION: LiPo batteries may ignite under certain conditions. Please read all safety precautions before use.***

***Please call 877-504-0233 with any concerns or questions regarding E-flite LiPo battery products or warranty.***

***United Kingdom:  
Please call +44 1279 641 097 or  
sales@horizonhobby.co.uk with any questions or concerns regarding this product or warranty.***

***Germany:  
Please call +49 4121 46199 66 or  
service@horizonhobby.de with any questions or concerns regarding this product or warranty.***

## **Usage Guidelines, Warnings and Safety Precautions.**

- LiPo batteries may explode if damaged or disposed of improperly.
- Always inspect batteries before charging.
- Never charge or use a LiPo battery that shows any damage or disfigurement of any kind. Swelling is a sign of internal damage. Any breach of protective cover, wiring or plugs is also a reason to discontinue use (see Disposal Instructions).
- Use a specific Lithium Polymer charger only. Do not use a NiCd or NiMH charger- failure to do so may cause a fire, which may result in personal injury and/or property damage.
- Never charge around or in the area of any flammable or combustible materials.
- Always charge LiPo batteries in or on fire resistant materials or containers.
- Never leave battery and charger unattended while in use. Improper charging or discharging of LiPo batteries could result in fire.
- Constantly monitor the temperature of the battery pack while charging. If the battery becomes hot to the touch discontinue charging immediately. Disconnect the battery from the charger and observe it in a safe place for at least 1 minute.
- If at any time you see a battery starting to balloon or swell, discontinue charging or using immediately.
- Lithium batteries can still ignite after at least 45 minutes due to a delayed chemical reaction. If the battery is damaged or overheats, observe the battery in a safe area outside of any building or vehicle and away from combustible material.
- Do not allow children to charge LiPo battery packs.
- Do not allow children to use LiPo batteries without direct adult supervision.
- Shorting the wire leads can cause fire. If you accidentally short the wires, the battery must be placed in a safe area for observation for at least 15 minutes.
- Never store or charge a battery pack where the temperature will go below 32 degrees Fahrenheit or above 130 degrees Fahrenheit. Extreme temperatures will damage the battery pack and may cause fire. Battery performance may be diminished by less extreme temperatures.
- Any of the following may cause the battery to be damaged resulting in battery swelling, leaking or fire:
  - Bending, folding or dropping of the battery
  - Damaging the edge seal of the battery
  - Taking the battery apart
  - Mixing cells of different chemistry, or types, or sizes
  - Mixing cells of different ages

### Crash Damage

If there are signs of smoke or overheating, DO NOT go near the battery or equipment until it has been observed from a safe distance for at least 15 minutes. Once it is safe, remove the battery and check for damage. Dispose of damaged batteries appropriately.

### Swollen Batteries

Immediately stop using or charging a battery showing any signs of swelling or becoming too warm. If the battery is not warm to the touch, move it to an open safe area and observe it for at least 15 minutes. Be VERY CAREFUL when moving the batteries. Do NOT put ANY pressure on the batteries or covering as this may cause fire.

### Additional Information and Guidelines

1. Battery temperature is the best indicator for safety. The E-flite LiPo battery's temperature should never drop below 32 degrees Fahrenheit or go above 130 degrees Fahrenheit while charging or discharging.
2. Changing plugs or connectors is not recommended as the process is dangerous and any error can cause fire due to shorts, reverse polarity or other improper handling which can cause battery damage.
3. Batteries should be stored in a vented, fire resistant container. Each pack should be stored in its own locked plastic bag within the container. The number of packs per container should be extremely limited to avoid chain reactions. Storage temperatures should not fall below 32 degrees Fahrenheit or above 130 degrees Fahrenheit. Damaged batteries must be kept at even more ambient temperatures. High temperatures may cause fire even with undamaged batteries.

### Battery Disposal

LiPo batteries require special handling for safe disposal. The following are basic instructions for safe disposal. For more detailed safety, disposal and recycling please go to: [www.rbr.org](http://www.rbr.org) or [www.earth911.org](http://www.earth911.org).

### Basic Disposal Instructions

Before discarding any LiPo battery it must be rendered safe. The following steps must be taken to avoid damage or injury to yourself, your property and anyone who comes in contact with the battery.

If the battery is undamaged but no longer useful:

1. Discharge the battery to a maximum of 2.5V using a slow, safe discharge method.
2. Leave battery discharged and retest after 24 hours. Many batteries experience 'rebound' and may measure more than 2.5V after 24 hours. If the voltage is greater than 2.5, repeat the procedure until the battery measures 2.5V or less.
3. Insulate each wire lead with electrical tape or other suitable material.
4. Assure that wire leads cannot touch each other by taping them to opposite sides of the battery.
5. Place battery in a sealed plastic bag and place bag in a sealed, vented, fire-safe container.
6. Use fire-safe container to deliver battery to a recycling center authorized for Lithium Polymer batteries. Please note that not all battery recycling services include LiPo's. If no LiPo recycling facility is available in your area, contact your local or state Hazmat agencies for instructions.
7. If the battery or wiring is damaged, please contact your local or state Hazmat facilities for instructions. Batteries must be rendered safe before being transported or recycled. Do NOT transport or ship batteries which have more than a 2.5V charge OR that show signs of damage without following the instructions given by authorities. Damaged batteries should be rendered as safe as possible and stored in a vented fireproof container until recycled.

### 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 users responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal 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.





## AMA National Model Aircraft Safety Code

### GENERAL

1. A model aircraft shall be defined as a non-human-carrying device capable of sustained flight in the atmosphere. It shall not exceed limitations established in this code and is intended to be used exclusively for recreational or competition activity.
2. The maximum takeoff weight of a model aircraft, including fuel, is 55 pounds, except for those flown under the AMA Experimental Aircraft Rules.
3. I will abide by this Safety Code and all rules established for the flying site I use. I will not willfully fly my model aircraft in a reckless and/or dangerous manner.
4. I will not fly my model aircraft in sanctioned events, air shows, or model demonstrations until it has been proven airworthy.
5. I will not fly my model aircraft higher than approximately 400 feet above ground level, when within three (3) miles of an airport without notifying the airport operator. I will yield the right-of-way and avoid flying in the proximity of full-scale aircraft, utilizing a spotter when appropriate.
6. I will not fly my model aircraft unless it is identified with my name and address, or AMA number, inside or affixed to the outside of the model aircraft. This does not apply to model aircraft flown indoors.
7. I will not operate model aircraft with metal-blade propellers or with gaseous boosts (other than air), nor will I operate model aircraft with fuels containing tetranitromethane or hydrazine.
8. I will not operate model aircraft carrying pyrotechnic devices which explode burn, or propel a projectile of any kind. Exceptions include Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight. Rocket motors up to a G-series size may be used, provided they remain firmly attached to the model aircraft during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code; however, they 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 Air Show Advisory Committee Document.
9. I will not operate my model aircraft while under the influence of alcohol or within eight (8) hours of having consumed alcohol.
10. I will not operate my model aircraft while using any drug which could adversely affect my ability to safely control my model aircraft.
11. Children under six (6) years old are only allowed on a flightline or in a flight area as a pilot or while under flight instruction.
12. 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.

### RADIO CONTROL

1. All model flying shall be conducted in a manner to avoid over flight of unprotected people.
2. I will have completed a successful radio equipment ground-range check before the first flight of a new or repaired model aircraft.
3. I will not fly my model aircraft in the presence of spectators until I become a proficient flier, unless I am assisted by an experienced pilot.
4. At all flying sites a line must be established, in front of which all flying takes place. Only personnel associated with flying the model aircraft are allowed at or in front of the line. In the case of airshows demonstrations straight line must be established. An area away from the line must be maintained for spectators. Intentional flying behind the line is prohibited.
5. I will operate my model aircraft using only 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.
6. I will not knowingly operate my model aircraft within three (3) miles of any preexisting flying site without a frequency-management agreement. A frequency-management agreement may be an allocation of frequencies for each site, a day-use agreement between sites, or testing which determines that no interference exists. A frequency-management agreement may exist between two or more AMA chartered clubs, AMA clubs and individual AMA members, or individual AMA members. Frequency-management agreements, including an interference test report if the agreement indicates no interference exists, will be signed by all parties and copies provided to AMA Headquarters.
7. With the exception of events flown under official AMA rules, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and located at the flightline.
8. 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.
9. Radio-controlled night flying is limited to low-performance model aircraft (less than 100 mph). The model aircraft must be equipped with a lighting system which clearly defines the aircraft's attitude and direction at all times.
10. The operator of a radio-controlled model aircraft shall control it during the entire flight, maintaining visual contact without enhancement other than by corrective lenses that are prescribed for the pilot. No model aircraft shall be equipped with devices which allow it to be flown to a selected location which is beyond the visual range of the pilot.

Warranty Period:

Exclusive Warranty- Horizon Hobby, Inc., (Horizon) warrants that the Products purchased (the "Product") will be free from defects in materials and workmanship at the date of purchase by the Purchaser.

Limited Warranty

(a) This warranty is limited to the original Purchaser ("Purchaser") and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Horizon dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims. Further, Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(b) Limitations- HORIZON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCT. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

(c) Purchaser Remedy- Horizon's sole obligation hereunder shall be that Horizon will, at its option, (i) repair or (ii) replace, any Product determined by Horizon to be defective. In the event of a defect, these are the Purchaser's exclusive remedies. Horizon reserves the right to inspect any and all equipment involved in a warranty claim. Repair or replacement decisions are at the sole discretion of Horizon. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than Horizon. Return of any goods by Purchaser must be approved in writing by Horizon before shipment.

Damage Limits:

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. 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 this Product, you are advised to return this 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).

Safety Precautions:

This is a sophisticated hobby Product and not a toy. 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. The Product 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 injury.

Questions, Assistance, and Repairs:

Your local hobby store and/or place of purchase cannot provide warranty support or repair. Once assembly, setup or use of the Product has been started, you must contact 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 direct your email to [productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com), or call 877.504.0233 toll free to speak to a service technician.

#### Inspection or Repairs

If this Product needs to be inspected or repaired, please call for a Return Merchandise Authorization (RMA). 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. A Service Repair Request is available at [www.horizonhobby.com](http://www.horizonhobby.com) on the "Support" tab. If you do not have internet access, please include a letter with your complete name, street address, email address and phone number where you can be reached during business days, your RMA number, a list of the included items, method of payment for any non-warranty expenses and a brief summary of the problem. Your original sales receipt must also be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

#### Warranty Inspection and Repairs

To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be repaired or replaced free of charge. Repair or replacement decisions are at the sole discretion of Horizon Hobby.

#### Non-Warranty Repairs

Should your repair not be covered by warranty the repair 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 repair you are agreeing to payment of the repair without notification. Repair estimates are available upon request. You must include this request with your repair. Non-warranty repair estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Please advise us of your preferred method of payment. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. If you choose to pay by credit card, please include your credit card number and expiration date. Any repair left unpaid or unclaimed after 90 days will be considered abandoned and will be disposed of accordingly. Please note: non-warranty repair is only available on electronics and model engines.

Electronics and engines requiring inspection or repair should be shipped to the following address:

Horizon Service Center  
4105 Fieldstone Road  
Champaign, Illinois 61822

All other Products requiring warranty inspection or repair should be shipped to the following address:

Horizon Product Support  
4105 Fieldstone Road  
Champaign, Illinois 61822

Please call 877-504-0233 or e-mail us at [productsupport@horizonhobby.com](mailto:productsupport@horizonhobby.com) with any questions or concerns regarding this product or warranty.

#### United Kingdom

Electronics and engines requiring inspection or repair should be shipped to the following address:

Horizon Hobby UK  
Units 1-4 Ployters Rd  
Staple Tye  
Southern Way  
Harlow  
Essex CM18 7NS  
United Kingdom

Please call +44 1279 641 097 or [sales@horizonhobby.co.uk](mailto:sales@horizonhobby.co.uk) with any questions or concerns regarding this product or warranty.

#### Germany

Electronics and engines requiring inspection or repair should be shipped to the following address:

Horizon Technischer Service  
Otto Hahn Str. 9a  
25337 Elmshorn  
Germany

Please call +49 4121 46199 66 or [service@horizonhobby.de](mailto:service@horizonhobby.de) with any questions or concerns regarding this product or warranty.



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