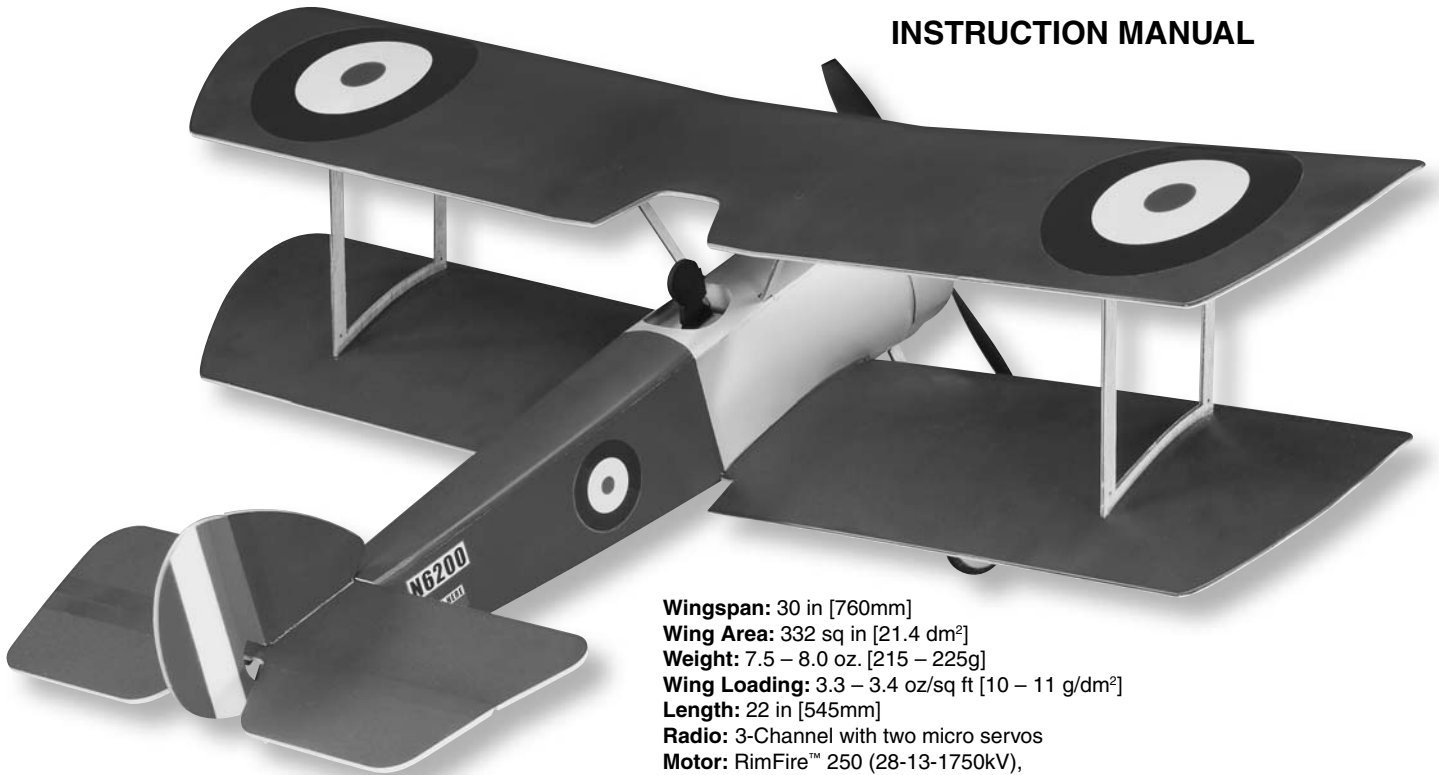


SOPWITH PUP

INSTRUCTION MANUAL



Wingspan: 30 in [760mm]
Wing Area: 332 sq in [21.4 dm²]
Weight: 7.5 – 8.0 oz. [215 – 225g]
Wing Loading: 3.3 – 3.4 oz/sq ft [10 – 11 g/dm²]
Length: 22 in [545mm]
Radio: 3-Channel with two micro servos
Motor: RimFire™ 250 (28-13-1750kV),
7.4V (2S) LiPo 300mAh, SS-8 ESC

WARRANTY

Great Planes® Model Manufacturing Co. guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. **In no case shall Great Planes' liability exceed the original cost of the purchased kit.** Further, Great Planes reserves the right to change or modify this warranty without notice.

In that Great Planes has no control over the final assembly or material used for final assembly, no liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return

this kit immediately in new and unused condition to the place of purchase.

To make a warranty claim send the defective part or item to Hobby Services at the address below:

Hobby Services
3002 N. Apollo Dr., Suite 1
Champaign, IL 61822 USA

Include a letter stating your name, return shipping address, as much contact information as possible (daytime telephone number, fax number, e-mail address), a detailed description of the problem and a photocopy of the purchase receipt. Upon receipt of the package, the problem will be evaluated as quickly as possible.

READ THROUGH THIS MANUAL BEFORE STARTING CONSTRUCTION. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.



Champaign, Illinois
(217) 398-8970, Ext 5
airsupport@greatplanes.com

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INTRODUCTION



Thank you for purchasing the ElectriFly Sopwith Pup Slow Flyer EP ARF. Obviously, the Pup was intended for indoor flying, but is also fun to fly outdoors on calm evenings or in the morning when the winds are still calm.

For the latest technical updates or manual corrections to the Sopwith Pup, visit the Great Planes web site at www.greatplanes.com. Open the "Airplanes" link, then select the ElectriFly Sopwith Pup ARF. If there is new technical information or changes to this model a "tech notice" box will appear in the upper left corner of the page.

AMA

If you are not already a member of the AMA, please join! The AMA is the governing body of model aviation and membership provides liability insurance coverage, protects modelers' rights and interests and is required to fly at most R/C sites.

Academy of Model Aeronautics

5151 East Memorial Drive

Muncie, IN 47302

Tele: (800) 435-9262

Fax (765) 741-0057

Or via the Internet at:

<http://www.modelaircraft.org>



IMPORTANT!!! Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.

PROTECT YOUR MODEL, YOURSELF & OTHERS...FOLLOW THESE IMPORTANT SAFETY PRECAUTIONS

1. Your Sopwith Pup should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Pup, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.

2. You must assemble the model **according to the instructions**. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.

3. You must take time to build **straight, true and strong**.

4. You must use an R/C radio system that is in good condition, a correctly sized engine, and other components as specified in this instruction manual. All components must be correctly installed so that the model operates correctly on the ground and in the air. You must check the operation of the model and all components before **every** flight.

5. If you are not an experienced pilot or have not flown this type of model before, we recommend that you get the assistance of an experienced pilot in your R/C club for your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.

6. While this kit has been flight tested to exceed normal use, if the plane will be used for extremely high stress flying, such as aggressive aerobatics, or if a motor larger than one in the recommended range is used, the modeler is responsible for taking steps to reinforce the high stress points and/or substituting hardware more suitable for the increased stress.

We, as the kit manufacturer, provide you with a top quality, thoroughly tested kit and instructions, but ultimately the quality and flyability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed model.

Remember: Take your time and follow the instructions to end up with a well-built model that is straight and true.

DECISIONS YOU MUST MAKE

This is a partial list of items required to finish the Sopwith Pup that may require planning or decision making before starting to build. Order numbers are provided in parentheses.

Motor, Battery and ESC Recommendations

The ElectriFly Sopwith Pup was designed to fly with a **RimFire 250 (28-13-1750kV) Outrunner Motor** (GPMG4502) powered by either a **7.4V (2S) 300mAh ElectriFly Power Series LiPo Battery** (GPMP0594) or a **7.4V (2S) 300mAh ElectriFly Competition BP LiPo Battery** (GPMP0700). The Power Series battery will allow the Pup to fly longer, but the Competition BP is lighter weight and will provide more power. An **ElectriFly SS-8 8 Amp Brushless ESC** (electronic speed control) is also required (GPMM1800).

Finally, a suitable propeller such as a **Great Planes 8 x 6 Power Flow Slo-Flyer Electric Propeller** (GPMQ6610, qty. 2) will also be required.

Radio Equipment

The ElectriFly Sopwith Pup is designed to fly on three channels—elevator, rudder and throttle. **Two ES40 Pico Micro Servos** (GPMM1200) are recommended and are featured in this manual. A minimum 3-channel receiver is also required.

ADDITIONAL ITEMS REQUIRED

In addition to common hobby tools, this is the list of additional accessories and building supplies required to finish the Pup. Order numbers are provided in parentheses.

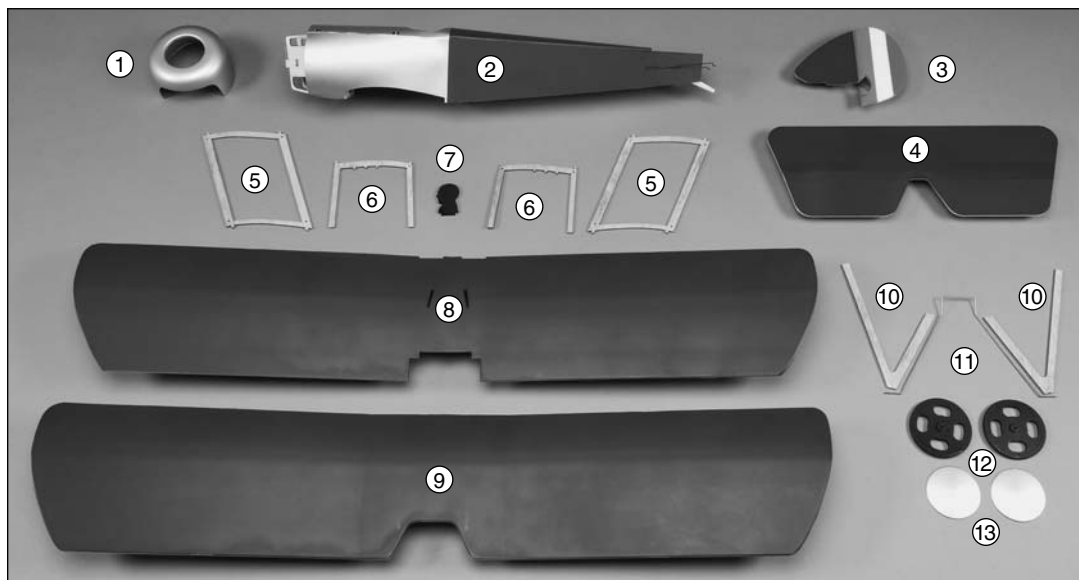
- Medium foam-safe CA (GPMR6069)
- J&Z R/C-56 white glue (or any household white glue)
- Optional: Black thread or string for flying wires (see page 8)

KIT INSPECTION

Before starting to build, take an inventory of this kit to make sure it is complete, and inspect the parts to make sure they are of acceptable quality. If any parts are missing or are not of acceptable quality, or if you need assistance with assembly, contact **Product Support**.

Great Planes Product Support
 3002 N Apollo Drive, Suite 1
 Champaign, IL 61822
 Telephone: (217) 398-8970, ext. 5
 Fax: (217) 398-7721
 E-mail: airsupport@greatplanes.com

KIT CONTENTS

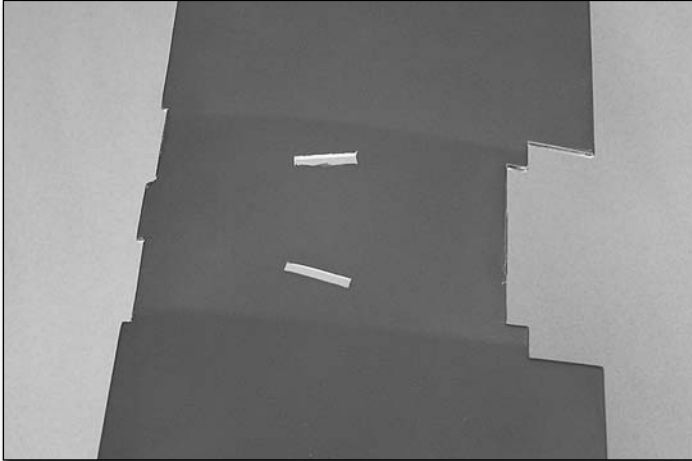


1. Cowl
2. Fuselage
3. Vertical Stabilizer
4. Horizontal Stabilizer
5. Struts (2)
6. Cabanes (2)
7. Pilot
8. Bottom Wing
9. Top Wing
10. Landing Gear Covers (2)
11. Landing Gear Wire
12. Wheels (2)
13. Wheel Covers (2)

ASSEMBLY

Join the Bottom Wing to the Fuselage

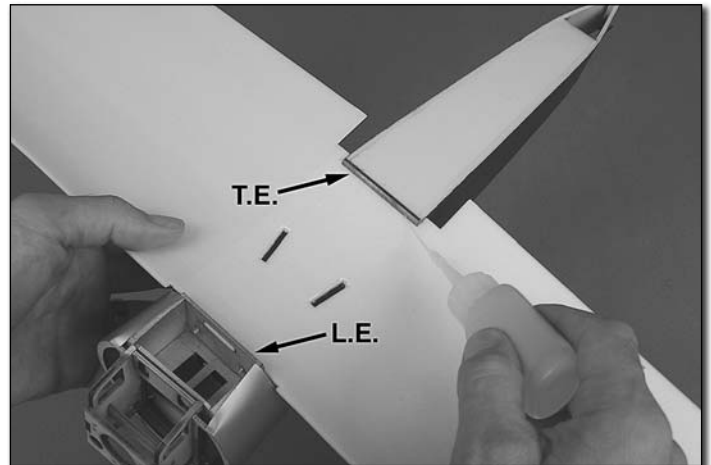
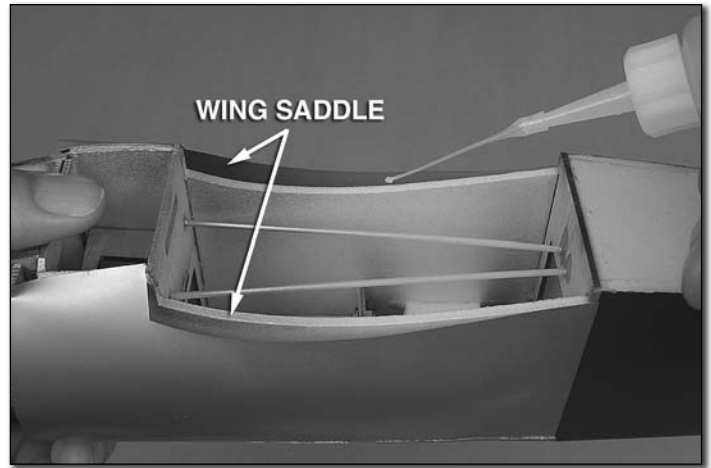
The bottom wing is done first so it can be used as a reference for aligning the horizontal stabilizer.



❑ 1. Use a sharp hobby knife to cut the skin from the top of the bottom wing over the landing gear slots. Also cut the skin from the slots near both ends of the wing for the struts.

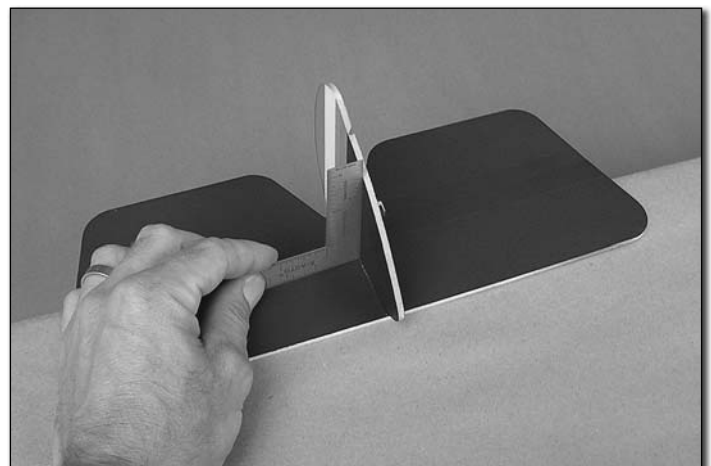


❑ 2. Using a pin with a straightedge as a guide, perforate the skin of the bottom wing between the outer strut slots as shown, but don't poke the holes all the way through to the bottom. These perforations will strengthen the glue bond between the struts and wing.

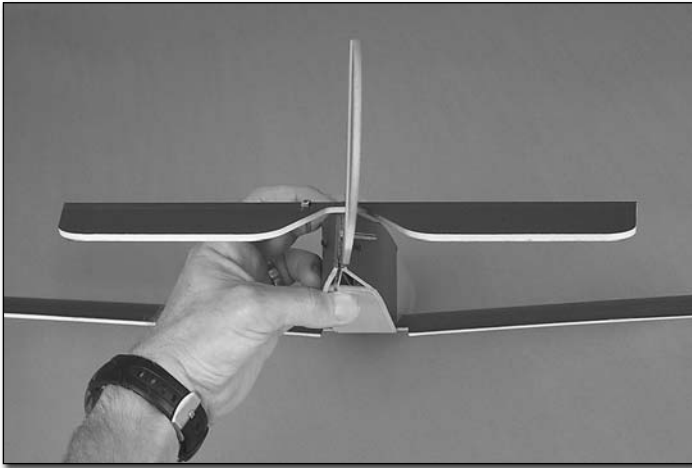
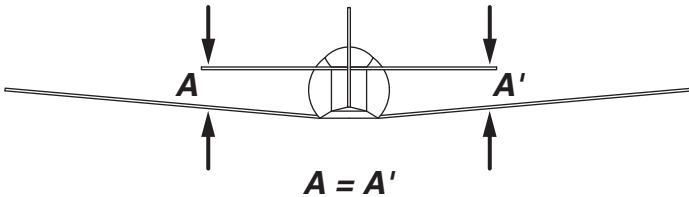


❑ 3. Test fit the bottom wing to the fuselage. When satisfied with the fit, apply a generous bead of foam-safe CA to both wing saddles on the fuselage, and then place the wing into position. Also glue the leading and trailing edges of the wings to the balsa formers.

Join the Stab and Fin to the Fuselage

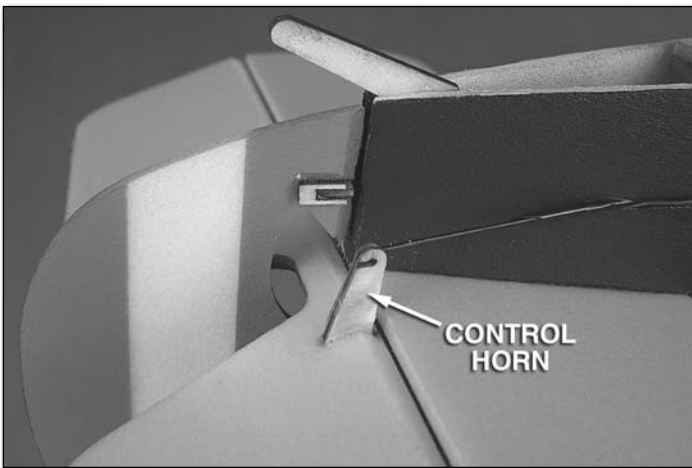


❑ 1. Glue the vertical stabilizer (fin) to the horizontal stabilizer (stab) using a small builder's square to make sure they are perpendicular. **Note:** Don't build up a large fillet of CA. Later, after the model has been completed, all of the glue joints will be reinforced with white glue (such as R/C 56 or regular white glue).



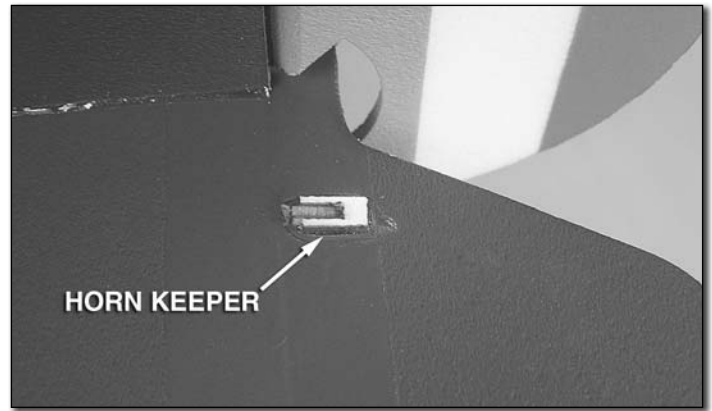
❑ 2. Hold the stab/fin assembly into position on the fuselage. View the alignment of the stab and wing from behind. If the stab and wing are not parallel with each other, use a sharp hobby knife to **carefully** trim the “high side” of the stab saddle to achieve the alignment.

❑ 3. Once the stab aligns with the wing, hold the assembly to the fuselage. Center the LE of the fin with the top of the fuselage and the LE of the rudder with the back of the fuselage. Securely glue the stab into position. Reinforce the joint by gluing from the bottom up inside the fuselage.

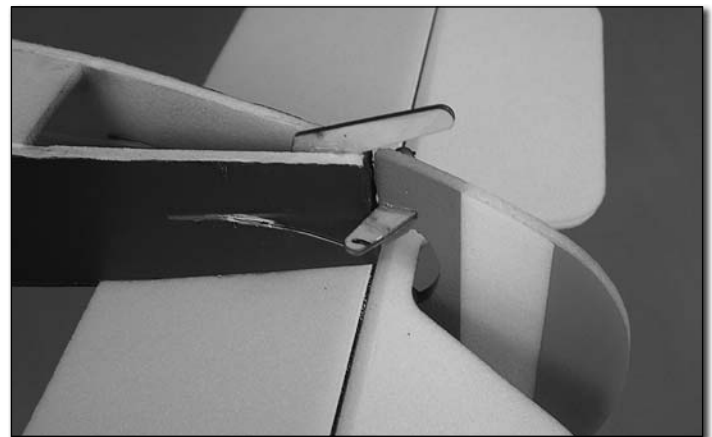


❑ 4. As shown in the photo, fit one of the plywood **control horns** to the Z-bend on the end of the **elevator pushrod** (already in the fuselage). Fit the horn into the slot in the **bottom** of the elevator. Use a sharp #11 hobby knife to cut the hinge tape from the slot on the top of the elevator so the horn will go all the way through. **Note:** If the pushrod is too long it may be bumping up against the former in the front of the servo compartment—cut the pushrod if necessary, but cut only enough to allow the horn to fit—otherwise you may inadvertently cut the wire too short.

❑ 5. Use foam-safe CA to securely glue the horn into position.



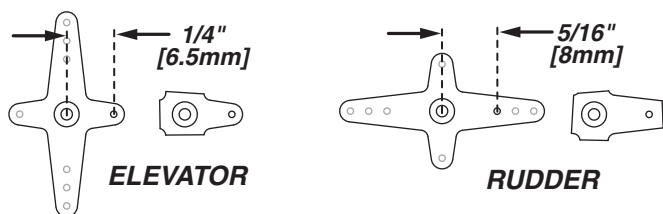
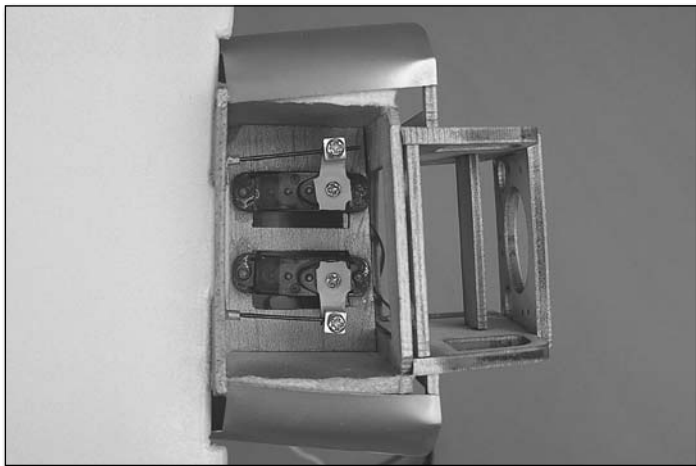
❑ 6. Glue the plywood **horn keeper** to the other side of the horn and to the top of the elevator.



❑ 7. Fit the other horn and keeper to the rudder pushrod and glue them to the rudder the same way.

Hook Up the Elevator and Rudder

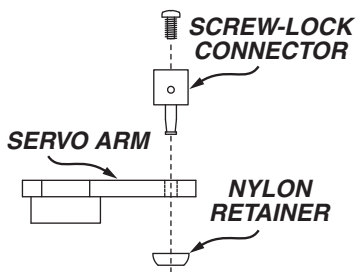
Refer to this picture while hooking up the elevator and rudder.



1. In order to achieve the correct elevator and rudder throws specified on page 11, the pushrods need to be connected to the servo arms as shown. If your servo arms don't already have holes that are the correct distance out, drill new holes in the servo arms you will be using and cut off the unused arms.

2. Place the elevator and rudder servos in the servo tray in the fuselage. Temporarily connect the servos to your receiver with the battery and ESC so you can power the system up. **Note:** With 3-channel models such as this (where there are no ailerons), it is common to connect the rudder servo into the "aileron" channel in the receiver. This way, the right stick will still be used for turning the model. If it is your preference however, you may connect the rudder servo into the rudder channel instead.

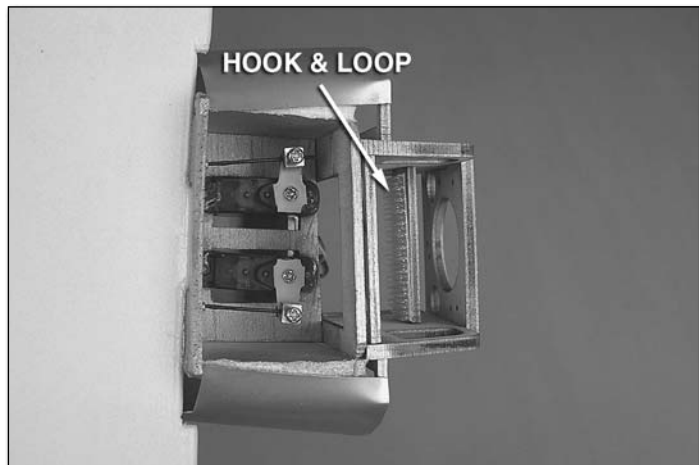
3. Turn on your transmitter and plug in the battery and center the servos. Connect screw-lock connectors to the servo arms. Then fit the arms onto the servos.



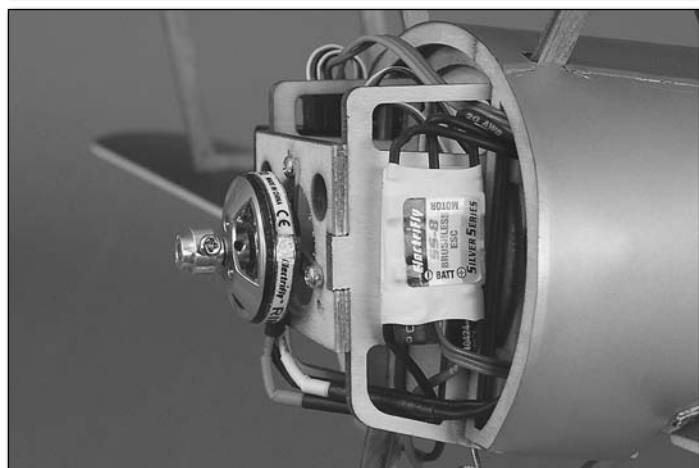
4. Connect the pushrods to the screw-lock connectors on the servo arms, and center the elevator and rudder. Then, with a drop of threadlocker on the screws, tighten the screws in the screw-lock connectors to lock the pushrods down.

5. Use CA to glue the servos into position. Install the screws that hold the servo arms onto the servo output shafts.

Mount the Motor, ESC and Battery



1. Cut a 1-1/4" x 1/2" [32 x 12mm] strip from the "rough" side of the adhesive-backed hook-and-loop strip that came with this kit. Stick the strip to the back of the firewall brace just behind the firewall. This is where the battery will be mounted.



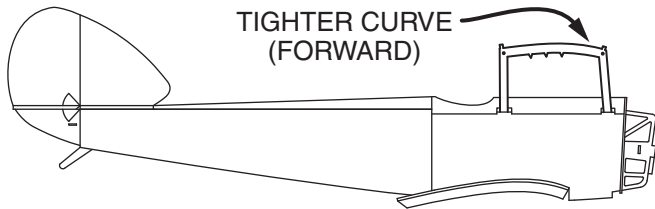
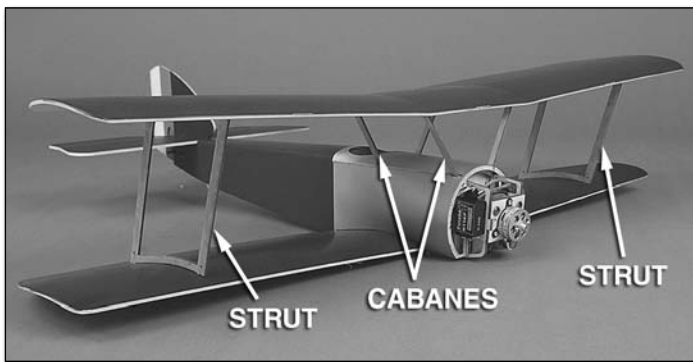
2. Mount the motor with the included (3) 2 x 5mm Phillips wood screws. Use the included adhesive-backed hook-and-loop strips, or double-sided foam tape (not included), to mount the receiver and ESC. Guide excess wiring behind each component inside the fuselage.

❑ 3. If you've mounted a 2.4GHz receiver as shown in the photo, guide one of the antennas back through the fuselage. The other antenna will be looped around the inside of the cowl when it is mounted later. If you've mounted a 72MHz receiver, guide the antenna down and out the bottom of the fuselage. Tape the antenna to the bottom of the fuselage in a few places so it will not get caught in the wheels or propeller or drag on the ground.

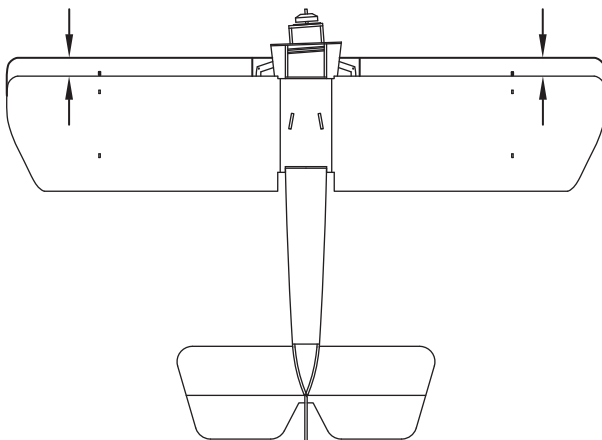
❑ 4. Test fit the cowl to make sure none of the wiring or the ESC or receiver interfere with the fit.

Mount the Top Wing and the Landing Gear

Refer to this picture while mounting the top wing.



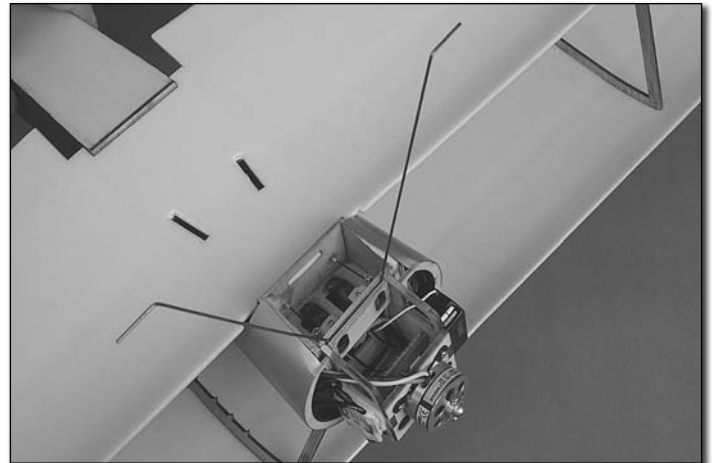
❑ 1. Test fit the cabanes into the fuselage so they are facing the correct direction as illustrated—the part with the “tighter curve” on the top goes forward. If necessary, trim the cutouts in the thin, plastic fuselage top so the cabanes fit easily, then glue them into position.



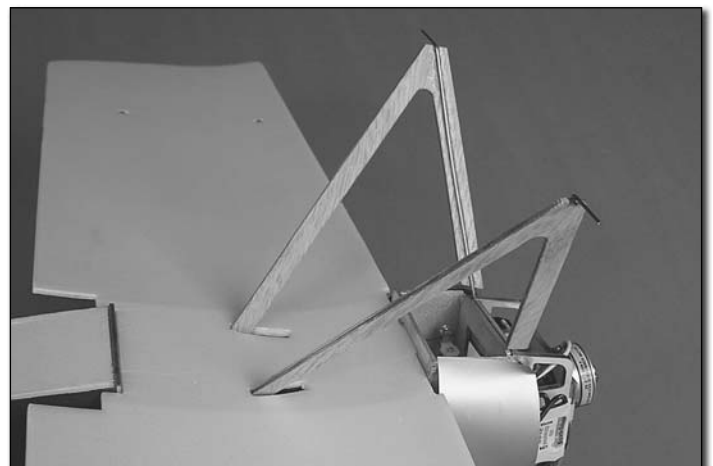
❑ 2. Test fit the top wing to the cabanes by fitting the tabs of the cabanes into the notches in the wing. View the model

from the bottom to make certain top wing is parallel with the bottom wing by “eyeballing” the leading edges. If necessary, trim the notches for the cabanes in the top wing to get it parallel with the bottom wing.

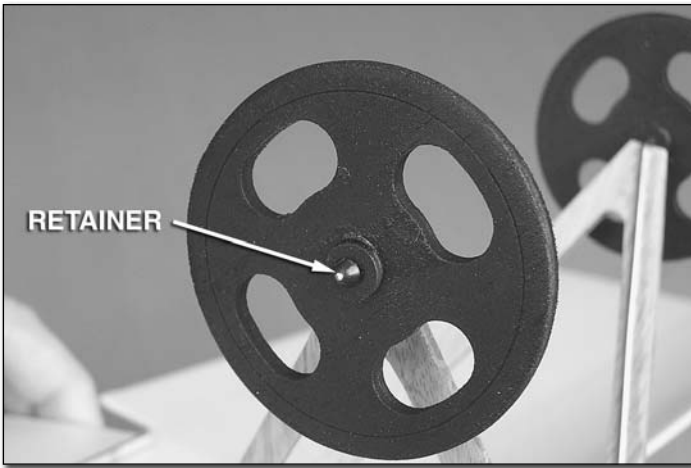
❑ 3. Holding the top wing to the cabanes in alignment with the bottom wing, glue the wing to the cabanes. Without adding any twist to the wings, glue the wing struts into position.



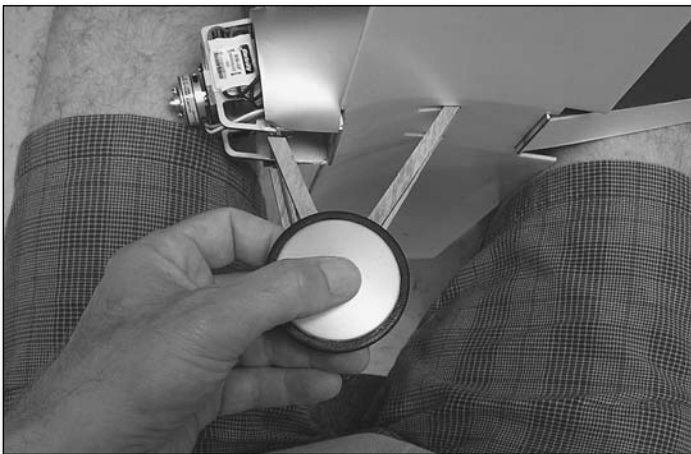
❑ 4. Wipe any residual oil or film from the main landing gear wire using a small paper towel scrap and denatured alcohol. Roughen the gear with medium-grit sandpaper so glue will adhere. Fit the gear into position. Note that it sweeps back. **Note:** The gear could be permanently glued into position, but it should fit tight enough so that no glue is required.



❑ 5. Test fit, then use CA to glue the plywood **landing gear covers** onto the gear wire. If necessary, trim the slots in the bottom wing to accommodate the braces.



❑ 6. Fit the wheels onto the gear followed by the small, black nylon **wheel retainers**.



❑ 7. Glue the **wheel covers** to the wheels—it may be necessary to cut a portion of the gear wire protruding from the wheel retainers to accommodate the covers. An easy way to glue on the hubs is to hold the plane in your lap with the wings vertical and the fuselage across your legs. Hold the cover in position with your thumb and your fingers around the other side of the wheels, and then apply medium CA all the way around.



❑ 8. Now that all the parts of the airframe have been glued together, reinforce the joints between the wings and the wood struts with J&Z Products RC-56 or white glue. Do the same for the tail surfaces.

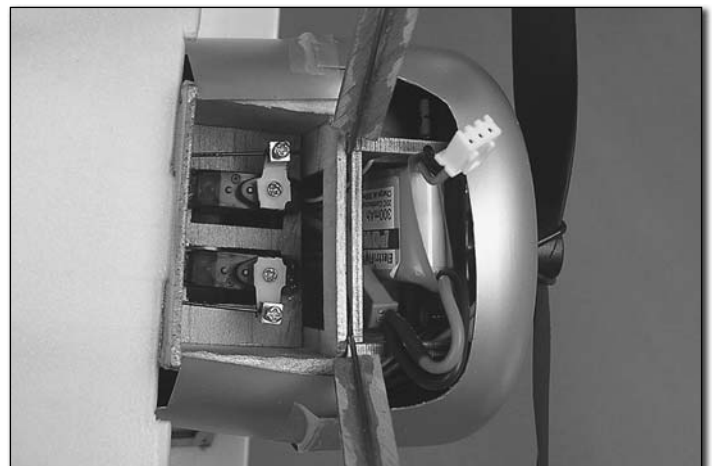
❑ 9. Glue the pilot into position.

Attach the Cowl and Add the Decals

❑ 1. Before attaching the cowl, connect your battery and turn on the radio and momentarily power up the motor to make sure it is turning the correct direction (counterclockwise when viewed from the front). If the motor is turning backwards, switch any two wires between the motor and ESC with each other.



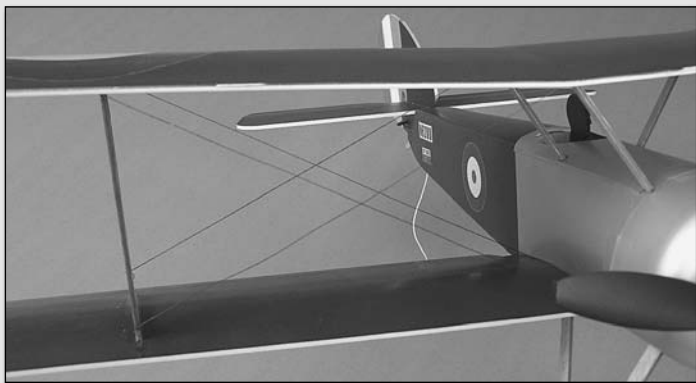
❑ 2. Fit the cowl into position. If using a 2.4GHz receiver, loop the second antenna (that is not inside the fuselage) around the inside of the cowl. Use a few pieces of clear tape to hold the cowl in place. Mount the propeller with the propeller saver O-ring.



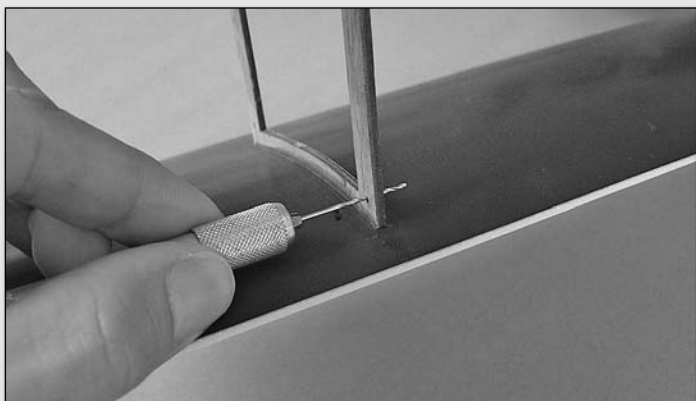
❑ 3. While we're working on the front end, cut a small strip of the softer "loop" side of the adhesive-backed hook-and-loop material and attach it to the middle of the battery. Test mount the battery in the fuselage.

❑ 4. Cut out the decals and carefully position on the model where shown on the kit box cover.

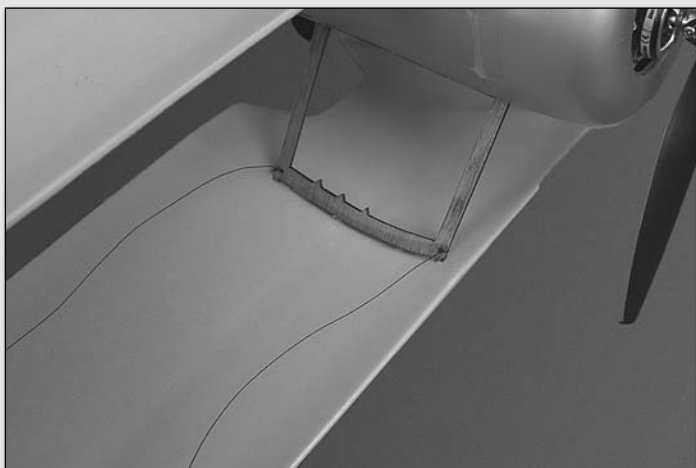
OPTIONAL: Add the Flying Wires



The flying wires are not included and are optional, but are one way to add realism and interest to your model. However, a little dexterity will be required to “lace them up.” If you wish to install the optional flying wires, use medium/heavy, black sewing thread, black carpet thread or any other lightweight line that seems appropriate. A wood toothpick or small wood dowel will also be required to anchor the ends of the lines down into the bottom wing at the fuselage.



❑ 1. If necessary, use a hobby knife or a pin vise with a small drill to reopen any of the holes in the canopies or wing struts that may have been covered with glue.

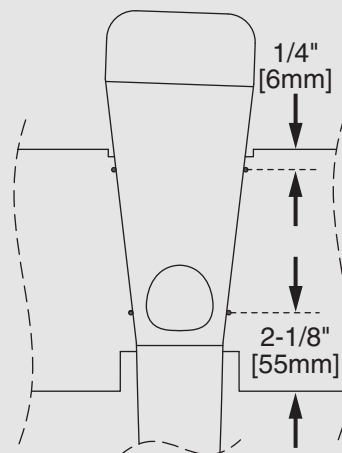
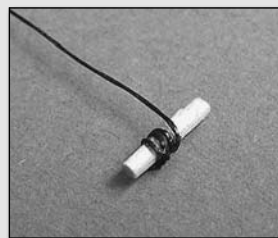


❑ 2. Cut four 20” [500mm] pieces of line. Turn the model upside-down and tie one end of each line to the canopies. After you tie each knot, add a drop of thin, foam-safe CA and cut off any excess line.

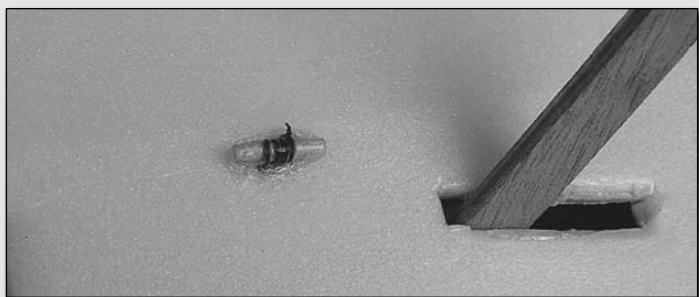


❑ 3. Turn the fuselage over. Using care to keep the lines just tight enough so they don’t sag, but not so tight as to introduce any warp into the wings, tie the other end of each line down to the holes in the bottom wing struts.

❑ 4. Cut four more 20” [500mm] pieces of line. Cut a toothpick or small wood dowel into four 3/8” [10mm] pieces. Tie one end of each string onto each dowel. Wrap each string around the dowel a few times, then set with a drop of thin CA.



❑ 5. Going down at an angle through the top of the bottom wing, use a pin to poke four holes for the strings on both sides of the fuselage where shown in the illustration.

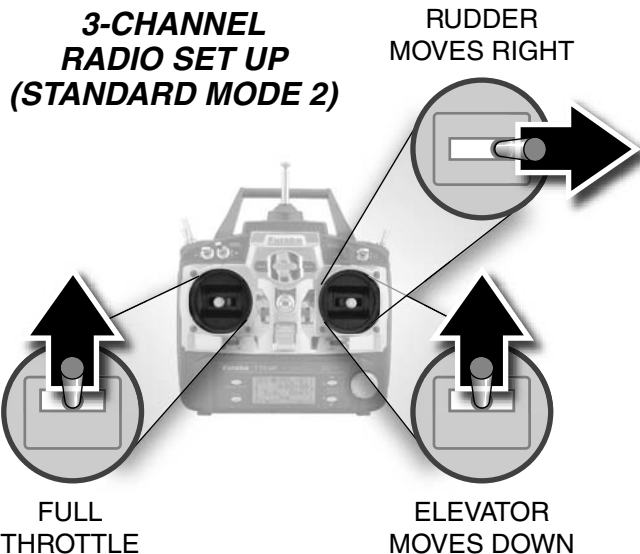


❑ 6. Guide the strings up through the holes in the bottom of the wing. Tie the other ends of the strings to the holes in the tops of the wing struts. Add a few drops of thin CA to the toothpicks in the bottom wing and to the knots on the ends of the strings at the struts. Cut off any excess line.

GET THE MODEL READY TO FLY

Check the Control Directions

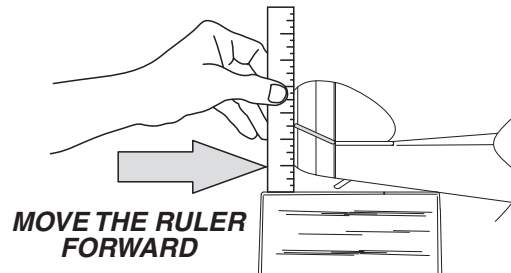
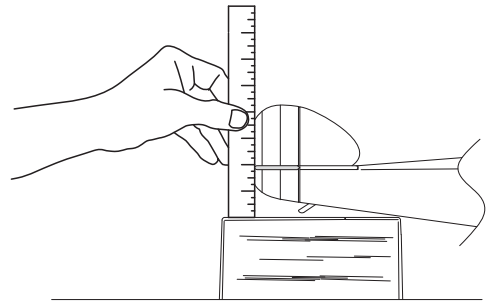
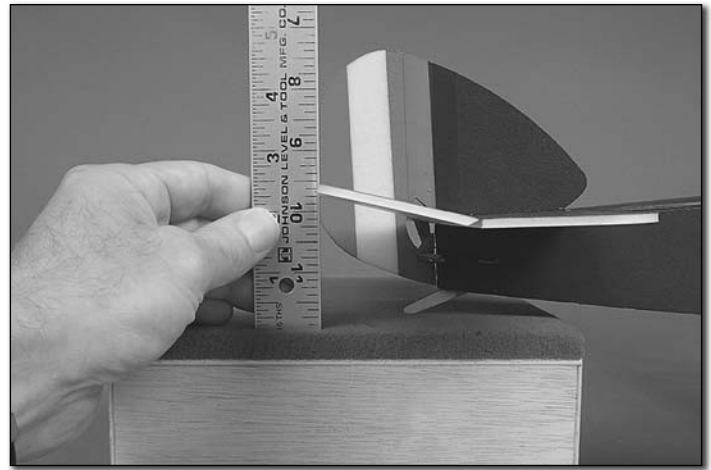
1. Connect the motor battery and turn on the transmitter and receiver and center the trims. Make sure the elevator and rudder are centered. If necessary, adjust the pushrods in the screw-lock connectors and center the elevator and rudder.



2. Make certain that elevator, rudder and throttle respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces have remained centered. Adjust if necessary.

Set the Control Throws

To ensure a successful first flight, fly your Sopwith Pup set up according only to the C.G. and control surface throws specified in this manual. The throws and C.G. are not arbitrary, but have been determined through extensive testing and accurate record-keeping. This provides you with the best chance for success and enjoyable first flights that should be surprise-free. Additionally, the throws and C.G. shown are true, real data which will allow the model to perform in the manner in which it was intended when flown by a pilot of the skill level for which it was intended. **DO NOT OVERLOOK THESE IMPORTANT PROCEDURES.** A model that is not properly set up may be unstable and possibly unflyable.



1. Prop up the rear of the fuselage on a box or something so the horizontal stabilizer will be level. Holding a ruler vertical, place it up against the trailing edge of the elevator and note the measurement. Use the transmitter to deflect the elevator. Keeping the ruler vertical, move it forward until it is touching the trailing edge of the elevator again. Note the new measurement. The difference in the two measurements is the control throw.

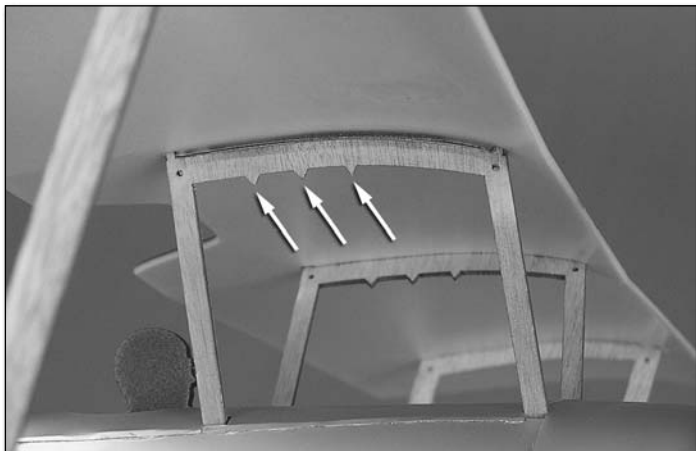
2. If you mounted the screw-lock connectors the correct distance (5/16" [8mm]) out on the servo arms, the throws should be correct (or very close). If necessary, use your endpoint adjustments in the transmitter to set the correct high and low rate throws.

3. Measure the rudder throw at the widest part of the rudder the same way.

These are the recommended control surface throws:				
	HIGH RATE		LOW RATE	
	Up	Down	Up	Down
ELEVATOR	5/8"	5/8"	3/8"	3/8"
	[16mm]	[16mm]	[10mm]	[10mm]
	17°	17°	10°	10°
RUDDER	Right	Left	Right	Left
	1-1/4"	1-1/4"	3/4"	3/4"
	[32mm]	[32mm]	[19mm]	[19mm]
	25°	25°	15°	15°

Balance the Model (C.G.)

At this stage the model should be in ready-to-fly condition with all of the systems in place including the motor, complete radio system, ESC, propeller and battery.



1. Note the “balance spikes” under the top of the canopies. These indicate the forward, aft, and recommended (middle) C.G. locations. For first flights it is recommended to balance the model at the middle location.



2. Lift the model with your fingers under the middle balance spikes. If the tail drops, the model is “tail heavy” and weight must be added to the nose to balance. If the nose drops, the

model is “nose heavy” and weight must be added to the tail to balance. If additional weight is required use segments of Great Planes “stick-on” lead (GPMQ4485). If nose weight is required, don’t attach it to the cowl. Attach any nose weight required to the firewall.

3. **IMPORTANT:** If you found it necessary to add any weight, recheck the C.G. after the weight has been installed.

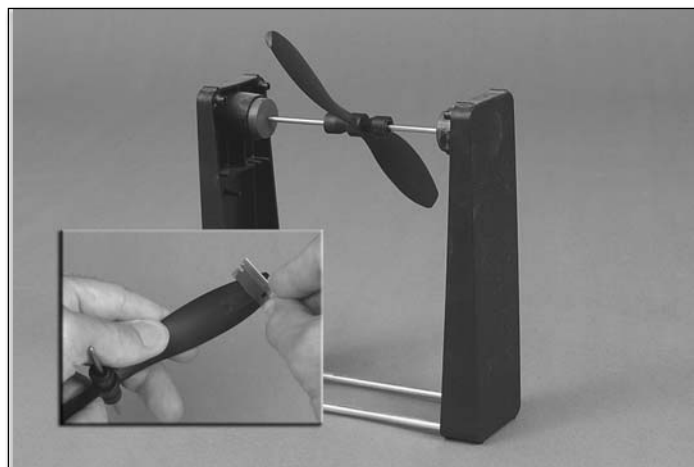
PREFLIGHT

Charge the Batteries

Follow the battery charging instructions that came with your radio control system to charge the transmitter batteries. You should always charge your transmitter and receiver batteries the night before you go flying, and at other times as recommended by the radio manufacturer.

CAUTION: Unless the instructions that came with your radio system state differently, the **initial** charge on **new** transmitter and receiver batteries should be done for 15 hours **using the slow-charger that came with the radio system**. This will “condition” the batteries so that the next charge may be done using the fast-charger of your choice. If the initial charge is done with a fast-charger, the batteries may not reach their full capacity and you may be flying with batteries that are only partially charged.

Balance Propellers



Take a few minutes to balance your propeller and a spare propeller before you fly. A balanced propeller will allow the motor run smoothly and efficiently. A severely unbalanced propeller can cause enough vibration to stress glue joints and cause screws to loosen.

If the propeller is unbalanced, use a single-edge razor blade or a hobby knife to scrape material off the heavy blade until you can get the propeller to balance.

MOTOR SAFETY PRECAUTIONS

Failure to follow these safety precautions may result in severe injury to yourself and others.

- Use safety glasses when starting or running motors.
- Do not run the motor in an area of loose gravel or sand; the propeller may throw such material in your face or eyes.
- Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you start and run the motor.
- Keep loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets away from the prop.

FLYING

Ground Check and Range Check

When you get to your flying site ground check the operational range of your radio before the first flight following the manufacturer's instructions that came with your radio. This should be done both with the motor off and with the motor running at various speeds. If the motor or control surfaces do not respond correctly or move erratically without command, **do not fly!** Find and correct the problem first. Look for loose servo connections or broken or loose motor or battery wires.

This model belongs to:

Name

Address

City, State Zip

Phone number

AMA number

Please fill in this identification tag and place inside your model.

Flight

The SlowFly Sopwith Pup is capable of "ROG" (rise off ground) takeoffs as long as the surface is smooth (as any indoor venue would be), but if flying outdoors over grass a hand-launch will be required. To hand-launch, hold the model by the fuselage just behind the cockpit and advance the throttle. Give the model a gentle push with a slightly nose-up attitude and let go. Allow the model to momentarily sink while it gains flying speed and work the controls to keep the wings and fuselage level. Once, after just a second or two, the model has gained sufficient flying speed, establish a gentle climb.

Once at "altitude" the first priority will be to trim the elevator and rudder so the model flies straight-and-level. Once the model has been trimmed continue to fly around for a few minutes getting used to how the model responds. If using dual rates, switch between the rates to see how the model responds. At a safe altitude, cut the power and see how the model reacts. Make sure there will be enough elevator to make a landing flair.

After flying around for a few minutes make a few landing approaches. Once you have an approach you "like," simply allow the model to land, applying elevator to execute the flair.

If there is enough battery power you could perform another takeoff and continue to fly around, or go back and change the battery (or recharge the battery you are using).

One final note about flying your model. Have a goal or flight plan in mind for **every** flight. This can be learning a new maneuver(s), improving a maneuver(s) you already know, or learning how the model behaves in certain conditions (such as on high or low rates). This is not necessarily to improve your skills (*though it is never a bad idea!*), but more importantly so you do not surprise yourself by impulsively attempting a maneuver and suddenly finding that you've run out of time, altitude or airspeed. Every maneuver should be deliberate, not impulsive. For example, if you're going to do a loop, check your altitude, mind the wind direction (anticipating rudder corrections that will be required to maintain heading), remember to throttle back at the top, and make certain you are on the desired rates (high/low rates). A flight plan greatly reduces the chances of crashing your model just because of poor planning and impulsive moves. **Remember to think.**

Have a ball! But always stay in control and fly in a safe manner

GOOD LUCK AND GREAT FLYING!