

# SPAD XIII GAS/GLOW/EP

## 1/5-SCALE ARF R/C SPORT-FLYER

# INSTRUCTION MANUAL



*Jacques Raphaël Roques*



*Shown with optional scale machine guns, engine and wooden propeller*



*Captain Eddie Rickenbacker*

The SPAD XIII was a World War I French fighter developed by the Société Pour L'Aviation et ses Dérivés (SPAD). Derived mainly from the earlier highly successful SPAD S.VII, its larger wings and rudder, more powerful engine, and twin Vickers machine guns made it superior to its predecessors and one of the most capable fighters of the war. The SPAD XIII was first flown on April 4, 1917; in May 1917 it was already being delivered to the French Air Service.

Faster than its contemporaries, the British Sopwith Camel and the German Fokker D.VII, the SPAD XIII was one of the most-produced fighters of WWI, with at least 8,472 built before the Armistice, barely a year and a half later on November 11, 1918.

Famous French pilots such as Georges Guynemer and Rene Fonck initially flew the SPAD XIII. Then, following the death of Quentin Roosevelt in a Nieuport 28, the Americans and other Allied forces also switched over to fly the SPAD XIII. Among the Allied aces who flew the SPAD XIII were Eddie Rickenbacker (America's leading ace with 26 victories – whose aircraft is on display at the National Museum of the U.S. Air Force near Dayton, Ohio) and American ace Frank Luke (who had 18 confirmed victories, was the first airman to receive the Medal of Honor, and in whose honor Luke Air Force Base is named). Francesco Baracca, Italy's top World War I ace with 34 aerial victories was another high-scoring Allied pilot who flew a SPAD XIII.

This project to model the SPAD XIII was started in late 2009. We based our version on pilot Jacques Raphaël Roques' SPAD XIII of the WWI French Air Service, SPA48, Aircraft Serial Number S1893.

This ARF is designed for a gas, glow, or electric power. Adjustable engine and motor mounting boxes are included, and the model is close in scale to the actual SPAD XIII (though some necessary changes were made to meet the needs and expectations of RC pilots as well as the requirements of factory-production).

***We invite you to enjoy the pride of ownership and the joy of flying  
this beautiful model of the famous SPAD XIII.***

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## TABLE OF CONTENTS

I. Safety Precautions & Assembly Tips .....	2	V. Parts List .....	5
II. Warranty, Liability Waiver & Return Policy ..	3	VI. Assembly Instructions .....	6
III. Specifications .....	4	VII. Setup & Adjustments .....	16
IV. Special features .....	4	VIII. Preflight Checks .....	16

### I. SAFETY PRECAUTIONS & ASSEMBLY TIPS:

#### ***(IMPORTANT – READ THIS SECTION BEFORE YOU BEGIN ASSEMBLY)***

1. This product should not be considered a toy, but rather a sophisticated, working model that functions much like a full-scale airplane. Because of its performance capabilities, this product, if not assembled and operated correctly, could cause injury to you or spectators and damage to property. Maxford USA provides you with a high-quality, thoroughly tested model airplane kit with assembly instructions. However, the quality and capabilities of your finished model airplane depend on how you assemble it, and your safety depends on how you use and fly it. Any testing or flying of this model airplane is done entirely at your own risk.
2. Assemble this model airplane according to these instructions. Do not alter or modify the model beyond the assembly and power system options covered in these instructions, as doing so may result in an unsafe or unworkable model. In a few cases the instructions may differ slightly from the photos; in those instances the written instructions should be considered as correct. If you have any question or concern about these instructions, before you proceed with assembly of this product, contact your dealer, or speak to a Maxford USA customer service representative at 562-529-3988 (Monday through Friday, except national holidays, 9 AM to 5 PM Pacific time).
3. While this kit has been flight-tested to meet or exceed our rigid performance and reliability standards in normal use, if you elect to perform any extremely high-stress flying, such as racing or advanced aerobatics, or if you install a larger power system than specified, you (the buyer or user of this product) are solely responsible for taking any and all necessary steps to reinforce the high-stress points and/or substitute hardware that is more suitable for such increased stresses.
4. Throughout the lifetime of this model, use only the Maxford USA-recommended or same-sized engine or motor and a new or well-maintained radio control system and batteries recommended by the maker of your engine or motor and radio system.
5. It is your responsibility to install the R/C system and other components in such a way that this model airplane passes all applicable safety/range tests and that the power system and controls operate correctly and smoothly.
6. Recheck the operation of this model airplane before every flight to ensure that all equipment is still operating correctly and that the model has remained structurally sound. Also before every flight, check all electrical and/or structural connections; do not fly without replacing any that you find damaged or worn.
7. Before you begin assembly of this model airplane, read all instructions and test-fit each part to ensure you fully understand the instructions and that no parts are missing, damaged or unsatisfactory. (Note: Temperature and/or humidity differences and changes between the factory, our warehouse and your home workshop may indicate the need for slight adjustment to the wing saddle and/or the horizontal stabilizer's mounting platform to ensure the wing is parallel to the horizontal stabilizer; however, we recommend you contact us before you attempt any such adjustments.)
8. If you are not an experienced R/C pilot or have not flown this type of model before, we strongly urge you to get assistance from an experienced R/C pilot.
9. To help ensure the security of the servo connections, we recommend you install optional Maxford USA servo extension safety clips wherever servo-leads are connected to any servo extender or Y-cable.



10. After you have determined each servo-mounting-screw location, apply thin CA adhesive to harden the wood where the servo's mounting screws will be inserted.
11. Use the tip of a hot soldering iron to burn and remove any Mylar covering material that may prevent you from obtaining good wood-to-wood gluing surfaces (such as at the bottom of the horizontal stabilizer, between it and its mounting platform at the end of the fuselage).
12. Use 30-minute epoxy to permanently attach critical parts (such as where the horizontal stabilizer is attached to its mounting platform at the end of the fuselage).
13. If you have concern about the security of any factory fabrication procedure(s), we recommend you apply 30-minute epoxy around the perimeter of such part(s) as an extra safety precaution.
14. A length of string may be supplied by the factory to pull your servo's lead, servo extension, or Y-cable through the airframe to your radio receiver; however, you might find it easier to use a little masking tape to temporarily attach the connector to the end of a length of coat hanger wire, then use the coat hanger wire to PUSH the lead and its connector through the airframe.
15. After you have adjusted each clevis into its position and secured it on its pushrod with the supplied jam nut, we recommend you then also apply a drop or two of thin CA adhesive to make this adjustment permanent. Also apply a thread-lock compound to secure your engine or motor mounting hardware from vibration.
16. To use a crimp tube to attach one end of a pull-pull cable to a brass rod and clevis ...
  - a) Slide the crimp-tube onto the end of the cable.
  - b) Pass the end of the cable through the small hole in the end of the brass rod.
  - c) Bring the end of the cable back into and all the way through the crimp tube.
  - d) Loop the end of the cable back into the crimp tube, but this time leave the end of the cable inside the crimp tube. (Using pliers, slide the cable inside the crimp tube to adjust the loops.)
  - e) Use your pliers to firmly squeeze several places along the length of the crimp tube to securely crimp the tube onto the cable.
  - f) Snug the lock nut against the clevis to anchor the clevis to the brass rod.
  - g) Apply thin CA adhesive to permanently anchor both brass rods into their clevises.
17. This model includes some fiberglass and/or carbon-fiber reinforced parts. If you drill, grind or sand a fiberglass or carbon-fiber reinforced part, never blow into the part to remove fiberglass or carbon fiber dust (the dust may blow back into your face), and always wear safety goggles, a particle mask and rubber gloves to guard yourself from eye, skin and respiratory-tract irritation.
18. Check the Mylar covering material's joints and surfaces; if necessary, carefully use a dedicated covering-material iron (do NOT set the iron's temperature too high) to secure the edges and to tighten any loosened areas. Recheck and retighten from time to time.



## II. WARRANTY, LIABILITY WAIVER & RETURN POLICY:

Maxford USA guarantees this kit to be free from defects in material and workmanship at the time of purchase. All our products have been inspected in our factory and are checked again when shipped from our warehouse. However, Maxford USA cannot directly control the materials you may use nor your final assembly process. Therefore, Maxford USA can NOT in any way guarantee the performance of your finished model airplane. Furthermore, in purchasing this product, you (the buyer or user of this product) exempt, waive, and relieve Maxford USA from all current or future liability for any personal injury, property damage, or wrongful death, and if you (the buyer or user of this product) are involved in any claim or suit, you will not sue Maxford USA or any of its representatives.

If you do not fully accept the above liability and waiver, you may request a return-merchandise authorization number (RMA#) as explained in item 2 on the following page.

If you think there is a missing, damaged or unsatisfactory part, please read our after-sales service and return policy, below.

1. Inspect your order upon delivery for any missing, damaged or unsatisfactory part(s). If you believe there is a problem, you must call us at 562-529-3988 (Monday through Friday except holidays, between the hours of 9 AM and 5 PM Pacific time) before you begin assembly and within 10 days from receipt of your purchase. During this telephone conversation, and with your support, we will determine how to resolve your concern.
2. To request a return-merchandise authorization number (RMA#), call 562-529-3988 (Monday through Friday except holidays, between the hours of 9 AM to 5 PM Pacific time). If we elect to issue you an RMA#, you must clearly mark this RMA# on the outside of the package. (No return or exchange will be authorized after 10 days from the date of your receipt of the product; any package delivered to us without a Maxford USA RMA# is subject to being returned to the sender, as received, with return postage payable upon delivery.) Returned merchandise must be in its original condition as received from Maxford USA, with no assembly or modification, in the product's original packing materials, complete with all manuals and accessories. Return shipping and insurance charges must be prepaid by you, the buyer.
3. Returned merchandise that is accepted by Maxford USA for credit is subject to a 10% to 20% restocking fee (the final amount will be determined by Maxford USA upon receipt and examination of the returned merchandise).

Return Address:

**Maxford USA RC Model Mfg, Inc.**  
**15247 Texaco Avenue**  
**Paramount, CA 90723**

IMPORTANT: Print the RMA# issued by Maxford USA near the above address.

### III. SPECIFICATIONS:<sup>\*</sup>

Wingspan .....	68-inches
Wing Area .....	885 sq. inches (combined, top and bottom wings)
Length .....	53-inches (includes prop on recommended engine)
ARF weight .....	10 pounds
Flying weight (complete with CRRC 26CC gas engine, batteries and radio system) .....	13 pounds
Power System (not included) .....	Gas – 26CC, Glow – 90-120, or Equivalent Electric (plus batteries and switches corresponding to your Power and Radio Systems' needs)
Propeller (not included) .....	16 to 18 inch diameter (as recommended by your power system's manufacturer)
Radio system (not included) .....	Minimum of 4 channels with 5 standard servos (Hitec HS311 or equivalent, x5)

<sup>\*</sup>(Dimensions and weights are approximate.)

### IV. SPECIAL FEATURES OF THIS ARF SPAD XIII:

- Realistic looking pre-trimmed windshield and pre-painted scale-looking fiberglass cowl with wooden louvers.
- The wings are easily removable in left and right pairs for transport, storage, and in-field setup.
- Wing wires are included. (Since the wing wires are not functional, wing wire installation is optional.)



- True-to-scale twin exhaust pipes. (An optional upgrade kit allows both exhaust pipes to be connected to a gas-engine's muffler.)
- The fuselage, wings and empennage are jig-assembled, laser-cut balsa and light plywood, finished with Mylar covering material; the rudder is operated by pull-pull cables; a steerable tailwheel is included.
- Includes a plywood box to securely mount and adjust for the depth of most power systems, plus an additional motor box for an electric power setup.
- The cockpit hatch is secured by a magnetic anchor.
- Includes scale markings for WWI French pilot Jacques Raphaël Roques' SPAD XIII aircraft serial number S1893.
- Precut mounting slots inside the cockpit for radio and ignition power switches.
- Scale-looking landing gear and wheels.
- Available optional scale Vickers machine guns and matching 1/5-scale WWI pilot figure.



## V. PARTS LIST:

### 1. Items you must supply

- Epoxy and cyanoacrylate (CA) adhesives, Micro Balloons or equivalent filler, masking tape, a high-speed rotary tool, a soldering iron or wood burning tool and common hand tools (such as screwdrivers, long-nosed and cutting pliers, etc.).
- Five(5) servos (see 'Specifications' on page 4), two 18-inch extender cables, one 12-inch Y cable, and a four-channel (or more) radio control system.
- Gas, glow or electric power system and 16 to 18 inch diameter propeller.
- Any batteries and switches required for your ignition, electric power and/or radio system.
- Options: 1/5-scale Vickers machine guns; WWI pilot figure; and an exhaust manifold system for connecting your gas engine's muffler to the supplied twin exhaust pipes.

### 2. Included items

- Rudder cables, aileron, elevator and throttle pushrods and all related linkages; precut rudder, elevator and throttle servo mounting trays.
- Precut hinge slots; CA hinges, control horns, clevises and pushrods, and all required hardware (except those items normally supplied with servos, an engine or a motor).
- Pre-trimmed, ready-to-install windshield, pre-painted fiberglass cowl, twin scale exhaust pipes, pre-covered fuselage, wing panels, vertical and horizontal stabilizers, rudder and elevator, and complete set of scale markings.
- Wing rods, cabanes, struts, wing wire and wing-to-fuselage hardware.
- Cockpit hatch with magnetic anchor.
- Scale-looking landing gear.
- Steerable tailwheel.
- This illustrated Instruction Manual.



## VI. ASSEMBLY INSTRUCTIONS:

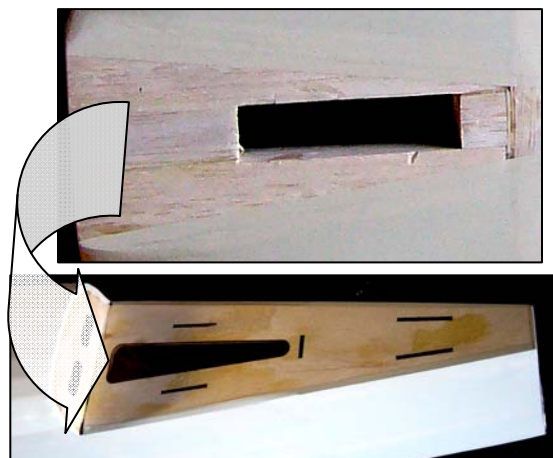
### Step 1. AILERONS

1. Drill 1/16-inch guide holes in the supplied hardwood blocks and attach your aileron servos to the blocks with the mounting screws provided by the manufacturer of your servos.
2. Connect your aileron servos to your radio, power ON the radio, and 'center' both servos. Disconnect the servos and set aside your radio system, then connect each aileron servo to one of your aileron-servo-wire extensions.
3. Center the aileron servo arms in their precut slot in the servo mounting plates and use 5-minute epoxy to secure the blocks (and the aileron servos) to the servo mounting plates.
4. Guide each aileron servo extension from the root rib to each aileron servo's wing opening.
5. Mount a control horn to each aileron and connect an aileron push-rod to each aileron control horn. (Note: One owner prefers to use QuickLinks pushrod connectors as shown below.)
6. Insert the provided CA hinges into the precut aileron hinge slots and insert the free end of each CA hinge into its corresponding precut slot in the upper wing panels.
7. Being careful to ensure the inner end of each aileron does not bind against the cutout in its mating wing panel, and also being careful to leave enough clearance between the trailing edge of each wing panel and its aileron to allow full UP and DOWN aileron travel, apply thin CA to secure each aileron hinge to its wing panel and aileron.
8. Temporarily hold each aileron in a 'neutral' position by applying a small piece of masking tape between each aileron and the trailing edge of its wing. Attach the free end of each aileron pushrod to each aileron-servo's control arm and adjust the clevis to hold the aileron in its 'neutral' position.
9. Secure the aileron clevises in position on their pushrods with the supplied jam nuts and apply a drop or two of thin CA adhesive to make each adjustment permanent.
10. Remove the masking tape between the ailerons and the wing, and set the upper wing panels aside.

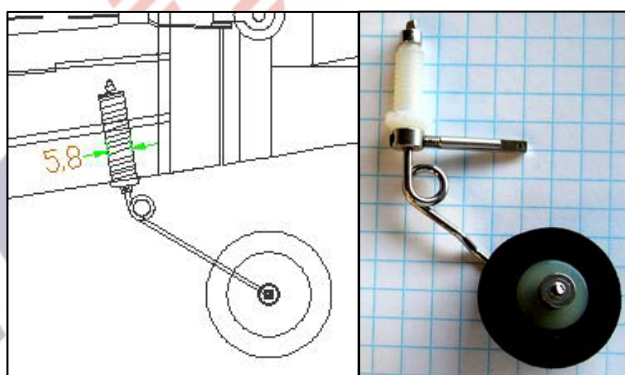
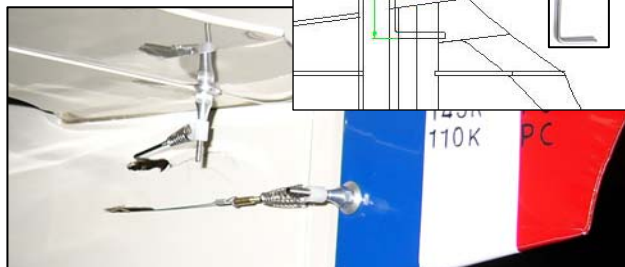
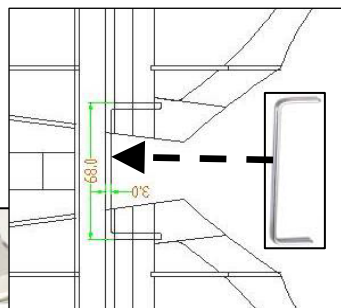


### Step 2. TAIL SURFACES AND TAILWHEEL

1. Using a soldering iron, burn and remove the covering material to obtain good wood-to-wood gluing surfaces between the bottom of the horizontal stabilizer and its mounting platform at the end of the fuselage.
2. Use 30-minute epoxy to permanently attach the horizontal stabilizer to the end of the fuselage.
3. Test-fit the vertical stabilizer in its opening on top of the horizontal stabilizer. Use a soldering iron to burn (or cut) and remove any excess Mylar covering material from the base of the vertical stabilizer to obtain good wood-to-wood gluing surfaces between the vertical and horizontal stabilizers.
4. Use 30-minute epoxy to secure the vertical stabilizer at all its points of contact with the horizontal stabilizer and where the vertical stabilizer's lower 'post' must be aligned and joined to the end of the fuselage.

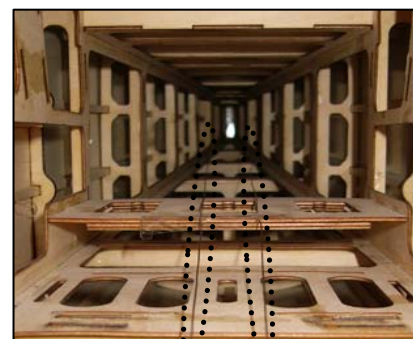
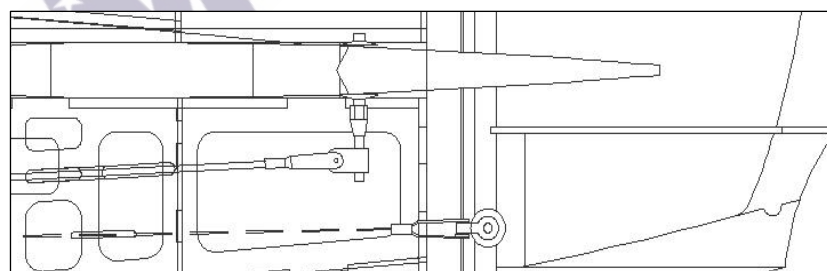


5. As illustrated at the right, this model uses a metal joiner to connect the two halves of the elevator. Ensure the joiner is well-secured inside both halves of the elevator with 5-minute epoxy.
6. Use thin CA adhesive, the supplied CA hinges, and the precut hinge slots to mount the elevator to the horizontal stabilizer and the rudder to the vertical stabilizer.
7. Using the predrilled holes, mount the control horns to the rudder and elevator.
8. Using the predrilled hole under the horizontal stabilizer in the bottom of the fuselage, install the tail-wheel assembly by twisting its threaded nylon housing fully into the fuselage. Apply a drop of thin CA where the base of the housing touches the fuselage.
9. Attach one end of the supplied tailwheel steering spring to the tailwheel's tiller arm. Stretch the spring 1 1/2-to-2 times its normal length and use a wood screw to anchor the loose end of the spring to the bottom of the rudder. Use thin CA adhesive to harden the hole where the spring's screw attaches rudder.
10. Guide the supplied rudder cables through the slots on each side of the fuselage under the horizontal stabilizer and to the rudder servo tray inside the cockpit. (HINT: *a.* As shown below, shine a bright light through the fuselage to locate these slots. *b.* Attach a small weight to the cables to guide them to the servo tray or use a length of coat hanger wire to push each wire through the fuselage.)



*Open one side for the elevator's pushrod.*

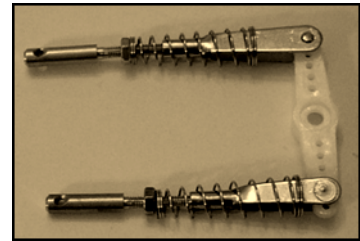
*Open both sides for the rudder's pull-pull cables.*



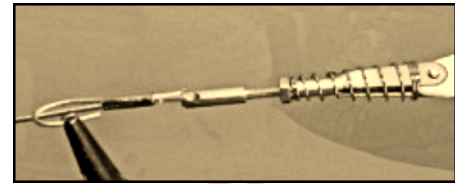
*The rudder's pull-pull cables as viewed through the opening in the nose of the fuselage.*

11. Remove the control arm from your rudder servo. Twist a brass rod with a retainer-spring and lock nut into two supplied clevises.

12. Attach the clevises to each end your rudder servo's control arm, then attach one end of each rudder cable to each brass rod.
13. Use the hardware provided with your servo to install the rudder servo in the center opening of the fuselage's preinstalled servo tray. Secure the rudder servo's control arm to your rudder servo.



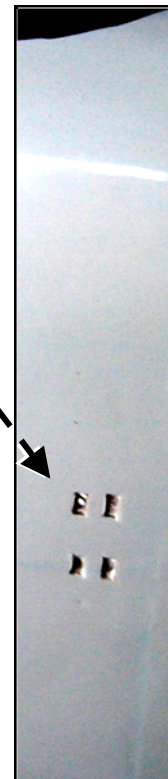
14. Apply masking tape to temporarily hold the rudder in a 'straight-ahead' position. At both sides of the rudder, draw the rudder cables 'snug' between the rudder servo's control arm and the rudder's control horn and secure the rudder cables to their brass pull-rods with crimp tubes. (Do not pull so hard on either cable that you pull the servo arm or rudder from their centered positions.)



15. With both tubes crimped onto their cables, snip off the excess rudder cable's ends with a pair of cutting-cutter pliers and discard the excess cable.
16. Snug the nut on each of the rudder's brass pull-rods against its clevis and permanently anchor each brass pull-rod in its clevis with thin CA adhesive. Remove the masking tape you applied to hold the rudder straight.
17. Insert the elevator pushrod through the nose of the fuselage and out through the opening under the vertical stabilizer (as shown in the photo and diagram on the left side of page 7). Using the provided clevis, attach the elevator pushrod to the elevator control horn. Using the hardware provided by your servo's manufacturer, install your elevator servo in the left-side opening of the fuselage's servo tray. Use the provided clevis to attach the forward end of the pushrod to your elevator servo.
18. Center the elevator servo and adjust the elevator pushrod's clevises to center the elevator. Snug the lock nuts against the elevator pushrod clevises. Permanently anchor each clevis to its pushrod with thin CA adhesive.
19. As a safety precaution, double-check that every brass rod's lock nut is snugged against its clevis and that every brass pull-rod is permanently anchored into its clevis with thin CA adhesive.

### Step 3. FUSELAGE

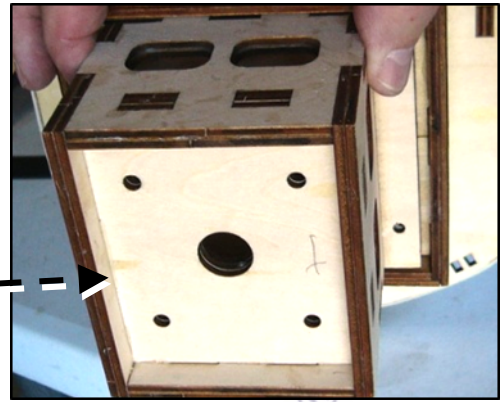
1. If you use a gas or glow engine, use the hardware provided with your servo to install the throttle servo in the right-side opening of the fuselage's preinstalled servo tray. (Harden the servo-tray's wood for the screws with thin CA adhesive.)
2. Test-fit the exhaust header pipes at the openings on each side of the nose and in the indentations below each side of the cockpit.
3. Align and secure the exhaust pipe's 'foot-steps' to the indentations in the fuselage using 5-minute epoxy. Mix Micro Balloons or an equivalent filler with your 5-minute epoxy and wood screws to secure both of the exhaust header pipes to the wood that extends forward of both sides of the fuselage. Apply extra epoxy and filler to the two extra-long front exhaust pipes at both the inside and the outside of the wood to ensure both the exhaust pipes are well-secured.
4. To make use of the engine mounting box's built-in tilt and offset, position your engine so its propeller's backplate is centered on the lines drawn on the engine mounting box's firewall. Also test-fit the cowl (but wait until #11 on the next page before you make the final adjustment of the space between the back of the propeller and the front of the cowl).



5. Mount your engine to the engine-box's firewall:
  - a. For a gas engine, use your engine's supplied blind nuts, mounting bolts, standoffs, washers, etc.
  - b. For a glow engine, use an engine mount (not supplied) sized to fit your particular engine.

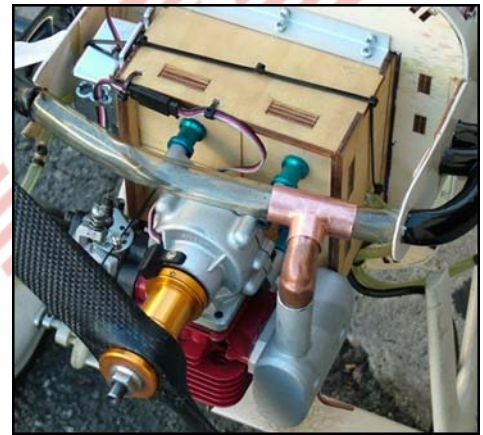
6. If you are using electric power, use the mounting hardware supplied with your motor to attach your motor to the included EP motor box, then attach the EP motor box to the front of the engine box.

(Remember to use a thread-lock compound to secure your engine or motor mounting hardware from vibration.)



7. If you use a gas or glow engine, install the supplied fuel tank inside the engine mounting box. Route all required fuel lines (such as the 'clunk' line for the carburetor, a vent line, and a line to fill the tank). Install the throttle-control linkage and your throttle servo.

8. If you use a gas engine, install a 'kill' switch and/or any extra linkages or controls required by your engine. Test-fit the ignition module at either side of your engine and route the ignition module's power, sensor and sparkplug wires. Before securing your engine and related components, apply a coat of 5-minute epoxy to seal and fuel-proof all exposed/raw wood.



9. If you use a gas engine and will install the optional exhaust-manifold system, connect the engine's muffler to the SPAD XIII's twin exhaust pipes by following the instructions included with the manifold system.

10. If you use electric power, use the space in front of your rudder and elevator servos for the power-system's batteries; mount your electronic speed control (ESC) above or on either side of the EP motor box.

11. Adjust the position of the engine box to fit your engine or electric power system as follows:
  - a. If you are using a gas or glow engine, temporarily remove the spark- or glow plug from your engine. Slide the cowl into position.
  - b. Temporarily mount your propeller to your engine or motor; slide the engine mounting box forward or backward within its opening in the fuselage so there is approx. 1/2-inch of clearance between the back of your propeller and the front of the cowl.

12. Being careful to not move the engine mounting box, remove and set aside the cowl and your propeller. Using wood screws, attach a piece of aluminum L-channel to the top and at the bottom of the engine mounting box as well as to the SPAD's firewall. Harden the holes in the wood where the engine mounting box will be secured with thin CA adhesive.

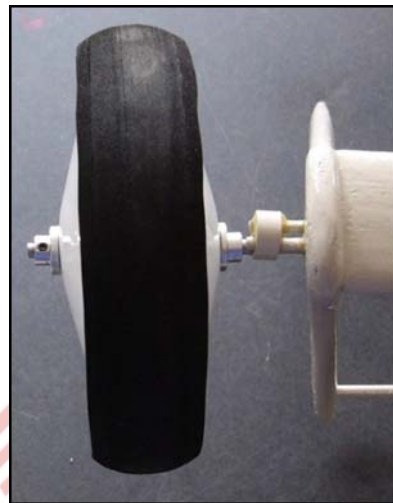
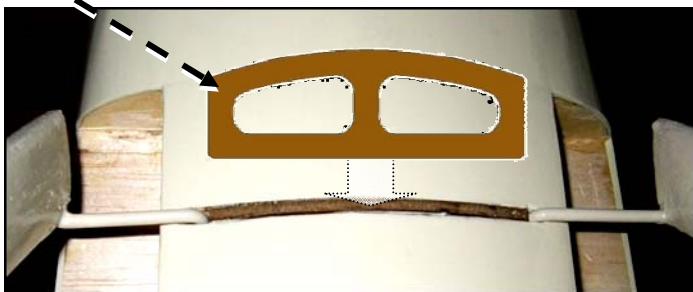
**IMPORTANT:** If you use a gas- or glow-fueled engine, you will need access to the fuel tank and fuel lines for periodic maintenance; therefore, you must NOT glue your SPAD XIII's engine mounting box into the fuselage if you use an engine.

13. Make all necessary openings in the cowl for your engine's exhaust pipe(s), sparkplug and high-voltage lead, etc. (WARNING: Wear your safety goggles, a particle mask and rubber gloves.)
14. Slide the cowl into position. Use a 1/16-inch drill-bit to make 6 to 8 guide holes evenly spaced around the back-edges of the cowl. Harden all guide holes where the cowl will attach to the fuselage with thin CA adhesive. Drive screws through the guide holes to attach the cowl to the fuselage.
15. If you will install the optional Vickers machine guns, attach them to the cowl by following the instructions included with the guns.

16. Install your radio receiver, switch and radio's power supply (such as a NiMH NiCd battery, BEC, or the ESC's built-in 5-volt power supply, etc.), as recommended by your radio's manufacturer.
17. Set up your radio system's servo-control throws for the rudder, elevator, throttle, and any other controls (such as an engine kill switch, choke control or other device) you may have installed.

#### Step 4. Main landing gear

1. Slide the main landing gear's wheels onto their axles and secure each wheel with the supplied wheel collars and set screws.
2. Press the main landing gear's rear crossmember fully into the slot in the bottom of the fuselage, then press the landing gear's wooden retainer down into this same slot.



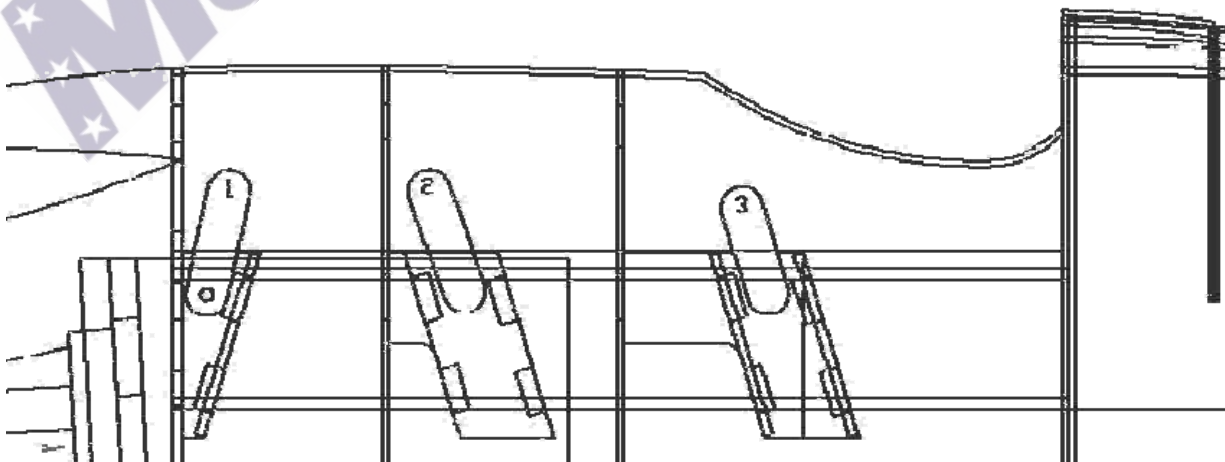
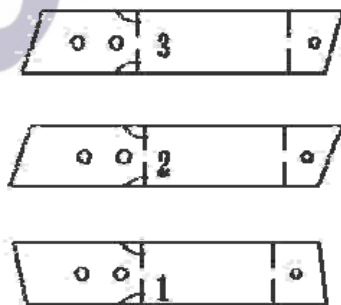
3. Press the landing gear's front crossmember into its mounting slot under the fuselage's nose. Use the supplied metal straps, 5/8-inch machine bolts, and pre-installed blind nuts to secure the main landing gear's front crossmember to the fuselage.



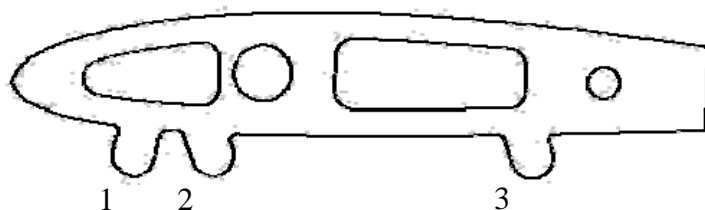
#### Step 5. Wings, Windshield and Flying Wires

1. Test-fit the six cabane struts into the fuselage's openings as 'keyed' by the numbers 1, 2, and 3 illustrated at the right and below.

(NOTE: The angle at the base of each cabane must correctly align with the base of its opening in the fuselage.)



2. With all six cabanes temporarily positioned in their openings in the fuselage, test-fit the mounting tabs on the upper wing's center section to confirm the top of each cabane correctly aligns with each of the corresponding mounting tabs on the upper wing's center section.



3. When all six cabanes are correctly positioned in the fuselage, set aside the upper wing's center section. Drill a 1/16-inch guide hole through the lower, exposed portion of each cabane, into the inboard plywood surface of each opening in the fuselage. Drive a wood screw through each guide hole to secure each cabane into its opening in the fuselage.

4. Center the supplied windshield in front of the cockpit and secure it to the fuselage with three wood screws.
5. Insert both of the lower wing's joiners midway through the fuselage. Slide one of the lower wing panels onto the joiners and position this wing panel snugly against the fuselage.



6. Slide the remaining lower wing panel onto the remaining exposed ends of the wing joiners and gently press both wing panels against the fuselage.

7. Test-fit the RETAINER (pictured in white and with the lower wing removed for clarity) by positioning it between the rear landing gear crossmember and the two lower wing panels, with two of its mounting holes behind the landing gear crossmember so that it covers the slot in the bottom of the fuselage and secures the main landing gear's rear crossmember and wooden retainer and with its remaining two holes extending out onto the lower wing panels.

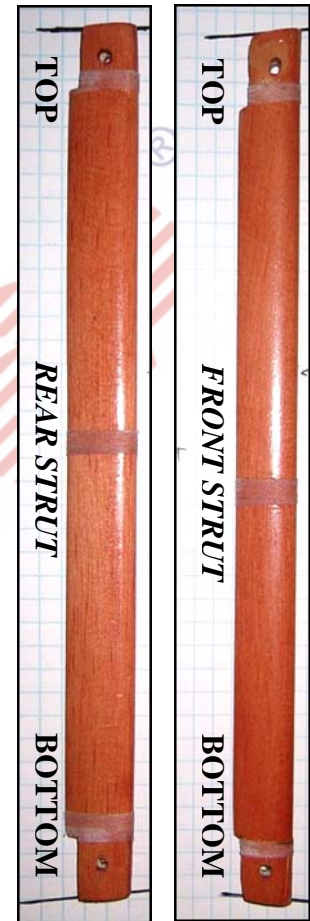


8. Drill 1/16-inch guide holes through the retainer and into the fuselage both the lower wing panels as shown above.
9. Apply thin CA adhesive to harden the four guide holes where the retainer will be mounted, and secure the retainer to the lower wing panels and to the fuselage with four wood screws.
10. Install the cockpit hatch (secured with its preinstalled magnet). If you will add an optional Maxford USA 1/5 scale WWI pilot figure, 'glue' it into position on the cockpit hatch with a dab of silicone or equivalent caulking. (Some customers prefer to use 5-minute epoxy.)
11. Place the ailerons' Y-cable inside the upper wing's center section with its female connectors positioned so they are accessible at the center section's root ribs. Using a sharp blade, remove the Mylar that covers a precut hole in the bottom of the center section, and guide the Y-cable's male connector out through this hole.

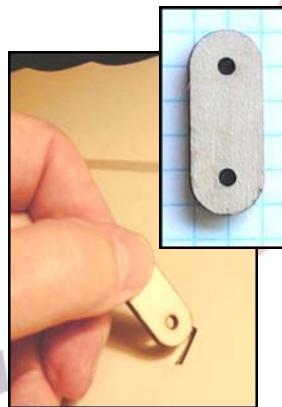
12. Insert and center the upper wing's joiners through the upper wing's center section. Slide both the left and the right top wing panels onto these joiners. As each top wing panel gets near the wing's center section, connect each wing panel's servo extension to the Y-cable at the center section's root rib. (Reminder: To help ensure the security of these servo-extension connections, we recommend you install an optional "servo-extension safety clip" at each servo/extender junction.)



13. Gently press the upper wing panels against the center section to form the complete upper wing. (NOTE: In the following steps the upper and lower wings will be joined into left- and right-hand pairs. There is little or no force acting to separate the wing panels from the center section, but some ultra-conservative customers like to apply a short length of transparent tape on the bottom of the upper wing between the cabanes to 'secure' the each wing panel to the center section. If you use tape, remember to always remove the tape before trying to remove the wings for transport and storage, and apply new transparent tape during your next preflight setup.)



14. Insert a wooden strut-mounting tab into each opening in the top surface of the left and right lower wing panels. Secure each tab with thin CA adhesive. Repeat this process to install and secure all the wooden strut-mounting tabs into in the openings in the bottom surface of the left and right upper wing panels.



15. Using the photos of struts at the right as your guide, test-fit the bottom ends of the front and rear struts to the lower wing's strut mounting tabs. Attach the struts with bolts and nuts.

16. Position the upper wing's center section with its wing panels above the cabanes and struts. Carefully guide the wooden mounting tabs for each cabane and wing strut to their corresponding cabane and strut.

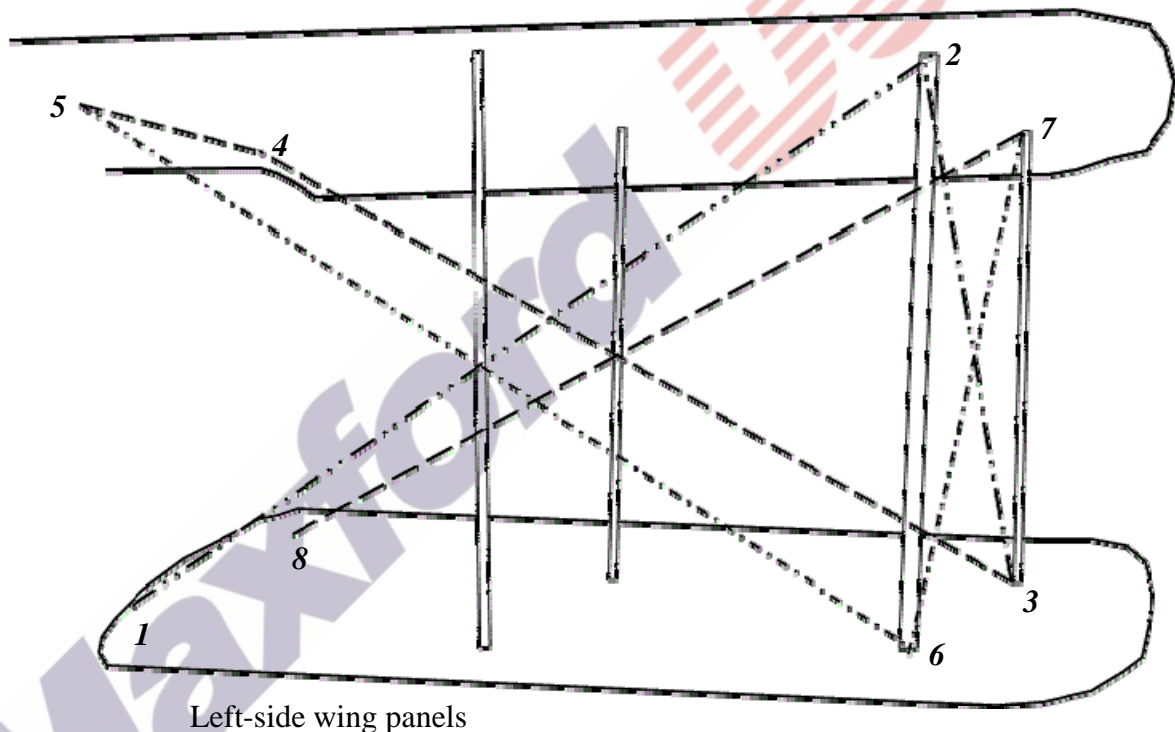
(NOTE: This ARF includes hardware for installing wing wires. These wing wires are only cosmetic – to enhance the model's appearance and are not required to safely enjoy this ARF model. Therefore, you have the option to omit the *italicized* portions of the following steps which pertain to wing wire installation.)

17. With the threaded end of each bolt pointed toward the fuselage, insert and push the bolts fully into and through the predrilled hole in each of the struts and wooden mounting tabs. *To install the wing wires, place a wing-wire anchor onto the exposed ends of the outer strut's bolts.* Firmly secure each bolt, wing strut *and wing-wire anchor* to its wooden mounting tab with a supplied self-locking nut.

18. *Use wood screws to install wing-wire anchors at approx. 1/4-inch outboard of the cabane struts on each upper wing panel. Apply CA adhesive to harden each of the holes in the wing panels where the screws are to be inserted.*



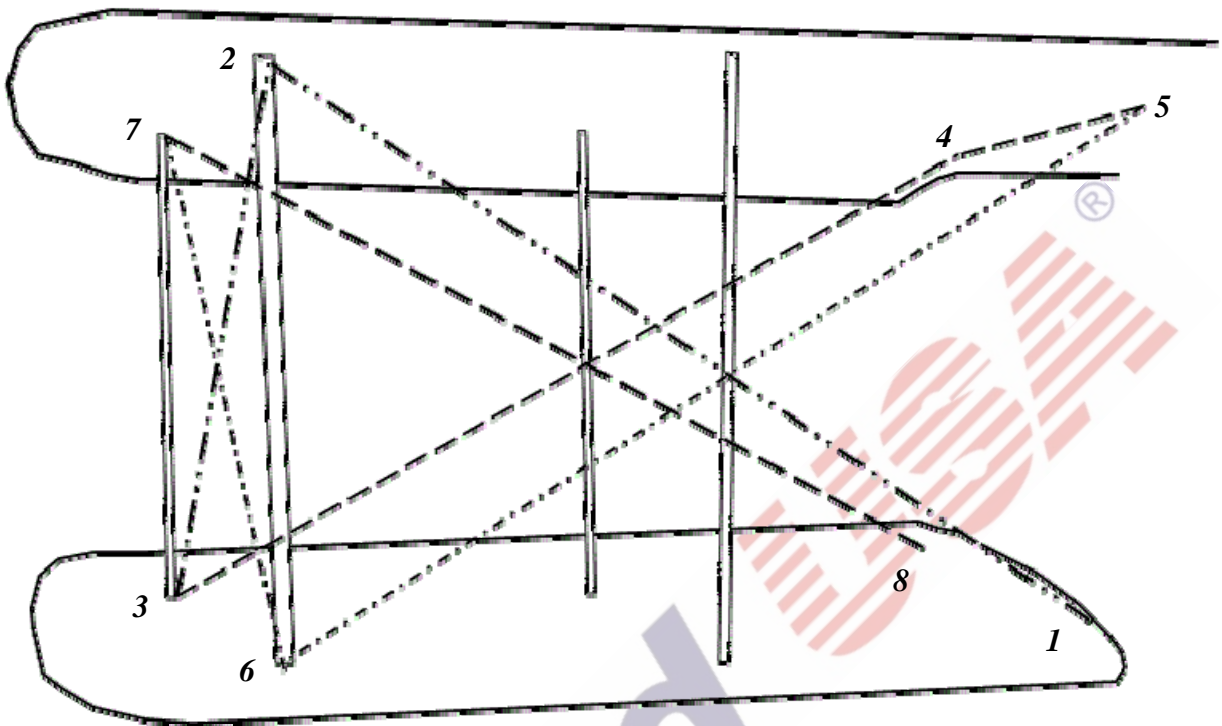
19. Connect the clevis end of the wires to the wing-wire anchors nearest the nose.
20. Using wood screws, secure two(2) wing-wire anchors near the leading and trailing edges of the lower wing approx. 1/4-inch from the fuselage. Harden each hole with CA adhesive where the wing-wire anchor screws are inserted. Direct the free end of each wing-wire anchor away from the fuselage as you tighten each screw.
21. The definition of 'Begin' is the beginning attachment point of each wing-wire cable as explained below:
  - 21.1 Screw the end of a brass pull rod halfway into the threaded end of a clevis.
  - 21.2 Slide a crimp tube onto the end of the cable.
  - 21.3 Pass the end of the cable through the hole in the brass pull rod's unthreaded end.
  - 21.4 Bring the end of the cable back into and all the way through the crimp tube.
  - 21.5 Loop the end of the cable back into the crimp tube and leave the end of the cable inside the crimp tube.
  - 21.6 Using long-nosed pliers, firmly squeeze several places along the length of the crimp tube to crimp the tube securely onto the cable.
22. Begin by attaching the end of one of the two long wires to point '1' on the left-hand set of wing panels. Guide the wire through each anchor point, from number to the next numbered point, as shown below:



(IMPORTANT: Carefully adjust the tension on each of the wing wires so the wings do not get pulled out of proper alignment to each other. If the wings are twisted by misadjusting the wing wires, this airplane may not be controllable in flight.)

23. 'End' the wing wire at anchor point '8' by repeating steps 21.1 through 21.4 above, but this time omit step 21.5, and replace step 21.6 with the following ...
  - 21.6 Using long-nosed pliers, pull the cable snug. Then loop the end of the cable back inside the crimp tube, but this time pull the remaining, excess cable fully through and out of the crimp tube. Crimp the tube securely onto the cable, snip off the excess cable with a pair of cutting pliers and discard the excess cable.

24. Begin by attaching the end of one of the second long wire to point '1' on the right-hand set of wing panel. Guide the wire through each anchor point, from number to the next numbered point, as shown below:

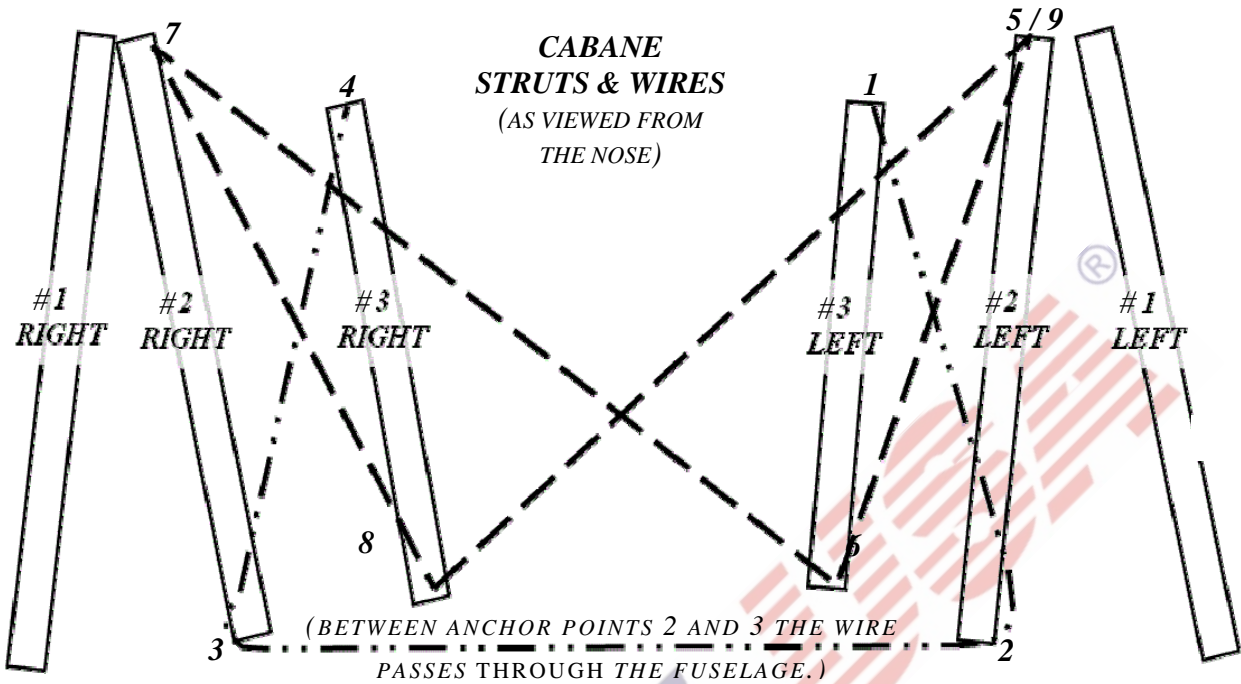


Right-side wing panels

(IMPORTANT: Carefully adjust the tension on each of the wing wires so the wings do not get pulled out of proper alignment to each other. If the wings are twisted by misadjusting the wing wires, this airplane may not be controllable in flight.)

25. 'End' the wing wire at anchor point '8' (i.e., the ending attachment point of each wing-wire cable) by repeating steps 21.1 through 21.4, and as before, omit step 21.5, and replace step 21.6 with the following ...
- 21.6 Using long-nosed pliers, pull the cable snug. Then loop the end of the cable back inside the crimp tube, but this time pull the remaining excess cable fully through and out of the crimp tube. Crimp the tube securely onto the cable, snip off the excess cable with a pair of cutting pliers and discard the excess cable.
26. With the shanks of each bolt pointed toward the wingtips, insert and push the bolts fully into and through the predrilled hole in each of the cabanes and the top wing's center section's wooden mounting tabs. To install the cabanes' wires, place a wing-wire anchor onto the exposed ends of the four rear cabanes' bolts. Also place a wing-wire anchor under each of the four wood screws that secure the four rear cabanes to the fuselage. Firmly secure each bolt, cabane and wing-wire anchor to its wooden mounting tab with a self-locking nut.
27. Connect the ailerons' servo lead to your receiver and position your receiver in the area immediately in front of your rudder and elevator servos.

28. Begin by attaching one end of the shortest wire to point '1' on the left-rear (top of #3 LEFT) cabane. Route the wire through each numbered anchor point to point number '4' as follows ...



29. 'End' the shortest cabane wire at anchor point '4' by repeating steps 21.1 through 21.4 as before, then omit step 21.5 and replace step 21.6 with the following ...
- 21.6 Using long-nosed pliers, pull the cable snug. Then loop the end of the cable back inside the crimp tube, but this time pull the remaining excess cable fully through and out of the crimp tube. Crimp the tube securely onto the cable, snip off the excess cable with a pair of cutting pliers and discard the excess cable.
30. Begin by attaching one end of the remaining cabane wire to point '5' on the center-left (top of #2 LEFT) cabane. Route the wire through each numbered anchor point to number '9' as shown above.
31. 'End' the remaining cabane wire at anchor point '9' by repeating steps 21.1 through 21.4 as before, omit step 21.5, and replace step 21.6 with the following ...
- 21.6 Using long-nosed pliers, pull the cable snug. Then loop the end of the cable back inside the crimp tube, but this time pull the remaining excess cable fully through and out of the crimp tube. Crimp the tube securely onto the cable, snip off the excess cable with a pair of cutting pliers and discard the excess cable.
32. When completed, each of the wing and cabane wires should all be 'evenly snug.'  
(IMPORTANT: Carefully adjust the tension on each of the wing wires so the wings do not get pulled out of proper alignment to each other.  
If the wings are twisted by misadjusting the wing wires, this airplane may not be controllable in flight.)

## Step 6. Finishing Touches

1. Attach the stick-on insignias and markings.
2. Balance the propeller.
3. Use the hardware supplied with your engine or motor to attach the propeller.



## ***Congratulations! Assembly is finished!***

### **VII. SETUP & ADJUSTMENTS:**

1. For the initial flight, set the SPAD XIII's **center of gravity (CG)** so the model hangs level (neither nose-up nor nose-down) when suspended at a point 3 5/8-to-4 inches back from the leading edge of the top wing.
2. If you are **using a Computer Radio**, for your initial flight, set all linkages for maximum possible deflections and soften the aileron's and elevator's control throws by applying 60% exponential (30% exponential for the rudder). If you are **using a Non-Computer Radio** ...

	<u>Low rates</u>	<u>High rates</u>
Ailerons .....	+20 degrees ( $\pm 3/4$ inch) .....	+35 degrees ( $\pm 1$ inch)
Elevator .....	+25 degrees ( $\pm 1 \ 1/2$ inches) .....	+30 degrees ( $\pm 2$ inches)
Rudder .....	+25 degrees ( $\pm 1 \ 3/4$ inches) .....	+30 degrees ( $\pm 2 \ 1/4$ inches)

3. Check/adjust servo centering, direction and end-point settings. Review your radio's instruction manual if you require assistance with any radio-related setup and/or servo-adjustment questions.
4. **Trim adjustments:** The ailerons and rudder will probably require no adjustment (in all probability you will be able to leave them centered, as assembled); however, be prepared to set the elevator trim depending on how slow or fast you may like to fly. For example, if you generally fly low and slow at scale-looking speeds, your SPAD XIII's elevator might need a small amount of up-trim.
5. **Preparation for Transport (and Field Setup):**
  - a) Unscrew and remove the wood screws that secure the retainer to the lower wing panels and to the fuselage. (Set aside the screws and retainer for future use.) Gently slide the left- and right-side pairs of wing panels away from the upper wing's center section and from the fuselage, disconnect the aileron servo connectors, and pull the wing panels fully free and away from their wing rods.
  - b) To reattach the wings, reverse the above procedure. Be careful to align and slide the wing panels evenly onto their joiner tubes, reattach the aileron servo connections, and snugly reinstall the retainer's screws into the bottom wing panels and fuselage.

### **VIII. PRE-FLIGHT CHECKS:**

1. Double-check the security of the engine-mounting box and firewall and make certain that all screws, clevises and other connections throughout the air frame are secure.
2. Double-check the control directions and amount of control throw of the ailerons, elevator, rudder and throttle.
3. As with all radio-controlled model airplanes, this model must pass the radio range ground check recommended by your radio's manufacturer or you may not fly safely.
4. Get into the habit of moving your transmitter's throttle to minimum before turning ON your transmitter and carefully operate your radio-control and power systems according to the manufacturer's instructions.

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