

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.

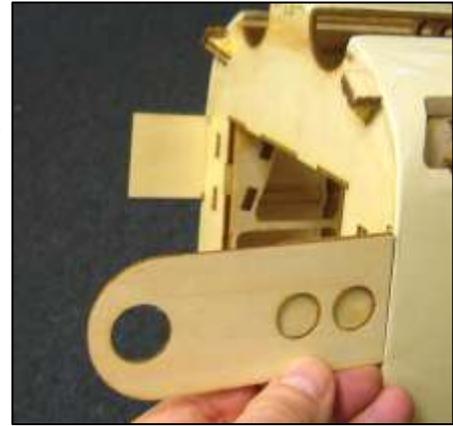
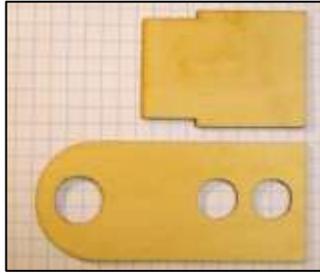
This ARF is designed for a gas, glow, or electric power. Adjustable engine and motor mounting boxes are included, and the model is close in scale to the actual SPAD XIII (though some necessary changes were made to meet the needs and expectations of RC pilots as well as the requirements of factory-production).

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

Maxford **USA**®

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, we recommend NOT gluing the engine-mounting box into the fuselage if you use an engine.

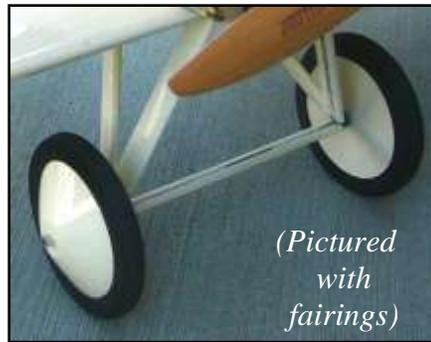
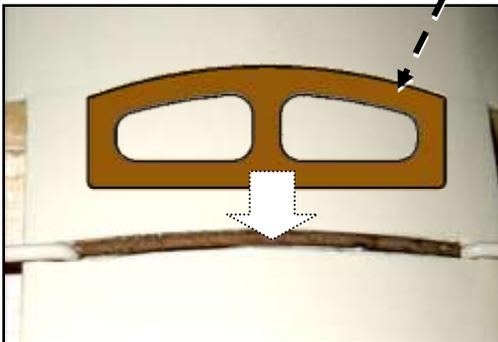
13. Glue in the nose pieces as shown at the right. (NOTE: Depending on the power system, these nosepieces may be trimmed or omitted altogether to increase air flow through the cowl. Although the plywood exposed at these nose pieces is minimal, a conservative modeler may take the precaution to fuel-proof this (and the surrounding areas) with paint or Mylar covering material.)



14. 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.)
15. 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.
16. If you will install the optional Vickers machine guns, attach them to the cowl by following the instructions included with the guns.
17. 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.
18. 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

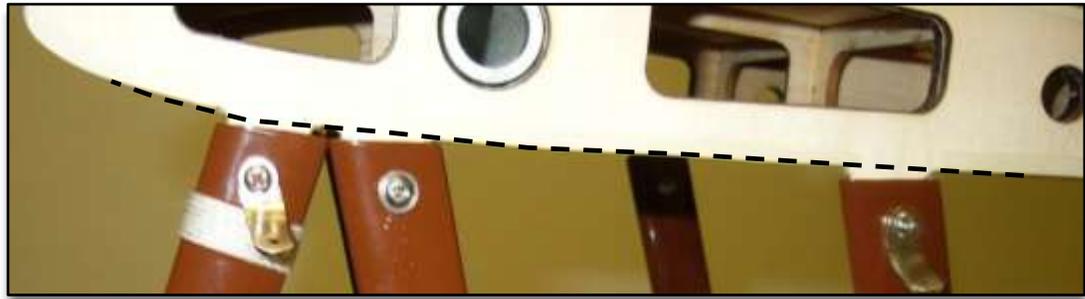
1. Slide the main landing gear's wheels onto their axles and secure each wheel with the supplied wheel collars and set screws.
2. Press the main landing gear's rear crossmember fully into the slot in the bottom of the fuselage, then press the landing gear's wooden retainer down into this same slot.



3. Press the landing gear's front crossmember into its mounting slot. 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.
4. Test fit the streamlined fairings onto the landing gear struts. With the fairings fitted to the struts, secure the fairings in position with glue.
5. Glue balsa strips into the slotted openings to cover the landing gear struts. Sand the balsa wood to shape. (If desired, these strips of balsa wood may be painted to match the fairings.)

Step 5. Wings, Windshield and Flying Wires

1. As pictured at the right, test-fit the upper ends of the six metal cabane struts to visually align with the bottom of the upper wing's center section.



2. Slide the lower wing rod midway through the fuselage. (NOTE: Apply a small amount of Graphite dry lubricant to the wing rods if necessary to help them slide.)
3. Temporarily position the lower left and right wing panels onto the lower wing rod.

4. Test-fit all six of the wooden mounting tabs and metal cabane struts into their openings in the fuselage.



5. Using the lower wing as a reference, test-fit the cabane struts to align the upper wing's center section at "0-0" with the lower wing.
6. Glue the wooden mounting tabs for the REAR cabane struts (only) into their pockets.
7. Check that each cabane strut remains visually aligned with the bottom of the upper wing's center section. Trim the openings in the fuselage to fit the cabane struts if necessary. Drill a 1/16-inch guide hole through the upper and lower openings in each cabane strut. Secure the lower ends of the cabane struts with wood screws. (NOTE: As shown above, a conservative modeler may drill a hole at the exposed lower ends of the REAR cabane struts and drive the wood screws through these holes and into the inner wall of the REAR cabane struts' fuselage pockets.)
8. Secure the upper ends of the cabane struts to the upper wing's center section with wood screws, or, if you prefer, enlarge the holes and install bolts and nuts.

9. Center the supplied windshield in front of the cockpit and secure it to the fuselage with three wood screws.
10. 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.



11. Slide the remaining lower wing panel onto the exposed ends of the wing joiners and gently press both wing panels against the fuselage.
12. Test-fit the RETAINER (pictured in white and with the lower wing removed for clarity).



Position the retainer 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 cross-member and wooden retainer and with its remaining two holes extending out onto the lower wing panels.

13. Drill 1/16-inch guide holes through the retainer and into the fuselage and the lower wing panels.
14. Apply thin CA adhesive to harden the guide holes and secure the retainer to the lower wing panels and to the fuselage with four wood screws.
15. 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 or 5-minute epoxy.
16. 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.
17. 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.)
18. 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 tape during your next pre-flight setup.)
19. 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.
20. Test-fit the bottom ends of the front and rear struts onto the lower wing's strut mounting tabs. Be careful to match the angle of each strut to the surface of the wing. Drill holes and attach the struts with bolts and nuts.
21. 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 which enhance the model's appearance, but 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.)



22. 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.

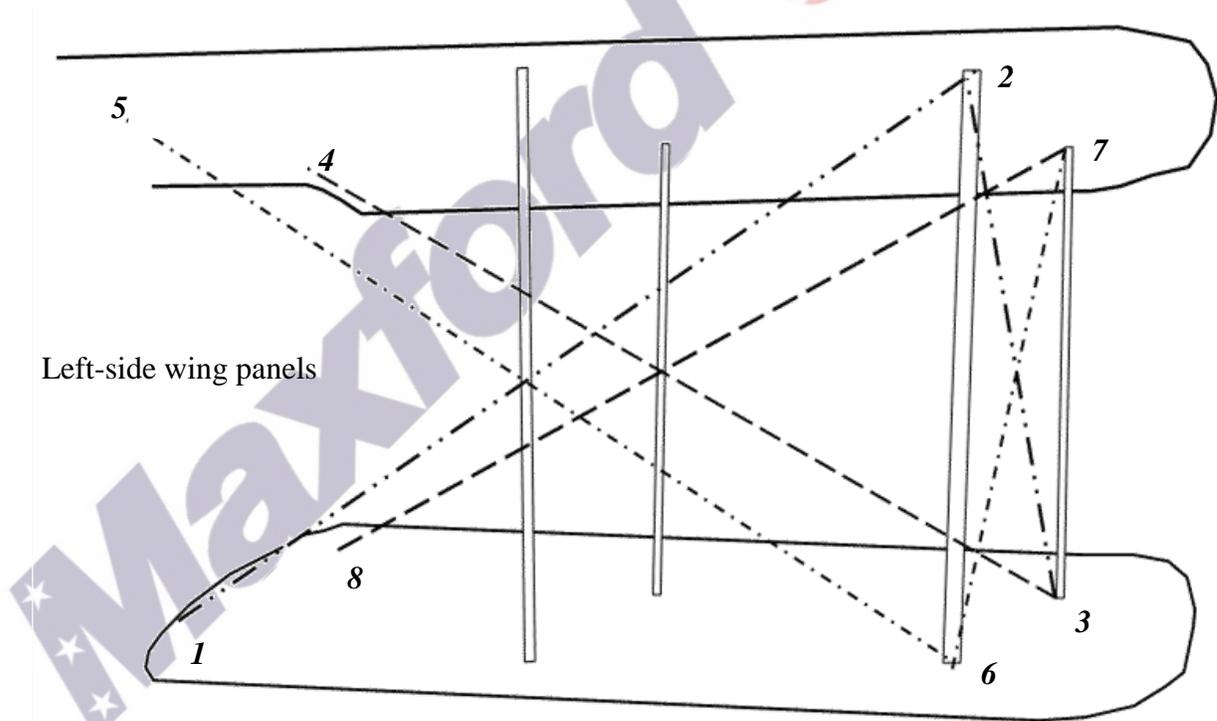
23. As shown at the right, install a wing-wire anchor at the top of each cabane strut.



24. Connect the clevis end of the wires to the wing-wire anchors nearest the nose.

25. 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.

26. 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 as pictured below:

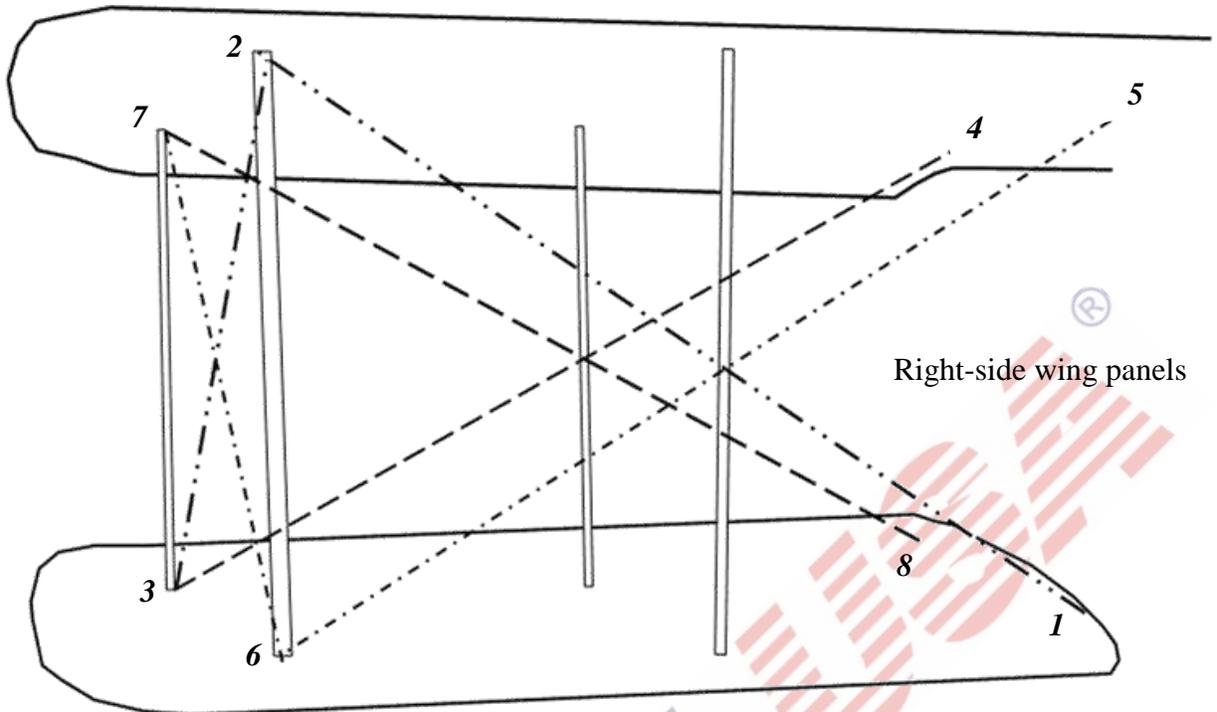


27. Install a threaded rod and clevis at anchor point 4.

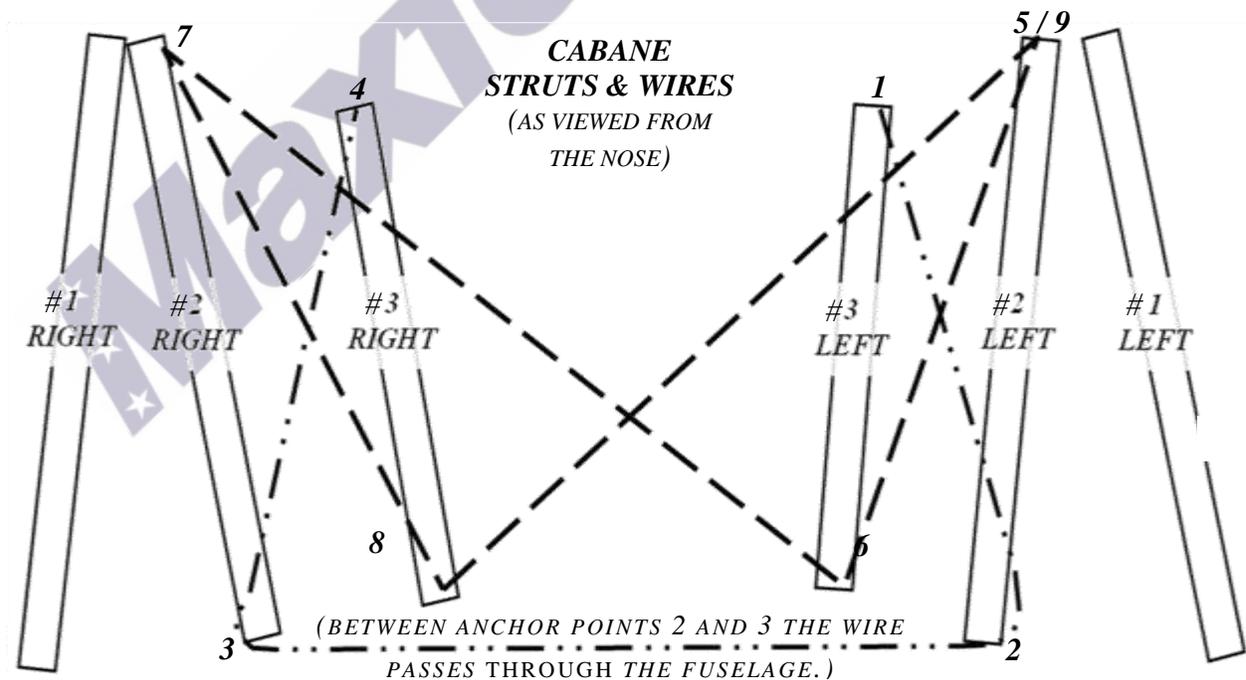
28. Repeat the above process between anchor point 5 and 8.

(IMPORTANT: Carefully adjust the tension on each wing-wire segment 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.)

29. In the same manner, install the right-side's wing wires between anchor points 1 and 4 and between 5 and 8 as shown below:



30. 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.
31. Connect the ailerons' servo lead to your receiver and position your receiver immediately in front of your rudder and elevator servos.
32. Begin by attaching one end of the 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 ...



33. 'End' the cabane wire at anchor point 4.
34. Using long-nosed pliers, pull the cable snug, loop the end of the cable back inside the crimp tube, 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.
35. Attach the remaining cabane wire to point 5 at the top of the LEFT center cabane. Route the wire through each numbered anchor point to number 9.
36. 'End' this cabane wire at anchor point 9 by 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.
37. When completed, each of the wing and cabane wires should all be 'evenly snug.'

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, we recommend setting 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. (NOTE: 3 5/8-to-4 inches back from the leading edge of the top wing is about 30% of the mean average chord – comfortable for many experienced RC pilots as shown on YouTube at <https://www.youtube.com/watch?v=H2I5En0HD40> ; however, if you prefer to fly with a more nose-heavy setup, setting the CG at 2 1/2-to-3 inches back from the leading edge of the top wing balances the SPAD XIII at 20% to 25% of the mean average chord.)
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 (±3/4 inch)	±35 degrees (±1 inch)
Elevator	±25 degrees (±1 1/2 inches)	±30 degrees (±2 inches)
Rudder	±25 degrees (±1 3/4 inches)	±30 degrees (±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.

Distributed by:

Maxford USA RC Model Distribution, Inc.

15939 Illinois Avenue #C

Paramount, CA 90723

Telephone (562) 529-3988

Email info@maxfordusa.com

Website www.maxfordusa.com