MENTOR-G V2 ARF

GAS ENGINE POWERED R/C TRAINER

INSTRUCTION MANUAL

The MENTOR-G V2 is a multi-functional RC trainer suited for RC pilots who want to use a fuel-efficient gas-powered engine. Some of the setup options include:

- Basic trainer.
- Aerobatic trainer.
- Large-size float-plane trainer.
- Glider or banner tow-plane.
- Load-carrying platform for video camera(s) or for dropping candy at fun-flys, etc..

We invite you to enjoy the joy of flying this balsa and light-ply almost-ready-to-fly aircraft.

Maxford USA®

TABLE OF CONTENTS

I. IMPORTANT SAFETY PRECAUTIONS TO PROTECT YOUR MODEL, YOURSELF & OTHERS:

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 build 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 the model airplane according to these instructions. We recommend that you do not alter or modify the model beyond the assembly 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 us at (562) 529-3988, Monday through Friday, except national holidays, between 9 AM to 5 PM Pacific Time.
3. 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 smoothly and correctly.
4. 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 clevises and other connectors; do not fly without replacing any that you find damaged or defective.
5. If you are not an experienced R/C pilot or have not flown this type of model before, we strongly recommend that you get the assistance of an experienced R/C pilot.
6. Throughout the lifetime of this model, use only the Maxford USA-recommended or same-sized engine and a new or well-maintained R/C radio system and batteries recommended by the maker of the engine and radio system.

7. While this kit has been flight-tested to meet or exceed our rigid performance and reliability standards in normal use, if you plan to perform any extremely high-stress flying, such as racing or advanced aerobatics, or if you plan to install a larger engine 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.

II. WARRANTY, LIABILITY WAIVER, AND RETURN POLICY:

Maxford USA guarantees this kit to be free from defects in material and workmanship at the time of purchase. All of 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 below.

If you think there is a missing part or any shipping damage, please read our after-sales service and return policy as outlined below.

1. Inspect your order upon delivery for any shipping damage or missing part. If you find a problem you must contact us within 10 days from receipt of your purchase by calling (562) 529-3988, Monday through Friday, except holidays, between the hours of 9 AM and 5 PM Pacific time. During this telephone conversation, and with your support, we will determine how to resolve your concern.
2. To request an 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 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 Ave.
Paramount, CA 90723

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

III. SPECIFICATIONS*:

Wingspan	83-inches
Wing Area	1,187 sq. inches
Length	60 inches
ARF weight	6.6 pounds
Flying weight (including fuel)	11.6 pounds
Engine (Not included)	CRRC 26i or equivalent 26CC-class 2-cycle gas engine
Propeller (Not included)	18x6 or 16x10 wood (or as-recommended for your engine)
Radio system (Not included)	Minimum of 4 channels with 5 or 6 standard servos (Recommended servos: Hitec HS-311 or equivalent)

*(All dimensions and weights are approximate.)

IV. FEATURES OF V2

NEW/IMPROVED FEATURES …

- All control surfaces have been enlarged and may be setup for more 'aerobatic' performance.
- Pin-lock hatch.
- New-designed aluminum landing gear.
- Optional floats.
- Optional drop box.

SPECIAL FEATURES …

- The firewall has predrilled holes for a CRRC 26i gas engine.
- The firewall and most of the fuselage is plywood; the wings and empennage are mostly balsa.
- The ailerons are operated by separate servos for optional use as flaperons.
- The elevator may easily be setup for two-servo operation.
- Default setup and hardware are for tail-dragger configuration. If tricycle landing gear is preferred, the builder may mount the main landing gear struts in alternate predrilled holes, add an extra layer of plywood, some blind nuts, a nose wheel, a nose-wheel steering servo and related linkages (these optional items are not included).

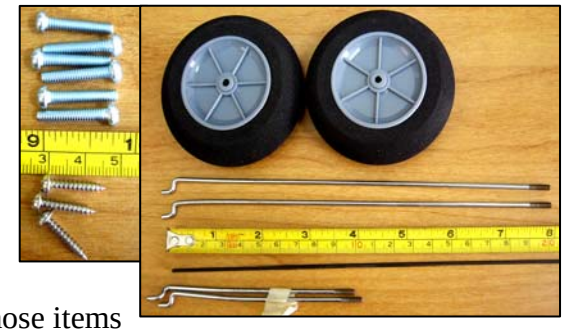
V. PARTS LIST:

1. Items you must supply to complete the MENTOR-G

- 5-minute epoxy glues, Cyanoacrylate (CA) adhesives, masking tape, a high-speed rotary tool and a few common hand tools (such as long-nosed and diagonal or side-cutter pliers, etc.).
- 26 CC gas engine.
- 18x6 or 16x10 propeller (or as-recommended for your engine) and optional spinner.
- Minimum of five(5) Hitec HS-311 or equivalent standard-sized servos, four(4) 12-inch extensions, one(1) 12-inch Y-connector, and a 4-channel radio control system.

2. Items included with your Mentor-G

- Precovered fuselage, wing panels, vertical and horizontal stabilizers, rudder and elevator.
- Precut, precovered hatch, secured in position by an easy-to-operate pin-lock assembly.
- Aileron, rudder and elevator pushrods and related linkages with precut hinge openings and all required CA hinges.
- Wooden mount for throttle servo and pushrod for throttle control.
- Tail wheel with steerable wire strut assembly.



- New, improved aluminum main landing gear with mains wheels, axles, and mounting hardware.
- Aluminum wing joiner with two preinstalled wood-dowel alignment pins, plywood wing hold-down plate and wing hold-down bolts.
- 18.5 oz. (550 CC) fuel tank, with three lengths of aluminum tubing, clunk and clunk's internal fuel line.
- All required control horns and associated hardware (except those items normally supplied with servos, gas or glow engines, and electric power systems).
- This detailed, illustrated instruction manual.

VI. ASSEMBLY INSTRUCTIONS:

1. Test fit the **vertical stabilizer**. Remove Mylar covering from the vertical stabilizer that will be 'buried' inside the vertical slot at the rear of the fuselage. Use 5-minute epoxy to secure the vertical stabilizer into its slot at the top-rear of the fuselage.
2. Slide the supplied **tail wheel** onto the tail wheel strut. (You may need to file or sand the end of the strut so the opening in the tail wheel smoothly slides onto the strut.) Secure the tail wheel onto its strut with a provided wheel collar. Position and secure a second provided wheel collar at the top of the spring on the tail wheel strut.
3. Slide the tail wheel strut fully through the hole in the end of the aluminum tail wheel mounting bracket, and test fit this tail wheel assembly at the bottom-rear of the fuselage so the tail wheel's wire strut aligns at the centers of the aft-ends of both the vertical stabilizer and the fuselage. Measure 3/4-inch from the top end of the tail wheel's wire strut and bend the strut back (toward the rear of the airplane) at a 90-degree angle. Attach the tail wheel assembly to the bottom of the fuselage with two provided 17-mm long wood screws. (Apply thin CA adhesive to reinforce these holes in the bottom of the fuselage.)
4. Test fit the **rudder** to the rear of the vertical stabilizer, and mark where a horizontal hole and a vertical notch are needed in the rudder for the tail wheel strut's wire. Drill the required hole and cut the notch in the front edge of the rudder to fit the tail wheel strut's wire.
5. With the rudder prepared for the tail wheel's wire, apply some 5-minute epoxy to the end of the tail wheel strut's wire and insert the wire into the hole in the rudder. Before this epoxy thickens, insert two(2) supplied CA hinges to secure the rudder to the vertical stabilizer and apply thin CA adhesive to the CA hinges; also apply some masking tape to hold the tail wheel strut's wire in position until the 5-minute epoxy has cured.
6. Using the provided 6 ea. 20-mm long steel bolts and the blind-nuts preinstalled in the fuselage, attach both halves of the **aluminum landing gear struts** to the bottom of the fuselage.
7. Test fit the **horizontal stabilizer**, then remove the Mylar covering that will be 'buried' inside its mounting- slot at the rear of the fuselage.

8. Using 5-minute epoxy, secure the horizontal stab. into its slot at the rear of the fuselage; before this epoxy thickens, **make sure that the horizontal stabilizer is aligned** at right angles to the fuselage by measuring the distance between the outside rear bolts on the landing gear and the outside end of each half of the horizontal stabilizer – and adjust the horizontal stabilizer so this distance is the same on both sides of the fuselage.

9. Insert the elevator's CA hinges in their precut slots and test fit the elevator to the horizontal stabilizer. Mark where a small **notch** must be cut in the center-front of **the elevator** to clear the tail wheel strut's wire, and cut this required notch. **Secure the elevator** to the horizontal stabilizer by applying thin CA adhesive to each of the elevator's CA hinges.

10. Position the pushrod-openings in the control horns directly over the hinge lines and **drill holes** in the rudder and elevator for the control horn mounting bolts. Attach one control horn to the rudder and one control horn to the elevator. (Note: If you setup the elevator to be driven by two servos, remove the covering material from the precut servo opening in the top of the fuselage directly in front of the rudder, and mount your rudder servo in this 'extra' servo-mounting opening.)

11. Connect a **12-inch servo-wire extension** to each of your rudder and elevator servos. (Note: To ensure the security of your servo extension connections, we recommend you install an optional "servo extension safety clip" at each servo wire/extension junction.)

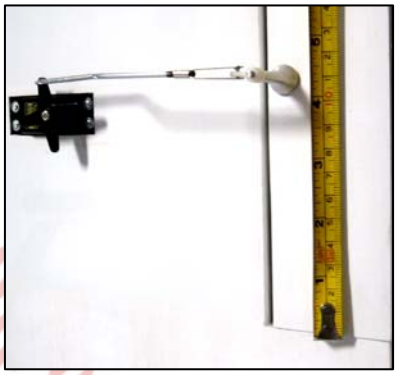
12. Guide the servo extensions through the rudder and elevator servo openings and into the fuselage, then secure the ends of the extensions inside the fuselage on the radio receiver's tray with a piece of masking tape.

13. Using your servos' hardware, mount your **elevator and rudder servos** in their openings. Using the preformed Z-bends and the supplied clevises, attach the 8-inch long **pushrods** as shown.

(Notes: The appearance of control horns may vary; For sport-flying, setup all control surfaces for maximum deflection.)

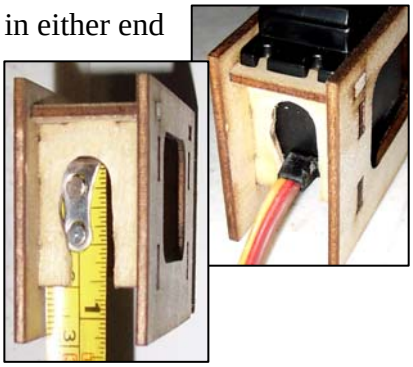
14. Connect a **12-inch servo-wire extension** to each of your aileron servos. Secure each connection with an optional "servo extension safety clip" and use masking tape and the provided string to pull each servo extension through its wing panel and out the hole near the wing root.

15. Insert the aileron's CA hinges in their precut slots and test fit each aileron to its wing panel. **Secure the ailerons** to their wing panels by applying thin CA adhesive to each of the aileron's CA hinges.
16. Test-fit the **aileron control horns**. (Note: You may minimize the effects of any possible *adverse yaw* by the use of 'aileron differential' by locating each servo horn's opening *behind* the aileron's hinge line. If you are not concerned about adverse yaw, or if you have a computer-radio with the option of setting up aileron differential at your transmitter, position each aileron control horn opening over each aileron's hinge line.) Mark the position for each aileron control horn, drill a hole in each aileron for each aileron control horn's mounting bolt, and attach one control horn to each aileron. Using your servos' hardware, mount your aileron servos in their precut openings.



17. Using the pre-formed Z-bends and the supplied clevises, attach the 4-inch long **aileron pushrods**.
18. Once all the clevises are adjusted, permanently secure each push-rod within its clevis with a few drops CA.
    Note:
    a) It is difficult to form new Z-bends in the supplied heavy-gauge pushrods; so, if you need to 'shorten' a push-rod, you may simply form an extended, shallow Z-bend near the middle of the rod, as shown.

    b) If you wish to enjoy the benefits of flying with flaps, use separate channels for the ailerons and set up your computer-radio's **'flaperon'** function (if available).
19. Form a Z-bend in one end of the 13-inch long **throttle pushrod**. Insert the pushrod almost fully through its opening in the firewall, leaving approx. two or three inches exposed in front of the firewall.
20. Select a servo control arm for your throttle servo that will provide enough pushrod 'travel' to go from 'full throttle' to 'just-below idle' (i.e., throttle 'cut-off'). Ream the hole in the throttle servo's control arm to accept the 'mounting bolt' in the end of the supplied quick-connector. Using the provided washers and knurled mounting nut, 'snugly' attach the quick connector to the servo control arm, then permanently affix the quick connector onto the servo control arm by applying a tiny drop of thick CA adhesive to the exposed threads at the bottom of the quick connector's mounting nut.
21. Slide the opening in the quick-connector onto the end of the throttle pushrod inside the fuselage; temporarily tighten the quick-connector's set screw to affix the quick-connector onto the throttle pushrod.
22. As shown at the right, you may extend the precut opening for the servo lead in either end of the wooden throttle servo mount by 3/4-inch to allow your throttle servo and its lead to fit down into the provided wooden throttle servo mount.

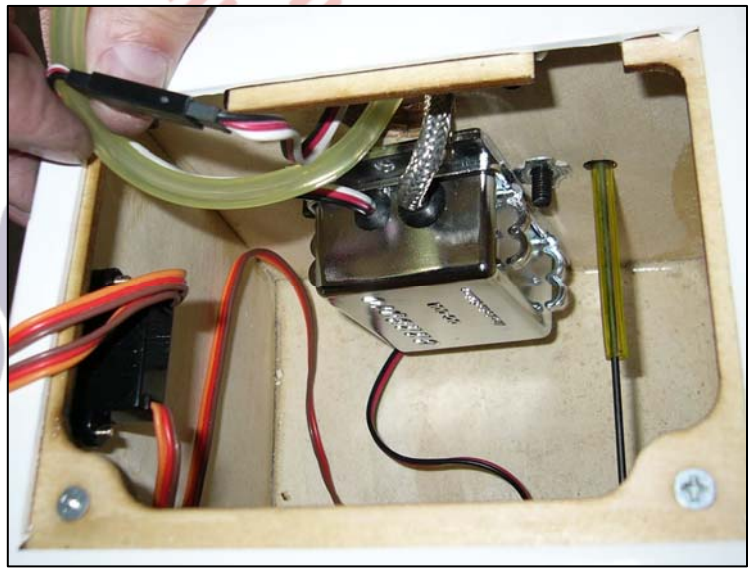


23. Assemble the provided **fuel tank** (i.e., open the 'stopper' for the vent and clunk lines, add the included short length of fuel tubing to attach the clunk to the clunk line, and use the included screw to seal the fuel tank's opening). Attach clunk and vent fuel lines to the outside of the tank, and insert the tank into the nose from the opening under the wing-saddle.
24. Test-position your **engine's battery** and your **receiver's battery** on the floor in the nose of the fuselage.(During setup and adjustment you will re-position these batteries to fine-tune the CG.)

25. Decide on where you wish to position the engine's and receiver's **power switches**. You may choose from among the precut switch openings, or decide on a new switch position if you wish. (Note: Regardless of your engine's manufacturer, it is always wise to maximize the distance between all of your engine's and radio's electrical components.) Trial fit both switches (trim the openings if necessary) and install the engine and receiver switches.

26. Test-fit the engine's **ignition module** immediately behind the firewall. Decide how you plan to route the power, sensor and spark-plug wires. (Note: If you find the ignition module's spark plug cap does not easily pass through the hole in the firewall, relieve the inside top of the hole in the firewall with a drum sander on a high-speed rotary tool.)

27. Test fit your engine (with its muffler) to the firewall. Use the engine's supplied standoffs, mounting bolts and blind-nuts to temporarily attach the engine to the firewall, then determine and mark where **wood needs to be cut away** from the front of the fuselage to allow clearance for the engine's cooling fins and muffler.
28. Remove and set aside the engine.
29. Remove the excess wood identified above, and smooth all edges. (We recommend a drum sander on a high-speed rotary tool.) Apply 5-minute epoxy to **seal and fuel-proof** all exposed/raw wood.



30. Once the 5-minute epoxy is cured, **install your engine** and its muffler, and make all engine connections: As you bring the engine toward the firewall, your first connection should be the throttle pushrod's Z-bend; then, secure the four sets of mounting bolts and standoffs (we recommend you apply Lock-Tite or a similar thread-locking compound). Route the high-voltage wire along the engine's left side, between the cylinder head and muffler; route the sensor wire and the fuel and vent lines along the engine's right-hand side.
31. As you **position your throttle servo (**in its wooden mount) inside the fuselage, place the throttle servo's control arm onto your throttle servo's output shaft. Attach the servo arm's mounting screw, rotate the servo's shaft to 'full throttle' and position the throttle servo so the engine's throttle linkage is at 'full throttle.' (If necessary, re-adjust the pushrod in the throttle arm's quick connector.)

32. With the throttle servo in position, attach the th**rottle servo's mount** to the inside of the fuselage with 5-minute epoxy.
33. **Cut away the Mylar covering material** from the wing's hold-down bolt holes and from the corresponding holes in the plywood wing hold-down plate.
34. **Connect** the rudder and elevator extensions, the throttle servo, and the receiver's battery switch to **your receiver**. If you are not setting up your radio for electronically-managed differential aileron response, connect a Y-cable to your receiver's aileron channel. If you have a computer-radio and will be setting up aileron differential at your transmitter, connect two 6-inch servo extensions to the two channels you will be using for aileron control. Wrap your receiver in cushioning foam rubber, position your radio receiver on the radio tray and secure your radio receiver safely in position with criss-crossed rubber bands. (If you are using a 72MHz. radio, route the antenna out of the fuselage and attach it to the top of the vertical stab.)
35. Slide the two wing panels toward each other on their supplied **aluminum wing rod**. As these two panels merge, allow them to self-align onto the factory-installed **wooden dowel-pins**.
36. While holding the wing above the fuselage, connect the aileron's extension wires to the corresponding aileron wires attached to your receiver.
37. Align and insert the plywood projections at the middle of the wing's leading edge with the opening behind the 'windshield' in the fuselage, then gently lower the wing onto the fuselage's wing saddle.

38. Place a flat washer onto each of the two (approx. 2 1/4-inch long) **wing hold down bolts**. Guide the bolts (with their flat washers) through the holes in the plywood wing hold-down plate, then into and through the hold-down holes in the wing.

39. With the wing squarely aligned in the wing saddle, drive these bolts firmly (but not so tight that wood becomes crushed) into the fuselage-mounted blind nuts at the rear of the wing-saddle. Then, carefully lift the airplane and lay it on its back on a soft surface.
40. If you sometimes fly from asphalt or concrete, we recommend you add a short length of **rubber tubing** (not included) at the outside-end of each axle to rub against the wheel and cause friction – which acts as a gentle 'brake' and helps reduce unwanted airplane movement when you are landing and/or taxiing. This friction is easily overcome during take-off by the application of throttle.

41. Slide a provided **mains-wheel** onto each of two (approx. 1 1/2- inch long) **axle bolts**. Twist a supplied hex-nut onto each axle bolt against the hub of each wheel (and adjust it to compress the rubber tubing, if used).
42. Insert the remaining threaded end of each axle bolt into the holes in the main landing gear struts.

43. Tighten a supplied self-locking nut onto the remaining exposed threads at the inside of each axle bolt, secure the axle bolt against vibration by applying a drop of thick CA adhesive to the exposed threads at each self locking nut, and return the airplane to its 'right side up.'

Congratulations! Assembly is finished!

VII. SETUP AND ADJUSTMENTS:

1. For initial flights set the MENTOR-G V2's center of gravity (CG) at approx. 3 3/4-inches back from the leading edge of the wing. If necessary, move the batteries and/or add weight to the nose or tail to ensure the CG is correct.

   (Hint: Once you have determined the final position for your CG, you may secure both the engine's and radio's batteries in place with double-sided foam tape and pack some scrap foam rubber into the fuselage's nose-area around the batteries and fuel tank to help secure these items against vibration.)

2. Check the Mylar covering material's joints and surfaces; if necessary, carefully use a dedicated covering-material iron to secure the edges and to tighten any loosened areas. Recheck and retighten from time to time.

3. Check/adjust servo centering, direction and end-point adjustments. When you pull the right stick toward you, the elevator should deflect upwards; push the right stick to the right and the right aileron should deflect upwards and the left aileron should deflect downwards; push the left stick left and the rudder should deflect to the left as viewed from the rear of the fuselage. Review your radio's instruction manual if you require assistance with any radio-related setup and/or servo-adjustment questions.

4. For initial flights set all linkages for near-max. possible deflections. If you are using a Computer Radio: soften the aileron's and elevator's control throws by applying 30% exponential.

   Initial settings if you are using a Non-Computer Radio:

	Low rates	High rates
Ailerons	±10 degrees (±3/8-inch)	±15 degrees (±1/2-inch)
Elevator	±10 degrees (±3/8-inch)	±15 degrees (±1/2-inch)
Rudder	±10 degrees (±3/4-inch)	±15 degrees (±7/8-inch)

5. Trim adjustments: The ailerons and rudder will probably require no adjustments (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 fly. For example, if you like flying low and slow, your MENTOR-G's elevator may require a bit of up-trim.

VIII. PREPARATION FOR TRANSPORT AND FIELD SETUP:

1. Unscrew and safely set aside the two screws that secure the wing to the fuselage.
2. Gently lift and slide the wing back, then lift it up and away from the fuselage.
3. Disconnect the two aileron servo's extension cables. (If your radio uses separate channels for each aileron servo, be sure to mark each aileron connection so they always get connected to the same channel.)
4. To reattach the wings, reverse the above procedure. Be careful to firmly connect both aileron servos and to snugly reattach (but not over-tighten) the wing hold-down screws into the blind nuts inside the fuselage.

IX. PRE-FLIGHT CHECKS:

1. Double-check the security of the engine, and make certain that all screws, linkages, clevises and other connections throughout the air frame are secure.
2. Double-check the control directions of the throttle, ailerons, elevator and rudder.
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 safely fly.
4. Get into the habit of moving your transmitter's throttle to minimum before turning ON your transmitter, and carefully break-in and operate your engine according to the manufacturer's instructions.

REMINDER: An important notice to our customers!

THIS PRODUCT IS NOT A TOY.

- The quality and capabilities of your finished model airplane depend on how you build it.
- 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.

Distributed by:

Maxford USA RC Model Mfg, Inc.
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Paramount, CA 90723 **www.maxfordusa.com**

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- Our mission is to provide better RC products and services for our customers.
- To help us offer quality RC models at competitive prices, 99% of our products are imported directly from the manufacturer's factories.
- Our Paramount, California showroom is open to the public from 10 AM to 5 PM Monday through Friday, except national holidays.
- All orders from retail customers are shipped from our Paramount, California warehouse.
- We also sell directly to brick-and-mortar hobby shops. To apply to become authorized to sell Maxford USA's extensive line of RC products, download a Dealer Application form from our Website; then email or fax the completed form to us at (562) 529-6988.
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