

ULTIMATE ARF

Instruction Manual



Thank you for purchasing one of the finest aerobatic ARF models on the market, Cermark's *ULTIMATE ARF*. The Ultimate ARF marks a new era in aerobatic excitement! Imagine, scale appearance with performance to match! The 5-color factory applied color scheme commands attention. Four ailerons, oversize control surfaces and the powerful Cermark 2814-1030 brushless outrunner motor insure sparkling performance! Cermark's quality engineering includes such features as one-piece wings, factory assembled cockpit with pilot, battery hatch and finished wheel pants to keep your building time to the minimum! Never before has something so beautiful been this easy to complete. And the Ultimate is small enough to take to the field in one piece, yet large enough to fly when the "park flyers" are grounded!

Specification: ULTIMATE ARF

Wingspan:	30.00 in.
Length:	31.00 in.
Wing area:	300 sq in.
Flying weight:	22 to 28 oz.
Motor:	CEM 2814-1030 Outrunner
Prop:	APC 11 x 7E
Controller:	ESC-30BL
Battery:	3-CELL Li-PO 900 to 1320mAh

Radio:	4 channels with 4 HS-55 servos or equivalent (A, E, R)
All hardware:	is included with your ARF kit.

Tools

- ~ Thick and thin CA & 30 min. epoxy
- ~ Small and medium screwdrivers
- ~ Needle nose pliers
- ~ Drill and drill bits
- ~ T-pins
- ~ Model knife
- ~ Pencil

TIPS & HINTS

- Before assembly, there may be some bubbles or wrinkles in the covering due to shipping of the model. Use a Sealing Iron covered with a cotton sock to tighten the covering. Seal the edges first, then tighten the open areas

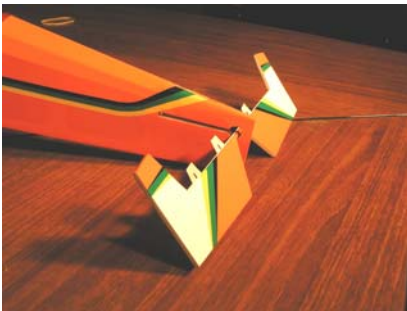
Step 1: Upper and Lower Wing Assembly

1. Attach the ailerons to the wings using the supplied CA hinges. Use T-pins to center the hinge and give it a slight gap between aileron and the wing.
2. Test the ailerons to give 45 degrees of throw. Once aligned, use thin CA to glue in the hinges.

Step 2: Tail Assembly.

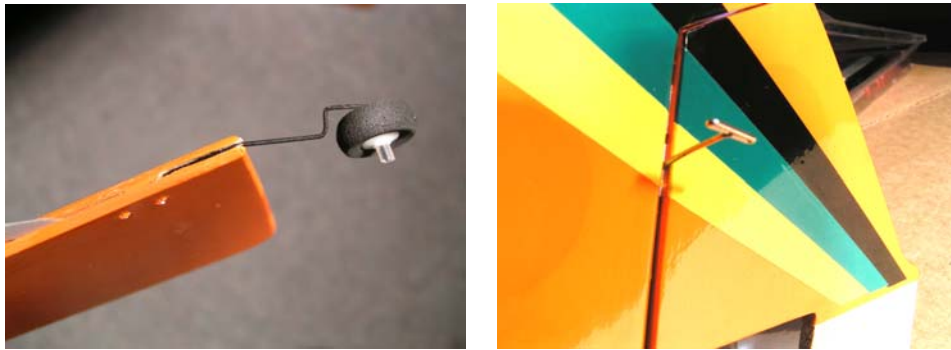
Horizontal Stabilizer/ Elevator

1. First **slide the elevator into the slot**, then the horizontal stabilizer. Determine the center and proper alignment of the stabilizer.
2. Mark the fuselage location on the top and bottom of the horizontal stab. Cut just inside the line carefully to avoid damaging the wood. Remove the covering.
3. Glue in the horizontal stab with 30-minute epoxy. **Make sure the elevator is in place.**
4. Attach the elevators with the supplied CA hinges. Use T-pins to center the hinges. Give it a 1/32" gap between the horizontal stab and elevator. Test the elevator to insure 45 degrees of throw in both directions, and then use thin CA to secure the hinges.



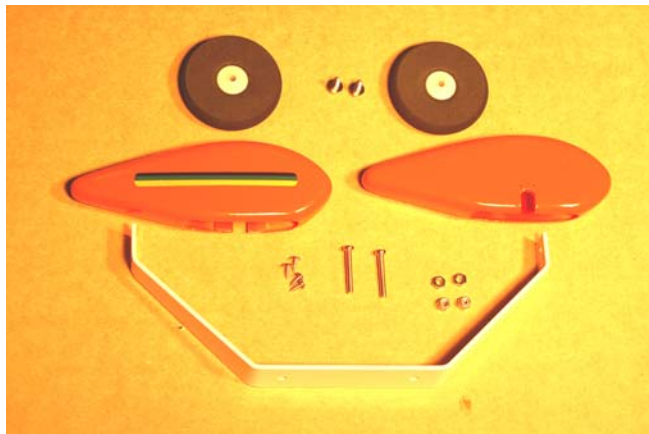
Rudder/ Fin

1. Install the tail wheel assembly into the bottom of the rudder using thick CA.
2. Test fit the vertical fin into the fuselage slot to insure proper alignment. Remove any covering from the fin area that enters the fuselage.
3. When you are satisfied with the alignment, epoxy the fin in place.
4. Slip three hinges into the fuselage and vertical fin. Use T-pins to center the hinges and leave a 1/32" gap.
5. Test the rudder to make sure you have 45 degrees of throw.
6. Use thin CA to secure the hinges.

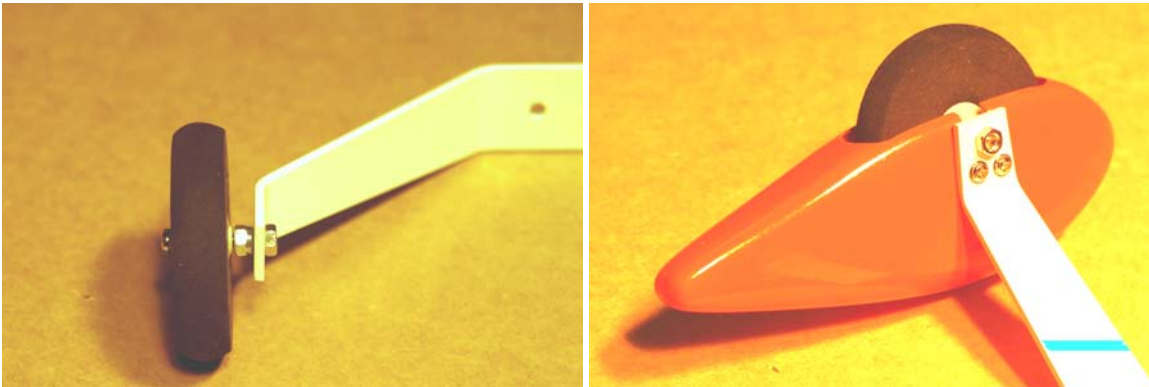


Step 3: Landing Gear Assembly.

1. Locate the aluminum main gear, wheel pants, wheels and hardware.



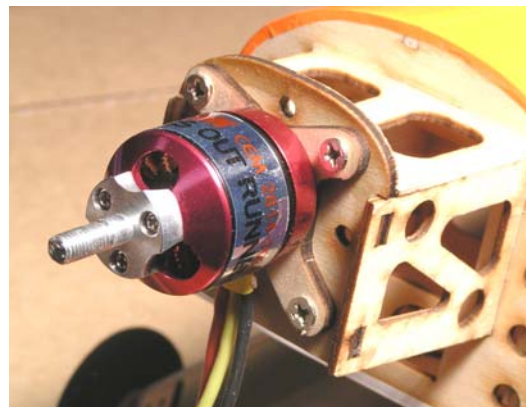
1. Slip one wheel on the axle, followed then the elastic stop nut. Tighten the nut until the wheel turns freely without binding.
2. Attach the axle assembly to the landing gear with the remaining 3mm nut.
3. Slide the wheel part in place. Adjust the position of the wheel on the axle if necessary to allow the wheel to turn freely.
4. Use thread-locking compound on the axle nut to prevent it from loosening. Complete the assembly by installing the 2 small screws to retain the wheel pants.
5. Repeat the procedure for the other side.
2. Bolt the finished landing gear in place on the fuselage with 2-3mm machine screws.



Step 4: Mounting the Motor

We recommend using Cermark's CEM-2814-1030 Outrunner motor

3. Carefully position the motor on the 3mm ply mounting plate. Use 4 flathead screws to attach the motor to the plate.
4. Use the remaining 4 screws to mount the motor plate to the fuselage.
5. Mount a Cermark # Adptr28 prop adaptor on the front of the motor with the 3 screws provided.



Step 5: Radio Installation

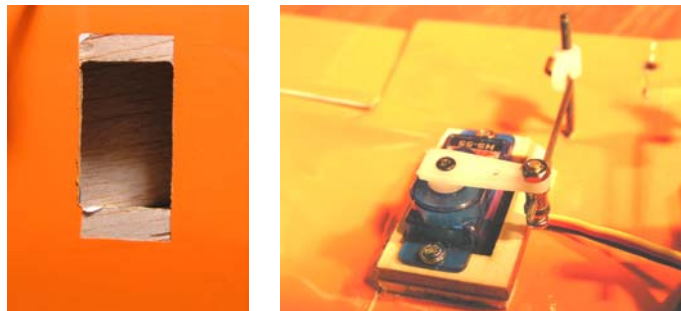
1. Mount the rudder and elevator servos into the fuselage tray using the screws provided with your servos.
2. Install the EZ connectors on the servo arms as shown. Center the servo arms with the transmitter on and install the arms facing outwards.



3. Make a 1/8" "L"-bend on one end of each of the 18" long pushrods.
4. Slide the pushrods down the plastic tubes installed in the fuselage.
5. Locate the exit points at the tail and carefully trim away the covering to allow the pushrod to exit.
6. Align the control horn with the pushrod and press the horn down lightly to mark the location.
7. Drill two 1/16" holes through the control surfaces.
8. Remove a small amount of covering as shown and epoxy the control horns in place.



9. Attach the pushrods to the control horns, using the white pushrod keepers.
10. Center the surfaces and tighten the EZ connectors firmly.
11. Locate the aileron servo trays. Note the trays have a high and low side.
12. Test fit the trays with the high side towards the trailing edge of the wing. Mark and remove a small amount of covering material to allow the trays to be epoxied into place.

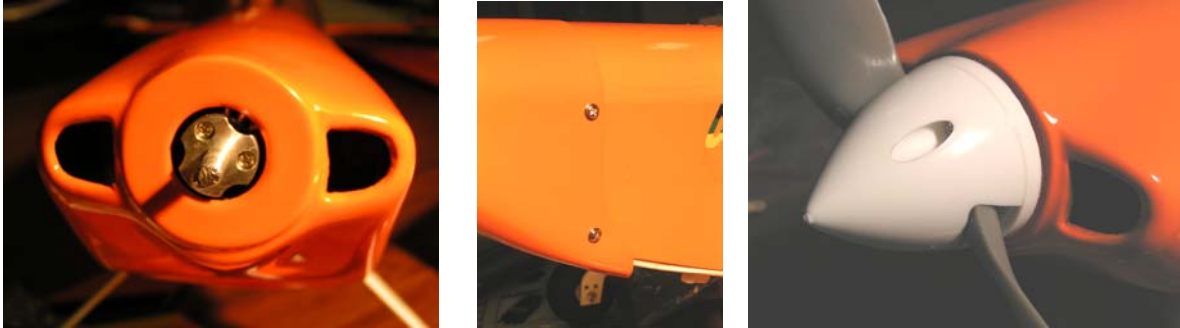


13. Install the aileron servos in the top of the lower wing as shown.
14. Attach the EZ connectors to the servo control arms
15. Make a "Z" bend on one end of the 2-3/4" long aileron pushrod.
16. Install the pushrod on the control horn using the "Z" bend
17. Slip the pushrod through the EZ connector on the aileron servo.

- Center the aileron and tighten the screw on the EZ connector firmly.
- Repeat this process for the other aileron servo.

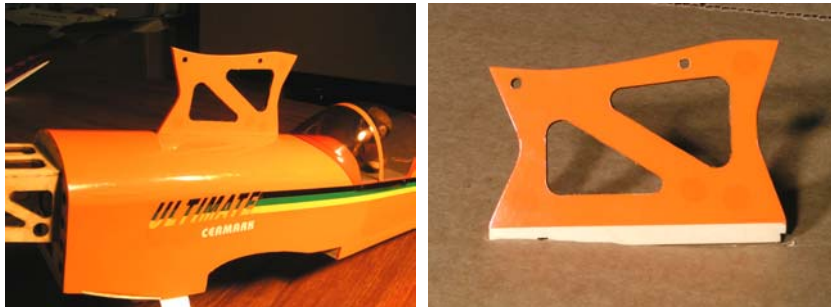
Step 6: Cowl installation

Mount the cowl to the fuselage with the 4 small sheet metal screws included inside the cowl. Slip the cowl in place and mount the spinner back plate on the motor. Center the cowl on the spinner and allow 1/16 to 1/8" clearance. Use small strips of Scotch tape to hold the cowl in position while you drill the holes for the mounting screws. Apply a drop of thin CA to the holes to reinforce the threads



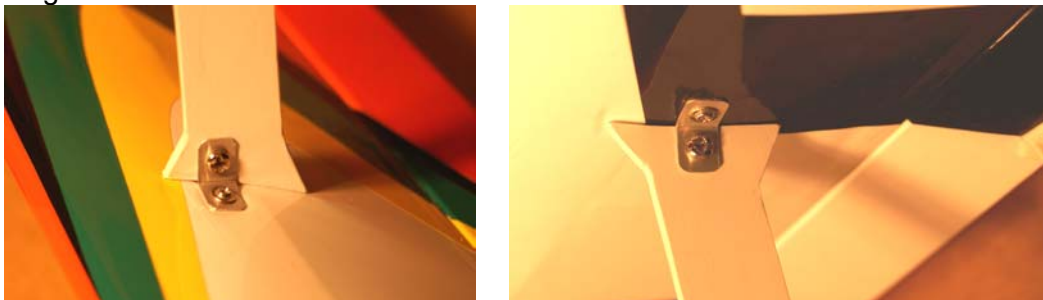
Step 7: Cabane Strut Installation

- Test fit the cabane strut into the slot on top of the fuselage. Study the photo to insure the cabane is oriented correctly. Remove any covering material from the cabane that enters the fuselage. Epoxy the cabane in place making sure it aligns vertically with the fin and is fully seated in the fuselage.



Step 8: Wing Mounting

- Slip the lower wing into the fuselage cutout and secure with the 4mm machine screw at the trailing edge
- Mount the 90-degree "I" strut brackets on the top surface of the lower wing. You will find a small hole pre-drilled just outside of the 3rd rib from the tip. Install the brackets on the bottom surface of the upper wing. Use the 2.5 x 5mm sheet metal screws.



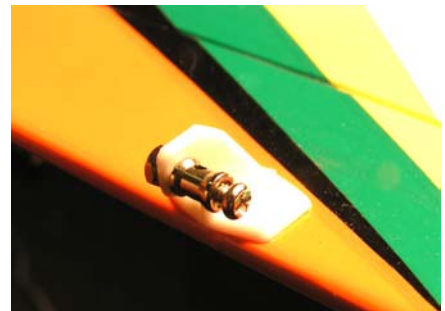
- Bolt the upper wing to the cabane using the 3 x 6mm machine screws, washers and nuts.



4. Install the "I" struts with the 3 x 6mm machine screws. Note there are a left and a right "I" strut. These will thread into the blind mounting nuts already installed in the "I" struts at the factory.

Step 9: Interconnecting the Ailerons

A wire pushrod is used to link the upper and lower ailerons together. The lower ailerons will have a cut-down control horn mounted on their top surface at the extreme trailing edge **facing aft**. The upper wing ailerons have a cut-down control horn installed on their lower surfaces, again **facing aft** at the extreme trailing edge. Study the photos to make sure you understand the process before you begin.



1. Cut down the remaining 4 control horns leaving only the inner most hole.
2. Locate 2 wire pushrods with the factory made "Z" bends, 5-3/4" long.
3. Install an EZ connector on 2 of the control horns. Note these will be the control horns used on the top surface of the lower ailerons and should both face outward.
4. Align the hole in the EZ connector with the "I" strut.
5. Align the control horn with the pushrod and press the horn down lightly to mark the location
6. Drill two 1/16" holes through the control surfaces.
7. Remove a small amount of covering as shown and epoxy the control horns in place.
8. Install the upper aileron control horns taking care to keep them in alignment with the lower horns.
9. Connect a pushrod to the to the upper control horn, with the "Z" bend end of the pushrod.
10. Drop the lower end of the pushrod through the EZ connector. Align the ailerons and carefully tighten the EZ connector.
11. Test aileron operation to insure equal movement of all 4 ailerons. Adjust if necessary.

Recommended Control Throws

The recommended control throws listed below are conservative. After you have flown your Ultimate ARF you can adjust the control throws to suit your flying style.

Center of Gravity

The Ultimate ARF balances 2-3/4 to 3" aft of the leading edge on the under surface of the **upper wing, measured at the cabane strut.**

Controls	Low rates/Expo		High rates/Expo	
Ailerons	3/8" up & down	25%	1/2" up & down	45%
Elevator	3/8 up & down	25%	1/2" up & down	60%
Rudder	1/2" left & right	25%	1" left & right	45%

Preflight Check

- Turn on your transmitter and then the receiver. Read the directions for your ESC. Program it to turn off the brake. Program any other parameters needed.
- Set up the radio as desired and check direction and throw for each control surface.
- Bolt the propeller adaptor onto the motor, followed by the propeller.
- Tighten securely.
- Open the battery hatch and install a freshly charged battery.

Propeller Safety

- Before use, remove any flash along the edges of the propeller with sandpaper or by scraping it with a sharp knife.
- Keep spectators at least 20 feet away and out of the path of the plane and rotating propeller.
- Wear safety glasses and hand protection when operating powerful electric motors. Do not permit any object to touch a turning propeller.
- Start and stop the propeller by use of the Electronic Speed Control only.
- Inspect the propeller after each flight. Discard any propeller that has nicks, scratches, or visible defects. Do not repair, alter, or modify propellers.
- Electric motors used in this model are capable of delivering 400 to 500 watts to the propeller and can cause serious damage and injury.

Limit of Liability

The craftsmanship, attention to detail and actions of the builder/flyer of this model airplane will ultimately determine the airworthiness, flight performance and safety of the finished model. The Distributor's obligation shall be to replace those parts of the ARF proven to be defective or missing. The user shall determine the suitability of the product for his or her intended use and shall assume all risk and liability in connection therewith. Weight is very important in aerobatic flight and this plane was designed to fly, not to crash which keeps weight to a minimum.

Distribution

ULTIMATE ARF is distributed by:
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