# **Hot Stik ARF**



## INSTRUCTIONS

#### WARNING

A radio-controlled model is not a toy and is not intended for persons under 16 years old. Keep this kit out of the reach of younger children, as it contains parts that could be dangerous. A radio-controlled model is capable of causing serious bodily injury and property damage. It is the buyer's responsibility to assemble this aircraft correctly and to properly install the motor, radio, and all other equipment. Test and fly the finished model only in the presence and with the assistance of another experienced R/C flyer. The model must always be operated and flown using great care and common sense, as well as in accordance with the Safety Code of the Academy of Model Aeronautics (www.modelaircraft.org). We suggest you join the AMA and become properly insured prior to flying this model. Also, consult with the AMA or your local hobby dealer to find an experienced instructor in your area. Per the Federal Communications Commission, you are required to use only those radio frequencies specified "for Model Aircraft."

#### LIMITED WARRANTY

Carl Goldberg Products has inspected and certified the components of this aircraft. The company urges the buyer to perform his own inspection, prior to assembly, and to immediately request a replacement of any parts he believes to be defective for their intended use. The company warrants replacement of any such components, provided the buyer requests such replacement within a period of 90 days from the date of purchase and provided the defective part is returned, if so requested by the company.

No other warranty, expressed or implied, is made by the company with respect to this kit. The buyer acknowledges and understands that it is his responsibility to carefully assemble the finished flying model airplane and to fly it safely. The buyer hereby assumes full responsibility for the risk and all liability for personal or property damage or injury arising out of the buyer's use of the components of this kit.

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Congratulations on your purchase of the Hot Stik ARF. Every effort has been made to produce a lightweight, straight, easy to assemble aircraft. Because of its oversize control surfaces which are double beveled to allow for extreme throws, great care must be taken in the set-up and flying of this airplane. Quality hardware components have been provided to allow for 3D set-up while maintaining adequate mechanical advantage to eliminate flutter. It is your responsibility as an advanced pilot to fly the aircraft in an intelligent manner. THROTTLE MANAGE-**MENT IS A MUST!!!!!!** Goldberg Models has flown the Hot Stik ARF through a very rigorous flight-testing schedule and have stressed the airframe beyond all practical parameters without a single failure. Goldberg models will NOT warranty the Hot Stik ARF against flutter due to improper set-up or excessive speed maneuvers. having said that, we believe you will find the Hot Stik ARF to be one of the most responsive, in-the-grove aircraft on the market. Just remember to use common sense when flying this high performance machine.

We are very proud of the construction of the Hot Stik ARF and all of our other ARF aircraft. Each aircraft is jig built to insure a straight true airframe. Every effort is made to build as light an aircraft as possible. As with any professional builder, glue is used sparingly. Please take a moment during assembly and run a bead of CA or aliphatic resin into the high stress joints that you can reach such as the landing gear plate, servo mounting trays, wing hold down blocks, Firewall, etc. Also, during the course of shipping from the manufacturer to our facility in the United States, it is not uncommon for the aircraft to experience several changes in climate. This may cause the iron-on covering to develop wrinkles. This is not a fault of the manufacturer. Please take a few minutes with your heating iron and heat gun to iron down the seams and re-shrink the covering where needed. The results will be a beautiful aircraft with a breathtaking finish that you will be proud to display at your flying club.

Before beginning assembly of your **Hot Stik ARF**, we highly recommend that you study this manual in its entirety. You should begin planning your radio installation based on your choice of engine and equipment from the beginning.

Because the Hot Stik ARF is intended for those with some degree of modeling experience, every minute detail will not be covered. This is not a basic trainer. Assembly of this aircraft will be easy for the experienced modeler, and by following the instructions within this manual and using the skills you've gained during your modeling career you will be able to produce a first class aircraft.

#### Building supplies needed

Hobby knife w/#11 blades Thin CA Medium CA Canopy glue 30 minute epoxy Thread lock **Diagonal wire cutters** Pliers Assorted drill bits Various sized screwdrivers( both Phillips and standard head) Tape measure Dry-erase marker Paper towels Rubbing alcohol Electrical tape 3/32, 7/64, 9/64 & 3mm Allen wrench Wax Paper

#### Note:

Thread lock must be used where ever any machine bolts are threading into any type of nuts. If you do not use thread lock the bolts could become loose and fall out in flight.

#### **ADHESIVES & GLUING TECHNIQUES**

CA adhesives are specially formulated to firmly glue the plywood, hardwood, and balsa used in your model and to withstand the vibration and stresses of high performance flight. However, there are times, such as when you are installing the stabilizer and fin on the fuselage and want more set-up time for careful alignment and positioning, then you should use epoxy. Occasionally, you also will want to use thin CA, which "wicks" into the surrounding areas. Aliphatic resin glue or similar water-based glues can also be used, but they will add to the assembly time because they dry so much more slowly than CA glue. Remember, when ever using any CA, you must be careful to read instructions thoroughly, as you will have only seconds for positioning of parts. Be sure to trial fit parts together before gluing. Also, never use watery THIN type CA glue for gluing plywood and hardwood parts. Thin CA's do not adequately bond these areas.

#### CAUTION

Some people may experience an allergic reaction when exposed to fumes from CA glue or epoxy. As with paints, thinners, and solvents, it is always important to use glues only where there is adequate ventilation to carry fumes away. A fan is recommended. Also, special care must be taken when using CA, as it will bond skin as well as other surfaces. Before using any CA, carefully read all label precautions. When using CA, protective eye-wear and care in keeping the glue away from the face is highly recommended. If CA does happen to get into the eye, hold lid open and flush with water only. Seek immediate medical attention.

#### **CONSTRUCTION TIPS**

IMPORTANT: ALWAYS READ A FEW STEPS AHEAD. This will alert you to coming instructions and will help you plan accordingly.

#### COVERING

The **Hot Stik ARF** is covered in a premium polyester film chosen by many of the world's top flyers for its beauty, toughness, and ease of application and repair. It is not uncommon for ARF's to develop a few wrinkles in transit. If this is true of your model, the situation is easily corrected. Before you begin putting the pieces together, run around the edge of the seams first then over the surface of each section with an iron (either specially designed for airplane use or the more cumbersome household iron). Apply the heat (set at about 350° F), following along with a soft cloth and pressing down on the covering as you go around. This will more firmly set the covering adhesive into the wood and keep your aircraft covering tight and smooth in the future. Once you have ironed the seams stay away from them with the heat or the covering will slide when you try to shrink the middle. If this happens the wrinkles will not come out of the covering.

#### ITEMS NEEDED TO COMPLETE THIS AIRCRAFT

- □ 1 24" FUEL LINE
- □ 1 ENGINE .40 TO .50
- □ 1 RADIO GUIDANCE SYSTEM
- □ 3 12" AILERON SERVO EXTENSION WIRES
- $\Box$  2 Y-CONNECTORS
- □ 1 CA ACCELERATOR
- □ 1 2 OZ. BOTTLE CA MEDIUM GLUE
- □ 1 1/2 OZ. BOTTLE CA THIN GLUE
- □ 1 30 MINUET EPOXY
- □ 1 1/2" FOAM RUBBER

□ 1 2" to 3" SPINNER OR ROUNDED PROP NUT OPTIONAL:

- □ 1 PILOT FIGURE
- □ 6 SERVO ARM EXTENSIONS

#### NOTE: The Hot Stik ARF covering closely

matches Oracover

- #890 Fluorescent red
- #893 Fluorescent Lime
- #891 Safety Yellow
- #881 Silver
- #874 Black
- #930 1" Black & White Checkered

## **Fuselage Assembly**



- 1. 
  □ COLLECT THE FOLLOWING ITEMS
  - (1) ALUMINUM LANDING GEAR
  - (2) 5/32" AXES
  - (2) AXLE NUTS
  - (2) WHEEL COLLARS
  - (2) 6-32 X 1" BOLTS
  - (2) 2-1/2" WHEELS
  - (2) FLAT WASHERS



2. □ Bolt the landing gear in place using the two 6-32 bolts and flat washers. Be sure to use locktite on the bolts. The blind nuts are preinstalled..



2. □ Locate the holes in the bottom of the fuselage just ahead of the wing opening. Remove covering with an x-acto knife or soldering iron.



**3**.  $\Box$  Mount the wheel on the axle using the 5\32" wheel collar.



4. □ Find the center of the stab at the trailing edge and make a mark at the location. Place the stab on the fuselage and align the center mark at the rear. Use a straight pin to hold in place.



**5**. □ Measure the stab to make sure it is square with the fuselage. Dimensions X-X should be the same and stab will be square.



6. □ Using a pencil, make a mark along the side of the fuselage on both side of the stab.



7. □ Using an x-acto knife or razor blade, remove the covering inside the line you marked. Cut about 1/16" inside the line so bare wood will not show after gluing in place. Be careful to cut just the covering and not the wood as cut-ting into the wood will weaken the stab.



8. □ Locate the two elevator halves and the elevator joiner wire. The elevators should be installed before installing the fin.



9. □ Mix some 5-minute epoxy and force into the holes for the joiner wire in the elevators. Fit the joiner wire into the holes and cover with masking tape. Lay flat on some wax paper and make sure both elevators are flat on the table. Set aside till epoxy cures.



**10.** □ Locate 6 hinges and install in the elevators. Use straight pins in the holes in the center to make sure hinges stay centered in holes.



**11**. □ Install the elevator on the stab pushing the hinges in until the pins are flush against the trailing edge of the stab. When all are in place, remove the pins and push the elevators flush against the stab.



- 12. □ Deflect the elevator into the up position to the full limit of its travel. From the bottom side, put one drop of thin CA on each hinge. Deflect the elevator to its full travel in the other direction and apply another drop of thin CA on each hinge. Repeat the operation for two drops of CA on each hinge top and bottom.
- **13**. □ Bolt the wing in place on the fuselage. Mix some epoxy and install the stab on the fuselage. Sight down the fuselage and make sure the stab is parallel with the wing. Slight pressure on either side is all that is needed to make sure stab is aligned with wing. Set aside till epoxy cures.



. □ Install the fin in the notch in the rear of the fuselage. Measure the center of the fuselage at the front of the stab and align the fin on the centerline. Make a mark on each side of the fin on the stab.



. □ Remove the covering between the lines you marked on the top of the stab where the fin mounts.



- . □ Remove the covering on the post of the fin, leave the back covered where it shown on the rear. Make sure covering is removed on the bottom of the fin where it sits on the stab.
- . □ Mix some epoxy and install the fin. Make sure it is centered on the front.



. 
Locate the tail wheel bracket.



**19**.  $\Box$  Mix some epoxy and install the nylon tail wheel bracket in the slot provided.



**20**. □ Locate the rudder and install the hinges using pins in the holes to make sure the hinges go half way into the rudder.



21. □ Mix some epoxy and force into the hole in the rudder where the tail wheel tiller are goes.Install the rudder on the fin and push hinges in until all pins are against the fin. Remove the pins and push rudder against the fin. Make sure rudder tiller arm is in its slot.



22. □ Deflect the rudder to its full travel in one direction and using thin CA, glue the hinges in place. Place one drop on each hinge. Deflect full in the other directions and glue hinges from the other side. Repeat process so each hinge gets two drops on both sides.

# **Engine Mounting**



- 1. COLLECT THE FOLLOWING ITEMS
  - (2) NYLON MOTOR MOUNTS
  - (2) 4MM X 25MM BOLTS
  - (2) FLAT WASHERS



2. □ Bolt the mounts to the firewall. The blind nuts are pre-installed. Be sure and use Locktite on the bolts. The mounts are spaced to fit most .40 to .46 motors. If yours does not fit you will have to knock the blind nuts out and reinstall the mounts to match your engine.



**3**. □ Place your engine on the mounts and mark the location of the engine mounting holes on the mounts. Remove the engine and drill a 5/64" hole at the marks.



- **4**. □ Reinstall the engine and bolt in place using the 6-32 bolts and aircraft lock nuts.
- **5**. □ Drill a 3/16" hole in line with the throttle arm on your engine.

### Wing Assembly

- 1. □ The wing is one piece so all there is to do is glue the aileron and flap hinges in place. Use the straight pins in the holes in the hinges to make sure they stay centered. Make sure aileron is aligned with wing tip and flap does not rub against aileron and both work freely.
- 2. □ Remove the pins and glue in the same manner as we did the elevators and rudder. Deflect the aileron and flap fully in one directions and apply one drop of thin CA. Turn the wing over and deflect the aileron and flap in the other direction and apply one drop to glue. Repeat process of two drops of glue on each hinge. Repeat for the other side of the wing.



3. □ Install the two servos in the cutout provided with the output arm to the rear. You will need a 12" extension on the out board servo. Use the string provided to pull the servo lead to the hole in the center of the wing. As the lead passes the inboard servo attach the wire from the servo and pull both to the middle.



4. □ Lay a straight edge along side the servo and mark the location of the horn on the aileron and flap. Mark both aileron servos on the outboard side of the servo (toward the tip of the wing). If you plan to use the flaps as just flaps you will have to mount the horn on the same side of the servo on both sides(right flap on the inboard side left flap on the outboard side) If you plan to use them just as ailerons and have them coupled to the ailerons you should mount the horns as you did for the ailerons.



5. □ Mount the control horns using the #2 screws with the nylon plate on top. Make sure the holes for the clevis to connect to are aligned over the hinge line.



6. 
□ Repeat for the other three horns.



7. □ Locate the four 2-56 x 6" pushrods and install the nylon snap link on the end. Thread the rod into the snap link until 1/16" extends into the opening. Slide the silicone tubing clevis keeper over the snap link.(silicone tubing 1/4" long)



8. □ Install the snap link on the control horn. With the aileron servo centered and the aileron level, mark the point where the pushrod crosses the control arm on the servo and make a 90 degree bend. But the bend off at 3/8". To get full potential out of the plane you will need a heavy duty servo arm 1 to 1-1/4" long.



- **9**. □ Install the pushrod in the servo output arm and retain with the nylon swing in keeper. Push the silicone clevis keeper down to the control horn.
- **10**.  $\Box$  Repeat for the other aileron and both flaps.

# **Rudder Servo Installation**



1. □ Mount the rudder servo in the opening provided on the bottom of the fuselage just in front of the stab. You will need a 1" extension on the servo lead. Be sure to tape the plug together so it does not come loose.



2. □ Install the cover door. Clear tape will hold it in place and be easy to remove if needed.



 □\* You will need a double sided heavy duty servo output arm.



4. □ Measure 1/2" from the bottom of the rudder and 3/8" back from the hinge line and drill a 9/64" hole for the rudder control horn. Install the 6-32 x 2-1/2" threaded rod with a nut and washer on each side. Center the rod in the rudder. Install the nylon control horn fittings on each end.



- 5. □ Locate the two 2-56 x 9" pushrods and install the nylon snap links on the ends as we did with the ailerons. Install the silicone keepers and attach to the pushrod fittings on the rudder.
- 6. □ Center the rudder servo and tape the rudder in the neutral position. Mark the position of the pushrods where they cross the control arm and make a 90 degree bend. Cut the bend off at 3/8".



7.  $\Box$  Install the pushrods in the servo output arm and retain using the nylon swing in keepers.

# **Elevator Servo Installation**



1. □ Install the elevator control horn on the inboard edge of the elevator on the right side of the fuselage. Align so the holes for the clevis are centered over the hinge line.



3. □ Install the elevator servo in the opening provided in the tray. The opening is made wide so you can align different length servo arms with the pushrod. To get full potential out of the plane you will need a 1" to 1-1/4" heavy duty servo arm.



2. □ Install a clevis on the end of the 2-56 x 24" pushrod as we did with the ailerons and rudder. You may need to push the rod through the nylon tube from the servo compartment to open the hole in the side of the fuselage. Insert the pushrod into nylon tube and attach the clevis to the elevator control horn..



**4**. □ Center the elevator servo and tape the elevator in neutral. Mark the location where the pushrod crosses the servo arm and make a 90 degree bend. Cut the bend at 3/8". Install the pushrod and retain using one of the nylon swing in keepers.

# Throttle Servo Installation

1. □ Two cutout are provided for the throttle servo, one on each side of the fuselage. Mount your servo on the side that matches the engine you are using.



2. □ Install a clevis and keeper on the end of the 2-56 x 15" pushrod and connect to the throttle arm on your engine.



3. □ Open the throttle on the engine to full and set the servo to full throttle. Mark the pushrod and make a 90 degree bend at the mark. The bend will need to be made down into the fuselage because of the close clearance of the wing. Cut the bend at 3/8" and install in the servo arm and retain with the nylon swing in keeper.

# **Fuel Tank Installation**



- 1. 
  □ COLLECT THE FOLLOWING ITEMS
  - (1) FUEL TANK
  - (1) RUBBER STOPPER
  - (2) CAP WASHERS
  - (3) ALUMINUM TUBES
  - (1) TANK CLUNK
  - (1) CAP SCREW
  - (1) SILICONE TUBE



2. □ Assemble the cap with the large washer on top the rubber stopper and the small washer on the bottom. Insert the screw into the center hole. Use the long aluminum tube and bend at a 45 degree angle to reach the top of the tank when the cap is installed. One of the short tubes will be the fuel pickup. Attach the silicone tube to the end of the aluminum and adjust the length so that the clunk will be about 1/4" off the bottom of the tank when held vertical.



3. □ Insert the cap in the tank, making sure the vent line is at the top of the tank. The top of the tank is the one closes to the cap. The clunk should be 1/4" off the bottom of the tank. Tighten the center screw to retain the cap in the tank.



**4**.  $\Box$  Insert the in the opening in the bulkhead.



5. Description Push tank forward until the cap fits in the hole in the firewall. The rear of the tank can be padded with foam.

# Receiver Switch and Battery Installation



1. □ The switch can be mounted on either side of the fuse, whichever is opposite the exhaust.



**2**. 
The receiver can be wrapped in foam and placed in the opening between the servo tray and rear of tank.



3. □ The battery can be mounted forward with the receiver if necessary for balance. It will probably need to be mounted toward the rear for balance. The opening opposite the throttle servo can be enlarged to allow the battery to be moved back.



**4**. □ The battery can be wrapped in form and fitted into the opening.

# **Canopy Installation**

- 1.  $\Box$  COLLECT THE FOLLOWING ITEMS
  - (1) PLASTIC COCKPIT INSERT
    - (1) TINTED CANOPY



2. □ Using Canopy glue, glue the cockpit insert to the top of the fuselage even with the leading edge of the wing and centered on the fuse-lage.



**3**. □ When the insert has dried, glue the canopy in place. Use masking tape to hold in place till dry.

# **Final Assembly**



- **1**.  $\Box$  Locate the 1/4-20 nylon bolt and the wing bolt reinforcement plate. Bolt the wing in place.
- 2. 
  The CG should be 4" to 4.75" behind the leading edge of the wing measured at the fuselage. Start off with the Cg forward and move it back as you become more familiar with the plane. The further back you move it the better it will perform the 3D maneuvers but it will also become more unstable and harder to control.
- **3**.  $\Box$  Set up the control throws as follows:

Elevator Low rate 1" each direction

High rate all you can get.

Ailerons Low rate 3/4" each direction

High rate all you can get.

Rudder 1-1/2" each direction

High rate all you can get.

Flaps 1-1/2" down or they can be coupled with the ailerons or set up as flaperons and coupled with the elevators.