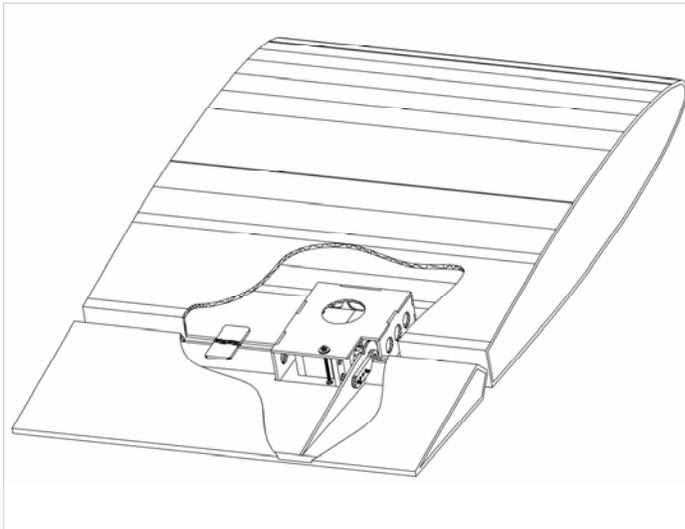




SINGLE SERVO MOUNTING BOX INSTRUCTIONS

Thank you for purchasing the patent pending, DuRant Direct Drive servo mount. This system is the ultimate in aircraft control. 100% servo torque is transmitted to the control surface - with zero travel, power, or precision loss due to linkage slop. Control travel is absolutely linear. Servo bearing and control hinge wear are greatly reduced. Fewer parts means less weight and greater reliability.



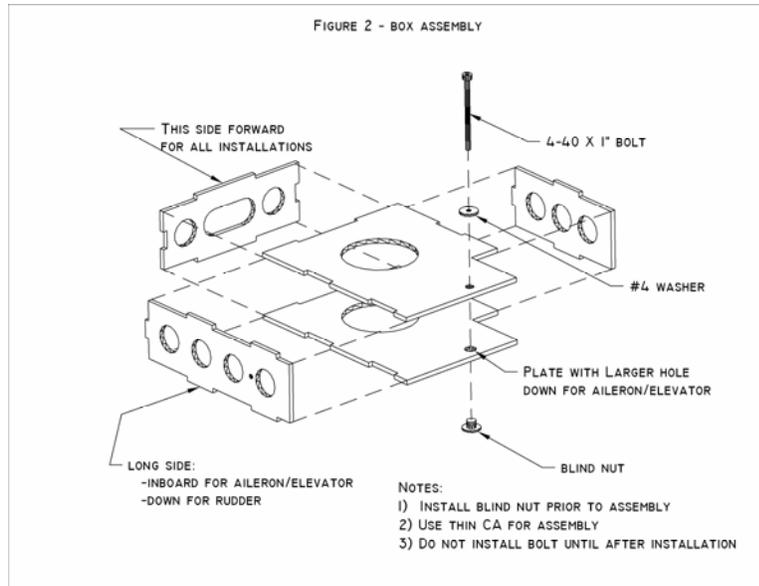
REQUIREMENTS

To begin, you will need the following:

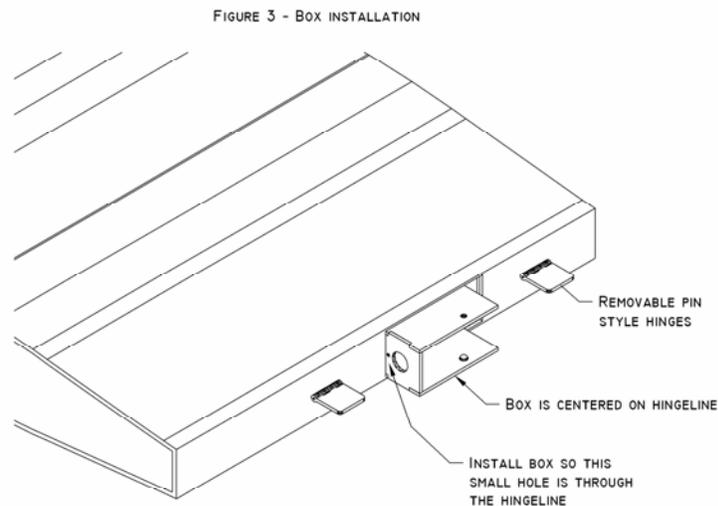
- 1) Computer radio, programmable servos, OR JR Matchbox (or equivalent)
- 2) Removable style hinges, such as Dubro ¼ scale hinges part number 257.
- 3) Length of .047" piano wire.
- 4) Hanger 9 HD ½ servo arm. (Futaba - part number HAN3575, or JR - part number HAN3574)
- 5) Servo. This mount is designed for a standard size servo not greater than .76" in width for mount #1, .82" wide for mount #1W, or 1.01" wide for mount #1XW. Any standard servo will work - but we highly recommend a quality servo, as your final control precision is only limited by the quality of your servo. Direct Drive especially optimizes the extreme precision of digital servos.
- 6) CA glue and basic modeling tools.

ASSEMBLY AND INSTALLATION

- Determine a location to install the box. Follow these guidelines:
 - 1) It is preferable to mount the box as far inboard as possible. This keeps total mass close to the aircraft center and usually provides a thicker airfoil section with which to work.
 - 2) If control surface stiffness is a factor, mount the box near the center of the surface.
 - 3) You may be limited by aircraft structure, available space, or cosmetics. In this case anywhere it will fit will work just fine.
 - 4) In a built-up wing, it is structurally desirable to mount the box against a wing rib.
- Determine the box orientation prior to assembling. The side with the oval cutout always goes forward. The long side normally goes inboard or down. The plate with the larger bolt hole goes down.

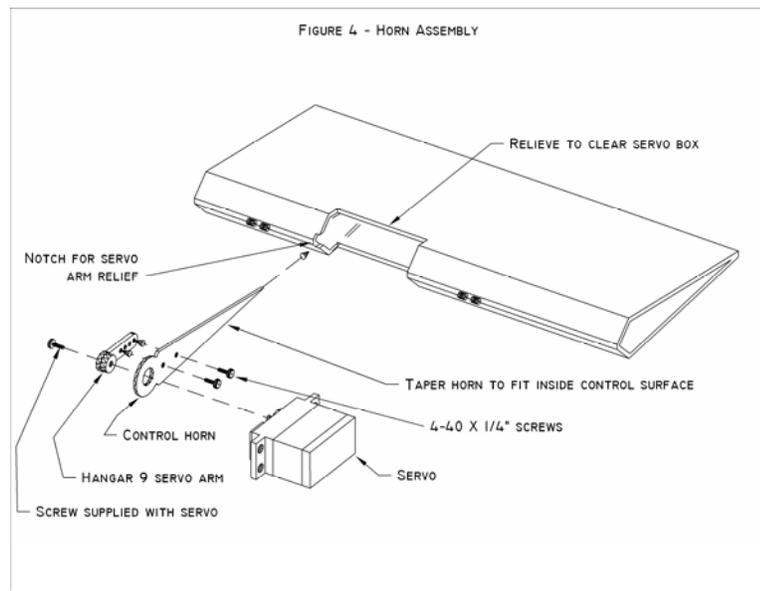


- Install the supplied 4-40 blind nut in the lower plate (the plate with the larger hole to accept it). Cut a small square of .56oz glass cloth or tissue to fit over the back of the nut. Add a drop of thin CA to bond the tissue and nut permanently to the plate. Be careful not to get the glue in the threads, or you will have to clear the threads with a 4-40 tap.
- Assemble the box using thin CA or equivalent glue, referencing figure 2. Add a fillet of glue around the inside of all joints.
- Install your control surface to the wing or tail using removable hinges. Be sure to leave a space where the box will be placed. When satisfied with the fit and travel, remove the control surface.



- Place the box against the airframe in the location where it will be mounted. Be sure it is perfectly centered on the hinge line. Use a fine tipped marker to trace the shape of the box onto the airframe.

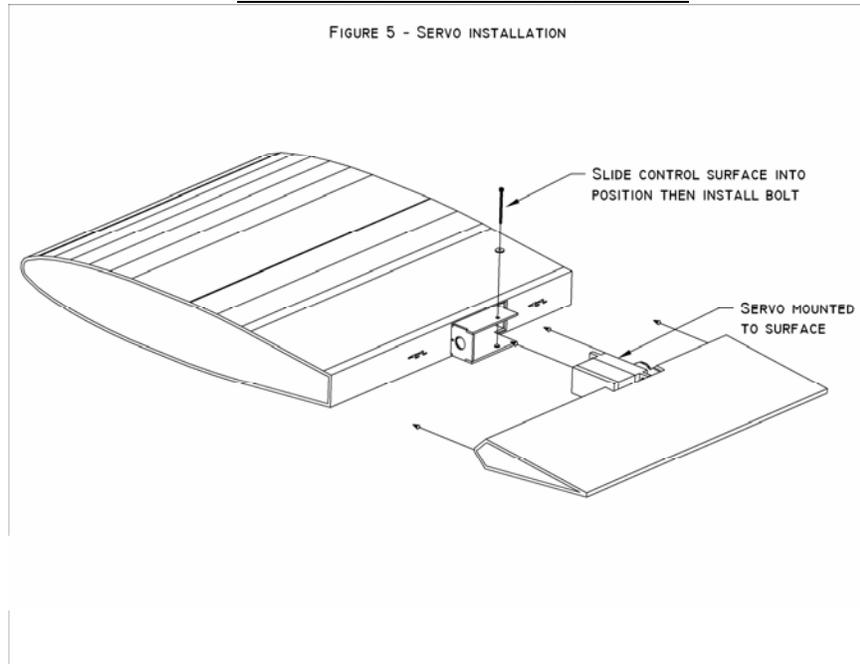
- Remove the box and carefully cut an opening into the airframe along your tracing. The hole must be deep enough to allow the box to enter up to the small hole located on the long side. Reference figure 3. Also make a pathway for your servo wire at this time.
 - Note: In foam wings, you can cut a hole in the foam using a hot wire. To do this, shape a length of piano wire to the dimensions of the box, and mark it so you can tell the desired depth to cut. The wire can be placed in a soldering gun to heat it, or simply heated over a flame. When hot, insert the wire to the proper depth – slice to the other side of the opening, and then remove. Do this all in one rapid, smooth motion.
- Install the box using glue appropriate for the structure. That is, if you have a foam-cored wing, be sure to use foam safe glue!



- Carefully make a cutout in the control surface to make room for the box. Reference figure 4. Make the relief just large enough to clear the box throughout the full range of motion.
- Make a 1/16" slot in the control surface where the horn will be installed. The horn must align with the center of the rectangular cutout in the box when the surface is installed.
- Install the Hangar 9 servo arm (not supplied) onto the horn using the two 4-40 X 1/4" bolts. Use a drop of thin CA where the arm contacts the horn to lock the assembly together.
- Taper the control horn to fit in the slot you just cut in the control surface. It is preferable, but not essential, to have the horn contact both outer skins of the surface. The servo screw hole must be centered on the hinge line. You will have to notch the control surface about 1/8" for the servo arm.
- Glue the horn into place in the control surface using slower drying glue. Ensure that the arm is exactly centered on the hinge line by running a .047" wire through the servo screw hole and the adjacent hinges.
- Cut a piece of scrap balsa sheet (1/16" to 1/8" thick) to fill the relief cut into the control surface. This will act as a sheer web to stiffen the control surface in this area. Set it into the surface enough to clear the box when the surface is reinstalled.

- Install the control surface on the airframe. Check for clearance throughout the full range of travel. Trim any areas that need more clearance. You will need about 1/32" to allow room for covering. Construction is now complete.

SERVO INSTALLATION PROCEDURE



- Run your servo leads to the servo through the oval cutout in the front of the box.
- Turn on your transmitter and receiver. Ensure that the trim and sub-trim are set to zero. If using a matchbox or programmable servo, reset the programming to neutral. Set travel limits to the maximum and equal in both directions.
- Mount the servo on the servo arm as close to centered as possible, then install the set screw that cam with the servo. It is normal for it to be cocked just a little at this point in the operation.
- Turn off your radio. Slide the servo/control surface assembly into place. Gently tuck the servo wires into the oval box hole as you slide the servo into the box to ensure they do not get crimped.
- Install your hinge pins, the 4-40 X 1" servo bolt and washer supplied. Just snug – do not over-tighten.

RADIO SETUP

- Turn the transmitter and receiver back on.
- Center the control surface by:
 - 1) If using a matchbox, etc., set the control surface to center using the matchbox.
 - 2) If using a programmable servo, program the center point.
 - 3) Otherwise, set the center point using the radio's sub-trim function.
- Now set each end point for maximum travel without binding by:
 - 1) If using a matchbox, etc., set the endpoints using the matchbox.
 - 2) If using a programmable servo, program the endpoints.
 - 3) Otherwise, set the endpoints using the travel volume function of the radio.

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Phone 817-243-8524