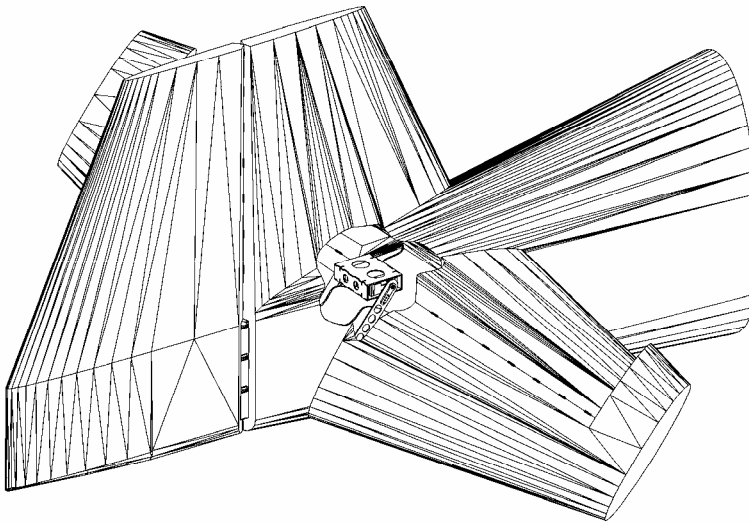




## DUAL ELEVATOR MOUNTING BOX INSTRUCTIONS

Thank you for purchasing the patent pending, DuRant Direct Drive dual elevator servo mount. This mount allows you to install two elevator servos in the tail of an aircraft to power opposing elevator halves. It is designed for those thin tail sections where the servos must be mounted with minimum space between them. (If the fuselage width is greater than 3.25" at the elevator hinge line, then use two single elevator mounts.)

Direct Drive is the ultimate in aircraft control. 100% servo torque is transmitted to the elevators - with zero travel, power, or precision loss due to linkage slop. Elevator travel is absolutely linear. Servo bearing and control hinge wear are greatly reduced. Fewer parts means less weight and greater reliability.



Dual Elevator Mount

## REQUIREMENTS

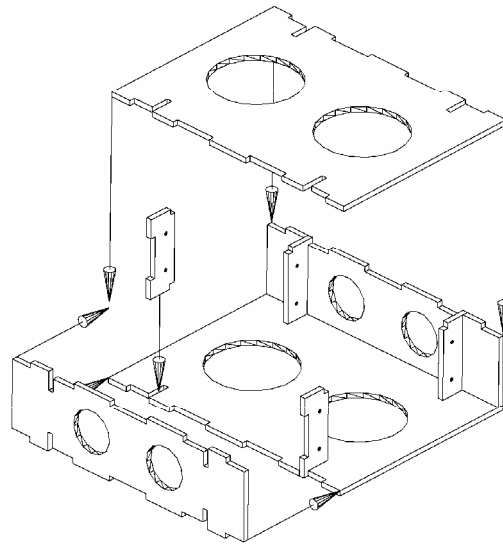
To begin, you will need the following:

- 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 arms. (Futaba - part number HAN3575, or JR - part number HAN3574)
- 5) Servo. This mount is designed for standard size servos not greater than .76" in width for mount #5, .82" wide for mount #5W, Or 1" wide for mount #5XW. Any standard servos will work - but we highly recommend quality servos, as your final control precision is only limited by the quality of your servos. Direct Drive especially optimizes the extreme precision of digital servos.
- 6) CA glue and basic modeling tools.

## ASSEMBLY AND INSTALLATION

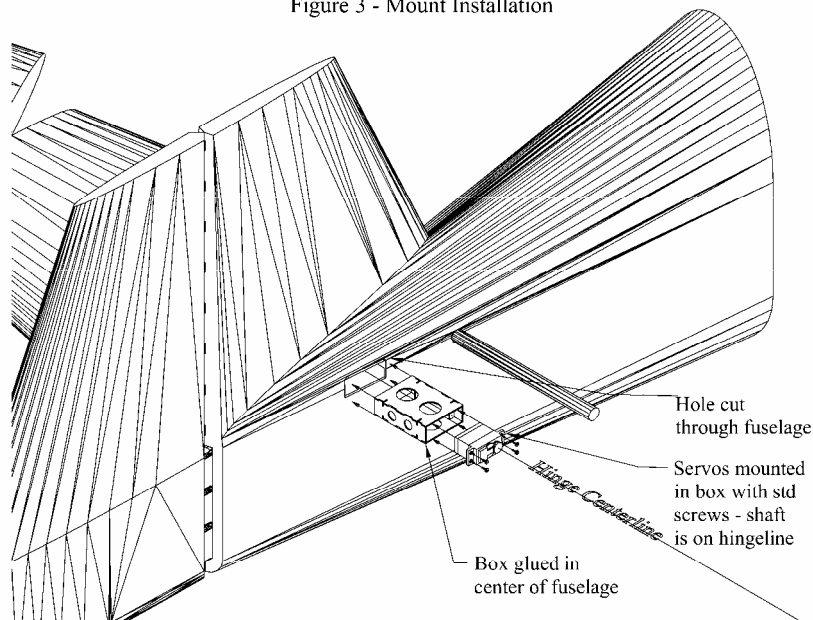
- Assemble the mount using thin CA or equivalent glue, referencing figure 2. Add a fillet of glue around the inside of all joints.

Figure 2 - Box Assembly



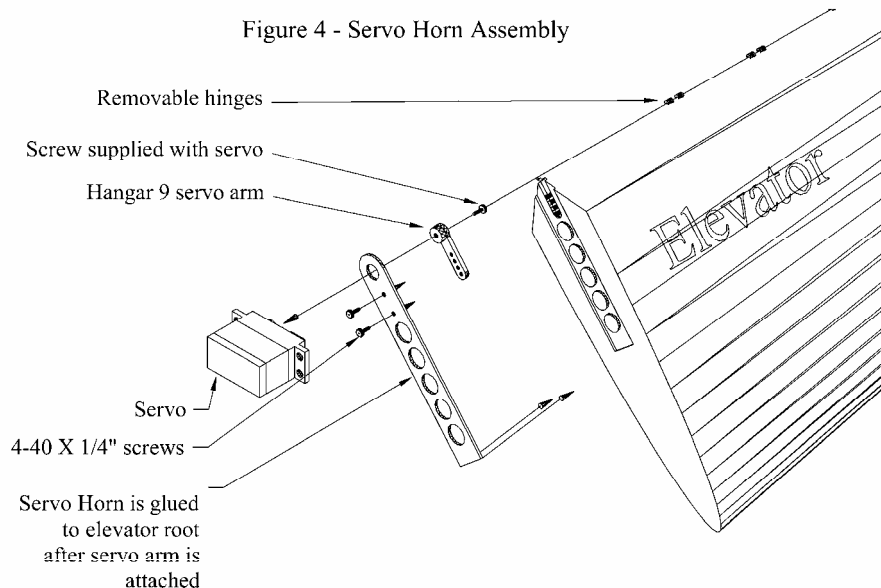
- Install your elevator to the horizontal stabilizer using removable hinges. When satisfied with the fit and travel, remove the elevator.
- Accurately mark the hinge centerline where it intersects the fuselage. If you have a removable stabilizer, then remove the horizontal stabilizer. This will make cutting the hole for the mount much easier.
- If the stabilizer is not removable, you will have to trim the rear of the stabilizer as necessary to make room for the mount. In some aircraft this may require adding some reinforcement to the stabilizer to compensate.
- Place the mount against the fuselage in the location where it will be mounted. Be sure the servo output shafts will be perfectly centered on the elevator hinge line, with the larger portion of the servo to the rear. Use a fine tipped marker to trace the shape of the mount onto the fuselage.
- Remove the mount and carefully cut an opening into both sides of the fuselage along your tracing.

Figure 3 - Mount Installation



- Install the mount as shown in figure 3 using CA or equivalent wood glue. Do not install the servos at this time. They are shown in the diagram to show the relation of the elevator hinge line to the servo output shafts.

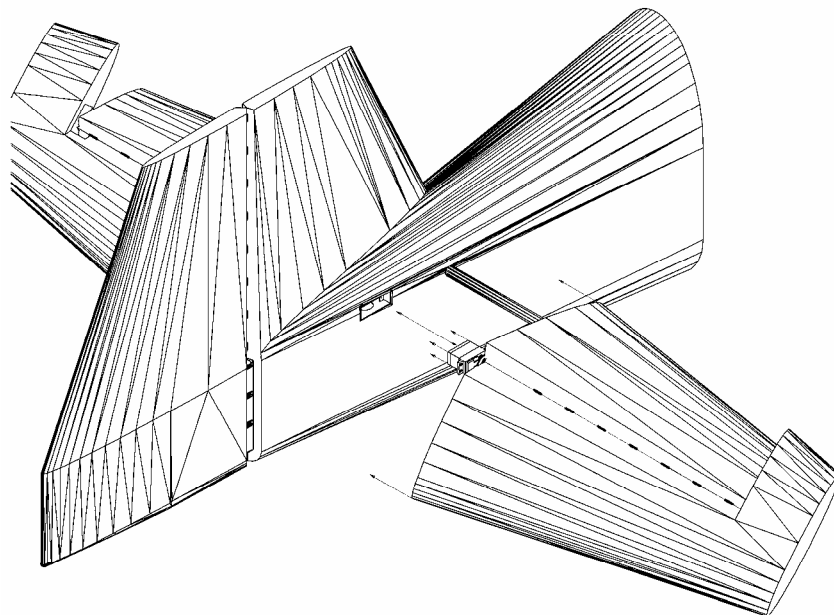
Note: If the stabilizer is not removable AND is already permanently installed on the aircraft, then you will have to extend the holes for the mount aft slightly. This will allow you to insert the mount into the fuselage, and then slide it forward into position. After it is located and glued, you can then plug the holes behind the mount with the scrap you cut out.



- Install Hangar 9 servo arms (not supplied) onto the horns using two 4-40 X 1/4" bolts – as shown in figure 4. Use a drop of thin CA where each arm contacts the horn to lock the assembly together.
- Trim the elevator roots as required so they will accept the horn assemblies. The end should be perpendicular to the hinge line and at the proper distance from the servo shaft. The horn lengths may be trimmed if necessary. Only about 2 inches of horn length is essential to bond to the elevator.
- Glue the horn assemblies into place on the elevator roots. Ensure that each servo arm is exactly centered on the hinge line by running a .047" wire through the servo shaft mount holes in the arm and the adjacent hinges. Do NOT install the servo onto the horn yet.
- Install the control surface on the airframe. Check for clearance throughout the desired range of travel. The maximum travel possible will be between 50 and 60 degrees in each direction. Trim any areas that need more clearance. As a minimum, you will have to notch the elevator slightly to gain access to the servo arm mounting screw and also the stabilizer to clear the horn assembly.
- Construction is now complete.

### SERVO INSTALLATION PROCEDURE

Figure 5 - Final Assembly



- Run your servo leads to the servos through the cutouts in the front of the mount.
- Turn on your transmitter and receiver. Ensure that all trims and sub-trims are set to zero. If using a matchbox or programmable servo, reset the programming to neutral. Set travel limits in your transmitter to the maximum and equal in both directions.
- Mount the servos on the servo arms as close to centered as possible, then install the set screws that came with the servos. It is normal for them to be cocked just a little at this point in the operation. The servo is now attached to the elevator.
- Turn off your radio. If you have a removable stabilizer, you may attach the elevator to the stabilizer at this time. Slide the servo/elevator assembly into place. Gently tuck the servo wires as you slide the servos into the mount to ensure they do not get crimped.
- Install your hinge pins, if not already installed. Secure the servos to the mount with the screws supplied with the servo. You will have to deflect the elevator to insert the screws. Only 2 screws are required.

### RADIO SETUP

- Turn the transmitter and receiver back on. For the steps below, it is helpful to set up one servo completely while the other is unplugged. Then plug in the second servo and set it to match the first.
- Center the control surface by:
  - 1) If using a matchbox, etc., set the control surface to center using the matchbox.
  - 2) If using programmable servos, program the center points of each servo.
  - 3) Otherwise, you will use two channels and mix the second to match the first. Set the center point for each servo using the radio's sub-trim function for each channel.
- Next you will set each end point for the maximum available travel without binding. In accomplishing this step, you may find that the total elevator travel is limited by the mechanical stop of one of the servos (this condition is indicated when the servo stops moving, even though the transmitter stick has more throw left). If this happens, reduce the endpoint travel of that servo until the "dead spot" is gone, then set the other elevator servo to match. Set endpoints by:
  - 1) If using a matchbox, etc., set the endpoints using the matchbox.
  - 2) If using programmable servos, program each servo's endpoints to match.
  - 3) Otherwise, set the endpoints using the travel volume function of the radio. Once again, you will have to set each servo as a separate channel.

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