Bashing The Hanger 9 Cessna 182 ARF
Part 3

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This is a four part series covering a variety of modifications, which I incorporated in a Hanger 9 182 ARF. Part 3 addresses the routing and connection of the nose wheel brake cable, incorporation of landing lights and upgrading the servo tray.

Nose wheel brake interface

In part 2, the nose wheel brake assembly was built and integrated onto the airframe. In this section, we will route, connect and adjust the brake cable, completing the brake installation effort.

Before connecting the brake cable to a servo, consideration should be given to how you plan on using the brakes. Some individuals may plan on using the brakes on a regular basis as part of the taxi and landing rollout activities. Others may plan to use the brakes as a parking brake type function. Should you plan on using your brakes as part of the taxi and landing rollout activities, I recommend on using the elevator servo as the actuator. Metering of brakes is controlled through the application of down elevator.

I incorporated a nylon tube into the airframe to route the brake cable through the fuselage skin, bulkheads and landing gear brace block. The routing tube provides a protective path for the cable, eliminating cable chafe. The nylon tube was scrap Ny-Rod material from a Ny-Rod pushrod kit. The brake cable was connected to the servo arm using a clevis and a spare rod coupling which was threaded on one end.

For this project, I decided to meter the brakes using down elevator. Application of elevator controls ranging from neutral through full down results in a metered amount braking with maximum application of the nose brake occurring at the full down elevator position. To set the brake cable tension manually (receiver off) set the elevator to ¾ of full down with the nose wheel set forward, parallel to the airframe centerline. Rotate the nose wheel and adjust the brake cable tension until the nose wheel no longer rotates freely.

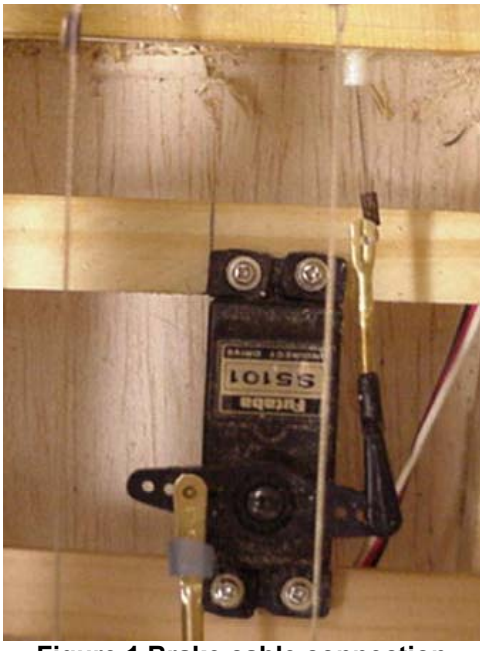

Figure 1 Brake cable connection

Perform a second check on the brake cable tension by turning on the transmitter and receiver. With the elevator in the neutral position, move the rudder and nose wheel to full left deflection.

Verify the nose wheel still turns freely. Repeat this process for full right deflection of the nose wheel. If the brake engages with neutral elevator and full nose wheel deflection, the tension needs to be reduced. Lastly, verify the elevator and elevator servo does not bind by operating it through its entire range of motion.

Incorporation of landing lights

Incorporation of landings lights into the Hanger 9 Cessna 182 was done to validate the design of an on board electronic switch. The landing lights are visible during daylight however; the viewing angle of the lights is limited to 3-5 degrees on either side of the flight path and the plane needs to be close in to see the lights. The landing lights are remotely operated through the use of an onboard electronic switch using a spare receiver channel and a separate battery, a single C-Cell.

Required materials

Qty	Description
2	1.5 VDC White Superbright LED's – King Bright
2	LED mounting kit - VCC Industries
2	LED Cable Harness - VCC Industries
1	C cell battery holder – Radio Shack
1	C cell battery – Radio Shack
1	Electronic Switch – Pongo Air

Measure the diameter of the LED mounts. Our LED mounts were from VCC Industries and required a ¼ inch-mounting hole. Locate the landing light dimples on the face of the Cessna 182 cowl. Drill a ¼ inch-mounting hole in the center of each landing light dimple.

The LED mounting kits are installed from the outside of the cowl and held in place by a retaining ring inside the cowl. Do not glue any of the components together. Install both LED-mounting kits and secure in place using the retaining ring.

Figure 2 landing light materials.

Connect the each of the LED's to the wiring harness and snap the each LED wiring harness into the mounting kit. Do not glue any of the components together. Drill a ¼ inch diameter cable feed through hole in the lower left corner of the firewall. Route the LED wiring harness through the feed through hole to the inside of the fuselage.

The LED wiring harness is connected to the electronic switch, connection marked **OUTPUT**. Load the C-cell battery into the battery holder and connect the battery holder to the electronic

switch, connection marked **POWER.** Connect the to the electronic switch to the spare receiver channels. Position and mount the cowl on the fuselage.

Servo tray upgrade

The servo tray supplied with the Cessna 182 is a single sheet of 1/16-inch hobby plywood. The tray does not have gussets or other supports to prevent flexing or distortion of the tray during flight. The thickness of the tray will not permit more than 1 to 1 ½ threads of the typical servo mounting screw to engage in the wood tray.

Upgrading the tray is accomplished by adding a pair of 3/16 x 3/16 hardwood spars to the underside of the tray. Position the spars as shown in figure 6.

Glue the spares in place using epoxy. Before gluing the tray inside the airframe, position the servos, mark and drill the servo mounting holes. Epoxy the servo tray in place.

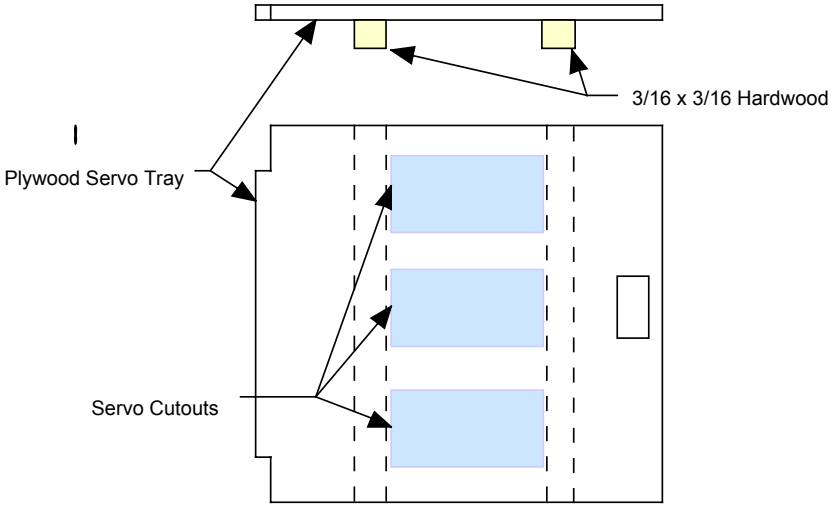

Figure 3 Servo tray upgrade