

15 RADIO AND CONTROL LINKAGE INSTALLATIONS

Photo 1 is a view of the fuselage, upside down, looking at the sheeting located at the base of the fin front. Two lite-ply pads were added for extra beef before drilling through the sheeting for the two rudder cable guides. The guides are short lengths of inner pushrod material, about 4" long. You can also see two red tubes that were added to the top fuselage corners, for the receiver antennas.



PHOTO 1

Photo 2 is the stabilizer area of the fuselage. Below the stab location is a lite-ply servo tray that was special cut to fit my two elevator servos. You can't see from this angle, but there are a couple of thicker plywood pads at the front and rear of the servo tray, under the lite-ply. The pads add some extra meat for the servo screws to bite into.



PHOTO 2

My removable stabilizer is held on with five bolts that thread into blind nuts under the crossbraces you see in the photo. The crossbraces were cut from 1/2" x 3/4" bass and they were firmly attached to the fuselage structure with various bits of triangle stock and plywood gussets. The servos were positioned where they would fit side-by-side and still be accessible underneath the stabilizer.

Photo 3 shows the HS-700BB elevator servos mounted in the completed fuselage. I used heavy-duty Du-Bro servo arms on all of the flight control servos. The pushrods are 12" long 4-40 threaded rods. I was afraid the rods by themselves weren't stiff enough, so tight-fitting brass tubes were soldered onto them, full length. The clevises at the servo end are 4-40 Du-Bro solder clevises.



PHOTO 3

Photo 4 shows the aft end of the elevator pushrods threaded into Du-Bro 4-40 clevises. These are their new molded nylon clevises with a slider that locks the removeable clevis pin in place. The control horns are Sullivan Super Horns, which are basically 8-32 bolts with a special aluminum base and molded nylon connectors. **Note:** If you make the stab removable, you must also make it easy to disconnect the elevator pushrods, the rudder cables, and the tail braces.

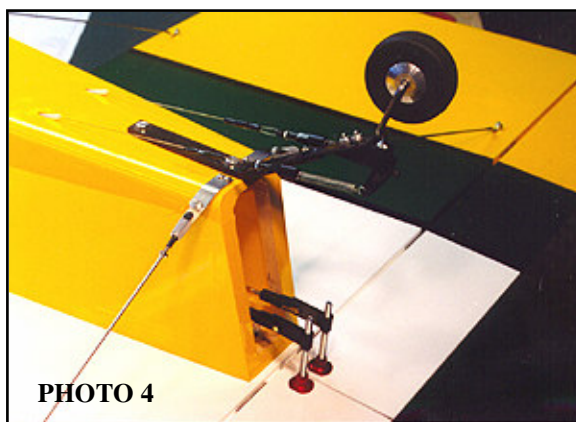


PHOTO 4

The tailwheel assembly is a Sig extra-large unit with a Du-Bro 1-3/4" tailwheel. A set of Du-Bro 4-40 pull-pull cables was used to control the tailwheel. The cables are guided through the tailwheel mount with two nylon tubes, just like the rudder cables. Notice my original tail braces made from 2-56 rods and clevises, which broke early in engine testing.

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Photo 5 is the fuselage and my "high tech" servo wire guides made from paper towel rolls. Cheap and light - works for me! The servo lead in the foreground is not in the tube in order to show you the connection to the long servo extension wire. All of my extensions came from Cermark. They feature heavy-gauge wire and you can get them with different color connectors. Always tape or tie all of your connections for security.



PHOTO 5

Photo 6 is the left side of the fuselage, at the rear of the cabin. I used my Rout-A-Bit tool in a Dremel to cut the groove all around the framework aft of the widow opening. The 1/8" plywood part lying on the fuse side was cut to fit perfectly in the groove and was glued in place. The cutouts in the ply are for the two radio switches. I used Cermark's Super Switches, which feature a built-in charging jack. A hole was cut in the doubler to make room for the switches.



PHOTO 6

Photo 7 is the lite-ply radio tray that I came up with to mount the bulk of my radio system. One thing about having a model this big, you can't just wrap your radio components with foam and stuff them in the fuse. You need to plan where everything goes, then provide a means to secure it. The four 1/4" x 1/2" bass wood sticks underneath stiffen the tray and help to anchor the numerous J-bolts that I used to strap rubber bands to.

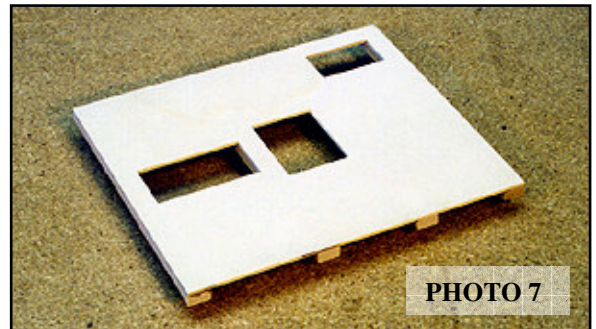


PHOTO 7

Photo 8 is the same tray, this time with the radio lashed in place. I left the foam rubber off the receivers and batteries just for clarity in the photo. The big hole in the center is just that - a hole for wires to pass through.

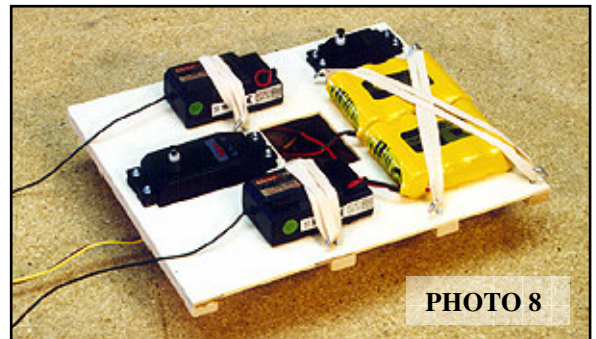


PHOTO 8

Photo 9 is a view looking straight down into the fuselage of the prototype. The tray is mounted to rails along each side using many little socket head wood screws. I didn't glue it in because I wanted to be able to change it later, if needed. The receivers are wrapped in red foam pads that were supplied with them from Hitec. Tucked under the rubber bands holding the receivers are servo reversers, which were needed for one of the flap servos and one of the elevator servos. The batteries are also wrapped in foam rubber. Tucked under the rubber bands holding the batteries are voltage indicators that use little lights to give you a quick idea of the battery voltage (also available from Cermark). The rudder servo is linked with a 4-40 rod to a Sig Tiller Bar which handles the tension of the pull-pull cables going to the rudder (outer cables) and tailwheel (inner cables). The throttle servo is at the bottom left. The throttle pushrod is a Sullivan Nyrod. Also notice the four plug extensions - two for the ailerons (blue) and two for the flaps (yellow). The forward cabin area is completely open and available for a payload.

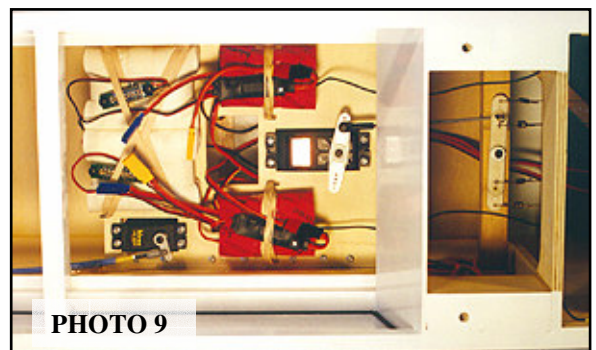


PHOTO 9

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Photo 10 shows the base of the fin and rudder. The rudder control horn is a Sullivan Double Super Horn. Here you can see the heads of the stabilizer hold-down bolts. They are flat-head socket bolts, so they don't stick up above the stabilizer. You can also see the two heads of the Sullivan Super Horns in the top of the elevators.



PHOTO 10

Photo 11 is a closeup of an aileron servo. It's a 4-40 threaded rod with a solder clevis at the servo end. Notice the fuel tubing keeper. The aileron end has a 4-40 Sullivan clevis with a jam nut to take out any possible play in the threads. The Sullivan clevises have a little clip that locks onto the pin, so a fuel tubing keeper isn't needed.

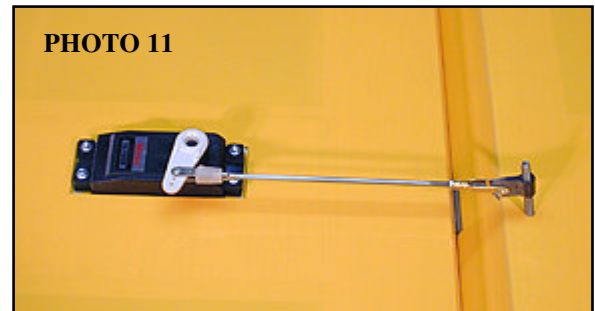


PHOTO 11

The nylon connectors that come with the Super Horns were trimmed down in length for the ailerons and flaps. This looks better and helps provide a bit of natural differential movement in the ailerons. Notice the servo arm sweeps forward slightly - that also contributes to differential, which is good. The ailerons should move "up" more than they move "down" for smoothest aileron response.

Photo 12 is a flap servo. As shown, the flap is up, as it would be during normal flight. The servo arm sweeps way back, but it swings forward when the flap is deflected. I didn't use a solder clevis because the required fuel line keeper would interfere with the servo arm (okay, found that out the hard way!). Instead, I soldered a 4-40 coupler to the servo end of the pushrod and used a Sullivan clevis at both ends.

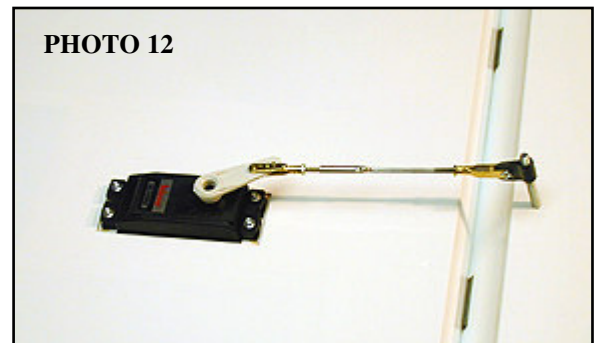


PHOTO 12

About the Hinges: I used Sig Brand "XX" hinges on all of the control surfaces of the prototype. These flat, pinned hinges use a large straight pin as the pivot pin. Push the pin through the nylon hinge halves and clip off the excess leaving about 1/8" sticking out. Then flatten the end of the pin slightly by squeezing it with a pair of pliers. Before gluing, treat the center of the hinge with a little oil or vaseline. I also like to score the nylon tabs with a knife, which raises little burrs that really grip in the hinge slots. Epoxy these carefully. You want to use plenty of epoxy, but not so much that you get a lot of excess on the center of the hinge. Tiny globs of excess glue can be cracked away after it dries. Of course, you can substitute your favorite brand of hinges if you like. The large Robart pinned hinges or Du-Bro's big hinges with the cotter pin will work fine for the Super Flyin' King.

The prototype has four hinges in each elevator half, three hinges in the rudder, four hinges in each flap, and five hinges in each aileron. I consider those the minimum amount; you may install more, if you wish.

-SFK