

RDS IN THE "WOODIE" SGP WING by Harley Michaelis

These instructions apply to a wing with 2" flap chord. As needed, shorten ribs ahead of the flap hinge-line to make flaps that width using any balsa sheet stock provided. Vertical space limitations require the use of micro servos the size of the JR or smaller. The JR case measures 1/2" thick, 1-1/8" wide and 1-5/32" tall. Remove mounting lugs flush to the cases.

WING BUILDING ORDER: Build the wing center section first. Locate the RDS pockets in the flaps as explained below. String the wiring harness through the ribs before film covering. Hinge after servos, Kimbrough couplers and the shafts are in place. Tacky film can be used as a servo cover.

SERVO BASE: Build the wing with the two center ribs spaced for 2" of sheeting, but omit that sheeting. Instead, a 9" long servo base of 1/8" balsa fits across the top of the wing. The 4 ribs it attaches to would need to be manually notched so the underside of the base is a flat plane. Make similarly notched partial ribs of 1/8" balsa to glue to the 2 outer ribs to double that gluing surface. Before attaching the base, block sand the top to the airfoil.

Shift the outer main ribs and the partial ribs outboard to get them under the outer edges of the base. This leaves 3-1/4" of side-to-side space for a servo and its mount.

SERVO ORIENTATION AND SHAFT BENDS: With the servo oriented 45 degrees to the hinge-line and the shaft bent 90, over 90 of down flap motion is possible if the hinging or the radio don't limit it. This is illustrated in the drawing below.

The servo must be far enough forward to be fully recessed when mounted on the servo base. For that, place the most rearward case corner of the angled JR servo 1-3/4" ahead of the hinge-line. Also, place the inboard case corner 1/4" from the adjacent center rib so the servo can be slid back to disengage the shaft.

However, a 40 degree orientation and an 80 bend works fine and takes up less side to side space. This allows the servo to be moved further toward the spar where the wing is thicker.

If the servo can be fully recessed, and if vertical space allows, strengthen the base by adding 1/64" or 1/32" ply to the underside between ribs where servos go.

SHAFT LENGTH: For the above JR servo placement and with the Kimbrough coupler attached, the drive shaft measures 2-9/16" in length. This puts the elbow of the bend in the "sweet spot" about 1/8" behind the hinge-line and allows the drive shaft to pass inboard of the adjacent ribs. File A6 details how to grind opposing flat spots on the shafts for the setscrews to firmly seat to.

CENTERING THE POCKET: The 2-1/2" flap "pocket" is to be centered where the shaft intersects the hinge-line. This leaves space for an inboard hinge. The pocket should be put 1/16" behind the hinge-line. If necessary to get it between the skins, compress the skins at their inside surfaces and bevel the pockets toward their rears. Wrap ends with Kevlar thread and then install. See File 3, part 2 about that. Make a 1/8" hole through the structure just ahead of the hinge-line, angled toward the output gear of the servo. The hole should be vertically positioned low to direct the shaft into the slot in the pocket. Make it oval-shaped to allow the essential "float" of the shaft as the flap deflects. Reinforce the hole with CA glue.

FIRMLY MOUNTING THE SERVO: Having defined the servo location, you need to mount it there. The HEMS detailed starting on page 1 of File 3, Part 2 has a base and a bracket that take up vertical space. Optionally, glue tight fitting 1/4" thick blocks of spruce, etc. against the servo front and sides. Make these a hair shorter than the thickness of the case. Screw a flat metal strap across the servo to cinch it down. The back side must be left open. To remove the servo for

service, loosen the drive shaft screws, slide the servo back and push the bent end of the shaft into the pocket opening to disengage the shaft. If tilting is needed to direct the shaft, glue a scrap of thin ply under an edge of the servo.

AILERON SERVOS; Do similarly. Use a 45 degree bend in the shaft. Study File 10 about installing a hard slot in the end of the aileron. Note the shaft must exit the center endcap on a line centered 5/16" forward of the hinge-line.

The drawing below illustrates the items mentioned above.

