

INSTRUCTIONS A-4 “SKYHAWK”

It is advisable to remove all parts needed for a particular section from their mother sheets just prior to starting construction of that section, using the reduced size pictures on the drawing as a “map”. If necessary, remove cutting fray by a light sanding.

Wing:

The wing is constructed from parts WF1 to WF11

Make up the bottom sheeting for each side as per plan with a little oversize.

Draw the rib and spar lines onto the sheeting as this will help to build it straight.

Place 2x6 midstringer onto the centre of the wing sheeting, but do not glue it to the sheeting as yet. The objective is to catch it under the spars.

Start with left or right side of wing

Place the main formers and ribs onto the sheeting, and glue the main spar WF5 onto the sheeting into the correct position.

Line out the ribs and formers and glue to the bottom sheeting, all is done on a worktable but at this stage it is not necessary to pin anything down,

Repeat the sequence for the other side and glue the bottom sheeting at the center to the 2x6 stringer.

Position and glue the false leading edge, aileron hinge formers WF7/WF8 and the 2x6 upper midstringer.

Make the top sheeting as per plan with a little oversize.

Do not forget to install the servo wiring extensions.

Pin down one side of the wing to a flat worktable, and use the 7 mm to 4 mm tapered packing strip to place under the trailing edge for the correct washout. Note that the lower 4 mm end is pointing outwards.

Make sure the wing is supported on the worktable over the entire half-span, and position the top sheeting with slow glue.

Sheet the other side of the wing in the same way.

Glue on the 6x9mm leading edges and sand to form the correct nose section as per plan.

Glue on the wing tips and sand to shape. Glue on the fairings WF1 and the 10x25x100 balsa and sand to shape.

Cut out the ailerons and bevel as per cross section to form a hinge line. Cut slots for the hinges. Hinges are cut to the correct size from the supplied mylar sheet and glued in with ca glue.

The servo arm should extend above the top of the wing, the access opening for the servo is best made into the wing bottom.

Strengthen the wing sheeting at the servo location with some scrap balsa sheeting, the servo is positioned and glued permanently in position with ca. If desired, the servo could be covered with shrink tubing first.

Glue the control horns in the correct position as per plan. Make a z-bend in the 1mm steel wire at the servo side and a 90-degree bend at the horn side; the wire is secured by glueing a small piece of white inner cable with ca at the wire end.

Fuselage:

Nose section: (parts NF1-NF4)

Glue the 20x20 triangle stock to NF2, it might be necessary to make some saw cuts into the 20x20 to bend it to the contour of NF1.

Glue NF4 and glue sides NF3 in place.

Glue on the top sheeting from 2 sheets of 6x60 balsa.

Glue on the noseblock 50x50x60.

Sand the complete nose section to the shapes as shown on the drawing.

Mid section: (parts MF1-MF7)

Place formers MF1 to MF4 onto sides MF5.

Place 2x6 duct supportstringers, adjust complete assembly until straight and square and glue with thin ca. Glue on MF6. Position the wing correctly and mark the position of the wing bolt through the hole in MF6. Position 2x10 side and top stringers. Make sure that MF1 and MF4 are straight before glueing, since this will affect alignment of nose and tail sections.

Glue in MF7.

Construct the duct section with formers DF1 to DF5. Bevel the trailing edge of DF3 to take the sheeting. Place the 1,5 mm duct sheeting lengthwise onto the duct section. Be careful not to warp the structure while sheeting. Sand the complete duct section smooth and sharp at the edges.

Paint the paper inlet duct with a thin paint or dope just enough to make it moisture resistant

Cut out the intake duct from the supplied pre-printed paper, leaving some oversize, and join with tape as indicated.

Trial fit the duct into the fuselage midsection, the duct should bend in a little from MF3 to MF4, if necessary slit and adjust duct.

Trial fit the mid duct section and if fitting is ok glue the outhter duct into the fuselage midframe and glue the inner duct assembly into the outhter duct. Beware of warping and maintain straightness here, if the fuselage is warped it is not possible to straighten it without distorting the duct sections .

Make the fuselage sheeting as per plan and trial fit, if necessary wet the outside of the sheeting with water to make a smooth bend over the fuselage formers.

Sand complete mid section and make the 4mm dowel hole in the top of the fuselage at MF7.

Tail section: (parts TF1-TF7)

Start by modifying the fan housing by shortening the mounting lugs as per the drawing, such that only approximately 3 mm wide positioning ridges are left on the housing. Ensure that the fan with shortened mounting lugs will slide through the hole in TF1.

The skeleton of the tailsection is best built vertically on a flat surface.

Pin down TF1 to a flat worktable (do not forget to put some plastic sheet underneath).

Position TF6 at right angle to TF1, using TF3, and glue TF1, TF3 and TF6 together. Glue TF7 to TF1. The slots for positioning the fan unit in TF6 and TF7 should both be on the same side of the centerline. I recommend to use the fan housing to ensure that TF6 and TF7 are positioned correctly and parallel before glueing.

Glue on TF4 (preferably with the fan still in place). Glue on TF2 ensuring the assembly is straight.

Glue the 2x10 balsa side and top stringers, glue in TF5, if ok take of the tailsection from the building board and slide out the fan. Cut the tailsection sheeting as per plan and trial fit, if necessary wet the outside of the sheeting with water to make a smooth bend over the tailsection formers.

Glue 5mm tailsection bottom sheeting and sand to contour as per plan.

Fin section:(parts FF1- FF13)

Pin down FF13 to the building board. Dry fit together parts FF9, FF8, FF5 and FF4 and position onto FF13.

Position FF3 into the slots in FF13 and FF8. Align the assembly carefully and glue. Position FF10 on FF9 and FF3, position FF12, align and glue place a 4mm balsa scrap piece on top of FF5 and glue FF6. Do the same for FF7.

Place FF2 (2x) flush with the front edge of FF3, take off fin assembly from building table.

Cut fin sheeting to approx size and butt sheeting to FF12, glue to fin framework. FF3 is best bevelled slightly at the L.E. to take the sheeting, do the same for the other side of fin and sand flush with FF2 and the top of FF3 / FF12. Glue on FF11. Sand the fin to shape by rounding the L.E. and tapering FF12

Glue FF1(2mm) onto FF13 with dowel 4x25mm, glue FF1 (10mm, 2x) onto the 2mm FF1 and sand assembly to shape.

Final assembly:

Fit the tailsection onto the midsection with the nylon M4 screws, you need to drill out and tap the holes in TF1, make servo wire opening in tailsection as per plan for elevator servo.

Fit the wing and drill holes for wing pegs in the L.E. Drill through the wing (pre-marked hole, see above) and tap MF6 for the wing bolt. Screw wing in place.

Slightly flatten the top of the tail section sheeting. Place the fin assembly with the 4mm dowel into fuselage midsection, now align the fin assembly with wing and fuselage and glue to tailsection. Avoid glueing the fin to the fuselage midsection, it may be best to put some polythene sheet in between.

Unscrew tailsection from mid fuselage section and make sure the glue joint with the fin assembly is OK. Improve with some thick glue if necessary.

Cut out the fin sheeting at the tailplane position, but do not cut through FF9.

Glue tailplane parts EF3 and EF4 together and fit in the fin slot, trial fit EF5 and glue complete assembly into fin.

Make the elevator halves from EF1 and EF2 and join through the fin with the elevator joiner from 2mm mild steel.

Glue on the elevator horn.

Place the elevator servo into the fin at the position indicated on the drawing, and fix it in the same way as described for the wing.

Remove the outlet opening in TF5. Leave a 2 mm ridge as indicated for reinforcement

Make the outlet duct from the separate drawing and trial fit this at the fan unit.

The fan unit should be modified by cutting off the mounting lugs, leaving an approximately 3 mm wide ridge.

Now the fan unit can be pushed into the tail section with the outlet duct cone fitted, trial fit this assembly before taping the cone to the fan. Do not forget to install speed controller and wiring also before taping up, and make sure the wiring hole in the cone is positioned so as to provide free passage of the wires.

The nose section can be glued onto the fuselage midsection now, sand transition smooth when dry. Glue twang hook in its slot in the nose bottom and MF1

Glue DF6 intake lips and sand to shape

The canopy can be placed now, cut along the scribed line and trial fit to fuselage, if fitting is ok place pilot and glue canopy with ca. Fogging of the canopy can be avoided by degreasing it with window cleaner or other blue stuff.

Construct landing gear covers from LG1 – LG2 and sheet with 2,5mm balsa, sand to shape as per plan and glue to wing.

Finish and balance the airplane with the CG at 150mm behind MF1.

Flying:

The Skyhawk needs a firm bungee launch, when launched it needs to pick up speed for a couple of meters and then flying is excellent, loops and rolls are no problem.

Fan:

The Skyray is designed around the WeMoTec Mini Fan 480.

Power requirement:

Plettenberg 200-20-6 minimum or equivalent

10 x 1250mAh for 3 minutes flying.

More power:

10 or 12x1250ma and BL480-33 or hacker HBR B40 9Wi-L.

With this setup and 10 cells you will have more power than with the Plettenberg and still 3minutes of flying, with 12 cells you will have power to spare.

Enjoy you're building and flying!