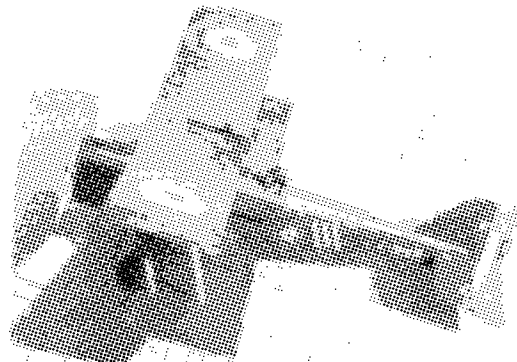


KEILKRAFT

SE5A



WORLD WAR I FIGHTER AIRCRAFT.

39½ INCH SPAN RADIO CONTROL MODEL
FOR -10-15cu in ENGINES

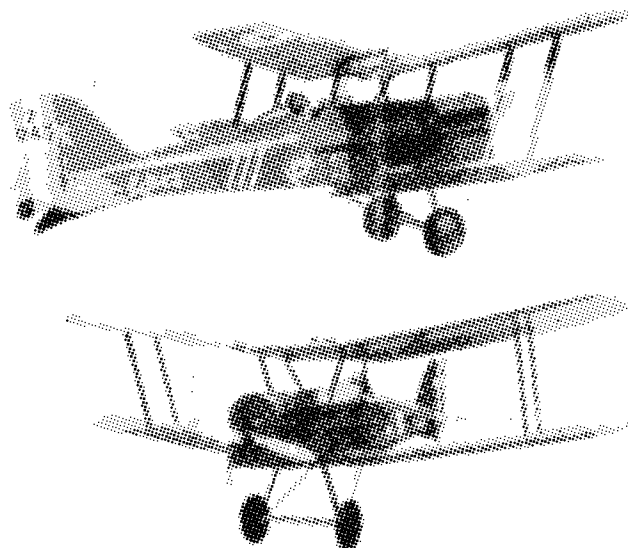
BUILDING INSTRUCTIONS

SE 5A

Flown by such Aces as "Ball", "Mannock" and "McCudden" the SE 5A has carved itself a place in history as one of the finest fighting aircraft of World War I. The men and machines of the period were quite unique and represented a style of warfare that was completely different to anything else before or since. There is much value in preserving information on this subject and we hope that your model will enable you to recapture the excitement of the age of fighting biplanes.

Before you begin building, read all the instructions carefully and study the plan to identify the parts of the model.

Commence with the fuselage construction.



200 h.p. Wolsley Viper S.E.5a, of No.92 Squadron.

FUSELAGE

- 1 Lay the two fuselage sides on the plan as shown in "Step 1" and glue the front and rear ply doublers in place. Use an 'impact' adhesive for this operation making sure that one right-hand and one left-hand side is built.
- 2 Carefully transfer the positions for the spacers and formers from the plan and mark these on to the inside of the fuselage sides.
- 3 Trim the ¼" square hardwood engine bearers to length and glue to ply doublers as shown in "Step 1" on the plan. Use formers F3 and F5 to obtain correct position.
- 4 Mark the positions of the front struts and main undercarriage wires on former 5 referring to plan for exact location. Drill small holes and bind with cord or soft wire to retain. Final cementing with epoxy resin adhesive is left until later.
- 5 Join the two fuselage sides as shown in "Step 2" with former 5 and the two ¼" square spacers at former 10 location.
- 6 Spot bind the pre-bent rear wire strut to former 7 at one place each side. Hold the assembly in place between fuselage sides and use the template to adjust the position of the wire strut. Remove assembly, complete drilling and binding before gluing permanently to fuselage. When set reinforce binding with epoxy resin adhesive again using template for final alignment of struts.
- 7 Glue formers 3, 6, 8 and 10 in position making sure that they are upright.
- 8 Pull the rear ends of the fuselage together and fit rear block shaped from ½" x ½" balsa. Add the ¼" square spacers at formers 11 to 14 locations.
- 9 Glue former 9 to front of former 10 and fit formers 11, 12, 13 and 14 to the rear of the top spacers.
- 10 Fit top ¼" square stringer from former 5 to beyond former 8.
- 11 Fit and glue ¼" x ¼" top stringer and ¼" x ¼" rear stringers into the notches in F10 and across F11-F14 to the rear. Sight along these and adjust as necessary.
- 12 Using ¼" sheet, fill in between stringers rear of F10 around the head fairing and either side of the top stringer where the fin will later be attached.
- 13 Fit ¼" sheet top decking between F5 and F9. This sheeting should be fitted in six sections, pairs of panels either side of the top spar joining at formers 6 and 8. When the sheeting is completed the cockpit opening is cut, using a sharp modelling knife.
- 14 Construct the hatch using formers 1, 2 and 4 and lengths of ¼" square holes. Make sure that the formers are absolutely upright and that the fit to fuselage is accurate. Add the ¼" diameter dowel rear locating peg and sheet hatch with ¼" balsa. Make hole for location peg in former 5.
- 15 Adjust the cut out in the motor mounting plate to suit the particular motor used. Drill and mount the engine to the mounting plate using 6BA nuts and bolts. Make sure that the engine is positioned so that the propeller will clear the cowling when completed and that engine sidethrust is offset to the right.
- 16 Screw the engine mounting plate to the engine bearers with the four woodscrews provided. ¼" diameter "pilot" holes drilled in the bearers will prevent splitting.
- 17 Place the 4oz clunk tank into the hole die-cut in former 5. Relieve former 3 as required to clear the neck of the bottle. Make sure that the centre line of the tank is level or just below the needle valve of the engine. Adjust if necessary.
- 18 Trim the ¼" nose former to clear the engine throttle, needle valve, etc., and when all adjustments have been made remove engine. Glue nose former to the fuselage and to the front of the built-up hatch.
- 19 Glue the moulded radiators onto the front face of the nose former with epoxy resin adhesive. "Fill in" around the radiators with ¼" sheet as shown on plan.
- 20 When completely set, carefully saw through the radiators and nose former, level with the bottom of the hatch to allow removal of this section.
- 21 Screw the pre-formed aluminium hatch retaining strap to the engine bearers behind former 3. Replace hatch and drill 7/64" diameter hole through the top spar to coincide with the hole in the strap. The hatch may now be retained by passing a 6BA bolt through the hatch to screw into a 6BA nut fixed with epoxy resin adhesive to the underside of the retaining strap.
- 22 Sheet the underside of the nose with ¼" ply.

- 23 Bind with fuse wire and solder the 14 SWG wing runners to the tops of the struts. Use the wing strut template to ensure accuracy.
- 24 Bind and solder the 16 SWG wire cross braces between the wing runners. Sight from all angles to check alignment and adjust if necessary.
- 25 Carve the head fairing from 3¼" x 1¼" x ½" block and glue to rear of the cockpit.
- 26 Drill ¼" diameter holes for lower wing dowels. Cut dowel to length, round off ends and fit to fuselage, but do not glue until after covering.
- 27 Make an exhaust extension from the tinplate supplied as shown on plan. Extension is not connected directly with engine exhaust manifold but should fit as close as possible. After cutting away hatch glue extension in place with epoxy resin adhesive.
- 28 Carve the dummy engine cylinder blocks from 3¼" x 1¼" x ½" balsa blocks. Relieve one to clear the exhaust extension and glue to hatch.
- 29 Cut a hole in the hatch above the glowplug to allow a glowclip to be connected.
- 30 The dummy exhaust pipes are made from ¼" dowel fitted with short lengths of 16 SWG wire which are taken right through the fuselage side and bonded to the ply doublers. The exhaust pipes should not be permanently fitted until after covering is completed.

WINGS

- 1 Place the fuselage to one side until the wings are completed. The construction of both the upper and lower wings is identical except for the addition of the rear undercarriage fixing in the lower wing.
- 2 Before you begin, cover the plan with a polythene sheet or apply soap or wax to the places where joints occur to prevent parts from sticking to the plan. All sections of the wing are built in position over the plan beginning with the top wing panels less the centre section. Cut the ¼" x ¼" main spars and ¼" x ¼" rear spars to length and pin in place over the plan. Glue the ¼" ply wing braces to the inboard ends of spars.
- 3 Cut the ¼" x ¼" pre-shaped trailing edges to length, position these over the plan and mark the rib positions. Cut notches to accept the wing ribs.
- 4 Remove all the wing ribs from the die-cut panels using a sharp knife. Check plan for correct rib positions.
- 5 Glue all the ribs to the spars and trailing edges, except the two "W5" ribs. These are more easily fitted after the wing tips have been constructed. Note that "W2" wing ribs should be angled to allow for dihedral, using the ¼" ply template provided. Make sure that the ribs are pushed "right down" onto the spars and trailing edges.
- 6 Glue wing braces to the inboard ends of the ¼" x ¼" leading edge strips and fit to ribs.
- 7 Cut lengths of ¼" square balsa to shape and construct the wing tips over the plan.
- 8 Wing ribs W5 may now be trimmed to exact length and glued in place.
- 9 Cut gussets from ¼" x ¼" strip and fit between the trailing edge and W2 and to the wing tip blocks.
- 10 When the outer panels are completely set, block up the wing tips to 1¼" keeping the inboard ends flat on the building board.
- 11 Cut the centre section spars and leading edge to length and glue between the ply dihedral braces.
- 12 Cut a length of ¼" x ¼" for the trailing edge and notch to accept the ¼" centre section ribs. Glue in place.
- 13 Add the corner pieces shaped from ¼" sheet.
- 14 Fit the three centre section ribs W1.
- 15 Use short lengths of ¼" x ¼" strip to build up the height of the rear spars to support the covering where the two uncovered bays allow the wing retaining bands to pass through the wing.
- 16 Allow glue to set thoroughly before removing wing from the building board. Then fit the ¼" ply strut mounts and add lengths of ¼" x ¼" balsa for reinforcement.

- 17 The wing tip blocks and leading edges may now be carved and sanded to section and the complete structure sanded smooth in preparation for covering. Build the lower wing in the same sequence as the upper wing to the stage where the centre section spars and leading edges are in place.
- 18 Trim the ¼" square hardwood undercarriage support to length and bind the 12 SWG rear undercarriage wire securely to this with soft wire or cord. Glue the hardwood in position but allow the wire to move under the bindings at this stage.
- 19 Add the three centre section ribs W7, ¼" x ¼" trailing edge and ¼" sheet corner pieces.
- 20 Fit ¼" sheet across the four centre panels. Note that this is fitted between, and not over the top of ribs W2.
- 21 Fit ¼" sheet to the underside of the bay where the undercarriage is attached to prevent the covering from becoming accidentally punctured by the undercarriage when removing the wing. Sand the wing to correct shape and remove rough edges.

UNDERCARRIAGE AND STRUTS

- 1 Fit wing to fuselage and hold with rubber bands. Cut four pieces of brass tubing ¼" long and select the two pieces of 12 SWG wire for the undercarriage rear struts.
- 2 Slip the brass tubing onto the ends of the front undercarriage legs and fit the rear struts into the brass tubes. Adjust the angles as necessary so that the top ends of the rear struts are in line with the wing mounted wire.
- 3 Slide on the two remaining lengths of brass tubing to join the struts to the wing.
- 4 Clean the ends of the wires and when satisfied that alignment is correct, solder the lower brass tubes to both pieces of wire and the upper two brass tubes to the rear struts only, allowing wing to be removed when required.
- 5 Bind and solder the axle into the "Vee" formed at the bottom of the main undercarriage legs.
- 6 Attach strips of ¼" balsa to the main undercarriage legs using epoxy resin adhesive and sand to a streamlined section.
- 7 Add the ¼" x ¼" balsa fairings to the wing mounting struts.
- 8 Fit the axle fairing made from a piece of ¼" x 1" balsa carved to a streamlined section and glue to the axle.
- 9 The wheels are retained by soldered washers on either side but are best fitted after the model is painted.
- 10 With the undercarriage assembled and wing correctly positioned, cover the wire and binding attached to the wing with epoxy adhesive to hold permanently at the correct angle.
- 11 The interplane struts are made from ¼" dowel glued to strips of ¼" x ¼" balsa sanded to a streamlined section. The true length of the struts is shown on the wing plan. The holes in the wing strut mounts should be carefully drilled to ¼" dia. to provide a push fit for the ends of the interplane struts. Note that these holes are angled both when viewed from the wing tip and when viewed from the front of the wing.

FIN AND RUDDER

- 1 Sand the fin and rudder to shape and fit hinges but only glue them into the fin, until covering and painting has been completed. The rudder should then be permanently retained by gluing, and pinning through the rudder into the hinge.
- 2 Join the two elevator halves with ¼" diameter aluminium tubing using epoxy resin adhesive. Sand to shape and hinge the tailplane and elevator together.
- 3 Strap the wings to the fuselage in their correct position. Cut away rear block and slot the tailplane and elevator in place. Sight from the rear and above and when satisfied that alignment is correct glue the tailplane securely in place.
- 4 Attach the fin and rudder making sure that it is at right angles to the tailplane and that all flying surfaces are true. Note that the rudder must be relieved to clear the aluminium elevator joiner.

RADIO

The radio control equipment may now be fitted and suggested positions for this are shown on the plan. However, the actual location will depend on the type of equipment used. Generally the battery pack is fitted as far forward as possible and prevented from moving with foam packing. The receiver must be surrounded with foam rubber for protection against vibration and shock damage. The servos may be screwed to bearers, mounted on a plate, or fitted with commercial servo mounting clips, but whichever method is used they must be secure. Pushrods made from ¼" square hard balsa may be used to connect the servos to the control surfaces. A cable and outer is usually used to connect the throttle linkage to its servo. The switch should be fitted away from the exhaust and positioned where it will not become accidentally switched on or off.

When satisfied with the radio installation the bottom of the rear fuselage is sheathed in with ¼" balsa running the "grain" across the fuselage.

Assemble the underfin from the balsa and ply parts, round off all the edges, except where attached to the fuselage, and glue in position.

COVERING

The choice of covering material is left to the builder, but silk or lightweight nylon is suggested for a tough model where radio weight is not excessive, and heavy-weight tissue for a lighter model. Give the airframe one coat of sanding sealer, and when dry, lightly sand to remove any rough edges. Cover the entire model using tissue paste or clear dope as clear dope, until a satisfactory surface is obtained as a base for final colour painting. Cover the undersides of the wings first and pin flat on the building board for final drying out. Dope the wings one section at a time again treating the undersides first and pinning down. Details of colours are shown on the centre panel on the plan.

Paint the dummy exhaust pipes and attach these permanently to the fuselage.

Split a piece of fuel tubing along its length, fit around the cockpit and add the acetate windshield.

To add authenticity to your model a 2" scale type pilot may be fitted. This can be mounted on a balsa plate fitted between the fuselage sides.

The water slide transfers are placed where indicated on the plan but note that these must be completely dry before the model is fuel-proofed using a "matt" fuel-proofer. Matt polyurethane varnish is ideal for this job. Fuelproof the whole of the inside of the engine and fuel tank compartments with at least two coats of fuel-proofer. When completely dry the engine may be installed.

The wheels are now fitted, avoiding the use of excessive heat when soldering the washers to retain the wheels.

The radio control equipment may now be installed and control surfaces adjusted to neutral. Keep the control surface movements to a minimum and check that the model balances where shown on the plan. Fit a suitable propeller to your motor. Run the engine and check that the throttle operates correctly, also that the other servos operate satisfactorily while the engine is running.

FLYING

The KEILKRAFT SE 5A is not an absolute beginner's model, which applies in general to scale models, and it will be expected that the builder has had some previous experience of flying model aircraft. However, if this is not the case it will be worthwhile obtaining some guidance from an experienced flyer.

Flying characteristics of the SE 5A are quite docile and whilst capable of aerobatics it is quite forgiving and can be flown as a "steerable" free flight model. For the less experienced flyer here are a few points that are worth bearing in mind.

BEFORE FLIGHT

- 1 If at all possible obtain some assistance from an experienced R/C flyer.
 - 2 Choose a site free of electric pylons or other sources of radio interference and with as few obstructions as possible. Take-off and landing area should be flat and smooth.
 - 3 Wait for a calm day for first flights.
 - 4 Always check the controls before launching.
- #### FIRST FLIGHTS
- 5 Always launch the model directly into wind. A hand launch will be easier for the first flight, providing the launcher is experienced.
 - 6 Take off on full throttle.
 - 7 Keep the model up-wind all the time and do not fly close to the ground until you really know what you are doing.
 - 8 Control the model gently with only small movements of the control sticks particularly the elevator control which is the most responsive.
 - 9 Where possible land the model with the engine still running and throttled back.

To experts and newcomers to radio control alike we wish you many hours of building and flying pleasure with your KeilKraft SE 5A.