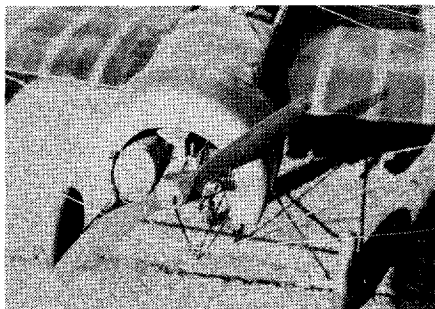




A 1/8th Scale model for 3 function R/C equipment and .15-.19cu. in. engines

WHEN THE FOKKER 'Eindekker' came into service on the Western front in WW1 it met with almost instant success; not because of a great superiority in engine performance or airframe design but, through its unique armament. Roland Garros, the French Air Ace, had experimented with firing a machine gun through the propeller arc of his Morane Saulnier Monoplane (using metal deflector wedges to prevent the bullets from cutting away the propeller) Anthony Fokker inspected the captured aircraft and set about improving on this crude system.

So, the 'Eindekker' became the first aircraft to be fitted with a practical interrupter gear, allowing the machine gun to be fired straight ahead through the arc of the propeller without risking damage to it. Armed with this new weapon and by changing the tactics of attack, the 'Eindekker's' became the scourge of the R.F.C. and were responsible for the coining of terms such as 'Fokker fodder' (the elderly two seat reconnaissance aircraft which were no match for the 'Eindekkers') and 'Bloody April' (because of the number of Allied aircraft brought down by the Fokkers). It was not until the new British pusher designs came into service — they still had not perfected an interrupter gear for their machine guns — that the balance was redressed.



By all accounts it was not a difficult machine to fly, it was modestly aerobatic and had a top speed of around 80 m.p.h. Wing warping was used in preference to ailerons and the airframe design was light and economically designed. Without the single forward firing machine gun it would probably have been regarded as just an average fighting machine but, with the advantage of being the first to use this device, it became a deadly killer in the hands of a skilful pilot.

Construction of the model

Conventional construction techniques are used throughout and the only areas where

any difficulties may be experienced is in the forming and soldering of the undercarriage and the fabrication of the tail surfaces hinging system. All flying rudder and tailplane (or elevators) are incorporated and are operated by closed loop cable control systems similar to the full size methods. The only real deviation from scale is the use of dihedral on the wings — the prototype had no dihedral — with a small model, such as this, it would be difficult to fit in a fourth servo for ailerons or wing warping. (No doubt someone will proceed to prove that it is possible!). A standard .15 cu.ins. engine will fly the model in a scale like manner i.e. without too much reserve of power and requiring a shallow dive to perform a loop. A '19' would certainly give a more sprightly flight repertoire — it depends what you want from your 'Eindekker'.

There is sufficient room in the fuselage for normal size radio equipment and a suggested layout is shown for the servos — adjust the position of the servo bearers to suit your choice of servo. A 500 mA Ni-cad battery can be used as the weight at the nose end will be an advantage, keep it close up to the engine bulkhead. The fuel tank on the original model was made up from a mustard tin and placed in the cowl, this had the advantage of concentrating the weight well forward and keeping the fuel away from the



radio equipment. You will have to search around for a silencer to suit the space available, although the cowling adds to the muffling effect, a manifold cut just short of the engine bulkhead should give acceptable results. Using a large diameter propeller (Top Flite 10" x 3 1/2") and keeping the engine r.p.m. down assists greatly in reducing noise levels.

No nasty flying characteristics were evident on the prototype model but it is suggested that a small amount of wing washout (about 1/4 in. - 3/8 in. at each tip) is introduced at the rigging stage to prevent tip stalling. Do try to build lightly, it is quite a

tough little model and does not require any further strengthening measures. Covering the wings and fuselage in nylon and tail surfaces in tissue is a good compromise, heat shrink covering materials could be used — why not try the new Solartex 'antique' finish woven material and confine the decoration to a white rudder and the German crosses, plus an aluminium finish to the cowl and front panels.

Fuselage

Two side panels are constructed from 3/16 in. sq. balsa wood (med/hard) 1/2 in. x 3/16 in. diagonals and 1/4 in. sheet infill pieces at the front end. Note that the longerons extend into former F2. Formers F3 and F7 are made from a lamination of 3/32 in. balsa wood and .4mm plywood (.8mm plywood would do if you cannot lay your hands on the .4mm variety). The plywood provides a hard base for binding and gluing the wing dowel tubes, which should be fixed to the former before they are installed in the fuselage. Cut slots in the top longerons at the position of the cabane strut and bend and epoxy the strut to former F3. Full depth .8mm plywood facings to the fuselage sides extend from the rear of F2 to the rear of F7 and holes must be drilled in the sides for the wing dowel positions. No problems should be encountered in assembling a square fuselage as there is very little taper, in plan view, towards the tail.

Pre-drilled servo bearers and the elevator crank assembly are added at this stage. The tail surface pivot assembly is fitted when the fuselage is complete but uncovered. Check that the 1/4 in. x 1/2 in. rear crossmember is securely positioned as this takes most of the weight and forces from the rudder and elevators. The engine mount/bearer assembly is from plywood and beech, the size of the bearers may have to be adjusted to suit your engine, use epoxy and small wood-screws to join the components and the mount to the bulkhead F2. Removable top hatches between F2 and F3 (Soft block) and F3 and F7 (formers F4 to F6, on a 1.5mm plywood base) give access to the radio equipment, the switch can be mounted on the plywood base in front of the pilot. Form the cowl from strips of .4mm plywood wrapped around formers to the diameters shown and glued to 3/8 in. hard balsa wood front cowl ring to the plywood ring. You may be lucky and find a small saucepan or kitchen utensil that is the correct size for the cowl. One inch soft balsa wood side checks fair in from the cowl to the fuselage sides, cut out for the wing

leading edge position — it is simpler than modifying the wing.

Undercarriage

To construct the undercarriage assembly the wire parts must be accurately bent and the components jiggled-up onto a baseboard — with the front and rear supports clamped down at the appropriate spacing. Bind all the joints with tinned copper wire, the joints can be temporarily held in position with cyanoacrylate adhesive. Only when you are completely satisfied that the undercarriage assembly is symmetrical and true should you solder all of the joints. No springing is incorporated, it is not an essential feature with a model of this size. Perhaps you can design a better method of assembling this slightly complex U/C structure — if so, let us know!

Wings

The wing ribs must be threaded onto the front and middle spars first but, the wing can then be built flat on the building board. Notch the trailing edge for the ribs and remember to angle the root rib to the dihedral template. Both the root rib and the rib immediately inboard are faced with .8mm plywood for additional security of the 14g wing dowel tubings — the latter are also bound and epoxied to the spars. Fit hardwood blocks at the rigging points, for the flying and landing wires, and blocks at the ends of the dowel tubes to prevent the 14g piano wire from projecting into the wing structure. Note the curvature on the $\frac{3}{32}$ in. wing tip sheeting, this assists in giving an undercambered effect when the wing is viewed from the end of the tip.

Tail surfaces

Construct the elevator halves as flat panels and add the $\frac{3}{32}$ in. sq. capping strips top and bottom, sliding them to an aerofoil section. The 14g pianowire elevator joiner must be bound and epoxied to the elevator halves before they are covered. This also involves fitting the elevator pivot tube at the same time and it is easier if the whole of the cruciform structure, including the elevator horn and tailskid/rudder crank is assembled first.

The rudder is a simple sheet construction, but the front and rear parts must be joined with the 14g pianowire rudder crank in position. Epoxy and bind the rudder pivot tubing to the rudder. Cover and dope the tail surfaces construction before attaching it to the fuselage.

Rigging

Rig the model before the wings are covered (it is easier than trying to rig and pull out warps at a later stage). Use nylon fishing trace line (15-25lbs strain) and small lengths of aluminium tubing (about 16g — according to the thickness of the trace line) as crimping pieces. Slide one end throughout the tubing then through the solder tag, back through the tubing, pull tight to the tag and crimp the tubing to secure. Fit all wires in this manner but do not crimp the wing connections until you are satisfied that the rigging of the wings is correct — the tubing will hold the wires taught if they are pulled up to the solder tags. When you are convinced that the wings are true (except for the washout) the tubing lengths can be crimped permanently. If the nuts and bolts are left slightly loose during

the rigging stage, the final tightening of them will pull the rigging wires really taught. Remove the rigging wires for completion of the airframe but remember to label them for future reference.

Finishing

Painting the model totally will add weight so use the paint sparingly — you might be tempted to emulate one fullsize aircraft which was covered completely in clear — or semi-clear — celluloid so that it could not be easily seen! Use a matt fuel proofer — matt polyurethane clear varnish or 'Tufcote' sprayed from a distance — and give the shiny plastic tyres on the wheels a good rub down with wire wool. Feed the rudder and elevator cables down the fuselage by attaching the fishing trace line cables to the end of a length of 20g piano wire (use self adhesive tape) and threading this through the holes at the rear of the fuselage. Use crimping pieces, as for the rigging, to secure the control cables and tighten them equally on both sides of the horns, with the surfaces central.

Control movements of $\frac{1}{2}$ in. each way on the rudder edge and $\frac{1}{4}$ in. up and down at the elevator trailing edge should be sufficient. Adjustments to the elevator and rudder throws are made at the servo output, holes nearer to the centre giving less throw. There is little you can do about the weight of the model when it is complete, except to ensure that the balance point is correct by adding weight to the nose end if necessary, to give you some indication. The prototype weighed $3\frac{1}{2}$ lbs and *that* is relatively heavy.

Flying — well, just go ahead and enjoy it!