Fokker EIII

Although not actually that outstanding an aircraft in terms of performance the Fokker monoplane (Eindecker) did without doubt leave its' mark in aviation history. Probably the first real fighter aircraft it was armed with a forward firing machine gun that fired through the arc of the propeller at a time when most opposing aircraft were armed with little more than a rifle fired by the observer. Carving a swathe through such types it led to the era being known as the 'Fokker Scourge'.

MATERIALS

Wood

3/32x1/4 bass x 18"	2 off	spars/tailskid
3.32x3/16 balsa x18"	2 off	leading edges
3/32 sq. balsa x 18"	5 off	fuselage frame
1/16x3/32 balsa x 18"	3 off	rudder outline/tail ribs
3/32x3/16 balsa x 18"	2 off	elevator outlines
1/32x3" balsa	9" off	wing root/fuselage decking
1/8 dowel	2" off	locating dowels

Wire

22 swg x 18"	1 off	undercarriage
20 swg x 18"	1 off	undercarriage
20 swg x 9"	1 off	P/rudder hinge post
18 swg x 9"	1 off	axle

Misc.

1/16 dia. carbon rod	4" off	elevator joiner
1/16 i.d. alu. tube	2" off	elevator hinge tube
20 swg i.d. alu. tube	1" off	rudder hinge tubes
Nylon monofilament	30 ft. off	rigging/control cables

INSTRUCTIONS

GENERAL NOTES

Please note that the fuselage is built in two sections that are joined when both are at 'basic box' stage. Since there is nothing complicated about either section this is a relatively simple task that assists with ensuring a straight, square fuselage. Since alignment of both wings and tail surfaces depends on a straight, square fuselage it's worth spending a little time to get it right.

The wings are self aligning, with the spars setting equal dihedral on both panels and the locating dowels ensuring they are both at the same angle of incidence.

Do not be tempted to replace the bass spars with balsa. The spars take all the flying loads (if you decide to omit the rigging) and even hard balsa is far too likely to fail when you take your Eindecker into combat. No matter how realistic the resulting spin and crash may look, it will do your model no good at all.

The plans show a 15 gram outrunner motor and 2S battery pack. You could use other motors but avoid having an excess of power or you simply make the model more difficult to fly. A set-up that provides around 40 Watts of power is ample for scale-like flight.

Also shown on the plan is the arrangement of parts for closed loop (pull-pull) controls. This can be replaced by pushrods, but be very wary of adding weight at the tail. These WW1 models are difficult enough to balance without extra weight at the tail end.

WINGS

Begin the wings by pinning down (over the protected plan) the leading edges, prepared spars (see notes on drawing) and parts TE, W1 and W2, gluing as required. Next use the marks you made on the spars to set the angle of ribs R1 as you glue them in place. This sets the wing roots for dihedral so that the ribs mate cleanly with the fuselage sides. Glue in all other wing ribs, ensuring that they are at 90 degrees to the building board. Allow to dry.

Cut the strips of 1/32 balsa to sheet the upper surface of the root bays and glue in place. This sheeting helps prevent the covering distorting the root rib as it shrinks. Allow to dry completely before removing the wings from the board.

Trim the leading edges and parts TE to follow the wing section shown, round off the tips, blending into leading and trailing edges and sand overall.

Make up some rolled paper tubes around the 20 swg wire and glue them in place against the ribs shown. They are full depth and allow the rigging to pass right through the wings to run from the upper pylon to the lower rigging points.

TAIL SURFACES

Begin the rudder by making a card former matching the inside dimensions of the outline. Either wax, or apply tape to the edges to prevent the laminations sticking.

Thoroughly soak the two softest pieces of 1/16x3/32 balsa. Once good and flexible, glue them together using white glue and tape them securely around your card former. By taping one end, and then pulling the strips around the former you will reduce the risk of kinks. Ensure everything is straight and flat before leaving to dry overnight.

Cut (file) a channel to clear the hinge rod and then pin the outline over the drawing. Glue in part T5 and the 1/16x3/32 balsa 'ribs'. Allow to dry.

Remove from the board and sand both sides smooth before gluing in place the hinge tube. It's important to have both sides smooth to make getting the tube central easier. Remember, the rudder will only be as vertical as your hinging allows. Fill over the tube if required and sand overall, rounding off the edges. Fit the horn after covering.

Build the two elevator halves over the plan using parts T1, T2, T3, T4, 3/32x3/16 strip and 1/16x3/32 strip wood. Trim the carbon joiner and hinge tube to exact length. Slip the tube onto the joiner and glue the joiner into the elevator halves. Ensure both joiner and tube are parallel to the building board - and that NO GLUE gets into the hinge. Allow to dry.

Remove from board and fill above and below the joiner before sanding smooth and rounding off the edges. Once again, fit horns after covering.

FUSELAGE

Because the rear section of the fuselage is marginally more complicated to get straight and square we'll start with that. Build two identical side frames over the plan and allow them to dry. Taper the extreme ends of TS and TE so they will meet correctly once glued in place between the lower and upper longerons. Cut matching pairs of cross braces as shown in the top view.

Now pin down the front of each side frame over the top view and pack up under the rear ends so that both frames are aligned with the drawing and square with each other. Glue in place the cross braces and part TE, ensuring that TE follows the curve of the longeron. Allow to dry, remove from the board and glue in place part TS.

On the sheet fuselage sides mark the positions of all formers and fit parts UC1 and UC2 to the inside of each side. Glue F1 and F3 to one side and attach the other side. Check for square and allow to dry. Glue F2 and F2A together and install the assembly to align with the spar slot. Securely glue in place UC1A and UC2A. Taper M as shown glue MA to it and glue the assembly to F1.

Join the front and rear frames taking care to keep everything straight and square. Once dry fit X and the lower 1/16 balsa fill piece. Fit the 1/32 balsa decking and sand overall, sanding the longerons flush with the sheet sides where front and rear sections join. Carefully open up the pylon holes in the decking and your fuselage is ready to cover before any more is done to it.

COWL

Glue the strip of 1/32 ply around formers C1 and allow to dry. Laminate parts N and glue to the cowl. Spot glue the assembly to the covered fuselage and glue the laminated parts F to the cowl only. Remove from fuselage and trim and sand to shape, sanding smooth overall. The cowl may be glued back in place after sealing and painting (or covering) after your motor is fitted.

ASSEMBLY

Begin assembly by making up the wire parts and gluing them securely into their locations, then do any binding and soldering required.

Drill the tailskid for the rudder hinge tube and temporarily tack glue it into TS. Using the hinge wire as a guide glue the short piece of tube securely into its' notch in TS/TE, ensuring that the hinge wire is truly vertical. Once set, bind the elevators in place but DO NOT glue the hinge tube yet. Remove the skid/hinge wire, position the rudder and slip the hinge wire back into place. Glue the tailskid in position to secure the assembly. Once again check the rudder is vertical before the glue dries.

Apply epoxy to the wing roots and F2/F2A and slide the wings into place ensuring the spar stubs are securely located to provide the correct dihedral. The locating dowels will automatically set wing incidence. Now you can adjust the elevator hinge tube to align with the wings and glue it to the fuselage.

The model doesn't require working rigging, but it will add a lot of strength for more spirited flying and add realism to the model.

Use a couple of scrap pieces of spar stock as servo rails and install the servos at the position shown. Using short lengths of nylon tube (ball-point pen refill or cotton-bud stick) install the reinforcements where the control cables exit the tail. Using monofilament install the closed loop control linkages. Fit your ESC and receiver to the fuselage sides, making sure you still have room for battery access.

The ply hatch may either be hinged with tape and secured with small magnets, or simply held by magnets.

FLYING SET-UP

Set up the model with as much rudder throw as you can get (but don't expect to need it all for most of the flight) but absolutely no more than 1/4" each way on the elevators. You definitely won't need all of that except during combat. Any more will just make the model overly sensitive during trimming flights.

Balance the model to hang just a hint nose low when supported at the point shown. Don't even think of flying it if it's in the least tail heavy. The model will probably survive, but you won't enjoy the experience one bit.

With power train shown you will have ample power for take-off, and that is the safest course with initial flights since it will show up any need for elevator adjustment before you find the model doing things you never intended. A frantic climb is acceptable, if a little unnerving, but a dive into the ground tends to be terminal.