Sleek lines of the Spitfire still show through, in spite of the modifications for precision aerobatics in the FAI pattern. Shortened landing gear improves ground handling, a consistent problem for tail-draggers under the present FAI takeoff and landing reguirements.

Pattern Spitfire

By TORE PAULSEN . . . This ship was outstanding at the 1975 World Championships, both in appearance and in performance. Scale-like aircraft in precision pattern is a trend we'd like to encourage.

• Pattern designs have, in my opinion, become very stereotyped. They are all variations on the same theme. I do not agree that it has to be this way, and this Spitfire is an attempt to prove that a semi-scale model can be competitive. A 41st place in the 1975 World Championships does not prove anything, but I blame that more on the pilot than the model design. I feel that if we could see more scale-like models at pattern meets it would be more fun for both competitors and spectators. *(Amen! wcn)*

Anyway, building and flying the Spitfire has given me more fun than I had for a long time. Seeing the Spitfire silhouette pull out of a high split-S and whistle by at a low altitude is really something, because this is not a slow lumbering scale model, but a high speed pattern aircraft with performance to spare.

One of the reasons for choosing the Spitfire for this project is the elliptical wing form. It gives less induced drag than a normal wing and therefore has less tendency to slow down in maneuvers. In designing this model, I used normal pattern parameters, and just drew the Spitfire outline to match. It therefore came out with a longer nose, larger stab and slimmer fuselage than would be scale, or even semi-scale.

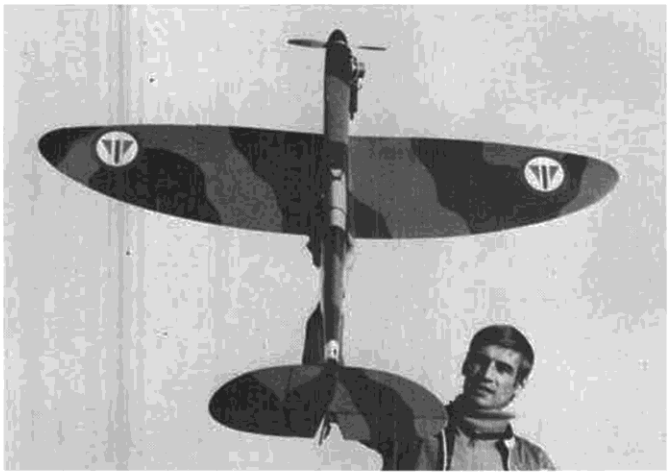
There are, of course, lots of other prop aircrafts to choose from . . . the ME 109 would be a natural. Likewise the Bearcat, Zero, Mustang, and several others.

There is one problem with this type of model, and that is the tail-dragger configuration. No problems on a grass field, but they tend to be tricky on a hard surface. I believe this problem can be solved by experimenting with wheel hardness, tracking, gear positioning, and tail wheel steering accuracy. I found, for example, that putting a slight drag brake on the main wheels improved both take offs and landings, even with uneven brakes. Going to harder wheels also helped. No brake on the tail wheel though, it fouls up the steering.

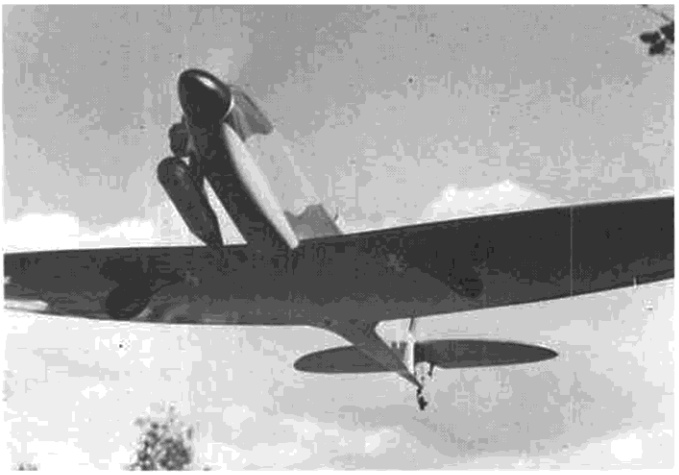
This Spitfire is a second design, correcting some problems I had on the first one. It is, of course, not the last and ultimate. I guess no design will ever be.

CONSTRUCTION

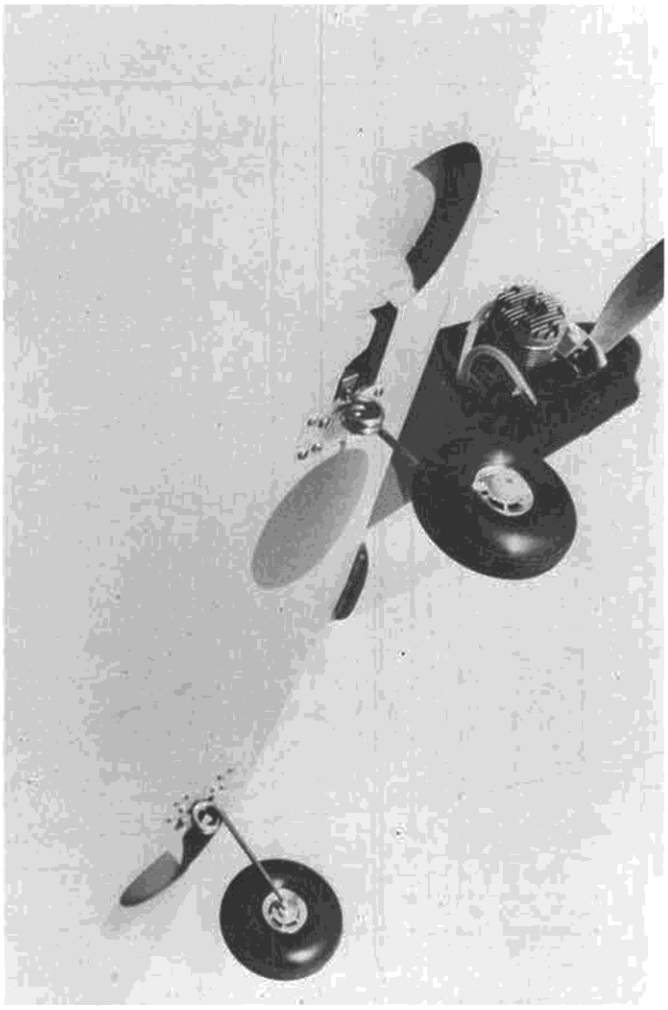
The elliptical wing might at first sight scare off potential builders, but is



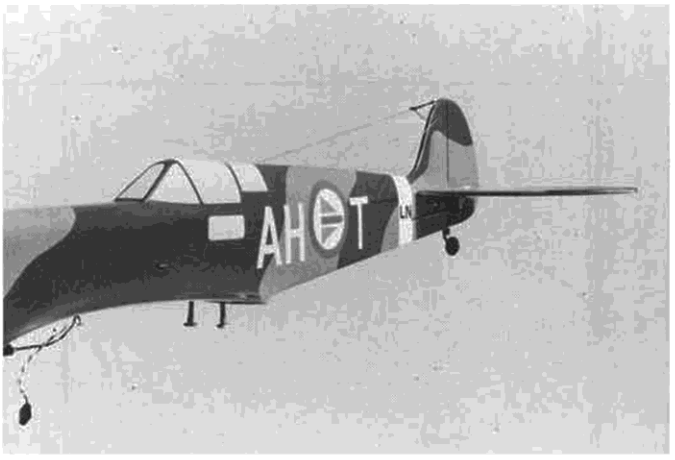
Tore Paulsen, Norwegian airline pilot, displays the most familiar and and most beautiful lines of the Spitfire, the double-elliptical wing.



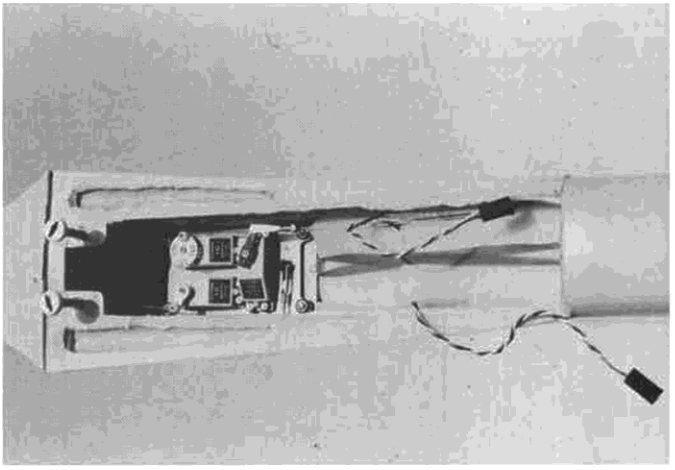
Would you believe the photographer shot this as the Spit roared over his head just after takeoff? No? Oh well, it was a nice try.



Underside of wing reveals landing gear wells and retracts. Tore explains ways to improve tail-dragger handling in the text.



We agree with Tore that painting a Spitfire with anything but an authentic camouflage design should bring doom upon the builder!



Futaba radio installation is simple and clean. Wing fillets are built up of micro-balloons and epoxy, are hollow to save weight.

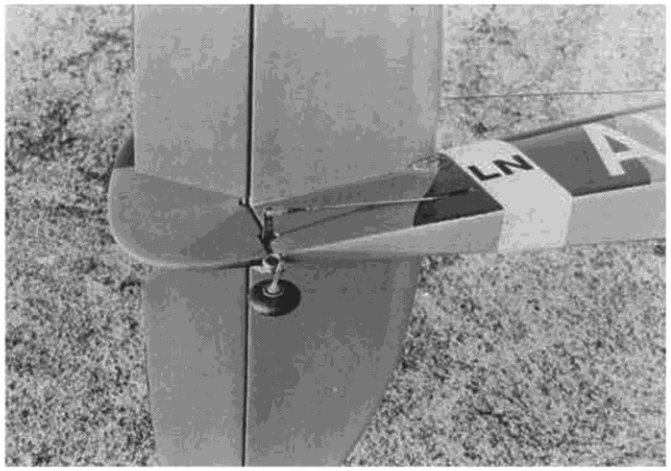
actually not hard to build with the method described. It must be built in one piece, in a suitable jig. If you don't have one, make one up by hinging two building boards together.

Mark down all rib and spar positions and set the board at 3 degrees dihedral. Cut out all ribs as described on plan and glue the jig pieces on the jig.

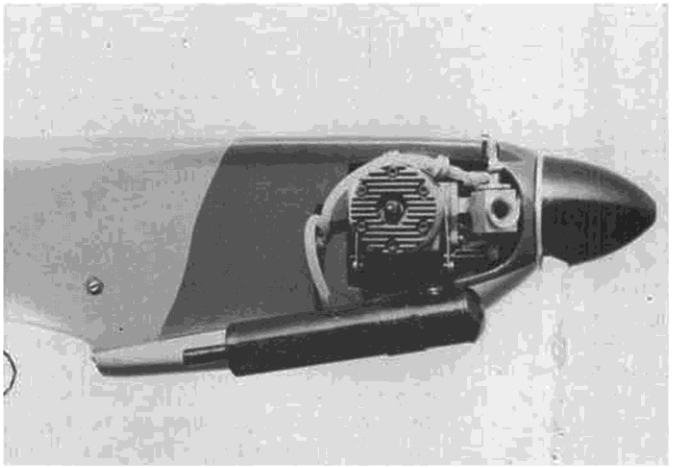
Wet and bend the two spruce spar joiners to dihedral, and when dry, glue them to spars. You now have one upper and one lower full length wing spar. Make a good joint, as the main wing strength comes from these spars.

Prepare ribs for retracts, pushrods, servo installation, etc. Pin down lower spar to jig and glue in all ribs and center section. Next add the preshaped T.E., W-10, and the inner lamination of the L.E. Cut this one slightly oversized and trim to follow rib contour when dry. Glue in upper spar. Bevel the spars at the tips and pull together, to follow the general curve of the wing. Ribs W-7 and 8 must be sanded down smoothly from the spars to meet W-10 in order to have a straight hinge line for the ailerons. Add upper sheeting, and when completely dry, remove wing from jig.

At this time, try your installations for fit. Set jig at 3 degrees anhedral, reverse wing and pin to jig. Trim L.E. and ribs W-7 and W-8 as on upper panel. Add lower sheeting and again, when dry, remove wing from jig. Glue in remaining



The author's tailwheel and rudder horn linkage appears to be a combination production unit. Sheet covered frame tail surfaces.



Webra Speed 61F is equipped with a special HP bucket sized carb, and Minivox Super Silent muffler which supplies fuel pressure.

L.E. laminations and wing tips. Sand entire wing. Cut aileron blank from light wood, tack-glue in place and shape to follow wing contour. Finally, cover center section with fiberglass.

The rest of the construction is conventional, and only a few points will be mentioned. Cut out fuselage sides and ply doublers. Glue together with polyester resin. It makes for a good and warp free bond.

Build fuselage upside down on a flat building board. Plan all your installations when the basic box is finished. Next, add nose block, upper block, aft turtle deck and bottom sheeting. Trim fuselage to shape before adding canopy.

Put Saran Wrap on wing center section and bolt to fuselage. Build up wing fillet from micro balloons or similar material. Make stab and bolt to fuselage, while checking for 0 degree incidence in relation to wing. Then epoxy in place. Glue on fin and fair into fuselage and stab with soft balsa.

To avoid flutter make control surfaces light and stiff . . . use straight pushrods and no sloppy linkages. I used nylon cloth hinges on ailerons and klett hinges on rudder and elevator.

My engine is a Webra Speed 61 F with a special HP carb. Use a good mount, like Fox, and position the engine as close to the firewall as possible. The RST 12 oz. slant tank is pushed in sideways, right up to the firewall, with the outlet facing the fuel tubing exit hole in fuselage. The vent line is connected to the muffler pressure tap. The tap must be around 3/32 I.D. to give good steady pressure. Use a large volume muffler, at least 100 cc, to reduce back pressure. The Minivox Super Silent is good. Prop and spinner must be balanced. Top Flite 11-7 Super M and Williams 2-1/2 inch spinner works fine.

The conversion from mm to inches on the plan is not always accurate, but this is in places where wood size is not critical.

The original model was finished in WW II camouflage colors, with the markings of the post war 332nd Norwegian Squadron. Refer to literature for this. A Spitfire finished in red will bring doom upon its builder! ●