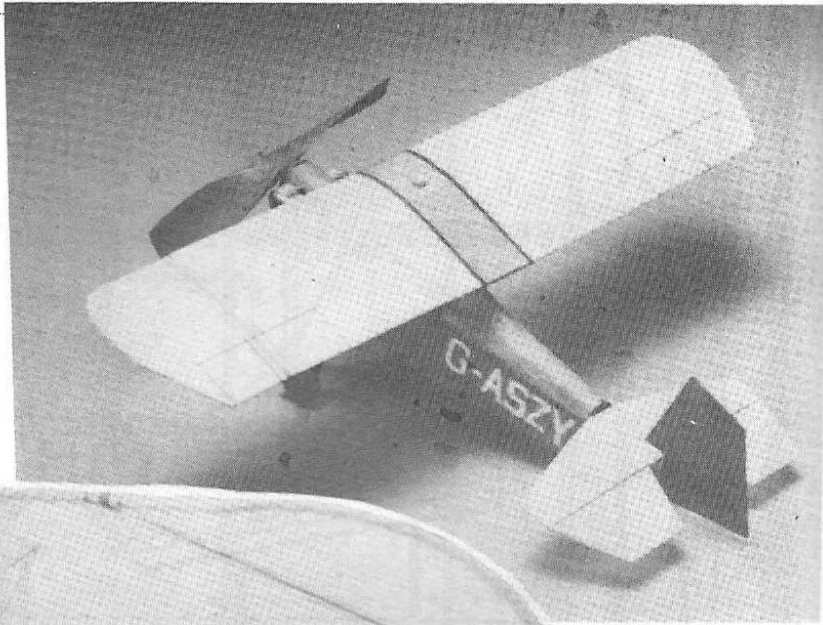


# FRED

*A peanut scale  
replica of  
Eric Clutton's  
famous  
homebuilt  
light aircraft*



By Siegfried  
Glöckner

**F**RED is the abbreviation for Flying Runabout Experimental Design. The aircraft is designed for recreational weekend and evening flying, not as a fast cross country plane.

Its thick high lift wing section (Goettingen 535) gives the plane safe stall characteristics, but not high speed. Except for high stressed parts like cabane struts, landing gear, hinges, etc., the aircraft is built from wood. Recommended engine is a 1500cm<sup>3</sup> Volkswagen engine or equivalent power plant.

Fred can be towed behind a car and stored in one half of a double garage, thus saving hangar fees. The horizontal tail and rudder are detachable and fit inside a small car. With the wings folded alongside the fuselage, 'FRED' can be towed on his own wheels behind the same car to the owner's garage.

## The model

The P-Nut version of 'Fred' is built in conventional manner and needs no detailed description. Some perhaps unorthodox construction sequences are thoroughly described.

**Fin and Stabiliser:** These are built from 1mm square balsa strip over the plan.

**Wing:** Wingtips are laminated from 0.5 x 1 mm balsa strips to be light and strong. Note thicker ribs W2 at centre section. Drill holes for cabane attachment into W2 before they are glued into wing construction. The centre section is to be sheeted with thin balsa, 0.4mm thick, from leading edge to the spar to simulate the fuel tank. Do not forget rigging point attachments.

**Fuselage:** Construction is from 1mm square balsa. Build the right fuselage side on the plan, cover it with clear plastic (household) film. Build the left side on the right fuselage side to get two identical fuselage sides. Note the front end: the top longeron extends to the nose former F1, the rest of the nose area is filled with 1mm sheet balsa, cut to size. Add rigging point reinforcements.

Glue F1 between fuselage sides. Glue fuselage sides at rear end together. After glue has set add F2 to F6 between fuselage sides. Glue 1mm square balsa spacers between bottom of fuselage sides, take length of spacers from plan. The fuselage's top is sheeted with 0.4mm balsa. Note that the formers F1 to F6 do not extend to the outer edges of the top longerons. They are slightly undersize so that the sheeting will be flush with the fuselage sides. Cut the top

sheeting slightly oversize. Glue the sheeting to the top of the formers at first, then fold around formers. Take a sharp balsa knife and cut the planking along the top longerons so that the sheeting will fit to the formers with no overlap at the fuselage sides.

Now glue sheet to top longerons. Glue F7 to top of F4, cut sheet for the headrest from 0.4mm dia. balsa, the cut the 0.4mm balsa sheet oversize and shape it to fit to the fuselage's top to form the headrest.

**Landing Gear:** The highly stressed parts are built from bamboo (see plan). Glue fairing to lower wheel strut (note wood grain direction). Wheel axle is a short piece of 0.8mm dia. steel wire, bent to shape over the plan and glued to lower wheel strut with epoxy or high viscosity cyano glue. Glue reinforcement F8 on bottom of fuselage under former F3 (see plan). F8 is needed later for landing gear attachment.

The wheels are cut from light balsa, doped and painted.

**Noseblock and Engine:** These parts are cut from light balsa, sanded to shape, doped and painted. Exhaust pipes were made from thin plastic tubing, bent to shape over the flame of a candle.

**Covering:** Cover model with your favourite paper. I used Micro-X tissue but did not do it. The tissue was shrunk with a light water spray from an airbrush. Add registration markings and windshield.

**Assembly:** Wing, tailplanes and fuselage have to be covered before assembly. Engine, wheels, landing gear must be ready for installation and painted.

Cut cabane struts from bamboo, and sand to shape. Glue together the two sticks of the front cabane struts at correct angle. Glue front cabane struts to fuselage.

Glue rear cabane struts to wing centre section. Push front cabane struts into drilled holes of centre section and add some glue to joints. Now check incidence between wing

and fuselage, if correct, glue rear cabane struts to fuselage. Glue stabiliser to fuselage, note incidence between stabiliser and fuselage. Glue rudder in place.

For installation of the landing gear you have to poke small holes at the forward side of F8 at both fuselage sides (see plan). Glue lower L.G. struts to F8 at correct angle. After glue has set install upper L.G. struts. Install wheels and secure them with small drops of glue to the axles. Make wheel hubs from paper or thin balsa.

Glue engine in place.

Bend small wire hooks for rigging points (six pieces) and glue in place. Make rigging from thin thread.

**Flying:** 'Fred' is a stable reliable flyer. My first model weighed 17 grams. With a North

Pacific prop and 1/8 Peck rubber it managed to fly for 35 seconds. The second model, weighing 6.8 grams flies a lot better. With a self-made balsa prop and a loop of 1/32 x 15 in. Peck rubber flights around a minute are standard. The model on the photos was 4th at West Baden in Modern Class in 1982 and 5th in 'Duration' at Flemalle Belgium in 1982.

'Fred' has no bad trim characteristics. Both models I built flew 'from the building board', and needed only fine tuning for higher performance. The second 'Fred' which weighs 6.8 grams has the ability of circling very tight, which has some advantage at smaller indoor contest sites.

To everyone who intends to build a 'Fred' wish a lot of fun and many long flights.