

# An Unorthodox Swedish Project

## Asymmetrical Fighter and Bomber : Prone Position for Pilot : Two Napier Sabre Engines

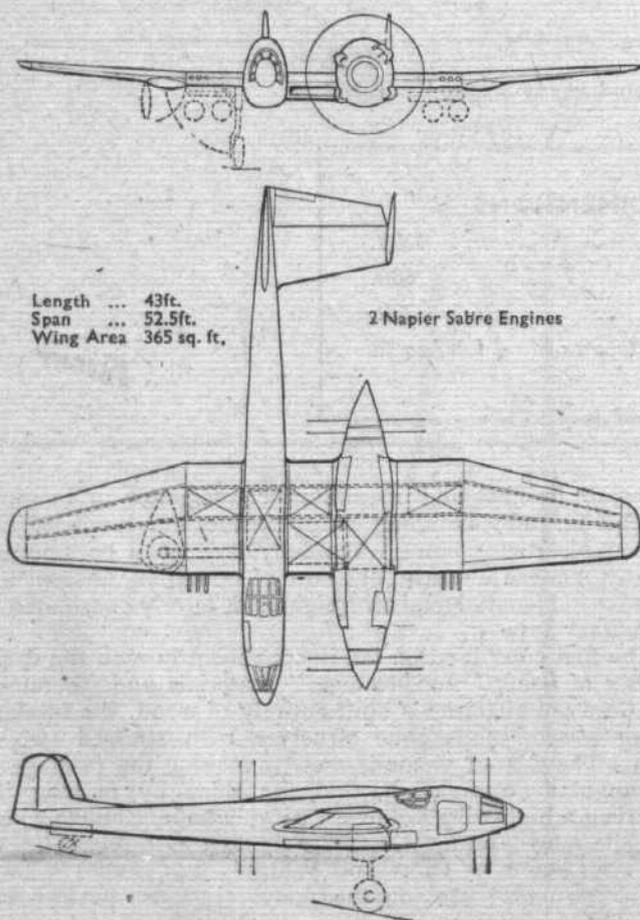
THE asymmetrical aircraft shown in the accompanying general arrangement drawings represents a project by a Swedish aircraft engineer, Mr. Sigurd Isacson. It was, in point of fact, a part of his passing-out examination, and was awarded "full marks." We are indebted to our Stockholm contemporary *Flyg* for the layout from which our g.a. drawing was prepared, and also for the description and data which follow.

Basis for the design was the provision of a heavy fighter which could also be used as a multi-purpose bomber and as an escort fighter. High speed was the fundamental idea, and in order to obtain this without sacrifice of armour and armament a somewhat unusual design was chosen which included a high-speed wing section and two powerful engines placed in tandem on an asymmetrical layout. The designer estimates that this combination results in a drag reduction of about 10 per cent.

### Reducing Effects of "g"

A feature which does not emerge from the drawings is that the intention is that the pilot should occupy a semi-prone position. Not only does this enable a fuselage of small cross section in front to be used, but full advantage can be taken of the machine's manoeuvrability, since a greater increase in "g" can be tolerated than when the pilot sits upright. The observer, too, can lie down by tilting back his seat during violent manoeuvres.

For the power plant Mr. Isacson chose the Napier Sabre, assuming 2,350 h.p. for take-off. The engines are fitted



### ISACSON DESIGN 2 Napier Sabre Engines

DIMENSIONS	
Length o.a. ...	13.1 m. (43ft.)
Wing span ...	16.0 m. (52.5ft.)
Wing area ...	33.9 sq. m. (365 sq. ft.)
WEIGHTS	
Gross weight (fighter) ...	9,000 kg. (19,800 lb.)
Wing loading ...	266 kg./sq. m. (54 lb./sq. ft.)
Bomb load (long range) ...	4 250-100- or 50-kg. bombs under wings up to 1,000 kg. (2,200 lb.)
Maximum bomb load ...	4 as above, plus 5 100- or 50-kg. bombs in fuselage and nacelle up to 1,500 kg. (3,300 lb.)
PERFORMANCE	
Max. speed (at 6,500 m. for 5 mins.) ...	770 km./h. (478 m.p.h.)
Max. cruising speed at 7,800 m. ...	700 km./h. (435 m.p.h.)
Ceiling ...	10,700 m. (35,000ft.)
Maximum rate of climb (at 6,500 m.) ...	1,170 m./min. (3,840ft./min.)
Climb to 6,500 m. in 6.1 mins.	
Max. range (fighter) ...	1,800 km. (1,120 miles)
Max. range with wing bombs ...	1,500 km. (930 miles)
Max. range with full bomb load ...	470 km. (290 miles)
Duration (fighter) ...	2.7 hours.
Landing speed ...	155 km./h. (96 m.p.h.)

with flame-damped and efflux-reaction exhausts. In order to avoid tip speeds above the speed of sound, contra-rotating airscrews are fitted.

Armament comprises two 20 mm. cannon and six 13 mm. machine guns. The cannon are located under and behind the pilot, while the machine guns are placed three on each side in the wing, near the outer ribs of the centre section. Ammunition is provided for a total firing time of 15 seconds. The cannon are heated, like the cabin, from a cooling system radiator, while the machine guns are heated from the engine exhaust.

Provision is made for a total fuel supply of 1,730 litres (380 gallons). These petrol tanks are located in the wings, of a total capacity of 570 litres (125 gallons), and an oil tank contains 150 litres (33 gallons). In the fuselage and engine nacelle are a further two petrol tanks, each of 580 litres (128 gallons). When the machine is to be used with full bomb load, these two tanks are removed and replaced by bomb racks and bombs. The tanks are provided with self-sealing rubber coverings, and provision is made for blowing cooled exhaust gas through them above the petrol level so as to reduce fire risk.

One of the drawbacks of the asymmetrical aircraft, the designer points out, is the difficulty of getting symmetrical loads. In this project the wing is itself symmetrical, and fuel, bomb and ammunition loads are evenly placed on each side of the centre of lift.

### HELICOPTER RESEARCH

THE Cierva Autogiro Co., Ltd., is resuming its activities in the field of helicopter research. For the present these activities will be confined to the completion of the development of the helicopter following successful experiments conducted between 1937 and 1940 under the guidance of Mr. C. G. Pullin, the first practical British helicopter, built by Messrs. G. and J. Weir, Ltd. in collaboration with the Cierva Autogiro Co., Ltd., being demonstrated on June 7th, 1938, at Dalrymple, Ayrshire, using only a 50 h.p. engine.

This technical programme will be under the direction of Mr. C. G. Pullin, whom the board have now invited to join them as managing director, with every confidence that this is a most suitable appointment for the phase upon which the company is entering.

Mr. R. Blake is returning as secretary and commercial manager and the company hope, despite present difficulties, to gather together a small but efficient technical staff to carry out their future plans for research and development of helicopter possibilities both during the war and afterwards.

For this purpose premises have been obtained with an engineering firm who have kindly placed a part of their works in England at the disposal of the company, where a certain amount of experimental work will be carried out, though the company will adhere to its original policy of subcontracting a greater part of its manufacture.