

FLYING OFFICER E. L. MOLE DESCRIBES HIS FLYING EXPERIENCES ON THE "TERN" SAILPLANE



The "Tern."

[Flying-Officer Mole already holds the British duration record of 6 hrs. 10 min., which he secured a year ago at Ditchling on a PROFESSOR sailplane. The British distance and previous altitude records were both obtained with a TERN sailplane at Ingleby Greenhow, one of the sites used in Flying-Officer Mole's recent attempts.—ED.]

I have just returned from an interesting sojourn in Yorkshire, where it has been my good fortune to spend a fortnight with a TERN sailplane kindly placed at my disposal by its designer, Mr. L. S. Norway, of Airspeed, Ltd., York.

The object of my visit to the North was to confirm officially the existing British endurance record, and to raise this to a more reasonable figure, if possible above the world's record of 21 hrs. 36 min. I am convinced that, although endurance in itself is of little technical value, the fact of obtaining a world's record would be of great value to the Gliding Movement in this country.

It was also hoped, should suitable weather conditions be obtained, to attempt distance and height flights. Unfortunately, owing to the disappointing weather and a mishap to the TERN, further attempts have now been postponed until September.

The first flight was made at Ingleby Greenhow one Sunday evening at 6.30 p.m. This site is the most imposing that it has been my good fortune to visit. It consists of a wide horseshoe with a plateau top 1,200 feet above the plain below, and miles of perfect heather landing ground.

A 20-m.p.h. northerly wind blew straight into the bowl, and conditions seemed ideal. The TERN was equipped with emergency landing flares for use at night, Very pistol and cartridges, food, water and a barograph. The launch was made with the help of a party of hikers rounded up from the moors, and the TERN climbed quickly to a height of 800 feet above the launching-point.

Owing to the strength of the wind at this height, I was forced to maintain a speed of 45 m.p.h. to avoid going backwards, and I then remained stationary over the bowl. After about an hour, a line of heavy black storm-clouds approached, which caused the TERN to climb rapidly until it was skimming the base of the clouds. I was forced to put down the nose until a speed of 55 m.p.h. was reached, to avoid being completely enveloped. Conditions were

vilely bumpy and rain fell heavily. I had the unpleasant sensation of being irresistibly sucked into the clouds.

Five separate storms of this nature were experienced, and in each case the TERN rose to the clouds, although I tried to avoid this owing to the severe bumps. The barograph chart shows clearly five separate peaks, recording a maximum height of 1,450 feet above the start. This exceeds the present official British record of 780 feet, also held by the TERN.

The final storm, which occurred as darkness fell, was so violent that the ground party were unable to place in position the flares which were to mark the edge of the hill. The clouds came lower, rain fell heavily, and it grew so dark that I was forced to land after a flight of 3 hrs. 45 min. Within a few minutes the clouds came right down on the hill, and the ground party and myself spent a miserable night sheltering from driving rain under the wings of the TERN.

The second attempt was made a few days later in a light westerly wind at Sutton Bank. This site is less imposing than Ingleby, being but 900 feet above the plain, and it does not possess the unlimited landing ground so convenient at Ingleby. However, landing conditions are reasonable if care is exercised, and the locality is much more accessible and civilised than Ingleby, which is reached after about fifteen miles' journey on rough moorland track. An hotel and some houses are situated near the top and a main road runs up the hill. For this reason I consider Sutton Bank the better site for normal purposes.

The TERN was launched by an assorted team of road workers, farmers, casual motorists and hikers. It flew steadily at about 500 feet, once reaching 800 feet. The flight, unfortunately, ended after four hours through failure of the wind. During the last twenty minutes I was forced to fly below the level of the hill-top, and finally had to land to avoid being forced down to the uninviting fields below. The observer's anemometer recorded a wind speed of just under 5 m.p.h. during this period, which must be about the minimum wind speed at which the TERN will soar at this site.

The final attempt was made under ideal conditions; the wind, which was strong and steady, actually continued without a lull for two days. Unfortunately, during the launch a stump of wood concealed in the heather damaged

the fuselage and thus put an end to further attempts for some weeks.

The TERN sailplane is most delightful to fly. It seemed unnecessary to move the controls to any extent, mere pressure on these causing the machine to respond smoothly and sweetly. No other sailplane that I have tried possessed quite the ease and certainty of control, which was a most pleasing revelation. The most outstanding characteristic, however, proved to be the absolute rigidity of the whole machine. I noticed this immediately after the first launch, and even the worst bumps under storm-clouds failed to produce any heart-rending groans or wing flapping. This certainly increases a pilot's confidence in the machine. The TERN can be removed from the trailer and rigged easily in ten minutes by two people, and the only criticism I have to offer is the difficulty found in launching in a light wind. At one time a crew of seventeen people made three unsuccessful attempts to launch it, although it must be admitted that the launching-rope left much to be desired.

During these attempts the greatest help was received from the officers and meteorological staff at Catterick Aerodrome. The weather forecasts proved uncannily accurate, rain ceasing or wind veering sometimes within thirty minutes of the time foretold. The value of these meteorological reports cannot be overestimated to the gliding enthusiast.

Through the courtesy of Mr. Norway, the TERN will again be at my disposal in September, when I sincerely hope that better luck will be experienced.

(Continued from page 164.)

was flown by a junior pilot. The speed is less than that of the FAFNIR, which is a handicap for distance flights.

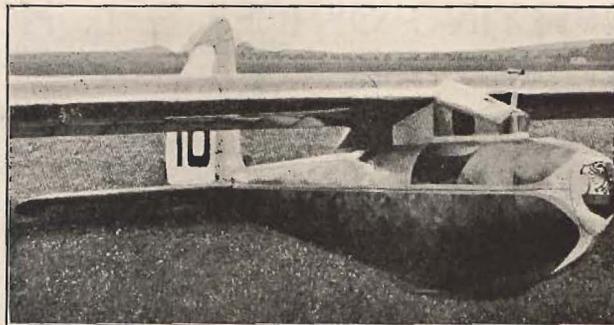
The OBS is a large, heavy two-seater built by Schleicher for the R.R.G., and is intended for observation purposes. It has a span of 83 feet and a wing area of 380 square feet. Both occupants are entirely enclosed in a cabin provided with large windows. The pilot's seat is in front, and between him and the observer is a table or platform for scientific work. Welded steel tubular construction, with bracing wires, is freely used, while the wing is supported by steel "N" struts. Camber flaps and air brakes are fitted to the main planes.

Only one flight has so far been made, and this ended prematurely owing to the towing machine, a "Flamingo," stalling shortly after the take-off and crashing into a wood.

The chief feature of interest on the THERMIKUS is provided by the employment of wing warping in place of ailerons, this being obtained by raising or depressing the rear spar. Like the OBS, the THERMIKUS wing is also supported by a pair of "N" struts, and the rear spars are actuated by movement of the rear struts. Rotation of the control wheel is transmitted by chains and sprockets to a horizontal shaft just above the point at which the rear struts attach. A screw thread on the shaft causes sideways movement in a short vertical lever which is pivoted at its centre and attached to the two rear struts at the base, so that one strut is pushed out and the other drawn in.

It is too early yet to say whether the design is a success, but it certainly leads the way for a return to the old system of wing warping.

The new machine of the Darmstadt Academic Group was



"The Askania."

not completed in time to take part in the contests. This should prove of considerable interest, since it represents an attempt to retain high efficiency with a small machine, and at the same time to provide excellent manoeuvrability which is to-day considered essential for thermal soaring flights. Few particulars are yet available, but the span is given as 38 feet, the wing area 114 square feet, with an empty weight in the neighbourhood of 132 lb.

General Observations.

The formula based on a calculated sinking speed for determining whether any machine falls in the sailplane category has now been dropped and in its place a minimum aspect ratio of 10 was substituted for this year's competition. Next year, however, the determining factor will be the span and there will be two classes, those between 12 and 16 metres span and those over 16 metres, besides which there will be some open events for machines of both classes.

The advantages of small machines are now being recognised, besides which it is found that sailplanes of small span and good manoeuvrability are most suitable for thermal work and light-wind soaring, whilst those of large span and high aspect ratio, with their extra weight and speed, are best for distance flights where a good gliding angle is imperative. Thus the smaller gliders are to be encouraged.

Besides the usual method of auto-towing, in which the car moves forward with the glider, the stationary winch method is largely used. A large drum may be fixed to one of the driving wheels of the car, which is properly jacked up for the purpose, or a drum may be mounted behind the driver's seat and worked by a separate drive fitted with a special gear and clutch. Lengths of cable up to 5,000 feet are used, and it is thus possible to launch from ground that is entirely unsuitable for a moving car.

The GRUNAU BABY did not show up very well against the bigger machines, but it is said to be very controllable and very suitable as a training machine. Curiously enough the HOLS DER TEUFEL does not seem to have too good a name in Germany, the reason given being that pilots who learn on this type kill themselves when they change over to another machine. It is not wise for pilots who have learnt on such a slow machine to change over directly to a machine like the PRÜFLING or PROFESSOR, but they should accustom themselves first to some intermediate type of fairly low wing loading.

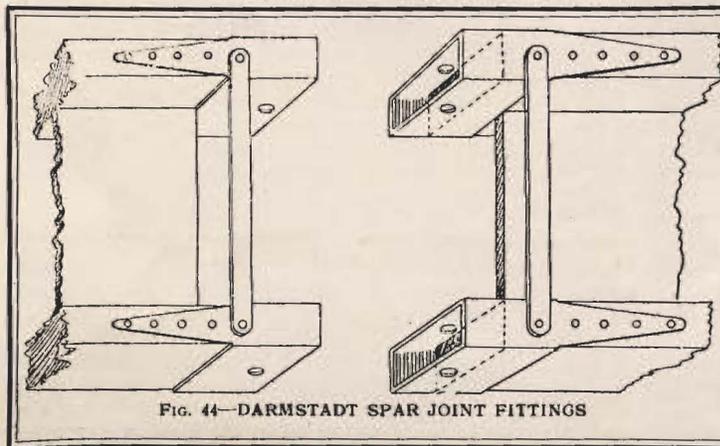


FIG. 44—DARMSTADT SPAR JOINT FITTINGS

SAILPLANES

THEIR DESIGN, CONSTRUCTION & PILOTAGE

By C. H. LATIMER NEEDHAM, M.Sc. (Eng.) Lond., F.R.Ae.S.

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