

Raiding by Celestial Navigation (contd.)

prising two 2,000-lb. bombs of H.E., four 250-lb. bombs of gas and explosives incendiary. They were fitted with delay-action fuses and were arranged for release in two lots.

The type of machine used is still on the Secret List, but I can say that it could carry a full load 1,500 miles and return empty without anxiety about fuel. It was powered with two of the new 2,000 h.p. fuel-oil-burning motors, fitted with silencers which could be cut in or out as required. No radio was to be used during the flight for fear that it would enable the detectors to pick them up. Whether at 25,000ft. they could slip over the lightships without being detected by cathode-ray devices, supposing the enemy had them, remained to be seen.

The cloud ceiling was down to 1,000ft. As soon as they reached that they split formation, the bombers each altering course 5° outwards from the navigation machine. They climbed through a deep belt of dirty stuff, wild, bumpy and black as the bowels of Mars. But at 18,000ft. Drake emerged and found himself in a gloomy chasm between towering black alto-cumulus. However, even this was cleared at 23,000ft., and he then found himself flying over a starry bright sky over a vast bed of cloud boulders.

He had kept the indicated air speed at 130 knots on the way up. (The instrument reading was adjusted for instrument error and pitot-head position error.) The air speed covered was found approximately from the air-speed correction scale on the Dalton "G" computer.

Up to 5,000ft., with temperature 0° Centigrade at 2,500ft., the true air speed for an average height of 2,500ft. and indicated air speed 130 knots was read off as the corrected figure of 132½ knots.

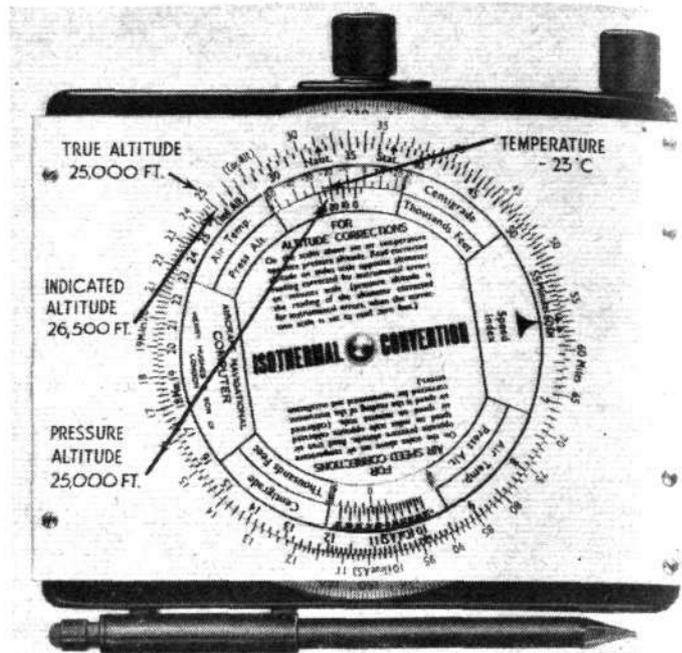
Distance flown in 5 minutes at 132½ knots = 11 miles.

Average Height Feet	Average Temperature	True Air speed Knots	Distance flown in 5 minutes Miles
2,500	0° C.	132½	11.0
7,500	- 5°	144	12.0
12,500	-10°	156	13.0
17,500	-15	170	14.2
22,500	-20	184½	15.4
			65.6

Distance flown in 25 minutes = 66 miles.

At 25,000ft. Drake decreased the indicated air speed to 107 knots, but continued to climb till the altimeter showed 26,500ft., when he carefully levelled off while holding the same air speed.

With temperature -23°, the true altitude for an indicated altitude of 26,500ft. was seen from the Dalton "G" to be 25,000ft.



How the altitude correction for temperature was made on the Dalton "G" computer. When the altimeter was showing 26,500 feet at a temperature of 23° C. the true altitude was 25,000 feet—that chosen for the flight.

With indicated altitude 26,500ft. and the temperature -23°, an indicated air speed of 107 knots represented a true air speed of 162½ knots.

On clearing the clouds, he had ordered a powerful beacon light to be turned on in the navigation superstructure, and flew on at the slow speed, waiting for the others to find and join him; their instructions were to change course 10° inwards as soon as they cleared the clouds, and to keep a sharp look out for Drake's beacon, which should be visible 10 miles away at their own level or below them.

Thirty-six minutes after the start, the port-side bomber ranged up alongside, and half a minute later the other arrived. This was at 23.23½ G.M.T. (they had been 7 minutes late in starting and had passed over Rame Head at 22.47 G.M.T.).

(To be continued.)

Navigational Training in Scotland

SOME little time ago Flt. Lt. C. W. Martin, the principal of the Imperial School of Air Navigation (of London) and of Martin Navigation (of Shoreham), joined the staff of Scottish Aviation at Prestwick. This company has acquired the goodwill of the I.S.A.N., and has consequently started a scheme for the training of commercial pilots for their First and Second Class Navigators' Licences.

As before, there will be correspondence courses for each of the syllabuses, as well as twelve-week day courses for the Second Class Licence, and pre-examination revision courses for both First and Second Class syllabuses. Flt. Lt. Martin is one of the best-known navigation instructors, and at his London school a very large number of civil pilots were successfully trained either directly at the centre or by correspondence methods.

Meanwhile, Scottish Aviation has obtained a contract for the training of air crews, in observation, wireless operation and air gunnery, at the R.A.F. aerodrome at Abbotsinch, Paisley. The personnel will be attached to the Glasgow town headquarters of the R.A.F.V.R. An additional course for the training of direct-entry air observers for the R.A.F. is also being started at Grangemouth, the site of the new Central Scotland airport which, with its opening ceremony, was described in *Flight* of July 6.

The Luscombe in England

THE only all-metal machine in the "very-light" class, the Luscombe 8, will shortly be available in this country. Aeronautical and Industrial Services, of Southampton, have been negotiating for the agency in this country and have now obtained it. Mr. R. F. Graham, who is Capt. Warren Merriam's partner in A.I.S., has recently been in the United States for this purpose. Arrangements have been made for Cunliffe Owen Aircraft to assemble and pass the machines out after the test.

The Luscombe, which is, so to speak, the young brother of the old Phantom, is a high-wing side-by-side seater monoplane, laid out in conventional American fashion, but with a monocoque fuselage and all-metal construction. With a Continental engine of 65 h.p. the more important performance figures are:—Max. speed, 115 m.p.h.; cruising speed, 104; landing speed, 37 m.p.h.; weight empty, 650 lb.; all-up weight, 1,200 lb.; and range, 350 miles. No price or delivery details have yet been arranged.

Free Breakfasts at Shoreham

MORE than sixty breakfasts were won, lost and consumed at Shoreham on August 6, when the South Coast Flying Club held a dawn patrol. Only two men got through the Shoreham defences, Mr. H. Whittaker and Mr. J. D. Parker, both of Redhill.

Mr. Whittaker is an instructor, but he uses a Miles Martlet for dawn patrolling. He is proud of his season's record of five patrols and five free meals. His breakfast-collecting technique, he says, consists of approaching at 2,000ft., and as soon as he sees anyone chasing him he half-rolls in the appropriate direction and dives out. With the Martlet he always seems to get away.

Weather in London was poor—ten-tenths at 1,000ft. with half mile visibility. Luckily three Swallows got away from Hanworth before Croydon 'phoned through to say that Q.B.I. was on and that machines should stay on the ground. The weather lifted just beyond the Dorking Gap, and Shoreham was enjoying a perfect summer morning. We approached at 2,000ft., and three of the red and black Moths promptly got on to us. One cannot successfully dive a Swallow away from a Moth, so we, amongst the very many other unlucky ones, were booked straight away.

Nine machines were holding the fort, and most efficiently they did it. There were five Moths from the Shoreham Club, two Tigers and a Leopard from Brooklands and one Moth from S.C.F.C.'s subsidiary aerodrome at Storrington.