VZ-9V AVRO CAR

7 mph (800 km/h) at 31,170–
) ft (9 500–10 500 m), an initial
rate (flaps and undercarriage
ted) of 4,330 ft/min (22 m/sec),
at 112,325 lb (50 945 kg) with
5-lb (8 630-kg) payload range was
mls (1 930 km) with 40 min
es, or with a 13,950-lb (5 330-kg)
ad and the same reserves was
mls (2 440 km). Empty opera-
equipped weight was 64,300 lb
90 kg), and overall dimensions
span, 88 ft 7½ in (27 m), length,
0¼ in (31,4 m), height, 29 ft 6 in
), wing area, 1,483 sq ft (138 m²).

ish Twosome

e perusing some magazines of the early recently I discovered illustrations of Turkish aircraft of rather unusual n. One was a twin-boom high-wing monoplane designated T.H.K.11 and ther was an all-wing glider designated .K.13. I shall be grateful if you can de some details of these intriguing aft.

ald Betterton, Scarborough, Yorks

T.H.K.11 and T.H.K.13 were ducts of the T.H.K.Uçak Fabrikasi, aircraft factory of the Turkish Air gue (*Turk Hava Kurumu*) at Etimes- (Ankara) which was established in 1 and, until the early fifties, pro- ed several original aircraft designs. e T.H.K.11, which appeared in 0, was a three-seat light touring air- ft of wooden construction powered a 135 hp de Havilland Gipsy Major which drove a pusher airscrew be- en the oval-section tailbooms. The H.K.11 attained maximum and ising speeds of 125 mph (201 km/h) d 102 mph (164 km/h) respectively, tial climb rate being 590 ft/min m/sec) and range being 497 mls 00 km). Empty and loaded weights were 1,825 lb (828 kg) and 2,535 lb (1 150 kg). Only one T.H.K.11 was built, and development was abandoned after limited flight testing.

The T.H.K.13 actually preceded the T.H.K.11, and was a wooden all-wing single-seat experimental glider tested in 1949. Featuring a fixed undercarriage, the single mainwheel being positioned beneath the cockpit nacelle and small outrigger wheels being attached to the vertical surfaces on the wing, the T.H.K.13 had an empty weight of 948 lb (430 kg) and a loaded weight of 1,146 lb (520 kg), and with a span of 65 ft 7½ in (20 m) and a gross wing area of 430.556 sq ft (40 m²) the T.H.K.13 had a gliding ratio of 1:22, and a minimum descent rate of 177 ft/min (0,9 m/sec) at 37 mph (60 km/h).

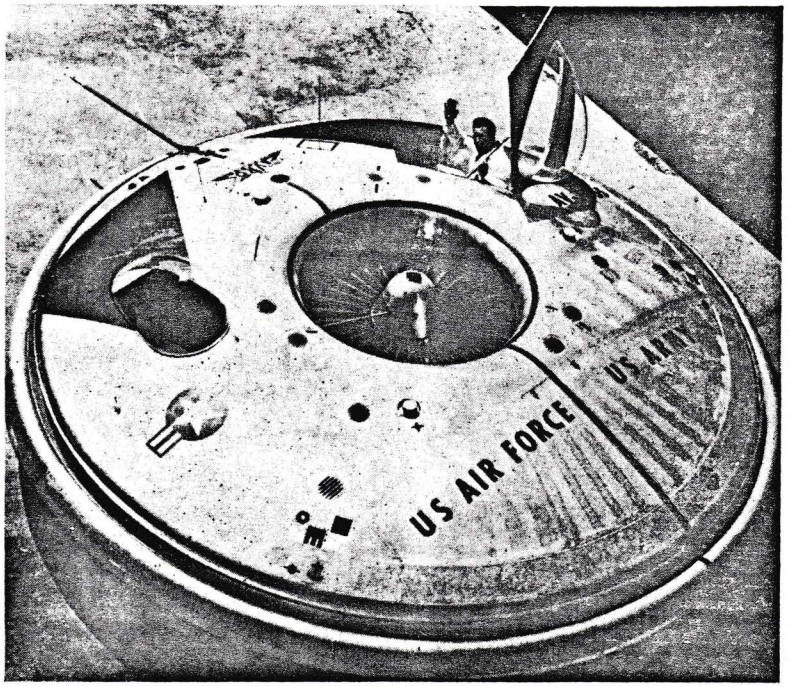
A "Flesh-and-Blood" Saucer

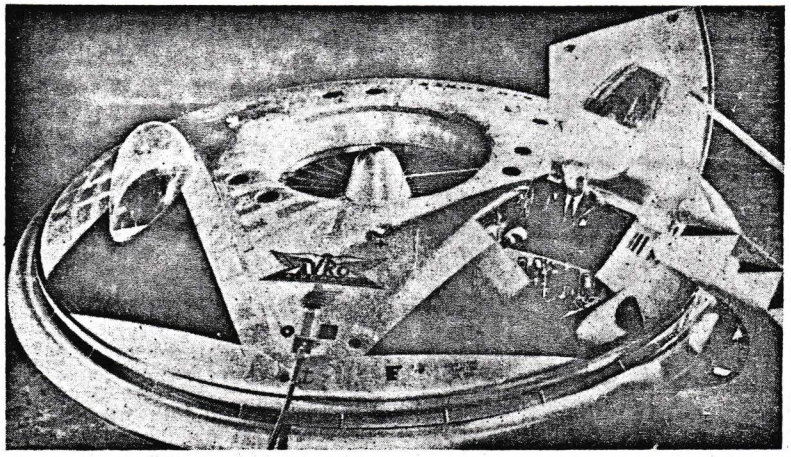
I recently read that a saucer- or disc-shaped aircraft was actually built and tested in Canada some years back. I shall be most appreciative if you can include in your invaluable "Facts by Request" column some details of the development and eventual fate of this oddity.

F Reynolds, Bishops Stortford, Herts

The intriguing vehicle to which you refer, Mr Reynolds, was the Avro VZ-9V Avrocar designed by Jack Frost of Avro Canada to explore the potential of a new approach to VTOL employing the Coanda Effect. Work on the design of the Avrocar was begun in 1952, and aroused considerable interest in the US Defense Department which believed it to have potential as a tactical weapon for the US Army, the entire programme being purchased outright by the USAF in 1955 as Weapon System 606A. The construction of two research vehicles, known by Avro Canada as the Model 1 and by the US Defense Department as the VZ-9V, was initiated. The Avrocar, as the vehicle was dubbed, was intended to take-off vertically by discharging an annular jet of air downward from the rim of the circular wing, and operating within the ground cushion until sufficient forward speed had been obtained for support to be provided by aerodynamic forces, the initial forward motion being provided by the aft deflection of the annular jetstream. Three 1,000 lb st (454 kgp) Continental J69 (licence-built Turboméca Marboré) turbojets were buried within the wing to provide the airstream exhausted around the perimeter of the disc-shaped aerofoil, the primary air being pumped by a large central fan and augmented by passing through a nozzle creating a jet pump effect, drawing in relatively low speed air. After attaining minimum velocity at which orthodox flight could be sustained, the aft-deflected jetstream was still intended to contribute lift.

The Avrocar had provision for two crew members, the pilot being seated to port and the observer to starboard beneath aft-hinging bubble canopies, and in 1960 one of the two test vehicles was delivered to the Ames Research Center of NASA for testing in the 40 × 80 ft (12,19 × 24,38 m) full-scale wind tunnel, the other being retained at Toronto for flight testing. The latter, after protracted tethered testing, made its first free "flight" on 17 May, 1961, the first tethered test having taken place on 5 December, 1960. A number of tests were conducted at Malton, but the Avrocar proved a limited technical success, rising no higher than a few feet from the ground and never achieving sufficient forward velocity to sustain itself in true flight owing to the insufficient power afforded by the three J69-T-9 turbojets. In the meantime, the Ames Research Center had concluded that, even if adequately powered, the Avrocar would have suffered serious stability problems in forward motion at high speeds, and thus the US Defense Department withdrew its financial support after having spent some $7.5m. Further development of the Avrocar was abandoned, and the example tested at Ames is currently on display at the US Army Transportation Museum at Fort Eustis, Virginia. □





The Avro VZ-9V Avrocar as tested in 1961

low, the T.H.K. 11 twin-boom tourer and, bottom, the all-wing T.H.K. 13 glider