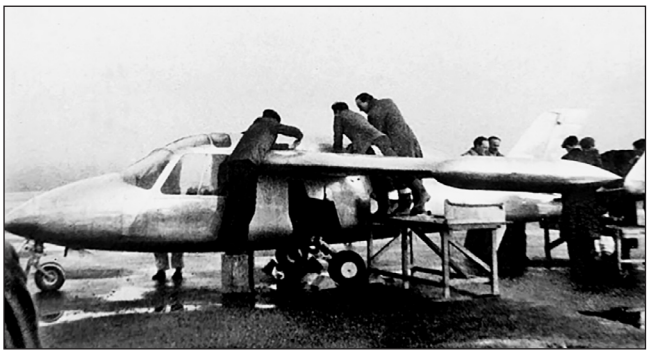
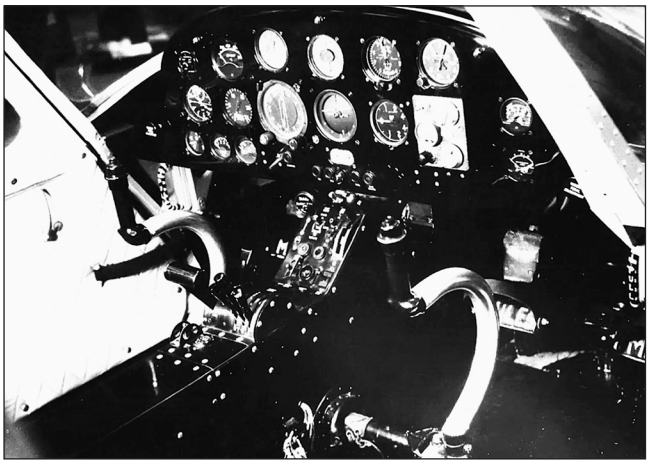
Above left: Miles M.38 Messenger Mk.2B **G-AGPX** seen here at Denham 7 March 1953, was overhauled by F G Miles Ltd at Redhill and its CofA renewed on 2 February 1951, for W S Shackleton Ltd prior to its sale to David Carnegie. *Above right:* Miles M.38 Messenger Mk.4A **G-ALBP** was purchased by John Paul Gunner in January 1951 and was fully refurbished by F G Miles Ltd with its CofA being renewed on 13 April 1951. It remained based at Redhill until its sale a year later.

Above: Miles M.65 Gemini Mk.1A **G-AJWF** at Redhill where F G Miles maintained it on behalf of its owner Edward Farrow. Flown by Farrow at Redhill for the 'night' flying scenes for the film *Rough Shoot* (with its registration removed) 17 November 1952. Note Tiltman Langley Ltd's hangar with the original control tower on its corner. *Below:* The Miles M.,65 Gemini Mk.IA **G-AKDL** was with F G Miles Ltd at Redhill when John Reid, from New Zealand, visited the UK in early 1950 to inspect it with a view to its purchase, which he did through WS Shackleton Ltd.

Miles M.65 Gemini Mk.1A **VR-SDC**, formerly **G-AKEH**, seen outside F G Miles Ltd's hangar at Redhill, probably in October 1951 following its CofA renewal prior to its sale in Singapore. *(Peter Volborth)*



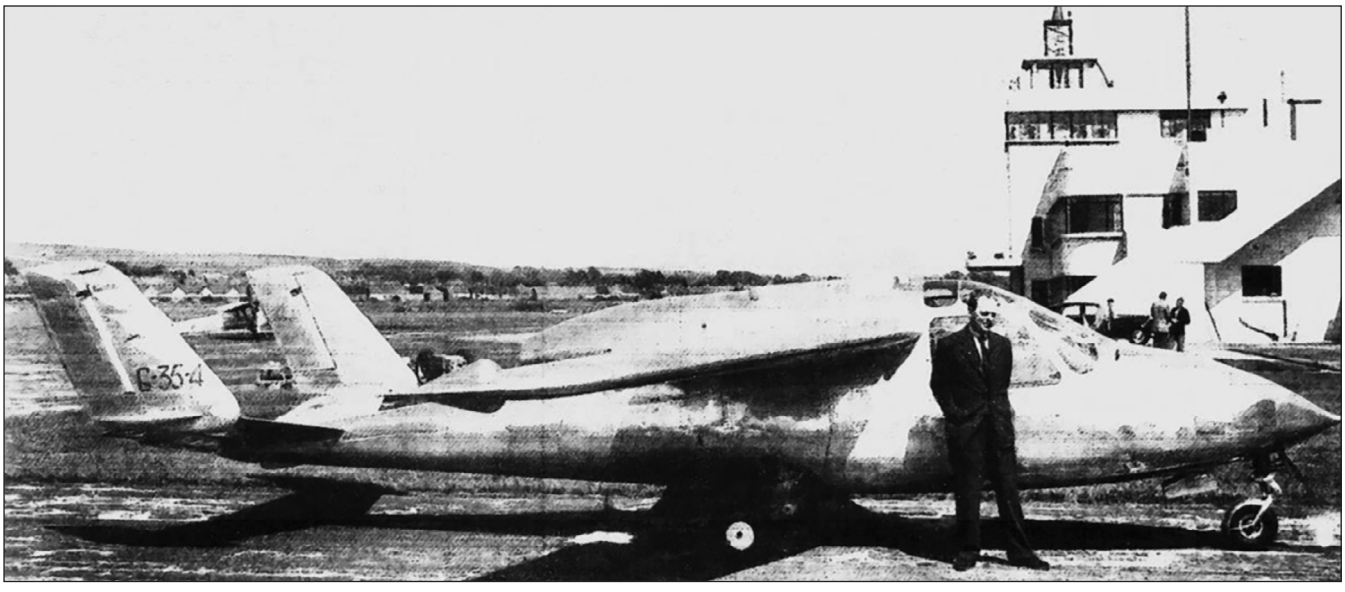
These two photographs show the Student being prepared in the rain, for its first flight.



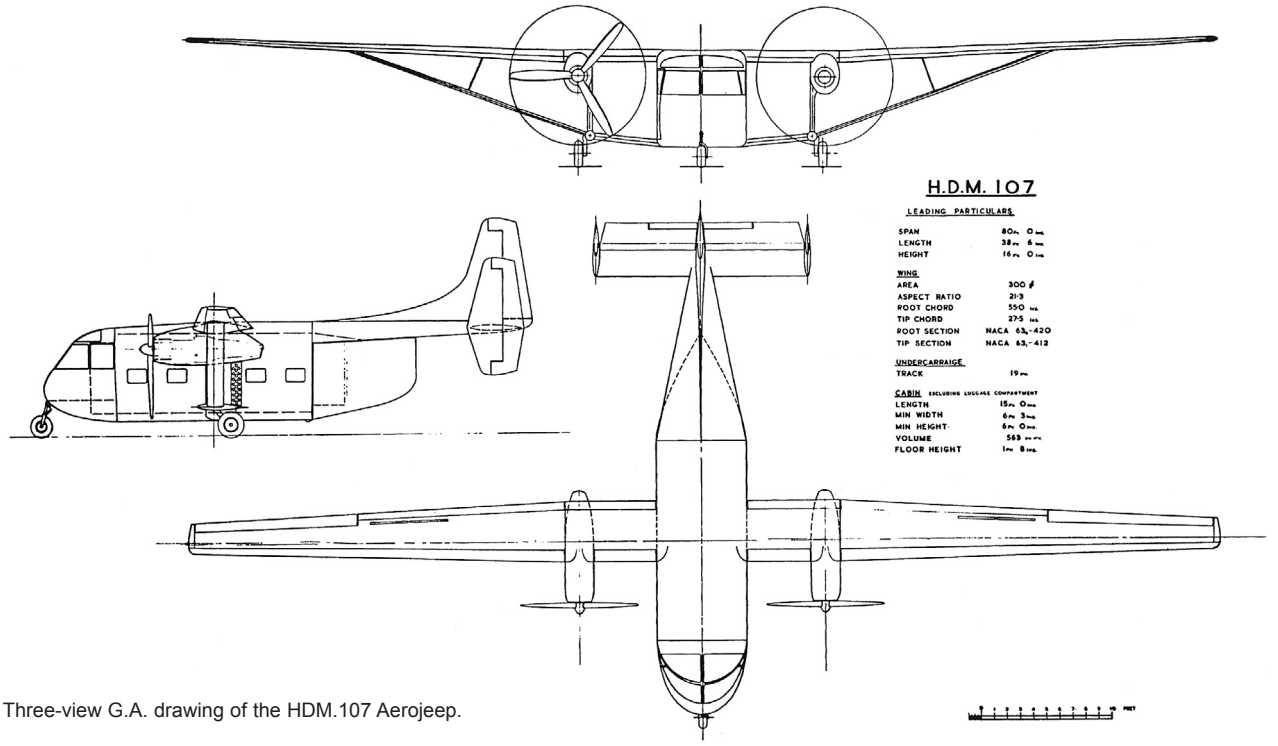
The Miles M.100 Student Instrument Panel.

Prince Philip visited Shoreham Airport on 20 May 1957, and this illustrated display of Miles products on the balcony of the Teminal Building is being shown to him by FG Miles. Note the wind tunnel model of the Miles M.52 standing on its rear fuselage at right. This model is now on display in the Museum of Berkshire Aviation at Woodley.

Prince Philip with FG Miles walking out to see the Student at Shoreham Airport.



The Miles M.100 Student with its proud designer – George Miles.



Three-view G.A. drawing of the HDM.107 Aerojeep.

Chapter 20: Miles Hurel Dubois HDM.107 Aerojeep Light Assault Transport for the US Army

At the end of 1956, a preliminary design study and performance estimate was prepared at the request of the Chief of Research and Development, US Army, following interest shown by them in the high aspect ratio wing light transport projects then under development. The Provisional Data for the HDM.107 Light Assault Transport was issued in January 1957.

The HDM.107 was similar to the HDM.106 but powered by two Lycoming T-53 turbine engines. This required some alterations to the basic design, including a general stiffening of the structure and modifications to the wing in order to take them, but it was expected to result in a considerably increased performance.

The main features, where it differed from the HDM.106, were that larger diameter propellers were used and the centre section span was extended by 4 ft 8 in, increasing the total wing span to 80 ft. To allow for the greater power of the turbine engines, the fin area was increased by the addition of a large dorsal fin and rudder with two outboard fins and rudders of higher aspect ratio. In order to decrease the landing distance from 50 ft, and the landing ground run, split perforated air brakes were incorporated in the vertical struts. Full span wing leading edge flaps were fitted to increase the coefficient of lift at take-off and landing, thereby reducing the stalling speed and shortening the take-off distance.

The landing distances quoted in the performance estimates were not based on the use of reversing propellers and a very considerable reduction in these distances was expected if reversing propellers were available for the T-53 engine.

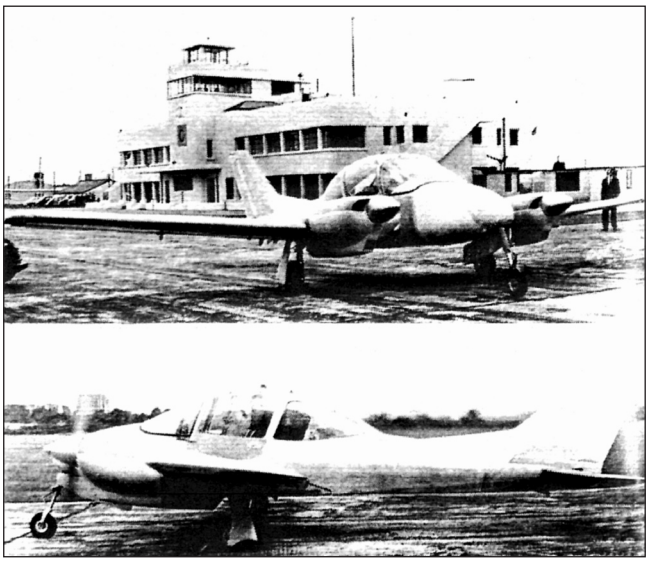
As a possible further development of the HDM.107, it was suggested that boundary layer control could have been used to great advantage in conjunction with the Hurel Dubois high aspect ratio wing. In this connection it should not be forgotten that the first full scale boundary layer research aeroplane was designed, built and flown by FG Miles as early as 1938.

The HDM.107 had one pilot and could have carried 15 passengers or large items of freight in its spacious cabin, which measured 15 ft 0 in long x 6 ft 3 in wide x 6 ft 0 in high, to give a freight hold volume of 563 cu ft and for ease of loading/unloading, the floor height was just 1 ft 6 in above the ground.

Unfortunately, the US Army showed little further interest in the project having in 1957 and prior to the initial flight of the HDM.105, already ordered five DHC-4 Caribous for evaluation.

Specification and Performance Data

Engines:	2 x 808 shp Lycoming T-53-L-1 propeller-turbine
Dimensions:	Span 80 ft 0 in; length 38 ft 6 in; height 16 ft 0 in; wing area 300 sq ft; aspect ratio 21.3; laminar flow aerofoil section, root NACA 63/4-420, tip NACA 63/1-412
Weights:	Empty 4,940 lb; disposable load 4,560 lb; AUW 9,500 lb; fuel capacity 175 gal; payload 3,000 lb
Performance:	At 9,500 lb AUW, provisional; max speed at sea level, normal rating 213 mph, military rating 218 mph; max speed at 15,000 ft, normal rating 234 mph; max cruising speed at sea level 213 mph; cruising speed at 5,000 ft, with 50% take-off power 173 mph; rate of climb at sea level at military rating 4,170 ft/min, at normal rating 3,790 ft/min; rate of climb on one engine at normal rating 1,490 ft/min; service ceiling, 400 ft/min at normal rating over 35,000 ft; stalling speed flaps up, power off 92 mph, flaps at take-off 77 mph, flaps at landing 67 mph; take-off distance to 50 ft at military rating, concrete 810 ft, grass 885 ft; min distance to unstick at military rating, concrete 360 ft, grass 435 ft; landing distance from 50 ft, concrete 1,755 ft, grass 1,260 ft; min ground run, concrete 525 ft, grass 600 ft



These two photographs are the first to be taken of the un-registered M.218 just after it left its assembly hangar at Shoreham for engine runs, on the apron, in mid-August 1962. Then, at 8.50 am on Sunday, 19 August 1962, it made its first flight.

pitch propellers. Even the jet engine, he noted, had for a long time been squeezed into airframes of obviously unsuitable shape. Nevertheless, he expressed surprise that it had taken some 20 years to bring the use of plastics for major airframe components to the stage of practical proof.

He concluded that one of the other main causes of this slow pace of development the issue of ensuring that resins and reinforcing materials were manufactured to reliable specifications, combined with the post-war concentration of the aircraft industry into huge combines which had eliminated the stimulus of competition, and also resulted in development costs being greatly inflated by soaring overheads.

In the Beagle-Miles M.218, George Miles's design philosophy had been to produce an aircraft which could be developed and manufactured in quantity, quickly, at low cost in labour and material and without need for complex or expensive tooling or of specialised training of operatives. He pointed to the practicability of sharing development, tooling and educational costs between a series of light aircraft ranging from a low-powered two/three seat trainer, through a more sophisticated, high performance, single-engined four-seat touring aircraft to a twin-engined machine having a good performance and comfort and accommodation equal to the best '*gran-turisimo*' cars.

The Beagle-Miles M.218 G-35-6 on the ground and in flight.

without the most elaborate investigations, and that he had been quite astounded at the research which had been done by various firms to ensure that the aeroplanes they built were accurate. Even to the extent that they had compared original reports by the design firm with German Air Force reports, and then with Allied reports on captured aeroplanes!

The three Fokkers were actually built as D.VIIIs by Rousseau Aviation at Dinard Airport in France, and were initially registered F-BNDF/H. They were joined in the film by two Fokker Dr.1 replicas, built by Bitz Flugzeugbau in Germany and initially registered as G-ATIY and G-ATJM.

The two S.E.5A Replicas were built at Rustington in Sussex by Miles Marine and Structural Plastics Ltd, and they helped to fill in a difficult trading period for that company. In view of the limited time available, it was decided to make the wings of wood and the fuselage of steel tubing, using a tubular space-frame construction, mainly to save time and to make use of the different skills available. Tiger Moth seats with GQ Parachutes and Sutton Harness were also agreed to be installed.

The DH Gipsy Queen engines were supplied by Hants and Sussex Aviation Ltd, Portsmouth and AE Hawes, Director and General Manager, confirmed that four fully serviced Gipsy Queen 32 engines, salvaged from Percival Prentices, would be available at £200 each, ex works, together with propellers, starters and other equipment at additional cost.

Jeremy Miles recalled that concerns were expressed over whether any drawings could be obtained (as for the Boxkite). The S.E.5A was designed by the RAE at Farnborough and it was written to, without too much hope, but to Miles's surprise, the RAE replied by return, confirming that it did in fact have a full set of manufacturing drawings, although it admitted that they might not be up to date! For a small sum of money, copies of the drawings were purchased and a packing case filled with drawings duly arrived at Shoreham, all stamped: "Not maintained since 1919"! Although time was tight to complete the two aircraft, this timely arrival made their manufacture relatively simple.

The long representative but 'imitation' exhaust pipes, were made from standard building quality plastic drain pipe and the late Terry Wilson recalls that while she was learning to fly with the Southern Aero Club at Shoreham at the time, she saw George Lowdell, one of the flying instructors, hobble out to one of the S.E.5As, park his walking stick up one of the 'exhaust pipes' and take-off!

John Walker, the special products manager at F G Miles Engineering Ltd, was scheduled to carry out the test flying and, after he had made the first fast taxi run at Shoreham Airport, he reported that the ailerons were so heavy that, at any speed above about 40 knots, he could not move them. Investigation soon showed that a bell crank, intended to provide mechanical advantage, had been fitted the wrong way round! Corrected, the aircraft then proved to have a stunning performance, as might well be expected from an aircraft of that size with a 250 hp engine and weighing only about 1,700 lb!

Right: The S.E.5A **G-ATGV** at Shoreham in July 1965. *(Ken Tilley)*

Below: The S.E.5A G-ATGV/EI-ARA painted to represent A4850 of No.56 Squadron as flown by Capt A Ball VC, seen at Baldonnel, Ireland on 29 July 1967. *(Air-Britain)*