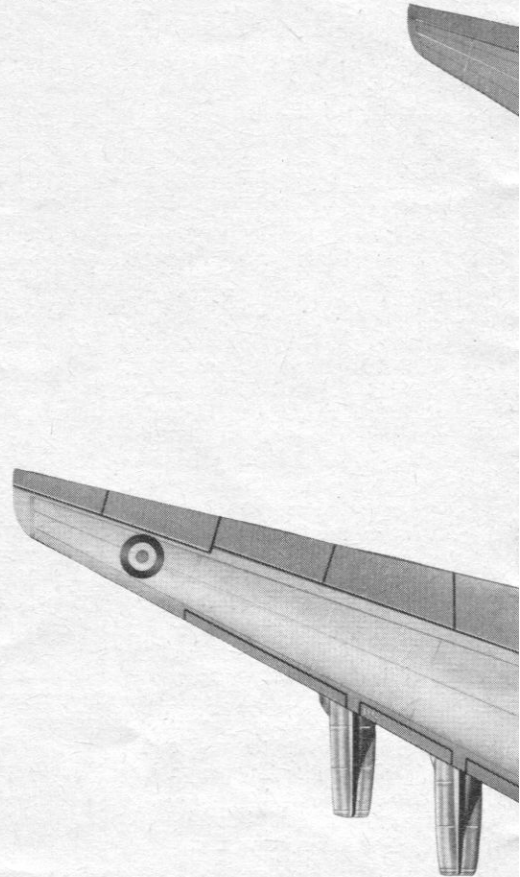




Artist's impression
of the H.S.681



Hawker Siddeley 681

by John W. R. Taylor

MORE THAN A year has passed since the Minister of Aviation announced, on 5th March 1963, that Hawker Siddeley were to design a new tactical jet transport with short landing and take-off capability to replace the R.A.F.'s fleet of piston-engined Beverleys and Hastings. He added that the new aircraft (to be known as the H.S.681) would be based on a design by the former Whitworth Gloster company and that a substantial share of the work would be sub-contracted to Short Brothers and Harland Ltd.

How much progress has been made in the past twelve months? The only clue was given by the Minister of Defence, Mr. Thorneycroft, in the recent defence debate in the House of Commons, when he stated with due solemnity that the H.S.681 would be ordered *into development* as a replacement for the R.A.F.'s Hastings and Beverleys and that a substantial amount of the work would be sub-contracted to Shorts. Lest this should seem to be a carbon copy of last year's announcement, he mentioned that it had been decided to power the aircraft with Rolls-Royce Medway engines.

If it has taken a year to select the power plant for the 681 and to get its development under way, one can only wonder if Transport Command's present vintage types will hold together long enough to fill the gap until their replacement gets into service. There is not even a positive assurance that metal is to be cut on proto-

types of the new aircraft at this stage. It is difficult to see how any industry can survive on such a diet of indecision and promise of possible jam tomorrow, but this is no place to discuss the politics of military aircraft procurement.

If the H.S.681 materialises in due course, there is little doubt that it will add tremendously to Britain's ability to prevent or combat outbreaks of violence or local wars. No details of its size or payload capacity have been given officially, apart from the fact that it is intended to accommodate the majority of current and projected British Army vehicles and equipment. It is, therefore, logical to assume that its freight hold must be at least as large as that of the Beverley.

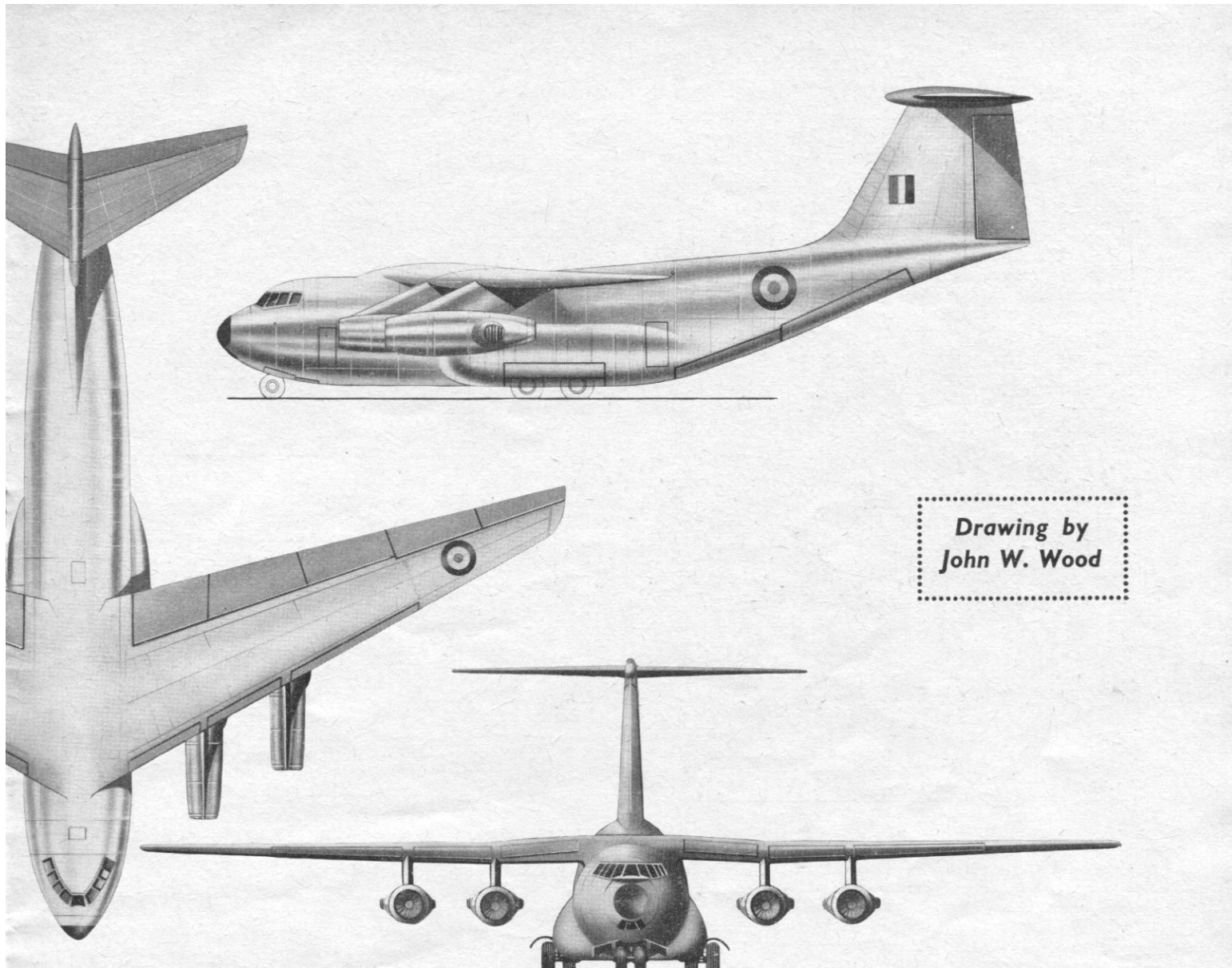
In round figures, the freight hold of the Beverley is 40 ft. long, 10 ft. high and 10 ft. wide, in a fuselage 99 ft. 5 in. long. If we assume that the H.S.681 also has an overall length of about 100 ft., this would give a wing span of around 125 ft. These dimensions are within 5 per cent of those of the Lockheed C-130 Hercules and it would be logical to expect the 681 to carry a payload at least as good as the 35,600 lb. hauled by the latest C-130E. Such capacity, allied to turbojet speed and STOL capability, would make the new transport quite outstanding in its class.

General features of the design, apparent in John Wood's drawings, include the use of four-wheel bogie main undercarriage units, retracting into the usual fairings

built on to the sides of the fuselage, and rear loading doors which will be openable in flight for air-dropping supplies and equipment.

Much more information has been released concerning the aircraft's Medway engines than on its airframe. Rolls-Royce have given the take-off thrust of each engine as 17,300 lb., putting it mid-way between the Spey and Conway. Like these engines, it is a by-pass turbojet, with low specific fuel consumption, but it has been specially adapted for use in STOL applications. Not only is it fitted with thrust deflectors to provide jet-lift during take-off and landing; it is also said to provide compressed air for the aircraft's high-lift devices. This, no doubt, means that the 681 has blown flaps and ailerons—perhaps blown tail surfaces as well now that these have reached the stage of everyday practical use on the Buccaneer.

Rolls-Royce say that recent test-bed running of the Medway has been at a higher thrust than that required for the 681, and that the initial rating of the engine will enable the 681 to exceed its minimum



Drawing by
John W. Wood

performance requirements. They add that Medway take-off thrust can be raised by over 20 per cent by the introduction of water injection on the existing version of the engine, while later, modified versions of the Medway will give even greater thrust outputs without water injection, giving very considerable improvement in the aircraft's performance.

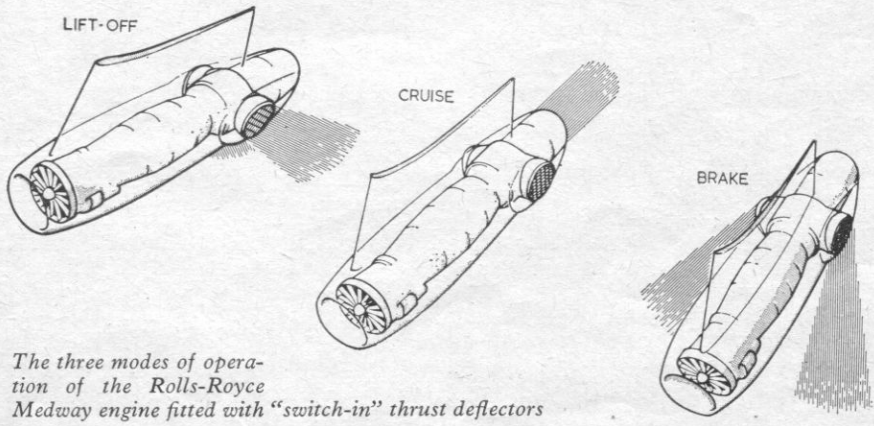
Despite this, the 681 will not offer VTOL capability in its present form. Future versions may be fitted with pods of lift-jets to make possible vertical take-off and landing.

Use of Medways instead of the originally - envisaged Bristol Siddeley Pegasus engines came as a surprise to some people. It is, however, quite wrong to

regard the Rolls-Royce engines as new and unproven. As the RB.141, the Medway was conceived to power the original version of the Hawker Siddeley Trident and first ran in 1959. Nine engines were built as a private venture and have completed over 1,500 hours of development running.

Nor is the "switch-in" thrust deflector an entirely new device, for it is based closely on the Rolls-Royce thrust reverser that has accumulated over two million hours in airline operation on Avon and Conway engines in the Comet, Caravelle and Boeing 707. The main difference is that a rotary cascade replaces the usual fixed cascade. Unlike the Pegasus, the Medway does not exhaust through the thrust-deflector nozzles in cruising flight, but through a straight tail-pipe which should give greater efficiency.

That is about all that can be said about the H.S.681. No doubt its design will undergo change and refinement before the present drawings evolve into a flying prototype. One can only hope that such changes will not delay further the production of an aeroplane the R.A.F. needs so much.



The three modes of operation of the Rolls-Royce Medway engine fitted with "switch-in" thrust deflectors