Release Items
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VERTICAL TAKE-OFF

One of the main reasons for research in the field of Vertical Take-Off is the ever increasing speed of modern winged aircraft and the resulting demand for longer and longer runways.

We are fast approaching the practical and economic limits to the length and number of runways possible for airport construction and expansion.

In Britain and in other countries an effort is being made to seek the solution to the problem in the development of vertical take-off.

In America experiments are being made with winged aircraft which are raised up on their tails and flown up into the air like rockets. Apart from other considerations this approach to the problem has obvious disadvantages imposed by the laws of gravity on passengers and unsecured contents of the plane.

In Britain the tendency is to develop techniques designed to enable aircraft to take off vertically from the normal horizontal position.

Undoubtedly one of the most interesting and impressive research projects is that being carried out by the Rolls-Royce Company on a Ministry of Supply research contract with a view to exploring the possibilities of wingless vertical take-off.

The existence of this project first became known to the public at the time of the 1954 S.B.A.C. Farnborough Air Display when brief details of the V.T.O. machine - known as the 'Flying Bedstead' - were announced.

The Security Authorities have now released some film shots taken at the Rolls-Royce Flight Establishment at Hucknall, Nottinghamshire during test flights of the machine.

The 'Flying Bedstead', weighing some $3\frac{1}{2}$ tons, is powered by two Rolls-Royce Nene engines set horizontally in opposition, one on either end of the framework. No attempt was made to develop special engines, for engine development is a lengthy business. Instead, the simplest and lightest framework was built which could use existing engines. The choice was limited by the engines available and by the need to have sufficient reserve thrust to carry a pilot and adequate fuel for a reasonable running time. The jets from these engines are ducted through 90° so that both engines discharge vertically downwards under the centre of gravity. This is a favourable arrangement for balancing the device and eliminates gyroscopic effects. The pilot sits on a platform above the two engines. The control moments which he needs to balance the machine are supplied by compressed air jets which are discharged through nozzles at the ends of cross arms which can be seen clearly in the picture. The air for these nozzles is bled from both engines and the pilot, using a conventional control column, and rudder bar, regulates the flow through the nozzles. In this way he provides the pitching, rolling and yawing moments which he requires.

The special control system was developed by the Royal Aircraft Establishment at Farnborough.

In the initial tests, in order to safeguard the machine and the pilot, the 'Flying Bedstead' was tethered to allow it only the limited freedom of a few feet movement. With increasing experience and confidence the freedom permitted was increased. In due course, all check wires were removed and the machine, piloted by Captain Ronald Shepherd, took off for the first time in free flight. It remained airborne for nearly ten minutes and during this time it moved about over the ground under the pilot's control at heights of from 5 to 10 feet returning finally to alight at its starting point. For subsequent flights it has been flown free at heights up to 25 feet by Rolls-Royce Test Pilots.

A great deal of investigation and development remains to be done. For example the problems of heat, noise, safety and the design of the most efficient engines and an airframe to employ this principle have all to be tackled and solved.

The absence of an Air Registration Board identification number on the 'Flying Bedstead' is explained by the fact that there is virtually nowhere to put it ... so special dispensation had to be obtained from the Air Ministry for the machine to perform minus 'number-plates'.

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