

*The Journal of*

**THE HELICOPTER  
ASSOCIATION OF  
GREAT BRITAIN**

CONTENTS include

Strain Gauge and Blade Motion Recording Systems for  
Helicopters by P. D. MacMahon

Wind Tunnel Development of a Tandem-Rotor Helicopter  
by J. R. Marsh B. Eng.

The Alan Marsh Memorial Trust Fund

LONDON  
4, THE SANCTUARY,  
WESTMINSTER, S W 1

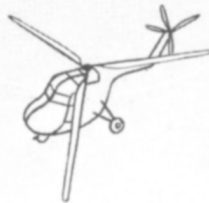
Vol 10 No 3 DECEMBER, 1966



# Helicopter

MAIN & TAIL

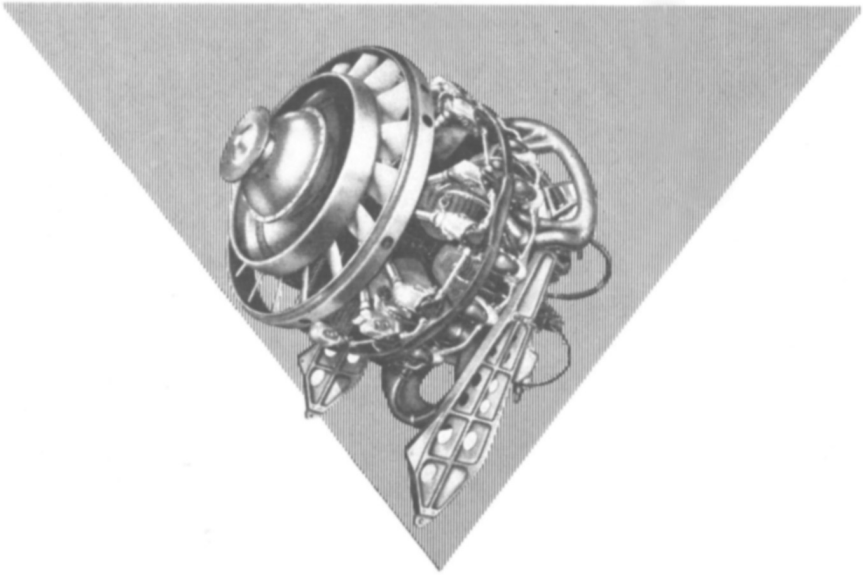
# Rotor Blades



**HORDERN - RICHMOND**  
LIMITED

HYDULIGNUM WORKS, HADDENHAM, BUCKS, ENGLAND  
TELEPHONE AYLESBURY 1100 1102 · TELEGRAMS WINSTIX HADDENHAM BUCKS

# Power for the Whirlwind



ALVIS Leonides MAJOR 870 b h p

The power plant for the

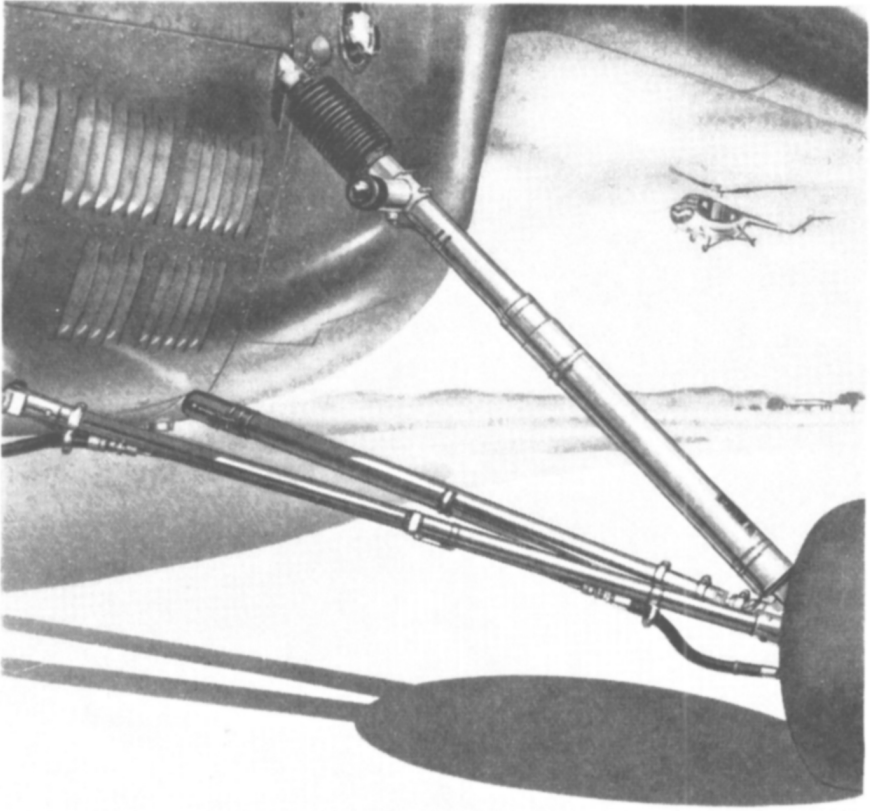
Westland-Sikorsky

Whirlwind



## ALVIS Leonides MAJOR

ALVIS LIMITED    COVENTRY    ENGLAND

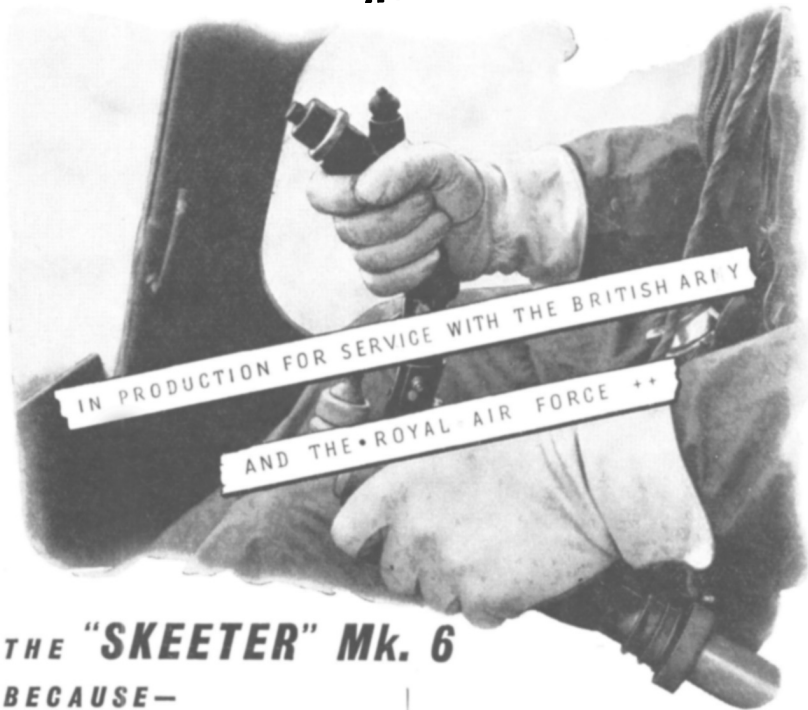


BRITISH  MESSIER  
L A N D I N G G E A R

*on the Sycamore*

BRITISH MESSIER LTD GLOUCESTER ENGLAND

**UNRIVALLED FOR TRAINING  
AND LIGHT LIAISON**



## **THE "SKEETER" Mk. 6**

### **BECAUSE—**

The handling qualities due in part to its three bladed fully articulated rotor are just those found in the larger types of helicopter. It is not difficult to fly, and the manoeuvrability is exceptional.

The throttle may readily be disconnected from the collective pitch lever, permitting practice autorotative landings without stopping the engine and the engine may safely be left running on the ground.

The engine of One Hour Power rating gives consistent and undiminished performance.

All maintenance can be done from ground level except for the main rotor hub which is reached by using footholds on the helicopter structure.

Vision from the cockpit is unusually good with a wide aspect rearwards.

A manual control of the centrifugal clutch prevents overloading of the rotor system when starting.

*These are some of the features of the Skeeter helicopter which commend it for its chosen duties. Each of them contributes towards the economy which is a feature of its initial and operating costs.*

**SAUNDERS - ROE LIMITED**

HEAD OFFICE OSBORNE EAST COWES ISLE OF WIGHT TEL COWES 2211  
HELICOPTER DIVISION EASTLEIGH SOUTHAMPTON TEL EASTLEIGH 2731



# SYCAMORE

*service*

More than one hundred Sycamores\* are now in service and over 20,000 hours have been flown by these uniquely versatile aircraft convertible in a matter of minutes to any of the five major roles—search and rescue ambulance, aerial crane freighter or five-seater passenger transport.

*\*powered by Avis Leonides engines*

BRISTOL AIRCRAFT LIMITED



# 3 engines of increasing importance to helicopter operators

**ELAND** Fairey's new large transport helicopter, the Rotodyne, is to be powered by two *Elands*—basically similar to the standard *Eland*, but with an auxiliary compressor mounted coaxially at the rear. Power is taken through the auxiliary compressor (in the form of compressed air to the rotor) for vertical flight, and through the propeller for forward flight. Two *Elands* will power the Westland 'Westminster' by direct mechanical drive to the rotor blades.

**GAZELLE** 1260-2000 s h p. A rugged new free turbine engine for helicopters—selected for the Royal Navy Westland 'Wessex' and the R A F twin-rotor Bristol 192. For ease of installation it can be mounted in any position between the vertical and horizontal. Helicopters demand tough reliable engines—the *Gazelle* is designed for strenuous duty, long service between overhauls, while its outstanding simplicity means economical and speedy maintenance.

**ORYX** 780-950 gas h p turbo gas-generator provides the hot gas which is ducted to the rotor head for the propulsion of helicopters by jet reaction at the rotor blade tips. This system eliminates all mechanical transmission. The *Oryx* has been officially Type Tested at 780 and 865 gas h p. In addition Napier helicopter **TIP THRUST UNITS** using liquid propellant have been fitted to the Saunders Roe 'Skeeter' light helicopter. They are the simplest, lightest and most compact means of providing additional independent power for any special conditions encountered in helicopter operations.

Designers and Manufacturers  
of Rocket Engines and Ramjets

# NAPIER

## MORE POWER AT LOWER COST

D NAPIER AND SON LIMITED LONDON W 3

RC 128



## *Fortune Hunting 1956*

The search for mineral deposits is now performed by the Helicopter equipped with a wire-borne magnetometer. These close range surveys at treetop height replace slow foot-slogging and often make a survey possible where no other means of transport could penetrate.

Westland Helicopters are daily employed throughout the world on surveys, crop spraying, exploration remote oilfield transportation and in more publicised personal rescue services on land and at sea in times of blizzard, storm and flood.

# WESTLAND

*The Hallmark of British Helicopters*



WESTLAND AIRCRAFT LIMITED YEovil ENGLAND



*The Journal of*  
**THE HELICOPTER ASSOCIATION**  
**OF GREAT BRITAIN**

Offices 4 The Sanctuary, Westminster, S W 1

Tel Abbey 5160

VOL 10 No 3

December 1956

PRICE 10/6

*President*  
 The Rt Hon Lord Brabazon of  
 Iara G B L M C P C Hon  
 F R Ae S

*Last Presidents*  
 J C Weir C M G C B L  
 F R Ae S

Γ Mensforth C B E M A  
 M I Mech I F R Ae S

M I P L

Marshal of the R A F Lord  
 Douglas of Kirtleside G C B  
 M C D I C

*Vice Presidents*  
 Norman Hill A M I Mech Γ  
 A R Ae S M C A I

R A C Brie A F R Ae S  
 A F I Ae S

**THE COUNCIL**

*Chairman*  
 G S Hislop Ph D B Sc (Γng)  
 A R T C M I Mech I  
 F R Ae S

B H Arkell A R Ae S  
 J A J Bennett D Sc Ph D  
 F R Ae S

R A C Brie A F R Ae S  
 A F I Ae S

A F Bristow A R Ae S  
 J A Cameron  
 I G Frise B Sc F R Ae S  
 A F I Ae S

W R Gellatly A F C  
 K Hafner F R Ae S  
 J I Harper A I C  
 A McClements A K T C  
 M I Mech I

Γ T Meacock A F R Ae S  
 M C A I

J W Richardson A F R Ae S  
 H Roberts Ph D B Sc D I C  
 A F R Ae S A M I Mech I

D I Hollis Williams B Sc  
 F R Ae S

*Hon Secretary*  
 Lt Col J W Richardson  
 A F R Ae S

*Hon Treasurer*  
 W G Leslie A C I S

*Asst Secretaries*  
 Miss I Chute  
 Miss J St George

*Lecture Sub Committee*  
 J A J Bennett D Sc Ph D  
 F R Ae S (Chairman)

R A C Brie A F R Ae S  
 A F I Ae S

A McClements A R T C  
 M I Mech E

J W Richardson A F R Ae S  
 R H Whitby D I C A R C Sc  
 B Sc A F R Ae S

D I Hollis Williams B Sc  
 F R Ae S

*Journal Hon Editors*  
*Administrative*  
 B H Arkell A R Ae S

*Technical*  
 D M Davies M A A F R Ae S  
 R H Whitby D I C A R C Sc  
 B Sc A F R Ae S

*Auditors* W B Keen & Co

The opinions expressed in papers read before the Association and in the discussions also recorded in this Journal are not necessarily those of the Executive Council or of the Association as a whole

**CONTENTS**

	<i>Page</i>
STRAIN GAUGE AND BLADE MOTION RECORDING SYSTEMS FOR HELICOPTERS, by P D MacMAHON	131
DISCUSSION	151
WIND TUNNEL DEVELOPMENT OF A TANDEM-ROTOR HELICOPTER IN AUSTRALIA, by J R MARSH	163
THE ALAN MARSH MEMORIAL MEDAL AND AWARD FOR 1956	170

**OBJECTS OF THE ASSOCIATION**

The objects of the Association are to collect compile and disseminate information of a technical and semi technical nature pertaining to Helicopters and all other types of Rotating Wing Aircraft. The Association aims to work in close co operation with existing Aeronautical Bodies on matters affecting its objects and it may act as an Advisory Body in the promotion of legislation calculated to be of benefit to the development of Rotating Wing Aircraft



**World's highest rate of climb**

**Precise Control**

**Negligible Maintenance**  
no specialist ground crew

**Assembles in minutes**  
survives rough handling



The **FAIREY** Ultra-Light

# MILITARY HELICOPTER



One three ton truck carries the helicopter, pilot, fuel and spares, and functions as a deck for landing and take-off, forming an entirely self-sufficient mobile unit.



THE FAIREY AVIATION COMPANY LIMITED - HAYES - MIDDLESEX  
ENGLAND AUSTRALIA CANADA