ROTORCRAFT SECTION REPRINTS

The following is a list of Rotorcraft Section lectures which have been published in the *Journal* up to the end of 1966. Most of them are available as reprints.

Author	*Title*	*Published*
Cummings, R. L.	**Vertical Transport Business**	April 1960
G. J. Sarsted and A. V. Coles	**The Development and Flight Testing of Helicopters**	April 1960
Brie, R. A. C.	***Experiences with an Operational Airport***	July 1960
Williams, John	**Some British Research on Basic Aerodynamics of Powered Lift Systems**	July 1960
Jones, J. P.	**Helicopter Vibrations**	Dec. 1960
Le Sueur, H. E.	**Certification of Civil Transport Rotorcraft with Particular Reference to Multi-Engines**	Aug. 1961
Bennett, J. A. J.	**The Era of the Autogiro**	Oct. 1961
Hafner, Raoul	**The Helicopter—The First of the VTOL Aircraft**	Dec. 1961
Lennox, S. G. and Mitchell, H. W.	**Helicopter Approach Aids—Approach Guidance Instrument Flight Developments**	Feb. 1962
Sullivan, N. and Simpson, J. A.	**Integrated Flight Systems for Multi-Engined Transport Rotorcraft**	Feb. 1962
Bell, J. C. G.	**Electronic Displays for Rotary Wing Aircraft**	Feb. 1962
Michel, P. L.	**Sikorsky Crane Helicopter**	Aug. 1962
Fitzek, R. A.	**Lessons Gained in Helicopter Air Traffic Control from FAA Activities**	Aug. 1962
McClements, A.	**Westland Belvedere Mk. 1**	Aug. 1962
Angstadt, R. S.	**Operations of Chicago Helicopter Airways, Inc.**	Aug. 1962
Stewart, W.	**Research and Development of Rotating Wing Aircraft**	Nov. 1962
Neumark, S.	**Rotating Aerofoils and Flaps**	Jan. 1963
Wallis, K.	**The Low Cost Autogyro**	Feb. 1963
Scanlon, J.	**Flight Requirements for the Operation of Rotorcraft**	April 1963
Nichols, J. B.	**Development of the Tilt-Wing Aircraft**	June 1963
Gustafson, F. B.	**Powered Lift Research at Langley Field**	June 1963
Fitzwilliams, O. L. L.	***The Engineering Reliability of Shaft-Driven Helicopters***	Aug. 1963
Poole, J.	**Rotorcraft Work at the A & AEE**	Aug. 1963
Heppe, R. R.	**Single-Rotor Helicoper with Rigidly Mounted Blades**	Oct. 1963
Miller, R. H.	**Unsteady Air Loads on Helicopter Rotor Blades**	April 1964
Ciastula, T. L.	**The Development of the P.531**	June 1964
Sibley, J. D.	**Some Aspects of Turboshaft Engine Installations in Multi-Engined Helicopters**	June 1964
Slocombe, A. E.	**Heliport Location and Design**	Aug. 1964
Mair, W. A.	**The Physical Principles of Hovercraft**	Oct. 1964
Morain, Paul H. L.	**Development of French Helicopters**	Oct. 1964
Crawford, C. C.	**Light Observation Helicopter Programme of the US Army**	Dec. 1964
Belinn, C. M.	**The First Two Years of Operational Experience with the Sikorsky S-61**	March 1965
Davidson, I. M. and Hargest, T. J.	**Helicopter Noise**	May 1965
Focke, Henrich	**German Thinking on Rotary-wing Development**	May 1965
Richards, E. J. and Sharland, I. J.	**Hovercraft Noise and its Suppression**	June 1965
Hewin, L. M.	**The General Requirements of the Three US Armed Services for Helicopters and Other VTOL Aircraft**	July 1965
Crookenden, N.	**The British Army Unit Light *Helicopter Project***	July 1965
Hibbert, W. A.	**Helicopter Trials Over Sand and Sea**	Nov. 1965
Lightfoot, R. B.	**The Heavy Assault Transport Helicopter**	Oct. 1966

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SMELT, R.

Looking Ahead In Aeronautics—A US View

This paper is a follow-up to the Second Century series, giving the American view of the next one hundred years. Included are comments on technological forecasting in general, developments in Space Flight—the ballistic missile, communications satellite, the meteorological, navigational and earth resources satellites. Air Transport—airline growth and aircraft size, transport aircraft speed, adverse aspects of Air Transport, V/STOL aircraft—military, commercial, personal aircraft.

The Aeronautical Journal RAeS August 1969

DORNIER, S.

Review of Post-War Research and Development at Dornier

When conditions permitted the resumption of aircraft construction on a small scale, Dornier started to develop, with the Do 27, a light all-round and liaison STOL aircraft, based on previous design work on the Do 25 in Spain.

The problems and possibilities of STOL techniques were studied with the twin-engined Do 28 of which various versions were built, and with the experimental Do 29 which was equipped with tilting propellers as a means for vectorising thrust.

The continuation of the studies for STOL aircraft concepts with the consideration of military operational requirements led to the design and development of the Do 31 VTOL jet transport.

Dornier-Werke have also been working on helicopters and the Do 32 one-man helicopter is well-known.

In view of the problems and tasks in the field of guided missile and space techniques, the Dornier-System GmbH was established a few years ago to co-ordinate the work in this field. Experimental studies in connection with the problem of rain erosion at high air speeds, and the possibilities and problems encountered in the development of retractable Rogallo wings are discussed.

The Aeronautical Journal RAeS August 1969

FLEMMING, M. and SCHOLTEN, R.

Noise Problems of VTOL with Particular Reference to the Do 31

Development trends in modern aircraft and the steady increase of air traffic have made aircraft noise a problem.

The paper shows how the noise problem can be influenced by the VTOL technique, and comprehensive noise calculations and measurements of the VTOL jet transport aircraft Do 31 are made public for the first time. The noise sources at VTOL aircraft and their correlation are explained. From the comparisons with the tests can be seen how the accuracy of the noise carpets of VTOL aircraft can be determined by calculations.

With the aid of this knowledge, further possibilities of noise reduction are described for future VTOL projects of the Dornier company. These possibilities refer to the use of mixing nozzles, new types of lift-pods, future engines as well as appropriate take-off and landing techniques. As far as possible, some comparisons with propeller-driven VTOL aircraft are made.

The Aeronautical Journal RAeS August 1969

WEST, R. G.

Fan Lift In VTOL Design

For some years it has been evident that a VTOL medium-range air liner could make a major contribution to the future growth of civil air transport. To gain the maximum journey time-saving which would be available with a VTOL system, the aircraft should be operated from "vertiports" which are situated fairly near to the city centres. Recent work at Rolls-Royce has shown that it should be possible to achieve the required noise levels and mechanical reliability for operation in an urban environment.

The basis of a successful VTOL aircraft is the powerplant. This is especially true in the case of the lift-fan aircraft, with a large number of engines installed in each airframe. The final design of the Rolls-Royce RB.202 Advanced Lift Fan is aimed at the best compromise between the engine thrust size, weight, noise level, and production cost. The design targets for the RB.202 Lift Fan are stated, and some important design trends are shown. The mode of operation, together with the estimated noise levels, reliability, and installation features of a lift-fan VTOL civil aircraft are discussed.

The Aeronautical Journal RAeS August 1969

SATRE, P.

Supersonic Air Travel—Present and Future

A Study on Air transport requirements during the 1970s shows that a big market is available for supersonic aircraft. These aircraft—and particularly the Concorde—will be capable of meeting the passengers' requirements for security and speed. However, a special effort on ground handling of passengers will be necessary to draw full benefit from high speed in flight. Later on, during the 1980s, the technical progress should enable the supersonic aircraft to meet also the passengers' economy requirements, that cannot be satisfied from the onset owing to the complexity of problems.

If united, European Industry is capable of achieving such technical progress.

The Aeronautical Journal RAeS August 1969

PINSKER, W. J. G.

The Theory and Practice of Inertia Cross-Coupling

Inertia cross-coupling is a condition peculiar to the modern highly-loaded and elongated aircraft. It can manifest itself in three distinct forms: roll-yaw-pitch coupling in aileron rolls, autorotation, and pitch-roll coupling in response to rudder. The mechanisms underlying these phenomena are discussed and possible remedies are considered. The remainder of the paper is devoted to a discussion of the part played by the aircraft designer and the test pilot in the process of establishing the flight limitations of an aircraft subject to inertia cross-coupling.

The Aeronautical Journal RAeS August 1969

CRAGO, W. A.

Marine Safety Aspects of Helicopters

The differing safety aspects of land-based and amphibious helicopters flying over the sea are discussed with reference to the various civil and military roles they are expected to undertake.

A short historical description of the experimental investigation of ditching characteristics is followed by a discussion of model testing techniques. The various aspects of design likely to be important for water-borne operation of amphibious helicopters are described and it is shown that a number of these are also of importance in the case of machines ditched in an emergency. The generation and characteristics of sea waves are briefly discussed and the results of model experiments are used to illustrate how they affect the floatation and other characteristics of water-borne helicopters or land-based machines with and without emergency floatation equipment.

Ditching procedures are described, together with their relationship to the human aspects which decide whether or not the occupants of the aircraft will be injured or able to vacate the machine before it sinks.

The paper closes with a brief discussion of the available statistics on the frequency of system or engine failure experienced in practice which could lead to crashing or ditching.

The Aeronautical Journal RAeS August 1969

PHILLIPS, F. C.

The Canadair CL-84 Tilt-Wing V/STOL Programme

In 1963 the Canadian Government and Canadair contracted to share the cost of designing and developing the CL-84 prototype to the point where flight demonstrations to military agencies could be made. The CL-84, a two-engined tilt-wing/slipstream-deflection V/STOL aircraft, was the product of a number of prior years of Canadair V/STOL research and development work, particularly in model propeller and aircraft testing, control system concepts, and flight simulation. The paper highlights briefly those portions of the earlier programme that were significant in defining the CL-84 for detail design.

Having described those elements of the aircraft that are least conventional, the paper goes on to outline the ground and early flight testing. Considerable attention is then paid to the experience gained in the flight test programme. The CL-84-1 aircraft now being manufactured for evaluation by the Canadian Armed forces is delineated. An indication is given of the significant improvements that can be provided in the aircraft type within the current state-of-the-art, and alternatively with incorporation of technical advances expected within the next five years.

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