

#### MINISTRY OF SUPPLY

AERONAUTICAL RESEARCH COUNCIL REPORTS AND MEMORANDA

## Published Reports and Memoranda of the Aeronautical Research Council

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Reports and Memoranda No. 2950
February, 1958

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Normally every R. & M. is bound into the Annual Technical Volume bearing the same year as the date of the original report. Owing to the post-war difficulties of publication this procedure will not be able to be rigidly adhered to, and such R. & M. which are not available at the time of compilation of the Annual Technical Volumes will be combined together in special volumes. Those R. & M. below marked with a star will be thus dealt with.

Monographs are not incorporated in Annual Technical Volumes.

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R. & M. No.	Council No.	Title	Author
2851	12,173 12,476 14,222	Tunnel-wall effect on an aerofoil at subsonic speeds. August, 1951.	Thom, A. Klanfer, L.
*2852	7741	A review of porpoising instability of seaplanes. February, 1944.	Smith, A. G. White, H. G.
2853	11,666	Note on the dynamic characteristics of servo tab systems of control. April, 1948.	Adamson, D. Lyons, D. J.
2854	13,917	The critical whirling speeds and natural vibrations of a shaft carrying a symmetrical rotor. December, 1950.	Downham, E.
2855	14,336	Oscillating wings in compressible subsonic flow. October, 1951.	Jones, W. P.
2856	13,628	Withdrawn.	
2857	13,639	The rolling power of an elastic swept wing. July, 1950.	Broadbent, E. G.
2858	14,474	Velocity distribution on thin tapered wings with fore-and-aft symmetry and spanwise constant thickness ratio at zero incidence. June, 1951.	Neumark, S. Collingbourne, J.

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2859	13,066	Optical considerations and limitations of the Schlieren method.  January, 1950.	Speak, G. S. Walters, D. J.
2860	13,592	The frequency response of the ordinary rotor blade, the Hiller servo blade, and the Young-Bell stabiliser. May, 1950.	Sissingh, G. J.
2861	14,478	Helicopter rotor behaviour after engine failure in forward flight. August, 1951.	Stewart, W. Burle, M. F.
2862	11,740	Assessment of the relative performance of the by-pass engine and the orthodox double compound jet engine. July, 1948.	Bridle, E. A.
2863	13,509 13,789 13,947	Tests at high subsonic speeds on a 10 per cent thick pressure- plotting aerofoil of R.A.E. 104 section. April, 1951.	Rogers, E. W. E. Berry, C. J. Cash, R. F.
2864	14,641	Force and moment measurements on a conical body and a rectangular wing, separately and in combination, at Mach number 1.94. August, 1951.	Anderson, J. R. Treadgold, D.
2865	14,473 14,475 14,476	Some applications of the Lamé function solutions of the linearized supersonic flow equation. Part I. Finite sweptback wings with symmetrical sections and rounded leading edges. Part II. Cambered and twisted wings. August, 1951.	Roper, G. M.
2866	13,910 11,008 (parts of)	Flutter and resonance characteristics of a model cantilever wing carrying localised masses. April, 1951.	Lambourne, N. C.
2867	14,024	The theory of torsional vibrations of a four-boom, thin-walled cylinder of rectangular cross-section. March, 1951.	Mansfield, E. H.
*2868	4948	Water performance of a four-engined flying boat with step fairings of length 3, 6 and 9 times the step depth. April, 1941.	Evans, G. J. Smith, A. G. Shaw, R. A. Morris, W.
2869	12,900	The flutter properties of a simple aero-isoclinic wing system. January, 1950.	Lambourne, N. C. Chinneck, A.
2870	13,945	A simplified treatment of a fixed-root swept wing built on Hill's isoclinic principle. January, 1951.	Williams, D.
2871	11,354	Experiments in the Compressed Air Tunnel on swept-back wings including two delta wings. March, 1948.	Jones, R. Miles, C. J. W. Pusey, P. S.
2872	14,830	An extension of Multhopp's method of calculating the spanwise loading of wing-fuselage combinations. November, 1951.	Weber, J. Kirby, D. A. Kettle, D. J.
2873	14,919	The effect of tight clamping on the fatigue strength of joints, February, 1952	Fisher, W. A. P. Winkworth, W. J.
2874	15,014	Improvements in the fatigue strength of joints by the use of interference fits. May, 1952.	Fisher, W. A. P. Winkworth, W. J.
2875	14,604	Evaporation from the surface of a body in an airstream. (With particular reference to the chemical method of indicating boundary-layer transition.) September, 1951	Owen, P. R. Ormerod, A. O.

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2876	14,713	Wind-tunnel tests on the N.P.L. 434 nose-slot suction aerofoil. March, 1952.	Williams, J. Pankhurst, R. C. Love, E. M.
2877	11,619 13,748	Permissible design values and variability test factors. July, 1950.	Atkinson, R. J.
2878	14,934	An experimental investigation of stress diffusion in non-buckling plates. May, 1952.	Mitchell, L. H.
2879	14,814	Determination of the stress distribution in reinforced monocoque structures. Part I. A theory of flat-sided structures. December, 1951.	Morley, L. S. D.
2880	13,979	The secondary flow in curved pipes. February, 1952.	Cuming, H. G.
2881	13,465 13,718	Control testing in wind tunnels. January, 1951. (And Appendix from 10,936.)	Bryant, L. W. Garner, H. C.
2882	13,655 14,139	Low speed tests on 45-deg swept-back wings. Part I. Pressure measurements on wings of aspect ratio 5. May, 1950. Part II. Balance and pressure measurements on wings of different aspect ratios. May, 1951.	Weber, J. Brebner, G. G. Küchemann, D. Weber, J. Brebner, G. G.
2883	13,632	An experimental investigation of a thick aerofoil nozzle cascade. May, 1950.	Andrews, S. J. Schofield, N. W.
2884	13,439	Methods for calculating the lift distribution of wings. (Subsonic lifting surface theory.) January, 1950.	Multhopp, H.
2885	15,096	Multhopp's subsonic lifting surface theory of wings in slow pitching oscillations. July, 1952.	Garner, H. C.
2886	15,083	Pressure and boundary-layer measurements on a two-dimensional wing at low speed. February, 1952.	Brebner, G. G. Bagley, J. A.
2887	14,338	The aerodynamic derivatives with respect to a rate of yaw for a delta wing with dihedral and at incidence at supersonic speeds. October, 1951.	Hunter-Tod, J. H.
2888	14,642	Calculation of the pressure distribution over a wing at sonic speeds. September, 1951.	Mangler, K. W.
2889	15,232	Theoretical load distribution on a wing with a cylindrical body at one end. June, 1952.	Weber, J.
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2893	13,729	A wind-tunnel technique for flutter investigations on swept wings with body freedoms. September, 1950.	Jordan, P. F. Smith, F.
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2894	11,602 11,883	A wind-tunnel investigation of entry loss on propeller turbine installations. Parts I and II. August, 1948.	Seddön, J. Spence, A.
2895	13,322 14,608	Rolling power measurements and comparative calculations for a flexible model wing constructed from Xylonite. With an Appendix by H. C. Garner. February, 1952	Lambourne, N. C. Batson, A. S. Chinneck, A.
2896	13,644	Water and air performance of seaplane hulls as affected by fairing and fineness ratio. August, 1950.	Smith, A. G. Allen, J. E.
2897	14,77.1	Boundary-layer control for high lift by suction on the leading edge of a 40 deg swept-back wing. October, 1951.	Poppleton, E. D.
2898	15,197	The full scale hydrodynamic performance of a large four-engined flying boat at overload in calm water and swell. August, 1952.	Hamilton, J. A. Gigg, R. V.
2899	15,196	A full scale investigation into the hydrodynamic behaviour of a highly faired flying boat hull. July, 1952.	Hamilton, J. A.
2900	15,184	Wind-tunnel tests on the NACA 63A009 aerofoil with distributed suction over the nose. September, 1952.	Gregory, N. Walker, W. S.
2901	12,543	A high-speed camera for the photography of shock-wave oscillations in a wind tunnel. August, 1949.	Holder, D. W. North, R. J. Standring, W. G. Looms, J. S. T.
2902	15,507	Flight tests at transonic speeds on freely falling models. Parts I to V. October, 1952.	Edited by Kell, C.
2903	13,667	Theoretical requirements of tunnel experiments for determining stability derivatives in oscillatory longitudinal disturbances. June, 1950.	Neumark, S. Thorpe, A. W.
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2905	14,164	The R.A.E. 4-ft × 3-ft experimental low turbulence wind tunnel. Part II. Measurements of turbulence intensity and noise in the working section. March, 1951. (Part I is R. & M. 2690.)	Schuh, H. Winter, K. G.
2906	15,152 Mono-	The spinning of model aircraft and the prediction of full scale spin and recovery characteristics. March, 1952.	Pringle, G. E. Harper, D. J.
2907	graph 14,759	An approximation to the slow mode of longitudinally disturbed motion of an aircraft in level flight. September, 1951.	Thorpe, A. W.
2908	_	The subsonic flow past swept wings at zero lift without and with body. March, 1953. Summary of material contained in earlier reports by authors, namely, 11,035, 12,493, T.N. Aero. 1932, 11,774, 12,421, 12,840, T.N. Aero. 2032.	Küchemann, D. Weber, J.
2909 .	13,928	Experiments on the flow into a swept leading-edge intake at zero forward speed, with notes on the wider uses of a slotted intake. January, 1951.	Seddon, J. Trebble, W. J. G.
2910	13,932	Model tests on the asymmetry of airflow occurring in twin-intake systems at subsonic speeds. February, 1951.	Seddon, J. Trebble, W. J. G.

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2911	15,054 16,080	Wind-tunnel tests on symmetrical flutter of swept-back wings including the tailplane effect. April, 1952.	Gaukroger, D. R.
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2913	15,145	Tests on a typical Whittle compressor. July, 1952.	Simons, A. Roberts, C. K.
*2914	.8462	A simple method of Computing $C_D$ from wake traverses at high subsonic speeds. December, 1944.	Thompson, J. S.
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2916	_	Abstracts of papers published externally. February, 1954.	_
2917	15,040 Mono- graph	Investigations of the behaviour of aircraft when making a forced landing on water (ditching). March, 1952.	Smith, A. G. Warren, C. H. E. Wright, D. F.
2918	16,124	The calculation of the pressure distribution over the surface of two-dimensional and swept wings with symmetrical aerofoil sections. July, 1953.	Weber, J.
2919	15,259	Effects of Reynolds number on the flow of air through a cascade of compressor blades. June, 1952.	Rhoden, H. G.
2920	15,260	Analysis of Reynolds number effects in fluid flow through two-dimensional cascades. July, 1952.	Stuart, D. J. K.
2921	15,642	The oscillating aerofoil in subsonic flow. February, 1953.	Jones, W. P.
2922	15,695	Calculation of stability derivatives for oscillating wings. February, 1953.	Lehrian, D. E.
2923	15,670 16,130	Hinge-moment derivatives for an oscillating control. Parts I and II. September, 1953.	Sinnott, C. S.
2924	15,316	A method of calculating the short period longitudinal stability derivatives of a wing in linearised unsteady compressible flow. June, 1952.	Mangler, K. W.
2925	15,499 16,210	Measurements of the aerodynamic derivatives for swept wings of low aspect ratio describing pitching and plunging oscillations in incompressible flow. October, 1953.	Scruton, C. Woodgate, L. Alexander, A. J.
2926	15,597	Some remarks on Multhopp's subsonic lifting surface theory. August, 1952.	Mangler, K. W. Spencer, B. F. R.
2927	15,999	Tests on a single-stage turbine comparing the performance of twisted with untwisted rotor blades. February, 1953.	Johnston, I. H. Knight, L. R.
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2929	12,623 14,671	Tests concerning novel designs of blades for axial compressors.  Part I. Blades designed for increased work at root and tip.  Part II. Blades designed to operate in a parabolic axial velocity distribution. October, 1951.	Andrews, S. J. Jeffs, R. A. Hartley, E. L.
2930	14,687	High-speed wind-tunnel tests on six wings of 40-deg sweepback, with various section shapes. January, 1952.	Holmes, L. N. Haines, A. B.
2931	15,141	Observations of the flow round a two-dimensional aerofoil oscillating in a high-speed airstream. August, 1952.	Chinneck, A. Holder, D. W. Berry, C. J.
2932	16,029	Aerodynamic flutter coefficients for subsonic, sonic and supersonic flow (linear two-dimensional theory). April, 1953.	Jordan, P. F.
2933	14,519 16,599	Flow instability of centre-body diffusers at supersonic speeds. November, 1953.	Beastall, D.
2934	. 15,292	Measurements of two-dimensional derivatives on a wing-aileron- tab system with a 1541 section aerofoil. October, 1952. Part I. Direct aileron derivatives.	Wight, K. C.
2935	15,633	A simple method for calculating the span and chordwise loading on straight and swept wings of any given aspect ratio at subsonic speeds. August, 1952.	Küchemann, D.
2936	13,359	See Current Paper No. 182.	McIvor, J. W.
2937	16,025	The forward take-off of a helicopter. June, 1953.	O'Hara, F.
2938	16,172	An experimental investigation of the effects of deformation on the aerodynamic characteristics of a swept-back wing. September, 1953.	Black, J.
*2939	6871	The flexural axis of thin-walled sections that have no plane of symmetry. May, 1943.	Williams, D. Rae, B. V. S. C.
2940	15,600	Analysis of short-period longitudinal oscillations of an aircraft. Interpretation of flight tests. September, 1952.	Neumark, S.
2941	14,701	Low-speed tunnel model tests on tailplane rolling moments in sideslip. October, 1951.	Spence, A. Leathers, J. W. Kirby, D. A.
2942	15,609	The aerodynamic effects of aspect ratio on flutter of unswept wings. November, 1952.	Molyneux, W. G. Chapple, E. W.
2943	16,430	Wind-tunnel wall interference effects on oscillating aerofoils in subsonic flow. December, 1953.	Jones, W. P.
2944	13,562 14,606	Technique for flutter tests using ground-launched rockets, with results for unswept wings. November, 1951.	Molyneux, W. G. Ruddlesden, F. Molyneux, W. G. Ruddlesden, F. Cutt, P. J.
2945	16,275	The time vector method for stability investigations. August, 1953. Part I. Basic information. Part II. Longitudinal motion.	Doetsch, K. H.

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2946	15,456	Measurement of lift, pitching moment and hinge moment on a two-dimensional cambered aerofoil to assist the estimation of camber derivatives. December, 1952.	Garner, H. C. Batson, A. S.
2947	15,933	The calculation of the loading and pressure distribution on cranked wings. January, 1953.	Brebner, J. G.
2948	16,153	Interference corrections for asymmetrically loaded wings in closed rectangular wind tunnels. September, 1953.	Garner, H. C. Acum, W. E. A.
2949	16,551	Some flutter tests on swept-back wings using ground-launched rockets. October, 1953.	Molyneux, W. G. Ruddlesden, F.
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