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Part 19 - Control Surfaces
Part 20 - Slots and Flaps

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FOREWORD

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ABBREVIATIONS

A.R.C. R. & M. - Great Britain. Aeronautical research committee. Reports and Memoranda.

A.S.M.E. - American society of mechanical engineers, New York.

Atti Assoc. ital. aerotecn. - Atti dell'Associazione italiana di aerotecnica. Roma.

C.A.H.I. - Central aero-hydrodynamical institute, Moscow.

C.I.N.A. - Commission internationale de navigation aérienne, Genève.

C. R. Acad. sci. - Comptes rendus hebdomadaires des séances de l'Académie des sciences, Paris.

D.V.L. - Deutsche versuchsanstalt für luftfahrt, Berlin.

F.A.I. - Fédération aéronautique internationale, Paris.

H.M. Stat. off. - His Majesty's Stationery office, London.

N.A.A. - National aeronautic association, Washington.

N.A.C.A. - National advisory committee for aeronautics, Washington.

N.P.L. - National physical laboratory, Teddington, England.

Pub. scient. tech. Min. de l'air. - Publications scientifiques et techniques du Ministère de l'air. Service des recherches de l'aéronautique, Paris.

R.A.F. - Royal air force (Great Britain)

R.A.S. - Royal aeronautical society (Great Britain)

Rend. Instituto sper. aer. - Rendiconto dell'Istituto, sperimentale aeronautico, Roma.

S.A.E. - Society of automotive engineers, New York.

U.S. Govt. print. off. - U.S. Government printing office, Washington.

V.D.I. - Verein deutscher ingenieure, Berlin.

W.G.L. - Wissenschaftliche gesellschaft für luftfahrt, Berlin.

Z.A.M.M. - Zeitschrift für angewandte mathematik und mechanik, Berlin.

Z.F.M. - Zeitschrift für flugtechnik und motorluftschiffahrt, München.

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BOOKS AND PAMPHLETS ON CONTROL SURFACES

Improvement of aileron effectiveness by the prevention of air leakage through the hinge gap as determined in flight, by Hartley A. Soulé and W. Gracey. Washington, 1938. 7 p. diagrs. (N.A.C.A. Technical notes no. 632)

Wind-tunnel investigations of rectangular and tapered N.A.C.A. 23012 wings with plain ailerons and full-span split flaps, by Carl J. Wenzinger and Milton B. Ames, Jr. Washington, 1938. 11 p. diagrs., tables. (N.A.C.A. Technical notes no. 651)

Considerations affecting the additional weight required in mass balance of ailerons, by Walter S. Diehl. Washington, 1937. 12 p. illus., tables. (N.A.C.A. Technical notes no. 609)

Experimental research on the effectiveness of ailerons and elevators, by T. Ogawa and K. Ito. Tokyo, Tokyo imperial university, 1937. 72 p. illus., tables. (Aeronautical research institute report no. 151)

Full scale tests of slotted flaps and ailerons on a Courier, by R. H. Francis. London, H.M. Stat. off., 1937. 20 p. diagrs., tables. (A.R.C. R. & M. no. 1819)

Full-scale wind-tunnel and flight tests of a Fairchild 22 airplane equipped with a Zap flap and Zap ailerons, by C. H. Dearborn and Hartley A. Soulé. Washington, 1937. 17 p. diagrs., tables. (N.A.C.A. Technical notes no. 596)

Lateral stability of a single engined high wing monoplane with air screw running; yawing moments due to side slip and rudder power, by C. A. McMillan, L. W. Bryant and A. G. Gadd. London, H.M. Stat. off., 1937. 41 p.. diagrs., tables. (A.R.C. R. & M. no. 1794)

Maximum forces applied by pilots to wheel-type controls, by William H. McAvoy. Washington, 1937. 7 p. diagrs., plates, tables. (N.A.C.A. Technical notes no. 623)

Résumé and analysis of N.A.C.A. lateral control research, by Fred E. Weick and Robert T. Jones. Washington, U.S. Govt. print. off., 1937. 27 p. diagrs., tables. (N.A.C.A. Report no. 605)

Theoretical span loading and moments of tapered wings produced by aileron deflection, by H. A. Pearson. Washington, 1937. 30 p. diagrs. (N.A.C.A. Technical notes no. 589)

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Wind-tunnel investigation of tapered wings with ordinary ailerons and partial-span split flaps, by Carl J. Wenzinger. Washington, U.S. Govt. print. off., 1937. 9 p. illus. tables. (N.A.C.A. Report no. 611)

Wind-tunnel investigation of wings with ordinary ailerons and full-span external-airfoil flaps, by Robert C. Platt and Joseph A. Shortal. Washington, U.S. Govt. print. off., 1937. 22 p. diagrs., illus. (N.A.C.A. Report no. 603)

Full scale tests of Hartshorn ailerons on a Bulldog, by A. E. Woodward Nutt. London, H.M. Stat. off., 1936. 16 p. diagrs., tables. (A.R.C. R. & M. no. 1734)

Limitations of the pilot in applying forces to airplane controls, by Melvin N. Gough and A. P. Beard. Washington, 1936. 13 p. (N.A.C.A. Technical notes no. 550)

Nature of torsion-aileron flutter of wing as revealed by analitical experiments, by K. Sezawa and K. Kubo. Tokyo, Tokyo imperial university, 1936. 55 p. plates. (Aeronautical research institute report no. 136)

A New form of biplane, by H. B. Irving and A. S. Batson. London, H.M. Stat. off., 1936. 44 p. diagrs., illus., tables. (A.R.C. R. & M. no. 1715)

Reduction of aileron operating force by differential linkage, by Robert T. Jones and Albert I. Merken. Washington, 1936. 13 p. diagrs. (N.A.C.A. Technical notes no. 586)

Study of two control operation of airplane, by Robert T. Jones. Washington, U.S. Govt. print. off., 1936. 16 p. diagrs. (N.A.C.A. Report no. 579)

Wind-tunnel investigation of the aerodynamic balancing of upper-surface ailerons and split flaps, by Carl J. Wenzinger. Washington, U.S. Govt. print. off., 1936. 18 p. diagrs., tables. (N.A.C.A. Report no. 549)

Aerodynamic characteristics of a wing with Fowler flaps including flap loads, downwash and calculated effect on take-off, by Robert C. Platt. Washington, U.S. Govt. print. off., 1935. 17 p. diagrs., tables. (N.A.C.A. Report no. 534)

Ailerons shape and size, by C. Habinskaya. Moscow, Scientific technical department of the Supreme council of national economy, 1935. 43 p. (C.A.H.I. Transactions no. 230)

Development of the N.A.C.A. slot-lip aileron, by Fred E. Weick and Joseph A. Shortal. Washington, 1935. 10 p. diagrs. (N.A.C.A. Technical notes no. 547)

The Effect of a reduction of aileron torsional stiffness on the flutter of a model wing, by V. M. Falkner, W. P. Jones and C. Scruton. London, H.M. Stat. off., 1935. 8 p. diagrs. (A.R.C. R. & M. no. 1722)

The Effect of variation of aileron inertia and damping on the flexural-aileron flutter of a typical cantilever wing, by V. M. Falkner. London, H.M. Stat. off., 1935. 12 p. diagrs. (A.R.C. R. & M. no. 1685)

Flight investigation of the lateral control characteristics of short wide ailerons and various spoilers with different amounts of wing dihedral, by Fred E. Weick, Hartley A. Soulé and Melvin N. Gough. Washington, U.S. Govt. print. off., 1935. 16 p. diagrs., illus., tables. (N.A.C.A. Report no. 494)

Flutter experiments on a model wing fitted with a dead-centre aileron control, by V. M. Falkner, W. P. Jones and C. Scruton. London, H.M. Stat. off., 1935. 10 p. diagrs., illus., tables. (A.R.C. R. & M. no. 1686)

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The Influence of differential aileron control on wing flutter, by R.A. Frazer. London, H.M. Stat. off., 1934. 20 p. diagrs. (A.R.C. R. & M. no. 1725)

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Wind tunnel research comparing lateral control devices. Upper surface ailerons on wings with split flaps, by Fred E. Weick and Carl J. Wenzinger. Washington, U.S. Govt. print. off., 1934. 17 p. diagrs., tables. (N.A.C.A. Report no. 499)

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Ailerons angles in high speed manoeuvres with single seater fighters, by B. V. Williams and J. H. Hartley. London, H.M. Stat. off., 1933. 8 p. diagrs., tables. (A.R.C. R. & M. no. 1582)

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A Theory of binary servo-rudder flutter with applications to a particular aircraft, by W. J. Duncan and A. R. Collar. London, H.M. Stat. off., 1933. 23 p. diagrs., tables. (A.R.C. R. & M. no. 1527)

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Wind tunnel research comparing lateral control devices, particularly at high angles of attack. Handley Page tip and full-span slots with ailerons and spoilers, by Fred E. Weick and Carl J. Wenzinger. Washington, 1933. 20 p. diagrs., tables. (N.A.C.A. Technical notes no. 443)

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Wind-tunnel research comparing lateral control devices, particularly at high angles of attack. Part III. Ordinary ailerons rigged up 10° when neutral, by Fred E. Weick and Carl J. Wenzinger. Washington, U.S. Govt. print. off., 1932. 12 p. diagrs., illus., tables. (N.A.C.A. Report no. 423)

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Wind-tunnel research comparing lateral control devices, particularly at high angles of attack. Part V. Spoilers and ailerons on rectangular wings, by Fred E. Weick and Joseph A. Shortal. Washington, U.S. Govt. print. off., 1932. 16 p. diagrs., tables. (N.A.C.A. Report no. 439)

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A Collection of wind tunnel data on the balancing of controls, by F. B. Bradfield. London, H.M. Stat. off., 1931. 16 p. diagrs., tables. (A.R.C. R. & M. no. 1420)

Control of airplanes at low speeds by means of conventional ailerons. U.S. Department of commerce. Washington, U.S. Govt. print. off., 1931. 24 p. diagrs., illus., tables. (Aeronautics bulletin no. 15)

Effect of variation of chord and span of ailerons on hinge moments at several angles of pitch, by Byron Harold Monish. Washington, U.S. Govt. print. off., 1931. 15 p. diagrs., illus., tables. (N.A.C.A. Report no. 370)

Wind tunnel tests on aileron loads. Part I. Force on aileron. Part II. Force on main wing ahead of aileron, by F. B. Bradfield, G. P. Midwood and F. R. C. Hounsfield. London, H.M. Stat. off., 1931. 20 p. diagrs., tables. (A.R.C. R. & M. no. 1443)

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Balanced and servo control surfaces. Washington, 1930. 15 p. diagrs., illus. (N.A.C.A. Technical memorandums no. 563) (From Aeroplane, London, Feb. 26, 1930, v. 38, no. 9, p. 345-46, 348, 350)

The Effect of the various types of lateral stabilizers on the take-off of a flying boat, by L. P. Coombes and R. H. Read. London, H.M. Stat. off., 1930. 5 p. diagrs., tables. (A.R.C. R. & M. no. 1411)

Effect of variation of chord and span of ailerons on rolling and yawing moments at several angles of pitch, by R. H. Heald, D. H. Strother and Byron Harold Monish. Washington, U.S. Govt. print. off., 1930. 27 p. diagrs. (N.A.C.A. Report no. 343)

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Maximum force on the fin and rudder of a Bristol fighter, by F.B. Bradfield. London, H.M. Stat. off., 1930. 8 p. diagrs. (A.R.C. R. & M. no. 1330)

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The Motions, at the stall, of a Bristol fighter aeroplane with slot and aileron control on both planes, by K. W. Clark. London, H.M. Stat. off., 1930. 7 p. diagrs., tables. (A.R.C. R. & M. no. 1341)

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Influence des ailerons sur les propriétés aérodynamiques des surfaces sustentatrices, par E. Carafoli. Paris, Le Centre de documentation aéronautique internationale de l'Aéro-club de France, 1929. 43 p. bibliog., diagrs.

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Aerodynamic characteristics of thin empirical profiles and their application to the tail surfaces and ailerons of aeroplanes, by A. Toussaint and E. Carafoli. Washington, 1928. 15 p. (N.A.C.A. Technical memorandums no. 493) (From L'Aérophile, Paris, June 1-15, 1928, v. 36, no. 11-12, p. 179-83)

Determination of the air forces and moments produced by the ailerons of an aeroplane, by C. Wieselsberger and T. Asano. Washington, 1928. 15 p. diagrs., illus. (N.A.C.A. Technical memorandums no. 488) (From Z.F.M., München und Berlin, July 14, 1928, v. 19, no. 13, p. 289-93)

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The Longitudinal control of an aeroplane beyond the stall, by H.M. Garner and K.V. Wright. London, H.M. Stat. off., 1928. 6 p. tables. (A.R.C. R. & M. no. 1193) (investigation of an aeroplane in which elevators are controlled in different ways)

Study of horizontal tail surfaces of Consolidated XPT-3 (NY-1). Washington, U.S. Govt. print. off., 1928. 8 p. illus. (U.S. Air corps information circular no. 615)

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Wind tunnel tests of various Servo rudder systems, by K. V. Wright. London, H.M. Stat. off., 1928. 17 p. diagrs., illus., tables. (A.R.C. R. & M. no. 1186)

The Aerodynamics of a simple Servo-rudder system, by H. M. Garner and C.E.W. Lockyer. London, H.M. Stat. off., 1927. 8 p. diagrs., tables. (A.R.C. R. & M. no. 1105)

The Effect of a flap and ailerons on the N.A.C.A. M-6 airfoil section, by George J. Higgins and Eastman N. Jacobs. Washington, U.S. Govt. print. off., 1927. 18 p. diagrs., illus., tables. (N.A.C.A. Report no. 260)

Experiments on airfoils with aileron and slot, by A. Betz. Washington, 1927. 6 p. diagrs., tables. (N.A.C.A. Technical memorandums no. 437)

Experiments on the action of the ailerons of a thick tapered wing, by C. Koning and H. J. van der Maas. (In Verslagen en Verhandelingen vanden rijks-studiendienst voor de luchtvaart, rapport A-32, Amsterdam, 1927, v. 4, p. 139-264. diagrs., tables)

Full scale test of slot and aileron control on a Woodcock, by H. L. Stevens. London, H.M. Stat. off., 1927. 2 p. diagrs. (A.R.C. R. & M. no. 1089)

Full scale tests of a Bristol fighter with slot and aileron control operated by a differential link mechanism, by H.M. Garner. London, H.M. Stat. off., 1927. 2 p. diagrs. (A.R.C. R. & M. no. 1101)

Further wind tunnel tests of a slot and aileron control on a wing of R.A.F. 31 section, by A. S. Hartshorn. London, H.M. Stat. off., 1927. 4 p. diagrs., tables. (A.R.C. R. & M. no. 1090)

Lift, drag, and elevator hinge moments of Handley-Page control surfaces, by Richard Herbert Smith. Washington, U.S. Govt. print. off., 1927. 22 p. (N.A.C.A. Report no. 278)

Preliminary report on the fitting of slots and flaps and slot-and-aileron control to a Bristol fighter, by H.L. Stevens. London, H.M. Stat. off., 1927. 3 p. diagrs. (A.R.C. R. & M. no. 1088)

Researches on ailerons and especially on the test loads to which they should be subjected, by J. Sabatier. Washington, 1927. 25 p. illus. (N.A.C.A. Technical memorandums no. 398) (From La Technique aéronautique, Paris, Nov. 15-Dec. 15, 1926)

Study of balanced rudders, by J. A. Roche. Washington, U.S. Govt. print. off., 1927. 4 p. diagrs., tables. (Air corps information circular no. 586)

Wind tunnel tests on DH-4B model fitted with various fins and rudders. Washington, U.S. Govt. print. off., 1927. 11 p. illus. (Air corps information circular no. 603)

Flying positions of control surfaces of Bristol fighter, by G.T.R. Hill. London, H.M. Stat. off., 1926. 6 p. diagrs. (A.R.C. R. & M. no. 1060)

Model tests of a combined slot and aileron control of a wing of R.A.F. 15 section. Push forward type of auxiliary, by F.B. Bradfield and A.S. Hartshorn. London, H.M. Stat. off., 1926. 10 p. diagrs., tables. (A.R.C. R. & M. no. 1047)

Rolling and yawing moments due to rolling and to ailerons, by A.S. Batson. London, H.M. Stat. off., 1926. 20 p. diagrs., tables. (A.R.C. R. & M. no. 1059)

Second report on full scale experience with the slot and aileron control fitted to a Bristol fighter, by H. L. Stevens. London, H.M. Stat. off., 1926. 3 p. diagrs. (A.R.C. R. & M. no. 1051)

Slot and aileron control on a wing of R.A.F. 31 section with various types of ailerons, by F.B. Bradfield and A. S. Hartshorn. London, H.M. Stat. off., 1926. 16 p. diagrs., tables. (A.R.C. R. & M. no. 1048)

Wind tunnel test for elevator hinge moment coefficients on the horizontal tail surface no. 5, with balanced elevator, by P. M. Lyons. Washington, U.S. Govt. print. off., 1926. 3 p. diagrs., illus. (Air corps information circular no. 567)

Full scale tests of a Bristol fighter with increased rudder control, by H. L. Stevens. London, H.M. Stat. off., 1925. 2 p. diagrs. (A.R.C. R. & M. no. 972)

Full scale tests of a new slot-and-aileron lateral control, by H. L. Stevens. London, H.M. Stat. off., 1925. 3 p. diagrs. (A.R.C. R. & M. no. 968)

Full scale tests of different ailerons on Bristol fighter aeroplane, by H. M. Garner and E. T. Jones. London, H.M. Stat. off., 1925. 7 p. diagrs., tables. (A.R.C. R. & M. no. 966)

The Lateral control of a biplane by combined use of ailerons and varying leading edge slots, by G. P. Douglas, F. B. Bradfield and A. S. Hartshorn. London, H.M. Stat. off., 1925. 14 p. diagrs., tables. (A.R.C. R. & M. no. 973)

Longitudinal control and rolling experiments, by H. B. Irving and A. S. Batson. London, H.M. Stat. off., 1925. 18 p. diagrs. (A.R.C. R. & M. no. 976)

Pitching and yawing moments with sideslip on a model aeroplane with zero stagger, by F.B. Bradfield. London, H.M. Stat. off., 1925. 14 p. diagrs., tables. (A.R.C. R. & M. no. 965) (various elevator settings, two new rudders designed to improve control)

Static test of the Curtiss XO-1 observation airplane, by D.B. Weaver. Washington, U.S. Govt. print. off., 1925. 42 p. diagrs., illus. (Air corps information circular no. 539)

Step by step calculations upon asymmetric movements of stalled aeroplanes, by B. Melvill Jones and Miss A. Trevelyan. London, H.M. Stat. off., 1925. 21 p. diagrs., tables. (A.R.C. R. & M. no. 999) (rudder and aileron control)

Wind channel tests of slot and aileron control on a wing of R.A.F. 15 section, by F.B. Bradfield, A.S. Hartshorn and L. Caygill. London, H.M. Stat. off., 1925. 29 p. diagrs., tables. (A.R.C. R. & M. no. 1008)

Wind tunnel test of aileron characteristics as affected by design and by airfoil thickness. Washington, U.S. Govt. print. off., 1925. diagrs., tables. (U.S. Air corps information circular no. 535)

Aileron effectiveness, by A. L. Morse. Washington, U. S. Govt. print. off., 1924. 8 p. diagrs. (Air service information circular no. 454)

The Control of a stalled aeroplane as affected by the use of differential ailerons, by H. L. Stevens. London, H.M. Stat. off., 1924. 5 p. diagrs. (A.R.C. R. & M. no. 964)

The Induction factor used for computing the rolling moment due to the ailerons, by Max Michael Munk. Washington, 1924. 5 p. illus. (N.A.C.A. Technical notes no. 187)

Lateral force and moments on Avro model, by R. G. Harris and A.S. Hartshorn. London, H.M. Stat. off., 1924. 6 p. diagrs., tables. (A.R.C. R. & M. no. 924)

On the distribution of lift along the span of an airfoil with displaced ailerons, by Max Michael Munk. Washington, 1924. 8 p. diagrs. (N.A.C.A. Technical notes no. 195)

Rolling moment due to ailerons, by Max Michael Munk. Washington, 1924. 5 p. diagrs. (N.A.C.A. Technical notes no. 187)

Slot control on an Avro with standard and balanced ailerons, by F. B. Bradfield. London, H.M. Stat. off., 1924. 16 p. diagrs., tables. (A.R.C. R. & M. no. 916)

Static test of the Curtiss PW-8 single seater pursuit airplane, by E. R. Weaver. Washington, U.S. Govt. print. off., 1924. 24 p. diagrs., illus. (Air corps information circular no. 492)

The Distribution of lift over wing tips and ailerons, by David L. Bacon. Washington, U.S. Govt. print. off., 1923. 24 p. diagrs., illus., tables. (N.A.C.A. Report no. 161)

Effect of airfoil thickness and plan form on lateral control, by H.I. Hoot. Washington, U.S. Govt. print. off., 1923. 11 p. diagrs., illus., tables. (N.A.C.A. Report no. 169) (test to determine the effectiveness of ailerons were made on six airfoils)

Experiments with rudders on two twin engine aeroplanes, by F.W. Meredith. London, H.M. Stat. off., 1923. 8 p. diagrs., tables. (A.R.C. R. & M. no. 908)

Notes on the design of ailerons, by Walter S. Diehl. Washington, 1923. 10 p. diagrs., tables. (N.A.C.A. Technical notes no. 144)

Static test of Martin bomber elevator controls. Washington, U.S. Govt. print. off., 1923. 1 p. diagrs. (Air corps information circular no. 424)

The Effect on rudder control of slip stream body and ground interference, by Henry I. Hoot and David L. Bacon. Washington, 1922. 7 p. diagrs. (N.A.C.A. Technical notes no. 110)

Lateral control of a Bristol fighter at low speeds; measurements of rolling and yawing moments of model wings due to rolling, by F.B. Bradfield. London, H.M. Stat. off., 1922. 23 p. diagrs., illus., tables. (A.R.C. R. & M. no. 787)

Notes on stalled flying, by R. M. Hill and H. L. Stevens. London, H.M. Stat. off., 1922. 9 p. diagrs., tables. (A.R.C. R. & M. no. 963) (experiments on Avro-Servo rudder)

Pressure distribution over the rudder and fin of an airplane in flight, by F. H. Norton and G. C. Brown. Washington, U.S. Govt. print. off., 1922. 9 p. diagrs. (N.A.C.A. Report no. 149)

Report of static test of the Junker L-6 monoplane. Washington, U.S. Govt. print. off., 1922. 35 p. diagrs., illus. (Air corps information circular no. 360)

Rolling and yawing moments due to roll of model Avro wings, with standard interplane ailerons, and rudder moments for standard and special large rudder, by F. B. Bradfield. and O. E. Simmonds. London, H.M. Stat. off., 1922. 12 p. diagrs., tables. (A.R.C. R. & M. no. 848)

Some suggestions for improving airplane control at low speeds, by A. Fage. London, H.M. Stat. off., 1922. 6 p. diagrs., tables. (A.R.C. R. & M. no. 855) (devices to be used in conjunction with ailerons)

Static test of the Dayton-Wright TA-3 airplane. Washington, U.S. Govt. print. off., 1922. 25 p. diagrs. (Air corps information circular no. 388)

A Study of airplane maneuvers with special reference to angular velocities, by H.J.E. Reid. Washington, U.S. Govt. print. off., 1922. 10 p. diagrs., illus. (N.A.C.A. Report no. 155)

Balance portion for the rudder of the F.3 flying boat, by J. H. Parkin, H.C. Crane and S. L. Galbraith. Toronto, Toronto university, 1921. diagrs., illus. (School of engineering research bulletin no. 2, p. 111-14)

Force of an aileron balanced by the "backward hinge" method, by H. B. Irving and A. S. Batson. London, H.M. Stat. off., 1921. 3 p. diagrs. (A.R.C. R. & M. no. 760) (Abstract Flight, London, Nov. 16, 1922, v. 14, no. 46, p. 670)

Lateral control at large angles of incidence - yawing and rolling moments due to aileron movement on a complete model of S.E. 5A, by A. S. Batson and C. N. H. Lock. London, H.M. Stat. off., 1921. 15 p. diagrs., tables. (A.R.C. R. & M. no. 773)

The Manoeuvers of getting off and landing, by R. M. Hill. London, H.M. Stat. off., 1921. 36 p. (A.R.C. R. & M. no. 740) (effectiveness of control surfaces at low speeds)

Measurements of rudder moments on an airplane during flight, by V. Heidelberg. Washington, 1921. 23 p. illus., tables. (N.A.C.A. Technical notes no. 38) (From Z.F.M., München, Nov. 15-29, 1919, v. 10, no. 21-22, p. 236-41, 49-55)

Practical stability and controllability of airplanes, by F. H. Norton. Washington, U.S. Govt. print. off., 1921. 16 p. diagrs. (N.A.C.A. Report no. 120) (aileron - elevator effect of position and area)

Report of static test on engineering, division messenger airplane. Washington, U.S. Govt. print. off., 1921. 15 p. diagrs., illus. (Air service information circular no. 270)

Rudder balance for F.3 flying boat, by J. H. Parkin, E. V. Ahara and J.S.E. MacAllister. Toronto, Toronto university, 1921. diagrs., illus. (School of engineering research bulletin 2, p. 118-24)

The Balancing of ailerons by the Avro patent method, by H. B. Irving and A. S. Batson. (In An Investigation of the aerodynamic properties of wing ailerons) London, H.M. Stat. off., 1920. 6 p. diagrs., tables. (A.R.C. R. & M. no. 696)

Effect of yaw on the balance of ailerons of the Horn type, by H.B. Irving and A.S. Batson. (In Investigations of the aerodynamic properties of wing ailerons. London, H.M. Stat. off., 1920. 16 p. diagrs., tables. (A.R.C. R. & M. no. 728)

Lateral control at low speeds, by F.B. Bradfield and I.L. Peatfield. London, H.M. Stat. off., 1920. 12 p. diagrs., tables. (A.R.C. R. & M. no. 717) (effect of floating and interplane ailerons)

Model experiments on the pitching moment and hinge moment due to elevators of various sizes on **BE** 2C aeroplane, by H.B. Irving and A.S. Batson. London, H.M. Stat. off., 1920. 10 p. diagrs., tables. (A.R.C. R. & M. no. 679)

Pressure distribution on wing with fixed balanced aileron - square horn type, by A.S. Batson. London, H.M. Stat. off., 1920. 10 p. diagrs., tables. (A.R.C. R. & M. no. 709)

The Balancing of ailerons, by H.B. Irving and E. Ower. (In An Investigation of the aerodynamic properties of wing ailerons. London, H.M. Stat. off., 1919. 23 p. diagrs., tables. (A.R.C. R. & M. no. 651)

The Effect of variation of chord of ailerons, the effect of washout on ailerons, tests on ailerons of the Panther type, in which the ailerons do not extend to the wing tips, by H.B. Irving and E. Ower. (In An Investigation of the aerodynamic properties of wing ailerons. London, H.M. Stat. off., 1919. 25 p. diagrs., tables. (A.R.C. R. & M. no. 615)

The Investigation of the spin of an aeroplane, by H. Glauert. London, H.M. Stat. off., 1919. 35 p. diagrs., tables. (A.R.C. R. & M. no. 618) (effect of rudder and ailerons)

Maximum control of elevators of different sizes. London, H.M. Stat. off., 1919. diagrs., tables. (A.R.C. R. & M. no. 641)

Pressure distribution over the tailplane of B.E.2C. Part I, by L.W. Bryant and A.S. Batson. London, H.M. Stat. off., 1919. 22 p. diagrs., tables. (A.R.C. R. & M. no. 661)

The Effect of variation of plan form of every tip and of span of aileron, by H.B. Irving, E. Ower and G.A. Hankins. (In An Investigation of the aerodynamic properties of wing ailerons. London, H.M. Stat. off., 1918. diagrs., tables. (A.R.C. R. & M. no. 550)

The Longitudinal control of an aeroplane, by H. Glauert. London, H.M. Stat. off., 1918. 11 p. diagrs., tables. (A.R.C. R. & M. no. 470)

Methods employed at the Royal aircraft establishment for the experimental determination of the ultimate strength of aeroplane structures, by William D. Douglas and A. W. Clegg. London, H.M. Stat. off., 1918. 19 p. diagrs., illus. (A.R.C. R. & M. no. 476)

On a method of measuring rolling moments and aileron hinge moments on a model biplane, by H.B. Irving. London, H.M. Stat. off., 1918. 6 p. diagrs. (A.R.C. R. & M. no. 512)

Full-scale experiments with elevators of different sizes, by H. Glauert. London, H.M. Stat. off., 1917. 6 p. diagrs., tables. (A.R.C. R. & M. no. 409)

Model experiments on the fin effect of balanced and unbalanced rudder when hinged freely. London, H.M. Stat. off., 1917. (A.R.C. R. & M. no. 391)

The Effect of balancing a rudder, by placing the rudder axis behind the leading edge, upon the controlling moment on the machine, by William L. Cowley, L.F.G. Simmons and J. D. Coales. London, H.M. Stat. off., 1916. 3 p. diagrs., tables. (A.R.C. R. & M. no. 253)

Experiments on the effect of altering the position of the hinges of the elevators for the B.E. 2C aeroplanes, by L.W. Bryant and H.B. Irving. London, H.M. Stat. off., 1916. 8 p. diagrs., tables. (A.R.C. R. & M. no. 254)

Experiments on the possible rate at which a pilot can pull back the control column in an aeroplane. London, H.M. Stat. off., 1916. 4 p. diagrs., illus. (A.R.C. R. & M. no. 282)

Full-scale experiment on the moment about the hinge of the air forces on an elevator. Experiment on R.A.F. whirling arm. London, H.M. Stat. off., 1916. 5 p. diagrs., illus. (A.R.C. R. & M. no. 284)

Test on elevator of F.E. 5 aeroplane, by William L. Cowley, L. G. Simmons and J. D. Coales. London, H.M. Stat. off., 1916. diagrs. (A.R.C. R. & M. no. 249, p. 134-42)

Torsional vibrations of the tail of an airplane. Elevator control, supplementing by tailplane adjustment, by F.W. Lanchester, L. Bairstow and A. Fage. London, H.M. Stat. off., 1916. 10 p. diagrs. (A.R.C. R. & M. no. 276)

Considerations as to the aspect ratio of tail fin and an example of the effect of an overbanked spiral. London, H.M. Stat. off., 1915. 2 p. (A.R.C. R. & M. no. 164)

Experiments on bodies with fins and rudders. Part I. Tests of vertical fin surfaces at the rear of different shaped bodies. Part II. Design of fins for the body of R.E.8. Part III. Tests of model of F.E. 4 body and tail. Part IV. Tests of a model of F.E. 4 body with a modified tail system. Part V. Tests of the yawing moment at small angles of yaw, by L. W. Bryant, H.B. Irving, J.R. Pannell and N.R. Campbell. London, H.M. Stat. off., 1915. 43 p. diagrs., tables. (A.R.C. R. & M. no. 201)

Stability of an aeroplane which has springs in its control surface connections, by L. Bairstow and R. Jones. London, H.M. Stat. off., 1915. 8 p. (A.R.C. R. & M. no. 210)

The Effect of wing flaps or ailerons on the forces and moments of an aerofoil of R.A.F.-6 section, by J.L. Nayler, L.W. Bryant and H.B. Irving. (In Experiments on models of aeroplane wings) London, H.M. Stat. off., 1914. diagrs., tables. (A.R.C. R. & M. no. 152)

Effect on the forces and moments on a biplane by varying the form of the tail plane and elevator, by F.H. Bramwell and E.W. Stedman. (In Experiments on models of complete aeroplanes. London, H.M. Stat. off., 1914. diagrs., illus. (A.R.C. R. & M. Report no. 111, p. 141-67)

Équilibre automatique de l'aéroplane, par Joseph Rodet. Lyon, A. Rey, 1914. 30 p. illus.

Experiments on models in free flight in illustration of the conclusions arrived at from the mathematical investigation of stability, by Leonard Bairstow and J. L. Nayler. London, H.M. Stat. off., 1914. 6 p. illus. (A.R.C. R. & M. no. 117) (effect of rudder, elevator and dihedral fins on stability)

The Longitudinal motion of an aeroplane in a natural wind when use is made of the elevator, by Leonard Bairstow and J.L. Nayler. London, H.M. Stat. off., 1914. 11 p. diagrs. (A.R.C. R. & M. no. 121)

Tests on aeroplane bodies, by E. F. Relf. London, H.M. Stat. off., 1914. 7 p. diagrs., table. (A.R.C. R. & M. no. 112) (effect of tailplane airbrakes on elevator and rudders)

Report on full scale work, by Mervyn O'Gorman. London, H.M. Stat. off., 1913. 23 p. diagrs., illus., tables. (A.R.C. R. & M. no. 86)

Gyroscopic moment due to sudden use of elevator, by Mervyn O'Gorman. London, H.M. Stat. off., 1912. 3 p. (A.R.C. R. & M. no. 81)

Experiments on rudders and lifting planes, by Thomas E. Stanton and Leonard Bairstow. London, H.M. Stat. off., 1910. 6 p. diagrs. (A.R.C. R. & M. no. 24)

Section II

PERIODICAL ARTICLES, BOOKS, PAMPHLETS, ETC., ON CONTROL SURFACES CLASSIFIED BY SUBJECT

AILERONS

High wing loading and some of its problems from pilots' point of view, by H. P. Fraser. Journal of the R.A.S., London, May 1938, v. 42, no. 329, p. 405-44. (irreversible aileron control)

Improvement of aileron effectiveness by the prevention of air leakage through the hinge gap as determined in flight, by Hartley A. Soulé and W. Gracey. Washington, 1938. (N.A.C.A. Technical notes no. 632)

Aero-elastic problems, by A. G. Pugsley. Aircraft engineering, London, Oct. 1937, v. 9, no. 104, p. 268-75. diagrs. (wing aileron flutter and reversal of aileron control)

Some methods used in static testing of aircraft structures, by E.W. Walker. Aero digest, New York, May 1937, v. 30, no. 5, p. 30, 32.

Improved lateral control, by Phiroze P. Nazir. Flight, London, Dec. 31, 1936, Jan. 28, 1937, v. 30-31, no. 1462, p. 698a-e; 94a-f. diagrs., illus.

Considerations affecting the additional weight required in mass balance of ailerons, by Walter S. Diehl. Washington, 1937. 12 p. illus., tables. (N.A.C.A. Technical notes no. 609)

Experimental research on the effectiveness of ailerons and elevators, by T. Ogawa and K. Ito. Tokyo, Tokyo imperial university, 1937. 72 p. illus., tables. (Aeronautical research institute report no. 151)

Full scale tests of slotted flaps and ailerons on a Courier, by R. H. Francis. London, H.M. Stat. off., 1937. 20 p. diagrs., tables. (A.R.C. R. & M. no. 1819)

Full scale wind tunnel and flight tests of Fairchild 22 airplane equipped with Zap flap and Zap ailerons, by C.H. Dearborn and Hartley A. Soulé. Washington, 1937. 17 p. (N.A.C.A. Technical notes no. 596)

Theoretical span loading and moments of tapered wings produced by aileron deflection, by H.A. Pearson. Washington, 1937. 30 p. diagrs. (N.A.C.A. Technical notes no. 589)

CONTROL SURFACES - AILERONS

Wind-tunnel and flight tests of slot-lip ailerons, by Joseph A. Shortal. Washington, U.S. Govt. print. off., 1937. 25 p. diagrs., illus., tables. (N.A.C.A. Report no. 602)

Wind-tunnel investigation of wings with ordinary ailerons and full-span external airfoil flaps, by Robert C. Platt and Joseph A. Shortal. Washington, U.S. Govt. print. off., 1937. 22 p. diagrs., illus. (N.A.C.A. Report no. 603)

Wind-tunnel investigations of tapered wings with ordinary ailerons and partial span split flaps, by Carl J. Wenzinger. Washington, U.S. Govt. print. off., 1937. 9 p. diagrs., illus. (N.A.C.A. Report no. 611)

Stability and control, by Alexander Klemin. Journal of the aeronautical sciences, New York, Dec. 1936, v. 4, no. 2, p. 75.

Lateral control design, by Arthur G. B. Metcalf. Journal of the aeronautical sciences, New York, Sep. 1936, v. 3, no. 11, p. 393-97. diagrs. (aileron control effectiveness)

Bestimmung der luftkräfte auf einem ebenen tragflügel mit querruder, von G. Ellenberger. Z.A.M.M., Berlin, Aug. 1936, v. 16, no. 4, p. 199-226.

Die Strömung um einen tragflügel mit querruder, von C. Schmieder. Z.A.M.M., Berlin, Aug. 1936, v. 16, no. 4, p. 193-98.

Move toward simpler flying, by Fred E. Weick. S.A.E. journal, New York, May 1936, v. 38, no. 5, p. 176-88.

Mesure des moments de charnière au laboratoire Eiffel, par Jean Monnin. La Technique aéronautique, Paris, Jan.-Mar. 1936, v. 27, no. 139, p. 40-63. diagrs., illus.

Lateral and directional control, by R. P. Alston. Aircraft engineering, London, Feb. 1936, v. 8, no. 84, p. 31-32. diagrs.

W.I.A. airplane, by Fred E. Weick. Aviation, New York, Jan. 1936, v. 35, no. 1, p. 17-19. diagrs. (description of ailerons, elevators, rudders and their effects)

Full scale tests of Hartshorn ailerons on a Bulldog, by A.E. Woodward Nutt. London, H.M. Stat. off., 1936. 16 p. diagrs., tables. (A.R.C. R. & M. no. 1734)

Full scale tests of the Hendy Heck, with an appendix giving pilots notes, by A.E. Woodward Nutt and P. A. Hufton. London, H.M. Stat. off., 1936. 18 p. diagrs., illus., tables. (A.R.C. R. & M. no. 1719) (aileron, elevator and rudder control actions on this airplane)

CONTROL SURFACES - AILERONS

Nature of torsion-aileron flutter of wing as revealed by analytical experiments, by K. Sezawa and K. Kubo. Tokyo, Tokyo imperial university, 1936. 55 p. plates. (Aeronautical research institute report no. 136)

A New form of biplane, by H.B. Irving and A. S. Batson. London, H.M. Stat. off., 1936. 44 p. diagrs., illus., tables. (A.R.C. R. & M. no. 1715)

Reduction of aileron operating force by differential linkage, by Robert T. Jones and Albert I. Nerken. Washington, 1936. 13 p. diagrs. (N.A.C.A. Technical notes no. 586)

Les Ailerons hypersustentateurs Pouit. Les Ailes, Paris, Mar. 7, 1935. 1 p. diagrs., illus.

Ailerons shape and size, by C. Habinskaya. Moscow, Scientific technical department of the Supreme council of national economy, 1935. 43 p. (C.A.H.I. Transactions no. 230)

Development of the N.A.C.A. slot-lip aileron, by Fred E. Weick and Joseph A. Shortal. Washington, 1935. 10 p. diagrs., illus. (N.A.C.A. Technical notes no. 547)

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