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Performance Series record of documents

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PERFORMANCE SERIES RECORD OF DOCUMENTS

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PERFORMANCE SERIES RECORD OF DOCUMENTS

1. PREFACE TO PERFORMANCE SERIES

The aim of these Data Items is to provide, in a form convenient to aeronautical engineers, information relating to the analysis and estimation of Aircraft Performance. The results of much valuable work, both theoretical and practical, are frequently not applied because they are buried in a large number of technical reports which engineers have not the time to discover or to read. In addition, much information exists which has never been published. Accordingly, the ESDU Performance Committee is appointed to examine published and unpublished information, to correlate experimental data, to assess theoretical predictions and to publish, in the form of Data Items the best information available in the light of present knowledge.

The present constitution of the Performance Committee is:

Chairman

Mr G.J.R. Skillen	—	Independent
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Vice-Chairman

Mr K.J. Balkwill	—	Independent
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Members

Mr P.V. Aidala [†]	—	Northrop Grumman ESID, Bethpage, New York, USA
Dr J.D. Avery	—	Independent, UK
Mr M. Baxter	—	BAE SYSTEMS, Brough, UK
Mr M. Broad	—	Independent, UK
Mr E. Burdak [†]	—	Pilatus Aircraft Ltd, Switzerland
Mr A. Dalton	—	MoD, Boscombe Down, UK
Mr G.W.H. van Es	—	National Aerospace Laboratory NLR, The Netherlands
Mr P. Giesman [†]	—	Federal Aviation Administration, USA
Mr S.J. Hyde	—	BAE SYSTEMS, Prestwick, UK
Mr L. Kornstaedt	—	Airbus Industrie, Toulouse, France
Mr D.A. Law	—	Independent, UK
Mr C.J. Loughton	—	Independent, UK
Mr P.E.C.S. Magalhaes [†]	—	Embraer, São José dos Campos, Brazil
Mr R.J. Orlowski [†]	—	Boeing Commercial Airplane Company, Seattle, Washington, USA
Dr P. Render	—	University of Loughborough, UK
Mr G.E. Smith	—	Independent, UK
Mr R. Storey	—	Independent, UK
Captain D. Thomas	—	Independent, UK
Mr S. Tsach [†]	—	Israel Aircraft Industries, Jerusalem, Israel
Mr C.J. Turner [†]	—	Boeing Commercial Airplane Company, Seattle, Washington, USA
Mr J. Werner [†]	—	Cessna Aircraft Company, Kansas, USA

Technical Staff

Dr J.D. Avery	—	Consultant
Mr K.J. Balkwill	—	Consultant
Mr A.J. Grundy	—	Consultant
Mr R.S.D. Sayers	—	Senior Engineer
Mr R. Storey	—	Consultant
Mr G.J.R. Skillen	—	Consultant
Mr C.J. Whittaker	—	Head, Performance Group

The Performance Committee has the assistance of many individuals in the aircraft industry, in research and educational establishments. From these sources much unpublished work is available to the Committee.

Since the Committee first met in June 1946 under the Chairmanship of Mr Handel Davies, there have been a number of changes in its membership and technical staff, so that many from the aircraft industry and research establishments have assisted in the preparation of the data sheets and memoranda.

[†] Corresponding Member

2. NUMBERING OF DATA ITEMS IN PERFORMANCE SERIES

Data Items issued prior to 1965 were classified by use of the following numbering system. They were divided into two sections, one on Performance Reduction[†] and the other on Performance Estimation indicated by the first letter, R or E respectively, of the double-letter prefix to the Item Number. Items in the first section were given the prefixes RG for general, RJ for turbo-jet, RT for turbo-prop and RP for piston engine, while in the estimation section there were two prefixes only, EG for general and ED for drag. Within each group of Items with a particular prefix each Item received a number of the form, for example, 1/3 where the first digit defined a subject area and the second was a running number in that area. All such Items were originally printed in a foolscap size and those that remain have been either photo reduced to A4 size or revised and re-issued in A4 format. All Items have been re-typed for the electronic version of the Series and these versions will be used as the basis of future amended issues.

Items issued since 1965 are in A4 size and carry a five digit number, the first two digits of which indicate an approximate year of issue and the remaining three give a sequential number within the total output of ESDU for that year. *Thus Items issued at different times receive quite unrelated numbers.* This change in numbering policy was made because rigid classification systems designed twenty years earlier were proving inadequate to deal with later Items. Guide Sections, detailed in Section 3, are used to divide the various subject related groupings and a Location Schedule for the complete Series is included in Section 4. An amendment record for the Performance Series is given in Section 5.

[†] The term “performance reduction” was originally applied to processes by which a given measurement could be incrementally adjusted to provide performance data applicable to a particular aircraft weight and “standard” atmospheric conditions, both little removed from the values at the time of test. Unfortunately the earlier Items extended the use of the term to cover any method of processing flight data. Where the term “performance analysis” is more appropriate, see ESDU 80009, the terminology is being corrected as the Items are updated.

3. SECTIONS FOR PERFORMANCE SERIES

SECTION NUMBER	SECTION TITLE
1	Explanatory and General Guidance
2	Equations of Motion
3	Atmospheric Data
4	Airspeed Data
5	Drag of Airframes
6	Drag of Engines
7	Estimation – Jet and Fan Engine Thrust
8	Estimation – Propellers
9	Tyre-runway Forces
10	Tyre Spray
11	Airfield Performance – General
12	Airfield Performance – Contaminated Runways
13	Landing
14	Estimation – Take-off
15	Estimation – Range and Endurance
16	Flight Path Optimisation
17	Estimation – Manoeuvres
18	Statistical Techniques
19	Similarity Methods
20	Fitting of Functions
21	Air Data – Flight Test Measurement
22	Air Data – Sensor Calibrations and Errors
23	Thrust Determination
24	Analysis – Jet Aeroplanes
25	Reduction Methods – Aeroplanes
26	Analysis – Turbine Helicopters
27	Aircraft Performance Program
28	Risk – Treatment and Analysis

4. LOCATION SCHEDULE FOR DATA ITEMS IN PERFORMANCE SERIES

Item No.	Section	Item No.	Section	Item No.	Section
68046	3	87018	14	08004	28
69006	23	87037	14	08005	28
69007	23	87038	22	08006	28
69008	23	88006	5	08010	19
69026	4	88025	21	08014	11
70020	24			10002	12
70021	24	89015	16	10003	12
70022	24	90012	16	10004	12
70023	24	91016	16	10015	12
		91017	18	11004	12
71025	9	91018	18	13002	12
72018	3	91019	18	13006	27
73018	15	91020	18	13007	12
73019	15	91032	13	15001	24
73026	26			15002	9
73027	26	92019	2	15003	9
		92020	13	15007	12
74018	15	92021	18	15008	12
74041	15	92022	18	15009	9
		93020	21	16003	24
74042	26	93021	16		
75018	15	93023	18	PERF ED 1/1	8
76011	14			PERF ED 1/2	8
76034	7	94012	16		
		94016	16	PERF EG 5/1	14
77001	7	94039	2	PERF EG 6/2	13
77015	15	94040	2	PERF EG 6/4	13
77022	3	94044	5	PERF EG 8/1	17
78012	3			PERF EG 8/2	17
78038	2	95024	22		
79018	24	96024	18	PERF RG 2/1	11
		97016	5		
80009	1	97025	19	PERF RJ 1/2	24
80026	1	98001	10	PERF RJ 2/0	25
80032	2	98026	19	PERF RJ 2/1	25
81009	6	99015	11		
81026	5	99016	11	PERF RT 1/0	25
81046	2	99017	11	PERF RT 1/1	25
82033	14	99035	1	PERF RT 1/2	25
		00018	11	PERF RT 1/3	25
83001	8	00031	27		
83028	8	00032	27	PERF RP 1/0	25
83029	21	00033	27	PERF RP 1/1	25
83042	10	00034	27	PERF RP 1/2	25
84004	6	00035	27	PERF RP 1/3	25
84005	6	00036	27	PERF RP 2/0	25
84007	22	00037	27		
84040	13	00038	27	TM 95	11
85011	22	00039	27	TM 96	11
85029	11			TM 151	12
85030	11	01011	20	TM 161	12
85036	22	04008	1	TM 165	12
		04012	1	TM 167	12
86004	2	05011	12	TM 170	12
86006	22	06025	20	TM 174	12
86031	21	08003	28	TM 176	12

5. AMENDMENT RECORD FOR PERFORMANCE SERIES

So that the user may at any time check where previous amendments to the Series have been made, the following is a complete list of those changes. Further details relating to the changes made may always be obtained from ESDU. An asterisk (*) in the left-hand margin here denotes a change from the previous issue.

This list is complete up to Supplementary Issue No. 112, July, 2016. The following table indicates the current amendment status of the Series.

Supplementary Issue No.	108	109	110	111	112
Amendments carried out	✓	✓	✓	✓	✓
Date	Sep. 2015	Oct. 2015	Nov. 2015	May 2016	July 2016

Item		Change	Dated
Conversion factors	–	Replaced by reprint.	Sep. 1969
Classification	Withdrawn	Superseded by Numbering.	Oct. 1975
Numbering	Amend. A	Replaced by reprint.	June 1981
	Amend. B	Replaced by reprint.	Aug. 1992
	Amend. C	Replaced by reprint.	July 1995
	Withdrawn	Incorporated into Item No. 99035.	Nov. 1999
Corrigenda	Amend. A	Page 1, Table 1 covered by label. Page 2, line 7, RJ 1/0 deleted.	Nov. 1970
	Amend. B	Revised version issued as single sheet. Withdrawn.	Feb. 1992 July 2010
ED 1/1	–	Page 1, red label in top left corner	Aug. 1969
PERF ED 1/1	Amend. A	Complete reprint incorporating Amendment A. Item No. changed from ED 1/1 to PERF ED 1/1.	July 2010
ED 1/2	–	Page 1, red label in top left corner.	Aug. 1969
	–	Replaced by A.4 format reprints.	Dec. 1984
PERF ED 1/2	Amend. A	Complete reprint incorporating Amendment A. Item No. changed from ED 1/2 to PERF ED 1/2.	July 2010
EG 0/0	Withdrawn	Superseded by Item No. 80032.	Nov. 1980
EG 1/1	–	Page 1, red label in top left corner.	Aug. 1969
	Withdrawn	Superseded by Item No. 80032 and 81026.	Nov. 1980 Sep. 1981
EG 2/1	Withdrawn		Aug. 1977
	–	Superseded by Item No. 86004.	May 1986