

ASLIB
CRANFIELD RESEARCH
PROJECT

**FACTORS DETERMINING THE PERFORMANCE
OF INDEXING SYSTEMS**

VOLUME 1. DESIGN

by

Cyril Cleverdon, Jack Mills and Michael Keen

Part 2. Appendices

**An investigation supported by a grant to ASLIB
by the National Science Foundation**

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Cranfield

1966

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PART 2

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INTRODUCTION TO APPENDICES

The appendices which follow provide complete information concerning the collection of documents and the set of questions used in the investigation, and are included with the intention that it should be possible for anyone - if they should wish to do so - to repeat the test. The main elements in this are the list of 1,400 documents (Appendix 3C), the list of 279 questions (Appendix 3D), and the complete relevance assessments of all the documents against all the questions (Appendix 3G). Not included is the indexing for each of the documents, since this would have added some seven hundred pages to this volume. However, to anyone interested, copies of the indexing sheets could be made available, either the complete set or any of the subsets which are given in Appendix 3E.. Alternatively, as the indexing has been put on to magnetic tape, a copy of the tape could be supplied.

The later appendices are mainly concerned with various arrangements of the terms used in the indexing of the documents, and illustrate the problems discussed in Chapters 4 and 5 of this volume.

APPENDIX 3A

First letter and enclosures sent to authors of research papers

For some years, with the aid of grants from the National Science Foundation, Washington, work has been undertaken at Cranfield into the efficiency of various techniques for indexing scientific and technical information. This investigation is now moving into a new phase, for which we are seeking the assistance of a number of scientists and engineers, and this letter is addressed to you as the author of a recent research paper.

The basic problem of information retrieval lies in the relationship between the desired recall of relevant documents ("message") and the unwanted recall of non-relevant documents ("noise"). In this respect, we have been able to make rough measurements of the performance of certain existing systems, and in the future work, we shall attempt to refine these measurements and reach a point where systems can be designed to meet given performance and economic requirements.

Before an investigation of this nature can be done, it is necessary to have:

- (a) a collection of documents,
- (b) a number of questions to be used for searching,
- (c) an assessment of the documents in the collection regarding their relevance to each of the search questions.

Briefly, our hope is that we will, with your assistance, be able to meet these requirements in the following way. The collection of documents will consist of the references (apart from books or papers written prior to 1954) contained in approximately 400 recent papers which will be mainly in the field of aerodynamics. We ask you, as author of such a paper, to give us the original problem which

Continued.....

occasioned the research and also some other questions which arose in the course of the work and which might have been responsible for the inclusion of any particular papers in the list of references. We then ask that each reference shall be given an assessment rating for each question.

If you feel that you cannot spare the time to do this, I should be grateful if you would let me know, but I am, of course, hoping that you will be able to assist us and assure you that your help will be most welcome. The preceding paragraph is a general outline of what we wish you to do, but in the enclosed sheets we have given more details and have also included some examples for your guidance. The sheet we ask you to complete and return lists the references in your papers which would be included in the document collection.

As I have said earlier, we hope for and would greatly appreciate your co-operation in helping us to investigate this problem of information retrieval. If it is a subject in which you are interested, I should be pleased to send you a copy of a report that was recently issued on our work so far.

Yours sincerely,

Director,
Aslib Cranfield Project.

INSTRUCTIONS FOR ENTERING QUESTIONS AND RELEVANCE ASSESSMENT

On the front of the attached sheet is entered the title and reference of a paper which you have published fairly recently. Would you please enter at (A) the basic problem, as closely as possible in the form of a search question, which was the reason for the research being undertaken. In addition would you please list any other questions (up to three in number) which, in the course of the work, you did put or might have put to an information service.

A number of the references which were given in your paper are listed on the reverse of the attached sheet, and it is assumed that they are all, in varying degrees, relevant to at least one of your questions. We would ask you to mark on this page in the appropriate column your assessment (1, 2, 3, 4 or 5) of the relevance of each reference in relation to each of the questions that you have listed.

This assessment of relevance should be based on the following definitions :-

- Mark as (1) references which are a complete answer to the question. Presumably this would only apply for supplementary questions, i.e. (B), (C) or (D) since if they applied to the main question, there would have been no necessity for the research to be done.
- Mark as (2) references of a high degree of relevance, the lack of which either would have made the research impracticable or would have resulted in a considerable amount of extra work.
- Mark as (3) references which were useful, either as general background to the work or as suggesting methods of tackling certain aspects of the work.
- Mark as (4) references of minimum interest, for example, those that have been included from a historical viewpoint.
- Mark as (5) references of no interest.

It is appreciated that it is not easy to do this objectively, for personal considerations tend to influence judgement. If you find that in certain cases you are uncertain as to which rating should be used, then we suggest that your doubts should be shown by giving a combined rating. An instance of this occurs in the example which we enclose of a sheet that has been completed by Dr. J. F. Clarke. In relation to his basic question A, he decided that references 1, 2, 3 and 5 were considered of no interest, and were therefore marked with a rating of '5'; reference 4 was assessed as falling between ratings '2' and '3' and this is indicated by his marking of '2-3'. For question B references 1 and 2 were rated at '1' while for question C, references 3 and 4 received this rating. Reference 4, as will be seen, was considered by Dr. Clarke to have varying degrees of relevance to questions A, B and C, but was not relevant to question D.

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EXAMPLE

ASLIB CRANFIELD INVESTIGATION INTO
PERFORMANCE OF INDEX LANGUAGES

Please complete and return to:

C. W. Cleverdon,
The College of Aeronautics,
Cranfield, Bletchley,
Bucks., England.

AUTHOR J. F. Clarke
TITLE Reaction-resisted Shock Fronts.
REFERENCE College of Aeronautics Report No. 150, May 1961.

BASIC QUESTION

- (A) Has anyone investigated the role of chemical reactions in determining shock wave structure?
-
- (B) Papers on acoustic wave propagation in reacting gases.
-
- (C) Have other types of 'non-viscous' compression waves been investigated analytically or observed experimentally
-
- (D) Is there any simple, but realistic, "model" gas which can be used to expedite analysis?

LIST OF REFERENCES

Ref. No.	ASSESSMENT			
	Question			
	A	B	C	D
1. Clarke, J. F. Flow of chemically reacting gas mixtures. College of Aeronautics Report 117.	5	1	5	3
2. Clarke, J. F. Linearized flow of a dissociating gas. Jnl. Fluid Mech., <u>7</u> , 1960, pp 577-595.	5	1	5	5
3. Griffith, W. C. and Kenny, A. Jnl. Fluid Mech. <u>3</u> , 1957, p. 268.	5	5	1	5
4. Lighthill, M. J. Survey in Mechanics, Ed. by G. K. Batchelor and R. M. Davies, Cambridge University Press, 1956.	2-3	3	1	5
5. Lighthill, M. J. Dynamics of a dissociating gas. Jnl. Fluid Mech., <u>2</u> , 1957, pp 1-32.	5	5	5	1

APPENDIX 3B

Second letter and enclosures sent to authors of research papers.

You may recollect that some months ago you were kind enough to help in our investigation into the efficiency of indexing systems. Since that time we have been engaged in indexing the documents in the collection and preparing for the test programme. In this we shall be using the questions which you, together with some two hundred other authors, compiled for us. You may remember that at that time we also asked you to make a relevance assessment against the questions you gave us, of some of the references included in your paper.

There have been external developments concerning our project during the past few months, and this is largely due to the co-operation which we have received from you and others whose assistance we requested. As you may possibly know, major efforts are being made to develop the use of computers for automatic translation and also for the automatic indexing of documents. The latter work has been proceeding at various levels but a number of groups have been concerned with what is usually known as associative indexing. Briefly, this involves having a computer analyse the key terms used in a collection of documents, and working out, usually by some statistical technique, the most useful associations of terms to be used in searching. For some time the National Science Foundation have been interested in having a collection of documents that can be used as a common corpus by the various groups working in this field, so that a relative assessment can be made of their differing techniques. The collection which we have

compiled has been selected for such a common corpus, with the result that the work which you did for us will be used additionally by groups working at Cambridge and at a number of American Universities or Research Establishments.

In addition, there is a further recently developed technique known as Citation Indexing. This depends on building up an index which allows one to find which papers have quoted an earlier paper. For instance, if one wished to find information on the area rule one might look up the early paper by G. Ward on this subject, and find, from the index, references to all the papers which had quoted it, on the assumption that these papers would have some relevance to the original subject. This is an assumption, the validity of which, we are testing.

As you may have guessed, this preamble is a lead in to ask whether you would be willing to help us further in two ways. In relation to the questions which you provided, you gave a relevance assessment of some or all of the references in your original paper. It is these references which, with those from similar papers, make up our collection of 1,400 documents. The result is that there may be in the total collection additional papers which are relevant to your questions. This could be either because they appeared after your work was published, because you knew of them but did not list them, because you included them in your list of references but we omitted them from our list, or because they did not come to your attention. We have had a number of post-graduate students analysing every document in the collection against each question, with the intention that we should have a matrix which will show the relevance of each document to each question. My instructions to the students were to list anything which might possibly be relevant, so my first request to you is to ask if you will check these assessments that have been done by the students. The papers concerned are listed on the attached sheet, together with the original questions, and I also include abstracts of the papers to help you decide.

The second matter concerns the questions which you prepared for us. Developments in testing indexing systems during the past few months have shown up, in a way not previously recognised, the importance of the actual search programmes. It is usually found that, within a question, certain aspects are more important than others, and this we would like you to indicate as far as possible by giving a "weighting" to each concept, as described in the attached sheets. Finally,

if you can suggest any related terms which you consider could be used as alternatives in searching, we would be grateful if you would give them.

I have set out these additional tasks in the order of their importance. Whilst we would, of course, be pleased if you could supply the answers to all these enquiries, most important is the relevance assessment, and I shall be very grateful if you can find time to deal with this matter.

Director
Aslib Cranfield Project

ASSESSMENT OF ADDITIONAL DOCUMENTS

The first attached sheet is a copy of the form which you originally completed by entering the questions that arose in the course of your research work. These questions were marked A, B, C, and D. The next sheet lists references to additional documents which we have located in the total collection and consider might be relevant to one or more of your questions. The four-figure file number for each document is followed by a letter or letters and these refer to your questions. It is only in relation to the particular question so indicated that we ask for your assessment of the relevance of the document. To assist you in this task we include abstracts of each paper listed.

The assessment of relevance should be, as before, based on the following definitions :-

- Mark as (1) references which are a complete answer to the question. Presumably this would only apply for supplementary questions, i.e. (B), (C) or (D) since if they applied to the main question, there would have been no necessity for the research to be done.
- Mark as (2) references of a high degree of relevance, the lack of which either would have made the research impracticable or would have resulted in a considerable amount of extra work.
- Mark as (3) references which were useful, either as general background to the work or as suggesting methods of tackling certain aspects of the work.
- Mark as (4) references of minimum interest, for example, those that have been included from a historical viewpoint.
- Mark as (5) references of no interest.

WEIGHTING AND NEW TERMS

On the attached sheets are listed the terms as given in your questions. In the box by the side of each term we would ask you to indicate its relative importance by marking 1, 2, or 3. These figures will indicate :-

1. A paper that did not cover this term would be of no use.
2. It is desirable that this term should be covered by the document.
3. This is a term which is not absolutely essential to the enquiry.

It may well be that you will rate each term as one; this would not be surprising but we would not wish to influence your decision in this respect.

Over the remainder of the sheet space is left for you to insert any alternative terms that you consider might be used in the search programme. In this case, however, it is more likely that you would wish to show alternative concepts rather than single terms, so the terms have been grouped into concepts. As examples of alternative terms or concepts, in the context of a question dealing with "pressure gradient", it might be reasonable to substitute "pressure distribution" or "pressure variation"; the concept "suddenly heated wall" might be changed to "rapidly cooled solid". Alternatively, the complete question might be rephrased, an example of this being where the original question was "has anyone investigated relaxation effects on gaseous heat transfer to a suddenly heated wall". Rephrased the question becomes "has anyone investigated conditions at the wall behind a plain reflected shock front in a real gas by theoretical analysis". If you would wish to rewrite your question in this way space is available on the sheet.

QUESTION 249 Is it possible to estimate the transonic drag-rise and buffet boundaries of aerofoils without recourse to experiment

Search Terms	Weight	Alternative Terms or Concepts
Transonic	1	Mixed subsonic/supersonic
Drag	2	
Rise	2	
Buffet	3	Onset of shock induced boundary layer separation
Boundary	3	
Aerofoil	1	Wing section
Theoretical		
Estimation		

Rephrased Question:

Is it possible to obtain a theoretical estimate of the transonic drag-rise and onset of shock-induced boundary layer separation Mach numbers for two-dimensional aerofoils

APPENDIX 3C

LIST OF 1400 DOCUMENTS IN THE TEST COLLECTION

- 1001 BRENNCKMAN, M. Experimental investigation of the aerodynamics of a wing in a slipstream. J. Ae. Scs. 25, 1958, 324.
- 1002 LI, T.Y. Simple shear flow past a flat plate in an incompressible fluid of small viscosity. J. Ae. Scs. 22, 1955, 651.
- 1003 GLAUERT, M.B. The boundary layer in simple shear flow past a flat plate. J. Ae. Scs. 24, 1957, 848.
- 1004 YEN, K.T. Approximate solutions of the incompressible laminar boundary layer equations for a plate in shear flow. J. Ae. Scs. 22, 1955, 728.
- 1005 WASSERMAN, B. One-dimensional transient heat conduction into a double-layer slab subjected to a linear heat input for a small time interval. J. Ae. Scs. 24, 1957, 924.
- 1006 CAMPBELL, W.F. One-dimensional transient heat flow in a multilayer slab. J. Ae. Scs. 25, 1958, 340.
- 1007 Van DRIEST, E.R. and McCAULEY, W.D. The effect of controlled three-dimensional roughness on boundary layer transition at supersonic speeds. J. Ae. Scs. 27, 1960, 261.
- 1008 KLEBANOFF, P.S. Measurements of the effect of two-dimensional and three-dimensional roughness elements on boundary layer transition. J. Ae. Scs. 22, 1955, 803.
- 1009 KORKEGI, R.H. Transition studies and skin friction measurements on an insulated flat plate at a Mach number of 5.8. J. Ae. Scs. 23, 1956, 97.
- 1010 CHAMBERE, P.L. and SCHAAF, S.A. The theory of the impact tube at low pressure. J. Ae. Scs. 15, 1948, 735.
- 1011 NAPOLITANO, L. Similar solutions in compressible laminar free mixing problems. J. Ae. Scs. 23, 1956, 389.
- 1012 BISPLINGHOFF, R.L. Some structural and aerelastic considerations of high speed flight. J. Ae. Scs. 23, 1956, 289.
- 1013 TSIEN, H.S. Similarity laws for stressing heated wings. J. Ae. Scs. 20, 1953, 1.
- 1014 ASHLEY, H. and ZARTARIAN, G. Piston theory - a new aerodynamic tool for the aero-elastician. J. Ae. Scs. 23, 1956, 1109.
- 1015 FUNG, Y.C. On two-dimensional panel flutter. J. Ae. Scs. 25, 1958, 145.
- 1016 MAGER, A. Transformation of the compressible turbulent boundary layer. J. Ae. Scs. 25, 1958, 305.
- 1017 TING, L. and LIBBY, P.A. Remarks on the eddy viscosity in compressible mixing flows. J. Ae. Scs. 27, 1960, 797.
- 1018 RHYMING, I.L. The flow field in the diffuser of a radial compressor. J. Ae. Scs. 27, 1960, 798.
- 1019 ZAKKAY, V. An investigation of the pressure distribution on conical bodies in hypersonic flows. J. Ae. Scs. 26, 1959, 457.
- 1020 LOVE, E.S. Generalised-Newtonian theory. J. Ae. Scs. 26, 1959, 314.
- 1021 MASLEN, S.H. On heat transfer in slip flow. J. Ae. Scs. 25, 1958, 400.
- 1022 OMAN, R.A. and SCHEUING, R.A. On slip-flow heat transfer to a flat plate. J. Ae. Scs. 26, 1959, 126.
- 1023 SEBAN, R.A. and BOND, R. Skin-friction and heat transfer characteristics of a laminar boundary layer on a cylinder in axial incompressible flow. J. Ae. Scs. 18, 1951, 671.
- 1024 FAY, J.A. and RIDDELL, F.R. Theory of stagnation point heat transfer in dissociated air. J. Ae. Scs. 25, 1958, 73.
- 1025 LEES, L. and KUBOTA, T. Inviscid hypersonic flow over blunt-nosed slender bodies. J. Ae. Scs. 24, 1957, 195.
- 1026 CHENG, H.K. and PALLONE, A.J. Inviscid leading-edge effect in hypersonic flow. J. Ae. Scs. 23, 1956, 700.
- 1027 COLE, J.D. Newtonian flow theory for slender bodies. J. Ae. Scs. 24, 1957, 448.
- 1028 FREEMAN, N.C. A note on the explosion solution of Sedov with application to the Newtonian theory of unsteady hypersonic flow. J. Ae. Scs. 27, 1960, 77.
- 1029 ISAKSON, G. A simple model study of transient temperature and thermal stress distribution due to aerodynamic heating. J. Ae. Scs. 24, 1957, 611.

- 1030 GERARD, G. and TRAMPOSCH, H. Photo-thermoelastic investigation of transient thermal stresses in a multiweb wing structure. J. Ae. Scs. 26, 1959, 783.
- 1031 HOFF, N.J. Thermal buckling of supersonic wing panels. J. Ae. Scs. 23, 1956, 1019.
- 1032 FRIEDRICH, H.R. and DORE, F.J. The dynamic motion of a missile descending through the atmosphere. J. Ae. Scs. 22, 1955, 628.
- 1033 RESLER, E.J. and SEARS, W.R. The prospects for magneto-aerodynamics. J. Ae. Scs. 25, 1958, 235.
- 1034 KERREEROCK, J.P. and MARBLE, F.E. Constant-temperature magneto-gasdynamic channel flow. J. Ae. Scs. 27, 1960, 78.
- 1035 LI, T.Y. and GEIGER, R.E. Stagnation point of a blunt body in hypersonic flow. J. Ae. Scs. 24, 1957, 25.
- 1036 SERBIN, H. Supersonic flow around blunt bodies. J. Ae. Scs. 25, 1958, 58.
- 1037 FERRI, A. and LIBBY, P.A. A new technique for investigating heat transfer and surface phenomena under hypersonic flow conditions. J. Ae. Scs. 24, 1957, 464.
- 1038 SINNOTT, C.S. On the prediction of mixed subsonic/supersonic pressure distributions. J. Ae. Scs. 27, 1960, 767.
- 1039 SINNOTT, C.S. On the flow of a sonic stream past an airfoil surface. J. Ae. Scs. 26, 1959, 169.
- 1040 Van DRIEST, E.R. and BOISON, J.C. Experiments on boundary layer transition at supersonic speeds. J. Ae. Scs. 24, 1957, 885.
- 1041 MORKOVIN, M.V. On transition experiments at moderate supersonic speeds. J. Ae. Scs. 24, 1957, 480.
- 1042 SCANLAN, R.H. and TRUMAN, J.C. The gyroscopic effect of a rigid rotating propeller on engine and wing vibration modes. J. Ae. Scs. 17, 1950, 653.
- 1043 POTTER, J.L. and WHITFIELD, J.D. The relation between wall temperature and the effect of roughness on boundary layer transition. J. Ae. Scs. 28, 1961, 663.
- 1044 BERTRAM, M.H. Tip-bluntness effects on cone pressures at $M=6.85$. J. Ae. Scs. 23, 1956, 898.
- 1045 CHARWAT, A.F. An investigation of separated flows, Part II: Flow in the cavity and heat transfer. J. Ae. Scs. 28, 1961, 513.
- 1046 KLEIN, B. Some comments on the inversion of certain large matrices. J. Ae. Scs. 28, 1961, 432.
- 1047 SAMSON, S.H. and BERGMANN, H.W. Analysis of low-aspect-ratio aircraft structures. J. Ae. Scs. 27, 1960, 679.
- 1048 WILLETT, J.E. Supersonic flow at the surface of a circular cone at angle of attack. J. Ae. Scs. 27, 1960, 907.
- 1049 CHAPMAN, D. and RUBESIN, M. Temperature and velocity profiles in the compressible laminar boundary layer with arbitrary distribution of surface temperature. J. Ae. Scs. 16, 1949, 547.
- 1050 Van DRIEST, E.R. Investigation of laminar boundary layer in compressible fluids using the Crocco method. NACA TN.2597, 1952.
- 1051 O'SULLIVAN, W.J. Theory of aircraft structural models subjected to aerodynamic heating and external loads. NACA TN.4115, 1957.
- 1052 MORGAN, H.G. Procedure for calculating flutter at high supersonic speed including camber deflections, and comparison with experimental results. NACA TN.4335, 1958.
- 1053 LARSON, H.K. and KEATING, S.J. Transition Reynolds numbers of separated flows at supersonic speeds. NASA TN.D349, 1960.
- 1054 MORDUCHOW, M. and CLARKE, J.H. Method for calculation of compressible laminar boundary layer characteristics in axial pressure gradient with zero heat transfer. NACA TN.2784, 1952.
- 1055 MORDUCHOW, M. and GRAPE, R.G. Separation, stability and other properties of compressible laminar boundary layer with pressure gradient and heat transfer. NACA TN.3296, 1955.
- 1056 EHRET, D.M. An analysis of the applicability of the hypersonic similarity law to the study of the flow about bodies of revolution at zero angle of attack. NACA TN.2250, 1950.

- 1057 ROSSOW, V.J. Applicability of the hypersonic similarity rule to pressure distributions which include the effects of rotation for bodies of revolution at zero angle of attack. NACA TN.2399, 1951.
- 1058 AMICK, J.L. Pressure measurements on sharp and blunt 5° and 15° half-angle cones at Mach number 3.86 and angles of attack to 100° . NASA TN.D753, 1961.
- 1059 BROWN, W.D. and DONOUGHE, P.L. Tables of exact laminar-boundary layer solutions when the wall is porous and fluid properties are variable. NACA TN.2479, 1951.
- 1060 BOBBITT, P.J. and MALVESTUTO, F.S. Estimation forces and moments due to rolling for several slender tail configurations at supersonic speeds. NACA TN.2955, 1953.
- 1061 ROSSOW, V.J. On flow of electrically conducting fluids over a flat plate in the presence of a transverse magnetic field. NACA TN.3971, 1957.
- 1062 COHEN, C.B. and RESHOTKO, E. Similar solutions for the compressible laminar boundary layer with heat transfer and pressure gradient. NACA TN.3325, 1955.
- 1063 TALBOT, L. Hypersonic viscous flow over slender cones. NACA TN.4327, 1958.
- 1064 MOORE, F.K. Unsteady oblique interaction of a shock wave with plane disturbances. NACA TN.2879, 1953.
- 1065 RIEMER, H.S. Convection of a pattern of vorticity through a shock wave. NACA TN.2864, 1953.
- 1066 GRIFFITH, G.E. and MILTONBERGER, G.H. Some effects of joint conductivity on the temperature and thermal stresses in aerodynamically heated skin-stiffener combinations. NACA TN.3609, 1956.
- 1067 TOBAK and ALLEN. Dynamic stability of vehicles traversing ascending or descending paths through the atmosphere. NACA TN.4275, 1958.
- 1068 LOVE, E.S. Some aspects of air-helium simulation and hypersonic approximations. NASA TN.D49, 1959.
- 1069 KAATTARI, G.E. Predicted shock envelopes about two types of vehicles at large angles of attack. NASA TN.D860, 1961.
- 1070 NITZBURG, G.E. and CRANDALL, S. A study of flow changes associated with airfoil section drag rise at supercritical speeds. NACA TN.1813, 1949.
- 1071 MIRELS, H. Laminar boundary layer behind shock advancing into stationary fluid. NACA TN.3401, 1955.
- 1072 MIRELS, H. Boundary layer behind shock or thin expansion wave moving into stationary fluid. NACA TN.3712, 1956.
- 1073 LEES, L. and LIN, C.C. Investigation of the stability of the laminar boundary layer in a compressible fluid. NACA TN.1115, 1946.
- 1074 GOODERUM, P.N. An experimental study of the turbulent boundary layer on a shock tube wall. NACA TN.4243, 1958.
- 1075 HESS, N.W. Studies of structural failure due to acoustic loading. NACA TN.4050, 1957.
- 1076 MULL, H.R. and ALGRANTI, J.S. Flight measurement of wall pressure fluctuations and boundary-layer turbulence. NASA TN.D280, 1960.
- 1077 EGGERS, A.J. A comparative analysis of the performance of long range hypervelocity vehicles. NACA TN.4046, 1957.
- 1078 REED, W.H. and BLAND, S.R. An analytical treatment of aircraft propeller precession instability. NASA TN.D659, 1961.
- 1079 JACK, J.R. Effects of extreme surface cooling on boundary layer transition. NACA TN.4094, 1957.
- 1080 BRASLOW, A.L. Effect of distributed three-dimensional roughness and surface cooling on boundary layer transition and lateral spread of turbulence at supersonic speeds. NASA TN.D53, 1959.
- 1081 OSTRACH, S. and THORNTON, P. Compressible laminar flow and heat transfer about a rotating isothermal disk. NACA TN.4320, 1958.
- 1082 ADAMS, E.W. Theoretical investigation of the ablation of a glass-type heat protection shield of varied material properties at the stagnation point of a re-entering IREM. NASA TN.D564, 1961.

- 1083 ANDERSON, K. and SINCHTEL, C.D. Discussion of solar proton events and manned space flights. NASA TN.D671, 1961.
- 1084 LIBBY, P.A. and CRESCI, R.J. Experimental investigation of the downstream influence of stagnation point mass transfer. J. Ae. Scs. 28, 1961, 51.
- 1085 FELDMAN, S. On trails of axisymmetric hypersonic blunt bodies flying through the atmosphere. J. Ae. Scs. 28, 1961, 433.
- 1086 STRAND, T. Inviscid-incompressible flow theory of static peripheral jets in proximity to the ground. J. Ae. Scs. 1961, 27.
- 1087 LU, Pau-Chang. Free-convection magnetohydrodynamic flow past a porous flat plate. J. Ae. Scs. 28, 1961, 346.
- 1088 CRAMER, K.R. Magnetohydrodynamic free-convection pipe flow. J. Ae. Scs. 28, 1961, 736.
- 1089 CHARWAT, A.F. An investigation of separated flows, Part I: The pressure field. J. Ae. Scs. 28, 1961, 457.
- 1090 STONECYPHER, T.E. Periodic temperature distributions in a two-layer composite slab. J. Ae. Scs. 27, 1960, 152.
- 1091 CAMPELL, W.F. Periodic temperature distribution in a two-layer composite slab. J. Ae. Scs. 27, 1960, 633.
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- 2399 WANG, T.K. Buckling of transverse stiffened plates under shear. J.App.Mech. 3, 1947, A269.
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APPENDIX 3D

List of 279 questions used in the test

- Q1 What similarity laws must be obeyed when constructing aeroelastic models of heated high speed aircraft.
- Q2 What are the structural and aeroelastic problems associated with flight of high speed aircraft.
- Q3 How can one describe the aerodynamic forces and heating rates acting on a high speed aircraft.
- Q4 What problems of heat conduction in composite slabs have been solved so far.
- Q8 Can a criterion be developed to show empirically the validity of flow solutions for chemically reacting gas mixtures based on the simplifying assumption of instantaneous local chemical equilibrium.
- Q9 What chemical kinetic system is applicable to hypersonic aerodynamic problems.
- Q10 What theoretical and experimental guides do we have as to turbulent Couette flow behaviour.
- Q12 Is it possible to relate the available pressure distributions for an ogive forebody at zero angle of attack to the lower surface pressures of an equivalent ogive forebody at angle of attack.
- Q13 What methods - exact or approximate - are presently available for predicting body pressures at angle of attack.
- Q14 What would be the effect of a slight gas rarefaction (i.e. velocity and temperature discontinuities at walls) on energy separation in tubes and ducts.
- Q15 Papers on internal 'slip flow' heat transfer studies.
- Q16 Can the reference enthalpy method be used to predict real-gas laminar-boundary layer skin friction and heat transfer.
- Q17 Has the reference enthalpy method been compared with exact calculations for the perfect-gas case over a wide range of free-stream Mach numbers.
- Q18 Are real-gas transport properties for air available over a wide range of enthalpies and densities.
- Q22 Is it possible to find an analytical, similar solution of the strong blast wave problem in the Newtonian approximation.
- Q23 How can the aerodynamic performance of channel flow ground effect machines be calculated.
- Q26 What is the basic mechanism of the transonic aileron buzz.
- Q27 Papers on shock-sound wave interaction.
- Q29 Material properties of photoelastic materials.

- Q31 Can the transverse potential flow about a body of revolution be calculated efficiently by an electronic computer.
- Q32 Can the three-dimensional problem of a transverse potential flow about a body of revolution be reduced to a two-dimensional problem.
- Q33 Are experimental pressure distributions on bodies of revolution at angle of attack available.
- Q34 Does there exist a good basic treatment of the dynamics of re-entry, combining consideration of realistic effects with relative simplicity of results.
- Q35 Has anyone formally determined the influence of Joule heating, produced by the induced current, in magnetohydrodynamic free convection flows under general conditions.
- Q39 Why does the compressibility transformation fail to correlate the high speed data for helium and air.
- Q40 Did anyone else discover that the turbulent skin friction is not over sensitive to the nature of the variation of the viscosity with temperature.
- Q41 What progress has been made in research on unsteady aerodynamics.
- Q49 What are the factors which influence the time required to invert large structural matrices.
- Q50 Does a practical flow follow the theoretical concepts for the interaction between adjacent blade rows of a supersonic cascade.
- Q51 What is a single approximate formula for the displacement thickness of a laminar boundary layer in compressible flow on a flat plate.
- Q52 How is the design of ring or part ring wings by linear theory affected by thickness.
- Q53 What application has the linear theory design of curved wings.
- Q54 What is the effect of cross sectional shape on the flow over simple delta wings with sharp leading edges.
- Q55 Papers on flow visualization on slender conical wings.
- Q56 What size of end plate can be safely used to simulate two-dimensional flow conditions over a bluff cylindrical body of finite aspect ratio.
- Q57 To find an approximate correction for thickness in slender thin-wing theory.
- Q58 How do interference-free longitudinal stability measurements (made using free-flight models) compare with similar measurements made in a low-blockage wind tunnel.
- Q59 Have wind tunnel interference effects been investigated on a systematic basis.

- Q61 Are there any papers dealing with acoustic wave propagation in reacting gases.
- Q62 Has anyone investigated relaxation effects on gaseous heat transfer to a suddenly heated wall.
- Q63 Are there any papers which treat heat conduction problems involving gas-phase-excited and surface-excited internal energy modes.
- Q64 What is the effect on the base pressure of a body from which a jet issues of varying (a) jet design Mach number, (b) free stream Reynolds number, (c) jet radius/base radius.
- Q66 Are there any theoretical methods for predicting base pressure.
- Q67 Does transition in the hypersonic wake depend on body geometry and size.
- Q68 How can one detect transition phenomena in boundary layers.
- Q69 How can one detect transition phenomena in hypersonic wakes.
- Q70 What work has been done on estimating forces and moments on cruciform wing-body configurations which are rolling.
- Q71 Has anyone investigated and developed a simple model for the vortex wake behind a cruciform wing.
- Q72 What is a criterion that the transonic flow around an airfoil with a round leading edge be validly analyzed by the linearized transonic flow theory.
- Q74 Can the transonic flow around an arbitrary smooth thin airfoil be analysed in a simple approximate way.
- Q79 What are the details of the rigorous kinetic theory of gases. (Chapman-Enskog Theory).
- Q80 Has anyone investigated the effect of surface mass transfer on hypersonic viscous interactions.
- Q81 What is the combined effect of surface heat and mass transfer on hypersonic flow.
- Q82 What are the existing solutions for hypersonic viscous interactions over an insulated flat plate.
- Q83 What controls leading-edge attachment at transonic speeds.
- Q84 Can the three-point boundary-value problem for the Blasius equation be integrated numerically, using suitable transformations, without iteration on the boundary conditions.
- Q85 What are the effects of small amounts of gas rarification on the characteristics of the boundary layers on slender bodies of revolution.

- Q86 What is the available information pertaining to boundary layers on very slender bodies of revolution in continuum flow (the "transverse curvature" effect).
- Q87 What is the available information pertaining to the effect of slight rarefaction on boundary layer flows (the "slip" effect).
- Q92 Is there a theory for prediction of aerodynamic force and movement on an oscillating thin airfoil in a real fluid (medium: water and air, angle of attack: small or large.)
- Q93 What investigations have been made of the flow field about a body moving through a rarefied, partially ionized gas in the presence of a magnetic field.
- Q94 How is the heat transfer downstream of the mass transfer region effected by mass transfer at the nose of a blunted cone.
- Q95 To what extent can the available information for incompressible boundary layers be applied to problems involving compressible boundary layers.
- Q97 To what extent can readily available steady-state aerodynamic data be utilized to predict lifting-surface flutter characteristics.
- Q98 What are the significant steady and non-steady flow characteristics which affect the flutter mechanism.
- Q99 Is it possible to determine rates of forced convective heat transfer from heated cylinders of non-circular cross-section, (the fluid flow being along the generators).
- Q100 How much is known about boundary layer flows along non-circular cylinders.
- Q101 Is there any simple, but practical, method for numerical integration of the mixing problem (i.e. the Blasius problem with three-point boundary conditions.)
- Q102 Does there exist a closed-form expression for the local heat transfer around a yawed cylinder.
- Q103 How far around a cylinder and under what conditions of flow, if any, is the velocity just outside of the boundary layer a linear function of the distance around the cylinder.
- Q104 Where can I find pressure data on surfaces of swept cylinders.
- Q105 Can't the static deflection shapes be used in predicting flutter in place of vibrational shapes? If so, can we provide a justification by means of an example.
- Q106 Does the boundary layer on a flat plate in a shear flow induce a pressure gradient.
- Q107 Can the procedure of matching inner and outer solutions for a viscous flow problem be applied when the main stream is a shear flow.

- Q108 Can series expansions be found for the boundary layer on a flat plate in a shear flow.
- Q109 What possible techniques are available for computing the injection distribution corresponding to an isothermal transpiration cooled hemisphere.
- Q110 What is known regarding asymptotic solutions to the exact boundary layer equations.
- Q111 Previous solutions to the boundary layer similarity equations.
- Q112 Experimental results on hypersonic viscous interaction.
- Q113 What has been done about viscous interactions in relatively low Reynolds number flows, particularly at high Mach numbers.
- Q114 What role does the effect of chemical reaction (particularly when out of equilibrium) play in the similitude laws governing hypersonic flows over slender aerodynamic bodies.
- Q115 Are there any experimental or exact numerical solution results around that might indicate the significance of nonequilibrium - dissociation effects on small disturbance flow fields.
- Q116 How significant is the possible pressure of a dissociated free stream with respect to the realization of hypersonic simulation in high enthalpy wind tunnels.
- Q117 Is it possible to use Biot's variational principle for general one dimensional and two dimensional heat conduction problems beyond those treated by Biot.
- Q118 Do the discrepancies among current analyses of the vorticity effect on stagnation-point heat transfer result primarily from the differences in the viscosity - temperature law assumed.
- Q119 How far can one trust the linear viscosity - temperature solution assumed in some of the analyses of hypersonic shock layer at low Reynolds number.
- Q120 How close is the comparison of the shock layer theory with existing experiments in the low Reynolds number (merged-layer) regime.
- Q121 Has anyone explained the kink in the surge line of a multi-stage axial compressor.
- Q122 Have any aerodynamic derivatives been measured at hypersonic Mach numbers and comparison been made with theoretical work.
- Q123 Are methods of measuring aerodynamic derivatives available which could be adopted for use in short running time facilities.
- Q124 Can the irrotational-flow pressure distribution, and certain characteristic "sideslip" parameters, be found in closed form in general motion (not symmetrical about vertical plane.)

- Q125 What effect has proximity to the ground on the pressure distribution and lift on an aerofoil with flaps.
- Q126 What are wind-tunnel corrections for a two-dimensional aerofoil mounted off-centre in a tunnel.
- Q127 What is the pressure distribution or load on a split flap on an aerofoil.
- Q128 How do Kuchemann's and Multhopp's methods for calculating lift distributions on swept wings in subsonic flow compare with each other and with experiment.
- Q129 What experimental measurements exist of span wise and chord wise loadings on swept wings at low subsonic speeds and small incidence.
- Q130 What is the present state of the theory of quasi-conical flows.
- Q131 References on the methods available for accurately estimating aerodynamic heat transfer to conical bodies for both laminar and turbulent flow.
- Q132 What parameters can seriously influence natural transition from laminar to turbulent flow on a model in a wind tunnel.
- Q133 Can a satisfactory experimental technique be developed for measuring oscillatory derivatives on slender sting-mounted models in supersonic wind tunnels.
- Q134 What are the values of the stability derivatives in pitch and yaw for cambered slender ogee wings.
- Q135 What effect has the boundary layer in modifying the basic inviscid flow behind the shock, neglecting effects of leading edge and corner.
- Q136 How does a satellite orbit contract under the action of air drag in an atmosphere in which the scale height varies with altitude.
- Q137 How is the flow at transonic speeds about a delta wing different from that on a closely-related tapered sweptback wing.
- Q138 Recent data on shock-induced boundary-layer separation.
- Q139 What interference effects are likely at transonic speeds.
- Q140 Given complete freedom in the design of an airplane, what procedure would be used in order to minimize sonic boom intensity, and is there a limit to the degree of minimizing that can be accomplished.
- Q141 Can methane-air combustion product be used as a hypersonic test medium and predict, within experimental accuracies, the results obtained in air.
- Q142 What is the theoretical heat transfer rate at the stagnation point of a blunt body.

- Q143 What is the theoretical heat transfer distribution around a hemisphere.
- Q145 Has anyone investigated the unsteady lift distributions on finite wings in subsonic flow.
- Q146 What information is available for dynamic response of airplanes to gusts or blasts in the subsonic regime.
- Q147 Will forward or apex located controls be effective at low subsonic speeds and how do they compare with conventional trailing-edge flaps.
- Q148 Given that an uncontrolled vehicle will tumble as it enters an atmosphere, is it possible to predict when and how it will stop tumbling and its subsequent motion.
- Q149 What are the effects of initial imperfections on the elastic buckling of cylindrical shells under axial compression.
- Q150 Why does the incremental theory and the deformation theory of plastic stress-strain relationship differ greatly when applied to stability problems.
- Q152 Basic dynamic characteristics of structures continuous over many spans.
- Q153 Is the information on the buckling of sandwich sphere available.
- Q154 Can the load deformation characteristics of a beam be obtained with the material being inelastic and a non uniform temperature being present.
- Q155 What is the effect of an internal liquid column on the breathing vibrations of a cylindrical shell.
- Q156 Experimental techniques in shell vibration.
- Q157 In summarizing theoretical and experimental work on the behaviour of a typical aircraft structure in a noise environment is it possible to develop a design procedure.
- Q158 What data is there on the fatigue of structures under acoustic loading.
- Q159 What are the effects of thermal stress and buckling on the flutter characteristics of elastically restrained nearly square panels.
- Q160 What procedures are available for calculating skin temperatures of panels subjected to aerodynamic heating.
- Q161 Can increasing the edge loading of a plate beyond the critical value for buckling change the buckling mode.
- Q162 Can thermal fatigue results, obtained experimentally in engines or laboratory tests, be related to other experimental results, such as creep, mechanical fatigue, plastic deformation.

- Q163 Have the effects of an elastic edge restraint been considered in previous papers on panel flutter.
- Q164 Has the solution of the clamped plate problem, in the classical theory of bending, been reduced to two successive membrane boundary value problems.
- Q165 What data exists on oscillatory aerodynamic forces on control surfaces at transonic Mach numbers.
- Q166 What information is there on control surface "buzz" (i.e. single degree of freedom flutter.)
- Q167 It is not likely that the airforces on a wing of general planform oscillating in transonic flow can be determined by purely analytical methods. Is it possible to determine the airforces on a single particular planform, such as the rectangular one by such method.
- Q168 Is the problem of similarity for representative investigations of aeroelastic effects in heated flow as intractable as previous investigations imply.
- Q169 What is the magnitude and distribution of lift over the cone and the cylindrical portion of a cone-cylinder configuration.
- Q170 Is there any information on how the addition of a "boat-tail" affects the normal force on the body of various angles of incidence.
- Q171 What are the aerodynamic interference effects on the fin lift and body lift of a fin-body combination.
- Q173 What is the effect of initial axisymmetric deviations from circularity on the non linear (large-deflection) load-deflection response of cylinders under hydrostatic pressure.
- Q175 Are previous analyses of circumferential thermal buckling of circular cylindrical shells unnecessarily involved or even inaccurate due to the assumed forms of buckling mode.
- Q176 What papers are there dealing with circumferential buckling either thermal buckling or due to mechanical loading.
- Q177 What analytical investigations have been made of the stability of conical shells. How do the results compare with experiment.
- Q181 Has any work been done on determining the nature of compressible viscous flow in a straight channel.
- Q182 In what areas, other than low density wind tunnel flows, is viscous compressible flow in slender channels a problem.

- Q183 Jet interference with supersonic flows - experimental papers.
- Q184 Thrust vector control by fluid injection - papers.
- Q186 Is there experimental data on base pressure and wake angle for conical bodies in laminar hypersonic flow.
- Q187 Is it possible to obtain a reasonably simple analytical solution to the heat equation for an exponential (in time) heat input.
- Q189 Has anyone programmed a pump design method for a high-speed digital computer.
- Q190 Has anyone derived simplified pump design equation from the fundamental three-dimensional equations for incompressible nonviscous flow.
- Q191 Has anyone obtained meridional plane or blade-to-blade plane solutions of pump flow.
- Q193 What are the effects of forward facing jets due to pressure ratio, exit mach number, ratio of specific heats, angle of attack, and exit to body diameter ratio.
- Q194 What is the static force and moment characteristics and the shape of the bow shock wave on a short blunt 10° semivertex angle cone with a flat base, and also one with a conical afterbody having a semivertex angle of 50° , in helium at $M = 15$.
- Q195 Effects of helium contamination on static pressures on surface of bodies and shock wave shapes in helium at $M = 15$.
- Q196 What are the flutter characteristics of the exposed skin panels of the X-15 vertical stabilizer when subjected to aerodynamic heating.
- Q198 What information is available concerning the thermodynamic and transport properties of air for temperature to about $10,000^\circ\text{K}$ and pressures to about 1,000 atmospheres.
- Q200 What agreement is found between theoretically predicted instability times and experimentally measured collapse times for compressed columns in creep.
- Q201 Theoretical studies of creep buckling.
- Q202 Experimental studies of creep buckling.
- Q203 Is it possible to correlate the results on the creep buckling of widely different structures within the framework of a single theory.
- Q204 What are the experimental results for the creep buckling of columns.
- Q205 What are the results for the creep buckling of round tubes under external pressure.

- Q206 Have any analytical studies been conducted on the time-to-failure mechanism associated with creep collapse for a long circular cylindrical shell which exhibits both primary and secondary creep as well as elastic deformations under various distributed force systems.
- Q207 Which investigations serve to demonstrate the viscoelastic action of creep collapse either by use of different or simplified structural models, or by assuming that the shell material exhibits only certain phases of creep deformations; e.g. steady secondary creep.
- Q208 Has the effect of initial stresses, on the frequencies of vibration of circular cylindrical shells, been investigated.
- Q209 Has the effect of the change of initial pressure due to deformation, on the frequencies of vibration of circular cylindrical shells been investigated.
- Q210 What are the discontinuity stresses at junctions in pressurized structures.
- Q211 What analytical solutions are available for stresses in edge-loaded shells of revolution.
- Q212 What dome contours minimize discontinuity stresses when used as closures on cylindrical pressure vessels.
- Q213 What general solutions for the stresses in pressurized shells of revolution are available.
- Q214 Can studies of pure membrane cylinders having no wall bending stiffness but maintaining their shape by virtue of internal pressure provide any insight into the behaviour of pressurized cylinders with finite wall stiffness.
- Q215 What are the best experimental data and classical small deflection theory analyses available for pressurized cylinders in bending.
- Q216 Does a membrane theory exist by which the behaviour of pressurized membrane cylinders in bending can be predicted.
- Q217 What are the equations which define the stability of simply supported corrugated core sandwich cylinders.
- Q218 Papers on small deflection theory for buckling of sandwich cylinders.
- Q219 Has anyone developed an analysis which accurately establishes the large deflection behaviour of conical shells.
- Q223 What is the magnitude of second-order wing-body interference at high supersonic Mach number.
- Q224 What is the best theoretical method for calculating pressure on the surface of a wing alone.

- Q225 How can the effect of the boundary-layer on wing pressure be calculated, and what is its magnitude.
- Q226 How should the Navier-Stokes difference equations be solved.
- Q227 Which iterative method for solving linear elliptic difference equations is most rapidly convergent.
- Q228 Is there any available information on the aerodynamic loading distribution on wings immersed in high-energy, non-uniform slipstream of the type common to V/STOL aircraft from large scale experimental investigation.
- Q229 Items on V/STOL aircraft operating in ground effect.
- Q230 Technical report on measurement of ablation during flight.
- Q231 What qualitative & quantitative material is available on ablation materials research.
- Q232 Have flow fields been calculated for blunt-nosed bodies and compared with experiment for a wide range of free stream conditions and body shapes.
- Q233 What are the available properties of high-temperature air.
- Q234 What is the magnitude of aerodynamic damping in flexible vibration modes of a slender body of revolution characteristic of launch vehicles.
- Q235 Is there any published literature on plastic buckling of orthotropic plates or shells.
- Q236 Papers on plastic buckling of isotropic shells and plates.
- Q237 How to stabilize thin faces of sandwich construction to carry maximum loads, i.e. stress faces up to yield point of material.
- Q238 Has the buckling of orthotropic and stiffened conical shells under external pressure and other loads been investigated.
- Q241 Compressive circumferential stresses in a torispherical shell reveal the possibility of buckling under internal pressure. Has anyone investigated for which ranges of shell parameters these stresses are sufficiently large to cause elastic buckling.
- Q245 Is there an integral method to give a single and sufficiently accurate method of calculating the laminar separation point for various incompressible and compressible boundary layers with zero heat transfer.
- Q246 What accurate or "exact" solutions of the laminar separation point for various incompressible and compressible boundary layers with zero heat transfer are available.
- Q247 Can the hypersonic similarity results be applied to the technique of predicting surface pressures of an ogive forebody at angle of attack.
- Q249 Is it possible to estimate the transonic drag-rise and buffet boundaries of aerofoils without recourse to experiment.

- Q250 What determines the onset of shock-induced boundary-layer separation.
- Q251 Are the stable profiles of a compressible boundary layer induced by a moving wave known.
- Q252 Are there experimental results on the stability of a compressible boundary layer induced by a moving wave.
- Q253 Exact solution methods for calculating the ablative mass loss of a material ablating at high temperatures in a hypersonic flight environment.
- Q254 What approximate solutions are known to the direct problem of transonic flow in the throat of a nozzle, i. e. finding the flow in a given nozzle.
- Q255 What approximate solutions are known to the indirect problem of transonic flow in the throat of a nozzle, i. e. finding a nozzle which has a given axial velocity distribution.
- Q256 Has the problem of self-sustained oscillations of a dynamic system of single degree of freedom with non-linear damping been investigated analytically in a way different from the classical Van der Pol's example. In particular, are any exact solutions known.
- Q257 Why do users of orthodox pilot-static tubes often find that the calibrations appear to be:-
(a) significantly different from those formerly specified.
(b) wildly variable at low Reynolds numbers.
- Q259 Has a comparison been made between interference-free drag measurements using free-flight models and similar measurements made in a low-blockage wind tunnel.
- Q260 Does transonic similarity suggest that leading-edge attachment at transonic speeds is a potential or a viscous flow phenomenon.
- Q261 Solution of the Blasius problem with three-point boundary conditions.
- Q262 Can the injection of a light weight gas, such as helium into the laminar boundary layer of a high speed flow, reduce the aerodynamic heating encountered during a missile or nose-cone re-entry into the earth's atmosphere.
- Q263 What is the process of reflection or absorption of charged particles from the surface of a body moving through a rarefield, partially ionized gas in the presence of a magnetic field.
- Q264 References on Lyapunov's method on the stability of linear differential equations with periodic coefficients.
- Q265 Obtain all papers and reports that contain shock detachment distance data.
- Q266 Work on flow in channels at low Reynolds numbers.
- Q267 Some approximate analytical heat conduction solutions using methods other than Biot's principle.

- Q268 What mode of stalling can be expected for each stage of an axial compressor.
- Q269 Has a criterion been established for determining the axial compressor choking line.
- Q270 Do theories exist for predicting the aerodynamic derivatives at hypersonic Mach numbers to include viscous and leading edge bluntness effects.
- Q271 Solutions for vortex sheets formed on the trailing and leading edges in the asymmetrical case.
- Q272 Has a theory of quasi-conical flows been developed, in supersonic linearised theory, for which the upwash distribution on the lifting surface, apart from being a homogeneous function in the co-ordinate, is permitted to have a quite general functional form.
- Q273 How does scale height vary with altitude in an atmosphere.
- Q274 Jet interference with supersonic flows - theoretical papers.
- Q275 Effects of leading-edge bluntness on the flutter characteristics of some square-planform double-wedge airfoils at Mach numbers less than 15.4.
- Q277 What factors have been shown to have a primary influence on sonic boom strength.
- Q278 What methods of testing and analysis have been used in investigating the static and dynamic stability characteristics of re-entry bodies in free flight tests.
- Q281 Papers on pressure and force distributions on wings.
- Q283 Work on small-oscillation re-entry motions.
- Q284 Experimental studies on panel flutter.
- Q285 How can wing-body, flow field interference effects be approximated rationally.
- Q288 Has anyone analytically or experimentally investigated the effects of internal pressure on the buckling of circular-cylindrical shells under bending.
- Q289 What basic equations should be used in the analysis of stresses and displacements in oval shells.
- Q290 What is the accuracy of certain types of equations used in analysis of stresses and displacements in shells.
- Q291 What theoretical and experimental work has been done on the excitation and response of typical structures in a noise environment.
- Q292 Is there a design method for calculating thermal fatigue endurance of components of various types and sizes in a variety of circumstances.

- Q293 Will an analysis of panel flutter based on arbitrarily assumed modes of deformation prove satisfactory, and if so, what is the minimum number of modes that need be considered.
- Q294 What is the criterion for true panel flutter, as opposed to small amplitude vibration arising from acoustic disturbances.
- Q295 Papers dealing with uniformly loaded sectors.
- Q296 General methods of solving clamped plate problems.
- Q297 How can the analytical solution of the buckling strength of a uniform circular cylinder loaded in axial compression be refined so as to lower the buckling load.
- Q298 In the problem of the buckling strength of uniform circular cylinders loaded in axial compression, does the linear solution help with improving the non-linear one.
- Q299 The problem of similarity for representative investigation of aeroelastic effects in a flow with the absence of heating effects.
- Q300 How is fatigue damage estimated using the normal long-hand method.
- Q301 Is there any information available on the difference in the effects of various edge conditions on the buckling of cylindrical shells.
- Q302 What approximate analytical or experimental investigations have been performed relating to the non-linear bending and buckling of conical shells.
- Q303 Have non-linear large deflection analyses been conducted for shell shapes other than conical.
- Q304 Are asymptotic methods sufficiently accurate in the determination of pre-buckling stresses in torispherical shells, or must we resort to numerical methods.
- Q305 What is the effect of an entrance tube on the measurement of pressure and density by a gage placed in a rarefied gas flow.
- Q306 What are the nonequilibrium chemical constituents in the viscous shock layer ahead of a blunt re-entry vehicle.
- Q310 How is shearing flow between two coaxial cylinders affected by suction or blowing at the cylinder walls.
- Q314 How accurate are existing analytical theories in estimating pressure distributions on cones at incidence, at hypersonic speeds.
- Q315 Are simple empirical methods of any use for estimating pressure distribution in cones.

- Q316 Do viscous effects seriously modify pressure distributions.
- Q317 Has anyone investigated theoretically whether surface flexibility can stabilize a laminar boundary layer.
- Q318 What is the side force induced on a supersonic nozzle wall when a liquid or gas is ejected from the wall.
- Q319 What is the effect of the shape of finite airplane wings on the lift and moment responses to sinusoidal gusts.
- Q320 What has been published on the subject of non-steady aerodynamic forces acting on airplane wings due to gusts and/or turbulence.
- Q321 How do subsonic and transonic flutter data measured in the new Langley transonic dynamics tunnel compare with similar data obtained in other facilities.
- Q322 How do subsonic and transonic flutter data measured in Freon - 12 compare with corresponding data obtained in air.
- Q323 How do large changes in new mass ratio quantitatively affect wing-flutter boundaries.
- Q327 What is the effect of the shape of the drag polar of a lifting spacecraft on the amount of reduction in maximum deceleration obtainable by continuously varying the aerodynamic coefficients during re-entry.
- Q328 What are the differences in range and aerodynamic heating during re-entry which may be associated with the use of different drag polars.
- Q330 What are the effects of a highly underexpanded rocket jet exhaust on vehicle static and dynamic stability at hypersonic speeds and high altitudes.
- Q331 What are the physical significance and characteristics of separated laminar and turbulent boundary layer flows.
- Q332 Has anyone analytically investigated the stabilizing influence of soft elastic cores on the buckling strength of cylindrical shells subjected to non-uniform external pressure.
- Q333 What papers are available on the buckling of empty cylindrical shells under non-uniform pressure.
- Q335 What effect do thermal stresses have on the compressive buckling strength of ring-stiffened cylinders.
- Q336 What is the effect on cylinder buckling of a circumferential stress system that varies in the axial direction.
- Q338 Can non-linear shallow shell analysis be reduced to an engineering technique by use of the matrix.

- Q339 Is it possible to predict the shape of a shroud which will allow simulation of the nose region flow field for a sphere in hypersonic flow.
- Q340 What investigations have been made of the wave system created by a static pressure distribution over a liquid surface.
- Q347 Has anyone investigated the effect of shock generated vorticity on heat transfer to a blunt body.
- Q348 What is the heat transfer to a blunt body in the absence of vorticity.
- Q349 What are the general effects on flow fields when the Reynolds number is small.
- Q352 Find a calculation procedure applicable to all incompressible laminar boundary layer flow problems having good accuracy and reasonable computation time.
- Q353 Papers applicable to this problem (calculation procedures for laminar incompressible flow with arbitrary pressure gradient).
- Q354 What stresses and displacements are found in square plates having two adjacent edges free and the others either clamped or simply supported when they are loaded either by a uniformly distributed load or a concentrated force at the free corner.
- Q355 Has anyone investigated the shear buckling of stiffened plates.
- Q356 Papers on shear buckling of unstiffened rectangular plates under shear.
- Q357 What theoretical methods are available for calculating the pressure distribution and the flow over symmetrical conical bodies with sharp leading edges.
- Q358 In what manner does the surface pressure on a supersonic or hypersonic blunted cone approach its asymptotic value.
- Q360 In practice, how close to reality are the assumptions that the flow in a hypersonic shock tube using nitrogen is non-viscous and in thermodynamic equilibrium.
- Q365 What design factors can be used to control lift-drag ratios at Mach numbers above 5.

APPENDIX 3E

SUBSETS OF DOCUMENTS AND QUESTIONS

In the course of the tests, various subsets were used of the 279 questions (as given in Appendix 3D) and of the 1400 documents (as given in Appendix 3C). The main subsets, which have been referred to in the text of this volume, are listed.

QUESTIONS

SUBSET 1. 35 Questions, each having seven starting terms.

2	82	142	177	285
9	87	145	181	292
34	95	157	189	293
40	113	160	205	294
49	122	165	211	299
67	131	170	219	315
81	132	171	261	338

SUBSET 2. 42 Questions, all dealing with aerodynamics

79	130	167	225	268
100	132	170	226	269
116	136	181	227	272
118	137	182	230	273
119	141	189	250	274
121	145	190	261	317
122	146	223	264	323
123	147	224	266	360
126	148			

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1	81	138	205	275
2	82	139	206	277
4	83	140	208	283
8	84	141	209	284
9	85	142	210	285
10	86	143	211	288
12	87	145	212	291
13	93	148	213	292
15	94	149	214	293
18	95	150	215	294
22	97	152	216	295
23	98	153	217	296
26	99	154	218	297
27	100	155	219	298
29	101	156	223	299
31	102	157	226	300
32	103	158	227	301
33	104	160	230	303
34	105	161	231	304
35	106	163	232	306
39	107	164	233	314
40	108	165	234	315
41	109	167	241	316
49	110	168	245	317
50	111	169	246	321
51	112	170	247	323
52	113	171	250	327
53	114	173	251	331
54	116	175	252	332
55	118	176	253	333
56	119	177	254	335
57	120	181	255	336
58	121	182	257	338
59	122	183	259	339
61	123	184	261	340
62	126	187	264	347
66	128	189	265	348
67	130	190	266	349
68	131	196	267	352
69	132	200	268	353
71	133	201	269	355
72	135	202	272	356
74	136	203	273	360
79	137	204	274	365
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DOCUMENTS

SUBSET 1. 200 documents, all of which are relevant to at least one question in Question Subset 2.

1302	1476	1618	1695	1779	1964	1994	2111
1311	1509	1619	1696	1782	1965	1995	2150
1316	1569	1620	1697	1783	1966	1997	2153
1317	1572	1621	1698	1785	1967	2001	2154
1320	1574	1622	1699	1786	1968	2002	2155
1321	1575	1655	1700	1787	1970	2061	2157
1322	1576	1656	1701	1788	1971	2074	2187
1324	1578	1666	1702	1792	1972	2075	2274
1335	1588	1667	1703	1793	1973	2076	2313
1351	1589	1670	1704	1794	1974	2077	2316
1360	1590	1671	1705	1795	1978	2078	2317
1367	1591	1672	1706	1796	1980	2080	2318
1378	1592	1675	1707	1797	1981	2081	2319
1383	1594	1676	1708	1798	1982	2082	2321
1399	1596	1677	1709	1799	1983	2083	2322
1406	1597	1680	1710	1800	1984	2084	2338
1409	1598	1681	1711	1836	1985	2085	2339
1415	1605	1682	1712	1874	1986	2087	2340
1416	1606	1683	1713	1879	1987	2088	2341
1420	1608	1684	1717	1880	1988	2099	2342
1436	1613	1687	1719	1916	1989	2100	2364
1437	1614	1688	1728	1919	1990	2101	2367
1443	1615	1691	1729	1920	1991	2102	2379
1451	1616	1692	1748	1921	1992	2103	2391
1467	1617	1693	1772	1963	1993	2104	1694

SUBSET 2. Consists of Subset 1, plus the following 150 documents

1014	1225	1309	1439	1562	1686	1811	2213
1016	1231	1310	1440	1566	1714	1922	2243
1021	1234	1314	1446	1567	1746	1923	2247
1022	1252	1315	1447	1570	1749	1924	2252
1023	1253	1326	1448	1571	1775	1925	2280
1025	1255	1329	1449	1573	1780	1927	2304
1033	1265	1332	1460	1577	1784	1969	2305
1062	1271	1375	1464	1609	1789	2062	2309
1068	1274	1376	1466	1612	1790	2096	2326
1082	1283	1377	1468	1625	1801	2097	2344
1094	1296	1379	1469	1629	1802	1098	2345
1101	1297	1380	1470	1643	1803	2108	2346
1160	1298	1381	1475	1659	1804	2110	2347
1161	1299	1382	1478	1660	1805	2112	2355
1163	1304	1390	1492	1661	1806	2114	2377
1164	1305	1391	1502	1662	1807	2115	2378
1180	1306	1401	1514	1663	1808	2185	2380
1187	1307	1421	1527	1664	1809	2198	2393
1208	1308	1431	1553	1668	1810		

APPENDIX 3F

AUTHORS OF BASE DOCUMENTS AND
QUESTION COMPILERS

The authors of the base documents are listed according to the country in which they were working at the time the paper was published. Against each author is shown the document number (as given in Appendix 3C) of his paper, and the number or numbers (as given in Appendix 3D) of the questions which he prepared and which were used in the test. Although all the authors prepared search questions, it will be noted that in some cases, none of the questions was used. There were various reasons for this; these are discussed in Chapter 3 of this volume.

<u>AUSTRALIA</u>	<u>Document</u>	<u>Questions</u>
G. A. Bird	1531	92, 263
<u>FRANCE</u>		
W. Eckhaus	1496	26, 27
<u>GERMANY</u>		
E. W. Adams	1509	253
<u>INDIA</u>		
D. Tirumalesa	2142	
<u>ISRAEL</u>		
J. Rom	1487	
J. Singer	2070	238
<u>JAPAN</u>		
I. Hosokawa	1521	72, 74
F. Sakao	1450	
M. Yasuhara	1494	
<u>SWITZERLAND</u>		
E. F. Brocher	1495	22

<u>UNITED KINGDOM</u>	<u>Document</u>	<u>Questions</u>
J. A. Bagley	1631	125, 126, 127
	1632	128, 129
L. Bernstein	2286	360
D. E. Bourne	1754	99, 100
J. W. Britton	1513	54, 55
D. Catherall	1547	135
J. F. Clarke	1517	61
	1518	62, 63
B. L. Clarkson	1640	157, 158, 291
I. T. Cook	2396	355, 356
J. C. Coole	1752	57
C. F. Cowdrey	1751	56
A. H. Craven	1519	64, 66
D. E. Davies	1895	167
M. D. C. Doyle	1543	121, 268, 269
N. T. Dunwoody	2283	310
R. A. East	1544	122, 123, 270
D. R. Gaukroger	1643	165, 166
G. H. Greenwood	1516	58, 59, 259
N. Gregory	2287	317
B. Glauert	1388	106, 107, 108
I. A. Hall	1750	254, 255
P. W. H. Howe	1767	162, 292
D. J. Johns	1769	175, 176, 301
W. P. Jones	1892	41
D. G. King-Hele	1548	136, 273
D. G. Mabey	1526	83, 260
W. G. Molyneux	1184	168, 299
K. C. Moore	1512	52, 53
L. S. D. Morley	1641	164, 295, 296
J. F. Nash	1940	
S. Neumark	1515	256
P. C. Parks	1532	264
P. H. Peckham	2285	314, 315, 316
J. Phillips	1768	300
H. Portnoy	1633	130, 272
R. H. Rogers	2284	
E. W. E. Rogers	1757	137, 138, 139
D. B. Russell	2063	226, 227
C. Salter	1893	257
D. M. Seal	1896	169, 170, 171
C. C. L. Sells	1545	124, 271
C. S. Sinnott	1503	249, 250
G. E. Smith	1894	163, 293, 294
A. J. Sobey	1642	297, 298
L. C. Squire	1514	357
B. S. Stratford	1511	50, 51
J. S. Thompson	1755	133, 134
P. G. Wilby	2062	223, 224, 225
J. G. Woodley	1546	131, 132

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A. Ambrosio	1533	265
M.S. Anderson	2146	335, 336
A.E. Armenakas	1953	208, 209
R.R. Berlot	1939	
E.R. Benton	1520	70, 71
M.A. Biot	1872	
H.L. Bohon	1948	196, 284
H.E. Brandmeier	1506	340
J.E. Broadwell	2288	318
D.O. Brush	2145	332, 333
O.R. Burggraf	1538	95
R.A. Burton	1491	10
H.W. Carlson	1758	140, 277
H.K. Cheng	1630	118, 119, 120
P.R. Choudhury	2140	306
Wen-Hwa Chu	1530	92
L.C. Coltrane	1759	278
K.R. Cramer	1500	35
R.J. Cresci	1123	94
B.E. Cunningham	2143	
J.H. Cunningham	2069	237
C.F. Dewey	1540	110, 111, 112
M.R. Denison	1943	186
S.C. Dixon	1766	159, 160, 161
J.A. Drischler	1637	145, 146
J. Dugundji	1486	1, 2, 3
R. Dunlap	1535	339
M.J. Fohrman	1947	194, 195
B.E. Gatewood	1762	154
G. Gerard	2067	235, 236
T.P. Goebel	2188	285, 365
H.S. Glick	1455	
R.C. Goetz	1634	275
A.W. Goldstein	1507	
A.F. Gollnick	1628	109
S.W. Gouse	1529	262
S.I. Gravitz	1753	97, 98
R.A. Greenberg	1508	
A.L. Greensite	1499	34
R.M. Gunderson	1490	
W.L. Haberman	1669	
P.W. Hanson	2066	234
J.G. Hall	1401	
L.A. Harris	1956	217, 218
G. Herrmann	2068	
J.M. Hedgepeth	2293	
J.L. Hess	1498	31, 32, 33
R.S. Hickman	2191	347, 348, 349
H. Hidalgo	1536	67, 68, 69
W.F. Hinson	2292	330, 331
G.R. Inger	1541	114, 115, 116
R.M. Inman	1534	14, 15
M. Inouye	2006	233, 232
W.E. Jahsman	1950	200, 201, 202
L.H. Jorgensen	1949	198
R.H. Johns	1954	210, 211, 212, 213
E.R. Keener	1492	12, 13, 247
J. Kempner	1897	173
G. Kleinstein	2372	
R.L. Kosson	2182	352, 353
W. Lansing	2294	338
T.J. Lardner	1542	117, 267
L.H.N. Lee	1760	149, 150

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A. Leiss	1636	
A.W. Leissa	1422	354
M. Lenard	488	8, 9
L.L. Levy	2291	327, 328
Y.K. Lin	1729	152
U.S. Lindholm	1764	155, 156
E.D. Martin	1527	84, 261
W.C. Lyons	1505	
S.H. Maslen	1629	113
H.G. McComb	1955	214, 215, 216
J. Mescall	2071	241, 304
M. Morduchow	1489	245, 246
H.N. Murrow	2289	319, 320
M. Newman	1957	219, 302, 303
W.A. Newsom	2144	
S. Ostrach	1504	251, 252
H.L. Pond	2139	305
M.A. Rahman	1523	
J.V. Rattayya	1627	105
W.P. Reid	1485	4
H.W. Ridyard	1501	
D.J. Romeo	1946	193
R.C. Rozycki	1524	79
C.H. Samson	1756	49
P. Seide	1898	177
J.C. Serpico	1952	206, 207
J.M. Solomon	1528	85, 86, 87
B. Spencer	1638	147
M.H. Steiger	2184	
N.O. Stockman	1945	189, 190, 191
F.J. Stoddard	1537	
E.Z. Stowell	1951	203, 204, 205
T. Strand	1624	23
R.J. Swigart	2179	
O.E. Tewfik	1623	
C.L. Tien	1525	80, 81, 82
K. Toba	1322	101
M. Tobak	1639	148, 283
H. Tramposch	1497	29
S.C. Traugoot	1626	358
W.P. Vafakos	1765	289, 290
J. Vasiliu	2061	
R.J. Vidal	1484	
R.E. Walker	1942	183, 184, 274
V.I. Weingarten	1763	288
W.R. Wells	1944	187
I. Weinstein	1635	141, 142, 143
D. Weiss	1539	102, 103, 104
D.C. Weiss	1510	
R.J. Whalen	1625	
J.C. Williams	1941	181, 182, 266
R.E. Wilson	1493	16, 17, 18
M.M. Winston	2064	228, 229, 281
C.W. Winters	2065	230, 231
J.C. Yao	1761	153
E.C. Yates	2290	321, 322, 323
V. Zakkay	1522	
S.L. Zeiberg	2141	

APPENDIX 3G

QUESTIONS - RELEVANT DOCUMENTS SETS

This Appendix lists the relevant documents for the 279 questions which are given in Appendix 3D. The document numbers refer to the documents as listed in Appendix 3C.

The questions are divided into the two groups of Basic Questions and Supplementary Questions. The difference in these groups of questions is discussed in Chapter 3; briefly the Basic Question is considered to be representative of the main problem which was the cause of the research being undertaken, while a Supplementary Question is a question which arose in the course of the research.

The Base Document refers to the original paper which was written by the compiler of the question, and as such it would always be expected to have a high relevance to the question. However, in the tests, the Base Document is eliminated in the search or searches to which it applies.

The relevant documents are divided into the four levels of relevance, as given on page 21. The papers are then listed in two groups, the first of which gives the papers which appeared in the list of references of the Base Document. The second group is marked with an asterisk against the document number. These refer to the additional papers which were located by students or by bibliographic coupling, and which were subsequently submitted to the authors for their decisions concerning relevance.

BASIC QUESTIONS

Question No.	Base Document	Relevance 1	Relevance 2	Relevance 3	Relevance 4
1	1486		1184, 1029*, 1031*, 1057*, 1378*, 1859*, 1875*	1012, 1051, 1102, 1185, 1030*, 1037*, 1056*, 1066*, 1095*, 1497*, 1858*, 1876*, 1879*, 1880*	1013, 1014, 1015 1052, 1142, 1195* 1462*
8	1488			1236, 1166*	
10	1491		1099	1115, 1257, 1258	
12	1492		1020	1056, 1057, 1058	1019
14	1534		1021, 1549	1550	
16	1493			1378*	1294*
22	1495			1027, 1028, 1262, 1263	1160, 1020*, 1654*
23	1624		1086, 1194, 1650, 1652		1649
26	1496		1064, 1265		1065, 1311*
31	1498		1266	1106, 1196	
34	1499		1032, 1067, 1164*	1639*, 1715*, 1716* 1717*	1719*, 2379*
35	1500			1087, 1088, 1104, 1267, 1268, 1269, 1270, 1407, 1408	
39	1502	1271	1016, 1413	1414	
41	1892	1900, 1902	1200, 1201, 1601 1901, 1544*, 1597* 1634*, 1687*, 1698* 1700*, 1704*, 1705* 2109*, 2112*, 2141* 2197*, 2256*, 2259* 2272*, 2289*	1899, 1903, 1593* 1749*, 1917*, 1919* 2290*	1199, 1594*, 2333*
49	1756		1046, 1047	1092	
50	1511		1213	1212, 1214, 1215, 1216, 1276, 1277, 1426, 1427	
52	1512		1224	1278, 1428	
54	1513		1250*, 1514*, 1609* 1612*	1225, 1793*	1464, 1465, 1466
56	1751				1776
57	1752		1465	1249, 1777, 1778	1247, 1250
58	1516			1252, 1431	1141
62	1518		1169	1168	
64	1519			1173, 1174, 1179, 1282	1172, 1176
67	1536		1024, 1283, 1552, 1553, 1554, 1555, 1556	1272	1557, 1558
72			1468	1467, 1469, 1470	1775*
80	1525		1305, 1570*	1308, 1481*, 1338* 2185*, 1629*, 1663* 1798*, 1572*	2226*, 2355*

Question No.	Base Document	Relevance 1	Relevance 2	Relevance 3	Relevance 4
83	1526		1439	1311, 1316, 1440, 1797*, 1798*	1187, 1314, 1315 1794*, 1265*
84	1527			1320	1478
85	1528		1326, 1629*		1021, 1094, 1022*, 1306*
92	1530			1361, 1441, 1442, 1443, 1445, 1748*	1362, 1363, 1444 1200*, 1201*, 1593* 1687*, 1753*, 1919* 2005*
93	1531			1296, 1033*	1446, 1447, 1448 1449, 1208*, 1297* 1298*, 1299*
94	1123		1084	1024, 1101, 1294, 1364, 1365, 1560	1628*, 1661*
95	1538		1016, 1375, 1460, 1562	1378, 1255*, 1271* 1502*	1376, 1377
97	1753		1380	1749*, 2339*	1014, 1705, 1779 1780, 1379, 1643* 1686*
99	1754		1788	1785, 1786, 1787	1023, 1381, 1382 1784, 1789
101	1322		1475	1476*, 1527*	1320*, 1478*
102	1539		1565, 1566	1564, 2159*	1661*
106	1388		1002, 1003, 1128, 1664*, 1629*	1180, 1323, 1324, 1393, 1394, 1659, 1004*, 1384*, 2302*	1418*
113	1629		1021, 1324, 1630*	1094, 1664, 1304*, 1570*, 1494*	1128, 1323, 1663 1305*, 1309*, 1571* 1655*, 1388*, 1062*
114	1541		1332, 1572, 1578, 1401*, 1625*	1573, 1574, 1421*, 1160*, 2213*, 2304* 1068*, 1571*, 2252*	1025, 1317, 1577 2198*, 1655*, 2355*
117	1542		1395, 1579, 1580, 1587, 1873*		
118	1630		1667	1324, 1378, 1666, 1670	
121	1543		1588	1589, 1590	
122	1544			1597, 1598	1688*, 1708*, 1713*
124	1545		1599		1060, 1782*
125	1631			1652, 1245*, 2094* 2095	
128	1632		1676, 1677	1678, 1679, 1205*	
133	1755			1594, 1790	
135	1547		1606, 1611	1562	1050, 1236, 1609 1612, 1406*
136	1548		1613, 1614, 1615	1616, 1617	1618
137	1757		1793, 1794	1797	1795, 1796, 1420*
140	1758		1802, 1803	1808, 1809, 1811, 1253*, 2247*	1804, 1805, 1806 1807, 1810, 2243*
141	1635			1691	

Question No.	Base Document	Relevance 1	Relevance 2	Relevance 3	Relevance 4
145	1637			1703, 1704, 1705, 2289*, 1779*	1698, 1699, 1700 1701, 1702, 1706 1792*, 2339*
147	1638		1713		1708, 1709, 1711 1712
148	1639		1717, 1719	2001*, 2379*	
149	1760		1821, 1822, 1824, 2122*	1820, 1823, 1825, 2051*, 2121*	
153	1761			1826, 1828	
154	1762			1833, 1834, 1835, 1836, 1837	
155	1764			1848	1844, 1845, 1846 1847
157	1640		1725, 1728	1729, 1911*	1720, 1075*, 1909*
159	1766			1391, 1864, 1012*, 1015*	1856, 1857, 1858 1859, 1746*, 1877* 1853*
162	1767		1865, 1867	1395, 1866, 1868, 1869, 1870	
163	1894		1015, 1391, 1864*	1914, 1392*, 1627*, 1658*	
164	1641			1731	1730
167	1895	1919	1916	1920, 1921	
168	1184		1051, 1185	1878	1874
175	1769		1829, 1887, 1890, 2146*	1885, 1886, 1888, 1891	1889
177	1898		1932, 1936, 1937, 1938	1957*, 2131*	1931, 1934, 1935
183	1942		1969, 1970, 1971, 1972, 1174*, 1997*	1187, 1973, 1173*, 1176*, 1409*, 1946* 1992*, 1994*, 1995*	1974, 1177*
187	1944		1101, 1164	1981	1982, 1983
189	1945			1985, 1990	
194	1947		1069, 2003, 2004, 2005, 2006, 2007	1999, 2000, 2001	1717
196	1948		1766*	1858, 1859, 2008, 1012*	
200	1950		2014, 2020	2013, 2016, 2017, 2018, 2019	2012
203	1951		2027	2028	
206	1952		2029	2034, 1951*, 2021*	
208	1953	1846, 2036			
210	1954	2038, 2039	2041, 2042		2043, 2044
214	1955		1840, 2045	1763, 1838, 1839, 1841	
217	1956			1889, 2046, 2048, 2050, 1843*	2047, 2049, 2051 1926*, 1822*
219	1957			2057, 2058, 2059, 1930*, 1931*, 1934* 1936*, 1937*, 1938* 2131*	2052

Question No.	Base Document	Relevance 1	Relevance 2	Relevance 3	Relevance 4
223	2062			2074, 2075	
226	2063			2078, 2083, 2084, 2085	2080, 2081, 2082
228	2064		2090, 2091, 1001* 2170*	1453, 2089, 2092, 2144*, 2162*, 2164* 1484*	
232	2006		1273, 2105, 2106, 2107, 1556, 1025* 1372*, 1410*, 1456* 1626*, 2151*	1093, 1161, 1302, 2011, 1019*, 1035* 1036*, 1044*, 1215* 1354*, 1369*, 1370* 1421*, 1471*, 1557* 1605*, 1655*, 1657* 1689*, 2307*, 1318* 1423*, 2304*, 1160* 1482*, 1572*	1122*, 1666*, 2355*
234	2066			1234, 2108, 2110, 2111, 2112, 1231*	2114, 2115
235	2067			1829, 2116, 2117, 2118, 2119, 2120, 2121, 1743*, 2130*	
237	2069		1822, 2127, 2128	1742, 2050, 2121, 2126, 1826*, 1743*	2051*
238	2070		2131	1936, 2129	2117, 2118
241				2134, 2137, 2138	2135, 2136
245	1489		1054, 2386*	1562*, 1336*	1055, 1996
249	1503		1038, 1039	1206, 1313*	1203, 1204, 1205
256	1515			1130, 1281	
257	1893		1139, 1238	1239, 1904, 1906, 1672*	
262	1529		1340, 1342, 1646*, 2199*	1337, 1338, 1339, 1343, 1344, 1480, 1481, 1353*, 1366*, 1565*	
272	1633			1680, 1681, 1682, 1683	
288	1763			1838, 1839, 1840, 1842, 2045*	1743*
297	1642		1739, 1740, 1742, 1743	1744	1741
305	2139				1010, 1183
306	2140		1552*, 1625*, 2296*	1093, 2151, 1401* 1541*, 2295*, 1318*	1110, 2391*, 1423* 2304*, 1160*, 1369* 1482*
310	2283			1385, 1386	
314	2285		2303, 2304, 2309, 2110*	2306, 2308, 1605*	1602, 1603, 1604 2305, 2310, 1048* 1232*
318	2288		1025, 1654, 2326, 2327, 2328, 1942*	1262, 1974, 1160* 1332*, 1572*	
319	2289		1704, 2331,	2330, 2332, 2333, 2334, 2341*	1779, 2329
321	2290		2338, 2341	2340	

Question No.	Base Document	Relevance 1	Relevance 2	Relevance 3	Relevance 4
327	2291			1163, 2344, 2345, 2346	1164, 2347
330	2292	1598*		2349, 2350, 2351 2352	
332	2145		2171	1891, 2172, 2173, 2174	2030*
335	2146		1888, 1889, 2178	1885, 1887, 1886* 1890*, 1769*, 1891* 2173*, 1843*	1841, 2176, 2177
338	2294			1833, 2361, 2362, 2363	
339	1535				1037, 1035*
340	1506	1156			
347	2191	1666, 1667, 2395	2258, 2394	1668*, 1670*, 2204* 2300*, 1037*, 1559* 1630*, 2107*, 2213*	2391
352	2182		2383, 2385	1155, 1241, 2382, 2384, 1150*, 1292* 1376*, 1459*, 2365* 1062*, 2366*	2370, 2386, 1111* 1458*, 1479*, 1977*
354	1422		1644	1647, 1648	1424, 1425, 1454 1551
355	2396			1400, 1419, 2387, 2397, 2400	1412, 2392, 2398 2399
365	2188		2379, 2305*, 2304*	1040, 1293, 2309, 2378, 2381, 1225*, 1448*, 1449*, 2124* 2280*, 1433*, 1923* 1924*, 2062*, 2074* 2075*, 2213*	1161, 1421, 2377 2380

SUPPLEMENTARY QUESTIONS

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3	1486		1012, 1014, 1142, 1184, 1606*	1051, 1052, 1102, 2147*, 1658*	1015, 1185, 1095*
4	1485			1005, 1006, 1090, 1091, 1119, 1144, 1181, 1399	
9	1488	1552*, 2296*		1401, 2297*	
13	1492	1048*, 1122* 1354*, 1360* 2005*		1020, 1058, 1196* 1197*, 1999*, 2112*	
15	1534		1021, 1022, 1550		
17	1493		1050	1260, 1406, 1378* 1606*	
18	1493		1259, 1405	1302*, 1436*, 1437* 1438*, 1998*, 2011*	

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29	1497	1463		1462	
32	1498		1106	1196	
33	1498		1196, 1197, 1198		
40	1502	1068			
51	1511	1145, 1611*	1376*, 1406*, 1565* 2076*		
53	1512			1224, 1279	
55	1513		1225, 1464, 1514*	1466, 1609*, 1612*	1793
59	1516	1252		1431, 1672*, 1714* 1799*, 1800*	
61	1517	1166, 1167		1132	
63	1518	1168			1171
66	1519		1173, 1188*	1172, 1097*, 1121* 1187*, 1242*, 1409* 1487*	
68	1536	1272, 1555	1024, 1283, 1552, 1554, 1556	1079*, 1207*, 1418* 1505*, 2257*	1557
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70	1520		1432	1434	1287, 1288, 1289
71	1520	1288, 1289	1433		
74	1521	1467, 1468 1469		1039*, 1503*, 1775*	
79	1524			1302, 1436	1437
81	1525		1305	1338*, 1344*, 1481* 1623*, 1570*, 1798*	1084*, 1123*, 2185* 2226*, 1629*, 1663* 1572*, 2355*
82	1525		1304, 1306, 1307, 1309, 1310, 1570* 1572*	1305, 1629*, 1663* 1798*, 2185*, 2355*	1308
86	1528	1094	1023*, 1105*, 1381* 1494*, 1629*	1192	1326, 1063*, 1261*
87	1528		1021, 1022*, 1306*		1326
98	1753		1380	1593*, 1746*, 1914*	1014, 1379, 1705 1779, 1780, 1704 1012*, 1015*, 1857*, 1859*
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103	1539	1566	1567, 2084*	2078*, 2081*	
104	1539	1567		1564, 1566	
105	1627	1390	1391		
107	1388		1664*, 1629*	1180, 1659, 1660	
108	1388	1002, 1003 1128, 1180	1664*, 1629*	1323, 1324, 1393 1394, 1659, 1389* 1004*, 2302*	
109	1628		1662	1101, 1460, 1661, 1062*	

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112	1540	1569, 1571 1572	2355*	1101, 1655*, 2213*	1798*
115	1541		1332, 1574, 1578, 2189*, 1625*	1317, 1575, 1576, 1110*, 1167*, 2295* 1421*, 1160*, 1068* 2252*	2210*, 2198*
116	1541		1576, 1656*	1575	1317, 1574, 1578
119	1630		1378, 1667	1324, 1666, 1670, 2391*, 1329*	
120	1630		1668	1666, 1667, 1670	1329*, 2391*
123	1544	1594, 1597		1596, 1598	
126	1631	1672			1799*
127	1631				
129	1632	1675, 1678 1679	1205*, 1794*		
130	1633		1680, 1681, 1682, 1683		
131	1546		1606, 1406*	1608, 1142*, 1294* 1962*, 2192*, 2213*	1354*, 1522*, 1873*
132	1546	1608	1406*	1606, 1710*	
134	1755			1791, 1792, 1545*	
138	1757		1794, 1797, 1798, 1256*	1793, 1796, 1291* 1311*, 1335*, 2364*	1800, 2187*, 2367*
139	1757		1252, 1801	1797, 1799, 1800, 2154*	1793, 1794, 1672*
142	1635	1024		1283, 1294*, 1559* 2393*	1689, 1690, 1101* 1354*, 2104*, 2161*, 2395*
143	1635	1283			1662*
146	1637			1699, 1700, 1701, 1702, 1703, 1779* 1681*	1698, 2289*, 2339*
150	1760		1817, 1818, 1819, 1824	1820, 1825	
152	1729	1728	1913	1910	1911
156	1764		1847	1846, 1849	1844, 1845
158	1640		1724, 1726, 1727	1075*, 1909*	1720, 1723
160	1766	1860, 1861		1606*, 1980*, 1012*	
161	1766	1862, 1863		1031*	2174*
165	1643			1746, 1748, 1749, 1265*	
166	1643			1746, 1748, 1265*	1014*
169	1896	1922		1360, 1605*, 1927*	1492*
170	1896		1360	1605*	
171	1896		1923	1924, 1925	

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176	1769	1885, 1886 1887, 1888 1890, 1891	2146*		
181	1941		1966	1967	
182	1941		1967, 1968	1964, 1965	
184	1942		1974, 2326*	1187, 1969, 1970 1971, 1972, 1973	
186	1943	1979		1474	
190	1945		1985, 1987	1984, 1988, 1989 1990	1986
191	1945	1984, 1985 1988, 1989 1990	1987		1986
193	1946			1991, 1992, 1993 1994, 1995, 1997	
195	1947	2003, 2004			1717
198	1949	1259, 1302 2011	1405		
201	1950	2014		2013, 2015, 2016 2017, 1951*, 2023* 2025*, 2026*	2012, 2018, 2019 2020, 1952*, 2024*
202	1950	2020	2018, 2019	2024*	2012, 2016, 2022*
204	1951	2018			2017, 2023, 2024 2025, 2026, 1950* 2016*
205	1951	2021			2022, 2034*
207	1952	2029, 2021* 1951*			
209	1953		2031, 2032, 2035		2037
211	1954	2038, 2041	2043, 2044	2039, 2042	
212	1954	2042			
213	1954	2043, 2044			
215	1955		1763, 1838, 1839 1841	2045, 1743*	1852*
216	1955	1840		2045	
218	1956		1889, 2048, 2050	2046, 2049, 1843*	
224	2062		1687, 2076	2074	2075, 2077
225	2062	2076		2077, 1569*, 1572* 1655*	1687
227	2063		2087	2088	
229	2064	2089, 2090 2091, 2093 2094, 2095	2144*	2164*	
230	2065	2103	2100	1983, 2101, 2104	2099
231	2065	1983, 2102 2104	2097, 2100, 1274* 1553*	2096, 2098, 2099 2101, 1082*	2103, 1982*
233	2006	1302, 2011	1552*	1998*, 2009*, 2010*	1273, 1556

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246	1489	1111,1155 1458,1459	1460, 1461	1054, 1562*	
247	1492			1020, 1056, 1057	
250	1503		1311*	1415, 1416, 1798* 2364*, 2367*	1316*, 1335*
251	1504	1071,1072			
252	1504		1040, 1041, 1074 1207, 1272, 1418 1170*, 2264*		
253	1509		1274	1082	
254	1750	1217,1774			
255	1750	1118,1157 1774,1775			
259	1516	1252,1431			1141
260	1526		1312, 1313		
261	1527	1320,1321		1322, 1476	
263	1531			1446, 1447	1449
264	1532	1367,1451			
265	1533	1058,1411 1482	1036		1423*
266	1941		1351, 1966, 1967	1964, 1965	
267	1542	1582,1583 1586,1982*		1584, 1585	1978*
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269	1543	1591		1590	1588, 1589
270	1544		1201, 1572, 1577 1593	1025*, 2355*, 1068*	1569*,2311*,1540* 1332*
271	1545		1229*	1191, 1600, 1601 1433*, 1782*	
273	1548		1622	1619, 1620, 1621	1617,1616,2150*
274	1942		1973, 1974, 1409*	1997*, 2061*	
275	1634	1685		1686	
277	1758	1803,1808 1809	1802	1807, 1811, 1253*	1804, 1805, 1806 1810,2243*,2247*
278	1759	1813	1032, 1814	2000*	
281	2064	2090,2091 2092		1453, 1443*, 1675* 1676*, 1677*, 1780* 1783*, 1794*, 1484*	
283	1639			1032, 1067, 1715 1716, 1499*,2379*	1717
284	1948		1858, 1859, 1857* 1766*	2008, 1856*	1015*,1285*,1894*
285	2188			2309, 2378, 1923* 1924*, 2062*, 2074* 2075*, 1225*, 2280* 2305*, 2304*	1161, 1421, 2377 2379, 2380
289	1765	1851		1829, 1852	

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291	1640		1721, 1722, 1723 1725, 1728, 1729 1911*	1075*, 1909*	1724, 1726
292	1767		1395, 1866, 1869	1865, 1868, 1870 1872, 1873	1867
293	1894	1015, 1391	1285*	1390*, 1864*	
294	1894	1914, 1915	1285*, 1857*, 1858*	1015, 1391, 1856* 1948*, 1864*, 1658*	1390*, 2008*
295	1641	1733, 1734 1735, 1736			
296	1641			1730, 1422*, 1648* 2392*	1731, 1733, 1734 1735, 1736
298	1642			1739, 1742, 1743	
299	1184		1051, 1185, 1874 1875, 1876	1878, 1879, 1880 1202*, 1746*, 1013*	1012*
300	1768		1881	1883, 1884	
301	1769		1887, 1888, 1889	1843*	
302	1957	2052, 2057 2058, 2059		1743*	
303	1957	2052, 2053	2054, 2055, 2056 2060, 1743*, 1744*		
304	2071		2134, 2137, 2138		
315	2285			1058, 2305, 2306 2307, 2310, 1019* 1122*	1602, 1603, 1604 1232*, 1323*, 1688* 2188*
316	2285		1572, 2311	1063*, 1540*	1602, 1603, 1604 2305, 2188*, 1307* 2213*, 1655*, 2355* 1068*
317	2287		2321, 2322		
320	2289		1779, 2331	2329, 2197*, 1637* 1699*	1698, 2330
322	2290		2336	2338, 2341	2335
323	2290		2338, 2339	2340, 2341	1879
328	2291			1163, 2344, 2348 2217*, 2219*	1164, 2345, 2347
331	2292		2351, 2356	2350, 1187*, 1487* 2383*, 2385*	1045*, 1055*, 1316* 2106*, 2228*
333	2145		1891, 2172	2173, 2174, 1763*	1769*, 2030*, 2031* 2033*, 2052*, 2068*
336	2146	1888	1885, 1887, 1889	2178, 1769*, 2173* 1886*, 1890*, 1843*	2177
348	2191	1024, 1101 2393		1666, 1667, 1093* 1559*, 1630*, 1662* 2104*, 2107*, 2204* 2213*, 2300*	2248

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353	2182		1155, 2383, 2385	2382, 1062*, 1292* 1458*, 1459*, 1461* 2365*, 2366*, 1111* 1150*, 1479*	1241, 2370, 2384 2386
356	2396			1400, 2387, 2392 2398	
357	1514	1019, 1122 1227			
358	1626	1025, 1093 1161, 1370 1372	1044, 1371, 1657 1423*, 1482*	1369, 1160*, 1332* 1572*	1318*
360	2286			1656, 2313, 2317 2318, 2319, 2157* 2274*	2316

APPENDIX 5.1

LIST OF INDEX TERMS

This Appendix contains the full list of the single terms used in the indexing of the complete set of 1400 documents. The terms are in alphabetical order; before each term is given a code which relates to the schedules of single terms to be found in Appendix 5.3.

Following each term is given the number of documents in which the term was used for indexing.

It will be noted that several terms do not have a code equivalent; such terms are proper names for which no reasonable place was available in the schedules.

Z10	Abel (1)	B12	Air (192)	W21	Applied (15)
W35	Aberration (1)	C36	Aircraft (170)	N113	Approach (10)
S45	Ablated (1)	F91	Aircraft-Research- Association (1)	N114	Approaching (4)
S44	Ablating (6)	O1a	Airflow (1)	Y93a	Appropriate (1)
C70	Able (1)	D2	Airframe (14)	V78	Approximate (94)
J5	About (2)	O84a	Airjet (1)	V79	Approximating (1)
J39	Above (6)	C43	Airliner (1)	V79b	Approximation (73)
K71	Abrupt (2)	R1a	Airload (1)	A78	Ar (1)
Y39	Absence (1)	N45	Airspeed (2)	M72d	Arbitrarily (3)
X110	Absolute (3)	O1b	Airstream (1)	M72c	Arbitrary (46)
W40	Absorbed (2)		Airy (1)	L64	Arc (19)
T8	Absorption (10)	A43	Alolad (2)	L101	Area (32)
N30	Accelerated (4)	A42	Alcoa (1)	A78	Argon (13)
P93	Accelerating (8)		Alden (1)	J4	Around (1)
P92	Acceleration (22)	P90	Alfven (1)	M65z	Arrangement (4)
F79	Accelerators (13)	V88	Algebraic (4)	T90	Arrest (1)
G18	Accelerometer (2)	V64	Algorithm (1)	L19	Arrow (2)
V109	Acceptance (1)	M104	Aligned (1)	Y57	Art (2)
X14c	Accidental (1)	M105	Alignment (1)	X15	Artificial (5)
S55	Accommodation (3)	H2a	All (1)	X15a	Artificially (1)
U8	Accumulation (2)	X104c	Allmovable (4)	B42	Asbestos (1)
Z3	Accuracy (6)	X104e	Allmoving (1)	N70	Ascending (1)
Z3a	Accurate (1)	R3	Allowable (4)	N69	Ascent (1)
B33	Acetate (2)	A39	Alloy (37)		A.S.M.E. (1)
	Ackeret (1)		Almen (1)	P53	Aspect (59)
R98	Acoustic (13)	J25b	Alone (1)	U95	Assessment (3)
R99	Acoustically (2)	K5a	Along (13)	X118	Associated (3)
K2d	Across (5)	T18	Alteration (3)	Y79a	Assumed (1)
S90a	Acting (1)	R112	Alternating (1)	V290a	Assuming (1)
S90	Action (3)	Y196	Alternative (1)	V290	Assumption (7)
Q28a	Activation (1)	J38	Altitude (41)	B45	Astrolite (1)
X106	Active (2)	A40	Aluminium (42)	C1	Astrophysics (1)
S90b	Activity (1)	J3	Ambient (8)	K34a	Asymmetric (4)
Y80	Actual (2)	F90	Ames (1)	K34	Asymmetrical (2)
U5	Addition (7)	B18	Ammonium (2)	M93a	Asymptote (1)
X65	Additional (2)	M29	Amount (2)	M93	Asymptotic (30)
S62	Adiabatic (21)	U11	Amplification (6)	M93b	Asymptotically (1)
J28	Adjacent (7)	L89	Amplitude (17)	C77	Atlas (1)
E34b	Adjustable (2)	Y19a	Analogous (1)	C16	Atmosphere (55)
X41	Adjusting (1)	V29r	Analogue (9)	C16	Atmospheric (21)
T9	Adsorption (2)	V29q	Analogy (22)	A5	Atom (10)
Q12b	Advance (2)	V61a	Analysar (2)	A8b	Atomic (5)
Q12c	Advancing (2)	V88	Analysis (226)	W66	Attached (21)
X92a	Adverse (11)	U89	Analytic (11)	D78	Attachment (9)
W5	Aeolotropic (1)	U90	Analytical (17)	J91a	Attack (19)
Z13	Aerodynamic (180)	G32	Anemometer (6)	R34	Attenuating (1)
Ob	Aerodynamically (1)	J90	Angle (224)	R115	Attenuation (6)
Oa	Aerodynamics (11)	L69a	Angled (23)	P43	Attitude (5)
P30a	Aeroelastic (9)	L69	Angular (10)	R110	Audio (1)
P30	Aeroelasticity (7)	L696	Angularly (1)	U4	Augmentation (6)
D3	Aerofoil (103)	P60	Anhedral (1)	R109	Aural (1)
C36a	Aeronautical (1)	W4	Anisotropic (1)	X416	Auto (1)
C36	Aeroplane (13)	W.4a	Anisotropy (2)	V117	Autocorrelation (3)
S29	Aerothermochemistry (1)	L33	Annular (8)	V118	Autocorrelogram (1)
S24a	Aerothermodynamic (1)	L34	Annulus (2)	S84	Autoignition (1)
P32	Aerothermoelastic (1)	G43	Antenna (1)	X40	Automatic (4)
W21a	Affected (1)	R22	Anticlastic (2)	E91	Autopilot (1)
H34	Aft (2)	K34	Antisymmetric (3)	M93	Auxiliary (2)
N36	After (1)	K34	Antisymmetrical (4)	Y88	Average (10)
H32	Afterbody (35)	H17	Apex (10)	V112a	Averaging (1)
F75	Afterburner (1)	J24	Apogee (3)	O48	Avoidance (1)
S79	Afterburning (1)	F80	Apparatus (17)	C51	Avro (1)
E84	Aftercooler (1)	Y79	Apparent (3)	J94	Axial (113)
P22	Afterflow (1)	U38	Appearance (2)	J94a	Axiability (35)
J47	Ahead (4)	X115c	Applicability (3)	J56	Axis (36)
D12	Aileron (16)	U81	Application (9)	K33	Axisymmetric (66)
				K33	Axisymmetrical (5)

H31	Back (2)	O93	Flast (16)	O82	Bursting (2)
D100a	Backing (1)	Q58b	Bleed (5)		Busemann (4)
K8	Backward (1)	Q58a	Bleeding (1)	P37	Buzz (10)
F1	Baffles (1)	E3	Block (2)		
	Bakanov (1)	P12	Blockage (10)	D33	Cabin (2)
E40	Bakelite (1)	P12a	Blocking (1)	V31b	Calculated (1)
P78	Balance (15)	F85	Blowdown (8)	V31a	Calculating (1)
E15	Ball (1)	E74	Blower (1)	V31	Calculation (252)
C83	Ballistic (12)	Z16	Blowing (14)	V99	Calculus (4)
O58	Ballotini (1)	W100	Blown (1)	Y100	Calibrated (1)
B2	Balsa (3)	O44	Blowoff (1)	V29b	Calibration (21)
D96	Bands (8)	Q54a	Blowout (1)	S27	Caloric (4)
R111f	Bandwidth (1)	K75	Bluff (8)	S28	Calorically (1)
D27	Bang-bang (1)	K73	Blunt (44)	P69	Camber (19)
M101	Bank (3)	K73	Blunted (18)	L40a	Cambered (13)
P47	Banked (1)	R37	Blunting (5)	G37	Camera (1)
D89	Bar (7)	K74	Bluntness (19)	F39a	Can (1)
M115	Bare (1)	E22	Boattail (1)	C58	Canard (1)
G7a	Barrel (1)	K84	Boattailed (1)	O83	Cancellation (1)
H24	Base (41)	K85	Boattailing (2)	M83	Canted (1)
K83a	Based (1)	E1	Body (288)	D102	Cantelever (14)
Y91	Basic (9)	S37	Boiloff (1)	E41	Cantelevered (6)
	Batdorf (8)	F49	Bolt (1)	F42	Cap (8)
D52	Bays (6)		Boltzmann (2)	Z4	Capability (2)
O57	Bead (1)	R104	Bomb (1)	S22a	Capacitance (2)
D101	Beam (26)	C45	Bomber (2)	Z5	Capacity (10)
	Beane (1)	F46a	Bond (1)	F55	Capillary (1)
F27	Bearing (3)	R102	Boom (13)	K83	Capped (1)
R106	Beat (1)	N49	Boost (1)	G72	Capsule (2)
H25	Bed (1)	W56	Boosted (1)	N74	Capture (1)
	Bedford (2)	E73a	Booster (2)	C44	Caravelle (3)
U26	Beginning (2)	N66	Boosting (2)	A70	Carbon (10)
S92	Behaviour (39)	L100a	Bore (1)	B14a	Carbonate (2)
J49	Behind (22)	H23	Bottom (3)	O56	Carborundum (1)
V107	Bei (1)	C48	Boulton-Paul (1)	L12	Caret (2)
C63	Bell (1)	J71	Bound (8)	T51	Carrying (6)
F45	Belleville (1)	J70	Boundary (512)	F4	Cascade (1)
	Belotserkovski (3)	M111	Bounded (3)	S91c	Case (3)
J8	Belt (1)	M112	Bounding (4)		Cassinian (1)
L68	Bend (3)	H29	Bow (38)		Castiellanos (1)
R16	Bending (102)	R20	Bowing (1)	B55	Castolite (1)
V108	Ber (1)	E4	Box (6)	T7	Catalytic (1)
	Bernoulli (2)	D57a	Boxtype (1)	G47	Cathode (1)
	Berthelot (1)	N106	Braking (3)		Cauchy (1)
	Bessel (1)	A48	Brass (5)	X17c	Caused (2)
V51	Bestfit (1)	O43	Breakdown (28)	T66a	Cavitating (1)
	Beta (1)	T44	Breaking (1)	R40	Cavitation (3)
J74	Between (13)	Q61	Breathing (5)	H72	Cavity (4)
K86	Bevelled (1)	C30	Bridge (1)	G12	Cell (2)
Y58a	Bibliography (1)	M20	Broad (1)	D47	Cellular (3)
L39	Biconvex (11)	S76a	Btu (1)	B32	Cellulose (2)
* T43	Bifurcation (4)	B78	Bubble (3)	C69	Centaur (1)
V90	Biharmonic (3)	R52	Buckle (14)	J51	Central (5)
O86	Billowing (1)	W106	Buckled (13)	J51a	Centrally (4)
A39a	Bi-metallic (1)	R51	Buckling (134)	J52	Centre (49)
A8d	Bimolecular (2)		Budiansky (1)	J51b	Centred (1)
M38	Binary (5)	P40	Buffet (1)	J56a	Centreline (3)
E35c	Binding (1)	P39	Buffeting (13)	J99	Centrifugal (8)
	Biot (8)	D41	Built (2)	J100	Centripetal (1)
C56	Biplane (2)	L90	Bulk (1)	B24	Ceramic (3)
	Birnbaum (1)	D69	Bulkhead (5)	U30	Cessation (2)
J57	Bisector (1)	H64	Bump (4)	F38	Chamber (10)
X104	Bistable (1)	Y36a	Buoyancy (1)	T16	Change (38)
S54	Black (1)	W43	Burned (1)	T17	Changing (3)
F21	Blade (38)	S78	Burning (4)	F64	Channel (22)
F21	Blading (3)	J46	Buried (1)		Chapman (5)
	Blasius (13)	Q60	Burst (2)	Y90	Characteristic (72)

S20	Charge (5)	V91	Compatibility (3)	V19	Contracting (2)
S7	Charged (8)	S94d	Competition (1)	V18	Contraction (11)
T5	Charging (1)	Y5	Complementary (1)	T15a	Contribution (1)
Y55	Chart (15)	M52	Complete (5)	U70	Control (66)
S96	Chemical (18)	U30a	Completion (1)	W88	Controlled (7)
S97	Chemically (10)	W7	Complex (5)	U71	Controlling (1)
T10	Chemisorption (1)	H4	Component (22)	W61	Convected (1)
	Cheng (1)	X19a	Composed (2)	T76	Convecting (1)
M876	Chessboard (3)	W8	Composite (13)	S50	Convection (27)
	Chien (1)	W6	Composition (9)	X52	Convective (23)
C31	Chimneys (1)	W9	Compound (2)	Y89	Conventional (2)
V25b	China (1)	B54	Compreg (1)	Q15	Convergence (12)
B15	Chloride (3)	W94	Compressed (10)	L85	Convergent (15)
P11a	Choke (1)	P1	Compressibility (28)	Q16	Converging (8)
P11b	Choked (7)	O40	Compressible (124)	T29	Conversion (8)
P11	Choking (11)	Q38a	Compressing (2)	E86	Convertor (1)
P65	Chord (25)	Q38	Compression (64)	L38	Convex (9)
K2	Chordwise (34)	X55	Compressive (36)	S70	Cool (2)
T48	Chroming (1)	Q386	Compressively (1)	A30	Coolant (13)
A56	Chromium (2)	E74	Compressor (1)	S69	Cooled (21)
B52	Cincinnati-Testing- Laboratory-Material (1)	V33	Computation (11)	E83	Cooler (4)
		V34	Computational (1)	S42	Cooling (57)
N82	Circling (1)	V32	Compute (1)	V67	Coordinate (17)
J22	Circuit (2)	V58	Computer (23)	L76	Coplanar (1)
G42a	Circuitry (1)	L37	Concave (7)	A49	Copper (2)
L29	Circular (154)	W70	Concentrated (8)	H46	Core (22)
L30	Circularity (1)	T68	Concentration (21)	H74	Corner (22)
Q4a	Circulating (1)	M117	Concentric (4)	E466	Cornered (2)
O101	Circulation (14)	Y43	Concept (7)	U73	Correction (18)
X32	Circulatory (2)	Y70a	Conceptual (1)	X42	Corrective (1)
J60	Circumferential (41)	S38	Condensation (6)	G23	Corrector (1)
V79d	Circumscribed (1)	B68	Condition (112)	X116	Correlated (1)
C42	Civil (1)	T74	Conducting (30)	V116	Correlation (25)
E27	Clamped (35)	T75	Conduction (40)	V60	Correlator (1)
T99	Clamping (1)	X48	Conductive (3)	V116a	Correlogram (1)
E42a	Clamshell (1)	X48a	Conductivity (21)	X115b	Corresponding (1)
Y89	Classical (8)	G51	Conductor (1)	F54	Corridor (8)
U86	Classification (2)	E11	Cone (128)	L81	Corrugated (7)
	Clausing (1)	K45	Coned (1)	H62	Corrugation (2)
V25a	Clay (1)	M66	Configuration (42)	U79	Cost (3)
N71	Climb (1)	T35	Confluence (1)		Couette (2)
K89	Clipped (1)	V106	Confluent (1)	P8	Coulomb (1)
J102	Clockwise (1)	V97	Conformal (5)	K11	Counter (4)
J33	Close (3)	K45	Conical (71)	S94c	Counteraction (1)
M109	Closed (23)	K45a	Conically (1)	V6	Counting (1)
J34	Closely (2)	M396	Conjugate (1)	P73	Couple (5)
F40	Closures (1)	X117	Connected (3)	X119	Coupled (5)
C21	Cloud (2)	V49	Conservation (7)	T100	Coupling (9)
J95	Coaxial (2)	Y89a	Conservativeness (1)	D93	Coupon (1)
O65	Cocurrent (2)	T156	Considerations (1)	F32	Cover (1)
U83	Code (2)	Y24	Consistent (2)	V111b	Coverage (1)
Y17	Coefficient (212)	X73	Constant (79)	E47	Covered (1)
S68	Cold (12)	T93	Constraint (7)	D35	Cowling (3)
	Cole (1)	U20	Constriction (1)	H68	Crack (2)
R49	Collapse (16)	U66	Construction (12)	R41	Cracking (1)
R50	Collapsing (12)	N50	Consumption (2)	F30a	Crank (1)
U9	Collecting (1)	J27	Contact (4)	R64	Creep (33)
M55	Collective (1)	X115	Containment (1)	O17	Creeping (1)
O31	Collision (1)	T39	Contamination (12)	H20	Crest (1)
M71a	Collocation (1)	M30	Content (1)	Y44	Criterion (14)
A61a	Columbium (1)	T88a	Continuation (1)	M23	Critical (57)
D104	Column (27)	X72	Continuity (5)		Crocco (2)
M71	Combination (38)	X70	Continuous (19)	M108a	Crookedness (1)
W28	Combined (45)	X71	Continuously (1)	K88	Cropped (3)
X6	Combustible (3)	O30	Continuum (11)	L28	Cross (72)
S78	Combustion (18)	L2	Contour (12)	M88	Crossed (3)
U87	Comparison (4)	F71	Contoured (1)	Q23	Crossing (1)

H21	Crown (1)	N34	Delay (5)	X81	Discrete (5)
L27	Cruciform (11)	L11	Delta (46)	P77	Disequilibrium (1)
N76	Cruise (3)	M28	Dense (1)	E10	Disk (21)
N75	Cruising (3)	L107	Density (120)	R44	Dislocation (1)
B69a	Crystals (1)	Y9	Dependant (2)	W63	Dispersed (1)
H87	Cubic (3)	Y7	Dependence (2)	T58	Dispersion (1)
X58	Cumulative (7)	Y8	Dependent (19)	W64	Displaced (2)
R21	Curling (1)	O59	Deposit (1)	R30	Displacement (12)
S18	Current (10)	O59a	Deposited (1)	T59	Dissipation (12)
O88	Curtain (3)	H66	Depression (1)	X44	Dissipative (5)
	Curtis (1)	L97	Depth (5)	W44	Dissociated (14)
O62	Curtiss-Wright (1)	U32	Derivation (8)	T3	Dissociating (10)
L63	Curvature (55)	Y17a	Derivative (39)	T2	Dissociation (27)
L62	Curve (64)		Deryagin (1)	W39	Dissolved (1)
L61	Curved (26)	N103	Descending (2)	L93	Distance (76)
L28a	Curvilinear (3)	N104	Descent (9)	J34a	Distant (1)
O89	Cushion (3)	Y52a	Description (1)	R43	Distorting (1)
K66	Cusp (1)	V29hc	Descriptive (1)	R42	Distortion (16)
K67	Cusped (2)	U64	Design (66)	W62	Distributed (19)
K87	Cut (2)	D101a	Destabilising (1)	T53	Distribution (442)
H73	Cutout (4)	P16	Destalling (3)	P83	Disturbance (42)
M95a	Cycles (4)	W65	Detached (21)	W67	Disturbed (3)
N21	Cyclic (4)	T63	Detachment (22)	T66	Disturbing (1)
S56a	Cycling (3)	V4	Detection (3)	N9	Diurnal (2)
G46	Cyclotron (1)	V98	Determination (68)	P38	Divergence (19)
E6	Cylinder (180)	O95	Detonation (2)	L86	Divergent (2)
K42	Cylindrical (118)	V59a	Deuce (1)	Q19	Diverging (7)
		X64	Developable (1)	O67	Dividing (2)
S19	D-C (1)	X20	Developed (3)	N90	Diving (3)
R46	Damage (11)	U48	Development (17)	T40	Division (1)
W52	Damped (2)	T84	Deviation (11)	C64	Doak (1)
R116	Damping (63)	F80b	Device (3)	L24	Dodecagonal (1)
G33	Dampometer (2)	X11	Dewpoint (1)	J6	Domain (3)
G12a	Dashpot (1)	Y53	Diagram (6)	E16	Dome (2)
Y49	Data (71)	L100b	Diameter (21)		Donnell (28)
N8	Day (12)	L18	Diamond (9)	D64	Door (1)
X49	Dead (9)	P5	Diaphragm (5)		Doppler (1)
B67	Debris (1)	A11	Diatomic (10)		Dorodnitzin (2)
	Debye (1)	S22	Dielectric (1)	M36	Double (26)
A61	Decarburized (1)		Dietze (1)	O71	Doublet (4)
U52	Decay (16)	Y25	Difference (22)	K13	Down (2)
U53a	Decaying (17)	Y26	Different (1)	K22	Downstream (36)
P95	Decelerating (5)	Y27	Differential (86)	K14	Downward (2)
P94	Deceleration (26)	Y28	Differentially (2)	P18	Downwash (26)
D63	Deck (1)	Y29	Differing (1)	P6	Drag (208)
T1	Decomposition (1)	R112b	Diffraction (1)	G6	Driers (1)
F26	Decoupling (1)	W64a	Diffuse (2)	P9	Drift (1)
U14	Decrease (3)	F66	Diffuser (9)	L84b	Drilled (1)
U13	Decreasing (2)	T60	Diffusion (26)	R40a	Drilling (1)
U15	Decrement (2)	X47	Diffusivity (3)	Q49a	Drive (1)
U92	Deduction (1)	V59	Digital (16)	W96	Driven (4)
U45	De-excitation (1)	P59	Dihedral (4)	G4	Driver (5)
Z7	Defect (3)	L87	Dimension (11)	Q49	Driving (5)
Z6	Deficiency (1)	M1	Dimensional (2)	R30a	Droop (1)
U16a	Deficit (2)	M2a	Dimensionless (3)	K92	Drooped (1)
S80	Deflagration (1)	R62	Dimpling (1)	O62	Drosophila (1)
W90	Deflected (12)	R20	Dioxide (6)	E9	Drum (2)
R31	Deflecting (3)		Dirac (1)	X9	Dry (2)
R30	Deflection (114)	J88	Direct (15)	M37	Dual (4)
W103a	Deformable (1)	W89	Directed (2)	F64	Duct (10)
R28	Deformation (50)	J84	Direction (17)	E49	Ducted (4)
R29	Deformed (1)	J86	Directional (8)	F64	Ducting (1)
	Deforming (1)	B65	Dirt (2)	X17a	Due (1)
U53	Degeneration (2)	Q50	Discharge (8)	A41	Duralumin (1)
M31	Degree (88)	X82	Discontinuity (14)	N2	Duration (2)
	De-Hoffman (1)	X80	Discontinuous (10)	N2a	During (1)
	DeLaval (1)	C81	Discover (1)	B66	Dust (2)

Q25	Dynamo (64)	E69	Engine (18)	Y79b	Expressible (1)
Q25a	Dynamically (1)	E59b	Eniac (1)	V29p	Expression (11)
			Enskog (1)	K93	Extended (1)
C14	Earth (19)	N109	Entering (10)	X63a	Extendible (1)
M120a	Eccentrically (1)	S58	Enthalpy (62)	R33a	Extending (1)
X30	Eccentricity (15)	M51a	Entirely (1)	X63	Extensible (1)
T85c	Echoes (1)	Z18	Entrainment (2)	R33b	Extension (7)
	Eckert (2)	F57	Entrance (5)	R33c	Extensional (5)
U78	Economics (2)	S60	Entropy (27)	L102a	Extensive (1)
O74	Eddy (11)	N108	Entry (19)	G26	Extensometers (1)
H52	Edge (200)	H41a	Envelope (6)	L102	Extent (2)
E46c	Edged (14)	J1	Environment (2)	J67	External (38)
K5	Edgewise (2)	J2	Environmental (1)	J68	Externally (1)
T15	Effect (136)	B35	Epoxy (1)	S86	Extinction (1)
Y86	Effective (13)	Y3a	Equal (2)	V47a	Extrapolated (1)
Z2	Effectiveness (10)	Y3b	Equality (1)	M56	Extreme (3)
Z1	Efficiency (8)	Y3	Equally (2)	W102	Extruded (1)
Z1a	Efficient (1)	V89	Equation (312)		
Q50	Effluxes (1)	C17	Equatorial (1)	C47	F (2)
Q52	Effusion (1)	S74	Equicohesive (1)	H36	Face (15)
V103	Eigenfunctions (2)	L25	Equilateral (1)	E45	Faced (8)
V102	Eigenvalue (6)	T103	Equilibration (2)	F80a	Facility (2)
H90a	Eighth (1)	P74	Equilibrium (96)	M90	Facing (4)
F74	Ejector (2)	F80	Equipment (17)	H6	Factor (49)
R68	Elastic (88)	Y1	Equivalence (3)	S76	Fahrenheit (7)
R69	Elastically (5)	Y2	Equivalent (19)	U53d	Failing (1)
R67	Elasticity (13)		Erdmann (1)	R4	Failsafe (1)
S9	Electric (12)	T12	Erosion (4)	R66	Failure (27)
S8	Electrical (15)	X85	Erratic (1)	C55	Fairchild (1)
S10	Electrically (24)	Z9	Error (7)	D74	Fairing (1)
A35	Electroformed (2)	N73	Escape (7)		Falkner (6)
S15	Electrodynamic (1)	U94	Estimate (2)	N94	Fall (1)
S14	Electrohydrodynamic (1)	U93	Estimation (26)	N93	Falling (4)
S1	Electromagnetic (4)	A22	Ethylene (3)	E77	Fan (7)
S2	Electromagnetically (1)		Euler (4)	J35	Far (5)
A3	Electron (13)	G7	Evacuators (1)		Farnborough (3)
S12	Electronic (8)	U96	Evaluation (11)	N29	Fast (2)
T47a	Electroplating (1)	S36	Evaporating (1)	R65	Fatigue (24)
S17	Electrostatic (2)	S35	Evaporation (2)	X92b	Favourable (1)
H5	Element (22)	S91	Event (1)	U77	Feedback (2)
Y76a	Elementary (1)	V36	Exact (34)	O83d	Feeding (2)
M22b	Elevated (5)	M55a	Excess (2)		Fenter (1)
D16	Elevator (5)	T71	Exchange (9)		Ferri (2)
D18	Elevon (1)	E82	Exchanger (1)	A57	Ferrous (1)
U23	Elimination (7)	V42	Excitation (17)	B51	Fiberglass (1)
L43	Ellipse (7)	X22	Excited (3)	B27	Fibre (4)
E17	Ellipsoid (3)	V44	Exciting (2)	B28	Fibrous (1)
K60	Ellipsoidal (6)	H59	Excrecence (3)	J9	Field (136)
L42	Elliptic (41)	R6	Exerted (2)	H89a	Fifth (2)
L44	Elliptical (7)	Q50	Exhaust (20)	C46	Fighter (4)
L45	Ellipticity (1)	Q51	Exhausting (16)	O66	Filament (2)
K94	Elongated (2)	F63	Exit (24)	D58	Filled (3)
Q44	Embedded (1)	Q55	Exiting (2)	D74b	Filler (1)
X56a	Embryonic (1)	S56	Exothermic (1)	U12a	Filling (1)
X53	Emissivity (5)	O32	Expanded (1)	B77	Film (10)
Q50	Emission (3)	U7	Expanding (1)	F6	Filter (2)
W101	Emitted (1)	U6	Expansion (80)	W37	Filtered (1)
Y68	Empirical (4)	N51	Expenditure (1)	D29	Fin (16)
M110	Enclosed (3)	V1	Experiment (144)	H91	Final (4)
S91b	Encounter (1)	V2	Experimental (128)	V4	Finding (1)
H48	End (25)	R105	Exploded (1)	P54	Fineness (9)
X23b	Ended (3)	C78	Explorer (3)	M40	Finite (67)
R83a	Endgrain (1)	O94	Explosion (2)	C41	Finned (2)
D84a	Endplate (1)	R54	Explosives (1)	S82	Fire (1)
R64a	Endurance (5)	V74a	Exponent (3)	S85	Firing (2)
Q28	Energy (104)	V104b	Exponential (4)	H82	First (29)
	Engessor (2)	M114	Exposed (5)	E71	Fission (1)

F47	Fit (1)	D70a	Framework (1)	X92o	Good (1)
V48	Fitting (1)	J83a	France (1)		Goodman (2)
M64	Five (1)	Y33	Free (64)		Gortler (1)
E35	Fixed (42)	E33	Free-free (2)	L45b	Gothic (1)
T97	Fixing (1)	Y32	Freedom (18)	W89a	Governed (1)
S81	Flame (11)	Y35	Freely (17)	M72b	Graded (1)
D74a	Flange (9)		Freeman (1)	J92	Gradient (104)
E32	Flanged (1)	T6a	Freeze (1)	N28a	Gradual (1)
D19	Flap (22)	T6	Freezing (5)		Graham (1)
R92a	Flapping (7)	A86	Freon (10)	B85	Grain (2)
K95	Flare (4)	N26	Frequency (66)	V43	Graphical (2)
K96	Flared (4)		Fresnal (1)	A71	Graphite (5)
L73	Flat (208)		Friction (144)		Grasshof (2)
R38	Flattening (1)	X24	Frictional (9)	B64	Gravel (3)
R67	Flexibility (13)	O14	Frictionless (1)		Gravelos (1)
R73	Flexible (11)	J60a	Fringe (5)	X28	Gravitational (2)
R74	Flexibly (1)	H27	Front (14)	Q35a	Gravity (13)
R17	Flexural (20)	W48	Frozen (20)	N107	Graze (2)
R18	Flexure (3)	O61	Fruitfly (1)		Green (4)
N52	Flight (74)	E12	Frustum (4)		Gregg (1)
E34a	Floating (5)	A20	Fuel (12)	F3	Grid (1)
O1	Flow (942)	C75	Fuelling (1)	H68a	Groove (1)
O2	Flowing (2)	M50	Full (7)	M65b	Gross (3)
G30	Flowmeter (3)		Fuller (1)	C24	Ground (35)
T26	Fluctuating (7)	M49	Fully (9)	Y42	Group (1)
T25	Fluctuation (12)	V104	Function (79)	V46	Growth (24)
	Flugge (9)	Y91	Fundamental (4)	N120	Guidance (4)
B71	Fluid (144)	A73	Fused (3)	F21a	Guide (5)
W38	Fluidized (1)	D32	Fuselage (28)	C84	Guided (3)
B23	Fluorochemicals (1)	L41	Fusiform (1)	F88	Gun (4)
P33	Flutter (68)	E72	Fusion (1)	C20	Gust (19)
P34	Fluttering (1)			Q6	Gyration (1)
O1	Flux (17)	Q35b	G (3)	E88	Gyroscope (1)
N53	Flying (1)	U5a	Gain (1)	Q11	Gyroscopic (2)
F30b	Flywheel (1)		Galcit (1)		H (2)
B81	Foam (1)		Galerkin (12)	E25	Haack (1)
A75	Foamed (1)	A58a	Gamma (1)	H9	Half (28)
V25c	Focal (1)	H71	Gap (2)		Hall (4)
C23	Fog (1)	B73	Gas (164)		Hamel (1)
F1a	Foil (1)	Z12	Gasdynamic (4)	K78	Hammerhead (1)
R24	Folding (2)			D86	Handley-Page (1)
J49a	Following (2)	B73	Gaseous (7)	N44	Handling (3)
H26a	Foot (9)	G25	Gauge (11)	R83	Hard (1)
Q32	Force (184)		Gauss (1)	T46	Hardening (2)
W86	Forced (2)		Gaussian (2)	R93	Harmonic (11)
R53	Forcible (1)	F24	Gear (1)	R93a	Harmonically (5)
V29ga	Forcing (3)	D17	Geared (1)		Hartmann (3)
H28	Forebody (9)	Y86b	General (18)		Hartree (1)
P7	Foredrag (3)	V29i	Generalized (7)	B56	Haveg (1)
Y31a	Foreign (8)	X18	Generated (7)	N128	Hazard (1)
H28	Forepart (1)	U36a	Generating (1)	A77	He (1)
H28	Foreplane (1)	U36	Generation (14)	H19	Head (23)
K29	Form (27)	E85	Generators (9)	K83	Headed (1)
U37	Formation (15)	D57b	Geodetic (1)	H62a	Heaps (1)
X19	Formed (1)	M2	Geometric (3)	S23	Heat (304)
B41	Formica (1)	K28a	Geometrical (2)	S73	Heated (25)
V75	Formula (32)	K28b	Geometrically (1)	G5	Heater (2)
V34a	Formulation (7)	K28	Geometry (15)	S40	Heating (80)
K6	Forward (29)		Gerard (1)	N97	Heave (1)
H26	Foundation (3)	Y79a	Given (2)	N96	Heaving (1)
M63	Four (4)	Q47a	Glancing (1)	M28b	Heavy (4)
	Fourier (17)	B25	Glass (7)	L96	Height (26)
H88	Fourth (7)	B26	Glassy (1)		Heisenberg (1)
H8	Fraction (6)		Glauert (1)	E50	Helical (1)
R47	Fracture (1)	N105	Glide (6)	G59	Helicopter (4)
D70	Frame (8)	C66a	Glider (6)	M118	Heliocentric (1)
E40b	Framed (1)	B8	Glycerin (1)		

A77	Helium (45)	L52	I (3)	M43d	Infinitesimally (1)
K49	Helix (2)		IBM (3)	M43a	Infinity (2)
	Helmholtz (4)	C87	ICBM (1)	W92	Inflected (1)
E16	Hemisphere (34)	C23a	Ice (1)	R19	Inflection (2)
K58a	Hemispheric (3)		Iconel (1)	O72	Inflow (2)
K58	Hemispherical (11)	Y71	Ideal (22)	T14	Influence (15)
K58b	Hemispherically (2)	V92b	Idealization (3)	O49	Inhibition (1)
W16	Heterogeneous (1)	Y72	Idealized (4)	W14	Inhomogeneous (2)
B9	Hexachlorethane (1)	W42	Ignited (1)	H82	Initial (62)
L22	Hexagonal (2)	S83	Ignition (4)	X18a	Initialed (1)
	Hiemenz (1)	V68	Ignorable (1)	H82a	Initially (8)
M21	High (136)		Illingworth (2)	O45a	Initiation (1)
M22a	Higher (1)	C44a	Ilushin (1)	A19a	Injectant (3)
M22	Highly (24)	O79	Image (1)	W99	Injected (6)
C66	Hiller (2)	N32	Immediately (1)	Z17	Injection (54)
F50	Hinge (9)	X99	Immobile (1)	F74	Injector (2)
E30	Hinged (5)	X104d	Immovable (1)	A19	Ink (1)
N3a	Historical (2)	Q43	Impact (16)	F57	Inlet (19)
N3	History (12)	R113	Impedance (12)	J65	Inner (18)
Y61	Hodograph (5)	W53	Impeded (1)	B9a	Inorganic (2)
	Hoff (2)	F15	Impeller (8)	Y48a	Input (10)
R23	Hogging (1)	Y82	Imperfect (5)	V79c	Inscribed (1)
	Hohmann (1)	Z8	Imperfection (27)	O60	Insect (2)
N43	Holding (1)	R90	Impermeable (4)	P82	Instability (44)
H69	Hole (7)	Q46	Impingement (3)	N33	Instantaneous (5)
D58	Hollow (5)	Q45	Impinging (5)	G17a	Instrumentation (18)
	Homas (1)	W70a	Imposed (2)	G17	Instruments (4)
C85	Homing (1)	W26	Improved (2)	S72	Insulated (22)
W13	Homogenous (13)	T21	Improvement (1)	S41d	Insulating (2)
P28	Homologous (1)	Q42	Impulse (6)	S41c	Insulation (3)
A9	Homonuclear (1)	Q42a	Impulsive (1)	F60	Intake (3)
D45	Honeycomb (3)	Q42b	Impulsively (1)	V82	Integrable (1)
	Hookean (1)	J65a	In (2)	W19	Integral (60)
D97	Hoop (5)	J59	Inboard (2)	W29	Integrated (1)
E40a	Hooped (1)	L92a	Inch (5)	V83	Integrating (1)
M73a	Horizontal (10)	J91	Incidence (64)	V57	Integration (28)
D22	Horn (1)	Y9a	Incident (11)	V83d	Integrative (1)
L36	Horseshoe (6)	X56	Incipient (5)	M28d	Intense (4)
S73	Hot (23)	M78	Inclination (8)	M28c	Intensity (18)
O63	Housefly (1)	M77	Inclined (7)	S94	Interacting (2)
N79	Hover (2)	Z8a	Inclusion (1)	S93	Interaction (104)
C34	Hovercraft (3)	K14a	Incoming (1)	J75a	Interangular (1)
N78	Hovering (6)	O39	Incompressible (28)	F65	Interblade (2)
	Howarth (3)	A45	Inconel (3)	R41a	Intercrystalline (1)
F19	Rub (7)	U2	Increase (7)	H39	Interface (12)
	Hugoniot (2)	W55	Increased (2)	P9a	Interference (20)
N123	Human (2)	U1	Increasing (5)	V25	Interferential (1)
X10	Humidity (3)	U3	Increment (1)	V21	Interferogram (3)
	Hurwitz (1)	X65	Incremental (3)	G41	Interferometer (2)
Z23	Hydroballistic (1)	Y32	Independence (1)	V20	Interferometric (1)
A23	Hydrocarbon (1)	Y33	Independent (4)	V19	Interferometry (1)
Z19	Hydrodynamic (10)	Y59	Index (2)	H45	Interior (7)
A76	Hydrogen (17)	G22	Indicator (2)	H94	Intermediate (14)
S13	Hydromagnetic (2)	P5	Indicial (8)	N19	Intermittent (2)
X26	Hydrostatic (21)	B89	Indirect (1)	J75c	Intermolecular (1)
L48	Hyperbola (1)	Y37a	Individual (1)	J65	Internal (42)
L49	Hyperbolic (11)	X21	Induced (74)	J66	Internally (2)
V105	Hypergeometric (1)	S21	Inductance (1)	C3	Interplanetary (2)
L50	Hyperliptic (3)	U35	Induction (7)	V46	Interpolating (1)
O10	Hypersonic (264)	B36	Inelastic (8)	V47	Interpolative (1)
O11	Hypervelocity (5)	Y31	Inequality (2)	Q14	Intersecting (2)
V29n	Hypothesis (2)	X102	Inert (3)	J76	Intersection (7)
Y70	Hypothetical (1)	Q26	Inertia (12)	J75	Interstage (1)
B57	Hysol (1)	G36a	Inexorable (1)	N13b	Interval (2)
R120	Hysteresis (6)	M43	Infinite (33)	K16	Into (1)
R118	Hysteretic (1)	M43b	Infinitely (14)	J75d	Intramolecular (1)
		M43c	Infinitesimal (3)	X17a	Introduced (1)

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|------|--------------------|------|--------------------|-------|-----------------------------|
| X75 | Invariant (1) | R63 | Kinking (1) | M28a | Lightly (1) |
| V37 | Inverse (3) | | Kirchhoff (5) | M28g | Lightweight (1) |
| T88 | Inversion (7) | | Kirk (1) | J73 | Limit (18) |
| M85 | Inverted (3) | H80 | Knee (2) | U24 | Limitation (1) |
| V85 | Investigation (32) | F53 | Knuckle (2) | M41 | Limited (1) |
| O15 | Inviscid (90) | | Knudsen (3) | U25 | Limiting (2) |
| K15 | Inward (1) | A79 | Krypton (2) | J16 | Line (45) |
| B16 | Iodide (1) | | Kuo (1) | M3 | Linear (54) |
| A81 | Iodine (1) | | Kussner (2) | V291 | Linearization (8) |
| A7 | Ion (12) | | Kutta (3) | V28k | Linearized (49) |
| T4 | Ionization (12) | | | M3a | Linearly (5) |
| W47 | Ionized (10) | R107 | L (2) | G9 | Liners (1) |
| C18 | Ionosphere (7) | F81 | Laboratory (1) | H54 | Lip (1) |
| C86 | IREM (1) | A17 | Lacquer (1) | S31a | Liquefaction (2) |
| A58 | Iron (1) | N35 | Lag (7) | B71a | Liquid (17) |
| X43 | Irregularity (1) | T66 | Lagging (1) | Y58b | Literature (1) |
| X60 | Irreversible (1) | | Lagrange (2) | R1 | Load (132) |
| O24 | Irrotational (4) | | Lagrangian (9) | W85 | Loaded (24) |
| O27 | Isentropic (17) | L56 | Lambda (1) | R1 | Loading (86) |
| Y62 | Isobar (3) | O18 | Laminar (288) | H65 | Lobe (2) |
| O28 | Isobaric (2) | O41 | Laminarization (1) | E44a | Lobed (1) |
| N20a | Isochrome (1) | D43 | Laminate (1) | J12 | Local (65) |
| N20 | Isochronous (2) | D43a | Lamination (1) | J13 | Locally (48) |
| T34 | Isoenergetic (1) | | Landahl (2) | J11a | Located (1) |
| Q28b | Isoerg (1) | N115 | Landing (2) | J11 | Location (50) |
| Y64 | Isogon (1) | | Langhaar (1) | B59 | Lockfoam (1) |
| J25a | Isolated (3) | | Langley (4) | V27 | Lockheed (1) |
| R117 | Isolation (1) | P13 | Lap (3) | V104a | Logarithmic (5) |
| V22 | Isopycnal (1) | | Laplace (2) | M13 | Long (37) |
| L26 | Isosceles (1) | M10 | Large (48) | K3 | Longitudinal (57) |
| S63 | Isothermal (11) | | Laszlo (1) | K4 | Longitudinally (3) |
| A6 | Isotope (1) | | Lateral (44) | D82 | Loop (2) |
| W2 | Isotropic (19) | K2b | Laterally (3) | E34 | Loose (1) |
| P23a | Isovel (4) | J80 | Latitude (2) | Q33 | Lorenz (2) |
| Q51 | Issuing (3) | M86 | Lattice (2) | S53 | Losing (1) |
| V52 | Iteration (8) | C73 | Launch (4) | V16b | Loss (20) |
| V53 | Iterative (15) | W98 | Launched (4) | | Love (4) |
| | | F70 | Laval (4) | M25 | Low (96) |
| V29f | Jacking (1) | V29m | Law (42) | J42 | Lower (15) |
| G15 | Jacks (1) | H43 | Layer (512) | J42a | Lowest (1) |
| | Janzen (1) | D43b | Layered (2) | A31 | Lubricant (2) |
| | Jeffrey (1) | M67 | Layout (1) | V51 | Lubrication (2) |
| O84 | Jet (108) | A52 | Lead (2) | B48 | Lucite (2) |
| Q41a | Jogs (1) | J48 | Leading (124) | R122 | Luminosity (2) |
| | Johannesen (1) | M47 | Least (2) | R123 | Luminous (2) |
| T98 | Joining (2) | Q51 | Leaving (2) | W72a | Lumped (1) |
| F46 | Joint (8) | | Lees (4) | C15 | Lunar (1) |
| E27a | Jointed (2) | K23 | Leeward (4) | C4 | Luni-solar (1) |
| | Jones (1) | H55 | Leg (2) | | Lyapunov (3) |
| | Jouguet (1) | | Legendre (1) | | |
| | Joukowski (7) | | Leggett (1) | | Maccoll (2) |
| S41 | Joule (1) | L92 | Length (55) | O102 | Mach (344) |
| F28 | Journal (1) | K3 | Lengthwise (2) | E56 | Machine (9) |
| E75 | Jumo (1) | L40 | Lenticular (2) | M12 | Macroscopic (1) |
| V2a | Jump (9) | M47a | Less than (12) | | Mager (1) |
| J77 | Junction (9) | J37 | Level (18) | A52 | Magnesium (2) |
| C10 | Jupiter (3) | | Lewis (1) | S11 | Magnetic (34) |
| | | B58 | Lexan (1) | S15 | Magneto-aerodynamic (4) |
| | Kaminsky (1) | R95 | Libration (1) | S13 | Magneto fluid mechanics (1) |
| | Karman (27) | | Liebmann (2) | S15 | Magneto-gasdynamic (3) |
| | Kelley (1) | N4 | Life (8) | S13 | Magneto-hydrodynamics (3) |
| S75 | Kelvin (7) | N5 | Lifetime (7) | E69 | Magneto-Plasma (2) |
| | Kendrick (1) | P3 | Lift (88) | S22b | Magnetostriiction (1) |
| H47 | Kernel (5) | P4 | Lifting (46) | V12 | Magnification (2) |
| G34a | Kinetheodolite (1) | | Light (5) | L88 | Magnitude (5) |
| Q28c | Kinetic (17) | | Lighthill (4) | | Magnus (3) |
| H77 | Kink (1) | V29c | Lighting (1) | E23 | Maikapar (1) |

H83	Main (16)	P63	Midspan (1)	G53	Multiplier (2)
V58	Maintenance (4)	A60	Mild (1)	D44	Multiply (1)
H83	Major (5)		Millikan (1)	F12a	Multipropeller (1)
T54	Maldistribution (1)	N7	Milliseconds (1)	D54	Multirib (1)
	Mangler (2)	U21	Minimisation (4)	W20a	Multisectional (1)
C68	Manned (6)	U22	Minimizing (1)	D55	Multispar (1)
N77	Manoeuvre (10)	M44	Minimum (31)	E76	Multistage (4)
N77a	Manoeuvring (2)	H84a	Minor (5)	D50	Multiweb (3)
G27	Manometer (3)		Mirels (1)	Y6	Mutual (1)
Y54	Map (5)	M106	Misaligned (1)	D51	MW-1 (1)
V98	Mapping (3)	M107	Misalignment (3)	B37	Mylar (3)
J72	Margin (3)		Mises (6)		
C33	Maritime (1)	N117a	Miss (2)	O91	N (1)
C9	Mars (5)	C82	Missile (29)		NACA (14)
C9	Martian (2)	N55	Mission (1)	D34	Nacelle (5)
L104	Mass (70)		Mit (2)	M16	Narrow (2)
D31a	Massbalanced (1)	W30	Mixed (11)		Nash (1)
V65	Matching (7)	T33	Mixing (54)	X16	Natural (15)
A15	Material (38)	W11	Mixture (26)	X16a	Nature (1)
V30	Mathematical (2)	R96	Modal (1)		Navier (15)
	Mathieu (1)	K29a	Mode (54)	M118	Navigation (1)
	Matric (1)	F83	Model (137)	J30	Near (16)
V94	Matrix (15)	M8a	Moderate (10)	J31	Nearest (1)
M46a	Maxima (1)	T19	Modification (9)	J32	Nearly (7)
M46	Maximum (49)	W24	Modified (34)	E78	Neck (1)
	Maxwell (18)	T20	Modifying (1)	X90	Negative (8)
	Maxwellian (1)	W23	Modulated (4)	X89	Negatively (2)
	Mayer (1)	T28	Modulating (1)	M47b	Negligible (4)
M45	Mean (30)	T27	Modulation (3)	M65a	Net (6)
Y99	Measured (5)	Y14	Modulus (19)	M87a	Network (1)
V102	Measurement (188)	E72	Moisture (1)		Neumann (1)
G24	Measuring (1)	A8a	Mol (1)	X92	Neutral (8)
X25	Mechanical (8)	A8c	Molecular (19)	J83	New Mexico (1)
P70	Mechanics (5)	A8	Molecule (13)		Newton (2)
E57	Mechanism (7)	A54	Molybdenum (2)		Newtonian (39)
J1c	Media (1)	P71	Moment (160)	V59e	NGTE (1)
J58	Median (3)	N15a	Momentary (1)		Nicholson (1)
M9	Medium (9)	Q27	Momentum (54)	A44	Nickel (5)
B31	Melamine (1)	A10	Monatomic (3)	N10	Night (2)
S31	Melting (4)	R55	Monocell (1)	A46	Nimonic (4)
Y42d	Member (2)	D56	Monocoque (2)		Niordson (1)
H41	Membrane (30)	D75	Monolithic (2)	A83	Nitric (2)
A66	Mercury (6)	C53	Monoplane (2)	A82	Nitrogen (23)
W32	Merged (4)	R125a	Monotonic (2)	A84	Nitrous (1)
T37	Merger (1)	B19	Monoxide (1)	X89a	No (2)
T36	Merging (1)		Morley (1)	N11	Nocturnal (1)
J81	Meridian (3)	P84	Motion (88)	J79	Nodal (5)
J81a	Meridional (7)	X99a	Motionless (1)	J78	Node (3)
M87	Mesh (1)	E60	Motor (8)	R101	Noise (37)
A38	Metal (2)	Q28b	Mound (1)	M43e	Nominal (1)
C12	Meteor (1)	E40	Mounted (7)	W36	Non-ablating (1)
C13	Meteorite (1)	D76	Mounting (2)	M108	Non-aligned (1)
C13	Meteoroid (1)	X104b	Movable (3)	K34b	Nonaxisymmetric (1)
G25	Meter (1)	P85	Movement (8)	K34c	Nonaxisymmetrical (1)
A21	Methane (3)	P86	Moving (18)	T7a	Noncatalytic (3)
A24	Methanol (1)	F76	Muffler (2)	L32	Non-circular (7)
U62	Method (180)	M35	Multi (2)	X33	Non-circulatory (3)
	Meyer (9)	J97	Multiaxial (1)	T39a	Non-concurrence (1)
G45	Microphone (1)	D53	Multibay (1)	X51	Non-conducting (5)
S5	Microwave (1)	F22a	Multiblade (1)	S62	Non-conductive (1)
J52a	Mid (1)	D48	Multicoell (1)	M8	Non-dimensional (3)
C76	Midas (1)	W10	Multicomponent (1)	J89a	Non-direct (1)
P66	Midchord (2)	D43	Multilayer (8)	N59a	Non-dissipating (1)
E64	Mid-course (2)	D43c	Multilayered (1)	X45	Non-dissipative (2)
J32	Middle (14)	W17	Multiphase (1)	E36e	Non-elastic (1)
J54	Midplane (7)	M35	Multiple (13)	F76	Non-equilibrium (21)
J53	Midpoint (1)	V87	Multiplication (1)	X7	Non-flammable (1)

W15	Non-homogeneous (3)	Oliver (1)	B18a	Oxide (4)	
M74	Non-inclined (1)	F52	Omega (1)	A32a	Oxidizer (1)
S64	Non-isothermal (1)	V23a	Omission (1)	A85	Oxygen (17)
C38	Non-lifting (15)	M58	One (11)		
M4	Non-linear (41)	M3	Onedimensional (15)	V59d	Pace (1)
M5	Non-linearity (4)		ONERA (1)		Packard (1)
X88	Nonmonotonic (2)	J28a	Onset (12)		Painleve (1)
X90a	Non-negative (1)	K17a	Onto (1)	A16a	Paint (1)
R95b	Non-oscillatory (1)	M113	Open (10)	M39	Pair (1)
M94a	Non-parallel (1)	F58	Opening (3)	D65a	Pane (1)
Y83	Non-perfect (1)	U61	Operating (2)	D85	Panel (49)
L77	Non-planar (1)	U60	Operation (8)	R100	Panting (1)
R90a	Non-porous (2)	V100a	Operational (1)	B66	Paper (1)
S52	Non-radiating (1)	N124a	Operator (1)	B53	Papreg (1)
X101a	Non-reacting (1)	M91	Opposed (1)	L46	Parabola (2)
X101	Non-reactive (1)	M90	Opposite (2)	L47	Parabolic (23)
D31	Non-recoverable (1)	G35	Optical (4)	E21	Paraboloid (2)
O97	Non-relativistic (1)	M46b	Optimal (1)	K64	Paraboloidal (3)
Q3	Non-rotating (2)	U72	Optimization (1)	M92	Parallel (45)
K35	Non-rotational (1)	Y78	Optimum (19)	V66	Parameter (38)
F83b	Non-separating (1)	J20	Orbit (20)	B38	Paraplex P43 (2)
X31b	Non-similar (2)	N56	Orbital (8)	V43	Parasitic (1)
M18	Non-slender (2)	N57	Orbiting (1)	C54	Parasol (1)
B70	Non-solid (1)	H81	Order (50)	H3	Part (9)
B87	Non-stationary (7)	M72	Ordered (1)	M48a	Partial (19)
X79	Non-steady (8)	Y86a	Ordinary (7)	M48	Partially (4)
K34	Non-symmetric (1)	V68a	Ordinate (3)	A1	Particle (12)
X8	Non toxic (1)	J85	Orientation (1)	Y98a	Particular (1)
K91	Non truncated (1)	F59	Orifice (5)	T42	Partition (3)
O19	Non turbulent (1)	H82b	Originally (1)	M48	Partly (1)
T24	Non-uniform (20)	U33	Originating (3)	Q24a	Pass (2)
X75b	Non-uniformity (1)		Orr (1)	F54	Passage (5)
X75a	Non-uniformly (1)	L70	Orthogonal (2)	Q24	Passing (2)
O75a	Non-vanishing (1)	L72	Orthogonality (2)	X100	Passive (1)
O15	Non-viscous (7)	L71	Orthogonally (1)	J20	Path (29)
D6	Nonweiler (1)	W3	Orthotropic (15)	M68	Pattern (61)
N87	Non-yawing (1)	R92	Oscillating (35)	N46	Pay (1)
M57b	Non-zero (1)	R91	Oscillation (50)	N46	Payload (1)
Y76b	Normal (8)	E96	Oscillator (2)	H22	Peak (15)
Y86b	Normally (2)	X36	Oscillatory (23)		Peak-to-peak (1)
H30	Nose (98)	G49	Oscillograph (1)	P68	Peaky (1)
X83b	Nosed (42)	G48	Oscilloscope (1)		Peclet (2)
X89b	Not (2)		Oseen (10)	V79a	Penalty (1)
H67	Notch (2)		Osgood (2)	G41a	Pendulum (1)
F68	Nozzle (82)	J61	Outboard (4)	Q18	Penetrating (4)
F89	NPL (1)	J67	Outer (23)	Q17	Penetration (7)
E73	Nuclear (2)	J62	Outermost (1)	Y73	Perfect (26)
V44	Numerical (74)	P25	Outflow (1)	Y73a	Perfectly (4)
O104	Nusselt (9)	F63	Outlet (5)	L84	Perforated (5)
B30	Nylon (4)	K81	Out-of-roundness (1)	H70	Perforation (1)
		L60	Out-of-straightness (1)	N40	Performance (55)
G29a	Object (2)	Y84b	Output (1)	J25	Perigee (12)
K55	Oblate (4)	J68a	Outside (2)	L98	Perimeter (2)
K56	Oblateness (1)	K17	Outward (2)	N6	Period (13)
M79	Oblique (19)	L42	Oval (7)	N16	Periodic (5)
W54	Obliterated (1)	J38a	Over (4)	N17	Periodically (2)
V3	Observation (4)	M54	Overall (7)	N18	Periodicity (2)
H65a	Obstacle (3)	O33	Overexpanded (2)	J60	Peripheral (4)
X17b	Obtained (1)	F69	Overexpanding (1)	N14	Permanent (1)
S91a	Occurrences (1)	O33a	Overexpansion (5)	R89	Permeable (2)
K35a	Octahedral (1)	F20	Overhang (1)	R3a	Permissible (2)
L23	Octogonal (1)	Q40	Overpressure (3)	M76	Perpendicular (9)
J36	Off (2)	V55	Overrelaxation (1)	M76a	Perpendicularly (2)
L45a	Ogee (4)	N116	Overshoot (5)	B46	Perspex (1)
K62	Ogival (1)	P81	Overstability (1)	P83	Perturbation (30)
E19	Ogive (18)	Q10	Overswing (1)	W68	Perturbed (1)
B6	Oil (15)	S77	Oxidation (1)	B68a	Phase (12)

B39	Phenolic (3)		Poincare (2)	Y49a	Product (5)
Y40	Phenomena (12)	J11	Point (136)	U36	Production (3)
Y40a	Phenomenological (2)	K65	Pointed (12)	L1	Profile (140)
V29	Philosophy (1)		Poiseuille (6)	V63	Programme (3)
A18	Phosphorescent (1)		Poisson (4)	D21a	Programmed (2)
S16a	Photoelastic (1)	Y60a	Polar (9)	V62	Programming (1)
S16	Photoelectric (1)	S22c	Pole (1)	X57	Progressive (3)
G36a	Photograph (13)	R87	Polished (1)	W98a	Projected (1)
G36	Photographic (2)	A12	Polyatomic (3)	C82	Projectile (8)
V14	Photography (6)	J97a	Polyaxial (1)	H57	Projection (1)
G38	Photomultiplier (3)	A14	Polycrystalline (2)	K57	Prolate (3)
V16	Photorecording (1)	B36	Polyester (1)	O54	Promoter (2)
S56d	Photothermoelastic (4)	L20	Polygon (3)	O51	Promotion (6)
S56e	Photothermoelasticity (1)	L21	Polygonal (1)	U106	Proof (3)
S95	Physical (10)	A13	Polymer (1)	U41	Propagating (2)
R119	Phugoid (1)	V93	Polynomial (6)	U40	Propagation (20)
	Pibal (1)	B50	Polystyrene (1)	A26	Propellants (10)
G52a	Pickup (1)		Ponderomotive (1)	W97	Propelled (1)
G40	Picture (1)	R88	Porous (32)	F12	Propeller (30)
H5c	Piece (1)	H1	Portion (4)	Wa	Property (45)
G28	Piezometer (1)	J11	Position (46)	Y11	Proportion (3)
A16	Pigment (1)	J14	Positioning (1)	Y10	Proportional (5)
W72	Piled (1)	X91	Positive (5)	N47	Propulsion (7)
N124	Pilot (3)		Possio (1)	E62	Propulsive (6)
N119	Piloting (1)	N37	Post (3)	U51a	Protection (5)
H60	Pimple (1)	R59	Postbuckling (12)	A4	Proton (1)
G49a	Pin (5)	A67	Potassium (1)	H58	Protuberance (1)
B5	Pine (1)	O25	Potential (74)	P27a	Proturbulence (1)
E28	Pinned (2)	G32a	Potentiometer (1)	U31a	Providing (1)
E7	Pipe (8)	L106a	Pound (6)	J26	Proximity (8)
F8	Piston (18)		Powell (1)		P.S.I. (1)
N88	Pitch (30)	Q31	Power (46)	Y23	Pseudo (1)
N89	Pitching (88)	N62	Powered (3)	R95a	Pulse (2)
G31	Pitometer (1)	B59	Powerplant (1)	E79	Pump (4)
G30a	Pitot (18)	Y81	Practical (1)	Y77	Pure (18)
F30	Pivot (1)	O103	Prandtl (38)	K37	Pyramidal (1)
V74	Pivotal (2)	M94	Preasymptotic (1)		
Y91a	Plain (1)	W108	Pre-buckled (1)	V76	Quadrature (1)
L75	Planar (5)	Q58	Pre-buckling (4)	R105a	Quadrupole (1)
	Planck (1)	Q12	Precession (1)	U104	Qualitative (1)
J17	Plane (63)	P34a	Precipitation (1)	W6	Quality (2)
C6	Planet (2)	V97	Prediction (10)	U103	Quantitative (4)
C6	Planetary (12)	Y95	Preferential (1)	M29	Quantity (2)
M119	Planetocentric (1)	H81a	Preliminary (1)	H10	Quarter (1)
P49	Planform (28)	R7	Preloading (1)	H89	Quartic (1)
E58	Plant (2)	W31	Premixed (1)	A74	Quartz (4)
	Plaskon (1)	Q4	Pre-rotation (1)	Y22	Quasi (1)
B87	Plasma (7)	E36d	Prescribed (7)	L29a	Quasi-circular (1)
R79	Plastic (34)	J1a	Presence (2)	K46	Quasi-conical (3)
R78	Plasticity (7)	Q36	Pressure (720)	E6a	Quasi-cylinder (3)
D84	Plate (278)	Q40a	Pressurisation (1)	K44	Quasi-cylindrical (1)
J18	Plateau (1)	D60	Pressurized (15)	P75	Quasi-equilibrium (1)
T47	Plating (1)		Preston (2)	M36	Quasi-onedimensional (2)
F39	Plenum (1)	W78a	Prevented (1)	X69	Quasi-steady (10)
B47	Plexiglass (1)	V74	Prevention (4)	X76a	Quasi-unsteady (1)
	PLK (1)	Q9	Prewhirl (2)	S87	Quenching (1)
V50	Plot (2)	H83	Primary (3)	N29	Quick (1)
V49	Plotting (4)	V29m	Principle (13)		Rabotnov (1)
F41	Plug (4)	N38	Prior (1)	G44	Radar (1)
O87	Plume (2)	K36	Prismatic (1)	J98	Radial (44)
N91	Plunging (8)	V111a	Probability (4)	J98a	Radially (2)
B3	Plywood (1)	C89	Probe (15)	S51	Radiant (2)
X26a	Pneumatic (1)	V65	Problem (46)	T79	Radiating (1)
O73a	Pocket (1)		Probstein (2)	T78	Radiation (33)
	Poggi (1)	V63a	Procedure (20)	X52a	Radiative (10)
	Pohle (1)	V59	Process (16)	G20	Radiator (1)
	Pohlhausen (15)	W21b	Processed (1)		

S6	Radioactive (1)	Reissner (3)	H61	Ridge (3)	
G51a	Radiotrajectory (1)	V116	Relation (47)	O99	Riemann (1)
L100	Radius (38)	V116	Relationship (13)	M76c	Right (6)
	RAE (16)	X111	Relative (16)	E36	Rigid (21)
M102	Rakes (1)	X112a	Relatively (1)	R76	Rigidity (11)
	Ramberg (2)	X112	Relativistic (1)	E36b	Rigidly (1)
D80	Ramp (2)	T104	Relaxation (26)	H53	Rim (1)
M73	Random (21)	V54	Relaxational (1)	L35	Ring (28)
N41	Range (32)	T105	Relaxing (4)	P35	Ripple (2)
	Rankine (3)	E90	Relay (1)	U1a	Rise (40)
	Raphson (1)	T80	Release (4)		Ritz (8)
N29	Rapid (4)	N42	Reliability (2)	F48	Rivet (1)
T61	Rarefaction (3)	X67a	Remain (1)		RMS (1)
B75	Rarefied (15)	T52	Removal (4)	E63	Rocket (43)
N25	Rate (118)	W59	Removed (1)	B56	Rocketon (2)
Y13	Ratio (288)	N58	Re-orbit (1)	D92	Rod (9)
S3	Ray (5)	V69	Replacement (1)	N83	Roll (11)
B43	Raybestos (1)	S39	Replenishment (1)	W111a	Rolled (7)
	Rayleigh (16)	V9	Representation (3)	N84	Rolling (30)
S99	Reacting (12)	Y93	Required (5)	D66	Roof (1)
S98	Reaction (26)	Y94	Requirement (10)	P67	Rooftop (2)
X107	Reactive (2)	V85	Research (12)	S67	Room (2)
E70	Reactor (1)	F36	Reservoir (2)	V72	Root (11)
V7	Reading (3)	X67	Residual (2)	J101	Rotary (5)
Y85	Real (22)	S61	Residue (1)	Q2	Rotating (20)
H33	Rear (10)	B34	Resin (4)	K39	Rotation (22)
K9	Rearward (2)	P83a	Resistance (13)	O22	Rotational (18)
O36a	Reattached (1)	W84	Resisted (1)	K41	Rotationally (9)
O46a	Reattaching (2)	P83b	Resisting (1)	X32a	Rotatory (1)
O46b	Reattachment (15)	S32	Re-solidification (1)	F10	Rotor (14)
F34	Receiver (1)	V101	Resolution (1)	L79	Rough (1)
Y66	Reciprocal (4)	R114	Resonance (9)	L80	Roughness (26)
Y6a	Reciprocity (1)	R94	Resonant (6)	K79	Round (4)
Q46	Recirculating (1)	U76	Response (23)	K80	Rounded (4)
T31	Recombination (13)	X93	Rest (4)	U30b	Rounding (1)
Q39	Recompression (3)	U29	Restart (1)	K79a	Roundness (1)
Y52	Record (4)	X93a	Resting (2)	U63	Routine (1)
V5	Recording (2)	Q35	Restoring (2)		Routt (1)
D30	Recoverable (1)	W79	Restrained (7)	M100	Row (8)
U55	Recovery (35)	T94a	Restraining (1)	B6a	Rubber (1)
L13a	Rectangle (1)	T94	Restrict (8)	D15	Rudder (4)
I13	Rectangular (66)	W79a	Restricted (2)	V29m	Rule (5)
L4	Rectilinear (3)	Y50	Result (45)	N26	Running (1)
T81a	Redirecting (1)	Y51	Resultant (11)	R48	Rupture (4)
T54a	Redistribution (2)	Y51a	Resulting (1)		
W51	Reduced (12)	O50	Retardation (1)	A65	SAE (1)
U16	Reduction (37)	N28	Retarded (4)	N129	Safety (2)
X66	Redundant (5)	T91	Retarding (2)	E68	Sail (1)
N111	Re-entering (2)	E65	Retrorocket (2)	B14	Salt (3)
T83a	Re-entrant (2)	N102	Return (1)	H5a	Sample (1)
N110	Re-entry (39)		Reuss (1)	V113	Sampling (1)
O53	Re-Establishment (1)	T87	Reversal (16)	B63	Sand (2)
Y45	Reference (7)	K10	Reverse (5)	O55	Sandpaper (1)
T22	Refinement (2)	W77	Reversed (1)	D43	Sandwich (17)
W76	Reflected (15)	X59	Reversibility (1)	O74	Satellite (31)
T86	Reflecting (1)	Y58	Review (4)	T11	Saturation (2)
T85	Reflection (22)	W25	Revised (1)	O11	Saturn (1)
R112a	Refraction (2)	K39	Revolution (96)	C35	Saunders-Roe (1)
A32	Refractory (2)	A47	Rex (1)	U80	Saving (2)
B44	Refrasil (1)	O105	Reynolds (152)	L91	Scale (36)
J6	Regime (20)	R108	RF (1)	V86	Scaling (2)
J9	Region (106)	R27	Rheological (2)	T57	Scattering (2)
S48	Regression (2)	L15	Rhombic (3)	Q57a	Scavenging (1)
X74c	Regular (1)	D72	Rib (1)		Schindel (1)
U71a	Regulation (1)	D95	Ribbon (1)		Schlichting (4)
Q47	Reimpingement (1)		Riccatti (1)	V17	Schlieren (20)
D42	Reinforced (11)		Richardson (2)		Schmidt (2)

	Schubauer (5)	K70	Sharp (48)	K97	Skirt (4)
F61	Scoop (1)	K70a	Sharpness (1)	K98	Skirted (1)
W57	Scooped (1)	R11	Shear (124)	D87	Slab (20)
U10	Scooping (1)	W91	Sheared (1)	D8	Slab-tail (1)
F2	Screen (4)	R12	Shearing (14)	D23	Slat (1)
F49b	Screw (1)	F32b	Sheath (1)	M15	Slender (90)
C25	Sea (1)	O81	Shedding (2)	L94	Slenderness (2)
	Seal (1)	D83	Sheet (25)	H12	Slices (1)
U51c	Sealing (2)	D88	Shell (114)	F29	Slider (1)
E25	Sears (1)		Shesterikov (1)	M47a	Slightly (8)
N12	Season (2)	D37	Shield (6)	O29	Slip (19)
N13	Seasonal (1)	E48	Shielded (1)	P24a	Sliplines (1)
Y15	Secant (3)	U51d	Shielding (2)	P24	Slipstream (16)
H85	Second (37)	V23	Shift (2)	J92	Slope (42)
H85a	Secondary (17)	C33	Ship (1)	M82	Sloped (1)
H11	Section (110)	O96	Shock (296)	P36	Sloshing (1)
W20	Sectional (14)	R5	Shocking (1)	D24	Slot (6)
H13	Sector (5)	O98a	Shockless (1)	L83	Slotted (9)
E44	Sectorial (3)	M14	Short (21)	N27	Slow (1)
	Sedov (1)	R35	Shortening (5)	N27a	Slowly (2)
B13	Seeded (4)	F32a	Shroud (10)	O28a	Slug (1)
H14	Segment (11)	F83a	Shrouded (2)	M25	Small (98)
U91	Segmentation (1)	T72	Shuffle (1)	B83	Smoke (2)
E43	Segmented (3)	A62	Sicromoz (1)	L78	Smooth (19)
	Seide (1)	H35	Side (21)	V56	Smoothing (1)
Y96	Selected (1)	G46a	Sided (1)	R85	Smoothness (1)
X41a	Self (10)	H35a	Sidedness (1)	R56	Snap (2)
M31b	Semi (3)	P19a	Sideforce (1)	R60	Snapping (2)
V42	Semianalytical (1)	N99	Sideslip (12)	C22	Snow (1)
H18	Semiapex (2)	G8	Sidewall (2)	S57	Soaked (1)
N59	Semiballistic (1)	P20	Sidewash (8)	Z22	Soaking (1)
L51	Semicircular (4)	R101a	Signals (3)	B60	Sod (1)
E18	Semi-ellipsoid (1)	F76	Silencer (1)	A68	Sodium (5)
K61	Semi-ellipsoidal (1)	A72	Silica (4)	R82	Soft (4)
Y68a	Semi-empirical (3)	B21	Silicate (1)	C5	Solar (7)
M42	Semi-infinite (19)	V80	Similar (24)	B69	Solid (46)
V38	Semi-inverse (1)	V81	Similarity (26)	V77	Solution (296)
H84	Semi-major (3)	V19	Similitude (7)		Sommerfeld (1)
V45	Semi-numerical (1)	Y76	Simple (22)	O5	Sonic (52)
B75a	Semi-rarefied (1)	U92c	Simplification (4)	S43	Soret (1)
E37	Semi-rigid (2)	Y74	Simplified (4)	R98	Sound (29)
P64	Semispan (4)	Y75	Simply (44)	E66	Sounding (1)
H18a	Semivertex (9)	X23	Simulated (10)	U31	Source (15)
R125	Sensitivity (1)	V7a	Simulating (1)		Southwell (2)
G22a	Sensor (2)	V8	Simulation (21)	C2	Space (23)
O35	Separated (26)	V61	Simulator (1)	C67	Spacecraft (4)
T62	Separating (5)	N23	Simultaneous (4)	M96	Spaced (7)
O46	Separation (132)	N24	Simultaneously (1)	C67	Spaceship (1)
M103	Sequential (1)	V106a	Sine (1)	M97	Spacing (11)
M95	Series (32)	M32	Single (31)	P61	Span (30)
E89	Servo (1)	M33	Singly (1)	K2a	Spanning (1)
Y42c	Set (3)	M34	Singular (4)	K3	Spanwise (42)
J93	Setting (3)	Y37	Singularity (8)	D71	Spar (2)
G2	Settling (5)	O70	Sink (4)	V18	Spark (1)
H90	Seventh (2)	N95	Sinking (8)		Sparrow (1)
M28e	Severe (2)	L66	Sinusoidal (20)	H95	Spatial (1)
M28f	Severely (1)	L66a	Sinusoidally (2)	Y42b	Species (1)
L16	Sextic (1)	R103	Siren (1)	Y98	Specific (31)
V13	Shadowgraph (6)	J1b	Situation (1)	H56	Specimen (5)
F13a	Shaft (1)	M65	Six (1)	R111a	Spectra (9)
T105a	Shakedown (1)	H89b	Sixth (1)	R111c	Spectral (7)
M27	Shallow (20)	L88	Size (30)	V11	Spectrography (1)
M27a	Shallowness (1)		Skan (6)	R111b	Spectrum (8)
F13	Shank (1)	M81	Skewed (1)	T85b	Specular (3)
	Shanley (1)	H40	Skin (164)	P89	Speed (168)
K27	Shape (238)	N60	Skip (4)		Sphere (44)
K30	Shaped (10)	N61	Skipping (1)	K52	Spherical (34)

K53 Spherically (4)	E38 Stiffened (36)	07 Supersonic (352)
K54 Spheroid (1)	D100 Stiffener (20)	08 Supersonically (1)
E13 Spike (2)	D99 Stiffening (4)	069 Supply (2)
K47 Spiked (1)	R77 Stiffness (50)	U69 Supplying (1)
N98 Spin (3)	X97 Still (1)	D75 Support (17)
D36 Spinner (3)	G13 Sting (9)	E40 Supported (50)
Q7 Spinning (1)	V119 Stochastic (1)	V29e Supporting (5)
K51 Spiral (4)	W12 Stoichiometric (2)	U75 Suppression (1)
O77 Spiralling (1)	Stokes (14)	H37 Surface (300)
D20 Split (4)	C60 STOL (4)	E46 Surfaced (1)
F22 Splitter (1)	Stone (1)	P29 Surge (5)
D26 Spoiler (2)	Stopping (2)	J4 Surrounding (3)
J15 Spot (2)	U67 Storage (4)	Y57 Survey (15)
Z20 Spray (1)	D38 Stores (2)	B82 Suspension (2)
T56 Spread (7)	U68 Storing (1)	X72a Sustained (2)
T55 Spreading (2)	L57 Straight (18)	U49a Sustaining (1)
F44 Spring (14)	L58 Straightness (3)	Sutherland (1)
B4 Spruce (1)	R28 Strain (64)	Q62 Swallowing (1)
C79 Sputnik (3)	R64b Straintime (1)	S47 Sweat (4)
L14 Square (28)	Stratford (2)	P50 Sweep (15)
Squires (1)	D43 Stratiform (1)	P51 Sweepback (13)
SRN 1 (1)	O1 Stream (156)	P52 Sweepforward (1)
P79 Stability (144)	064 Streamline (40)	L5 Swept (29)
T102 Stabilization (2)	F56 Streamtube (6)	L6 Sweptback (28)
W81 Stabilized (4)	K20 Streamwise (15)	L8 Sweptforward (3)
D28 Stabilizer (4)	O80 Street (2)	O76 Swirl (4)
T101 Stabilizing (2)	R81 Strength (41)	T82 Switching (1)
X103 Stable (8)	R1 Stress (196)	K31 Symmetric (54)
F17 Stacking (3)	E51 Stressed (2)	K31 Symmetrical (30)
F16 Stage (13)	E2 Stressing (1)	K32 Symmetrically (1)
M98 Stagger (1)	K99 Stretched (1)	K30a Symmetry (5)
M99 Staggered (1)	R33 Stretching (5)	U92a Synthesis (1)
M99a Staggering (1)	Q41 Striking (2)	Y41 System (29)
X94 Stagnant (2)	D68 Stringer (14)	M72a Systematic (2)
P10 Stagnation (176)	V24 Strioscopy (1)	
A64 Stainless (7)	D94 Strip (18)	L52a T (1)
P14 Stall (17)	V12 Stroboscopic (1)	D25 Tab (5)
O37 Stalled (2)	X14 Strong (21)	Y55a Table (13)
P15 Stalling (8)	Strouhal (2)	Y55b Tabulation (1)
Stalmach (1)	W1 Structural (28)	D7 Tail (29)
D77 Stand (2)	D40 Structure (61)	C57 Tailless (1)
Y87 Standard (3)	D103 Strut (5)	F87 Tailored (1)
O92 Standing (2)	U85 Study (12)	T22a Tailoring (1)
O98 Standoff (20)	St. Venant (1)	D9 Tailplane (9)
Stanton (7)	L65 Subarc (1)	N65 Take-off (3)
U28 Start (2)	R111 Sub audio (1)	J27a Tangency (1)
U27 Starting (8)	O4 Subcritical (1)	Y16 Tangent (18)
B68 State (31)	S94b Subject (3)	K19 Tangential (13)
X98 Static (96)	W87 Subjected (3)	F33 Tank (7)
X98a Statically (7)	H44 Sublayer (6)	V29g Tap (1)
J11 Station (2)	S33 Sublimation (4)	K68 Taper (10)
X95 Stationary (25)	J44 Submerged (1)	K65 Tapered (13)
V112 Statistical (5)	O3 Subsonic (106)	W101a Tapped (1)
V111 Statistics (2)	Y19c Substitutes (1)	Q58 Tapping (1)
F7 Stator (4)	N22 Successive (6)	Y48d Target (1)
X68 Steady (94)	Z15a Sucking (1)	N64 Taxiing (1)
B11 Steam (1)	Z15 Suction (27)	Taylor (12)
A59 Steel (15)	N31 Sudden (7)	V62 Techniques (47)
M84 Steep (1)	F62 Sugar (1)	H63 Teeth (1)
M84a Steepest (3)	C5 Sun (1)	B49 Teflon (7)
Stefan (1)	Z14 Superaerodynamic (3)	V92 Telegraph (1)
H56 Stem (2)	L31 Supercircular (2)	N122 Telemetering (1)
D81 Step (16)	M24 Supercritical (3)	N121 Telemetry (3)
V53 Step-by-step (4)	O13 Superfast (1)	G39 Television (1)
P55 Stepdown (1)	W71 Superimposed (2)	Teller (1)
M99b Stepwise (1)	V115 Superposition (7)	S66 Temperature (272)
Stewartson (6)	O12 Super-satellite (2)	V79a Tending (2)

R10	Tensile (10)	J50	Trailing (46)	Y42a	Type (23)
R9	Tension (9)	J20	Trajectory (25)	J83b	U.K. (1)
V100	Tensor (1)	V100b	Transcendant (1)	Y47	Ultimate (2)
V70	Term (6)	V91a	Transcendental (2)	M22c	Ultra-high (1)
H92	Terminal (5)	G52	Transducers (1)	S4	Ultra-violet (1)
X23a	Terminated (3)	T70	Transfer (228)	J97b	Unaxial (1)
V71	Termwise (1)	W60	Transferred (1)	P48	Unbanked (1)
F82	Test (236)	V96	Transform (2)	K77	Unblunted (1)
F82	Testing (24)	V95	Transformation (34)	M116	Unbounded (2)
B17	Tetrachloride (2)	W27	Transformed (3)	W107	Unbuckled (2)
	Theodorsen (3)	N15	Transient (41)	L40b	Uncambered (4)
V84	Theorem (10)	Q22	Transit (1)	W32a	Unchanged (1)
V29ha	Theoretical (152)	O42	Transition (104)	S71	Uncooled (1)
V29h	Theory (406)	O20	Transitional (10)	Y33	Uncoupled (5)
S24	Thermal (86)	P96	Translation (4)	J43	Under (4)
S26	Thermally (5)	X35	Translational (3)	O34	Underexpanded (1)
P31	Thermo-aeroelastic (1)	P97	Translatory (2)	O34a	Underexpansion (2)
T13	Thermo-chemical (1)	T73	Transmission (5)	S94a	Undergoing (1)
G29	Thermocouple (3)	O6	Transonic (72)	N117	Undershoot (4)
S24	Thermodynamic (23)	R124	Transparent (1)	H38	Undersurface (1)
S56c	Thermoelastic (2)	S46	Transpiration (4)	J45	Underwater (1)
B45a	Thermold (1)	T50	Transport (15)	W46	Undissociated (3)
S56b	Thermo-mechanical (1)	P80	Transstability (4)	W69	Undisturbed (3)
L56a	Theta (1)	V98a	Transversality (1)	R75	Unelastic (1)
M18	Thick (20)	K1	Transverse (56)	Y30	Unequal (3)
X1	Thickened (1)	K2c	Transversely (1)	X84	Unevenness (1)
O47	Thickening (2)	L17	Trapezoidal (1)	F37	Unfired (2)
L95	Thickness (174)	P88	Travelling (4)	E32a	Unflanged (1)
M15	Thin (140)	N67	Traversal (1)	R26	Unfolding (1)
H86	Third (3)	U100	Traverse (3)	S72	Unheated (1)
E24	Thor-Able (1)	N68	Traversing (3)	J96	Uniaxial (4)
M61	Three (9)	U62a	Treatment (4)	J87	Unidirectional (1)
M7	Three-dimensional (62)		Trefftz (1)	V29j	Unified (2)
M7a	Three-dimensionality (1)	L11a	Triangle (2)	X74	Uniform (106)
R57	Threshold (1)	L11	Triangular (23)	X74a	Uniformity (2)
H79	Throat (20)	V110	Trigonometric (7)	X74b	Uniformly (17)
F78	Throttle (1)	P45	Trim (8)	R97	Unimodal (1)
K18	Through (5)	P46a	Trimmed (2)	M59	Unit (11)
N48	Thrust (45)	P46	Trimming (2)	M59a	Unity (5)
D21	Thwaites (3)	O52	Trip (5)	V59c	Univac (3)
P42	Tilt (9)	O45	Tripped (1)	E33a	Unloaded (1)
E31a	Tilting (1)	O52a	Tripping (1)	R26a	Unloading (1)
N1	Time (72)	Y24b	True (1)	X74d	Unperturbed (1)
N1	Timewise (1)	K90	Truncated (13)	N63	Unpowered (1)
A63	Timken (1)	D105	Truss (3)	D61	Unpressurized (1)
	Timken Roller Bearing Co. (1)	E7	Tsien (1)	W83	Unretarded (1)
H50	Tip (39)	E7	Tube (70)	O36	Unseparated (1)
C88	Titan (1)	K43	Tubing	O38	Unstalled (1)
A51	Titanium (3)	V28	Tubular (3)	P17	Unstalling (1)
A28	TNT (1)	N92	Tuft (1)	X77	Unsteadily (1)
N127	Tolerance (1)	A55	Tumbling (4)	X78	Unsteadiness (3)
	Tollmien (5)	F84	Tungsten (16)	X76	Unsteady (41)
H16	Top (2)	E80	Tunnel (296)	E39	Unstiffened (10)
	Torda (2)	E61	Turbine (14)	Y33a	Unsupported (1)
K48	Toriconical (2)	E74	Turbojet (8)	L10	Unswapt (12)
K59	Torispherical (4)	P27	Turbonachine (1)	K34a	Unsymmetrical (2)
K63	Toroidal (5)	O21	Turbulence (30)	K76	Untapered (4)
P72	Torque (6)	N80	Turbulent (132)	L82b	Unwrinkled (1)
R13	Torsion (25)	T83	Turn (1)	W74	Unyawed (8)
R14	Torsional (27)	M39a	Turning (8)	K12	
E20	Torus (4)	P57	Twin (1)	P19	Upflow (1)
M53	Total (59)	W93	Twist (10)	P18a	Upload (1)
K7	Towards (1)	R15	Twisted (5)	J40	Upper (28)
Y60	Traces (1)	M60	Twisting (7)	F18	Uprating (1)
U99	Tracing (1)	M6	Two (14)	K21	Upstream (21)
R32	Tractions (1)	M6a	Two-dimensional (168)	P19	Upwash (9)
P26	Trail (4)		Two-dimensions (1)		

Y65	U.R. (1)	E48a	Walled (11)
U82	Use (1)		Wallis (1)
			Ward (1)
L54	V (3)	E94	Warhead (1)
B76	Vacuum (5)	P58	Warp (1)
Y24a	Valid (3)	R15a	Warping (1)
V73	Value (39)	W105	Warped (1)
Y99a	Valued (1)		Warren (1)
F43	Valve (1)	W68a	Washed (1)
	Vandriest (1)	B10	Water (17)
	Van Dyke (4)	U51b	Waterproofing (1)
F21	Vane (9)	O90	Wave (244)
F67	Vaneless (1)	R111e	Waveform (1)
C80	Vanguard (1)	R111d	Wavelength (5)
Q20	Vanishing (5)	L82c	Waviness (1)
M47c	Vanishingly (1)	L82	Wavy (2)
B74	Vapour (10)	X14b	Weak (11)
S34	Vapourisation (4)	U53b	Weakening (1)
X86	Variable (30)	E92	Weapon (2)
T23	Variation (18)	D73	Web (7)
V41	Variational (17)	K38	Wedge (63)
T24	Varying (12)		Weierstrass (1)
Y63	Vector (13)	L105	Weight (33)
C32	Vehicle (66)	V114	Weighting (1)
P89	Velocity (360)		Weinstein (1)
Q57b	Venting (1)		Weissinger (4)
F72	Venturis (1)	J28a	Wetted (1)
C8	Venus (3)	Z21	Wetting (1)
U105	Verification (2)	Q8	Whirl (2)
H17	Vertex (1)		Whitham (3)
M75	Vertical (34)	H2	Whole (1)
C65	Vertol (2)	M19	Wide (4)
M516	Very (4)	M19a	Widely (1)
F35	Vessels (9)	L100c	Width (19)
R92	Vibrating (4)	C19	Wind (266)
R91	Vibration (49)	D65	Window (4)
X37	Vibrational (10)	K24	Windward (4)
X38	Vibrationally (3)	D4	Wing (252)
X36	Vibratory (5)	C39	Winged (4)
J29	Vicinity (3)	C40	Wingless (1)
Q30	Virtual (2)	D90	Wire (12)
O16	Viscid (2)	X115a	With (1)
R71	Viscoelastic (3)	I66a	Within (1)
R70	Viscoelasticity (1)	Y38	Without (1)
R80	Viscoplastic (1)	B1	Wood (4)
P2	Viscosity (44)	Q29	Work (5)
O16	Viscous (116)	Y84	Working (14)
N126	Visibility (1)	D91	Woven (1)
N125	Vision (1)	L82a	Wrinkled (1)
V9a	Visual (1)	R61	Wrinkling (6)
V10	Visualisation (9)		
	Volterra (1)	C49	X (1)
L103	Volume (15)	A80	Xenon (1)
L103a	Volumetric (1)		
O74	Vortex (59)	N85	Yaw (32)
O75	Vortical (2)	W73	Yawed (17)
O100	Vorticity (47)	N86	Yawing (13)
N54	Voyage (1)	Y48c	Yield (10)
C61	VTOL (20)	U53c	Yielding (1)
			Young (3)
L55	W (1)	E26	Yo-Yo (1)
	Wagner (2)		
H80a	Waists (1)	L55a	Z (2)
P22	Wake (60)	M57a	Zero (73)
P23	Wakelike (2)	A10	Zinc (2)
	Walkden (1)	J10	Zone (8)
H42	Wall (172)	N72	Zoom (1)

APPENDIX 5.2

SINGLE-TERM DICTIONARIES

This Appendix lists the 723 search starting terms which occurred in the set of 361 questions. These are shown, in the first column, in the form used by the questioner, and following each starting term are the terms in the three groups of Synonyms, Word-Endings and Quasi-Synonyms, these being denoted by the numbers (1), (2) and (3) respectively. These dictionaries are discussed on pages 66 to 68.

ABLATING	(2) Ablated, Ablation (3) Ablation, Melting
ABLATION	(2) Ablated, Ablating (3) Ablating, Melting
ABOVE	(3) Higher
ABSENCE	(3) Without
ABSORPTION	(2) Absorbed
ACCURACY	(2) Accurate (3) Accurate
ACCURATE	(2) Accuracy (3) Exact, Perfect, Accuracy, True
ACOUSTIC	(1) Sound, (2) Acoustically, (3) Sonic
ACTION	(3) Behaviour, Process
ADJACENT	(3) Near, Close, Proximity
AERODYNAMIC	(2) Aerodynamically, Aerodynamics
AERODYNAMICS	(2) Aerodynamic, Aerodynamically
AEROELASTIC	(2) Aeroelasticity
AEROFOIL	(3) Profile, Lifting x Element, Lifting x Surface
AEROPLANE	(1) Aircraft (3) Air x Vehicle, Flight x Vehicle, Aerodynamic x Body
AEROTHERMODYNAMIC	
AFTERBODY	
AFTERBURNING	(2) Afterburner
AHEAD	(3) Forward, Upstream
AILERON	
AIR	(3) Atmosphere, Atmospheric
AIRCRAFT	(1) Aeroplanes, (3) Air x Vehicle, Flight x Vehicle, Aerodynamic x Body
ALTITUDE	(3) Height
AMOUNT	(1) Quantity (3) Magnitude, Size, Total, Dimension
ANALYSIS	(2) Analyser, Analytic, Analytical (3) Analytical x Investigation
ANALYTICAL	(2) Analyser, Analysis, Analytic (3) Analysis
ANGLE	(2) Angled, Angular, Angularly
ANTISYMMETRIC	(1) Antisymmetric, Asymmetric, Asymmetrical, Nonsymmetric (2) Antisymmetric
ANTISYMMETRICAL	(1) Antisymmetric, Asymmetric, Asymmetrical, Non-symmetric
	(2) Antisymmetric
APEX	(1) Vertex, (3) Top, Head, Crest, Crown, Cap, Semiapex, Semivertex
APPLICATION	(2) Applicability, Applied (3) Use
APPLIED	(2) Applicability, Application
APPROPRIATE	(3) Optimum, Ideal, Perfect
APPROXIMATE	(2) Approximating, Approximation (3) Generalized, Approximation, Simple, Simplified, Simplification, Idealized, Near x Perfect, Imperfect
APPROXIMATION	(2) Approximate, Approximating (3) Simplification
ARBITRARILY	(2) Arbitrary
ARBITRARY	(2) Arbitrarily
AROUND	(3) Circumferential, Adjacent, Peripheral, Bounding, Ambient, Surrounding
ASPECT	
ASSUMED	(1) Given, (2) Assuming, Assumption (3) Prescribed, Imposed
ASSUMPTION	(2) Assumed, Assuming (3) Theory, Theoretical, Hypothesis, Prediction, Principle, Law, Rule
ASYMMETRICAL	(1) Antisymmetric, Antisymmetrical, Asymmetric, Non-symmetric,
	(2) Asymmetric
ASYMPTOTIC	(2) Asymptote, Asymptotically
ATMOSPHERE	(2) Atmospheric, (3) Air
ATTACHMENT	(2) Attached, (3) Reattachment, Reattaching, Reattached
ATTACK	(3) Incidence
AXIAL	(2) Axially, Axis (3) Parallel
AXISYMMETRIC	(1) Axisymmetrical (2) Axisymmetrical, (3) Axial x Symmetric, Axial x Symmetrical, Axially x Symmetric, Axially x Symmetrical
	(2) Based, Basic (3) Bottom, Undersurface, End
BASE	(1) Fundamental (2) Base, Based
BASIC	
BEAM	
BEHAVIOUR	(3) Process, Action
BEHIND	(3) Back, Rearward
BENDING	(1) Flexure (2) Bend (3) Deflection
BETWEEN	(3) Mid
BIOT	
BLADE	(1) Vane (2) Blading
BLASIUS	
BLAST	(3) Explosion, Detonation, Gust
BLOCKAGE	(2) Block, Blocking (3) Choking, Stagnation
BLOWING	(2) Blower, Blown
BLUFF	(3) Blunt

BLUNT	(1) Blunted (2) Blunted, Blunting, Bluntness (3) Blunted, Bluff, Rounded
BLUNTED	(1) Blunt (2) Blunt, Blunting, Bluntness (3) Rounded, Bluff
BLUNTNES	(2) Blunt, Blunted, Blunting (3) Blunt, Blunted, Blunting, Bluff, Round, Rounded, Roundness
BOATTAIL	(2) Boattailed, Boattailing
BODY	(3) Surface, Structure, Fuselage
BOOM	
BOUNDARY	(2) Bound, Bounded, Bounding (3) Threshold, Bound, Limit, Limiting, Onset, Start, Starting, Appearance, Beginning
BOW	(2) Bowing (3) Ahead, Front, Forward, Forebody
BREATHING	(3) Pulse
BUCKLING	(2) Buckle, Buckled
BUFFET	(2) Buffeting (3) Buffeting, Oscillation
BUZZ	(3) Single x Degree x Freedom x Flutter
CALCULATED	(2) Calculating, Calculation, Calculus (3) Estimate, Estimation, Prediction, Assessment
CALCULATING	(2) Calculated, Calculation, Calculus (3) Computation, Determination, Solution, Quantitative x Measurement, Formula, Estimate, Estimation, Prediction, Assessment
CALCULATION	(1) Computation (2) Calculated, Calculating, Calculus (3) Determination, Solution, Quantitative x Measurement, Formula, Estimate, Estimation, Prediction, Assessment
CALIBRATION	(2) Calibrated
CAMBERED	(2) Camber (3) Camber
CAPACITY	(2) Capacitance
CARRYING	(1) Supporting (3) Loaded, Exposed, Subjected
CASCADE	(3) Lattice
CENTRE	(1) Middle (2) Central, Centrally, Centred (3) Central
CESSATION	(1) Stopping (3) Completion, Terminated, Braking, Arrest
CHANGE	(1) Alteration (2) Changing (3) Transition
CHANNEL	(1) Duct (3) Passage, Ducting
CHAPMAN	
CHARACTERISTIC	(1) Property (3) Quality, Nature
CHARGED	(1) Ionized (2) Charge, Charging (3) Dielectric
CHEMICAL	(2) Chemically
CHEMICALLY	(2) Chemical
CHOKED	(2) Choke, Choking
CHOKING	(2) Choke, Choked
CHORDWISE	(2) Chord, (3) Chord
CIRCULAR	(2) Circularity, Circling (3) Round
CIRCULARITY	(2) Circular, Circling (3) Roundness
CIRCUMFERENTIAL	(1) Peripheral
CLAMPED	(2) Clamping
CLASSICAL	(1) Conventional
CLOSED	(2) Closure
CLOSURE	(1) Seal (2) Closed
COAXIAL	(3) Concentric
COEFFICIENT	(3) Factor
COLLAPSE	(2) Collapsing
COLUMN	
COMBINATION	(2) Combined (3) System
COMBUSTION	(1) Burning (2) Combustible
COMPARISON	
COMPONENT	(3) Element, Part
COMPOSITE	(2) Composed, Composition (3) Complex
COMPRESSED	(2) Compressibility, Compressible, Compressing, Compression, Compressive, Compressor, Compressively
COMPRESSIBILITY	(2) Compressed, Compressible, Compressing, Compression, Compressive, Compressor, Compressively
COMPRESSIBLE	(2) Compressed, Compressibility, Compressing, Compression, Compressive, Compressor, Compressively (3) Subsonic, Transonic, Supersonic, Hypersonic
COMPRESSION	(2) Compressed, Compressibility, Compressible, Compressing, Compressive, Compressor, Compressively (3) External x Pressure, External x Load
COMPRESSIVE	(2) Compressed, Compressibility, Compressible, Compressing, Compression, Compressor, Compressively

COMPRESSOR	(1) Blower, Turbomachine (2) Compressed, Compressibility, Compressible, Compressing, Compression, Compressive, Compressively (3) Impeller, Pump
COMPUTATION	(1) Calculation (2) Computational, Compute, Computer (3) Derivation, Mathematical x Technique, Determination
COMPUTER	(2) Computation, Computational, Compute
CONCENTRATED	(2) Concentration
CONDITION	(1) State (3) Problem, Concept
CONDUCTION	(2) Conducting, Conductive, Conductivity, Conductor (3) Heat x Flow
CONDUCTIVITY	(2) Conducting, Conduction, Conductive, Conductor
CONE	(2) Coned, Conical, Conically (3) Conical x Body
CONFIGURATION	(3) Arrangement, System, Shape, Contour, Spatial x Distribution
CONICAL	(2) Cone, Coned, Conically (3) Quasi-Conical, Cone x Shaped
CONSTRUCTION	(3) Surface, Structure, Body
CONTAMINATION	(3) Foreign x Gas x Injection
CONTINUOUS	(2) Continuation, Continuity, Continuously, Continuum (3) Steady, Quasi-Steady
CONTINUOUSLY	(2) Continuation, Continuity, Continuous, Continuum (3) Constant, Steady, Continuous
CONTINUUM	(2) Continuation, Continuity, Continuous, Continuously (3) Steady x State
CONTOUR	(2) Contoured (3) Configuration, Profile, Geometry, Form, Shape
CONTRACTION	(2) Contracting (3) Reduction
CONTROL	(2) Controlled, Controlling (3) Guidance, Reduction, Limitation, Decreasing, Reduced, Decrement, Fall, Limiting, Minimisation, Minimising
CONVECTION	(2) Convected, Convecting, Convective
CONVECTIVE	(2) Convected, Convecting, Convection (3) Convection, Non-Radiating
CONVERGENT	(2) Convergence, Converging
COOLED	(2) Cool, Coolant, Cooler, Cooling (3) Insulated
COOLING	(2) Cool, Coolant, Cooled, Cooler (3) Insulation, Heat x Protection, Heat x Dissipation
COORDINATE	
CORE	(3) Kernal, Centre, Middle
CORNER	(2) Cornered
CORRECTION	(2) Corrective, Corrector (3) Modified, Revised, Evaluation, Assessment, Analysis
CORRELATION	(1) Relation, Relationship (2) Correlated, Correlator, Correlogram
CORRESPONDING	(3) Similarity, Similitude, Analogy, Analogue, Coupling.
CORRIDOR	(3) Similar
CORRUGATED	(1) Passage (3) Path
COUETTE	(2) Corrugation
COUPLED	(2) Couple, Coupling
CREEP	(2) Creeping (3) Plastic x Flow
CRITERION	(3) Parameter, Value, Factor, Requirement, Principle
CRITICAL	(3) Maximum
CROCCO	
CROSS	(2) Crossed, Crossing
CRUCIFORM	(3) Crossing, Crossed, Intersecting, Cross
CURRENT	
CURVATURE	(2) Curve, Curved (3) Arc, Subarc, Curve, Curved
CURVED	(2) Curvature, Curve (3) Arc, Round
CYLINDER	(2) Cylindrical (3) Drum, Cylindrical x Body, Cylindrical x Shell
CYLINDRICAL	(2) Cylinder (3) Tubular, Quasi-Cylindrical, Quasi-Cylinder
DAMAGE	
DAMPING	(2) Damped (3) Reduction, Decrease, Decreasing, Decrement, Reduced
DATA	(3) Result, Output, Statistics, Value
DECELERATION	(2) Decelerating, (3) Decelerating, Braking, Speed x Reduction, Motion x Arrest
DEFLECTION	(1) Displacement (2) Deflect, Deflected, Deflecting (3) Deviation
DEFORMATION	(1) Strain (2) Deformable, Deformed, Deforming (3) Failure
DEGREE	
DELTA	(1) Triangular (3) Isosceles, Caret
DENSITY	(2) Dense
DERIVATION	(2) Derivative (3) Transformation
DERIVATIVE	(2) Derivation
DESIGN	
DETACHMENT	(2) Detached (3) Separation

DETECTION	(1) Finding (3) Determination, Deduction, Prediction, Observation, Investigation
DETERMINATION	(3) Estimation, Prediction, Finding
DEVELOPMENT	(2) Developable, Developed (3) Formation, Generation, Production, Growth
DEVIATION	(3) Variation, Fluctuation, Change, Deflection
DIAMETER	
DIFFERENCE	(1) Differential (2) Different, Differential, Differentially (3) Differing
DIFFERENT	(2) Difference, Differential, Differentially, Differing (3) Variable, Variation, Varying, Alteration, Change, Deviation
DIFFERENTIAL	(1) Difference (2) Difference, Different, Differentially (3) Differing
DIFFUSION	(2) Diffuse, Diffuser, Diffusivity (3) Joining, Merging, Merger, Merged, Exchange, Impinging, Impingement
DIGITAL	
DIMENSION	(2) Dimensional, Dimensionless
DIRECTION	(2) Direct, Directed, Directional (3) Inclination
DISCONTINUITY	(2) Discontinuous (3) Irregularity
DISPLACEMENT	(1) Deflection (2) Displaced
DISSOCIATED	(2) Dissociating, Dissociation
DISSOCIATION	(2) Dissociated, Dissociating (3) Breakdown, Decomposition
DISTANCE	(2) Distant
DISTRIBUTED	(1) Spread (2) Distribution
DISTRIBUTION	(2) Distributed (3) Field, Gradient, Differential, Fluctuation, Variation, Divergence, Profile, Slope, Load x Input
DISTURBANCE	(1) Perturbation (2) Disturbed, Disturbing (3) Instability, Unsteadiness, Nonequilibrium, Alteration, Change, Interference
DIVERGENCE	(2) Divergent, Diverging (3) Expansion
DOME	(1) Hemisphere
DOUBLE	
DOWNSTREAM	(3) Behind
DRAG	(3) Resistance
DRIVEN	(2) Drive, Driver, Driving (3) Forced
DUCT	(1) Channel (2) Ducted, Ducting (3) Passage, Ducting
DURATION	(2) During (3) Period, Time
DURING	(2) Duration
DYNAMIC	(2) Dynamically
EARTH	
EDGE	(2) Edged, Edgewise (3) Lip, Surface, End, Boundary
EFFECT	(2) Effective, Effectiveness (3) Influence, Phenomena, Action
ELASTIC	(1) Flexible (2) Elastically, Elasticity
ELASTICALLY	(1) Flexibly (2) Elastic, Elasticity
ELECTRON	(2) Electronic
ELECTRONIC	(2) Electron
ELEMENT	
ELLIPTIC	(1) Oval (2) Elliptical, Ellipticity
EMPIRICAL	(3) Experimental, Semi-Empirical, Measured
END	(2) Ended (3) Tip, Edge, Boundary
END PLATE	
ENDURANCE	(3) Strength, Load x Carrying x Capacity, Fatigue x Resistance
ENERGY	
ENGINE	(1) Motor (3) Power x Plant, Propulsion x System, Power Plant
ENSKOG	
ENTHALPY	(3) Heat x Content
ENTRANCE	(1) Inlet (2) Entering, Entry (3) Orifice, Intake
ENTRY	(2) Entering, Entrance (3) Re-entry, Re-entering, Entering, Entrance
ENVIRONMENT	(2) Environmental (3) Surrounding, Condition
EQUATION	(3) Expression, Operator
EQUILIBRIUM	(2) Equilibration, (3) Stability, Quasi-Equilibrium
ESTIMATE	(2) Estimation (3) Prediction, Assessment
ESTIMATION	(2) Estimate (3) Prediction, Assessment
EXACT	(3) Accurate
EXCITATION	(2) Excited, Exciting (3) Exciting, Generation, Production
EXCITED	(2) Excitation, Exciting (3) Generated
EXHAUST	(1) Discharge, Efflux, Emission (2) Exhausting (3) Outflow, Issuing, Leaving, Plume, Exhausting
EXIT	(1) Outlet (2) Exiting
EXPANSION	(2) Expanded, Expanding
EXPERIMENT	(2) Experimental (3) Measuring, Measurement, Test, Investigation, Testing

EXPERIMENTAL	(2) Experiment (3) Empirical, Semi-empirical, Measured
EXPONENT	(2) Exponential
EXPONENTIAL	(2) Exponent
EXPOSED	(3) Bare, Open, Loaded, Subjected
EXPRESSION	(2) Expressible (3) Equation, Operator
EXTERNAL	(1) Outer (2) Externally (3) Outboard, Peripheral
FACE	(2) Faced, Facing (3) Surface
FACING	(1) Opposite (2) Face, Faced
FACTOR	(3) Constant, Variable, Criterion, Value, Function, Parameter
FAILING	(2) Failure (3) Defect
FAILURE	(2) Failing (3) Instability
FAST	(1) Quick, Rapid
FATIGUE	
FIELD	(1) Region (3) Area, Domain, Regime
FIN	(2) Finned (3) Stabilizer
FINDING	(1) Detection (3) Estimation, Determination, Prediction
FINITE	
FLAP	(2) Flapping
FLAT	(2) Flattening (3) Plane, Planar
FLEXIBILITY	(1) Elasticity (2) Flexible, Flexibly, Flexural, Flexure
FLEXIBLE	(1) Elastic (2) Flexibility, Flexibly, Flexural, Flexure (3) Flexural
FLIGHT	(2) Flying (3) Flying, Fall, Falling
FLOW	(1) Flux, Stream (2) Flowing (3) Motion, Movement, Moving, Flowing
FLUID	(2) Fluidized
FLUTTER	(2) Fluttering
FLUX	(1) Flow, Stream (3) Transfer
FLYING	(2) Flight (3) Flight, Fall, Falling
FORCE	(2) Forced, Forcible, Forcing (3) Load, Stress, Pressure, Loading
FORCED	(2) Force, Forcible, Forcing
FOREBODY	(1) Forepart, Foreplane (3) Nose, Cap, Bow, Head, Front, Leading x Edge
FORM	(2) Formation, Formed (3) Shape
FORMULA	(2) Formulation (3) Solution, Theory, Principle
FORWARD	(3) Leading, Ahead
FREE	(1) Independent, Uncoupled (2) Freedom, Freely (3) Without, Negative, Negatively, Ideal, Independence
FREEDOM	(1) Independence (2) Free, Freely
FREON	
FREQUENCY	
FRICTION	(2) Frictional (3) Resistance
FUNCTION	
GAS	(2) Gaseous
GASEOUS	(2) Gas
GAUGE	(1) Meter (3) Measurement
GENERAL	(2) Generalized
GENERATED	(1) Formed (2) Generating, Generation, Generator (3) Excited
GENERATORS	(2) Generated, Generating, Generation
GEOMETRY	(2) Geometric, Geometrical, Geometrically (3) Shape, Profile, Contour, Geometrical, Form, Proportion, Configuration
GIVEN	(1) Assumed (3) Prescribed, Imposed
GRADIENT	(1) Slope (2) Graded (3) Load, Input, Distribution, Field, Differential, Fluctuation, Exchange, Variation, Divergence, Profile
GRAPHICAL	(3) Diagram
GROUND	(3) Surface
GROWTH	(3) Spread, Increase, Increased, Increasing, Increment, Rise, Jump, Amplification, Spreading, Expansion
GUIDANCE	(2) Guide, Guided (3) Control
GUST	(3) Air x Current, Air x Blast
HEAT	(2) Heated, Heating, Heater, Hot (3) Thermal
HEATED	(1) Hot (2) Heat, Heating, Heater, Hot (3) High x Temperature, Elevated x Temperature
HEATING	(2) Heat, Heated, Heater, Hot (3) Heat x Input, Heat x Addition, Temperature x Rise
HEIGHT	(2) High, Higher, Highly (3) Altitude
HELIUM	
HEMISPHERE	(1) Dome (2) Hemispheric, Hemispherical, Hemispherically
HIGH	(2) Higher, Highly, Height (3) Large

HIGHLY	(2) High, Higher, Height (3) Fully, Entirely
HOMOGENEOUS	(1) Heated, (2) Heat, Heated, Heating, Heater (3) High x Temperature, Elevated x Temperature
HOT	(3) Stagnant, Stationary x Fluid, Static x Fluid, Dead x Air, Still x Air
HYDROSTATIC	(3) Hypervelocity
HYPERSONIC	(3) Hypersonic x Flight, Hypersonic x Flow, Hypersonic x Speed, Ultra-High x Mach
HYPERVELOCITY	(1) Defect (2) Imperfect
IMPERFECTION	(2) Incident (3) Attack
INCIDENCE	(3) Subsonic, Subcritical
INCOMPRESSIBLE	(2) Increased, Increasing (3) Increased, Increasing, Increment, Rise, Spread, Spreading, Growth, Jump, Amplification, Expansion
INCREASE	(1) Additional (2) Increment (3) Increasing
INCREMENTAL	(2) Inductance, Induction (3) Generated, Caused
INDUCED	(1) Rigid, Unelastic
INELASTIC	(2) Infinitely, Infinitesimal, Infinitesimally (3) Unbounded
INFINITE	(2) Effect, Phenomena, Action
INFLUENCE	(1) First (2) Initialed, Initially, Initiation (3) Starting
INITIAL	(2) Injectant, Injected, Injector (3) Addition
INJECTION	(1) Internal (3) Interior
INNER	
INPUT	
INSTABILITY	(3) Failure
INSTANTANEOUS	(3) Sudden
INSTRUMENT	(2) Instrumentation (3) Device, Machine, Mechanism, Equipment, Apparatus
INSULATED	(1) Adiabatic, Nonconductive (2) Insulating, Insulation (3) Unheated, Recovery x Temperature x Distribution, Zero x Heat x Transfer
INTEGRAL	(2) Integrated, Integrating, Integration, Integrative
INTEGRATION	(2) Integral, Integrated, Integrating, Integrative, (3) Integral x Method
INTENSITY	(2) Intense (3) Strength, Level, Volume
INTERACTION	(2) Interacting (3) Interference, Interferential, Disturbance, Perturbation
INTERBLADE	
INTERFERENCE	(2) Interferential (3) Interaction, Interacting, Disturbance
INTERNAL	(1) Inner (2) Internally, (3) Interior
INTERVAL	(3) Gap
INVERSION	(2) Inverse, Inverted
INVESTIGATION	(1) Research, Study
INVISCID	(1) Non-viscous (3) Viscosity x Zero
IONIZED	(1) Charged (2) Ion, Ionization, Ionosphere
IRROTATIONAL	(1) Non-rotating (3) Potential
ISENTROPIC	(3) Constant x Entropy
ISOTHERMAL	(3) Constant x Temperature
ISOTROPIC	
ISSUING	(1) Exhausting, Leaving (3) Discharge, Emission, Efflux, Outflow
ITERATION	(2) Iterative (3) Iterative x Process, Finite x Difference x Method, Finite x Difference x Procedure, Finite x Difference x Solution
ITERATIVE	(1) Step-by-step (2) Iteration (3) Finite x Difference
JET	(3) Stream
JOULE	
JUNCTION	(3) Joint, Intersection
KELVIN	
KINETIC	(3) Dynamic, Motion
KINK	(2) Kinking (3) Deviation, Disturbance, Perturbation, Displacement, Deflection, Divergence
LABORATORY	
LAMINAR	(2) Laminarization (3) Smooth
LANGLEY	
LARGE	(3) High, Extensive, Large x Order, Large x Size
LAUNCH	(2) Launched (3) Takeoff, Propelled
LAW	(1) Rule, Principle (3) Hypothesis, Assumption
LAYER	(2) Layered (3) Flow, Stream, Region, Regime
LEADING	(2) Lead (3) Front
LEES	
LENGTH	(2) Lengthwise, Long (3) Span, Extent
LIFT	(2) Lifting
LIGHTWEIGHT	(1) Light
LINE	(2) Linear, Linearization, Linearized, Linearly, Liners (3) Point, Limit, Boundary
LIFTING	(2) Lift (3) Inclined

LINEAR	(1) One-Dimensional (2) Line, Linearization, Linearized, Linearly
LINEARIZED	(2) Line, Linear, Linearization, Linearly, Liners (3) One-Dimensional, Quasi-One-Dimensional
LIQUID	(2) Liquefaction (3) Fluid
LOAD	(1) Loading, Stress (2) Loaded (3) Airload, Force, Pressure
LOADED	(2) Load, Loading (3) Exposed, Subjected, Supporting, Carrying
LOADING	(1) Load, Stress (2) Loaded, Load (3) Airload, Force, Pressure
LOCAL	(2) Locally, Located, Location (3) Ambient, Surrounding, Area, Proximity, Vicinity
LOCATED	(2) Local, Locally, Location (3) Location, Position
LOCATION	(1) Position, Point, Station (2) Local, Locally, Located
LONG	(2) Length, Lengthwise (3) Elongated, Extended
LONGITUDINAL	(1) Lengthwise, Spanwise (2) Longitudinally
LOSS	(2) Losing (3) Transfer, Emission, Removal
LOW	(1) Reduced, Small (2) Lower, Lowest
LOWER	(2) Low, Lowest (3) Base, Bottom, Under
LUNAR	
LYAPUNOV	
MACH	
MACHINE	(3) Vehicle
MAGNETIC	
MAGNETOGASDYNAMIC	(1) Magnetoaerodynamic, Electrogasdynamic, (3) Magnetohydrodynamic, Magnetofluidmechanic, Hydromagnetic, Conducting x Magnetic x Fluid, Conducting x Magnetic x Flow
MAGNETOHYDRODYNAMIC	(1) Hydromagnetic, Magnetofluidmechanic (3) Magnetogasdynamic, Magneto-aerodynamic, Electrogasdynamic, Conducting x Magnetic, x Fluid, Conducting x Magnetic x Flow
MAGNITUDE	(1) Size (3) Amount, Quantity, Total Dimension
MAIN	(1) Major, Primary (3) First
MAINTENANCE	
MASS	(3) Inertia, Weight
MATCHING	(3) Integrating, Integration, Correlation
MATERIAL	(3) Medium
MATHEMATICAL	(3) Computational, Algebraic
MATRIX	(2) Matric
MAXIMUM	(2) Maxima (3) Complete, Extreme, Peak, Total
MAXWELL	(2) Maxwellian
MEASURED	(2) Measurement, Measuring (3) Measurement, Experiment, Experimental, Determination, Exact, Test, Testing
MEASURING	(2) Measured, Measurement (3) Measurement, Determination, Experiment, Test, Testing
MEASUREMENT	(2) Measured, Measuring (3) Measuring, Determination, Experiment, Test, Testing
MECHANICAL	(2) Mechanics, Mechanism
MECHANISM	(2) Mechanical, Mechanics (3) Action, Characteristic, Nature, Problem, Structure
MEDIUM	(3) Environment, Surrounding, Region, Atmosphere, Material
MEMBRANE	(3) Skin, Surface, Shell
MERGED	(1) Combined (2) Merger, Merging (3) Mixed, Integrated, Interacting
MERIDIONAL	(2) Meridian (3) Central, Centre, Centred, Midplane, Median, Axis, Bisector, Midpoint
METHANE	
METHOD	(1) Technique (3) Procedure, Treatment
MINIMISATION	(2) Minimizing, Minimum (3) Minimizing, Reduction, Limitation, Limiting, Removal
MISSILE	(1) Projectile (3) Rocket, Warhead
MIXING	(2) Mixed, Mixture (3) Diffusion, Joining, Merged, Merging, Merger, Exchange, Impinging, Impingement
MIXTURE	(2) Mixed, Mixing
MODE	(2) Modal (3) Type, Form, Shape, Method
MODEL	(3) Specimen, Idealized x Structure, Experiment, Test, Analysis, Theory, Hypothesis, Solution
MODERATE	(3) Low, Small, Reduced
MOLECULAR	(2) Mol, Molecule
MOMENT	(2) Momentary, Momentum (3) Aerodynamic x Influence x Coefficient
MOTION	(3) Moving, Movement, Travelling, Reaction, Reacting, Non-stationary
MOUNTED	(1) Supported (2) Mounting, (3) Support, Suspension, Supporting, Resting, Mounting

MOVING	(1) Non-Stationary, Travelling (2) Movable, Movement
MULTI	(1) Multiple
MULTISTAGE	(3) Multi, Multiple
NATURAL	(2) Nature (3) Self x Induced
NATURE	(2) Natural (3) Property, Characteristic, Quality
NAVIER	
NEARLY	(2) Near, Nearest (3) Near, Quasi, Semi
NEUTRAL	
NEWTONIAN	(2) Newton
NITROGEN	
NOISE	(3) Pressure x Fluctuation, Random x Pressure x Load, Acoustic x Disturbance
NON-CIRCULAR	(2) Non-Circulatory
NON-EQUILIBRIUM	(3) Frozen, Freezing, Instability, Unsteadiness
NON-LINEAR	(2) Non-Linearity
NON-STEADY	(1) Unsteady (3) Quasi-Unsteady, Variable, Varying, Fluctuating, Fluctuation, Variation, Discontinuous, Unsteadiness, Unsteadily, Time x Dependent, Alternating, Sinsusoidal
NON-UNIFORM	(1) Varying (2) Non-Uniformity, Non-Uniformly (3) Non-Linear, Variable, Differential
NON-VISCOUS	(1) Inviscid (3) Viscosity x Zero
NON-ZERO	(3) Non-Negative, Positive
NOSE	(2) Nosed (3) Cap, Head, Front, Forebody, Bow, Forepart, Foreplane, Leading x Edge
NOSED	(1) Headed, Capped (2) Nose
NOZZLE	(3) Duct, Tube, Pipe, Venturi, Orifice, Wind x Tunnel x Contraction
NORMAL	(2) Normally (3) Vertical, Perpendicular, Average, Mean
NUMERICAL	(2) Number
OFF	
Ogee	(2) Ogival, Ogive
OGIVE	(2) Ogee, Ogival (3) Gothic
ONE-DIMENSIONAL	(1) Linear (3) Linearized, Quasi-Onedimensional
ONSET	(3) Beginning, Appearance, Start
OPERATING	(2) Operation, Operational, Operator (3) Operation, Performance
OPTICAL	(3) Visual
OPTIMUM	(2) Optimal, Optimization (3) Ideal, Perfect, Appropriate
ORBIT	(1) Trajectory, Path (2) Orbital, Orbiting
ORDER	(2) Ordered
ORTHOTROPIC	
OSCILLATING	(1) Vibrating (2) Oscillation, Oscillator, Oscillatory (3) Vibrational, Oscillatory
OSCILLATION	(1) Vibration (2) Oscillating, Oscillator, Oscillatory
OSCILLATORY	(1) Vibratory (2) Oscillating, Oscillation, Oscillator, (3) Wavy, Sinsusoidal,
OUTER	(1) External (2) Outermost (3) Outboard, Peripheral, Outlet, Output, Outward
OUTSIDE	(3) External, Peripheral
OVAL	(1) Elliptic
PANEL	(3) Plate
PARAMETER	(3) Constant, Variable, Criterion, Value, Factor, Function
PART	(2) Partial, Partially, Partly (3) Component, Element
PARTIALLY	(1) Partly (2) Partial, Part (3) Part, Semi
PARTICLE	
PERFECT	(2) Perfectly (3) Simple, Ideal, Idealized, Simplified, Approximate, Model, Hypothetical, Pure
PERFORMANCE	(3) Operation, Operating
PERIODIC	(2) Period, Periodically, Periodicity
PERIPHERAL	(1) Circumferential
PHASE	(3) State
PHENOMENA	(2) Phenomenological (3) Effect, Characteristic
PHOTOELASTIC	
PITCH	(2) Pitching
PITOT	
PLANE	(2) Planar (3) Direction, Axis
PLANFORM	(3) Shape
PLASTIC	(2) Plasticity (3) Soft
PLATE	(2) Plating (3) Panel
POINT	(1) Location, Position, Station (2) Pointed, (3) Area
POLAR	(3) Curve

POSITION	(1) Location, Point, Station (2) Positioning
POTENTIAL	(3) Irrotational, Non-Rotating
PRACTICAL	(3) Real, Working, Imperfect, Non-Perfect
PREBUCKLING	(2) Prebuckled
PREDICTION	(3) Estimate, Estimation, Assessment, Determination, Calculation, Deduction
PRESENCE	(3) Ambient, Environment, Environmental, Surrounding, Proximity, Vicinity
PRESSURE	(2) Pressurisation, Pressurized (3) Load, Stress, Force, Loading
PRESSURIZED	(2) Pressure, Pressurization
PRIMARY	(1) Main, Major
PRINCIPLE	(1) Law, Rule (3) Theory, Theoretical, Hypothesis, Prediction, Assumption
PROBLEM	(3) Concept, Condition
PROCEDURE	(3) Method, Technique, Treatment
PRODUCT	(2) Production (3) Result
PRODUCTION	(1) Generation (2) Product (3) Propagation
PROFILE	(3) Distribution, Field, Gradient, Differential, Fluctuation, Variation, Divergence, Slope, Load x Input
PROGRAMME	(2) Programmed, Programming (3) Algorithm
PROPAGATION	(2) Propagating (3) Generation, Production, Originating, Source, Development, Spread, Radiation, Emission, Excitation
PROPELLER	(2) Propellant, Propelled
PROPERTY	(1) Characteristic (3) Quality, Nature
PROXIMITY	(3) Near, Close, Adjacent
PUMP	(3) Blower, Compressor
PURE	(3) Simple, Simplified, Ideal, Idealized, Approximate, Perfect, Model, Hypothetical
QUANTITATIVE	(2) Quantity
QUASI-CONICAL	
RADIUS	(2) Radial, Radially
RANGE	(3) Distance
RAREFACTION	(2) Rarefied (3) Free x Molecular x Flow, Rarefied x Gas x Flow, Semi-Rarefied x Gas x Flow, High x Altitude x Flow, Low x Density x Flow, Wall x Discontinuity x Velocity, Wall x Discontinuity x Temperature
RAREFIED	(2) Rarefaction (3) Semi-Rarefied, Free x Molecule, Free x Molecular
RATE	(3) Speed, Velocity
RATIO	
REACTING	(2) Reaction, Reactive, Reactor (3) Reactive, Active, Action, Activation, Activity
REACTION	(2) Reacting, Reactive, Reactor (3) Energy, Force, Action, Behaviour, Kinetic, Response
REAL	(3) Non-Perfect, Imperfect, True
RECTANGULAR	(2) Rectangle
REDUCTION	(2) Reduced (3) Reduced, Limitation, Limiting, Decreasing, Decrement, Fall, Control, Minimisation, Minimising
RE-ENTRY	(2) Re-entering, Re-Entrant (3) Re-Entering, Entry, Entering, Entrance
REFERENCE	(3) Characteristic
REFINEMENT	(3) Improvement
REFLECTION	(2) Reflected, Reflecting (3) Deflection
REGIME	(1) Domain
REGION	(1) Field (3) Area, Ambient, Regime, Local, Locally, Environment, Presence, Surrounding
REINFORCED	(3) Stiffened
RELATION	(1) Relationship, Correlation (2) Relative, Relatively, Relativistic, (3) Coupling
RELATIONSHIP	(1) Relation, Correlation (2) Relative, Relatively, Relativistic, Coupling
RELAXATION	(2) Relaxational, Relaxing
REQUIRED	(2) Requirement
RESEARCH	(1) Investigation, Study
RESERVOIR	(3) Storage x Vessel
RESPONSE	(3) Reaction
RESTRAINED	(2) Restraining, Restraint (3) Retarded, Controlled
RESTRAINT	(2) Restrained, Restraining (3) Constraint
RESULT	(2) Resultant, Resulting (3) Data, Output, Statistics, Value
RETURN	(3) Descent, Descending, Deceleration, Approach, Homing
REVOLUTION	(1) Rotation
REYNOLDS	
RING	(3) Annular, Round, Rounded

RISE	(3) Increase, Increment
ROCKET	(3) Missile, Projectile
ROLLING	(2) Roll, Rolled
ROUGHNESS	(2) Rough (3) Irregularity
ROUND	(2) Rounded, Rounding, Roundness (3) Rounded, Blunt, Convex, Semi-circular, Circular, Circularity, Curved, Curvature
ROW	(3) Series
RUNNING	(3) Operation
SANDWICH	(1) Multilayer, Laminate, Stratiform, (3) Lamination
SATELLITE	
SCALE	(2) Scaling (3) Size, Dimension, Area
SECOND	(2) Secondary (3) Two
SECTION	(2) Sectional, Sector, Sectorial (3) Segment, Plane, Sector
SECTOR	(2) Section, Sectional, Sectorial (3) Section, Plane, Segment
SELF	
SEMIVERTEX	(3) Top, Head, Crest, Apex, Crown, Cap, Semi-Vertex, Vertex
SENSITIVITY	(2) Sensor
SEPARATED	(2) Separating, Separation (3) Free, Detached
SEPARATION	(2) Separated, Separating (3) Detachment
SERIES	(3) Row, Line, Bank
SHALLOW	(2) Shallowness
SHAPE	(2) Shaped (3) Configuration, Profile, Contour, Geometry, Form
SHARP	(2) Sharpness (3) Intermediate
SHEAR	(2) Sheared, Shearing (3) Shearing, Longitudinal x Velocity x Gradient
SHEARING	(2) Shear, Sheared (3) Shear, Longitudinal x Velocity x Gradient
SHEET	(3) Layer, Path, Core, Line, Trail, Field, Street
SHELL	
SHOCK	(2) Shocking (3) Blast
SHORT	(2) Shortening
SHROUD	(2) Shrouded
SIDE	(2) Sided, Sidedness
SIDESLIP	(3) Cross x Load
SIMILAR	(2) Similarity, Similitude
SIMILARITY	(2) Similar, Similitude (3) Similitude, Correlation, Analogy, Analogue
SIMILITUDE	(2) Similar, Similarity (3) Similarity, Correlation, Analogue, Analogy
SIMPLE	(1) Simplified, Simplification (2) Simply, Simplified (3) Idealised, Approximate, Perfect, Model, Hypothetical, Ideal, Pure
SIMPLIFIED	(1) Simple (2) Simplification, Simply, Simple (3) Idealised, Approximate, Perfect, Model, Hypothetical, Ideal, Pure
SIMPLY	(2) Simple, Simplification, Simplified
SIMULATION	(2) Simulated, Simulating, Simulator (3) Analogy
SINGLE	(2) Singly, Singular, Singularity (3) One
SINUSOIDAL	(2) Sinsusoidally, Sine
SIZE	(1) Magnitude (3) Dimension
SKIN	(3) Membrane, Surface, Shell
SLAB	
SLENDER	(1) Thin (2) Slenderness (3) Narrow
SLIP	
SLIPSTREAM	(3) Downwash, Wake, Vortex, Trail, Afterflow
SMALL	(1) Low, Reduced (3) Infinitesimal, Infinitesimally, Vanishing, Minimum, Slightly, Negligible
SMOOTH	(2) Smoothing, Smoothness (3) Polished
SOFT	(3) Plastic
SOLID	
SOLUTION	(3) Result, Equation, Procedure, Expression
SONIC	(2) Sound, Sounding (3) Sound x Speed, Sound x Velocity
SOUND	(1) Acoustic (2) Sounding, Sonic
SPACECRAFT	(1) Spaceship (3) Space x Vehicle
SPAN	(2) Spanning, Spanwise (3) Length, Extent
SPANWISE	(1) Longitudinal, Lengthwise (2) Span, Spanning, (3) Longitudinally
SPECIES	(2) Specific
SPECIFIC	(2) Species (3) Exact, Particular
SPEED	(1) Velocity (3) Flow, Flight, Stream, Mach
SPHERE	(2) Spherical, Spherically, Spheroid (3) Spheroid, Spherical x Body
SPHERICAL	(2) Sphere, Spherically, Spheroid
SPLIT	(2) Splitter
SQUARE	

STABILITY	(2) Stabilization, Stabilized, Stabilizer, Stabilizing, Stable (3) Equilibrium, Quasi-Equilibrium
STABILIZATION	(2) Stability, Stabilized, Stabilizer, Stabilizing, Stable (3) Stability, Stabilizing, Control, Equilibrium
STABILIZER	(2) Stability, Stabilization, Stabilized, Stabilizing, Stable (3) Fin
STABILIZING	(2) Stability, Stabilization, Stabilized, Stabilizer, Stable (3) Stability, Stabilization, Control, Equilibrium
STABLE	(2) Stability, Stabilization, Stabilized, Stabilizer, Stabilizing (3) Equilibrium, Steady
STAGE	(3) Blading, Blade x Row, Blade x Set
STAGNATION	(2) Stagnant (3) Stationary x Flow, Zero x Velocity
STALLING	(2) Stall, Stalled (3) Flow x Reversal
STANDARD	(3) Normal
STANDOFF	(3) Detachment
STATE	(1) Condition (3) Problem, Concept
STATIC	(2) Statically
STATISTICS	(2) Statistical (3) Result, Data, Output, Value
STEADY	(3) Quasi-Steady, Continuous, Stable, Invariant, Time x Independent
STIFFENED	(2) Stiffener, Stiffening, Stiffness (3) Reinforced
STIFFENER	(2) Stiffened, Stiffening, Stiffness (3) Stiffening
STIFFNESS	(2) Stiffened, Stiffener, Stiffening (3) Rigidity
STING	
STOKES	
STOL	(3) Vtol
STRAIGHT	(2) Straightness (3) Rectilinear
STRAIN	(1) Deformation
STREAM	(1) Flow, Flux
STRENGTH	(2) Strong (3) Intensity, Endurance, Load x Carrying x Capacity, Fatigue x Resistance
STRESS	(1) Load, Loading (2) Stressed, Stressing (3) Strain, Concentrated x Force
STRONG	(2) Strength (3) Intense, Severe
STRUCTURAL	(2) Structure
STRUCTURE	(2) Structural (3) System, Nature, Construction, State, Body, Surface
STUDY	(1) Investigation, Research
SUBJECTED	(2) Subject (3) Bare, Open, Loaded, Exposed
SUBSONIC	(3) Subcritical, Incompressible
SUCTION	
SUDDEN	(3) Rapid, Instantaneous, Fast, Quick
SUPERSONIC	(2) Supersonically (3) Supercritical, High x Speed
SUPPORTED	(1) Mounted (2) Support, Supporting
SURFACE	(2) Surfaced (3) Face, Structure, Body
SURGE	(3) Instability, Unsteadiness, Pressure x Rise
SUSTAINED	(2) Sustaining (3) Supported
SWEPT	(2) Sweep (3) Sweptback
SWEPTBACK	(2) Sweepback (3) Swept
SYMMETRIC	(1) Symmetrical (2) Symmetrical, Symmetrically, Symmetry (3) Regular, Uniform, Steady
SYMMETRICAL	(1) Symmetric (2) Symmetrically, Symmetry, (3) Regular x Shape
SYSTEM	(2) Systematic
TABLE	(3) Chart, Tabulation
TAPERED	(1) Pointed (2) Taper
TECHNIQUE	(1) Method (3) Process, Operation, Procedure
TEMPERATURE	(3) Heat
TEST	(2) Testing (3) Experiment, Measurement
THEORETICAL	(2) Theory (3) Perfect, Ideal, Model
THEORY	(2) Theoretical (3) Theoretical, Hypothesis, Prediction, Assumption, Principle, Law, Rule
THERMAL	(1) Thermodynamic (2) Thermally, (3) Heat
THERMOCHEMICAL	
THERMODYNAMIC	
THICK	(1) Thermal (3) Heat (1) Nonslender (2) Thickened, Thickening, Thickness (3) Broad, Not x Slender, Not x Thin
THICKNESS	(2) Thick, Thickened, Thickening
THIN	(1) Slender (3) Narrow
THREE	
THREE-DIMENSIONAL	(2) Three-Dimensionality
THROAT	(3) Contraction, Contracting x Section, Convergent x Duct

THRUST	(3) Boost, Resultant x Jet x Force
TILT	(2) Tilting
TIME	(2) Timewise (3) Period, Duration
TORISPHERICAL	
TRAILING	(2) Trail (3) Rear, Aft
TRANSFER	(2) Transferred (3) Flow, Flux, Exchange, Transport
TRANSFORMATION	(2) Transform, Transformed (3) Transform, Transformed, Conversion
TRANSIENT	(3) Discontinuous, Random
TRANSITION	(2) Transit, Transitional (3) Change, Breakdown x Laminar x Flow
TRANSITIONAL	(2) Transit, Transition (3) Changing, Breakdown x Laminar x Flow
TRANSONIC	(3) High x Subsonic
TRANSPARATION	(3) Sweat
TRANSPORT	(3) Distribution, Carrying
TRANSVERSE	(1) Lateral (2) Transversality, Transversely, (3) Chord, Chordwise
TREATMENT	(3) Method, Technique, Procedure
TRIANGULAR	(1) Delta (2) Triangle (3) Isosceles, Caret
TRUE	(3) Accurate, Exact, Real, Perfect, Accuracy
TUBE	(1) Pipe, Tubing (2) Tubular, (3) Head, Probe, Hollow x Cylinder, Hollow x Body, Tubular x Body
TUMBLING	(3) Falling, Plunging, Sinking, Diving
TUNNEL	(3) Tube
TURBULENCE	(2) Turbulent (3) Mixing, Eddy, Velocity x Fluctuation
TURBULENT	(2) Turbulence
TWO-DIMENSIONAL	(2) Two-Dimension (3) Two-Dimension
UNDEREXPANDED	(2) Underexpansion (3) Expanded
UNIFORM	(2) Uniformity, Uniformly (3) Regular
UNIFORMLY	(2) Uniform, Uniformity
UNSTEADY	(1) Non-Steady (2) Unsteadily, Unsteadiness, (3) Alternating, Sinusoidal, Time x Dependent, Quasi-Unsteady, Variable, Varying, Fluctuating, Fluctuation, Variation, Discontinuous, Unsteadily, Unsteadiness
UNSTIFFENED	(3) Flexible, Elastic, Stiffener x Zero, Stiffness x Zero
UPWASH	(1) Upflow (3) Upload
USE	(3) Value, Applicability, Application
VALUE	(2) Valued (3) Data, Output, Result, Statistics
VARIABLE	(2) Variation, Variational, Varying (3) Variation, Varying, Different, Alteration, Change, Deviation
VARIATION	(2) Variable, Variational, Varying (3) Variable, Varying, Different, Differing, Change, Changing, Alteration, Fluctuation, Fluctuating, Deviation
VARIATIONAL	(2) Variable, Variation, Varying
VARYING	(1) Non-Uniform (2) Variable, Variation, Variational
VECTOR	(3) Direction
VEHICLE	(3) Machine, Ship
VELOCITY	(1) Speed (3) Flow, Flight, Stream, Mach
VERTICAL	(2) Vertex (3) Perpendicular, Normal
VERY	(3) Highly
VESSEL	
VIBRATION	(1) Oscillation (2) Vibrating, Vibrational, Vibrationally, Vibratory
VIBRATIONAL	(2) Vibrating, Vibration, Vibrationally, Vibratory (3) Vibrating, Oscillating, Oscillatory
VISCOELASTIC	(2) Viscoelasticity
VISCOSITY	(2) Viscous, Viscid (3) Internal x Friction
VISCOUS	(1) Viscid (2) Viscosity
VISUALISATION	(2) Visual (3) Flow x Survey, Visual x Flow x Investigation
VORTEX	(1) Eddy (2) Vortical, Vorticity (3) Swirl, Spiral, Spiralling x Fluid, Vorticity x Layer, Rotational x Flow, Rotational x Fluid
VORTICITY	(2) Vortex, Vortical (3) Rotation, Spiral, Swirl
VTOL	(3) Stol
WAKE	(1) Afterflow, (3) Trail
WALL	(2) Walled (3) Boundary, Bound, Limit
WALLED	(2) Wall (3) Bounded, Enclosed
WATER	
WAVE	(2) Waviness, Wavy
WEDGE	(3) Triangular, Ramp
WEIGHT	(2) Weighting
WIDTH	(2) Wide, Widely (3) Thickness

WIND	(2) Windward
WING	(2) Winged
WITHOUT	(3) Absence
YAW	(2) Yawed, Yawing
YAWED	(2) Yaw, Yawing
YIELD	(2) Yielding
ZERO	(3) Negative, Negligible, Without, Absence

APPENDIX 5.3

SINGLE TERM HIERARCHIES

The schedules list single terms only, and include all the terms used in indexing the 1,400 documents, with the exception of the proper names. The single terms are in natural uncontrolled language, and different verbal forms of a word often appear in different places.

Notation is purely ordinal and in no way reflects the relations between the terms represented.

Plus signs indicate synonyms.

Superordinate, subordinate and coordinate relations are shown by indentation.

These hierarchies represent an attempt to interpret hierarchical linkage as an obligatory recall device, that is, an original vocabulary is reduced by condensing species into containing genera, and no option is left in searching. Three stages of reduction are shown in the columns on the right of each page.

Further information on these hierarchies is given on pages 69-73

Summary of main sections

- A1 Particles
- A15 Materials; fuels, metals, non-metals, aggregates.
- B68 State and form of matter
- C1 Astronomical and geophysical phenomena
- C30 Constructs and structures
- C32 Vehicle: aircraft, missiles
- D2 Parts: aerofoils, control surfaces.
- D40 Structural systems, parts and elements
- E1 By shape: bodies
- E56 Machines, engines, auxiliary systems
- F1 Machine components
- F80 Apparatus, equipment: wind tunnels, instruments
- H1 Spatial relations; portion, position, direction, shape, dimension, arrangement
- N1 Temporal relations: duration, periodicity, rate.
- N40 Flying operations, processes, properties.
- Oa Aerodynamics
 - O1 Flow; types, by speed etc.
- O64 Flow elements and phenomena, streamlines, vortices, jets, waves.
- Q100 Flow attributes: viscosity, forces, loads, stagnation, wake.
- P30 Aeroelasticity
- P42 Aerodynamic reference parameters; attitude, planform, section etc.
- P70 Mechanics
 - P84 Kinematics
 - Q32 Force
 - R1 Behaviour of deformable bodies
 - R91 Vibration, wave phenomena
 - S23 Thermodynamic behaviour and properties
- S77 Physical-chemical processes
- T14 General processes, activities, operations, change (of composition, state, location, direction, dimension, etc.)
- U59 Technical operations and processes
- U85 Research
 - V1 Experiment
- V30 Mathematical operations
- Wa Common properties
- X30 Properties of processes (e.g. incipient, continuous, erratic)
- X108 General relations
- Y40 Abstract concepts, form.

		First Reduction	Second Reduction	Third Reduction
A1	Particles	1	1/8a	1/8a
A3	Electron + Beta	3/4		
A4	Proton			
A5	Atom	5/6		
A6	Isotope			
A7	Ion	7		
A8	Molecule	8/8a		
A8a	Mol			
	(Structure)			
A8b	Atomic	8b/14	8b/14	8b/14
A8c	Molecular			
A8d	Bimolecular			
A9	Homonuclear			
A9a	Nuclear			
A10	Monatomic			
A11	Diatomic			
A12	Polyatomic			
A13	Polymer			
A14	Polycrystalline			
A15	Matter + Material	15	15	15/19a
	(By use)			
A16	Pigment	16	16 + 19	+ 27/35
A17	Lacquer	17/18	17/18	
A18	Phosphorescent			
A19	Ink	19		
A19a	Injectant	19a	19a	
A20	Fuel	20/24	20/24	20/26
A21	Methane			
A22	Ethylene			
A23	Hydrocarbon			
A24	Methanol			
A26	Propellant	26	26	
A27	Explosive	27/28	27/28	
A28	TNT			
A30	Coolant	30	30	
A31	Lubricant	31	31	
A32	Refractory	32	32	
A32a	Oxidizer	32a	32a	
	(By origin)			
A34	Electrodeposit	34/35	34/35	
A35	Electroformed			
	(By constitution)			
A38	Metal	38/39a	38/39a	38/56
A39	Alloy		+48/56	+66/68
A39a	Bi-metallic			
A40	Aluminium	40/43	40/43	
A41	Duralumin			
A42	Alcoa			
A43	Alclad			
A44	Nickel	44/47	44/47	
A45	Inconel			
A46	Nimonic			
A47	Rex			
A48	Brass	48		
A49	Copper	49		
A50	Zinc	50		
A51	Titanium	51		
A52	Lead	52		
A53	Magnesium	53		
A54	Molybdenum	54		
A55	Tungsten	55		
A56	Chromium	56		
A57	Ferrous	57	57/65	57/65
A58	Iron	58		
A58a	Gamma	58a		
A59	Steel	59/65		
A60	Mild			
A61	Decarburized			
A61a	Columbium			
A62	Sicromo 2			
A63	Timken			
A64	Stainless			
A65	SAE			
A66	Mercury	66	66/68	
A67	Potassium	67		
A68	Sodium	68		

		First Reduction	Second Reduction	Third Reduction
	[Metal]			
	[Sodium]			
	(Non-metal)			
A70	Carbon	70	70/71	70/75
A71	Graphite	71		
A72	Silica	72/75	72/75	
A73	Fused			
A74	Quartz			
A75	Foamed			
	(Gas)			
A76	Hydrogen	76	76 + 81/84	76/87
A77	Helium	77/80	+ 87	
A78	Argon		77/80	
A79	Krypton			
A80	Xenon			
A81	Iodine	81		
A82	Nitrogen	82/84		
A83	Nitric (oxide)			
A84	Nitrous (oxide)			
A85	Oxygen	85	85	
A86	Freon	86	86	
	(Natural materials)			
B1	Wood	1/5	1/5	1/6b
B2	Balsa			
B3	Plywood			
B4	Spruce			
B5	Pine			
B6	Oil	6	6/6b	
B6a	Rubber	6a		
B6b	Paper	6b		
B8	Glycerine	8	8/9	8/23
B9	Hexachlorethane	9		
	Inorganic (compounds)			
B9a	Water	9a	9a + 18/23	
B10	Steam	10	10/11	
B11	Air	11		
B12	Seeded	12/13	12/13	
B13	Salt	14/17	14/17	
B14	Carbonate			
B14a	Chloride			
B15	Iodide			
B16	Tetrachloride			
B17	Amonium	18		
B18	Monoxide	19		
B19	Dioxide	20		
B20	Silicate	21		
B21	Fluorochemical	23		
B23				
B24	Ceramic	24	24	24/28
B25	Glass	25/26	25/26	
B26	Glassy			
B27	Fibre	27/28	27/28	
B28	Fibrous			
	(Plastics)			
B30	Nylon	30	30/33+37/38	30/59
B31	Melamine	31	+46/50+55/59	
B32	Cellulose	32/33		
B33	Acetate			
B34	Resin	34	34/36	
B35	Epoxy	35	+39/45a	
B36	Polyester	36		
	(Polyester (plastics))			
B37	Mylar	37		
B38	Paraplex	38		
B39	Phenolic (resins)	39/45a		
B40	Bakelite			
B41	Formica			
B42	Asbestos			
B43	Raybestos			
B44	Refrasil			
B45	Astrolite			
B45a	Thermold J.			
	(Methyl methacrylates)			
B46	Perspex	46/48		
B47	Flexiglass			
B48	Lucite			
B49	Teflon	49		
B50	Polystyrene	50		
	(Reinforced plastics)			
B51	Fibreglass	51/54	51/54	
B52	Cinnati-Testing-Laboratory-Material			

	[Resin]	First Reduction	Second Reduction	Third Reduction
	[Reinforced plastics]			
	[Cincinnati-Testing-Laboratory-Material]			
B53	Papreg			
B54	Compreg			
B55	Castolite	55		
B56	Haveg-Rocketon	56		
B57	Hysol	57		
B58	Lexam	58		
B59	Lockfoam	59		
	(Ground: aggregates by particle size)			
B60	Sod	60/67	60/67	60/67
B63	Sand			
B64	Gravel			
B65	Dirt			
B66	Dust			
B67	Debris			
	(State and form of matter)			
B68	State + Condition	68/68a	68/68a	68/87
B68a	Phase			
B69	Solid	69/69a	69/69a	
B69a	Crystal			
B70	Non solid	70	70	
B71	Fluid	71/72	71/72	
B71a	Liquid			
B72	Moisture			
B73	Gas + Gaseous	73/74	73/74	
B74	Vapour			
B75	Rarified	75	75/76	
B75a	Semi-rarified	75a		
B76	Vacuum	76		
B77	Film	77	77	
B78	Bubble	78	78	
B81	Foam	81/83	81/83	
B82	Suspension			
B83	Smoke			
B85	Grain	85	85	
B87	Plasma	87	87	
	(Astronomical and Geophysical phenomena)			
C1	Astrophysics	1/2	1/4	1/4
C2	Space			
C3	Interplanetary	3		
C4	Luni-solar	4		
C5	Sun + Solar	5	5	5
C6	Planet+Planetary	6/11	6/13	6/13
	(Non-terrestrial)			
C8	Venus			
C9	Mars + Martian			
C10	Jupiter			
C11	Saturn			
C12	Meteor	12/13		
C13	Meteorite + Meteoroid			
C14	Earth	14	14	14/15
C15	Moon + Lunar	15	15	
C16	Atmosphere + Atmospheric	16/17	16/18+21/23a	16/23a
C17	Equational			
C18	Ionosphere	18		
	(Atmospheric phenomena)			
C19	Wind	19/20	19/20	
C20	Gust			
C21	Cloud	21/23a		
C22	Snow			
C23	Fog			
C23a	Ice			
C24	Ground	24		
C25	Sea	25		
	(Constructs and Structures)			
C30	Bridge	30	30/31	30/31
C31	Chimney	31		
C32	Vehicle	32	32	32
C33	Ship + Marine + Maritime	33	33	33
C34	Hovercraft	34/35	34/35	34/35
C35	Saunders-Roe SRN1			
C36	Aircraft + Airplane	36/36a	36/36a	36/41+53/58
C36a	Aeronautical (vehicle)			
C38	Non-lifting	38	38	
C39	Winged	39	39/40	
C40	Wingless	40		
C41	Finned	41	41	
C42	Civil	42/44a	42/44a	42/52

		First Reduction	Second Reduction	Third Reduction
	[Vehicle]			
	[Aircraft]			
	[Civil]			
C43	Airliner			
C44	Caracelle			
	(Military)			
C45	Bomber			
C46	Fighter			
C47	F-100			
C48	Boulton-Paul (Delta PIII)			
C49	X-15			
C50	B47A			
C51	Avro (707A)			
C52	F8U3			
	(Winged)			
C53	Monoplane	53/55	53/56	
C54	Parasol			
C55	Fairchild 22			
C56	Biplane	56		
	(Tailless)			
C57	Canard	57	57/58	
C58		58		
	(Aircraft)			
C59	Helicopter	59	59	59
	(STOL)			
C60	STOL	60	60	60/66
C61	VTOL	61/66	61/66	
C62	Curtiss-Wright			
C63	Bell			
C64	Doak			
C65	Vertol			
C66	Hiller			
C66a	Glider	66a	66a	66a
C67	Spacecraft + Spaceship	67+69/71	67+69/72	67/89
C68	Manned	68	68	
	(Centaur)			
C69	Centaur			
C70	Able			
C71	X-15			
	(Capsule)			
C72	Capsule	72		
C73	Launch (vehicle)	73	73	
C74	Satellite	74/81	74/81	
C75	Fuelling			
C76	Midas			
C77	Atlas			
C78	Explorer			
C79	Sputnik			
C80	Vanguard			
C81	Discoverer			
C82	Missile + Projectile	82/83	82/89	
C83	Ballistic			
C84	Guided	84/85		
C85	Homing			
C86	IREM	86		
C87	ICBM	87		
C88	Titan	88		
C89	Probe	89		
	(Parts of aircraft)			
D2	Airframe	2	2	2+32/38
D3	Airfoil	3	3 + 11	3/11
D4	Wing	4/6	4/6	
D5	Winglike			
D6	Nonweiler			
D7	Tail	7/9	7/9	
D8	Slabtail			
D9	Tailplane			
D11	Foreplane	11		
	(Control surfaces)			
D12	Aileron	12	12	12/13a
	(Rudder)			
D15	Rudder	15	15	
D16	Elevator	16/17	16/17	
D17	Geared			
D18	Elevon	18	18+22	
D19	Flap	19/21a	19/21a	
D20	Split			
D21	Thwaites			
D21a	Programmed (flap)			

		First Reduction	Second Reduction	Third Reduction
	[Programmed (flap)]			
D22	Horn	22		
D23	Slat	23/24	23/24	
D24	Slot			
D25	Tab	25	25	
D26	Spoiler	26/27	26/27	
D27	Bang-bang			
D28	Stabilizer	28+30/31	28/31a	
D29	Fin	29		
D30	Recoverable			
D31	Non-recoverable	31a		
D31a	Mass balanced			
D32	Fuselage	32/33	32/33+38	
D33	Cabin			
D34	Nacelle	34	34	
D35	Cowling	35/36	35/36	
D36	Spinner			
D37	Shield	37	37	
D38	Store	38		
	(Structural systems, parts and elements)			
	(System)			
D40	Structure	40+57a	40/42	40/57b
D41	Built-up	41	+45/46	
D42	Reinforced	42	+54/57b	
D43	Stratiform + Laminate + Sandwich	43/44	43/44	
D43a	Lamination			
D43b	Layered			
D43c	Multilayered			
D44	Multiply			
D45	Honeycomb	45		
D47	Cellular	47/48	47/48	
D48	Multicell			
D50	Multiweb	50/51	50/51	
D51	MW-1			
D52	Bay	52/53	52/53	
D53	Multibay			
D54	Multirib	54		
D55	Multispar	55		
D56	Monocoque	56		
D57	Monolithic	57		
D57a	Boxtype 1	57a		
D57b	Geodetic	57b		
	(By core condition)			
D58	Hollow	58/61	58/61	58/61
D59	Filled			
D60	Pressurized			
D61	Unpressurized			
	(Structural Parts)			
D63	Deck	63	63	63/74a
D64	Doors	64/65a	64/66	
D65	Windows			
D65a	Pane			
D66	Roof	66		
D63	Stringer	68/70a	68/73	
D69	Bulkhead			
D70	Frame			
D70a	Framework			
D71	Spar	71/72		
D71a	Shaft			
D72	Rib			
D73	Web	73		
D74	Fairing	74	74	
D74a	Flange 9	74a	74a	
	(Structural elements)			
D74b	Filler	74b	74b/77	74b/82
D75	Support	75/77	+80/82	
D76	Mounting			
D77	Stand			
D78	Attachment	78	78	
D80	Ramp	80		
D81	Step	81		
D82	Loop	82		
D83	Sheet	83	83	83/88
D84	Plate			
D84a	Endplate	84/84a	84/84a	
D85	Panel	85/86	85/87	
D86	Handley-Page			
D87	Slab	87		
D88	Shell	88	88	

		First Reduction	Second Reduction	Third Reduction
	[Shell]			
D89	Bar	89/93	89/96	89/96
D90	Wire			
D91	Woven			
D92	Rod			
D93	Coupon			
D94	Strip	94/96		
D95	Ribbon			
D96	Band			
D97	Hoop	97	97/100	97/100
D99	Stiffening (ring)	99		
D100	Stiffener	100/100a		
D100a	Backing			
D101	Beam	101/102	101/102	101/105
D102	Cantilever			
D103	Strut	103/104	103/104	
D104	Column	105	105	
D105	Truss			
	(Structures characterized mainly by shape)			
E1	Bodies	1/4+23/26	1/4+23/26	1/4+22/26
E3	Block			
E4	Box			
	(Body of revolution)			
E6	Cylinder	6/6a+9	6/6a+10	6/21
E6a	Quasi-cylinder			
E7	Tube + Pipe + Tubing	7/8	7/8	
E9	Drum			
E10	Disc	10		
E11	Cone	11/13	11/13	
E12	Frustum			
E13	Spike			
E14	Sphere	14/15	14/16	
E15	Ball			
E16	Hemisphere + Dome	16		
E17	Ellipsoid	17/18	17/18	
E18	Semi-ellipsoid			
E19	Ogive	19	19	
E20	Torus	20	20	
E21	Paraboloid	21	21	
E22	Boattail	22	22	
E23	Maikapar			
E24	Thor-Able			
E25	Sears-Haack			
E26	Yo-Yo			
	(Structures by edge, support and junction)			
E27	Clamped	27	27/29	27/42
E27a	Jointed	27a/29		
E28	Pinned			
E29	Pinjointed			
E30	Hinged	30	30/31	
E31	Tilting	31		
E32	Flanged	32/32a	32/32a	
E32a	Unflanged			
E33	Free-free	33/34b	33/34a	
E33a	Unloaded			
E34	Loose			
E34a	Floating			
E34b	Adjustable			
E35	Fixed	35	35/38	
E36	Rigid + Inelastic + Unelastic	36/38	+42	
E36a	Inexorable			
E36b	Rigidly			
E36c	Binding			
E36d	Prescribed			
E36e	Non-elastic			
E37	Semi-rigid			
E38	Stiffened			
E39	Unstiffened	39	39	
E40	Supported + Mounted	40/41	40/41	
E40a	Hooped			
E40b	Framed			
E41	Cantilevered			
E42	Clamshell	42		
	(Structures by various other principles)			
E43	Segmented	43/44a	43/44a	43/51
E44	Sectorial			
E44a	Lobed			
E45	Faced	45/46b	45/46a	
E46	Surfaced			

		First Reduction	Second Reduction	Third Reduction
	[Surfaced]			
E46a	Sided			
E46b	Cornered			
E46c	Edged	46c		
E47	Covered	47/49	47/49	
E48	Shielded			
E48a	Walled			
E49	Ducted			
E51	Stressed	51	51	
E56	Machine + Mechanism* + Plant*	56/57	56/59	56/73a
E57	Mechanism			
E58	Plant	58/59		
E59	Power Plant			
E60	Engine + Motor	60	60	
	(Gas turbine)			
E61	Turbojet	61/62	61/62	
E62	Propulsive (jet)			
	(Direct combustion)			
E63	Rocket	63/69	63/69+73a	
E64	Midcourse			
E65	Retrorocket			
E66	Sounding (rocket)			
E68	Sail (i.e. solar sail)			
E69	Magnetoplasma			
E70	Reactor	70/73	70/73	
E71	Fission			
E72	Fusion			
E73	Nuclear			
E73a	Booster 2	73a		
	(Auxiliary systems)			
E74	Compressor + Blower + Turbomachine	74/76	74/76+79	74/80
E75	Jump			
E76	Multistage			
E77	Fan	77	77	
E79	Pump	79		
E80	Turbine	80	80	
E82	Exchanger (i.e. Heat exchanger)	82	82/84	82/88+96
E83	Cooler	83/84		
E84	Aftercooler			
E85	Generator	85	85	
E86	Convertor	86	86	
E88	Gyroscope	88	88	
	(Control systems)			
E89	Servo	89/91	89/91	89/91
E90	Relay			
E91	Autopilot			
E92	Weapon	93/94	92/94	92/94
E94	Warhead			
E96	Oscillator	96		
	[Machine components]			
	(Fixed)			
F1	Baffle	1/3	1/3+5/6	1/7
F1a	Foil			
F2	Screen			
F3	Grid			
F4	Cascade	4	4	
F5	Diaphragm	5		
F6	Filter	6		
F7	Stator	7	7	
	(Reciprocating)			
F8	Piston	8	8	8/13a
	(Rotating)			
F10	Rotor	10/13a	10/13a	
F12	Propeller			
F12a	Multipropeller			
F13	Shank			
F13a	Shaft			
	(Parts of compressor)			
F15	Impeller	15	15	15/22a
F16	Stage	16/18	16/18	
F17	Stacking			
F18	Up-rating			
F19	Hub	19	19	
F20	Overhang (Section)	20	20	
F21	Blade + Blading + Vane	21/22a	21/22a	
F21a	Guide			
F22	Splitter			
F22a	Multiblade			
F24	Gear	24	24+27/30	24/30b
F26	Decoupling	26	26	
F27	Bearing	27/29		

		First Reduction	Second Reduction	Third Reduction
F28	[Bearing]			
F29	Journal			
F30	Slider			
F30a	Pivot	30	30	
F30b	Crank	30a/30b	30a/30b	
F30b	Flywheel			
	(Container)			
F32	Cover	32/32b	32/39a	32/39a
F32a	Shroud			
F32b	Sheath			
F33	Tank	33/37		
F34	Receiver			
F35	Vessel			
F36	Reservoir			
F37	Unfired			
F38	Chamber	38/39a		
F39	Plenum			
F39a	Can			
F40	Seal + Closure	40/42	40/42	40/45
F41	Plug			
F42	Cap			
F43	Valve	43	43/43a	
F44	Spring	44/45	44/45	
F45	Belleville			
F46	Joint	46/47	46/53	46/53
F46a	Bond			
F47	Fit			
F48	Rivet	48/49b		
F49	Bolt			
F49a	Pin			
F49b	Screw			
F50	Flexible			
F50	Hinge	50		
F51	Bellows (Joint)	51/52		
F52	Omega (Expansion joint)			
F53	Knuckle	53		
F54	Passage + Corridor	54	54	54/72
F55	Capillary	55	55	
F57	Entrance + Inlet	57/60	57/62	
F58	Opening			
F59	Orifice			
F60	Intake			
F61	Scoop	61/62		
F62	Sugar			
F63	Outlet + Exit	63	63	
F64	Channel + Duct + Ducting	64/65	64/65	
F65	Interblade			
F66	Diffuser	66/67	66/67	
F67	Vaneless			
F68	Nozzle	68/71a	68/71a	
F69	Overexpanding			
F70	Laval			
F71	Contoured			
F72	Venturi	72	72	
F73	Injector	73	73	73/79
F74	Ejector	74	74	
F75	Afterburner	75	75	
F76	Muffler + Silencer	76/77	76/77	
F77	Wideangle			
F78	Throttle	78/79	78/79	
F79	Accelerator			
F80	Apparatus + Equipment + Facility* + Device*	80/81	80/81	80/81+83/83b
F80a	Facility			
F80b	Device			
F81	Laboratory			
F82	Test + Testing (equipment)	82	82	82+84/91
F83	Model	83/83b	83/83b	
F83a	Shrouded			
F83b	Non-separating (model)			
F84	(Wind) Tunnel	84+89/91	84/91	
F85	Blowdown	85		
F87	Tailored	87		
F83	Gun			
F89	NPL			
F90	Ames			
F91	ARA			
	(Parts and components of wind tunnel)			
G2	Settling (chamber)	2	2/7a+12/12a	1/15
G4	Driver (gas) + Driving (gas)	4		

		First Reduction	Second Reduction	Third Reduction
	[Driver (gas) + Driving (gas)]	4		
G5	Heater	5/6		
G6	Drier			
G7	Evacuator	7		
G7a	Barrel (Wall)	7a		
G8	Sidewall	8/9	8/9	
G9	Liner			
G12	Cell	12/12a		
G12a	Dashpots			
	(Model support)			
G13	Sting	13/15	13/15	
G15	Jack			
G17	Instrument + Instrumentation*	17/18+22/22a	17/18+22/22a	17/23
G17a	Instrumentation	+41a+52/53	+41a+52/53	+41a
G18	Accelerometer			+52/53
G20	Radiator	20	20	
G21	Ribbon (Vibrating)	21	21	
G22	Indicator			
G22a	Sensor			
G23	Corrector	23	23	
G24	Measuring	24	24	24/34a
G25	Gauge + Meter	25/29a	25/34a	+41
G26	Extensometer			
G27	Manometer			
G28	Piezometer			
G29	Thermocouple			
G29a	Pickup			
G30	Flowmeter	30/32a		
G30a	Pitot (tubes)			
G31	Pitometer			
G32	Anemometer			
G32a	Potentiometer			
G33	Dampometer			
G34	Theodolite	34/34a		
G34a	Kinetheodolite			
G35	Optical	35	35/40	35/40
G36	Photographic	36/40		
G36a	Photograph			
G37	Camera			
G38	Photomultiplier			
G39	Television			
G40	(Motion) Picture			
G41	Interferometer	41	41	
G41a	Pendulum	41a		
	[Electric, Electronic equipment]			
G42a	Circuitry	42a + 51	42/46	42/51a
G43	Antenna	43	+51/51a	
G44	Radar	44		
G45	Microphone	45		
G46	Cyclotron	46		
G47	Cathode (ray tube)	47		
G48	Oscilloscope	48/49		
G49	Oscillograph			
G51	Conductor			
G51a	Radiotrajectorygraph			
G52	Transducer			
G52a	Pickup			
G53	Multiplier			
	(Spatial relations of parts)			
H1	Portion	1/2a	1/2a	1/10
H2	Whole			
H2a	All			
H3	Part	3/6	3/6+8/10	
H4	Component			
H5	Element			
H5a	Sample			
H5b	Specimen			
H5c	Piece			
H6	Factor			
H8	Fraction	8/10		
H9	Half			
H10	Quarter			
H11	Section	11/12	11/12	11/14
H12	Slice			
H13	Sector	13	13/14	
H14	Segment	14		
	(By Position)			
	(Vertical plane)			
H16	Top	16+19/22	16/22	16/26a
H17	Apex + Vortex	17/18a		
H18	Semi apex			

		First Reduction	Second Reduction	Third Reduction
H18a	[Semi apex] Semi vertex			
H19	Head			
H20	Crest			
H21	Crown			
H22	Peak			
H23	Bottom	23+25/26a	23+25/26a	
H24	Base	24	24	
H25	Bed			
H26	Foundation			
H26a	Foot			
	(Longitudinal plane)			
H27	Front	27	27/29	27/35a
H28	Forepart + Forebody + Foreplane	28		
H29	Bow	29		
H30	Nose	30	30	
H31	Back	31+33/34	31/34	
H32	Afterbody	32		
H33	Rear			
H34	Aft			
	(Lateral plane)			
H35	Side	35/35a	35/35a	
H35a	Sidedress			
	(Outer)			
H36	Face	36	36 + 39	36/42
H37	Surface	37/38	37/38	
H38	Undersurface			
H39	Interface	39		
H40	Skin	40	40/41a	
H41	Membrane	41/41a		
H41a	Envelope			
H42	Wall	42	42	
H43	Layer	43	43/42	43/47
H44	Sublayer	44		
	(Inner)			
H45	Interior	45/47	45/47	
H46	Core			
H47	Kernel			
	(Extremity)			
H48	End	48	48	48/56
H50	Tip	50	50	
H52	Edge	52/54	52/54	
H53	Rim			
H54	Lip			
H55	Leg	55	55/56	
H56	Stem	56		
	(Prominence)			
H57	Projection	57	57/65	57/65
H58	Protuberance	58/65		
H59	Exorescence			
H60	Pimple			
H61	Ridge			
H62	Corrugation			
H62a	Heap			
H63	Teeth			
H64	Bump			
H65	Lobe			
H65a	Obstacle			
H66	Depression	66/68	66/68	
H67	Notch			
H68	Crack			
H68a	Groove			
H69	Hole + Perforation*	69/73	69/73	
H70	Perforation			
H71	Gap			
H72	Cavity			
H73	Outout			
	(Connections)			
H74	Corner	74/77+80a	74/77+80a	74/80a
H77	Kink			
H78	Neck	78	78/79	
H79	Throat	79	80	
H80	Knee	80/80a		
H80a	Waist			

		First Reduction	Second Reduction	Third Reduction
H95	[Spatial relations]			
J1	Spatial	95+1/5	95 + 15	95 + 1/10
J1a	Environment			
J1b	Presence			
J2	Situation			
J3	Environmental			
J4	Ambient			
J5	Surrounding			
	About			
	(With similar conditions)			
J6	Regime + Domain	6+9/10	6/10	
J8	Belt	8		
J9	Region + Field			
J10	Zone			
J11	Position + Location + Point + Station	11/11a +83/83b	11/15 +83/83b	11/18 +80/83b
J11a	Located			
J12	Local			
J13	Locally			
J14	Positioning			
J15	Spot	15		
J16	Line	16	16	
J17	Plane	17/18	17/18	
J18	Plateau			
J20	Path + Orbit + Trajectory	20/21+23	20/21+23	20/25
J22	Circuit	22	22	
J23	Course			
J24	Apogee	24	24/25	
J25	Perigee	25		
	(By proximity, distance)			
J25a	Isolated	25a	25a	25a/3b
J25b	Alone			
J26	Proximity	26	26+29	
J27	Contact	27/28a	27/28a	
J27a	Tangency			
J28	Adjacent			
J28a	Wetted			
J29	Vicinity	29		
J30	Near	30/34	30/34	
J31	Nearest			
J32	Nearly			
J33	Close			
J34	Closely			
J34a	Distant	34a/35	34a/35	
J35	Far			
J36	Off	36	36	
	(In vertical plane)			
J37	Level	37	37	37/46
J38	Altitude	38	38	
J38a	Over	38a/40	38a/40	
J39	Above			
J40	Upper			
J41	Below	41/42a	41/42a	
J42	Lower			
J42a	Lowest			
J43	Under	43/46	43/46	
J44	Submerged			
J45	Underwater			
J46	Buried			
	(In horizontal plane)			
J47	Ahead	47	47/48	47/50
J48	Leading	48		
J49	Behind	49/49a	49/50	
J49a	Following			

		First Reduction	Second Reduction	Third Reduction
J50	[Following] Trailing	50		
	(By Centrality)			
J51	Central	51/54	51/55	51/73
J51a	Centrally			
J51b	Centred			
J52	Middle + Centre			
J52a	Mid			
J53	Midpoint			
J54	Midplane			
J56	Axis	56/56a		
J56a	Centreline			
J57	Bisector	57		
J58	Median	58		
J59	Inboard	59	59+61	
J60	Peripheral + Circumferential	60/60a	60/60a	
J60a	Fringe			
J61	Outboard	61		
J62	Outermost	62/64	62/64	
J63	Extremal			
J64	Beyond			
J65	Inner + Internal	65/66a	65/66a	
J65a	In			
J66	Internally			
J66a	Within			
J67	External + Outer	67/68a	67/68a	
J68	Externally			
J68a	Outside			
J70	Boundary	70	70	
J71	Bound	71/73	71/73	
J72	Margin			
J73	Limit			
J74	Between	74/75d	74/75d	74/79
J75	Interstage			
J75a	Interangular			
J75c	Intermolecular			
J75d	Intramolecular			
J76	Intersection	76/77	76/79	
J77	Junction			
J78	Node	78/79		
J79	Nodal			
	[Terrestrial]			
J80	Latitude	80	80	
J81	Meridian	81/81a	81/81a	
J81a	Meridional			
J83	New Mexico			
J83a	France			
J83b	U.K.			
	(Directional relations)			
J84	Direction	84/85	84/89a	84/89a
J85	Orientation			
J86	Directional	86/89a		
J87	Unidirectional			
J88	Direct			
J89	Indirect			
J89a	Non-direct			
J90	Angle	90/91a+93	90/91a+93	90/93
J91	Incidence			
J91a	Attack			
J92	Slope + Gradient	92		
J93	Setting			
J94	Axial + Axially*	94/94a	94/97b	94/102
J94a	Axially			
J95	Coaxial	95/97a		
J96	Uniaxial			
J97	Multi axial			
J97a	Polyaxial			
J97b	Unaxial	97b		
J98	Radial	98/98a	98/98a	
J98a	Radially			
J99	Centrifugal	99	99/100	
J100	Centripetal	100		
J101	Rotary	101/102	101/102	
J102	Clockwise			
K1	Lateral + Transverse + Laterally*	1/2d	1/2d	1/5d
K2	Chordwise + Transversely*			
K2a	Spanning			

		First Reduction	Second Reduction	Third Reduction
	[Spanning]			
K2b	Laterally			
K2c	Transversely			
K2a	Across			
K3	Longitudinal + Lengthwise + Spanwise	3/4	3/4	
K4	Longitudinally			
K5	Edgewise	5/5a	5/5a	
K5a	Along			
K6	Forward	6/7	6/7	6/11
K7	Towards			
K8	Backward	8/9	8/9	
K9	Rearward			
K10	Reverse	10/11	10/11	
K11	Counter			
K12	Up	12	12/14	12/24
K13	Down	13/14		
K14	Incoming	14/16	14/17a	
K15	Inward			
K16	Into			
K17	Outward	17/17a		
K17a	Onto			
K18	Through	18	18	
K19	Tangential	19	19	
K20	Streamwise	20	20/22	
K21	Upstream	21		
K22	Downstream	22		
K23	Leeward	23/24	23/24	
K24	Windward			
K27	Shape	27/30	27/30	27/30
K28	Geometry+Geometrical*+Geometrically*			
K28a	Geometrical			
K28b	Geometrically			
K29	Form			
K29a	Mode			
K30	Shaped			
K30a	Symmetry	30a/32	30a/32	30a/34b
K31	Symmetrical + Symmetric			
K32	Symmetrically			
K33	Axisymmetric + Axisymmetrical	33	33	
K34	Antisymmetric + Antisymmetrical + Asymmetric + Asymmetrical + Non-Symmetric	34/34a	34/34b	
K34a	Unsymmetrical			
K34b	Non-axisymmetric+Non-axisymmetrical	34b		
	(3-dimensional)			
K35	Non-rotational	35/37	35/37	35/38
K35a	Octahedral			
K36	Prismatic			
K37	Pyramidal			
K38	Wedge	38	38	
K39	Revolution + Rotation	39	39/41	39/64
K41	Rotationally	41		
K42	Cylindrical	42/43	42/44	
K43	Tubular			
K44	Quasi-cylindrical	44		
K45	Conical + Coned + Conically*	45/45a	45/45b	
K45a	Conically			
K46	Quasi-conical	46		
K47	Spiked	47	47	
K48	Toriconical	48	48+59+63	
K49	Helix	49/51	49/51	
K50	Helical			
K51	Spiral			
K52	Spherical	52/53	52/53	
K53	Spherically			
K54	Spheroid	54/57	54/57	
K55	Oblate			
K56	Oblateness			
K57	Prolate			
K58	Hemispherical + Hemispheric	58/58b	58/58b	
K58b	Hemispherically			
K59	Torispherical	59		
K60	Ellipsoidal	60/61	60/61	
K61	Semi-ellipsoidal			
K62	Ogival	62	62	
K63	Toroidal	63		
K64	Paraboloidal	64	64	
	(By extremities, edge condition)			
K65	Pointed + Tapered			

		First Reduction	Second Reduction	Third Reduction
	[Pointed + Tapered]	65+68/69	65+68/69	65/86
K66	Crisp	66/67	66/67	
K67	Crisped			
K68	Taper			
K69	Tapering			
K70	Sharp + Sharpness*	70/71	70/71	
K70a	Sharpness			
K71	Abrupt			
K73	Blunt + Blunted + Bluntness*	73/75	73/75	
K74	Bluntness			
K75	Bluff			
K76	Untapered	76/77	76/77	
K77	Unblunted			
K78	Hammerhead	78	78+83	
K79	Round	79/80	79/80	
K79a	Roundness			
K80	Rounded			
K81	Out-of-roundness	81	81	
K83	Headed + Nosed + Capped	82	82	
K83a	Based	83		
K84	Boattailed	83a	83a	
K85	Boattailing	84/85	84/85	
K86	Bevelled	86	86	
K87	Cut	87/90	87/90	87/99
K88	Cropped			
K89	Clipped			
K90	Truncated			
K91	Non-truncated	91	91	
K92	Drooped	92	92	
K93	Extended	93/99	93/99	
K94	Elongated			
K95	Flare			
K96	Flared			
K97	Skirt			
K98	Skirted			
K99	Stretched			
	(2-dimensional)			
L1	Profile	1/3	1/3	1/3
L2	Contour			
L4	Rectilinear	4	4+15/19	4/28
L5	Swept	5	5/9	
L6	Sweptback	6/7		
L8	Sweptforward	8/9		
L10	Unswept	10	10	
L11	Triangular + Delta + Triangle*	11/12	11/12	
L11a	Triangle			
L12	Caret			
L13	Rectangular	13/14	13/14	
L13a	Rectangle			
L14	Square			
L15	Rhombic	15		
L16	Sextic	16		
L17	Trapezoidal	17		
L18	Diamond	18		
L19	Arrow	19		
L20	Polygon	20"24	20/24	
L21	Polygonal			
L22	Hexagonal			
L23	Octagonal			
L24	Dodecagonal			
L25	Equilateral	25/26	25/26	
L26	Isosceles			
L27	Cruciform	27/28	27/28	
L28	Cross			
L28a	Curvilinear	28a/31	28a/31	28a/51
L29	Circular			
L29a	Quasi-circular			
L30	Circularity			
L31	Supercircular			
L32	Non-circular	32	32	
L33	Annular	33/35	33/35	
L34	Annulus			
L35	Ring			
L36	Horseshoe	36	36/37	
L37	Concave	37		
L38	Convex	38/40b	38/40b	
L39	Biconvex			
L40	Lenticular			
L40a	Cambered			
L40b	Uncambered			
L41	Fusiform	41	41	
L42	Oval + Elliptic	42/45	42/45	
L43	Ellipse			

		First Reduction	Second Reduction	Third Reduction
	[2-dimensional]			
	[Curvilinear]			
	[Ellipse]			
L44	Elliptical			
L45	Ellipticity			
L45a	Ogee	45a/45b	45a/45b	
L45b	Gothic			
L46	Parabola	46/47	46/47	
L47	Parabolic			
L48	Hyperbola	48/49	48/49	
L49	Hyperbolic			
L50	Hypelliptic	50	50	
L51	Semi-circular	51	51	
	[Letter]			
L52	I	52/56	52/56	52/56
L52a	T			
L54	V			
L55	W			
L55a	Z			
L56	Lamda			
L56a	Theta			
	[One-dimensional]			
L57	Straight	57/58	57/60	57/72
L58	Straightness			
L60	Out-of-straightness	60		
L61	Curved + Curve* + Curvature*	61/63	61/66a	
L62	Curve			
L63	Curvative			
L64	Arc	64/65		
L65	Subarc			
L66	Sinusoidal	66/66a		
L66a	Sinusoidally			
L67	Bent + Bend*	67/68	67/72	
L68	Bend			
L69	Angular	69/72		
L69a	Angled			
L69b	Angularly			
L70	Orthogonal			
L71	Orthogonally			
L72	Orthogonality			
	(Surface features)			
L73	Flat	73/76	73/76	73/84a
L75	Planar			
L76	Co-planar			
L77	Non-planar	77	77	
L78	Smooth	78	78	
L79	Rough + Roughness*	79/80	79/80	
L80	Roughness			
L81	Corrugated	81/82o	81/82o	
L82	Wavy			
L82a	Wrinkled			
L82b	Unwrinkled			
L82c	Waviness			
L83	Slotted	83/84a	83/84a	
L84	Perforated			
L84a	Drilled			
	(Cross section area)			
L85	Convergent	85	85	85/86
L86	Divergent	86	86	
	(Dimension)			
L87	Dimension	87	87/91	87/91
L88	Magnitude + Size	88/91		
L89	Amplitude			
L90	Bulk			
L91	Scale			
L92	Length	92/93	92/93	92/100o
L92a	Inch			
L93	Distance			
L94	Slenderness	94	94/95+100o	
L95	Thickness	95+100o		
L96	Height	96	96/97	
L97	Depth	97		
L98	Perimeter	98/99	98/99	
L99	Circumference			
L100	Radius	100/100b	100/100b	
L100a	Bore			
L100b	Diameter			
L100c	Width			
L101	Area	101/102a	101/102a	101/102a
L102	Extent			

		First Reduction	Second Reduction	Third Reduction
	[Extent]			
L102a	Extensive			
L103	Volume	103/103a	103/103a	103/103a
L103a	Volumetric			
L104	Mass	104	104/106a	104/107
L105	Weight	105/106a		
L106a	Pound			
L107	Density	107	107	
	[Dimensions (spatial)]			
M8a	Moderate	8a/9	8a/9	8a/12
M9	Medium	10/11	10/12	
M10	Large			
M11	Super			
M12	Macroscopic	12		
	[Dimensions]			
M13	Long	13	13	13/14
M14	Short	14	14	
	[Dimensions]			
M15	Slender + Thin	15/16	15/17	15/20
M16	Narrow			
M17	Not-so-thin + Not-so-slender	17		
M18	Thick + Non-Slender	18	18/20	
M19	Wide	19/20		
M19a	Widely			
M20	Broad			
	[Dimensions]			
M26	Deep	26	26	
M27	Shallow	27/27a	27/27a	
M27a	Shallowness			
	[Spatial relations]			
	[Arrangement]			
M73a	Horizontal	73a	73a	73a/85
M74	Non-inclined	74	74	
M75	Vertical	75/76a	75/76a	
M76	Perpendicular			
M76a	Perpendicularly			
M76b	Normal			
M76c	Right			
M77	Inclined + Inclination*	77/78	77/78+82/84a	
M78	Inclination			
M79	Oblique	79/81	79/81	
M80	Skew			
M81	Skewed			
M82	Sloped	82/84a		
M83	Canted			
M84	Steep			
M84a	Steepest			
M85	Inverted	85	85	
	[Spatial relations]			
M86	Lattice	86/87b	86/87b	86/88
M87	Mesh			
M87a	Network			
M87b	Chessboard			
M88	Crossed	88	88	
M90	Opposite + Facing	90/91	90/91	90/94a
M91	Opposed			
M92	Parallel	92	92	
M93	Asymptotic	93/94	93/94a	
M93a	Asymptote			
M93b	Asymptotically			

		First Reduction	Second Reduction	Third Reduction
	[Spatial relations]			
	[Arrangement]			
	[Asymptotically]			
M94	Pre-asymptotic			
M94a	Non-parallel	94a		
M95	Series	95/95a	95/95a	95/108
M95a	Cycle		+100/102	
M96	Spaced	96/97	96/97	
M97	Spacing			
M98	Stagger	98/99b	98/99b	
M99	Staggered			
M99a	Staggering			
M99b	Stepwise			
M100	Row	100/102		
M101	Bank			
M102	Rake			
M103	Sequential	103	103	
M104	Aligned	104/105	104/108a	
M105	Alignment			
M106	Misaligned	106/107		
M107	Misalignment			
M108	Non-aligned	108/108a		
M108a	Crookedness			
M109	Closed	109/110	109/110	109/116
M110	Enclosed			
M111	Bounded	111/112	111/112	
M112	Bounding			
M113	Open	113/115	113/116	
M114	Exposed			
M115	Bare			
M116	Unbounded	116		
M117	Concentric	117	117	117/120a
M118	Heliocentric	118/119	118/119	
M119	Planetcentric			
M120	Eccentric	120/120a	120/120a	
M120a	Eccentrically			
	(Temporal relations)			
N1	Time + Timewise	1	1/5	1/15
N2	Duration	2/5		
N2a	During			
N2b	Running			
N3	History			
N3a	Historical			
N4	Life			
N5	Lifetime			
N6	Period	6	6/13b	6/15a
N7	Millesecond	7		
N8	Day	8/9		
N9	Diurnal			
N10	Night	10/11		
N11	Nocturnal			
N12	Season	12/13		
N13	Seasonal			
N13b	Interval	13b		
N14	Permanent	14	14	
N15	Transient			
N15a	Momentary	15/15a	15/15a	
N16	Periodic	16/19	16/22	16/24
N17	Periodically			
N18	Periodicity			
N19	Intermittent			
N20	Isochronous	20/20a		
N20a	Isochrone			
N21	Cyclic	21		
N22	Successive	22		
N23	Simultaneous	23/24	23/24	
N24	Simultaneously			
N25	Rate	25	25	25/33
N26	Frequency	26	26	
N27	Slow	27/28a	27/33	
N27a	Slowly			
N28	Retarded			
N28a	Gradual			
N29	Fast + Quick + Rapid	29/30		
N30	Accelerated			
N31	Sudden	31/33		
N32	Immediately			
N33	Instantaneous			
N34	Delay	34/35	34/35	34/35
N35	Lag			
N36	After	36/37	36/38	36/38

		First Reduction	Second Reduction	Third Reduction
N37	[After]			
N38	Post			
	Prior	38		
	<u>[Flying operations]</u>			
N40	Performance	40+42/46	40/46	40/51
N41	Range	+50/51	+50/51	+62/63
N42	Reliability	41		
N43	Holding			
N44	Handling			
N45	Airspeed			
N46	<u>Payload</u>			
N47	Propulsion		47/49	
N48	Thrust	48	+62/63	
N49	Boost			
N50	Consumption (of fuel)			
N51	<u>Expenditure (of power)</u>			
	<u>[Flying operations, processes]</u>			
N52	Flight + Flying	52/55	52/55	52/55
N54	Voyage			
N55	Mission			
N56	Orbital (trajectory)	56/58	56/61	56/61
N57	Orbiting			
N58	Re-orbit			
N59	Semi-ballistic (trajectory)	59		
N60	Skip (trajectory)	60/61		
N61	Skipping			
N62	Powered			
N63	Unpowered			
N64	Taxiing	64/68	64/68	64/74
N65	Take-off			
N66	Boosting			
N67	Traversal			
N68	Traversing			
N69	Ascent	69/71	69/72	
N70	Ascending			
N71	Climb			
N72	Zoom			
N73	Escape (from a force field, e.g. gravity)	73/74	73/74	
N74	Capture (by a force field, e.g. gravity)			
N75	Cruising	75/76	75/76	75/99
N76	Cruise			
N77	Manoeuvres + Manoeuvring*	77/77a	77/82+87	
N77a	Manoeuvring	+80/82	+98/101	
N78	Hovering	78/79		
N79	Hover			
N80	Turn			
N82	Circling			
N83	Roll	83/84	83/84	
N84	Rolling			
N85	Yaw	85/86	85/86	
N86	Yawing			
N87	Non-yawing	87		
N88	Pitch	88/89	88/89	
N89	Pitching			
N90	Diving	90/95	90/97	
N91	Plunging			
N92	Tumbling			
N93	Falling			
N94	Fall			
N95	Sinking			
N96	Heaving	96/97		
N97	Heave			
N98	Spin	98		
N99	Sideslip	99		
N102	Return	102	102+113/117a	102/117a
N103	Descending	103/105	103/107	
N104	Descent			
N105	Glide			
N106	Braking	106/107		
N107	Graze			
N108	Entry	108/112	108/112	
N109	Entering			
N110	Re-entry			
N111	Re-entering			
N113	Approach	113/114		
N114	Approaching			
N115	Landing	115/117a		

		First Reduction	Second Reduction	Third Reduction
	[Landing]			
N116	Overshoot	115/117a		
N117	Undershoot			
N117a	Miss			
	(Miscellaneous activities)			
N118	Navigation	118/119	118/119	118/119
N119	Piloting			
N120	Guidance (of space vehicles)	120/122	120/122	120/122
N121	Telemetry			
N122	Telemetering			
	(Agents)			
N123	Human	123/124a	123/124a	123/124a
N124	Pilot			
N124a	Operator			
	(Properties of flight, agents of flight)			
N125	Vision	125/126	125/129	125/129
N126	Visibility			
N127	Tolerance (to acceleration)	127/129		
N128	Hazard			
N129	Safety			
0a	Aerodynamics	0a/0b	0a/0b	0a/02
0b	Aerodynamically			
01	Flow + Stream + Flux + Airflow* + Airstream* + Flowing*	1/2+28a/28b	1/2+28a/28b	+28/28b +32/34a
01a	Airflow			
01b	Airstream			
02	Flowing (By speed)			
03	Subsonic	3/4	3/4	3/4
04	Subcritical			
05	Sonic	5	5	5/13
06	Transonic	6	6	
07	Supersonic	7/9	7/9	
08	Supersonically			
010	Hypersonic	10/13	10/13	
011	Hypervelocity			
012	Supersatellite			
013	Superfast			
	(By viscosity effects)			
014	Frictionless	14/15	14/15	14/15
015	Inviscid + Non-viscous			+24/25
016	Viscous + Viscid	16/17	16/17	16/21
017	Creeping (motion regime)			
018	Laminar	18/19	18/19	
019	Non-turbulent			
020	Transitional	20	20	
021	Turbulent	21	21	
	(By degree of vorticity)			
022	Rotational	22	22	22
024	Irrotational + Non-rotating	24/25	24/25	
025	Potential			
028	Isobaric	28/28b	28/28b	
028	Slug			
028b	Mound			
	(Regimes - by density conditions, etc.)			
029	Slip	29	29/31	29/31
030	Continuum	30		
031	Collision	31		
032	Expanded	32/34a	32/34a	
033	Overexpanded			
033a	Over-expansion			
034	Under expanded			
034a	Underexpansion			
035	Separated	35 + 37	35/38	35/38
036	Unseparated	36 + 38		
036a	Reattached			
037	Stalled			
038	Unstalled			
039	Incompressible	39	39	39/40
040	Compressible	40	40	
	[Flow elements and phenomena]			
	[Boundary layer - Processes and operations]			

		First Reduction	Second Reduction	Third Reduction
	[Boundary layer - Processes and operations]			
041	Laminarization	41+43/45a	41+43/45a	41/46a
042	Transition	42	42	
043	Breakdown			
044	Blowoff			
045	Tripped			
045a	Initiation			
046	Separation	46	46	
046a	Reattaching	46a/46b	46a/46b	
046b	Reattachment (B.L. Control)			
047	Thickening	47/50+53	47/53	47/53
048	Avoidance			
049	Inhibition			
050	Retardation			
051	Promotion	51/52a		
052	Trip			
052a	Tripping			
053	Re-establishment			
054	Promoters (of transition)	54/63	54/63	54/63
055	Sandpaper			
056	Carborundum			
057	Bead			
058	Ballotini			
059	Deposit			
059a	Deposited (dirt, etc.)			
060	Insect			
061	Fruitfly			
062	Drosophila			
063	Housefly			
	[Flow elements]			
064	Streamline	64/67	64/68	64/68
065	Cocurrent			
066	Filament			
067	Dividing			
068	Streamtube	68		
069	Supply (stream)	69+72/73a	69+72/73a	69/73a
070	Sink			
071	Doublet			
072	Inflow			
073a	Pocket			
074	Vortex + Eddy	74	74/79	74/79
075	Vortical	75/79		
076	Swirl			
077	Spiralling (fluid)			
078	Co-rotating (vortex)			
079	Image (vortex)			
080	Street	80	80/83a	80/83a
081	Shedding	81/83a		
082	Bursting			
083	Cancellation			
083a	Feeding			
084	Jet	84/84a	84/84a	84/89
084a	Airjet			
085	Jetlike	85/88		
086	Billowing			
087	Plume			
088	Curtain			
089	Cushion	89		
090	Wave	90	90	90/99
091	N(-wave)	91/92+99	91/92+99	
092	Standing			
093	Blast	93/95	93/95+97/98a	
094	Explosion			
095	Detonation			
096	Shock	96	96	
097	Non-relativistic	97/98a		
098	Standoff			
098a	Shockless			
099	Riemann			
	(Flow attributes)			
0100	Vorticity	100	100	100/101
0101	Circulation	101	101	
	(Similarity parameters)			
0102	Mach (number)	102	102	102
0103	Prandtl (number)	103	103	103
0104	Nusselt (number)	104	104	104
0105	Reynolds (number)	105	105	105
	(Fluid attributes)			
P1	Compressibility	1	1	1/2
P2	Viscosity	2	2	

		First Reduction	Second Reduction	Third Reduction
	[Viscosity]			
	(Aerodynamic characteristics)			
	(Loads)			
P3	Lift + Lifting*	3	3/5	3/5
P4	Lifting	4		
P5	Indicial	5		
P6	Drag	6	6	6/9
P7	Foredrag	7/9	7/9	
P8	Coulomb			
P9	Drift			
P9a	Interference	9a	9a	9a/17
P10	Stagnation	10	10	+27/29
P11	Choking	11/12a	11/13	
P11a	Choke			
P11b	Choked			
P12	Blockage			
P12a	Blocking			
P13	Lap	13		
P14	Stall	14/17	14/17	
P15	Stalling			
P16	Destalling			
P17	Unstalling			
P18	Downwash	18	18/21	18/26
P18a	Upload	18a/19		
P19	Upwash + Upflow			
P19a	Sideforce	19a/21		
P20	Sidewash			
P21	Crossflow			
P22	Wake + Afterflow	22/23a	22/26	
P23	Wakelike			
P23a	Isoval			
P24	Slipstream	24/25		
P24a	Sliplines			
P25	Outflow			
P26	Trail	26		
P27	Turbulence	27/28	27/29	
P27a	Proturbulence			
P28	Homologous			
P29	Surge	29		
	(Aerodynamic properties and processes)			
Z12	Gasdynamic	12/14	12/14	12/18
Z13	Aerodynamic			
Z14	Superaerodynamic			
Z15	Suction	15/15a	15/16+18	
Z15a	Sucking			
Z16	Blowing	16		
Z17	Injection	17	17	
Z18	Entrainment	18		
Z19	Hydrodynamic	19/23	19/23	19/23
Z20	Spray			
Z21	Wetting			
Z22	Soaking			
Z23	Hydroballistic			
P30	Aeroelasticity	30/32+35/36	30/32	30/40
P30a	Aeroelastic		+35/40	
P31	Thermoaeroelastic			
P32	Aerothermoelastic			
P33	Flutter	33/34a	33/34a	
P34	Fluttering			
P34a	Precipitation			
P35	Ripple			
P36	Sloshing			
P37	Buzz	37		
P38	Divergence	38		
P39	Buffeting	39/40		
P40	Buffet			
	(Aerodynamic reference parameter)			
P42	Tilt	42	42	42/48
P43	Attitude	43	43/48	
P45	Trim	45/46a		
P46	Trimming			
P46a	Trimmed			
P47	Banked	47/48		
P48	Unbanked			
P49	Planform	49	49/52+54	49/69
P50	Sweep	50/52		
P51	Sweepback			
P52	Sweepforward			
P53	Aspect (ratio)	53	53	
P54	Fineness (ratio)	54		

		First Reduction	Second Reduction	Third Reduction
	[Fineness (ratio)]			
P55	Stepdown (height)	55/58		
P57	Twist			
P58	Warp			
P59	Dihedral	59		
P60	Anhedral	60		
P61	Span	61/64	61/64	
P63	Midspan			
P64	Semispan			
P65	Chord	65/66	65/66	
P66	Midchord			
	(Airfoil section)			
P67	Rooftop			
P68	Peaky			
P69	Camber			
P70	Mechanics (phenomena)	70	70	
	(Statics)			
P71	Moment	71/72	71/72	71/73
P72	Torque			
P73	Couple	73	73	
P74	Equilibrium	74/77	74/78	74/83b
P75	Quasi-equilibrium			
P75a	Non-vanishing			
P76	Non-equilibrium			
P77	Disequilibrium			
P78	Balance	78		
P79	Stability	79	79	
P80	Transtability	80/83	80/83	
P81	Overstability			
P82	Instability			
P83	Disturbance + Perturbation			
P83a	Resistance	83a/83b	83a/83b	
P83b	Resisting			
	(Kinematics)			
P84	Motion + Movement* + Moving* + Non-stationary* + Travelling*	84/88	84/88	84/88
P85	Movement			
P86	Moving			
P87	Non-stationary			
P88	Travelling			
P89	Velocity + Speed	89/90	89/90	89/90
P90	Alfven (speed)			
P92	Acceleration	92/93	92/95	92/95
P93	Accelerating			
P94	Deceleration	94/95		
P95	Decelerating			
P96	Translation	96/97	96/97	96/Q12
P97	Translating			
Q2	Rotating	2/4b	2/4b	
Q4	Pre-rotation		+6/10	
Q4a	Circulating			
Q4b	Recirculating	5	5	
Q6	Gyration	6/10		
Q7	Spinning			
Q8	Whirl			
Q9	Preshirl			
Q10	Overswing			
Q11	Gyroscopic	11/12	11/12	
Q12	Precession			
	(Kinds of motion by direction)			
Q12b	Advance	12b/12o	12b/12c	12b/12o
Q12c	Advancing			
	(Inwardly)			
Q14	Intersecting	14	14	14/18
Q15	Convergence	15/16	15/16	
Q16	Converging			
Q17	Penetration	17/18	17/18	
Q18	Penetrating			
	(Outwardly)			
Q19	Diverging	19	19/20	19/20
Q20	Vanishing	20		
	(Across, past)			
Q22	Transit	22/23	22/24a	22/24a
Q23	Crossing			
Q24	Passing	24/24a		
Q24a	Pass			
Q25	Dynamic + Dynamically*	25/26	25/26	25/31
Q25a	Dynamically			
Q26	Inertia			
Q27	Momentum	27	27	
Q28	Energy	28		
Q28a	Activation (Energy)	28a/28o	28/28o	
Q28b	Isoerg			
Q28c	Kinetic			
Q29	Work	29/30	29/31	
Q30	Virtual	31		
Q31	Power			
Q32	Force	32/35	32/35a	32/40a

		First Reduction	Second Reduction	Third Reduction
	[Force]	32/35	32/35a	
Q33	Lorenz (force)			
Q34	Pondero (force)			
Q35	Restoring (force)			
Q35a	Gravity	35a		
Q36	Pressure	36/37	36/37	
Q38	Compression	38/39	38/39	
Q38a	Compressing			
Q38b	Compressively			
Q39	Recompression			
Q40	Overpressure	40/40a	40/40a	
Q40a	Pressurization			
Q41	Striking	41+48	41/47a	41/49a
Q41a	Jog	41a/44		
Q42	Impulse			
Q42a	Impulsive			
Q42b	Impulsively			
Q43	Impact			
Q44	Embedded			
Q45	Impinging	45/47a		
Q46	Impingement			
Q47	Re-impingement			
Q47a	Glancing			
Q49	Driving	49/49a	49/49a	
Q49a	Drive			
Q50	Emission	50	50/58b	50/60
Q51	Issuing	51/53		
Q52	Effusion			
Q53	Efflux			
Q54	Discharge	54/57b		
Q54a	Blowout			
Q55	Exiting			
Q56	Exhaust			
Q57	Exhausting			
Q57a	Scavenging			
Q57b	Venting			
Q58	Tapping	58/58b		
Q58a	Bleeding			
Q58b	Bleed			
Q60	Burst	60	60	
Q61	Breathing	61/62	61/62	61/62
Q62	Swallowing			
	(Behaviour of deformable bodies)			
R1	Load + Loading + Stress	1/2+5+26a	1 + 26a	1/26a
R1a	Airload			
R2	Stressing			
R3	Allowable	3/4		
R3a	Permissible			
R4	Failsafe			
R5	Shocking			
R6	Exerted	6/7		
R7	Pre-loading			
R9	Tension	9/10	9/10	
R10	Tensile			
R11	Shear	11/12	11/12	
R12	Shearing			
R13	Torsion + Torsional*	13/14	13/15a	
R14	Torsional			
R15	Twisting	15/15a		
R15a	Warping			
R16	Bending	16/18	16/23	
R17	Flexural			
R18	Flexure			
R19	Inflection	19/23		
R20	Bowing			
R21	Curling			
R22	Anti-elastic (effect)			
R23	Hogging			
R24	Folding	24/26	24/26	
R26	Unfolding			
R26a	Unloading			
R27	Rheological (behaviour)	27/29	27/29+60/63	27/66
R28	Deformation + Strain			
R29	Deforming			
R30	Deflection + Displacement	30/30a	30/32	
R30a	Droop			
R31	Deflecting	31/32		
R31a	Deflect			
R32	Traction + [edge traction]			
R33	Stretching	33/34	33/34	
R33a	Extending			
R33b	Extension			
R33c	Extensional			

		First Reduction	Second Reduction	Third Reduction
	[Extensional]			
R34	Attenuating			
R35	Shortening	35/36	35/36	
R36	Truncation			
R37	Blunting	37/38	37/38	
R38	Flattening			
R40	Cavitation	40/41a	40/41a	
R40a	Drilling			
R41	Cracking			
R41a	Intercrystalline			
R42	Distortion	42/43	42/43	
R43	Distorting			
R44	Dislocation	44	44/50	
R46	Damage	46/48		
R47	Fracture			
R48	Rupture			
R49	Collapse	49/50		
R50	Collapsing			
R51	Buckling + Buckle*	51/52	51/52	
R52	Buckle			
R53	Forcible	53/59	53/59	
R54	Explosive			
R55	Monocell			
R56	Snap			
R57	Threshold			
R58	Pre-buckling			
R59	Post-buckling			
R60	Snapping			
R61	Wrinkling			
R62	Dimpling			
R63	Kinking			
R64	Creep	64	64	
R64a	Endurance	64a/65	64a/65	
R64b	Straintime			
R65	Fatigue			
R66	Failure	66	66	
	(Mechanical properties)			
	[Flexibility]			
R67	Elasticity + Elastic* +Elastically*	67/69+73/74	67/74	67/77
R68	Elastic + Flexibility*+Flexible*+Flexibly*			
R69	Elastically			
R70	Viscoelasticity	70/71		
R71	Viscoelastic			
R73	Flexible			
R74	Flexibly			
R76	Rigidity	76/77	76/77	
R77	Stiffness			
R78	Plasticity	78/80	78/80	78/83a
R79	Plastic			
R80	Viscoplastic			
R81	Strength	81+83a	81+83a	
R82	Soft	82/83	82/83	
R83	Hard			
R83a	Endgrain	83a		
	(Surface condition)			
R85	Smoothness	85/87	85/87	85/87
R87	Polished			
R88	Porous	88/89	88/90a	88/90a
R89	Permeable	90/90a		
R90	Impermeable			
R90a	Non-porous			
	(Processes)			
R91	Vibration + Oscillation +Vibrating*+Oscillating*			
R92	Vibrating + Oscillating	91/92a	91/92a	91/97
R92a	Flapping			
R93	Harmonic	93/95	93/97	
R93a	Harmonically			
R94	Resonant			
R95	Libration			
R95a	Pulse	95a		
R95b	Non-oscillatory	95b		
R96	Modal	96/97		
R97	Unimodal			
R98	Sound + Acoustic + Acoustically*	98/100	98/100	98/105a
R99	Acoustically			
R100	Panting			
R101	Noise	101/105a	101/105a	
R101a	Signals			
R102	Boom			

		First Reduction	Second Reduction	Third Reduction
R103	[Boom]			
R104	Siren			
R105	Bomb			
R105a	Exploded			
	Quadrupole			
	(Properties and processes of vibration)			
	(Frequencies)			
R106	Beat	106/108	106/111	106/111
R107	L(-band)			
R108	RF			
R109	Aural	109/111		
R110	Audio			
R111	Subaudio			
R111a	Spectra	111a/111c	111a/111f	111a/111f
R111b	Spectrum			
R111c	Spectral			
R111d	Wavelength	111d/111f		
R111e	Waveform			
R111f	Bandwidth			
R112	Alternating	112	112	112/120
R112a	Refraction	112a/112b	112a/112b	
R112b	Diffraction			
R113	Impedance	113		
	(Amplification)			
R114	Resonance	114	114	
R115	Attenuation	115	115	
R116	Damping	116/119	116/119	
R117	Isolation			
R118	Hysteretic			
R119	Phugoid			
R120	Hysteresis	120	120	
R122	Luminosity	122/124	122/125	122/125a
R123	Luminous			
R124	Transparent			
R125	Sensitivity	125		
R125a	Monotonic	125a	125a	
S1	Electromagnetic (wave)+Electromagnetically*			
S2	Electromagnetically	1/2	1/5	1/5
S3	Ray	3/5		
S4	Ultraviolet			
S5	Microwave			
S6	Radioactive	6	6	6/22c
	(Electric and magnetic phenomena)			
S8	Electrical	8/10+16a+21/22c	8/10+12+	
S9	Electric		16/17+21/22c	
S10	Electrically			
S11	Magnetic	11		
S12	Electronic			
S13	Magnetofluid mechanics + Magnetohydrodynamics			
	+ Hydromagnetics	13/15	13/15	
S14	Electrohydrodynamics			
S15	Magnetogasdynamics + Magnetoaerodynamic			
	+ Electrogasdynamics			
S16	Photoelectric	16		
S16a	Photoelastic	16a		
S17	Electrostatic	17		
S18	Current	18/19	18/19	
S19	D-C			
S20	Charge	20	20	
S21	Inductance			
S22	Dielectric			
S22a	Capacitance			
S22b	Magnetostriotion			
S22c	Pole			
	[Thermodynamic behaviour, properties]			
S23	Heat	23	23/29	23/29
S24	Thermodynamic	24/29		
S24a	Aerothermodynamic			
S25	Thermodynamically			
S26	Thermally			
S27	Caloric			
S28	Calorically			
S29	Aerothermochemistry			
	(Change of state)			
S31	Melting	31/31a	31/38	31/38
S31a	Liquefaction			
S32	Resolidification	32/33+38		
S33	Sublimation			
S34	Vaporisation	34/37		
S35	Evaporation			

		First Reduction	Second Reduction	Third Reduction
S36	[Evaporation]			
S37	Evaporating			
S38	Boiloff			
S39	Condensation			
	(Heat transfer processes)			
S39	Replenishment	39+56a	39+51/56a	39/56a
S40	Heating	40/41	40/41	
S41	Joule			
S41c	Insulation	41c/41d	41c/41d	
S41d	Insulating			
S42	Cooling	42+48/49	42/49	
	(By mass transfer)			
S43	Soret (effect)	43/45		
S44	Ablation			
S45	Ablating			
S46	Transpiration	46/47		
S47	Sweat			
S48	Regression (of surface)			
S50	Convection	50	50	
S51	Radiant (heat transfer)	51/54		
S52	Non-radiating			
S53	Losing			
S54	Black (body radiation)			
S55	Accommodation	55		
S56	Exothermic (reaction)	56		
S56a	Cycling			
	(Thermal properties and processes)			
S56b	Thermomechanical	56b/56c	56b/56c	56b/65
S56c	Thermoelastic			
S56d	Photothermoelastic			
S56e	Photothermoelasticity			
S57	Soaked	57	57+62/65	
S58	Enthalpy	58		
S60	Entropy	60/61	60/61	
S61	Residue (of heat energy)			
	Adiabatic + Non-conductive + Insulated			
S62	Isothermal	62		
S64	Non-isothermal	63/64		
S65	Isentropic	65		
	Temperature	66/67+74	66/76a	66/76a
S67	Room			
S68	Cold	68/70		
S69	Cooled			
S70	Cool			
S71	Uncooled	71/72		
S72	Unheated			
S73	Heated	73		
S74	Equicohesive (Measures)			
S75	Kelvin	75/76a		
S76	Fahrenheit			
S76a	BTU			
S77	Oxidation	77/80		77/87
S78	Combustion + Burning			
S79	Afterburning			
S80	Deflagration			
S81	Flame	81/82		
S82	Fire			
S83	Ignition	83/85	83/87	
S84	Autoignition			
S85	Firing			
S86	Extinguishing	86/87		
S87	Quenching			
	(General processes, physical-chemical processes)			
S90	Action	90/92	90/92	90/94a
S90a	Acting			
S90b	Activity			
S91	Event			
S91a	Occurrence			
S91b	Encounter			
S91c	Case			
S92	Behaviour			
S93	Interaction	93/94	93/94a	
S94	Interacting			
S94a	Undergoing			

		First Reduction	Second Reduction	Third Reduction
S94b	[Undergoing]			
S94c	Subject (to)	94a/94b		
S94d	Counteraction	94c/94d		
	Competition			
S95	Physical	95	95	96/99
S96	Chemical + Chemically*	96/97+T13	96/97+7/7a	+1/13
S97	Chemically		+13	
S98	Reaction + Reacting*	98/99	98/99+12	
S99	Reacting			
T1	Decomposition	1	1/6b	
T2	Dissociation	2/3		
T3	Dissociating			
T4	Ionization	4/6a		
T5	Charging			
T6	Freezing			
T6a	Freeze			
T6b	Lagging	6b		
T7	Catalytic	7/7a		
T7a	Non-catalytic			
T8	Absorption	8/10	8/11	
T9	Adsorption			
T10	Chemisorption			
T11	Saturation	11		
T12	Erosion	12		
T13	Thermochemical	13		
	(General processes, activities, operations)			
T14	Influence +Effect*+Contribution*	14	14+16/22a	14/29
T15	Effect +Consideration*	15/15b	15/15b+29	
T15a	Contribution			
T15b	Consideration			
T16	Change	16/18+29		
T17	Changing			
T18	Alteration			
T19	Modification	19/20		
T20	Modifying			
T21	Improvement	21/22a		
T22	Refinement			
T22a	Tailoring			
T23	Variation	23/24	23/28	
T24	Varying			
T25	Fluctuation	25/26		
	Peak to peak			
T26	Fluctuating			
T27	Modulation	27/28		
T28	Modulating			
T29	Conversion			
	(Altering composition)			
T31	Recombination	31	31+35/38	31/39a
T33	Mixing	33/34		
T34	Isoenergetic			
T35	Confluence	35/38		
T36	Merging			
T37	Merger			
	(Altering state)			
T39	Contamination	39		
T39a	Non-concurrence	39a		
	(Altering state)			
T40	Division	40/44	40/44	40/44
T42	Partition			
T43	Bifurcation			
T44	Breaking			
	(Altering state)			
T46	Hardening	46	46	46/48
T47	Plating	47/48	47/48	
T47a	Electroplating			
T48	Chroming			
	(Altering location)			
T50	Transport + Removal*	50/52	50/52	50/52
T52	Removal			+70/80
T53	Distribution	53/54a	53/54a	53/66a
T54	Maldistribution			
T54a	Redistribution			
T55	Spreading	55/58+61	55/61	
T57	Scattering			

		First Reduction	Second Reduction	Third Reduction
	[Scattering]			
T58	Dispersion			
T59	Dissipation	59/59a		
T59a	Non-dissipation			
T60	Diffusion	60		
T61	Rarefaction			
T62	Separating	62/63	62/63	
T63	Detachment			
T66	Disturbing	66/66a	66/66a	
T66a	Cavitating			
T68	Concentration	68	68	68
T70	Transfer	70	70	
T71	Exchange	71/72+80	71/72+80	
T72	Shuffle			
T73	Transmission	73	73/79	
T74	Conducting	74/75		
T75	Conduction			
T76	Convecting	76		
T78	Radiation	78/79		
T79	Radiating			
T80	Release			
	(Changing direction)			
T81	Redirection + Redirecting*	81/84	81/88	81/88
T81a	Redirecting			
T82	Switching			
T83	Turning			
T83a	Re-entrant			
T84	Deviation			
T85	Reflection	85/86		
T85b	Specular			
T85c	Echoes			
T86	Reflecting			
T87	Reversal	87		
T88	Inversion	88		
	(Retaining)			
T88a	Continuation	88a+89/92	88a/94a	88a/105a
T89	Holding			
T90	Arrest			
T91	Retarding			
T93	Constraint	93/94a		
T94	Restraint			
T94a	Restraining			
T97	Fixing	97	97/100	
T98	Joining	98/100		
T99	Clamping			
T100	Coupling			
T101	Stabilizing	101/103	101/105a	
T101a	Destabilizing			
T102	Stabilization			
T103	Equilibration			
T104	Relaxation	104/105a		
T105	Relaxing			
T105a	Shakedown			
	(Influencing dimension)			
U1	Increasing	1/5a	1/5a+8/12a	1/12
U1a	Rise			
U2	Increase			
U2a	Jump			
U3	Increment			
U4	Augmentation			
U5	Addition			
U5a	Gain			
U6	Expansion	6/7	6/7	
U7	Expanding			
U8	Accumulation	8/10		
U9	Collecting			
U10	Scooping			
U11	Amplification	11/12a		
U12	Magnification			
U12a	Filling			
U13	Decreasing	13/15a+20	13/23a	13/23a
U14	Decrease			
U15	Decrement			
U15a	Drop			
U16	Reduction	16		
U16a	Deficit	16a/16b		
U16b	Loss			
U18	Contraction	18/19		
U19	Contracting			

		First Reduction	Second Reduction	Third Reduction
	[Contracting]			
U20	Constriction			
U21	Minimisation	21/22		
U22	Minimising			
U23	Elimination	23/23a		
U23a	Omission			
U24	Limitation	24/25	24/25	24/25
U25	Limiting			
	(Development)			
U26	Beginning	26/29	26/29	26/30b
U27	Starting + Start*			
U28	Start			
U28a	Onset			
U29	Re-start			
U30	Stopping + Cessation	30/30b	30/30b	
U30a	Completion			
U30b	Rounding (off)			
U31	Source	31/31a	31/31a	31/46
U31a	Providing			
U32	Derivation	32/34+38	32/38	
U33	Originating			
U34	Initiating			
U35	Induction	35		
U36	Generation	36/37		
U36a	Generating			
U37	Formation			
U38	Appearance			
U40	Propagation	40/41	40/45	
U41	Propagating			
U42	Excitation	42/45		
U43	Parasitic			
U44	Exciting			
U45	De-excitation			
U46	Growth	46/48	46/48	46/51d
U48	Development			+55
U49	Conservation	49/51	49/51	
U49a	Sustaining			
U50	Maintenance			
U51	Lubrication	51a/51d	51a/51d	
U51a	Protection			
U51b	Waterproofing			
U51c	Sealing			
U51d	Shielding			
U52	Decay	51/53d	51/53d	52/53d
U53	Degeneration			
U53a	Decaying			
U53b	Weakening			
U53c	Yielding			
U53d	Failing			
U55	Recovery	55	55	
	(Technical operations and processes (general))			
U59	Process	59/61	59/61+67/69	59/63a
U60	Operation + Operating*			+67/69
U61	Operating			
U62	Method + Technique	62/63a	62/63a	
U62a	Treatment			
U63	Routine			
U63a	Procedure			
U64	Design	64/65	64/65	64/66a
U65	Matching			
U66	Construction	66/66a	66/66a	
U66a	Output			
U67	Storage	67/68		
U68	Storing			
U69	Supplying	69		
U70	Control	70/72	70/72+74/75	70/77
U71	Controlling			
U71a	Regulation			
U72	Optimisation			
U73	Correction	73	73	
U74	Prevention	74/75		
U75	Suppression			
U76	Response	76/77	76/77	
U77	Feedback			
U78	Economics	78/80	78/82	78/83
U79	Cost			
U79a	Penalty			

		First Reduction	Second Reduction	Third Reduction
U30	[Penalty]			
U31	Saving			
U32	Application			
U33	Use			
U33	Code			
U85	Research + Investigation + Study (Operations)	85	85	85
U86	Classification	86/87+92/92a	86/87+92/92c	86/92c
U87	Comparison	+96	+96	
U88	Analysis	88/91	88/91	
U89	Analytic [operations]			
U90	Analytical			
U91	Segmentation			
U92	Deduction			
U92a	Synthesis			
U92b	Idealization	92b/92c		
U92c	Simplification			
U93	Estimation	93/95	93/95	93/97
U94	Estimate			
U95	Assessment			
U96	Evaluation			
U97	Prediction			
U98	Determination	97/101	97/101	98/106
U99	Tracing			
U100	Traverse			
U101	Resolution			
U102	Measurement	102/104	102/104	
U103	Quantitative			
U104	Qualitative			
U105	Verification	105/106	105/106	
U106	Proof (test)			
V1	Experiment + Experimental*	1/2	1/2	1/9
V2	Experimental			
V3	Observation	3/7	3/9	
V4	Detection			
V5	Recording			
V6	Counting			
V7	Reading			
V7a	Simulating	7a/9		
V8	Simulation			
V9	Representation			
V9a	Visual (methods) + Visualization*	9a/13	9a/25b	9a/25b
V10	Visualization	+25a/25b		
V11	Spectrography			
V12	Stroboscopic			
V13	Shadowgraph			
V14	Photography	14/16		
V16	Photorecording			
V17	Schlieren	17/18		
V18	Spark			
V19	Interferometry	19/25		
V20	Interferometric			
V21	Interferogram			
V22	Isopycral (chart)			
V23	(fringe) Shift			
V24	Strioscopy			
V25	Interferential			
V25a	Clay			
V25b	China			
V25c	(Model tests)			
V27	Focal (point method)	25c/28	25c/28	25c/28
V27	Lockheed			
V28	Tuft			
V29B	(Operations)			
V29C	Calibration	29b/29ga	29b/29ga	29b/29ga
V29E	Lighting			
V29E	Supporting + Carrying			
V29F	Jacking			
V29G	Tap			
V29GA	Forcing			
V29H	Theory + Theoretical* + Philosophy* + Descriptive*			
V29HA	Theoretical	29h/29hc	29h/29hc	29h/29r
V29HB	Philosophy			
V29HC	Descriptive			
V29I	Generalized	29i/29l	29i/29l	
V29J	Unified			
V29K	Linearized			
V29L	Linearization			

		First Reduction	Second Reduction	Third Reduction
	[Linearization]			
V29M	Rule + Law + Principle	29M/29R	29M/29R	30/57
V29N	Hypothesis			+87
V29O	Assumption			
V29OA	Assuming			
V29P	Expression			
V29Q	Analogy			
V29R	Analogue			
V30	Mathematical (operations)	30/34a+43	30/34a+43	
V31	Calculation	+87	+46/51	
V31a	Calculating		+54/56	
V31b	Calculated		+87	
V32	Compute			
V33	Computation			
V34	Computational			
V34a	Formulation			
	(Methods)			
	(Analytical)			
V36	Exact	36/38+42	36/38+42	
V37	Inverse			
V38	Semi-inverse			
	(Approximate)			
V41	Variational	41	41	
V42	Semi-analytical			
V43	Graphical			
V44	Numerical	44/45	44/45	
V45	Semi-numerical			
V46	Interpolation	46/48+51+56		
V47	Interpolative			
V47a	Extrapolated			
V48	(Curve) Fitting			
V49	Plotting	49/50		
V50	Plot			
V51	Bestfit (curve)			
V52	Iteration	52/53	52/53	
V53	Iterative + Step-by-step			
V54	Relaxational	54/55		
V55	Over-relaxational			
V56	Smoothing			
V57	Integration	57	57	
	[Agents in mathematical operations]			
V58	Computer	58/61a	58/64	58/64
V59	Digital			
V59a	Dence			
V59b	Eniac			
V59c	Univac			
V59d	Pace			
V59e	NGTE			
	(Analogue)			
V60	Correlator			
V61	Simulator			
V61a	Analyzer			
	(Operations)			
V62	Programming	62/64		
V63	Programme			
V64	Algorithm			
	(Elements, etc. in mathematics)			
V65	Problem	65	65	65/84
V66	Parameter	66	66/72+74/76	
V67	Co-ordinate	67/68a		
V68	Ignorable			
V68a	Ordinate			
V69	Replacement	69/72+74/76		
V70	Term			
V71	Termwise			
V72	Root			
V73	Value	73	73	
V74	Pivotal (point)			
V74a	Exponent			
V75	Formula			
V76	Quadrature			
V77	Solution	77+82/83	77+82/83a	
V78	Approximate	78/79d	78/79d	
V79	Approximating			
V79a	Tending			
V79b	Approximation			
V79c	Inscribed			
V79d	Circumscribed			
V80	Similar	80/81	80/81	

		First Reduction	Second Reduction	Third Reduction
V81	[Similar]			
V82	Similarity			
V83	Integrable			
V83a	Integrating			
V84	Integrative Theorem	84	84	
V85	Dimensional (analysis)	85/86	85/86	85/86
V86	Scaling (law)			
V87	Multiplication			
V88	Algebraic	88+90/92	88+90/94	88/98a
V89	Equation	89	89	
V90	Biharmonic			
V91	Compatibility			
V91a	Transcendental			
V92	Telegraph			
V93	Polynomial	93		
V94	Matrix	94		
V95	Transformation	95/98a	95/98a	
V96	Transform			
V97	Conformal			
V98	Mapping			
V98a	Transversality (condition)			
V99	(Analysis)			
V100	Calculus	99/103	99/103	99/103
V100a	Tensor			
V100b	Operational			
V102	Transcendant			
V103	Eigenvalue			
V104	Eigenfunction			
V104a	Function	104/109	104/109	104/109
V104b	Logarithmic			
V105	Exponential			
V106	Hypergeometric			
V106a	Confluent			
V107	Sine (law)			
V108	Bei			
V109	Ber			
V110	(Joint) Acceptance			
V111	Trigonometric	110	110	110
V111a	Statistics	111/115+119	111/115+119	111/119
V111b	Probability			
V112	Coverage			
V112a	Statistical			
V113	Averaging			
V114	Sampling			
V115	Weighting			
V116	Superposition	116/118	116/118	
V116a	Correlation + Relation + Relationship			
V117	Correlogram			
V118	Autocorrelation			
V119	Autocorrelogram			
	Stochastic			
	(Common properties)			
Wa	Property + characteristic + Quality*	a/b	a/b	a/20a
Wb	Quality			
W1	Structural	1	1	
W2	Isotropic	2/5	2/5	
W3	Orthotropic			
W4	Anisotropic			
W4a	Anisotropy			
W5	Aisotropic			
W6	Composition	6+7	6/10+13/17	
W7	Complex	7/10		
W8	Composite			
W9	Compound			
W10	Multi-component			
W11	Mixture	11/12	11/12	
W12	Stoichiometric			
W13	Homogeneous	13		
W14	Inhomogeneous	14/16		
W15	Non-homogeneous			
W16	Heterogeneous			
W17	Multiphase			
W19	Integral	19	19	
W20	Sectional	20/20a	20/20a	
W20a	Multi-sectional			

		First Reduction	Second Reduction	Third Reduction
	[Multi-sectional]			
	(Results of action)			
	(Influenced, altered)			
W21	Applied	21/21b	21/21b	21/37
W21a	Affected			
W21b	Processed			
W23	Modulated			
W24	Modified			
W25	Revised	25/26		
W26	Improved			
W27	Transformed	27	27/32a	
W28	Combined + Merged	28/29		
W29	Integrated			
W30	Mixed	30/32a		
W31	Premixed			
W32a	Unchanged			
W33	Bifurcated	33	33+37	
W35	Ablated	35/36	35/36	
W36	Non-ablating			
W37	Filtered	37		
	(State altered)			
W38	Fluidized	38/40	38/40	38/48
W39	Dissolved			
W40	Absorbed			
W42	Ignited	42/43	42/43	
W43	Burned			
W44	Disassociated	44	44/48	
W46	Undissociated	46		
W47	Ionized + Changed	47		
W48	Frozen	48		
	(Dimensions altered)			
W52	Damped	52/54	52/54	52/58
W53	Impeded			
W54	Obliterated			
W55	Increased	55/57	55/57	
W56	Boosted			
W57	Scooped			
	(Position, etc., altered)			
W59	Removed	59/61	59/69	59/72a
W60	Transferred			
W61	Convected			
W62	Distributed + Spread	62/64a		
W63	Dispersed			
W64	Displaced			
W64a	Diffuse			
W65	Detached	65		
W66	Attached	66		
W67	Disturbed	67/68a		
W68	Perturbed			
W68a	Washed			
W69	Undisturbed	69		
W70	Concentrated	70/72a	70/72a	
W70a	Imposed			
W71	Superimposed			
W72	Piled			
W72a	Lumped			
	(Direction altered)			
W73	Yawed	73	73/78	73/78
W74	Unyawed	74		
W76	Reflected	76		
W77	Reversed	77		
	(Held, retained)			
W78a	Prevented	78a/84	78a/84	78a/84
W79	Restrained			
W79a	Restricted			
W81	Stabilized			
W83	Unretarded			
W84	Resisted			
	(Result of various forces)			
W85	Loaded	85/89a	85/89a	85/89a
W86	Forced			
W87	Subjected			
W88	Controlled			
W89	Directed			
W89a	Governed			
	(By direction)			

		First Reduction	Second Reduction	Third Reduction
	[(By direction)]			
W90	Deflected	90/93	90/93	90/93
W91	Sheared			
W92	Inflected			
W93	Twisted			
W94	Compressed	94	94	94/102
W96	Driven	96/98a	96/102	
W97	Propelled			
W98	Launched			
W98a	Projected			
W99	Injected	99/100		
W100	Blown			
W101	Emitted	101/102		
W101a	Tapped			
W102	Extruded			
	(Shape altered)			
W103a	Deformable	103a/105	103a/109	103a/X1
W104	Deformed			
W105	Warped			
W106	Buckled	106/108		
W107	Unbuckled			
W108	Prebuckled			
W111a	Rolled	111a	111a	
X1	Thickened	1	1	
	(Chemical/Physical properties)			
X6	Combustible	6/8	6/11	6/11
X7	Non-flammable			
X8	Non-toxic			
X9	Dry	9/11		
X10	Humidity			
X11	Dewpoint			
X14	Strong	14/14b	14/14b	14/14b
X14b	Weak			
	(Origin, source)			
X14c	Accidental	14a/16a	14a/16a	14a/16a
X15	Artificial			
X15a	Artificially			
X16	Natural			
X16a	Nature			
X17a	Introduced	17a/20+23a/23b	17a/20	18/23b
X17b	Obtained		+22/23b	
X17c	Caused			
X17d	Due			
X18	Generated			
X18a	Initiated			
X19	Formed			
X19a	Composed			
X20	Developed			
X21	Induced	21	21	
X22	Excited	22		
X23	Simulated	23		
X23a	Terminated			
X23b	Ended			
X24	Frictional	24	24	24/28
X25	Mechanical	25/26a	25/26a	
X26	Hydrostatic			
X26a	Pneumatic			
X28	Gravitational	28	28	
	(Properties of processes)			
X30	Eccentricity	30	30	30/35
X32	Circulatory	32/32a	32/35	
X32a	Rotatory			
X33	Non-circulatory	33/35		
X35	Translational	36	36/39	36/39
X36	Oscillatory			
X37	Vibrational	37/39		
X38	Vibrationally			
X39	Vibratory			
X40	Automatic	40/41b	40/42	40/42
X41	Self-adjusting			
X41a	Self			
X41b	Auto			
X42	Corrective	42		

		First Reduction	Second Reduction	Third Reduction
[Corrective]				
X44	Dissipative	44/45+53	44/47+53	44/53
X45	Non-dissipative			
X47	Diffusivity	47		
X48	Conductive	48/51+52a	48/52a	
X48a	Conductivity			
X51	Non-conducting			
X52	Convective	52		
X52a	Radiative			
X53	Emissivity			
X55	Compressive	55	55	55
X56	Incipient	56/56a	56	56/67a
X56a	Embryonic			
X57	Progressive	57/58	57/58+63/65	
X58	Cumulative			
X59	Reversibility	59/60	59/60	
X60	Irreversible			
X63	Extensible	63/64		
X63a	Extendible			
X64	Developable			
X65	Incremental	65		
X66	Redundant	66/67a	66/67a	
X67	Residual			
X67a	Remain			
X68	Steady	68/69	68/75	68/75
X69	Quasi-steady			
X70	Continuous	70/72a		
X71	Continuously			
X72	Continuity			
X72a	Sustained			
X73	Constant	73+75		
X74	Uniform	74/74a		
X74a	Uniformity			
X74b	Uniformly			
X74c	Regular			
X74d	Unperturbed			
X75	Invariant			
X75a	Non-uniformly	75a/79	75a/88	75a/88
X75b	Non-uniformity			
X76	Unsteady			
X76a	Quasi-unsteady			
X77	Unsteadily			
X78	Unsteadiness			
X79	Nonsteady			
X80	Discontinuous	80/82		
X81	Discrete			
X82	Discontinuity			
X83	Irregularity	83/85		
X84	Unevenness			
X85	Erratic			
X86	Variable	86		
X88	Non-monotonic	88		
X89	Negatively	89/90	89/92	89/92
X89a	No			
X89b	Not			
X90	Negative			
X90a	Non-negative	90a/91		
X91	Positive			
X92	Neutral	92/92a		
X92a	Adverse			
X92b	Favourable			
X92c	Good			
X93	Rest	93/94+96/97	93/97	93/107
X93a	Resting			
X94	Stagnant			
X95	Stationary	95		
X96	Dead			
X97	Still			
X98	Static	98/98a	98/98a	
X98a	Statically			
X99	Immobile	99/102	99/102	
X99a	Motionless			
X100	Passive			
X101	Non-reactive			
X101a	Non-reacting			
X102	Inert			

		First Reduction	Second Reduction	Third Reduction
	[Inert]			
X103	Stable	103/104a	103/104a	
X104	Bistable	104b/104e	104b/104e	
X104b	Movable			
X104c	Allmovable			
X104d	Immovable			
X104e	Allmoving			
	[Active]			
X106	Active	106/107	106/107	
X107	Reactive	106/107	106/107	
	[General relations]			
X110	Absolute	110	110/112a	110/119
X111	Relative	111/112a		
X112	Relativistic			
X112a	Relatively			
X113	Containment	113	113/119	
X115	Correlation	115/119		
X115a	With			
X115b	Corresponding			
X115c	Applicability			
X116	Correlated			
X117	Connected			
X118	Associated			
X119	Coupled			
	[Sequence and Rank (General relations)]			
H81	Order	81	81+84a/90	81/92
H81a	Preliminary	81a/84	81a/84	
H82	First + Initial			
H82a	Initially			
H82b	Originally			
H83	Primary + Major + Main			
H84	Semi-major			
H84a	Minor	84a/85a		
H85	Second + Secondary			
H86	Third	86/87		
H87	Cubic			
H88	Fourth	88/9		
H89	Quartic			
H89a	Fifth	89a		
H89b	Sixth	89b		
H90	Seventh	90		
H90a	Eighth	90a		
H91	Final	91/92	91/92	
H92	Terminal			
H93	Auxiliary	93	93	93/94
H94	Intermediate	94	94	
	(Dimensional properties)			
M1	Dimensional	1/2a	1/2a+8	1/8
M2	Geometric			
M2a	Dimensionless			
M3	One-dimensional + Linear	3/3b	3/3b	
M3a	Linearly			
M3b	Quasi-one-dimensional			
M4	Non-linear	4/5	4/5	
M5	Non-linearly			
M6	Two-dimensional	6/6a	6/6a	
M6a	Two-dimensions			
M7	Three-dimensional	7/7a	7/7a	
M7a	Three-dimensionality			
M8	Non-dimensional	8	8	
M21	High + Highly*+Higher*+Elevated*	21/22c	21/24	21/27a
M22	Highly			
M22a	Higher			
M22b	Elevated			
M22c	Ultrahigh			
M23	Critical	23/24		
M24	Supercritical			
M25	Low + Small + Reduced	25	25	
	[Magnitude]			
M28	Dense	28	28/28b	28/28b
M28a	Lightly	28a/28g	+28g	+28g
M28b	Heavy	28b		
M28c	Intensity	28c/28d	28c/28f	28c/28f
M28d	Intense			
M28e	Severe	28e/28f		
M28f	Severely			
M28g	Light + Lightweight			
M29	Quantity + Amount	29/30	29/30	29/31b
M30	Content			+65a/65b

		First Reduction	Second Reduction	Third Reduction
[General relations]				
[Magnitude]				
[Content]				
M31	Degree	31/31b	31/31b	
M31a	Percentage			
M31b	Semi			
M32	Single	32/34	32/34	32/29b
M33	Singly			+57/65
M34	Singular			
M35	Multi + Multiple	35	35/39b	
M36	Double	36/39b		
M37	Dual			
M38	Binary			
M39	Pair			
M39a	Twin			
M39b	Conjugate			
M40	Finite	40/41	40/41	40/43d
M41	Limited			
M42	Semi-infinite	42	42	
M43	Infinite	43/43d	43/43d	
M43a	Infinity			
M43b	Infinitely			
M43c	Infinitesimal			
M43d	Infinitesimally			
M44	Minimum	44	44	44/56
M45	Mean	45	45	
M46	Maximus + Maxima	46	46/46b	
M46b	Optimal	46b		
M47	Least	47/47d	47/47d	
M47a	Less-than			
M47b	Negligible			
M47c	Vanishingly			
M47d	Slightly			
M48	Partially + Partly	48/48a	48/48a	
M48a	Partial			
M49	Fully	49/52	49/56	
M50	Full			
M51	Completely			
M51a	Entirely			
M51b	Very			
M52	Complete			
M53	Total	53/55a		
M54	Overall			
M55	Collective			
M55a	Excess			
M56	Extreme	56		
M57	Number	57/57b	57/65	
M57a	Zero	+60/65		
M57b	Non-zero			
M58	One	58/59a		
M59	Unit			
M58a	Unity			
M60	Two			
M61	Three			
M63	Four			
M64	Five			
M65	Six			
M65a	Net	65a/65b	65a/65b	
M65b	Gross			
M65c	Arrangement	65c/68	65c/68	65c/71a
M66	Configuration			
M67	Layout			
M68	Pattern			
M71	Combination	71/71a	71/71a	
M71a	Collocation			
M72	Ordered	72/72b	72/72b	72/73
M72a	Systematic			
M72b	Graded			
M72c	Arbitrary	72c/73	72c/73	
M72d	Arbitrarily			
M73	Random			

		First Reduction	Second Reduction	Third Reduction
	[Random]			
Y1	Equivalence	1/3b	1/3b	1/3b
Y2	Equivalent			
Y3	Equally			
Y3a	Equal			
Y3b	Equality			
Y5	Complementary	5/6b	5/6b	5/17a
Y6	Mutual			
Y6a	Reciprocity			
Y6b	Reciprocal			
Y7	Dependence	7/9	7/9b	
Y8	Dependent			
Y9	Dependant			
Y9a	Incident	9a/9b		
Y9b	Coincident			
Y10	Proportional	10/11	10/11+14/16	
Y11	Proportion			
Y13	Ratio	13	13	
Y14	Modulus	14/16		
Y15	Secant			
Y16	Tangent			
Y17	Coefficient	17	17/17a	
Y17a	Derivative	17a		
Y19	Similitude	19/23	19/24b	19/24b
Y19a	Analogous			
Y19b	Alternative			
Y19c	Substitute			
Y22	Quasi			
Y23	Pseudo			
Y24	Consistent	24/24b		
Y24a	Valid			
Y24b	True			
Y25	Difference	25/26+28/29	25/26+28/31	25/31b
Y26	Different			
Y27	Differential	27	27	
Y28	Differentially			
Y29	Differing			
Y30	Unequal	30/31		
Y31	Inequality			
Y31a	Foreign	31a/31b	31a/31b	
Y31b	Non-similar			
Y32	Independence	32/33a	32/33a+37/37a	32/39
Y33	Independent + Free + Uncoupled			
Y33a	Unsupported			
Y35	Freely	35/36a	35/36a	
Y36	Freedom			
Y36a	Buoyancy			
Y37	Singularity	37/37a		
Y37a	Individual			
Y38	Without	38/39	38/39	
Y39	Absence			
	(Abstract concepts)			
Y40	Phenomena	40/40a	40/40a	40/40a
Y40a	Phenomenological			+43/48
Y41	System	41/42d	41/42d	41/42d
Y42	Group			
Y42a	Type			
Y42b	Species			
Y42c	Set			
Y42d	Member			
Y43	Concept	43		
Y44	Criterion	44/47	44/47	
Y45	Reference			
Y47	Ultimate			
Y48	Best	48	48	
Y48a	Input	48a/48d	48a/48d	48a/48d
Y48b	Output			
Y48c	Yield			
Y48d	Target			
Y49	Data	49/52	49/52	49/52
Y49a	Product			
Y50	Result			
Y51	Resultant			
Y51a	Resulting			

		First Reduction	Second Reduction	Third Reduction
	[Resulting] (Form of information)			
Y52	Record			
Y52a	Description	52a+53/58b	52a/58b	52a/60
Y53	Diagram			
Y55	Chart			
Y55a	Table			
Y55b	Tabulation			
Y57	Survey			
Y57a	Art (state of)			
Y58	Review			
Y58a	Bibliography			
Y58b	Literature			
Y59	Index	59	59/60	
Y60	Trace	60		
	(Curves, etc.)			
Y60a	Polar	60a	60a/65	60a/65
Y61	Hodograph	61/65		
Y62	Isobar			
Y63	Vector			
Y64	Isogon			
Y65	U-R (velocity-distance)			
	[Abstract concepts]			
Y68	Empirical	68/68a	68/68a	68/68a
Y68a	Semi-empirical			+80/86a
Y70	Hypothetical	70/73a+79/79b	70/79b	70/79b
Y71	Ideal			
Y72	Idealized			
Y73	Perfect			
Y73a	Perfectly			
Y74	Simplified	74/76a		
Y75	Simply			
Y76	Simple			
Y76a	Elementary			
Y77	Pure	77		
Y78	Optimum	78		
Y79	Apparent			
Y79a	Assumed + Given			
Y79b	Expressible			
Y80	Actual	80/83	80/86a	
Y81	Practical			
Y82	Imperfect			
Y83	Non-perfect			
Y84	Working	84/85		
Y85	Real			
Y86	Effective	86/86a		
Y86a	Ordinary			
Y86b	General	86b/88	86b/91a	86b/99
Y86c	Normally			
Y87	Standard			
Y88	Average			
Y89	Classical	89/89a		
Y89a	Conservativeness			
Y91	Basic	91/91a		
Y91a	Plain			
Y93	Required	93/94	93/94	
Y93a	Appropriate			
Y94	Requirement			
Y95	Preferential	95/96	95/96	
Y96	Selected			
Y98	Specific	98/98a	98/98a	98/100
Y98a	Particular			
Y99	Measured	99/100	99/100	
Y99a	Valued			
Y100	Calibrated			
Z1	Efficiency	1/2		
Z1a	Efficient			
Z2	Effectiveness			
Z3	Accuracy	3/3a		
Z3a	Accurate			
Z4	Capability	4/5		
Z5	Capacity			
Z6	Deficiency	6/8a		
Z7	Defect			
Z8	Imperfection			
Z8a	Inclusion [in crystal]			
Z9	Error	9/10		
Z10	Aberration			

APPENDIX 5.4

SIMPLE CONCEPT HIERARCHIES

The schedules include the concepts used in the indexing of the sub-set of 200 documents as given in Appendix 3E. The concepts are in natural uncontrolled language. Notation is purely ordinal, and in no way reflects the relations between the concepts represented. Plus signs indicate synonyms. Certain concepts appeared in the sub-set of test questions, but did not occur in the indexing of the documents. Such concepts have been included and are followed by the letter 'Q'.

Summary of the main sections

	[Bodies, Structures]
A2	Aircraft types
	[Parts of Aircraft]
A79	Airfoils; control surfaces
C57	Other parts: Fuselage, panels, skin, forebody, etc.
E61	Propulsion systems, etc.
E64	Compressors
G5	Ducts: pipes, nozzles
H17x	Bodies
H43	By shape, etc.
J35	Non aerodynamic structures: pivots, beams, etc.
J46	Flight
J48	Interplanetary flight
K6	Performance
K43	Flying operations
L5	Fluids
L25	Gases
L86	Atmosphere
M34	Flow
M42	By speed
M69	By various other characteristics
N64	Boundary layer
O64	Flow elements: streamline, vortices, jets, etc.
P27	Jets
Q33	Waves, shock waves
R22	Aerodynamic forces and loads: lift, drag, moments, pressure, etc.
T27	Aerodynamic processes and properties: control, stability, interference, wake, velocity, flow parameters
U77	Fluid properties: density, viscosity, etc.
U90	Aeroelasticity, flutter
V94	Aerodynamic reference parameters: angle of attack, planform, aspect ratio, section, camber, etc.
W50	Mechanics: motion, force, stress-strain phenomena
X4	Heat
X80	Heat transfer
Y35p	Kinetic theory: dissociation
Y76	Research and investigation
Y82	Experiment
Z1	Wind tunnel
Z98	Theory
ZA9	Mathematics
ZB27	Automatic control theory
ZB45	General properties
ZB73	General processes

A1	Bodies	A74	Magnetoplasma [r.p.]
A2	[Airplane] Q	A75	Ion [r.p.]
A3	High speed aircraft	A76	Solar heating r.
A4	Avro-707A	A77	Midcourse r.
A5	Aircraft structures	A78	Light wave propulsion + Solar sail
A6	Models of complete aircraft		
A7	Tailless a.	A79	Airfoil
A8	Tail-boom a.	A80	Lifting element
A9	Aircraft shapes	A81	Non-l. airfoil + Non-l. body
A10	Vehicles	A82	Airfoil equation
A11	Ballistic v. + B. Missile	A83	Two-dimensional a.
A12	Winged missile	A84	Three-d. a.
A13	Long range m.	A85	A. shape
A14	Missile oscillating in roll	A86	Wedge a.
A15	Space v.	A87	Single w.a.
A16	Satellite + S.v. + Artificial a.	A88	Double w.a.
A17	Earth satellite	A89	Circular arc a. + C.arc profile
A18	Atlas	A89a	Biconvex a.
A19	Discoverer s.	A90	Straightline a.
A20	Explorer 1	A91	Blunt nosed a.
A22	Explorer 3	A92	Blunt trailing edge a.
A23	Explorer 4	A93	Symmetrical a.
A24	Midas 2	A94	Rigid a.
A25	Sputnik 1	A95	NACA 4412 a.
A26	Sputnik II	A95a	NACA 64A008 a.
A27	Sputnik III	A96	Semi-infinite plane
A28	Sputnik V	A97	Wing body combination + W.b. arrangement
A29	Vanguard I		W.b. interference + W.fuselage i.
A30	Re-entry v. + R. body	A98	[Effect of] Small span curvature of flowfield
A31	Highly cooled body	A99	Airplane wing + W. + W.body
A32	Graphite r.e. body	B1	Linearized w. theory
A33	Lifting r.e. configuration	B2	W. model
A34	Delta wing r.e. configuration	B3	W. shapes + Arbitrary planform
A35	Sweptback w. r.e. configuration	B4	w. + W.p.
A36	Blunt r.e.v. + Blunted r.e. configuration	B5	[Simple planform w.] Q
A37	Re-entry glider + R.e. glider configuration + Glide v. + Glider r.e. configuration + Glider v.	B6	Swept w.
A38	Winged r.e.g. configuration	B7	Highly s.w.
A39	[with] Wing tip panel	B8	W. sweep small
A40	Folding	B9	Sweptback w.
A41	Unfolding	B10	S.w. model
A42	Lifting r.e.g. configuration	B10a	45° sweptback w.
A43	[Uncontrolled v.] Q	B10b	S.w. 50°
A44	Skip v.	B11	60° sweptback w.
A45	R.e.v. surfaces	B12	S. delta w.
A46	Test v.	B13	Sweptforward w.
A47	Probe v. + P.v. configuration + Space p.	B14	Sweptforward w. tip
A48	Short p.v.	B15	Unswep w. + Straight w.
A49	Sounding p. + S. rocket system	B16	Triangular w. + Delta w.
A50	Supersonic v.	B17	Near t.w.
A51	S. model	B18	Flat t.w.
A52	Hypersonic v. + H. body	B19	Clipped d.w.
		B20	T.w. with twist
		B21	Rectangular w. + R.planform w.
		B22	Slender r.w.
		B23	Circular planform w.
		B24	Curved tip planform w.
A53	[Vehicle shapes]	B24a	Biconvex section w.
A54	Arrowing v.	B25	Elliptical w. + Elliptic w.
A55	Blunt body of revolution v.	B26	[with] Major/minor axis ratio 5:1
A56	Blunt nose v.		
A57	10° blunted cone v.	B27	Symmetrical w.
A58	Conical afterbody v.	B28	S.w. thickness
A59	Flat base v.	B29	Tapered w.
A60	Propulsion systems	B30	T.w. model
A61	Airbreathing v.	B31	Untapered w.
A62	Rocket p. + R.p. system + R. propelled v. + R.v.		
A63	Multiple r. engine	B32	Cambered w.
A64	Five stage r.s.	B33	Uncambered w.
A65	Chemical r.	B34	Twisted w.
A66	Liquid propellant	B35	W. with parabolic twist
	Solid propellant + Solid fuel r.s.	B36	Warren 12 planform
A67	Electrical r.	B37	Rigid w.
A68	Nuclear energy source	B38	Elastic w.
A69	Fusion	B39	Arbitrary stiffness w.
A70	Fission	B40	Solid construction w.
A71	Radioactive isotopes	B41	Cantilevered w.
A72	Decay	B42	C.w. flutter
A73	Arc-heating r.		

B43	Cropped w.	C22	Tailplane [i.e. horizontal stabilizing surface]
B44	Perforated w. + Hole drilled w.		
B45	Sharp edge w.	C23	T. setting
B46	Sharp leading edge w.	C24	T. spanload
B47	Subsonic edged w.	C25	Control surface
B48	Supersonic edged w.	C26	All movable c.s.
B49	Two-dimensional w.	C27	[Apex located c.] Q
B50	Three-d. wing	C28	[Forward located c.] Q
			[Rudder]
B51	Long w.	C29	R. deflection
B52	Wide w.	C30	Differential r.d.
B53	Narrow w.		Aileron
B54	Slender w. + Thin w.	C31	Oscillatory a. coefficients
B55	S.w. theory		[Elevon]
B56	Not so slender w. theory	C32	E. deflection
B57	Thick w.	C33	Differential e.d.
B58	Low aspect ratio w. + L.a.r.	C34	Control flap
B59	Vanishing l.a.r.w.	C35	Hinged f.
B60	W. of very small a.r.	C36	Blowing f.
B61	High a.r.w.	C37	Jet f.
B62	Finite a.r.w.	C38	Thwaites j.f.
B63	Infinite a.r.w.	C39	Leading edge f.
B64	Finite w.	C40	Trailing edge f.
B65	Finite span w.	C41	[Slot]
B66	Infinite w.		Slot blowing + High velocity blowing
B67	Infinite s.w.	C42	S. configuration
B68	W. with concentrated weights	C43	Control surface tabs
B69	W. with flaps	C44	Oscillatory t. coefficient
B70	Flat w.	C45	Trailing edge spoiler
B71	F. plate w.	C47	[Vortex generators]
B72	F. surface w.	C48	Airjet v.g.
B73	Flat w. surface	C49	Ramp type v.g.
B74	Model w.	C50	Twisted strip type v.g.
B75	Half w.	C51	Wedge type v.g.
B76	H.w. model	C52	Wing type v.g.
	[By state]	C53	Biplane type v.g.
B77	Oscillating w.		Vane v.g.
B78	Harmonically o.w.	C54	[V.g. characteristics]
B79	Slowly o.w.	C55	Generator scale
B80	Fluttering w.	C56	Blade design
B81	Pitching w.	C56a	Multiple rows
B82	Rolling w.		Control surface buzz
B83	Rotating w.		
B84	Sinking w.	C57	[Other parts]
B85	Lifting w.	C58	Fuselage
B86	Nonlifting w.	C59	F. sizes
B87	Yawed w.	C60	Panels
B88	Loaded w.	C61	F. panels
B89	Inclined w.	C62	Stringer p.
B90	Laminar w.	C63	Supporting stringers
B91	Steady w.		Stiffener p.
B92	Differentially deflected w.	C64	[Skins]
B93	Spanning [a wind tunnel]	C65	Continuous s.
		C66	C. fuselage s.
B94	Wing flow pattern + W.f. study	C67	Fused silica s.
B95	Wing pressure distribution	C68	Mild steel s.
B96	[Study using] Tangent wedge method	C69	Thick s. structure
B97	Wing lift		Thin s. structure
		C70	S. thickness
	[Characteristics]	C71	S. temperature
B99	W. Chord	C72	S. flexibility
C1	W. thickness		
C2	W. slope		
C3	Plans of w.	C73	[Nacelle]
	[Parts]	C74	Turbojet nacelle exit
C4	W. surface		Simulated turbojet n.
C5	W. tip		[see also Choked convergent nozzle]
C6	W.t. deflection	C75	External stores
C7	Size [of w.t. panel]	C76	E.s. matrices
C8	Central section + Middle s.	C77	Balance chamber
C9	Rear	C78	Rocket chamber
C10	Root section		[Forebody]
C11	R. bending moment	C79	F. length
C12	Tail	C80	F. interference
C13	All movable t.	C81	F. drag
C14	Horizontal t.	C82	Bow
C15	Vertical t.	C83	B. shock wave + B. shock
C16	45° sweptback t.	C84	B. s. geometry
C17	Unswep t. surface	C85	Nose
C18	T. surface		

C86	N. region	D57	N. isobars
C87	Body n.	D58	S.p. distribution
C88	Teflon n. piece		[predicted by]
C89	Graphite n.	D59	Impact (Newtonian)
C90	Concave n.		theory prediction
C91	Spherical segment n.	D60	Local s.p.
C92	Modified s.s.n.	D61	S. temperature
C93	Hemispherically nosed body +	D62	Wall t.
	Hemispherical nose piece	D63	Adiabatic w.t. +
C94	N. bluntness + N. blunting		A. surface t.
C95	Blunt n. shapes	D64	Equilibrium s.t.
C96	Slightly blunted n.	D65	Maximum s.t.
C97	N. incidence	D66	S. combustion <u>See also</u>
C98	N. drag		Ablation
	[Afterbody]	D67	S. heat transfer
C99	Conical base a.		distribution
D1	Boattail	D68	S. h.t. rate
D2	B. angles	D69	S. radiation
D3	Cylinder a. + Cylindrical a.	D70	Surface curvature
D4	Truncated a.	D71	Body s. slope
D5	A. surface	D72	S. material
D6	A. drag		<u>see also</u> D43
D7	Flat base		S. conditions
	[Face]	D73	Wall
D8	Forward flat f.	D74	Composite w. + C. slab
D9	Surface	D75	Homogeneous w.
D10	Isotropic s.	D76	W. thickness
D11	Homogeneous s.	D77	Finite thickness w.
D12	Flat s.	D78	Plane w.
D13	Adjacent f.s.	D79	Non-parallel w.
D14	Curved s.	D80	Thermally thick w.
		D81	Thermally thin w.
D15	Flexible s. + F. boundary +	D82	Inconel w.
	Elastic surface +	D83	Copper w.
	[S. flexibility] Q	D84	Boundaries
D17	Response coefficient	D85	Fixed b.
D18	Elastic constant	D86	Moving b.
D19	Material stiffness	D87	Inner b.
		D89	Mixing b.
D20	Dissipative f.s.	D90	Supersonic interface
D21	Nondissipative f.s.	D91	Wall conditions
D22	Non dissipating s.	D92	Boundary motion
D23	Non-ablating s.	D93	Wall interference
D24	Contact s.	D94	Wind tunnel i.
D25	Surface exposed [to fluid]		effects
D26	S. subjected to heat transfer	D95	Boundary constraint
D27	Insulated s.		+ Wall c. + Tunnel a.
D28	S. free of stress	D96	Zero b.c.
D29	Non catalytic body s.		[Effect of]
D30	S. of uniform thickness	D97	Moisture condens-
D31	Thin s.		ation + Humidity
		D98	Saturation vapour
D32	Upper s.		pressure
D33	Interior s. <u>See also</u>	D99	Constant w. temperature
	D87 Inner boundary	E1	W. temperature gradient
D34	Intersecting s.	E2	Heat transfer at the
			wall
D35	Leeward s. contribution	E3	W. heat flux history
D36	S. of revolution		[Connecting portions]
D37	Smooth s. of r.	E7	Edges
D38	[with] Vertical axis	E8	Leeward e.
D39	Motion of particles	E9	Windward e.
D40	[by] Influence of	E10	Leading e.
	s. reaction	E11	L.e. shape + L.e.
D41	Two dimensional s.		contour + L.e. profile
D43	S. conditions [should follow	E12	Blunt l.e. + Blunt-
	Characteristics after D73]		ness [of l.e.] +
D44	Lifting s.		L.e. bluntness +
D45	L.s. theory		Bluntness effects
D46	Subsonic l.s.t.	E13	Tip bluntness
D47	L.s. shape		[of l.e.]
D48	Upper l.s.	E14	Sharp l.e.
		E15	Sharp nosed l.e.
	[Characteristics]	E16	Elliptic l.e.
D49	S. flow		contours
D50	S.f. pattern	E17	Parabolic l.e.
D51	S. wave		contours
D52	S. stresses	E17a	L.e. sweep 53.5°
D53	S. shear stress	E18	L.e. sweepback 53.5°
D54	S. drag	E19	Subsonic l.e.
D55	S. downwash	E20	Nearly sonic l.e.
D56	S. pressure		

E21	Transonic l.e.	E85	Isentropic impeller
E22	Supersonic l.e.	E86	[ump design method] Q
E23	Heat sustaining l.e.	E87	[Simplified p. design equation] Q
	[L.e. characteristics]		Generalized design curve
E24	L.e. diameter + L.e. radius	E88	
E25	L.e. droop	E89	[Stage] Q
E26	L.e. roughness	E90	3. characteristics
E27	L.e. separation	E91	S. efficiency +
E28	Inboard		S. performance
E30	L.e. stall	E92	Cascade losses
E31	L.e. suction	E93	S. matoning
	[L.e. vortices]	E94	Double-valued performance curves
E32	Location of l.e.v.		S. stacking
	[Proximity to]	E95	S.s. analysis
E33	Distance from l.e.	E96	Uprating stage one
E34	Near l.e.	E97	Uprating stage two
E35	Trailing e.	E98	S. temperature rise
E36	Blunt t.e.	E99	T. coefficient
E37	Thick t.e.	F1	S. flow coefficient
E38	Thickened t.e.	F2	High f.c.
E39	Supersonic t.e.	F3	S. interaction
E40	T.e. pressures	F4	S. stall
E41	T.e. suction	F5	Type of s.s.
E42	Sharp edged	F6	Front s. unstalled
E43	Corners	F7	First s. stalled
E44	Number and angles of c.	F8	Root to tip
E45	Separation [in] corners	F9	[between] Adjacent main blades
E46	Pivotal point	F10	Single s.s.
	[Hole]		Inlet s.
E47	H. pattern	F11	Inlet conditions
E48	Spanwise h.p.	F12	S. loading
E49	Square h.p.	F13	Division of l.
E50	Staggered h.p.	F14	Meridional plane force
E51	H. diameter	F15	+ Forces in m.p.
E52	Orifice size	F16	Rotational forces
E53	H. drilling		Blade bending stress
E54	H. filling	F17	
E55	Material removed [in hole drilling]	F18	
E56	Amount		[Blade]
E57	Soft material [filling up hole]	F19	Rotor b.
		F20	Stator b.
		F21	Impulse blading
E58	T. shock wave	F22	Reaction blading
E59	Initial t. [s.w.]	F23	Adjustable blading
E60	T. vortex	F24	Main b.
E61	Propeller	F25	B. row
E62	Models with p.	F26	Rotating b.r.
E63	P. stall flutter	F27	Inlet of b.r.
		F28	Vane
E64	Compressor	F29	Splitter v. + s.
E65	Centrifugal c. + Radial flow c. + Radial flow turbomachine	F30	S.v. surfaces
	Axial flow c. + Axial c. + A.f. turbomachine	F31	Inlet guide v.
	Drum construction	F32	I.g.v. stagger
E67	Disk construction	F33	Adjustable i.g.v.
E68	A.f.c. blade		[Blade characteristics]
E69	Naca 65(12)10 Blower b.	F34	Number of b.
E70	Jumo 004	F35	B. shape
E71		F36	Arbitrary b.s.
E72	Single stage c.	F37	B. curvature
E73	Multi s.c.	F38	Circular blading
		F39	Parabolic shaped b. + P. blading
E74	Subsonic turbomachines + S.c.	F40	Skewed p. blading
E75	Supersonic turbomachines	F41	Constant reaction b. form
E76	Mixed flow c. + M.f. turbomachine	F42	Free vortex b. form
	Isentropic c.	F43	Half vortex b.f.
E77	High pressure ratio c.	F44	B. stagger
E78	Idealized c.	F48	B. failure
E79		F49	Section characteristics
E80	Pump impeller	F50	Air outlet angle
E81	Centrifugal i. + Impeller + Pump rotor + Impeller rotor	F51	Outlet flow angle
	Mixed flow i. + M.f. pump + M.f. rotor	F52	Inlet blade angle
E82		F53	Turning angle
E83	Axial inlet i. + A.i. pump + A.i. rotor		[Angle of attack]
E84	Rocket propellant i. + R.p. pump + R.p. rotor	F55	Positive a. of a.
		F56	Blade surface velocity
		F57	Maximum relative b.s.v.
		F58	Trailing surface velocity
		F59	Pitchline blade speed

F60	Blowing air jet [effects]	329	Change in slope + Knee [Kink] Q
	[Location of compressor processes]	330	Flow rate
F61	Blade to blade	331	Constant f. angles
F62	Inlet to outlet	333	[V. streamlines]
F63	Along hub	335	Relative stream surface
F64	Between hub and shroud	335a	Streamline spacing
F65	Blade tip	335b	Maximum s.s.
F66	Main b. surface	335c	Meridional s.s.
F67	Propeller b. surface		
F68	Impeller b. surface	336	[Performance]
F69	B. driving face + Driving f.		Prescribed velocity
F72	Impeller inlet	337	distribution
F74	Meridional plane	338	Severe v. gradient
		339	Relative upstream v.
	[Other parts]	340	Exit relative v.
F75	Hub	341	Inlet flow speed
F76	H. profile	342	Rotational speed
F77	H. surface		Percentage of design speed
F78	Hub-Shroud profiles	343	Low speed efficiency
F79	Arbitrary h.s. contour	344	Intermediate speed
	[Shroud]		performance character- istics
F80	S. shape		Range of operation + Operation
F81	Improved s. design	345	Wide range
F82	S. surface		Discontinuities in performance + Discontin- uity [See also Stall and surge]
F83	S. pressure	346	Slip [See also Stall and range]
F84	Vaneless diffuser	347	S. factor
	[See also Ducts]		
F85	Impeller tip		
F86	I.t. speed		
F87	Annulus area	348	
F89	Inlet baffles	349	
	[Flow phenomena]		
F90	Absolute flow		[Pressure characteristics]
F91	Irrrotational f.	350	Pressure ratio
	[Rotational f.]		characteristics
F92	Inlet whirl	351	Peak p.r.
F93	Prewheel		[P. rise]
F94	Upstream f. whirl	352	Head rise
F95	Potential f. eddy	353	H.r. parameter
F96	P.f.e. formation	354	Maximum adiabatic temp. rise
F97	Formation of eddy		
F98	Mass f.		
F99	Weight f.		[Ducts]
G1	Maximum w.f.		[Pipe]
G2	Overall w.f.	355	Circular p.
			[P. flow]
G3	Equivalent w.f. characteristics	356	Accelerated
G4	W.f. range	357	[BY] Magnetic field
G5	W.f. variation	358	[N] Electric field
G6	Choked f.	359	[Channel, Ducts]
G7	Choking f. coefficient	360	[Slender c.] Q
G8	Choke line + [choking line]	361	[Straight c.] Q
G9	Sonic throat velocity	362	Converging c.
	[Unsteady f.]		Diverging c.
G10	Radial maldistribution of f.	363	Channel walls
G11	Circumferential m. of f.	364	C. flow + [Flow in channels] Q
G12	Flow division		Variation across c.
G13	Compressor air bleed	365	Large Peclet number
G14	Basic aerothermodynamic relations	366	
	Stalling	367	[Nozzles]
G15	[Mode of stalling] Q	368	Rocket n.
G16	Part speed operation	369	Shock tube n.
G17	Progressive stall		[Jet n.]
G18	Rotating stall	370	Sonic j.n.
G19	Progressive r.s.	371	Supersonic j.n.
G20	Abrupt stall	372	Exhaust n.
G21	Complete compressor stall	373	Compression n.
G22			
	[Phenomena]	374	[Shapes]
G23	Stalling point	375	Conical n.
G24	Stall limit line	376	Nearly c.n.
G25	Hysteresis effect		Converging n. +
G26	Unstalling h.	377	Convergent n.
G27	Compressor surge See also	378	Sonic c.n.
	Rotating stall	379	Choked c.n.
	S. line	380	Divergent n.
G28			Conically d.n.

J30	Slender b. + Thin b.	J93	Variation of p.d. with time
J31	S.b. theory (<u>see also</u> S.wing theory)	J94	Perigee air density + Air d. at p.
J32	Ward extension	J95	Apogee height
J33	Leeward b.	J96	Apogee distance change
J34	Windward b.	J97	Semimajor axis
J35	[Structures - non-aerodynamic] Fixed s.	J98	S.a. change
J36	Pivot	J99	Inclination
J37	Crossed flexure p. + Crossed spring p.	K1	Angle between sun and perigee
J38	Properties	K2	[Processes] Satellite o. changes
J39	Displaced p.	K3	Contraction + Orbital c.
J40	Strips	K4	Motion of s.o. perigee
J41	Strips crossing point	K5	Node line regression
J42	Centre of rotation		[Interplanetary flight conditions] <u>see</u> K98/L4
J43	Continuous beams	K6	[Flight performance] Aerodynamic characteristics
J44	Single span beams	K7	Aerodynamic problems
J45	Aluminium alloy 2024 T4	K8	[Dynamic response] Q
J46	[Flight] Supersonic f.	K9	Efficiency
J47	Hypersonic f.	K10	Vehicle requirements
J48	Interplanetary f. + I. missions	K11	Volume
J49	Escape from Earth's gravity field	K12	Design flexibility
J50	Target planet approach	K13	Growth flexibility
J51	Capture manoeuvre	K14	Reliability
J52	Motion prediction	K15	Structural requirements
J53	[Entry into planetary atmosphere] Entering + Entry into p.a. + Re-entry into p.a. + Planetary re-entry	K16	Weight ratio
J54	Tumbling entry	K17	Payload
J55	Transition from tumbling body motion	K17a	25 lb. p.
J56	Tumbling cessation	K18	Cruising performance
J57	Libration onset	K19	Handling qualities
J58	Entering Martian atmosphere	K20	Manoeuvre margin
J59	Entering Earth's atmosphere + Re-entering E.a. + a. re-entry	K21	[Engine performance] E. p. requirements
J60	Hypersonic re-entry	K22	Rocket e. performance
J61	Terminal phase	K23	Supersonic e. intake [p.]
J62	Trajectory + Flight t.	K24	E. reliability
J63	Transfer t.	K25	E. weight
J64	Interplanetary orbit transfer	K26	Duration of power
J65	Change of plane	K27	Restart capability
J66	Generalized trajectory	K28	Maximum velocity
J67	Flight path angle	K29	Trajectory velocity requirements
J68	Orbit	K30	Mass ratio
J69	Satellite o.	K31	Thrust
J70	Elliptic o.	K32	Gross t.
J71	Circular o.	K33	Jet t.
J72	O. eccentricity	K34	J.t. coefficient
J73	O. High e.	K35	Rocket j.t.
J74	Small e.o. + O.Small e.	K36	T. vector control
J75	[Characteristics] Velocity vector	K37	[By] Fluid injection
J76	Rate of contraction	K38	Gas i.
J77	At perigee	K39	Liquid i.
J78	Rate of change with time + Time variation	K40	Thrust augmentation
J79	Rate of decay	K41	T. loss
J80	Orbital period + Period of revolution	K42	T. coefficient
J81	Satellite p.		[Flight operations] Low speed problems
J82	Rate of change	K43	Airspeed + Flight velocity
J83	S. orbital period of revolution decrease	K44	Speed control
J84	Lifetime	K45	Airspeed holding
J85	Orbital eccentricity + Eccentricity	K46	Speed stability
J86	Perigee height	K47	Acceleration
J87	P.h. decrease	K48	Variations in a.
J88	P.h. oscillation	K49	A. during boost
J89	[By] Solar radiation pressure	K50	Deceleration
J90	[By] Luni-solar gravitational perturbation	K51	[By] Retrorocket
J91	Perigee distance	K52	Piloting
J92	P.d. change	K53	Glide path holding
		K54	Trajectory correction
		K55	[Flight attitude] Vehicle attitude + V. orientation
		K57	Attitude control
		K58	Trim attitude
		K59	Nose forward a.
		K60	Base forward a.
		K61	Statically stable a.
		K62	Body angle
		K63	Pitch
		K64	

K65	Pitching	L39	Equilibrium g.
K66	P. oscillating	L40	Reacting gases + Chemically active
K67	Pitchup		g. + Chemically reacting g.
K68	Arbitrary p. rate	L41	Gas particles
K69	Pitch stability	L43	Gas flow
K70	Damping in pitch	L44	Initiated by strong shock
K71	Pitch damping coefficient	L45	Low density f.
K72	D. in pitch moment	L46	Rarefied g.f.
K73	Rolling oscillation	L47	First collision regime
K74	Bang bang roll control + Non-linear roll c.	L48	Merged layer r.
	Steady roll	L49	Incipient m.l.f.
K75	Rolling derivative	L50	Viscous layer r.
K76	0° Yaw	L51	Navier Stokes r.
K77	30° Yaw	L52	Dissociated stream
K78	Yaw stability	L53	Gas expansion
K79	Yawing derivatives	L54	Air
K80	Yaw control	L55	Compressed a.
K81	Plunging oscillation	L56	Still a.
K82	Sinking + S. motion	L57	Heated a.
K83	Indicial s.m.	L58	High temperature a.
K84	S. speed and S. velocity	L59	500-15000 Degrees Kelvin
K85	Sudden change	L60	Dissociated air
K86	Spin rate	L61	Fully ionized air
K87	Sideslip	L62	Air components
K88	Mode of rotation of satellite	L63	Mol fractions
K89	R. about axis	L64	Energy of a.
K90	[Flight conditions]	L65	[Airflow] Q
K91	Altitude	L66	Airstream + Air current
K92	Flight a.	L67	Wind speed
K93	High a. condition	L68	Cold air expansion
K94	High a. flight	L69	[Hot air flow] Q
K95	A. of 300 nautical miles	L70	Equilibrium a.f.
K96	A. of 525 " "	L71	Correlated non-a. airflow
K97	Maximum a.	L72	[Other gases]
K98	[Interplanetary flight conditions]	L73	Nitrogen
K99	Environmental characteristic	L74	Atomic n.
L1	Zero gravity	L75	Oxygen
L2	Radiation	L76	Atomic o.
L3	Meteorites	L77	Gas mixture
L4	Meteoroids		Nitrogen-oxygen m.
	High vacuum requirements	L78	[Fuels]
L5	Fluid	L79	Ethylene
L6	Perfect f.	L80	Methane
L7	Compressible f.	L81	Mixed hydrocarbon compound f.
L8	Incompressible f.	L82	[Fuel] Burned in air
L9	Viscous f.	L83	Combustion product gas
L10	Nonviscous f.	L84	Equivalence ratio
L11	Heavy f.	L85	Flow properties
L12	Light f.	L86	[Atmosphere] Q + Atmospheres
L13	F. layer	L87	Oblate a.
L14	At rest	L88	O. rotating a.
	[Liquid]	L89	Spherically symmetrical a.
L15	Hydrodynamic problem	L90	Planetary a.
L16	Hydrodynamic	L91	Earth a.
L17	Water flow	L92	Upper a.
L18	H. stability	L93	Extreme u.a.
L19	Instability + Wave 1.	L94	F.I. layer
L20	Buoyancy	L96	150-230 Km. attitude
L21	Underwater	L97	210-660 " "
L22	Oil flow	L98	190-280 " "
L23	Surface oil	L99	[Study of atmosphere]
L24	Flow pattern	M1	[By] Satellite observation
L25	[Gases] Q	M2	Atmospheric model
L26	Ambient g.	M3	investigation
L27	Ideal g.		Rocket measurement
L28	Diatonic model gas		Altitude results
L29	ARDC 1956 Model atmosphere		
L30	Real g.		[Atmosphere properties,
L31	R.g. effect	M4	characteristics]
	[By condition]	M5	Scale height
L32	High temperature g.	M6	Atmospheric oblateness
L33	Rarefied g. condition	M7	Atmospheric rotation
L34	Dissociating g.		Atmospheric drag + A.
L34a	Dissociated g.	M8	resistance + Air drag
L35	Ionized g.	M9	[Effect of] Equatorial belt
L36	Electrically conducting g.	M9a	" " " Earth rotation
L37	Seeded g.	M9x	Air drag around orbit
L38	Initially undissociated g.	M12	[Pressure] .0001-100 atmospheres
		M13	Air density + Atmospheric d.
			Air d. profile

M14	D. scale height	M55b	Mach 5.8
M15	Logarithmic curve + L.d.c.	M55c	M.6
M16	Density results	M55d	M.6.2
M17	Variation of d.	M55e	M.6.8
M18	Seasonal d.v. + V. with season	M55f	M.6.86
M19	V. from day to night	M55g	M.9.6
M20	Daytime d.	M55h	M.10
M21	Diurnal d.v. + Diurnal v.	M55i	M.12
M22	[Effect of] Ultra-violet radiation absorption + Electromagnetic radiation	M55j	M.n. up to 14
M23	Nighttime d.	M55k	M.14
M24	Latitude variations + V. of latitude	M55m	M.19.6
M25	Relative variation with height	M55n	M.n. range 16.7-25.4
M26	Solar activity [effect on a.d.]	M55p	Escape speed + E. velocity
M27	Standard flux [" " "]	M55q	Re-entry v.
M28	Solar 20 c.m. radiation ["]	M55s	Super satellite speed
	[Study of air density]	M60	[Hypersonic layer] Q
M29	Gauge on satellite	M61	H. approximation
M30	Singly mounted gauge	M63	[H. simulation] Q
M31	Gauge errors	M64	H. similitude
		M65	H. experimental data
	[Influences on atmosphere]	M69	Free stream + F.s. flow
M32	Latitude	M70	F.s. Mach no.
M33	Season	M71	Subsonic f.s.
		M72	F.s. with Mach nos. near unity
M34	Fluid mechanics	M73	F.s. pressure ratio
M35	Flow + Fluid f.	M74	F.s. static pressure
M36	Flow surveys	M75	Main stream f.
M37	F. pattern	M76	Supersonic m.s.
M38	F. field	M77	M.s. Mach no.
M39	Body f.f.	M77a	External flow
M40	B.f.f. gradient	M77b	E.f. conditions
M41	Local f.		[Boundary layer]
M42	Low speed f. [M.O.3]	M78	Boundary layer (N64/063)
M43	Mach 0.	M79	Laminar f.
M44	Subsonic f. + S. speeds	M80	Natural l.f.
M45	[S. regime] Q	M81	Turbulent f.
M46	S. Mach no. + Subcritical M.n.	M82	T.f. field
M47	[Low s. speeds] Q + Low s.f.	M83	Steady f.
M48	High s.s. + High s.f.	M84	F. past parallel walls
M49	Mach 0.5 - 0.6.	M85	S.f. theory
M50	M.O.5	M86	Potential equations
M51	M.O.6	M87	S. motion characteristics
M52	M.O.7	M88	Uniform f.
M53	Transonic speed + T.f. [M.O.8-1.2]	M89	U.f. duration
M53a	T.s. range	M90	Unsteady f.
M53b	M.O.6-1.20	M91	Non-steady f.
M53c	M.O.65-2.20		Kirchoff discontinuities
M53d	M.O.7-1.1	M92	f. theory
M53e	M.O.8-1.15		Separation induced unsteady effects
M53f	M.O.8	M93	Adiabatic f.
M53g	M.1	M94	Isentropic f.
M53h	T.f. theory	M95	Equilibrium f.
M53i	High speed	M96	Non-equilibrium f.
M53j	Sonic s. + s.f.	M97	Non-E. stream
M53k	Speed of sound	M98	Slip f.
M54	Supersonic s. + S.f.	M99	Free molecule f. regime
M54b	Low s.s. + Low s.f.	N1	Shear f.
M54c	Mach 1.39	N2	Unbounded f.
M54d	M.1.62	N3	Poiseuille f.
M54e	M.1.75	N4	Couette f.
M54f	M.1.8	N5	Fully developed f.
M54h	[High s.M.no.] Q + High s.f.	N6	Accelerating f.
M54i	M.2	N7	Decelerating f.
M54j	M.2.02	N8	Separated f.
M54k	M.2.47	N9	Severely s.f.
M54m	M.2.49	N10	Intersecting f. fields
M54n	M.2.91	N11	Isobaric f.
M54p	M.3		
M54q	M. nos. above 3	N12	One-dimensional f.
M54s	M.3.3	N13	Quasi one-d.f.
M54t	M.4	N14	Q. one-d. f. equations
M54v	S. stream	N15	Two-d. f. + Plane f.
M54w	Ambient s.s.	N16	Two-d. f. field
M54x	Local s.f.	N17	Two-d. f. theory
M55	Hypersonic speed + Hypervelocity + H. flow [> Mach 5] + [H.Mach no.] Q + High flight M. nos.	N18	Three-d. f.
		N19	Three-d. motion
		N20	Three-d. f. theory

N21	Symmetrical f.	N94	Forward [s.i.b.l.s.]
N22	Axisymmetric f. [= 3-d. f.]	N95	Outboard
N23	Perpendicular f. field	N96	Laminar b.f.s.
N24	F. curvature + Curvature	N97	Separation of forward f.
N25	Conical f. field	N98	Rearward turbulent s.
N26	C. f. theory	N99	Transitional b.l. separation
N27	Generalized theory [of conical f.]	01	+ T. layer regime
N28	[Quasi-c. f.] Q	02	Turbulent b.l.s.
N29	Q-c.f. field	03	Vortex type b.l.s.
N30	[Q-c.f. theory] Q	04	Separation onset
N31	Parabolic f.	05	B.l.s. delay
N32	Non-viscous f. + Inviscid f.	06	B.l.s. position +
N33	Frictionless f.	06a	Separation positions
N34	Inviscid f. model	07	Separated region
N35	Outer [i.f.m.]	08	Extent [of s.r.]
N36	Viscous f. + Viscous + Viscid f.	09	S. point
N37	V. fluid motion + V.m.	010	Spanwise position of s.
N38	Incompressible f. + I. fluid f.	011	S. pressure
N39	I. fluid motion	012	B.l. reattachment + R
N40	I. + theory	013	B.l. viscosity effects
N41	Compressible f.	014	B.l. displacement + D.
N42	C.f. analysis	015	B.l.d. effect
N43	Continuum f. field development	016	B.l. interference
N44	C.f. model	017	B.l. shock wave interaction +
N45	C.f. theory	018	With s.w.
N46	Unidirectional motion	019	Generated externally
N47	Flow parallel to generators + In stream	020	Generated internally
N48	Forward f.	021	[By] Wedge
N49	Reversed f.	022	Wedge Generated s.w.
N50	Pure translational motion +	023	Upstream influence
N51	Potential f. theory	024	B.l. heat transfer
N52	Vertical translation	025	Laminar b.l. heating
N53	Rotational f.	026	[B.l. Properties]
N54	Non stationary f. + Transient f.	027	B.l. profile
N55	T. electrical f. [analogy]	028	B.l. thickness
N56	Low Reynolds no. f.	029	[Thick b.l.] Q
N57	High " " f.	030	B.l. momentum t.
N58	Newtonian f.	031	M.t. [of laminar b.l.]
N59	Slug f.	032	Artificial thickening
N60	Forced f.	033	Displacement t. + B.l.d.t.
N61	High temperature f.	034	B.l. form parameter
N62	[Hot f.] Q	035	Divergence boundary
N63	Linearized f. analysis	035a	B.l. stability
N64	Boundary layer + B.l. flow [should follow M77b]	036	Tollmien Schlichting theory
N65	B.l. theory (see also T57/58)	037	Shear wave resonances
N66	Polhausen solution	037f/s	B.l. control
N67	Wall b.l.	038	Blowing
N70	Laminar b.l. + L.b.l.f.	039	Blowing at knee
N71	Inner l.b.l.	040	Slot blowing + High
N72	L.b.l. thickness	041	velocity b.
N73	Turbulent b.l. + T.b.l.f.	042	Blowing etc. (from U66/76)
N74	Compressible b.l.	044	Distributed suction
N75	Incompressible b.l.	045	Suction at knee
N76	Fully attached f.	046	Transition promotion
N77	Stagnation b.l.	047	[By] Surface roughness
N78	3-dimensional b.l.	048	Two dimensional wire
N79	Ionized b.l.	049	Three dimensional disc
N80	Behaviour	050	Spanwise wire
N81	F. attachment see also R62	051	Sandpaper
N82	A. line	052	Distributed roughness
N83	B.l. growth	053	bands + R. band
N85	Thickening of b.l.	054	techniques
N86	B.l. traverses	055	R. band materials
N87	B.l. transition + Transitional b.l.	056	B. width
N88	[Natural t.] Q	057	Carborundum
N89	B.l.t. position	058	Ballotini glass bead
N90	B.l. separation + Flow separation +	059	Sublimation indicator
N91	F. with s. + S. + B.l.f.s.		Hexachloromethane
N92	Stalledf.		[Properties of roughness
N93	Low speed b.l.s.		elements]
	Shockwave induced b.l.s. +		Critical r. height
	S.i.b.l.s. + S.i. + S.i.s.		R. Reynolds number
			Degree of tunnel
			turbulence
			R. location
			R. shape
			Grain size + Particle
			size

060	Spacing between grains	P42	Propulsive j.
	[B.l. control research in	P43	Sonic p.j.
	wind tunnels]	P44	Hot p.j.
061	Complete aerofoil technique	P45	Reaction j.
062	Half aerofoil technique +	P46	Air j.
	Bump t.	P47	Subsonic a.j.
063	Lockheed bump	P48	Supersonic a.j.
	[Flow elements]	P49	High energy a.j.
064	Cocurrent streams	P50	Small a.j.
065	Streamtube	P51	Cold a.j.
066	Streamline + Flow s.	P52	Airblowing j.
067	Filament line	P53	Cold helium j.
068	Stagnation streamline	P54	Mixture of cold gases
069	S. position	P55	Hydrogen and carbon
070	Normal s. slope		dioxide
071	Induced by crossflow	P56	Two dimensional j.
072	Induced by change	P57	Axially symmetric nozzle j.
073	[in] Mass flow density	P58	Two-d. nozzle j.
077	S. walls	P59	Sonic nozzle j.
078	Stream filament theory	P60	Supersonic nozzle j.
079	Stream functions	P61	High temperature j.
080	Stokes stream function variable	P62	Ethylene heated j.
	[Sources, sinks, doublets]	P63	Sonic j.
081	Source sink methods	P64	Supersonic j.
082	Von Karman s.s.m.	P65	Side j.
083	Doublet superposition	P66	[Forward facing j.] Q
084	Supersonic d. equation		[see also Direction of
085	Source distribution	P67	emission Q1/7]
086	Doublet distribution	P68	[Exit] Q + Jet exit
087	Vortices	P69	Propulsive j. exit
088	Bound vortex	P70	Jet exit diameter
089	Trailing vortices	P71	[Exit position] Q
090	Horseshoe vortex	P72	J. location
091	Elementary h. vortex distribution	P73	Rocket j.l.
092	Vortex system	P74	Upstream exhaust
094	Individual v.		Downstream exhaust
095	Eddy region	P75	[Location of effects]
097	Stationary vortex pair	P76	Ahead of j.
098	Karman street	P77	Downstream of exit
099	Main vortex	P78	Location within j.
P1	Secondary vortex	P79	J. energy
P2	Chordwise v.	P80	J. force
P3	Spanwise v.	P81	J. Mach no.
P4	Rectangular vortex	P82	J. Reynolds no.
P5	Co-rotating v.	P83	J. total pressure
P6	Counter rotating v.	P84	J. static pressure
	[Processes and properties]	P85	J. stagnation pressure +
P7	Vortex flow	P86	J. stagnation
P8	Vortex formation	P87	J. pressure ratio
P11	Vortex growth	P88	J. structure
P12	Vortex movement	P89	J. wavelength
P13	Main vortex displacement	P90	J. boundary
P14	Eddy separation		J.b. curvature
P15	Vorticity interaction domain	P91	Initial inclination
P16	Vorticity interaction theory	P92	[to exit shock]
P17	Vortex distribution	P93	J.b. shape
P18	Eddy frequency	P94	J. size
P19	Location of part span vortices	P95	J. diameter ratio
P20	Vortex paths	P96	J. slot width
P21	V. p. location	P97	Specific heat of j.
P22	Vortex sheet position	P98	Exhaust ratio of s.h.
P23	Vorticity variable	P99	Exhaust density
P24	Vorticity contours		Exhaust velocity
P25	Vortex strength		Jet noise
P26	Main v.s.	Q1	[Direction of emission]
		Q2	see also P66
P27	Jet		Exhausting + Issuing
P28	J. stream	Q3	E. normal + Exiting n. +
P29	Free j.	Q4	E. perpendicularly
P30	Axisymmetric f.j.	Q5	E. laterally
P31	J. exhaust + E.j.	Q6	E. countercurrent
P32	Hot e.j. + Hot j.e.	Q7	Spanwise direction
P33	Hydrogen burned in air	Q8	Beneath wing
P34	Rocket e.j. + R.e.	Q9	Forward from nose
P35	Supersonic rocket	Q10	Rocket j. firing
P36	Propulsive j.e.	Q11	J. viscous scavenging phenomena
P37	Rocket j. + Rocket [producing j.]	Q12	J. interference + J.i. phenomena
P39	Supersonic retrorocket	Q13	Rocket j.i.
P40	Simulated r.	Q14	Jet exhaust i.
P41	Jet engine [producing j.]	Q15	J.i. effects
			Exit shock
			E.s. wave angle

Q16	J.s.w. angle	Q88	Terminal position
Q17	J.s.w. apex location	Q89	S.w. position divergence
Q18	J. wake	Q90	Sonic point location +
Q19	Propulsive j.w.		Location of s.p. + Sonic p.
Q20	J. mixing		+ Position
Q21	Compressible j.m.	Q91	Stand-off distance +
Q22	Isoenergetic j.m.		s.s-o.d. + S.detachment
Q23	Turbulent j.m.		distance
Q24	Production of species	Q92	Shock Mach no.
	[in reacting gases]	Q93	Range of primary s.m.n.
Q25	Net mass rate	Q94	High s.m.no.
Q26	Continuity of species	Q95	Low s.m.no.
Q27	Chemical reaction	Q96	Air s. velocity
Q28	Concentration profiles	Q97	S. equilibrium temperature
Q29	[Effect of] Rocket thrust	Q98	[Shock layer] Q
	[Study]	Q99	Entropy layer
Q30	[Use of] Sting balance	R1	Detached s.l.
	measurement	R2	Thin s.l.
Q31	Jet simulation	R3	Thin s.l. theory
Q32	[By] Helium s.	R4	Shock wave surface
	[Waves]		[Properties]
Q33	Kelvin Helmholtz w.	R5	S. layer luminosity
Q34	Riemann w.	R6	S.l. luminous gas region
Q35	Tollmien Schlichting w.	R7	Equilibrium s.l.property
Q36	Reflected w. + Waves reflected		[Processes]
Q37	Reflected from contact surface	R8	S.w. formation
Q38	Wave reflection interference	R9	Time of appearance
Q39	Flexural w.	R10	S.w. development
Q40	Longitudinal w.	R11	S.w. movement
Q42	Compression w.	R12	S. reflection
Q43	C.w. resonances	R13	R. of primary s.
Q44	Expansion w.	R14	Attenuation of reflected s.
Q45	Reflected head	R15	Attenuation of s.w.
Q46	Originating	R16	[Analysis by] Conservation
Q47	[at] Main diaphragm		of mass equation
	[of shock tunnel]	R17	Transonic flow attachment
Q48	Shock w. + S.	R18	S. displacement
Q49	Strong s.w.	R19	Conical s. separation
Q50	Mach w. + M. line	R20	S. transition zone
Q51	Infinitesimally thin s.w.	R21	S.w. interaction
Q52	Forward s.w.	R22	Aerodynamic forces + [Airforces] Q
Q53	Rear s.w.	R24	Aerodynamic inertia
Q54	Terminal s.w.	R25	A. normal f. + Normal f.
Q55	Rate of movement	R26	Reaction n.f.
Q56	Outboard s.w.	R27	Incremental n.f.
Q57	Normal s.w.	R28	Spanwise coordinate
Q58	Oblique s.w. + O.s.w.system	R29	Axial f.
Q59	Detached s.w.	R30	A. body f.
Q60	Attached s.w. system	R31	Centrifugal f.
Q61	Hypersonic s.w.	R33	Side f.
Q62	Incident s.	R34	Tangential f.
Q63	Oxygen s.w.		
Q64	O.s. front	R35	Retarding f.
Q65	Nitrogen s.w.	R36	Deceleration f.
Q66	N.s. front	R37	Newtonian impact f.
Q67	Argon s.w.	R39	Body f.
Q68	Spherical s.	R40	F. coefficient
Q69	Cylindrical s.	R41	Static aerodynamic
Q69a	Mach cone		characteristics
Q70	Primary s.	R42	Longitudinal aerodynamic
Q71	Reflected s.		characteristics + Longitudinal aerodynamic coefficients
	[Shock wave phenomena]	R43	Axial i.c.
Q72	Rankine-Hugoniot s. relations	R44	Chord f.c.
Q73	Mach angle	R45	Normal f.c.
Q74	Deflexion angle	R46	Incremental n.f.c.
Q75	Expansion zone + E. region	R47	Force determination
Q76	Supersonic e.r.	R48	Force measurement
Q77	Initial e.r. + Prandtl-Meyer region	R49	Loading + Aerodynamic load +
			A. loading
Q78	Flow behind a.s.w. +	R50	Chordwise load + C.loading
	Flowfield behind + Region	R51	Spanwise loading
	behind shock + Upstream of s.w.	R52	Uniform s.l.
	Behind normal s.	R53	Subsonic span loads
Q79	Ahead of s.w.	R54	Total span loads
Q80	S.w. pattern	R55	Symmetrical loading
Q81	S.w. structure	R56	Model loading
Q83	S.w. shape	R57	Induced load
Q84	S. curvature	R58	Continuous load + C. loading
Q85	S.w. thickness	R59	Representation [by]
Q86	S.w. strength + S.s.	R60	Patterns of horseshoe
Q87	S.w. location + S. positions		vortices

R61	Unsteady loads	
R62	Vanishing load [see also Flow attachment]	S36
R63	Load distributions	S37
R65	Lift	S38
R66	Starting l.	S39
R67	Transient l.	S40
R68	Final l.	S41
R69	Maximum l.	S42
R70	Zero l.	
R71	Unsteady l.	S44
R72	[U.l. distribution] Q	S45
R73	Indicial l.	S46
R74	Non-linear l.	S47
R75	Circulatory l.	S48
R76	Compressible l.	S49
R77	Incompressible l.	S50
R78	Induced l.	S51
R79	Incremental l.	S52
R80	Body l.	S52a
R81	Section l.	S53
	[Lift phenomena]	S54
R82	Lift effect [see also Vortex system 092]	S55
		S56
R83	L. slope	S57
R84	Sectional l.s. + Section l. curve	S58
R85	Distribution of s.	S59
R86	Lift-curve slope	S60
R87	Lift-drag ratio	S61
R88	Maximum l.d.r.	S62
R89	L. vector	S63
R90	Phase angle	S64
R91	Magnitude	S65
R92	L. distribution	S66
R93	[Calculation by] Rounding off rule	S67
R94	Spanwise l.d.	S68
R95	D. of pivoted points	S69
R96	L. interference	S70
R97	Total l. response	S71
R98	Frequency response in l.	S72
R99	Indicial response in l.	S73
S1	Apparent mass effects	S74
S1a	Vertical acceleration	S75
S2	Lift coefficient + Lifting c. + C. of l.	S76
S3	L.c. divergence	S77
S4	Oscillatory l.c.	S78
S5	Asymptotic behaviour	S79
S6	Total l.c. + Coefficient of t.l.	S80
S7	Trim l.c.	S81
S8	No-lift moment coefficient	S82
S9	Indicial l. function + Unsteady l.f.	S83
S10	Wagner i.l.f.	S84
S11	Theodorsen alternating l.f.	S85
S12	Kussner function	S86
	[Determination, etc.]	S87
S13	Downwash integral equation	S88
S14	Classical wave equation solution	S89
S15	Kirchoff formula	S90
S16	Drag + Retarding force	S91
S17	Friction effects	
S18	Model d.	S92
S19	Total d.	S93
S20	Total d. coefficient	S94
S21	Profile d. coefficient	S97
S22	Form d.	S98
S23	Skin friction + S.f.d.	S99
S24	Average s.f. coefficient	T1
S25	Distribution	T2
S26	Viscous d. + V. force	T3
S27	Pressure d. (see also Form d.)	T4
S28	Normal p.d.	T5
S29	Wave d.	T6
S30	Lift dependent d. + Induced d.	T7
S31	L.d.d. component	T8
S32	Induced d. correction	T9
S33	Resultant d.	T10
S34	D. penalty	T11
S35	Excess d.	T12

[Drag phenomena]	
D. coefficient	
Profile d.c.	
Total d.c.	
D. reduction	
Minimum-d.design	
D. rise	
D. reversibility theorem	
[Other loads]	
[Blast + Gust] Q	
Sinusoidal gust	
Gust penetration	
P. of sharp edged g.	
P. of s.e. normal g.	
Moments + Aerodynamic m.	
Pitching m.	
Aerodynamic centre	
A.c. characteristics	
Local s.c.	
P.m. coefficients	
P.m. curves	
P.m. derivatives	
P.m. reversal	
Rolling m.	
Frequency response in moment	
Indicial response in moment	
M. function	
Indicial m.f.	
M. vector	
M. coefficient	
Aerodynamic balance	
Pressure + P. load	
Total p.	
T. head measurement	
T.p. ratio	
Static p.	
S.p. survey	
S.p. ratio	
S.p. measurements	
S.p. gradient	
S.p. distribution	
Dynamic p.	
Impact p. survey	
Base p.	
Two-dimensional	
B.p. measurement	
Kink p.	
Stagnation p. + S. point p.	
S. pressure coefficient	
Flight s.p.	
Centre of p.) see	
Spanwise c.o.p.) P. char-	
Chordwise location) acteri-	
stics (S92)	
Induced p.	
Constant p.	
Oscillating p. field	
Oscillatory p. decay	
Oscillatory p. plotting	
[Pressure characteristics]	
see also S85/86	
P. field	
P. coefficient	
P. ratio	
P. distribution + P.profile	
P. gradient	
Self-induced	
Streamwise	
Body p.d.	
Chordwise p.d.	
Longitudinal p.d.	
Radial p.d.	
Sinusoidal p.d.	
Deflexion	
Travelling p.d.	
Prescribed p.d.	
Tangential p. gradient	
Vanishing p.gradient	
Zero p. gradient	

T13	P. variation + P. Fluctuation	T78	Discrete horseshoe vortex
T14	+ P. difference		[method] + Finite step
T15	P. divergence	T79	Shock expansion method
T16	P. reduction + Fall of p.	T79a	Blasius equation
T17	Base bleed		[Interference parameters]
T18	P. recovery	T80	Nonsteady perturbation
T19	P.r. reduction		potential
T20	P. rise	T81	Perturbation velocity
T21	Pressure determination		potential
T22	P. measurement	T82	Relaxation time effects
T23	P. plotting	T83	Interaction force
T24	P.p. model	T84	I.f. ratio
T25	P. tappings	T85	Mixing flow + Fluid m. +
T26	Photorecording manometer		M. process
	Multiple tube manometer		Constant pressure m.
	[Aerodynamic processes and properties]	T86	Laminar m.
T27	Flow development	T87	Turbulent m.
T28	Control	T88	Stagnation flow
T29	Longitudinal o.	T89	S. air f.
T30	Vertical plane c.	T90	S. region
T31	Lateral o.	T91	Axisymmetric s.r.
T32	Directional c.	T92	S.r. regime I
	[Agents]	T93	S.r. regime II
T33	Projection of jet	T93a	S. point + S.p. flow
T34	Jet reaction control + Reaction	T94	Rear s.p.
	type j.c.	T95	S. conditions
T35	Stability + Aerodynamic s.	T96	S. gas state
T36	Flow s.	T97	S. temperature
T37	Static s.	T98	High s.t.
T38	S.s. characteristics	T99	S.t. from 2400-3600°F
T39	S.s. derivatives	T99a	S.p. heating
	[Dynamic s.]	T100	Flight s. enthalpy
T40	D.s. characteristics	T101	Choking
T41	D.s. derivatives	T102	Choking Mach no.
T42	Longitudinal s.	U1	[Choked tunnel] Q
T43	Lateral s.	U4	C. wind t.
T44	Directional s.	U5	C.w.t. tests
T45	[Aerodynamic derivatives] Q	U6	Downwash
	+ Stability d.	U7	Induced d.
T46	Direct a.d.	U8	Total d.
T47	Indirect a.d.	U9	Centre line d.
T48	Rotary d.	U10	Steady d. conditions
T49	S. control	U11	D. distribution
T49a	[Stabilization] Q	U12	Periodic d.d.
T50	Destabilizing effect	U13	[Upwash]
T51	Disturbance + D. to flow	U15	U. field
T52	Distortion	U16	U. distribution
T53	Downstream d.	U17	Sidewash
T54	Small flow d.	U18	Spanwise outflow
T55	Infinitely small d.	U19	Wake + W. flow
T56	Small d. theory + Small	U20	W. width divergence
	perturbation theory	U21	Development of circulating w.
T57	Inviscid s.d.t. <u>see also</u>	U22	External slipstream
	B.L. theory N65	U23	Turbulent
T58	Hypersonic s.d.t. <u>see also</u>	U24	Surge
	B.L. theory N65		[Flow attributes]
T59	Interference + Interaction		Velocity
T60	Interference load	U25	Induced v.
T61	Aerodynamic interaction effect	U27	Vertical i.v.
	+ Interaction effects + Interference	U28	Vertical v.
	effects	U29	Gas flow v.
T62	Second order interference	U32	V. potential
T63	Wake interference effects	U33	Symmetric v.p.
T64	Viscous interaction	U34	Anti-s.v.p.
T65	Support system interference	U35	Acceleration p.
T66	[Interaction between] Parallel	U36	V. distribution + V. variation
	streams	U37	V. gradient
T67	Blockage interference	U38	V. profile
T68	B. effects	U39	Linear v.p.
T69	Solid b.	U40	Jeffery-Hamel solution
T70	Wake b.	U40a	Quasi-conical v. field
T71	B. ratios	U41	V. measurement
T72	B. correction	U42	M.f. fluctuation[<u>see also</u>
T73	Mass flow method	U44	Sound waves]
T74	Reflection + Reflected	U45	Mass flow profile
T75	Multiple reflection	U46	Flow parameters
T76	Ground effect + Proximity	U47	Mach number
	to ground	U48	Stream l.n.
T77	Adverse g.e.	U49	Local l.n.
	[Methods of determination, etc.,	U50	Increasing l.n.
	of interference]	U53	M.n. profile

U54	Prandtl number	V21	Aerodynamic f. derivatives
U55	Reynolds number	V22	Two-dimensional f.d.
U56	Low R.n.	V23	Subsonic f.d.
U56a	R.n. less than 40	V24	F. frequency
U56b	R.n. 40	V25	F. speed
U56c	R.n. 44	V26	Critical f.s.
U57	Local mesh R.n.	V27	F. boundaries
U58	Hartmann number	V28	Margins of safety
U59	Flow coefficient	V29	F. calculation
	[Circulation]	V30	F. testing + F. tests
U60	C. function	V31	Variable medium
U61	C. control	V32	F. model
U62	[by] Laminarization	V33	Construction
U63	Reduction of c.	V34	M. density ratio
U64	Vorticity	V35	M. stiffness [=bending s.]
	[Injection]	V36	M. weight ratio
	[Characteristics]	V37	Reduction m. elasticity
U66	Blowing pressure 037f	V38	Mass loading
U67	Injected gas + Injected gas stream 037g	V39	Increased
U68	Molecular weight 037h	V40	Modal analysis
U69	Specific heat ratio 037i	V41	F. precipitation
U70	Accommodation height 037j	V42	Static testing
U71	Injected liquid 037k	V43	Modified strip analysis + Rayleigh type s.
U72	Primary gas 037m	V44	Dietze's method
U73	Exothermic reaction 037n	V45	Vibrational modes + Oscillation m.
U74	Magnification factor 037p	V46	Uncoupled v.m.
U75	Small rate of heat addition 037q	V47	Normal m. + N.m. of v.
	Specific impulse 037s	V48	Oscillating in elastic m.
U76	[Fluid properties]	V49	Oscillating in rigid m.
	Density	V50	Body m.
U77	D. distribution	V51	Rayleigh oscillation m.
U78	D. variation + Change of d.	V52	Selected m.
U79	D. ratio	V53	Sound waves <u>see also</u> Mass flow fluctuation
U80	Low d.	V54	Aerodynamic noise
U81	Compressibility	V55	Subjected to + Exposed to +
U82	C. effects	V56	Engine noise
U83	Viscosity	V57	Jet e.n.
U84	[Characteristics]	V58	Sound propagation
U85	[v.-Temperature law] Q		Acoustic radiator
U86	[Linear v.-t. solution] Q		[Vibration characteristics]
U87	Viscous effects		[<u>see also</u> Stability]
U88	Shear	V59	Oscillatory coefficients
U89	Coefficient of v.	V60	O. aerodynamic derivatives
	[Aeroelasticity]	V61	Measurement of reaction
U90	Static a.	V62	[Measurement by]
U91	Oscillatory motion + Oscillating		Logarithmic circuit
	[<u>see also</u>] W50	V63	Aerodynamic stiffness
U92	Electrical excitation + Electrically excited oscillations	V64	derivatives + S.d.
U93	[at] Phase resonance	V65	Degrees of freedom
U94	Electrical self-excitation	V66	[Frequency]
U95	[with] Coupled freedoms	V67	Natural frequencies
U96	Elastic excitation	V67a	Reduced frequency
U97	Slowly propagating o.	V68	Frequency parameters
U98	Fast propagating o.		F.p. less than .02
U99	Decaying o.	V69	F. measurement
V1	Sinusoidal sinking o.		[Phase]
V2	Continuous o.	V70	P. measurement
V3	Oscillating harmonically	V71	[Amplitude]
V4	Sinusoidal vertical o.	V72	A. measurement
V5	Asymmetrical o.	V73	Excitation
V6	Flapping o.	V74	Damping
V7	Torsional o.	V75	Internal d.
V8	Bending o.	V76	Structural d.
V9	Sinusoidal o. displacement	V77	Aerodynamic d.
V10	Neutral o.	V78	Phugoid d.
V11	Free o. + Free vibration	V79	A.d. coefficient
V12	Angle of attack o.		A.d. derivatives + D.d.
V13	Resonant vibration	V81	Buzz
V14	Inexorable forcing	V82	[Divergence]
V15	External rigid drive	V83	D. dynamic pressure
V16	Internal rigid drive		Buffeting
	[Flutter]	V84	B. boundary
V17	F. oscillations + Flutter	V85	[Research]
V18	Bending type f.	V86	Systematic procedure
V19	High speed f.	V87	Kernel function
	[Characteristics]	V88	Piston theory
V20	F. coefficients	V89	Reciprocal relations [method]
			V. testing + V. tests
			Reference material

V90	Dampometer	W47	9% RAE 101 streamwise s.
V91	Displacement pickups	W48	5% RAE 101 streamwise s.
V92	Force pickups	W49	NACA 65A 004 s.
V93	Pressure pickups		
	[Aerodynamic reference parameters]	W50	[Mechanics]
V94	[Angle of incidence] Q + Angle of attack + Arbitrary a.of.a + Incidence	W51	Motion
V95	A. of a. correction + A.of i.o.	W52	Transient m.
V96	Zero a. of a.	W53	Translation
V97	Zero model incidence	W54	Rotation
V98	Moderate a. of a.	W56	Rotational modes
V98a	Angle of a. range 0 - 65°	W57	[Oscillation, vibration <u>see</u> U91]
V99	Incidence range 0 - 10°	W58	Momentum deficiency profile
V99a	A. of a. range 4 - 18°	W59	Gravity
W1	High a. of a. + High incidences + Large a. o. a. <u>see also</u> F54	W60	Influence of gravity
W2	Uniform a. of a.	W61	Forces
W3	Increasing i.	W62	Load + Applied f.
W4	A. of a. distribution	W63	[Pressure]
W5	Vertical position [of tail]	W64	Random p. loading
W6	Planform	W65	Compression + C. load
W7	Sweep angle + Sweep	W66	Tension + T. load
W8	Angle of sweep range of 0-75 degrees	W67	Bending + B. load
W9	Angle of sweepback	W68	Thermal stress
W9a	S. a. 55°	W69	Elastic range
W10	S. a. 60°	W70	Plastic range
W11	79.5° s.	W71	Maximum stresses
W12	Aspect ratio	W72	Loads, Longitudinal
W13	Zero a.r.	W73	Loads, Concentric axial
W13a	Aspect ratio 1	W74	Loads, One-dimensional
W13b	" " 2	W75	[Stress-strain phenomena]
W13c	" " 2.823	W76	Weakening
W13d	" " 2.828	W77	Compression buckling
W13e	" " 6.1	W78	Post-buckling
W14	Taper ratio	W79	Torque
W14a	T.r. .333	W80	Rotational stiffness
W15	Thickness	W81	Bending stiffness
W16	Thickness/chord ratio	W82	Torsional stiffness
W16c	T.c.ratio about 5%	W83	Torsional rigidity
W16d	" 6%	W84	Modules of elasticity
W16e	" 16%	W85	Time dependent
W16f	" 24%	W86	Mode shapes
W17	Thickness distribution	W87	Stress distribution
W18	Twist	W88	S. frequency d.
W19	Dihedral angle	W89	Spanload d.
W20	A. of d. range 0 - 30 degrees	W90	Steady state d.
W20a	4.5 d.a.	W91	[Method of determining s.d.]
	[Span]	W92	Weissinger method
W21	Spanwise	W93	Downwash matrix
W22	Finite s.	W94	Elasticity matrices
W23	Half-s. model	W95	Aerodynamic twist matrices
W24	Part s.	W96	Structural twist matrices
W25	Body size	W97	Plastic analysis
W26	B. diameter	W98	Stress power spectra
W27	B.d. ratio	W99	[Prediction by]
	[Chord]	X1	Model response
W28	Chordwise	X2	Statistical superposition
W29	C.coordinate	X3	Powell theory
W30	Model c.		Test specimens
W31	C. ratio		Instrumentation
W32	Camber		Material control
W33	Conical c.	X4	Coupon test
W34	C. correction	X5	Magneto-fluid mechanics
W35	C. distribution	X6	Electric body force
W36	Centre of gravity location	X7	Electro-magnetical induced forces
	[Section]	X8	[Thermal phenomena]
W38	Aerodynamic design	X9	[Heat equation] Q
W39	Cross section + Body c.s. + Arbitrary c.s.	X10	Thermal equilibrium
W40	Percentage of solid c.s.	X11	Temperature
W41	Peaky s.	X12	Ambient t. + Local stream t.
W42	Roof-top s.	X13	Flame t.
W43	Midspan s.	X14	Room t.
W44	Sectional shape + S. shape	X15	Transient t.
W45	S. thickness	X16	Constant t. + T. uniform
W46	R.A.E. 101 s.	X17	Recovery t.
W46a	10% RAE 101 s.	X18	Elevated t.
		X19	Maximum t.
			Reduced t.
			T. dependent values
			T. inversion
			T. variation
			Unit triangle v.

X20	T. distribution + T.profiles +	X94	Quartz protection shield
X21	T. history	X95	Heat sink
X22	Transient t.d.	X96	Thicker outer skin
X23	One-dimensional t. gradient	X97	Copper
X24	Zero β . gradient	X98	Graphite
X25	T. gradients, Transverse	X99	Molybdenum
X26	T. Linear gradient	Y1	Tungsten
X27	Equilibrium t.	[Heating]	
X28	T. measurement	Y2	Convection h. + Convective
X29	Spectrum line reversal		h. + Convection + C. of
X30	Double light beam		heat + Convective heat
X31	Single light beam		transfer
X32	Carbon arc	Y3	Forced c.h.
X33	Sodium line reversal + S.l.r. method	Y4	Convective heat transfer
X34	Oscillograph		rate
X35	Interference filters	Y5	Frictional h.
X36	Sodium chloride + Salt	Y6	Aerodynamic h.
X37	Sodium iodide	Y7	A. laminar h.
X38	Specific heat	Y8	A.h. rate + H.r.
X39	S.h. ratio parameters 1.10-1.67	Y9	Laminar a.h.r.
X40	S.h. variation	Y9a	Green function
X41	Conductivity + Thermal c.		[integration with]
X42	Variable c.	Y10	H. at edge
X43	Coefficient of t.c.	Y11	Local h. rate
X44	Emissivity	Y12	Conduction + Heatflux +
X45	High radiative c.		Heat flow + Heat Conduction
	[Thermal processes]	Y14	Average h. flow
	[Expansion]	Y15	One-dimensional h.c.
X46	Coefficient of t. expansion	Y16	Transient c.
	[Change of state]	Y17	Heat flux distribution
X47	Combustion erosion	Y18	H.c. equations
X48	Sublimation erosion	Y19	Transient h.c.e.
X49	S. rate	Y20	Diffusion
X50	Ablation + Surface a.	Y21	[effect of] Charged
X51	A. rate + Rate of removal	Y22	particles
X52	A. r. sensor	Y23	Radiation h. transfer
X53	Variable capacitance sensor	Y24	Heat release
X54	Effective heat of a.	Y25	Total h. transfer
X55	Ablating materials	Y26	Transient h.t.
X56	Evaporation + Vaporization	Y27	Steady h.t.
X57	Evaporating into main stream	Y28	Frozen h.t.
X58	Thermal distributions	Y29	H.t. coefficient
	[Thermodynamic phenomena]	Y30	H.t. rate
X60	Thermodynamic problem	Y31	Large gross h.t.r.
X61	Thermodynamic properties	Y32	Small net h.t.r.
X62	[Thermodynamic equilibrium] Q	Y33	Local h. flow rates
X63	Enthalpy	Y34	Laminar [local heating r.]
X64	Total e.	Y35	Laminar h.t. distribution
X65	Intermediate e.	Y35p	Kinetic theory
X66	I.e. approximation	Y35q	K.t. solution
X67	Newtonian intermediate	Y35r	Energy equations
	e.a.	Y35s	Equations of motion
X68	Mean e.	Y35t	Momentum e.
X69	E. functions	Y35u	E. of continuity
X70	Recovery e.	Y35v	Perfect gas theory
X71	Stream e.	Y35w	Equations of state
		Y35x	[Chapman-Enskog theory] Q
X72	E. layer	Y36	Dissociation
X73	Recovery factor	Y37	Dissociating fraction +
X74	Effective heat capacity		Dissociation f.
X75	Entropy	Y38	Ambient atom mass fraction
X76	E. gradient	Y39	Amount of d.
X77	Isentropic exponent	Y40	Freestream d.
X78	Specific gas constant	Y41	D. energy
X79	Heat transfer	Y42	Rate of d.
X80	[Heat input] Q	Y43	R. constant
X81	Cooling	Y44	D. profiles
X82	Strong surface c.	Y45	D. scaling law
X83	Radiation c.	Y46	Model scaling
X84	Back r.	Y47	D. equilibrium
X85	R. effects	Y48	E. composition
X86	Transpiration c.	Y49	Complete e.
X87	T.c. results	Y50	Molecular d.
X88	Ablation c.	Y51	Ionization
X89	Downstream cooling effects	Y52	I. effect
	[Cooling agents]	Y53	I gauge
X90	Shielding mechanism	Y59	Non equilibrium d.
X91	Polymers (Teflon type)	Y60	Deviation from chemical e.
X92	Teflon material	Y61	Non-e. effects
X93	T. heat shield	Y62	Frozen flow + F.f. conditions
		Y63	Freezing of flow + Freezing
			of a flow of gas

Y64	Chemically f.f.	Z30	[Solid wall t.] Q + S.w.w.t. +
Y65	Approaching c.f.f.		S.w.w.t. tests
Y66	Approaching vibrationally f.f.	Z31	Slotted wall w.t. test
Y67	Across bow shock	Z32	Variable density w.t.
Y68	Radiative disequilibrium	Z33	[Low density w.t.] Q
	[Recombination]		[Parts]
Y54	Atomic r.	Z34	Working section + Test section
Y55	Molecular r.	Z35	W.s. with open jet
Y56	Chemical r.	Z36	Closed throat w.s. + Closed
Y57	Rate of r.		tunnel w.s.
Y58	Rate of reaction	Z37	Slotted w.s.
	[Collision phenomena]	Z38	W.s. size
Y69	Collision	Z39	Test section wall
Y70	Local mean free path	Z40	W.t. walls + T.w. + Wall of tube
Y71	Free molecule limits	Z41	[Wall divergence] Q
Y72	Emitted molecular density	Z42	Slotted liners
	distribution	Z43	Modified liners
Y73	Transport properties	Z44	[Nozzle] see Ducts in general
Y74	Transport processes	Z45	Driving tube
Y75	Transport coefficients	Z46	Upstream of nozzle entry
		Z47	Piston
Y76	Research and investigation	Z47h	Test gas
Y77	Evaluation	Z48	[Hypersonic test medium] Q
Y78	Determination	Z49	[Methane air combustion] Q
Y79	Measurement	Z50	Loss
Y80	[Measured] Q		Behind interface
Y81	[Measuring method] Q	Z51	Non perfect gas
Y82	Experiment + Experimental investigation	Z52	Dry air
	+ Experimental test + Test	Z53	Liquefaction point
Y83	Experimental determination +	Z54	Freon gas
	Experimental measurement	Z55	Apparatus + Equipment
Y86	Flight test + [During flight] Q	Z56	Support gear
	+ Experimental f.t.	Z57	Driers
Y87	Simulated f.t.	Z58	Models
Y88	Continuous measurements	Z59	Rigid m.
Y89	Telemetering system	Z60	Compreg wood m.
Y90	Prediction in flight	Z61	Pine Balsa m.
Y92	Ground testing	Z62	Magnesium m.
Y93	Model test		[Model characteristics]
Y94	Simulation	Z63	Model flexibility effects
		Z64	Model dimensions + M. size
Y95	Experimental data + E. results +	Z65	[Mounted off-centre] Q
	Results + Test data		[Location in tunnel]
Y96	Wind tunnel data	Z66	End of tube
Y97	Tables of results	Z67	Open area of walls
Y98	Flight test data	Z68	Near model base
Y99	[Facilities] Q	Z69	Along model
Z1	Wind tunnel		[Characteristics]
Z2	W.t. tests + W.t. experiment +	Z70	Cross sectional size
	W.t. investigation	Z71	Cross sectional shape
Z3	W.t. determination + W.t. measurement	Z72	Length of tube
Z4	Transonic w.t.	Z73	Tunnel weight
Z5	T.w.t. results	Z74	Tunnel speed
Z6	N.P.L: 18 x 14 w.t.	Z75	Power requirements
Z7	Supersonic w.t.	Z76	Running time + Flow duration
Z8	Hypersonic w.t. + Hypervelocity w.t.	Z77	[Short running time] Q
Z9	Hypersonic shock t. + H.s.tube	Z78	Experimental testing time +
Z10	H.s.tunnel tests		Testing time
Z11	Driven	Z79	Theoretical t.t. + Ideal time
Z12	[by] Ignited mixture	Z80	Actual time
Z13	Stoichiometric m.	Z81	Tunnel wall pressures
Z14	Oxygen and hydrogen m.	Z82	Bursting pressure ratio
Z15	M. with excess of helium	Z83	[with] Removal of damping plate
Z16	Hypersonic gun tunnel	Z84	Reservoir temperature
Z17	Shock tube + Tube		[W.T. interference etc.
Z18	S.t. experiment + S. tunnel		see Walls...]
	experiment	Z85	Corrections
Z19	Straight through s. tunnel		[Visualisation methods]
Z20	Reflected s. tunnel	Z86	Oil flow study
Z21	[driven by] Unheated hydrogen	Z87	Oil flow pattern
	driving air	Z88	Surface o.f.p.
Z22	Constant diameter s.t.	Z89	Photographs + Photographic
Z23	[High enthalpy w.t.] Q		record + Photographic study
Z24	Blowdown tunnel tests	Z90	Photomultiplier
Z25	Arc discharge w.t.	Z91	Schlieren photographs
Z26	Cascade t. test	Z92	Shadowgraph study
		Z93	S. measurement
Z27	Circular t.	Z94	Hot wire measurement + H.w.
Z28	Closed octagonal t.		anemometer
Z29	Closed rectangular t.		

Z95	Blunt nosed Pitot tube	ZA55	[Stability]
Z96	Spherical pendulum	ZA56	Asymptotic stability
Z97	Gyroscopic pendulum	ZA57	Routh-Hurwitz criterion
		ZA58	Phase space + State space
Z98	[Theoretical work] Q + T.study +	ZA59	Partial d.e.
	T. investigation + Theory	ZA60	[Difference equation] Q
Z99	[Assumption] Q	ZA61	[Navier Stokes d.e.] Q
ZA1	[Comparison] Q + Analogy	ZA62	Finite d.e.
ZA2	Prediction + Theoretical p.	ZA63	F.d. methods
ZA3	[Criterion] Q	ZA64	F.d. approximation
ZA3x	Linearized theory	ZA65	Eigenvalue problems
ZA3y	Approximate theory	ZA66	Integral equations
ZA4	Zero order theory	ZA67	Generalized i.e.
ZA5	Second order t.	ZA68	Abel i.e.
ZA6	[Rigorous t.] Q	ZA69	Birbaum i.e.
ZA7	Potential t.	ZA70	Possio i.e.
ZA8	Modified Newtonian t.	ZA71	Prandtl i.e.
		ZA72	Finite part
	[Mathematics]		[Series]
ZA9	Tables + Tabulation	ZA73	Time series
ZA10	Table of values	ZA75	Convergence
ZA11	Calculation + C. method +	ZA76	C. rates
	[Calculated] Q + [Calculating] Q	ZA77	Asymptotic s.
	+ Methods for calculating +		[Boundary values]
	Computation	ZA78	B.v. problems
ZA12	Routine method	ZA79	Blasius problem
ZA13	Practical calculation	ZA80	Rayleigh's problem
ZA14	Theoretical c.	ZA81	Boundary conditions + Given b.c.
ZA15	Estimate + Estimation	ZA82	Three point b.c.
ZA16	Approximate c.	ZA83	Time dependent b.c.
ZA17	Formula	ZA84	Function
ZA18	Asymptotic expansion f.	ZA85	Partition f.
ZA19	General f.		[Methods, techniques, operations]
ZA20	Solution	ZA86	Method + [Theoretical m.] Q
ZA21	Method of s.	ZA87	Generalized m.
ZA22	Simple s.	ZA88	Analysis + Analytical m. Q
ZA23	Approximate s.		+ Analytical study +
ZA24	Accurate s.		Theoretical a. + Analytic
ZA25	Exact s.		determination + Determination
ZA26	Theoretical s.		by a.
ZA27	Second order s.	ZA89	Analytical estimation
ZA28	Similarity s.	ZA90	Analytical results
ZA29	Asymptotic s.	ZA92	Approximation
ZA30	Analytical s.	ZA94	Successive a.
ZA31	Approximate a.s.	ZA95	Closed form
		ZA96	Newtonian a.
	[Dimensional analysis]	ZA97	Variational principle
ZA32	Dimensionless form	ZA98	V.p. of Biot
ZA33	Scale effects	ZA99	Perturbation method
		ZA99a	Orthogonal functions
	[Algebra]		expansion method
ZA34	Equations	ZB1	Graphical a.
ZA35	Approximate e.	ZB2	Numerical determination +
ZA36	Linear e.		N. calculation + N.solution
ZA37	Non-l. e.	ZB3	[Iterative method] Q +
ZA38	[Three dimensional e.] Q		Iterative solution +
ZA39	Singular e.		Iterative numerical solution
ZA40	Six degrees of freedom e.	ZB4	[Convergent] Q
ZA41	Elliptic e.	ZB4a	Finite difference
ZA42	Navier Stokes e.		numerical s.
ZA42a	[with] No-surface slip	ZB5	Richardson method
	[Transformation]	ZB6	Second order R.m.
ZA43	Fourier t.	ZB7	Liebmann m.
ZA44	Lorenz t.	ZB8	Extrapolated L.m.
		ZB9	Relaxation methods
	[Analysis]	ZB10	[with] Spherical polar
ZA45	Newtonian a.		coordinate
	[Calculus]		Modified
ZA47	Complete elliptic integral	ZB11	Successive overrelaxation m.
ZA48	Integration + I. methods +	ZB12	Analytic continuation
	Integrating solution	ZB12a	[by] Taylor's series
ZA49	Asymptotic i. method	ZB12b	Inversion
ZA50	Differential equations	ZB14	Linearization
ZA51	Linear d.e.	ZB15	Method of characteristics
ZA52	L.d.e. with constant	ZB17	Johannsen and Meyer method
	coefficients	ZB18	Polhausen m.
ZA53	L.d.e. with periodic	ZB19	Extension of Stratford m.
	coefficients + [Periodic	ZB20	
	coefficient] Q	ZB21	Newtonian closed-form
ZA54	[Lyapunov's method] Q	ZB22	expression
			Newtonian coefficient

ZB23 Computer
 ZB24 [High speed computer] Q
 ZB25 [Digital computer] Q
 ZB26 [Programme] Q

 [Automatic control]
 ZB27 Automatic control theory
 [See also Stability]
 ZB28 Dynamic systems
 ZB29 Linear s.
 ZB30 Non-linear s.
 ZB31 Non-linear mechanics
 ZB32 Stationary s.
 ZB33 Non-stationary s.
 ZB34 Lyapunov's theory
 ZB35 Second method of L.
 ZB36 Stable regions
 ZB37 Transient behaviour
 ZB38 Limit cycles
 ZB39 Random disturbances
 ZB40 Relay servos
 ZB41 Nonlinear autopilot
 ZB42 Autopilot with feedback
 ZB43 Control system optimization
 ZB44 Time-optimum control

 [General properties]
 ZB45 [General form] Q
 ZB46 [Nature] Q
 ZB47 Characteristic
 ZB48 [Parameters]
 ZB49 Variable properties
 ZB50 Material properties
 ZB51 Configuration
 ZB52 Arbitrary shape
 ZB53 Length
 ZB54 L. changes
 ZB55 Thickness effect
 ZB55a Stability [non-aerodynamic]
 ZB55e Effective
 ZB56 Combined + Combination
 ZB57 Combined effect
 ZB58 Attached
 ZB59 Associated
 ZB60 Carry
 ZB61 Relationship
 ZB62 Non-linear relation
 ZB63 Ratio
 ZB64 Finite rate
 ZB65 [Quantitative] Q

 [Location, position]
 ZB66 Location
 ZB67 Streamwise
 ZB68 Ahead of body
 ZB69 Behind
 ZB70 Passing through
 ZB71 Downstream influence
 ZB72 Far downstream

 [General processes]
 ZB73 [Effect] Q + [Influence] Q
 ZB74 Design
 ZB75 Controlling
 ZB76 Elimination
 ZB77 Variation
 ZB78 Arbitrary v.
 ZB79 [Large change] Q
 ZB80 Transition
 ZB81 Onset
 ZB82 Deviation
 ZB84 [Production] Q
 ZB85 Derivation
 ZB86 Performance
 ZB87 Dynamic behaviour
 ZB88 Expansion
 ZB89 Reduction

APPENDIX 5.5

ALPHABETICAL INDEX OF CONCEPTS

This Appendix lists all the concept terms used in the indexing of the 200 documents comprising Subset 1, as given in Appendix 3E. For each term in its natural form is given the appropriate notation for its location in the concept term schedules, which appear as Appendix 5.4.

Each concept appears under each key term, so that, for instance, the following entries will be found:

- Abel integral equation
- Integral equation, Abel
- Equation, Abel integral

In addition, this list includes terms which occurred in the set of search questions but which did not appear in the indexing. All such terms are marked by an asterisk.

Abel Integral Equation	ZA68	Aerodynamic Stability	T35
Ablating Materials	X56	Stiffness Derivatives	V63
Ablation	X51	Twist Matrices	W89
Cooling	X88	Aeroelasticity Static	
Effective Heat of		Aerofoils Blunt-Nosed	
-Rate Sensor	X53	Single Wedge	
Rates	X52	Straight Line	
Surface		Technique Complete	
Abrupt Stall	G21	Technique Half	
Absolute Flow	F90	Three Dimensional	
Absorption Ultra-Violet		Aerothermodynamic Relations Basic	
Radiation	G56	Afterbody Conical Base	
Accelerated	G56	Cylinder	
Accelerating Flow	N6	Cylindrical	
Acceleration	K48	Drag	D6
During Boost	K50	Surface	D5
Potential	U36	Truncated	
Variations in		Vehicle Conical	
Vertical		Ahead of Body	ZB68
Accommodation Height	O37J	Jet	P75
Accurate Solution	ZA24	Shock Wave	Q80
Acoustic Radiator	V58	Aileron Coefficients Oscillatory	
Across Bow Shock	Y67	Air	L54
Active Gas Chemically		Bleed Compressor	
Activity Solar		Blowing Jet	P52
Actual Time	Z80	Breathing Vehicle	A60
Addition Small Rate of Heat		Burned In	
Adiabatic Flow	M93	Combustion, methane*	
Surface Temperature	D63	Components	L62
Temperature Rise Maximum		Compressed	
Wall Temperature	D63	Current	L66
Adjacent Flat Surface	D13	Density	M12
Main Blade	F10	Density at Perigee	J94
Adjustable Blading	F23	" Perigee	
Inlet Guide Vanes	F33	" Profile	M13
Adverse Ground Effect	T77	Disassociated	
Aerodynamic Balance	S64	Drag	M7
Centre	S51	Drag around Orbit	M9d
Centre Characteristics	S52	Dry	
Centre Local		Energy of	
Characteristics	K6	Expansion Cold	
" Longitudinal		Flow*	L65
" Static		" Correlated Non-Equilibrium	
Coefficients Longitudinal		" Equilibrium	
Damping	V75	" Hot*	
Damping Coefficient	V77	" Stagnation	
" Derivatives	V78	Fully Ionized	
Derivatives*	T45	Heated	
" Direct		High Temperature	
" Indirect		Hydrogen Burned	
" Oscillatory		Jet	P46
Design	W38	" Blowing	
Flutter Derivatives	V21	" Cold	
Forces	R22	" High Energy	
Heating	Y6	" Small	
Heating Rate	Y8	" Subsonic	
" " Laminar		" Vortex Generators	C47
Inertia	R24	Outlet Angle	F50
Interaction Effect	T61	Shock Velocity	Q96
Laminar Heating	Y7	Still	
Load	R49	Stream	L66
Loading	R49	Unheated Hydrogen Driving	
Moments	S49	Aircraft High Speed	
Noise	V54	Models Complete	
Normal Forces	R25	Shapes	A9
Problems	K7	Structures	A5

Airfoil	A79	Angle of Attack Arbitrary	
Blunt Trailing Edge		" " Correction	V95
Circular Arc		" " Distribution	W4
Double Wedge		" " High	
Equation	A82	" " Large	
NACA 4412		" " Moderate	
Nonlifting		" " Oscillation	V12
Rigid		" " Positive	
Shape	A85	" " Uniform	
Symmetrical		" " Zero	
Two-Dimensional		Between Sun and Perigee	K1
Wedge		Boattail	
Airforces*	R22	Body	
Airplane*	A2	Cone 10 Degree Semivertex	
Airplane Wing	B1	Constant Flow	
Tail-Boom		of Corners Number and	
Tailless		Deflexion	
Airspeed Holding	K46	Dihedral	
All Movable Control Surface	C26	of Dihedral Range of 30 Degrees	W20
Tail	C16	Exit Shock Wave	
Alloy 2024 T4 Aluminium		Flight Path	
Along Hub	F63	Greater than $\frac{1}{2}\pi$ Re-Entrant	
Model	Z69	of Incidence*	V94
Alternating Lift Function Theodorsen		of Incidence Correction	V95
Altitude	K91	Inlet Blade	
Various heights in KM-L 96/L98		Jet Shock Wave	
Condition High		Mach	
Flight		Nozzle Divergence	
Flight High		Nozzle Exit	
Maximum		Outlet Flow	
of 300 Nautical Miles	K95	Phase	
of 525 Nautical Miles	K96	Sweep	
Results	M3	of Sweep Range 0-75 Degrees	W8
Aluminium Alloy 2024 T4	J45	of Sweepback	W9
Ambient Atom Mass Fraction	Y38	Turning	
Gas	L26	Wedge	
Supersonic Stream	M54w	Wedge Shock	
Temperature	X7	60° Sweepback	
Amount	E56	Annulus Area	F87
Amount of Dissociation	Y39	Anti-Symmetric Velocity Potential	U35
Amplitude Measurement	V70	Apex Located Controls*	C27
Analogy	ZA1	Location Jet Shock Wave	
Analysis	ZA88	Apogee Distance Change	J96
Compressible Flow		Apparatus	Z55
Determination		Apparent Mass Effects	S1
Linearized Flow		Appearance Time of	
Modal		Applied Forces (=Load)	W59
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Newtonian		Approaching Chemically Frozen Flow	Y65
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Surface Splitter		Short Probe	
Vortex Generator	C53	Skip	
Vaneless Diffuser	F84	Space	
Vanguard I	A29	Supersonic	
Vanishing Load	R62	Surface Re-Entry	
Low Aspect Ratio Wing	B59	Uncontrolled*	
Pressure Gradient	T11	Velocity	U25
Vaporization	X57	Air Shock	
Vapour Pressure Saturation		Blade Surface	
Variable Capacitance Sensor	X54	Blowing High	
Conductivity	X42	Distribution	U37
Density Wind Tunnel	Z32	Distribution Prescribed	
Medium	V31	Escape	
Property	ZB49	Exhaust	
Stokes Stream Function		Field Quasi-Conical	
Vorticity		Flight	
Variation	ZB77	Gas Flow	
in Acceleration	K49	Gradient	U38
Across Channel	G65	Gradient Severe	
Arbitrary		Induced	
From Day to Night	M19	Maximum	

Velocity	Maximum Relative Blade Surface Measurement	U42	Vortex	Discrete Horseshoe Displacement Main	
	Potential	U33		Distribution Elementary Horseshoe Flow	P7
	Anti-Symmetric Perturbation			Formation	P8
	Symmetric			Generator Air Jet	
	Profile	U39		Ramp-Type	
	Profile Linear			Twisted Strip Type	
	Re-Entry			Vane	
	Relative Upstream Requirement Trajectory			Wedge-Type	
	Sinking			Wing-Type	
	Slip Exit Relative			Growth	P11
	Sonic Throat			Horseshoe	
	Trailing Surface			Individual	
	Uniform			Location of Leading Edge	
	Variation	U37		Location of Part Span	
	Vector	J75		Main	
	Vertical			Movement	P12
	Vertical Induced			Pair Stationary	
Venturi	Rounded-Entry			Path	P20
Vertical	Acceleration	S1a		Path Location	P21
	Axis	D38		Pattern of Horseshoe	
	Induced Velocity	U28		Rectangular	
	Nozzle Position	H6		Secondary	
	Oscillation Sinusoidal			Sheet Position	P22
	Plane Control	T30		Spanwise	
	Position	W5		Strength	P25
	Tail	C18		Strength Main	
	Translation	N52		System	O92
	Velocity	U29		Tip	
Very Small Aspect Ratio Wing of				Trailing	
Vibration	Free			Type Boundary Layer Separation	O2
	Mode Uncoupled		Vorticity		U64
	Normal Mode			Contour	P24
	Resonant			Distribution	P17
	Testing	V88		Interaction Domain	P15
	Test	V88		Interaction Theory	P16
Vibrational Mode		V45		Variable	P23
Vibrationally Frozen Flow Approaching				Wagner Indicial Lift Function	S10
Viscid Flow		N36		Wake	U19
Viscosity		U84		Blockage	T70
	Coefficient			Development of Circulating	
	Effect Boundary Layer			Flow	U19
	Temperature Law*	U85		Interference Effect	T63
	Temperature Solution Linear*			Propulsive Jet	
Viscous		N36		Width Divergence	U20
	Drag	S26	Wall		D73
	Effect	U87		Boundary Layer	N69
	Flow	N36		Channel	
	Fluid	L9		Composite	
	Fluid Motion	N37		Condition	D91
	Force	S26		Constraint	D95
	Interaction	T64		Copper	
	Layer Regime	L50		Divergence*	Z41
	Motion	N37		Finite Thickness	
	Scavenging Phenomena Jet			Flow Past Parallel	
Volume		K11		Heat Flux History	B3
Von-Karman Source Sink Method		O82		Heat Transfer	
Vortex		O87		Homogeneous	
	Blade Form Free			Inconel	
	Blade Form Half			Interference	D93
	Bound			Non-Parallel	
	Chordwise			of Open Area	
	Co-Rotating			Plane	
	Counter-Rotating			Pressure Tunnel	
				Streamline	

Wall Temperature			
Temperature Adiabatic			
Temperature Constant			
Temperature Gradient			
Test Section			
Thermally Thick			
Thermally Thin			
Thickness			
of Tube			
Tunnel			
Tunnel Solid*			
Wind Tunnel			
Wind Tunnel Solid			
Wind Tunnel Test Slotted			
Wind Tunnel Test Solid			
Ward Extension			
Warren 12 Planform			
Water Flow			
Wave Ahead of Shock			
Angle Exit Shock			
Angle Jet Shock			
Apex Location Jet Shock			
Argon Shock			
Attenuation of Shock			
Bow Shock			
Compression			
Detached Shock			
Development Shock			
Drag			
Equation Solution Classical			
Expansion			
Flexural			
Flow Behind a Shock			
Formation Shock			
Forward Shock			
Generated Shock			
Hypersonic Shock			
Induced Boundary Layer Separation Shock			
Infinitesimally Thin Shock			
Instability			
Interaction Boundary Layer Shock			
Interaction Shock			
Kelvin Helmholtz			
Location Shock			
Longitudinal			
Mach			
Movement Shock			
Nitrogen Shock			
Normal Shock			
Oblique Shock			
Outboard Shock			
Oxygen Shock			
Pattern Shock			
Position Divergence Shock			
Propulsion Light			
Rear Shock			
Reflected			
Reflection Interference			
Resonance Compression			
Riemann			
Shape Shock			
Shock			
Sound			
Strength Shock			
Strong Shock			
Structure Shock			
	D62	Wave Surface	
		Terminal Shock	
		Thickness Shock	
	E1	Tip Shock	
		Tollmien Schlichting	
		Upstream of Shock	
		Wavelength Jet	
	D76	Weakening	W71
	Z40	Wedge	018
		Aerofoil Single	
		Airfoil	A86
		Airfoil Double	
		Angle	J13
		Blunted	
		Method Tangent	
	J32	Shock Angle	J14
	B36	Type Vortex Generator	C50
	L17	Weight Engine	
		Flow	F99
		Flow Characteristic Equivalent	
		Flow Maximum	
		Flow Overall	
		Flow Range	G4
		Flow Variation	G5
		Molecular	
		Ratio	K16
		Ratio Model	
		Tunnel	
	329	Wing with Concentrated	
		Weissenger Method	W86
		Whirl Inlet	
		Upstream Flow	
		Wide Range	G46
		Wing	B52
		Width Band	
		Divergence Wake	
		Infinite	
		Jet Slot	
		Wind Speed	L67
		Wind Tunnel	Z1
		Arc Discharge	
		Choked	
		Data	Y96
		Determination	Z3
		Experiment	Z2
		High Enthalpy*	
		Hypersonic	
		Hypervelocity	
		Interference Effect	D94
		Investigation	Z2
		Low Density*	
		Measurement	Z3
		Result Transonic	
		Solid Wall	
		Supersonic	
		Test	Z2
		Test Choked	
		Test Slotted Wall	
		Test Solid Wall	
		Transonic	
		Variable Density	
		Wall	Z40
		18" x 14" NPL	
		Windward Body	J34
		Edge	E9
		Wing	B1
		Wing Airplane	

Wing Arbitrary Planform		Wing Sharp Leading Edge	
Arbitrary Stiffness		Simple Planform*	
Beneath		Sinking	
Body	B1	Slender	
Body Arrangement	A97	Slender Rectangular	
Body Combination	A97	Slope	
Body Interference	A98	Slowly Oscillating	
Cambered		Solid Construction	
Chord	B99	Steady	
Circular Planform		Straight	
with Concentrated Weight	B68	Subsonic Edged	
Curved Tip Planform		Supersonic Edged	
Cantilevered		Surface	C4
Clipped Delta		Surface Flat	
Cropped		Sweep Small	B8
Delta		Swept	
Differentially Deflected		Sweptback	
Elastic		Sweptback Delta	
Elliptic		Sweptforward	
Elliptical		Symmetrical	
Finite		Tapered	
Finite Aspect Ratio		Theory "Not-so-Slender"	
Finite Span		Theory Linearized	
with Flap	B69	Theory Slender	
Flat		Thick	
Flat Plate		Thickness	C1
Flat Surface		Thickness Symmetrical	
Flat Triangular		Thin	
Flow Pattern	B94	Three-Dimensional	
Flow Study	B94	Tip	C8
Flutter Cantilever		Tip Deflection	C9
Fluttering		Tip Panel	A39
Fuselage Interference	A98	Tip Panel Unfolding	
Half		Tip Sweptforward	
Harmonically Oscillating		With Twist Triangular	
High Aspect Ratio		Triangular	
Infinite Span		Twisted	
Laminar		Two-Dimensional	
Lift	B97	Type Vortex Generator	C51
Lifting		Uncambered	
Loaded		Unswapt	
Long		Untapered	
Low Aspect Ratio		Vanishing Low Aspect Ratio	
Model	B3	Vehicle Arrow	
Model Half		of Very Small Aspect Ratio	B60
Model Sweptback		Wide	
Model Tapered		Yawed	
Narrow		Winged Missile	A12
Near Triangular		Re-Entry Glider Configuration	A38
Nonlifting		Wire Anemometer Hot	
Oscillating		Measurement Hot	
With Parabolic Twist	B35	Spanwise	
Perforated		Two-Dimensional	
Pitching		With Feedback Autopilot	
Plane of		Within Jet Location	
Planform	B94	Without Corner Cylinder	
Pressure Distribution	B95	Wood Model Compreg	
Rectangular		Work Theoretical*	
Rectangular Planform		Working Section	Z34
Re-Entry Configuration Delta		Closed Throat	
Re-Entry Configuration Sweptback		Closed Tunnel	
Rigid		With Open Jet	Z35
Rolling		With Rigid Boundary	Z36
Rotating		Size	
Shape	B4	Slotted	
Sharp Edge		0° Yaw	K77

30° Yaw	K78
Yaw Control	K81
Stability	K79
Yawed Body of Revolution	H52
Wing	B87
Yawing Derivative	K80
Zero Angle of Attack	V96
Aspect Ratio	W13
Boundary Constraint	D96
Gravity	K99
Lift	R70
Model Incidence	V97
Order Theory	ZAA
Pressure Gradient	T12
Temperature Gradient	X23
Zone Expansion	
Shock Transition	

APPENDIX 5.6

CONTROLLED TERM VOCABULARY

Terms marked with an asterisk represent terms used in the collection of 200 documents (Document Subset 1 of Appendix 3E), and are therefore comparable with the terms in the concept schedules (Appendix 5.4) and rotated index (Appendix 5.5). The remaining terms were used in the additional 150 documents that make up Document Subset 2.

These terms were based on those which appear in the Thesaurus of Engineering Terms of the Engineers Joint Council. Terms which do not appear in this Thesaurus are preceded by a cross.

- | | |
|--------------------------------|----------------------------|
| + Ablating materials* | Automatic control* |
| Ablation* | Autopilots* |
| Absorption* | + Axial distribution |
| Acceleration* | + Axial flow |
| + Accommodation height* | + Axial forces* |
| Accuracy* | Axial flow pumps* |
| Actual time* | Baffles* |
| Adiabatic conditions* | Balances* |
| Adjustment* | Balancing |
| + Aerodynamic balance* | Ballistic missiles* |
| + Aerodynamic center* | Balsa woods* |
| + Aerodynamic characteristics* | Bands* |
| + Aerodynamic configurations* | + Base pressure* |
| + Aerodynamic forces* | Bases* |
| Aerodynamic heating* | Bearing* |
| + Aerodynamic loads* | Beams (Radiation)* |
| + Aerodynamics* | Beaming* |
| Aerothermodynamics* | Bearing (Direction)* |
| + Afterbodies* | Behaviour* |
| Agents* | Bending* |
| Ahead* | Beveling |
| Ailerons* | Binary systems |
| Air* | Blades* |
| Aircraft* | + Blasius equation* |
| Air flow* | Bleeding* |
| Airfoils* | Blocking* |
| Airframes* | Blowers* |
| Airplanes* | Blowing* |
| Air resistance* | Blunt bodies* |
| Airspeed* | + Blunt cones* |
| Altitude* | Blunt cylinders |
| | + Blunt leading edges* |
| Aluminium alloys* | + Blunt trailing edges* |
| Ammonium compounds | + Bluntness* |
| Amplitude* | + Boat tails* |
| Analogies* | Bodies of revolution* |
| Analogue computers | Bombers |
| Analyzing* | Booms* |
| Angle of incidence* | Booster rockets* |
| Angles* | Boundaries* |
| Annuli* | Boundary layer* |
| Antennas | Boundary layer control* |
| Applying | Boundary layer transition* |
| Approaches | Braking |
| Approximation* | Bridging* |
| Arcs* | Buckling* |
| Area* | + Buffeting* |
| Argon* | Buoyancy* |
| + Arrow wings* | Bursting* |
| Asbestos | Calibration |
| Aspect ratio* | Camber* |
| Atmosphere | + Cantilever structures* |
| Atmosphere Extra-terrestrial* | Cantilever wings* |
| Atmosphere Terrestrial* | Capacity |
| Atmosphere Entry* | Caps |
| Atomic properties* | Carbon Dioxide* |
| Atoms* | Carbon arcs* |
| Attenuation* | Carbon tetrachloride |
| Attitude* | + Cascades* |
| Attitude control | |

- Catalysis
- Catalysts*
- Cathode-Ray oscilloscopes
- Centre of Gravity*
- + Centre of pressure*
- Centres*
- Centrifugal compressors*
- Centrifugal force*
- Ceramics
- Chamber*
- + Channels (Fluid flow)*
- Characteristics*
- Charge
- Charged particles*
- Chemical equilibrium*
- + Choking*
- + Chord*
- Circuits*
- + Circular arc*
- + Circular cone*
- + Circular cross section
- + Circular cylinder*
- Circulation*
- Clamping
- + Closed throat*
- Clouds
- Coefficients*
- Cold gases*
- Combustion*
- Commercial planes
- Compatability
- Components*
- Composite materials*
- Compositions*
- Compressed air*
- Compressibility*
- Compressible flow*
- Compressing*
- Compressor blades*
- Compressors*
- Computation*
- Computers*
- Concentrating*
- Concentration
- Condensing
- Conduction*
- Conductivity*
- Conductors
- Cones*
- Conics
- Constraining
- Constraints*
- Constrictions
- Construction*
- Contingency*
- Continuity equation*
- Continuous beams*
- + Continuous panels*
- Contraction*
- Control surfaces*
- Control systems*
- Convection*
- Convection heating*
- Convergence*
- Conversion
- Coolants
- Coolers
- Cooling*
- Co-ordinates*
- Copper*
- + Corners*
- Correction*
- Correlation*
- Corridor
- + Couette flow*
- Cracking
- Criteria*
- Critical Mach No.
- Critical velocity*
- + Crocco's equation
- Cross flow*
- Cross sections*
- Crossings*
- Curvature*
- Curves*
- + Curvilinear co-ordinates
- Cycles*
- Cylinders*
- Damage
- Damping*
- Data*
- Data reduction
- Day*
- Decay*
- Deceleration*
- Deceleration rate*
- Deflection*
- Deformation
- Degrees of Freedom*
- Delay time*
- Delta wings*
- Density*
- Density ratio*
- Depth
- Derivation*
- Derivatives*
- Design*
- Detaching*
- Detection
- Determination*
- Development*
- Diameters*
- Diaphragms*
- + Diatomic gases
- Dielectrics
- Differences*
- Differential equations*
- Diffuser*
- Diffusion*
- Dimensionless numbers*
- Dimensions*
- Discharge*
- Discontinuity*
- Disks*
- Dispersion*
- Displacement*
- Dissipation*
- Dissociation*
- Distance*
- Distortion*
- Distribution*
- Diurnal variations*
- Divergence*
- Dividers*
- Documents*
- + Downstream*
- + Downwash*
- Drag*
- Driers*
- Drilling*
- Drive*
- Driving*
- Drum*
- Dry gas*
- Ducts
- Dynamic characteristics*
- Dynamics*
- Earth*
- Eccentricity*
- Eddies*
- Edges*
- Efficiency*
- + Eigen Functions*
- Elasticity*
- Electric arcs*
- Electric arc heaters

Electric fields*	Flow meters*
Electric heating	Fluctuation
Electric potential*	Fluid flow*
Electric propulsion*	Fluid mechanics*
Electrical filters	Flux*
Electrical properties	Folding*
Electricity*	Fog
Electromagnetic induction*	Force*
Electromagnetic waves*	+ Forebodies*
Electrons	+ Form drag*
Electrons density	Formica
Electrostatics	Forming*
Elements*	Formulas*
Elevators	Foundation*
Elevons*	Fourier transforms*
Elimination*	Fractions*
Ellipses*	+ Free flight models
Elliptic functions*	+ Free molecule flow*
Emission*	+ Free stream*
Emissivity*	Freezing*
Energy*	Freon*
Engine*	Frequencies*
Engine noise*	Frequency response*
Enthalpy*	Friction*
Entropy*	Fuel consumption
+ Entry angle	Fusile*
+ Entry corridor	Functions*
Environment*	Gas flow*
Equations*	Gas Injection*
Equation of Motion*	Gases*
Equation of State	Gears*
Equilibrium*	Generators
Equipment*	Geometry*
Equivalence*	Glass
Equivalent weight*	Glass Fibres
Erosion*	Glanders*
Errors*	Gradients*
+ Escape velocity*	Grain size*
Estimation*	Graphite*
Ethylene*	Graphs
Evaluation*	Gravitation*
Evaporation*	Green Function*
Exchanging*	Ground effects*
Excitation*	+ Ground height
Exhaust gases*	+ Ground pressure
Exhausting*	+ Ground reflection*
Expansion	+ Ground resonance
Experimentation*	Growth*
Exponents*	Guidance*
Exposure*	Guide vanes*
Expressions*	Gust loads*
Extension*	Gyroscopes*
+ Faces*	Hall effect
Failure*	Harmonics*
Feedback*	Head*
Field	Heat*
Fighters	+ Heat of ablation*
Filling*	+ Heat absorption*
Filtration*	Heat shields*
+ Fineness ratio	Heat sinks*
Finite difference theory*	Heat transfer*
+ Finite span*	Heat transfer coefficient*
Fins	Heat Transmission*
Firing*	Heating*
Fixtures*	Height*
Flames*	Helium*
Flaps*	Hemispheres*
Flat plate models*	High pressure*
Flatness*	High temperature*
Flaw	+ Hinges*
Flexibility*	History*
Flexing*	Holding*
Flight*	Holes*
Flight paths	Homogeneity*
Flight testing*	Homogeneous flow*
Flow*	+ Hot gas
Flow equations*	Hot wire anemometers*
Flow measurement	Humidity*

Humidity control
 Hydrocarbons*
 Hydrodynamics*
 Hydrogen*
 Hyperbolas
 Hyperbolic functions
 Hypersonic flight*
 Hypersonic flow*
 Hypersonic planes*
 Hysteresis*
 Ideal fluid*
 Ideal gas*
 Ideal gas law
 Ignition*
 Impact*
 Impedance
 Impellers*
 Inconel*
 Increasing*
 Increments*
 Indicators*
 + Induction (Aerodynamics)*
 Inertia*
 Initiation*
 Injectant
 + Injected gases*
 + Injected liquids*
 Injection
 Injectors
 Inoculation*
 Inorganic salts
 Instrumentation*
 Insulation*
 Intake system*
 Integral equations*
 Integrals*
 Integration*
 Intensity
 Interference*
 Interplanetary flight*
 Intersection*
 Iodides*
 Ion propulsion*
 Ionization*
 Ionization gages*
 Ionosphere*
 Ions*
 Isobars*
 Isolation
 Isotropy*
 Iteration*
 Jet*
 Jet Engines*
 Jet nozzles*
 Jetstreams*
 Joining*
 Joists*
 Jupiter
 Junctions
 + Karman-Polhausen approximation
 + Karman Street
 Kinetic energy
 Kinetic theory*
 + Kirchoff theory*
 + Knees*
 Knudsen flow
 Kussner function*
 Laminar boundary layer*
 Laminar flow*
 Laminates*
 + Lateral stability*
 Latitude*
 Launching
 Layers*
 + Leading edges*
 Legendre polynomials
 Length*
 Life*
 Lift*
 Lift dependent drag*
 + Lifting*
 Light*
 Linear equations*
 Linear differential equations*
 Linear systems*
 Liners*
 Lines*
 Line spectra*
 Liquefaction*
 Liquid flow*
 + Liquid injection*
 Liquid propellants*
 Liquids*
 Loading*
 Loads*
 Logarithms*
 + Longitudinal Jets
 + Longitudinal stability*
 Longitudinal waves*
 Losses*
 + Low density*
 + Low Reynolds No. *
 Luminosity*
 + Lyapunov method*
 + Mach cone*
 + Mach Number*
 Magnesium*
 Magnetic fields*
 Magnetic flux*
 Magnetic properties*
 Magnetohydrodynamics*
 Magnification*
 Magnitude*
 + Main stream*
 Man
 Mars*
 Mass*
 Mass flow*
 Mass transfer
 + Mass transfer cooling
 Matching*
 Materials*
 Materials testing*
 Mathematical analysis*
 Mathematical models
 Matrices*
 Maxima*
 Mean*
 Mean free path*
 Measurement*
 Measuring instruments*
 Mechanics*
 Melamine
 Melting
 + Merged layer*
 Meteorites*
 Methane*
 Midcourse guidance*
 Minima*
 Minimization
 Missiles*
 Mixing*
 Mixtures*
 + Modal analysis*
 Mode*
 Models*
 Modulation
 Modulus of elasticity*
 Molecular weight*
 Molecules*
 Molybdenum*
 Moments*
 Momentum*
 Momentum transfer
 Motion*
 Mounting*
 + Multiple*

- Multiplier phototubes*
- + Nacelles*
- + Navier-Stokes equation*
- + Negative lift
- + Newtonian flow
- Night*
- Nitrogen*
- Nitrogen compounds
- Nodes*
- Noise*
- + Non-Equilibrium flow*
- Non-linear systems*
- Non-uniform flow
- + Normal force*
- + Noses*
- Nozzles*
- Nuclear fusion*
- Nuclear propulsion*
- Numerical analysis*
- Observation*
- Ogives*
- One-dimensional*
- Openings*
- + Open Throat*
- Operations*
- Optimization*
- Orbits*
- Ordinates*
- Orientation*
- Orifices*
- Orthogonal functions*
- Oscillations*
- Oscillographs*
- Outlets*
- Output*
- Oxygen*
- Panels*
- Parabolas*
- Parameters*
- Partial differential equations*
- Particles*
- Payloads*
- Pendulums*
- Penetration*
- Performance*
- Periodic variations*
- Permeability*
- Perturbation*
- Perturbation theory*
- Phase*
- Phase angle*
- Phenolic resins*
- Photographs*
- Physical property*
- Pine wood*
- Pipe*
- Pipe flow*
- Pistons*
- Pitch*
- Pitot tubes*
- Pivots*
- Plane geometry*
- Planets*
- + Planforms*
- Plasma*
- Plasticity*
- Plastics
- Plates*
- Plotting*
- + Pointed bodies*
- Points*
- + Polar co-ordinates*
- Polyamide resins
- Polygons*
- Polymethyl methacrylate
- Polystyrene
- Polytetra Fluoroethylene*
- + Porous cone
- Porous materials
- Position*
- Potential energy*
- + Potential flow*
- Power*
- Power series
- Prandtl No. *
- Predictions*
- Preservation*
- Pressure*
- Pressure distribution*
- + Pressure drag*
- Pressure drop
- Pressure gradient*
- + Pressure jumps
- Pressure measurement*
- Pressure pumps
- Pressure reduction*
- Prevention
- Procedures*
- Production*
- + Profile drag*
- Projectiles
- Projection*
- Propagation*
- Propellers*
- Properties*
- Propulsion systems
- Proving
- Pumps*
- Purity*
- Qualitative analysis
- Quartz*
- Radar
- Radiation*
- Radiation effects*
- Radioactive decay*
- Radioisotopes*
- Radii*
- Randomization*
- Range*
- Ratios*
- + Rayleighs Problem*
- Reactions (Chemical)*
- Reaction kinetics*
- Recombination reactions*
- Recovery*
- Rectangles*
- Reduction*
- Re-Entry*
- Re-entry vehicles*
- Regression*
- Reflection
- Refraction
- Reinforced plastics*
- Relaxation*
- Relaxation method*
- Relaxation time*
- Reliability*
- Relieving*
- Removal*
- Repeater*
- Research*
- Reservoirs*
- Resistance*
- Resistivity*
- Resonant frequency*
- Response time*
- Retarding*
- + Reversal of control
- Revisions*
- Revolution*
- Reynolds No.*
- + Rigid airfoils*
- + Rigid bodies
- + Rigid wings*
- Rigidity*

Rocket*	Span*
+ Rocket chambers*	Specific heat*
Rocket engines*	Specification*
+ Rocket gliders*	Specific impulse*
Rocket nozzles*	Spectra*
Rocket planes*	Specular reflection*
Rocket propellants*	Spheres*
Rocket propulsion*	Spikes*
Rods*	Spirals
Roll*	Spoilers*
Roofs*	Spreading
Rotation*	Springs*
Rotor blades*	Squares*
Rotors*	Stability*
Roughness*	+ Stages*
Rudders*	Stagnation point*
Safety factor*	+ Stall*
Satellites*	+ Stanton No.
+ Satellite velocity*	Starting*
Saturation*	Static characteristics*
Scale*	Static pressure*
Scattering*	Static tests*
Scavenging*	Stationary processes*
Screens	Statistical methods*
Seasonal variations*	Stator blades*
Sensors*	Steady flow*
Separation*	+ Steady forces
Series*	+ Steady pressure
Servomechanisms*	Steady state*
Shadow photography	Steels*
Shape*	Stiffening*
Shear flow*	Stiffness*
Shearing*	+ Sting*
Shear stress*	Stopping*
Sheet*	Stoichiometry*
Shells	Straightness*
Shock*	Strain gages
Shock tubes*	+ Stream function*
Shock waves*	+ Streamlines*
+ Shroud*	Strength*
Sides*	Stress concentration*
+ Sideslip*	Stresses*
+ Sidewash*	Stretching
Silica*	Strip*
Silicon carbide*	+ Strip theory
+ Similarity*	Structures*
Similarity laws*	Subcritical flow*
Simulation*	Sublimation*
+ Sinking*	+ Subsonic flow*
Sinusoidal functions*	Sun*
Skewness*	Supersonic flow*
+ Skin*	Supersonic planes*
Skin friction*	Supports*
+ Skipping*	Surfaces*
+ Skip rockets	+ Surface combustion*
Skip vehicles*	+ Surface radiation*
Slabs*	Surface temperature*
+ Slender bodies*	Surges*
+ Slender cones*	Surveys*
+ Slipstream*	+ Sweep*
Slope*	Sweepback*
Slots*	Swept wing*
Sodium*	Swirling*
Sodium carbonate	Symmetry*
Sodium chloride*	Systems*
Solar heating*	Tables*
Solar phenomena*	Tabs*
Solar radiation*	Tabulation*
Solar sails*	+ Tails*
Solid propellants*	Take off*
Solids*	Tangent*
Sound waves*	+ Taper ratio*
Sounding*	+ Tapered wing
Sounding rockets*	Taylor's Series*
Sound propagation	+ Teflon*
+ Sources*	Telemetry*
Spacecraft*	Temperature*
Space probes*	Temperature control
Spacing*	Temperature distribution*

Temperature inversions*	Viscosity*
Tensions*	Viscous*
Terminal guidance	Viscous flow*
Test facilities*	+ Viscous fluids*
+ Test section*	+ Visualisation
Testing*	Volume*
Testing equipment*	Vortex*
Testing machines*	+ Vortex filament
Theories*	Vortex generators*
Theorems*	Vortex sheet
Thermal conductivity*	+ Vorticity*
Thermal expansion*	+ Wake*
Thermal diffusivity	Walls*
Thermal insulation	Water
Thermal stresses*	Water flow*
Thermodynamics*	Wavelength*
Thickening*	Wave propagation
Thickness*	Waves*
Thin layer	+ Wedges*
+ Thin wings*	Weight*
+ Throats*	+ Whitham Theory
Thrust*	Wind*
Thrust vector control*	Wind tunnel*
Time*	Wind tunnel models*
Time constant	Wind tunnel nozzles*
Time series analysis*	Wind velocity*
+ Tips*	Windows
Titan*	Wing-body configurations*
Torque*	+ Wing-body-tail configurations*
Torsion*	Wings*
+ Total drag*	Wires*
+ Trailing edges*	Wood*
Trajectory*	Yaw*
Transferring*	
Transformation*	
Transition point*	
+ Transitional layer*	
Transonic flight*	
Transonic flow*	
Transpiration*	
Transverse waves*	
Triangles*	
Trips*	
Tumbling*	
Tungsten*	
Turbine blades	
Turbines*	
Turbocompressions*	
Turbojet engines*	
Turbulence*	
Turbulent boundary layer*	
Turbulent flow*	
Twisting*	
+ Two-dimensional*	
Two-phase flow*	
Ultraviolet radiation*	
+ Undershoot	
Uniform flow*	
+ Uniform pressure*	
Unsteady flow*	
+ Unsteady lift*	
Unsteady state*	
Upper atmosphere*	
+ Upwash*	
Vacuum*	
Vanes*	
Vaporising*	
Vapors	
Vapour pressure*	
Variability*	
Variables*	
Variations*	
Vectors*	
Velocity*	
Venturi Meters*	
Venus*	
Vibrations*	
+ Vibrational equilibrium	

APPENDIX 6.1

EXAMPLES OF VARIOUS COMPUTER PRINT-OUTS

Original I. B. M. Tape arrangement

The indexing information is arranged in document order, resulting in a linear file of 1,400 documents. The information transferred from the index sheet is recorded in two separate 'blocks' as follows:-

1. List of themes and the concepts which make up each theme, as given in the index sheet.
2. Lists of the concepts, giving the code letter and terms in each concept. The weight is assigned to each term in the concept, but since these weights have been transferred from those assigned to the single terms, the highest weight that any term has received will appear in all its concepts.
e.g. Concept F = Turbulent (10) Flow(9) Field(9)
Concept L = Transonic(8) Flow(9)

The tape was prepared from 80-column punched cards, with the information punched on each line as follows:-

Column 1. Punched with figure 1 or 2. This indicates whether the index information given in columns 6-80 refers to Block 1 (themes) or Block 2 (Concepts)

Columns 2-5 The four-figure document reference number.

Columns 6-80 The index information:

- If Block 1,
- a. A comma indicates the start of each theme.
 - b. The themes are identified by a two figure number, and are punched in order 01, 02, 03, etc.
 - c. The concepts which make up each theme are listed by their two-letter code.
 - d. An asterisk indicates the end of the final theme.
- If Block 2
- a. A comma indicates the start of each concept.
 - b. The concepts are identified by a two-letter code and are listed in the following sequence:-
blank A to blank Z, AA, BB, CC, etc.
 - c. The terms making up each concept are punched in full
 - d. Each term is followed by the weight number, enclosed by slashes //
 - e. An asterisk indicates the end of the final concept.

```

11419,01 A B C,02 A D E F J,03 A D E G J,04 A D E H J,05 A D E I J*
21419,ASTIFFENED/10/WEB/10/PLATE/10/,BSHEAR/10/LOADING/10/,CINTERMEDIATE/9/
21419,VERTICAL/9/STIFFENER/10/DESIGN/9/,DINTERMEDIATE/9/VERTICAL/9/STIFFENER/10/
21419,ESHEAR/10/BUCKLING/8/STRESS/8/,FSTIFFENER/10/FLEXURAL/8/RIGIDITY/8/
21419,GSTIFFENER/10/SPACING/8/,HSINGLE/6/SIDED/6/STIFFENER/10/,IDDOUBLE/6/
21419SIDED/6/STIFFENER/10/,JTEST/7/*
11420,01 A C D E F G,02 A C D H I G,03 A C D J G,04 A C D K G,05 A C D L M
11420,06 A C D N K,07 A C D O,08 A C D P,09 A C D Q S G,10 A C D Q T G
11420,11 A C D Q U G,12 A C D R S G,13 A C D R T G,14 A C D R U G,15 B C D E F G
11420,16 B C D H I G,17 B C D J G,18 B C D K G,19 B C D L M,20 B C D N K
11420,21 B C D O,22 B C D P,23 B C D Q S G,24 B C D Q T G,25 B C D Q U G
11420,26 B C D R S G,27 B C D R T G,28 B C D R U G*
21420,ASWEPT/10/WING/10/HIGH/9/ASPECT/9/RATIO/9/,BNARROW/9/DELTA/10/WING/10/
21420,CSHARP/10/EDGED/10/,DHIGH/9/ANGLE/9/ATTACK/9/,EUPPER/9/SURFACE/9/
21420,FTURBULENT/10/FLOW/9/FIELD/9/,GWIND/9/TUNNEL/9/EXPERIMENT/9/,HROOT/8/
21420SECTION,ICONICAL/8/FLOW/9/FIELD/9/,JVORTEX/8/SHEET/8/POSITION/7/
21420,KVORTEX/8/PATH/8/LOCATION/8/,LTRANSONIC/8/FLOW/9/,MDRAG/8/RISE/8/
21420,NLEADING/8/EDGE/8/SEPARATION/8/,OVORTICITY/8/,PSTALL/8/FLOW/8/
21420,QPRESSURE/8/DISTRIBUTION/8/,RVELOCITY/8/DISTRIBUTION/8/,SSWEEP/8/
21420ANGLE/9/,TANGLE/9/ATTACK/9/,UREYNOLDS/8/*
11421,01 A D F G H,02 B C D F G H,03 A E F G H,04 B C E F G H,05 A D I G H
11421,06 B C D I G H,07 A E I G H,08 B C E I G H,09 A D F J G H,10 B C D F J G H
11421,11 A E F J G H,12 B C E F J G H,13 A D I J G H,14 B C D I J G H
11421,15 A E I J G H,16 B C E I J G H,17 A D F Q S,18 A E F Q S,19 A D I Q S
11421,20 A E I Q S,21 A D P Q R,22 A E P Q R,23 K C D F G H,24 K C E F G H
11421,25 K C D I G H,26 K C E I G H,27 L C D F G H,28 L C E F G H,29 L C D I G H
11421,30 L C E I G H,31 M C D F G H,32 M C E F G H,33 M C D I G H,34 M C E I G H
11421,35 N C D F G H,36 N C E F G H,37 N C D I G H,38 N C E I G H,39 O C D F G H
11421,40 O C E F G H,41 O C D I G H,42 O C E I G H*
21421,ABLUNT/10/NOSED/10/LONG/9/BODYOFREVOLUTION/10/,BBLUNT/10/NODE/8/
21421,CLONG/9/CYLINDRICAL/10/AFTERBODY/10/,DHYPERSONIC/9/AIR/9/FLOW/9/
21421,EHYPERSONIC/9/HELIUM/10/FLOW/9/,FINDUCED/10/PRESSURE/9/,GTHEORETICAL/9/

```

Tape arrangement at Harvard Computation Laboratory.

The indexing information is arranged in document order, and includes only the indexed concepts, ignoring the themes. Each concept consists of the constituent single terms, terminated by a stop; each concept is treated in the same way as the sentences in the full text normally processed by the SMART system, with the running totals of concepts indicated in a right-hand column. The weights assigned at Cranfield are incorporated by repeating the concepts; three levels are recognised, concepts weighted 10 and 9 are recorded three times, concepts weighted 8 and 7 are recorded twice, and concepts weighted 6 and 5 once.

A copy of the print-out for the same document as shown on the previous page, namely 1420, is printed below.

HIGH ASPECT RATIO SWEEP WING . HIGH ASPECT RATIO SWEEP WING .	1
HIGH ASPECT RATIO SWEEP WING . NARROW DELTA WING SHARP EDGED .	3
NARROW DELTA WING SHARP EDGED . NARROW DELTA WING SHARP EDGED .	5
. HIGH ANGLE ATTACK . HIGH ANGLE ATTACK . HIGH ANGLE ATTACK	6
. UPPER SURFACE FLOW FIELD TURBULENT . UPPER SURFACE FLOW FIELD	9
TURBULENT . UPPER SURFACE FLOW FIELD TURBULENT . WIND TUNNEL EXPERI-	11
MENT . WIND TUNNEL EXPERIMENT . WIND TUNNEL EXPERIMENT . ROOT	13
SECTION, ICONICAL FLOW FIELD . ROOT SECTION, ICONICAL FLOW FIELD	16
. POSITION VORTEX SHEET VORTEX PATH LOCATION . POSITION VORTEX	17
SHEET VORTEX PATH LOCATION . TRANSONIC FLOW . TRANSONIC FLOW	19
. DRAG RISE LEADING EDGE SEPARATION . DRAG RISE LEADING EDGE SEPARAT-	21
ION . VORTICITY . VORTICITY . STALLED FLOW PRESSURE DISTRIBUTION	23
. STALLED FLOW PRESSURE DISTRIBUTION . VELOCITY DISTRIBUTION	26
. VELOCITY DISTRIBUTION . SWEEP ANGLE . SWEEP ANGLE . ANGLE	28
ATTACK . ANGLE ATTACK . ANGLE ATTACK . REYNOLDS . REYNOLDS	32
	36

Tape arrangement at Cambridge Language Research Unit.

This follows more closely the information on the original tapes, with two sections for each document, the first covering themes, and the second giving the concepts and terms.

An example of the print-out, for document 1420, is shown below; the description of the print-out is as follows.

Section 1

- Line 1. Document number; Section 1 digit; half-word count for document.
- Line 2. Theme count; Half-word count for themes.
- Line 3. Theme number; Concept letter count; Half-word count for concept letters; Concept letters.

.....

.....

- Line n. Section 1 terminator.

Section 2

- Line 1. Document number; Section 2 digit.
- Line 2. Concept count; Half-word count for concepts.
- Line 3. Concept letter; Word count; Half-word count for words; weight number; Half-word count for word; Word.

.....

.....

- Line n. Section 2 terminator.

1420 1 +270

28 +82

```

1      6 + 3  A C D E F G
2      6 + 3  A C D H I G
3      5 + 3  A C D J G
4      5 + 3  A C D K G
5      5 + 3  A C D L M
6      5 + 3  A C D N K
7      4 + 2  A C D O
8      4 + 2  A C D P
9      6 + 3  A C D Q S G
10     6 + 3  A C D Q T G
11     6 + 3  A C D Q U G
12     6 + 3  A C D R S G
13     6 + 3  A C D R T G
14     6 + 3  A C D R U G
15     6 + 3  B C D E F G
16     6 + 3  B C D H I G
17     5 + 3  B C D J G
18     5 + 3  B C D K G
19     5 + 3  B C D L M
20     5 + 3  B C D N K
21     4 + 2  B C D O
22     4 + 2  B C D P
23     6 + 3  B C D Q S G
24     6 + 3  B C D Q T G
25     6 + 3  B C D Q U G
26     6 + 3  B C D R S G
27     6 + 3  B C D R T G
28     6 + 3  B C D R U G
/

```

1420 2

20 +186

A 5 +14

B 3 + 9

C 2 + 7

D 3 + 9

E 2 + 7

F 3 +10

G 3 +10

H 4 +13

J 2 + 8

K 3 + 9

L 2 + 7

M 2 + 5

N 3 +10

O 1 + 5

P 2 + 6

Q 2 + 8

R 2 + 8

S 2 + 7

T 2 + 7

U 1 + 4

#

(10)+ 3 SWEEP

(9)+ 3 RATIO

(9)+ 3 NARROW

(10)+ 3 SHARP

(9)+ 2 HIGH

(9)+ 3 UPPER

(10)+ 4 TURBULENT

(9)+ 2 WIND

(8)+ 2 ROOT

(8)+ 4 VORTEXSHEET

(8)+ 3 VORTEX

(8)+ 4 TRANSONIC

(8)+ 2 DRAG

(8)+ 3 LEADING

(8)+ 4 VORTICITY

(8)+ 3 STALLED

(8)+ 3 PRESSURE

(8)+ 3 VELOCITY

(8)+ 3 SWEEP

(9)+ 3 ANGLE

(8)+ 3 REYNOLDS

(10)+ 2 WING

(10)+ 3 DELTA

(10)+ 3 EDGED

(9)+ 3 ANGLE

(9)+ 3 SURFACE

(9)+ 2 FLOW

(9)+ 3 TUNNEL

(8)+ 5 SECTION=ICONICAL

(7)+ 3 POSITION

(8)+ 2 PATH

(9)+ 2 FLOW

(8)+ 2 RISE

(8)+ 2 EDGE

(8)+ 2 FLOW

(8)+ 4 DISTRIBUTION

(8)+ 4 DISTRIBUTION

(9)+ 3 ANGLE

(9)+ 3 ATTACK

(9)+ 2 HIGH

(9)+ 3 ASPECT

(10)+ 2 WING

(9)+ 3 ATTACK

(9)+ 3 SURFACE

(9)+ 3 FIELD

(9)+ 4 EXPERIMENT

(9)+ 2 FLOW

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(8)+ 3 LOCATION

(8)+ 4 SEPARATION

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DSPACE

<https://dspace.org/>

Factors determining the performance of indexing systems. Volume 1, Design, Pt 2, Appendices

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1966

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