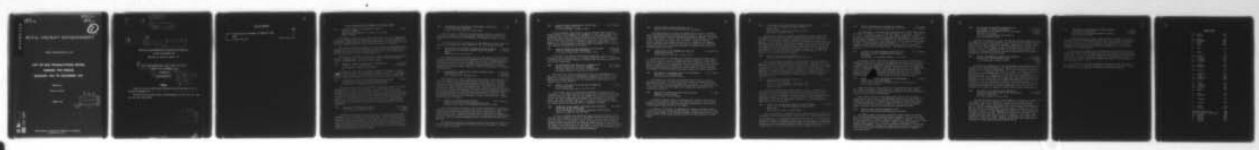
AD-A043 159 ROYAL AIRCRAFT ESTABLISHMENT FARNBOROUGH (ENGLAND) F/G 5/2
LIST OF RAE TRANSLATIONS ISSUED DURING THE PERIOD JANUARY 1976 --ETC(U)
MAR 77 M BROMLEY

UNCLASSIFIED RAE-LIBRARY BIB-360 DRIC-BR-58188 NL

1 OF 1
AD A043159



END
DATE FILMED
9-77
DDC

ROYAL AIRCRAFT ESTABLISHMENT

LIBRARY BIBLIOGRAPHY No. 360

LIST OF RAE TRANSLATIONS ISSUED DURING THE PERIOD JANUARY 1976 TO DECEMBER 1976

Compiled by

Margaret Bromley

MARCH 1977

PROCUREMENT EXECUTIVE, MINISTRY OF DEFENCE
LONDON, W.C.2.

ROYAL AIRCRAFT ESTABLISHMENT

Library Bibliography 360

Received for printing 15 March 1977

(6) LIST OF RAE TRANSLATIONS ISSUED DURING THE PERIOD JANUARY 1976 TO DECEMBER 1976

Compiled by

(10) **Margaret Bromley**

(11) 15 Mar 77

(12) 14 p.

SUMMARY

This list covers all RAE Library Translations published during 1976 and follows Bibliography 353. Translations, with summaries, are listed in report number order. A personal author index is provided.

Previous lists have been issued in Bibliographies 243, 249, 254, 261, 283, 313, 319, 324, 330 and 353.

LIST OF CONTENTS

LIST OF TRANSLATIONS AND SUMMARIES IN NUMERICAL ORDER

1750 A COMPUTER PROGRAM FOR STATISTICS OF LINE OF SIGHT IN A TERRAIN — J. Palme
Försvarets Forskningsanstalt, Sweden, FOA P Report C8189-13 (1968)

The program described in this report takes input data from a TERROR-chart (a matrix of height values obtained from the terrain). The program then sets out different flight profiles towards given observer positions on the charts and the line of sight between the aircraft and the observer is calculated.

The program carries out statistics of line of sight by calculating sight probability, circular sight interruption rate and radial sight interruption rate. The data values for the controlling parameters are taken from another report describing the intervisibility tracking generator.

The program as described in this report, outputs sighting data on punched cards or on magnetic tape, which can then be used by a subsequent program, eg TUT-3 and TERROR-MOD.2, for anti-aircraft studies.

1835 METHODS OF DYNAMIC MEASUREMENTS IN TURBOMACHINES. — R. Larguier, A. de Sievers
L'Aéronautique et L'Astronautique, 46, 9-18 (1974); ONERA TP 1403 (1974)

An account of work started at ONERA on dynamic measurements in turbomachines, which extends from incompressible to supersonic flow. It presents data on surface pressures on moving blades and on the external casing, opposite the rotor, and on determination of the wake by pressure sensor and hot wire.

1850 DETERMINATION OF THE TIME-AVERAGED PRESSURES IN STRONGLY FLUCTUATING FLOWS AND ESPECIALLY IN TURBO-MACHINES — H. Weyer
Deutsche Luft- und Raumfahrt, DLR-FB 74-34 (1974)

The present report treats the problems of measuring pressure in strongly fluctuating flow - eg, in turbo-machines - with particular regard to the determination of clearly defined average pressures. It gives a detailed description of the operating principles of three new procedures for determining the actual time-averages of pressure fluctuations of high frequency and amplitude and also of the construction of the corresponding measuring devices. In addition, it contains reports on the laboratory testing of these procedures using a newly developed calibration device that generates defined pressure fluctuations, and describes initial tests of the measuring devices in turbo-compressors.

1859 FUNCTIONAL TWO-DIMENSIONAL MANIKINS — H.W. Jürgens, K. Helbig, T. Kopka
Ergonomics, 18, 2, 185-194 (1975)

Two-dimensional manikins are used as tools in designing and assessing workplaces (on a 1:1 scale) in the broadest sense. Models available to date reduce the joints of the human body to fixed axial joints and are therefore incapable of reproducing changes in the shape of the body resulting from movement. A new type of joint in the 'Kieler Puppe' model introduced here for a seated and standing person in profile, and a seated person as seen from above, permits only physiological body postures and reproduces natural body contours in every posture and every postural change.

1873 CONTRIBUTIONS TO THE OPTICS OF TURBID MEDIA, PARTICULARLY OF COLLOIDAL METAL SOLUTIONS — G. Mie
Annalen der Physik, 25, 3, 377-445 (1908)

Over the years, a number of theories had been submitted to explain the colouration of metals in a colloidal state. However, none of these proved satisfactory and it was not until 1908 that Mie proposed a theory in an exact form.

This paper considers the simplest case, the spherical particle, where the particles in suspension are small compared to the illuminating wavelength.

1874 THE POSSIBILITIES OF USING A SCANNING ELECTRON MICROSCOPE FOR THE STUDY OF COMPOSITE MATERIALS HAVING AN ORGANIC MATRIX — J. Auvinet, J. Rouchon
AGARD CP163, 10.1-10.5 (1975)

The scanning electron microscope, with its large depth of field and high resolution makes possible the direct examination of fine and deeply contoured surfaces and is thus particularly suitable for the study of composite materials. This paper describes the use of a scanning electron microscope for product quality control and the study of failure surfaces and corrosion in glass and high modulus fibre/epoxy matrix composites. Each of these facets is illustrated photographically.

1875 ELECTROCHEMICAL IMPREGNATION OF NICKEL HYDROXIDE INTO A POROUS NICKEL PLATE — T. Takamura, T. Shir gami, T. Nakamura
Denki Kagaku 42, 11, 582-588 (1974)

The impregnation of nickel hydroxide into the porous nickel electrode has been investigated by the electrochemical reduction method of nickel nitrate solution at varied concentrations and cathodic current densities. The amount of nickel hydroxide impregnated was estimated from the capacity of a nickel cadmium cell constructed with the prepared plate. Contrary to the results so far reported, under an appropriate condition the capacity exceeded that which was obtained by a conventional technique. The amount of nickel hydroxide impregnated was strongly dependent on current density and concentration of nickel nitrate. The rechargeability of the prepared nickel electrode was satisfactory. The mechanism of the impregnation is discussed in terms of the formation of ammonia by the reduction of nitrate.

1877 MATERIALS, CONSTRUCTION AND STRENGTH — M.R. L'Hermite
Annales de l'Institut Technique du Batiment et des Travaux Publics, Théories et Méthodes de Calcul No.5 (1949)

This report presents a picture of the principal deformations in materials subjected to various forces but particularly shear. Distinction is made between structural and non-structural materials and the difference between these characterised by their reactions to a stress cycle. Hysteresis is examined in elastic bodies and the unstable viscosity states of thixotropy and antithixotropy discussed. Aging is another phenomenon which, if superposed on the above may mask them.

The author has attempted to distinguish between these different effects and has also introduced stresses other than pure shear thus leading to a statement of the concept of rigidity.

1878 FRACTURE SURFACE OBSERVATIONS OF FATIGUE CRACK GROWTH IN AlZnMgCu 0.5 F 46 — K.-H. Schwalbe
Z. Metallkunde, 66, 7, 408-416 (1975)

From fractographic observations, it can be concluded that the growth of fatigue cracks in the aluminium alloy AlZnMgCu 0.5 F 46 at medium growth rates is characterised by the formation of striations on the fracture surface. At high growth rates, there is a gradual transition from the striation mechanism to one involving the formation of dimples at inclusions. The stress intensity range at this transition can be estimated by means of a simple model. It is shown that the crystallographic crack growth models presented in the literature can be modified to explain curved striations.

1879 PRACTICAL METHODS FOR THE DETERMINATION OF THE STRESS INTENSITY FACTOR FOR CRACK PROPAGATION — A. Monthulet, S. Bhandari, C. Rivière
La Recherche Aérospatiale, No.5, 297-303 (1971)

Two methods, both based on strain gauge measurements, may be used to obtain the stress intensity factor in fatigue cracked thin sheets. A comparison is presented of the results obtained in a simple case with those obtained in the case of a stiffened sheet.

1880 THE INVESTIGATION AND SELECTION OF PARAMETERS FOR HARMONIC DRIVES WITH A DISC WAVE GENERATOR — D.P. Volkov, A.F. Krainev
4th World Congress on the Theory of Machines and Mechanisms, Session 2B, Paper 20, 103-108 (1975)

The results are given of investigations into, and recommendations are made for selection of, the basic parameters of harmonic drives with disc wave generators, having diameters of flex splines between 250 and 730 mm, a transmission ratio between 100 and 365 in one mechanism and calculated torsional moments between 5 and 100 kN m.

1881 EFFECT OF THE SIZE OF AXIAL AND RADIAL COMPRESSORS ON THEIR EFFICIENCY — W. Bolte
Brennst.-Wärme-Kraft, 26, 10, 441-445 (1974)

In an earlier report, an investigation was made into the rise in the efficiency of axial compressors with size, where size was characterised by the inspired volume flow rate. That work is extended here, in that the efficiencies of axial and radial compressors are compared with one another at the design point. The axial compressor then turns out to be only about one efficiency point better than the radial compressor. In addition, a procedure is derived for calculating the exit pressure and the isentropic efficiency.

1882 VIBRATIONS IN GEAR DRIVES; TEST RESULTS AND CALCULATION METHOD FOR DYNAMIC TOOTH FORCES — H. Rettig
4th World Congress on the Theory of Machines and Mechanisms, Session 3B, Paper 30, 163-168 (1975)

In order to determine the vibrational forces and the stability of vibrations in a gear assembly, the effect of disturbance factors on the behaviour of the visco-elastic vibration system must be known. In solving this problem, the question arises as to the extent to which the idealisation of such a system is possible without suppression of the important characteristics of the solution. The answer is given by a series of test results. On the basis of these, together with theoretical investigations, a simplified calculation for the determination of the dynamic forces on the teeth has been developed.

1883 SWEDISH DEFENCE RESEARCH ABSTRACTS 74/75-4
Research Institute for National Defence, Stockholm

The Swedish Research Institute for National Defence issues a quarterly list of unclassified Reports published by the Institute. The titles of these Reports and informative abstracts have been translated in English. This volume is the fourth issue of 1974/75. Further volumes will be translated in due course. The main topics covered are: Protection - atomic, biological, chemical; ammunition and weapons; conduct of war, information and commands; vehicles and spacecraft; reliability and logistics; human factors; associated studies and their solutions; positive methods for limitation and control of armaments; psychology reports.

1884 INVESTIGATION OF THE PHENOMENON OF SELECTIVE MIGRATION IN FRICTION — I.V. Kragel'skii
Vestnik Akademii Nauk SSR, 1, 25-32 (1975)

A review is given of the way in which selective migration reduces wear. The process involves a series of stages; selective diffusion of atoms from the surface of an alloy, eg Sn or Zn from copper alloys, weakening of the surface layer, the formation of an electrostatic field in which metal ions and colloidal particles migrate, and the formation of a surface film from these particles. Specific fluid lubricants, eg glycerine, play an important role by inhibiting the formation of oxide films and by providing a medium for particle migration.

1885 THE EFFECT OF THE THERMAL STATE OF AN ASYNCHRONOUS MACHINE ON ITS CHARACTERISTICS — Yu.V. Gaintsev
Elektrotekhnika, 3, 20-21 (1975)

The variation in the power and starting characteristics, as well as additional losses with variation of the thermal state of a machine have been experimentally checked on 14 type-dimensions of series A02. It has been shown that all the tests of the machines should be performed in the heated state. It is advisable to adopt special measures for aligning the temperature of the stator and of the rotor.

1886 SIMULATION OF SEVERE COLLISIONS WITH AN ELECTRO-HYDRAULIC CATAPULT SYSTEM — W. Lange
A.T.Z., 72, 5, 162-167 (1970)

A hydraulic catapult system is described which enables a test sledge to be subjected to controlled impacts. The reactions of the test subject on the sledge are investigated by force and acceleration measurements, and filmed by a high-frequency camera mounted on the sledge.

A series of experiments to investigate the subject of whiplash trauma in crashes was carried out using dead human bodies. Information was gained on the effect of prior damage to the cervical vertebrae, unconnected with the accident, on the severity of the trauma produced, as well as on the importance of head support.

1888 A STUDY BASED ON THE PROBLEMS OF ELECTRONIC WARFARE IN A TYPICAL SITUATION OF AN AERIAL ATTACK ON A TARGET AT SEA — T. Linell
Swedish Research Institute for National Defence, FOA 3 report C 3790-M4 (1974)

The report is a study of potential interference problems arising from self-induced disturbances in a defined assault situation using aerial attack (by side A), taken from an example in FOA publication OM No.7: 'Electronic Warfare'. The consequences of such conflicts are analysed from basic principles with quantitative examples. The analysis considers both an attack system with its telecommunications and weapons (target seeking radar missile) and also the telecommunications system used by the party under attack (side B), assumed to be conducting an overseas operation; the defence consisting of frigates armed with surface to air missiles and ECM equipment for disturbing the electronic systems in the aircraft and their armament.

1889 SWEDISH DEFENCE RESEARCH ABSTRACTS 1975/76-1
Research Institute for National Defence, Stockholm

The Swedish Research Institute for National Defence issues a quarterly list of unclassified Reports published by the Institute. The titles of these Reports and informative abstracts have been translated in English. This volume is the first issue of 1975/76. Further volumes will be translated in due course. The main topics covered are: Protection - atomic, biological, chemical; ammunition and weapons; conduct of war, information and commands; vehicles and spacecraft; reliability and logistics; human factors; associated studies and their solutions; positive methods for limitation and control of armaments; psychology reports.

1890 MAGNETIC BEARINGS FOR SPACE TRAVEL AND CONVENTIONAL APPLICATIONS — C.J. Reimers
Dt. Ges. f. Ort. & Navigat., Duesseldorf, Symp. Gyro-Technology, Heidelberg, 25-26 April 1974, Paper 9, 211-226

Increasing demands required new methods to be tried. Possibilities offered by modern semiconductor technology which allowed electronic resources for control of magnetic bearings to be kept within reasonable bounds were additional stimuli. Development of better ferromagnetic and permanent magnetic materials has doubtless had similar positive effect. A 100N m s electromagnetically supported, all axes active, flywheel and an electrodynamically supported fly ring are described.

1892 THE ROLE OF STACKING FAULT ENERGY IN HIGH TEMPERATURE CREEP. PART 2: CREEP OF ALUMINIUM, NICKEL, COPPER AND SILVER — A. Orlová
Kovové Materialy, 3, 7, 242-253 (1969)

The creep behaviour of aluminium, nickel, copper and silver is shown to be controlled by lattice self-diffusion. The influence of stacking fault energy, γ, on creep rate, $\dot{\varepsilon}$, is through a power law of the form $\dot{\varepsilon} \propto \gamma^{k}$. This has been reported previously but unlike the earlier work, the exponent, k, is approximately 2.6. Studies of dislocation substructure clearly demonstrate the manner in which stacking fault energy influences behaviour and suggests that the rate controlling event is the non-conservative glide of jogged dislocations.

1894 TEXTURE STRENGTHENING OF TITANIUM AND ZIRCONIUM — N.V. Ageev
Izvest. Akad. Nauk. SSSR, Metally, 2, 81-90 (1975) — A.A. Babareko

The development of crystallographic textures and the corresponding effects on strength and hardness in Ti, Zr, and their alloys were studied. The addition of α or β stabilizing elements to Ti, for example, changed the tendency towards dislocation formation, and encouraged the development of the base texture. By varying the temperature, the deformation rate, and the amount of reduction during rolling, in addition to the orientation of the principal deforming forces, the type of crystallographic texture developed in α and $(\alpha + \beta)$ Ti alloys assumed various predictable forms, many of which gave special mechanical properties to parts made from these alloys. Analogous effects were obtained for Zr.

1895 A REVIEW OF THE MOST IMPORTANT ESTABLISHED FACTS ABOUT THE VISIBILITY (MAXIMUM DETECTION RANGE) OF AIRCRAFT — H.-E. Hoffmann
Deutsche Luft- und Raumfahrt DLR-Mitt. 74-33 (1974)

An aircraft becomes visible for an observer as soon as the difference of brightness between the aircraft and its background are large enough to reach or to exceed the contrast threshold of the human eye. The results of laboratory tests have shown how dependent the contrast threshold is on size and shape of an object, adaptation brightness, exposure time and location of an image on the retina. In field experiments it was determined in what manner the maximum detection range depends on horizontal standard visibility, type of aircraft, background, adaptation brightness and on the observer himself. The maximum detection range is the distance in which an aircraft can just be seen.

1896 INFLUENCE OF LEADING EDGE RADIUS ON THE PERFORMANCE OF HIGH DEFLECTION STATOR BLADES — J. Paulon
Bulletin de l'Association Technique Maritime et Aéronautique, No.73, 485-503 (1973)

Some stator blade sections typical of a high pressure ratio stage have been tested in an annular cascade facility. A range of inlet Mach numbers (0.3 to 0.8) and incidence angles were investigated and the stator pressure rise, deflection and efficiency were measured.

Test results show that leading edge radius controls the off-design characteristics of the stator. The experiments made with the same blades the leading edge of which are progressively cut-off and the leading edge radius increased give pressure rise and efficiency independent of the leading edge radius but improved deflection for a small but finite leading edge radius. A simple correlation formula is derived from the experimental results.

1898 SWEDISH DEFENCE RESEARCH ABSTRACTS 75/76-2
Research Institute for National Defence, Stockholm

The Swedish Research Institute for National Defence issues a quarterly list of unclassified Reports published by the Institute. The titles of these Reports and informative abstracts have been translated in English. This volume is the second issue of 1975/76. Further volumes will be translated in due course. The main topics covered are: Protection - atomic, biological, chemical; ammunition and weapons; conduct of war, information and commands; vehicles and spacecraft; reliability and logistics; human factors; associated studies and their solutions; positive methods for limitation and control of armaments; psychology reports.

1900 EXPERIMENTAL AND MEASURING ARRANGEMENTS FOR THE RECORDINGS OF BLAST FROM WEAPONS. MEASUREMENTS IN THE PRESSURE FIELD OF AN INFANTRY RIFLE HK 33 (5.56 mm)
Institut Franco-Allemand de Recherches de Saint-Louis RT14/70 (1970)

M. Froböse
G. Parmentier
G. Mathieu
D. Seydel

Equivalent procedures are called for, from the various working groups, for the measurement of gun blast pressures, for which an exacting standard of experimental and measurement technique is necessary. Some sensors, possible arrangements of them in the pressure field, and some amplifiers are discussed, and results of tests given. Comment is made on the limitations of sensors and possible solutions. Examples are given of blast pressure recordings in the vicinity of an infantry rifle HK 33, calibre 5.56 mm, together with isobars of maximum pressures and frequency analyses.

1901 FORMING, MICROSTRUCTURE FORMATION AND MECHANICAL PROPERTIES OF TITANIUM ALLOY TiA16V4
Z. Metallkunde 67, 4, 209-218 (1976)

K. Gazioglu
K.-J. Grundhoff
P. Funke
W. Bunk

The effects of deformation on the microstructure and mechanical properties of alloy TiA16V4 were investigated. An ingot divided into four sections was deformed at four different temperatures. Three of the temperatures chosen were below the $\alpha \rightarrow \beta$ transition temperature, ie in the $(\alpha + \beta)$-field, and one was above the transition temperature, ie in the β-field. Two techniques of β working were used: (i) forging and (ii) extrusion using a high-speed ram. The deformation stages were established in such a way that a characteristic homogeneous structure resulted when the specimens were examined metallographically. Homogeneity of the microstructure was achieved after working in the $(\alpha + \beta)$-field if the degree of deformation following β-forging exceeded 60%, and if the deformation stages were sufficiently large at *ca.* 20%. The effect of the homogeneous microstructure was clearly demonstrated by the reduction in the scatter of test values as compared with that found in earlier investigations.

1906 THE EFFECT OF THE BENZODIAZEPINE ADUMBRAN ON THE RESTING AND SLEEP EEG AND ON THE VISUAL EVOKED POTENTIAL IN ADULT MAN
Med. Welt, 67, No.9, 510-514 (1967)

G. Dolce
E. Kaemmerer

The administration of 20 to 40 mg of Adumbran to 27 adults in all gave rise to no significant clinical changes in vigilance in the waking state and no appreciable change in the EEG pattern, particularly as regards frequency. In tests to determine psychic disturbances after eliminating or shortening paradoxical sleep we recorded polygraphically the effect of Adumbran on the sleep EEG from 2300 hours to 0500 hours, testing 11 normal and 5 epileptic subjects. The overall duration of sleep lengthened under medication, with a simultaneous intensification of slow sleep. Paradoxical sleep was only shortened by an insignificant amount and, above all, was not suppressed. The visual evoked potential suffered only a slight reduction in amplitude, while there was no appreciable increase in latency. Adumbran relies mainly on the physiological conditions of sleep without showing secondary effects.

1907 SIGNIFICANCE OF IRREGULARITY OF GAUSSIAN RANDOM SEQUENCES ON FATIGUE LIFE
Laboratorium fuer Betriebsfestigkeit, Darmstadt, Report No.FB-124 (1976)

E. Gassner
H. Lowak
D. Schuetz

A notched specimen and a single shear lap joint of AlCuMg 2 were tested under axial random loading sequences to determine the influence of irregularity on fatigue life. At I = 0.99, 0.7 and 0.3, the irregularity factors investigated cover the range which is of interest for fatigue life. The method of generating random sequences ensures that the irregularity factor is the only variable of the random sequence.

The fatigue life defined by zero crossings grows with increasing irregularity both in the notched bar and in the joint, the increase in life depending on the stress ratio in the notched specimen and on stress ratio and stress level in the joint. With the uncertainty involved in any determination of life in practice, the increase observed only becomes significant if the irregularities are relatively large (I = 0.3).

The extension of life with increasing irregularity can be explained by the difference in the amplitude distributions, evaluated by the levels crossed and range pair counting methods, and can be successfully predicted.

AUTHOR INDEX

AUTHOR INDEX (concluded)

REPORT DOCUMENTATION PAGE

Overall security classification of this page

UNCLASSIFIED

As far as possible this page should contain only unclassified information. If it is necessary to enter classified information, the box above must be marked to indicate the classification, e.g. Restricted, Confidential or Secret.

1. DRIC Reference (to be added by DRIC)	2. Originator's Reference	3. Agency Reference	4. Report Security Classification/Marking
	RAE Lib Bib 360	N/A	UNCLASSIFIED

5. DRIC Code for Originator	6. Originator (Corporate Author) Name and Location
850100	Royal Aircraft Establishment, Farnborough, Hants, UK
5a. Sponsoring Agency's Code	6a. Sponsoring Agency (Contract Authority) Name and Location
N/A	N/A

7. Title List of RAE translations issued during the period January 1976 to December 1976

7a. (For Translations) Title in Foreign Language

7b. (For Conference Papers) Title, Place and Date of Conference

8. Surname, Initials	9a. Author 2	9b. Authors 3, 4	10. Date	Pages	Refs.
Compiled by Margaret Bromley			March 1977	12	-

11. Contract Number	12. Period	13. Project	14. Other Reference Nos.
N/A	N/A		

15. Distribution statement
(a) Controlled by

(b) Special limitations (if any) –

16. Descriptors (Keywords) (Descriptors marked * are selected from TEST)

17. Abstract

This list covers all RAE Library Translations published during 1976 and follows Bibliography 353.

Previous lists have been issued in Bibliographies 243, 249, 254, 261, 283, 313, 319, 324, 330 and 353.

F5910/1

RAE Form A143