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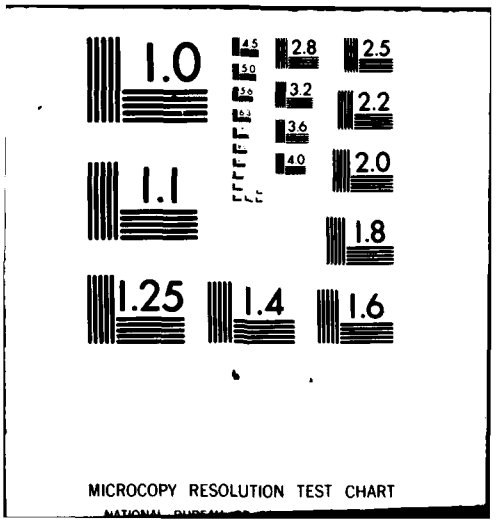
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ROYAL AIRCRAFT ESTABLISHMENT

Library Bibliography 373

Received for printing 22 January 1980

(6) LIST OF RAE TRANSLATIONS ISSUED DURING THE PERIOD JANUARY 1979 TO DECEMBER 1979

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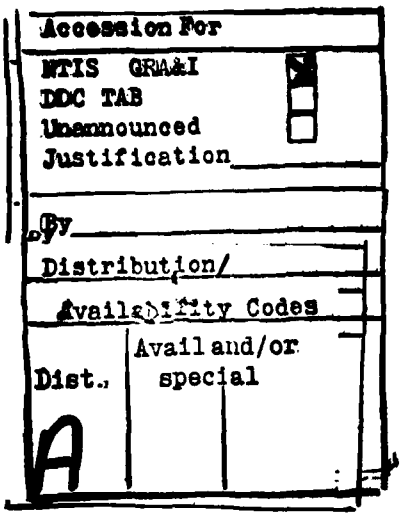
(19) BR-73994

SUMMARY

This list covers all RAE Library Translations published during 1979 and follows Bibliography 369.

Previous lists have been issued in Bibliographies 243, 249, 254, 261, 283, 313, 319, 324, 330, 353, 360, 366 and 369.

LIST OF CONTENTS



LIST OF TRANSLATIONS AND SUMMARIES IN NUMERICAL ORDER

1897 INFLUENCE OF THE ENVIRONMENTAL CONDITIONS ON A QUARTZ RESONATOR M. Valdois
ONERA Technical Note 225 (1974)

Quartz oscillators, used for aerospace applications, are subjected to very severe environmental conditions, particularly as far as accelerations and vibrations, which can be periodic or random, are concerned. The main effect of these disturbances is to modify the natural frequency of the resonator and thus to cause frequency instabilities in the oscillator.

In this paper the quartz resonator is studied both by itself, as a passive element placed in a transmitting circuit, and installed in an oscillator, which is its normal condition of usage.

The accelerations to which the resonators were subjected were steady state, sinusoidal or random. The orientation of the acceleration relative to the quartz crystallographic axis, as well as its direction, are of prime importance.

The same tests were performed on oscillators containing the resonators previously studied. The results confirm the part played by the resonator in the degradation of the stability of a quartz oscillator subjected to external disturbances.

1918 ULTRASONIC DOPPLER DIRECTIONAL BLOOD FLOW VELOCITY METER
Izvest. vuz priborostroenie (USSR) 19, 4, 5-8 (1976)

V.S. Postnikov
L.I. Yakimenkov
Yu. N. Gusev
P.M. Zykov

An investigation is made of a principle for detecting the sense of the velocity of a blood flow using ultrasonic Doppler meters. The USD meter operates in single-frequency continuous-signal conditions with a combined piezoelectric sender/receiver.

1924 MECHANICAL PROPERTIES AND CLEAVAGE FRACTURE OF IRON SINGLE CRYSTALS AT 77 K
Acta Metallurgica, 15, 1057-1072 (1967)

F. Terasaki

Single crystals of good purity iron with various crystallographic orientations have been tested in tension at 77 K. The stress-strain curves have been analyzed and the variation of mechanical properties and fracture mode with the orientation of the tensile axis is discussed. The experimental results are examined in the light of the most important models which are generally considered for cleavage fracture initiation.

When the load is applied along the [001] axis, the deformation of the specimens occurs by twinning and the fracture by cleavage which is obtained is associated with the presence of these twins. The specimens having their axis orientated along a [110] direction fail in a ductile manner. The fracture mode of these specimens can only be explained in terms of Cottrell type dislocations. When the tensile axis is parallel to the [111] direction the results are more difficult to interpret: almost all models are in agreement with the observed behaviour of the specimens, but the exact conditions of cleavage initiation are such that no definite conclusions can be drawn.

1974 A COMPARATIVE INVESTIGATION OF FLAME RETARDANTS
Plaste und Kautschuk, 23, 3, 192-197 (1976)

A. Hopp
H.-P. Skilandal
Barbara Taubert
I. Klotzscher

In the case of all plastics investigated, it was found that different test methods give information which agrees only roughly, the findings being greatly affected by the type of test method used. Although the oxygen index cannot, by reason of limitations mentioned above where information obtained is concerned, particularly in the case of dripping materials and of products of low thermal stability, be recommended as the sole test method, it nevertheless occupies a special position as a satisfactorily reproducible method with a wide field of application to all types of material and to all shapes of manufactured products.

The classification of phosphate plasticisers according to their flame-resistant properties always followed the order: tris-(halogen-alkyl-)phosphate; triarylphosphate; trialkylphosphate.

In the case of inorganic flame retardants, it was possible to show that, in general, 50% of the antimony trioxide used can be replaced by borate without any decrease in the flame resistance, whereupon the different effects on the thermal stability of PVC when Ba and Zn borate are used reveal a certain action on the flame retardant properties, in accordance with UL 94, part 2.

1981 A METHOD OF MEASURING THE VISIBILITY OF MILITARY OBJECTS
Netherlands Organisation of Applied Scientific Research, Institute of Perceptual Physiology, Soesterberg.
Report No. IZF 1978-10

J. Boogaard
A. van Meeteren

In the Dutch Army there is a need for a simple method of determining the visibility of military objects. Experiments in the field, as described in WEU Agreement Appendix A5-4FT6 TM/05-10 are impracticable. In this report an alternative approach is explored by taking photographs in the field and then by determining indoors the simulated detection distances. This approach is demonstrated for vehicle types YA 2442 and YA 126, with and without trailer. The YA 126 would seem to be the less conspicuous under all circumstances, both with and without the trailer.

1985 SWEDISH DEFENCE RESEARCH ABSTRACTS 77/78-2

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 into English. This volume is the second issue of 1977/78. 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.

1988 VISUAL ERGONOMICS IN CARTOGRAPHIC AND LITHOGRAPHIC WORK AT THE TOPOGRAPHIC SERVICE. PART 1: OPTOMETRIC ASPECTS AND VISUAL REQUIREMENTS
IZF (Instituut voor Zintuigfysiologie)
Report 1978-14 (Holland)

J. Boogaard
K. A. de Vries
E. Ellens
H.J. Leebeek

At the Topographic Service the cartographic draftsmen had complaints about the execution of their work. The complaints were connected with the fact that almost continuously small map details had to be examined at very short distances.

The job situation could be improved by providing the cartographers and lithographers with special working glasses. Furthermore, visual standards were formulated to be used when applicants for jobs are examined medically or in the case of re-examination of cartographic co-operators. In a second report lighting conditions and working posture will be discussed.

1989 LIGHTING THEORY IN PRACTICAL SITUATIONS
IZF (Instituut voor Zintuigfysiologie)
Report 1978-17 (Holland)

H.J. Leebeek

Starting from the typical physics-man relation as it is given by the light source-human eye combination a view is given about the main terms and definitions as luminous intensity, illuminance, luminance, luminous flux and reflection. The subjective appraisal of the visual environment can be well described by means of luminances ratio.

Recommended illuminances are given. As to the colour aspects of lighting also recommendations as well as some background data are given.

Finally, this report contains daylight and sunshade data.

1990 DETERMINATION OF HYDROXYL GROUPS IN EPOXY AND POLYOXYPHENYLENE RESINS BY GASOMETRIC METHOD
Polimery, 19, 12, 622-4 (1974) Warsaw

Feliksa Majewska
Zdzislawa Glinka

This paper provides the experimental details for the determination of hydroxyl groups in epoxy and polyoxyphenylene resins. The method is based on the quantitative reaction of hydroxyl groups with lithium aluminium hydride, and the measurement of the hydrogen released. This avoids the difficulty of other methods whereby the epoxy groups also react with the reagent employed, and this method is said to use simpler apparatus and techniques compared with others utilising the same basic reaction.

1991 SCATTERING OF A MONOCHROMATIC WAVE BY A TURBULENT FLOW IV
L39 388(A), Onera TP, 1977-125

S. Candel
A. Guedel
A. Julienne

In order to study the structure and radiation of aerodynamic noise sources, French official services have financed the construction at CEPr of an anechoic open-jet wind tunnel: CEPRA 19.

In this installation the sound field generated by the source to be investigated will be modified outside the jet by interactions which occur as the sound waves propagate through the mixing layer of the free jet. It has therefore been

found necessary to devise correction methods, the study of which forms the subject of a research programme conducted by ONERA using the open-jet wind tunnel L_1 of of the von Karman Institute.

In the case of a monochromatic wave (1 kHz $\leq f_0 \leq$ 100 kHz), interaction with turbulence changes the phase and amplitude. The comparison between the spatio-temporal structure of the aerodynamic velocity field, and that of the sound field characterised by fluctuations in the phase and amplitude, shows the propagation effect of large-scale turbulent structures which are convected in the jet shear layer.

1992 LIMITING QUANTITIES OF THE GLASS TRANSITION TEMPERATURE — R. Becker
Plaste und Kautschuk, 25, No.1, 1-5 (1978)

The relative importance of several properties, including heat capacity, cohesive energy, free volume and chain rigidity, in determining the value of the glass transition temperatures of polymers is reviewed in the light of new and previous relationships. Equations are developed showing the interrelationship between dominant parameters.

1994 THE DEVELOPMENT OF INTERNAL STRESS IN α TITANIUM COLD WORKED IN TENSION — J. Charrier, J. de Fouquet
Materials Science and Engineering, 34, 1, 91-96 (1978)

The internal stress in commercial titanium cold worked under tension between 133 and 673 K has been determined by relaxation tests. At low temperature this stress varies much more rapidly than does the shear modulus. Studies carried-out on samples with different grain sizes have shown that the hardening observed between 133 and 293 K has an intergranular origin and can be attributed to the formation of hydrides, with the most probable hardening mechanism being of the Orowan type.

1995 A MATHEMATICAL MODEL FOR OR STUDIES — H. Schedler
BMVg-FBWT 75-29, pp 35-52 (1975) (West Germany)

The Dornier System Planning Department have been working on OR problems for the West German Navy for over 10 years, with the analysis of weapon systems forming a major part of the work.

The last 2 years have been spent converting the studies into a universal, flexible system. This work was aimed at the production of a general mathematical model to be used for the analysis of future Navy weapon systems.

This report provides a summary of the scheme, and an introduction to the model.

1996 STUDIES IN THE GLASS TRANSITION REGION OF ACRYLONITRILE-ISOBUTYLENE COPOLYMERS — J. Ritter, E. Helm
Plaste und Kautschuk, 25, No.1, 5-8 (1978)

Specific heats, over a range of temperatures, and glass transition temperatures were determined by differential scanning calorimetry for copolymers of isobutylene and acrylonitrile. Cohesive energy and free volume values were

calculated and the dependence of T_g on these parameters was estimated using known equations.

1997 SWEDISH DEFENCE RESEARCH ABSTRACTS 77/78-3 — 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 into English. This volume is the third issue of 1977/78. 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.

1998 THE EFFECT OF BRINELLING AND FRETTING FATIGUE ON THE FATIGUE LIFE OF ASSEMBLED MACHINE COMPONENTS — L. Kreitner
Forschungshefte Forschungskuratorium Maschinenbau e.V., Part 56 (1976)
D6000 Frankfurt/M-Niederrad 71, West Germany

Fatigue tests were carried out on specimens of heat treatable steels and titanium alloys with and without fretting pads. The effect on fatigue performance of slip, surface pressure, lubricants, surface treatments, heat treatments and loading sequences were evaluated. It was found that the main damaging mechanism of fretting fatigue is the high alternating shear stresses induced in the contact (friction welded) points. Theoretical evaluation of the stress paths under these contact points gave good agreement between the directions of the main stress and the cracks which caused failure.

Using the conclusions drawn from this work, a summary is presented, outlining the various methods of preventing fretting fatigue failures or reducing their damaging effect.

1999 ENVIRONMENTAL EFFECTS ON THE ELASTIC-PLASTIC PROPERTIES OF ADHESIVES IN BONDED METAL JOINTS — Walter Althof, Gerhard Klinger, Gerhard Neumann, Johanna Schlothauer
DLR-FB 77-63, 1977

The shear modulus, the stress at 1% shear strain, the shear strength, the strain at fracture and the appertaining shear stress-strain diagrams are analysed for ten aircraft structural adhesives. These values are calculated from the measured load-deflection behaviour of the adhesives in the bond line of lap joints with a thick adherend and a small overlap length, as well as from the torsion pendulum testing of cast adhesives. The measurements are made before and after a long exposure to warmth, cold, moisture, warmth combined with moisture, and changes between cold and combined warmth and moisture. The environmental effects on the adhesion between adherend and adhesives as observed in the tests are described.

2000 THE FATIGUE STRENGTH OF PLAIN, NOTCHED AND JOINTED SPECIMENS OF CARBON FIBRE COMPOSITES
Report No.78-188, DGLR Symposium, 22 September 1978, Darmstadt

D. Schütz
J.J. Gerharz
E. Alschweig

A programme of static and fatigue testing in tension and compression has been carried out on carbon fibre/epoxy material of angle-ply lay up in the form of plain and notched specimens and bolted joints. This report discusses the differences observed between the types of specimen as regards stress-strain behaviour, tensile and compressive strength and performance and modes of failure under fatigue loading.

It is shown that stress concentration has an appreciable effect on static and short term fatigue strength but little effect in long term fatigue. It was found that the performance of the open hole specimen was modified by fitting a clamped, oversize bolt and that appreciable effects could arise from load transfer and secondary bending in the joint specimens. In general the scatter in static and fatigue strength was found to be comparable with that for similar features in metals. Finally when the plain material was loaded transversely instead of longitudinally the static and fatigue strengths were lower by a factor of about 3.

2001 THE SIGNIFICANCE OF THE ELLIPSOID SHAPE OF THE EARTH IN AERIAL NAVIGATION
Dissertation - Publ. No.166, Series C, German Geodetic Commission, Munich (1971)

L. Kiefer

Owing to developments in navigation measurement techniques a sphere no longer suffices as an adequate earth model. This report takes an ellipsoid as a better approximation to the actual shape. Further refinements to the shape are not considered.

The prime aim of this work is to generate formulae which are neat yet accurate enough for small airborne navigation computers to produce a fix at an appropriate rate.

The second aim is to modify the task to fit the size and speed limitations of such a computer.

This report considers all the most important navigation methods except hyperbolic navigation, which has been investigated in depth by another employee of the University of Stuttgart Geodetic Institute.

2003 RAIN-EROSION RESISTANT MATERIALS IN AIR AND SPACE TRAVEL — MBB WF-Information 5/78 pp 2-10

The development of rain erosion resistant protective coatings for radomes is described for use in subsonic applications on aircraft and for supersonic applications on missiles at velocities up to Mach 6. The associated requirements for antistatic, antiflash and ablation on the re-entry of missiles are also considered.

Tests are described, mostly in the USA, and examples given in suitable materials for each application. Some flight experience with erosion damage sustained on Starfighters of the Federal German Air Force is included.

2004 IMPROVEMENT IN THE STATISTICAL INFORMATION YIELDED BY ENDURANCE STRENGTH TESTS (STAIRCASE METHOD) — M. Hück - Bär
Report TF-651 B, IABG MBH (1977)

The staircase method for determining the fatigue limit of materials and components has been reassessed with the aim of reducing confidence limits to reduce the number of tests necessary for a certain statistical margin of safety.

As a result of statistical evaluations of fatigue tests simulated by computer it was found that current staircase methods considerably underestimate the standard deviation of the results. Methods are described for estimating the mean, standard deviation and associated confidence zones using all occurring events in the staircase method such that 20% fewer tests are required compared to other methods to achieve the same confidence zones.

2005 AN ULTRA-WIDEBAND ANTENNA — I.T. Ivanov
Izvest VUZ Radioelektronika (USSR) 13, 1, 74-76 (1970)

A size-reduced ultra-wideband three-element antenna is described. Each resonator element is a half-wave dipole, tuned to long, medium and short wave points in the frequency band, respectively. Size reduction of the dipoles is effected by employing a slow-wave helical structure wound coaxially on an insulated tube. The helices are short-circuited at their outer ends to achieve broadbanding. The reported match of this antenna over 4-5 octaves is 1.5 VSWR.

2006 SWEDISH DEFENCE RESEARCH ABSTRACTS 77/78-4 — 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 1977/78. 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.

2007 WEAR OF MODIFIED ELECTRICAL BRUSH MATERIAL IN VACUUM
Report No.980-2.1, 15 January 1978.
Laboratoire Suisse de Recherches Horlogères, Neuchâtel

M. Maillat
H.R. Kocher
H.E. Hintermann

In 1974 a preliminary study was undertaken to examine the influence of the direction of friction on the wear of a particular material for electrical contacts. After the composition and structure of this material had been changed, in the hope of obtaining a greater degree of homogeneity, new friction tests were carried out in a high vacuum, without any electrical current, and in one position, only, with respect to the structural orientation of the material.

It would appear that for these brushes, with a composition of 84 Ag, 15 MoS_2, 1 Cu by weight, the wear is greater than in the case of the brushes studied originally and that it varies considerably from one sample to another.

2008 ANALYSIS AND SYNTHESIS OF OPERATIONAL LOADS
ISD Report 193 (February 1976), University of Stuttgart

J.H. Argyris
W. Aicher
E.J. Ertelt

The inadequate estimation of fatigue lives of structures by theoretical methods has led to the development of techniques for simulating service loading histories in the laboratory. The techniques required for the synthesis of a laboratory loading sequence from service loading data are described using the standard fighter loading sequence, FALSTAFF, as an example.

2009 THE CALCULATION OF INVISCID SEPARATED FLOW ABOUT A SLENDER CONE FOR LARGE ANGLES OF ATTACK
Uchenye Zapiski TsAGI VII, 6 (1976)

S.B. Zacharov

Results are presented of calculations using the method of establishing, within the framework of the theory of a slender body, the symmetrical, separated flow about a circular cone. The configuration of vortex layers, coefficients of the normal force in dependence on the angle of separation and the distribution of pressure in the plane of cross-section over the range of relative angles of attack of $2.1 \leqslant \alpha/\theta_K \leqslant 3.3$ are determined.

2011 THE RESPONSE OF AN ELECTROSTATIC MICROPHONE TO AN AIRFLOW
Revue d'Acoustique, 40, 46-57 (1977)

R. Gamba

The origins of the different pressure fluctuations picked up by a microphone in an air stream are stated exactly. This is followed by a theoretical study of the behaviour of a Brüel and Kjaer condenser microphone when the direction of the airflow is perpendicular to the diaphragm.

After that, an experimental study is conducted during which the following parameters are varied:-

- average wind velocity (5-20 m/s);
- percentage of turbulence (0.01-1%);
- diameter of microphone (1 inch, ½ inch, ¼ inch).

From these experiments are deduced:

- the output level induced by turbulence, which is found to be in good agreement with results published by other authors;
- the output level induced by a laminar quiet airflow, the magnitude of which appears to be less important than the one found by the manufacturer.

The effect of the standard protection grill or ogive is studied in each case.

2012 DEVELOPMENT OF AN AIR HEATER FOR A MIXTURE FORMATION TEST RIG — H.-D. Distelrath
DFVLR Report IB-351-77/36, Institut für Angewandte Gasdynamik, December 1977

This report describes the design, development and assessment of a 400kW air heater which is required for a mixture formation rig. Also described is the useful previous experience gained from the development of two continuous flow electrical heaters. These have been used to heat air for two hypersonic wind tunnels and have maximum outputs of 2500 kW and 230 kW. The 400kW heater is based on the 230kW heater which has also been used for some years to heat air for an engine and combustion chamber test rig.

2014 SWEDISH DEFENCE RESEARCH ABSTRACTS 78/79-1 — 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 1978/79. 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.

2015 SICA INSTALLATION. SIMULATION OF THE INTERCEPTION OF AIRBORNE TARGETS
Note ETEL HF/78-285, ECAN, Ruelle, France

The SICA equipment was designed to give a dynamic simulation of the interception of airborne targets, using proximity fuzes, and to overcome some of the problems, such as cost and limitations in live situations, which occur in full-scale testing.

A model of the fuze to be simulated is mounted on a carriage and moved at a constant speed towards a target model. The simulation of the fuze parameters and also of the position and attitude of the target are controlled by computer programs. The system works normally to a scale of 1/8, but this can be increased to 1/1 for small targets. The whole action of interception is carried out automatically, controlled from a central console, and the results of an interception can be available as a computer print-out or on magnetic tape.

The equipment has applications to the evaluation of fuze-warhead combinations against various targets, to the optimisation of proximity fuzes and to the determination of target signatures. It is hoped to extend the usefulness by introducing sea or ground echoes, leading to applications to low-altitude fuzes.

2016 A NEW METHOD OF ELECTRIC MEASUREMENT OF CRACK LENGTH — G. Baudin, H. Policella
La Recherche Aérospatiale, 4, 195-203 (1978)

The paper concerns improvements on devices used for determining the existence of propagation of a crack in an electrically conducting material.

The procedure consists in ensuring a pulsed electric supply, which reduces the response time of the measurement, and, more important still, makes it free of noise and of the constant current amplifier zero drift. In case of cyclic loadings, the pulse may be synchronised with these loadings.

After a description of a new type of instrument, the paper emphasises, by specific applications, its great flexibility of use and the performance obtained.

2019 THE HUMAN BODY TEMPERATURE REGULATION SYSTEM — J. Werner
Biol. Cybernetics, 17, 53-63 (1975) © Springer-Verlag 1975

The control-loop of human body-temperature is treated as a distributed-parameter-system. The equations of heat-balance are formulated, admitting discontinuities of parameters. Using two succeeding integral-transformations and an expansion with eigenfunctions, an analytical solution is found for the closed control-loop. Regarding the stationary as well as the dynamical behaviour, the mathematical results are on the whole compatible with experimental results.

2021 FUNCTION AND COMPUTATION OF TRANSDUCERS FOR THE CONTACT-FREE MEASUREMENT OF DISTANCE ON THE BASIS OF THE EDDY CURRENT EFFECT, PART 1 — H.R. Loos
Technisches Messen ATM, 7/8, 229-234 (1976)

Contact free-measurements of distance can be made using inductive transducers. These operate by changes in the impedance of a coil by magnetic and eddy current effects. A simplified model is described.

2024 SWEDISH DEFENCE RESEARCH ABSTRACTS 78/79-2 — 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 1978/79. 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.

AUTHOR INDEX