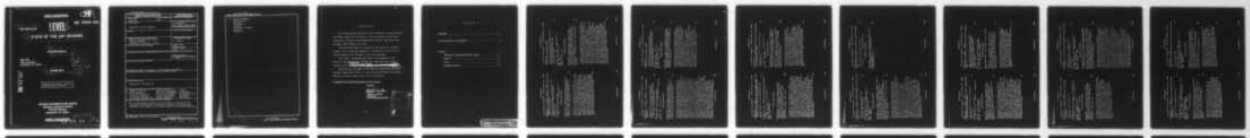
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LEVEL II

(6) STATE OF THE ART REVIEWS.

(9) Report

A DDC BIBLIOGRAPHY

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: DDC-TOS	2. GOVT ACCESSION NO.: AD-	3. RECIPIENT'S CATALOG NUMBER:
4. TITLE (and Subtitle): STATE OF THE ART REVIEWS		5. TYPE OF REPORT & PERIOD COVERED: Bibliography Dec. 1965 - July 1978
		6. PERFORMING ORG. REPORT NUMBER:
7. AUTHOR(s):		8. CONTRACT OR GRANT NUMBER(s):
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Defense Documentation Center, Cameron Station, Alexandria, Virginia 22314		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: PE 65601S
11. CONTROLLING OFFICE NAME AND ADDRESS:		12. REPORT DATE: March 1979
		13. NUMBER OF PAGES: 262
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office):		15. SECURITY CLASS. (of this report): Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

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17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Supersedes AD-A005 375

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

* State of the art	Research Management	Lasers
* Bibliographies	Electronic Equipment	Holography
* Scientific Research	Aircraft Equipment	Instrumentation
Literature Surveys	Flight Instruments	Computers
Earthquake Engineering	Medical Research	Meterology

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This bibliography contains 335 citations pertinent to the evaluation and results of surveys, studies, and literature searches in the state of the art reviews of selected subjects.

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19. Data Processing
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Literature Surveys
Indexes
Abstracts

FOREWORD

This bibliography consists of 335 citations of unclassified/unlimited reports on *The State of the Art Reviews*, which were processed in the Defense Documentation Center's data bank from December 1965 through July 1978.

Citations pertinent to evaluation and results of surveys, studies, and literature searches in the state of the art of selected subjects are included in this bibliography.

This report supersedes DDC report bibliography on The State of the Art Reviews, AD-A005 375, DDC-TAS-74-41, dated February 1975, [redacted]

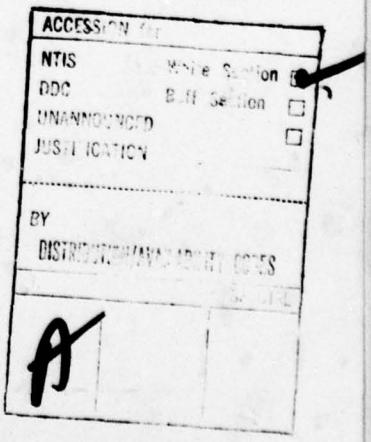
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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A060 091 15/7 13/2 15/3
OFFICE OF THE CHIEF OF ENGINEERS (ARMY) WASHINGTON D C
ENGINEER STUDIES GROUP

Battlefield Obstacles -- An Appraisal of the State of the Art in Measuring Obstacle Effectiveness. (U)

DESCRIPTIVE NOTE: Final rept.,
SEP 76 72P Cooper,Gerald E. ;

UNCLASSIFIED REPORT

DESCRIPTORS: *Battlefields, *Barriers, *Military tactics, *Combat effectiveness, Combat areas, State of the art, Warfare, Military engineers, Military strategy, War games, Simulation (U)

The US Army is concerned with the question: What do obstacles have to do with winning or losing battles. This appraisal collects many thoughts from a variety of sources about the measurement or demonstration of the effectiveness of battlefield obstacles, natural and manmade. From consideration of the historical record and a number of approaches to combat analysis, the paper notes that the measurement of obstacle effectiveness has remained primitive and produced unconvincing results. Part of the difficulty is traced to limitations in the representation and interpretation of obstacle-free combat. The paper concludes that, despite a number of identified difficulties, obstacle-related combat analysis can be made much more convincing and offers several suggestions toward that aim. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A059 797 6/3 6/5
DAYTON UNIV OHIO RESEARCH INST

Procedures Used to Generate Three- and Six-Year-Old-Child Data Sets for the Articulated Total Body Model from Anthropometric Data. (U)

MAY 78 15P Leet,Duane G. ;
CONTRACT: F33615-78-C-0504
PROJ: 7231
TASK: 05
MONITOR: AMRL 78-11

UNCLASSIFIED REPORT

DESCRIPTORS: *Anthropometry, *Crash injuries, Aircraft, Passengers, Models, Anatomy, Input, Computer programs, Geometric forms, State of the art, Motor vehicle accidents, Cost effectiveness, Protection, Vehicles (U)
IDENTIFIERS: Anthropometric data, WUAMRL72310518, PE62202F (U)

A class of rigid component, chained system models has been developed to predict relative limb and whole body motion of humans during vehicle crashes and aircraft ejection situations. Members of this class include the 3-D Crash Victim Simulator and the Articulated Total Body Model. Both have similar input data requirements, including individual segment inertial properties, joint locations and their biomechanical characteristics, and contact surface definitions. Currently, the only body class for which a significant amount of such data exist is the adult male. In this paper state-of-the-art techniques are presented for generating ATB Model input data sets for two other body classes, the three- and six-year-old child, from anthropometric data. The anthropometric data on these two classes are unique because dental stone manikins have been developed from them that provide various direct inertia and dimensional data for comparison with the corresponding values developed using these techniques. (Author) (U)

AD-A059 073 8/11 8/6
SAINT LOUIS UNIV MO DEPT OF EARTH AND ATMOSPHERIC SCIENCES

State-of-the-Art for Assessing Earthquake Hazards in the United States. Report 10. Attenuation of High-Frequency Seismic Waves in the Central Mississippi Valley. (U)

DESCRIPTIVE NOTE: Miscellaneous paper, JUL 78 79P Nuttli,Otto W. ;Dwyer,John J. ;
MONITOR: WES MP-S-73-1-10

UNCLASSIFIED REPORT

DESCRIPTORS: *Earthquakes, *United States, *Threat evaluation, Mississippi, State of the art, Seismic data, Ground motion, Seismic waves, Attenuation, Statistical analysis, Seismological stations, Hazards, Earthquake engineering (U)

This study was concerned with the attenuation of high-frequency earthquake waves in the central Mississippi valley. The data were obtained from seismographs which measured the vertical component of ground motion. Recording was on analog magnetic tape and on 16-mm photographic film. Most attention was devoted to a study of Lg waves, which are higher mode surface waves that produce the largest ground motion. At frequencies of 1 to 10 Hz the specific dissipation factor Q of the Lg waves was found to be 1500. The results of the present study indicate that in the central United Sates high-frequency waves will produce significant ground motions at relatively large distances, which is not the case in California or other tectonic areas. In the frequency domain the Fourier displacement spectra of the Lg motion showed the typical flat level at the lower frequencies and the rapid fall-off of amplitude with increasing frequency at the high frequencies. In the time domain, on the other hand, the level of ground displacement in the source region was essentially constant between frequencies of 1 to 10 Hz. This fact, together with the relatively low attenuation of the Lg waves, indicates that waves of frequencies as high as 10 Hz may have relatively large amplitudes and accelerations at epicentral distances as large as hundreds of kilometers for central United States earthquakes (U)

AD-A058 797 4/1 20/3
GEORGIA INST OF TECH ATLANTA

Federal Aviation Administration-Georgia Institute of Technology Workshop on Grounding and Lightning Protection. Held at Atlanta, Georgia on May 2-4 1978. (U)

DESCRIPTIVE NOTE: Final rept. MAY 78 419P
MONITOR: FAA-RD 78-83

UNCLASSIFIED REPORT

DESCRIPTORS: *Lightning, *Electrical grounding, Electronic equipment, Protection, Aviation safety, Workshops, State of the art, Safety, Voltage regulators, Storms, Simulation, Electromagnetism, Shielding, Inductance (U)

A state-of-art review and background research reveals a number of opinions as to the preferred techniques of grounding of electronic equipment and systems. These techniques become important when protection must be provided for transients induced by lightning, electromagnetic pulses (EMP) and other sources. The Systems Research and Development Service of the Federal Aviation Administration in conjunction with the Georgia Institute of Technology conducted a workshop which brought together distinguished experts in the fields of grounding, lightning, transient protection, EMP protection for electrical and electronic facilities and lightning transient protection of aircraft electronics. This report contains the papers presented at the workshop. This is the fifth workshop conducted on the subject. (Author) (U)

AD-A058 456 10/2
ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND FORT MONMOUTH NJ ELECTRONICS TECHNOLOGY/DEVICES LAB

Improved Anodes for Liquid Hydrocarbon Fuel Cell. (U)

DESCRIPTIVE NOTE: Research and development technical rept.,
APR 78 17P Perry,John ;
REPT. NO. DELET-TR-78-8
PROJ: 1S762705AH94
TASK: P1

UNCLASSIFIED REPORT

DESCRIPTORS: *Fuel cells, *Anodes, Carbinols, Hydrocarbons, Liquid phases, Ethylene glycol, State of the art, Catalysts, Platinum, Palladium, Lead dioxide, Graphite, Silver compounds, Air, Power supplies, Military applications (U)
IDENTIFIERS: PE62705A, ASH94, WU032 (U)

Low power fuel cells operating on liquid hydrocarbons, such as methanol and ethylene glycol, have received renewed attention. The current state-of-the-art of anodes used in liquid hydrocarbon fuel cells operating at ambient temperatures of 22 C consist of platinum and palladium catalyst loadings of approximately 10 mg/sq cm. The cost and quantity of these noble metals required for anode electrode fabrication are high. Investigations conducted to reduce the noble metal catalyst loadings have lead to the development of an electrode consisting of graphite, platinum (2.4 mg/sq cm), and anodic lead dioxide. Cells fabricated with the new anode (graphite, platinum, and lead dioxide) and silver amalgam cathodes were capable of operating at current densities of 20 mA/sq cm at 0.60 V when charged with an anolyte solution of either methanol in potassium hydroxide or ethylene glycol in potassium hydroxide. (Author) (U)

AD-A057 834 20/4
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT NEUILLY-SUR-SEINE (FRANCE)

Instability, Transition to Turbulence and Predictability, (U)

JUL 78 40P Morkovin,M. V. ;
REPT. NO. AGARD-AG-236

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the AGARD Fluid Dynamics Panel Symposium on Laminar-Turbulent Transition Held at Lyngby (Denmark) 2-4 May 77.

DESCRIPTORS: *Boundary layer transition, Laminar flow, Turbulent flow, Stability, Flow fields, Mathematical prediction, Symposia, Literature surveys, State of the art (U)
IDENTIFIERS: NATO furnished (U)

Contained herein is a concise state-of-the-art review and perspective on the phenomenon of transition which constituted the Opening Address at the Fluid Dynamics Panel Symposium on Laminar-Turbulent Transition (AGARD-CP-224). Various instability mechanisms leading to transition are proposed and discussed. A valuable insight is provided based on existing experimental evidence and postulated flow structures. Critical questions are asked relating to the conceptual foundations on which much of the transitional effort is based. To enhance our understanding of the basic mechanisms and processes, detailed microscopic experiments are encouraged to increase the data base. (U)

AD-A057 562 5/1 5/9 5/10
NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER SAN DIEGO CALIF

Job Performance Aids: Research and Technology State-of-the-Art. (U)

DESCRIPTIVE NOTE: Final rept.,
JUL 78 93P Booher,Harold R. ;
REPT. NO. NPRDC-TR-78-26
PROJ: Z0828
TASK: Z0828-PN

UNCLASSIFIED REPORT

DESCRIPTORS: *Personnel management, *Naval training, *Information systems, *Job analysis, *Job training, *Performance(Human), *State of the art, Job satisfaction, Systems analysis, Mathematical analysis, Costs, Cost analysis, Test and evaluation, Naval personnel, Mathematical models, Goal programming (U)
IDENTIFIERS: Job performance aids, Research and technology, PE63720N (U)

This report describes and compares the various Job Performance Aid techniques and identifies and categorizes factors important to selection, design, cost-performance trade-off, conduct of future research, and implementation of performance aiding technology. More than 100 surveyed JPA systems and techniques are classified under five categories: (1) format/content, (2) display media, (3) applied training, (4) peripheral test/diagnostic, and (5) delivery systems. Major factors are identified as critical to the development of a JPA algorithm, including personnel aptitude and experience, type and complexity of task, type and complexity of equipment, and degree of proceduralization required. A conceptual model is presented for use by the JPA community in cost trade-off analyses, in JPA selection algorithms, and in the grouping of theoretical trends. The report also presents a theoretical base for use of memory in JPA; previews a theory for mixing JPA techniques, principles, and methodologies; and outlines goals for future JPA research and technology efforts. (Author) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A056 451 15/7
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Tunnel Destruction State-of-the-Art, (U)

JUN 78 11P Joachim,Charles E. ;

UNCLASSIFIED REPORT

DESCRIPTORS: *Tunnels, *Destruction, *State of the art, Army operations, Sizes(Dimensions), Length, Damage (U)
IDENTIFIERS: Criteria (U)

AD-A056 014 17/8 20/6
ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND DOVER NJ TECHNICAL SUPPORT DIRECTORATE

Beyond the State-of-the-Art Illumination Measurements. (U)

DESCRIPTIVE NOTE: Final rept.,
APR 78 29P Smith,C. L. ;Everswick,D. N. ;
REPT. NO. ARTSD-TR-77002
MONITOR: SBIE AD-E400 151

UNCLASSIFIED REPORT

DESCRIPTORS: *Illuminants, *Photometry, Test methods, Field conditions, Data reduction, Real time, State of the art, Mathematical models, Illumination, Light, Intensity, Flares, Computer programs, Light transmission, Radiation attenuation, Atmospheres, Transmittance, Reduction, Costs (U)

The invention of a direct method of obtaining candlepower has led to he development of a mathematical model of a simplified system for field testing illuminant items. In addition to obtaining the light intensity independent of the source distance, an innovation for assessing the atmospheric transmissivity is described. The light transmission is measured without employing special equipment other than that used for the basic candlepower measurements. The model configuration constraints are based on present field test practice. This technique will allow two or three people to set up and man a complete field test system. Test results which formerly required extensive data reduction and processing will be available on-site for instant readout. Besides increasing the reliability of data and on-the-spot readout, this system should reduce costs and generally enhance illuminant testing. (Author) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A055 971 8/11 5/2
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

State-of-the-Art for Assessing Earthquake Hazards in the United States. Report 9. Catalogues of Strong Motion Earthquake Records. Volume I. Western United States, 1933-1971. (U)

DESCRIPTIVE NOTE: Miscellaneous paper,
APR 78 56P Chang,Frank K. ;
REPT. NO. WES-MP-S-73-1-9-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Rept. no. 8, AD-A050 750.

DESCRIPTORS: *Earthquakes, *Catalogs, Records, Intensity, Faults(Geology), Depth, Site selection, Classification, Acceleration, Peak values, Velocity, Displacement, Epicenters, Graphs, Earthquake engineering, Ground motion, State of the art (U)

A working catalogue was prepared to facilitate the selection of strong motion earthquake records for design purposes. The records are those processed by the California Institute of Technology from western United States during the period 1933-1971. They are presented graphically in terms of magnitude, type of fault, focal depth, site classification, peak acceleration, velocity, displacement, duration, and distance from epicenter. (Author) (U)

AD-A055 739 11/4 20/11
ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF MATERIALS ENGINEERING

A Review of Dynamic Response of Composites. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jul 75-31 Dec 76,
APR 78 141P Lee,T. C. ;Ting,T. C. T. ;
CONTRACT: DAAG46-75-C-0090
PROJ: 1W362306AH72
MONITOR: AMMRC TR-78-20

UNCLASSIFIED REPORT

DESCRIPTORS: *Composite materials, *Dynamic response, Literature surveys, State of the art, Harmonic analysis, Transients, Dynamic loads, Mathematical analysis, Anisotropy, Modulus of elasticity (U)
IDENTIFIERS: PE62306A, ASH72 (U)

The purpose of this project was to review the state of the art on the dynamic response of composites and to suggest possible future research directions. More than three hundred papers are reviewed and compiled at the end of this report. The existing theories of the dynamic response of composites are summarized in Chapter I. The harmonic waves and transient waves in, and the experiments on, composites are discussed in Chapters II, III and IV, respectively. The differences between various theories and possible future research directions are presented in Chapter V. (Author) (U)

AD-A054 246 1/4
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY N J

Head-Up Displays: A Literature Review and Analysis with an Annotated Bibliography. (U)

DESCRIPTIVE NOTE: Final rept. Oct 76-Sep 77,
APR 78 134P Shrager,Jack J. ;
REPT. NO. FAA-NA-77-42
MONITOR: FAA/RD 78/31

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates: All DDC reproductions will be in black and white.

DESCRIPTORS: *Head up displays, *Flight instruments, *Bibliographies, Cockpits, Civil aviation, Display systems, State of the art, Pilots, Human factors engineering, Symbols, Aviation safety, Avionics, Approach indicators (U)
IDENTIFIERS: LPN-FAA-073-320-510 (U)

This report is, in part, a bibliographic compilation of 293 publications relating to head-up displays (HUD's) for aircraft cockpit application and a summary of an evaluation of their contents in the areas of human factors, optical techniques, symbology, system concept, safety, simulation and flight test, and other factors or applications. The objective of this in-depth literature review is to determine the appropriate follow-up course of action in HUD's as it relates to civil aircraft application using current production HUD's. The results of a state-of-the-art HUD analysis which was also performed simultaneously is also summarized. It indicated that a HUD for the next generation can offer not only (1) resolution of illusionary problems, (2) reduction in pilot workload, (3) standardized cockpit procedures for both IFR and VFR operation, (4) reduction in intercrew dependency and coordination, but also has the potential for (5) terrain avoidance during takeoff and landing, (6) collision avoidance both in-flight and during ground operations, (7) taxi and takeoff clearance and conformation, (8) clearance delivery, (9) weather advisories, (10) efficient energy management and fuel economy, (11) noise abatement guidance, (U)

AD-A053 322 22/3
AEROSPACE CORP EL SEGUNDO CALIF ENGINEERING SCIENCE OPERATIONS

High Altitude Attitude Determination Study. (U)

DESCRIPTIVE NOTE: Final rept., MAR 78 265P Uyeminami,Richard T. ;Dixon, Martin V. ;Fuhrman,Thomas A. ;Melzer,Stuart M. ;Potter,J. E. ;
REPT. NO. TR-0078(3526)-1
CONTRACT: F04701-77-C-0078
MONITOR: SAMSO TR-78-70

UNCLASSIFIED REPORT

DESCRIPTORS: *Satellite attitude, *Attitude control systems, Determination, Space technology, Artificial satellites, Systems analysis, Mathematical models, Detectors, Filters, Kalman filtering, High altitude, State of the art (U)
IDENTIFIERS: High Altitude Attitude Determination Study, Attitude reference systems (U)

Results are presented of various hardware and software studies to determine the attitude of satellites in high altitude (greater than 500 nmi) orbits. A technology survey was conducted to determine the state of the art in attitude reference systems and sensors. Six attitude reference system conceptual designs are hypothesized and parametric performance analyses conducted to determine their performance capabilities. Performance sensitivities for various sensor and filter combinations are presented, and possible areas for technology improvements are suggested. (Author) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A052 048 9/3
NAVAL SURFACE WEAPONS CENTER WHITE OAK LAB SILVER SPRING MD

Analog without Fear. (U)

DESCRIPTIVE NOTE: Final rept., DEC 77 23P Delagrange,Arhtur D. ;
REPT. NO. NSWC/WOL/TR-77-173
PROJ: W0490, WAS47
TASK: W0490140

UNCLASSIFIED REPORT

DESCRIPTORS: *Analog systems, *Circuit analysis, State of the art, Linear systems, Operational amplifiers, Integrated circuits, Electric filters, Comparison, Digital systems, Reliability(Electronics), Phase locked systems, Voltage regulators, Multiplexing, Converters, Timing circuits (U)
IDENTIFIERS: PE64219N, WUA5353300C4D (U)

Analog circuitry, also referred to as Linear, has been nearly run over by the digital/computer bandwagon. This is unfortunate because tremendous advances are being made in the field of analog integrated circuitry. Each year's progress raises the state-of-the-art, bringing achievements not possible even the year before. Many of the traditional prejudices against analog circuitry are no longer valid. This report attempts to summarize what is available now and what can (and can't) be done with analog integrated circuitry. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A051 439 4/2
CALIFORNIA UNIV BERKELEY STATISTICAL LAB

A Statistician's View of Weather Modification Technology (A Review), (U)

AUG 77 10P Neyman,Jerzy ;
CONTRACT: DAAG29-76-G-0167
MONITOR: ARO 13676.1-M

UNCLASSIFIED REPORT

Availability: Pub. in the Proceedings of the National Academy of Sciences v74 n11 p4714-4721 Nov 77.

DESCRIPTORS: *Weather modification, *State of the art, United States Government, Policies, Cloud seeding, Rainfall, Statistical analysis, Reprints (U)

The present paper is motivated by the enactment, in October 1976, of Public Law 94-490 which directs the U.S. Secretary of Commerce to formulate an appropriate national policy on weather modification. The current widespread drought contributes to the interest in the present state of this art. Here, then, the question of national policy becomes combined with the necessity of a more or less immediate decision on the use of public funds to pay for cloud seeding operations (as distinct from experiments) with the hope of increasing precipitation where it is most needed. The following presents a series of facts deemed relevant both to the immediate question of alleviating the drought and to the more general problem of long-range national policy. (Author) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A051 069 12/1
SOUTHERN METHODIST UNIV DALLAS TX DEPT OF OPERATIONS RESEARCH AND ENGINEERING MANAGEMENT

The Convex Cost of Network Flow Problem: A State-of-the Art Survey. (U)

DESCRIPTIVE NOTE: Interim rept., JAN 78 44P Ali,A. I. ;Helgason,R. V. ;Kennington,J. L. ;
REPT. NO. OREM-78001
CONTRACT: AFOSR-77-3151
PROJ: 2304
TASK: A6
MONITOR: AFOSR TR-78-0332

UNCLASSIFIED REPORT

DESCRIPTORS: *Network flows, *Nonlinear programming, Cost analysis, Convex sets, Algorithms, Mathematical models, Distribution theory, Production models, Surveys, State of the art, Flow fields, Simplex method (U)
IDENTIFIERS: PE61102A (U)

This exposition presents a state-of-the-art survey of models and algorithms for the convex cost network flow problem. (Author) (U)

AD-A050 750 8/11
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

State-of-the-Art for Assessing Earthquake Hazards in the United States. Report 8. Duration, Spectral Content, and Predominant Period of Strong Motion Earthquake Records from Western United States. (U)

DESCRIPTIVE NOTE: Miscellaneous paper, DEC 77 87P Chang,Frank K. ;Krinitzsky, Ellis L. ;
REPT. NO. WES-MP-S-73-1-8

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Rept. no. 7, AD-A048 309.

DESCRIPTORS: *Earthquakes, Hazards, State of the art, Ground motion, Earthquake engineering, Measurement (U)
IDENTIFIERS: Earthquake resistant structures (U)

The purposes of this investigation were principally to assess the duration and spectral content of strong-earthquake accelerograms and, indirectly, to consider their applicability in earthquake design. Correlations of duration with MM intensity for the near and far fields and for Richter magnitude have been obtained. Difference in durations for soil and rock sites was determined. A set of relations between the duration and distance for soil and rock sites was established from records of the San Fernando Earthquake of 9 February 1971 (magnitude of 6.5). Values for other magnitudes were extrapolated. Duration is taken to be the time interval between the first and last peaks of acceleration equal to or greater than 0.05 g. The spectral content in the range of 0.1-10 Hz for strong-motion records in western United States for acceleration level equal to or greater than 0.05 g processed with the modified Nigam and Jennings' response spectra computer programs. (U)

AD-A049 770 13/8 11/6
BATTELLE COLUMBUS LABS OHIO METALS AND CERAMICS INFORMATION CENTER

Rheocasting. Proceedings of the Work Shop on Rheocasting held at Army Materials and Mechanics Research Center on 3-4 February 1977. (U)

DESCRIPTIVE NOTE: State of the art rept., JAN 78 139P French,Robert D. ;Hodi, Frank S. ;
REPT. NO. MCIC-78-35
CONTRACT: DSA900-76-C-2471

UNCLASSIFIED REPORT
Available from National Technical Information Service, Springfield, Va. 22161. PC $12.50, MF $12.50.

DESCRIPTORS: *Casting, *Slurries, *Metallurgy, *State of the art, Workshops(Meetings), Abstracts, Alloys, High strength alloys, Technology, Castings, Dies, Steel, Superalloys, Copper alloys, Aluminum alloys, Economics, Planning, Technology forecasting (U)
IDENTIFIERS: *Rheocasting, Thixocasting (U)

This booklet contains a program and extended abstracts of presentations given at a Workshop on Rheocasting held at the Army Materials and Mechanics Research Center, Watertown, MA, on 3-4 February 1977. The purpose of the meeting was twofold: (1) to disseminate information on the state-of-progress in the continuing development of Rheocasting, and (2) to obtain comments from industry on its future development to assist Department of Defense planning. (U)

AD-A049 338 11/9 7/3
NATIONAL MATERIALS ADVISORY BOARD (NAS-NAE) WASHINGTON D C

Organic Polymer Characterization. (U)

DESCRIPTIVE NOTE: Final rept.
77 152P
REPT. NO. NMAB-332
CONTRACT: MDA903-74-C-0167

UNCLASSIFIED REPORT

DESCRIPTORS: *Polymers, *Plastics, *State of the art, Structures, Structural properties, Military requirements, Space technology, Molecular structure, Molecular properties, Physical properties, Mechanical properties, Test methods, Fracture(Mechanics), Amorphous materials, Organic materials, Elastomers, Foam, Glass, Crystals (U)

This report attempts to define those properties of organic polymers that are critical to their use in current and advanced structural applications. It discusses and evaluates the characterization methodology that is available to measure and control those properties. It suggests some specific areas in which this technology can be employed to achieve improved performance and reliability through its application to procurement and quality control procedures. Case studies are presented to illustrate the utilization of characterization. Conclusions and recommendations are presented. A list of more than a hundred useful methods of characterization with Committee commentary on use and limitations is given in an appendix. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A049 247 5/9 9/2 5/8
AIR FORCE HUMAN RESOURCES LAB BROOKS AFB TEX

Display and Speech Devices for Simulator Instructor/Operator Station Applications. (U)

DESCRIPTIVE NOTE: Final rept. Jun 75-Jun 76,
DEC 77 18P Schwartz,Noel F. ;
REPT. NO. AFHRL-TR-77-50
PROJ: 6114
TASK: 20

UNCLASSIFIED REPORT

DESCRIPTORS: *Flight simulators, *Flight training, *Display systems, *Speech recognition, Instructors, Operators(Personnel), Cathode ray tubes, Man computer interface, State of the art, Line scanning, Rasters, Input output devices, Voice communications, Liquid crystal display systems, Plasmas(Physics), Calligraphic displays, Screens(Displays), Stereoscopic display systems, Computer graphics, Speech, Synthesis (U)
IDENTIFIERS: WUAFHRL61142001, PE62205F (U)

The Air Force Human Resources Laboratory (AFHRL) has the responsibility for research and development of advanced simulation techniques, including more efficient and more effective Instructor Operator Stations (IOS) which would possibly use newly developed display devices and techniques and speech response/recognition devices. This review was undertaken to become better acquainted with the state of the art of hardware devices which could be used for the IOSs of advanced aircraft training simulators and to provide some guidance in these devices to designers, specifiers and users of IOSs. Attention focused mainly on display devices and speech response/recognition devices. A survey of technical literature concerning display devices, and speech synthesis and speech recognition devices was accomplished and contacts were established with a number of manufacturers and developers of these devices to determine the latest developments and potential applications. Also, literature was searched for R and D related to the application of such devices. (U)

AD-A048 309 8/11
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

State-Of-The-Art for Assessing Earthquake Hazards in the United States. Report 7. Specifying Peak Motions for Design Earthquakes. (U)

DESCRIPTIVE NOTE: Miscellaneous paper, DEC 77 38P Krinitzsky,Ellis L. ;Chang, Frank K. ;
REPT. NO. WES-MP-S-73-1-7

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Rept. no. 6, AD-A040 870.

DESCRIPTORS: *Earthquakes, Forecasting, Correlation techniques, Hazards, Faults(Geology), Strength(General), Threat evaluation, Folds(Geology), Earthquake resistant structures, Tectonics, State of the art, Ground motion (U)
IDENTIFIERS: Seismic risk (U)

The large dispersion of data for components of earthquake motion requires that the spread be appraised in design applications. Instrumental data also must be related to historic records of intensity. The near field and the far field contribute greatly to differences in peak motions. Site conditions, soil versus rock, affect duration. With these considerations, and with geological studies and the probability of recurrence, peak values can be specified from parameters of motions related to Modified Mercalli intensities. These peak values can be used for rescaling selected strong motion records or alternatively for the generation of synthetic seismograms. The procedure incorporates the wide variability in ground motions that have occurred during earthquakes. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A048 039 20/1
ARMY MATERIALS AND MECHANICS RESEARCH CENTER WATERTOWN MASS

A Survey of Advanced Techniques for Acoustic Imaging. (U)

DESCRIPTIVE NOTE: Final rept., AUG 77 41P Smith,James M. ;
REPT. NO. AMMRC-MS-77-7

UNCLASSIFIED REPORT

DESCRIPTORS: *Acoustics, *Images, *Holography, *State of the art, Image processing, Photographic processing, Thermal radiation, Optics, Surfaces, Deformation, Electronics (U)
IDENTIFIERS: *Acoustic imaging, Holosonics, LPN-PRON-A1-6-P6350-AW-AW (U)

This document is a state-of-the-art survey of advanced acoustic imaging techniques developed for nondestructive testing and medical applications. Several techniques are evaluated: simple mechanical scanning systems, array imaging, acoustic holography, synthetic aperture, Bragg imaging, and ray tracing. Examples of practical imaging systems that employ these techniques are described and compared, and in order to put these systems into proper chronological perspective, an appendix is included that briefly discusses older acoustic imaging techniques. (Author) (U)

AD-A047 484 20/4
MICHIGAN UNIV ANN ARBOR CAVITATION AND MULTIPHASE FLOW LAB

Cavitation Damage Predicting Capability - State of Art and Possibilities, (U)

AUG 77 35P Hammitt,F. G. ;De,M. K. ;

REPT. NO. UMICH-014456-23-I
CONTRACT: N00014-76-C-0697

UNCLASSIFIED REPORT

DESCRIPTORS: *Cavitation, *Cavitation noise, *Cavitation corrosion, Erosion, Fluid dynamics, Hydrodynamics, Damage, Predictions, State of the art, Bubbles (U)
IDENTIFIERS: *Cavitation erosion efficiency, WUNR062545 (U)

New results from cavitating venturi water tests are used to reinforce the concept of 'cavitation erosion efficiency', previously developed here from tests in a vibratory facility with both water and sodium. This concept emerges from a technique herein described to allow a priori prediction of eventual cavitation erosion rates in flowing machines. Bubble collapse pulse height spectra obtained from submerged microprobes are correlated with measured erosion rates in given laboratory and/or field devices to allow this prediction. Preliminary results from such correlations, along with other measurements of the effects of gas content, velocity, and cavitation condition upon 'mechanical' cavitation intensity as measured by the pulse height spectra, are here presented. New results from vibratory facility tests in tap water and synthetic sea water upon three materials of variable corrodibility (304 SS, 1018 carbon steel, and 1100-0 aluminum) are also presented. The ratio between maximum erosion rates for the salt and fresh water tests are found to increase toward unity as the mechanical cavitation intensity is increased, i.e., increased MDPR. This is expected on theoretical grounds. Finally, the relation between incubation period and maximum MDPR is examined from the vibratory test results, and found to depend upon the material properties as well as the fluid-flow conditions. (Author) (U)

AD-A047 197 20/5 17/2
GENERAL ELECTRIC CO PHILADELPHIA PA SPACE DIV

Low Repetition Rate Copper Vapor Laser. (U)

DESCRIPTIVE NOTE: Final rept. Jun 76-May 77,
SEP 77 100P Anderson,Robert S. ;Homsey, Robert J. ;Karras,Thomas W. ;
CONTRACT: N00014-76-C-0975

UNCLASSIFIED REPORT

DESCRIPTORS: *Gas lasers, *Metal vapors, *Laser communications, *Underwater communications, Copper, Visible spectra, Military requirements, Pulse generators, Pulse rate, Repetition rate, Low rate, Pulsed lasers, Brassboard models, State of the art, Life tests (U)

The program has resulted in a significant advance in the state-of-the-art. A laser module was demonstrated at a PRF of 1.0 kHz with a 12.12 mJ per pulse output, which is a factor of 7 greater than the prior art. The laser was operated consistently at a PRF as low as 700 Hz. Analysis of experimental data for a range of tube diameters and PRF values show that output pulse energy scales linearly with the active lasing volume. Significantly, no physical limit to this volumetric scaling was observed during the program. It has been concluded that a laser system for producing greater than 50 mJ per pulse is feasible using two laser modules. A brassboard design can be assembled with moderate risk using electronic components within the present state-of-the-art. (Author) (U)

AD-A046 500 1/3 17/7
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

A State-of-the-Art Assessment of Air Data Sensors for Naval Aircraft. (U)

DESCRIPTIVE NOTE: Master's thesis,
SEP 77 176P Neil,Robert Dale ;

UNCLASSIFIED REPORT

DESCRIPTORS: *Flight control systems, Naval aircraft, Navigation computers, Data transmission systems, Navigational aids, State of the art, Aircraft equipment, Jet fighters, Vertical takeoff aircraft, Short takeoff aircraft, Fly by wire control, Data displays, Theses (U)

A review of current air data measurement techniques in Naval aircraft was conducted. Future requirements were identified for three classes of aircraft: conventional, fly-by-wire, and V/STOL. A survey of state-of-the-art air data sensors was performed based on information obtained from current literature, correspondence, and personal interviews with major government contractors, government agencies, and private companies. The major areas covered include pressure, airspeed, fiber optics, laser gyros, temperature, and fuel quantity. The basic operation of each system considered was presented and recommendations given based on its present stage of development and potential. (Author) (U)

AD-A045 272 13/2 8/13
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Engineering Behavior of Pavement Materials: State of the Art. (U)

DESCRIPTIVE NOTE: Final rept.,
FEB 77 414P Chou,Yu. T. ;
REPT. NO. WES-TR-S-77-9
CONTRACT: DOT-FA73WAI-377
PROJ: 4A762719AT04
MONITOR: FAA-RD 77-37

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Federal Aviation Administration, Washington, DC. Systems Research and Development Service.

DESCRIPTORS: *Pavements, *Soil stabilization, Construction materials, Soil mechanics, Airports, Highways, Bituminous coatings, Concrete, Deformation, Fatigue(Mechanics), Cements, Limestone, Stress strain relations, State of the Art, Dynamic response (U)
IDENTIFIERS: AST04, PE62719A (U)

This report reviews the engineering behavior of pavement materials with respect to highway and aircraft loadings and environmental conditions. The materials covered are bituminous mixtures, portland cement concrete, granular materials, chemically stabilized soils, and fine-grained soils. Basic properties of each are discussed. Factors influencing engineering properties and properties of stabilized soils with respect to strength, modulus, and fatigue are discussed. For fine-grained subgrade soils, discussions also concentrate on the resilient and plastic properties. Constitutive stress-strain relations are presented with respect to resilient, static, viscoelastic, plastic, dynamic, and shear properties. The modulus of subgrade reaction used in rigid pavements and the nature of expansive soils in relation to rigid pavement design are discussed. (U)

AD-A044 652 20/11
NATIONAL MATERIALS ADVISORY BOARD (NAS-NAE) WASHINGTON D C

Control of Fretting Fatigue. (U)

DESCRIPTIVE NOTE: Final rept.
77 97P
REPT. NO. NMAB-333
CONTRACT: MDA903-74-C-0167

UNCLASSIFIED REPORT

DESCRIPTORS: *Fretting, *Fatigue(Mechanics), *Friction, *Coatings, State of the art, Test methods, Control, Crack propagation, Fracture(Mechanics), Corrosion, Wear, Lubrication, Surfaces, Films, Bibliographies (U)

The state of the art of fretting and available fretting-initiated fatigue tests are assessed. Recommendations focus on a program of research designed to improve understanding of fretting-initiated fatigue mechanisms and on aspects of evaluation. Guidelines for use by designers to circumvent the development of fretting also are described. An extensive review of the literature is included as is a 210-item bibliography. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A044 601 13/2 8/1
MISSISSIPPI STATE UNIV MISSISSIPPI STATE

Estimate of Maximum Level of Oil Innocuous to Marine Biota as Inferred from Literature Review. (U)

DESCRIPTIVE NOTE: Final task rept.,
APR 77 20P Brown,Lewis Raymond ;
CONTRACT: DOT-CG-81-76-1476
MONITOR: CGR/DC,USCG 9/77,D-43-77

UNCLASSIFIED REPORT

DESCRIPTORS: *Oil pollution, *Marine biology, Toxicity, Crude oil, Lethal dosage, Literature surveys, Bibliographies, Crustacea, Damage assessment, Oil spills, State of the art, Lethality, Kill probabilities (U)

The objective of this study was to derive an estimate of the maximum level of oil which can be considered harmless to the marine biological community based on the current state-of-the-art as determined through review and interpretation of the literature. Overall nearly 2,000 individual articles relating to oil pollution were examined. One hundred and thirty-five of the most germane of these articles are listed as references. (U)

AD-A044 584 8/10
MAR INC ROCKVILLE MD

A Survey and Assessment of the Navy's Oceanographic Instrumentation Needs. (U)

DESCRIPTIVE NOTE: Final rept.,
AUG 77 48P Koeppen,Stephen H. ;
Hesselbacher,Thomas H. ;Pierre,Leslie J. ;
REPT. NO. MAR-TR-189
CONTRACT: N00014-77-C-0186

UNCLASSIFIED REPORT

DESCRIPTORS: *Oceanographic equipment, *Instrumentation, *Surveys, State of the art, Assessment, Measurement, Naval research, Weapon systems, Detectors, Temperature, Salinity, Water quality, Artificial satellites, Ocean currents, Remote systems, Ocean surface (U)

A survey program was conducted to identify the Navy's oceanographic measurement needs which are not being met by currently available instrumentation. The scope of the survey, as dictated by funding limitations and a quick response requirement, was limited to measurements needed to support ongoing Navy programs related to sensor and weapon systems as opposed to measurements needed for general oceanographic research. The survey also included a summary of the state-of-the-art capabilities of current oceanographic instrumentation. A number of instrumentation needs have been identified which are receiving inadequate attention and/or support. (Author) (U)

AD-A043 951 13/1 10/1 3/2
LITTLE (ARTHUR D) INC CAMBRIDGE MASS

Solar Air - Conditioning Study. (U)

DESCRIPTIVE NOTE: Final rept.,
APR 77 149P Merriam,Richard ;
REPT. NO. ADL-C-79679
CONTRACT: N68305-76-C-0029
PROJ: F57571
TASK: ZF57571001
MONITOR: CEL CR-77.018

UNCLASSIFIED REPORT

DESCRIPTORS: *Air conditioning equipment, *Solar energy, *Energy conversion, Cooling and ventilating equipment, State of the art, Life cycle costs, Heat transfer coefficients, Rankine cycle, Desiccants, Dehumidifiers, Refrigerants, Storage, Silica gel, Solar collectors, Buildings, Climate, Heat pumps (U)
IDENTIFIERS: PE62765N (U)

The state-of-the-art of solar cooling is evaluated to determine the near term performance potentials and life-cycle costs of the most promising approaches. The heat actuated absorption cycle, Rankine cycle, and desiccant dehumidification cycle are examined. The principles of operation are described, performance coefficients are reviewed, operating constraints are examined, and the commercial status of each approach is evaluated. An analysis of the major solar cooling demonstrations (as of 1976) is carried out. Savings-to-investment ratios are calculated for solar cooling systems in buildings in seven locations within the United States. (Author) (U)

AD-A043 826 20/4 1/3
DAVID W TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER BETHESDA MD AVIATION AND SURFACE EFFECTS DEPT

An Assessment of Circulation Control Airfoil Development. (U)

DESCRIPTIVE NOTE: Research and development rept. Jul 75-Sep 76,
AUG 77 53P Wilkerson,Joseph B. ;
REPT. NO. Aero-1238
MONITOR: DTNSRDC 77-0084

UNCLASSIFIED REPORT

DESCRIPTORS: *Airfoils, *Boundary layer control, *Circulation, Two dimensional flow, High lift, Wind tunnel tests, Mach number, Criticality, Pressure distribution, Aerodynamic configurations, Trailing edges, Rotor blades(Rotary wings), Helicopter rotors, Augmentation, State of the a (U)
IDENTIFIERS: PE63203N, WU11619200 (U)

A circulation control (CC) airfoil development program is presented, including an airfoil designation system. Specific performance objectives are set forth as development goals. Background information includes an assessment of state-of-the-art design practices, a comparison of operational requirements with those of conventional airfoils, and a discussion of previous airfoil performance. Selection and design criteria are described for five new CC airfoils. These designs were wind tunnel evaluated as two-dimensional models and a limited amount of airfoil data is shown for comparison to the prior data base. Two of the airfoils were designed with the objective of maintaining high lift augmentation and improving the critical Mach number characteristics, a combination of qualities that was previously nonexistent. Both designs theoretically accomplished the prescribed goals and were validated by experimental results. The development program has advanced the state of the art and nearly doubled the available data base for CC airfoils. (Author) (U)

AD-A043 737 13/7 9/5
HARRY DIAMOND LABS ADELPHI MD

Proceedings of the Fluidic State-of-the-Art Symposium Held at Naval Surface Weapons Center, White Oak, Md on 30 September - 3 October 1974. Volume VI. (U)

74 289P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 5, AD-787 550.

DESCRIPTORS: *Fluidics, *Fluerics, *Flueric devices, Computer aided design, Fluid amplifiers, Fluidic control, Bistable devices, Vortices, Coanda effect, Feedback, Fabrication, Quality control, Meetings, State of the art (U)
IDENTIFIERS: Proportional amplifiers (U)

This volume contains that part of the HDL Fluidics State-of-the-Art Symposium Proceedings that for one reason or another could not be published prior to the symposium. Emphasis is on discussions after each paper was given. (U)

AD-A043 632 20/6 14/2 15/7
HUGHES AIRCRAFT CO CULVER CITY CA DISPLAY PRODUCTS DEPT

Diffraction Optics Study. (U)

DESCRIPTIVE NOTE: Final rept. 1 Mar-30 Sep 76,
JUN 77 225P Lewis,W. N. ;Close,D. H. ;Cook,L. G. ;Jaccbs,R. S. ;
CONTRACT: F33615-76-C-0508
PROJ: 7184
TASK: 04
MONITOR: AMRL TR-76-119

UNCLASSIFIED REPORT

DESCRIPTORS: *Holography, *Display systems, *Diffraction, Optics, Helmet mounted displays, Head up displays, Canopies, Visors, Data displays, Fighter aircraft, Lasers, Test and Evaluation, Computer applications, Weapon delivery, Target acquisition, Effectiveness, Mission profiles, Simulation, Tactical analyses, Feasibility studies, State of the art (U)
IDENTIFIERS: WUAMRL71840448, PE62202F (U)

A study has been conducted to determine the feasibility of extending the information display capability in a modern fighter aircraft through the employment of diffraction optics techniques. Baseline concepts were designed using (1) reflective holographic optical elements on the aircraft canopy and (2) transmissive holographic optical elements on the operator's flight helmet visor. Evaluation of these systems performance by computer was conducted. State-of-the-art surveys in holographic technology, image sources and materials technology are presented. The impact of future advances in the state of the art on the feasibility of these systems is discussed. Requirements for the extended display technology are formulated, using simulated encounter and mission analysis data. (Author) (U)

AD-A043 581 17/9 9/1
ARMY MISSILE RESEARCH AND DEVELOPMENT COMMAND REDSTONE ARSENAL ALA ADVANCED SENSORS DIRECTORATE

Millimeter and Submillimeter Wave Receivers. (U)

DESCRIPTIVE NOTE: Technical rept.,
JUL 77 50P Waldman,Jerry ;
REPT. NO. DRDMI-TE-77-17
PROJ: 1L362303A214

UNCLASSIFIED REPORT

DESCRIPTORS: *Radar receivers, *Superheterodyne receivers, Millimeter waves, Submillimeter waves, Schottky barrier devices, State of the art, Demodulators, Microwave receivers, Radio astronomy, Solid state electronics, Microelectronics, Lasers (U)
IDENTIFIERS: AS214, PE62303A (U)

This report reviews the current state-of-the-art performance figures for millimeter and submillimeter wave detectors and receiver systems. The frequency range under consideration is roughly 100 to 600 GHz. In contrast to the microwave (and optical) region where detectors perform close to the ideal limit, present millimeter and submillimeter wave detector sensitivities are one to two orders of magnitude away from the ideal. This situation does not represent any fundamental limitation but rather reflects technological problems in detector and source development peculiar to this region of the spectrum. At the present time, rapid technological progress is occurring as a consequence of (1) the demand from fields such as radio astronomy, fusion diagnostics, and high resolution radar, and (2) the breakthroughs in microelectronic techniques, ultra-high frequency solid-state sources, tubes, and lasers. These developments are reviewed and the implications for millimeter wave radar systems are discussed. (Author) (U)

AD-A043 344 6/19
WAYNE STATE UNIV DETROIT MICH BIOMECHANICS RESEARCH CENTER

Survey of the State of the Art of Human Biodynamic Response. (U)

DESCRIPTIVE NOTE: Technical rept., MAR 77 19P King,Albert I. ;Tennyson, S. A. ;
REPT. NO. TR-7
CONTRACT: N00014-75-C-1015

UNCLASSIFIED REPORT
Availability: Pub. in Mathematical Modeling Biodynamic Response to Impact, p31-44 n.d.

DESCRIPTORS: *Biodynamics, *Acceleration tolerance, Impact acceleration, State of the art, Humans, Spinal column, Mathematical models, Kinematics, Biomechanics, Electromyography, Reprints (U)
IDENTIFIERS: WUNR064524 (U)

A biodynamic model of the spine simulated the action of spinal musculature on the head, vertebral bodies and pelvis in the midsagittal plane. Muscle was treated as a force generator whose contractile force was dependent on muscle stretch, stretch rate and neural delay time. Eight model runs were conducted with and without muscle, simulating + G(z) and -G(x) impact acceleration. The model predicted that spinal musculature was incapable of affecting overall spinal column kinematics. However, as a result of muscle contraction, significantly higher local axial forces were predicted in the discs and facets than were predicted when muscle was absent. (Author) (U)

AD-A042 981 13/9 9/2
SKF INDUSTRIES INC KING OF PRUSSIA PA RESEARCH LAB

Computer Program Operation Manual on SHABERTH. A Computer Program for the Analysis of the Steady State and Transient Thermal Performance of Shaft-Bearing Systems. (U)

DESCRIPTIVE NOTE: Technical rept., JUL 76 246P Crecelius,W. J. ;Pirvics, J. ;
REPT. NO. AL76P030
CONTRACT: F33615-76-C-2061
MONITOR: AFAPL TR-76-90

UNCLASSIFIED REPORT

DESCRIPTORS: *Shafts(Machine elements), *Roller bearings, *Computer programs, *Programming manuals, Performance(Engineering), Thermal properties, Mapping, Steady state, Transients, Lubrication, Deflection, Heat transfer, Elastic properties, Hydrodynamics, Boundary layer, State of the art, Mathematical models (U)
IDENTIFIERS: SHABERTH computer program (U)

This report is a self contained manual describing an advanced state-of-the-art analytical computer program (SHABERTH) for the study of steady state and transient thermal performance of rolling element bearing and shaft systems. This program embodies mathematical models describing the role of the lubricant in bearing behavior. Descriptions of these models are set forth along with a detailed description of the program organization method of solution and convergence criteria. Input data preparation forms and program output are discussed and examples are included. (Author) (U)

AD-A042 787 11/6 14/2
NATIONAL BUREAU OF STANDARDS WASHINGTON D C

Improved Ultrasonic Standard Reference Blocks. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jan 74-31 Dec 75, APR 77 134P Sushinsky,G. F. ;Eitzen,D. G. ;Chwirut,D. J. ;Bechtoldt,C. J. ;Ruff, A. W. ;
REPT. NO. NBSIR-76-984
CONTRACT: F33615-74-M-6752
PROJ: 7381
TASK: 07
MONITOR: AFML TR-77-40

UNCLASSIFIED REPORT

DESCRIPTORS: *Aluminum alloys, *Steel, *Titanium alloys, *Ultrasonic tests, *Nondestructive testing, State of the art, Standards, Standardization (U)
IDENTIFIERS: PE62102F (U)

A program to improve the quality, reproducibility and reliability of nondestructive testing through the development of an improved ASTM-type ultrasonic reference standards system is described. Reference blocks of aluminum, steel, and titanium alloys are considered. Equipment representing the state-of-the-art in laboratory and field ultrasonic equipment was obtained and evaluated. RF and spectral data on twenty-two sets of ultrasonic reference blocks were taken as part of a task to quantify the variability in response from nominally identical blocks. Techniques for residual stress, preferred orientation, and microstructural measurements were refined and applied to reference blocks rejected by manufacturers during fabrication in order to evaluate the effect of metallurgical condition on block response. The effects of certain dimensional variables on block response were studied and new fabrication techniques considered. A study of the effects of measurement system variables on block response was carried out. A calibration service for ASTM E127-type reference blocks has been established and the development of a loaner service for calibration blocks is underway. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A042 463 21/2 21/5
ROCKET RESEARCH CORP REDMOND WASH

Hydrazine-Fueled Aircraft Starter Feasibility Demonstration. (U)

DESCRIPTIVE NOTE: Final rept. 30 May 75-31 Mar 77, MAR 77 150P Jorgenson,W. E. ;Schmitz, B. ;
CONTRACT: F33615-75-C-2027
PROJ: 3145
TASK: 01
MONITOR: AFAPL TR-77-16

UNCLASSIFIED REPORT

DESCRIPTORS: *Engine starters, *Jet engines, *Hydrazine, Cartridges(PAD), Monopropellants, Gas generating systems, Thermal properties, Decomposition, Test methods, Performance(Engineering), State of the art, Feasibility studies (U)
IDENTIFIERS: MXU-4A/A engine starters, PE62203F, WUAFAPL31450129 (U)

The purpose of this program was to determine the feasibility of converting an aircraft jet engine starter that is normally powered with an 8LBm solid propellant cartridge (type MXU4A/A), to an equivalent liquid monopropellant-fueled device utilizing state-of-the-art hydrazine technology, the single most difficult development constraint being that the complete hydrazine system must package within the space normally occupied by the MXU4A/A solid propellant cartridge in the starter breech. The feasibility of packaging a hydrazine fueled cartridge in the existing solid propellant breech volume and meeting performance requirements was successfully demonstrated using a breadboard hydrazine system in conjunction with actual cartridge starter hardware. (U)

AD-A042 121 14/2 13/9
TRW DEFENSE AND SPACE SYSTEMS GROUP REDONDO BEACH CALIF

Advanced High Speed Roller Bearing Inspection Techniques. (U)

DESCRIPTIVE NOTE: Final rept. 30 Oct 76-1 Apr 77, MAY 77 80P Jacoby,Jerold L. ;Bohn, Jack R. ;
CONTRACT: F33615-76-C-2147
PROJ: 3048
TASK: 06
MONITOR: AFAPL TR-77-32

UNCLASSIFIED REPORT

DESCRIPTORS: *Test equipment, *Roller bearings, Inspection, Automation, Microcomputers, Cost effectiveness, State of the art, Technology, Sizes(Dimensions), Measurement, Precision, Preparation, Sorting, Quality control, Tolerances(Mechanics), Test methods, Turbine parts, Turbofan engines, High velocity, Optical equipment, Pneumatic devices, Electronic equipment, Off the shelf equipment, Probes, Transducers (U)
IDENTIFIERS: F-100 engines, Design, WUAFAPL30480695, PE62203F (U)

A comprehensive survey of state-of-the-art precision measurement techniques applicable to dimensional inspection of rollers for high speed bearings (greater than 2.0 million DN) was undertaken. Particular attention was given to noncontacting techniques which would permit automated 100% inspection of the rollers for use in such bearings. The measurement techniques were evaluated to determine their utility for incorporation into cost-effective roller inspection system. A concept for a fully automated roller inspection system is described. It provides for the preparation, inspection, re-oiling and sorting of the rollers with minimal human supervision. The system is conceived to be self-contained so that it can operate independent of environmental constraints. It can be developed by adapting existing technology to the specific requirements for roller inspection. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A041 798 9/2 14/1
DEFENSE SYSTEMS MANAGEMENT COLL FORT BELVOIR VA

Interactive Computer Graphics: A Responsive Planning and Control Tool for DoD Program Management. (U)

DESCRIPTIVE NOTE: Research rept., JAN 77 56P Callahan,Joseph E. ; Roberson,Carlton F. ;Perino,George H. , Jr;
REPT. NO. DSMC-RR-77.1

UNCLASSIFIED REPORT

DESCRIPTORS: *Interactive graphics, *Management planning and control, *Executive routines, *Cost analysis, Networks, Computer programs, Pert, Cathode ray tube screens, Display systems, Computer applications, Department of defense, State of the art, Feasibility studies (U)
IDENTIFIERS: *Program management (U)

This report summarizes the methodology, conduct and findings of the Defense Systems Management College (DSMC) research study of Interactive Computer Graphics (ICG) as a tool for program management planning and control. The study was conducted in four phases to meet four objectives: to determine the feasibility of representing and interrogating a program/project network on a graphics console; to determine the feasibility of developing an Interactive Computer Graphics Networking System (ICGNS) software prototype for program management planning and control; to examine the affordability of implementing an ICGNS in the PMO; and to assess the state-of-the-art in industry and DOD regarding existing and/or proposed ICG managerial applications. (U)

AD-A041 262 5/2 14/2
SOUTHWEST RESEARCH INST SAN ANTONIO TEX

Nondestructive Testing Information Analysis Center, 1976. (U)

DESCRIPTIVE NOTE: Annual technical rept. 15 Feb 76-15 Feb 77,
JUN 77 32P Bradshaw,W. W. ;Hicks,F. P. ;King,R. R. ;Smith,R. T. ;
REPT. NO. SwRI-15-3903(3)
CONTRACT: DSA900-74-C-5268

UNCLASSIFIED REPORT

DESCRIPTORS: *Nondestructive testing, *Information systems, *Information centers, Information retrieval, Data bases, State of the art (U)

During the contract year, a total of approximately 12,000 entries has been reached in NTIAC's computerized data file records. The NTIAC Newsletter has a distribution of approximately 3,000 recipients. A State-of-the-Art Survey on Advanced Ultrasonic Testing Systems was published. NTIAC responded to over 100 technical inquiries. (Author) (U)

AD-A040 959 9/4
EDUCATIONAL TESTING SERVICE PRINCETON N J

Application Description and Evaluation for NLS, (U)

JUL 76 31P Potter,David A. ;
REPT. NO. ETS-3
CONTRACT: MDA903-74-C-0290, ARPA Order-2651

UNCLASSIFIED REPORT

DESCRIPTORS: *Information processing, *On line systems, Information retrieval, Production control, Documents, Text processing, Editing, Man machine systems, Computer applications, Cost effectiveness, User needs, State of the art (U)

NLS (On-Line System) is a text-editing, dialog-support, and communications system which provides users with a state-of-the-art tool for document production, communication, and information management and retrieval. This paper reviews the history of NLS at one site, and indicates the range of potential uses for the tools inherent to NLS. These uses were primarily for correspondence, document production, and information management. An informal evaluation is the second major part of this report. It concentrates on users' impressions of the system's utility, ease of access, and factors which might impede acceptance. Sample products and a discussion of office automation conclude the report. (Author) (U)

AD-A040 941 13/10
GENERAL DYNAMICS CORP QUINCY MASS QUINCY SHIPBUILDING DIV

Review of Ship Structural Details. (U)

DESCRIPTIVE NOTE: Final technical rept.,
77 327P Glasfeld,R. ;Jordan,D. ;
Kerr,M. , Jr.;Zoller,D. ;
CONTRACT: N00024-74-C-5230
MONITOR: SSC 266

UNCLASSIFIED REPORT

DESCRIPTORS: *Ship structural components, *Shipbuilding, *Ship hulls, Ship design, Merchant vessels, Cargo ships, State of the art, Structural analysis, Marine engineering, Shipyards, Labor, Cost estimates, Manpower, Structural members, Strength(Mechanics), Girders, Failure(Mechanics), Structural mechanics, Damage, Fatigue(Mechanics), Tankers, Liquefied natural gas (U)
IDENTIFIERS: Naval architecture (U)

This review of structural detail design is intended to serve as a summary of the state of the art and a guide to development of tools for design and analysis of these details. It includes a count of common structural details aboard two modern commercial vessels, and labor estimates for representative sizes of those details intended to provide a total cost per type of detail ranking for those ships. Current shipyard practice is reported with sketches and application description of about 160 ship structural details. Design improvements related to shipyard producibility are suggested. The most relevant rules promulgated by technical and classification societies are excerpted, and comparison of rules is illustrated by application to specific examples. Damage induced by poor design or fabrication of details is reviewed and illustrated. The relatively sparse technical literature related to analysis and design of structural details is summarized. A framework for fatigue criteria is developed as a suggestion for possible detail strength criteria. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A040 870 8/11
MACKAY SCHOOL OF MINES RENO NEV

State-of-the-Art for Assessing Earthquake Hazards in the United States. Report 6. Faults and Earthquake Magnitude. (U)

DESCRIPTIVE NOTE: Miscellaneous paper,
MAY 77 170P Slemmons,David B. ;
REPT. NO. WES-MP-S-73-1-6
CONTRACT: DACW39-76-C-0009
MONITOR: WES MP-S-73-1

UNCLASSIFIED REPORT

DESCRIPTORS: *Earthquakes, *Forecasting, *Earthquake engineering, Correlation techniques, Hazards, Faults(Geology), Strength(General), Threat evaluation, Probability, Folds(Geology), Tectonics, Earthquake resistant structures, State of the art (U)

The short seismologic and historic records, in combination with the long recurrence intervals between potentially damaging earthquakes, create a need for developing geologic methods as alternatives or supplements to seismologic methods of establishing design earthquakes. The main goal of this report is to review geologic methods of determining the maximum probable earthquakes for active faults based on empirical relationships between magnitude, length of surface faulting, maximum fault displacement, and combinations of fault length and maximum displacement. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A040 436 9/5 20/1
TRW DEFENSE AND SPACE SYSTEMS GROUP REDONDO BEACH CALIF

Advanced Surface Acoustic Wave (SAW) Oscillator Investigation. (U)

DESCRIPTIVE NOTE: Final rept. 1 Feb 76-1 Feb 77.
APR 77 55P
CONTRACT: N00123-76-C-0588

UNCLASSIFIED REPORT

DESCRIPTORS: *Oscillators, *Acoustic waves, *Surface waves, Acoustic equipment, Advanced systems, Ultranigh frequency, Acoustic delay lines, Fabrication, Thermal properties, Loading(Electronics), Fabrication, Aging(Materials), Life tests, Cyclic tests, State of the art (U)

This report describes the results of the development, fabrication, evaluation, and test performed on Advanced Surface Acoustic Wave (SAW) Oscillators. The main purpose of the SAW oscillator program was the fabrication and characterization of SAW oscillators operating at 250 MHz, 500 MHz, and 1 GHz. As the data presented shows, the performance of these oscillators closely approaches or exceeds the current state-of-the-art in nearly every respect. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A039 464 1/2 12/2
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

Decision-Making and Optimization in Aircraft Design, (U)

FEB 77 63P Haupt,Ulrich ;
REPT. NO. NPS-67Hp77021A

UNCLASSIFIED REPORT

DESCRIPTORS: *Aeronautical engineering, *Decision making, Optimization, Parametric analysis, Computer aided design, Reliability, Maintainability, Operational effectiveness, Trade off analyses, Life cycle costs, State of the art (U)
IDENTIFIERS: *Aircraft design (U)

The state of the art in aircraft design is surveyed with regard to the decision-making process. It is shown that the empirical approach to decision-making as it is generally practiced in hardware design has inherent limitations. There is an increasing need to consider uncertainties and preferences explicitly. This leads to a new design outlook combining the experience of old-time designers with an analytical approach to complex problems. An outline is given for the development of practice-oriented text material as a most essential step toward preparing engineers for new tasks in design and decision-making. (Author) (U)

AD-A039 096 13/2 13/3
HALLIBURTON SERVICES DUNCAN OKLA

Placement of Concrete in the Ocean. (U)

DESCRIPTIVE NOTE: Final rept.,
DEC 76 64P Evans,George W. ;Herndon, Joe ;
CONTRACT: N68305-76-C-0038
PROJ: S4636X
MONITOR: CEL CR-77.006

UNCLASSIFIED REPORT

DESCRIPTORS: *Concrete, *Underwater structures, Ocean bottom, Oil wells, Deep water, Underwater construction, State of the art, Pumping, Slurries, Grout (U)
IDENTIFIERS: Tremie concrete, WU316101, PE63713N (U)

This report presents state-of-the-art and proposed methods of concrete placement in the ocean to depths of 20,000 feet. Current technology includes bucket, tremie pipe, pumping, preplaced aggregate and bagged concrete methods as well as oil field cementing techniques. Problem areas, limitations and deficiencies of the current technology are discussed. Five new concepts of ocean concrete placement are presented and evaluated, most of which are variations of the current tremie method or bucket placement. Recommendations are made for research on materials and their properties, test methods, control devices and guidance systems for placement. A comprehensive bibliography is included. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A038 814 9/5
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

A Survey of Antenna Array Technology for Surveillance Systems. (U)

DESCRIPTIVE NOTE: Final rept.,
FEB 77 32P Gregorwich,Walter S. ;
REPT. NO. RADC-TR-76-409
PROJ: 9361
TASK: 07

UNCLASSIFIED REPORT

DESCRIPTORS: *Antenna arrays, Antenna feeds, Broadband, State of the art, Lens antennas, Planar structures, Bibliographies (U)
IDENTIFIERS: WURADC93610701 (U)

This report acquaints the reader with a survey of the latest state-of-the-art technology that may be applicable to various types of ground signal collection systems. An overview of the performance parameters of both planar and lens fed arrays is presented. An extensive bibliography is a key feature of this report. (Author) (U)

AD-A038 748 5/9
SENSORS DATA DECISIONS INC SAN DIEGO CALIF

Computerized Collective Training for Teams. (U)

DESCRIPTIVE NOTE: Interim rept. 30 Aug-13 Nov 76,
FEB 77 62P Kribs,H. Dewey ;Thurmond, Paul ;Mark,Linda ;
CONTRACT: DAHC19-76-C-0042
PROJ: 2Q762722A764
MONITOR: ARI TR-77-A4

UNCLASSIFIED REPORT

DESCRIPTORS: *Computer aided instruction, *Teams(Personnel), Military training, State of the art, Systems approach, Teaching methods, Learning, Decision making, Memory(Psychology (U)
IDENTIFIERS: PE62722A, AS764 (U)

A review and evaluation was conducted of state-of-the-art findings and instructional theory directly applicable to the problem of developing instructional strategies for computer-assisted team training. Two major conclusions were drawn from the review and evaluation. The first is that a conceptual framework for a general purpose set of instruction strategies for team training does not exist. The second conclusion is that an Instructional Systems Development (ISD) approach must be developed for team training. The paper also describes the initial development for deriving team training instructional strategies. (U)

AD-A038 621 15/7 12/1
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

Design Considerations for Lanchester-Type Models of Warfare (LATMW). (U)

DESCRIPTIVE NOTE: Master's thesis,
SEP 76 135P Mauerer,Herbert-Hans ;

UNCLASSIFIED REPORT

DESCRIPTORS: *Lanchester equations, *Mathematical models, Army operations, Combat areas, War games, Tactical warfare, State of the art, Theses, Attrition, COmputerized simulation, Trade off analyses (U)

This thesis discusses design considerations for Lanchester-Type Models of Warfare (LATMW). It establishes a framework for setting minimum design standards for such combat models. The state-of-the-art for models is briefly reviewed and major pitfalls in modelling combat are sketched. Modern combined arms forces are abstracted as coherent systems of complementary and supplementary components. A method is derived to refine Lanchester Attrition-Rate Coefficients (LARC) as system capability measures by additionally considering reliability and availability weightings. Examples are given to demonstrate the implementation of these refined LARC quantifications in LATMW. (U)

AD-A038 590 13/7 13/10 20/4
DAVID W TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER BETHESDA MD SHIP PERFORMANCE DEPT

Hydrodynamic Performance of the Model of a Variable Area Waterjet Inlet Designed for a 200 Ton, 100 Knot Hydrofoil Ship, (U)

FEB 77 91P Sobolewski,Alan D. ;
REPT. NO. SPD-735-01
PROJ: S3246, F43270
TASK: S324613, SF43270201

UNCLASSIFIED REPORT

DESCRIPTORS: *Hydraulic jets, *Inlets, *Hydrodynamics, High velocity, Hydrofoil craft, Cavitation, Struts, Hydrofoils, Pressure, Recovery, Performance(Engineering), Computer programs, State of the art, Experimental design, Test methods, Water tunnels, Scale models, Pressure distribution, Drag (U)
IDENTIFIERS: WU17867, PE62543N, PE63508N (U)

The primary objective of this study was to assess the state-of-the-art in waterjet inlet design capability for high-speed hydrofoil applications. A contract was let for the design of a variable-area, strut-pod inlet for the waterjet propulsion system of a 200 ton, 100 knots hydrofoil ship. A basic requirement of the design was that the inlet must provide cavitation-free operation for prescribed flow-rates at both the 100 knots cruise and 35 knots take-off speed. The most up-to-date design procedures and performance prediction techniques were to be used. (U)

AD-A038 505 5/9
HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA VA

Team-Training and Evaluation Strategies: State-of-the-Art. (U)

DESCRIPTIVE NOTE: Technical rept., FEB 77 53P Wagner,Harold ;Hibbits,Nancy ;Rosenblatt,Richard D. ;Schulz,Russel ;
REPT. NO. HumRRO-TR-77-1
CONTRACT: MDA903-76-C-0210, ARPA Order-3187

UNCLASSIFIED REPORT

DESCRIPTORS: *Teaching methods, *Teams(Personnel), *Military training, Military doctrine, Policies, Group dynamics, Behavior, Skills, Classification, Feedback, Efficiency, Assessment, Simulation, Simulators, Flight simulators, Test methods, Education, Instructions, State of the art (U)
IDENTIFIERS: *Team training (U)

A critical review and evaluation of the literature was performed to describe existing instructional and evaluative techniques relevant to team training. Comprehensive documentation sources such as Educational Resources Information Center (ERIC), Defense Documentation Center (DDC), and National Technical Information Service (NTIS) were searched. In addition, the social psychological areas and the industrial training field were surveyed for relevant publications. Current studies and team training practices underway within the Services were examined and described. A classification scheme was introduced in which the training situations discussed in this review were categorized as either emergent or established. Established situations are those in which the tasks and required behaviors can be almost completely specified. Emergent situations permit some discretionary behaviors because all activities cannot be predicted. Additionally, team training was distinguished from multi-individual training. Although both occur in a group setting, the focus in the latter is on individual skills whereas team training focuses on team skills (e.g., coordination). Using this classification scheme, state-of-the-art gaps in team training and evaluation were identified for needed research and development. (U)

AD-A038 409 14/2
GENERAL ELECTRIC CO PLEASANTON CALIF VALLECITOS NUCLEAR CENTER

Advanced Mass Spectrometer. (U)

DESCRIPTIVE NOTE: Final rept. 17 Jan 72-31 Oct 76,
JAN 77 105P Halliday,Fred ;Stein,John D. ;
REPT. NO. NEDG-12045-245
CONTRACT: F33657-72-C-0484, ARPA Order-1702

UNCLASSIFIED REPORT

DESCRIPTORS: *Mass spectrometers, Advanced systems, State of the art, Ion sources, Ion beams, Microprobes, Multichannel, Magnetic separation, Heterogeneity, Variations, Computer applications, Acceptance tests (U)

The Advanced Mass Spectrometer (AMS) is a state-of-the-art ion microprobe with fine primary ion beam focus and a unique mass spectrometer. A variable inhomogeneity magnet system, with 288 detectors, all serviced by computer data handling, provides the heart of an instrument which can monitor from mass 17 to 304 amu simultaneously. The AMS has been integrated and has undergone acceptance tests which delineate the instrument's initial operating parameters. (Author) (U)

AD-A038 192 1/3 20/1
KAMAN AEROSPACE CORP BLOOMFIELD CONN

Helicopter Noise Reduction Design Trade-Off Study. (U)

DESCRIPTIVE NOTE: Final rept Mar 76-Jan 77,
JAN 77 252P Bowes,Michael A. ;
REPT. NO. R-1493
CONTRACT: DOT-FA76WA-3791
MONITOR: FAA-AEQ 77-4

UNCLASSIFIED REPORT

DESCRIPTORS: *Helicopters, *Aircraft noise, *Noise reduction, Aircraft engine noise, Helicopter rotors, Helicopter engines, Performance(Engineering), Experimental design, Performance(Engineering), Modification, Trade off analyses, Cost analysis, State of the art, Cost benefits (U)

A study was performed to determine the noise reduction benefits and economic costs associated with applying state-of-the-art noise reduction methods to future design civil helicopters. As part of this study, a survey of the make-up of the civil fleet was performed, and this fleet make-up was projected to the 1980 time frame. Analytical methods were developed and/or adopted for calculating helicopter component noise, and these methods were incorporated into a unified total vehicle noise calculation model. Analytical methods were also developed for calculating the effects of noise reduction methodology on helicopter design, performance and cost. The analytical methods were used to calculate baseline noise and cost characteristics of several existing civil helicopters. These methods were also used to calculate changes in noise, design, performance and cost due to the incorporation of engine and main rotor noise reduction methods. All noise reduction techniques were evaluated in the context of an established mission performance criterion which included consideration of hover ceiling, forward flight range/speed/payload and rotor stall margin. (Author) (U)

AD-A038 126 20/2
ARMY ELECTRONICS LABS FORT MONMOUTH N J

Crystal Resonators, (U)

JUL 74 18P Hafner,Erich ;

UNCLASSIFIED REPORT

Availability: Pub. in IEEE Transactions on Sonics and Ultrasonics, vSU-21 n4 p220-237 Oct 74.

DESCRIPTORS: *Quartz resonators, *Piezoelectric crystals, Frequency, Control, Stability, State of the art, Problem areas, Elastic properties, Thermal properties, Reprints (U)

This review attempts to present a broad-brush picture of the present state of the art of crystal resonators. It considers primarily, the theoretical point of view and leaves the very extensive subject of crystal resonator technology, which includes the problem of frequency stability, as the subject of another article. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A038 088 13/2
LITTLE (ARTHUR D) INC CAMBRIDGE MASS

State-of-the-Art Survey of Land Reclamation Technology. (U)

DESCRIPTIVE NOTE: Final rept. Jun 75-Jun 76,
MAY 76 98P Berkowitz,J. B. ;Harrison, J. E. ;Huska,P. A. ;Johnson,S. L. ; O'Brien,P. J. ;
CONTRACT: DAAA15-75-C-0188
MONITOR: EC CR-76076

UNCLASSIFIED REPORT

DESCRIPTORS: *Reclamation, *Decontamination, *Soils, State of the art, Ground water, Trenching, Water wells, Sanitary engineering, Contamination, Vegetation, Inoculation, Degradation, Excavation, Activation, Chemical reactions (U)

This report focuses on absolute removal of contaminants from soil. A combination of downgradient ground and surface water collection and treatment with soil activation is recommended. The first method aims at eliminating leaching to ground (surface) water. The second stimulates natural degradation processes by way of soil activation. One method works on low-lying contaminants, the other works on the upper foot of soil. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A038 058
PURDUE UNIV LAFAYETTE IND PURDUE LAB FOR APPLIED INDUSTRIAL CONTROL

Significant Accomplishments and Documentation of the International Purdue Workshop on Industrial Computer Systems. Part IV. Some Reports on the State-of-the-Art and Functional Requirements for Future Applications. (U)

DESCRIPTIVE NOTE: Final rept. 1 Feb 76-31 Jan 77
JAN 77 320P
CONTRACT: N00014-76-C-0732

UNCLASSIFIED REPORT

DESCRIPTORS: *Digital computers, *Computer applications, *Industries, Workshops(Meetings), Programming languages, Real time, Consoles, Multiplexing, Production control, Computer programming, Failure, State of the art, International (U)
IDENTIFIERS: *Meetings (U)

This volume represents Part 4 of a six volume set reproducing the major work accomplished during the past eight years. This material is reprinted from the minutes of the several individual meetings of the Workshop and represents the work carried out by the standing committees of the Workshop. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A037 686 21/5 13/10
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

The Marine Gas Turbine--The UK Provides a Case Study in Technological Development, (U)

FEB 77 29P Nunn,Robert H. ;
REPT. NO. ONRL-R-1-77

UNCLASSIFIED REPORT

DESCRIPTORS: *Gas turbines, *Marine surface propulsion, State of the art, Case studies, Great Britain, Foreign technology (U)

This report provides a review of the history of marine gas turbines (MGTs) as propulsors for the Royal Navy, and some of the technological extensions that now appear to be especially promising. Beginning with the Gatric engine in 1943, successive engines are described which, in 1967, provided the confidence necessary for the UK to opt for total MGT propulsion in future naval surface craft. The developments from 1967 onward are briefly summarized, and the current state-of-the-technology is described. Special attention is given to gas generators and their associated ducting systems for use aboard ship. (Author) (U)

AD-A037 402 1/2 13/12
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

Aircraft Operational Experience and Its Impact on Safety and Survivability. (U)

DESCRIPTIVE NOTE: Conference Proceedings.
JAN 77 330P
REPT. NO. AGARD-CP-212

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Flight Mechanics Panel Symposium, 31 May-3 Jun 76, Sandefjord(Norway). NATO furnished.

DESCRIPTORS: *Aviation safety, *Crash resistance, Aviation accidents, Accident investigations, Vulnerability analysis, Survival(General), Reliability, Hazards, Fire protection, Fire resistance, Fire suppression, Flight crews, Flight training, Flight recorders, Fault tree analysis, State of the art, NATO (U)
IDENTIFIERS: *Aircraft design (U)

The AGARD Flight Mechanics Panel Symposium on Aircraft Operational Experience and its Impact on Safety and Survivability was held so that experts in the fields of aircraft accident investigation; aircraft design for reliability and survivability; and hazards and piloting factors in aircraft operation could share their understanding, knowledge and experience in order to improve aircraft safety and survivability. The papers presented offer an excellent overview of the international state-of-the-art in aircraft safety and survivability. The symposium was organized into five sessions: (1) Accident Statistics and Analysis; (2) Design Practices for Aircraft Safety; (3) Design for Aircraft Vulnerability and Survivability: (4) Operational Experience and Safety Considerations; (5) Aircrew Considerations. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A037 239 20/4 14/2
PENNSYLVANIA STATE UNIV UNIVERSITY PARK APPLIED RESEARCH LAB

Design Concepts for a Free Surface Flow Test Tunnel. (U)

DESCRIPTIVE NOTE: Technical memo.,
FEB 77 58P Talian,J. S. ;
REPT. NO. TM-77-33
CONTRACT: N00017-73-C-1418

UNCLASSIFIED REPORT

DESCRIPTORS: *Water tunnels, Test facilities, Hydrodynamics, Surfaces, Fluid flow, Literature surveys, Experimental design, State of the art, Conversion (U)

A proposal was made to build a free surface flow test facility at the Garfield Thomas Water Tunnel. This facility was to be built by the conversion of the rectangular test section of one of the existing tunnels. As the project was begun a literature search was conducted to determine the state-of-the-art of free surface test sections. A testing program was then initiated and some design ideas were considered. This is a report of all the relevant work that has been completed to date. (Author) (U)

AD-A035 921 12/2
TEXAS UNIV AT AUSTIN CENTER FOR CYBERNETIC STUDIES

Some Recent Practical Misconceptions about the State of the Art of Network Algorithms. (U)

DESCRIPTIVE NOTE: Research rept.,
AUG 76 11P Glover,Fred ;Klingman,Darwin
;
REPT. NO. CCS-270
CONTRACT: N00014-75-C-0616, N00014-75-C-0569
PROJ: NR-047-021

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Colorado Univ., Boulder. Sponsored in part by Contract N00014-76-C-0383.

DESCRIPTORS: *Network flows, Algorithms, State of the art (U)

The purpose of this technical note is to correct several errors and misconceptions in a recent article appearing in Operations Research Concerning the state of the art in network solution methods and their computer implementations. (U)

AD-A035 873 13/2 13/13 8/13
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Pavement Performance Models. Volume I. Repeated Load Fracture of Pavement Systems. (U)

DESCRIPTIVE NOTE: Rept for May 74-Nov 75,
AUG 76 195P Witczak,Matthew W. ;
REPT. NO. WES-CR-S-76-15-Vol-1
CONTRACT: DOT-FA73WAI-377
PROJ: 4A762719AT40
MONITOR: FAA RD-75-227-1

UNCLASSIFIED REPORT

DESCRIPTORS: *Pavements, *Pavement bases, Civil engineering, Fatigue(Mechanics), Cracking(Fracturing), Loads(Forces), State of the art, Models, Asphalt, Cements, Binders, Materials, Road building equipment, Concrete, Emulsions, Deformation, Fracture(Mechanics), Soils, Strain(Mechanics), Test methods (U)
IDENTIFIERS: Dynamic stiffness machine, Pells strain criterion, WU006, PE62719A (U)

This report volume presents a state of the art for fatigue cracking of pavement systems. The report deals with prior research relating to the fatigue of asphalt concrete, asphalt emulsions, cement-modified emulsions, lime-treated material, lime fly ash, lime cement fly ash mixes, cement-treated material, and portland cement concrete. A comprehensive summary touching upon laboratory test procedures. test methods, influence of mix factors upon fatigue, generation of typical fatigue curves, development of fatigue fracture subsystems, and verification studies is presented. The state of the art is summarized and qualitatively rated relative to eleven different features felt to be necessary for the development of a fatigue subsystem. In addition, this summary formed the basis for recommendations dealing with future research on fatigue. The basis of the fatigue subsystem is formulated upon the concept that any such methodology proposed for fracture distress must ultimately be founded upon a functional pavement failure. Accordingly, the major results for future research, regardless of material type, (U)

AD-A035 687 13/13 11/7
CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN ILL

Design Criteria for Theater of Operations Glued-Laminated Timber Highway Bridges. Volume I. (U)

DESCRIPTIVE NOTE: Final rept.,
JAN 77 209P Knab,L. I. ;Moody,R. C. ;Sanders,W. W. , Jr.;Elleby,H. A. ;
REPT. NO. CERL-TR-M-198-Vol-1
PROJ: 4A763734DT34
TASK: 04

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A035 688.

DESCRIPTORS: *Military bridges, *Laminates, *Bridges, Wood, Specifications, Theater level operations, Criteria, State of the art, Construction, Materials, Loads(Forces), Cost effectiveness, Civil engineering (U)
IDENTIFIERS: Design, *Military fixed bridges, PE63734A, AST34, WU002 (U)

This report presents structural design criteria recommendations for theater of operations (T/O) temporary glued-laminated timber highway bridges. The report consists of two volumes: Volume I provides the design criteria, procedures, and material specifications, and Volume II contains the development of and justification for the criteria in Volume I. State-of-the-art methodologies were used to develop the criteria, which are based on modifications to existing military and permanent criteria. Use of the criteria by engineers in bridge design offices should result in T/O bridges that have adequate safety and perform satisfactorily. Material weight of glued-laminated timber stringers in T/O bridges designed using the recommended criteria, typically will be about 15 percent less than when designed using permanent bridge criteria. (Author) (U)

AD-A035 437 11/4
DELAWARE UNIV NEWARK CENTER FOR COMPOSITE MATERIALS

The Effects of Relative Humidity and Elevated Temperature on Composite Structures. (U)

DESCRIPTIVE NOTE: Final rept. 1 Dec 75-31 Nov 76,
DEC 76 513P Vinson,J. R. ;Pipes,R. B. ;Walker,Willian J. ;Ulrich,Donald R. ;
CONTRACT: AF-AFOSR-2966-76
PROJ: 9782
TASK: 05
MONITOR: AFOSR TR-77-0030

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at Workshop on The Effects of Relative Humidity and Elevated Temperature on Composite Structures, Delaware Univ., Newark, 30-31 Mar 76.

DESCRIPTORS: *Composite structures, *Composite materials, *Humidity, *High temperature, Workshops(Meetings), State of the art, Degradation, Structural properties, Structural mechanics, Moisture, Polymers, Matrix materials (U)
IDENTIFIERS: WUAFOSR978205, PE61102F (U)

Understanding the influence of combined relative humidity and elevated temperature on the performance of advanced polymer matrix composite structures is a matter of pacing importance to the Air Force in the development of future innovative structures. Degradation of structural strength and durability must be predictable if advanced composites are to be widely accepted as an alternate material in aerospace structural design. These Transactions are the result of a Workshop which discussed the state-of-the-art in both Polymer Chemistry and Mechanics research dealing with the effects of relative humidity and elevated temperature on composite structures. In addition, pacing research topics were identified which must be addressed in the future if the goal of aerospace structural applications with advanced composites is to be achieved. (U)

AD-A035 137 13/2 7/1 13/10
COAST GUARD WASHINGTON D C OFFICE OF RESEARCH AND DEVELOPMENT

Ultimate Disposal of Oil and Hazardous Materials. (U)

DESCRIPTIVE NOTE: Final feasibility study, OCT 75 68P Leary,John F. ;
REPT. NO. USCG-D-36-76

UNCLASSIFIED REPORT

DESCRIPTORS: *Oil spills, *Hazardous materials transportation, *Water pollution, *Waste disposal, *Accidents, Chemicals, Storage, Material separation, Recovery, Sorption, Linings, Incinerators, Ships, Storage tanks, State of the Art (U)
IDENTIFIERS: Oil pollution removal, Water pollution control, Liquid waste disposal, Contingency planning, Materials recovery, Sorbents, Solid waste disposal (U)

This report covers an investigation of the state of the art of methods available to store and/or dispose of recovered oil and other hazardous chemicals which are the result of a discharge into United States inland and coastal waters. It includes the work accomplished by other organizations, both industry and government. The report also describes the kinds of materials which likely will be recovered and discusses alternative techniques/systems for storage and disposal. Additionally, it discusses the areas of the Ultimate Disposal Problem which require research and development. It places particular emphasis on the need to establish the most cost effective and environmentally suitable Ultimate Disposal System to satisfy the Coast Guard's needs. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A034 401 1/1
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

State-of-the-Art in Unsteady Aerodynamics, (U)

NOV 76 12P Rodden,William P. ;
REPT. NO. AGARD-R-650

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Structures and Materials Panel Meeting (43rd), London (England) Sep 76. NATO furnished.

DESCRIPTORS: *Aerodynamic loading, *Aeroelasticity, Instability, State of the art, Aerodynamics, Lifting bodies, Mathematical prediction, Review (U)

The accurate prediction of unsteady air loads is essential to avoiding problems and assuring safety in many interdisciplinary regions involving aeroelasticity and the dynamics of active controls. However, the methods to predict such airloads are complex and intricate. It was considered essential to specify standard configurations and parameters, and to encourage pioneering NATO scientists to report their results early. This would provide bases for evaluation and improvement of later and following developments by other countries. New developments are rapidly emerging in unsteady aerodynamics. The aeroelastician will continue heavy reliance on prediction of airloads from theoretical methods. A terse description of the new state of the art is provided in this report. (U)

AD-A034 241 10/1 10/2 8/7
BATTELLE PACIFIC NORTHWEST LABS RICHLAND WASH

The Use of Geothermal Energy at Military Installations. (U)

DESCRIPTIVE NOTE: Research rept. 1 Sep-15 Oct 76,
OCT 76 68P McSpadden,W. R. ;

UNCLASSIFIED REPORT

DESCRIPTORS: *Energy conversion, *Geothermy, Military facilities, Naval shore facilities, California, Geophysics, Electric power plants, Drilling, Cost estimates, State of the art, Bibliographies (U)
IDENTIFIERS: Hot springs, Coso geothermal area, Naval weapons center (U)

This report is a result of a review of eight ARPA funded projects conducted to identify (1) geothermal resources for military installations and (2) key problems for their development. Of these, four projects dealt with identification and evaluation of resources; two dealt with problems associated with the chemistry of geothermal fluids, in particular corrosion and scaling; one project was concerned with the critical problem of drilling for geothermal resources; and one was a review of the current state-of-the-art of geothermal energy development. As a result of these studies, two target areas have been identified as prime candiates for development of geothermal energy at military installations. The Coso Hot Springs, on the Naval Weapons Center at China Lake, CA, and the Marine Corps base at Twenty-nine Palms, CA. In addition, two test sites are proposed in southern Texas for research and development of geopressured systems. As of the beginning of FY77, the Coso Geothermal Site is under active exploration and development with research funding from ERDA. The objectives of these eight ARPA funded research projects have been accomplished. (U)

AD-A033 924 1/5 11/6
NAVAL AIR ENGINEERING CENTER LAKEHURST N J GROUND SUPPORT EQUIPMENT DEPT

Control of Corrosion in Ground Support Equipment. (U)

DESCRIPTIVE NOTE: Interim rept.,
SEP 76 52P Roberts,E. W. ;
REPT. NO. NAEC-GSED-106
PROJ: F41461
TASK: F41461400

UNCLASSIFIED REPORT

DESCRIPTORS: *Corrosion, *Ground support equipment, *Naval aircraft, Corrosion inhibition, Marine atmospheres, State of the art, Surveys, Photographic analysis, Maintenance, Control, Naval shore facilities (U)
IDENTIFIERS: WUA340000051B, WU23 (U)

A summary of efforts to provide guidelines for control of corrosion of ground support equipment. Problem definition and 'state-of-the-art' investigations include findings of surveys of East and West Coast NAS/MCAS/CV sites. A Comprehensive Corrosion Key analyzes the extensive photographic record from the survey. Data has been compiled relating to corrosion control methods, materials and equipment for inclusion in a NAVAIR manual specifically oriented for GSE. (Author) (U)

AD-A033 847 14/5
SOUTHWEST RESEARCH INST SAN ANTONIO TEX

Evaluation of Single- and Multicolor Map and Chart Reproduction Equipment. (U)

DESCRIPTIVE NOTE: Final rept. 26 Feb-1 Nov 76,
NOV 76 90P Baker,E. J. ;Sissung,M. A. ;
CONTRACT: DAAG53-76-C-0094
MONITOR: ETL 0080

UNCLASSIFIED REPORT

DESCRIPTORS: *Reproduction(Copying), *Printing equipment, Topographic maps, Charts, Maps, Lithography, Images, Military requirements, Electrostatics, Colors, Test and evaluation, Screens(Displays), State of the art, Offset printing, Reprography, Diazo compounds, Chromium compounds, Dioxides, Performance(Engineering) (U)
IDENTIFIERS: Reproduction equipment, Chromium dioxide (U)

This report covers the results of the investigation to determine the ability of state-of-the-art printing technologies to meet the military requirements for a quick reaction/limited quantity map and chart reproduction capability. The processes covered are aimed at meeting the requirements for single and multicolor reproduction. These requirements include: input, output, speed and quality of the reproduction, as well as restrictions on size, weight and environmental operating conditions. Covered in this report are the printing technologies which are considered to be the best candidates. Each of the methods are briefly described and the acceptable, marginally acceptable, and unacceptable characteristics as they relate to the military requirements are discussed. Specific additional comments are made about several of the processes and a representative list of manufacturers for each process is included. (Author) (U)

AD-A033 625 9/2
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

Presentations at the RADC/ARPA Invitational DOD/Industry Conference on Software Verification and Validation August 3, 4, 5 1976. (U)

AUG 76 421P
PROJ: 5581
TASK: 02

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Advanced Research Projects Agency, Arlington, Va.

DESCRIPTORS: *Computer program verification, *Computer program documentation, Computer programs, Computer programming, Conferences, Validation, Programming languages, Department of Defense, FORTRAN, State of the art, Industries, Quality control, On line systems, Antimissile defense systems (U)
IDENTIFIERS: *Computer software, Jovial programming language, PE62702F, WURADC55810273 (U)

Original and previously published papers are presented that define the state-of-the-art in software verification and validation. The papers, in general, cover the spectrum from large scale software system verification through working validation tools to Symbolic Execution and the theoretical proof of correctness advances. (Author) (U)

AD-A033 248 12/2
DECISIONS AND DESIGNS INC MCLEAN VA

Calibration of Probabilities: The State of the Art. (U)

DESCRIPTIVE NOTE: Technical rept., AUG 76 72P Lichtenstein,Sarah ;Fischhoff, Baruch ;Phillips,L. D. ;
CONTRACT: N00014-76-C-0074, ARPA Order-3052

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Oregon Research Inst., Eugene, Rept. no. ORI-DDI-3.

DESCRIPTORS: *Decision theory, *Confidence level, Calibration, Uncertainty, Probability, Assessment, Forecasting, Accuracy, Heuristic methods, Scientific research, Reviews, State of the art (U)

An important criterion for evaluating probability assessors is their degree of calibration. A probability assessor is well calibrated if, over the long run, for all statements assigned a given probability the proportion that is true is equal to the probability assigned. For example, if you are well calibrated, then across all the many occasions that you assign a probability of .8, in the long run 80% of them should turn out to be true. If, instead, only 70% are true, you are not well calibrated, you are overconfident. If 95% of them are true, you are underconfident. (U)

UNCLASSIFIED

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A032 862 6/6
FLORIDA UNIV GAINESVILLE DEPT OF PLANT PATHOLOGY

Biological Control of Aquatic Weeds with Plant Pathogens. (U)

DESCRIPTIVE NOTE: Final rept., OCT 76 28P Freeman,T. F. ;Conway,K. E. ;Charudattan,R. ;Zettler,F. W. ;
CONTRACT: DACW73-73-C-0049
MONITOR: WES CR-A-76-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Supersedes report dated Feb 76, AD-B009 804L.

DESCRIPTORS: *Weed control, *Aquatic weeds, *Biological control, Pathogenic microorganisms, Literature surveys, State of the art, Herbicides, Plant pathology, Temperature, Humidity, Flori (U)
IDENTIFIERS: Eichhornia crassipes, Acremonium zonatum, Cercospora, Rhizoctonia solani (U)

In the early 1970's, an effort was initiated to locate and isolate pathogenic organisms for use in the biological control of aquatic plants with special reference to waterhyacinth. This report describes the exhaustive search which has been conducted both in the United States and in several foreign countries. Informaton on laboratory and field research studies is presented as well as the current state of the art in this area of aquatic plant management research. (Author) (U)

AD-A032 436 13/10
NAVAL INTELLIGENCE SUPPORT CENTER WASHINGTON D C TRANSLATION DIV

Present State of the Art and Trends in the Development of Hydrofoils (Sovremennoye Sostoyaniye i Tendentsii Razvitiya Sudov na Podvodnykh Kryl'yakh). (U)

SEP 76 23P Milovanov,E. V. ;
REPT. NO. NISC-Trans-3858

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Trans. of Sudostroyeniye (USSR) n9 p10-17 1972.

DESCRIPTORS: *Hydrofoil craft, Lifting surfaces, Lift, Hydrodynamics, Hydrofoils, Marine engines, Cavitation, Cavitation corrosion, Stability, Performance(Engineering), Foreign technology, State of the art, Translations, USSR (U)
IDENTIFIERS: Hydrodynamic lift (U)

Present State of the Art and Trends in the Development of Hydrofoils--Translation.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A030 932 13/8 9/2
TEXAS A AND M UNIV COLLEGE STATION DEPT OF INDUSTRIAL ENGINEERING

State-of-the-Art in Improved Parts Programming for Numerically Controlled Machines. (U)

DESCRIPTIVE NOTE: Final rept.,
OCT 76 113P Fox,M. J. , Jr.,;Goforth, R. E. ;Allen,Donald L. ;Bowers,B. C. , Jr;
CONTRACT: DAAG47-76-C-0024

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Supersedes report dated Jun 76, AD-A026 231.

DESCRIPTORS: *Manufacturing, *Control sequences, *Computer aided instruction, *Computer programs, *Numerical analysis, *Production control, *Production engineering, *Machining, Machines, Computer applications, State of the art, Material forming, Programming languages, Standardization (U)
IDENTIFIERS: *Numerical control machines, *Numerical control (U)

This report discusses the state-of-the-art of numerical controlled manufacturing technology, as reflected by current literature and research. Standardization of machine languages and computer software are identified as areas of major importance. The incompatability of postprocessors was found to be a significant problem. The research of Bradford M. Smith in the standardization of postprocessors is identified as an important contribution to the efficient use of numerical controlled machine tools. Little research or literature on numerical controlled tooling, or its standardization, was located. Direct numerical control and computer numerical control are defined, and their impact on numerical control noted. An example of successful work exchange is cited, however, the lack of standardization of postprocessors is identified as a deterrent to effective work exchange. On line, interactive computer based information retrieval systems were used, and the results are reported. (Author) (U)

AD-A030 398 20/11 11/8
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

An Industrial Technology Called Tribiology--the UK Experience and Its Implications. (U)

DESCRIPTIVE NOTE: Technical rept.,
AUG 76 40P Nunn,Robert H. ;Herman, Herbert ;
REPT. NO. ONRL-R-7-76

UNCLASSIFIED REPORT

DESCRIPTORS: *Lubrication, *Wear, *Sliding friction, *Wear resistance, *State of the art, Bearings, Friction, Surfaces, Surface properties, Lubricants, Sliding contacts, Lubricants, Surface chemistry, Interactions, Metals, Foreign technology, Great Britain (U)
IDENTIFIERS: *Tribology (U)

Tribology, defined as the science and technology of interacting surfaces in relative motion and of related subjects and practices, is the result of a series of UK activities, begun in 1966, to provide remedies to certain industrial ills. This report, intended for the general reader, is an overview of the birth, growth, and present state of tribology in the UK. The actions of the Committee on Tribology are discussed, as well as those of the Tribology Centres and other UK organizations concerned with lubrication and wear. Relevant but broader issues are also discussed. These include the interdisciplinary approach, effective communication between academia and industry, and the concept of industrial technologies. Comments are offered concerning the lessons to be learned from the UK experience. Appendices provide brief descriptions of the proposed educational module in tribology, the symposium titled 'Tribology 1976,' and the practice of lubrication analysis including ferrography. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A030 385 11/6
NORTHEASTERN UNIV BOSTON MASS

State-of-the-Art and Prospects for Magnetic, Electronic and Mechanical Applications of Amorphous Metals: A Synopsis of the ONR Materials Workshop at Northeastern University, Boston, Massachusetts 20-21 November 1975. (U)

DESCRIPTIVE NOTE: Technical rept.,
76 11P Polk,D. E. ;Giessen,B. C. ;Gardner,F. S. ;
REPT. NO. TR-1
CONTRACT: N00014-75-C-0713
PROJ: NR-031-736

UNCLASSIFIED REPORT
Availability: Pub. in Materials Science and Engineering, v23 p309-316 1976.

DESCRIPTORS: *Metals, *Amorphous materials, State of the art, Physical properties, Magnetic properties, Mechanical properties, Resistors, Alloys, Preparation, Reprints (U)

A workshop on the State-of-the-Art and Prospects for Magnetic, Electronic and Mechanical Applications of Amorphous Metals was held to provide a forum for discussions of the potential applications of amorphous metals and their related physical properties. Half-day sessions were devoted to: (1) preparation and characterization, (2) mechanical applications and (3) magnetic and electronic applications. This report seeks to present a synopsis of the views which were expressed. (U)

AD-A029 422 1/5 4/2
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Climatic Effects on Airport Pavement Systems State of the Art. (U)

DESCRIPTIVE NOTE: Final rept. Oct 74-May 75,
JUN 76 285P Dempsey,Barry J. ;
REPT. NO. WES-CR-S-76-12
MONITOR: FAA-RD 75-196

UNCLASSIFIED REPORT

DESCRIPTORS: *Pavements, *Landing fields, *Climate, Runways, Pavement bases, Civil engineering, Surface temperature, Moisture content, Predictions, Surfaces, Strength(Mechanics), Stiffness, Heat transfer, Soil mechanics, Cements, Asphalt, Mechanical properties, Physical properties, Frost heave, State of the art, Methodology (U)
IDENTIFIERS: Design (U)

This state-of-the-art report reviews the climatic parameters important to airport pavement design, the methodology by which climatic parameters are used to predict pavement design parameters, and the methodology by which climatic parameters are incorporated into design procedures. Methods for predicting temperature and moisture conditions in the pavement system are discussed. Also the pavement distresses which result from temperature and moisture effects are reviewed. The report includes a comprehensive discussion of the methodology for assessing the influence of climatic parameters on the properties of the airport pavement materials. Probabilistic procedures for evaluating the influence of climate on pavement systems are described. In conclusion, a brief summary of methodologies which could be used to include climatic parameters in airport pavement design is presented. (Author) (U)

AD-A029 235 13/8 20/5
AIR FORCE MATERIALS LAB WRIGHT-PATTERSON AFB OHIO

Laser Welding - The Present State-of-the-Art. (U)

DESCRIPTIVE NOTE: Interim rept. Jan-Jul 75,
NOV 75 75P Breinan,E. M. ;Banas,C. M. ;Greenfield,M. A. ;
REPT. NO. AFML-TR-75-149
PROJ: AF-7351
TASK: 735102

UNCLASSIFIED REPORT

DESCRIPTORS: *Laser welding, *Welds, Metals, Ruby lasers, High temperature, High power, Structural properties, State of the art, Aluminum alloys, Titanium alloys (U)

The evolution of laser systems is briefly reviewed from the first successful operation of the ruby laser in 1960 to the present. Laser materials processing developments are then reviewed followed by general discussions of currently available high power laser equipment, laser welding performance, laser weld characteristics, and the properties of laser welds in metals and alloys. A discussion of current industrial laser welding applications is also included. The report constitutes an effort to comprehensively review the important developments in laser welding up to the summer of 1975. (Author) (U)

AD-A028 605 14/5 9/2 13/5
CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN ILL

Investigation of Automated Evaluation of Field Weld Radiographs. (U)

DESCRIPTIVE NOTE: Final rept.,
JUL 76 19P Kearney,F. ;Fornango,J. ;
REPT. NO. CERL-TR-M-185
PROJ: DA-4-A-762719-AT-41
TASK: 4-A-762719-AT-4104

UNCLASSIFIED REPORT

DESCRIPTORS: *Welds, *Radiography, *Automation, *Image processing, Images, Electronic scanners, Defects(Materials), Detection, Computers, State of the art (U)
IDENTIFIERS: Image analysis (U)

Since evaluation of field welds using radiographs requires that an inspector compare the radiograph with a standard, subjectivity is introduced. An automated image-analyzing system is proposed to remove this subjectivity. Radiographs containing sharp, well-defined defects on a uniform background can be analyzed the cathode-ray scanners and special-purpose computers in real time. However, the visual contrast in field weld radiographs is rather poor, and many extraneous features are usually present. A scan of 80 standard radiographs using an image analyzer detected only 296 weld defects while human operators identified 988. Techniques for enhancement and filtering of extraneous features are essential to the automated analysis of field weld radiographs. It is recommended that further work on development of an automatic radiographic analyzer be deferred until major advancements occur in the state of the art of image analysis. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A028 226 11/4 1/3
DAYTON UNIV OHIO RESEARCH INST

Current Status of Composites Vulnerability to Lightning. (U)

DESCRIPTIVE NOTE: Technical rept. Mar-Aug 74,
SEP 75 67P Walko,L. C. ;
CONTRACT: F33615-72-C-2193
MONITOR: AFFDL TR-74-146

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with General Electric Co., Pittsfield, Mass. Environmental Electromagnetics Unit, Rept. no. SRD-74-090.

DESCRIPTORS: *Composite materials, *Reinforced plastics, Vulnerability analysis, Lightning, State of the art, Vulnerability, Protection, Reinforcing materials, Boron, Carbon fibers, Epoxy resins, Airframes (U)
IDENTIFIERS: *Boron reinforced plastics, *Carbon fiber reinforced plastics, Graphite reinforced composites (U)

The report summarizes the current state of the art of knowledge regarding both the direct and indirect effects of Lightning on Composites. It includes a description of research and development efforts which should be undertaken to provide additional composite vulnerability data and enable development of effective protective measures. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A028 031 13/3 13/2
CALIFORNIA UNIV BERKELEY

State-of-the-Art Review on Shotcrete. (U)

DESCRIPTIVE NOTE: Final rept.,
JUN 76 122P Brekke,T. L. ;Einstein,H. H. ;Mason,R. E. ;
CONTRACT: DACA39-74-M-0371
MONITOR: WES CR-S-76-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge Contract DACA39-75-M-0082, and Mathews (A. A.), Inc., Rockville, Md.

DESCRIPTORS: *Tunnels, *Shotcrete, State of the art, Supports, Linings, Rock mechanics, Applicators, Sealants, Construction materials (U)
IDENTIFIERS: *Tunnel linings, *Underground supporting, Gunite, New Austrian tunneling method (U)

This report contains the results of four studies pertaining to shotcrete technology. The first part of the report is an overview of American practices in shotcrete. The second part is a discussion of the development and practice of shotcrete technology in Europe, including a description of the New Austrian Tunneling Method (NATM). The third part describes the experiences of the U. S. Bureau of Reclamation in using shotcrete for tunnel linings and their design and construction concepts. The final part of the report is a discussion of instrumentation currently employed for obtaining the data used in design of shotcreted tunnels being constructed by the NATM. The NATM involves the use of the theoretical-observational approach to design. Each part of the report also gives recommendations as to needed research requirements and suggestions pertaining to possible extended uses of shotcrete in this country. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A027 507 5/9
HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA VA

Team Training and Evaluation Strategies: A State-of-Art Review. (U)

DESCRIPTIVE NOTE: Special rept.,
JUN 76 79P Wagner,H. ;Hibbits,N. ;
Rosenbalt,R. ;Schulz,R. ;
REPT. NO. HumRRO-SR-ED-76-11
CONTRACT: MDA903-76-C-0210, DARPA Order-3187

UNCLASSIFIED REPORT

DESCRIPTORS: *Teaching methods, Skills, State of the art, Feedback, Military training, Assessment, Literature surveys, Simulation, Individualized training, Classification (U)
IDENTIFIERS: Team training (U)

A critical review and evaluation of the literature was performed to describe existing instructional and evaluation techniques relevant to team training. Comprehensive documentation sources such as Educational Resources Information Center (ERIC), Defense Documentation Center (DDC), and National Technical Information Service (NTIS) were searched. In addition, the social psychological areas and the industrial training field were surveyed for relevant publications. Current studies and team training practices underway within the Services were examined and described. A classification scheme was introduced in which the training situations discussed in this review were categorized as either emergent or established. Using this classification scheme, state-of-the-art gaps in team training and evaluation were identified for needed research and development. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A027 248 15/4 9/2
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

Tactical Electronic Reconnaissance Processing and Evaluation Segment, A New Look. (U)

DESCRIPTIVE NOTE: Master's thesis, JUN 76 98P Kollay,Daniel Patrick ; Kreutzer,Kenneth Lee ;

UNCLASSIFIED REPORT

DESCRIPTORS: *Electronic reconnaissance, *Data processing, *Tactical reconnaissance, Minicomputers, Electronic aircraft, State of the art, Computer architecture, Computer programs, Computer program documentation, Acceptability, Theses (U)
IDENTIFIERS: Terpes project, CP-642B computers, CP-808 computers, AN/UYK-20, AN/TSQ-90, EA-6B aircraft, Mean time between failures, Cost of ownership, Computer software (U)

With the proposed procurement of EA-6B aircraft, the U. S. Marine Corps planned the development of TERPES (Tactical Electronic Reconnaissance Processing and Evaluation Segment) to perform post-mission tape analysis. The development phase was initiated on a first generation tactical computer, CP-642B. The thrust of this paper was to identify state-of-the-art replacements for the CP-642B, while identifying areas of concern within the development cycle. Alternative systems were discussed with the emphasis on system flexibility and expandability. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A027 164 18/6 20/14
SCIENCE APPLICATIONS INC BERKELEY CALIF

Evaluation of Present internal Electromagnetic Pulse Interaction Technology: Description of Needed Improvements. (U)

DESCRIPTIVE NOTE: Final rept., MAY 76 57P Tesche,F. M. ;Morgan,M. A. ;Fishbine,B. H. ;
CONTRACT: F29601-75-C-0112
PROJ: AF-1209
TASK: 120905
MONITOR: AFWL TR-75-288

UNCLASSIFIED REPORT

DESCRIPTORS: *Internal electromagnetic pulses, *Coupling(Interaction), Electromagnetic fields, Mathematical models, Transmission lines, State of the art, Statistical analysis, Multiconductor cables, Electric cables, Aircraft (U)
IDENTIFIERS: Bulk current (U)

This report presents a description of the state of the art in the area of internal electromagnetic pulse (EMP) interaction technology. Improvements in the modeling methodology are suggested and a number of specific problems are described which will permit more accurate solutions to problems in this area. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A026 944 9/5
MARTIN MARIETTA AEROSPACE ORLANDO FLA

Printed Wiring Board Production Assembly Cost Guidelines Manual. (U)

DESCRIPTIVE NOTE: Final production manual rept. 26 Mar 75-25 Mar 76,
MAR 76 234P Osborne,Sol C. ;Hutchinson, Wendell R. ;Tartaglia,Frederick E. ;
REPT. NO. OR-13826-2
CONTRACT: DAAB07-75-C-0029
PROJ: DA-2759673

UNCLASSIFIED REPORT

DESCRIPTORS: *Printed circuit boards, Cost analysis, Cost models, Production engineering, Automation, State of the art, Manual operation, Costs (U)

Cost forms, cost/mannour data tables and equipment payoff breakeven cost models provided for the user of this manual a direct approach of selecting the lowest cost PWB component assembly method. The comparisons required for solving assembly problems are given on state-of-the-art manual and automatic assembly methods. Formulated assembly and cost guidelines are provided for processes and equipment described for variety of manual and automatic assembly methods. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A026 937 1/1 14/2 12/1
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

Flight/Ground Testing Facilities Correlation. (U)

DESCRIPTIVE NOTE: Conference proceedings.
75 486P
REPT. NO. AGARD-CP-187

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Papers presented at the Meeting of the Flight Mechanics Panel (46th) 9-13 Jun 75, Valloire (France). Text in English and French. NATO furnished.

DESCRIPTORS: *Wind tunnel tests, *Flight testing, *Correlation techniques, *Symposia, Test methods, Experimental design, Experimental data, Wind tunnel models, Computer applications, Mathematical prediction, Model theory, Data reduction, On line systems, Reynolds number, Wind tunnels, Walls, Transonic characteristics, Helicopters, Short takeoff aircraft, Jet fighters, Supersonic transports, Aerodynamic characteristics, State of the art, Conferences, NATO (U)

Correlation is ultimately the only way of measuring the validity of any analytical tool or ground test technique. As programs become more and more expensive, and the risks more and more dependent on ability ro predict flight characteristics with confidence, it becomes increasingly important to establish the state of our correlation base. The purpose of this Symposium was to provide an opportunity to focus on correlation as a technology in its own right, the techniques available, and the state-of-the-art as revealed by results. The Symposium was organized around three subject areas: Correlation of basic wind-tunnel techniques; Flight-test techniques for correlation; and Wind-tunnel/Flight correlation. (U)

AD-A024 526 5/9 5/2
NAVAL TRAINING EQUIPMENT CENTER ORLANDO FLA

Instructional Systems Development: Conceptual Analysis and Comprehensive Bibliography. (U)

DESCRIPTIVE NOTE: Interim rept. Sep 75-Jan 76, FEB 76 291P Montemerlo,Melvin D. ; Tennyson,Michael E. ;
REPT. NO. NAVTRAEQUIPC-IH-257

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Includes Errata Notice No. 1 dated 11 May 76.

DESCRIPTORS: *Teaching methods, *Bibliographies, Training devices, Education, Human factors engineering, Job analysis, Computer aided instruction, Cost effectiveness, Personnel management, Systems analysis, Operations research, Manuals, Instruction manuals, State of the art (U)

This report constitutes a first step in improving the state-of-the-art of instructional systems development (ISD). It contains a bibliography of about 4,000 entries divided into the following sections: instructional systems development/ systems approach to training, evaluation, methodology selection, media selection, programmed instruction/ computer assisted instruction, task analysis, job analysis, task taxonomy, specific behavioral objectives, sequencing, instructor training, educational management, cost effectiveness, innovation, educational technology, human engineering, simulation, and systems analysis/ operations research. This report also presents a conceptual analysis of ISD, a process which is also known as: the systems approach to training (SAT), systems engineering of training (SET), training situation analysis (TSA), and the design of instructional systems (DIS). The related literature, dating from 1951 to the present, indicates the state-of-the-art to be unsettled. Over 100 ISD manuals are available which contain fundamental disagreement on the most basic aspects of course design. None of the manuals have been empirically validated. In an effort to understand the present state of affairs with respect to ISD, (U)

AD-A024 401 9/2 17/8
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

OCR and Its Application to Documentation - A State of the Art Review, (U)

MAR 76 38P Bush,Donald A. ;Weaver,J. A. ;
REPT. NO. AGARD-ograph-216

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Nato furnished.

DESCRIPTORS: *Optical character recognition, *Input output devices, Machine translation, Abstracts, State of the art, Reviews, Nato, Documents, Data bases (U)
IDENTIFIERS: Technical information, Type setting, Computer type setting, Machine abstraction, Research needs (U)

The purpose of this Agardograph is to consider current methods of preparation, abstraction and dissemination of technical information, and to make suggestions and recommendations as to how these processes could be speeded up and otherwise improved. The technology of data handling and data processing has improved dramatically over the last decade, and the pace of advance seems to be still increasing. Techniques of OCR (Optical Character Recognition), large scale data-base access and manipulation, (perhaps via world wide computer networks) and computer controlled typesetting are relevant to the area of interest of this paper. They have all been fully proven by extensive real use in the hard commercial world. Two others areas of interest - automatic machine translation and abstraction - whilst not yet proven to the same degree, are being actively worked upon and may shortly become a useful reality. Extensive use of the technological tools already available, together with a conscious monitoring of technical advances can lead to hardware systems which can enhance our present capability in the area of documentation. To make best use of such systems, however, requires the establishment of, and compliance with, standard rules of procedure. It is hoped that this note may give those having the authority to define such procedural guidelines some information to consider. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A023 987 17/4 9/3
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

Postulated an Airborne ECM Threat. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 76 19P Anderson,Donald D. ;
REPT. NO. ECOM-5722
PROJ: DA-1-S-763718-D-267
TASK: 1-S-763718-D-26708

UNCLASSIFIED REPORT

DESCRIPTORS: *Electronic countermeasures, Airborne, Threats, Threat evaluation, Jamming, State of the art, United States, Predictions (U)

This report will permit the reader to postulate his own ECM threat based on US technology. He will be able to calculate the power of airborne jammers at any frequency from 0.2 to 12 GHz and make a state-of-the-art estimate or estimate future threats (1980). He will also know tube power, antenna gain, system losses, prime power requirements, and total system weight. The information in this report is based entirely on unclassified US information. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A023 622 14/2 11/1 11/4
ROCKWELL INTERNATIONAL THOUSAND OAKS CALIF SCIENCE CENTER

Proceedings of the ARPA/AFML Review of Quantitative NDE. (U)

DESCRIPTIVE NOTE: Annual rept. no. 1, 3 Jun 74-17 Jul 75,
DEC 75 848P Thompson,Donald O. ;
REPT. NO. SC595-10AR
CONTRACT: F33615-74-C-5180
PROJ: AF-7351
TASK: 735109
MONITOR: AFML,GIDEP TR-75-212,E059-1944

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Also available as Rept. no. GIDEP-556.45.00.00-G7-01.

DESCRIPTORS: *Nondestructive testing, *State of the art, *Adhesive bonding, *Composite materials, *Adhesives, *Ultrasonic radiation, Signal processing, Residual stress, Acoustics, Emission, Failure(Mechanics), Electrons, Positrons, Photons, Annihilation radiation, Quality assurance, Standards, Ultrasonics, Scattering, Transducers (U)

The edited transcripts of the ARPA/AFML Review of Quantitative NDE held on July 15-17, 1975, at the Science Center, Rockwell International, are presented in this document. Several key topics form the core of these presentations and discussions. They include quantitative ultrasonics, adhesives and composites, emissions related to the prediction of failure, and residual stress. In addition a panel discussion is presented related to the role of ultrasonic standards in the emerging quantitative ultrasonics area. It is believed that this document provides a reasonable summary of NDE research and development currently underway in the areas selected for presentation. (Author) (U)

AD-A023 580 14/2 20/6
FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

Atomic Fluorescence Spectrometry--Past, Present and Future. (U)

75 7P Winefordner,James D. ;
CONTRACT: AF-AFOSR-2574-74
PROJ: AF-9536
TASK: 953601
MONITOR: AFOSR TR-76-0281

UNCLASSIFIED REPORT
Availability: Pub. in Chemtech, p123-127 Feb 75.

DESCRIPTORS: *Atomic spectroscopy, *Fluorescence, *State of the art, Atomic spectra, Spectrometry, Flames, Reviews, Reprints (U)
IDENTIFIERS: *Atomic fluorescence spectrometry (U)

Atomic fluorescence spectrometry (AFS) is reviewed with respect to the past, the present, and the future. The past consists of a historical survey of physical studies. The present consists of a survey of the types of fluorescence, the sensitivity of measurement, the experimental setup, and a listing of some analytical figures of merit and applications of AFS. The future of AFS is speculated upon with respect to analytical and physical uses and instrumental improvements. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOMO7

AD-A021 484 8/1
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Feasibility of Transplantation, Revegetation, and Restoration of Eelgrass in San Diego Bay, California. (U)

DESCRIPTIVE NOTE: Final rept.,
FEB 76 50P Boone,Charles G. ;Hoeppel, Ronald E. ;
REPT. NO. WES-MP-Y-76-2
CONTRACT: DACW09-75-B-0026

UNCLASSIFIED REPORT

DESCRIPTORS: *Aquatic plants, *Grasses, *San Diego Bay, Vegetation, Reviews, State of the art, Transplantation, Costs, Feasibility studies, California (U)
IDENTIFIERS: *Zostera marina, Sea grasses (U)

The study was conducted to evaluate the feasibility of several methods of eelgrass (Zostera marine L.) transplantation, restoration, and revegetation in San Diego Bay, California. A literature survey was conducted and current state-of-the-art eelgrass transplant methodologies are presented. Two transplant methods are recommended; however, since neither of these has been tested in a large-scale field program, a preliminary pilot transplant study is also recommended. Transplantation costs for each method have been estimated and are also presented. (U)

AD-A020 698 13/2 19/1
PICATINNY ARSENAL DOVER N J

Ammonia Removal from Wastewaters: A Review of the State of the Art. (U)

DESCRIPTIVE NOTE: Final rept. Jul-Dec 74,
JAN 76 64P Whiting,John H. ;Adams,A. Paul ;Roth,Milton ;
REPT. NO. PA-TR-4904
PROJ: USATECOM-5-CO-523-ECP-011

UNCLASSIFIED REPORT

DESCRIPTORS: *Waste treatment, *Wastes(Industrial), *Waste water, *Munitions industry, *Military facilities, State of the art, Ammonia, Removal, Toxicity, Cost effectiveness, Oxidation, Algae, Nitrates, Ion exchange, Regulations, Land use, Reverse osmosis, Effectiveness, Chlorination (U)
IDENTIFIERS: *Industrial waste treatment, Nitrification, *Denitrification (U)

Processes applicable to the removal of ammonia present in munitions plant waste streams were reviewed and evaluated. The high levels of ammonia, nitrates, and the presence of various explosive wastes contained in the wastewaters present unique problems to ammonia abatement processes. Abatement regulations require removal of both the ammonia and nitrates from these munition plant waste streams. Several processes are effective in the removal of ammonia from wastewaters, but they do not reduce the nitrate concentration. Other processes must be employed to accomplish the nitrate removal, thus imposing additional costs. Ammonia removal processes such as air stripping, ion exchange, and breakpoint chlorination are examples of methods that are only effective in removing ammonia. Biological nitrification-denitrification is an effective two-step abatement process for reducing both ammonia and nitrate concentrations in the wastewater. It is a clean, efficient, and cost-effective process in which ammonia is biologically oxidized to nitrite, then to nitrate which, in turn, is reduced to nitrogen gas by the biological dentrification process. (U)

AD-A019 859 20/6 17/2 1/3
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

A Theoretical Study of Fiberoptronics for Avionic Applications. (U)

DESCRIPTIVE NOTE: Master's thesis,
DEC 75 118P Gaffney,William Michael ;
REPT. NO. GEO/PH/75-10

UNCLASSIFIED REPORT

DESCRIPTORS: *Fiber optics, *Optical communications, *Avionics, Laser communications, Optical waveguides, Semiconductor devices, Light emitting diodes, Lamps, Light transmission, Optical detectors, Aircraft equipment, State of the art, Multiplexing, Theses (U)
IDENTIFIERS: Optical data processing, Design (U)

This project provides a survey of the current state-of-the-art and considers fiberoptronics in the light of potential avionic applications. Types of fibers, light generators, and light detectors which are suitable for avionic applications are discussed. Fiberoptronic links are viable for use in highly selective areas such as multiplexed data bus and cryptographic systems but components need to be qualified to the environmental conditions of the aircraft. Calculations for a basic fiberoptronic link are discussed. The report contains a 42-item bibliography. (U)

AD-A018 738 1/3 13/10
INFORMATICS INC ROCKVILLE MD

Soviet and East European Developments in Surface Effect Vehicles. (U)

NOV 75 83P Boylan,L. H. ;
CONTRACT: MDA903-76-C-0099, DARPA Order-3097

UNCLASSIFIED REPORT

DESCRIPTORS: *Surface effect vehicles, *Surface effect ships, *Ground effect machines, *Air cushion vehicles, Foreign, State of the art, Land transportation, Water traffic, Landing, Takeoff, Trailers, Tractors, Lift fans, Skirts, Ground effect, Drilling machines, Air transportation, Aerodynamic configurations, Aerodynamic characteristics, Performance(Engineering), USSR, Bulgaria, Poland, Rumania, Military forces(Foreign), Government(Foreign), Specifications, Patents (U)
IDENTIFIERS: Rigid sidewall vessel, Wing in ground effect, Aerostatic vehicles, Aerodynamic vehicles, Design, Hoverscooters (U)

The purpose of this report is to provide an overview of the history and state of the art of Soviet and East European developments in surface effect vehicles. Part I reviews 22 vehicles which were designed or built between 1927 and the mid 1960's. Part II of the report focuses on the operational surface-effect vehicles of the Soviet Union, Bulgaria, Poland and Romania. Air lubricated vessels are not covered in this report. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A018 681 13/2 1/5 20/11 12/1
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

State-of-the-Art for Prediction of Pavement Response. (U)

DESCRIPTIVE NOTE: Final rept. 26 Aug 74-12 Sep 75,
SEP 75 81P Crawford,John E. ;Katona, Michael G. ;
CONTRACT: DOT-FA73WAI-377
MONITOR: FAA-RD,WES 75-183,CR-S-75-8

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Civil Engineering Lab. (Navy) Port Hueneme, CA.

DESCRIPTORS: *Pavements, *Finite element analysis, *Mathematical models, *Runways, State of the art, Mathematical prediction, Structural engineering, Layers, Elastic properties, Three dimensional, Models, Computerized simulation (U)
IDENTIFIERS: DOT/4CZ/CA (U)

This report focuses on the finite element idealization as related to principles of pavement analysis, while other techniques and topics are introduced to provide a complete picture. The topics presented are organized to illustrate the similarities and consequences of using various prediction techniques. These topics include: the theoretical basis of the principal techniques, material models, comparison of analytical and measured results, and the selection of a prediction technique. (Author) (U)

AD-A018 368 15/4 15/7
BOLT BERANEK AND NEWMAN INC ARLINGTON VA

Tactical Order of Battle: A State-of-the-Art Survey. (U)

DESCRIPTIVE NOTE: Final rept. Nov 72-Jan 74, OCT 75 122P Bowen,Russell J. ;Halpin, Jeanne A. ;Russell,Peter T. ;Staniforth,Bruce J. ;
REPT. NO. BBN-2662
CONTRACT: DAHC19-73-C-0019
PROJ: DA-2-0-062101-A-754
MONITOR: ARI Technical Paper-265

UNCLASSIFIED REPORT

DESCRIPTORS: *Order of battle, *Tactical warfare, *Combat effectiveness, *Military intelligence, Enemy personnel, Military forces(Foreign), Deployment, Army operations, Division level organizations, Battalion level organizations, Data acquisition, Data processing, Military doctrine, Targeting, Timeliness, Decision making, Military requirements, Computer programs, Display systems, Electronic intelligence, Information retrieval, Vietnam, Command and control systems, Army training, Manpower utilization, Questionnaires, Methodology, Skills, State of the art, Surveys, Confidence level, Confidence limits, Uncertainty (U)
IDENTIFIERS: Lessons learned (U)

This report provides a state-of-the-art survey of tactical order of battle (OB) intelligence, concentrating on the division OB section and based on official documentation, authoritative reference material, and the results of an informal questionnaire and interview program with experienced combat intelligence and operations personnel. The survey includes: Historical development of OB; role, function, and operations of the division OB section; examination of the OB factors; and the results of a brief survey of military opinions on OB. OB analysis requires more varieties of detailed information processing than any other single area of combat intelligence. However, the procedures and techniques available are not standarized or well developed. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A017 373 13/8 14/2
BOEING COMMERCIAL AIRPLANE CO SEATTLE WASH

Practical Sensitivity Limits of Production Nondestructive Testing Methods in Aluminum and Steel. (U)

DESCRIPTIVE NOTE: Final rept. 15 Mar 73-15 Sep 74, JAN 75 187P Southworth,Howard L. ; Steele,Norman W. ;Torelli,Peter P. ;
REPT. NO. D6-41978
CONTRACT: F33615-72-C-2202
PROJ: AF-7351
MONITOR: AFML TR-74-241

UNCLASSIFIED REPORT

DESCRIPTORS: *Nondestructive testing, Defects(Materials), Steel, Aluminum alloys, State of the art, Magnetic materials, Particles, Penetration, Test methods, Ultrasonic tests, Radiography, Eddy currents, Sensitivity (U)
IDENTIFIERS: Steel 4340, Aluminum alloy 2024 (U)

The report describes the work accomplished under an 18-month program conducted to evaluate the sensitivity capabilities of current state-of-the-art nondestructive inspection methods. The methods include magnetic particle, penetrant, eddy-current, ultrasonic, and radiographic. These capabilities were demonstrated in response to varied surface flaws and were statistically defined in terms of probability and confidence of detection. This was accomplished with differing specimen configurations in two representative aircraft structural alloys and for both laboratory and production inspections. (U)

AD-A014 640 1/3 20/1
UNITED TECHNOLOGIES CORP WINDSOR LOCKS CONN HAMILTON STANDARD DIV

A Comprehensive Review of Helicopter Noise Literature. (U)

DESCRIPTIVE NOTE: Final rept.,
JUN 75 188P Magliozzi,B. ;Metzger,F. B. ;Bausch,W. ;King,R. J. ;
CONTRACT: DOT-FA74WA-3477
MONITOR: FAA-RD 75-79

UNCLASSIFIED REPORT

DESCRIPTORS: *Helicopters, *Aircraft noise, State of the art, Bibliographies, Impulse noise, Gear noise, Propeller noise, Gas turbines, Engine noise, Tolerances(Physiology), Noise reductio (U)
IDENTIFIERS: Noise certification criteria (U)

This report summarizes the state-of-the-art in helicopter noise. It includes a bibliography of reports on all components of helicopter noise including main rotor, tail rotor, engine and gearbox. Literature on helicopter noise reduction and subjective evaluation of helicopter noise were also included. Capsule summaries of important reports are included which describe the purpose of the report, summarizes the important results, compares the report with others on the same subject, and provides a critical evaluation of the work presented. It is concluded that the available prediction methodology provides a means for estimating helicopter sources on a gross basis. However, the mechanisms of noise generation are still not fully understood, although the experimental and theoretical tools are now available to conduct the definitive experiments and establish the mathematical models needed for accurate definition of helicopter noise generation mechanisms. Spectrum analyses of helicopter noise show that main rotor, tail rotor, and engine sources contribute significantly to annoyance. In cases where these sources have been heavily suppressed, gearbox noise will also appear as a significant contributor to annoyance. Therefore, quieter helicopters must include suppression of all of these components.

(U)

AD-A014 233 9/2 17/2
ILLINOIS UNIV AT URBANA-CHAMPAIGN CENTER FOR ADVANCED COMPUTATION

A State-of-the-Art Report on Network Data Management and Related Technology, (U)

APR 75 159P Belford,Geneva G. ;Bunch, Steve R. ;Day,John D. ;Alsbert,Peter A. ; Brown,Deborah S. ;
REPT. NO. UIUC-CAC-DN-75-150
CONTRACT: DCA100-75-C-0021

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also AD-A014 232.

DESCRIPTORS: *Communications networks, *Data management, State of the art, Data compression, Clustering, Time sharing, Allocations, Data processing security, Programming languages (U)
IDENTIFIERS: *Computer networks, Resource allocation, Computer privacy, Data structures, Protocols (U)

The state-of-the-art is described in 16 areas related to data management and resource sharing on computer networks. The data management topics covered include data organization (structures and access techniques), optimization (hashing, clustering, partitioning, and compression), data languages (for structure definition and query), and file allocation on a network. The topics covered relating to the network and systems environment include communications, resource allocation, measurement and evaluation, network front ends, and security. The topics relating to network applications discuss general user support, and network management. (U)

AD-A013 961 20/3
CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF PHYSICS

Superconductivity in 1973, (U)

74 3P Matthias,Bernd T. ;
CONTRACT: F44620-72-C-0017
PROJ: AF-9764
MONITOR: AFOSR TR-75-1210

UNCLASSIFIED REPORT

Availability: Pub. in International Jnl. of Quantum Chemistry, Symposium (8th), p499-500 1974.

DESCRIPTORS: *Superconductors, *State of the art, Organic materials, Crystals, Solid state physics, Niobium alloys, Germanium alloys, Lithium compounds, Titanium oxides, Reprints (U)

Superconductivity in 1973 experienced steeper ups and downs than at any other time during the past five years. (Autnor) (U)

AD-A013 668 17/10 8/11
RAND CORP SANTA MONICA CALIF

Soviet Strong-Motion and Vibration-and-Blast Seismographs. (U)

DESCRIPTIVE NOTE: Interim rept.,
JUL 75 98P Shishkevish,Charles ;
REPT. NO. R-1652-ARPA
CONTRACT: DAHC15-73-C-0181, ARPA Order-189-1

UNCLASSIFIED REPORT

DESCRIPTORS: *Seismographs, *Seismometers, USSR, Ground motion, Seismic detection, Blast, Vibration, Foreign technology, Literature surveys, State of the art, Galvanometers, Accelerometers, Seismic arrays, Networks, Instrumentation, Recording systems, Specifications (U)
IDENTIFIERS: Strong Motion Seismometers, Design (U)

This report contains a description of the current state of the art of Soviet strong-motion and vibration-and-blast seismographs, taken from Soviet publications available in the United States through early 1975. It is intended primarily for U.S. seismologists working with strong-motion data, and persons interested in Soviet advances in seismic instruments. The report contains: (1) four tables listing the technical specifications of Soviet seismometers and accelerometers used most widely in galvanometrically recording strong-motion seismographs; (2) a description of recorders; characteristics of four of the most widely used strong-motion instruments; and specifications of direct-recording, three-component seismograph systems. Also treated are auxiliary equipment, including seismic triggers, and seismic engineering networks. An extensive bibliography is included. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A012 837 6/6 6/3 8/8
MICHIGAN UNIV ANN ARBOR SCHOOL OF NATURAL RESOURCES

State-of-the-Art Survey and Evaluation of Marsh Plant Establishment Techniques: Induced and Natural. Volume II. A Selected Anotated Bibliography on Aquatic and Marsh Plants and Their Management. (U)

DESCRIPTIVE NOTE: Final rept., DEC 74 209P Wentz,W. Alan ;Smith, Rachel L. ;Kadlec,John A. ;
CONTRACT: DACW72-74-C-0010
MONITOR: AEWES CR-D-74-9-Vol-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Report on Dredged Material Research Program. See also Volume 1 dated Dec 74, AD-A012 834.

DESCRIPTORS: *Aquatic plants, *Swamps, *Ecology, *Plant growth, *Bibliographies, State of the art, Salt water, Fresh water, Drainage, Aeration, Water table, Rainfall, Soils, Evaporation, Temperature, Light, Ocean tides, River currents, Water waves, Great Lakes, Coastal regions, Estuaries, Pollution, Grasses (U)
IDENTIFIERS: *Salt marshes, *Spartina alterniflora, Vascular plants, *Dredging, Dredge spoil, Ecosystems (U)

The purpose of the bibliography is to make available an annotated listing of references which were not cited in Volume I. Although the bibliography does not represent an exhaustive review of the literature, it does provide an extensive survey of the pertinent references on the ecology and management of aquatic and marsh plants. The references selected for the bibliography emphasize studies useful to researchers and managers. In accordance with the focus of Volume I, this volume concentrates on coastal, Great Lakes, and riverine marshes. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A012 834 6/6 6/3 8/8
MICHIGAN UNIV ANN ARBOR SCHOOL OF NATURAL RESOURCES

State-of-the-Art Survey and Evaluation of Marsh Plant Establishment Techniques: Induced and Natural. Volume 1. Report of Research. (U)

DESCRIPTIVE NOTE: Final rept., DEC 74 271P Kadlec,John A. ;Wentz,W. Alan ;
CONTRACT: DACW72-74-C-0010
MONITOR: AEWES CR-D-74-9-Vol-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Report on Dredged Material Research Program. See also Volume 2 dated Dec 74, AD-A012 937.

DESCRIPTORS: *Aquatic plants, *Swamps, *Ecology, *Plant growth, State of the art, Salt water, Fresh water, Drainage, Aeration, Water table, Rainfall, Soils, Evaporation, Temperature, Ocean tides, River currents, Water waves, Fresh water, Turbidity, Reproduction(Physiology), Seeds, Atlantic Ocean, Coastal regions, Grasses, Pollution (U)
IDENTIFIERS: *Salt marshes, *Spartina alterniflora, Atlantic Coast(United States), Dredging, Dredge spoil, Ecosystems (U)

Knowledge of marsh and aquatic plant establishment was assessed by reviewing the literature and contacting agencies and individuals likely to have relevant information. Factors that affect plant establishment in saltwater areas include tides, salinity, drainage, aeration, water table, rainfall, soil, evaporation, temperature, biota, water depth, light penetration, and current and wave action. In freshwater areas water levels or depths, substrate, water quality, turbidity, and currents and wave action are particularly important to plant establishment. Aquatic and marsh plants propagate naturally by both seeds and vegetative parts. The propagules are dispersed by wind, water animals, and man. By controlling various environmental factors, it is possible to promote and encourage the natural invasion and growth of aquatic and marsh plants, especially in freshwater systems. (U)

AD-A012 728 13/13 13/2 8/11
ARMY CONSTRUCTION ENGINEERING RESEARCH LAB CHAMPAIGN ILL

Guidelines for Developing Design Earthquake Response Spectra. (U)

DESCRIPTIVE NOTE: Final rept.,
JUN 75 362P Hays,Walter W. ;Algermissen, S. T. ;Espinosa,Alvaro F. ;Perkins,David M.;Rinehart,Wilbur A. ;
REPT. NO. CERL-TR-M-114
PROJ: CERL-72-32

UNCLASSIFIED REPORT
Availability: Microfiche copies only.

DESCRIPTORS: *Earthquake resistant structures, *Civil engineering, *Seismology, Construction, Site selection, Ground motion, Foundations(Structures), Earthquakes, Seismic waves, Propagation, Intensity, Power spectra, Loads(Forces), Shaking, Attenuation, Soils, Faults(Geology), Geological survey, Hospitals, Communications central, Electric power plants, Fire fighting, Military facilities, Architecture, State of the art, United States, Hazards (U)
IDENTIFIERS: Guidelines, Architectural engineering, Fire stations (U)

State-of-the-art information required for developing design earthquake response spectra is compiled and synthesized in a manual-like format to provide the user with general guidelines for estimating the ground motion load expected for sites of interest located throughout the United States. The information contained in this document constitutes a subset of the comprehensive body of knowledge available in the field. This subset is considered pertinent for a technical understanding of the theoretical and empirical bases currently used to develop design earthquake response spectra for use in construction, design, and evaluation of important facilities. These guidelines relate to the following analyses: (1) determination of seismicity parameters, (2) estimation of seismic attenuation functions, (3) estimation of maximum intensity of shaking, (4) estimation of ground motion response spectra, and (5) estimation of local soil amplification effects. (U)

AD-A012 651 13/2 8/8
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Heat Dispersion in Physical Estuarine Models. Report 1. State of the Art, (U)

JUN 75 26P Zitta,Victor L. ;Douglas, George W. ;
REPT. NO. AEWES-RR-H-75-2-1

UNCLASSIFIED REPORT

DESCRIPTORS: *Estuaries, *Heat transfer, *Hydraulic models, *Thermal pollution, State of the art, Dispersing, Turbulent diffusion, Plumes, Mass transfer, Convection(Heat transfer), Entrainment, Buoyancy, Air water interactions, River currents, Prototypes, Far field, Distortion, Turbulent flow, Reynolds number (U)
IDENTIFIERS: Receiving waters, Froude number (U)

Prototype heat exchange mechanisms and scaling laws for the reproduction of thermal phenomena in hydraulic models are presented for each stage of the dispersion process. These stages are: Turbulent or momentum entrainment at the efflux jet; buoyant rise or fall of the heated plume; convective spread of the plume over the surface of the receiving waters; mass transport of the plume by ambient currents; diffusion and dispersion due to turbulence in the receiving waters; and surface heat exchange with the atmosphere. (U)

AD-A011 802 9/1
RCA LABS PRINCETON N J

Transferred-Electron-Device (TED) Technology Impact Study. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 74-31 Mar 75,
JUN 75 53P Nowogrodzki,Markus ;Narayan, S. Yegna ;
REPT. NO. PPRL-75-CR-24-Vol-1
CONTRACT: N00014-75-C-0077
PROJ: NR-383-022, RF54-545
TASK: RF54-545-003

UNCLASSIFIED REPORT

DESCRIPTORS: *Semiconductor devices, *Signal processing, Gallium arsenides, Microwave equipment, Solid state electronics, State of the art, Reviews (U)
IDENTIFIERS: *Transferred electron devices (U)

The objective of the overall program reviewed in the report was the assessment of the impact of a new technology - that of signal processing by means of transferred-electron devices (TEDs) - on a particular class of systems of interest to the U.S. Navy. This volume contains the findings of the first task; it describes the state-of-the-art of transferred electron devices used for signal processing purposes, and it provides projections of short-range progress in the device and system technologies. (U)

AD-A010 065 14/2 14/3
HUMAN ENGINEERING LAB ABERDEEN PROVING GROUND MD

An Advanced Eye-Movement Measuring and Recording System. (U)

75 8P Monty,Richard A. ;
REPT. NO. HEL-TM-13-75

UNCLASSIFIED REPORT
Availability: Pub. in American Psychologist, v30 n3 p331-335 Mar 75.

DESCRIPTORS: *Oculometers, *Eye movements, *Recording systems, *Measurement, State of the art, High rate, Reprints (U)

Young and Sheena (1975) have provided a comprehensive summary of available eye-movement recording devices. This companion article describes one of the more advanced eye-movement measuring systems currently in existence, the EG and G/HEL oculometer developed by Robert H. Lambert. The system reflects up-to-date use of the current state of the art of the corneal-reflection-pupil-center technique to monitor the eye while imposing only minimal constraints on the subject, and it incorporates automatic high-speed processing technology. (Author) (U)

AD-A009 026 9/2
UNIVERSITY OF SOUTHERN CALIFORNIA MARINA DEL REY INFORMATION SCIENCES INST

A Fast Approach to Computer System Performance Prediction. (U)

DESCRIPTIVE NOTE: Research paper,
74 14P Kimbleton,Stephen R. ;
CONTRACT: DAHC15-72-C-0308, N00014-67-A-0181-0036
PROJ: ARPA Order-2223, NR-049-311

UNCLASSIFIED REPORT

Availability: Pub. in Conference of Computer Architectures and Networks, IRIA (France), Aug 74, p251-262 1974.

DESCRIPTORS: *Information systems, *Computer architecture, Systems engineering, Predictions, Input output processing, State of the art, Reprints (U)

Computer system performance has been intensively studied over the last five years. Nevertheless, few would be inclined to regard the current state of the art with satisfaction. In part, this would appear to be due to the failure to clearly distinguish between organizational and technological issues in performance. This paper discusses the nature of technological issues in performance and observes that a major requirement for the development of an appropriate solution methodology is a capability for rapid prediction of system performance. One means of achieving this capability is through analytically driven simulation techniques. An implementation of such an approach is described and observations resulting from this implementation are discussed. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A008 558 9/3
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER BETHESDA MD

Pressure-Tolerant Device Technology State of the Art. (U)

DESCRIPTIVE NOTE: Research and development rept.,
MAY 75 64P Pugliese,V. W. ;Gilbert,D. E. ;
REPT. NO. NSRDC-4297
PROJ: XF54-545
TASK: XF54-545-010

UNCLASSIFIED REPORT

DESCRIPTORS: *Underwater equipment, *State of the art, Electronic equipment, Electrical equipment, Pressure, Deep depth, Housings(Enclosures), Tolerance, Hydrostatic pressure, Semiconductor devices (U)

The report describes the research effort devoted to the study and development of a device and material technology to provide electronic and electrical components, circuits, and equipment that will operate successfully in the ocean environment without the need for pressure shell protection. The work has been concerned with: (1) identification and evaluation of device problem areas, (2) development of technology to be used to prevent device failures, and (3) identification and evaluation of system requirements. Its purpose is to document, in a logical manner, the results of the work in determining the influences of an oil/pressure environment on contemporary electronic/electrical components and systems. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A008 552 17/2
JOINT TACTICAL COMMUNICATIONS OFFICE FORT MONMOUTH N J

TRI-TAC Technology Forecast. (U)

DESCRIPTIVE NOTE: Final rept.
OCT 74 171P
REPT. NO. TTO-ORT-035-74

UNCLASSIFIED REPORT

DESCRIPTORS: *Tactical communications, *State of the art, *Forecasting, Fiber optics, Laser communications, Voice communications, Digital systems, Power supplies, Communication satellites, Switching, Memory devices, Communication equipment, Microelectronics, Information processing (U)

The report presents the documentation of interviews, a literature review, and technology forecasts which relate to the state-of-the-art of military tactical communication systems for the 1975-1980 time frame. The interviews were conducted at various Government laboratories and selected industry facilities. Technical areas for which forecasts were made include microelectronics, computers/switching, satellite subsystems, optical communication, power sources, RF power generation, and information processing. Most technological projections that are documented have been obtained from the interview and literature sources. Independent assessment and forecasting have been limited to assessing the impact of rapidly improving technologies on the development of future tactical military communication equipment. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A007 152 1/5
ARMY CONSTRUCTION ENGINEERING RESEARCH LAB CHAMPAIGN ILL

Pavement Functional Condition Indicators. (U)

DESCRIPTIVE NOTE: Final rept.,
FEB 75 96P Shahin,Mohamed Y. ;Darter, Michael I. ;
REPT. NO. CERL-TR-C-15
PROJ: DA-4-A-664717-D-895
TASK: 4-A-664717-D-89504

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Report on Condition Indicators for Military Pavements.

DESCRIPTORS: *Pavements, *Runways, *Skidding, Military facilities, Performance(Engineering), Roughness, Slope, Test methods, Indicators, State of the art, Friction, Measurement, Acceptability (U)
IDENTIFIERS: Service life (U)

Functional performance is defined as the trend of the level of service provided to the pavement users through the initial life of the pavement and between major rehabilitations. The information presented in this report includes: (1) Identification of pavement functional condition indicators; (2) state of the art of measuring and evaluating the most significant functional indicators (roughness and skid resistance); and (3) preliminary concepts for incorporating functional consideration into pavement life-cycle analysis. The report covers pavements in general, with special consideration given to airfields. (U)

AD-A006 197 20/5
RENSSELAER POLYTECHNIC INST TROY N Y

Problems of the Gamma Ray Laser. (U)

DESCRIPTIVE NOTE: Rept. for 1 May 73-1 Jun 74,
AUG 74 145P Baldwin,George C. ;
CONTRACT: [illegible]-D-31-124-73-G162
PROJ: DA-1-T-16:102-B-11-A
MONITOR: BRL CR-179

UNCLASSIFIED REPORT

DESCRIPTORS: *Lasers, Gamma rays, State of the art, Nuclear isomers, Resonance absorption, Optical pumping, Crystal lattices, Nuclear mome (U)
IDENTIFIERS: *Gamma ray lasers (U)

This report is addressed to the problem of the state-of-the-art of gamma ray laser development. It is intended to identify the various disciplines and specific research areas which can best contribute to resolving the question of 'graser' feasibility. Topics discussed include the following: The basic mechanisms of laser action; Gamma ray emission from nuclear isomers; The resonance cross section; Nonresonant absorption; Photon kinetics; Inhomogeneous line breadths; Problems of pumping. (U)

AD-A005 708 8/11
TELEDYNE GEOTECH GARLAND TEX

Strain/Inertial Seismograph Complexes. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 74 302P Fix,James E. ;
REPT. NO. TR-73-16
CONTRACT: F08606-73-C-0008
PROJ: AFTAC-T/3703

UNCLASSIFIED REPORT

DESCRIPTORS: *Seismology, *Seismometers, Seismographs, Rayleigh waves, Seismic waves, Signal to noise ratio, Strain gages, Performance(Engineering), Nuclear explosions, Earthquakes, Seismic arrays, Seismic detection, State of the art, Installation, Digital recording systems, Costs (U)
IDENTIFIERS: Love waves, Seismic noise (U)

The purposes of this report are to present the results of a comprehensive review of the state-of-the-art of strain seismographs and their applications and to present the cost/performance tradeoffs between spatial arrays and strain/inertial arrays. The review included: strain seismometer operating characteristics, present designs, and possible future designs; installation methods, techniques, and configurations; applications of combined strain and inertial seismograms including detection thresholds of the prototype station; the character and magnitude of the strain noise field; and budgetary costs for typical installations. (U)

AD-A005 530 6/5 5/10
NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF

A Consideration of the State of the Art of Diagnosis in Real Clinical Settings. (U)

MAY 74 9P Edwards,Darrel ;Fichman,J. Susan ;Bucky,Steven F. ;Berry,Newell H. ;
REPT. NO. NMNRU-73-18
PROJ: MF51-524
TASK: MF51-524-002

UNCLASSIFIED REPORT
Availability: Pub. in The Jnl. of Psychology, 87 p305-310 1974.

DESCRIPTORS: *Diagnosis(Medicine), *Psychiatry, *Clinical medicine, State of the art, Demography, Behavior, Hospitals, Psychoses, Neuroses, Psychotherapy, Personality, Reprints (U)

In 1966 the International Classification of Diseases, Eighth Revision, with its controversial Section V was adopted by the Nineteenth World Health Assembly for use in member states beginning in 1968. An examination of the initial use of the new system indicated that label differences might be affecting diagnosis in psychiatric cases. This study examined a number of demographic and behavioral variables in order to arrive at a decision concerning the efficacy of psychiatric diagnosis. Diagnosis was found to be a major predictor of industrial effectiveness in a military setting. Psychiatric dispositions were determined on the basis of diagnosis. When the correlates of diagnostic classes were examined, no stable profile could be found. A factor analysis of diagnosis, demography, and behavioral information indicated that diagnostic categories defined rather unique factors in the total clinical picture of a patient. It was concluded that diagnosis is a useful clinical tool, but that the elements constituting a diagnostic impression are not essentially historical in nature. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A005 375 5/2
DEFENSE DOCUMENTATION CENTER ALEXANDRIA VA

State-of-the-Art Reviews. (U)

DESCRIPTIVE NOTE: Report bibliography Feb 47-May 74.
FEB 75 281P
REPT. NO. DDC-TAS-74-41

UNCLASSIFIED REPORT

DESCRIPTORS: *Scientific research, *Bibliographies, Reviews, State of the Art, Aircraft equipment, Chemistry, Data processing, Computers, Medical research, Naval vessels, Flight instruments, Holography, Lasers, Microelectronics, Oceanography, Structural engineering (U)

This bibliography contains 229 references pertinent to the evaluation and results of surveys, studies, and literature searches in the state-of-the-art reviews of selected subjects. The Indexes included are Corporate Author-Monitoring Agency and Subject. (U)

AD-A005 225 13/2 5/3
BOVET (ERIC D) ALEXANDRIA VA

Evaluation of Quality Parameters in Water Resource Planning. (A State- of-the-Art Survey of the Economics of Water Quality). (U)

DESCRIPTIVE NOTE: Final rept.,
DEC 74 264P Bovet,Eric D. ;
CONTRACT: DACW01-73-C-0043
MONITOR: IWR CR-74-13

UNCLASSIFIED REPORT

DESCRIPTORS: *Water quality, *Water supplies, *Economics, Water pollution, Sewage treatment, Waste water, Allocations, Chemical properties, Bacteria, Costs, Purification, State of the art, Reviews (U)
IDENTIFIERS: *Water economics, Water purification (U)

This report reviews water quality from the standpoint of determining the influence of water contaminants on various uses of water, the technology and cost of water supply purification, the technology and cost of waste and recycling water purification, the benefits from enhanced water quality, economic techniques for optimal water supply purification and allocation, and economic techniques for optimal waste and recycling water purification. The intent of the report is to provide Corps of Engineers and other planners with a summary and critique of the literature and a synopsis of relevant methodology which relates water quantity and water quality. Economic cost and benefit calculations are stressed along with optimizing procedures. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD-A001 101 1/3 8/13
KAMAN AEROSPACE CORP BLOOMFIELD CONN

Mechanical Instabil.ty Ground Dynamics Program. (U)

DESCRIPTIVE NOTE: Final rept.,
MAR 74 61P Metzger,Ross F. ;
REPT. NO. R-1249
CONTRACT: N00019-73-C-0460

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: *Helicopters, *Soil dynamics, Instability, Soil models, State of the art, Mechanical impedance (U)
IDENTIFIERS: H-2 aircraft, UH-2 aircraft (U)

A state-of-the-art survey has been performed to determine if any work has been performed which associates soil dynamics with mechanical instability in helicopters. None was found. No data pertaining to the range of near surface soil dynamic properties were found. A method of determining the mechanical stability of a helicopter in contact with the soil has been developed. A parametric study has been performed to examine the UH2 helicopter under conditions of a range soil properties. It was found that there are ranges of parameters which will cause mechanical instability. It is recommended that a program be initiated to obtain quantitative near surface dynamic characteristics of representative soils through field testing. (U)

AD- 916 001 14/4 5/1
BOEING CO SEATTLE WASH

Life Cycle Cost/System Effectiveness Evaluation and Criteria. (U)

JAN 74 71P Walker,G. A. ;
REPT. NO. D180-17648-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*Life cycles, Costs), (*Cost analysis, State of the art), (*Cost effectiveness, Management planning and control), Reliability, Maintenance, Maintainability, Logistics support, Acquisition, Procurement, Operation, Computer programs, Data bases, Quality assurance, Planning, Manpower, Training, Research management, Aircraft, Guided missiles, Bibliographies (U)
IDENTIFIERS: Design, Systems worth, *Life cycle costs (U)

This document contains results of an independent research and development task on life cycle cost performed by Boeing Aerospace Company. This seven month study is Phase I of a planned continued effort and includes discussion on life cycle cost current state-of-the-art, a planned approach and recommendations on where emphasis should be placed to effectively perform cost analysis studies on new systems. Included is a bibliography of 160 documents relevant to life cycle cost, and an evaluation of 14 computer programs which provided the data base from which cost consideration elements and new criteria were developed. (Author) (U)

UNCLASSIFIED

AD- 915 151 15/7 13/6 19/3
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA

Model Study of Instant Vehicular Camouflage. (U)

DESCRIPTIVE NOTE: Final rept.,
OCT 73 65P Bressler,Peter ;
DeBenedictis,John A. ;
REPT. NO. FIRL-F-C3547-5
CONTRACT: DAAD05-73-C-0140
PROJ: DA-1-G-663702-D-471
TASK: 1-G-663702-D-47101
MONITOR: LWL CR-21C73

UNCLASSIFIED REPORT

DESCRIPTORS: (*Camouflage, Military vehicles), State of the art, Reviews, Feasibility studies, Shape, Distortion, Deception, Foliage, Coatings, Colors, Paints, Plastics, Decoys, Wire, Terrain, Surface targets, Foam, Models, Inflatable structures, Reflectors, Carbon dioxide, Cartridges, Trees, Plants(Botany), Tanks(Combat vehicles), Deployment, Fluorescence, Liquid crystals, Fresnel lens, Optical images, Acoustics, Holography (U)
IDENTIFIERS: *Instant camouflage, Infrared paints, Foam nets, Plastic foliage kits, Spring loaded foliage, Wire nets (U)

A feasibility study to determine what materials and geometric systems would be required for fabrication of a camouflage system that would instantaneously cover a military vehicle in order to disrupt its characteristic shape or outline. The program involved intensive research and field trips in which the state-of-the-art of modern camouflage was studied; conception of numerous camouflage systems from the research and group synetics process; production of prescribed models and diagrams; and analysis of systems and conclusions as to their feasibility. (Author) (U)

AD- 912 698 20/5 20/6
FRANKFORD ARSENAL PHILADELPHIA PA

Cooled Metal Laser Mirrors - State-of-the-Art Review. (U)

DESCRIPTIVE NOTE: Memorandum rept.,
JUN 73 28P Cytron,Sheldon J. ;
REPT. NO. FA-M73-17-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*LASERS, STATE-OF-THE-ART REVIEWS), (*MIRRORS, LASERS), COOLING, METALS, SURFACES, CONSTRUCTION, MANUFACTURING, ASSEMBLY, OPTICS, HEAT TRANSFER, DESIGN, COATINGS, QUALITY CONTROL, TRACKING, BEAMS(ELECTROMAGNETIC), DISTORTION, REFLECTION, HEAT FLUX, EFFECTIVENESS, CONVECTION(HEAT TRANSFER), STRUCTURAL MEMBERS, THERMAL EXPANSION, REFLECTIVITY, POLISHES, OPTICAL EQUIPMENT COMPONENTS (U)

This report is a state-of-the-art review of cooled metal laser mirror technology. The design philosophy and parametric tradeoffs underlying cooled laser mirror designs are presented. Various construction aspects of cooled metal laser mirrors are discussed, along with the fabrication techniques employed in the assembly of the mirror. Areas that need further developmental work are reviewed, and recommendations for specific study and development efforts are made to deal with future laser mirror requirements. (Author) (U)

AD- 910 179 20/5
AIR FORCE WEAPONS LAB KIRTLAND AFB N MEX

New Gas Lasers Committee Report on Electronic Transition Chemically and Electrically Excited Lasers. Meeting of 20-22 September 1972. (U)

DESCRIPTIVE NOTE: Technical rept. 1 Sep-1 Dec 72,
MAY 73 43P Wilson,Leroy E. ;Benson, Sidney ;Cool,Terry ;Javan,Ali ;kuppermann,Aron ;
REPT. NO. AFWL-TR-73-60
PROJ: AF-3326
TASK: 332606

UNCLASSIFIED REPORT

DESCRIPTORS: (*GAS LASERS, *INFRARED LASERS), SYMPOSIA, STATE-OF-THE-ART REVIEWS, PUMPING(ELECTRONICS), ELECTRON TRANSITIONS, EFFICIENCY, LIFE EXPECTANCY, GAIN, DIATOMIC MOLECULES, OXIDES, HALIDES, HYDROXIDES, CONSTRUCTION, ULTRAVIOLET SPECTRA, VISIBLE SPECTRA, EXCITATION, MAGNESIUM, CESIUM, CALCIUM, CHEMICAL REACTIONS, STRONTIUM, CHEMILUMINESCENCE, BARIUM, FLAMES, BORON, INFRARED PULSES, ALUMINUM, GALLIUM, INDIUM, THALLIUM, TIN, LEAD(METAL), RARE EARTH ELEMENTS, DESIGN (U)
IDENTIFIERS: CHEMICALS, PUMPS, *CHEMICAL LASERS, *ELECTRONIC TRANSITION LASERS (U)

This report summarizes the ideas generated by a committee of consultants. The purpose of the meeting was to recommend an approach for finding new efficient gas lasers where the inversion is obtained from an electronic transition of the gas. Probable criteria such as quantum efficiency, concentration, lifetime, gain, etc., have been suggested for a suitable system to aid in sorting among the many possible candidates. The most promising diatomic candidates that should be screened are molecular radicals (like CS; OH) and the oxides and halides of Mg, Ca, Sr, Ba, B, Al, Ga, In, Tl, Sn, Pb, and the rare earths. Several experimental and theoretical approaches are suggested that would yield information, such as radiative lifetimes, amount of population inversion, and energy branching ratios, necessary to permit the construction of a laser system. (Author) (U)

AD- 909 137 17/1 9/2
TRACOR INC AUSTIN TEX

Mobile Sonar Technology Information Bank. (U)

DESCRIPTIVE NOTE: Final rept., APR 73 75P Bardin,J. L. ;
REPT. NO. T73-AU-9537-U
CONTRACT: N00024-71-C-1132
PROJ: SF111-111, TRACOR-037-001-01
TASK: SF111-111-500, 12851

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONAR, *INFORMATION RETRIEVAL), (*SUBJECT INDEXING, *SONAR EQUIPMENT), (*TECHNICAL INFORMATION CENTERS, SONAR), DATA STORAGE SYSTEMS, DOCUMENTS, REPORTS, VOCABULARY, INDEXES, STATE-OF-THE-ART REVIEWS, PREPARATION, FEASIBILITY STUDIES, DICTIONARIES, CODING, CLASSIFICATION, COMPUTATIONAL LINGUISTICS (U)
IDENTIFIERS: DATA BANKS, *DESCRIPTIVE WORD SYSTEMS FACETED CLASSIFICATION, DIST, *MOBILE SONAR TECHNOLOGY, MULTIDIMENSIONAL SUBJECT RETRIEVAL, SIGNAL PROCESSING (U)

This report describes the development of the basis for a mobile sonar technology information storage and retrieval system which will induce centralization of the appropriate documents into a library and will provide a reasonable method of access to the desired documents. The work described has produced a concept which has been named the 'descriptive word' approach to information storage and retrieval. The development of the descriptive word system involved first the organization of mobile sonar technology into ten categories which were derived from an overview of the physical process of a sonar system operating in its intended environment; the categories were further subdivided. Next, elements to describe other aspects of a document were generated. These are the sonar function concerned with the general orientation of the subject, the key words, and finally the notation of any specifically designated sonar systems. (Author) (U)

AD- 908 037 20/6 19/5 9/5
NAVAL ELECTRONICS LAB CENTER SAN DIEGO CALIF

Integrated Optical Circuits in Avionics Systems. Volume 1. (U)

DESCRIPTIVE NOTE: Research and Development rept. 1 Jan-1 Jun 72, NOV 72 54P Poulson,J. F. ;Lindgren,T. P. ;Taylor,H. F. ;
REPT. NO. NELC-TR-1846-Vol-1
PROJ: RR014-11, NELC-F212
TASK: RR014-11-04

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-524 558.

DESCRIPTORS: (*ELECTROOPTICS, *AIRCRAFT FIRE CONTROL SYSTEMS), (*ADVANCED WEAPONS, ELECTROOPTICS), (*INTEGRATED CIRCUITS, OPTICAL EQUIPMENT), NAVAL AIRCRAFT, JET FIGHTERS, ATTACK BOMBERS, ANTISUBMARINE AIRCRAFT, SEMICONDUCTOR DEVICES, LOGIC CIRCUITS, MULTIPLEXING, WAVEGUIDES, LASERS, STATE-OF-THE-ART REVIEWS, PLANNING, OPTICAL COMMUNICATIONS, OPTICAL EQUIPMENT, DATA TRANSMISSION SYSTEMS, COSTS, COST EFFECTIVENESS, MODULATION, WEIGHT, NAVIGATION, INTEGRATED SYSTEMS (U)
IDENTIFIERS: *AVIONICS, *A-7 AIRCRAFT, *F-14 AIRCRAFT, HEADS UP DISPLAY, *INTEGRATED CIRCUITS, *OPTICAL EQUIPMENT, *S-3 AIRCRAFT (U)

An integrated optical circuit is a transparent substrate upon which different types of electro-optic components and optical waveguide interconnections are fabricated. Some components which might be contained in IOC's are optical sources, detectors, amplifiers, logic elements, switches, filters, directional couplers, and fan-in/fan-out elements. The avionics systems on three representative naval aircraft (A-7E, S-3A and F-14A) were studied to identify design trends, degree of system integration, and the areas in which IOC technology might apply. On the basis of information obtained in the aircraft survey, a prediction of 1980 avionics-system requirements was developed. A literature search was conducted to determine the extent and objectives of current developments in IOC technology, and obtain a data base for predicting trends in IOC research and avionics design. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 907 528 13/10
NAVAL MATERIAL COMMAND WASHINGTON D C

Deep Ocean Technology Project Development Objectives Assessment. Volume I. (U)

DESCRIPTIVE NOTE: Final rept.,
OCT 72 344P Greenert ,William J. ;Witt, Benjamin F. ;
PROJ: S46-36X

UNCLASSIFIED REPORT

DESCRIPTORS: (*MARINE ENGINEERING, NAVAL RESEARCH), OCEANS, DEEP WATER, OCEAN BOTTOM, CONSTRUCTION MATERIALS, CONSTRUCTION, STRUCTURES, BALLAST, HYDRAULIC EQUIPMENT, UNDERWATER VEHICLES, DEEP SUBMERGENCE, ELECTRIC POWER PRODUCTION, ELECTRIC CABLES, UNDERWATER PROPULSION, POWER SUPPLIES, UNDERWATER COMMUNICATION SYSTEMS, INSTRUMENTATION, DISPLAY SYSTEMS, TRANSPORTATION, LIFE SUPPORT, PLANNING, STATISTICAL ANALYSIS, DECISION MAKING, COSTS (U)
IDENTIFIERS: DEEP OCEAN TECHNOLOGY, DEEP OCEAN TECHNOLOGY PROJECT, DEEP SUBMERGENCE VEHICLES, DOT(DEEP OCEAN TECHNOLOGY) (U)

The Deep Ocean Technology (DOT) Project has as general requirements the definition, analysis, and development of the technological state-of-the art for ocean engineering in the deep ocean environment. The specific requirements for the DOT Project are that there be adequate demonstrated technology options available to support the specific operational requirements for deep ocean programs which are generated in the foreseeable future. Such options are those specific technology developments required to achieve operational systems that will fulfill the Navy's future requirements in manned and unmanned submersible work systems, seafloor construction systems, and weapons support systems. Within these bounds the question naturally arises--what options are the most suitable and how should their development be undertaken. After four years of development effort in implementation of the original project objectives, and in view of past and current funding limitations, it appeared necessary to reassess the DOT Project development programs to ensure that the most cost-effective approaches were being taken. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 907 523 9/1 17/2 13/10
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

Display Systems State of the Art. (U)

DESCRIPTIVE NOTE: Final rept.,
AUG 72 94P Piehler ,D. ;Hirshberg,N. ;
REPT. NO. U440-72-081
CONTRACT: N00014-68-C-0392
PROJ: NR286-001-5

UNCLASSIFIED REPORT

DESCRIPTORS: (*DISPLAY SYSTEMS, STATE-OF-THE-ART REVIEWS), (*COMMAND AND CONTROL SYSTEMS, SUBMARINES), CATHODE RAY TUBES, PHOTODIODES, LIQUIDS, CRYSTALS, PLASMAS(PHYSICS), FERROELECTRIC MATERIALS, DRIVES, COLORS, VOICE COMMUNICATIONS, ELECTROOPTICS, SPEECH RECOGNITION, FIRE CONTROL SYSTEMS, SONAR EQUIPMENT, MAINTENANCE, MONITORS, BIBLIOGRAPHIES, DESIGN (U)
IDENTIFIERS: DATA PROCESSING TERMINALS, HOLOGRAPHY, LIGHT EMITTING DIODES, LIQUID CRYSTALS, PORTED CATHODE RAY TUBES, Most Project-3 (U)

This report presents an overview of the current and projected state of the art in information display systems as they relate to submarine command and control. Included are a discussion of the principles of operation, applications, development status of such diverse displays as cathode ray tubes, light emitting diodes, liquid crystals, plasmas, ferroelectric devices, and others. Characteristics of the electronic devices required to drive these displays are given. Sections are included on the principles of subjective color and the use of computer speech as a mode of display interaction. (Author) (U)

AD- 906 267 20/6
GENERAL ELECTRIC CORPORATE RESEARCH AND DEVELOPMENT SCHENECTADY N Y

Structural Characterization of Materials by Use of Electron Microscopy and Spectroscopy. (U)

DESCRIPTIVE NOTE: Technical information series, JAN 71 53P Phillips,V. A. ;Lifshin, Eric ;
REPT. NO. 71-C-029

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRON MICROSCOPY, *STATE-OF-THE-ART REVIEWS), OPTICAL ANALYSIS, SCIENTIFIC RESEARCH, MICROSCOPY, ELECTRON OPTICS, RESOLUTION, SCANNING, VOLTAGE, COMPUTERS, CONTROL SIMULATORS, IMAGE INTENSIFIERS(ELECTRONICS), ENERGY, ANALYSIS, DAMAGE, RADIATION EFFECTS, X RAY ABSORPTION ANALYSIS, X RAY DIFFRACTION, LUMINESCENCE, MATERIALS (U)
IDENTIFIERS: ELECTRON SPECTROSCOPY, ENERGY ANALYZING MICROSCOPY, HIGH VOLTAGE MICROSCOPY, LATTICE RESOLUTION, LATTICES(MATHEMATICS), ELECTRON MICROSCOPY, ELECTRONIC SCANNERS (U)

The present status of the techniques of conventional electron microscopy, energy analyzing and energy selecting microscopy, direct resolution microscopy, high-voltage microscopy, and scanning electron microscopy is critically discussed and future trends are indicated. The basic principles of each technique and types of application are reviewed. (U)

AD- 905 663 11/3 20/6 1/3 17/7
ARMY COATING AND CHEMICAL LAB ABERDEEN PROVING GROUND MD

Coatings for Infrared Signature Control of Helicopters. (U)

DESCRIPTIVE NOTE: Memorandum rept., SEP 72 7P McLeskey,J. J. , III;
REPT. NO. CCL-MR-4
PROJ: DA-1-F-166605-AA-52
TASK: 1-F-166605-AA-5203

UNCLASSIFIED REPORT

DESCRIPTORS: (*COATINGS, *INFRARED RADIATION), (*HELICOPTERS, PAINTS), (*HEAT HOMING, VULNERABILITY), (*AIRCRAFT FINISHES, HELICOPTERS), INFRARED SPECTRA, COLORS, COSTS, STATE-OF-THE-ART REVIEWS, ABSORPTION, EMISSIVITY, IRON OXIDES, SURVIVAL(PERSONNEL), SOURCES, SPECTRUM SIGNATURES, CARBON, HYDROGEN, CHEMICAL BONDS, CARBON BLACK, PIGMENTS, REFLECTIVITY, TITANIUM, DIOXIDES (U)
IDENTIFIERS: *INFRARED SIGNATURES, *INFRARED COATINGS, NEAR INFRARED REGION (U)

This report reviews the state-of-the-art in coating design for control of the infrared signature of helicopters. Past work is summarized and current work identified. The feasibility of using low emittance coatings is discussed. (Author) (U)

AD- 889 087 13/10 13/13
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

Seafloor Pile Foundations: State-of-the-Art, and Deep-Ocean Emplacement Concepts. (U)

DESCRIPTIVE NOTE: Technical note Jul 70-Apr 71, OCT 71 30P Raecke,D. A. ;Migliore,H. J. :
REPT. NO. NCEL-TN-1182
PROJ: YF38.535.004.01.002

UNCLASSIFIED REPORT

DESCRIPTORS: (*FOUNDATIONS(STRUCTURES), OCEAN BOTTOM), (*ANCHORS(STRUCTURAL), DEEP WATER), DESIGN, DRILLING, HAMMERS, UNDERWATER EQUIPMENT, VIBRATORS(MECHANICAL), EXPLOSIVES, ACCEPTABILITY, CONSTRUCTION, COSTS, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: *PILE FOUNDATIONS (U)

A review of the state-of-the-art of the emplacement and design of seafloor pile foundations/anchorages was conducted. Several concepts for emplacement mechanisms suitable for use in water depths to 6,000 feet were considered, and a preliminary effectiveness evaluation of the mechanisms was conducted to reduce the number of systems for further investigation. The state-of-the-art review indicates that marine drilling techniques and equipment could be readily adapted for deep-ocean pile emplacement for a very near-term requirement; however, the use of such a method would be quite costly. Other pile emplacement systems are presently limited to depths of about 1,000 feet by the need for relatively large amounts of power. Development of a 6,000-foot pile foundation/anchorage emplacement capability is not limited by any need to develop novel mechanical equipment. (Author) (U)

AD- 888 815 13/2 1/5
AIR FORCE WEAPONS LAB KIRTLAND AFB N MEX

Continuously Reinforced Concrete Pavement. The State of the Art. (U)

DESCRIPTIVE NOTE: Technical rept. Sep 70-Sep 71, OCT 71 99P York,Guy P. ;
REPT. NO. AFWL-TR-71-102
PROJ: AF-683M

UNCLASSIFIED REPORT

DESCRIPTORS: (*PAVEMENTS, *REINFORCED CONCRETE), (*RUNWAYS, PAVEMENTS), STATE-OF-THE-ART REVIEWS, REINFORCING MATERIALS, STEEL, DESIGN (U)
IDENTIFIERS: *CONTINUOUSLY REINFORCED CONCRETE PAVEMENTS (U)

The report presents the state of the art of continuously reinforced concrete (CRC) pavement and the feasibility and desirability of constructing this type of pavement on USAF air bases. It is the result of a thorough review of the literature, field investigations of highway and airport CRC pavements, and discussions with the foremost experts in the field. It includes a discussion of the characteristics and performance of CRC pavements and current design procedures. It concludes that the Air Force should begin constructing new and overlay airfield pavements with CRC, but also that additional research is required to improve design criteria. (Author) (U)

AD- 888 286 9/5
PHILCO-FORD CORP BLUE BELL PA MICROELECTRONICS DIV

Procedural Guidelines for the Reliability Assessment of MOS Microcircuits. (U)

DESCRIPTIVE NOTE: Final rept. Jun 69-Mar 71,
SEP 71 212P Ewald,Henry J. ;
REPT. NO. FSC-A7D2
CONTRACT: F30602-69-C-0252
MONITOR: RADC TR-71-178

UNCLASSIFIED REPORT

DESCRIPTORS: (*INTEGRATED CIRCUITS, RELIABILITY(ELECTRONICS)), SEMICONDUCTOR DEVICES, STATE-OF-THE-ART REVIEWS, FAILURE(ELECTRONICS) (U)
IDENTIFIERS: METAL OXIDE SEMICONDUCTORS, MICROELECTRONICS (U)

The objective of this study program was the development of a set of procedural guidelines for effectively assuring, predicting and assessing the reliability of MOS integrated circuits. The end product of the study was a set of recommendations for additions or modifications to portions of MIL-STD-883 as they would apply to the screening and reliability verification of MOS IC's. The two approaches to the investigation included, first, a canvass of the industry, both manufacturers and users of MOS IC's, combined with a proposal for an optimized and practical set of screens and reliability verification procedures based upon in-house experience as well as upon the response to the industry canvass. The second approach was to select a moderately complex test vehicle, namely the dual-fifty bit shift register using the 'p' channel enhancement mode of operation. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 888 218 17/3 17/7 17/2.1
ILLINOIS UNIV URBANA RADIOLOCATION RESEARCH LAB

Proceedings of the Allerton-House Conference (4th) on HF Radio Direction Finding and Radiolocation Research. (U)

DESCRIPTIVE NOTE: Final rept.,
SEP 71 435P Bailey,A. D. ;
REPT. NO. RRL-Pub-392, UILU-ENG-71-2542
CONTRACT: N00014-71-C-0221

UNCLASSIFIED REPORT

DESCRIPTORS: (*DIRECTION FINDING, *SYMPOSIA), (*POSITION FINDING, *RADIO EQUIPMENT), HIGH FREQUENCY, RADIO WAVES, PROPAGATION, RADIO TRANSMISSION, ANTENNAS, RADIO RECEIVERS, COMPUTERS, DISTANCE MEASURING EQUIPMENT, IONOSPHERIC DISTURBANCES, RADIOFREQUENCY INTERFERENCE, ANGLE OF ARRIVAL, NOISE(RADIO), MODELS(SIMULATIONS), SIMULATION, INSTRUMENTATION, STATE-OF-THE-ART REVIEWS, RADIO INTERFEROMETERS (U)

The purpose of this conference is to promote discussion between Governmental, Educational and Industrial Groups on the 'State-of-the-art' and Science of Radio Direction Finding, Radio Position Finding, Directional Radio Propagation: and to explore, where possible, the future direction of these research efforts, based on user requirements. The General Theme of this Conference: 'D/F in the Seventies' with subtopics (1) RDF Systems, (2) Radiolocation Systems, (3) Modeling and Simulation Studies, (4) HF Directional Propagation Research, (5) Instrumentation. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 884 439 1/3
CORNELL AERONAUTICAL LAB INC BUFFALO N Y FLIGHT RESEARCH DEPT

Background Information and User Guide for MIL-F-83300-Military Specification -- Flying Qualities of Piloted V/STOL Aircraft. (U)

DESCRIPTIVE NOTE: Final rept., MAR 71 469P Chalk,Charles R. ;Key, David L. ;Kroll,John , Jr.;Wasserman,Richard ;Radford,Robert C. ;
CONTRACT: AF 33(615)-3736, F33615-70-C-1322
PROJ: AF-698DC
MONITOR: AFFDL TR-70-88

UNCLASSIFIED REPORT

DESCRIPTORS: (*VERTICAL TAKEOFF AIRCRAFT, PERFORMANCE(ENGINEERING)), (*SHORT TAKEOFF AIRCRAFT, SPECIFICATIONS), MILITARY REQUIREMENTS, STATE-OF-THE-ART REVIEWS, FLIGHT TESTING, HOVERING (U)

The specification was compiled after an extensive literature review and many meetings and discussions with personnel from essentially all concerned civilian and governmental organizations. The report attempts to explain the concept and philosophy underlying the V/STOL Specification and to present some of the data and arguments upon which the requirements were based. The document should also serve as a summary of the state of the V/STOL flying qualities art as determined from flight test, simulation, analysis, and theory. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 883 920 9/5 9/2
MCDONNELL AIRCRAFT CO ST LOUIS MO RECONNAISSANCE LAB

Electronic Viewing for Image Interpretation. (U)

DESCRIPTIVE NOTE: Final rept., MAR 71 306P Kozlowski,D. R. ;Jauer,R. A. ;
REPT. NO. MDC-A0783
CONTRACT: N00019-69-C-0619

UNCLASSIFIED REPORT

DESCRIPTORS: (*SCREENS(DISPLAYS), STATE-OF-THE-ART REVIEWS), DISPLAY SYSTEMS, LASERS, CATHODE RAY TUBES, TELEVISION DISPLAY SYSTEMS, PHOTOGRAPHIC FILM, HUMAN FACTORS ENGINEERING (U)
IDENTIFIERS: ELECTROLUMINESCENCE, PANELS, ELECTRONIC DISPLAY SYSTEMS, HOLOGRAMS, HOLOGRAPHY, LIQUID CRYSTAL DISPLAY SYSTEMS, DISPLAY SYSTEMS, PHOTOCHROMISM, DISPLAY SYSTEMS, PLASMAS(PHYSICS) (U)

The purpose of the study was to evaluate the potential of recent electronic and electro-optical technology for meaningful assistance to the interpreter in the 1970-1980 decade. Functional requirements of the image interpreter (operator), as well as his psychophysical limitations were studied. The literature was researched for technological posture in optical viewing systems, laser and holographic displays, electronic viewing devices, storage and retrieval systems, and auxiliary devices and techniques. Based on this knowledge and on equipment tests, system evaluations and projections were made to arrive at recommended design concepts for the near future and to establish guidelines for future research and development in the application of electronic viewing to the interpretation task. (Author) (U)

AD- 880 384 9/2
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J COMMUNICATIONS/ ADP LAB

A Brief Survey of the History and Future Needs of Computer Systems, (U)

FEB 68 18P Cave,William C. ;
REPT. NO. CADPL-74

UNCLASSIFIED REPORT

DESCRIPTORS: (*COMPUTERS, STATE-OF-THE-ART REVIEWS), HISTORY, PROGRAMMERS, COMPUTER PROGRAMMING, PROGRAMMING LANGUAGES, INPUT OUTPUT DEVICES, SUBROUTINES, TELETYPE SYSTEMS, COMPUTER LOGIC, MEMORY DEVICES, COMPILERS, TIME SHARING, REAL TIME, DIGITAL COMPUTERS, DATA PROCESSIN(U)
IDENTIFIERS: COMPUTER PROGRAMS, FIRST GENERATION COMPUTERS, FORTRAN, LGP-30 COMPUTERS, MAGNETIC DRUM MEMORIES, ON LINE SYSTEMS, SCEPTRE PROGRAMMING LANGUAGE, SECOND GENERATION COMPUTERS, THIRD GENERATION COMPUTERS (U)

The purpose of the following discussion is to survey development and utilization of the computer by highlighting two pressing problems, development of expandable languages and expandable systems. It is convenient to unfold these problems via chronological discussion, and to this end generation numbers have been assigned. This, admittedly, is artificial, but serves well as a vehicle for the intended presentation. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 878 676 11/2 13/10 20/11 13/3
11/4
NAVAL SHIP RESEARCH AND DEVELOPMENT LAB ANNAPOLIS MD

State-of-the-Art Survey of Ferrocement. (U)

DESCRIPTIVE NOTE: Research and development rept.,
JAN 71 38P Brauer,Frank E. ;
REPT. NO. NSRDL/A-8-529
PROJ: ZFXX-412
TASK: ZFXX-412-001

UNCLASSIFIED REPORT
Availability: Microficne copies only.

DESCRIPTORS: (*CEMENTS, *REINFORCED CONCRETE), (*COMPOSITE MATERIALS, CEMENTS), (*CONSTRUCTION MATERIALS, SHIPS), WIRE, REINFORCING MATERIALS, TENSILE PROPERTIES, FLEXURAL STRENGTH, MODULUS OF ELASTICITY, FATIGUE(MECHANICS), COMPRESSIVE PROPERTIES, SHEAR STRESSES, CORROSION RESISTANCE, IMPACT SHOCK, MECHANICAL PROPERTIES, SHOCK RESISTANCE, STATE-OF-THE-ART REVIEWS, CRACKS, DUCTILITY, STEEL, BONDING, CORROSION INHIBITION (U)
IDENTIFIERS: *FERROCEMENT, PORTLAND CEMENT (U)

From this literature study it was found that ferrocement is a composite material of superior mechanical properties when compared to reinforced concrete. This superiority is reflected in greater flexural crack strength, tensile strength, ductility, and impact strength. Much more research into the material properties of ferrocement must be done to fully understand the nature of the strengthening mechanism in ferrocement and to provide designers with comprehensive, reliable information necessary for the maximum utilization of ferrocement. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 870 900 9/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

Actual State and Perspectives of the Technology of Solid State Semiconductor Circuits and the Problem of Selecting the Optimum Technology for a Domestic Program, (U)

MAY 70 22P Ambroziak,Andrzej ;
REPT. NO. FTD-HT-23-190-70
PROJ: FTD-6019704
TASK: DIA-T68-01-02

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Edited trans. of Przeglad Elektroniki (Poland) v10 n7/8 p388-398 1969, by L. Marokus.

DESCRIPTORS: (*INTEGRATED CIRCUITS, STATE-OF-THE-ART REVIEWS), DESIGN, STANDARDIZATION, POLAND (U)
IDENTIFIERS: TRANSLATIONS (U)

The first part of the paper describes tremendous progress in the production of semiconductor integrated circuits, particularly in the United States and Japan. Next, the standardization of technology and progress in designing of integrated circuits is described. Fourth part is devoted to obstacles encountered in development of the large scale integration. In conclusion, the situation in this century in the field of semiconductor integrated circuits is briefly described. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 870 890 19/1 7/4 15/7
FRANKFORD ARSENAL PHILADELPHIA PA

Barrier/Counterbarrier Research. Molecular Sensing. (U)

DESCRIPTIVE NOTE: Memorandum rept., MAR 70 26P Lannon,Joseph A. ;Salamon, Robert ;
REPT. NO. FA-M70-14-1
PROJ: DA-1-J-6627708-A-462

UNCLASSIFIED REPORT

DESCRIPTORS: (*MINE DETECTORS, GAS DETECTORS), (*GAS DETECTORS, SENSITIVITY), (*UNDERGROUND STRUCTURES, DETECTION), CONCENTRATION(CHEMISTRY), DETECTORS, DECOMPOSITION, GASES, GAS CHROMATOGRAPHY, GAS ANALYSIS, AIRBORNE, LAND MINES, UNDERGROUND, SAMPLING, SMELL, RESPONSE, EFFECTIVENESS, SELECTION, DETECTORS, ODORS, MASS SPECTROSCOPY, HUMANS, INFRARED SPECTROSCOPY, ULTRAVIOLET SPECTROSCOPY, STATE-OF-THE-ART REVIEWS, DIFFUSION (U)
IDENTIFIERS: MOLECULAR SENSING, PERSONNEL DETECTORS, TUNNEL DETECTORS, TUNNELSUNDERGROUND STRUCTURES) (U)

The purpose of this study was to draw a comparison between the sensitivities of present day chemical detectors and sensitivities which are needed for the detection of mines and tunnels. An attempt to determine the levels of concentration of effluents emanating from mines and tunnels is presented. The sensitivities of detectors used with chromatographs and of other direct detectors are given. From these sensitivities it appears that present day chemical detectors are not capable of detecting mines and tunnels. Research areas are suggested (especially the olfactory mechanism) which offer promise for detecting trace amounts of gas with orders of magnitude of more sensitivity and selectivity than present day detectors. (Author) (U)

AD- 869 528 14/2 13/2
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Nondestructive Testing of Flexible Pavements: A Literature Review. (U)

DESCRIPTIVE NOTE: Technical rept. May 67-Jun 69,
MAY 70 35P Hall,J. W. ;
PROJ: AF-5224
TASK: 522403
MONITOR: AFWL TR-68-147

UNCLASSIFIED REPORT

DESCRIPTORS: (*PAVEMENTS, NONDESTRUCTIVE TESTING), ROADS, LANDING FIELDS, DEFLECTION, VIBRATION, FATIGUE(MECHANICS), MEASUREMENT, STATE-OF-THE-ART REVIEWS, LOADS(FORCES), SOIL MECHANICS (U)

A review of literature concerned with the nondestructive testing of flexible pavements, and two types of testing methods are presented in this report. The first method deals with the measurement of pavement response through the deflection of the pavement surface. Effect of the loading characteristics, pavement structure, and environment on measured deflections are discussed. Experience has shown that deflections of certain magnitudes are associated with failure. Bending strain has also been associated with failure through field measurements of radius of curvature of the deflection basin and through laboratory fatigue studies. The second method involves the application of a vibratory load to the pavement surface and determination of pavement response through deflection of the surface under a low-frequency vibration or by measurement of wave propagation at higher frequencies. The deflection of the pavement under the vibratory loading is used to determine dynamic stiffness, or type of spring constant, for the pavement structure. The wave velocity is used to arrive at a shear modulus and compression modulus of each pavement layer and the subgrade as well as thickness of each layer. Theoretical calculations involved and typical results are presented. Conclusions are made from findings in the literature, and recommendations are given for developing a method of nondestructive evaluation of flexible pavements. (Author) (U)

AD- 861 821 14/4 13/8
IIT RESEARCH INST CHICAGO ILL

Nondestructive Determination of Nonelectronic Part Reliability. (U)

DESCRIPTIVE NOTE: Final technical rept. 20 Feb 68-20 Feb 69,
OCT 69 81P Tobin,Henry G. ;
REPT. NO. IITRI-E6111-FR
CONTRACT: F30602-68-C-0210
PROJ: AF-5519, IITRI-E6111
TASK: 551902
MONITOR: RADC,IDEP TR-69-209,347.40.00.00-F9-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIR FORCE EQUIPMENT, VALUE ENGINEERING), (*NONDESTRUCTIVE TESTING, DEFECTS(MATERIALS)), STATE-OF-THE-ART REVIEWS, ENGINES, MOTORS, BEARINGS, RELAYS, SOLENOIDS, ELECTRIC SWITCHES, GEARS, RELIABILITY, LIFE EXPECTANCY, FAILURE(MECHANICS) (U)

An investigation of the state-of-the-art of the application of nondestructive testing to the task of reliability screening and/or life estimation was carried out. Both the literature and industry were surveyed to allow an assessment of the feasibility of carrying out the screening or estimation tasks. Among the nondestructive methods investigated were eddy current, X-ray, ultrasonics, infrared, vibration analysis, penetrants, dyes, stains, films, cumulative and conventional strain gages, microwave, optical, and neutron radiography. Components studied included motors, bearings, relays, switches, solenoids, and gear trains. The study found that NDT methods are well advanced. However, insufficient information concerning the failure modes of the components studied limits the applicability of these methods to the screening or estimation process. The two components for which significant information is available are relays and bearings. Suggested methods by which reliability screening or life estimation can be accomplished are described. (Author) (U)

AD- 854 277 17/2 17/2.1 9/5 9/2
RCA DEFENSE COMMUNICATIONS SYSTEMS DIV WEST WINDSOR N J

Project MALLARD Systems Study. Special Report on Switching. Volume I. (U)

MAR 69 312P
CONTRACT: DAAB07-68-C-0119
PROJ: WBS-HA010301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-854 278L.

DESCRIPTORS: (*COMMUNICATION SYSTEMS, TACTICAL WARFARE), (*SWITCHING CIRCUITS, *VOICE COMMUNICATIONS), (*ELECTRONIC SWITCHES, *DATA TRANSMISSION SYSTEMS), DATA STORAGE SYSTEMS, INTEGRATED CIRCUITS, QUEUEING THEORY, TRAFFIC, FLOW CHARTING, SCHEDULING, MEMORY DEVICES, COMMUNICATIONS CENTRAL, COMMAND AND CONTROL SYSTEMS, COMPUTER PROGRAMMING, MULTIPLEXING, TIME, ANALOG-TO-DIGITAL CONVERTERS, DELAY LINES, DIGITAL SYSTEMS, GATES(CIRCUITS), SHIFT REGISTERS, LOGIC CIRCUITS, COMMUNICATION AND RADIO SYSTEMS, RELAXATION OSCILLATORS, DATA PROCESSING, FIELD EFFECT TRANSISTORS, STATE-OF-THE-ART REVIEWS, COST EFFECTIVENESS, PLANNING, RELIABILITY(ELECTRONICS), AUTOMATIC, REDUNDANT COMPONENTS, DESIGN (U)
IDENTIFIERS: LARGE SCALE INTEGRATED CIRCUITS, *MALLARD PROJECT, FORECASTING, TECHNOLOGY, *TIME DIVISION SWITCHES, TRADEOFFS (U)

This volume is divided into three major sections: The first presents a summary of the previously reported switch configuration trade-offs that resulted in the selection of the recommended Mallard Switch configuration. This is followed by a discussion on the selection of the multiple-highway configuration and the trade-offs involved. The next section outlines the present state-of-the-art in component technology. Projections for the 1972 time-frame are also presented. The next part describes the design of the recommended Mallard Switch. A description of the associated software is also included. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 851 938 11/6 13/8 1/3
BOEING CO SEATTLE WASH SPACE DIV

An Investigation of the Generation and Utilization of Engineering Data on Weldments. (U)

DESCRIPTIVE NOTE: Technical rept., OCT 68 186P Hood,D. W. ;Eichenberger, T. W. ;Lovell,D. T. ;
REPT. NO. D2-114287-1
CONTRACT: F33615-67-C-1680
PROJ: AF-7381
TASK: 738106
MONITOR: AFML TR-68-268

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRFRAMES, STRUCTURAL MEMBERS), (*ALUMINUM ALLOYS, WELDS), (*TITANIUM ALLOYS, WELDS), STANDARDIZATION, DESIGN, MODELS(SIMULATIONS), JOINTS, MANUFACTURING, TEST METHODS, STATE-OF-THE-ART REVIEWS, TENSILE PROPERTIES, COMPRESSIVE PROPERTIES, PIPES, PRESSURE VESSELS (U)
IDENTIFIERS: ALUMINUM ALLOY 6061, EVALUATION, TITANIUM ALLOY 6AL 4V, WELDMENTS (U)

AD- 844 288 9/3 9/2 13/8
GENERAL ELECTRIC CO SCHENECTADY N Y RESEARCH AND DEVELOPMENT CENTER

Computerized Techniques for the Manufacture of Integrated Electronic Systems. (U)

DESCRIPTIVE NOTE: Final technical rept. 15 Apr 67-15 May 68,
OCT 68 258P Chestnut,H. ;Segal,R. ;
REPT. NO. S-68-1152
CONTRACT: F33615-67-C-1569
PROJ: AF-531-78
MONITOR: AFWL TR-68-226

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRONIC EQUIPMENT, DESIGN), (*DESIGN, AUTOMATION), MANUFACTURING, SYSTEMS ENGINEERING, COMPUTERS, COMPUTER PROGRAMMING, INTEGRATED SYSTEMS, EFFECTIVENESS, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: COMPUTER AIDED DESIGN (U)

The study's objectives were to identify and demonstrate the areas where a computer can aid in the development and manufacture of electronic equipments, and to determine the scope, direction, and objectives of future work necessary to establish operational computerized techniques which effectively exploit the most advanced technologies available for the production of electronic systems. This report examines the manufacturing process from design through production, the environment for utilizing computer-aided techniques, the current state-of-the-art in application programs, and various pertinent hardware and software considerations. A concept referred to as DAMES (Design Automation for the Manufacture of Electronic Systems), an integrated system capable of providing computer assistance to a wide variety of users, has been formulated to overcome current limitations and provide a base for evolution and expansion to accommodate future needs. This report describes the requirements, components, and characteristics of DAMES, the recommended first steps in obtaining this capability, and the manner in which the first step can evolve into the dessired ultimate system. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 842 706 11/6 20/11
BATTELLE MEMORIAL INST COLUMBUS OHIO DEFENSE METALS INFORMATION CENTER

Current Problems in Prevention of Fatigue. (U)

JUN 68 27P Grover,H. J. ;Mittenberge, A. A. ;
REPT. NO. DMIC-S-25
CONTRACT: F33615-68-C-1325

UNCLASSIFIED REPORT

DESCRIPTORS: (*METALS, FATIGUE(MECHANICS)), STATE-OF-THE-ART REVIEWS, TEST METHODS, CRACKS, PROPAGATION, MATERIALS, PROCESSING, FAILURE(MECHANICS), NONDESTRUCTIVE TESTING, DAMAGE, DETECTORS (U)

The Defense Metals Information Center conducted a brief survey of the present state of knowledge about fatigue with wide coverage to applications and with particular emphasis on means of early detection of fatigue damage. The survey has excluded consideration of reports of proprietary interest and of reports with security classification. However, it has included information from various branches of the U.S. Army, the U.S. Navy, the U.S. Air Force, and the National Aeronautics and Space Administration. The results of such considerations as have been possible are described in the following pages with the objectives of: (1) Delineating the current state of knowledge; (2) Indicating some of the current research toward increasing this knowledge; and (3) Pointing out areas where further work seems desirable. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 839 524 13/1 20/3
AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OHIO

THERMOELECTRIC AIR CONDITIONER PERFORMANCE INVESTIGATION, (U)

JUN 68 63P Herald,Richard H. ;
REPT. NO. AFAPL-TR-68-39
PROJ: AF-8174
TASK: 817411

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIR CONDITIONING EQUIPMENT, THERMOELECTRICITY), STATE-OF-THE-ART REVIEWS, PERFORMANCE(ENGINEERING), MILITARY REQUIREMENTS, HEAT EXCHANGERS, CIRCUITS, BLOWERS, POWER SUPPLIES, CONTROL SYSTEMS (U)
IDENTIFIERS: BISMUTH TELLURIDE, EVALUATION (U)

An experimental program directed towards establishing a firmer level of performance for state-of-the-art thermoelectric air conditioners is described. Experimental data showing typical performance characteristics of a 1800 BTU per hour thermoelectric air conditioner under varying environmental and system operating conditions is presented. On the basis of the experimental results and observations made during this investigation, it is concluded that a thermoelectric air conditioner unit can be a practical and advantageous means of meeting military air conditioning requirements under certain environmental and system operating conditions. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 832 042 1/3 20/11
LOCKHEED-GEORGIA CO MARIETTA MATERIALS SCIENCES LAB

THE APPLICABILITY OF A FRACTURE MECHANICS-NONDESTRUCTIVE TESTING DESIGN CRITERION. (U)

DESCRIPTIVE NOTE: Technical rept. 1 Jan-31 Dec 67,
MAY 68 286P Packman,Paul F. ;Pearson, Hugh S. ;Owens,John S. ;Marchese,Gloria B. ;
REPT. NO. LGR-ER-9106-4
CONTRACT: F33615-67-C-1180
PROJ: AF-7381
TASK: 738102
MONITOR: AFML TR-68-32

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRFRAMES, *NONDESTRUCTIVE TESTING), (*FRACTURE(MECHANICS), PREDICTIONS), COMPUTER PROGRAMS, CRACK PROPAGATION, ENDURANCE(PHYSIOLOGY), STATE-OF-THE-ART REVIEWS, CRACKS, DETECTION, LOADS(FORCES), X RAYS, PENETRATION, ULTRASONIC PROPERTIES, TEST METHODS, ACCURACY, DESIGN (U)
IDENTIFIERS: GRAPHS(CHARTS) (U)

This report describes the work conducted on a program designed to investigate the potential applicability of a combined fracture mechanics-nondestructive inspection procedure as a design approach for aircraft structures. The program consisted of three phases, conducted simultaneously: (1) a literature survey to determine if sufficient fracture toughness information exists to determine a statistically valid value of K1c; (2) a test program to determine the minimum size of a crack that can be detected by each of four NDT methods: X-ray, magnetic-particle, penetrant, and ultransonics; and (3) a test program to determine if fracture mechanics, when combined with flaw size as determined by NDT, can accurately predict the failure load of selected structures. (Author) (U)

AD- 829 418 8/5 20/6
ARMY ENGINEER TOPOGRAPHIC LABS FORT BELVOIR VA

FEASIBILITY STUDY FOR AN ALL-WEATHER SURVEYING SIGNAL LIGHT, (U)

FEB 68 58P Hawker,Mahlon C. ;
REPT. NO. USAETL-37-RR
PROJ: DA-1M6-23501-A-576
TASK: 1M6-23501-A-576-05

UNCLASSIFIED REPORT

DESCRIPTORS: (*SURVEYING(GEOGRAPHIC), SIGNAL LIGHTS), (*SIGNAL LIGHTS, STATE-OF-THE-ART REVIEWS), VISUAL SIGNALS, THEODOLITES, EYE, INTENSITY, RANGE(DISTANCE), WEATHER, LIGHT TRANSMISSION, COSTS, WEIGHT, RELIABILITY, LOGISTICS, INCANDESCENT LAMPS, XENON LAMPS, MERCURY LAMPS, LASERS, GENERATORS, FUEL CELLS, BATTERY COMPONENTS, ELECTRIC BATTERIES (U)

An investigation of the state-of-the-art in lightweight light sources and power sources and the general characteristics of atmospheric light transmission applicable to an improved all-weather surveying signal light. The report concludes that a more powerful light with a theoretical range increase of 50% is feasible but would require large, heavy, and expensive power supplies. The cost of the improved light system would be many times that of the present light and would most likely require more than one man to carry the complete system. The utility and overall efficiency of the present light source is considered to be very high by comparison. (Author) (U)

AD- 828 005 21/8.1
TRW SYSTEMS REDONDO BEACH CALIF POWER SYSTEMS DIV

SMALL DROPLET MEASURING TECHNIQUE. (U)

DESCRIPTIVE NOTE: Interim rept. on Phase 1, 1 May-30 Aug 67,
FEB 68 82P Matthews,Birch C. ;Wuerker, Ralph F. ;Harrje,David T. ;
REPT. NO. 4768.67-006
CONTRACT: F04611-67-C-0105
MONITOR: AFRPL TR-67-295

UNCLASSIFIED REPORT

DESCRIPTORS: (*LIQUID PROPELLANT ROCKET ENGINES, *FUEL INJECTION), INJECTORS, SPARK SHADOWGRAPH PHOTOGRAPHY, DROPS, DETECTION, ANALYSIS, LASERS, INTERFERENCE, COLD FLOW, FLUORESCENCE, SIMULATION, SPRAYS, BIBLIOGRAPHIES, STATE-OF-THE-ART REVIEWS, FLOW VISUALIZATION (U)
IDENTIFIERS: HOLOGRAPHY (U)

A study and experimental program is being conducted which involves the detection and analysis of size distributions of droplets associated with the injection process in liquid propellant rocket engines. Program objectives are to: (1) Determine, through a review of the literature, applicable methods of detecting and recording rocket injector droplet spray distributions; (2) Demonstrate feasibility of experimental techniques selected from the literature using cold flow propellant simulants; and, (3) Improve the methods of data reduction such that large quantities of droplet data may be reduced economically. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 827 985 19/4 8/7 20/11 18/3
NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL ENGINEERING RESEARCH FACILITY

DYNAMIC ROCK INSTRUMENTATION SURVEY. (U)

DESCRIPTIVE NOTE: Rept. for May-Aug 67,
FEB 68 47P Simmons,Kenneth B. ;
CONTRACT: F29601-68-C-0009, AF 29(601)-6002
PROJ: AF-5710
MONITOR: AFWL TR-68-3

UNCLASSIFIED REPORT

DESCRIPTORS: (*NUCLEAR EXPLOSIONS, ROCK), (*ROCK, STRESSES), SHOCK WAVES, MEASUREMENT, MOTION, STRAIN(MECHANICS), UNDERGROUND EXPLOSIONS, SIMULATION, STRAIN GAGES, MODULUS OF ELASTICITY, MODEL TESTS, STATE-OF-THE-ART REVIEWS, INSTRUMENTATION, TEST METHODS, TERRAIN, PRESSURE, DETECTORS, TRANSDUCERS (U)
IDENTIFIERS: *HIGH EXPLOSIVES SIMULATION TECHNIQUES, HOLES(OPENINGS) (U)

The problem of measuring stress, strain, and motion in a dynamically loaded rock environment is considered. A survey of the literature is made and extensions of previous work proposed. Methods are proposed for building new gages, fabricating rock samples, evaluating field gages in the laboratory, and placing the gages in the field. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 826 193 15/7 17/2.1 17/9 17/4
9/2 17/7 9/3
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

ELECTRONICS IN MILITARY SCIENCE, (U)

SEP 67 350P Jecmen,Jiri ;
REPT. NO. FTD-HT-66-477

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Trans. of mono. Elektronika ve Vojenstvi, Prague, 1964 298p.

DESCRIPTORS: (*ELECTRONIC WARFARE, CZECHOSLOVAKIA), (*ELECTRONICS, MILITARY REQUIREMENTS), GUIDED MISSILE COUNTERMEASURES, COMMUNICATION SYSTEMS, COMMUNICATION EQUIPMENT, RADAR, RADAR EQUIPMENT, ELECTRONIC COUNTERMEASURES, RADIO NAVIGATION, RADIO EQUIPMENT, COMPUTERS, GUIDANCE, GUIDED MISSILES, ELECTRONIC EQUIPMENT, POWER EQUIPMENT, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: TRANSLATIONS (U)

The aim of the book is to focus attention on the impact of electronics on military science, tactics and equipment, and to combine the accumulated information into one volume presenting the present state of the art of electronically supported warfare. The aim is to offer a sufficiently broad knowledge of problems in military electronics to serve as preparation for deeper study of special interest. Nine chapters compose the volume, headings are as follows: Communicat.ons techniques; Radar technique; Measures for jamming and locating radars; Radio navigation devices; Electronic computers; Missile guidance systems; Special-purpose electronic devices; Design and technology of the electronic devices; Power-source elements in electronic devices. Counter measures as well as capabilities are discussed under each appropriate topic. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 821 988 9/5 14/4
MARTIN CO ORLANDO FLA

DORMANT OPERATING AND STORAGE EFFECTS ON ELECTRONIC EQUIPMENT AND PART RELIABILITY. (U)

DESCRIPTIVE NOTE: Final rept. May 65-Mar 67,
JUL 67 172P Cottrell,D. F. ;Gagnier,T. R. ;Kimball,E. W. ;
REPT. NO. OR-8846
CONTRACT: AF 30(602)-3772
PROJ: AF-5519
TASK: 551902
MONITOR: IDEP 347.20.00.00-F9-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRONIC EQUIPMENT, *RELIABILITY(ELECTRONICS)), (*FAILURE(ELECTRONICS), STORAGE), LIFE EXPECTANCY, DATA, STANDARDS, GRAPHICS, STATISTICAL ANALYSIS, DESIGN, ENVIRONMENT, MATHEMATICAL MODELS, STRESSES, STATE-OF-THE-ART REVIEWS, CIRCUITS, MICROELECTRONICS (U)

A 22 month program has been conducted to determine the effects of dormant operating and storage conditions on electronic equipment and parts. An extensive data search has been made covering major aerospace industries, research institutes, and government agencies. Over 760 billion part-hours of dormant operating and storage information on various part classes have been collected from all sources. Of these data, approximately 76 billion part-hours are on military standard parts, 52 billion on selected military standard parts, 630 billion on high reliability parts, and 3 billion on microcircuits. These data have been processed and are presented in the form of storage or dormant operating failure rates by part type and subtypes for the various part classes. Failure rate charts have been constructed and partially validated for military standard and for high reliability part classes. Environmental effects of dormant operation and storage on the various part classes are discussed together with some factors relating them to each other whether in the dormant operating or storage mode. Test data from storage programs have been statistically analyzed to determine performance drift trends with nonoperating time. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 819 521 20/4
MASSACHUSETTS INST OF TECH CAMBRIDGE HYDRODYNAMICS LAB

CAVITATION NEAR SURFACES OF DISTRIBUTED ROUGHNESS. (U)

DESCRIPTIVE NOTE: Technical rept.,
JUN 67 150P Arndt,Roger E. A. ;Ippen, Arthur T. ;
REPT. NO. 104, R67-17
CONTRACT: DA-31-124-ARO(D)-189, DA-31-124-ARO(D)-410
PROJ: DA-20014501B33G, AROD-6024-E
MONITOR: AROD 6024:1-E

UNCLASSIFIED REPORT

DESCRIPTORS: (*TURBULENT BOUNDARY LAYER, *CAVITATION), (*SURFACE ROUGHNESS, CAVITATION), DIFFUSION, PROPAGATION, TURBULENCE, DISTRIBUTION, STABILITY, GROWTH(PHYSIOLOGY), INTERFACIAL TENSION, FRICTION, INTENSITY, SHEAR STRESSES, STATE-OF-THE-ART REVIEWS, THEORY, TEST FACILITIES, TEST METHODS, INSTRUMENTATION, WATER, FLOW FIELDS, REYNOLDS NUMBER (U)
IDENTIFIERS: SKIN(STRUCTURAL MEMBER), SURFACE FRICTION (U)

This investigation consists of an experimental study of cavitation inception and the associated bubble dynamics in turbulent boundary layers adjacent to surfaces roughened with two-dimensional triangular grooves. The project was initiated due to the apparent lack of published information on the effects of distributed roughness on cavitation inception as opposed to the effects of isolated irregularities. The experimental program covers the measurement of mean velocity profiles, turbulence intensity and the determination of the cavitation inception index for turbulent flow adjacent to both smooth and rough boundaries. In all cases the test liquid was water at room temperature. Four triangular roughness patterns were tested, consisting of roughness heights of 0.100, 0.050, 0.025, and 0.0125 inches, respectively. The maximum velocity was varied between the limits 16 to 51 feet per second. For the same conditions, cavitation flow was observed by high speed motion pictures. Data concerning bubble distribution, stability, (U)

AD- 818 940 14/2 9/5
GOODYEAR AEROSPACE CORP AKRON OHIO

SIMULATION IMAGE GENERATION. VOLUME II. STUDY OF TRANSPARENCY AND STYLIZED IMAGE TECHNIQUES; VIRTUAL IMAGE DISPLAY. (U)

DESCRIPTIVE NOTE: Final rept. 15 Sep 65-15 Jul 66, APR 67 91P Stoner,L. D. ;Keates,D. T. ;
REPT. NO. GER-12755
CONTRACT: AF 33(615)-2394
PROJ: AF-6114
TASK: 611405
MONITOR: AMRL TR-66-18-Vol-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-485 304L.

DESCRIPTORS: (*FLIGHT SIMULATORS, *TELEVISION DISPLAY SYSTEMS), STATE-OF-THE-ART REVIEWS, OPTICAL IMAGES, ELECTRONIC SCANNERS, TERRAIN, TELEVISION CAMERAS, CAMERA LENSES, CATHODE RAY TUBE SCREENS, PHOTOGRAPHY, OPTICAL SCANNING, DATA STORAGE SYSTEMS, IMAGE CONVERTERS, RESOLUTION, ELECTROOPTICS, ELECTRONIC EQUIPMENT, CLOSED CIRCUIT TELEVISION, FOCUSING, LOW ALTITUDE (U)
IDENTIFIERS: FLYING SPOT SCANNERS (U)

Phase II investigates depth of field, resolution, perspective, and shading as related to flying spot scanner (FSS) and stylized visual image generation. The study extended the definitions of FSS systems to include scanning pickups, with suitable light sources, conventional pictorial transparencies, and the coupling optics subsystem with analysis of problem areas and recommendations for improving the state of the art. An analysis was made of typical stylized image generation requirements from a viewer and equipment standpoint. This analysis leads to recommendations for improved languages and mechanics and for optimization of the system with respect to viewers characteristics. Reviewed in this study are equipment concepts and hardware and especially the need for video-data storage devices capable of operating in real time with ordinary and high-resolution TV equipment. (U)

AD- 818 906 21/5
NORTH CAROLINA STATE UNIV RALEIGH

TURBINE ENGINE CHECKOUT. (U)

DESCRIPTIVE NOTE: Final rept. 25 Aug 66-15 May 67, AUG 67 39P Barrett,Rolin F. ;Hart, Franklin D. ;Smetana,Frederick O. ;Hartsell, H. Craig ;
CONTRACT: AF 33(615)-5413
PROJ: AF-8119
TASK: 811925
MONITOR: AFAPL TR-67-88

UNCLASSIFIED REPORT

DESCRIPTORS: (*GAS TURBINES, *CHECKOUT EQUIPMENT), CHECKOUT PROCEDURES, MAINTAINABILITY, EFFECTIVENESS, OPERATION, COMBUSTION CHAMBERS, FLIGHT TESTING, AIRBORNE, AUTOMATIC, AUDITORY SIGNALS, COST EFFECTIVENESS, EXHAUST FAIRINGS, OIL FILTERS, SPECTROMETERS, MONITORS, DESIGN, TURBINE PARTS, COMPRESSOR PARTS, FAILURE(MECHANICS), DETECTION, THERMODYNAMICS, LUBRICATION, INSTRUMENTATION, BEARINGS, STATE-OF-THE-ART REVIEWS, VIBRATION, DIAGNOSTIC AGENTS, X RAYS, ACOUSTIC SIGNALS (U)

Various procedures currently employed for the assessment of aircraft turbine engine conditions are studied and analyzed. A new analyzer concept and the developments necessary for implementation are discussed. The major conclusions and methods discussed are that in order for turbine engines to be maintainable: (1) Engine design should include comprehensive means for analysis and easy access to the engine interior; (2) Economic efficiency demands engine operation to the point where maintenance service is required to prevent failure and performing only those services which are required; (3) No single concept or system currently being used is sufficient for complete engine diagnosis, but the correct incorporation of certain techniques and features of such systems may be used in concert to fulfill this need. Such a concept has been envisioned and discussed. (Author) (U)

AD- 816 434 9/3
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB

JOINT SERVICES ELECTRONICS PROGRAM. (U)

DESCRIPTIVE NOTE: Final rept. 16 Feb 66-15 Feb 67,
FEB 67 68P Angelakos,D. J. ;Whinnery,
J. R. ;
REPT. NO. ERL-67-5
CONTRACT: AF-AFOSR-139-66
PROJ: AF-4751

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRONICS, *BIBLIOGRAPHIES), STATE-OF-THE-ART REVIEWS, PLASMAS(PHYSICS), QUANTUM THEORY, WAVE PROPAGATION, PROPAGATION, ELECTRON MICROSCOPY, SOLID STATE PHYSICS, SYSTEMS ENGINEERING, COMPUTERS, SEMICONDUCTORS, BIONICS, BIOPHYSICS (U)

Contents: Bioelectronics; Plasmas; Quantum and Optical Electronics; Radiation and Propagation; Scanning Electron Microscopy; Semiconductor Electronics; Systems and Computer Sciences. (U)

AD- 816 533 9/2
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

THE BRITISH COMPUTER SCENE, PART IV, THE UNIVERSITIES. (U)

DESCRIPTIVE NOTE: Technical rept.,
JUN 67 55P Cowie,James ;Hemann,John W. ;Maycock,Paul D. ;
REPT. NO. ONRL-33-67

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Part 3, AD-814 890.

DESCRIPTORS: (*COMPUTERS, GREAT BRITAIN), UNIVERSITIES, UNITED STATES, COMPUTER PROGRAMS, INFORMATION RETRIEVAL, PROGRAMMING LANGUAGES, DATA PROCESSING, DATA STORAGE SYSTEMS, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: FORTRAN, MULTIPLE ACCESS SYSTEM (U)

A survey of the British computer scene was undertaken in late 1966 and early 1967. The authors acknowledge the encouragement of the Information Systems Branch, ONR. The purpose of the survey was to review the state of development of the British computer scene and to identify future trends. This report is fourth in a series. It describes the university efforts in computing science. Computer development, language development, computer tuition, and computer usage are covered. The first report in this series is the Government Impact on the Computer Scene' (ONRL-21-67); the second is 'The British Computer Industry' (ONRL-27-67); the third is 'The Regional and National Computer Centres' (ONRL-28-67). Other reports (Parts V and VI) will cover the management schools; computer interests and a summary of the series. (Author) (U)

AD- 815 891 5/3
BOEING CO SEATTLE WASH MISSILE AND INFORMATION SYSTEMS DIV

SURVEY OF MANUFACTURERS OF FILM CIRCUITRY INITIAL REPORT. (U)

DESCRIPTIVE NOTE: Technical rept.,
APR 67 312P Hughes,Victor C. ;
CONTRACT: N00163-67-C-0040
MONITOR: NAFI TR-1031

UNCLASSIFIED REPORT

DESCRIPTORS: (*FILMS, *INDUSTRIAL PRODUCTION), (*ELECTRICAL INDUSTRY, DIRECTORIES), (*CIRCUITS, STATE-OF-THE-ART REVIEWS), ELECTRONICS LABORATORIES (U)
IDENTIFIERS: *THICK FILM CIRCUITS, *THICK FILMS, THIN FILM ELECTRONICS, *THIN FILMS (U)

This document reports the findings of an extensive mail and personal-visit survey of organizations that are now producing prototype or production quantities of thin and thick film circuitry or that wish to produce it in the immediate future. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 813 462 20/14
ADVANCED TECHNOLOGY CORP TIMONIUM MD

IMPLICATIONS OF MILLIMETER WAVE RESEARCH AND TECHNOLOGY ON NAVAL PROBLEMS. (U)

DESCRIPTIVE NOTE: Semiannual rept.,
JAN 67 195P Cohn,Marvin ;Littlepage, Robert S. ;
CONTRACT: N00014-66-C-0166

UNCLASSIFIED REPORT

DESCRIPTORS: (*MILLIMETER WAVES, STATE-OF-THE-ART REVIEWS), RADIO RECEIVERS, ELECTRON TUBES, PROPAGATION, ANTENNAS, POWER EQUIPMENT, ANTENNA ARRAYS, PHASE SHIFT CIRCUITS, ELECTRIC FILTERS, COMMUNICATION AND RADIO SYSTEMS, RADAR, ATMOSPHERICS, CIRCUITS, SEMICONDUCTOR DEVICES, ATMOSPHERES, ATTENUATION, SCATTERING, METEOROLOGICAL PHENOMENA, ATMOSPHERE MODELS, PHASED ARRAYS, WAVEGUIDE CIRCULATORS, ELECTRONIC SWITCHES, RADAR RECEIVERS (U)

This technical report contains a survey and critical analysis of the existing and projected millimeter wavelength state-of-the-art. Specific areas treated include: propagation effects, antennas, components, power sources, and receiver techniques. Areas where further research and development would result in increased performance have been pointed out. (Author) (U)

AD- 811 679 20/4 14/2
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

STUDY OF HIGH-DENSITY HYPERVELOCITY FLOWS AND SIMILITUDES. (U)

DESCRIPTIVE NOTE: Interim technical rept. May 65-May 66,
APR 67 286P Wittliff,C. E. ;Sundaram, T. R. ;Rae,W. T. ;Lordi,J. A. ;
REPT. NO. CAL-AF-2081-A-1
CONTRACT: AF 40(600)-1131
PROJ: AF-5950
MONITOR: AEDC TR-67-72

UNCLASSIFIED REPORT

DESCRIPTORS: (*HYPERSONIC FLOW, TEST METHODS), (*REENTRY VEHICLES, HYPERSONIC CHARACTERISTICS), HYPERSONIC WIND TUNNELS, WIND TUNNEL MODELS, MODELS(SIMULATIONS), MODEL TESTS, SCALE, RELIABILITY, NOZZLE GAS FLOW, VISCOSITY, TURBULENCE, LAMINAR BOUNDARY LAYER, TURBULENT BOUNDARY LAYER, BLUNT BODIES, SLENDER BODIES, SHOCK WAVES, WEDGES, FLAT PLATE MODELS, CYLINDRICAL BODIES, CONICAL BODIES, ABLATION, CHEMICAL REACTIONS, STAGNATION POINT, MAGNETOHYDRODYNAMICS, NONEQUILIBRIUM FLOW, FROZEN EQUILIBRIUM FLOW, HIGH ALTITUDE, STATE-OF-THE-ART REVIEWS (U)

This report presents the results of a study of hypervelocity flows, with particular emphasis on the similitude requirements. A primary objective has been to delineate the similitude parameters for certain typical flows and, where possible, to evaluate the effects of not duplicating all of the similitude parameters in wind-tunnel tests. As a part of this study, a comprehensive review of inviscid and viscous similitude is given, as well as a state-of-the-art survey of flow solutions. It is shown that in many instances there do not exist, at present, sufficient experimental data or theoretical solutions to evaluate the sensitivity of various flow quantities to variations in the similitude parameters nor to determine whether some similitude parameters are less important than others. Such an evaluation has been accomplished for certain simple flows, such as wedges, cones, blunt-nosed flat plates and stagnation-region flows. (U)

AD- 807 400 9/2 22/2
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

SPACEBORNE SOFTWARE SYSTEMS STUDY. VOLUME IV: SURVEY OF SOFTWARE TECHNIQUES. (U)

DESCRIPTIVE NOTE: Final rept. Sep 65-Dec 66,
JAN 67 330P Hirschfield,Gerard A. ; Carey,Levi J. ;Tucker ,Alfred E. ;Ilger, Henry J. ;Shaw,Christopher J. ;
CONTRACT: AF 19(628)-5166
MONITOR: SSD TR-67-11-Vol-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-807 399L,

DESCRIPTORS: (*DIGITAL COMPUTERS, SPACEBORNE), (*PROGRAMMING LANGUAGES, SPACEBORNE), DATA STORAGE SYSTEMS, DATA PROCESSING, MANAGEMENT PLANNING AND CONTROL, LEAD TIME, STATE-OF-THE-ART REVIEWS, DESIGN, *DECISION MAKING*, *VALUE ENGINEERING*, *SYSTEMS ENGINEERING*, COMPUTER PROGRAMS, GUIDED MISSILE COMPUTERS, COMPUTERS, NAVIGATION COMPUTERS, GROUND SUPPORT EQUIPMENT (U)
IDENTIFIERS: SPL(SPACE PROGRAMMING LANGUAGE) (U)

This volume presents a collection of techniques applicable to general software development and in particular to spaceborne computer software. These techniques were selected for their utility in reducing development time and costs and increasing reliability and accuracy. After reviewing the information processing requirements of future space missions, a state-of-the-art survey was made of applicable software practices. References are included to indicate how to find techniques applicable to various mission elements. These techniques are grouped according to information processing functions performed by spaceborne and ground computers. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 807 399 9/2 22/2
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

SPACEBORNE SOFTWARE SYSTEMS STUDY. VOLUME III: RECOMMENDATION FOR A COMMON SPACE PROGRAMMING LANGUAGE. (U)

DESCRIPTIVE NOTE: Final rept. Sep 65-Dec 66, JAN 67 151P Hirschfield,Gerard A. ; Carey,Levi J. ;Tucker,Alfred E. ;Ilger, Henry J. ;Shaw,Christopher J. ;
CONTRACT: AF 19(628)-5166
MONITOR: SSD TR-67-11-Vol-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 4, AD-807 400

DESCRIPTORS: (*DIGITAL COMPUTERS, SPACEBORNE), (*PROGRAMMING LANGUAGES, SPACEBORNE), DESIGN, STATE-OF-THE-ART REVIEWS, COMPUTER PROGRAMS, MANAGEMENT PLANNING AND CONTROL, SPECIFICATIONS, SCHEDULING, DATA STORAGE SYSTEMS, DATA PROCESSING, PERFORMANCE(HUMAN), MANPOWER, GUIDED MISSILE COMPUTERS, COMPUTERS, NAVIGATION COMPUTERS (U)
IDENTIFIERS: JOVIAL, SPL(SPACE PROGRAMMING LANGUAGE) (U)

This volume of the Spaceborne Software Systems Study recommends a programming language for adoption as the common higher-order programming language for spaceborne software. The volume describes the benefits to be obtained from adopting a higher-order language and describes the reasons why the present time is appropriate for adoption of such a language. The spaceborne software application area is analyzed and reviewed including: programming personnel, hardware, production methods, and data processing functions. An evaluation of existing widely accepted languages is made and a description of the semantic capabilities of the recommended language and its subsets is included. A description of implementation considerations is also provided; this includes compiler capability requirements and a recommendation regarding compiler development techniques. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 807 398 9/2 22/2
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

SPACEBORNE SOFTWARE SYSTEMS STUDY. VOLUME II: SURVEY, ANALYSIS AND RECOMMENDATIONS. (U)

DESCRIPTIVE NOTE: Final rept. Sept 65-Dec 66, JAN 67 225P Hirschfield,Gerard A. ; Carey,Levi J. ;Tucker,Alfred A. ;Shaw, Christopher J. ;Ilger,Henry J. ;
CONTRACT: AF 19(628)-5166
MONITOR: SSD TR-67-11-Vol-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-807 399L.

DESCRIPTORS: (*DIGITAL COMPUTERS, SPACEBORNE), (*PROGRAMMING LANGUAGES, SPACEBORNE), DESIGN, STATE-OF-THE-ART REVIEWS, PROBLEM SOLVING, COMPUTER PROGRAMS, PROGRAMMING LANGUAGES, PERFORMANCE(HUMAN), MANPOWER, VALUE ENGINEERING, SPECIFICATIONS, LEAD TIME, MANAGEMENT PLANNING AND CONTROL, MANAGEMENT PLANNING AND CONTROL, GUIDED MISSILE COMPUTERS, NAVIGATION COMPUTERS, COMPUTERS (U)
IDENTIFIERS: SPL(SPACE PROGRAMMING LANGUAGE) (U)

This volume of the Spaceborne Software Systems Study final report presents the data and information collected from a state-of-the-art survey of spaceborne software systems. The data and information presented are analyzed in respect to current and future problem areas and conclusions are established in regard to both the technical and managerial aspects of spaceborne software development. Based upon the conclusions, recommendations are presented as guidelines for an advanced spaceborne software development program. (Author) (U)

AD- 804 956 9/1 9/5
EIMAC SAN CARLOS CALIF

STUDY AND INVESTIGATION LEADING TO THE DESIGN OF BROADBAND HIGH POWER KLYSTRON AMPLIFIERS. (U)

DESCRIPTIVE NOTE: Rept. no. 4(Final), 1 Mar-31 Aug 66,
NOV 66 88P Lien,Erling ;Robinson, Darrell ;
CONTRACT: DA-28-043-AMC-01362(E)
PROJ: DA-5624-11-905-04-78
MONITOR: ECOM 01362-F

UNCLASSIFIED REPORT

DESCRIPTORS: (*KLYSTRONS, *MICROWAVE AMPLIFIERS), POWER AMPLIFIERS, BROADBAND, DESIGN, STATE-OF-THE-ART REVIEWS, RESONATORS, IMPEDANCE MATCHING, RADIO SIGNALS, C BAND, GAIN, COMPUTERS, CAVITY RESONATORS, ANALYSIS, THEORY (U)
IDENTIFIERS: INTERACTION CIRCUITS (U)

The objective of this program has been to investigate rf interaction circuits and stagger-tuning techniques leading to at least a fifty percent improvement in the 1 db bandwidth of high-power klystrons over the current state-of-the-art. In this report, the findings of the final phase of this contract are presented. The major part of the effort during this final reporting period included: the completion of large-signal efficiency calculations across the band assuming a filter-loaded output resonator, the final theoretical design of the buncher section, theoretical stability calculations on the filter-loaded output resonator, and cold test measurements on a filter-loaded extended-interaction resonator. The measured interaction impedance obtained with the cold-test filter-loaded output resonator closely approximated the impedance assumed in the theoretical efficiency calculations. The final buncher section, designed with the aid of the small-signal computer program, yielded a nearly constant rf drive current to the output resonator, as was assumed in the large-signal efficiency calculations. The small-signal analysis indicated that conventional single-gap resonators are to be preferred over extended-interaction resonators in the klystron buncher section at the high power level considered in this study. (Author) (U)

AD- 804 840 14/5 9/2
XEROX CORP ROCHESTER N Y

SELECTIVE PHOTOCOPIER. (U)

DESCRIPTIVE NOTE: Final rept. Jan 65-Feb 66,
JUN 66 214P Sokolov,D. A. ;
CONTRACT: AF 30(602)-3413
PROJ: AF-5591
MONITOR: RADC TR-66-222

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA PROCESSING, *PHOTOGRAPHIC RECORDING SYSTEMS), PHOTOGRAPHIC DATA LINKS, DATA TRANSMISSION SYSTEMS, PHOTOGRAPHY, STATE-OF-THE-ART REVIEWS, DOCUMENTS, MASKING, HUMAN FACTORS ENGINEERING, OPTICAL EQUIPMENT, OPTICAL EQUIPMENT COMPONENTS, PERFORMANCE(ENGINEERING), BIBLIOGRAPHIES, MICROFILM, INPUT OUTPUT DEVICES. COMPUTERS (U)
IDENTIFIERS: PHOTOCOPYING (U)

The purpose of this effort was to determine the feasibility of developing a Selective Photocopier through a study and investigation of various aspects of document preparation and handling and by the construction of a breadboard model. The Photocopier is a preprocessing device which will separately record text and graphic information from hard copy intelligence containing both. This preprocessing function will provide hard copy intelligence in a form suitable for automatic machine coding and recomposition. The final report covers the study areas and various state-of-the-art techniques which lead to the design of the breadboard model of the Selective Photocopier. The construction and operational functions of the breadboard as well as recommendations for further development are included in the report. (Author) (U)

AD- 802 998 14/4 9/3
ARINC RESEARCH CORP ANNAPOLIS MD

AVIONICS RELIABILITY AND MAINTAINABILITY PREDICTION BY FUNCTION. (U)

DESCRIPTIVE NOTE: Final rept. Apr 64-Aug 66, OCT 66 186P Balaban,H. S. ;Harrison,G. T. ;Plotkin,R. H. ;Retterer,B. L. ;
REPT. NO. 317-02-2-647
CONTRACT: AF 30(602)-3387
PROJ: AF-5519
TASK: 551902
MONITOR: RADC TR-66-509

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRONIC EQUIPMENT, RELIABILITY(ELECTRONICS)), (*RELIABILITY(ELECTRONICS), *MATHEMATICAL PREDICTION), (*MAINTAINABILITY, MATHEMATICAL PREDICTION), AIRBORNE, FAILURE(ELECTRONICS), SYSTEMS ENGINEERING, NUMERICAL METHODS AND PROCEDURES, STATE-OF-THE-ART REVIEWS, FEASIBILITY STUDIES (U)

The report represents the results of a broad investigation that seeks to advance the state-of-the art of the data analysis techniques used to predict system reliability and maintainability. Principally, this study was directed toward development of a reliability prediction-by-function technique for avionic equipment and units. As a result of the large scale data collection and analysis program carried out during this study, a series of equations have been formulated which permits the prediction of mean-time-between-failures through a knowledge of selected performance parameters; these parameters represent quantities that are generally known early in the design cycle, enabling reliability predictions by function to be made long before parts population and stress data, the basis of existing prediction techniques, become available. Also, as a result of this study, the development of maintainability prediction-by-function techniques for avionic equipment was determined to be feasible. Predictions in terms of shop-mean-time-to-repair, based on general design characteristics, were shown to be achievable. The feasibility of drawing useful reliability design guidelines from engineering and data analysis also was established. (U)

AD- 800 137 21/9.1 21/2
DYNAMIC SCIENCE CORP MONROVIA CALIF

EFFECTS OF ADDITIVES ON THE COMBUSTION OF HYDRAZINE. (U)

DESCRIPTIVE NOTE: Quarterly rept. no. 1, 2 May-2 Aug 66, SEP 66 21P Breen,B. P. ;Lawver,B. R. ;
REPT. NO. SN-86-3-1
CONTRACT: AF 04(611)-11616
MONITOR: AFRPL TR-66-254

UNCLASSIFIED REPORT

DESCRIPTORS: (*HYDRAZINE, COMBUSTION), (*FUEL ADDITIVES, HYDRAZINE), HYPERGOLIC ROCKET PROPELLANTS, HYPERGOLIC IGNITION, IGNITION LAG, DROPS, FLAMES, AMMONIA, NITROGEN COMPOUNDS, DIOXIDES, HYDROGEN, SPECTROSCOPY, INSTRUMENTATION, STATE-OF-THE-ART REVIEWS (U)

This is the first quarterly report of a twelve month research program being conducted to study the effects of additives upon the combustion of single liquid hydrazine droplets. These effects will be related to rocket chamber combustion and to combustion instability. Phase I of this study was completed and is described in this report. This involved literature survey for potential additives and combustion test equipment buildup. Preliminary photographic and concentration experiments are being performed in order to more logically choose the additives to be studied in the remaining portion of this program. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 787 550 13/7
HARRY DIAMOND LABS WASHINGTON D C

Proceedings of the Fluidic State-of-the-Art Symposium Held at Naval Ordnance Lab., White Oak, Md. on 30 September-3 October, 1974. Volume V. (U)

74 518P
PROJ: HDL-302531

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 4, AD-787 549.

DESCRIPTORS: *Fluidics, *State of the art, *Meetings, Fluerics, Flueric devices, Fluid amplifiers, Fluidic control, Bistable devices, Vortices, Coanda effect (U)
IDENTIFIERS: *Proportional amplifiers, *Flow attachment (U)

Contents: Fluidics fabrication; fluidic products; fluidic industrial process applications; fluidic cooling controls; hydraulic control systems; fluidic fuel controls; fluidic ejection seat control; fluidic brake control; fluidic anti-skid systems; fluidic bag manufacturing control; fluidic military applications; fluidic oil-water separator; fluidic bistable actuator; fluidic missile control valve; and flow control circuits. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 787 549 13/7
HARRY DIAMOND LABS WASHINGTON D C

Proceedings of the Fluidic State-of-the-Art Symposium Held at Naval Ordnance Lab., White Oak, Md. on 30 September-3 October, 1974. Volume IV. (U)

74 391P
PROJ: HDL-302531

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 5, AD-787 550.

DESCRIPTORS: *Fluidics, *State of the art, *Meetings, Fluerics, Flueric devices, Fluid amplifiers, Fluidic control, Bistable devices, Vortices, Coanda effect (U)
IDENTIFIERS: *Proportional amplifiers, *Flow attachment (U)

Contents: Computer aided fluidic circuit design; fluidic compensation networks; fluidic multiplier; fluidic impedance measurement; fluidic interconnections; pneumatic transmission lines; Sixth Cranfield Fluidics Conference; and fluidics stabilization contamination effects on fluidic devices. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 787 548 13/7
HARRY DIAMOND LABS WASHINGTON D C

Proceedings of the Fluidic State-of-the-Art Symposium Held at Naval Ordnance Lab., White Oak, Md. on 30 September-3 October, 1974. Volume III. (U)

74 485P
PROJ: HDL-302531

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 4, AD-787 549.

DESCRIPTORS: *Fluidics, *State of the art, *Meetings, Fluerics, Flueric devices, Fluid amplifiers, Fluidic control, Bistable devices, Vortices, Coanda effect (U)
IDENTIFIERS: *Proportional amplifiers, *Flow attachment (U)

Contents: Digital fluidic components; digital fluidic systems; digital analog hybrid fluidic system; regenerative process fluidic switching circuits; fluid logic networks; fluidic threshold logic; state diagram synthesis of sequential feedback control circuits; signal analysis of fluidic networks; flueric controller, fluidic carrier techniques; fluidic notch filters; analog fluidic circuits; and low power hydraulic control components. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 787 547 13/7
HARRY DIAMOND LABS WASHINGTON D C

Proceedings of the Fluidic State-of-the-Art Symposium Held at Naval Ordnance Lab., White Oak, Md. on 30 September-3 October, 1974. Volume II. (U)

74 642P
PROJ: HDL-302531

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-787 548.

DESCRIPTORS: *Fluidics, *State of the art, *Meetings, Fluerics, Flueric devices, Fluid amplifiers, Fluidic control, Bistable devices, Vortices, Coanda effect (U)
IDENTIFIERS: *Proportional amplifiers, *Flow attachment (U)

Contents: Fluidics; fluerics; miniature fluid amplifier; bistable fluid amplifier; laminar flip-flop; moving part fluidic devices; fluidic pressure-flow interface; fluidic sensors; fluidic acoustic sensor; vortex rate sensor; laminar jet rate sensor; fluidic G sensor; pneumatic rate/acceleration sensor; fluidic non-contact gaging; rotational speed control; fluid amplifier scaling; heat and mass transfer in fluidic circuits; thrust of free and submerged jets; particles in fluidic devices; and supersonic boundary layer. (U)

AD- 787 546 13/7
HARRY DIAMOND LABS WASHINGTON D C

Proceedings of the Fluidic State-of-the-Art Symposium Held at Naval Ordnance Lab., White Oak, Md. on 30 September-3 October, 1974. Volume I. (U)

DESCRIPTIVE NOTE: Technical rept., 74 605P
PROJ: HDL-302531

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-787 547.

DESCRIPTORS: *Fluidics, *State of the art, *Meetings, Fluerics, Flueric devices, Fluid amplifiers, Fluidic control, Bistable devices, Vortices, Coanda effect (U)
IDENTIFIERS: *Proportional amplifiers, *Flow attachment (U)

Contents: Fluerics; fluidics; vortex diode; vortex triode; turbulence amplifier; laminar proportional amplifier; wall-attachment fluid amplifiers; and bistable fluidic amplifiers. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 785 551 13/13 9/2
ARMY CONSTRUCTION ENGINEERING RESEARCH LAB CHAMPAIGN ILL

An Evaluation of Computer-Aided Architectural Systems. (U)

DESCRIPTIVE NOTE: Interim rept., AUG 74 37P Dains,R. B. ;Kelley,K. C. ;
REPT. NO. CERL-IR-D-31
PROJ: DA-4-A-062103-A-891
TASK: 4-A-062103-A-89106

UNCLASSIFIED REPORT

DESCRIPTORS: *Computer applications, *Architecture, State of the art, Allocations, Questionnaires (U)
IDENTIFIERS: *Computer aided design, *Structural design, Evaluation (U)

This report outlines the state-of-the-art in computer-aided design, suggests a number of possible uses of computers to solve Corps design problems, and makes recommendations for the direction of future work. (Modified author abstract) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 784 944 1/3 14/2
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

AGARD Flight Test Instrumentation Series. Volume 6. Open and Closed Loop Accelerometers. (U)

JUL 74 46P McLaren,I. ;
REPT. NO. AGARD-ograph-160-Vol-6

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 4, AD-771 192. NATO furnished.

DESCRIPTORS: *Aircraft, *Flight testing, *Accelerometers, Instrumentation, Open loop systems, Closed loop systems, Transducers, Calibration, State of the art (U)

The report provides a balanced up-to-date presentation of the state-of-the-art of both open and closed loop accelerometers used for aircraft flight test work, covering system and component analysis and basic hardware design. Both physical design problems and mathematical analysis are covered and special emphasis is put on those aspects likely to be relevant to aircraft flight test work. Performance details includes repeatability, compensation for temperature variation, insusceptibility to cross effects, stability under vibration and frequency response. The application of accelerometers in several flight test techniques together with their performance requirements are reviewed in order to guide the flight test engineer in making his choice of instrument in any particular case. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 781 651 21/5
NAVAL AIR PROPULSION TEST CENTER TRENTON N J PROPULSION TECHNOLOGY AND PROJECT ENGINEERING DEPT

State-of-the-Art Review - Small Gas Turbine Engine Technology. (U)

DESCRIPTIVE NOTE: Final technical rept., JUN 74 199P Benham,Robert B. ;
REPT. NO. NAPTC-PE-35
PROJ: A330-5360/218-B/2F004-32-30-8

UNCLASSIFIED REPORT

DESCRIPTORS: *Gas turbines, *State of the art, Fabrication, Turbine parts, Scaling factors, Performance(Engineering), Cost analysis, Fuel consumption (U)
IDENTIFIERS: *Small gas turbines (U)

The report looks at the spectrum of Navy missions and determines the major applicable performance or cost parameters. The competitiveness in each parameter is examined for three types of small engines -- the reciprocating (both Otto and Diesel cycles), the rotary-combustion and the gas turbine. A discussion on the impact of military programs - ATEGG, STEP, STAGG, SCAD, HARPOON, ETE, and RPV - on the small turbine engine evolutionary cycle is provided. It is found that evolution will proceed along each of two separate lines (1) maximum performance and (2) minimum specific cost. It is determined that the gas turbine engine suffers from size effects which render the 5 lb/sec air-flow engine inferior in every parameter to the 30 lb/sec engine. The effects of scaling on the performance of the major components - compressor, turbine, combustor, bearings, seals, and controls, is examined. Techniques for cost reduction are considered. Programs for upgrading component performance and lowering fabrication costs are proposed. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 781 138 8/5
INFORMATICS INC ROCKVILLE MD

Soviet Satellite Geodesy. Basis and Status of Soviet Laser Geodesy and Long-Base Line Interferometry. (U)

DESCRIPTIVE NOTE: Interim rept.,
MAY 74 262P Hibben,Stuart G. ;Rowell, Eleanor M. ;
CONTRACT: F44620-72-C-0053
PROJ: ARPA Order-1622
MONITOR: AFOSR TR-74-0962

UNCLASSIFIED REPORT

DESCRIPTORS: *Geodesy, *USSR, State of the art, Geodetic satellites, Satellite tracking systems, Triangulation, Instrumentation, Cameras, Range finding, Lasers, Radio interferometers, Frequency standards (U)
IDENTIFIERS: Laser range finders, Long baseline radio interferometry (U)

The report is a survey of Soviet developments in satellite geodesy, presented in the following sections: survey of Soviet literature; observation and tracking stations; space triangulation networks; cameras used for satellite geodesy; laser geodesy; and long-baseline interferometry. Four appendices are included. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 781 114 9/5
POLYTECHNIC INST OF NEW YORK BROOKLYN

Generation of Ultra-High Power Electrical Pulses. (U)

DESCRIPTIVE NOTE: Final rept. 1 Dec 72-30 Nov 73,
MAY 74 86P Birenbaum,L. ;Levi,E. ;
CONTRACT: F30602-73-C-0053
PROJ: AF-4506
TASK: 450603
MONITOR: RADC TR-74-119

UNCLASSIFIED REPORT

DESCRIPTORS: *Pulse generators, *Radiofrequency generators, High power, Video signals, Microwave equipment, Generators, Radiofrequency power, Reviews, State of the art, Energy conversion, Superconductivity, Plasmas(Physics) (U)

The report is a comprehensive assessment of the state-of-the-art of various energy conversion techniques involving high power electrical pulse generation. The subjects treated include rotating machines, explosive devices, superconductivity, switching, and plasma techniques, including the supercritical temperature and pressure regions. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 780 712 20/14 17/2.1
ARMY COMMUNICATIONS COMMAND FORT HUACHUCA ARIZ ADVANCED CONCEPTS OFFICE

Workshop on Radio Systems in Forested and/or Vegetated Environments. (U)

DESCRIPTIVE NOTE: Technical rept.,
FEB 74 313P Wait,J. R. ;Ott,R. H. ;
Telfer,T. ;
REPT. NO. ACC-ACO-1-74

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Summaries of 20 Technical Papers and 4 Working Group Reports presented at subject Workshop held at Fort Huachuca, Ariz., on 6-9 Nov 73.

DESCRIPTORS: *Electromagnetic wave propagation, *Radio transmission, *Meetings, Reviews, State of the art, Jungles, Forests, Environments, Radar, Losses, Propagation, Spectra, Utilization, Electrical properties, Vegetation, Southeast Asia, Computerized simulation (U)
IDENTIFIERS: SEACORE Project (U)

The purpose of the Workshop was to review the state-of-the-art in the theory of operation and design of radio systems for which the air/earth interface becomes a controlling factor. Each of the twenty technical papers are presented in summary, with the name of the author, his affiliation and address for each. The papers are principally devoted to radio and radar propagation in jungles and forests, path loss predictions, electrical characteristics of the forest and earth media, and lateral wave applications. The Working Group reports cover: (1) Application of Antenna and Propagation Theory; (2) Spectrum Usage Below 300 MHz (including UHF Radio 225-400 MHz, but exclusive of radar); (3) Spectrum Usage above 300 MHz (including radar above 30 MHz, but exclusive of UHF radio 225-400 MHz); and, (4) Environmental Descriptions (in relation to propagation and system performance modeling). Appendices provide names and addresses of all attendees, and a bibliographic summary of reports and articles from Project SEACORE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 780 688 5/9
HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA VA

Simulation and Aircrew Training and Performance. (U)

DESCRIPTIVE NOTE: Professional paper,
APR 74 15P Prophet,Wallace W. ;Caro, Paul W. ;
REPT. NO. HumRRO-PP-4-74

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at OCRD Conference, Fort Rucker, Ala., Nov. 73.

DESCRIPTORS: *Flight crews, *Training devices, Army personnel, Flight simulators, Cost effectiveness, Aeronautics, Training, State of the art, Reviews (U)

The paper outlines some major areas of use of simulation in Army Aviation and comments on current research. Equipment development, crew performance studies, concept development and training are discussed. Only in the training area has the Army made substantial progress. A broad program of simulation research with emphasis on engineering and behavior is suggested toward the goal of improving aircrew performance. There are significant simulation research problems unique to the Army which need to be worked out. (Author) (U)

AD- 780 440 11/2 21/5
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER ANNAPOLIS MD

Ceramics for Gas Turbine Applications (A State-of-the-Art Survey), (U)

74 37P Dapkunas,S. J. ;
REP NSRDC-4199, NSRDC-28-769
PR 22

UNCLASSIFIED REPORT

DESCRIPTORS: *Ceramic materials, Gas turbines, Reviews, State of the art, Silicon nitrides, Silicon carbides, Hot pressing, Mechanical properties, Rupture, Thermal shock, Impact strength, Tensile properties, Stresses, Creep, Fatigue(Mechanics), Oxidation, Corrosion, Heat (U)

Silicon nitride and silicon carbide are shown to be the ceramics having the most promise, with major efforts currently under way to develop these materials for use in the near future. Mechanical properties and data on oxidation and hot corrosion have been compiled and presented for comparison with those of currently available superalloys. These comparisons show hot-pressed ceramics to have strength and environmental resistance superior to nickel- and cobalt-base superalloys at elevated temperatures but lacking in impact strength. Reaction-sintered silicon nitride is shown to be a low-strength material. Hot-pressed silicon nitride and silicon carbide are expected to find application in situations where strength and reliability rather than cost are determining factors, whereas reaction-sintered silicon nitride offers distinct advantages when low cost achieved through mass production is of great importance for lower stress applications. (Modified author abstract) (U)

AD- 778 207 19/1 13/8
RESEARCH TRIANGLE INST DURHAM N C

Characteristics of Non-Military Explosives. (U)

DESCRIPTIVE NOTE: Final rept.,
FEB 74 81P Liepens,R. ;Handy,R. W. ;
Harrison,J. W. ;
CONTRACT: DAAK02-73-C-0128

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Naval Explosive Ordnance Disposal Facility.

DESCRIPTORS: *Technology, *State of the art, *Explosives, Reviews, Manufacturing, Bombs, Chemical composition, Detection, Vapors, Covert operations (U)
IDENTIFIERS: *Homemade bombs (U)

The report describes the composition of commercial explosives and explosive materials used for clandestine bomb fabrication. (U)

AD- 777 542 9/2
EUROPEAN RESEARCH OFFICE LONDON (ENGLAND)

Hybrid Computer Technology in Europe. A State of the Art Survey. (U)

DESCRIPTIVE NOTE: Technical rept.,
FEB 74 63P Enslow,Philip H. , Jr;
REPT. NO. ERO-1-74

UNCLASSIFIED REPORT

DESCRIPTORS: *Hybrid computers, *Europe, *State of the art, Analog computers, Digital computers, Digital differential analyzers, Manufacturing, Universities, Great Britain (U)

A survey of the state-of-the-art of hybrid (analog-digital) computer technology in Europe was made with the specific objective of identifying and evaluating projects, either in progress or completed, that were advancing the hardware, software, or application technologies. Over 50 people were interviewed by telephone and several installations were visited. Projects of significant importance were found covering the subjects of automatic patching, all-digital systems (e.g., digital differential analyzer), compilers supporting the full hybrid system, interactive hybrid computing, applicability of hybrid solutions and their cost effectiveness, and advanced applications. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 777 046 13/2
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

Trenching on Shore and In the Ocean in Arctic Regions: State-of-the-Art Survey. (U)

DESCRIPTIVE NOTE: Technical note,
MAR 74 54P Hironaka,M. C. ;
REPT. NO. NCEL-TN-1335

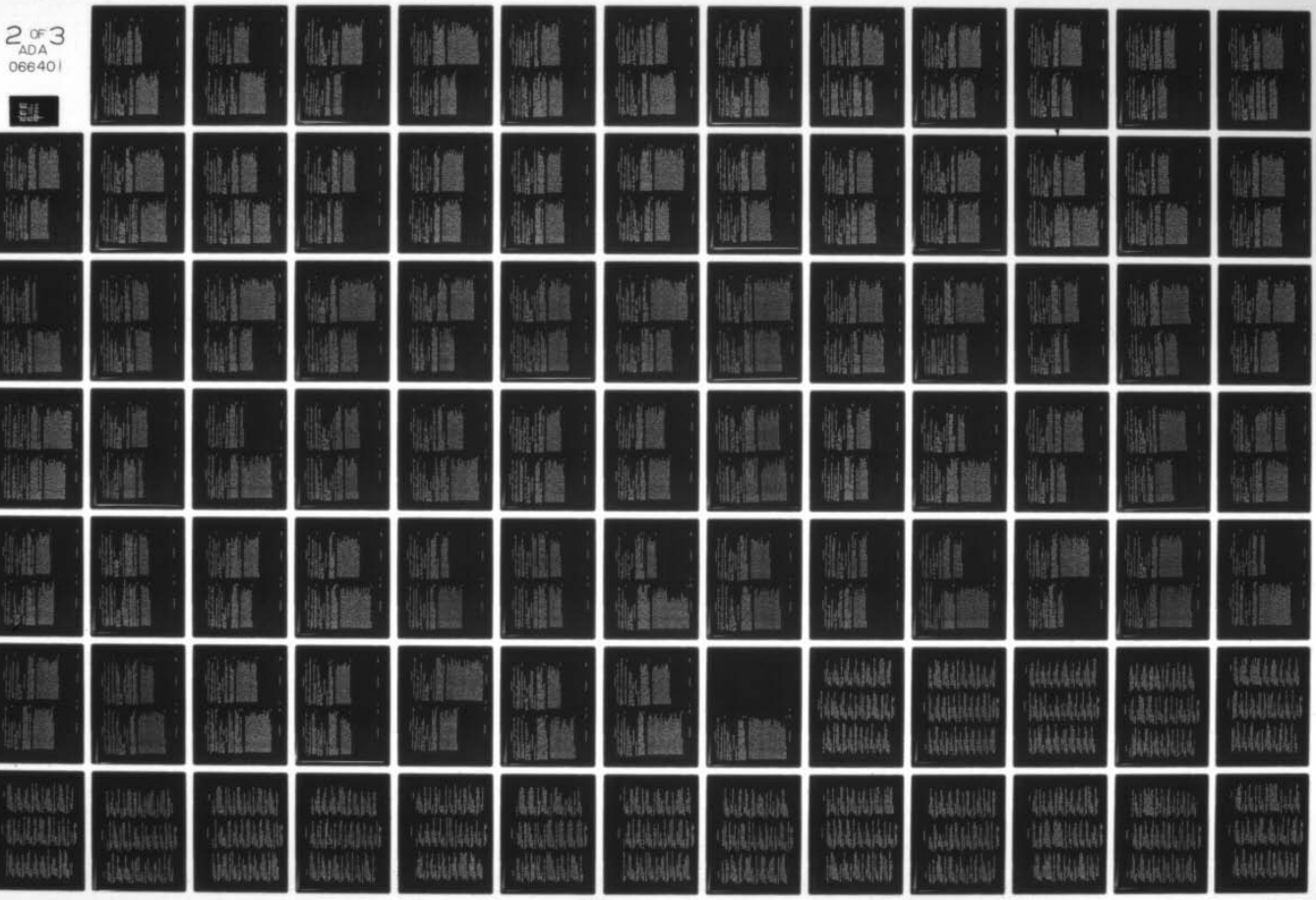
UNCLASSIFIED REPORT

DESCRIPTORS: *Trenching, *Arctic regions, *State of the art, Underground, Underwater, Cables, Pipelines (U)

The objective of this study was to identify present techniques, procedures, and equipment that could be used for developing trenches for cables and pipelines in sea-to-shore installations in arctic regions. In pursuing this objective, a literature search was performed. The results of that effort are reported herein. Factors influencing polar trenching operations include: (1) materials to be trenched, (2) properties of permafrost and frozen ground, (3) depth to permafrost or frozen ground, (4) seafloor ice scoring, (5) oceanographic factors, and (6) seasonal effects. For sea-to-shore cable and pipeline installations, present trenching methods have some limitations; thus, it is recommended that a trenching device capable of operating on land, through the surf zone, and in deep water be developed to trench through all material including rock and which uses high pressure water jetting, normal water jetting, and suction dredging techniques. (Modified author abstract) (U)

AD-A066 401 DEFENSE DOCUMENTATION CENTER ALEXANDRIA VA F/G 5/2
STATE OF THE ART REVIEWS.(U)
MAR 79
UNCLASSIFIED DDC/BIB-79/01 NL

2 OF 3
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AD- 776 776 5/9
HUGHES AIRCRAFT CO CULVER CITY CALIF

A Survey of the Present State-of-the-Art In Learning Center Operations. (U)

DESCRIPTIVE NOTE: Final rept.,
FEB 74 115P Sullivan,Dennis J. ;Smith, Edgar A. ;Filinger,Ronald H. ;
CONTRACT: F4:609-72-C-0033
PROJ: AF-1121
TASK: 1121011
MONITOR: AFHRL TR-74-11

UNCLASSIFIED REPORT

DESCRIPTORS: *Learning, *Facilities, Training, Education, Individualized training, Automation, Assessment, State of the art, Surveys (U)

The report summarizes a survey of selected military, industrial, government, and academic learning centers. Documentation of 28 learning center programs is recorded and illustrated. This documentation includes primary characteristics and a description of operational procedures and experience at the learning centers. Learning centers deemed effective were (1) designed to meet a clearly defined and existing instructional need (and typically included student performance requirements), (2) administered under a unified control of courseware content and production quality, and (3) largely developed and produced their own courseware to meet their specific needs. In general, student time savings and increased training effectiveness were reported. Learning centers can provide cost-effective instruction. (Author) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 776 642 5/2
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

Semi Automatic Indexing - State of the Art. (U)

DESCRIPTIVE NOTE: AGARDograph rept.,
FEB 74 26P Fangmeyer,H. ;
REPT. NO. AGARD-AG-179

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO furnished.

DESCRIPTORS: *Subject indexing, Automation, Information processing, Computer applications, Man machine systems, State of the art, Reviews (U)
IDENTIFIERS: Automatic indexing (U)

;Contents: Semi-automatic indexing techniques; Primary or internal index production (derivative indexing); Secondary index production (assignment indexing); Production and maintenance of indexing aids. (U)

AD- 776 261 4/2
GEOMET INC ROCKVILLE MD

Present Capabilities to Modify Warm Fog and Stratus. (U)

DESCRIPTIVE NOTE: Technical rept.,
JAN 74 109P Moschandreas,Demetrios J. ;
REPT. NO. GEOMET-EF-300
CONTRACT: N00014-71-C-0271
PROJ: NR-082-275

UNCLASSIFIED REPORT

DESCRIPTORS: *Fog, *Weather modification, *State of the art, Cloud seeding, Stratus clouds, Wake, Heating, Computerized simulation, Instrumentation (U)
IDENTIFIERS: *Fog dispersal (U)

Numerical model simulations, chamber tests, and field experiments are the three scientific approaches used to investigate the modification of warm fog and stratus. This study is an in-depth review of the literature on warm fog dissipation; both theoretical and experimental projects are reviewed and critical comments are made on the reported claims. Most all the projects on warm fog modification are summarized in various tables while a few are analyzed in a more detailed fashion. Special emphasis is put on the sponsoring agencies; the goals, objectives, and the amounts allocated by the various research sponsoring organizations are also reviewed. The need for greater statistical analysis in evaluating the results of field experiments is noted. Among the numerous techniques used to improve visibility, two are proposed as the most promising: the thermal dissipation of warm fog and stratus, and the combination of the seeding and helicopter techniques. (Modified author abstract) (U)

AD- 775 227 6/5
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

British Medical Research Council's Report 1972-1973, (U)

NOV 73 33P Frisch,Arthur W. ;
REPT. NO. ONRL-R-28-73

UNCLASSIFIED REPORT

DESCRIPTORS: *Great Britain, *Medical research, State of the art, Finance (U)
IDENTIFIERS: Grants (U)

The report provides an overview of some of the ongoing investigative activities in the United Kingdom. The total expenditure of Medical Research Council for 1971-72 was roughly 62.5 million dollars; this amount was increased to around 71 million during 1972-73. About half of the support was given in 5 of 16 disease categories which include infective and parasitic diseases (25), neoplasma (21), endocrine, nutritional and metabolic (18), mental disorders (21) and diseases of the nervous system and sense organs (24). (U)

AD- 775 226 9/5
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

Conference on 'Hybrid Microelectronics'. (U)

DESCRIPTIVE NOTE: Conference rept.,
NOV 73 17P Enslow,P. H. ;Waynick,
Arthur H. ;
REPT. NO. ONRL-C-25-73

UNCLASSIFIED REPORT

DESCRIPTORS: *Microelectronics, *Hybrid circuits, Microminiaturization, State of the art, Reviews, Technology, Thick films, Conferences, Great Britain (U)

A 'state of the art' survey of thick film and thin film hybrid circuits. Combinations of descrete and deposited components, was the subject matter of the conference covered in the report. All facets of the technology are dealt with and specifically related to other forms of electronic assemblies. (Author) (U)

AD- 774 919 5/9
NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER SAN DIEGO CALIF

Survey of Unit Performance Effectiveness Measures. (U)

DESCRIPTIVE NOTE: Preliminary rept. Jan-Jun 73,
JAN 74 37P Larson,Orvin A. ;Sander,
Stephen I. ;Steinemann,John H. ;
REPT. NO. NPRDC-TR-74-11
PROJ: PF55.522
TASK: PF55.522.105

UNCLASSIFIED REPORT

DESCRIPTORS: *Marine Corps personnel, *Combat readiness, *Military training, *Performance(Human), Efficiency, Assessment, State of the art, Reviews, Decision making, Military research (U)

Improved measures of performance effectiveness are required by the Marine Corps for its combat unit training program in order to ensure the maintenance of appropriate levels of unit readiness in accordance with its assigned mission. A survey to determine the state-of-the-art of performance assessment systems and methodologies was conducted as an initial research phase in support of this requirement. A two-fold effort was made to review the research literature in performance evaluation, decision making, and unit training, and to gather first-hand information about existing performance assessment systems. A broad informational survey provides a number of alternative theoretical and practical methodologies which may serve as feasible approaches in ensuing research. (Author) (U)

AD- 774 188 13/6 14/2
ARMY MATERIALS AND MECHANICS RESEARCH CENTER WATERTOWN MASS

The State of the Art of Nondestructive Testing of Tires. (U)

DESCRIPTIVE NOTE: Final rept.,
OCT 73 37P Vogel,Paul E. J. ;
REPT. NO. AMMRC-PTR-73-9

UNCLASSIFIED REPORT

DESCRIPTORS: *Tires, *Nondestructive testing, State of the art, Infrared detection, Halography, Ultrasonic tests, X rays, Eddy currents (U)

The work was performed to provide a source of information on all known methods of nondestructive testing of tires. The report reflects the results of a tire testing survey which has been conducted over the past year. It represents an extensive literature search, visits to Army, Navy, Air Force, Department of Transportation installations, and to the National Bureau of Standards; to three major high performance tire rebuilders; ten tire test equipment manufacturers; three major test tracks; and 22 manufacturers of new tires. (Modified author abstract) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 767 327 9/2 1/3
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

All Application Digital Computer: Course Notes. (U)

DESCRIPTIVE NOTE: Technical rept. 1972-1973,
MAR 73 420P Syms,Gordon H. ;
REPT. NO. NPS-53ZZ73031A

UNCLASSIFIED REPORT

DESCRIPTORS: (*COMPUTERS, NAVAL AIRCRAFT), STATE-OF-THE-ART REVIEWS, DIGITAL COMPUTERS, THIN FILM STORAGE DEVICES, PROGRAMMING LANGUAGES, COMPUTER PROGRAMMING, DESIGN, REAL TIME, TIME SHARING, SYMPOSIA (U)
IDENTIFIERS: MAGNETIC FILM MEMORIES, MODULAR COMPUTERS, MULTIPROCESSING, AIRBORNE COMPUTERS, AVIONICS, BLOCK ORIENTED RANDOM ACCESS MEMORIES, BORAM(BLOCK ORIENTED RANDOM ACCESS MEMORIES), RANDOM ACCESS COMPUTER STORAGE (U)

The report is a set of course notes, or text, on the proposed Navy All Application Digital Computer. The AADC, as it is called, is a programmer-oriented, general purpose, modular digital computer that was originally designed to meet all the 1975-1985 Naval airborne data processing requirements, but it has now had its role generalized to include 'All Applications.' Since the AADC combines many of the most advanced computer hardware concepts now under development in the United States, the study of AADC should be of general interest. The all application role includes real-time and time-sharing computations, and special applications such as line concentrators, super modems, data channels and aircraft electric power controllers. This report includes a chapter on each of the following: a general introduction and summary of all chapters, AADC architectures, all application role, hardware technology, Data Processor Element, Master Executive Control, Signal Processing Element, evaluating AADC developments, High Order Language, and AADC applications. (Modified author abstract) (U)

AD- 766 974 9/2
STANFORD RESEARCH INST MENLO PARK CALIF

A Study of Fault-Tolerant Computing. (U)

DESCRIPTIVE NOTE: Final rept. 12 Jan 72-15 May 73,
JUL 73 228P Neumann,Peter G. ;Goldberg,
Jack ;Levitt,Karl N. ;Wensley,John H. ;
CONTRACT: N00014-72-C-0254, ARPA Order-1998
PROJ: SRI-1693

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA PROCESSING, MAINTENANCE),
(*COMPUTERS, RELIABILITY(ELECTRONICS)), REAL TIME,
MULTIPLE OPERATION, LOGIC CIRCUITS,
FAILURE(ELECTRONICS), FAILURE, COST EFFECTIVENESS,
REDUNDANT COMPONENTS, DESIGN, STATE-OF-THE-ART REVIEWS,
DATA STORAGE SYSTEMS (U)
IDENTIFIERS: LARGE SCALE INTEGRATED CIRCUITS,
COMPUTERS, MULTIPLE OPERATION, ARITHMETIC AND LOGIC
UNITS, VIRTUAL MEMORIES, COMPUTER SELF MAINTENANCE,
*FAULT TOLERANT COMPUTING, FAULT DETECTION (U)

The report presents the results of a study of fault-tolerant computing. Existing and new architectural techniques are evaluated for use in cost-effective systems attaining desired measures of correctness, availability and recovery. Various architectures and applications are considered. Appendices contain a brief census of 35 fault-tolerant systems, and a concise survey of 17 representative systems, as well as detailed results on reliable memories and arithmetic. (Author) (U)

AD- 764 651 9/1 1/3
BATTELLE COLUMBUS LABS OHIO TACTEC

Lightning Protection Measures for Low-
Altitude Tethered Balloon Systems. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAY 73 91P Eggers,P. E. ;Brown,J.
B. , Jr.;Ollila,R. G. ;
REPT. NO. A-4038(LP)
CONTRACT: DAAH01-72-C-0982, ARPA Order-2209

UNCLASSIFIED REPORT

DESCRIPTORS: (*LIGHTNING ARRESTERS, *BALLOONS),
GROUND(ELECTRICAL), LASERS, PROTECTION, STATE-OF-THE-ART
REVIEWS (U)

The findings of a comprehensive review of information relating to state-of-the-art techniques for atmospheric electrical protection are reported for both ground-based (tall buildings, towers, power transmission lines) and airborne (aircraft, rockets) systems. An assessment has been made as to the applicability of this information to the protection of tethered balloons. Candidate techniques for the atmospheric electrical protection of balloons with conducting and nonconducting tethers are discussed. In addition, the results of investigative studies of the technical feasibility of air-ionization techniques for lightning protection are discussed. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 764 357 10/2
AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OHIO

Lithium-Doped Silicon Solar Cells State-of-the-Art. (U)

DESCRIPTIVE NOTE: Technical rept. Apr-Oct 72,
JUN 73 42P Green,John M. ;
REPT. NO. AFAPL-TR-73-4
PROJ: AF-3145
TASK: 314519

UNCLASSIFIED REPORT

DESCRIPTORS: (*SOLAR CELLS, STATE-OF-THE-ART REVIEWS), SILICON, LITHIUM, DOPING, ENERGY CONVERSION, DAMAGE, RADIATION EFFECTS, INHIBITION, SPACECRAFT COMPONENTS, SPACE ENVIRONMENTS (U)

The present status of lithium-doped solar cells was investigated. Improvements in fabrication techniques have made possible lithium-doped cells which are 11.9% efficient at AMO conditions and 28 C. Cell areas of 12 square centimeters are now feasible. Annealing characteristics are highly temperature dependent with 60 C being the minimum array temperature for good performance. If the recovered power levels for N/P cells and P/N lithium-doped cells are compared for an array temperature of 80 C, it is found that the P/N lithium-doped cells are 15% higher after 10 to the 15th power/sq cm 1 Mev equivalent electrons and 85% higher after 10 to the 13th power/sq cm fission spectrum neutrons. Based on this survey the use of lithium-doped cells is recommended for missions which require solar arrays to operate at temperatures above 60 C, especially if the satellite must survive a nuclear weapon environment. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 763 948 13/8
NAVAL INTELLIGENCE SUPPORT CENTER WASHINGTON D C TRANSLATION DIV

State of the Art of Argon-Arc Welding Technology in Joining Aluminum and Aluminum Alloys to Steel, (U)

JUL 73 46P Belchuk,G. A. ;Ryabov,V. R. ;Yumatova,V. I. ;
REPT. NO. NISC-Trans-3453

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Trans. of mono. Sovremennoe Sostoyanie Tekhnolog.i Argono-Dugovoi Svarki Alyuminiya i Ego Splavov so Stalyu, Leningrad, 1967 p11-27 p130-137 p163-173.

DESCRIPTORS: (*INERT GAS WELDING, STATE-OF-THE-ART REVIEWS), WELDS, ALUMINUM, ALUMINUM ALLOYS, STEEL, INDUSTRIAL RESEARCH, CORROSION RESISTANCE, STORAGE TANKS, CRYOGENICS, USSR, STAINLESS STEEL, AUSTENITE (U)
IDENTIFIERS: TRANSLATIONS (U)

Topics included are the use of alloyed filler metal, special features of welding aluminum alloy to 18-8(1Kh18N9T) steel, corrosion resistance of welded aluminum-alloy and steel joints, some examples of industrial application of argon-arc welding technology in joining aluminum and aluminum alloy to steel, some fields of application of chromium-nickel austenitic steels, and properties of the most widely-used Fe-Cr-Ni-Mn and Fe-Cr-Mn steels. (U)

AD- 763 194 5/9
HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA VA

The State of Knowledge Pertaining to Selection of Cost-Effective Training Methods and Media. (U)

DESCRIPTIVE NOTE: Technical rept.,
JUN 73 127P Spangenberg,Ronald W. ;
Riback,Yair ;Moon,Harold L. ;
REPT. NO. HumRRO-TR-73-13
CONTRACT: DAHC19-73-C-0004
PROJ: DA-2-Q-062107-A-745
TASK: 2-Q-062107-A-74500

UNCLASSIFIED REPORT

DESCRIPTORS: (*ARMY TRAINING, *COST EFFECTIVENESS), (*MANAGEMENT PLANNING AND CONTROL, ARMY TRAINING), OPTIMIZATION, STATE-OF-THE-ART REVIEWS, SELECTION, COSTS, INEQUALITIES (U)
IDENTIFIERS: *COST ANALYSIS (U)

Review and analysis of pertinent literature was the first step in research to develop criteria and procedures for optimal selection of cost-effective methods and media for use in Army training. Existing methods-media selection procedures, training cost-analysis procedures, and suggested approaches for developing such procedures are criticized, although portions of some of these may be useful in developing procedures for Army use. Possible approaches for removing inadequacies are discussed. (Modified author abstract) (U)

AD- 762 068 9/2
MITRE CORP MCLEAN VA

Survey of Computer Networks. (U)

DESCRIPTIVE NOTE: Technical rept. Jan-Apr 71,
SEP 71 91P Peterson,Jack J. ;Veit,
Sandra A. ;
REPT. NO. MTP-357
CONTRACT: F19628-71-C-0002

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA PROCESSING, NETWORKS), STATE-OF-THE-ART REVIEWS, DATA TRANSMISSION SYSTEMS, DESIGN (U)
IDENTIFIERS: ARPA COMPUTER NETWORK, *COMPUTERS, *NETWORKS (U)

The paper presents the results of a survey of state-of-the-art computer networks. It identifies ten major networks: ARPA, COINS, CYBERNET, the Distributed Computer Systems, DLS, MERIT, Network/440, Octopus, TSS, and TUCC and outlines their capabilities and design. A tabular presentation of the most significant network features and a brief discussion of networks that were examined but rejected for the survey are also included. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 761 614 5/9
NAVAL PERSONNEL RESEARCH AND DEVELOPMENT LAB WASHINGTON D C

Computer Models for Manpower and Personnel Management: State of Current Technology (with Emphasis on Navy Operational Models), Appendix A. Compendium of Models and Related Manpower/Personnel Programs and Studies, (U)

APR 73 667P Hutchins,Elmer S. , Jr.; Prather,Rebecca C. ;Barefoot,David B. ;Flint, Barry D. ;
REPT. NO. WTR-73-25A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report dated Apr 73, AD-761 613.

DESCRIPTORS: (*PERSONNEL MANAGEMENT, MATHEMATICAL MODELS), (*MANAGEMENT PLANNING AND CONTROL, MANPOWER), (*MANPOWER, NAVY), NAVAL PERSONNEL, STATE-OF-THE-ART REVIEWS, COMPUTER PROGRAMMING, BIBLIOGRAPHIES, NAVAL RESEARCH, MILITARY REQUIREMENTS (U)
IDENTIFIERS: MANAGEMENT INFORMATION SYSTEMS, EVALUATION (U)

The document is an appendix to a Naval research study conducted to ascertain the current state of computer modelling technology in the Navy, specifically, the area of manpower/personnel management planning and resources management. (Modified author abstract) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 761 613 5/9
NAVAL PERSONNEL RESEARCH AND DEVELOPMENT LAB WASHINGTON D C

Computer Models for Manpower and Personnel Management: State of Current Technology (with Emphasis on Navy Operational Models), (U)

APR 73 332P Hutchins,Elmer S. , Jr.; Prather,Rebecca C. ;Barefoot,David B. ;Flint, Barry D. ;Letsky,Michael ;
REPT. NO. WTR-73-25

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report dated Apr 73, AD-716 614.

DESCRIPTORS: (*PERSONNEL MANAGEMENT, MATHEMATICAL MODELS), (*MANAGEMENT PLANNING AND CONTROL, MANPOWER), (*MANPOWER, NAVY), NAVAL PERSONNEL, STATE-OF-THE-ART REVIEWS, COMPUTER PROGRAMMING, BIBLIOGRAPHIES, NAVAL RESEARCH, MILITARY REQUIREMENTS (U)
IDENTIFIERS: MANAGEMENT INFORMATION SYSTEMS, EVALUATION (U)

Within the field of manpower and personnel management over 230 computer models are reported and a significant number are exposed to an examination of their techniques and areas of application. In addition, 102 related studies and programs are identified. A strategy for performing a technical evaluation is developed and a functional taxonomy of computer models designed. A review of the questionnaire technique employed in the data acquisition phase of the project, is included. A glossary of modelling terms and a bibliography is also included. A by-product of this research is the sizable Compendium of Models and Related Manpower/Personnel Programs and Studies (listed as Appendix 'A' and published under separate cover as WTR 73-25A). (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 761 103 19/6
WATERVLIET ARSENAL N Y

Infantry Support Weapons System Technology (Project DES-VAL). A Review of Mathematical Models Relevant to Automatic Weapons. (U)

DESCRIPTIVE NOTE: Technical rept., MAR 73 161P Simkins,Thomas E. ; Vasilakis,John D. ;Carofano,Garry C. ; Scavullo,Maurice A. ;Racicot,Ronald L. ;
REPT. NO. R-WV-T-6-12-73
PROJ: DA-1-W-562603-A-005

UNCLASSIFIED REPORT

DESCRIPTORS: (*MATHEMATICAL MODELS, STATE-OF-THE-ART REVIEWS), (*MACHINE GUNS, MATHEMATICAL MODELS), AUTOMATIC WEAPONS, ABSTRACTS, DESIGN, VIBRATION, HEAT TRANSFER, STRESSES, PERFORMANCE(ENGINEERING) (U)
IDENTIFIERS: COMPUTER AIDED DESIGN (U)

The principal effort of the math-modeling portion of Project DES-VAL (Design and Evaluation of 20-40mm Gun Systems) was in establishing an up-to-date knowledge of existing computer models of automatic weapons. Included in this report is a listing of approximately four hundred documents surveyed for relevance in five separate categories, i.e.: dynamics, vibration, stress, heat transfer, reliability, and math-modeling. A brief account is given of the general course of math-modeling including recommendations for future work. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 760 639 17/7
GEORGIA INST OF TECH ATLANTA COMMUNICATIONS DIV

Electronic Facility Bonding, Grounding and Shielding Review. (U)

DESCRIPTIVE NOTE: Final rept., NOV 72 121P Denny,H. W. ;Holder,F. P. ;Robinette,S. L. ;Toler,J. C. ;Woody, J. A. ;
CONTRACT: DOT-FA72WA-2850
MONITOR: FAA-RD 73-51

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIR TRAFFIC CONTROL SYSTEMS, RELIABILITY(ELECTRONICS)), ELECTRONIC EQUIPMENT, GROUND(ELECTRICAL), ELECTROMAGNETIC SHIELDING, BONDING, LIGHTNING ARRESTERS, STATE-OF-THE-ART REVIEWS, RADIOFREQUENCY INTERFERENCE, REDUCTION, ELECTROMAGNETIC COMPATIBILITY, SAFETY (U)

Air traffic control electronic facilities, earth grounding requirements are examined in terms of the needs for lightning protection is reviewed to determine the ground system requirements necessary to protect personnel, equipment, and facilities. A signal ground reference system is developed based on relative tradeoffs between interference reduction principles, implementation practicalities, and cost considerations. Equipment and facility shielding needs are reviewed from the perspectives of electromagnetic compatibility enhancement and personnel hazard prevention. Bonding techniques and practices are summarized with special emphasis placed on maintenance requirements. Finally, useful ground system maintenance test procedures are described and additional cost factors not emphasized elsewhere are discussed. (U)

AD- 759 165 20/4
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

Rarefied Gasdynamics. (U)

DESCRIPTIVE NOTE: Final rept.,
FEB 73 18P Petty,James S. ;
REPT. NO. ARL-73-0012
PROJ: AF-7064
TASK: 706404

UNCLASSIFIED REPORT

DESCRIPTORS: (*RAREFIED GAS DYNAMICS, TRANSPORT PROPERTIES), CONTINUUM MECHANICS, FLAT PLATE MODELS, PIPES, HEAT TRANSFER, SHOCK WAVES, WALLS, STATE-OF-THE-ART REVIEWS, MATHEMATICAL MODELS, BOUNDARY LAYER, CONTROL (U)
IDENTIFIERS: *GAS DYNAMICS (U)

In a study of basic phenomena in rarefied gas flows, particular attention was given to transport phenomena. Principal items of research included studies of the rarefied Rayleigh problem, Pouiselle-like flow, anomolous heat transfer, normal shock reflection, and a state-of-the-art survey of rarefied gas-dynamics. (Author Modified Abstract) (U)

AD- 758 807 5/10
MICHIGAN UNIV ANN ARBOR HUMAN PERFORMANCE CENTER

Information Encoding in Training for Efficient Access in Memory. (U)

DESCRIPTIVE NOTE: Interim rept. 1 Jan-31 Dec 72,
JAN 73 7P Melton,Arthur W. ;
CONTRACT: F44620-72-C-0038
PROJ: AF-9778
MONITOR: AFOSR TR-73-0556

UNCLASSIFIED REPORT

DESCRIPTORS: (*INFORMATION RETRIEVAL, MEMORY(PSYCHOLOGY)), LEARNING, RECALL, CODING, PERFORMANCE(HUMAN), STATE-OF-THE-ART REVIEWS, TRAININ (U)
IDENTIFIERS: *INFORMATION PROCESSING(PSYCHOLOGY) (U)

Coding processes involved in storing and retrieving information in event, simple associative, and serial associative learning were examined in experiments and literature-reviews reported in four presentations to scientific meetings, one review of quantitative theory in press, and nine scientific articles in preparation. A new technique for identifying and analysing trainee-determined coding units in serial learning and the 'access cues' to these units provides a promising methodology for detecting learner organization of serial tasks and compatible management of training schedules. Other studies extend and refine the hypothesis that encoding variability during learning, as contrasted with rote repetition, is beneficial for long-term recall. (Author Modified Abstract) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 758 447 13/2
ARMY CONSTRUCTION ENGINEERING RESEARCH LAB CHAMPAIGN ILL

Pavement Distress Identification and Repair. (U)

DESCRIPTIVE NOTE: Technical rept., MAR 73 140P Barenberg,Ernest J. ; Bartholomew,Charles L. ;Herrin,Moreland ;
REPT. NO. CERL-TR-P-6
CONTRACT: DACA88-71-C-0013

UNCLASSIFIED REPORT

DESCRIPTORS: (*PAVEMENTS, MAINTENANCE), DEGRADATION, IDENTIFICATION, STATE-OF-THE-ART REVIEWS (U)

The report is a comprehensive state-of-the-art report on pavement distress, its identification and repair. It presents information to enable technically trained, but relatively inexperienced, personnel to identify pavement distress types in the field and plan repair or maintenance work accordingly. (Author Modified Abstract) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 756 452 20/6 15/5
LIFE SYSTEMS RESEARCH INST LOS ANGELES CALIF

Feasibility Study of Automatic Fabrication of Spectacle Lenses in the Field. (State-of-the-Art Survey). (U)

DESCRIPTIVE NOTE: Technical rept. 14 Apr-13 Oct 69, JAN 70 148P Celentano,J. T. ;
REPT. NO. LSRI-69R113
CONTRACT: DADA17-69-C-9062

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Univis, Inc., Fort Lauderdale, Fla. See also report dated Aug 69, AD-756 451.

DESCRIPTORS: (*EYEGLASSES, PLASTIC LENSES), (*PLASTIC LENSES, MANUFACTURING), STATE-OF-THE-ART REVIEWS, POLYESTER PLASTICS, AUTOMATIC, COATINGS, OPHTHALMOLOGY, DESIGN, SAFETY, PATENTS, MATERIALS, ARMY RESEARCH, MILITARY MEDICINE (U)

A literature survey was accomplished, including library and patent searches and vendor contacts. The literature was searched for articles related to plastic lenses, ophthalmic and optical techniques and pro- ducts, automated lens fabrication techniques, and plastic automation fabrication techniques. Approximately 50,000 titles were reviewed and more than 300 articles and patents considered applicable. (Author-PL) (U)

AD- 756 015 20/5
ILLINOIS UNIV URBANA DEPT OF ELECTRICAL ENGINEERING

WA1-Far-Infrared Molecular Lasers, (U)

AUG 72 11P Coleman,Paul D. ;
CONTRACT: AF-AFOSR-2154-72
PROJ: AF-9768
TASK: 976802
MONITOR: AFOSR TR-73-0330

UNCLASSIFIED REPORT
Availability: Pub. in IEEE Jnl. of Quantum Electronics, VQE-9 n1 p130-138 Jan 73.
SUPPLEMENTARY NOTE: Revision of report dated 7 Jul 72.

DESCRIPTORS: (*INFRARED LASERS, STATE-OF-THE-ART REVIEWS), GAS LASERS, EXCITATION, ELECTRON IRRADIATION, OPTICAL PUMPING, ELECTRON TRANSITIONS, CHEMICAL REACTIONS (U)
IDENTIFIERS: WATER VAPOR LASERS, *MOLECULAR LASERS, HELIUM NEON LASERS, HYDROGEN CYANIDE LASERS, HYDROGEN SULFIDE, SULFUR DIOXIDE LASERS, FAR INFRARED RADIATION (U)

A summary is presented of recent accomplishments and the state of the art of far-infrared (far-IR) molecular lasers. Problems of excitation, laser line assignments, relaxation, and absolute frequency measurements are discussed. Predictions of future far-IR developments are made. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 755 780 13/1 20/12
AEROSPACE CORP EL SEGUNDO CALIF ENGINEERING SCIENCE OPERATIONS

Survey of Cryogenic Cooling Techniques. (U)

DESCRIPTIVE NOTE: Rept for 1 Nov 70-15 May 72,
OCT 72 188P Donabedian,Martin ;
REPT. NO. TR-0073(3901-01)-1
CONTRACT: F04701-72-C-0073
MONITOR: SAMSO TR-73-34

UNCLASSIFIED REPORT

DESCRIPTORS: (*REFRIGERATION SYSTEMS, *CRYOGENICS), THERMODYNAMIC CYCLES, REFRIGERANT COMPRESSORS, SPACECRAFT, SPACE ENVIRONMENTS, LIQUEFIED GASES, STORAGE, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: CRYOGENIC REFRIGERATORS (U)

A survey was made to determine the state of the art of various methods of cooling to cryogenic temperatures for potential adaptation to spaceborne systems. The study included evaluation of mechanical closed-cycle refrigerators, open-cycle expendable systems, passive radiation concepts which utilize the low temperature of the deep space environment, and thermoelectric devices. The following mechanical refrigeration cycles were evaluated: Vuilleumier, Stirling, Gifford-McMahon/Solvay, Brayton and Claude. Open-cycle expendable systems evaluated were high-pressure gas coupled with Joule-Thomson expansion, cryogenic liquids in both the subcritical and supercritical state, solidified cryogens, and liquids storable at room temperature. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 755 116 14/2 14/5
ARMY MATERIALS AND MECHANICS RESEARCH CENTER WATERTOWN MASS

State of the Art Survey on Holography and Microwaves in Nondestructive Testing. (U)

DESCRIPTIVE NOTE: Monograph series,
SEP 72 109P Grubinskas,Robert C. ;
REPT. NO. AMMRC-MS-72-9
PROJ: DA-M716350-PEMA

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the International Meeting of the Technical Cooperation Program's Working Panel 4, Sub-Group P, Evaluation Methods for Materials and Materials in Structures (13th), held in Anaheim, Calif., on 20-29 Apr 71.

DESCRIPTORS: (*NONDESTRUCTIVE TESTING, STATE-OF-THE-ART REVIEWS), (*STEREOPHOTOGRAPHY, NONDESTRUCTIVE TESTING), PHOTOGRAPHY, PHOTOGRAPHIC FILM, PHOTOGRAPHIC EQUIPMENT, LASERS, ULTRASONIC RADIATION, MICROWAVES, MICROSCOPY, INTERFEROMETERS (U)
IDENTIFIERS: HOLOGRAPHY, MICROWAVES, ACOUSTIC HOLOGRAPHY, *HOLOGRAPHY, HOLOGRAPHIC MICROSCOPY, HOLOGRAPHY, INTERFEROMETERS, ULTRASONIC HOLOGRAPHY, ULTRASONIC TESTS (U)

The object of this monograph is to trace the evolution of relatively new nondestructive testing techniques arising from the vigorously active fields of holography and microwaves. Highlighted areas include the description of existing techniques and a discussion of their capabilities and limitations. Receiving primary emphasis are the applications of these techniques to the evaluation of materials, structures, and end items for quality assurance purposes. An extensive reference and bibliographical section has also been included to increase the usefulness of this document and to provide a launching point for further study. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 753 814 5/1
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA SCIENCE AND TECHNOLOGY DIV

The Evaluation of Research Supported by a Mission-Oriented Agecny-Structured Approaches. Volume I: On Measures of Research Effectiveness, (U)

DEC 71 54P Molander,Roger C. ;Milton, A. Fenner ;Selwyn,Philip A. ;
REPT. NO. P-753-Vol-1
CONTRACT: DAHC15-67-C-0011
MONITOR: IDA/HQ 71-12639

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report dated Dec 71, AD-753 815.

DESCRIPTORS: (*SCIENTIFIC RESEARCH, *RESEARCH MANAGEMENT), (*DEPARTMENT OF DEFENSE, SCIENTIFIC RESEARCH), MANAGEMENT PLANNING AND CONTROL, FEASIBILITY STUDIES, STATE-OF-THE-ART REVIEWS, ORGANIZATIONS (U)
IDENTIFIERS: MANAGEMENT INFORMATION SYSTEMS, METHODOLOGY, INTERVIEWS (U)

The feasibility of developing structured approaches to prospective and retrospective evaluation of basic research supported by a mission-oriented agency, specifically the Advanced Research Projects Agency, is examined. It is argued that the existence of an applied technological mission for the agency, combined with the unreliability of assessing the potential applied impact of individual research projects, calls for an approach to research evaluation which (1) measures scientific disciplines and subdisciplines according to their relevance to the agency's mission and (2) measures individual research projects within these categories against a yardstick of scientific excellence. Potential structured research methods to accomplish these tasks are considered. (Author) (U)

AD- 753 655 6/5
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)

Introduction to Medical Research, (U)

71 1P Joseph,Sammy William ;
REPT. NO. NAMRU-2-TR-527

UNCLASSIFIED REPORT
Availability: Pub. in Medical Jnl. of the Indonesian Armed Forces, v3 n6 p8-10 Nov 71.

DESCRIPTORS: (*MEDICAL RESEARCH, *INDONESIA), INFECTIOUS DISEASES, BACTERIA, VIRUS DISEASES, STATE-OF-THE-ART REVIEWS (U)

During 1970, medical researchers developed means for detecting hidden heart attacks, discovered why ex-smokers get fat, created a biologically active gene and made a lysosome. Physiologists continued to debate the structure of membranes, and cigarettes were more and more implicated as contributers to lung cancer. The major challenges confronting medical science to day are Cancer, hypertension arteriosclerosis, and geriatrics. More recently, at NAMRU-2 the microbiology section has been involved in several areas of medical research including enteric diseases, fevers of undetermined origin, zoonotic disease and gangrenous stomatitis. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 753 000 21/5 20/1
NAVAL AIR PROPULSION TEST CENTER TRENTON N J PROPULSION TECHNOLOGY AND PROJECT ENGINEERING DEPT

State-of-the-Art Review of Turbine Engine Inlet Noise. (U)

DESCRIPTIVE NOTE: Final technical rept.,
NOV 72 159P Benham,Robert B. ;
REPT. NO. NAPTC-PE-6
PROJ: A330-5360/218-B/1F32-432-308

UNCLASSIFIED REPORT

DESCRIPTORS: (*JET ENGINE NOISE, *TURBOJET INLETS), (*TURBOFAN ENGINES, JET ENGINE NOISE), DESIGN, NOISE, ATTENUATION, INLET GUIDE VANES, DUCT INLETS, VORTICES, ACOUSTIC INSULATION, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: VORTEX SHEDDING, NOISE REDUCTION, NOISE POLLUTION, TF-34 ENGINES (U)

The report points out that turbine-type engine design is evolving in a direction which will make fan and compressor turbomachinery noise continually more obstrusive. The TF34 engine is representative of 'state-of-the-art' high bypass ratio subsonic turbofan technology. It contains no inlet noise-suppression design and the inlet noise exceeds Federal Air Regulation Part 36 take-off sideline noise limits by about 6PNdb. There are descriptions and theoretical presentations explaining the principal mechanisms producing the three inlet noise contributors; interaction tones, combination tones, and broadband radiation. It is shown that noise control can be affected either at the rotor-stator source or with nacelle installation attenuation. (Author) (U)

AD- 752 890 1/3 15/5
NORTHROP CORP PALOS VERDES PENINSULA CALIF ELECTRONICS DIV

UH-1 Test Bed Program. Volume I. (U)

DESCRIPTIVE NOTE: Final rept.,
JUN 72 413P Butcher,Robert R. ;Kirby, Russell , Jr.;Nakakihara,John ;Watkins,T. C. ;
REPT. NO. NORT-71-293A
CONTRACT: DAAJ01-70-C-0828
PROJ: DA-1-F-164204-DC-32
TASK: 1-F-164204-DC-3201
MONITOR: USAAVSCOM TR-72-19-Vol-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-752 891.

DESCRIPTORS: (*HELICOPTERS, *CHECKOUT PROCEDURES), (*ARMY AIRCRAFT, MAINTENANCE), AUTOMATIC, STATE-OF-THE-ART REVIEWS, FAILURE, TESTS (U)
IDENTIFIERS: MALFUNCTION DETECTION, UH-1 AIRCRAFT, UH-1H AIRCRAFT (U)

The UH-1H helicopter test bed program was accomplished at the US Army Aeronautical Depot Maintenance Center (ARADMAC), Corpus Christi, Texas, during the period 4 October 1970 through 17 December 1971. The program objective was to determine the capability of state-of-the-art hardware to automatically accomplish inspection, diagnostic and prognostic maintenance functions on selected subsystems of the UH-1H helicopter. Northrop's hardware for the program is identified as a Maintenance Reporting System (MRS). Helicopter components, both serviceable and degraded, were run and monitored for malfunction discrimination by the MRS in ARADMAC test cells and in two UH-1H aircraft. Trending for prognosis was attempted while accumulating flight time on two additional UH-1H aircraft utilizing serviceable components. The test results demonstrated the objectives of the test bed program. (Author) (U)

AD- 750 742 20/9
AEROSPACE CORP EL SEGUNDO CALIF LAB OPERATIONS

The Induction Arc, a State-of-the Art Review. (U)

DESCRIPTIVE NOTE: Rept. for Feb-Jun 72,
OCT 72 78P Eckert,Hans U. ;
REPT. NO. TR-0073(3220-20)-2
CONTRACT: F04701-72-C-0073
MONITOR: SAMSO TR-72-227

UNCLASSIFIED REPORT

DESCRIPTORS: (*PLASMA MEDIUM, *ELECTRIC ARCS), MAGNETIC FIELDS, GAS IONIZATION, ARGON, TRANSFORMERS, INDUCTANCE, RADIOFREQUENCY, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: ARGON, PLASMAS(PHYSICS), DIAGNOSIS(GENERAL), PLASMAS(PHYSICS) (U)

The induction arc is, in principle, a high-frequency transformer in which the secondary is formed by a thermal plasma. Since its invention in 1961, this arc has been the subject of over 100 investigations with widely differing goals. Information contained in the literature up to 1972, covering history, experimental techniques, theory, and applications, has been collected and reviewed. Fair agreement between experimental and theoretical data indicates that heat balance and skin effect are the two basic processes governing the arc plasma. This agreement appears to be limited by non-equilibrium effects for which no provisions have been made in the theoretical models. The absence of contamination by electrode material makes the induction arc suitable for applications where a clean plasma is essential. The most important industrial application may be in plasma chemistry, provided such an arc can be operated more efficiently. A promising approach is low-frequency operation directly from the power line by means of a sufficiently large iron core. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 750 680 20/5
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA JASON DIV

Report of the 1971 JASON Laser Summer Study. Volume II. Supporting Appendices A-M, (U)

AUG 71 216P Asmus,John F. ;Case, Kenneth M. ;Dashen,Roger ;Javan,Ali ;Kelley, Paul ;
REPT. NO. S-391-2
CONTRACT: DAHC15-67-C-0011
MONITOR: IDA/HQ 71-13452

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report dated Aug 71, AD-743 098.

DESCRIPTORS: (*LASERS, SCIENTIFIC RESEARCH), GAS LASERS, INFRARED LASERS, MEDICAL RESEARCH, RADIOBIOLOGY, OPTICAL COMMUNICATIONS, STEREOPHOTOGRAPHY, DATA STORAGE SYSTEMS, CHEMICAL INDUSTRY, PHOTOCHEMICAL REACTIONS, AIR POLLUTION, GEOPHYSICS, DISTANCE MEASURING EQUIPMENT, STRAIN GAGES, METEOROLOGICAL INSTRUMENTS, MANUFACTURING, NONDESTRUCTIVE TESTING, MINING ENGINEERING, SAFETY, ASTROPHYSICS, BIOPHYSICS, BIOCHEMISTRY, SYMPOSIA, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: LASER RADIOBIOLOGY, LASER RADIATION PROTECTION, DATA PROCESSING, OPTICAL DATA, HOLOGRAPHY, HOLOGRAPHIC INFORMATION STORAGE (U)

The volume contains a summary of the current state of the art in laser devices and associated technology, plus discussions of the current and potential uses of lasers in the following areas: medicine and biological research, communications, holography and information processing, chemical processing, atmospheric monitoring and air pollution detection, geophysics, industry, basic research in the physical sciences, and ignition of controlled thermonuclear reactions. The current status of laser safety standards and laws is also discussed. These articles provide the background for the conclusions and recommendations given in Volume I. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 750 629 13/7 16/4 13/9
HONEYWELL INC ST PAUL MINN RESEARCH DEPT

Adaptation of Fluidic Control Technology to Missile Hardware Manufacturing. (U)

DESCRIPTIVE NOTE: Final rept. 15 Dec 69-30 Jan 71,
JUN 71 195P Zabsky,John M. ;Brown, James L. ;Merrill,Fred W. ;Whittlesey,Marc W. ;
REPT. NO. 12179-FR
CONTRACT: DAAH03-69-C-0481
MONITOR: QL TR-71-3

UNCLASSIFIED REPORT

DESCRIPTORS: (*GUIDED MISSILE COMPONENTS, *MANUFACTURING), FLUIDICS, MACHINE SHOP PRACTICE, STATE-OF-THE-ART REVIEWS, FLUID AMPLIFIERS, CONTROL SYSTEMS, AUTOMATION, PRODUCTION CONTROL, MACHINE TOOLS (U)
IDENTIFIERS: *FLUERICS, EVALUATION (U)

The report focuses on applying fluidic control technology to missile hardware production. Results from literature searches, mail surveys, and the observation of production processes in industry established the status of fluidics as an important control technology. By investigating several missile hardware production lines, 12 candidate systems using fluidic controls are evaluated. The evaluation concerns the predicted performance over the present operation, the consideration of advantages and benefits, and the expansion of the system into commonality areas. (Author) (U)

AD- 750 101 13/3
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Resin Concretes: A Literature Review. (U)

DESCRIPTIVE NOTE: Final rept.,
SEP 72 29P Dennard,James E. , Jr;
REPT. NO. AEWES-Misc-Paper-C-72-21

UNCLASSIFIED REPORT

DESCRIPTORS: (*CONCRETE, *POLYMERS), STATE-OF-THE-ART REVIEWS, PLASTICS, EPOXY RESINS, POLYESTER PLASTICS, PHYSICAL PROPERTIES (U)

Specialized investigations of resin concrete research are reviewed. The authors generally agreed on the advantages, disadvantages, and applications of resin concrete. A research program to provide design criteria and construction techniques for use by the Corps of Engineers is proposed. (Author, modified-PL) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 749 476 21/5
BOEING CO SEATTLE WASH

Thrust Reverser and Thrust Vectoring Literature Review. (U)

DESCRIPTIVE NOTE: Technical rept. Jul-Sep 71,
APR 72 120P Petit,John E. ;Scholey, Michael B. ;
CONTRACT: F33615-71-C-1850
PROJ: AF-643A
TASK: 63205F
MONITOR: AFAPL TR-72-11

UNCLASSIFIED REPORT

DESCRIPTORS: (*THRUST VECTOR CONTROL SYSTEMS, STATE-OF-THE-ART REVIEWS), (*THRUST REVERSAL, STATE-OF-THE-ART REVIEWS), DESIGN, BIBLIOGRAPHIES, ABSTRACTS, TURBOJET ENGINES, TURBOFAN ENGINES, MOVABLE NOZZLES, EXHAUST GASES, DOWNWASH (U)
IDENTIFIERS: JET IMPINGEMENT, JET PENETRATION (U)

The state-of-the-art of thrust reverser and thrust vectoring technology has been surveyed to identify the available test data and prediction methods in the literature. The literature review resulted in a bibliography of documents related to thrust reverser and thrust vectoring systems. The bibliography contains references to approximately 160 reports and is organized in three sections: Literature review summary, abstracts and data review summary. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 748 989 21/5
RAND CORP SANTA MONICA CALIF

Measuring Technological Change: Aircraft Turbine Engines. (U)

JUN 72 48P Alexander,Arthur J. ;Nelson, J. R. ;
REPT. NO. R-1017-ARPA/PR
CONTRACT: DAHC15-67-C-0141, F44620-67-C-0045
PROJ: ARPA Order-189

UNCLASSIFIED REPORT

DESCRIPTORS: (*TURBOJET ENGINES, HISTORY), TURBOFAN ENGINES, TURBOPROP ENGINES, REGRESSION ANALYSIS, PERFORMANCE(ENGINEERING), STRUCTURAL MEMBERS, EXPERIMENTAL DESIGN, STATE-OF-THE-ART REVIEWS (U)

The report estimates turbine engine parameter tradeoffs over time, using multiple regression analysis. Movement of the parameter tradeoff curve is defined as technological advance. The data base includes the first model of a given turbine engine to pass the model qualification test. The history of turbine engines strongly suggests that single parameter analysis cannot capture the richness of the development process. The rate of technological advance seems fairly constant over time. However, two major manufacturers have been ahead of the others in the level of technology. Comparison of Soviet and American equations revealed an early Soviet lead, reversed since the 1950s. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 748 092 15/3 13/13
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Recommended Long-Range Research Program for Blast-Loaded Structures, (U)

NOV 66 60P Smith,E. F. ;Denton,D. R. ;
REPT. NO. AEWES-Misc-Paper-1-825

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, BLAST), (*CIVIL DEFENSE, SHELTERS), STATE-OF-THE-ART REVIEWS, BIBLIOGRAPHIES, RESEARCH MANAGEMENT, STRUCTURAL PROPERTIES, FAILURE(MECHANICS), TEST METHODS, PLANNING (U)

The Office of Civil Defense (OCD) is responsible for planning and providing fallout shelter spaces. Reinforced-concrete and masonry-type structures are efficient material systems for protection from gamma radiation (Fallout) and are utilized extensively as fallout shelters. A need new exists fro information with which to evaluate the inherent protection provided by existing fallout shelters against airblast loads in low over-pressure regions. In the report, short- and long-range programs of research on building elements of blast-loaded structures are developed and discussed. Recommendations are also included on the nature, conduct, and scope of a research program which is believed to best meet the need of the OCD for information on the response of building elements to blast loads. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 747 366 8/10 8/13 13/13
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

State-of-the-Art of Marine Soil Mechanics and Foundation Engineering. (U)

DESCRIPTIVE NOTE: Final rept.,
AUG 72 182P Ling,Shun C. ;
REPT. NO. AEWES-TR-S-72-11

UNCLASSIFIED REPORT

DESCRIPTORS: (*SOIL MECHANICS, *OCEAN BOTTOM), (*FOUNDATIONS(STRUCTURES), UNDERWATER), OCEAN BOTTOM TOPOGRAPHY, OCEAN BOTTOM SAMPLING, GEOPHYSICAL PROSPECTING, MARINE ENGINEERING, TEST EQUIPMENT, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: PILE STRUCTURES, SOIL STRUCTURE (U)

The report presents the state-of-the-art of marine soil mechanics and foundation engineering. The study involved an extensive literature search and personal contacts with individuals in Government and industry involved in offshore work. The fields of subbottom exploration, laboratory and in situ testing, soil properties, and marine foundation engineering were examined to delineate existing capabilities and limitations. The viewpoint taken was that of a soils and foundation engineer attempting to plan, design, and construct an offshore foundation with the available knowledge and experience. The study was limited to water depths of 600 ft or less. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 747 336 11/8
ESSO RESEARCH AND ENGINEERING CO LINDEN N J GOVERNMENT RESEARCH LAB

Boundary Lubrication. (U)

DESCRIPTIVE NOTE: Final rept. Jun 69-Jun 72,
JUN 72 353P Beerbower,Alan ;
REPT. NO. GRU.1GBEN.72
CONTRACT: DAHC19-69-C-0033

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Report on Scientific and Technical Applications Forecast (STAF).

DESCRIPTORS: (*LUBRICATION, STATE-OF-THE-ART REVIEWS), LUBRICANTS, LUBRICANT ADDITIVES, WEAR RESISTANCE, CHEMICAL REACTIONS, FRICTION, METALLURGY, FILMS, MATHEMATICAL MODELS, ANOMALIES, BIBLIOGRAPHIES (U)
IDENTIFIERS: *TECHNOLOGY FORECASTING (U)

The report reviews the state-of-the-art of Boundary Lubrication and presents the prospects of such improvements in the lubrication of highly-loaded bearings as virtually to eliminate bearing failures and of mathematical models which might explain the low wear observed. These models are shown to be inadequate and some steps are taken to complete them. It is shown that 27 out of the 28 anomalies are explained by the expanded models. A plan for applying this knowledge to design practices is outlined. (Author) (U)

AD- 746 297 6/16
MIAMI UNIV OXFORD OHIO

Factors Affecting the Detection and Recognition of Colored Targets. (U)

DESCRIPTIVE NOTE: Final technical rept. 1 Jul 70-15 May 72,
MAY 72 227P White,Raymond M. , Jr.; Dainoff,Marvin J. ;Reynolds,Richard E. ;
CONTRACT: F33615-70-C-1766
PROJ: AF-7183
MONITOR: AMRL TR-72-38

UNCLASSIFIED REPORT

DESCRIPTORS: (*TARGET DISCRIMINATION, *VISUAL PERCEPTION), (*TARGET RECOGNITION, COLORS), PERFORMANCE(HUMAN), SIGNAL LIGHTS, FACTOR ANALYSIS, BACKGROUND, REACTION(PSYCHOLOGY), SELECTION, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: STIMULUS(PSYCHOPHYSIOLOGY) (U)

The literature was reviewed in the areas of (a) effects of limited stimulus energy and background factors on the detection and recognition of colored signal lights; and (b) determining factors affecting observers' performance in absolute identification of target colors. Five experiments were conducted to determine the effects of two classes of variables on an observer's ability to quickly and accurately identify the reflected color of a target: background and reaction time. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 744 479 8/6
CLEMSON UNIV S C DEPT OF CIVIL ENGINEERING

A State of the Art Survey of the Applications of Aerial Remote Sensing to Coastal Engineering, (U)

MAY 72 195P Stafford,Donald B. ;
CONTRACT: DACW72-70-C-0034

UNCLASSIFIED REPORT

DESCRIPTORS: (*NATURAL RESOURCES, AERIAL RECONNAISSANCE), STATE-OF-THE-ART REVIEWS, AERIAL PHOTOGRAPHY, COLOR PHOTOGRAPHY, INFRARED PHOTOGRAPHY, PHOTOGRAMMETRY, MULTIBAND SPECTRAL RECONNAISSANCE, SPACEBORNE, COASTAL REGIONS, RADAR IMAGES, LASERS, METEOROLOGICAL SATELLITES, RADIOMETERS, FLUOROMETERS, BIBLIOGRAPHIES, ABSTRACTS (U)
IDENTIFIERS: *COASTAL ENGINEERING, *REMOTE SENSING, SPACEBORNE PHOTOGRAPHY (U)

The report presents the results of a comprehensive survey of the applications of aerial remote sensing techniques in the field of coastal engineering. Part 1 presents a narrative summary of the state of the art of coastal engineering applications of aerial remote sensors. Existing and potential applications of the techniques are described. Important characteristics of the various aerial remote sensors and the limitations of the techniques in coastal engineering applications are discussed. The primary aerial remote sensors considered are black and white, black and white infrared, color, and color infrared aerial photographs, satellite photographs, infrared imagery, multispectral imagery, and radar imagery. Part 2 is an annotated bibliography describing the coastal engineering applications of aerial remote sensing techniques. This is a representative compilation of literature written over the past 30 years. A variety of coastal engineering applications of aerial remote sensors are described. Approximately 200 references are listed in the annotated bibliography. (Author) (U)

AD- 742 672 19/5
ARMY INFANTRY BOARD FORT BENNING GA

State of the Art Study Antitank Miss Distance Indication System, (U)

DEC 71 51P James,Richard D. ;Clark, John J. ;
REPT. NO. USAIB-3353
PROJ: USATECOM-9-CO-08F-000-001

UNCLASSIFIED REPORT

DESCRIPTORS: (*FIRE CONTROL SYSTEM COMPONENTS, STATE-OF-THE-ART REVIEWS), (*ANTITANK AMMUNITION, MISS DISTANCE), CIRCULAR ERROR PROBABLE, ACOUSTIC DETECTORS, RADAR EQUIPMENT, INFRARED DETECTORS, FEASIBILITY STUDIES (U)

The study was conducted by the US Army Infantry Board (USAIB), Fort Benning, Georgia, to determine the most feasible approach to obtain the capability for measuring the miss distance and direction of antitank missiles fired in day, night and all weather conditions at stationary and moving targets. The study pertains to the feasibility of instrumentation design for subsonic antitank projectiles. It was directed on the basis that there is no available MDI system that provides X and Y coordinates under all conditions previously stated. The study was to determine the state-of-the-art of miss distance scoring in all services for all types of projectiles. By using this open approach all existing methods and their combinations were examined for possible solutions. (Author) (U)

AD- 739 422 15/5
ARMY MATERIEL COMMAND TEXARKANA TEX INTERN TRAINING CENTER

A Survey of the Presentation of Technical Data for Maintenance. (U)

DESCRIPTIVE NOTE: Research rept.,
MAY 71 53P Kruvand,Daniel H. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Master's thesis.

DESCRIPTORS: (*MAINTENANCE, HANDBOOKS), INSTRUCTION MANUALS, STATE-OF-THE-ART REVIEWS, DATA, PRINTING, MICROFILM, DISPLAY SYSTEMS, HUMAN FACTORS ENGINEERING, READING, MAINTENANCE PERSONNEL (U)
IDENTIFIERS: RECOMMENDATIONS, INFORMATION SYSTEMS, TROUBLESHOOTING (U)

The paper presents the results of a survey conducted in the area of maintenance information communication. The structure of the conventional technical manual is described, as well as attempts to overcome its faults. The military maintenance technician and his environment are discussed to better explain the role of technical manuals in maintenance support. New concepts and techniques for presenting maintenance information are surveyed, and recommendations are made for future research in the area. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 739 265 11/6 20/12
CONNECTICUT UNIV STORRS DEPT OF METALLURGY

Fracture Mechanics and Corrosion Fatigue, (U)

FEB 72 57P McEvily,Arthur J. ;Wei, Robert P. ;
CONTRACT: F44620-69-C-0011
PROJ: AF-9560
MONITOR: AFOSR TR-72-0408

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Lehigh Univ., Bethlehem, Pa. Dept. of Mechanical Engineering and Mechanics.

DESCRIPTORS: (*FRACTURE(MECHANICS), *STATE-OF-THE-ART REVIEWS), (*CORROSION, *FATIGUE(MECHANICS)), CRACK PROPAGATION, ALUMINUM ALLOYS, STEEL (U)
IDENTIFIERS: CORROSION, FATIGUE(MECHANICS) (U)

The development and current state-of-the art in fracture mechanics in relation to studies of environment-enhanced fatigue-crack growth (corrosion fatigue) and fatigue-crack growth per se are reviewed. Patterns of response of materials to different loading and environmental conditions are considered in terms of the probable mechanisms for environmental embrittlement. The usefulness of the fracture mechanics approach in developing understanding of the mechanisms for fatigue fracture and the engineering utility of this approach are discussed. Areas for additional research are also indicated. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 738 204 13/11
DYNAMIC SCIENCE ENGINEERING OPERATIONS PHOENIX ARIZ

Evaluaton of Self-Sealing Breakaway Valves for Crashworthy Aircraft Fuel Systems. (U)

DESCRIPTIVE NOTE: Final rept.,
NOV 71 75P Anson,Bruce ;
REPT. NO. 4820-71-25
CONTRACT: DAAJ02-70-C-0038, DAAJ02-67-C-0004
PROJ: DA-1-F-164204-D-154
MONITOR: USAAMRDL TR-71-65

UNCLASSIFIED REPORT

DESCRIPTORS: (*VALVES, EXPERIMENTAL DESIGN), (*AVIATION ACCIDENTS, FIRE SAFETY), STATE-OF-THE-ART REVIEWS, TEST METHODS, PROBLEM SOLVING, FACTOR ANALYSIS, CORRELATION TECHNIQUES, SPECIFICATIONS (U)

A program was aimed at improving the component performance characteristics of breakaway valves used to eliminate fuel spillage and subsequent fire in otherwise survivable aircraft crashes. It consisted of an initial study and literature survey to establish the state of the art followed by two series of static and dynamic tests of various types of valves to define problem areas and to verify that the problems had been corrected. An analysis to correct the indicated deficiencies was accomplished between the two test phases. The results were then collated into a draft military specification. (U)

AD- 737 694 1/3
NORTH AMERICAN ROCKWELL CORP COLUMBUS OHIO COLUMBUS DIV

Study of Control Devices for Improved Tactical Agility. (U)

DESCRIPTIVE NOTE: Final rept.,
AUG 71 327P Hanna,Richard H. ;Stewart, Vearl R. ;
REPT. NO. NR71H-317
CONTRACT: N00014-71-C-0062
PROJ: NR-212-202

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLIGHT CONTROL SYSTEMS, STATE-OF-THE-ART REVIEWS), (*JET FIGHTERS, FLIGHT CONTROL SYSTEMS), FLIGHT PATHS, RESPONSE, AERODYNAMIC CONTROL SURFACES, MANEUVERABILITY, ANGLE OF ATTACK, BIBLIOGRAPHIES, ABSTRACTS (U)
IDENTIFIERS: EVALUATION (U)

A study was conducted to determine the effect of the control device characteristics on airplane agility at transonic speeds. A list of over 600 reports containing data on various control devices is presented. A discussion of the more widely used control devices is presented together with data showing trends and general characteristics. From this list of control devices certain devices were selected for evaluation on a baseline configuration. An Agility Index was formulated for the evaluation of the selected control devices. The results of this portion of the study showed certain control devices than enhanced agility. A fighter aircraft was configured with the agility enhancement control devices, evaluated for agility and compared to the baseline airplane. (Author) (U)

AD- 736 871 5/2
CALIFORNIA UNIV LOS ANGELES

Library Environmental Design: Physical Facilities and Equipment. (U)

DESCRIPTIVE NOTE: Final rept. 1 Oct 70-31 Dec 71 on Phase 1,
DEC 71 267P Evans,G. Edward ;Iredale, Ralph ;Kamnitzer,Peter ;Vreeland,Thomas ; Anderson,LeMoyne ;
CONTRACT: DACA73-71-C-0001
PROJ: DA-2-P-062101-A-728
TASK: 2-P-062101-A-72802
MONITOR: TISA 33

UNCLASSIFIED REPORT

DESCRIPTORS: (*LIBRARIES, DESIGN), STRUCTURAL PROPERTIES, STATE-OF-THE-ART REVIEWS, MANAGEMENT PLANNING AND CONTROL, ARMY (U)

The state of the art report summarizes current practice and accepted standards in library physical facility design. It is intended to serve as an interim planning guide for Army technical libraries until the completion of the Guided Inquiry System in the second phase of this study. Recommendations made in the report are based on a thorough review of the leterature on library planning and design, an analysis of the present Army procedures for obtaining library facilities, interviews with librarians, building consultants and architects, and site visits to a number of different types of military and non-military libraries. The report concludes that a generic base exists from which to plan all libraries and makes specific recommendations to improve the procedures for providing Army technical libraries. (Author) (U)

AD- 736 822 9/2
GTE SYLVANIA INC NEEDHAM HEIGHTS MASS ELECTRONIC SYSTEMS GROUP

A Study of Solid State Bulk Memory Storage Techniques. (U)

DESCRIPTIVE NOTE: Final technical rept. 29 Jun 70-29 Jun 71,
NOV 71 199P Abbott,Matthew C. ;Powicki, Henry R. ;Dillon,Clay J. ;
CONTRACT: F30602-70-C-0261
MONITOR: RADC TR-71-273

UNCLASSIFIED REPORT

DESCRIPTORS: (*MEMORY DEVICES, STATE-OF-THE-ART REVIEWS), (*DATA STORAGE SYSTEMS, MILITARY REQUIREMENTS), THIN FILM STORAGE DEVICES, CORE STORAGE, MAGNETIC CORES, CRYOGENIC STORAGE DEVICES, SHIFT REGISTERS, SEMICONDUCTOR DEVICES. INTEGRATED CIRCUITS, OPTICAL EQUIPMENT, MAGNETIC MATERIALS, RELIABILITY, PERFORMANCE(ENGINEERING), COSTS (U)
IDENTIFIERS: LARGE SCALE INTEGRATED CIRCUITS, MAGNETIC BUBBLE DOMAINS, MAGNETIC FILM MEMORIES, OPTICAL STORAGE DEVICES, RANDOM ACCESS COMPUTER STORAGE, SEMICONDUCTOR COMPUTER STORAGE, HOLOGRAPHIC INFORMATION STORAGE (U)

The report describes a study to determine which solid state memory technique is most promising for use in building a reasonably-priced, ruggedized, random access, 1 billion -bit mass memory. Those techniques currently under development were identified. These included LSI, beam accessed, magnetic shift register, ferroacoustic, and array memory techniques. A thorough search of the literature was conducted, and a memory system model was constructed for each technique that showed suitability for use in a mass memory. Six models were constructed: bubble, Soniscan, optical, DOT, LSI, and oligatomic. The models were rated and compared, indicating that the magnetic bubble technique was likely to prove the most satisfactory. A five-year research and development plan was generated to indicate the steps required to reach the goal of a militarized 1 billion -bit random-access memory using the magnetic bubble technique. (Author) (U)

AD- 736 238 5/9
SINGER-GENERAL PRECISION INC BINGHAMTON N Y LINK DIV

Study of Advanced Vehicle Simulation Techniques. (U)

DESCRIPTIVE NOTE: Final rept. Jul 70-Apr 71,
OCT 71 419P Collier,A. F. ;Peters,D. ;
Simpson,R. G. ;
CONTRACT: N61339-70-C-0312
PROJ: NAVTRADEVCEN-7883-24
MONITOR: NAVTRADEVCEN 70-C-0312-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*SIMULATORS, *TRAINING DEVICES), (*VEHICLES, SIMULATORS), VISUAL SIGNALS, STATE-OF-THE-ART REVIEWS, HYDROFOIL CRAFT, GROUND EFFECT MACHINES, AMPHIBIOUS VEHICLES, TANKS(COMBAT VEHICLES) (U)
IDENTIFIERS: LVTP-7 VEHICLES, MBT-70 TANKS, PC(H)-1 HYDROFOIL CRAFT, SKMR-1 VEHICLES (U)

The report presents the results of a study to determine the feasibility of developing a visual simulation system for meeting the training requirements for operators of a variety of surface vehicles. The vehicles considered were a tank (MBT-70), an air cushion vehicle (SKMR-1), a hydrofoil (PC(H)-1) and an amphibious assault personnel carrier (LVTP-7). Included in the report is an analysis of the visual system requirements for these vehicles, a state-of-the-art investigation of visual system techniques, and the formulation of a recommended visual system. The recommended system combines a camera model approach for generating land scene with a scanned transparency approach for generating waves, the latter being inset into the land imagery. (Author) (U)

AD- 736 017 14/2
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN

Evaluation of Probes for Measuring Static Pressure in Supersonic and Hypersonic Flows. (U)

DESCRIPTIVE NOTE: Final rept. Jul-Oct 70,
JAN 72 43P Gray,J. Don ;
REPT. NO. AEDC-TR-71-265
CONTRACT: F40600-72-C-0003
PROJ: AF-8219, ARO-VT0036

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with ARO, Inc., Tallahoma, Tenn., Rept. no. ARO-VKF-TR-71-212.

DESCRIPTORS: (*WIND TUNNELS, *PROBES), AERODYNAMIC CHARACTERISTICS, STATE-OF-THE-ART REVIEWS, PRESSURE GAGES, SLENDER BODIES, CONICAL BODIES, DISKS, ANGLE OF ATTACK, ORIFICES, ACCURACY, VISCOSITY, CORRECTIONS, INTERFERENCE (U)
IDENTIFIERS: EVALUATION (U)

Pertinent facts in the literature have been examined regarding the aerodynamic characteristics of static-pressure measuring probes in order to assess the relative merits and limitations of cone-cylinder, sharp-cone, and planar (disk) probles. The effects of Mach number, angle of attack, orifice location, and Reynolds number on the inferred local pressures were all evaluated at Mach numbers up to 8. It is concluded that the planar probe and sharp-cone probe (if properly designed) are equally more accurate than the cone-cylinder probe at supersonic and hypersonic speeds. However, the cone-cylinder is judged to be superior for use at Mach numbers below 4. Details of a recommedned procedure to correct for the effects of viscous interaction (all probes) and angle of attack (planar probes only) are included. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 735 758 17/2
CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF COMPUTER SCIENCE

Speech-Understanding Systems. (U)

DESCRIPTIVE NOTE: Final rept.,
MAY 71 146P Newell,A. ;Barnett,J. ;
Forgie,J. ;Green,C. ;Klatt,D. ;
CONTRACT: F44620-70-C-0107
PROJ: AF-A0827-5
MONITOR: AFOSR TR-72-0142

UNCLASSIFIED REPORT

DESCRIPTORS: (*SPEECH, ANALYSIS), PHONETICS, STATE-OF-THE-ART REVIEWS, INSTRUMENTATION, SPEECH RECOGNITION, SCIENTIFIC RESEARCH (U)

The report provides an evaluation of the state of the art and a program for research towards the development of speech understanding systems. To assess the possibility of such systems four specific tasks were considered and evaluated. Problem areas are identified and discussed leading to the conclusions on the technical aspects of the study. A possible program for research and development is presented. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 734 648 14/2
NAVAL ORDNANCE LAB WHITE OAK MD

Evaluation of Two Types of Facilities to Fulfill the Need for High Reynolds Number Transonic Testing. (U)

JUL 71 248P Enkenhus,Kurt R. ;Merritt, David L. ;
REPT. NO. NOLTR-71-147
PROJ: ONR-PO-1-0109, RR009-02-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*TRANSONIC WIND TUNNELS, STATE-OF-THE-ART REVIEWS), NAVAL RESEARCH, DESIGN, COSTS, PERFORMANCE(ENGINEERING), CORRELATION TECHNIQUES (U)
IDENTIFIERS: LUDWIEG TUBES, BLOWDOWN TUNNELS (U)

The Navy's need for high Reynolds number transonic testing is reviewed and some specific problem areas in weapon and aircraft design are cited. The abilities of currently available wind tunnels in the United States to meet those needs are assessed and the Ludwieg tube wind tunnel at NASA Marshall is evaluated. The theory of the Ludwieg tube is discussed and tables and charts of the parameters are presented. A second option to meet the high Reynolds number testing requirements is examined in the theory and design of a conventional blowdown tunnel. The costs of the two types of facilities are compared for Navy weapons and flight vehicles at subsonic, transonic and low supersonic speeds. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 734 247 9/2
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

CRT Graphics Consoles - An Aid to Selection. (U)

DESCRIPTIVE NOTE: Technical rept.,
NOV 71 85P Jacobs,Lesley D. ;
REPT. NO. RADC-TR-71-61

UNCLASSIFIED REPORT

DESCRIPTORS: (*CATHODE RAY TUBE SCREENS, STATE-OF-THE-ART REVIEWS), (*DATA PROCESSING SYSTEMS, GRAPHICS), DIGITAL COMPUTERS, DATA TRANSMISSION SYSTEMS, TELEVISION DISPLAY SYSTEMS, INPUT-OUTPUT DEVICES, OPERATION (U)
IDENTIFIERS: LIGHT PENS, *COMPUTER GRAPHICS (U)

Computer driven, on-line, cathode ray tube devices i.e. CRT graphics consoles, have only recently made the transition from the 'research and development stage' to the user-oriented environment. The wide range and variety of consoles, costs, capabilities, and performance require that the console buyer intelligently and discriminatingly select the display and features which best meet his requirements for the least overall cost. To assist in the selection of such a console is the purpose of this report. Included in the report is information which will explain the technology-the 'how and why'-behind graphic CRT displays, describe basic display capabilities, terminology, functions and relative merit and comparatively discuss display techniques and devices. Finally, a current listing (as of 1 Oct 70) of specific displays, capabilities and costs is provided. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 733 983 20/4 19/1
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER BETHESDA MD

Location of Separation on a Circular Cylinder in Crossflow as a Function of Reynolds Number, (U)

NOV 71 29P Coder,David D. ;
REPT. NO. NSRDC-3647
PROJ: S4611-010
TASK: 11098

UNCLASSIFIED REPORT

DESCRIPTORS: (*CYLINDRICAL BODIES, *FLOW SEPARATION), (*UNDERWATER PROJECTILES, HYDRODYNAMICS), EXPERIMENTAL DATA, STATE-OF-THE-ART REVIEWS, THEORY, LAMINAR BOUNDARY LAYER, NUMERICAL METHODS AND PROCEDURES, EQUATIONS OF MOTION (U)
IDENTIFIERS: CROSS FLOW (U)

All available information on the location of separation on a circular cylinder in crossflow as a function of Reynolds number, from creeping flow to transcritical flow, has been summarized. The results of an experiment by the author in the transition or supercritical flow regime are included. The various theoretical and experimental results are discussed and compared. Areas needing additional theoretical and experimental work are pointed out. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 732 934 5/1
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

A Critical Review and Comparative Analysis of Definitions, Concepts, and State of the Art in Literature Regarding Systems Management. (U)

DESCRIPTIVE NOTE: Master's thesis,
SEP 71 89P Williams,Roger L. ;
REPT. NO. GSM/SM/71-14

UNCLASSIFIED REPORT

DESCRIPTORS: (*SYSTEMS ENGINEERING, REVIEWS), (*MANAGEMENT CONTROL SYSTEMS, SYSTEMS ENGINEERING), STATE-OF-THE-ART REVIEWS, HISTORY, MANAGEMENT PLANNING, DECISION MAKING, ADVANCED PLANNING, BIBLIOGRAPHIES, THESES (U)
IDENTIFIERS: *MANAGEMENT BY EXCEPTION, *MANAGEMENT INFORMATION SYSTEMS, *MANAGEMENT METHODS, *PROGRAM MANAGEMENT, *SYSTEMS MANAGEMENT (U)

In the last two decades the concept of systems management has been broadly applied and frequently treated in management literature. The rapid growth and expansion of the systems management concept has resulted in conflict and contradiction concerning its terminology, status, application, and philosophy. In view of this apparent conflict and contradiction, this research study was undertaken to develop and present a comprehensive review and comparative analysis of the literature concerning the systems management concept. The principle methodology applied was a review and critical comparison of secondary source data obtained mainly from libraries and correspondence with professional journals and associations. The definitions of a system and the systems approach were studied and compared as they appeared in the literature. Next the relationship of the systems approach and management was examined and the systems management concept viewed through its ancestry, present applications, and its future importance. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 732 794 13/3 13/10
SANTA FE-POMEROY INC SAN FRANCISCO CALIF ENGINEERING DIV

Study of Construction Methods for Large Undersea Concrete Structures. (U)

DESCRIPTIVE NOTE: Final rept. 22 Mar-9 Sep 71,
SEP 71 103P Genwick,Ben C. , Jr.;
Talbot,W. J. , Jr.;Chow,P. Y. ;Brown,A. L. ;Brauner,H. A. ;
CONTRACT: N62399-71-C-0015
MONITOR: NCEL CR-72.002

UNCLASSIFIED REPORT

DESCRIPTORS: (*CONSTRUCTION, STATE-OF-THE-ART REVIEWS), (*CONCRETE, UNDERWATER STRUCTURE), OCEAN BOTTOM, SITE SELECTION, DEEP WATER, DESIGN, MIXTURES, HANDLING (U)

The study was undertaken to annotate up-to-date capability of the construction industry to emplace those structures on the seabed. In equating this capability to the requirement, several methods and combinations of systems were evident, predicated on the final site selection for the emplacement. Each offshore site has a different set of geographical conditions that should be evaluated prior to designing and selecting any one method for construction. The report considers these variables in water depths up to 1000 feet deep. In evaluating design and construction methods for even larger objects and at depths to to 3000 feet, additional unknowns were indicated by the research. From this research and analysis several future study areas were suggested. Concepts involving underwater mixing and placing of concrete were reviewed along with various justifications for such developments. Recommendations and items for future research are also included in the report. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 732 490 6/5
GEORGE WASHINGTON UNIV WASHINGTON D C BIOLOGICAL SCIENCES COMMUNICATION PROJECT

Review of Publications and Support of Research in Cryopreservation of Blood 1949-1969. (U)

71 82P Turner,Arthur R. ;
CONTRACT: N00014-67-A-0214-0008

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also AD-723 231.

DESCRIPTORS: (*BLOOD, FREEZING), CRYOGENICS, STATE-OF-THE-ART REVIEWS, RESEARCH PROGRAM ADMINISTRATION, PRESERVATION, BIBLIOGRAPHIES, HUMANS, ANIMALS, BLOOD CELLS (U)

The document is concerned with the preservation of the blood cells of humans and animals at cryogenic temperatures. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 732 241 20/12 20/3
CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF PHYSICS

High Temperature Superconductors--An Empirical Approach to Superconductivity. (U)

DESCRIPTIVE NOTE: Final rept., OCT 71 22P Matthias,Bernd T. ;
CONTRACT: AF-AFOSR-631-67
PROJ: AF-9764
TASK: 976401
MONITOR: AFOSR TR-71-2324

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUPERCONDUCTORS, TRANSITION TEMPERATURE), STATE-OF-THE-ART REVIEWS, MAGNETIC FIELDS, FERROELECTRICITY, ATOMIC ENERGY LEVELS, CRYSTAL STRUCTURE (U)
IDENTIFIERS: CRITICAL FIELD (U)

The superconducting transition temperature has been raised to 21 degrees K, the critical magnetic field to 415 kilogauss. Twelve new superconducting elements have been discovered, one third of all those known. Ferroelectricity and lattice instabilities have been found as a major obstacle to much higher transition temperatures. Two entirely new groups of superconducting compounds have been discovered. F-electron superconductivity has been detected making lanthanum superconducting above 12 degrees K, the highest of all elements. Two new theories have been published. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 731 996 13/10 20/4
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER BETHESDA MD

Estimating the Wind Resistance of Cargo Ships and Ships and Tankers. (U)

DESCRIPTIVE NOTE: Final rept., MAY 70 33P Wilson,Charles J. ;Roddy, Robert F. , Jr;
REPT. NO. NSRDC-3355

UNCLASSIFIED REPORT

DESCRIPTORS: (*CARGO SHIPS, DRAG), WIND, MODEL TESTS, SHIP MODELS, STATE-OF-THE-ART REVIEWS, APPROXIMATION(MATHEMATICS), VELOCITY, TANKERS (U)
IDENTIFIERS: *SHIP DESIGN (U)

A study was made of the wind resistance of current merchant ships designs, based on available experimental results. Various methods of estimating wind resistance were evaluated. A proposed method which allows for natural wind gradients appears promising but needs more experimental data. A method based on current practice at the Naval Ship Research and Development Center is recommended for interim use. Model full-scale powering correlation studies were made using the recommended method. A change in the correlation allowance presently in use is discussed. (U)

AD- 731 774 5/11 5/3
KALTER (ROBERT J) ITHACA N Y

The Economics of Water-Based Outdoor Recreation: A Survey and Critique of Recent Developments. (U)

DESCRIPTIVE NOTE: Final rept.,
MAR 71 205P Kalter,Robert J. ;
CONTRACT: DACW31-71-C-0039
MONITOR: IWR 71-8

UNCLASSIFIED REPORT

DESCRIPTORS: (*RECREATION, ECONOMICS), (*MANAGEMENT PLANNING, RECREATION), STATE-OF-THE-ART REVIEWS, NATURAL RESOURCES, SOCIOMETRICS, STATISTICAL DATA, IMPACT, PREDICTIONS, ANALYSIS (U)
IDENTIFIERS: BENEFIT COST ANALYSIS, REGIONAL PLANNING (U)

The report is a survey and critique of the literature and practice of estimating use of and benefits from outdoor recreation for the purpose of determining the direction of further research efforts by the Corps of Engineers. The report outlines the conceptual and empirical difficulties associated with the various methodologies in use and suggests promising approaches to improved analysis within the framework of multiple objectives of water resources development. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 731 708 13/13
FOUNDATION SCIENCES INC PORTLAND OREG

Review and Critical Analysis of the State-of-the-Art in Underground Works Construction. (U)

DESCRIPTIVE NOTE: Semiannual technical rept. Feb-Aug 71,
SEP 71 145P Dodds,Donald J. ;
CONTRACT: H0210035
PROJ: ARPA-1F10

UNCLASSIFIED REPORT

DESCRIPTORS: (*UNDERGROUND STRUCTURES, STATE-OF-THE-ART REVIEWS), STATISTICAL ANALYSIS, TABLES, COMPUTER PROGRAMS, FOUNDATIONS(STRUCTURES), COSTS, QUESTIONNAIRES, OREGON, WASHINGTON(STATE) (U)
IDENTIFIERS: TUNNELS (U)

Foundation Sciences. Inc. is determining the feasibility of collecting information on the construction of underground works, especially those of the last twenty years. The gathering and quantitizing of this type of information is being performed for the Oregon and Washington areas as a pilot project. The first phase of the study is the collection of as much of the data as available about the geology, design, construction and performance of existing underground rock excavations and the tabulation of this knowledge for a data bank. To date, all information contained in the 'general data' forms for 256 projects have been entered into the computer. Four general computer programs are employed to obtain accurate answers to specific inquiries and report writing demands. The Inquire and Print program is the only program necessary for the data user and is available to all terminal users at any location in the United States. Detailed operating instructions are included for this program plus a brief discussion of three other programs used to enter the information into the computer. The second phase of the study is the evaluation of data available with special reference to those items of design and construction affecting supports. Two projects have been selected for intensive study. (Author) (U)

AD- 731 593 20/5
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MECHANICAL ENGINEERING

Excitation of Gases Using Wavelength-Tunable Lasers. (U)

71 50P Dewey,C. Forbes , Jr;
CONTRACT: N00014-67-A-0204-0040

UNCLASSIFIED REPORT
Availability: Pub. in Modern Optical Methods in Gas Dynamic Research, p221-270 1971.

DESCRIPTORS: (*LASERS, STATE-OF-THE-ART REVIEWS), GAS LASERS, IRASERS, COHERENT RADIATION, PUMPING(OPTICAL), FREQUENCY MULTIPLIERS, TUNING DEVICES, ATOMIC ENERGY LEVELS, ELECTRON TRANSITIONS (U)
IDENTIFIERS: LIQUID LASERS, NONLINEAR OPTICS, ORGANIC DYE LASERS, SEMICONDUCTOR LASERS, *GAS DYNAMICS, INJECTION LASERS, TUNABLE LASERS (U)

Recent developments in liquid dye lasers, semiconductor lasers, and nonlinear optical techniques have made possible the production of high-intensity monochromatic radiation at wavelengths ranging from the near ultraviolet to the far infrared. Wavelength tuning opens an entirely new dimension in the spectroscopy and resonant excitation of gases. This paper reviews the state-of-the-art in wavelength-tunable lasers. A number of applications are also discussed, including selective excitation spectroscopy, plasma ionization enhancement, and velocity determinations in high-speed gas flow. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 731 493 1/3
LOCKHEED-CALIFORNIA CO BURBANK

Advanced Anti-Torque Concepts Study. (U)

DESCRIPTIVE NOTE: Final rept.,
AUG 71 232P Velazquez,J. L. ;
REPT. NO. LR-24295
CONTRACT: DAAJ02-70-C-0043
PROJ: DA-1-F-162203-A-143
MONITOR: USAAMRDL TR-71-44

UNCLASSIFIED REPORT

DESCRIPTORS: (*ANTITORQUE ROTORS, DESIGN), TAIL HELICOPTER ROTORS, CONFIGURATION, OPTIMIZATION, ROTARY WINGS, ROTOR BLADES(ROTARY WINGS), DUCTED FANS, PATENTS, STATE-OF-THE-ART REVIEWS, SHROUDED PROPELLERS, CONVERTIBLE PLANES (U)

A design study has been conducted by the Lockheed-California Company on advanced antitorque concepts intended to replace tail rotors on conventional single-main-rotor/tail-rotor helicopters. The principal design objectives were to reduce hazard to ground personnel and to reduce vulnerability of helicopters to terrain-contact damage. Secondary objectives were reduced vulnerability to small-arms fire and improvements in dynamic, reliability, maintainability and noise characteristics. Two systems were selected from a broad literature search and subsequent design studies. The first concept is based on a main-rotor-driven axial flow fan internally mounted in the aft fuselage delivering air under pressure to a variable geometry louvered exit for antitorque and/or forward-flight propulsion thrust. The second concept employs a main-rotor-driven ducted fan installed in a central pylon supporting a twin-fin empennage. Results of preliminary design studies applying these concepts to an existing Lockheed Model 286 helicopter are presented in this report, including performance and weight data. Improvements over the research vehicle that could result from applying these concepts to a totally new vehicle, using current state-of-the-art design technology, are also discussed. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 730 179 13/12 1/2
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C FLIGHT STANDARDS SERVICE

Aircraft Fire Detection: Report of Conference Held in Washington, D. C., on 16-17 November 1970. (U)

71 210P

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRCRAFT FIRES, SYMPOSIA), (*FIRE ALARM SYSTEMS, AIRBORNE), DETECTION, VERTICAL TAKE-OFF PLANES, SMOKES, HELICOPTERS, STATE-OF-THE-ART REVIEWS, NAVAL AIRCRAFT, AIR FORCE OPERATIONS, FIRE SAFETY (U)

A symposium on aircraft fire detector systems was held to familiarize Federal Aviation Administration Regional personnel with the characteristics, capabilities, and limitations of the currently available detector systems. A number of presentations were made by representatives of leading fire detector, helicopter, and small airplane manufacturers, and by representatives of the military and the FAA National Aviation Facilities Experimental Center. All aspects of aircraft fire detection were reviewed. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 729 697 9/3 20/12
RESEARCH ADVISORY INST NEWPORT BEACH CALIF

Device Applications of Cryogenics. Part I. Superconducting Electronics. (U)

DESCRIPTIVE NOTE: Final rept. on Phase 1,
JUL 71 360P Clarke,John ;Dick,George J. ;Langenberg,Donald N. ;Little,William A. ; Mercereau,James E. ;
REPT. NO. RAI-100
CONTRACT: N00014-70-C-0133
PROJ: NR-274-110, RF018-02-06

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRONIC EQUIPMENT, *SUPERCONDUCTIVITY), SUPERCONDUCTORS, CRYOGENICS, GALVANOMETERS, VOLTMETERS, MAGNETOMETERS, TRANSFORMERS, RESONATORS, TRANSMISSION LINES, BOLOMETERS, SEMICONDUCTOR DEVICES, INTERFEROMETERS, STANDARDS, REFRIGERATION SYSTEMS, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: METROLOGY, JOSEPHSON JUNCTIONS, CRYOTRONS (U)

The purpose of this study is to present a brief review of the physics of the low temperature phenomenon, superconductivity; to describe the characteristics, technology, and capabilities of electronic devices based on the unusual properties of superconductors; and to indicate some of the ways in which these devices may be applied to the solution of important technological problems. The report also contains a review of the present state of the art of small refrigeration systems applicable to superconducting electronic systems, and discusses the prospects for development of superconducting materials with higher transition temperatures and critical fields. Specific recommendations are made for areas of possible Navy applications of this new electronic technology as well as areas in which further research and development seem appropriate in order to determine Navy use. (Author) (U)

AD- 729 130 5/2
CALIFORNIA UNIV DAVIS DEPT OF HUMAN PHYSIOLOGY

Information Support Systems for Experimental Investigation. (U)

DEC 69 15P Walters,R. F. ;Roth,F. ; Renoud,C. R. G. ;Brin,K. P. ;Morrison,J. T. ;
CONTRACT: AF-AFOSR-1659-69, NGL-05-004-031
PROJ: AF-9777
MONITOR: AFOSR TR-71-2320

UNCLASSIFIED REPORT
Availability: Pub. in Comput. Biol. Med., v1 p75-86 1970.
SUPPLEMENTARY NOTE: Prepared in cooperation with New York Univ., School of Medicine, N. Y.

DESCRIPTORS: (*DATA PROCESSING SYSTEMS, SCIENTIFIC RESEARCH), STATE-OF-THE-ART REVIEWS, INDEXES, INFORMATION RETRIEVAL, MEDICAL RESEARCH, PERFORMANCE(HUMAN), PHYSIOLOGY (U)

The report describes a coordinated Information Support System which is designed to reduce time lags in providing an experimental researcher with essential data during the various phases of his investigations. The system includes an indexing approach for detailed categorization of pertinent references, a microfiche file of original references, a data bank that can be selectively retrieved and various programs that facilitate input and conversion of data. The Information Support System, when coupled with other on-line iteractive programs for simulation and data comparison and analysis, provides a powerful tool which has already benefitted physiological studies of human performance. (Author) (U)

AD- 728 292 20/11 13/13
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA

A Study of Pre-Crack Fatigue. Part I. (U)

DESCRIPTIVE NOTE: Final technical rept., MAY 71 94P Zisfein,Melvin B. ;
REPT. NO. FIRL-F-C2231-2
CONTRACT: F44620-68-C-0068
PROJ: AF-9782
TASK: 978202
MONITOR: AFOSR TR-71-1802

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also AD-722 854.

DESCRIPTORS: (*FATIGUE(MECHANICS), MATERIALS), (*STRUCTURAL PARTS, FATIGUE(MECHANICS)), STATE-OF-THE-ART REVIEWS, NON-DESTRUCTIVE TESTING, DAMAGE, FRACTURE(MECHANICS), STRUCTURAL PROPERTIES, THEORY (U)
IDENTIFIERS: *THRAUSTICS (U)

The report is an examination of current technological posture in materials fatigue, especially that area of fatigue before the formation of a finite or 'technical' crack. A computerized search of the literature was performed by the Defense Documentation Center leading to the establishment of a bibliography which was intensively examined. The various concepts and rules of fatigue damage were critically examined as were their effects on fatigue analysis. The fatigue implications of Non-Destructive Evaluation (NDE) were also reviewed with the objective of recommending new approaches. Throughout all, a number of specific recommendations for future activity were made and discussed. These are summarized at the conclusion of this report. (Author) (U)

AD- 728 224 9/2
COMPUTER RESEARCH CORP NEWTON MASS

Interactive Programming Systems and Languages. (U)

DESCRIPTIVE NOTE: Final rept.,
JUL 71 114P Clapp,Lewis ;
CONTRACT: F44620-67-C-0015
PROJ: AF-9769
MONITOR: AFOSR TR-71-2159

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA PROCESSING SYSTEMS, *TIME SHARING), (*PROGRAMMING LANGUAGES, TIME SHARING), PROGRAMMING(COMPUTERS), ANALOG-DIGITAL COMPUTERS, INPUT-OUTPUT DEVICES, INTERFACES, COMPUTER LOGIC, COMPILERS, ARTIFICIAL INTELLIGENCE, NUMERICAL ANALYSIS, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: MULTIPROGRAMMING, ON LINE COMPUTERS, CENTRAL PROCESSING UNITS, COMPUTER AIDED DESIGN, COMPUTER GRAPHICS, DATA PROCESSING TERMINALS (U)

In an attempt to shed some light on this dynamic new field of time sharing applications, the author has prepared this survey on the state of the art in on-line systems. It is our purpose to help the reader become aware of the important potential of on-line systems, especially as it affects his own areas of specialization and endeavor. In a small way, one hopes to encourage progress in advanced applications of on-line systems by indicating to those developers of new systems what work has gone on before, so that they may build upon this rather than be forced to reinvent the wheel. (Author) (U)

AD- 727 728 11/3 1/5
DOW CHEMICAL CO MIDLAND MICH

Latex Modification of Fast-Fix C-1 Cement for the Rapid Repair of Bomb-Damaged Runways. (U)

DESCRIPTIVE NOTE: Final rept. 16 Apr 70-12 May 71,
MAY 71 203P Eash,R. Douglas ;Hart,G. M. ;
CONTRACT: DACA39-70-C-0022
MONITOR: AEWES CR-C-71-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*CEMENTS, RUNWAYS), (*RUNWAYS, MAINTENANCE), ADDITIVES, PAVEMENTS, DAMAGE, PLASTICS, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: LATEX (U)

The report consists, essentially, of two parts: a state-of-the-art review and laboratory testing of the effects of adding two Dow polymeric latexes to Fast-Fix C-1. The state-of-the-art review covers several basic studies in which many materials, both organic and inorganic, were investigated. The study was then focused on the study of fast-setting inorganic cements and methods to obtain high strength concrete, silicate concrete, and cementitious ceramic materials, are also covered. The state-of-the-art review also has a section indicating areas in which fast-setting cements can serve and the requirements placed on this service. Topics covered are runway design, pavement requirements, pavement evaluation, surface repair, and cold weather construction. In the lab study, two polymeric latexes, Dow Latex 460 and Dow Latex 464, were incorporated at selected concentrations in Fast-Fix C-1 mortars. Tests were conducted to determine freeze-thaw durability, tensile strength, compressive strength, flexural strength, and shear bond. All latex concentrations improved bond strength and freeze-thaw durability and decreased 24-hour water absorption. All concentrations tended to retard set and early strength gain. Low concentrations (4%) of Latex 464 produced a modest improvement in compressive and flexural strengths, but no change in the elastic modulus. (Author) (U)

AD- 726 097 20/4
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

The Transfer of Mass, Momentum and Energy in Free-Particle and Transition Flow Systems. (U)

DESCRIPTIVE NOTE: Final rept.,
JAN 71 247P Patterson,Gordon N. ;
CONTRACT: AF-AFOSR-1481-68
PROJ: AF-9783
TASK: 978301
MONITOR: AFOSR TR-71-1165

UNCLASSIFIED REPORT

DESCRIPTORS: (*RAREFIED GAS DYNAMICS, KINETIC THEORY), SATELLITES(ARTIFICIAL), STATE-OF-THE-ART REVIEWS, MASS TRANSFER, MOMENTUM, ENERGY, MATHEMATICAL MODELS, COMPUTER PROGRAMMING, THEORY, MOLECULAR PROPERTIES, CANADA (U)
IDENTIFIERS: FREE MOLECULE FLOW, TRANSITION FLOW (U)

A final report is made on the transfer of mass, momentum and energy in free-particle and transaction flow systems. It includes a state-of-the-art survey of the kinetic theory of gas flows based on reviews of basic background information. The report describes a study in the free particle regime in the hyperthermal free-molecule flow with application to satellite drag. Schamberg's reflection model is applied in the calculation of drag coefficients for convex bodies in free molecule flows and of the torque exerted on the Explorer 6 satellite. The same reflection model is also used for the calculation of the molecular transmission probability for conical tubes in hyperthermal free molecule flow. An experimental electron beam study of diffusive separation in transition-flow aerodynamic situations is noted. A method based on the studies has been developed to determine the ambient temperature and density of the major components of the upper atmosphere. (Author) (U)

UNCLASSIFIED

AD- 725 617 13/2
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

Investigation of Sinking Methods for Removal of Oil Pollution from Water Surfaces. Phase I: Survey of the State-of-the-Art. (U)

FEB 71 70P Houston,B. J. ;
CONTRACT: DOT-CG-00583-B
PROJ: CG-704110
MONITOR: USCG 704110/A/001-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*WATER POLLUTION, OILS), (*ABSORPTION(PHYSICAL), *OILS), STATE-OF-THE-ART REVIEWS, REMOVAL, CARBONATES, SULFATES, ASBESTOS, SAND, TOXICITY (U)
IDENTIFIERS: *OILS, *POLLUTION, OILS, POLLUTION, REMOVAL, BARITE, CALCIUM CARBONATES, FLY ASH (U)

The objective of the program was to investigate materials that can be utilized in the cleanup of massive oil spills by sinking the oil. Articles and publications were reviewed to locate and develop information on sinking absorbers. Literature pertaining to sinking absorbers was not abundant and most of the work that has been done was done in Europe, especially in England. It is believed, however, that practically all information of any value pertaining to sinking absorbers was located and processed. Eighteen materials offered by manufacturers have been located for investigation as sinking absorbers: one latex treated barite, one treated chalk, five expansive clays, three talcs (treated and untreated), three asbestos materials (treated and untreated), three treated snads, and two treated fly ashes. Based on results of the literature survey and on information supplied by the manufacturers, the 18 materials are assessed and rated herein with regard to effectiveness in absorbing and sinking oil, effectiveness in retaining oil, availability and cost of the material, hazards to personnel and plant and animal life, and difficulty of application. It is emphasized that the assessments and ratings are tentative, based on current knowledge of the materials, and thus may change drastically as more information is gathered. (U)

AD- 724 185 1/3 1/1
BOEING CO PHILADELPHIA PA VERTOL DIV

STOL High-Lift Design Study. Volume I. State-of-the-Art Review of STOL Aerodynamic Technology. (U)

DESCRIPTIVE NOTE: Final rept. Jan-Dec 70,
APR 71 205P May,Fred ;Widdison,Colin A. ;
REPT. NO. D210-10201-1
CONTRACT: F33615-70-C-1277
MONITOR: AFFDL TR-71-26-Vol-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-724 186.

DESCRIPTORS: (*SHORT TAKEOFF AIRCRAFT, *AERODYNAMICS), STATE-OF-THE-ART REVIEWS, LIFT, DESIGN, FLAPS(CONTROL SURFACES), PITCH(MOTION), PROPULSION SYSTEMS, MATHEMATICAL PREDICTION (U)
IDENTIFIERS: SLIPSTREAM (U)

The state of the art of STOL aerodynamic technology for selected lift/propulsion concepts was surveyed to identify the available test data and prediction methods in the literature. The report consists of two volumes. In Volume I important areas of technology and information necessary for the evaluation of STOL aircraft aerodynamics are listed; the aerodynamic test data and prediction methodology relevant to the deflected slipstream and externally blown flap concepts are assessed, with emphasis on the latter; an empirical method for the prediction of the longitudinal aerodynamic characteristics of externally blown flap configurations is presented; and high-lift technology for five lift/propulsion concepts is assessed in application to a medium-sized STOL transport. (Author) (U)

AD- 723 848 21/5
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

Small Gas Turbines for Helicopters and Surface Transport. (U)

DESCRIPTIVE NOTE: Lectures series.
MAY 71 142P
REPT. NO. AGARD-LS-46-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO furnished.

DESCRIPTORS: (*GAS TURBINES, *SYMPOSIA), (*HELICOPTER ENGINES, GAS TURBINES), (*SURFACE PROPULSION, GAS TURBINES), VEHICLES, STATE-OF-THE-ART REVIEWS, RELIABILITY, LIFE EXPECTANCY, EXHAUST GASES, TURBINE PARTS, PERFORMANCE(ENGINEERING) (U)

After a survey of the field of application for small gas turbines, to replace reciprocating engines for helicopters and surface vehicles propulsion, the present state-of-the-art is reviewed together with problems related to reliability, life time, pollution regulation, weight and volume according to various applications. Conventional and advanced cycles (cycle of Nernst cycle with heat exchange) will be compared. A description of components (compressors, combustion chanber, turbines, nozzles, shafts with various configurations) will be followed by a review of industrial and technological problems. The use of small gas turbines for power generation, auxiliary stand by or emergency power plant is then presented. The last paper is a survey of future possible developments and performance improvements (mixed diesel and turbines--use of high temperature materials). (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 723 586 17/2 5/10
HASKINS LABS NEW HAVEN CONN

Speech Research: A Report on the Status and Progress of Studies on the Nature of Speech, Instrumentation for Its Investigation, and Practical Application. (U)

DESCRIPTIVE NOTE: Status rept. 1 Jul-30 Sep 70.
SEP 70 212P
REPT. NO. SR-23-1970
CONTRACT: N00014-67-A-0129-0001, PHS-DE-01774

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also report dated 30 Jun 70, AD-719 382.

DESCRIPTORS: (*SPEECH, *STATE-OF-THE-ART REVIEWS), PHONETICS, AUDITORY PERCEPTION, HEARING, SYNTHESIS, TIME, INSTRUMENTATION (U)

The reports are state-of-the-art reviews of work central to the Laboratories' areas of research: phonetics--an overview; the perception of speech; physiological aspects of articulatory behavior; laryngeal research in experimental phonetics; speech synthesis for phonetic and phonological models; on time and timing in speech; a study of prosodic features. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 723 392 4/2
AIR WEATHER SERVICE SCOTT AFB ILL

Forecasters' Guide to Tropical Meteorology. (U)

DESCRIPTIVE NOTE: Technical rept.,
APR 71 361P Atkinson,Gary D. ;
REPT. NO. AWS-TR-240

UNCLASSIFIED REPORT

DESCRIPTORS: (*WEATHER FORECASTING, *TROPICAL REGIONS), AIR FORCE OPERATIONS, INSTRUCTION MANUALS, CLIMATE, ATMOSPHERIC MOTION, MATHEMATICAL MODELS, TROPICAL CYCLONES, BAROMETRIC PRESSURE, ATMOSPHERIC TEMPERATURE, HUMIDITY, CLOUDS, RAINFALL, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: SYNOPTIC METEOROLOGY (U)

A practical manual is presented for training and reference use of USAF weather forecasters who will work in the tropics. It covers basic facts of climatology circulation, synoptic models, analysis and forecasting, applicable throughout the tropics. A broad survey is made of the literature, evaluated in light of the experience of the author. Physical factors controlling tropical circulations are briefly discussed. The data sources for synoptic purposes are reviewed. Climatology of pressure, winds, temperature, humidity, clouds, rainfall and disturbances is presented in a form specially suitable for forecasters. Analysis and forecasting of disturbances, cyclones, severe weather, terminal weather, etc., are treated at length. Emphasis is placed on uses of climatology and satellite cloud photos. Over 230 figures adapted from the literature or prepared by the author serve to illustrate all the essential facts and principles discussed. A summary of the state of art and future outlook of tropical meteorology is included. (Author) (U)

AD- 720 843 9/2
HAWAII UNIV HONOLULU

Computers in Japan. (U)

DESCRIPTIVE NOTE: Technical rept.,
JAN 71 26P Kuo,Franklin F. ;
REPT. NO. THEMIS-A71-1
CONTRACT: F44620-69-C-0030
PROJ: AF-9749
MONITOR: AFOSR TR-71-0738

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Report on the Aloha System.

DESCRIPTORS: (*COMPUTERS, JAPAN), STATE-OF-THE-ART REVIEWS, PROGRAMMING LANGUAGES, TIME SHARING, INDUSTRIES, GRAPHICS, PERFORMANCE(ENGINEERING) (U)
IDENTIFIERS: ALOHA SYSTEM, THEMIS PROJECT, COMPUTERS, GRAPHICS, COMPUTERS (U)

A critical examination of the Japanese computer industry is presented. Some firstnand observations of current projects and practices in computing in Japan are also given. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 720 260 17/7
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

A Literature Survey on the Gyroscope and Its Applications, (U)

FEB 71 20P Sorg,Helmut ;
REPT. NO. AGARD-582

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO furnished.

DESCRIPTORS: (*GYROSCOPES, *BIBLIOGRAPHIES), STATE-OF-THE-ART REVIEWS, INERTIAL NAVIGATION, INSTRUMENTATION, DYNAMICS, FLIGHT CONTROL SYSTEMS, GYRO COMPASSES, SPACE NAVIGATION, MATHEMATICAL MODELS, THEORY, AIRCRAFT EQUIPMENT, AUTOMATION, ERRORS, GYRO STABILIZERS, CLASSIFICATION (U)
IDENTIFIERS: NATO, ANNOTATED BIBLIOGRAPHIES, GYRODYNAMICS (U)

The purpose of the report is to offer engineers and scientists a listing of books which are readily available from commercial sources, as well as from various documentation centers and libraries. Only books which were unclassified and unrestricted were considered for this bibliographical listing. This list is a comprehensive tabulation of works by engineers and scientists in the various NATO nations. It also includes some Russian texts on the subject, many of which have been translated into English. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0MO7

AD- 719 902 6/19
NAVAL AIR DEVELOPMENT CENTER WARMINSTER PA AEROSPACE MEDICAL RESEARCH DEPT

A Review of Experimental Data on the Cardiovascular Response to Acceleration, (U)

DEC 70 23P Goodhart,Glen L. ;
REPT. NO. NADC-MR-7004
PROJ: MF12.524
TASK: MF12.524.005
MONITOR: NAVMED MF12.524.005-7001-14

UNCLASSIFIED REPORT

DESCRIPTORS: (*CARDIOVASCULAR SYSTEM, *ACCELERATION TOLERANCE), STATE-OF-THE-ART REVIEWS, STRESS(PHYSIOLOGY), SIMULATION, GRAVITY, CEREBROSPINAL FLUID, VEINS, ARTERIES, PULSE RATE, HUMANS, LABORATORY ANIMALS, EXPERIMENTAL DATA, NAVAL RESEARCH (U)
IDENTIFIERS: COMPUTERIZED SIMULATION (U)

Controlled physiological responses to gravitational stress is a major concern in cardiovascular simulation. Information pertaining to the physiological effects of positive acceleration on the cardiovascular system has been gathered from the literature and is presented in light of requirements for cardiovascular simulation. Both generalized and long term responses to G stress are considered as well as the transient G studies that were available. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0MO7

AD- 718 828 6/6 17/2.1
NAVAL ELECTRONIC SYSTEMS COMMAND WASHINGTON D C

SANGUINE System Environmental Compatibility Assurance Program (ECAP). (U)

DESCRIPTIVE NOTE: Status rept. 1967-70,
DEC 70 375P Carlson,Richard E. ;
PROJ: PME-117-21

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTROMAGNETIC FIELDS, EXTREMELY LOW FREQUENCY), (*GLOBAL COMMUNICATION SYSTEMS, EXTREMELY LOW FREQUENCY), (*ECOLOGY, ELECTROMAGNETIC FIELDS), TEST FACILITIES, ENVIRONMENT, MANAGEMENT PLANNING AND CONTROL, BIOCHEMISTRY, SAFETY, STATE-OF-THE-ART REVIEWS, THEORY, PLANTS(BOTANY), RADIOFREQUENCY INTERFERENCE (U)
IDENTIFIERS: SANGUINE PROJECT (U)

The Project SANGUINE environmental compatibility assurance program is described: its goals, work accomplished and results to date are presented. Part 1 is the program overview. The ECAP, the SANGUINE environment, the program status, and future research plans are outlined. Part 2 is a summary of major program areas. Biological and ecological assurance includes pertinent literature, electrical safety, biological and biochemical research, ecological surveys, heart pacer experiments and associated activities. Facilities construction and operation assurance addresses environmental awareness, land acquisition and joint use, installation, land restoration and coordination. Interference mitigation describes interference theories, systems and devices susceptible to extremely low frequency (ELF) interference, interference mitigation thresholds, techniques and practices. Part 3 is a description of the program management. Supporting technical documentation is provided in four appendices. (Author) (U)

AD- 718 811 13/5 13/8
NAVAL ORDNANCE LAB WHITE OAK MD

A Survey of the Ultrasonic Inspection of Welds. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jul 65-30 Jun 66,
FEB 67 44P Yousnaw,Robert A. ;
REPT. NO. NOLTR-67-29
PROJ: NOL-693

UNCLASSIFIED REPORT

DESCRIPTORS: (*WELDS, NONDESTRUCTIVE TESTING), (*NONDESTRUCTIVE TESTING, ULTRASONIC RADIATION), STATE-OF-THE-ART REVIEWS (U)

A state-of-the-art survey was made on the ultrasonic inspection of welds including a thorough search of the literature and personal contacts with representatives of companies engaged in fabricating and inspecting steel welds. In general this survey revealed that both the technology and equipment are available for weld inspection by ultrasonics. Many examples of successful application are cited. The survey also revealed that many potential applications with economic advantage are precluded by contractual agreements which specify a different form of testing. This and other problems which retard the further usage of ultrasonics are discussed and recommendations are made. (U)

AD- 718 096 9/1 17/5 17/8 20/12
AEROSPACE CORP EL SEGUNDO CALIF LAB OPERATIONS

Photodetectors for the 0.1 Micrometer to 1 Micrometer Spectral Region, (U)

JAN 71 212P Seib,David H. ;Aukerman, Lee W. ;
REPT. NO. TR-0059(9230-20)-1
CONTRACT: F04701-70-C-0059
MONITOR: SAMSO TR-71-14

UNCLASSIFIED REPORT

DESCRIPTORS: (*SEMICONDUCTOR DEVICES, PERFORMANCE(ENGINEERING)), (*INFRARED DETECTORS, STATE-OF-THE-ART REVIEWS), (*ULTRAVIOLET DETECTORS, STATE-OF-THE-ART REVIEWS), PHOTODIODES, PHOTOELECTRIC MATERIALS, PHOTOCONDUCTIVITY, PHOTOELECTRIC EFFECT, PHOTOTUBES, PHOTOMULTIPLIER TUBES, AVALANCHE DIODES, ALKALI METAL COMPOUNDS, INFRARED SPECTRA, PHOTOCATHODES, BAND THEORY OF SOLIDS, GAIN, SIGNAL-TO-NOISE RATIO, PHOTOELECTRIC CELLS(SEMICONDUCTOR), ULTRAVIOLET SPECTRA, VISIBLE SPECTRA, IONIZATION CHAMBERS (U)
IDENTIFIERS: *PHOTODETECTORS (U)

The state of the art of detectors of electromagnetic radiation in the wavelength region 0.1 micrometer to 1 micrometer is reviewed. The types of detectors considered are photoemissive detectors, semiconductor junction detectors, photoconductors, and photoionization chamber devices. For each type of detector the theory of operation and general material and device properties, including spectral response, frequency response, noise properties, etc., are discussed. The actual properties of presently available, state-of-the-art detectors are summarized. Finally, a comparison of the detectivities possible with the various types of detectors over the 0.1 micrometer to 1 micrometer wavelength range is given. Comparisons of other relevant detector properties (speed of response, reliability) are also included. (Author) (U)

AD- 717 655 1/4
AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO

The Feasibility of Utilizing Color Cathode Ray Tubes for Aircraft Crew Station Displays. (U)

DESCRIPTIVE NOTE: Technical rept. Feb-May 70,
NOV 70 47P Vokits,Ronald S. ;
REPT. NO. ASD-TR-70-33

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLIGHT INSTRUMENTS, COLOR TELEVISION TUBES), (*COLOR TELEVISION TUBES, DISPLAY SYSTEMS), FEASIBILITY STUDIES, STATE-OF-THE-ART REVIEWS, CATHODE RAY TUBE SCREENS (U)

The report compiles the characteristics of various state-of-the-art color cathode ray tubes (CRT's). The structures, theory of operation, and technical advantages and disadvantages of the various color CRT's for use in aircraft display instruments are evaluated. The results of the study were that presently available types of color CRT's are not suitable for cockpit displays and the Penetron and other non-patterned screens could be used in low ambient light areas. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 716 953 5/9
FLORIDA STATE UNIV TALLAHASSEE COMPUTER-ASSISTED INSTRUCTION CENTER

The Development and Implementation of a Model for the Design of Individualized Instruction at the University Level. (U)

DESCRIPTIVE NOTE: Technical rept.,
OCT 70 208P Lipe,James Gary ;
REPT. NO. CAI-TR-15
CONTRACT: N00014-68-A-0494
PROJ: NR-154-280

UNCLASSIFIED REPORT

DESCRIPTORS: (*INSTRUCTORS, TRAINING), (*UNIVERSITIES, INSTRUCTORS), (*PROGRAMMED INSTRUCTION, ADAPTIVE SYSTEMS), MODELS(SIMULATIONS), TEACHING METHODS, STATISTICAL PROCESSES, CORRELATION TECHNIQUES, STATE-OF-THE-ART REVIEWS, ANALYSIS, DESIGN, PREDICTIONS (U)
IDENTIFIERS: INSTRUCTION MODELS (U)

The study involved the development and implementation of the Production, Implementation Evaluation and Revision of Instructional Modules (PIERIM) model for the design of individualized instruction. PIERIM is designed as an interactive model with activities explicitly prescribed for the instructor and the educational technologist. PIERIM's purpose is to provide a means by which the content of existing teacher training programs can be transformed into a format (i.e., instructional modules) which is compatible with an individualized teacher training program. The PIERIM model was also compared with two other system models for the design of instruction. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 716 503 6/12
WESTINGHOUSE ELECTRIC CORP PITTSBURGH PA HEALTH SYSTEMS DEPT

Systems Analysis Study Towards a 'New Generation' of Military Hospitals. Volume IV. State-of-the-Art. (U)

DESCRIPTIVE NOTE: Final rept. 25 Jun 69-24 Nov 70 on Phase 1.
NOV 70 407P
CONTRACT: DAHC15-69-C-0354, ARPA Order-1494

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-716 502 and Volume 5, AD-716 504.

DESCRIPTORS: (*HOSPITALS, SYSTEMS ENGINEERING), (*MILITARY MEDICINE, HOSPITALS), STATE-OF-THE-ART REVIEWS, INVENTORY, MEDICINE, DIAGNOSIS(MEDICINE), PUBLIC HEALTH, MEDICAL LABORATORIES, DENTISTRY, COSTS, SURGERY, NUTRITION, MONITORS, PHYSIOLOGY, MEDICAL PERSONNEL, MANAGEMENT PLANNING AND CONTROL, TRAINING, RADIOGRAPHY (U)
IDENTIFIERS: *MEDICAL SERVICES, *MILITARY HOSPITALS, *MULTIPHASIC HEALTH TESTING, *PREVENTIVE MEDICINE (U)

The volume presents the State of the Art (SOA) of sixteen areas related to the Base Level Health Care System. For each area, the SOA improvement alternatives that are now available or will be by 1972, and the advanced technology improvement alternatives likely to be available in the 1972 - 1980 time frame are presented. The survey forms a major data resource for the Systems Analyses volume of this report. The sixteen areas surveyed were: General medicine; clinical laboratory; communications and data management; construction; dentistry; dietary; education and training; maintenance and housekeeping; materiel handling; multiphasic testing; pharmacy; physiological monitoring; planning; radiology; sterilization; and ward management. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 716 502 6/12
WESTINGHOUSE ELECTRIC CORP PITTSBURGH PA HEALTH SYSTEMS DEPT

Systems Analysis Study Towards a 'New Generation' of Military Hospitals. Volume III. Medical Health Care Review. (U)

DESCRIPTIVE NOTE: Final rept. 25 Jun 69-24 Nov 70 on Phase 1.
NOV 70 118P
CONTRACT: DAHC15-69-C-0354, ARPA Order-1494

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-716 501 and Volume 4, AD-716 503.

DESCRIPTORS: (*HOSPITALS, SYSTEMS ENGINEERING), (*MILITARY MEDICINE, HOSPITALS), DESIGN, EFFECTIVENESS, EFFICIENCY, COSTS, OPERATION, PUBLIC HEALTH, MANAGEMENT PLANNING AND CONTROL, MODELS(SIMULATIONS), MILITARY PERSONNEL, MEDICAL PERSONNEL, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: *MEDICAL SERVICES, *MILITARY HOSPITALS (U)

The data presented were collected by the Westinghouse Medical Health Care Review Team, composed of physicians, nurses and a hospital administrator, during interviews and observations at the three primary Base Level Health Care Systems (BLHCS). The basic objective of this study was to identify and evaluate the critical elements within the BLHCS which directly or indirectly affect the delivery of professional services. Results of observations/interviews and recommendations are presented for the following five elements basic to effective operation of a BLHCS: The quality of personnel (i.e., qualifications, assignments and continuing education); the facilities (space, beds, special care and diagnostic units and equipment); the professional services (diagnostic, therapeutic and special); policies and practices for basic health services (outpatient and emergency department, admissions, etc.); quality control (tissue and hospital stay committees, death-complication conferences etc.). (Author) (U)

AD- 715 674 20/1 20/12
NORTHWESTERN UNIV EVANSTON ILL INFORMATION-PROCESSING AND CONTROL SYSTEMS LAB

Surface Microacoustics. (U)

DESCRIPTIVE NOTE: Technical rept.,
SEP 70 89P Epstein,Max ;
REPT. NO. TR-70-101
CONTRACT: N00014-67-A-0356-0003, ARPA Order-1129

UNCLASSIFIED REPORT

DESCRIPTORS: (*ULTRASONIC RADIATION, MICROWAVE FREQUENCY), STATE-OF-THE-ART REVIEWS, BIBLIOGRAPHIES, PIEZOELECTRIC CRYSTALS, SEMICONDUCTORS, CADMIUM SULFIDES, MAGNETOSTRICTION, RADAR EQUIPMENT (U)
IDENTIFIERS: LITHIUM NIOBATES, LOVE WAVES, MAGNETOELASTIC EFFECTS, MAGNONS, *MICROACOUSTICS, *ACOUSTICS, *MICROWAVES, *ACOUSTIC WAVES, *SURFACE WAVES, PIEZOELECTRIC MATERIALS, SEMICONDUCTORS, INTERDIGITAL TRANSDUCERS, SURFACE WAVES (U)

The report contains an introduction to the field of surface microacoustics. It includes a review of the present state-of-the-art, and an annotated bibliography. (Author) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 714 693 20/11
CALIFORNIA UNIV LOS ANGELES DEPT OF MATERIALS

Recent Developments in Macroscopic and Microscopic Fracture Mechanics. (U)

DESCRIPTIVE NOTE: Technical rept.,
SEP 70 50P Tetelman,Alan S. ;
REPT. NO. TR-2
CONTRACT: DAHC04-69-C-0008
PROJ: DA-2-0-061102-B-32-D
MONITOR: AROD 8016:2-MC

UNCLASSIFIED REPORT

DESCRIPTORS: (*FRACTURE(MECHANICS), STATE-OF-THE-ART REVIEWS), ALLOYS, PREDICTIONS (U)

The report presents a brief state-of-the-art review of the science and application of Fracture Mechanics Technology as of Spring 1970. Part 1 contains a brief introduction to fracture mechanics and fracture toughness. Part 2 illustrates how various fracture toughness data correlate with each other. In Part 3 relations between macroscopic and microscopic aspects of fracture in low alloy steels are presented. In Part 4, the fracture behavior of high strength materials is treated, while Part 5 deals with some aspects of safe-life prediction in alloys. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 713 915 14/2 19/4
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

Ballistic-Range Technology. (U)

DESCRIPTIVE NOTE: AGARDograph rept., AUG 70 513P Canning,Thomas N. ;Seiff, Alvin ;James,Carlton S. ;
REPT. NO. AGARD-AG-138-70

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO furnished.

DESCRIPTORS: (*RANGES(FACILITIES), CONFIGURATION), (*BALLISTICS, EXPERIMENTAL DATA), EXTERIOR BALLISTICS, TERMINAL BALLISTICS, LIGHT GAS GUNS, SABOT PROJECTILES, WIND TUNNELS, HYPERVELOCITY GUNS, DETECTORS, MEASURING INSTRUMENTS, MEASURING INSTRUMENTS, AERODYNAMIC CHARACTERISTICS, STATE-OF-THE-ART REVIEWS (U)

The report is a comprehensive treatment of the state-of-the-art of ballistic-range testing, written for graduates by members of the staffs of the Hypersonic Free-Flight Branch at NASA-Ames Research Center and the Aerophysics Division of the Defence Research Establishment of Canada. The capability and potential of ballistic ranges are not as widely appreciated as they deserve to be and the book aims to show the opportunities they afford for experimental research in ballistic-missile aerodynamics, to point out the problems involved, to guide the preliminary design of new ballistic ranges, to provide reference material to enable full exploitation of existing ranges, and to help in evaluating the applicability and accuracy of results. Individual chapters deal with modern ranges and their uses, light-gas guns, model design and launching techniques, terminal ballistics, counterflow, measurement systems, aerodynamics of bodies from motion analysis, photographic techniques, optical radiation studies, microwave studies, point measurements in the wake and convective-heating measurements. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 713 794 13/10.1
NAVAL INTELLIGENCE COMMAND ALEXANDRIA VA TRANSLATION DIV

SUBMARINES VERSUS SUBMARINES, (U)

OCT 70 41P Suzdalev,N. I. ;
REPT. NO. NIC-Trans-3130

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Trans. of mono. Podvodnie Lodki Protiv Podvodnikh Lodok, n.p., 1968 p45-87.

DESCRIPTORS: (*SUBMARINES, NUCLEAR POWERED SHIPS), MARINE NUCLEAR PROPULSION, BALLISTIC MISSILE SUBMARINES, GUIDED MISSILESUnderwater-to-surface), antisubmarine ammunition, rockets, submarine hulls, state-of-the-art reviews, ussr (U)
IDENTIFIERS: NATO COUNTRIES, TRANSLATIONS (U)

The report is a state-of-the-art review of present and proposed nuclear powered submarines of various non-communist countries. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 713 656 6/12 9/2
PHILCO-FORD CORP PALO ALTO CALIF WESTERN DEVELOPMENT LABS

FEASIBILITY STUDY AUTOMATED MEDICAL EXAMINING SYSTEM STATE-OF-THE-ART SURVEY - DATA PROCESSING EQUIPMENT. (U)

DESCRIPTIVE NOTE: Rept. on Phase 1, 1 Dec 69-25 Aug 70.
SEP 70 114P
REPT. NO. WDL-TR-4173-Aug-70
CONTRACT: F41609-70-C-0012
PROJ: AF-7996
TASK: 799603
MONITOR: SAM TR-70-84

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also AD-713 655.

DESCRIPTORS: (*DATA PROCESSING, STATE-OF-THE-ART REVIEWS), (*MEDICAL EXAMINATION, AUTOMATION), COMPUTERS, FEASIBILITY STUDIES, COMPUTER PROGRAMS, DATA STORAGE SYSTEMS, COSTS, RELIABILITY, MAINTENANCE, EFFICIENCY (U)

The survey was conducted to identify all existing equipment and procedures capable of accomplishing recommended improvements in Armed Forces Entrance and Examination Station operations. This survey classifies the alternative devices or procedures which should be considered for each AFEES data handling function in order of estimated merit based upon such factors as cost, reliability, maintainability and personnel requirements. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 713 655 6/12 9/2
PHILCO-FORD CORP PALO ALTO CALIF WESTERN DEVELOPMENT LABS

FEASIBILITY STUDY AUTOMATED MEDICAL EXAMINING SYSTEM STATE OF THE ART SURVEY - MEDICAL. (U)

DESCRIPTIVE NOTE: Rept. on Phase 1, 1 Dec 69-29 May 70.
SEP 70 157P
REPT. NO. WDL-TR-4173-May-70
CONTRACT: F41609-70-C-0012
PROJ: AF-7996
TASK: 799603
MONITOR: SAM TR-70-83

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also AD-713 656.

DESCRIPTORS: (*MEDICAL EXAMINATION, AUTOMATION), (*MEDICAL EQUIPMENT, STATE-OF-THE-ART REVIEWS), FEASIBILITY STUDIES, TEST METHODS, MEDICAL LABORATORIES, DATA PROCESSING, COMPUTERS, MEDICAL PERSONNEL, COSTS, RELIABILITY, EFFICIENCY (U)

The survey was conducted to identify all existing equipment and procedures capable of accomplishing recommended improvements in the Armed Forces Entrance and Examination Stations (AFEES) physical examination. This survey classifies the alternative devices or procedures which should be considered for each AFEES medical function in order of estimated merit based upon such factors as cost, reliability, maintainability, personnel requirements, data handling requirements, and resistance to malingering. (Author) (U)

AD- 713 644 8/13 13/2
WATER RESOURCES ENGINEERS INC WALNUT CREEK CALIF*

EROSION CONTROL ON AIR FORCE BASES. (U)

DESCRIPTIVE NOTE: Technical note,
AUG 70 25P Hay,DeLynn R. ;Kibler,D.
F. ;Busby,C. E. :
CONTRACT: F29601-69-C-0039
PROJ: AF-921A
TASK: 921A06
MONITOR: WLC TN-70-018

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Annual Meeting of the American Society of Agronomy, Div. A-2, Tucson, Ariz., 24-28 Aug 70.

DESCRIPTORS: (*EROSION, CONTROL), (*SOILS, EROSION), (*CONSTRUCTION, MILITARY FACILITIES), STATE-OF-THE-ART REVIEWS, CONTROL, RAINFALL, DRAINAGE, INTENSITY, EXPOSURE(PHYSIOLOGY), TERRAIN, WIND, WATER, PARTICLES, AIR FORCE OPERATIONS (U)
IDENTIFIERS: *CONTROL, *EROSION (U)

A state-of-the-art review of the soil erosion field as it relates to the erosion control needs of the US Air Force was conducted. The review will serve as a guide for preparation of a Base Civil Engineer erosion control handbook. Typical military construction activities which have exposed large areas of unprotected soil and subsequently have led to serious erosion problems are presented. Factors involved in the wind and erosion processes are discussed and soil-loss equations and soil erodibility indices are reviewed. The erodibility K-factor in the ARS soil-loss equation is evaluated for land management planning techniques. Guidelines for effective erosion control practices to protect exposed land surfaces against soil particle detachment and transport by either water or wind are presented. Further efforts to establish a more reliable erodibility index which can be used to define areas of highly erodible soils, especially for subsurface soils that are exposed during construction are indicated. (Author) (U)

AD- 712 314 15/3
STANFORD RESEARCH INST MENLO PARK CALIF

THE USE OF SYSTEMS TECHNIQUES IN CIVIL DEFENSE. (U)

DESCRIPTIVE NOTE: Final rept.,
MAY 70 186P Devaney,John F. ;
CONTRACT: DAHC20-67-C-0136
PROJ: OCD-2313A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with URS Research Co., San Mateo, Calif., Rept. no. URS-691.

DESCRIPTORS: (*CIVIL DEFENSE, *SYSTEMS ENGINEERING), RESEARCH MANAGEMENT, STATE-OF-THE-ART REVIEWS, TRAINING, BUDGETS, UNITED STATES GOVERNMENT, SHELTERS, COST EFFECTIVENESS (U)
IDENTIFIERS: EVALUATION (U)

Civil defense has the attributes of a system and the techniques of systems evaluation have been applied in the development of policy and programs since the middle 1950's. Advances have been made in the state-of-the-art of civil defense and of systems evaluation. Application of systems evaluation techniques to civil defense is reviewed. A modified analytic framework is presented with definitions, graphic aids, and a qualitative demonstration of the method and of tis application to other activities such as: operational planning, organization, training, and so on. (Author) (U)

AD- 712 301 14/2 8/11 13/2
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

GELATIN MODELING METHODS FOR THE STUDY OF FOUNDATION DYNAMICS GROUND MOTION, AND SEISMIC PHENOMENA, (U)

FEB 68 40P Paek,Yong K. ;Heller,Lyman W. ;
REPT. NO. AEWES-Misc-Paper-4-969
PROJ: DA-1-L-013001-A-91-A

UNCLASSIFIED REPORT

DESCRIPTORS: (*SEISMOLOGY, MODELS(SIMULATIONS)), (*FOUNDATIONS(STRUCTURES), SEISMIC WAVES), GELATINS, STATE-OF-THE-ART REVIEWS, ELASTIC PROPERTIES, LIFE EXPECTANCY, COSTS (U)
IDENTIFIERS: GROUND MOTION (U)

The objective of this study was to assess by means of a literature review the state-of-the-art in gelatin modeling methods to determine if they can be successfully exploited for solving difficult problems in the field of foundation dynamics, ground motion, and seismic phenomena. Important practical problems such as the influence of multiple layers, variable thickness of layers, and rough interfaces on ground motion and seismic wave propagation might be formulated, studied, and evaluated with these techniques. Gelatin modeling holds promise for effective use in the study of alternate remedial approaches for the stabilization of existing foundations that may become inadequate for future operational requirements. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 711 267 13/10 20/4
TELEDYNE MATERIALS RESEARCH CO WALTHAM MASS

SLAMMING OF SHIPS: A CRITICAL REVIEW OF THE CURRENT STATE OF KNOWLEDGE. (U)

DESCRIPTIVE NOTE: Technical rept.,
70 48P Henry,J. R. ;Bailey,F. C. ;
CONTRACT: N00024-67-C-5312, N00024-69-C-5231
PROJ: SR172
MONITOR: SSC 208

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Sponsored in part by Contract NObs-94252.

DESCRIPTORS: (*SHIPS, *HYDRODYNAMICS), (*SHIP HULLS, IMPACT), STATISTICAL ANALYSIS, DESIGN, STATE-OF-THE-ART REVIEWS, CARGO SHIPS (U)
IDENTIFIERS: WOLVERINE STATE VESSEL, *SLAMMING (U)

The review of bottom slamming phenomena was undertaken to assure that maximum value will be gleaned from recorded data obtained on the SS Wolverine State. The review covers experimental laboratory and ship data and their correlation with available theory; and structural implications and possible design improvements. Although there are certain areas in the theory which require expansion, the most pressing need is for additional full-scale experimental data to provide confirmation of existing analytical techniques. (Author) (U)

AD- 709 294 20/13 7/4
CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF PHYSICS

SUPERCONDUCTIVITY AND THE PERIODIC SYSTEM. (U)

70 7P Mattnias,Bernd T. ;
CONTRACT: AF-AFOSR-631-67
PROJ: AF-9763
TASK: 976303
MONITOR: AFOSR 70-1967TR

UNCLASSIFIED REPORT
Availability: Pub. in American Scientist, v58 n1 p80-83 Jan-Feb 70.

DESCRIPTORS: (*SUPERCONDUCTIVITY, CHEMICAL ELEMENTS), STATE-OF-THE-ART REVIEWS, TRANSITION TEMPERATURE, MAGNETIC PROPERTIES, ATOMIC ORBITALS (U)
IDENTIFIERS: BCS THEORY (U)

In the past, when there was not the rigid and rather arbitrary split between physics and chemistry that we find now, Mendeleev's periodic system for the elements was a major foundation of the natural sciences. Gradually, after the discovery of the Pauli principle, the concern of physicists with the periodic system began to fade, since the basic explanation for the periodicity was now given. And finally, today, its use is almost considered the trademark of an alchemist. Yet, by paying close attention to the rather elementary systematics of the periodic system, we have managed to discover many hundreds of new superconductors and to raise the transition temperatures to their present maximum value, namely one half of a degree above the boiling point of liquid hydrogen at atmospheric pressures. (Author) (U)

AD- 709 086 5/10
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

DYNAMIC DEPTH PERCEPTION. (U)

DESCRIPTIVE NOTE: Master's thesis,
APR 70 48P Rolstad,Lawrence Arian ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*VISUAL ACUITY, MOTION), (*SPACE PERCEPTION, PERFORMANCE(HUMAN)), VISION, NAVAL RESEARCH, RESPONSE(BIOLOGY), STATE-OF-THE-ART REVIEWS, THRESHOLDS(PHYSIOLOGY), STATISTICAL DATA, CORRELATION TECHNIQUES, PERFORMANCE(HUMAN), THESES (U)

A review of research in visual acuity and depth perception of moving objects disclosed differing estimates of the relation between dynamic and static vision performance. Additionally, two distinct types of responses appear in distance estimates for moving targets as well as the elapsed time estimates for partially concealed targets. The possible relation of this depth estimation error dichotomy to lateral phoria is discussed. An experiment demonstrates that the depth estimation error dichotomy, if it exists, is not related to phoria and is independent of the direction of target motion. Further evidence of the lack of correlation between dynamic and static depth perception is presented. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 708 028 5/1 9/2 15/7 5/2
PLANNING RESEARCH CORP WASHINGTON D C

CHIEF OF NAVAL OPERATIONS COMMAND/MANAGEMENT INFORMATION SYSTEM (CNOCOM/MIS) STUDY. VOLUME II. (U)

DESCRIPTIVE NOTE: Final rept. Apr-Oct 69,
JAN 70 205P Jones,R. A. ;Walker,R. C. ;Dully,R. ;Lackner,M. R. ;Reardon,J. P. ;
REPT. NO. PRC-R-1388-Vol-2
CONTRACT: N00014-69-A-0321

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-708 027.

DESCRIPTORS: (*NAVAL OPERATIONS, MANAGEMENT PLANNING AND CONTROL), (*MANAGEMENT PLANNING AND CONTROL, *INFORMATION RETRIEVAL), DATA PROCESSING, MANAGEMENT PLANNING AND CONTROL, DECISION MAKING, DATA STORAGE SYSTEMS, DATA TRANSMISSION SYSTEMS, COMMAND AND CONTROL SYSTEMS, INPUT OUTPUT DEVICES, RECORDING SYSTEMS, COMPUTERS, COMPUTER PROGRAMMING, FLOW CHARTING, STATE-OF-THE-ART REVIEWS, DESIGN (U)
IDENTIFIERS: *MANAGEMENT INFORMATION SYSTEMS, MILITARY PLANNING (U)

The objective of the Chief of Naval Operations Command/Management Information System (CNOCOM/MIS) Study, as set forth in reference (a), is to develop a concept and implementation plan for the operation of a Chief of Naval Operations command/management information system which will provide Naval Operations management the capability to retrieve, display, evaluate and transmit information. The study is limited to the methods and facilities required to extract and fully utilize information from an automated data bank and is concerned with determining the required management/system interactions. It will deal with the development of operational procedures which will provide maximum responsiveness to the needs of the users. The determination of specific user information requirements and the design of the internal data processing system itself is being accomplished by separate means. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 708 027 5/1 5/2 9/2 15/7
PLANNING RESEARCH CORP WASHINGTON D C

CHIEF OF NAVAL OPERATIONS COMMAND/MANAGEMENT INFORMATION SYSTEM (CNOCOM/MIS) STUDY. VOLUME I. (U)

DESCRIPTIVE NOTE: Final rept. Apr-Oct 69,
JAN 70 260P Jones,R. A. ;Walker,R. C. ;Dully,R. ;Lackner,M. R. ;Reardon,J. P. ;
REPT. NO. PRC-R-1388-Vol-1
CONTRACT: N00014-69-A-0321

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-708 028.

DESCRIPTORS: (*NAVAL OPERATIONS, MANAGEMENT PLANNING AND CONTROL), (*MANAGEMENT PLANNING AND CONTROL, *INFORMATION RETRIEVAL), DATA PROCESSING, MANAGEMENT PLANNING AND CONTROL, DECISION MAKING, DATA STORAGE SYSTEMS, DATA TRANSMISSION SYSTEMS, COMMAND AND CONTROL SYSTEMS, FLOW CHARTING, DESIGN, STATE-OF-THE-ART REVI (U)
IDENTIFIERS: *MANAGEMENT INFORMATION SYSTEMS, MILITARY PLANNING (U)

The purpose of the Chief of Naval Operations Command/Management Information System (CNOCOM/MIS) study was to develop an overall operating system concept and an implementation plan as a framework within which the Information Systems Division could design and implement CNOCOM/MIS. The objective of the system concept and implementation plan is to provide the Chief of Naval Operations and the OPNAV staff a framework within which to develop the capability to acquire, store, retrieve, display, evaluate and transmit information from an integrated data base to achieve better support for the information requirements of the Navy. The system to be implemented is to be highly automated and capable of responding to requirements in a timely fashion. (A THOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 707 708 9/1 17/7
NAVAL RESEARCH LAB WASHINGTON D C

SOLID STATE MILLIMETER WAVE SOURCES FOR CAINS. (U)

DESCRIPTIVE NOTE: Interim rept.,
MAY 70 18P Ayoub,J. J. , Jr;
REPT. NO. NRL-MR-2132
PROJ: NRL-52-R01-48, A5-335-337/652-C/0W34150000

UNCLASSIFIED REPORT

DESCRIPTORS: (*MICROWAVE OSCILLATORS, MILLIMETER WAVES), (*SEMICONDUCTOR DEVICES, REVIEWS), INERTIAL NAVIGATION, NAVAL AIRCRAFT, VARACTOR DIODES, SEMICONDUCTOR DIODES, FREQUENCY MULTIPLIERS, STATE-OF-THE-ART REVIEWS, DATA TRANSMISSION SYSTEMS (U)
IDENTIFIERS: CAINS(CARRIER AIRCRAFT INERTIAL NAVIGATION SYSTEMS), GUNN DIODES, IMPATT DIODES (U)

The state of the art of Millimeter Wave Varactor Multipliers, IMPATT and Gunn Effect Oscillators is reviewed. The relative merits of using these sources as the local oscillator in an aircraft mounted millimeter wave receiver are discussed. This includes a discussion of the basic limitations, the practical limitations, and the need for determining the device performance from the systems designers viewpoint. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 705 524 1/3 13/10 13/10.1
MASSACHUSETTS UNIV AMHERST SCHOOL OF ENGINEERING

DUCTED PROPELLERS--A REVIEW AND DESCRIPTION OF CURRENT INVESTIGATION, (U)

JAN 70 78P Weetman,Ronald J. ;Cromack, Duane E. ;
REPT. NO. THEMIS-UM-70-1
CONTRACT: N00014-68-A-0146
PROJ: NR-200-016

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHROUDED PROPELLERS, *STATE-OF-THE-ART REVIEWS), VERTICAL TAKEOFF AIRCRAFT, TUGBOATS, DEEP SUBMERGENCE, THEORY, EXPERIMENTAL DATA, MODEL TESTS, TEST FACILITIES, BIBLIOGRAPHIES (U)
IDENTIFIERS: THEMIS PROJECT (U)

The paper describes the past theoretical and experimental work on ducted propellers. Also included is a discussion of the limitations of these past investigations. Since the ducted propeller is used parimarily for low speed applications (i.e., deep sea submersibles, tugboats and VTOL's) the theoretical and experimental development for low speed and static conditions is obviously needed. A description of the current and proposed theoretical and experimental investigation for these conditions is presented. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 704 140 8/2 8/13 15/7
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS

EARTH SCIENCE APPLIED TO MILITARY USE OF NATURAL TERRAIN. (U)

DESCRIPTIVE NOTE: Air Force Surveys in geophysics, AUG 69 209P Needleman,Stanley M. ; Molineux,C. E. ;
REPT. NO. AFCRL-AFSIG-211, AFCRL-69-0364
PROJ: AF-7600, AF-7628

UNCLASSIFIED REPORT

DESCRIPTORS: (*AERIAL RECONNAISSANCE, MILITARY OPERATIONS), (*MAPPING, TERRAIN), (*TERRAIN, TRAFFICABILITY), STATE-OF-THE-ART REVIEWS, CLASSIFICATION, LANDING FIELDS, TARGET ACQUISITION, DATA PROCESSING, DATA STORAGE SYSTEMS, PHOTOINTERPRETATION, GRAVITY, SONAR, SEISMIC WAVES, GAMMA RAYS, LASERS, INFRARED PHOTOGRAPHY, RADAR IMAGES, MULTIBAND SPECTRAL RECONNAISSANCE, SOILS, RADIOMETERS, BIBLIOGRAPHIES (U)
IDENTIFIERS: *REMOTE SENSING (U)

A survey of the state-of-the-art in the evaluation of natural terrain by earth-science techniques and measurement systems is presented in response to a need that existed for many years. This report considers the terrain as an envelope of the environment and all related parameters that are basic in an evaluation for relevant military applications such as unimproved landing areas, trafficability, site selection for operational facilities, terrain reconnaissance and surveillance, and target detection within a masked terrain complex. Methods of terrain-data acquisition, analysis, and evaluation and their limitations are reviewed. The status of research and development, specifying the gaps in technology, is summarized with accompanying conclusions. The report forecasts the requirement for an automated terrain-data acquisition, storage, and display system. Information pertaining to the classification of terrain data, field devices to measure bearing strength, and a visualized optimum remote sensing system is also given in the appendix. A glossary and a comprehensive bibliography are included. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 704 137 17/2
MITRE CORP BEDFORD MASS

EQUALIZATION STUDIES FOR THE PAM DIGITAL MODEM. (U)

DESCRIPTIVE NOTE: Technical rept., MAR 70 48P Post,Allen E. ;
REPT. NO. MTR-1723
CONTRACT: F19628-68-C-0365
PROJ: AF-700G
MONITOR: ESD TR-70-29

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Revision of Rept. no. WP-2888.

DESCRIPTORS: (*DATA TRANSMISSION SYSTEMS, *PULSE AMPLITUDE MODULATION), MODULATORS, DEMODULATORS, DISTORTION, STATE-OF-THE-ART REVIEWS, NARROWBAND, TRANSMISSION LINES (U)
IDENTIFIERS: *MODEMS (U)

The report reviews the present state-of-the-art techniques of narrowband (4 KHz) wireline equalization for PAM signals. Two basic minimization techniques are discussed. Related derivations and proofs are included. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 703 377 5/9 5/10
HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA, VA

THEORY AND STATE OF THE ART OF SMALL-GROUP METHODS OF INSTRUCTION. (U)

DESCRIPTIVE NOTE: Technical rept.,
MAR 70 54P Olmstead,Joseph A. ;
REPT. NO. HUMRRO-TR-70-3
CONTRACT: DAHC19-70-C-0012
PROJ: DA-2-Q-062107-A-712

UNCLASSIFIED REPORT

DESCRIPTORS: (*TEACHING METHODS, ADULTS), EFFECTIVENESS, GROUP DYNAMICS, MOTIVATION, ATTITUDES(PSYCHOLOGY), LEARNING, STATE-OF-THE-ART REVIEWS, THEORY (U)

The purpose of the report is to evaluate the more common small-group methods in terms of their effectiveness for teaching adults. A rationale for small-group instruction is presented, followed by descriptions of the principal methods, and an evaluation of the techniques based on existing research findings. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 703 313 13/10
COAST GUARD BALTIMORE MD FIELD TESTING AND DEVELOPMENT CENTER

RECOGNITION CHARACTERISTICS STUDY FOR BUOYS. (U)

DESCRIPTIVE NOTE: Test rept.,
JAN 70 67P Clark,G. P. ;
REPT. NO. USCG-503
PROJ: CG-792102/006

UNCLASSIFIED REPORT
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.
SUPPLEMENTARY NOTE: Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

DESCRIPTORS: (*BUOYS, *VISUAL PERCEPTION), COLORS, SPAR BUOYS, VISUAL SIGNALS, OPERATION, VISUAL PERCEPTION, MODELS(SIMULATIONS), HARBORS, REFLECTION, PAINTS, DETECTION, COLOR PHOTOGRAPHY, COAST GUARD RESEARCH, VISION, STATE-OF-THE-ART REVIEWS (U)

By determining the present day required buoy significances, both lateral and non-lateral, to be provided as distinctive daymark qualities to the mariner, the present system of buoy color and shape coding is shown to have some shortcomings. The basis of these shortcomings stems from numerous additions to the original two-color, two-shape, two-signal system. A system is presented to provide a far more distinctive twelve-signal system utilizing four shapes and six colors. A review of the present day state-of-the-art of vision science yields some expectation as to which colors and shapes may be good. Experimentation is proposed to determine an optimal set of colors and shapes for the presented system. (Author) (U)

AD- 702 262 5/2 5/3
DEFENCE RESEARCH BOARD OTTAWA (ONTARIO)

THE PRACTICE OF CHARGING USERS FOR INFORMATION SERVICES: A STATE OF THE ART REPORT. (U)

70 21P Penner,Rudolf J. ;

UNCLASSIFIED REPORT

Availability: Pub. in Jnl. of American Society for Information Science, v21 n1 p67-74 Jan/Feb 70.

DESCRIPTORS: (*INFORMATION RETRIEVAL, *COSTS), STATE-OF-THE-ART REVIEWS, ATTITUDES(PSYCHOLOGY), COST EFFECTIVENESS, DOCUMENTS, CANADA (U)
IDENTIFIERS: *INFORMATION SERVICES (U)

The state of the art literature review disclosed that society has not yet come to the point that paying for library information services is a common thing. It was also found that a sound basis for determining the costs of the services-let alone charge for them-does not exist: While some data on specific costs for unit peration are available, it is very difficult to compare the data and arrive at meaningful figures. Nevertheless, there is an indication that large operating centers are becoming concerned with costs to the point that they are cost-accounting their operations, which would permit them to establish realistic fees for their services. (Author) (U)

AD- 700 980 7/4 20/12
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN

SORPTION PUMPING OF HYDROGEN BY CRYODEPOSITS-SORPTION CAPACITY MEASUREMENT. (U)

DESCRIPTIVE NOTE: Final rept. Apr-Sep 69,
FEB 70 62P Templemeyer,K. E. ;
REPT. NO. AEDC-TR-69-266
CONTRACT: F40600-69-C-0001
PROJ: ARO-SW3003

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with ARO, Inc., Tullahoma, Tenn.

DESCRIPTORS: (*HYDROGEN, *CRYOPUMPING), SORPTION, CARBON DIOXIDE, HELIUM, DIFFUSION, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: FROST (U)

The state-of-the-art of cryosorption of hydrogen (H2) and helium by cold cryodeposited frost is reviewed and summarized in some detail, and the results of additional measurements of the sorption of H2 by carbon dioxide (CO2) frosts are reported. It is shown that the sorption capacity of the frost depends upon the conditions at which the frost was formed and upon its temperature hisory. Frosts formed in a manner to make them porous or disordered are shown to possess greater sorption capacities. It appears that surface diffusion of adsorbed molecules into a disordered frost structure is the basic pumping mechanism. Isotherms for H2 sorbed by CO2 forests formed over a wide range of conditions are presented. Also, the reuse sorption capacity of CO2 frost is well documented. As a result of the present tests, it is now possible to put the process of frost cryosorption pumping into better perspective and understand the conflicting results of previous experimental investigations. (Author) (U)

AD- 699 147 9/3 14/2
NEW YORK UNIV N Y RESEARCH DIV

THE ELECTRONIC SENSOR. VOLUME I, (U)

NOV 69 78P Lax,Henry S. ;DeSantis, Gregory ;
CONTRACT: N00039-68-C-3607
PROJ: XF-013-17-01
TASK: 5730

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-699 148.

DESCRIPTORS: (*ELECTRONIC EQUIPMENT, TEST EQUIPMENT), (*TEST EQUIPMENT, DETECTORS), TEST METHODS, AUTOMATIC, STATE-OF-THE-ART REVIEWS, STANDARDS (U)
IDENTIFIERS: ATE(AUTOMATIC TEST EQUIPMENT), AUTOMATIC, TEST EQUIPMENT, BITE(BUILT IN TEST EQUIPMENT), BUILT IN TEST EQUIPMENT (U)

The electronic sensor is defined according to Mil-Std-1326 as 'Circuitry and related hardware located within the prime equipment for the purpose of providing a suitable test signal for the automatic test equipment (ATE) ...'. This report reflects the state-of-the-art and present availability of such sensors by an analysis of the special characteristics of the electronic sensor and by providing a collection of more than 250 individual sensor data sheets (both specially developed and standard off-the-shelf items) with descriptions and many block and circuit diagrams. Special consideration is given to sensors which meet the requirements of Mil-Std-1326 but the report is not limited to such sensors. To help the designer to select suitable sensors, sensor tabulations according to parameters and ranges are provided. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 697 956 14/2 11/4 11/9 1/3
AIR FORCE MATERIALS LAB WRIGHT-PATTERSON AFB OHIO

AEROSPACE-AFML CONFERENCE ON NDT OF PLASTIC/ COMPOSITE STRUCTURES, DAYTON, OHIO, MARCH 18-20, 1969. (U)

DESCRIPTIVE NOTE: Technical papers
MAR 69 474P
PROJ: AF-7351
TASK: 735109

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRFRAMES, STRUCTURAL MEMBERS), (*REINFORCED PLASTICS, *NONDESTRUCTIVE TESTING), (*COMPOSITE MATERIALS, NONDESTRUCTIVE TESTING), SYMPOSIA, STATE-OF-THE-ART REVIEWS, QUALITY CONTROL, X RAY PHOTOGRAPHY, ULTRASONIC RADIATION, OPTICAL PROPERTIES, THERMAL PROPERTIES, ELECTRON MICROSCOPY, SCHLIEREN PHOTOGRAPHY, MICROWAVES, DATA PROCESSING, LAMINATES, HONEYCOMB CORES, SANDWICH CONSTRUCTION, BONDING, DEFECTS(MATERIALS), SYSTEMS ENGINEERING, BLADE AIRFOILS, FUEL NOZZLES (U)
IDENTIFIERS: COMPUTERS, GRAPHICS, EVALUATION, FIBER COMPOSITES, F-5 AIRCRAFT, F-111 AIRCRAFT, HOLOGRAPHY, T-38 AIRCRAFT (U)

The document contains a collection of twenty papers presented by nondestructive testing engineers and scientists at the Aerospace-AFML conference on nondestructive testing of Plastic/Composite Structures held in March, 1969. Topics covered included a state of the art review, acoustic optical imaging, x-ray mapping of flaws by computer graphics, ultrasonics, microwave and thermal techniques. (Author) (U)

AD- 695 458 14/2
AEROSPACE CORP EL SEGUNDO CALIF ENGINEERING SCIENCE OPERATIONS

ASPECTS OF PRECISION TIMING SYSTEMS, (U)

OCT 69 118P Begley,Warren W. ;Shapiro, Arthur H. ;
REPT. NO. TOR-0066(5306)-2
CONTRACT: F04701-69-C-0066

UNCLASSIFIED REPORT

DESCRIPTORS: (*TIMING DEVICES, ACCURACY), (*TIME INTERVAL COUNTERS, DESIGN), STATE-OF-THE-ART REVIEWS, TIME SIGNALS, ATOMIC CLOCKS, ELECTRONIC EQUIPMENT, SYNCHRONIZATION(ELECTRONICS), CALIBRATION, ERRORS, SCIENTIFIC SATELLITES, PERIODIC VARIATIONS, ANOMALIES, MASERS, CRYSTAL OSCILLATORS, RELIABILITY(ELECTRONICS)(U)

Various factors that are pertinent to the implementation and operation of precision timing systems are identified and evaluated. These factors include basic concepts associated with timekeeping, time scales, stable clocks and establishment and maintenance of time synchronization between remotely located clocks. As an example of the application of these factors, the precision timing system recently implemented in the United States Air Force (USAF) Satellite Control Facility (SCF) is described. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 692 774 14/2 9/3
PENNSYLVANIA UNIV PHILADELPHIA OFFICE OF ENGINEERING RESEARCH

VALIDATION OF THEORETICAL AUTOMATIC CHECKOUT TECHNIQUES. (U)

DESCRIPTIVE NOTE: Final rept. Jun 65-Aug 68,
OCT 68 306P Berkowitz,Raymond S. ;Faust, William G. ;Vartanian,Michael M. ;
CONTRACT: AF 33(615)-2609
PROJ: AF-8174
TASK: 817412
MONITOR: AFAPL TR-68-120

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRONIC EQUIPMENT, CHECKOUT PROCEDURES), (*CHECKOUT PROCEDURES, AUTOMATIC), TEST METHODS, STATISTICAL ANALYSIS, COMPUTER PROGRAMS, SEARCH THEORY, ALGORITHMS, FAILURE(ELECTRONICS), DIGITAL COMPUTERS, SIMULATION, FEASIBILITY STUDIES, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: AN/GUQ-9 (U)

Experimental and theoretical studies were made for the validation of theoretical automatic checkout techniques. After a discussion of the state of art, detailed validation studies are described for three specific fault isolation techniques: the UNIVAC Key Element Search, the RCA-Test Point Algorithm Technique, and the University of Pennsylvania Statistical Estimation Fault Isolation Procedure. The extent to which such techniques can be applied to practical electronic circuits is determined; it is indicated that the procedure embodying estimation of component parameter values has most potential value as a general purpose fault isolation technique. Thorough discussions are presented of the experimental equipment designed and assembled, the FORTRAN programs written for the IBM-7094, and the PLACE programs written for the Bendix AN/GUQ-9 as required in the detailed validation studies. Additional contributions are presented concerning fault isolation of control systems as well as a variety of electronic systems with suggestions as to future Air Force efforts in the automatic checkout field. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 690 150 20/8 7/4
YALE UNIV NEW HAVEN CONN DEPT OF PHYSICS

ATOMS, (U)

69 6P Hughes,Vernon W. ;
CONTRACT: AF-AFOSR-249-67
PROJ: AF-9767
TASK: 976702
MONITOR: AFOSR 69-1570TR

UNCLASSIFIED REPORT
Availability: Pub. in Physics Today, v22 n2 p33-37 Feb 69.

DESCRIPTORS: (*ATOMIC STRUCTURE, STATE-OF-THE-ART REVIEWS), ATOMS, FIELD THEORY, MUONS, ATOMIC SPECTROSCOPY, ELECTRONS, INVARIANCE, SELECTION RULES(PHYSICS), EXCITATION, MESONS, LASERS, ELECTROMAGNETIC FIELDS (U)
IDENTIFIERS: FINE STRUCTURE CONSTANT, LAMB SHIFT, QUANTUM ELECTRODYNAMICS (U)

Modern advances, developments and unifying accomplishments of atomic physics are reviewed. Special reference is made to quantum electrodynamics, the role of the muon, fine structure constant and the gyromagnetic ratio in recent precise experiments. This and other events connecting invariance and symmetry, atomic structure, collisions, and, maser and laser development lead to the conclusion that atomic physics now takes its place in modern fundamental physical theory, principally through the study of electromagnetic interaction of the elementary particles in the atom.(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 686 836 8/6
ARIZONA UNIV TUCSON INST OF ARID LANDS RESEARCH

INVENTORY OF RESEARCH ON DESERT REGIONAL TYPES, (U)

68 69P Healy,John R. ;
CONTRACT: DA-49-092-ARO-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Chapter 9 of Inventory of Geographic Research on Desert Environments. See also Chapter 8, AD-668 853.

DESCRIPTORS: (*DESERTS, REVIEWS), SCIENTIFIC RESEARCH, CLASSIFICATION, STATE-OF-THE-ART REVIEWS, RESEARCH MANAGEMENT, BACKGROUND, GEOGRAPHY, ENVIRONMENT, TERRAIN (U)
IDENTIFIERS: ANNOTATED BIBLIOGRAPHIES (U)

The purpose of the inventory is to determine in detail what topics have been or are being investigated for the world's deserts, to appraise the reported work, and to disclose areas of study where further work is needed. The series of chapters does not attempt to recapitulate all information known about the deserts of the world, but rather comprises a compendium-guidebook to past and present research. It is based upon a critical review of the published literature augmented by consultations with specialists. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0MO7

AD- 684 145 20/6 14/2
MASSACHUSETTS INST OF TECH CAMBRIDGE EXPERIMENTAL ASTRONOMY LAB

INVESTIGATION OF VISIBLE REGION INSTRUMENTATION FOR OCEANOGRAPHIC SATELLITES. VOLUME II, (U)

MAR 68 60P Conrod,A. C. ;Boersma,A. ; Kelly,M. G. ;
REPT. NO. RE-31-Vol-2
CONTRACT: N62306-2082
PROJ: MIT-DSR-76389

UNCLASSIFIED REPORT

PORTIONS OF THIS DOCUMENT ARE ILLEGIBLE. SEE INTRODUCTION SECTION OF THIS ANNOUNCEMENT JOURNAL FOR CFSTI ORDERING INSTRUCTIONS.

SUPPLEMENTARY NOTE: See also Volume 1, AD-684 144.

DESCRIPTORS: (*AERIAL RECONNAISSANCE, INSTRUMENTATION), OCEANOGRAPHIC DATA, SITE SELECTION, RADIOMETERS, CAMERAS, MAPPING, AERIAL PHOTOGRAPHS, PHOTOGRAPHIC IMAGES, STATE-OF-THE-ART REVIEWS, BAHAMA ISLANDS, SATELLITES(ARTIFICIAL), ULTRAVIOLET SPECTRA, VISIBLE SPECTRA (U)
IDENTIFIERS: SPRING SEASON, SUMMER (U)

A review of the present state of the art in visible region passive instruments for over-water surveying is reported. Experiments are described in which some possible techniques of data collection were tested. The areas in which further work is needed are described, and the suggested studies and experiments are outlined. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0MO7

AD- 684 144 20/6 14/2
MASSACHUSETTS INST OF TECH CAMBRIDGE EXPERIMENTAL ASTRONOMY LAB

INVESTIGATION OF VISIBLE REGION INSTRUMENTATION FOR OCEANOGRAPHIC SATELLITES. VOLUME I, (U)

JUL 67 52P Conrod,A. C. ;
REPT. NO. RE-31-Vol-1
CONTRACT: N62306-2082
PROJ: MIT-DSR-76389

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-684 145.

DESCRIPTORS: (*AERIAL RECONNAISSANCE, INSTRUMENTATION), OCEANOGRAPHIC DATA, SPECTROMETERS, PHOTOGRAPHY, STATE-OF-THE-ART REVIEWS, COLOR PHOTOGRAPHY, AERIAL PHOTOGRAPHY, PHOTOGRAPHIC FILM, ABSORPTION, RAYLEIGH SCATTERING, SPECTROPHOTOMETERS, DATA PROCESSING, SATELLITES(ARTIFICIAL), ULTRAVIOLET SPECTRA, VISIBLE SPECTRA (U)
IDENTIFIERS: ARGUS ISLAND, CRAWFORD VESSEL, MULTISPECTRAL PHOTOGRAPHY, SATELLITE PHOTOGRAPHY (U)

A review of the present state of the art in visible region passive instruments for over-water surveying is reported. Experiments are described in which some possible techn.ques of data collection were tested. The areas in which further work is needed are described, and the suggested studies and experiments are outlined. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 683 369 14/2 13/9 14/4 20/5
AMPEX CORP REDWOOD CITY CALIF RESEARCH AND ADVANCED TECHNOLOGY DIV

RESEARCH ON FAILURE INDICATOR SYSTEM. (U)

DESCRIPTIVE NOTE: Final interim rept. 1 Apr 67-31 Jul 68,
68 47P Markevitch,Bob V. ;van Heeckeren,Jacob ;
REPT. NO. RR-68-19
CONTRACT: N00014-67-C-0401

UNCLASSIFIED REPORT

DESCRIPTORS: (*BEARINGS, FAILURE(MECHANICS)), (*FAILURE(MECHANICS), DETECTORS), DETECTORS, MONITORS, STATE-OF-THE-ART REVIEWS, VIBRATION, LASERS, PROCESSING, SIGNALS, ROTATION, MODULATION, SPECTRUM SIGNATURES (U)
IDENTIFIERS: *FAILURE INDICATORS (U)

Recording and frequency analysis by means of coherent optical data processing techniques is described with special emphasis on the detection or diagnosis of failures in rotating mechanisms. Vibration signals from bearing assemblies have showed good correlation with themselves and poor cross correlations, implying the possibility of detection of specific bearing noise signatures. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 682 827 9/2 22/2
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

MICROMINIATURE AEROSPACE DIGITAL COMPUTERS, (U)

JUN 68 335P Dolkart,V. M. ;Novik,G. Kh. ;Koltypin,I. S. ;
REPT. NO. FTD-MT-24-27-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Edited machine trans. of mono. Mikrominiatyurnye Aerokosmicheskii Tsifrovye Vychislitelnye Mashiny, Moscow, 1967 p1-348.

DESCRIPTORS: (*SPACECRAFT, COMPUTERS), (*COMPUTERS, *MICROELECTRONICS), DIGITAL COMPUTERS, RELIABILITY(ELECTRONICS), INTEGRATED CIRCUITS, TRANSISTORS, SEMICONDUCTOR DIODES, MEMORY DEVICES, PRINTED CIRCUITS, PERFORMANCE(ENGINEERING), STATE-OF-THE-ART REVIEWS, USSR (U)
IDENTIFIERS: MICROELECTRONICS, THIRD GENERATION COMPUTERS, TRANSLATIONS (U)

The book is dedicated to contemporary third-generation aerospace digital computers using integral circuits. It examines in detail the basic technological problems involved in creating such machines, which are the basic factors ensuring achievement of high reliability. Great attention is allotted to questions of electronics, memory units, and construction of contemporary foreign aerospace digital computers and their application. The peculiarities of construction of these machines are examined, and their basic characteristics are given. (U)

AD- 682 463 9/5 9/2
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

USE OF MODULATED, NONCOHERENT, OPTICAL FREQUENCY CARRIERS IN ELECTRONIC COMPUTER ELEMENTS. (U)

JUL 68 20P Georgievskaya,E. A. ; Mansurov,A. N. ;Etkin,V. S. ;
REPT. NO. FTD-HT-23-525-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Edited trans. of Poluprovodnikovye Pribory i ikh Primenenie: Sbornik Statei (USSR) n17 p28-43 1967, by L. Heenan.

DESCRIPTORS: (*COMPUTER LOGIC, OPTICAL EQUIPMENT), SWITCHING CIRCUITS, PHOTODIODES, MODULATION, GALLIUM ARSENIDES, OPTICAL COMMUNICATIONS, FIBER OPTICS, LASERS, LOGIC CIRCUITS, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: OPTICS, TRANSLATIONS (U)

Light-coupled switching devices are surveyed with the aim of investigating their usefulness in optic digital computers and other complex logic machines. Light-emitting diodes such as GaAs diodes utilizing the injection mechanism may be used as light modulators up to frequencies of the order of 1-4 GHZ. Their properties and capabilities are cited. Photodiodes with p-n and p-i-n structures are mentioned as effective demodulators or optic receivers. Their frequency operating ranges, output signal amplitudes, and temperature ranges are compared. Advantages cited for these devices are their low cost, small size, and handling convenience. Disadvantages listed include low light-generating efficiency, high receiver inertia, and losses (about 1.1 db/m), when fiber optic conductors are used as the transmission medium. Various applications of these optic devices are illustrated, e.g., a CRT beam modulation circuit, quartz generator output circuit, and phase detector, light relay (using a p-n-p-n switch as a receiver). The authors also present examples of logic circuits (and, NOT, and OR) bases on these devices. (Author) (U)

AD- 682 010 5/2
INDIANA UNIV BLOOMINGTON GRADUATE LIBRARY SCHOOL

THE ROLE OF THE LIBRARY IN RELATION TO OTHER INFORMATION ACTIVITIES. (U)

DESCRIPTIVE NOTE: A State-of-the-Art Review,
AUG 68 92P Painter,Ann F. ;
PROJ: EF-68-45
MONITOR: TISA 23

UNCLASSIFIED REPORT

DESCRIPTORS: (*LIBRARIES, STATE-OF-THE-ART REVIEWS), DOCUMENTS, TECHNICAL INFORMATION CENTERS, UNITED STATES GOVERNMENT, BIBLIOGRAPHIES (U)
IDENTIFIERS: INFORMATION SERVICES (U)

Traditionally the library has been the repository of printed information and has assumed the responsibility for its acquisition, processing, storage, and dissemination. Since World War II, and more particularly in the last ten years other information activities have largely taken over some of the old functions. The purpose of the state-of-the-art is to establish on the basis of the literature the role the library plays in relation to these other information activities in the Federal Government and perhaps shed some light upon the reasons for the development of separate facilities. Some of the characteristics investigated include definitions, functions, objectives, organization, financial base, services, personnel, and the user. A two-part bibliography (alphabetical and classified) supplements the text. (Author) (U)

AD- 681 809 6/4
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

THE CONTEMPORARY STATE OF THE PATTERN RECOGNITION PROBLEM, (U)

MAR 68 24P Kovalevskii,V. A. ;
REPT. NO. FTD-HT-23-155-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Edited trans. of Kibernetika (USSR) n5 p78-86 1967, by F. Dion.

DESCRIPTORS: (*PATTERN RECOGNITION, STATE-OF-THE-ART REVIEWS), COMPUTERS, SPEECH RECOGNITION, MATHEMATICAL MODELS, ALGORITHMS, LEARNING, USSR (U)
IDENTIFIERS: TRANSLATIONS (U)

This article surveys 32 citations (23 Soviet) covering the period up to 1967. Despite the fact that works devoted to the pattern recognition problem have been published for at least 12 years, and in increasing number, as a scientific discipline this problem still can not be considered clearly outlined. Different authors examine different statements of recognition problems; the overwhelming majority generally proceed without a statement and, thus, work on the solution of a problem that can not be formulated. The absence of a sufficiently general statement of the pattern recognition problem impedes the comparison of patterns because of the difficulty of systematizing numerous and very diverse works. Therefore, a statement of the problem that is proposed, evidently, embraces the majority of individual problems of recognition and allows us to examine them from a certain single point of view. (U)

AD- 678 764 11/7 14/2
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

RECENT ACTIVITIES IN PHOTOELASTICITY AND PHOTOPLASTICITY, (U)

DEC 67 43P Chia Yu-Ch'uan.;
REPT. NO. FTD-HT-23-732-67

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Edited trans. of Li Hsueh Hsueh Pao (Mainland China) v8 n2 p77-100 1965.

DESCRIPTORS: (*MATERIALS, NONDESTRUCTIVE TESTING), STRESSES, PLASTIC PROPERTIES, ELASTIC PROPERTIES, PHOTOMETERS, EPOXY RESINS, OPTICAL COATINGS, STRAIN GAGES, MATHEMATICAL MODELS, REFRACTION, STATE-OF-THE-ART REVIEWS, CHINA (U)
IDENTIFIERS: TRANSLATIONS (U)

The report reviews current developments and research in photoplasticity techniques related to the solution of stress problems. Equipment used, model materials, coating methods, and solutions of plane, three-dimensional, and dynamic stress problems are described. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 677 162 13/8
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

DYNAMIC AND STATIC BALANCING OF GYROSCOPIC DEVICES, (U)

JAN 68 314P Kovalev,M. P. ;Morzhakov, S. P. ;Tereknova,K. S. ;
REPT. NO. FTD-MT-24-309-67

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Edited machine trans. of mono. Dinamicheskoe i Staticheskoe Uravnovesnivanie Giroskopicheskikh Ustroistv, Moscow, 1965 p1-304.

DESCRIPTORS: (*GYROSCOPES, CALIBRATION), MACHINE TOOLS, GYRO STABILIZERS, GIMBALS, BALL BEARINGS, FRICTION, INSTRUMENTATION, OSCILLATION, DYNAMICS, STATICS, ROTATION, LIFE EXPECTANCY, WIRING DIAGRAMS, MEASURING INSTRUMENTS, STATE-OF-THE-ART REVIEWS, USSR (U)
IDENTIFIERS: STATORS, TRANSLATIONS (U)

The book presents the theory of balancing rotating parts of machines and instruments demonstrating the dependence of precision of dynamic balancing upon the quality of the support. Also, it analyses basic causes of vibrations and methods of their elimination. Explanations are given of the principles of action of balancing machines and their elements, and practical recommendations on the technique of constructing and balancing them are given. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 676 866 11/6 13/8
MINISTRY OF TECHNOLOGY LONDON (ENGLAND)

THE ADVANTAGES AND LIMITATIONS OF COMMONLY USED METHODS OF NON-DESTRUCTIVE TESTING, (U)

SEP 68 19P
REPT. NO. MIN-TECH-S/T-Memo-9/68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: A collection of papers by members of the Gas Turbine Collaboration Committee Inspection Technique Panel, Non-Destructive Testing Methods Working Party.

DESCRIPTORS: (*NONDESTRUCTIVE TESTING, STATE-OF-THE-ART REVIEWS), IRON ALLOYS, MAGNETIC MATERIALS, CRACK PROPAGATION, DEFECTS(MATERIALS), LIQUID IMMERSION TESTS, DYES, FLUORESCENCE, ULTRAVIOLET RADIATION, ULTRASONIC PROPERTIES, X RAY PHOTOGRAPHY, GAMMA RAYS, GREAT BRITAIN (U)
IDENTIFIERS: NONFERROUS METALS (U)

The report assesses the state-of-the-art in six commonly used methods and highlights their shortcomings as well as their field of useful application. The methods are: (1) Magnetic particle inspection, (2) Penetrant inspection, (3) Ultrasonic testing, (4) X-and gamma radiography, (5) Fluoroscopy, and (6) Eddy-current testing. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 675 784 11/6 13/8
MATERIALS ADVISORY BOARD (NAS-NRC) WASHINGTON D C

METALWORKING PROCESSES AND EQUIPMENT. (U)

DESCRIPTIVE NOTE: Final rept.
SEP 68 90P
REPT. NO. MAB-206-M(7)
CONTRACT: DA-49-083-OSA-3131

UNCLASSIFIED REPORT

DESCRIPTORS: (*MATERIAL FORMING, REPORTS), RESEARCH MANAGEMENT, STATE-OF-THE-ART REVIEWS, ALLOYS, MECHANICAL WORKING, DUCTILE BRITTLE TRANSITION, FAILURE(MECHANICS), PLASTIC PROPERTIES, STRAIN HARDENING, HARDNESS, MODELS(SIMULATIONS), PHOTOELASTICITY, COMPUTER PROGRAMMING, DIES, MANUFACTURING, EXTRUSION, HIGH ENERGY RATE FORMING, ROLLING(METALLURGY), BENDING, DEFORMATION, STRESSES, LUBRICATION, SINGLE CRYSTALS (U)
IDENTIFIERS: COMPUTER AIDED DESIGN (U)

The Government Metalworking Processes and Equipment Program is a coordinated effort of the Army, Navy, Air Force and NASA to identify salient factors which limit metal deformation processes and concurrently to sponsor research to extend these limits for improvement of manufacturing capabilities. This is the final report of the committee. The advice of the committee and its two panels (one on Lubrication in Metalworking and the other on Application of Deformation Theory to Practice) is in the form of 34 recommendations for R and D in the following areas of metalworking: Vibrational Energy; Hydrostatic Extrusion; Laboratory Measurements of Mechanical Properties; Superplasticity; Ductile Fracture; The Application of Computers to Deformation Processing; Heat Transfer; Crystal Mechanics; The Function of Continuum Mechanics in the Analysis and Design of Metalworking Processes; Lubrication; Application of Deformation Theory to Practice; Limitations of Extrusion Processes; Thin Sheet Rolling; The Use of Computers in Forging Die Design; The Use of Model Experiments in Forging Die Design; The Application of Plasticity Mechanics to Forging Die Design; (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 673 830 9/2
RAND CORP SANTA MONICA CALIF

THIRD-GENERATION COMPUTER TRENDS, (U)

AUG 68 16P Boehm,B. W. ;
REPT. NO. P-3903

UNCLASSIFIED REPORT

DESCRIPTORS: (*DIGITAL COMPUTERS, STATE-OF-THE-ART REVIEWS), MAN MACHINE SYSTEMS, GRAPHICS, PERFORMANCE(ENGINEERING), INTEGRATED CIRCUITS, COMPUTER PROGRAMMING, DESIGN, MEMORY DEVICES, FEEDBACK, DATA PROCESSING, SYMPOSIA (U)
IDENTIFIERS: COMPUTERS, GRAPHICS, *THIRD GENERATION COMPUTERS (U)

This report describes some of the prospects for third-generation computers, and also points out some of the problems and pitfalls. It discusses the problem area to which engineering managers can contribute most effectively: the inadequate feedback in the process of developing and using computer systems. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 673 447 15/7 14/2
NAVAL SHIP ENGINEERING CENTER PHILADELPHIA PA PHILADELPHIA DIV

TURBINE TYPE FLOWMETERS 'STATE OF THE ART' LITERATURE SURVEY. (U)

DESCRIPTIVE NOTE: Final rept.,
JUN 68 39P Castorina,Joseph S. ;
REPT. NO. NAVSECPHILADIV-A-771
PROJ: SF013-06-02
TASK: 3950

UNCLASSIFIED REPORT

DESCRIPTORS: (*NAVAL OPERATIONS, REFUELING), (*FLOWMETERS, PERFORMANCE(ENGINEERING)), NAVAL VESSELS, NAVAL VESSELS, FLUID FLOW, VELOCITY, FREQUENCY, REACTION KINETICS, VISCOSITY, BOUNDARY LAYER, THERMAL EXPANSION, PRESSURE, CAVITATION, CALIBRATION, TURBULENCE, PULSE RATE, INSTRUMENTATION, PROBES(ELECTROMAGNETIC), TRANSDUCERS, DESIGN, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: EVALUATION (U)

A survey of the literature was conducted in order to evaluate the ability of the turbine meter to meet the flow measurement needs of the Fleet. Parameters effecting meter performance were investigated as well as pertinent related topics. The turbine meter is burdened with the inherent weaknesses peculiar to most velocity sensing meters. It was found suitable for future use in shipboard automation and fueling-at-sea applications under the following provisos: a turbine meter satisfying current shipbuilding specification access flange requirements should be developed, or the specifications making this demand revised. If one of these cannot be accomplished, investigate other pulse output meter types which will meet the access flange requirement and may also drive direct totalizing devises. Application guidelines and standard practices should be prepared for the meter type(s) ultimately selected for control-input and fueling-at-sea use. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 672 747 5/10
WASHINGTON UNIV ST LOUIS MO DEPT OF PSYCHOLOGY

A RESIDUAL GAIN MEASURE OF REMINISCENCE AND CLASSROOM LEARNING. (U)

DESCRIPTIVE NOTE: Technical rept.,
68 46P Peters,Edward N. ;
REPT. NO. TR-14
CONTRACT: Nonr-816(14), NSF-G22296

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also TR-15, AD-672 748.

DESCRIPTORS: (*PSYCHOLOGICAL TESTS, RECALL), (*LEARNING, CORRELATION TECHNIQUES), INFORMATION THEORY, INSTRUCTION MANUALS, PERFORMANCE(HUMAN), CHARACTER RECOGNITION, MECHANICAL ENGINEERING, AERONAUTICS, RELAXATION(PHYSIOLOGY), ELECTRONICS, STATE-OF-THE-ART REVIEWS, TABLES(DATA) (U)

The residual gain technique was applied in a study of the relationship between reminiscence of a motor learning task and learning in the classroom under different sets of instructions. No relationship between residualized reminiscence and classroom learning was found and there was no change in this finding under different sets of instructions. Doubt was cast on the existence of consistent individual differences in reminiscence independent of general performance level. Prior findings of relationships between reminiscence and other variables seem to be explainable in terms of statistical artifacts in earlier methods and in relationships of the other variables with general motor performance. (Author) (U)

AD- 672 452 5/9 9/2
ENTELEK INC NEWBURYPORT MASS

COMPUTER-ASSISTED INSTRUCTION GUIDE. (U)

68 153P
CONTRACT: Nonr-4757(00)

UNCLASSIFIED REPORT
Availability: Hard copy available from ENTELEK Inc., 42 Pleasant St., Newburyport, Mass. 01950, $10.00.

DESCRIPTORS: (*PROGRAMMED INSTRUCTION, *COMPUTER PROGRAMS), SPECIFICATIONS, STATE-OF-THE-ART REVIEWS, COMPUTERS, TEACHING METHODS, PROGRAMMING LANGUAGES, INPUT OUTPUT DEVICES (U)
IDENTIFIERS: *COMPUTER AIDED INSTRUCTION (U)

The CAI Guide contains the specifications of all operational CAI programs that have come under ENTELEK's surveillance since the inception of the CAI Information Exchange. A total of 226 CAI programs by 160 authors of 38 CAI centers are cited. 30 major subject matter areas are represented. Research and preliminary results from over 50 programs cited in the Guide can be found in the report abstracts of the CAI Information Exchange. (U)

AD- 668 405 12/1 8/5
HARVARD UNIV CAMBRIDGE MASS LAB FOR COMPUTER GRAPHICS

GEOGRAPHY AND THE PROPERTIES OF SURFACES. N-DIMENSIONAL SPATIAL ANALYSIS AND COMPUTER GRAPHICS. PART A. (U)

DESCRIPTIVE NOTE: Technical rept.,
APR 68 60P Lindgren,C. Ernesto S. ;
REPT. NO. Paper-16
CONTRACT: N00014-67-A-0298-0004
PROJ: NR-389-147

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Report on Harvard Papers in Theoretical Geography.

DESCRIPTORS: (*GRAPHICS, COMPUTERS), SURFACES, GEOMETRY, GEODESICS, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: COMPUTER AIDED GRAPHICS, DESCRIPTIVE GEOMETRY, GRAPHS(CHARTS) (U)

The paper, the first of a series with the same title, discusses the state of the art in n-dimensional methods of spatial analysis and selects one of such methods, developed within the last 10 years, proposing its application by means of computer graphics techniques. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0MO7

AD- 665 696 8/10 13/10
WESTINGHOUSE ELECTRIC CORP ANNAPOLIS MD OCEAN RESEARCH AND ENGINEERING CENTER

FEASIBILITY STUDY OF A SEDIMENT POD FOR SUBMERSIBLE USE. (U)

DESCRIPTIVE NOTE: Phase 1 rept.
DEC 67 174P
CONTRACT: N62306-68-C-0016

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Report on SEDOPOD Phase 1.

DESCRIPTORS: (*UNDERWATER VEHICLES, OCEAN BOTTOM SAMPLING), OCEANOGRAPHIC SHIPS, SPECIFICATIONS, DETECTORS, UNDERWATER SOUND EQUIPMENT, DENSITY, THERMISTORS, SHEAR STRESSES, DIGITAL SYSTEMS, INSTRUMENTATION, DEEP SUBMERGENCE, DESIGN, SEDIMENTATION, STATE-OF-THE-ART REVIEWS, LIFE EXPECTANCY, RELIABILITY, FEASIBILITY STUDIES (U)
IDENTIFIERS: MANNED SUBMERSIBLES (U)

The objective of the SEDOPOD Study Program is to provide the Naval Oceanographic Office, Deep Vehicle Branch with information necessary to design, purchase, and fabricate a sensor package capable of measuring several mass properties of unconsolidated bottom sediments. The resulting design shall be deployed by a submersible vehicle which shall make in-situ measurements and record at several bottom locations. The device will measure in the sediment the parameters of sound velocity, attenuation, density, temperature, shear strength, and Eh/pH in water depths to 20,000 feet with 3 foot sediment penetration. This report covers the approaches used to investigate the state-of-the-art of available sensors including an extensive literature survey, visits, interviews, and contacts with suppliers and users of sensors and related instrumentation. This investigation involves a determination, where possible, of availability, cost, life expectancy, power, size, weight, reliability, and accuracy. Where sensors do not exist to perform in the environment or meet the stated requirements, a determination of the amount of development necessary has been made. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0MO7

AD- 663 226 4/2
LIBRARY OF CONGRESS WASHINGTON D C AEROSPACE TECHNOLOGY DIV

HAIL PREVENTION RESEARCH, (U)

DEC 67 39P Michaels,Daniel W. ;
REPT. NO. ATD-68-26-101-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Rept. of Surveys of Foreign Scientific and Technical Literature.

DESCRIPTORS: (*METEOROLOGICAL PHENOMENA, HAIL), (*HAIL, CONTROL), CLOUDS, ATMOSPHERIC PRECIPITATION, METEOROLOGICAL RADAR, INTENSITY, ROCKETS, WEATHER, INSTRUMENTATION, ARTIFICIAL PRECIPITATION, MEASUREMENT, THEORY, SCIENTIFIC RESEARCH, USSR, STATE-OF-THE-ART REVIEWS (U)

Contents: Experimental cloud modification testing ranges; Instrumentation; Ice nucleants; VGI technique (Alazan Valley experiments); Samsari Range experiments; Moldavian Range experiments; Ukrainian Range experiments; Gissar Valley experiments; Chinese experiments; Polish experiments. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 663 198 9/2 5/11 5/8
MASSACHUSETTS INST OF TECH CAMBRIDGE

THE COMPUTER UTILITY AND THE COMMUNITY, (U)

67 9P Fano,R. M. ;
CONTRACT: Nonr-4102(01)

UNCLASSIFIED REPORT
Availability: Published in IEEE International Convention Record, Pt. 12 p30-7 1967.
SUPPLEMENTARY NOTE: Report on project MAC.

DESCRIPTORS: (*COMPUTERS, *SOCIOLOGY), (*TIME SHARING, STATE-OF-THE-ART REVIEWS), COMPUTER PROGRAMMING, MAN MACHINE SYSTEMS, COSTS, MANAGEMENT PLANNING AND CONTROL, DATA PROCESSING (U)
IDENTIFIERS: MAC PROJECT, PRIVACY (U)

The report considers the following terms: (1) The state of the art in time sharing; (2) Computers as assistants to the individual; and, (3) Social implications. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 663 117 8/3
NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C

EVALUATION OF SPECTRAL WAVE HINDCASTS USING THE AUTOMATED WAVE PREDICTION PROGRAM OF THE NAVAL OCEANOGRAPHIC OFFICE. (U)

DESCRIPTIVE NOTE: Informal rept.,
OCT 67 39P Moskowitz,Lionel I. :
REPT. NO. NOO-IR-67-78
PROJ: HF-103-08-01c-01, 631-FF-DAG

UNCLASSIFIED REPORT

DESCRIPTORS: (*OCEAN WAVES, PREDICTIONS), MODELS(SIMULATIONS), NUMERICAL METHODS AND PROCEDURES, POWER SPECTRA, WIND, SURFACE PROPERTIES, WEATHER FORECASTING, DEEP WATER, STORMS, OCEANOGRAPHY, STATE-OF-THE-ART REVIEWS (U)

For the past few years a spectral wave forecasting program has been under development at the Naval Oceanographic Office. Primarily designed as a first step for an automated aircraft carrier landing system this model, at present, represents the state of the art in ocean wave forecasting. The first section of this paper presents a brief historical summary and description of the wave forecasting model. In conjunction with New York University a forecast/hindcast evaluation program has been undertaken. The second section of this paper attempts to evaluate spectral hindcasts made in the vicinity of Bermuda, B.W.I. during the latter part of November 1961. Wave data recorded at ARGUS ISLAND, situated 25 miles SW of Bermuda, are the sole means of evaluation for the hindcasts. Comparisons of hindcasted to observed spectra are quite favorable. Rapidly changing synoptic conditions appear to be the major cause for discrepancies in the spectral comparisons. Modifications to the model for improved spectral forecasts are also discussed. (Author) (U)

AD- 662 607 20/8 7/4
POMONA COLL CLAREMONT CALIF DEPT OF PHYSICS

LOW ENERGY X-RAY AND ELECTRON PHYSICS. (U)

DESCRIPTIVE NOTE: Final rept. 1 Jun 64-31 May 67,
DEC 67 9P Henke,Burton L. ;
CONTRACT: AF-AFOSR-689-64
PROJ: AF-9767
TASK: 976791
MONITOR: AFOSR 67-2751

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also AD-662 384.

DESCRIPTORS: (*X RAY SPECTROSCOPY, STATE-OF-THE-ART REVIEWS), X RAY SPECTRA, ENERGY, INTERACTIONS, ABSORPTION, X RAYS, INSTRUMENTATION, SPECTRUM ANALYZERS, FLUORESCENCE, SINGLE CRYSTALS, DETECTION, EXCITATION, QUANTITATIVE ANALYSIS, ELECTRONS, PLASMAS(PHYSICS), SOLAR CORONA, TABLES(DATA) (U)

The research is concerned with a study of the complete interaction of the ultrasoft x-rays with matter in the 10-to-100 A wavelength region and of the associated production of photo and Auger electrons in the 10 to 1000 electron volt energy region. Such a study is important because it is on an area of atomic physics which has been hitherto neglected and because it has important applications to chemical and solid state analysis, microanalysis, high temperature plasma diagnostics, and to x-ray astronomy via rockets and satellites. The specific objectives of this grant period were: (1) The measurement and tabulation of ultrasoft x-ray interaction coefficients. (2) The continued development and refinement of methods for the generation, the detection and the spectroscopy of the low energy x-rays and electrons. (3) The application, independently and collaboratively of the low energy x-ray and electron interaction physics and its associated instrumentation to the chemical and valence band analysis of matter and high temperature plasma analysis through the ultrasoft x-ray spectroscopy of the solar corona. A resume of the results of the research and a list of publications are given. (Author) (U)

AD- 662 342 20/5 14/2
AAI CORP COCKEYSVILLE MD

STUDY OF LASER APPLICATION TO VELOCITY MEASURING SYSTEM. (U)

DESCRIPTIVE NOTE: Phase 9 of technical summary rept.,
APR 67 38P Watkins,M. C. ;
REPT. NO. ER-4889
CONTRACT: AF 29(600)-4136
PROJ: AF 6888
TASK: 688802
MONITOR: MDC TR-67-136

UNCLASSIFIED REPORT

DESCRIPTORS: (*LASERS, *DOPPLER SYSTEMS), (*VELOCITY, MEASUREMENT), (*ROCKET-PROPELLED SLEDS, VELOCITY), FEASIBILITY STUDIES, STATE-OF-THE-ART REVIEWS, DESIGN, STEERING, CONTROL SYSTEMS, ACCELERATION (U)

The report summarizes results of the feasibility study phase utilizing a laser doppler system for determining high accuracy velocity and acceleration profiles of high speed rocket sleds. The report also presents recommendations and specifications for an operational laser velocity measuring system. Objectives of the study phase were twofold: the first and primary one being the implementation and testing of a laser doppler velocity measuring system. Construction of the experimental breadboard incorporated designs and modifications which were dictated by earlier experimental results and the latest state-of-the-art techniques; the second objective was the design, fabrication and testing of a laser beam steering control which would enable the transmitted laser energy to be concentrated on a sled-mounted retroreflector during sled travel. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 660 614 1/4 6/4
AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO DEPUTY FOR ADVANCED SYSTEMS PLANNING

BIONICS-BASE FOR INNOVATION: A MANAGEMENT OVERVIEW OF THE BIRTH AND DEVELOPMENT OF BIONICS AT WRIGHT FIELD, (U)

67 33P Zahrt,K. W. ;
REPT. NO. ASD-TM-67-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*BIONICS, RESEARCH MANAGEMENT), (*FLIGHT CONTROL SYSTEMS, BIONICS), AIR FORCE RESEARCH, STATE-OF-THE-ART REVIEWS, MANAGEMENT ENGINEERING (U)

The report presents the story of a new technology which has produced a flight control system with a learning, or self-organizing, functional capability; a system which can adapt more quickly than even the most skillful pilot to the flight characteristics of an aircraft. It promises a radical step forward in Air Force operational capability by, in effect, invisibly adding a superman in the cockpit to share the flight control duties. The story is a retrospective analysis which traces the evolution of a major state-of-the-art advance from the serendipity of early Air Force research planners. It illustrates the fact that a well-chosen, carefully nurtured, and well-managed, research program without a specific initial military objective often can provide a series of startling breakthroughs in weapon system operational effectiveness. The background information which introduces the story provides a realistic picture of the time factor involved in bringing hitherto unrelated research ideas into a well-focused, applicationally-oriented reality. Woven into the story are recurring references to the evolution of long range planning concepts within the Air Force research and development community. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 657 329 9/2
RAND CORP SANTA MONICA CALIF

THE SYSTEMS GAP, (U)

AUG 67 8P Armer,Paul ;
REPT. NO. P-3641

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared for presentation in Datamation Aug 1967.

DESCRIPTORS: (*COMPUTERS, USSR), (*CYBERNETICS, STATE-OF-THE-ART REVIEWS), ECONOMICS, FEEDBACK, MACHINES, MAINTENANCE, SPARE PARTS, RELIABILITY(ELECTRONICS), MAGNETIC TAPE (U)

The author discusses the state of the computer art in the USSR and comes to the inescapable conclusion that there exists a computer gap between the U.S. and the USSR. (U)

AD- 656 340 5/2 12/1
BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS

EFFECTIVENESS OF INFORMATION RETRIEVAL METHODS, (U)

JUN 67 52P Swets,John A. ;
REPT. NO. Scientific-8, BBN-1499
CONTRACT: AF 19(628)-5065, ARPA Order-627-2
PROJ: AF 8668
MONITOR: AFCRL 67-0412

UNCLASSIFIED REPORT

DESCRIPTORS: (*INFORMATION RETRIEVAL, EFFECTIVENESS), DECISION THEORY, ANALYSIS, STATE-OF-THE-ART REVIEWS, STATISTICAL ANALYSIS, MATHEMATICAL MODELS, EXPONENTIAL FUNCTIONS, INDEXES, DOCUMENTS (U)
IDENTIFIERS: DENSITY FUNCTIONS, EVALUATION, INFORMATION RETRIEVAL EFFECTIVENESS, ON-LINE SYSTEMS (U)

Results of some fifty different retrieval methods applied in three experimental retrieval systems were subjected to the analysis suggested by statistical decision theory. The analysis validates a previously-proposed measure of effectiveness and demonstrates its several desirable properties. The examination of a wide range of data in relation to this one metric provides a clear and general assessment of the current state of the retrieval art, and shows that the art is still far from what might be considered a desirable state. (Author) (U)

AD- 653 461 5/11 7/1
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER ANNAPOLIS MD ANNAPOLIS DIV

A PATENT SEARCH FOR MOVING BEDS FOR ABSORPTION, TO CLEAN AIR. (U)

DESCRIPTIVE NOTE: Technical note,
JUN 67 19P Calbert,W. R. ;
PROJ: S-F013-08-03
TASK: 4095
MONITOR: NSRDC 208/67

UNCLASSIFIED REPORT

DESCRIPTORS: (*CONTROLLED ATMOSPHERES, ADSORPTION), (*SUBMARINES, CONTROLLED ATMOSPHERES), CATALYSTS, FLUIDIZED BED PROCESSES, STATE-OF-THE-ART REVIEWS, PATENTS, AIR, DECONTAMINATION, PURIFICATION (U)
IDENTIFIERS: ADSORBENTS (U)

A ventilation system is yet to be developed for providing clean air to displace contaminated air in submarine atmospheres. A moving bed absorption means is one approach to the removal of contaminations and providing of high purity air. A state of the art search was made to list and sort disclosures of interest. (Author) (U)

AD- 651 707 9/2
NAVAL RESEARCH LAB WASHINGTON D C

MULTIPROCESSOR OPERATING SYSTEMS, (U)

APR 67 33P Wald,Bruce ;
REPT. NO. NRL-6531
PROJ: RF-001-08-41-4552

UNCLASSIFIED REPORT

DESCRIPTORS: (*TIME SHARING, STATE-OF-THE-ART REVIEWS), (*DATA PROCESSING, OPTIMIZATION), (*MULTIPLE OPERATION, COMPUTERS), COMPUTER PROGRAMMING, HISTORY, MONTE CARLO METHOD, DIGITAL COMPUTERS, THESES, SCHEDULING, BIBLIOGRAPHIES (U)
IDENTIFIERS: MULTIPROCESSING, MULTIPROGRAMMING (U)

The history and present status (1965) of multiprocessing, multiprogramming, and timesharing are reviewed. It is concluded that, despite their diverse histories, these techniques are destined to be intertwined. Although the mechanical problems in operating systems that exploit these techniques have largely been solved and the difficult memory allocation problem is on the brink of solution, the important question of optimum operating system strategy in initiating, suspending, and terminating jobs is largely unexplored. Suggestions are made concerning models which might be suitable for both analytic and Monte-Carlo approaches to the optimization of operating system strategy and to the selection of optimum hardware mixes. An extensive bibliography is included. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 651 102 7/4
NAVY MARINE ENGINEERING LAB ANNAPOLIS MD

DETERMINATION OF THE SURFACE AREAS OF SELECTED SOLIDS. (U)

DESCRIPTIVE NOTE: Research and development rept.,
MAR 67 32P Hatfield,Norman L. ;
REPT. NO. MEL-27/67
PROJ: Z-R011-01-01
TASK: 0401

UNCLASSIFIED REPORT

DESCRIPTORS: (*SURFACE AREA, *SOLIDS), (*ADSORPTION, *PHYSICAL CHEMISTRY), MOLECULAR PROPERTIES, MEASUREMENT, THEORY, MOLECULAR ASSOCIATION, PRESSURE, TEMPERATURE, CARBON, STATE-OF-THE-ART REVIEWS, GLASS, SUBLIMATION, INSTRUMENTATION, ERRORS, NAVAL RESEARCH (U)

Because of the many applications of solid-gas interface phenomena in Navy technology, a study was made of methods for the determination of the surface area of solids with the purpose of investigating new adsorbents. After a review of the literature on the many techniques for measuring surface area, the dynamic flow methods using the Brunauer-Emmett-Teller theory of molecular adsorption was selected. The error in this method is less than 5 percent, and the instrumentation required is not overly complicated. The instrumentation was set up, sample treatment and measuring techniques were standardized, and the surface areas of selected materials were determined. The values ranged from a high of almost 1000 square meters per gram for activated carbon to a low of 0.078 squares meters per gram for glass beads. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 645 461 13/13 9/2
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF LOCKHEED PALO ALTO RESEARCH LAB

DEVELOPMENT OF IMPROVED STRUCTURAL DYNAMIC ANALYSIS. VOLUME I: GENERAL SURVEY. (U)

DESCRIPTIVE NOTE: Rept. for Jul 65-Aug 66,
OCT 66 120P Coale,C. W. ;Forsberg,K. J. ;
REPT. NO. LMSC-L-30-66-1
CONTRACT: AF 33(615)-3131
PROJ: AF-1370
TASK: 137008
MONITOR: AFFDL TR-66-187-Vol-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*STRUCTURAL PROPERTIES, DYNAMICS), COMPUTERS, MAN MACHINE SYSTEMS, SHELLS(STRUCTURAL FORMS), STATE-OF-THE-ART REVIEWS, GRAPHICS, SYNTHESIS, SPACECRAFT, INTERACTIONS (U)

The stringent design requirements of modern aerospace vehicles have resulted in continuing demands for improvement of methods for structural dynamic analysis. Improved capabilities in this area will arise from increased analytical capability, more extensive techniques for structural synthesis and integration, and from efficient utilization of improvements in computer hardware. In this study attention has been given to three areas: (1) a review of the current state-of-the-art of structural dynamic analysis: (2) a discussion of the areas where attention should be concentrated to advance the present state-of-the-art, with particular attention given to those critical problem areas requiring long-term research: and (3) a discussion of the current and future developments in computer hardware. Particular attention is given to the exciting new field of computer graphics. It is anticipated that the field of active computer graphics will have tremendous impact on methods of structural dynamic analysis. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 637 735 20/6
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS

THE HISTORY AND CURRENT STATUS OF FOURIER TRANSFORM SPECTROSCOPY. (U)

DESCRIPTIVE NOTE: Physical sciences research papers.
JUL 66 13P Loewenstein,Ernest V. :
REPT. NO. AFCRL-PSRP-247,AFCRL-66-486
PROJ: AF-7670,
TASK: 767003,

UNCLASSIFIED REPORT

Availability: Published in Applied Optics v5 p845-54 May 1966.
SUPPLEMENTARY NOTE: Prepared for presentation at Mellon Institute Symposium on Far Infrared Transpose Spectroscopy, Pittsburgh, 10-11 June 1965.

DESCRIPTORS: (*SPECTROSCOPY, *INTEGRAL TRANSFORMS), (*INTERFEROMETERS, INTEGRAL TRANSFORMS), MULTIPLEXING, SCANNING, NOISE, INSTRUMENTATION, HISTORY, STATE-OF-THE-ART REVIEWS (U)

The paper is concerned with the development of Fourier transform spectroscopy from its beginnings in Michelson's visibility technique through the present day application using modern digital computers. Methods used in maximizing the efficiency of the computation, as well as the interferometer, are discussed. Means of finding the Fourier transform other than by digital computer are mentioned, and currently available commercial instruments are named. (Author) (U)

AD- 637 488 5/2 5/8 9/2
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C
DIRECTORATE OF INFORMATION SCIENCES

INFORMATION SYSTEM NETWORKS . . . . LET'S PROFIT FROM WHAT WE KNOW. (U)

DESCRIPTIVE NOTE: Scientific rept.
JUN 66 54P Swanson,Rowena W. ;
PROJ: 9769,
MONITOR: AFOSR 66-0873

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared for presentation at the Annual National Colloquim on Information Retrieval (3rd), University of Pennsylvania, Museum Auditorium, 12-13 May 1966.

DESCRIPTORS: (*INFORMATION RETRIEVAL, STATE-OF-THE-ART REVIEWS), DOCUMENTS, SYSTEMS ENGINEERING, TECHNICAL INFORMATION CENTERS, DATA PROCESSING, MAN MACHINE SYSTEMS, COMPUTERS (U)
IDENTIFIERS: INFORMATION NETWORKS, INFORMATION SYSTEMS (M)

The paper reviews information systems that are being built or planned for use in science and technology, industry and commerce, management, libraries, and military activities. The paper takes a systems engineering approach to information systems and discusses how this is applicable and relevant. The paper considers several proposals for information system networks, particularly those of the 'Weinberg Panel' and COSATI, and suggests functions appropriate for a Task Group such as COSATI has recommended. The paper also discusses current research projects concerned with systems design and evaluation, programs for implementing designs, and hardware that may be expected to be useful in the modification of present systems and the creation of new ones. The author contends that technology has significantly changed the concept of network structures, and suggests that networks can be fluid structures exploiting the switching capabilities of machines. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 637 072 15/4 17/9
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

THEORY OF SCANNING IN MILITARY SCIENCE. (U)

MAR 66 248P Emelyanov,L. A. ;Abchuk,V. A. ;
REPT. NO. FTD-TT-65-1259,
MONITOR: TT 66-62043

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Unedited rough draft trans. of mono. Teoriya Poiska v Voennom Dele, Moscow, 1964 p1-208.

DESCRIPTORS: (*MILITARY INTELLIGENCE, *SCANNING), (*DETECTION, MILITARY INTELLIGENCE), THEORY, INSTRUMENTATION, STATE-OF-THE-ART REVIEWS (U)

Methods of scientific analysis pertaining to problems of encounter and discovery of moving targets (ships, aircraft, tanks, etc.) are elucidated in the theory of scanning. The book shows how, on the basis of the theory of scanning, it is possible to obtain practical recommendations for the best means of action in scanning for targets and in evading scanning under various conditions. The book is intended for a wide circle of army and navy officers, as well as students and cadets at institutions of military learning. It will be useful to specialists in civil aviation, in the navy, and in the merchant marine, whose work is connected with scanning for certain movable and stationary targets. The book is based on domestic and foreign open-source materials. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 633 930 9/2 5/2
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

SEMIANNUAL TECHNICAL SUMMARY REPORT TO THE DIRECTOR, ADVANCED RESEARCH PROJECTS AGENCY FOR THE PERIOD 18 NOVEMBER 1965 THROUGH 17 MAY 1966. (U)

DESCRIPTIVE NOTE: Technical memo.,
MAY 66 54P Baum,C. ;
REPT. NO. TM-687/006/00,
CONTRACT: AF 19(628)-5166,ARPA Order-773

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*INFORMATION RETRIEVAL, STATE-OF-THE-ART REVIEWS), (*PROGRAMMING LANGUAGES, STATE-OF-THE-ART REVIEWS), (*DATA PROCESSING, COMPUTERS), (*COMPUTERS, SCHEDULING), SYNTAX, COMPUTER PROGRAMMING, COMPILERS, SYSTEMS ENGINEERING, COMMAND AND CONTROL SYSTEMS (U)
IDENTIFIERS: DATA BASES, LISP LANGUAGE, LUCID, NATURAL LANGUAGE (U)

This report describes work done in the ARPA-sponsored Information Processing Techniques and Command and Control Research and Laboratory Program from 18 November 1965 through 17 May 1966. Projects covered are Time-Sharing, Data Base Systems, Computer Processing of Natural Language, and the Research and Technology Laboratory. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 632 594 20/4
MASSACHUSETTS INST OF TECH CAMBRIDGE ENGINEERING PROJECTS LAB

DETERMINATION OF THE STATE OF THE ART IN TWO-PHASE GAS-LIQUID FLOW PHENOMENON. (U)

DESCRIPTIVE NOTE: Final rept., 1 Feb 61-31 Dec 65,
APR 66 6P Gouse,S. W. ,Jr.;
CONTRACT: Nonr-1841(73),
PROJ: DSR-8734,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*TWO PHASE FLOW, STATE-OF-THE-ART), (*GAS FLOW, TWO PHASE FLOW), (*LIQUIDS, TWO PHASE FLOW), RESEARCH MANAGEMENT, BIBLIOGRAPHIES (U)

The purpose of the program was to conduct an extensive and detailed study of the literature on two-phase gas-liquid flow phenomena and to compile the results of such a study in a useful form. A three-part bibliography and subject index to the literature were published listing and indexing by subject 5,253 separate references on two-phase gas-liquid flow phenomena, excluding the problem areas of condensation, cavitation, and atomization. Four technical reports, presenting reviews of various problem areas were also completed and distributedd. (Author) (U)

AD- 632 477 9/2 5/8
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

TRENDS IN COMPUTER HARDWARE. (U)

DESCRIPTIVE NOTE: Professional paper,
MAR 66 35P Fanwick,Charles ;
REPT. NO. SP-2393,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COMPUTERS, STATE-OF-THE-ART REVIEWS), (*DATA PROCESSING, COMPUTERS), (*MAN-MACHINE, COMPUTERS), COMPUTER PROGRAMMING, SYSTEMS ENGINEERING, ELECTRICAL ENGINEERING (U)

The capabilities of elements of data processing systems which might be expected to be economically available about 1971 are described. This description is based on an extrapolation by the writer of the present state-of-the-art. Systems are hypothesized containing these capabilities in their parts. It is shown that these systems have capabilities inherent in the hardware which are now expected to be provided only by sophisticated software developments. It is emphasized that software system designers should anticipate hardware capabilities which will be available at the time when their software systems are expected to be available. (Author) (U)

UNCLASSIFIED

AD- 631 748 5/2 9/2 5/7
HEBREW UNIV JERUSALEM (ISRAEL)

DATA RETRIEVAL BY COMPUTER. A CRITICAL SURVEY. (U)

DESCRIPTIVE NOTE: Technical rept.,
JAN 66 78P Kasher,Asa ;
REPT. NO. TR-22,
CONTRACT: N62558-4695,
PROJ: NR-049-130/6,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also PB-161 547.

DESCRIPTORS: (*INFORMATION RETRIEVAL, STATE-OF-THE-ART), (*DATA, INFORMATION RETRIEVAL), COMPUTERS, ARTIFICIAL INTELLIGENCE, COMPUTATIONAL LINGUISTICS, CONTEXT FREE GRAMMARS, DATA PROCESSING, PROGRAMMING LANGUAGES, CONTEXT SENSITIVE GRAMMARS, ISRAEL (U)
IDENTIFIERS: NATURAL LANGUAGE, TURING MACHINES (U)

The report constitutes a critical survey of work in the field of data-retrieval from a theoretical viewpoint. The conditions to be fulfilled, ideally, by a data-retrieval system which distinguish it from other types of data-processing systems are enumerated. Section 1 deals with problems of sentence ambiguity, syntactic and/or semantic, with special reference to context-dependence. Various fallacies and misconceptions are pointed out. Section 2 is devoted to the question of data-based versus text-based systems. Sections 3 and 4 discuss the ambivalent attitude to various theoretical results. Examples: Questions of consistency, decidability, syntactic simplification, inadequate explication. Various attempts to overcome these difficulties are described, and their respective merits and defects discussed. Section 5 deals with the fallacious identification of 'conversation' and 'cross -examination', which is traced back to a misunderstanding of a classical paper of Turing. Section 6 digresses, to discuss systems having a two-dimensional input. Section 7 points out the fallacy of indiscriminate application of considerations of efficiency, etc., which are in general not accompanied by careful analysis of the specific systems in question. The conclusion asserts the need to concentrate research on less ambitious lines than hitherto. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 631 663 1/4 9/2 5/8
LITTON SYSTEMS INC WOODLAND HILLS CALIF GUIDANCE AND CONTROL SYSTEMS DIV

COMPUTERS AND DISPLAYS/CONTROLS STATE-OF -THE-ART TECHNOLOGY STUDIES. (U)

DESCRIPTIVE NOTE: Rept. for 1 Jun 65-31 Jan 66,
FEB 66 395P Pizzicara,D. J. ;
REPT. NO. Pub-4902,
CONTRACT: Nonr-4951(00),

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COMPUTERS, DISPLAY SYSTEMS), (*DISPLAY SYSTEMS, *FLIGHT INSTRUMENTS), (*MAN-MACHINE, FLIGHT INSTRUMENTS), STATE-OF-THE-ART REVIEWS, AERONAUTICS, FLIGHT CONTROL SYSTEMS, COMPUTER LOGIC, MEMORY DEVICES, ANALOG-TO-DIGITAL CONVERTERS, CATHODE RAY TUBES, SCANNING, ELECTRON OPTICS, COLOR, DIGITAL COMPUTERS, ANALOG COMPUTERS, ELECTROLUMINESCENCE (U)
IDENTIFIERS: JANAIR PROJECT (U)

Computers and Displays/Controls for avionics systems are discussed primarily from a technology standpoint. The current state of the art is reviewed, current research developments are pointed out and prediction of when these developments will be incorporated into avionic systems is given. With respect to computers, the following major categories are assessed: a) Logic, b) Memory, c) Computer Organization, d) Analog/Digital Conversion. Emphasis is placed on the impact of batch fabrication to these areas. With respect to Displays/ Controls the following major categories are reviewed: a) CRT's, b) Scan Conversion, c) Color, d) Analog/Digital Techniques for range scaling and symbol generation, e) Electroluminescence. A summary chart projecting state of the art for computers and displays/controls to the 1975 period is presented at the end of the report. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 631 535 9/2 5/8
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C DIRECTORATE OF INFORMATION SCIENCES

INFORMATION SCIENCES: SOME RESEARCH DIRECTIONS, (U)

66 14P Swanson,Rowena W. ;
PROJ: AF-9769,
MONITOR: AFOSR , 66-0632

UNCLASSIFIED REPORT

Availability: Published in Air University Review v17 n3 p56-67 Mar-Apr 1966. Copies to DDC users only.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COMPUTERS, SCIENTIFIC RESEARCH), (*DATA, SCIENTIFIC RESEARCH), (*MAN-MACHINE, SCIENTIFIC RESEARCH), (*PROGRAMMING LANGUAGES, SCIENTIFIC RESEARCH), INFORMATION RETRIEVAL, ARTIFICIAL, REPORTS, STATE-OF-THE-ART REVIEWS (U)
IDENTIFIERS: INFORMATION SCIENCES (U)

The paper briefly summarizes current research and exploratory development activities in areas concerned with document and data systems, management and command systems, man-machine systems, and programming languages. The orientation of the paper is toward exposition. The bibliography augments a section on intelligent systems and new mathematics with references to several proceedings and anthologies. Implications are drawn for future research and military applications. (Author) (U)

AD- 629 352 17/2 9/5
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

MILITARY COMMUNICATIONS SWITCHING SYSTEM DESIGN. (U)

DESCRIPTIVE NOTE: Technical rept.,
JAN 66 66P Kunze,Allan A. ;
REPT. NO. RADC-TR-65-483,
PROJ: AF-DP-64-23,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COMMUNICATION SYSTEMS, SWITCHING), (*ELECTRONIC SWITCHES, COMMUNICATION SYSTEMS), STATE-OF-THE-ARTS REVIEWS, MILITARY REQUIREMENTS, NETWORKS, REAL TIME, ELECTRONIC EQUIPMENT, COMMUNICATION EQUIPMENT, CONTROL SYSTEMS (U)

The past few years have witnessed the rapid evolution of communications switching. As in many other technical areas, requirements of the defense community have tended to outstrip technological progress. The result is that military communications switching systems that are now, or shortly will be, in operation are doomed to varying degrees of obsolescence in the not-too-distant future. This technical report is intended to review the state of the art in the area of communications switching, examine major problems and recommend areas of investigation. The report covers four major topics: (1) Military Communications Switching Requirements, based on Military Standard 188B, which was released early in 1964. (2) Switching System Design Problems, including a discussion of switching fundamentals and a description of the influence of system requirements on the choice of techniques and devices used for implementation. (3) The State of the Art in communications switching, from the point of view of system operation and useful or promising devices. () Recommended Research and Development Efforts, indicating technical areas in which such efforts should result in worthwhile additions to the communications switching discipline. (Author) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 628 763 6/5
AEROSPACE MEDICAL DIV AIR FORCE SYSTEMS COMMAND BROOKS AFB TEX

FOREIGN DEVELOPMENTS IN SURGICAL TRANSPLANTATION, (U)

DESCRIPTIVE NOTE: Foreign technology rept.,
MAR 66 68P Friedman,Howard S. ;
REPT. NO. AMD-CR-01-1-66,
MONITOR: TT , 66-60637

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*TRANSPLANTATION, SURGICAL TECHNIQUES), MEDICAL RESEARCH, MEDICAL PERSONNEL, IMMUNOLOGY, PATHOLOGY, STATE-OF-THE-ART REVIEWS, SKIN(ANATOMY), BLOOD, NEOPLASMS, TENDONS, CARTILAGE, MUSCLES, BONES, BONE MARROW, ENDOCRINE GLANDS, HEART, LUNG, KIDNEYS, INTESTINES, EXTREMITIES, SURGICAL SUPPLIES, BIBLIOGRAPHIES, USSR (U)

A brief history of surgical transplantation in general, and of Soviet activities in this area in particular, is presented. Surgical practice and research facilities and major personalities of the Soviet Union are outlined. Soviet activities and research are discussed in reference to the transplantation of: skin; tumor transplants, fasciae; tendons; cartilage; muscle; bone and bone marrow; endocrine glands; heart, lung, kidney, intestine, and other organs; and the extremities. Biochemical, pathologic, and immunobiologic aspects are included in the discussion. A current state-of-the-art in the Soviet Union is projected. (Author) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z0M07

AD- 625 005 5/7 9/2
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

NATURAL-LANGUAGE PROCESSING BY COMPUTERS-1966. (U)

DESCRIPTIVE NOTE: Professional paper,
DEC 65 31P Simmons,R. F. ;
REPT. NO. SP-2279/000/00
CONTRACT: SD-97

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COMPUTATIONAL LINGUISTICS, STATE-OF-THEART REVIEWS), (*LANGUAGE, ANALYSIS), COMPUTERS, COUNTING METHODS, INFORMATION RETRIEVAL, SEMANTICS, SYNTAX, LINGUISTICS, INDEXES, MACHINE TRANSLATION (U)
IDENTIFIERS: NATURAL LANGUAGE, SYNTHEX, WORDS(LANGUAGE) (U)

The eventual goal of language-processing research is the development of highly sophisticated question-answering systems. These would accept natural-language questions, search a multilingual library for pertinent factual text, translate and generate from that widely separated text essays that answered the question at any desired level of detail. Examples of existing question answerers, translations, essay writers, etc., are presented. These examples are evaluated as highly inventive linguistic gadgetry that is still far from practical usefulness. Linguistic, semantic, and psychological problems both of theory and practice must be solved before this gadgetry results in useful systems. Specific difficulties facing researchers in these areas are described. The paper concludes that the strongest existing machine capability with language is that of counting and indexing words of a text. This capability has already made the computer an indispensible partner in concordancing, information retrieval, linguistic analysis, and stylistic and context analysis. Although fascinating linguistic gadgetry is available on computers, the solid contribution so far lies in this well-developed capability of word counting and indexing. (Author) (For presentation at the Annual Meeting of the American Association for the Advancement of Science, Berkeley, Calif., Dec. 26-31, 1965) (U)

*AAI CORP COCKEYSVILLE MD

* * *

ER-4889
STUDY OF LASER APPLICATION TO VELOCITY MEASURING SYSTEM.
(MDC-TR-67-136)
AD- 662 342

*ADVANCED TECHNOLOGY CORP TIMONIUM MD

* * *

IMPLICATIONS OF MILLIMETER WAVE RESEARCH AND TECHNOLOGY ON NAVAL PROBLEMS.
AD- 813 462

*ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT NEUILLY-SUR-SEINE (FRANCE)

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AGARD-AG-236
Instability, Transition to Turbulence and Predictability,
AD-A057 934

*ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

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AGARD-582
A Literature Survey on the Gyroscope and Its Applications,
AD- 720 260

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AGARD-AG-138-70
Ballistic-Range Technology.
AD- 713 915

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AGARD-CP-187
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AD-A026 937

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AGARD-CP-212
Aircraft Operational Experiance and Its Impact on Safety and Survivability.
AD-A037 402

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AGARD-LS-46-71
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AD- 784 944

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OCR and Its Application to Documentation - A State of the Art Review,
AD-A024 401

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AGARD-R-650
State-of-the-Art in Unsteady Aerodynamics,
AD-A034 401

*AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO

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ASD-TR-70-33
The Feasibility of Utilizing Color Cathode Ray Tubes for Aircraft Crew Station Displays.
AD- 717 655

*AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO DEPUTY FOR ADVANCED SYSTEMS PLANNING

* * *

ASB-TM-67-1
BIONICS-BASE FOR INNOVATION: A MANAGEMENT OVERVIEW OF THE BIRTH AND DEVELOPMENT OF BIONICS AT WRIGHT FIELD,
AD- 660 614

*AEROSPACE CORP EL SEGUNDO CALIF ENGINEERING SCIENCE OPERATIONS

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TOR-0066(5306)-2
ASPECTS OF PRECISION TIMING SYSTEMS,
AD- 695 458

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TR-0073(3901-01)-1
Survey of Cryogenic Cooling Techniques.
(SAMSO-TR-73-34)
AD- 755 780

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TR-0078(3526)-1
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(SAMSO-TR-78-70)
AD-A053 322

*AEROSPACE CORP EL SEGUNDO CALIF LAB OPERATIONS

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Photodetectors for the 0.1 Micrometer to 1 Micrometer Spectral Region,
(SAMSO-TR-71-14)
AD- 718 096

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TR-0073(3220-20)-2
The Induction Arc, a State-of-the Art Review.
(SAMSO-TR-72-227)
AD- 750 742

*AEROSPACE MEDICAL DIV AIR FORCE SYSTEMS COMMAND BROOKS AFB TEX

* * *

AMD-CR-01-1-66
FOREIGN DEVELOPMENTS IN SURGICAL TRANSPLANTATION,
(TT-66-60637)
AD- 628 763

*AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB OHIO

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AMRL-78-11
Procedures Used to Generate Three- and Six-Year-Old-Child Data Sets for the Articulated Total Body Model from Anthropometric Data,
AD-A059 797

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AMRL-TR-66-18-VOL-2
SIMULATION IMAGE GENERATION. VOLUME II. STUDY OF TRANSPARENCY

AND STYLIZED IMAGE TECHNIQUES; VIRTUAL IMAGE DISPLAY.
AD- 818 940

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AMRL-TR-72-38
Factors Affecting the Detection and Recognition of Colored Targets.
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AMRL-TR-76-119
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*AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

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ARL-73-0012
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AD- 759 165

*AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OHIO

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AFAPL-TR-67-88
TURBINE ENGINE CHECKOUT.
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AFAPL-TR-68-39
THERMOELECTRIC AIR CONDITIONER PERFORMANCE INVESTIGATION,
AD- 839 524

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