

Management A Bibliography for NASA Managers NASA SP-7500(20) April 1986

3837

National Aeronautics and Space Administration

(NASA-SP-7500 (20)) MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS (National Aeronautics and Space Administration) 169 p CSCL 05A HC A08 00/81 N86-27108

Unclas 43435

# **Management** Management Mana entManagemen nentManagen na nagementMa anagement ntNanagemen entManac len

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by RMS Associates.

# NASA SP-7500(20)

# MANAGEMENT

# A BIBLIOGRAPHY FOR NASA MANAGERS

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system during 1985.



This document is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, price code A08.

# FOREWORD

*Management* gathers together references to pertinent documents — reports, journal articles, books — that will assist the NASA manager to be more productive. Items are selected and grouped according to their usefulness to the manager *as manager*. A methodology or approach applied to one technical area may be worthwhile for a manager in a different technical field.

Individual sections can be quickly browsed. Indexes will lead quickly to specific subjects or items.

# **TABLE OF CONTENTS**

.

	Page
Category 01 Human Factors and Personnel Issues Includes organizational behavior, employee relations, employee attitudes and morale, personnel management, personnel development, personnel selection, performance appraisal, training and education, computer literacy, human factors engineering, ergonomics, human-machine interactions.	1
Category 02 Management Theory and Techniques Includes management overviews and methods, decision theory and decision making, leadership, organizational structure and analysis, systems approaches, operations research, mathematical/statistical techniques, modeling, problem solv- ing, management planning.	10
Category 03 Industrial Management and Manufacturing Includes industrial management, engineering management, design engineer- ing, production management, construction, aerospace/aircraft industries, manufacturing.	19
Category 04 Robotics and Expert Systems Includes artificial intelligence, robots and robotics, automatic control and cybernetics, expert systems, automation applications, computer-aided design (CAD), computer-aided manufacturing.	23
Category 05 Computers and Information Management Includes information systems and theory, information dissemination and retrieval, management information systems, database management systems and databases, data processing, data management, communications and communi- cation theory, documentation and information presentation, software, software acquisition, software engineering and management, computer systems design and performance, configuration management (computers), networking, office au- tomation, information security.	31
Category 06 Research and Development Includes contracts and contract management, project management, program management, research projects and research facilities, scientific research, innovations and inventions, technology transfer and utilization, R&D resources, agency, national and international R&D.	43
Category 07 Economics, Costs and Markets Includes costs and cost analysis, cost control and cost effectiveness, productivity and efficiency, economics and trade, financial management and finance,	58

13

58

investments, value and risk (monetary), budgets and budgeting, marketing and market research, consumerism, purchasing, sales, commercialization, competition, accounting.

# Logistics and Operations Management Category 08 Includes inventory management and spare parts, materials management and handling, resources management, resource allocation, procurement management, leasing, contracting and subcontracting, maintenance and repair, transportation, air traffic control, fuel conservation, operations, operational programs. Category 09 **Reliability and Quality Control** Includes fault tolerance, failure and error analysis, reliability engineering, quality assurance, wear, safety management and safety, standards and measurement, tests and testing inspections, specifications, performance tests, certification. Category 10 Legality, Legislation, and Policy Includes laws and legality, insurance and liability, patents and licensing, legislation and government, regulation, appropriations and federal budgets, local, national, and international policy.

72

78

86

Subject Index	A-1
Personal Author Index	B-1
Corporate Source Index	C-1
Foreign Technology Index	D-1
Contract Number Index	E-1
Report Number Index	F-1
Accession Number Index	G-1

# MANAGEMENT

A Bibliography for NASA Managers

# **APRIL 1986**

# 01

# HUMAN FACTORS AND PERSONNEL ISSUES

Includes Organizational Behavior, Employee Relations, Employee Attitudes and Morale, Personnel Management, Personnel Development, Personnel Selection, Performance Appraisal, Training and Education, Computer Literacy, Human Factors Engineering, Ergonomics, Human-Machine Interactions.

# A85-13587#

# TRAINING AND DEVELOPMENT OF ENGINEERS AT THE AIR FORCE FLIGHT TEST CENTER - AN OVERVIEW

R. E. HART (USAF, Flight Test Center, Edwards AFB, CA) AIAA, AHS, ASEE, Aircraft Design Systems and Operations Meeting, San Diego, CA, Oct. 31-Nov. 2, 1984. 6 p

(AIAA PAPER 84-2528)

Training and development of engineers is a major undertaking for the 6520 Test Group at the Air Force Flight Test Center Guidance and policy regarding training is provided in the Master Training Plan. The plan evolved as a result of some training and development deficiencies within the organization. This paper comments on means for identifying training deficiencies and discusses changes made to improve training and development of engineers at the Flight Test Center. The paper also briefly addresses such related items as why training is needed, assessing training needs, and preventing obsolescence. Author

## A85-17232# SIMULATORS/TRAINING DEVICES FOR COMMUTER AIRLINES

R. L. COLLIE (Regional Airline Association, Washington, DC) (Royal Aeronautical Society and Canadian Aeronautics and Space Institute, Spring Convention, London, England, May 9, 10, 1984) Canadian Aeronautics and Space Journal (ISSN 0008-2821), vol 30, Sept. 1984, p. 263-268

The reasons for developing economical simulators for training pilots for flying regional aircraft are delineated, along with standards the simulators must meet. The current cost of simulators is \$5-8 million, too much for regional airlines to pay, while at the same time the pilots must learn during actual flights, an expensive school in which to gain all proficiency skills. The rapid expansion of regional services and numbers of passengers carried in the period 1972-1982 has placed a heavy burden of in-flight training on existing, operational aircraft. It is suggested that a motion-equipped, non-visual simulator can be built for \$0.75 million. The device would furnish line-oriented flight training and cockpit resource management skills. Detailed requirements for Levels I-III simulators which would meet FAA standards have been defined and can be tailored to any specific aircraft. The equipment specifications and performance test, tolerance and characteristics at each level are M.S.K. outlined.

## A85-17781

# **QUALITY CIRCLES - SQUARE DEAL FOR PRODUCTIVITY**

B. HUNT (General Dynamics Corp., Pomona, CA) Engineering Management International (ISSN 0167-5419), vol 2, July 1984, p. 271-278 refs

It is pointed out that the United States productivity growth is at an all time low, trailing several industrial nations, particularly Japan. Fullmer (1981) has stated that a failure to tap the tremendous amount of personal energy available in the U.S. has contributed to a declining position. He claims that only 10 percent of the individual potential is used. The investigation of avenues related to an optimization of human creative effort is an important aspect of the productivity formula. One avenue, 'quality circles', has already been used successfully in Japan. The present investigation is concerned with questions regarding a successful application of this concept in the U.S., taking into account a study conducted by an American aerospace company The study included a six-month pilot program. It was found that 'quality circles' are an effective means to productivity improvement which taps that other 90 percent of human potential which, according to Fullmer, is still available. G.R.

## A85-18720

# NEW SYSTEM FOR THE SELECTION OF AIR TRAFFIC CONTROL PERSONNEL [NEUES AUSWAHLSYSTEM FUER FLUGSICHERUNGSPERSONAL]

K. STEININGER (Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Institut fuer Flugmedizin, Hamburg, West Germany) DFVLR-Nachrichten (ISSN 0011-4901), vol. 43, Nov. 1984, p. 35-37. In German.

Air traffic control operations in West Germany are very demanding on account of the great air traffic density in this country. It is, therefore, vital that the personnel of the air traffic control organization is well qualified for their work. The selection of suitable applicants represents an essential precondition for the successful development of personnel qualified for the performance of the air traffic control operations. Education and training leading to the position of a fully responsible air traffic controller requires a time of five years Certain difficulties have arisen in connection with the current selection system, and a fundamental revision of this system is necessary A description is given of the approaches developed by the DFVLR for such a revision, taking into account the great differences in performance shown even in the case of people of the same age group, education, and orientation with respect to interests. Attention is given to the criteria which are considered in the selection process. G.R.

## A85-21560#

# DISPLAYS, DEJA VU

R. B. HUNTOON (Rockwell International Corp., Collins Government Avionics Div., Cedar Rapids, IA) IN: Symposium on Aviation Psychology, 2nd, Columbus, OH, April 25-28, 1983, Proceedings. Columbus, OH, Ohio State University, 1984, p. 77-84. refs

This paper is intended to briefly review the development and status of avionics and human engineering with particular emphasis on human engineering recommendations and requirements as applied to current display technology. Existing and near term cockpit management systems are used to illustrate potential areas for human factors specialists, and some suggestions, indicated by recent cockpit display research, are offered. Author

## A85-21565#

# UNITED AIRLINES' COCKPIT RESOURCE MANAGEMENT TRAINING

D. L. JACKSON (United Air Lines, Inc., Denver, CO) IN Symposium on Aviation Psychology, 2nd, Columbus, OH, April 25-28, 1983, Proceedings . Columbus, OH, Ohio State University, 1984, p. 131-137. refs

This paper describes a unique pilot training program which focuses on five elements of synergistic cockpit crew teamwork. The five elements are: inquiry, advocacy, conflict resolution, critique and decision making. The Managerial Grid provides a theoretical basis for crew self-assessment of performance effectiveness on each of the five elements. The primary goal of this training program is to improve aviation safety. The data indicate a positive acceptance of the program by flight crewmembers and a positive effect upon their performance during annual proficiency checks Plans for future data collection on United Airlines and recommendations for industry-wide data collection are discussed Author

# A85-21579#

**PILOT JUDGMENT TRAINING - PAST, PRESENT AND FUTURE** G S LIVACK (General Aviation Manufacturers Association, Washington, DC) IN: Symposium on Aviation Psychology, 2nd, Columbus, OH, April 25-28, 1983, Proceedings . Columbus, OH, Ohio State University, 1984, p. 353-362.

Until very recently, conventional flight training was not concerned directly with proper judgment, because it appeared that 'judgment' could neither be taught, measured, or modified. However, in recent years, developments related to improved accident investigation technology have led to a growing realization of the significance of pilot judgment errors A description is given of recent pilot judgment related projects, taking into account a U.S. Air Force program designed to teach judgment to the pilot, pilot judgment training activities initiated by a U.S airline, judgment research efforts undertaken by the Federal Aviation Agency, and the development of a student pilot judgment training program for use in Canada. A proposed future, multifaceted, pilot judgment training program is also discussed. G.R.

# A85-21581

# THE MYERS-BRIGGS TYPE INDICATOR AS A TOOL TO IDENTIFY FLIGHT STUDENT'S LEARNING STYLES

A. C POWERS (AOPA - Air Safety Foundation, Bethesda, MD) IN: Symposium on Aviation Psychology, 2nd, Columbus, OH, April 25-28, 1983, Proceedings Columbus, OH, Ohio State University, 1984, p. 385-391.

A test to identify the personality types of flight students has been developed. The test is based on Jung's (1923) theory of types and can be used to characterize the way an individual perceives his environment or judges events and actions. It is shown that an awareness of personality types during flight training makes it possible to modify training approaches to meet the specific needs of each student. The benefits of a more individual approach to flight training include greater retention of information and faster learning rates A complete list of the different personality types is given in a table I.H

## A85-21588#

# THE FUNCTIONAL AGE PROFILE - AN OBJECTIVE DECISION CRITERION FOR THE ASSESSMENT OF PILOT PERFORMANCE CAPACITIES AND CAPABILITIES

R. J. BRAUNE and C. D. WICKENS (Illinois, University, Champaign, IL) IN<sup>.</sup> Symposium on Aviation Psychology, 2nd, Columbus, OH, April 25-28, 1983, Proceedings . Columbus, OH, Ohio State University, 1984, p. 437-444 refs (Contract N00204-82-C-0113)

# A85-21589#

# AUTOMATED PERFORMANCE MEASUREMENT FOR NAVAL AVIATION - APARTS, A LANDING SIGNAL OFFICER TRAINING AID

C A. BRICTSON (Dunlap and Associates West, Inc, La Jolla, CA) IN Symposium on Aviation Psychology, 2nd, Columbus, OH, April 25-28, 1983, Proceedings . Columbus, OH, Ohio State University, 1984, p. 445-448 Navy-sponsored research.

Development of the Automated Performance Assessment and Remedial Training System (APARTS) is described. APARTS is an automated training aid designed to assist the Landing Signal Officer (LSO) in training pilots during the acquisition of carrier landing skills APARTS is based on general principles of learning and provides graphic displays of pilot landing technique problems for LSO evaluation and pilot feedback. APARTS also integrates Field Carrier Landing Practice (FCLP), conducted in the aircraft, with Night Carrier Landing Trainer (NCLT) instruction. Landing technique problems are identified and fed back to the pilot as a basis for remedial instruction in the NCLT trainer. APARTS is designed to process, store and graphically display pilot landing performance data, including the type, frequency and location of problems. Application of APARTS data has improved initial carrier landing performance, reduced cost and provided normative data for training evaluation The evolution of the program to its present operational status is an example of how automated performance measurement can be applied to Naval aviation Author

# A85-21602#

# THE USAF PILOT SELECTION AND CLASSIFICATION RESEARCH PROGRAM

J. E KANTOR (USAF, Human Resources Laboratory, Brooks AFB, TX) IN. Symposium on Aviation Psychology, 2nd, Columbus, OH, April 25-28, 1983, Proceedings . Columbus, OH, Ohio State University, 1984, p 547-552.

A battery of experimental tests to select combat pilot trainees for the US Air Force is described. The tests are given in a stand-alone format on computer and provided measures of behavior previously not available through traditional testing formats. Among the psychological parameters evaluated by tests are: psychomotor abilities; cognitive abilities; attitudinal characteristics; and personality traits. Some preliminary results of the tests are considered, within the context of a discussion concerning the usefulness of psychomotor testing, in general. I.H.

# A85-23276

SOME PERSPECTIVES ON THE STUDY AND IMPROVEMENT OF THE COGNITIVE-CREATIVE ACTIVITY OF AN INDIVIDUAL AND A GROUP [O NEKOTORYKH PERSPEKTIVAKH IZUCHENIIA I SOVERSHENSTVOVANIIA POZNAVATEL'NO-TVORCHESKOI DEIATEL'NOSTI LICHNOSTI I GRUPPY1

I. S. ZAMALETDINOV and R. B BOGDASHEVSKII (Tsentr Podgotovki Kosmonavtov, USSR) Psikhologicheskii Zhurnal, vol. 5, Sept.-Oct. 1984, p. 13-24. In Russian. refs

The available psychological literature concerned with the origins and characteristics of creative processes is reviewed Attention is given to the results of experimental investigations of the cognitive and creative abilities of human operators in a variety of environments. Some practical applications of the experimental results in the fields of personnel selection and operator training are discussed. I.H.

# A85-23278

# INTERPERSONAL ACTIVITY IN CONDITIONS OF GROUP LEARNING [MEZHLICHNOSTNAIA AKTIVNOST' V USLOVIIAKH GRUPPOVOGO OBUCHENIIA]

R. S. NEMOV (Akademiia Pedagogicheskikh Nauk SSSR, Nauchno-Issledovatel'skii Institut Obshchei i Pedagogicheskoi Psikhologii, Moscow, USSR) and K. A. KHVOSTOV (Akademiia Pedagogicheskikh Nauk SSSR, Nauchno-Issledovatel'skii Institut Trudovogo Obucheniia i Professional'noi Orientatsii, Moscow, USSR) Psikhologicheskii Zhurnal, vol. 5, Nov.-Dec 1984, p. 39-47. In Russian. refs

# A85-23279

# SOME PRINCIPLES FOR THE CONSTRUCTION OF AN ADAPTIVE TRAINING SYSTEM (NEKOTORYE PRINTSIPY POSTROENIIA ADAPTIVNOI SISTEMY PODGOTOVKI]

L. P. GRIMAK, V. M. VASILETS, and V F. ZHERNAVKOV Psikhologicheskii Zhurnal, vol 5, Nov.-Dec 1984, p 62-68. In Russian. refs

The role of computer models in aircraft mechanic training exercises is discussed. Attention is given to some of the benefits of computer-assisted mechanical instruction, including an increase in the time available for hands-on instruction, and a more logical organization of the lesson plan. In preliminary experiments with a prototype computer training system, it was found that the computer's selections with respect to exercise complexity and lesson sequence were in substantial agreement with the selections of a number of professional aircraft mechanic trainers. 1H

## A85-23283

# THE PRINCIPLES OF EXPERIMENTAL SETUP IN MODELS OF COMPLEX HUMAN OPERATOR ACTIVITIES [PRINTSIPY POSTANOVKI EKSPERIMENTOV PRI RAZRABOTKE MODELEI SLOZHNYKH DEISTVII CHELOVEKA-OPERATORA]

G. M ZARAKOVSKII, S. L. RYSAKOVA, and K. A. CHERNOV Psikhologicheskii Zhurnal, vol. 5, Nov.-Dec. 1984, p 93-105. In Russian. refs

# A85-23285

### INTERRELATIONSHIP BETWEEN LEARNING AND DEVELOPMENT IN THE PROCESS OF MASTERING AN OCCUPATIONAL ACTIVITY [VZAIMOSVIAZ' OBUCHENIIA I RAZVITIIA V PROTSESSE OSVOENIIA PROFESSIONAL'NOI DEIATEL'NOSTI]

V. SHKALIKOV and V. D SHADRIKOV (laroslavskii 1 Gosudarstvennyi Pedagogicheskii Institut, Yaroslavl, USSR) Psikhologicheskii Zhurnal, vol. 5, Sept.-Oct. 1984, p 94-103. In Russian. refs

# A85-25986

# T-45 TRAINING SYSTEM - CONCEPT AND ACQUISITION STRATEGY

W. J. CATLETT (U.S. Navy, Washington, DC) and R. G. GROWER (McDonnell Douglas Corp., St. Louis, MO) Society of Automotive Engineers, Aerospace Congress and Exposition, Long Beach, CA, Oct. 15-18, 1984. 7 p.

(SAE PAPER 841588)

An account is given of the U.S. Navy's Full Scale Development program for the T-45 trainer aircraft, which attempts to work with the manufacturer within the Navy's schedule, priority, and affordability constraints. Acquisition of the T-45 is unique in being a closed loop system which has to demonstrate pilot production and cost-to-train advantages. In addition, program management has striven to encompass hardware, software, and 'courseware' from the Navy's curriculum guidelines 00

## A85-28024

BASIC PRINCIPLES OF THE DEVELOPMENT AND EXECUTION OF A SYSTEM FOR THE PSYCHOLOGICAL SELECTION OF MILITARY PERSONNEL [OSNOVNYE PRINTSIPY RAZRABOTKI SISTEMY PROFESSIONAL'NOGO PSIKHOLOGICHESKOGO OTBORA VOENNOSLUZHASHCHIKH I EGO PROVEDENIIA]

V. A. BODROV Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), Sept 1984, p. 41-43. In Russian

# A85-29863

# SIMULATORS FOR TRAINING AIRCRAFT MAINTENANCE PERSONNEL [VYCVIKOVE TRENAZERY PRO TECHNICKY PERSONAL V UDRZBE LETADEL]

J. TUMA (Ceskoslovenske Aerolinie, Prague, Czechoslovakia) Zpravodaj VZLU (ISSN 0044-5355), no. 6, 1984, p. 345-349. ln Czech. refs

Finding more efficient ways of training the ground support personnel becomes increasingly important as the requirements for the qualifications of such personnel become more stringent. The qualification of aircraft maintenance specialists directly affects the cost effectiveness of aircraft maintenance and flight safety. The use of simulators in training aircraft maintenance technicians is discussed, and the principal characteristics of such simulators are examined. V.L.

## A85-29865

# POSSIBLE APPLICATIONS OF SIMULATORS IN VARIOUS AREAS [VALIDITA UZITI TRENAZERU V RUZNYCH OBORECH]

J. STIKAR and J HOSKOVEC (Karcova Univerzita, Prague, Czechoslovakia) Zpravodaj VZLU (ISSN 0044-5355), no 6, 1984, p. 357-360. In Czech

The possibilities afforded by simulators for improving the efficiency of training in various areas are discussed, and various types of systems for simulating simple and complex skills are examined. It is noted that the use of simulators is particularly effective in areas where acquiring the necessary skills during actual operation is too dangerous, expensive, or difficult Methods for evaluating the efficiency of simulators and assessing the acquired skills are presented. V.L.

# A85-39368

# HUMAN FACTORS IN AVIATION. I

E. EDWARDS Aerospace (UK) (ISSN 0305-0831), vol 12, June-July 1985, p 13-17

The ergonomic factors influencing the design of cockpit instruments, control devices and accommodations are discussed, on the basis of data accumulated in the fields of perceptual psychology, anthropometry, and cognitive psychology The design of cockpit displays is noted to call for careful attention to the relevant human perceptual processes, irrespective of the technical problems associated with the instrument's production Attention must also be given to cockpit temperature control and especially to cockpit lighting ΟĊ

# A85-39623#

# **GRADUATE EDUCATION IN PROPULSION**

B H. GOETHERT (Tennessee, University, Tullahoma, TN) AIAA, SAE, ASME, and ASEE, Joint Propulsion Conference, 21st, Monterey, CA, July 8-10, 1985 6 p (AIAA PAPER 85-1147)

The main elements of MS-programs in propulsion are discussed in relationship to undergraduate and Ph.D.-programs. Consideration is given to the role of the faculty which is required to have good engineering experience and close contact with outside industry, and to graduate student participation in research, accomplished by close cooperation within professor-student teams. The advantages of bringing engineers and scientists from the outside into the university programs by appointing them to the faculty as adjunct professors and of teaching engineering by taped lectures or lecturing by telephone are examined The demand for special short courses of usually one week, as exemplified in specific short courses in aeropropulsion, is also discussed. MD

# A85-40554#

# AV-8B HARRIER II TRAINING CAPABILITIES

R. J. MUFFLER (McDonnell Aircraft Co., St. Louis, MO) IN Flight Simulation Technologies Conference, St. Louis, MO, July 22-24, 1985, Technical Papers New York, AIAA, 1985, p 11-15. (AIAA PAPER 85-1734)

An evaluation is made of the training facilities that have been developed for U.S. marine pilots' transition to AV-8B harrier II operation These are designated the Operational Flight Trainer (OFT) and Weapons Tactics Trainer (WTT) OFT is specifically concerned with the development of pilot skills associated with V/STOL, WTT has the complementary role of refining pilots' air-to-ground and air-to-air weapons delivery skills, especially those which involve low altitude navigation and target penetration Attention is presently given to the OFT and WTT simulators' imagery display pilot fields-of-view. O.C

# A85-43183#

# WHY WRESTLE WITH JELLYFISH?

R. J BOYLE (Honeywell, Inc , Minneapolis, MN) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality. Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 51-54.

Based on experience with stimulating organizational change, it is suggested that executives should make sure they are devoting their attention to the right things - culture, quality and management systems. Eight pitfalls that accompany dealing with change are noted, and eight corollary lessons are offered. Author

# A85-43193#

# RENEWING LARGE ORGANIZATIONS

L. W. LEHR (3M Co, St. Paul, MN) IN White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p 113-117.

Strategies for promoting innovation and flexibility in large established organizations are discussed from a management point of view, with examples from business and government. Topics examined include the key role of individual innovators in initiating and carrying through new products or procedures, the need for management sponsors for new ideas, the establishment of reward structures which permit innovators to continue their activity (with higher pay and prestige but without becoming supervisors or managers), job security in the case of an unsuccessful innovation, identification of customer needs as the source of innovation, techniques for maintaining close communication with customers, the innovative design of the NASA SPAS-01 space platform, and creativity as a fundamental human drive T.K

# A85-43198#

# ENCOURAGING AND MAINTAINING AN INNOVATIVE WORK CLIMATE

H E. EDMONDSON (Hewlett-Packard Co., Palo Alto, CA) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality; Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 145-148

Strategies for promoting innovation in large corporate or governmental organizations are discussed. The primary emphasis is on defining the role of innovation in fulfilling the overall corporate mission, selecting and motivating innovators, and establishing work environments and reward structures which encourage innovation.

T.K.

# A85-43200#

# LABOR-MANAGEMENT COOPERATIVE PROGRAMS

J. R. STEPP (U.S. Department of Labor, Washington, DC) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 157-160.

# A85-44244

# PSYCHOLOGICAL TECHNIQUES FOR THE SELECTION AND INITIAL TRAINING OF MILITARY AIR TRAFFIC CONTROLLERS [METHODES D'APPROCHE PSYCHOLOGIQUE DE LA SELECTION ET DE LA FORMATION INITIALE DU CONTROLEUR AERIEN MILITAIRE]

J.-J. HOFFMANN and G. VERON (Service de Santedes Armees, Saint-Cyr-l'Ecole, France) Medecine Aeronautique et Spatiale, vol. 24, 2nd Quarter, 1985, p. 130-134. In French. refs

An 18 month psychological study was carried out on 120 probationary students at the French military air traffic controller (ATC) school. Results of a pre-school battery of tests were compared with the results of entrance tests for the school. It was hypothesized that ATCs must minimize logical thought in utilizing the high technology tools at their disposal, and must have a good capacity for spatial conception and for verbal communications.

The candidates were given tests dealing with accident avoidance in space Written tests were also given to establish the levels of nervousness, extroversion and introversion, anxiety, hysteria, obsessiveness, neuroses, paranoia, schizophrenia, and psychosomatic illnesses. The results, when correlated (or negatively correlated) with the entrance tests scores, indicated that the psychological profile tests will be a valid aid in determining the motivational levels of candidates for ATC training. M.S.K.

# A85-44624

# AGE AND SPACE FLIGHT

S. R. MOHLER (Wright State University, Dayton, OH) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol. 56, July 1985, p. 714-717. refs

Criteria for space flight crew and passenger selection should be based on the following three considerations: (1) freedom from impairing disease, (2) ability to perform mission requirements and (3) motivation to undertake the mission Chronologic age of itself is not a valid criterion. Forecast life expectancy and vitality relative to mission duration are valid criteria and can be applied on an individual basis using modern assessment techniques. The good health and vitality characterizing the upper ages of today's population widens the opportunity to utilize increasingly broad fields of experience and skills in future space flights, further enhancing the odds for total mission accomplishment. Author

# A85-45094

ANALYTICAL MODELS OF PERFORMANCE OF PROCEDURES P. J STICHA (Human Resources Research Organization, Alexandria, VA) IN: NAECON 1984; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 21-25, 1984 Volume 2. New York, IEEE, 1984, p. 841-848 refs (Contract MDA903-81-C-0517)

Models that represent the performance of procedural tasks are described, concentrating on different ways sequencing may be represented. Three network simulation techniques are discussed, the Siegel-Wolf model, which predicts the performance of individuals affected by stress, the Human Operator Simulator, which makes extensive use of psychological micromodels, and the System Analysis of Integrated Network of Tasks (SAINT) The techniques are compared for flexibility, validity, generality, and pragmatic considerations Production systems for representing procedural control are discussed and compared to network simulations in terms of how they represent control and approach cognitive modeling. Of the network simulations, SAINT is preferred for flexibility and generality, while the other simulations are advantageous in situations for which the task domain is restricted. Network models are more suited to requirements of procedural tasks than production systems, which are data driven. CD.

# A85-45122

# TRAINING TASK HIERARCHY DEVELOPMENT

R. CLAPP (Boeing Military Airplane Co., Wichita, KS) IN NAECON 1984; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 21-25, 1984. Volume 2. New York, IEEE, 1984, p. 1072-1075. refs

Special emphasis should be directed in flight simulation training programs to those tasks that are especially hazardous to crew or aircraft in actual flying, and are characterized by contingency or emergency events in flight procedures. Attention is presently given to a Training Task Hierarchy which has been developed to cover the range of possible simulator training tasks, listing those that are fully, partly, or not at all adequately simulable Fully simulable emergency and malfunction situations encompass engine radio communication and electrical system failures, icy or wet runways, and the appearance of unfriendly aircraft. O.C.

A85-46148

# AN ANALYSIS OF ERGONOMIC SYSTEMS [ANALIZ ERGOTEKHNICHESKIKH SISTEM]

G. V. DRUZHININ Moscow, Energoatomizdat, 1984, 160 p In Russian. refs

The book is concerned with the application of the concepts of human factors engineering to the design and development of automated systems. Attention is given to the biological and psychological characteristics of human operators, method of describing the structure of individual work processes, and operational characteristics of technical equipment. The discussion also covers various methods for describing schedules of operations, probabilistic modeling of work processes, and assessment of the confidence level of information in ergonomic systems.

## A85-48752

# HUMAN-SYSTEM PERFORMANCE MEASUREMENT IN TRAINING SIMULATORS

D VREULS and R. W OBERMAYER (Vreuls Research Corp, Thousand Oaks, CA) Human Factors (ISSN 0018-7208), vol. 27, June 1985, p. 241-250. refs

Present deficiencies in human performance measurement techniques for training simulators are discussed Automated performance measurement is controlled by algorithms in real-time, recording performance data wherever feasible. The systems cannot assess hidden knowledge, only overt actions, thereby missing any indication of complex decision-making processes. The practice of measuring whatever is measurable is a default technique employed in the absence of a satisfactory human performance theory. Furthermore, no extensive validation programs have been carried out to prove that the data is a basis for predicting future performance. Finally, there is a lack of quantitative criteria for evaluating performance changes. It is recommended that quantitative operational performance standards be established and that AI systems be developed for measuring performance and providing immediate feedback, using performance data from experts at tasks as reference points. MSK.

N85-10648# Denver Research Inst, Colo.

# FACTORS CRITICAL TO THE IMPLEMENTATION OF SELF-PACED INSTRUCTION: A BACKGROUND REVIEW Final Technical Paper May - Dec. 1982

S. M. BACK and B. L. MCCOMBS Aug. 1984 61 p (Contract F33615-81-C-0007)

(AD-A145143; AFHRL-TP-84-24) Avail: NTIS HC A04/MF A01

CSCL 051

In a previous effort the literature pertaining to self-paced instruction was initially collected and reviewed to support a study of factors associated with the successful utilization of self-paced instruction in Air Force technical training. The purpose of this technical paper is to provide a more in-depth analysis of the literature relevant to the findings of that study. In general, the analysis of the literature revealed a high level consensus among military and civilian reports with respect to factors associated with successful implementation of self-paced instruction. GRA

N85-11426\*# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil)

# A REPORT ON THE TRAINING COURSE AT FORTALEZA (CEARA) [RELATORIO DO CURSO DE TREINAMENTO DE FORTALEZA (CEARA)]

M. P. BARBOSA, Principal Investigator Dec 1983 28 p In PORTUGUESE; ENGLISH summary Sponsored by NASA ERTS

(E85-10013; NASA-CR-168570, NAS 1.26:168570;

INPE-2989-RPE/453) Avail: NTIS HC A03/MF A01 CSCL 05B

The activities of the on the job training course Applications of the Remote Sensing Data, with Emphasis on LANDSAT Images, to Study the Natural Resources are described. M.A.C N85-11597# Office of Navai Research, Arlington, Va.

# OVERVIEW OF TRAINING AND AIDING

H HALFF In Denver Research Inst. Artificial Intelligence in Maintenance p 67-81 Jun. 1984

(AD-P003917) Avail NTIS HC A22/MF A01 CSCL 05A

This article discusses the role that people play in maintaining systems and about psychological research which addresses that role. GRA

N85-12302# Denver Research Inst., Colo Social Systems Research and Evaluation Div.

TRAINING CAPABILITIES TEST OF ELECTRONICS EQUIPMENTMAINTENANCETRAINER(EEMT):FINDINGSANDCONCLUSIONS Final Technical Report, Sep. 1981 - Feb. 1984L. F CICCHINELLI, R. A. KELLER, and K R. HARMON Orlando,Fia. Naval Training Equipment Center Jul. 1984125 p(Contract N61339-81-C-0126)

(AD-A146075; TAEG-TR-158) Avail: NTIS HC A06/MF A01 CSCL 051

The objective of the study was to design and conduct a Training Capabilities Test (TCT) of the Electronic Equipment Maintenance Trainer (EEMT) within the Primary Power portion of the AN/SPS-10 radar training course at ET A School, Naval Training Center, Great Lakes. The TCT consisted of a series of studies which examined the training effectiveness, operational suitability, and life cycle cost of the EEMT as it supports the training system. Author (GRA)

# N85-14558\*# Army Aviation Center, Fort Rucker, Ala DETERMINING TRAINING DEVICE REQUIREMENTS IN ARMY AVIATION SYSTEMS

M L POUMADE *In* NASA. Ames Research Center 20th Ann. Conf., on Manual Control, Vol. 2 p 273-282 Sep. 1984 refs Avail: NTIS HC A18/MF A01 CSCL 05H

A decision making methodology which applies the systems approach to the training problem is discussed. Training is viewed as a total system instead of a collection of individual devices and unrelated techniques. The core of the methodology is the use of optimization techniques such as the transportation algorithm and multiobjective goal programming with training task and training device specific data. The role of computers, especially automated data bases and computer simulation models, in the development of training programs is also discussed. The approach can provide significant training enhancement and cost savings over the more traditional, intuitive form of training development and device requirements process. While given from an aviation perspective, the methodology is equally applicable to other training development efforts. E.A.K.

N85-16475# Human Resources Research Organization, Alexandria, Va

# HUMAN FACTORS AND TRAINING RESEARCH IN MILITARY ORGANIZATIONS AND SYSTEMS Final Report

A L. KUBALA Army Research Inst. for Behavioral and Social Sciences Oct. 1984 13 p

(Contract MDA903-79-C-0191; DA PROJ. 2Q2-62717-A-765; DA PROJ 2Q2-62731-A-792)

(AD-A146832, HUMRRO-FR-MTRD(TX)-80-9; ARI-RN-84-124)

Avail: NTIS HC A02/MF A01 CSCL 051

This report summarizes the resulting five research projects conducted between March 1979 and February 1980. Separate, more detailed reports describing the work in each of the five areas are being published concurrently. These reports are: 'Preliminary Development of the Commander's Unit Analysis Profile: A Leadership Tool for the Small Military Unit; The Impact of Adopting Physical Fitness Standards on Army Personnel Assignment. A Preliminary Study; Testing and Training Methods for Skill Qualification Testing; Reading Ability and Other Correlates of the SQT Written Component; Development of a Basic Training Program in Combat Vehicle Identification, and Improvement of Training Realism for Tactical Units: Opposing Force (OPFOR) Program. GRA

# N85-17542# Electronic Systems Div., Hanscom AFB, Mass TRAINING GUIDE FOR SCIENTIFIC AND ENGINEERING **TRAINEES 1984**

Jun. 1984 24 p

(AD-A147963; ESD-TR-84-184) Avail NTIS HC A02/MF A01 CSCL 051

This Training Guide is to provide a unique opportunity to selected graduate engineers, mathematicians, and computer scientists to acquire applicable knowledge and experience in technical management with the guidance of the Electronic Systems Division Scientific and Engineering Career Panel It is to provide trainees with an effective and meaningful entry into a technical management career. GRA

### N85-18013\*# Piedmont Aviation, Inc., Winston-Salem, N C MANAGEMENT TRAINING FOR COCKPIT CREWS AT PIEDMONT FLIGHT

J C. SIFFORD In NASA. Ames Research Center Flight Training Technol. for Regional/Commuter Airline Operations p 79-101 Dec. 1984

Avail: NTIS HC A12/MF A01 CSCL 05I

A brief history of Piedmont Airlines' flight operations is presented A captain-management seminar conducted regularly by Piedmont is discussed. Piedmont's approach to cockpit resource management (CRM) is reviewed, and the relationship of CRM training to other aspects of flight training is addressed. Future leadership research plans and CRM training is considered along with critical training issues. R.S.F

# N85-18017\*# Air Midwest, Inc., Wichita, Kans. COMMUNICATIONS SKILLS FOR CRM TRAINING

M. SHEARER In NASA. Ames Research Center Flight Training Technol. for Regional/Commuter Airline Operations p 143-146 Dec. 1984

Avail: NTIS HC A12/MF A01 CSCL 051

A pilot training program in communication skills, listening, conflict solving, and task orientation, for a small but growing commuter airline is discussed. The interactions between pilots and management, and communication among crew members are examined Methods for improvement of cockpit behavior management personnel relations are investigated. EA.K.

# N85-18025\*# Scenic Air Lines, Inc., Las Vegas, Nev LOW COST TRAINING AIDS AND DEVICES

J LAWVER and A LEE In NASA Ames Research Center Flight Training Technol. for Regional/Commuter Airline Operations p 221-228 Dec. 1984

Avail NTIS HC A12/MF A01 CSCL 051

The need for advanced flight simulators for two engine aircraft is discussed. Cost effectiveness is a major requirement. Other training aids available for increased effectiveness are recommended Training aids include. (1) audio-visual slides, (2) information transfer, (3) programmed instruction, and (4) interactive training systems BW.

N85-18026\*# Air Midwest, Inc., Wichita, Kans. PILOT EDUCATION AND SAFETY AWARENESS PROGRAMS

M SHEARER and W D. REYNARD In NASA Ames Research Center Flight Training Technol for Regional/Commuter Airline Operations p 229-239 Dec 1984 Avail: NTIS HC A12/MF A01 CSCL 01C

Guidelines necessary for the implementation of safety awareness programs for commuter airlines are discussed A safety office can be viewed as fulfilling either an education and training function or a quality assurance function. Issues such as management structure, motivation, and cost limitations are discussed B.W

# N85-18027\*# Air Wisconsin, Inc., Appleton.

INITIATIVE USES OF AIRCRAFT FOR FLIGHT TRAINING

M. SELE and M BAETGE In NASA. Ames Research Center Flight Training Technol. for Regional/Commuter Airline Operations p 241-247 Dec 1984

Avail. NTIS HC A12/MF A01 CSCL 01C

The use of the aircraft rather than a flight simulator as a training device is investigated. Particular attention is paid to the application of LOFT concepts to the aircraft in its home environment BW.

## N85-18028\*# Command Airways, Wappingers Falls, N.Y INNOVATIVE APPROACHES TO RECURRENT TRAINING

H NOON and M. MURPHY In NASA. Ames Research Center Flight Training Technol. for Regional/Commuter Airline Operations Dec 1984 p 249-263

Avail NTIS HC A12/MF A01 CSCL 051

Innovative approaches to recurrent training for regional airline aircrews are explored. Guidelines for recurrent training programs which include in corporation of cockpit resource management are discussed BW.

# N85-18561# Joint Publications Research Service, Arlington, Va **ROLE OF ENGINEERING PSYCHOLOGY**

A SAVAYAN In its USSR Rept. Life Sci. Biomed. and Behavioral Sci. (JPRS-UBB-85-002) p 26-30 23 Jan. 1985 Transl. into ENGLISH from Trud (Moscow), 18 Sep. 1984 p 3 Avail. NTIS HC A09/MF A01

Human factors engineering in the working force is discussed. The psychological effects of automation and robotics are analyzed The contribution of human factors to work accidents and lost work hours is outlined. Psychological fitness of equipment operators for the appropriate jobs is outlined.

# N85-19620# Joint Publications Research Service, Arlington, Va. STUDY OF COGNITIVE STYLES OF STUDENTS IN AUTOMATED TEACHING SYSTEM Abstract Only

T A BRUTSENTSOVA In its USSR Rept Life Sci Biomed. and Behavioral Sci. (JPRS-UBB-85-011) p 19-20 26 Feb. 1985 Transl into ENGLISH from Vopr. Psikhologii (Moscow), no. 4, Jul. - Aug. 1984 p 70-76

Avail NTIS HC A05/MF A01

Computer-assisted experiments revealed cognitive styles in students which must be considered during development of computer-assisted teaching systems and showed the possibility of using computer-based teaching systems in psychological study of aspects of teaching Subjects included 12 8th grade students and 7 Moscow State University students using 3 variants of the BASIC language Two cognitive styles were noted. Subjects with cognitive style A acted impulsively without preliminary analysis of the situation, used trial and error and guess work and did not worry about mistakes, while those with cognitive style B were very cautious, analyzed carefully in order to avoid errors, checked their answers carefully, made few errors but were greatly bothered by them The experiments showed the advisability of using computer-assisted teaching methods in teaching students with individual differences. A brief account of the history of the study of this problem is presented. Author

# N85-19640\*# Federation of American Societies for Experimental Biology, Bethesda, Md Life Sciences Research Office. RESEARCH OPPORTUNITIES IN HUMAN BEHAVIOR AND

PERFORMANCE

J. M. CHRISTENSEN, ed. and J M TALBOT, ed. Jan. 1985 77 p refs

(Contract NASW-3924)

(NASA-CR-175473, NAS 1.26 175473) Avail: NTIS HC A05/MF A01 CSCL 051

Extant information on the subject of psychological aspects of manned space flight are reviewed; NASA's psychology research program is examined; significant gaps in knowledge are identified; and suggestions are offered for future research program planning. Issues of human behavior and performance related to the United States space station, to the space shuttle program, and to both

near and long term problems of a generic nature in applicable disciplines of psychology are considered. Topics covered include: (1) human performance requirements for a 90 day mission, (2) human perceptual, cognitive, and motor capabilities and limitations in space; (3) crew composition, individual competencies, crew competencies, selection criteria, and special training, (4) environmental factors influencing behavior; (5) psychosocial aspects of multiperson space crews in long term missions; (6) career determinants in NASA; (7) investigational methodology and equipment; and (8) psychological support A.R.H.

N85-19874# Brigham Young Univ., Provo, Utah Dept. of Civil Engineering

STRATEGIC MANAGEMENT FOR ORGANIZATIONAL EFFECTIVENESS. THE EFFECT OF HUMAN RESOURCE PLANNING ON RETENTION AND RELATED ISSUES, VOLUME 1 Final Report

L. S. OPPENHEIM, S. D. HYMAN, and C. T KYDD Dec 1984 137 p

(Contract N00014-82-C-0803)

(AD-A149398; ONR-FR-1-VOL-1) Avail: NTIS HC A07/MF A01 CSCL 05A

This study assessed the match between strategic direction, human resource policies and the perceptions of those policies held by middle managers in five successful organizations. Human resource practices related to retention -- job movement, organizational signals, and incentives -- were the focus of three separate studies. The results indicated that the strategic considerations of these organizations were well served by their human resource practices although the configuration of policies and practices differed. The research also indicated that these effective organizations exhibited greater flexibility in interpreting policy and enforcing boundaries in areas in which they needed information to innovate and adapt. GRA

N85-19875# Brigham Young Univ., Provo, Utah Dept. of Civil Engineering.

STRATEGIC MANAGEMENT FOR ORGANIZATIONAL EFFECTIVENESS. THE EFFECT OF HUMAN RESOURCE PLANNING ON RETENTION AND RELATED ISSUES, VOLUME 2 Final Report

L. S OPPENHEIM, S. D. HYMAN, and C T KYDD Dec 1984 123 p

(Contract N00014-82-C-0803)

(AD-A149399, ONR-FR-1-VOL-2) Avail NTIS HC A06/MF A01 CSCL 05A

This study assessed the match between strategic direction, human resource policies and the perceptions of those policies held by middle managers in five successful organizations. Human resource practices related to retention -- job movement, organizational signals, and incentives -- were the focus of three separate studies. Results from the studies were combined with information from formal documents and interviews to form the basis for comparative case studies Approximately 100 managers at each of the six sites contributed to these results. Key findings were: (1) a model of job movement which took expectations into account was a good predictor of the way in which a manager and his boss divided tasks, (2) the rate of movement from one job to the next was more rapid in organizations where jobs were clearly and narrowly defined than when jobs evolved and expanded over time; (3) signals from the organization which were public, positive and relevant to a manager's goals increased the likelihood of his remaining with the organization, (4) managers were more likely to see themselves as resource constrained if goal setting and resource allocation were decided at different levels in the organization, (5) informal incentives were more salient to middle managers than most formal incentives. GRA N85-19876# Brigham Young Univ, Provo, Utah. Dept of Civil Engineering

STRATEGIC MANAGEMENT FOR ORGANIZATIONAL EFFECTIVENESS. THE EFFECT OF HUMAN RESOURCE PLANNING ON RETENTION AND RELATED ISSUES, VOLUME 3 Final Report

L. S. OPPENHEIM, S. D. HYMAN, and C T KYDD Dec. 1984 78 p

(Contract N00014-82-C-0803)

(AD-A149400, ONR-FR-1-VOL-3) Avail NTIS HC A05/MF A01 CSCL 05A

This research evaluated the match between strategic direction, human resource policies and the perceptions of those policies held by middle managers in five successful organizations. Human resource practices related to retention -- job movement, organizational signals, and incentives -- were the focal points of three separate studies Results from the studies were combined with data from formal documents and interviews to form the basis for comparative case studies The key research findings were (1) a model of job movement which took expectations into account was a good predictor of the way in which a manager and his boss divided tasks, (2) the rate of movement from one job to the next was faster in organizations where jobs were clearly and narrowly defined than when jobs evolved and expanded over time, (3) signals from the organization which were public, positive and related to a manager's goals increased the likelihood of his remaining with the organization; (4) managers were more prone to see themselves as resource constrained if goal setting and resource allocation were decided at different levels in the organization; (5) informal incentives were more salient to middle managers than most formal incentives GRA

N85-19877# Brigham Young Univ, Provo, Utah Dept of Civil Engineering.

STRATEGIC MANAGEMENT FOR ORGANIZATIONAL EFFECTIVENESS. THE EFFECT OF HUMAN RESOURCE PLANNING ON RETENTION AND RELATED ISSUES: METHODOLOGICAL APPENDIX Final Report

L S. OPPENHEIM, S. D HYMAN, and C T. KYDD Dec. 1984 139 p

(Contract N00014-82-C-0803)

(AD-A149401, ONR-FR-1-APP) Avail: NTIS HC A07/MF A01 CSCL 05A

This research studied the relationship between strategic direction, human resource policies and the perceptions of those policies held by middle managers in five successful organizations. Human resource practices dealing with retention -- job movement, organizational signals, and incentives -- were the focus of three different studies. Information from the studies were combined with information from formal documents and interviews to form the basis for comparative case studies The main reseach findings were: (1) a model of job movement which took expectations into consideration was a good predictor of the way in which a manager and his boss divided tasks, (2) the rate of movement from one job to the next was more rapid in organizations where jobs were clearly and narrowly defined than when jobs evolved and expanded over time; (3) signals from the organization were public, positive and relevant organization; (4) managers were more likely to envision themselves as resource constrained if goal setting and resource allocation were decided at different levels in the organization; (5) informal incentives were more salient to middle managers than most formal incentives GRA

**N85-21978#** Advanced Research Resources Organization, Bethesda, Md.

TEAM DIMENSIONS: THEIR IDENTITY, THEIR MEASUREMENT AND THEIR RELATIONSHIPS Final Research Note

V. F NIEVA, E. A. FLEISHMAN, and A. RIECK Jan. 1985 101

(Contract DAHC19-78-C-0001)

(AD-A149662; ARI-RN-85-12) Avail NTIS HC A06/MF A01 CSCL 05J

This report represents the initial phase of a programmatic effort aimed at answering basic questions about the nature of team performance and the factors affecting it. An extensive literature review on the relationships between various team or group characteristics and collective performance was conducted, and a summary of propositions derived from this literature is presented. In addition, a new conceptualization of team performance proposed, and a provisional taxonomy of team performance dimensions consistent with this conceptualization is presented

GRA

# N85-23693# Joint Publications Research Service, Arlington, Va. IMPROVEMENTS IN PERSONNEL NEEDED FOR BETTER FLIGHT SAFETY

Y. KOLESNIKOV *In its* USSR Rept.: Transportation (JPRS-UTR-85-005) p 17-20 25 Mar. 1985 Transl. into ENGLISH from Vozdushnyy Transport (Moscow), 24 Jan. 1985 p 2

Avail: NTIS HC A05/MF A01

Flight safety is that generalized indicator in accordance with which the level of professional skill is evaluated along with the quality of training of flight controller, and engineering and technical personnel. The status of organized operation and discipline in flight subunits, in the traffic services, and in the technical maintenance services of air maintenance bases is also evaluated. The ground services and the effectiveness of organizational and political education work in a collective is reviewed Author

N85-24732# Michigan Univ., Ann Arbor. THE ACQUISITION OF PROCEDURES FROM TEXT. A PRODUCTION-SYSTEM ANALYSIS OF TRANSFER OF TRAINING

D. E. KIERAS and S. BOVAIR 29 Jan 1985 40 p (Contract N00014-84-K-0731)

(AD-A151029; TR-85; ONR-TR-16) Avail: NTIS HC A03/MF A01 CSCL 05I

The current theory of cognitive skill describes knowledge of procedures in terms of a production rule representation which is constructed on the basis of an initial declarative (prepositional) representation. In these terms, learning a procedure from written instructions consists of converting the propositional content of the written material into production rules. This process was studied in a transfer of training experiment. Subjects learned from step-to-step instructions a series of related procedures for operating a simple device, with the major manipulation being the order of learning the procedures. Very strong transfer effects were obtained, which could be predicted very well by a simple model of transfer. Individual production rules can be transferred, or re-used in the representation of a procedure if they appeared in a previously learned procedure, meaning that learning time is mostly a function of the number of completely new production rules that must be acquired. Examination of the time required to read individual instruction steps suggests, however, that this transfer mechanism involves processes acting on declarative propositional representatives of the production rules. This means that the transfer process is more similar to comprehension processes rather than conventional practice mechanisms, or Anderson's (1982) learning principles.

Author (GRA)

**N85-26147** British Aerospace Dynamics Group, Bristol (England). Human Factors Dept.

HUMAN FACTORS DEPARTMENT 1981 PUBLICATIONS

J. L. EVANS Jan. 1982 26 p refs

(BAE-BT-12685) Avail Issuing Activity

About 90 papers covering human factors of remotely controlled systems; gun aiming; sight performance modeling; man computer interaction; target acquisition; and vision modeling are listed. Author (ESA)

## N85-26200# Naval Postgraduate School, Monterey, Calif A LEARNING STRATEGY APPROACH FOR TEACHING NOVICE COMPUTER PROGRAMMERS M.S. Thesis D.D. BEGLEY Sen 1984 85 n

D D BEGLEY Sep. 1984 85 p (AD-A151523) Avail: NTIS HC A05/MF A01 CSCL 09B

The purpose of this thesis is to investigate various learning strategies and present some suggested applications for the teaching of computer programming to Marine Corps entry-level programmers. These learning strategies are used to develop a cognitively designed structure for the teaching of the software engineering process. This structure was designed so that programmers could have readily available in their thinking process modern software engineering goals and principles that ultimately affect the quality of software. Also suggested at a lower level of the overall structure is a syntax and semantics organizer. This particular framework serves as an advance organizer for which specific programming language features could be introduced. This structure can act as an organizing mechanism for the introduction of various, useful programming chunks that would start the novice programmer on his quest to becoming an expert. Author (GRA)

N85-27028# Ballistic Research Labs., Aberdeen Proving Ground, Md.

# A REVIEW OF SAFETY PRACTICES AND SAFETY TRAINING FOR THE EXPLOSIVES FIELD

J. HERSHKOWITZ Feb. 1985 125 p (Contract DA PROJ. 1L1-61102-AH-43, DA PROJ 1L1-62618-AH-80) (AD-A152295; AD-F300588, BRL-TR-2635) Avail. NTIS HC

A06/MF A01 CSCL 13L

Various safety practices and the content of selected training programs emphasized at several major installations involved with explosives and explosive devices are reported herein. The report is divided into independent sections, each of which addresses a commonly encountered facet of explosives safety. Supplemented by a safety file consisting of regulations, references, documents, videotapes, and cassettes (all listed in an appendix) and suggestions for presentation and demonstrations (also included as an appendix), the report can be used as the basis for a modular training course. It is being used in this mode by the Ballistic Research Laboratory (BRL) in the production of a video training tape which, ultimately, will be made available to those working in the field of explosives. Although the report provides the reader with a comprehensive view of many of the safety practices currently in use at representative installations, it is not an endorsement of any of the safety practices described nor does it supersede existing safety regulations at any installation In all cases, the safety regulations at the individual installations continue in effect until formally altered. GRA

N85-27223 Welding Inst, Cambridge (England). WELDER TRAINING/WELDER TESTING

30 Jan. 1985 13 p Transl into ENGLISH from ZIS-Mitt. (West Germany), no. 11, 1980 p 1214-1220

(BLL-WI-TRANS-683-(9312.57)) Avail British Library Lending Div., Boston Spa, England

There are various areas of weakness in the conventional training of arc welders, which negatively influence the overall result in such a manner that the course time is exceeded, a number of trainees fail to achieve the course objective and the level which is attained is all in all not entirely satisfactory. Based on the recognition of these shortcomings, investigations were carried out into teaching trainees arc welding, with a view to eliminating the existing areas of weakness, to raise the educational effectiveness of the lessons, to make the training more rational and effective and to achieve an improvement in the overall quality. Particular importance is given to the use of television techniques in this training.

# N85-28550# RAND Corp., Santa Monica, Calif. INDIVIDUAL CHARACTERISTICS AND UNIT PERFORMANCE: A REVIEW OF RESEARCH AND METHODS Interim Report

J P KAHAN, N. WEBB, R. J. SHAVELSON, and R. M. STOLZENBERG Feb. 1985 124 p

(Contract MDA903-83-C-0047)

(AD-A153145; RAND/R-3194-MIL) Avail. NTIS HC A06/MF A01 CSCL 05J

This study is an initial effort to understand how characteristics of individuals influence the effectiveness and efficiency with which the military units to which they belong perform their missions. It was undertaken as a systematic review of existing knowledge about the relationship between individual characteristics and group performance. It identified five general catagories of predictors of group performance: (1) individual characteristics (general ability, task proficiency, and personality characteristics); (2) leadership; (3) group structural composition, or the mix of individual characteristics, (4) group processes (cohesiveness, attraction); and (5) training techniques (feedback vs. individual performance). Among its conclusions, the study finds that the relationship between ability and performance depends on the nature of the task, and that feedback, both on level of the individual members' performance and on the level of unit performance, is very important GRA

**N85-28556#** Bundesanstalt fuer Flugsicherung, Frankfurt am Main (West Germany).

GUIDELINES OF THE FEDERAL MINISTER OF TRANSPORTATION FOR THE FORMATION AND EXAMINATION OF AIRLINE PERSONNEL, PART 4 [RICHTLINIEN DES BUNDESMINISTERS FUER VERKEHR FUER DIE AUSBILDUNG UND PRUEFUNG DES LUFTFAHRTPERSONALS, HEFT 4] Oct. 1984 165 p in GERMAN

Avail: NTIS HC A08/MF A01

The methods and extent of the formation and examination of airline personnel are outlined. Pilots' theoretical and practical instruction, extension or renewal of a type rating, tolerances to be respected during the flight, and certificate for instruction and examinations, are discussed. Theoretical and practical instruction and examination of instrument rating and long range rating are presented. Author (ESA)

N85-28558# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Hamburg (West Germany). Abt. Flugphysiologie und -psychologie.

CONSTRUCTION OF A JOB-ORIENTED TEST FOR THE SELECTION OF AIR TRAFFIC CONTROLLERS Thesis - Hamburg Univ.

T. SPOHRER Oct. 1984 46 p refs In GERMAN; ENGLISH summary Report will also be announced as translation (ESA-TT-921)

(DFVLR-FB-84-51; ISSN-0171-1342) Avail NTIS HC A03/MF A01; DFVLR, Cologne DM 17.50

The Approach Control Test (ACT) simulating air traffic control operations is a paper-pencil group test consisting in controlling the collision-free landing of two to three aircraft over check points in the Approach Control area. The test requires the use of a test map representing the approach control area, a tape or cassette recorder and a blackboard for occasional explanations. The test results prove the validity of the ACT used as a part of the psychological selection program for air traffic controllers.

Author (ESA)

N85-28559\*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

HAND CONTROLLERS FOR TELEOPERATION. A STATE-OF-THE-ART TECHNOLOGY SURVEY AND EVALUATION

T L. BROOKS and A. K. BEJCZY 1 Mar. 1985 94 p refs (Contract NAS7-918)

(NASA-CR-175890, JPL-PUB-85-11; NAS 1.26:175890) Avail NTIS HC A05/MF A01 CSCL 05H

Hand controller technology for teleoperation is surveyed in three major catagories. (1) hand grip design, (2) control input devices, and (3) control strategies In the first category, 14 hand grip designs are reviewed and evaluated in light of human factor considerations. In the second, 12 hand controller input devices are evaluated in terms of task performance, configuration and force feedback, controller/slave correspondence, operating volume, operator workload, human limitations, cross coupling, singularities. anthropomorphic characteristics. physical complexity, control/display interference, accuracy, technological base, cost, and reliability. In the third catagory, control strategies, commonly called control modes, are surveyed and evaluated. The report contains a bibliography with 189 select references on hand controller technology. Author

N85-29562\*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif.

# SOME IDEAS AND QUESTIONS REGARDING SPACE STATION DESIGN FOR HUMAN USE

S. SKOLNICK In its Proc. of the Seminar on Space Station Human Productivity 9 p Mar 1985

Avail: NTIS HC A99/MF E03 CSCL 05H

Design concepts for interior utility of space station crew areas are offered Planning of a living environment that maintains elements of humanity is stressed. G.L.C

# N85-29567\*# McDonnell Aircraft Co., St. Louis, Mo. CUSTOMER AND MISSION INFLUENCE ON SPACE STATION ARCHITECTURE

F. C RUNGE *In* NASA. Ames Research Center Proc of the Seminar on Space Station Human Productivity 17 p Mar 1985 Avail: NTIS HC A99/MF E03 CSCL 05H

Overall Space Station architecture is presented in schematic outlines and plans. How the customer and mission needs influence this design is studied. The uses, occupants, activities, interfaces, utilities, locomotion, environments, and technological costs are all factors which influence the architecture User and system functions are profiled, interfaces are characterized and functions are grouped. These lead to packaging of functions into modules and the design of system and user accommodations. E R.

**N85-29568\***# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SIMULATION FOR HUMAN FACTORS RESEARCH. A CENTRAL QUESTION: FIDELITY

D. NAGEL *In its* Proc. of the Seminar on Space Station Human Productivity 4 p Mar. 1985

Avail: NTIS HC A99/MF E03 CSCL 05H

Generalized outlines are presented for simulation in human factors research. Recent trends in aeronautical simulation are given. Some criteria for effective training devices are also given. Full system/full mission simulation in aviation and in space human factors research is presented.

N85-30628# Applied Science Associates, Inc., Valencia, Pa. MAINTENANCE TRAINING SIMULATORS PRIME ITEM DEVELOPMENT SPECIFICATION. MODEL SPECIFICATION AND HANDBOOK Final Technical Report, Sep. 1983 - Sep. 1984

R. J HRITZ, G R. PURIFOY, JR, and J. A FITZPATRICK Brooks AFB, Tex. Air Force Human Resources Lab. Apr. 1985 456

(Contract F33615-78-C-0019)

(AD-A154108; AFHRL-TP-84-44) Avail NTIS HC A20/MF A01 CSCL 051

This document contains a model specification for maintenance training equipment. An accompanying handbook gives instructions on tailoring the specification for a particular application. The specification allows both training and engineering functional requirements to be stated and is designed to facilitate the inclusion of information related to instructional systems development. The specification provides a standard format while avoiding over-specification of requirements or restriction of contractor engineering decisions. The handbook assists the specification preparer in determining appropriate requirements and gives reasons for these requirements. The value appropriate for particular parameters, source documents, and lessons learned in previous acquisition. GRA

N85-32768# American Coll. Testing Program, Iowa city, Iowa Test Development Div.

MODELS FOR MULTIDIMENSIONAL TESTS AND HIERARCHICALLY STRUCTURED TRAINING MATERIALS Final Report, 1 Sep. 1981 - 28 Feb. 1985

M D. RECKASE May 1985 32 p

(Contract N00014-81-K-0817; RR0-4204)

(AD-A155231, RR-85-1-ONR) Avail NTIS HC A03/MF A01 CSCL 14B

Work on item response theory was extended to include two areas that had not been extensively researched previously They include models for test items that require more than one ability for a correct response and models for the interaction between modules of instruction that have a hierarchical relationship. For both of these types of models, estimation procedures were developed for model parameters and extensive work was done to determine the appropriate interpretation of the parameter values. This report is a summary of work performed on these modules over a three year period. GRA

N85-35821 George Washington Univ, Washington, D.C DATA PROCESSING PROFESSIONALS AND DP APPLICATION USERS' PERCEPTIONS AND EXPECTATIONS OF OPERATIONAL ROLES OF PERSONS WORKING IN A DP/APPLICATION USER INTERFACE GROUP Ed.D Thesis M K. WOLF 1985 148 p

Avail: Univ. Microfilms Order No. DA8506771

The purpose of this study is to determine the perceptions and role expectations of data processing professionals (DPP) and data processing application users (DPAU) working in a data processing/application user interface (DPAU)/application user interface (DPAU) group in an organization. From two mailings sent to each of the two subpopulations, a total of 349 computer processable questionnaires were received from 213 DPPs and 136 DPAUs. A Likert type scale is used to obtain four grouped responses for each of the 16 technical questions. The four responses corresponds with four points of view related to what DPPs and DPAUs are doing or should be doing in their daily work It is found that DPAUs have a very low level of perceived competency and a low level of job expectancy and that DPPs have a low level of perceived competency and a high/medium high level of job expected competency. Competency training for DPPs and DPAUs should be developed and required in order to create more effective and efficient DPAU groups in organizations. Dissert. Abstr.

02

# MANAGEMENT THEORY AND TECHNIQUES

Includes Management Overviews and Methods, Decision Theory and Decision Making, Leadership, Organizational Structure and Analysis, Systems Approaches, Operations Research, Mathematical/Statistical Techniques, Modelling, Problem Solving, Management Planning.

## A85-12647

# AN ENGINEER'S GUIDE TO BOOKS ON STATISTICS AND DATA ANALYSIS

G. J HAHN (General Electric Co.; Union College, Schenectady, NY) and W. Q. MEEKER, JR. (Iowa State University of Science and Technology, Ames, IA) Journal of Quality Technology (ISSN 0022-4065), vol. 16, Oct 1984, p. 196-218 refs

An annotated bibliography of statistics and data-analysis texts of use to engineers is presented General texts on applied statistics (of varying degrees of mathematical sophistication) are listed; introductions to mathematical statistics are assessed; and works on such specific application areas as error analysis, experimental design, multivariate analysis, probability distributions, product-life analysis, regression analysis, reliability analysis, statistical computing, statistical graphics, quality control, sampling methods, and time-series analysis are characterized. Consideration is given to special methods, including decision and risk analysis population selection, sample-size determination, sequential analysis, and simultaneous inference T.K.

## A85-17777

# THE ROLE OF COMPANY BOARDS IN DESIGN LEADERSHIP

A TOPALIAN (Alto Design Management, London, England) Engineering Management International (ISSN 0167-5419), vol 2, March 1984, p. 75-86 refs

Difficulties regarding the establishment of design leadership are partly related to an acute worldwide shortage of design specialists with qualifications required to provide such leadership. For this reason, in the foreseeable future, industry will have to find design leaders among managers who have no design training. Problems arise because to the majority of managers design remains unfamiliar territory. Attention is given to different perceptions of design in industry, the characteristics of design activities, the sequence of stages through which design projects progress, aspects of design project management, corporate design management, design 'management' and design 'responsibility', the 'ultimate' responsibility for design, 'visible' and 'invisible' leadership, design responsibility and company boards, and a checklist of board responsibilities for design G R

A85-21540\* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

# REPORT-READING PATTERNS OF TECHNICAL MANAGERS AND NONMANAGERS

T E PINELLI, V. M. CORDLE (NASA, Langley Research Center, Hampton, VA), M GLASSMAN (Old Dominion University, Norfolk, VA), and R. F VONDRAN, JR. (Catholic University of America, Washington, DC) Technical Communication (ISSN 0049-3155), vol 31, 3rd Quarter, 1984, p 20-24 refs

A survey to determine the review and reading processes used by technical managers and nonmanagers indicates that the summary, abstract, conclusion, title page, and introduction are the components used most frequently by both groups to decide whether to read a NASA technical report. In the review process, significantly more managers than nonmanagers use the summary and conclusion, whereas significantly more nonmanagers use the abstract and title page. The most common sequence of review consists of the title page, abstract, and summary, in that order, for both groups. In the reading process, the conclusion, results and discussion, and summary are the components read by the highest percentage of both groups Author

# A85-26785

# SUPPORT PROGRAM PLANNING - MANAGING TO GET IT SUPPORTED

R. A. NAVARRO (McDonnell Aircraft Co, St. Louis, MO) IN. AUTOTESTCON '83, Proceedings of the Conference, Fort Worth, TX, November 1-3, 1983. New York, Institute of Electrical and Electronics Engineers, Inc., 1983, p 61-64.

Major avionics development programs impose significant management and schedule burdens on the Automatic Test Euipment (ATE) community. The success of an avionic system is directly proportional to the success of its ATE support Successful, on-time ATE support requires that the contractor create and employ a management process which is usable and responsive to the manager's needs, which provides visibility into the development process, and which assists the manager in the selection of alternate courses of action. McDonnell Aircraft Company (MCAIR) has developed such a Management System for use in MCAIR's management of ATE development efforts associated with the F-15 Multistaged Improvement Program (MSIP)

## A85-26786

# MANAGEMENT TECHNIQUES IN MEETING REQUIREMENTS FOR INTEGRATING TECHNICAL PUBLICATIONS AND TRAINING INTO ATE STATIONS

R. L. MANGANELLI (Harris Corp., Government Support Systems Div., Syosset, NY) IN. AUTOTESTCON '83; Proceedings of the Conference, Fort Worth, TX, November 1-3, 1983. New York, Institute of Electrical and Electronics Engineers, Inc, 1983, p 69-74.

## A85-26847

# INTERCOMPANY TECHNOLOGY TASK FORCES PROMOTE COOPERATION AT LOCKHEED

R. L. HEIMBOLD (Lockheed Space Operations Co., Titusville, FL) Lockheed Horizons, Feb. 1985, p 2-14

Attention is given to the features of a large aerospace corporation's 'technical task force' system, in which 13 such groups, each composed of five to 15 members from sister companies, meet several times a year in order to exchange technologies and computer programs, coordinate research plans, and arrange interchanges with universities and government agencies An evaluation is made of the impact of these task forces in the fields of advanced metallic materials, communications research, composite materials. electronic warfare. computational aerodynamics, control systems, corrosion control, human factors engineering, nondestructive evaluation, and signal processing O.C.

# A85-29402

# MULTILEVEL MONITORING SYSTEM FOR A CENTRAL RESEARCH AND DEVELOPMENT AGENCY

P. S. NAGPAUL (National Institute of Science, New Delhi, India) and D. K BHATNAGAR (Council of Scientific and Industrial Research, India) Engineering Management International (ISSN 0167-5419), vol. 3, Feb. 1985, p. 101-112. refs

The conceptual framework and salient features of a multilevel, recently developed monitoring system are described. The design takes into account the organizational structure, R&D project characteristics, and information requirements for decision making at various levels, and incorporates environmental dynamics. A practical method for tracking environmental changes is suggested. The choice of parameters, structure of the monitoring system, information flow, filtering, and aggregation are discussed C.D.

# A85-32129

# OVERCOMING PROJECT PLANNING AND TIMELINESS PROBLEMS TO MAKE LANDSAT USEFUL FOR TIMELY CROP AREA ESTIMATES

R DOBBINS, R RYERSON, and J LEBLANC-COOKE (Statistics Canada, Agriculture Statistics Div., Ottawa, Canada) IN Canadian Symposium on Remote Sensing, 8th, and Association Quebecoise de Teledetection, Congress, 4th, Montreal, Canada, May 3-6, 1983, Proceedings . Sainte-Foy, Quebec, Canada, Association Quebecoise de Teledetection, 1984, p 485-494 refs

# A85-33649

STRATEGIC PLANNING FOR INVESTMENT IN R&D USING DECISION ANALYSIS AND MATHEMATICAL PROGRAMMING

G. R. MADEY (Goodyear Aerospace Corp., Akron, OH) and B. V. DEAN (Case Western Reserve University, Cleveland, OH) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-32, May 1985, p 84-90 refs

This paper investigates the strategic planning and investments associated with research and development (R&D) project selection and budgeting within a division of an aerospace firm A model is described that is used in an R&D planning environment where considerable risks result from technological, economic governmental, and market factors. Several forms of a multi-attribute utility (MAU) objective function are maximized using mathematical programming techniques. Approximate methods, including compromise programming and goal programming, are evaluated and yield results that are reasonably close to and require less computation than more exact methods. Solutions are used to recommend to management an R&D portfolio that maximizes expected utility for the division Author

# A85-33650

# RELIABILITY OF COMMUNICATION FLOW IN R&D ORGANIZATIONS

P. SULLO, W. A. WALLACE (Rensselaer Polytechnic Institute, Troy, NY), and T TRISCARI, JR (USAF, Institute of Technology, Wright-Patterson AFB, OH) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol EM-32, May 1985, p 91-97. refs

(Contract NSF 78-16414)

Much attention has been given to the communication process in R&D organizations since the concept of a technological gatekeeper was proposed. By viewing the R&D organization as an information processing and generating system, the role communication network structure plays in determining R&D performance can be isolated and studied. Findings from empirical research are reviewed, providing a framework in which to examine and assess the communication patterns present in an R&D organization. A methodology is presented to evaluate the effectiveness of an organizational communication network with particular reference to project management. The proposed method permits the assessment of contemplated management actions intended to improve organizational communication Author

## A85-37163 INTEGRATED MANAGEMENT

O. A SOLI (Pan American World Airways, Inc., Cocoa Beach, FL) IN New opportunities in space, Proceedings of the Twenty-first Space Congress, Cocoa Beach, FL, April 24-26, 1984. Cape Canaveral, FL, Canaveral Council of Technical Societies, 1984, p. 4-82 to 4-91.

Management techniques for obtaining the best results from employees are discussed. Key concerns of the professional manager, including change, competition, commitment, and creativity, are summarized. Managerial planning is discussed, including predetermining objectives, forecasting outcomes, programming steps of action, and scheduling a time sequence of actions. The manager's organizational responsibility is addressed, identifying and grouping the work, delegating including responsibility, creating conditions for cooperative work, and Managerial choosing positions. people for leadership responsibilities are considered, including communication.

motivation, and decision-making. Finally, the managerial tasks involved in maintaining a steady course are examined, including the budgeting, reporting, evaluating, and correcting the work done and the results attained. C.D.

# A85-38415

# USER AND R&D SPECIALIST EVALUATION OF DECISION-SUPPORT SYSTEMS

L. ADELMAN, P. E LEHNER (PAR Technology Corp., McLean, VA), and F. W. ROOK (Science Applications International Corp., Albuquerque, NM) IEEE Transactions on Systems, Man, and Cybernetics (ISSN 0018-9472), vol. SMC-15, May-June 1985, p. 334-342. refs

(Contract F30602-81-C-0263; F30602-83-C-0154)

There exists little empirical research regarding how users and specialists evaluate the ability of decision-support system (DSS) prototypes. To obtain such information one must develop a measurement instrument that can be used to evaluate different prototypes and thereby collect data regarding what factors different user and specialist groups generally consider most/least important when making utility judgments. A standardized questionnaire recently used by substantive experts (i.e., potential users) and technical representatives (i.e., R&D specialists) to evaluate five DSS prototypes for U.S. Air Force tactical decisionmaking is described. Reliability and validity measures obtained after analyzing the evaluation participants' responses indicate that the questionnaire was an acceptable instrument for measuring people's subjective assessment of DSS prototypes. In addition, there was support for the theoretical position that people use themselves (i.e., their knowledge, skills, needs, etc.) as a reference point when evaluating the potential utility of DSS prototypes. These results represent an initial step toward developing an empirical knowledge base for understanding the different perspectives of DSS users and developers. Author

A85-41319\* Jet Propulsion Lab., California Inst. of Tech., Pasadena.

# THE SIMRAND METHODOLOGY - SIMULATION OF RESEARCH AND DEVELOPMENT PROJECTS

R. F. MILES, JR. (California Institute of Technology, Jet Propulsion Laboratory, Pasadena) Large Scale Systems (ISSN 0167-420X), vol. 7, 1984, p. 59-67. refs

(Contract NASA TASK RE-152; DE-Al01-76ET-20356)

In research and development projects, a commonly occurring management decision is concerned with the optimum allocation of resources to achieve the project goals. Because of resource constraints, management has to make a decision regarding the set of proposed systems or tasks which should be undertaken SIMRAND (Simulation of Research and Development Projects) is a methodology which was developed for aiding management in this decision. Attention is given to a problem description, aspects of model formulation, the reduction phase of the model solution, the simulation phase, and the evaluation phase. The implementation of the considered approach is illustrated with the aid of an example which involves a simplified network of the type used to determine the price of silicon solar cells. G.R.

# A85-42587

# THE MULTIPLE FUNCTIONS OF FORMAL AIDS TO DECISION MAKING IN PUBLIC AGENCIES

J. D. ROESSNER (Georgia Institute of Technology, Atlanta) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol EM-32, Aug. 1985, p. 124-128 refs

This article examines how the value to a decision maker of formal, quantitative decision aids changes as the setting shifts from the program level to senior executives and, ultimately, to external groups to which the decision maker is accountable. Examples drawn from the use of research and development project selection models in the U.S. Department of Energy are used to illustrate the various meanings that 'use' of such models can have in a public agency, and how a public agency's accountability to OMB and the Congress affects the ways its program managers use formal project selection models. The article concludes with a discussion of how changes in the administration in power and differences in the technical competence among agency oversight groups might affect the use of formal decision aids Author

# A85-43177# MANAGEMENT PHILOSOPHIES ASSOCIATED WITH LEADING A SUCCESSFUL ORGANIZATION

M. T. STAMPER (Boeing Co., Seattle, WA) IN. White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p 11-15.

The productivity accomplishments of the U.S. aerospace industry are reviewed, and strategies to further improve productivity are suggested, from the perspective of the president of a large aerospace corporation. Consideration is given to the critical part played by employees on all levels in initiating and implementing improvements; the role of the federal government in promoting international trade and intranational competition, financing R&D efforts, and limiting taxation and regulation; the need to consider environmental, social, and human values in developing management goals; the value of balanced news reporting on aerospace-productivity issues rather than solely negative coverage of waste, mismanagement, and overcharges, thus instilling public trust and support; and the potential benefits of cooperation among military, industry, government, news media, and the general public. T.K.

## A85-43184#

# JAPANESE MANAGEMENT IN U.S.

R. A. KRAFT (Matsushita Industrial Co., Franklin Park, IL) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 55-57.

Japanese management practices and their application to increase the productivity and product quality of U.S. firms are discussed by the head of a Japanese electronics-manufacturing operation in the U.S. Techniques examined include focus on product rather than short-term gains, acceptance and support of long-term plans, emphasis on cooperation rather than confrontation with all personnel, attention to detail without inundation in details (which are best analyzed by lower-level employees), willingness to study and learn from all available sources, and adoption of a clearly defined consistent corporate philosophy. T.K.

## A85-43185# ARE INCENTIVES RIGHT FOR U.S. WHITE COLLAR ORGANIZATIONS?

F. B. WALLACE (General Motors Corp., Allison Gas Turbine Div., Indianapolis, IN) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 58, 59.

In response to the workshop's objective - to explore challenges and problems which may impede white collar productivity - attention is directed to the effectiveness of white collar efforts and the creative results which they achieve. Tendencies in our current management systems may place undesired incentives of short- vs long-term emphasis on strategies and investments, or may stifle risk taking, creativity, and entrepreneurship. These management practices are discussed, as are avenues for continuing the progress currently being made in U.S. organizations. Author

# 02 MANAGEMENT THEORY AND TECHNIQUES

## A85-43186# QUALITY IN PRACTICE AT IBM

J. B. JACKSON (IBM Corp., Purchase, NY) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality. Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 63-70.

The paper discusses the excellence values of IBM and how they were made operational through quality improvement for the decade of the '80s. First, consideration is given to the importance of underlying beliefs of a corporation that brings out the great energies and talents of its people. The most important single factor in corporate success is the faithful adherence to those beliefs Quality as a productivity driver is examined. The five concepts that IBM uses as a basis for its quality improvement are discussed. Tools and techniques for the removal of 'defects' from nonproduct processes, e.g., accounting, inventory control, distribution, order entry, etc., are reviewed. Specific attention is given to the 'job processe' and to complex cross functional processes that every large organization has and must manage in a defect-free manner if it is to be competitive Author

# A85-43197#

# MAKING THE 'Z' CONCEPT WORK

C W. JOINER, JR. (Mead Corp., Mead Imaging Div., Dayton, OH) IN: White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality; Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 137-141.

Techniques for implementing the Theory Z management strategy of Ouchi (1984) in large organizations are discussed using examples from the author's recent private-sector experience. The basic principles of Theory Z are briefly reviewed, and their realization is linked to common-sense leadership (based on belief in people and commitment to excellence); team management; and establishment of long-term corporate goals and strategy, strong personnel systems, and participative structures. It is argued that national policy should be changed to promote stable ownership of firms (penalizing gross financial manipulation), stable workforce patterns, intracorporate training and education, long-term government contracts with suppliers, and industry cooperation in developing and applying new technologies. T.K

# A85-43205#

# THE DANA STYLE - PARTICIPATION BUILDS THE CLIMATE FOR PRODUCTIVITY

C. H. HIRSCH (Dana Corp., Toledo, OH) IN: White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 192-196.

The management strategies developed at Dana corporation to maintain and increase productivity are reviewed. The measures discussed include employee stock-purchase plans, quality circles, productivity-gain sharing, continuous communication, and a minimal five-level management structure (indirect/direct ratio = 0.75) involving strict regionalization and ad hoc structures to solve superregional problems. The emphasis on the initiative of individual employees or small groups is shown to have produced significant productivity increases at large, medium-sized, and small manufacturing plants.

# A85-45079

# SOFTWARE CONTINGENCY PLANNING

M W. EVANS (Integrated Computer Engineering, Mountain View, CA) IN: NAECON 1984; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 21-25, 1984. Volume 2 . New York, IEEE, 1984, p. 744-751.

This paper describes how in a project situation, a software manager can anticipate and avoid the crises which can impact productivity and ultimate project success. The paper describes how, through planning, the manager can anticipate the crises thereby predefining alternatives and options in the event of their occurrence. The paper provides a sample project crises matrix which is a tool a manager may use to project and summarize the potential software development problem areas. Author

# A85-45157#

# JOINT SERVICE ACQUISITION MANAGEMENT INITIATIVES

P. S. BABEL (USAF, Wright-Patterson AFB, OH) IN NAECON 1984; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 21-25, 1984. Volume 2. New York, IEEE, 1984, p. 1332-1335. refs

A Software Acquisition Working Group has been formed by the U.S. Army, Navy, and Air Force, under the Department of Defense's 'Software Technology for Adaptable and Reliable Systems' (STARS) program, to identify and define near-term software acquisition improvements that will be applied in all three services. These improvements will be based on advanced acquisition practices for mission-critical (embedded) software. All mission-critical software will be designed and developed in Ada. The acquisition management initiatives under consideration are guidelines for proposal of software tools, principles of software acquisition, software development capability/capacity reviews, software acquisition education, software baseline estimation, software development incentives, software engineering design verification methodologies, a request for proposal checklists, a system test software baseline initiation, and integrated software acquisition management tools. O.C.

# A85-47678

# A RESEARCH PARADIGM FOR MULTI-HUMAN DECISION MAKING

D. L KLEINMAN, D. SERFATY, and P B. LUH (Connecticut, University, Storrs) IN<sup>.</sup> 1984 American Control Conference, San Diego, CA, June 6-8, 1984, Proceedings. Volume 1 New York, IEEE, 1984, p. 6-11

A novel experimental paradigm, motivated by Naval tactical Command Control and Communication (C3) problems, is proposed that can be used to examine the general problem of how a team of humans 'solve' problems of distributed resource management under uncertainty in a multi-task environment. Via the paradigm, different organizational and informative structures, and different assignment of responsibility among the team members can be examined. The paradigm is highly amenable to analytic modeling, making it an excellent candidate for a research tool with which to develop normative-descriptive theories of team decision making.

Author

# A85-47795

# EFFECTS OF REDUNDANCY MANAGEMENT ON RELIABILITY MODELLING

R. H. LUPPOLD, E. GAI (Charles Stark Draper Laboratory, Inc., Cambridge, MA), and B K. WALKER (MIT, Cambridge, MA) IN: 1984 American Control Conference, San Diego, CA, June 6-8, 1984, Proceedings. Volume 3 . New York, IEEE, 1984, p. 1763-1770, refs

Two methods are investigated for incorporating the effects of fault detection and isolation (FDI) decision errors and redundancy management (RM) policy into reliability models for a simple one component - dual redundant system. The two methods are combinatorial analysis and Markov chain modelling. It is shown that the existence of time-ordered event sequences resulting from the interaction of the FDI decision errors with the RM policy considerably complicates the combinatorial model. An error analysis illustrates the inaccuracy in the system's predicted reliability which results for a combinatorial model when the time-ordered event sequences are ignored. The Markov modelling technique is shown to accurately account for these effects.

N85-11675# Massachusetts Inst. of Tech, Cambridge Lab for Information and Decision Systems.

A MATHEMATICAL THEORY OF COMMAND AND CONTROL

STRUCTURES Final Report, 1 Jul. 1983 - 30 Jun. 1984 A. H. LEVIS 30 Aug. 1984 77 p

(Contract AF-AFOSR-0229-80)

(AD-A145608; LIDS-FR-1393; AFOSR-84-0830TR) Avail: NTIS HC A05/MF A01 CSCL 12A

The elements of a mathematical theory for the analysis and design of organizations are presented. The focus of the research has been on information processing and decisionmakers supported by Command Control organizations and Communications(C3) systems. The mathematical framework used in modeling the individual decisionmakers, as well as the organization, is that of n-dimensional information theory. Petri Net representation of the organizational structure is used to model the interactions between organization members as well as their interactions with the C3 system. Comparison and evaluation of alternative organizational forms is accomplished by considering organizational performance, individual workload and the sets of satisfying decision strategies. A brief description of research on distributed estimation and on information storage and flow in C3 systems is also included. GRA

N85-11896# National Research Inst. for Mathematical Sciences, Pretoria (South Africa).

DECISION SUPPORT SYSTEM (DSS): A SURVEY

H. W. ITTMANN Jun 1983 34 p refs (NRIMS-TWISK-317) Avail NTIS HC A03/MF A01

A survey of Decision Support Systems defines the concept and relates it to other fields. A frame work of the typical functions and components of such a system are presented. Practical applications are discussed for illustrative purposes Author

N85-11906# Naval Ship Research and Development Center, Bethesda, Md. Computation Mathematics/Logistics Dept.

A MANAGEMENT WORKSTATION CONCEPT

S. BERKOWITZ Jul 1984 35 p (AD-A145617, DTNSRDC/CMLD-84-17) Avail NTIS HC A03/MF A01 CSCL 05B

The David Taylor Naval Ship R&D Center is designing an automated, paperless environment for logistics functional managers at HQ, Naval Supply System Command This paper asserts that technology is currently available to radically change the way that the logistics or financial manager deals with his business environment. The change would affect both quantitative and qualitative aspects of his work environment. In principle, the manager could summon up large volumes of data with a touch of a finger and gain analytical insight by interacting with and graphics Interpreting displays He could instantaneously communicate his newly-found perceptions and decisions through voice and hand-drawn sketches to a select, remote audience without benefit of keyboard and paper. As a practical matter, however, the separate technologies that would accommodate such office power still need to be integrated at a marketable price. Moreover, keyboard and paper may be preferable modes of entry for some managers Until continuous speech and unconstrained hand-lettered recognition become practical realities for large vocabularies, mundane activities such as editing (formatting, composition, publication, distribution) may best be left to a support staff. GRA

### N85-12772# Air Command and Staff Coll., Maxwell AFB, Ala. ORGANIZATIONS: OVERCOMING MATRIX THE DISADVANTAGES

H. E. BERG Apr. 1984 44 p

(AD-A145318; ACSC-84-0225) Avail: NTIS HC A03/MF A01 CSCL 05A

This paper is a background on the matrix management organizational structure. The author identifies typical disadvantages of the matrix organization with the focus on project and functional managers, functional experts, and project teams. Various techniques to counteract these disadvantages are examined and evaluated for potential application in matrix organizations. GRA

International City Management Association, N85-12791# Washington, D.C.

DESIGN OF A SCIENTIFIC INFORMATION COLLATION AND **DISSEMINATION SYSTEM, VOLUMES 1 THRU 3 Final Technical** Report

G. J. HOETMER, A. C. PAUL, and N. CARSON 28 Jun. 1984 203 p

(Contract EMW-C-0877)

(AD-A146002) Avail NTIS HC A10/MF A01 CSCL 05B

The purpose of this study is to: (1) determine the scientific and technological information needs of the emergency management community, and (2) explore the options available to the Federal Emergency Management Agency to coordinate or develop a mechanism to provide this information. GRA

### N85-16474# Massachusetts Inst. of Tech., Cambridge. INTERACTION OF HUMAN COGNITIVE MODELS AND COMPUTER BASED MODELS IN SUPERVISORY CONTROL T B. SHERIDAN Mar 1984 38 p (Contract N00014-83-K-0193)

(AD-A142547) Avail NTIS HCA03/MFA01 CSCL 05H

This report summarizes the first year's effort of a three year research systems and how the operators of such systems apparently represent and utilize such knowledge. The first section of the report discusses the relationship of computer based supervisory control to computer based decision aiding (expert systems) by identifying component variables and functions and building up block diagrams. The second section deals quantitatively with internal models, knowledge, and calibration, both with respect to expectations of the existence of identifiable states of the world and with respect to the overlap of meanings of terms (mental) or linguistic encodings, fuzzy variables) The third section discusses mental models and their importance in three kinds of activities supervisors must do in complex systems (1) discovering how things work; (2) determining what is wanted out of the set of alternatives states of the attributes; (3) encoding and manipulating fuzzy concepts; (4) combining evidence and confidence; (5) deciding what to do. The fourth section of the report deals with the human use of computer based models in automatic control and in decision aiding. It reports on three sets of experiments underway or completed. GRA

N85-16665\*# National Aeronautics and Space Administration, Washington, D.C.

# THE MANAGEMENT OF RESEARCH INSTITUTIONS: A LOOK AT GOVERNMENT LABORATORIES

H MARK and A LEVINE 1984 311 p refs

(NASA-SP-481; NAS 1.21.481) Avail. NTIS MF A01; SOD HC \$9.00 as SN-033-000-00937-2 CSCL 05A

Technology development; project management; employment patterns; research productivity; legal status of support services; functions of senior executives; the role of the sponsoring agency; research diversification; obstacles to technical innovation, organizational structures; and personnel management are addressed BG

# N85-16668# Logistics Management Inst., Washington, D. C LIFE CYCLE COST MANAGEMENT MASTER PLAN FOR THE **DEFENSE COMMUNICATIONS AGENCY Final Report, Nov. 1982** - Feb. 1984

J. S. DOMIN and F L. ADLER Apr. 1984 47 p

(Contract MDA903-81-C-0166)

(AD-A146876; LMI-DC301-B) Avail: NTIS HC A03/MF A01 CSCL 05A

The Defense Communications Agency (DCA) has evolved from functioning simply as primary manager and operator of the Defense Communications System to providing command, control, and communications (C3) mission analysis, long-term planning, and systems engineering and integration support at the National, Office of Secretary of Defense, Joint Chiefs of Staff, and Unified and

Specified Command levels To accommodate its enhanced role, DCA has identified a need to upgrade its life cycle cost (LCC) estimating and analysis capabilities consistent with new DoD acquisition policy in an environment of rapidly changing C3 technology and deregulation of the communications industry. DCA tasked LMI to prepare a master plan for developing LCC advanced-system capabilities. including cost estimating. independent cost estimating, LCC quality assurance, comparative economic analysis, acquisition management analysis, program cost, tracking, special studies, and funding requirements forecasting for planning, programming, and budgeting GRA

# N85-17544# Perceptronics, Inc , Woodland Hills, Calif COMPATIBILITY EFFECTS AND PREFERENCE REVERSALS A. TVERSKY and P. SLOVIC 21 Aug 1984 110 p (Contract N00014-82-C-0643)

(AD-A148399, PFTR-1127-84-8) Avail NTIS HC A06/MF A01 CSCL 05J

Recent studies of decision making show that people's preferences among risky and riskless prospects often depend on the manner in which the options are described or framed Much as changes in vantage point after the apparent size of objects, different representations of a given decision problem induce predictable changes in preferences. These findings violate the normative principle of invariance, which states that the preference order between prospects should not depend on the manner in which they are described. This study investigates the effect of elicitation method on preferences among simple gambles. Three strategically equivalent elicitation procedures, choice, pricing, and attractiveness rating, produced reversals of preference when the same pairs of gambles were evaluated under different procedures These results are attributed to the compatibility effect, a tendency to weight more heavily those aspects of the stimulus that are most easily mapped into the response. This phenomenon is described by a differential weighting model in which the effect of the elicitation procedure on the relative weighting of the stimulus attributes is expressed by a bias parameter b Implications of these and related findings for the theory and the practice of decision GRA making are discussed.

# N85-17736# Massachusetts Inst of Tech, Cambridge. AUTONOMY IN THE INDUSTRIAL R AND D LAB Interim Technical Report L. BAILYN Oct 1984 47 p

(Contract N00014-80-C-0905, NR PROJ. 170-911)

(AD-A148075; TR-30-ONR) Avail: NTIS HC A03/MF A01 CSCL 05A

This paper distinguishes between strategic autonomy (the freedom to set one's own research agenda) and operational autonomy (the freedom, once a problem has been set, to attack it by means determined by oneself, within given resource constraints). The paper argues, and presents preliminary corroborating data, that the optimal position for the start of careers in the R&D lab is to be low on strategic but high on operational autonomy Most labs, however, seem to espouse a philosophy of strategic autonomy. This confusion between strategic and operational autonomy creates dilemmas and contradictions in the technical career areas.

N85-17738# Research Inst of National Defence, Stockholm (Sweden).

# DECISION MAKING IN STRESSFUL CONDITIONS: A MODEL BASED ON THE COPING PERSPECTIVE

G. LARSSON and B. STARRIN Aug 1984 32 p refs (FOA-C-55064-H3; ISSN-0347-7665) Avail: NTIS HC A03/MF

A01 A model of decision making in stressful conditions was developed by elaborating the Janis-Mann model to make it fit the more general stress and coping theory. The importance of the goal hierarchy of the decision maker, at all levels of awareness, is brought into a fuller consideration. The kinds of emotions elicited by different kinds of cognitive appraisals during different stages of the decision making process are specified. The role of emotion-focused coping in taking care of these emotions is emphasized The interdependence of problem and emotion-focused coping is elaborated and specific combinations are related to different coping patterns in decision making Methodological suggestions for empirical studies of the model are offered.

Author (ESA)

# N85-18193# University City Science Center, Philadelphia, Ra MANUFACTURING COSTS, EQUIPMENT NEEDS AND TECHNOLOGICAL OPPORTUNITIES AMONG SMALL AND MEDIUM-SIZE MANUFACTURERS

F W KIRSCH May 1984 8 p (Contract DE-FC01-83CE-40654)

(DE85-000479; DOE/CE-40654/T1) Avail NTIS HC A02/MF A01

During a series of 54 performance evaluation interviews conducted during March and April, 1984, 15 plant representatives were chosen for a further confidential interview about their plants' overall manufacturing costs, their equipment needs, and the opportunities they envision for research, development, and technology transfer Manufacturers' response are summarized to a series of questions designed to elicit useful information about the factors that contribute most to their plants' manufacturing costs; the manufacturers' preferred approaches to increasing their plants' profitability, perceived management needs for new equipment, its availability, and barriers to purchasing it; plant management's attitude toward the potential for research and development (R and D) to improve product quality, and the same persons' estimates of whether the R and D will be done within five years (if needed) and by whom. In addition to summarizing that information, an analysis of the patterns which these responses reveal and observations about the priorities which they indicate are described. DOF

N85-19694# Naval Postgraduate School, Monterey, Calif Dept of Administration Sciences

# A DECISION MODEL FOR SELECTION OF MICROCOMPUTERS AND OPERATING SYSTEMS M.S. Thesis

K. G. HIGHFILL Jun 1984 76 p

(AD-A149076) Avail NTIS HC A05/MF A01 CSCL 09B

A framework for the construction of an economic analysis model is suggested for the selection of microcomputer hardware and operating systems. The model is suggested in order to guide prospective Navy microcomputer systems. The model is designed such that common spreadsheet software programs can be utilized to manipulate the model and store data on available systems. In addition, comparisons are made of current popular microcomputer systems and operating systems, in order to provide a frame or reference for the use of the model GRA

N85-19881# Texas A&M Univ, College Station Dept. of Management

A PROPOSED INTEGRATION AMONG ORGANIZATIONAL INFORMATION REQUIREMENTS, MEDIA RICHNESS AND STRUCTURAL DESIGN

R. L. DAFT and R. LENGEL Nov. 1984 64 p

(Contract N00014-83-C-0025)

(AD-A149317; TR-ONR-DG-10) Avail NTIS HC A04/MF A01 CSCL 05B

This paper argues that information processing in organizations is influenced by two forces--equivocality and uncertainty. Equivocality is reduced through the use of rich media and the enactment of a shared interpretation among managers (Weick, 1979). Uncertainty is reduced by acquiring and processing additional data (Galbraith, 1973, Tushman and Nadler, 1978). Elements of organization structure vary in their capacity to reduce equivocality versus uncertainty Models are proposed that link structural characteristics to the level of equivocality and uncertainty that arise from organizational technology, interdepartmental relationships, and the environment. GRA N85-20690\*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SOFTWARE MANAGEMENT ISSUES

In its Space Sta. of Software Issues p 6-16 Feb. 1985 Avail: NTIS HC A04/MF A01 CSCL 09B

Issues related to the development of a software management plan are discussed with reference to contract requirements, NASA control, integration and testing, governmetin staffing, and the role of the Space Station Software Working Group The major issues include software management planning, independent verification and validation, and quality assurance and configuration management Essential considerations for each of these topics are outlined and recommendations are given. M.G

N85-22248# National Academy of Sciences - National Research Council, Washington, D. C. Committee on Human Factors. RESEARCH AND MODELING OF SUPERVISORY CONTROL BEHAVIOR, REPORT OF A WORKSHOP

T. B. SHERIDAN and R. T HENNESSY 1984 81 p Workshop held in Sarasota, Fla, Feb. 1983

(Contract N00014-81-C-0017)

(AD-A149621) Avail: NTIS HC A05/MF A01 CSCL 05A

This report of a workshop on Supervisory Control was compiled under the Review of the National Research Council. Supervisory control is the human activity involved in initiating, monitoring, and adjusting processes in systems that are otherwise automatically controlled. The two-day workshop covered three major themes (1) concepts and characteristics of supervisory control systems, (2) the choice of appropriate research vehicles, and (3) the interchange between researchers and designers Summary conclusions are: (1) it is useful to characterize the emergency class of human-supervised, computer-controlled systems by strict as well as broader definitions; (2) no single or simple model of supervisory control is appropriate at this time; (3) experimenting with supervisory control systems is difficult for various reasons; (4) experienced subjects are essential for research; (5) supervisory control systems can never be completely closed, since the human supervisor must have the capability to set subgoals; and (6) better guidance from researchers is needed for designers and operators, in the form of principles and checklists. Various articles cover the analysis of supervisory control systems and behavior, mental models, matching mental models of operators and designers and models of human performance. Failure modes are also discussed GRA

N85-22249# Purdue Univ., West Lafayette, Ind. Dept. of Statistics.

# A STATISTICAL APPROACH TO VENDOR SELECTION

S. S. GUPTA and G C. MCDONALD (General Motors Research Lab., Warren, Mich.) Sep. 1984 30 p (Contract N00014-75-C-0455; N00014-84-C-0167)

(AD-A149781; TR-83-44) Avail: NTIS HC A03/MF A01 CSCL 12A

A common problem that arises in practice is the comparison of several Bernoulli processes (or populations) with unknown parameters p sub I, .... p sub k, respectively, where the p sub i's denote the success probabilities. A particular realization of this problem is the critical issue of vendor selection. Deming (1982) notes the importance of vendor selection in a company's efforts to achieve high quality and productivity. In his 14 points, Demin's point 4 suggests the reduction of the number of suppliers to a subset of vendors who can furnish statistical evidence of dependable quality. Vendor selection involves a consideration of many aspects - cost, service, reliability, and quality. Pettit (1984) described the approach that 3M Corporation uses in the evaluation of prospective suppliers. It consists of evaluating potential vendors in four areas quality, price, performance, and facility capabilities. While quality is explicitly considered in this approach, it is not evaluated in a statistical sense. It is the intent of this article to indicate how statistics can be utilized as one objective evaluation tool in this decision setting. Author (GRA)

16

N85-24736\*# Hilton (Conrad N.) Coli. of Hotel and Restaurant Management, Houston, Tex FOOD SERVICE MANAGEMENT

C. L RAPPOLE and S. A. LOUVIER (Houston Univ.) In NASA. Lyndon B. Johnson Space Center Food Serv. and Nutr for the Space Shuttle p 16-19 Apr 1985

Avail NTIS HC A05/MF A01 CSCL 06H

A study to design a food service system using current technology to serve a small scale Space Station was conducted. The psychological, sociological and nutritional factors affecting feeding in microgravity conditions was investigated. The logistics of the food service system was defined FR.

# N85-24876# Naval Postgraduate School, Monterey, Calif. SOME APPLICATIONS OF FUZZY SETS AND THE ANALYTICAL HIERARCHY PROCESS TO DECISION MAKING M.S. Thesis A. C ROSAS Sep. 1984 74 p

(AD-A150720) Avail: NTIS HC A04/MF A01 CSCL 12B

This thesis examines the use of fuzzy set theory and the analytic hierarchy process in decision making. It begins by reviewing the insight of psychologists, social scientists and computer scientists to the decision making process The Operations Research-Systems Analysis approach is discussed followed by a presentation of the basis of fuzzy set theory and the analytic hierarchy process. Two applications of these methods are presented. The first uses fuzzy sets and a little of the analytic hierarchy process to solve an hypothetical decision problem for the commanding officer of a naval task force. The second applies the latter technique and estimated data to the problem of choosing the best alternative to provide quality air service to Mexico City. Author (GRA)

N85-25283# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio School of Engineering.

### DECISION SUPPORT METHODOLOGY FOR SPACE **TECHNOLOGY ADVOCACY M.S. Thesis**

P. H. RENSEMA and R. W. CHAPMAN Dec 1984 393 p (AD-A151895, AFIT/GS0/OS/84D-3) Avail. NTIS HC A17/MF A01 CSCL 05A

In this thesis a decision support methodology for space technology advocacy was developed. Decision models inadequately address the risk and uncertainty inherent in R&D A decision support methodology was developed that would assist the Air Force space technology advocate to determine the strategic and technical utility of space technology issues. Model criteria were developed that could be used in a worth assessment of space technology issues. Using these criteria the decision maker can focus on the strategic appreciation of the technology issues and their relative worth to military space strategy and doctrine and military space technology A description was presented of the information requirements and the analytical tool (the Analytic Hierarchy Process) which could be used by the decision maker, with the appropriate user interface, to apply the criteria in a worth assessment of space technology issues. The results of testing the validity, adequacy, and suitability of the proposed methodology are presented. The criteria was applied to sets of space technology issues within the context of the Analytical Hierarchy process. Results indicate that the proposed methodology provides a firm foundation for development of a microcomputer-based decision support system. Included is an extensive bibliography of mathematical models pertaining to R&D project selection GRA

### N85-26190# Ninham Shand, Inc. (South Africa). MANAGEMENT COMMUNICATION AND **FINANCIAL** MODELING

H N P. PELLS In South African Inst of Civil Engineering Symp. on Computers in Civil Eng., 1983 10 p 1983 refs Avail NTIS HC A10/MF A01

The basis of modern management is effective communication Recent developments in the field of data communication by the South African Post Office, the establishment of a South African Library Network and the development of program writing financial modeling systems have all improved communication and thence

N85-26439\* National Aeronautics and Space Administration, Washington, D.C.

# MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS Mar. 1985 183 p

(NASA-SP-7500(19); NAS 1.21 7500(19)) Avail NTIS HC A08 ĊSCL 05A

This bibliography lists 706 reports, articles, and other documents introduced into the NASA scientific and technical information system in 1984 Entries, which include abstracts, are arranged in the following categories human factors and personnel issues; management theory and techniques, industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management, reliability and quality control, and legality, legislation, and policy Subject, personal author, corporate source, contract number, report number, and accession number indexes are included ARH

N85-27743# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

# PERSONAL COMPUTER AIDED DECISION ANALYSIS M.S. Thesis

G. R. WHITE 14 Dec. 1984 273 p

(AD-A151911: AFIT/GSO/OS/84D-8) Avail. NTIS HC A12/MF A01 CSCL 09B

The increasing complexity of today's business and military decisions demand informed decision making at all levels of management. Such decision making must be fully supported by timely and accurate analysis. Computers are well-suited for such analysis. Unfortunately, the large mainframe computers are not flexible or responsive enough for use by most managers in a timely manner The growing popularity, presence, and capability of microcomputers represents a new opportunity for operations research. These small, low-cost machines can provide much of the computer support needed for decision making by managers and analysts provided that the necessary software tools are developed. This thesis was undertaken to provide a user-oriented decision analysis tool which exploits the advantages of personal computers. Of the many useful quantitative techniques available, the weighting and constraint techniques of multi-objective decision analysis were selected and implemented. GRA

N85-27746# Texas A&M Univ., College Station Coll. of Business Administration.

MANAGEMENT CONTROL SYSTEMS AND INTERDEPENDENCIES: AN EMPIRICAL STUDY N. B. MACINTOSH and R L. DAFT Mar. 1985 33 p

(Contract N00014-83-C-0025)

(AD-A152280; TR-ONR-DG-13) Avail: NTIS HC A03/MF A01 CSCL 05A

Two themes in behavioral accounting research suggest that management accounting system characteristics are related to characteristics of the larger organization and that the management accounting system is one element in a control system package The research reported here investigates the relationship between departmental interdependencies and the design and use of three management control systems - the operating budget, periodic statistical reports, and standard operating policies and procedures. The findings support the idea that interdependency between departments influences the emphasis placed on specific management control systems Standard operating procedures are an important control device when interdependence is moderate. When interdependence between departments is high, the role of all three control systems diminish. The findings support the themes that accounting based systems are one device in the organizational control package and that control systems are employed differently according to organizational characteristics. Author (GRA)

N85-27812 European Space Agency. European Space Operations Center, Darmstadt (West Germany).

### HELIOS PROJECT SUPPORT In DFVLR Ten Years of Helios p 189-192 K JEFTMAN 1984 In ENGLISH and GERMAN

Avail: Issuing Activity

The way in which the Jet Propulsion Laboratory supported the Helios project is described. The preparation procedures for operations are explained. The tracking coverage during the flight operations is described. The spacecraft performance exceeded expectations. Author (ESA)

# N85-28392# Lawrence Livermore National Lab, Calif. INTEGRATING QUALITY ASSURANCE AND RESEARCH AND DEVELOPMENT

J. J. DRONKERS 15 Feb 1985 5 p refs Presented at the 16th ASQC Ann. Calif. Quality Week Conf, San Jose, Calif., 22 Mar. 1985

(Contract W-7405-ENG-48)

(DE85-007974; UCRL-92210; CONF-8503107-1) Avail NTIS HC A02/MF A01

Quality assurance programs cannot be transferred from one organization to another without attention to existing cultures and traditions. Introduction of quality assurance programs constitutes a significant change and represents a significant impact on the organizational structure and operational mode. Quality assurance professionals are change agents, but do not know how to be effective ones. Quality assurance as a body of knowledge and experience can only become accepted when its practitioners become familiar with their role as change agents. DOE

N85-28616# Brigham Young Univ., Provo, Utah Computer Aided Mfg Lab

MANUFACTURING INFORMATION SYSTEM Final Report, 1 Jul. 1982 - 31 Oct. 1984

D. K. ALLEN, P. R. SMITH, and M J. SMART 26 Dec 1984 258 p

(Contract AF-AFOSR-0253-82)

(AD-A152715; AFOSR-85-0275TR) Avail: NTIS HC A12/MF A01 CSCL 13H

This is the final report of a project to develop prototype miniature laboratory apparatus to be used in conducting a series of experiments and investigations relating to a Manufacturing Information System. The size and cost of manufacturing equipment has made it extremely difficult to perform a realistic modeling and simulation of the manufacturing process in university research laboratories Likewise the size and cost factors, coupled with many uncontrolled variables of the production situation has even made it difficult to perform adequate manufacturing research in the industrial setting. The difficulty of developing Integrated Manufacturing Systems is well documented by the large amount of funding and effort being spent by industry and government. It was the purpose for research funded under this grant to continue the development of miniature prototype equipment for use in an integrated CAD/CAM Laboratory The equipment developed under this grant and from previous work is capable of actually performing production operations (e.g., drilling, milling, turning, punching, etc.) on metallic and non-metallic workpieces. It is now expected that the prototype equipment developed or otherwise acquired under this grant will now provide the basis for extensive research on Database Information Systems, Common Manufacturing Development, CIM Application Program Development, Local Area Networking, and Knowledge-based CAD/CAM Training utilizing Interactive Videodisc Delivery Systems. GRÁ

N85-28637# Technische Hogeschool, Delft (Netherlands) Dept. of Mathematics and Informatics.

# THE INTERFACE WITH DECISION MAKERS IN INTERACTIVE MULTIOBJECTIVE LINEAR PROGRAMMING

M KOK 1984 40 p refs (REPT-84-38) Avail: NTIS HC A03/MF A01

The mathematical formulation of interactive multiobjective linear programming methods is investigated, showing that they are all based on weighting, constraint, or reference point scalarization Interactive methods in each class of scalarization are presented and illustrated with a numerical example. The type and amount of information given by decision makers in the interactive methods are discussed it is shown that in many applications, weighting methods do not fully recognize that the ability of a decision maker to oversee a large number of stimuli is limited. Author (ESA)

N85-28852# Minnesota Univ., Minneapolis Strategic Management Research Center

# CENTRAL PROBLEMS IN THE MANAGEMENT OF INNOVATION Interim Technical Report

A H. VANDEVAN Dec. 1984 65 p

(Contract N00014-84-K-0016)

(AD-A152598; SMRC-DP-21; TR-7-ONR) Avail. NTIS HC A04/MF A01 CSCL 05A

Innovation is defined as the development and implementation of new ideas by people who over time engage in transactions with others within an institutional order. This simple and seemingly innocuous definition has major implications for managing innovation. This definition focuses on four basic factors (new ideas, people, transactions, and institutional context). An understanding of how these factors are related lead to four basic problems confronting most general managers: (1) A human problem of managing attention, (2) A process problem in managing new ideas into good currency, (3) A structural problem of managing part-whole relationships, and (4) A strategic problem of institutional leadership. Appreciating these problems and their consequences provides a first step in developing a practical theory on the management of innovation. GRA

N85-28854# Minnesota Univ, Minneapolis. Strategic Management Research Center

THE CONCEPT OF FIT IN CONTINGENCY THEORY Interim Technical Report

A. H. VANDEVAN and R DRAZIN Nov. 1984 66 p (Contract N00014-84-K-0016)

(AD-A152603; SMRC-DP-19; TR-5-ONR) Avail NTIS HC

A04/MF A01 CSCL 05A

Contingency theories dominate scholarly studies of organization behavior, design, performance, planning and management strategy. While they vary widely in subject matter, they have the common proposition that an organizational outcome is the consequency of a fit or match between two or more factors. Fit is the key concept in this proposition, and the core problem common to contingency theories is not defining this term clearly. This paper examines three ways to define and test this concept of fit: Selection, interaction, and Systems approaches. A critical discussion of these approaches will clarify much of the current confusion in the literature on contingency theories, and suggest ways that future theorizing and research can become more systematic and constructive GRA

G

**N85-28870**# Technische Hogeschool, Delft (Netherlands). Dept of Mathematics and Informatics.

# MULTICRITERIA DECISION ANALYSIS AS AN AID TO STRATEGIC PLANNING OF ENERGY RESEARCH AND DEVELOPMENT

F. A LOOTSMA, J. MEISNER (Shell Research BV, Amsterdam), and F. SCHELLEMANS (Energy Research Council, Hague) 1984 53 p refs

(REPT-84-02) Avail: NTIS HC A04/MF A01

The use of multicriteria decision analysis as an aid for an advisory council to select areas of interest for government-financed Energy R&D subject to a budget constraint is described A way of comparing the anticipated impact of energy R&D in different technological areas based on the opinions of the council members given a number of judgment criteria is outlined Maximizing the overall impact of an R&D program for a given level of expenditure is explained. It is shown how the decision model can be used as a discussion model highlighting the points of agreement and disagreement among council members Author (ESA)

# N85-29835# Naval Postgraduate School, Monterey, Calif. OVERHEAD MANAGEMENT GUIDE FOR AEROSPACE PROCUREMENTS M.S. Thesis

D D. DIETZE and K F. WALTER Dec 1984 129 p (AD-A153626) Avail: NTIS HC A07/MF A01 CSCL 14A

This thesis focuses on the management emphasis concerning overhead cost control. Senior personnel within the Naval Air Systems Command (NAVAIR) review a multitude of cost information. Due to the nature and complexity of these costs, it is extremely difficult to analyze and interpret cost data and, more specifically, to use these data as a basis for the management of cost control. This study will focus on overhead costs, their impact on total costs, and an analysis of management indicators deemed most useful in controlling overhead costs. Findings of the study included: administrative indicators, variance analysis, base forecasting, companison of dollar amounts, companison of ratios and a new tool called Overhead Cost Analysis package GRA

**N85-30704#** National Bureau of Standards, Gaithersburg, Md. Center for Programming Science and Technology.

GUIDE ON WORKLOAD FORECASTING Final Report H LETMANYI Mar 1985 71 p

(PB85-177632; NBS/SP-500/123; LC-85-600504) Avail NTIS HC A04/MF A01; SOD HC \$3.00 as 003-003-02634-4 CSCL 09B

A guide was compiled to provide ADP managers and technical personnel with useful quantitative techniques for forecasting future workload requirements. It additionally provides a step by step approach to the forecasting process. Readers can then, in a timely manner, provide the computing resources needed to perform the user's workload at required service levels throughout the life cycle of an ADP system. These techniques are described so that readers with little or no training in statistics should find them useful. However, this guide does not intend to give an exhaustive treatment of the techniques. Author (GRA)

N85-30966# Logistics Management Inst., Bethesda, Md. PRODUCIBILITY ENGINEERING AND PLANNING (PEP): PROGRAM MANAGEMENT GUIDELINES Final Report, Nov. 1983 - Dec. 1984

F. L ADLER, D. G ALDUCIN, D. V. GLASS, and R A. GUNKEL Jan 1985 44 p

(Contract MDA903-81-C-0166)

(AD-A153730; LMI-RE403) Avail NTIS HC A03/MF A01 CSCL 05A

Weapon systems and equipment are not always designed for economical fabrication, assembly, inspection, and testing with available production techniques. As a result, deliveries are often late and costs exceed expectations. Production suffers because producibility is not considered early enough during design and because production planning during development is inadequate. We propose guidelines that will provide managers of weapons system programs with a practical approach to developing, executing and funding individual PEP programs. To get the most out of PEP, we recommend that the program manager focus on producibility at the very start of the program and conduct a PEP program that balances design and producibility and incorporates demonstrations of advanced manufacturing processes. During full-scale development, he should carryout out a PEP program that designs and demonstrates production tooling, facilities, and manufacturing methods. We found that when requirements and funding are sound, such as in the F-16 and Air-Launched Cruise Missile programs, a good PEP program can smooth transition from development to production. GRA

Texas A&M Univ., College Station. Dept. of N85-32769# Management

### SYMBOLIC AND INTERACTIONAL PERSPECTIVES ON LEADERSHIP: AN INTEGRATIVE FRAMEWORK

R. W. GRIFFIN, K. D. SKIVINGTON, and G. MOORHEAD May 1985 52 p

(Contract N00014-83-C-0025)

(AD-A155247; TR-ONR-DG-15) Avail NTIS HC A04/MF A01 CSCL 05J

This paper presents the development of a Symbolic Interactional Leadership model. The model integrates three emergent streams of thought, symbolic action, reciprocal interactions, and interactional psychology, into a fresh approach which offers considerable advancement over simple, unidirectional, bivariate, static models Implications for future theory and research are discussed. This model, while not yet a fully articulated theory, does represent a significant advancement over simple unidirectional, bivariate, static models While likely to be subject to further refinement and development, the SIL model, then, may provide a useful framework for organizing existing theory and serving as a blueprint for future research. GRA

N85-35313# International Association of Fire Chiefs, Washington, D.C.

# FIRE SERVICE EMERGENCY MANAGEMENT HANDBOOK Final Report, Apr. 1983 - Jan. 1985

Jan. 1985 287 p (Contract EMW-C-0743)

(AD-A155780) Avail NTIS HC A13/MF A01 CSCL 13L

This planning guide was prepared for the Federal Emergency Management Agency by the International Association of Fire Chiefs as part of an effort to update and improve emergency management information available to the fire service Intended as a primary source for fire chiefs, fire executives, and planners, it incorporates the following main topic areas: instruction for the use of the handbook, description of the emergency management process; and checklists for specific hazards. The volume includes a self evaluation form for determining community risk, concepts of emergency management, and specific steps in community risk reduction in the four phases of emergency management process. Sample forms, tables, and letters of agreement are also included. GRA

# N85-35498# Air Command and Staff Coll., Maxwell AFB, Ala A GUIDE FOR NEW ENVIRONMENTAL COORDINATORS J F KARASEK Apr 1985 49 p

(AD-A156327, ACSC-85-1405) Avail: NTIS HC A03/MF A01 CSCL 05A

This guide provides introductory information about the environmental coordinator's role in the implementation of pollution abatement policy, programs, and requirements. It was written for new environmental coordinators The guide doesn't replace any document, nor is it a substitute for more detailed information. It identifies requirements, programs, agencies, and sources of information necessary for the environmental coordinator to perform his/her duties. GRA

# 03

# INDUSTRIAL MANAGEMENT AND MANUFACTURING

Includes Industrial Management, Engineering Management, Design Engineering, Production Management, Construction, Aerospace/Aircraft Industries, Manufacturing,

A85-11245 AIRCRAFT MAINTENANCE **[TEKHNICHESKAIA** EKSPLAUATATSIIA SAMOLETOV] Moscow, Izdatel'stvo

N V. ANIKIN and IU. V NAZAROV Transport, 1984, 200 p In Russian.

The organization of the aviation engineering service, the general rules of aircraft maintenance, and specific technical servicing procedures are discussed. Attention is given to various types of maintenance. maintenance-related documentation, the maintenance of piping, filters, control systems, airframe, chassis, and hydraulic systems and maintenance procedures under different climatic conditions. Other topics discussed include tools, fixtures, and ground equipment, the structure of an airfield, and take-off preparation. The examples used in the discussion concern An-24 and Tu-154, two of the most popular types of aircraft V.L.

# A85-13921

## STRATEGIC MANAGEMENT OF INDUSTRIAL TECHNOLOGY -A REVIEW OF THE ISSUES

P. H. BIRNBAUM (Indiana University, Bloomington, IN) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Nov 1984, p 186-191 refs

The English language literature concerning the relationship between strategic management and technological development in U.S. industrial organizations is reviewed. Although still largely normative, there is consistent focus on life cycle approaches and a growing body of empirical evidence which lends support to the argument that more successful firms use technology appropriate to different stages in the product life cycle Author

# A85-17776

# ENGINEERING MANAGEMENT PROGRAMS AS AIDS IN MOVING FROM TECHNICAL SPECIALTY TO TECHNICAL MANAGEMENT

D F KOCAOGLU (Pittsburgh, University, Pittsburgh, PA) Engineering Management International (ISSN 0167-5419), vol. 2, Jan. 1984, p 33-47 refs

## A85-17780

# ARE DECISION SUPPORT SYSTEMS APPLICABLE TO **ENGINEERING MANAGEMENT?**

E. J HANSS (Mallinckrodt, Inc., St Louis, MO) Engineering Management International (ISSN 0167-5419), vol. 2, July 1984, p. 243-250. refs

The challenges of the 'information age' are confronting corporate engineering managers and they must determine if decision support systems (DSS) can be applied and in what manner Managerial concerns of financial responsibilities, technical responsibilities, competitive pressures, together with the availability of computer technology, have led to DSS. The use of these systems in the planning, technology, financial and personnel activities of an engineering department are presented. Development of the DSS will be by conscious decision or by default. The changing roles of a corporate engineering department and the challenges of the next decade justify using DSS Author

# A85-19181

# WORK FLOW IN MANUFACTURING SYSTEMS

B. G. DALE (University of Manchester Institute of Science and Technology, Manchester, England) Engineering Management International (ISSN 0167-5419), vol. 3, Nov. 1984, p 3-13 refs

This paper analyses the material flow system created by functional and group technology manufacturing systems. The results of a survey are discussed which measures the effectiveness of the way in which work flows through the respective systems and tentative reasons are advanced for the throughput efficiency of some group technology systems not coming up to expectation The paper also discusses the contribution which group technology can make to flexible manufacturing systems. Author

# A85-21298#

# MANAGING PROJECTS FOR HIGH PERFORMANCE

H SHEPARD (Portsmouth Consulting Group, Stamford, CT) and J. GONZALEZ (Bell Northern Research, Ltd, Ottawa, Canada) American Society of Mechanical Engineers, Annual Energy Sources Technology Conference and Exhibit, 7th, New Orleans, LA, Feb 11-17, 1984 5 p.

# (ASME PAPER 84-MGT-8)

The effectiveness of organizations developed to handle particular projects was assessed through interviews with managers of twenty different efforts. The projects covered energy, aerospace and chemical endeavors Team management solving problems in an ongoing manner was found preferable to vertical management structures. Communication among the managers is therefore a critical need, as are clearly defined goals, role clarity, teamwork values, flexibility in response to need and a team commitment to success. Rewards and recognition assure teamwork when combined with open dealings with shortfalls A clear, consistent management philosophy must be articulated at the outset and must account for interim goals and a gradual introduction of the operational organization as the project progresses. Blurring the between contract and project personnel is distinctions recommended, as are celebrations of milestones. Finally, emphasis is laid on factors such as open communications, dealing with whatever problems arise as they are perceived, and maintaining a matrix consciousness of the entire system. M S.K

# A85-25117

# A METHODOLOGY FOR ORGANIZING PERFORMANCE REQUIREMENTS FOR COMPLEX DYNAMICAL SYSTEMS

H. L MALCHOW and S. R. CROOPNICK (Charles Stark Draper Laboratory, Inc, Cambridge, MA) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-32, Feb 1985, p. 10-15. refs

Management of the development of complex dynamical systems includes the tasks of establishing system performance requirements. These requirements are typically obtained from a nonsystematic process, which often results in premature constraining of system design. This paper describes an orderly methodology for establishing performance requirements for complex systems. The methodology uses a 'top-down' approach Connections between the system high level mission requirements and the lower level functional performance requirements are made in a series of steps. The steps include identification of system activities, identification of activity-derived state vector elements, definition of state maintenance functions, and identification of functional components.

# A85-25118

# **R&D PROJECT TERMINATION IN HIGH-TECH INDUSTRIES**

J. A. RAELIN (Boston College, Chestnut, MA) and R. BALACHANDRA (Northeastern University, Boston, MA) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-32, Feb. 1985, p. 16-23 refs

(Contract NSF PRA-81-0558)

Based upon extensive data on 51 R&D projects in high-tech companies, a discriminant analysis produced 16 factors which discriminated very well the decision to continue or terminate a project in the development phase. The most important discriminating variables were virtually strategic parameters of the high-technology research environment. Specifically, high rates of product turnover, high market share, and small size were found to lead to continuations, whereas infancy stage product life cycle and innovative versus aligned research strategy led to terminations A number of controllable behavioral properties were also critical to project continuation, among them project management effectiveness, management support, worker commitment, and project leader championship during the projects later stages. In constrast to high-tech firms, 'non-high-tech'project's were found to have greater potential where product turnover was low and projects had limited focused end uses offering sizable profit margins. Author

# A85-35100

# QUALITY CHARACTERISTIC FEEDBACK CONTROL

G. TAGUCHI (Academy of Quality, Japan) International QC Forum (ISSN 1471-521TX), vol. 2, Feb 1985, p. 9-27. Translation.

Every manufacturing plant has a system to control the conditions of its working process by checking the characteristic value of its product. In this paper, the design of a quality control system by means of feedback control is explained. It is assumed that the mean square drift is proportional to production volume and that the cost of measuring the characteristic value is B yen and that of adjusting the cost is C yen. Measuring errors and time lag are also considered. C.D.

# A85-35799

# MACHINE VISION: THE EYES OF AUTOMATION - A MANAGER'S PRACTICAL GUIDE

J HOLLINGUM Kempston, Beds., England/Berlin, IFS (Publications), Ltd /Springer-Verlag, 1984, 119 p. refs

The applications of machine vision to robot manufacturing and product inspection are discussed. The image processing and analysis procedures of machine vision systems are described, and detailed case studies of several companies' experience with machine vision systems are presented. Among the machine vision applications discussed are: break-stem rivet inspection, car body type identification; machine loading inspection, and the alignment of automobile windshields. A detailed bibliography is provided, as well as a list of the major organizations and companies which are active in the development of machine vision systems for industrial applications I.H

# A85-39076\* Naples Univ. (Italy).

# SPACELAB TO SPACE STATION; PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON SPACELAB 1 - RESULTS, IMPLICATIONS AND PERSPECTIVES, NAPLES AND CAPRI, ITALY, JUNE 11-16, 1984

L. G NAPOLITANO, ED. (Napoli, Universita, Naples, Italy) Symposium sponsored by the Universita di Napoli, Aeritalia S.p.A., ESA, and NASA Earth-Oriented Applications of Space Technology (ISSN 0277-4488), vol. 5, no. 1-2, 1985, 169 p. For individual items see A85-39077 to A85-39096.

Consideration is given to the scientific objectives of the Spacelab program, a review of data obtained during the STS-9/Spacelab 1 mission on board the Shuttle, and the coordination of future Spacelab research among participating European nations. Among the specific fields of study covered by Spacelab 1 were space plasma physics, materials and fluid sciences and technology, astronomy and solar physics, and atmospheric physics and earth observations. Consideration is also given to the legal aspects of space manufacturing activities, the role of private industry in space-based manufacturing ventures, plant production and breeding in space, and the development of remote sensing systems for use in a microgravity environment.

# A85-43189#

NEW TECHNOLOGY IMPLICATIONS ON THE WORK FORCE

F. W. GARRY (General Electric Co., Fairfield, CT) IN: White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality: Strategies for improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984 New York, AIAA, 1985, p. 87-90.

The introduction of automation and advanced technology into manufacturing plants is discussed from a management perspective, drawing on recent experience at GE. The gradual nature of technological change is considered; the role of international competition in forcing productivity increases and product improvements is indicated; case histories illustrating successful and unsuccessful implementation of productivity-raising measures and/or new technology in existing plants are presented; and strategies for managers are proposed. Recommendations offered include clear definition of actual needs, preliminary analysis of the organizational environment, selection of implementation teams, realistic implementation planning, training and informing workers well in advance, and close cooperation with technology suppliers.

**N85-10002#** Aeronautical Systems Div., Wright-Patterson AFB, Ohio. Directorate of Support Systems Engineering.

AERONAUTICAL SYSTEMS TECHNOLOGY NEEDS: ESCAPE, RESCUE AND SURVIVAL, TEST FACILITIES AND TEST EQUIPMENT AND TRAINING-SIMULATION EQUIPMENT Annual Report, Jan. 1983 - Jan. 1984

D. C. KITTINGER Apr. 1984 68 p

(AD-A145059; ASD/(ENE)-TR-84-5003; ASD-TR-84-5006) Avail: NTIS HC A04/MF A01 CSCL 01C

This report is part of a compilation of formalized Technology Needs (TNs) covering Support Systems as identified in the Aeronautical Systems Division. They are based on development/operational experience, systems studies, and new concepts -- all related to future system applications Their presentation is to serve a threefold purpose (1) guidance for technology programs, (2) prove developmental potential, and (3) engineering data/requirements essential for technology use in systems. The identified needs delineate progress desired in performance, control, design flexibility, safety and cost. GRA

N85-10218# National Research Inst. for Mathematical Sciences, Pretoria (South Africa).

# MODELLING THE DÉMAND FOR CONSTRUCTION

H. R. WEISTROFFER Jul. 1983 21 p refs Submitted for publication

(CSIR-TWISK-322) Avail NTIS HC A02/MF A01

A system dynamics approach to modelling the demand for construction in South Africa is described. The model presented is intended as a first step in an iterative process of modelling construction demand, and as such is deliberately kept small Results obtained through the model using historical data indicate that the relations included in the model are indeed relevant. The accuracy of the model is discussed and suggestions for further developing the model are made.

N85-11910# Cologne Univ. (West Germany). Betriebswirtschaftliches Institut fuer Organisation und Automation BUSINESS PLANNING FOR INFORMATION SERVICES UNDER SPECIAL CONSIDERATION OF GERMAN MANAGEMENT INFORMATION SYSTEMS Final Report, Jun. 1978

N. SZYPERSKI, L. BERENS, K. HOERING, W. STEINBRECHER, and M. WOLFF Bonn Bundesministerium fuer Forschung und Technologie Jul. 1983 161 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-ID-83-007, ISSN-0170-8996) Avail: NTIS HC A08/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 33

Data base services, information brokers, management information systems, publishers and information consultants are examined in order to assist these planning activities decision support systems were developed Methods for industrial management development planning; computer aided planning model; data logging, and analysis of pilot systems are described Author (ESA)

**N85-13684#** Centre National d'Etudes Spatiales, Toulouse (France). Direction des Affaires Internationales et Industrielles. **VALUE ANALYSIS [L'ANALYSE DE LA VALEUR]** 

C PETITDEMANGE Jan. 1984 110 p refs In FRENCH; ENGLISH summary

(CNES-NT-110) Avail NTIS HC A06/MF A01

Industrial competitiveness is analyzed to establish value analysis techniques as a fundamental tool Product development, user requirements, and cost analysis are discussed Organization necessary for the implementation of value analysis in the industrial environment is detailed Author (ESA)

N85-16691# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio

ORGANIZATIONS AND INFORMATION PROCESSING: A FIELD STUDY OF RESEARCH AND DEVELOPMENT UNITS WITHIN THE UNITED STATES AIR FORCE SYSTEMS COMMAND Ph.D. Thesis

T. TRISCARI, JR. Aug 1984 349 p

(AD-A147381; AFIT/CI/NR-84-68D) Avail. NTIS HC A15/MF A01 CSCL 05A

This study conceptualizes the Research and Development (R&D) organizational unit as an information processing system which, to be most effective, must respond to the changing information requirements encountered in proceeding from a research orientation (information generation and expansion) to a product or system development emphasis (information application). To contend with and reduce the level of uncertainty, a unit must process information from various sources for its problem solving or decision making activities. This approach suggests that those units matching their information processing capabilities to the information processing requirements should be effective. The intent of this research is to investigate the information processing model of organizational design within an R&D setting. Specifically, the research will examine if perceived information requirements differ between research units and development units. GRA

**N85-18079\***# National Academy of Sciences - National Research Council, Washington, D C. Ad Hoc Committee on Space Station Engineering and Technology Development

SPĂCE ŠTATION ENĞINEERING AND TECHNOLOGY DEVELOPMENT

1985 86 p

(Contract NASW-3455)

(NASA-CR-174383, NAS 1.26 174383) Avail. NTIS HC A05/MF A01 CSCL 22B

Historical background, costs, organizational assignments, technology development, user requirements, mission evolution, systems analyses and design, systems engineering and integration, contracting, and policies of the space station are discussed.

BG.

**N85-21414\*#** National Academy of Sciences - National Research Council, Washington, D. C. Commission on Engineering and Technical Systems.

COMPUTER INTEGRATION OF ENGINEERING DESIGN AND PRODUCTION: A NATIONAL OPPORTUNITY Final Report Oct 1984 73 p

(Contract NASW-3811)

(NASA-CR-175483; NAS 1.26:175483; PB85-128429) Avail: NTIS HC A04/MF A01 CSCL 13H

The National Aeronautics and Space Administration (NASA), as a purchaser of a variety of manufactured products, including complex space vehicles and systems, clearly has a stake in the advantages of computer-integrated manufacturing (CIM). Two major NASA objectives are to launch a Manned Space Station by 1992 with a budget of \$8 billion, and to be a leader in the development and application of productivity-enhancing technology. At the request of NASA, a National Research Council committee visited five companies that have been leaders in using CIM. Based on these case studies, technical, organizational, and financial issues that influence computer integration are described, guidelines for its implementation in industry are offered, and the use of CIM to manage the space station program is recommended. GRA

N85-21989# Carnegie-Mellon Univ, Pittsburgh, Pa Robotics Inst

# THE MAN-MACHINE INTERFACE Interim Report

R. U. AYRES Dec 1984 31 p

(AD-A149971; CMU-RI-TR-84-26) Avail NTIS HC A03/MF A01 CSCL 05H

Our basic objective was to define a composite measure of human capabilities that could also be used to measure the skill requirements of various manufacturing tasks in the course of our research, however, we have come to the conclusion that most human workers (at least in the semiskilled categories) are not employed for their manual skills, or dexterity, but for a different purpose Although our basic objective remains unchanged, our research focus has shifted to the emerging competition between human workers as machine process controllers in certain highly engineered environments, and the use of sensor-based, computerized systems for the same purpose. Author (GRA)

# N85-24309# ESCOM, Cleveland (South Africa)

STATUS OF THE U.K. N.D.T. INDUSTRY TODAY

E. A. LLOYD In its Mini-Seminar on Non-Destructive Testing 8 p Oct. 1983

Avail: NTIS HC A07/MF A01

Government interest in the advancement of nondestructive testing methods is discussed. The problem of manufacturing costs was investigated and it was found that these could most effectively be minimized by the provision of abundant, cheap and secure supplies of energy. Exploitation of North Sea oil reserves, the expansion of the Nuclear Power Program, and measures to increase the availability of existing power plant within the Electrical Industry, were all proposed as means of reducing dependence on expensive and increasingly unreliable imported energy. The reliability of pressurized equipment is seen as a principal problem area in nearly every activity associated with a secure energy supply. Representations and recommendations are made for the rationalization and expansion of the domestic NDT Industry

E.A.K

## N85-25824# Whessoe Ltd , Darlington (England) THE DEVELOPMENT AND IMPLEMENTATION OF ADVANCED WELDING TECHNOLOGY

W P. CARTER In Welding Inst. Welding Technol. Japan p 1-3 1904

Avail. Issuing Activity

The principal reasons for adopting more advanced techniques must be identified and the possible limitations on the adoption of mechanized/automated systems must also be considered for specific applications. Three aspects of welding technology examined include the organization of development activities when considering new technology implementation, the importance of material quality developments in achieving success, and technology for welding tunnel lining closing seams, helical pipes to large tubes, and overhead tubes to plate joints. A.R.H.

# N85-25835# Babcock Power Ltd , London (England).

WELDING TECHNIQUES IN PRESSURE PART TECHNOLOGY J C LOCHHEAD *In* Welding Inst. Welding Technol.. Japan p 119-129 1984

# Avail: Issuing Activity

Japanese pressure part welding technology appears to have invested heavily in high rate deposition techniques. These include multiwire electroslag and submerged arc processes and numerous variations on the narrow gap principle. The Japanese success in the introduction of new technologies is a combination of four main factors, which are as follows: (1) market incentive; (2) Attitude, (3) NDE requirements; and (4) Financial Considerations. These factors can be related to their historical and cultural background. E.A.K.

## N85-26184# Hill Kaplan Scott, Inc. (South Africa). COMPUTERS AND THE CONSULTING ENGINEER

A D. TUFF *In* South African Inst of Civil Engineering Symp. on Computers in Civil Eng., 1983 15 p 1983 Avail NTIS HC A10/MF A01

The implementation of computers within the total consulting engineering environment from administration through to project management is discussed. The advantages to be had by creating an integrated system and describes the various areas of application are outlined. Current design software is discussed and the means for its needed improvement are suggested. Author

# N85-27121# Naval Postgraduate School, Monterey, Calif. AN ANALYSIS OF DATA DICTIONARIES AND THEIR ROLE IN INFORMATION RESOURCE MANAGEMENT M.S. Thesis S. L LANDIN and R. L. OWENS Sep 1984 109 p

(AD-A152134) Avail. NTIS HC A06/MF A01 CSCL 05B

The goal of efficient management of an organization's information resource can be accomplished through the implementation and use of a data dictionary This thesis defines the structure and functions of a data dictionary and analyzes the attempt of the National Bureau of Standards to promulgate a standard software specification for use in the evaluation and selection of data dictionaries in the federal government. Criteria for the ideal data dictionary are developed based on the role a dictionary can play in information resource management and are then used to evaluate four commercial data dictionary packages. Finally, some ideas concerning possible applications for data dictionary technology are presented. GRA

N85-27821# Messerschmitt-Boelkow-Blohm G.m b.H., Munich (West Germany)

ACTIVITIES IN AEROSPACE Annual Report, 1983 [KONZERN-GESCHAEFTSBEREICH 1983]

Jun. 1984 45 p In GERMAN Original contains color illustrations

Avail NTIS HC A03/MF A01

Research concerning helicopters and aircraft, astronautics, transport and passenger aircraft, and military techniques is summarized. Author (ESA)

# N85-28189# Joint Publications Research Service, Arlington, Va. APPLICATIONS OF ROBOTS IN MACHINE TOOL INDUSTRY REVIEWED

N TYURIN *In its* USSR Rept.: Machine Tools and Metalworking Equipment (JPRS-UMM-84-014) p 46-49 31 Jul. 1984 Transl. into ENGLISH from Sov. Rossiya (Moscow), 28 Apr. 1984 p 1 Avail: NTIS HC A04

Progress in the development of the application of robots in the machine tool industry is reported. The implementation of major comprehensive programs will raise the production to a new level. Robot technology and the development of its major resource is emphasized. E.A.K.

# N85-32785# Joint Publications Research Service, Arlington, Va. QUALITY ANALYSIS

P KYJOVSKY *In its* East Europe Rept Sci and Technol. Selections on CSSR JPRS-ESA-84-017 p 17-20 31 May 1984 Transi. into ENGLISH from Sdelovaci Technika (Prague), no 11, 1983 p 401-402

Avail: NTIS HC A05/MF A01

Quality analysis and quality engineering are one of the means for intensifying the national economy that have an impact not only on the sphere of products, but also on the management and evaluation of entire production organisms in defining their economic and social utility. Quality analysis as such is a system oriented complex of methods, the ultimate objective of which is searching for and proposing improved or even basically new solutions relevant to the function of the analyzed object in order to improve its effectiveness. Examples of improvements in such products as

# N85-35410# Applied Concepts Corp , Woodstock, Va. INVESTMENT JUSTIFICATION OF ROBOTIC TECHNOLOGY IN AEROSPACE MANUFACTURING. USER'S MANUAL Final Report, 21 Feb. - 28 Sep. 1984

J. A. SIMPSON Oct. 1984 80 p

(Contract F33615-83-C-5080)

(AD-A156193; BRMC-83-5080-3) Avail. NTIS HC A05/MF A01 CSCL 05C

A computer program summary of the results of a three phased research program entitled Investment Justification of Robotic Technology in Aerospace Manufacturing, whose objective was to develop a computerized economic analysis methodology appropriate for investment justification of robotics and flexible manufacturing systems (FMS) in aerospace manufacturing is presented. A microcomputer-based economic justification methodology was developed, called the Robotics Investment Decision Model (RIDM) In Phase 1 a nation-wide survey was performed of robotics investment analysis methodologies used or proposed by government, industry, and academia. The survey included discussions with financial, engineering, and management personnel at eight major U.S. aerospace corporations, to determine their needs and constraints, and how a model might best be designed. Phase 2 was the model development phase. The model was written as a Lotus 1-2-3 template, and is called the Robotics Investment Decision Model. Phase 3 was a review and field test of the model, RIDM was demonstrated to several USAF organizations, and was assessed by a major U.S aerospace manufacturer. Internal testing continued, improving RIDM through several format changes, one minor technical change, and adding a few new features The model is now ready for release to the aerospace industry. GRA

# 04

# **ROBOTICS AND EXPERT SYSTEMS**

Includes Artificial Intelligence, Robots and Robotics, Automatic Control and Cybernetics, Expert Systems, Automation Applications, Computer-Aided Design (CAD), Computer-Aided Manufacturing.

## A85-13599

# A QUANTITATIVE EVALUATION OF HUMAN ACTIVITY IN MAN-MACHINE SYSTEMS [KOLICHESTVENNAIA OTSENKA DEIATEL'NOSTI CHELOVEKA V SISTEMAKH CHELOVEK-TEKHNIKA]

G P SHIBANOV Moscow, Izdatel'stvo Mashinostroenie, 1983, 264 p. In Russian. refs

Problems related to the analytical representation of the characteristics of man as an element of the man-machine system are examined with a view to developing an approach to the quantitative evaluation of human activity. Based on a systems approach, several mathematical models describing various aspects of human activity in man-machine systems are proposed. The basic principles of the evaluation of the efficiency of the human operator in man-machine systems are formulated and evaluation algorithms are presented.

# A85-16093\*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va. COOPERATIVE CONTROL - THE INTERFACE CHALLENGE FOR

# MEN AND AUTOMATED MACHINES

W W HANKINS, III and N E. ORLANDO (NASA, Langley Research Center, Automation Technology Branch, Hampton, VA) American Society of Mechanical Engineers, International Computers in Engineering Conference and Exhibit, Las Vegas, NV, Aug 12-16, 1984, Paper 9 p. refs

The research issues associated with the increasing autonomy and independence of machines and their evolving relationships to human beings are explored. The research, conducted by Langley Research Center (LaRC), will produce a new social work order in which the complementary attributes of robots and human beings, which include robots' greater strength and precision and humans' greater physical and intellectual dexterity, are necessary for systems of cooperation. Attention is given to the tools for performing the research, including the Intelligent Systems Research Laboratory (ISRL) and industrial manipulators, as well as to the research approaches taken by the Automation Technology Branch (ATB) of LaRC to achieve high automation levels. The ATB is focusing on artificial intelligence research through DAISIE, a system which tends to organize its environment into hierarchical controller/planner abstractions M.D.

# A85-17817#

# MODEL-BASED REASONING IN EXPERT SYSTEMS - AN APPLICATION TO ENROUTE AIR TRAFFIC CONTROL

S. E. CROSS (USAF, Institute of Technology, Wright-Patterson AFB, OH) IN Digital Avionics Systems Conference, 6th, Baltimore, MD, December 3-6, 1984, Proceedings New York, American Institute of Aeronautics and Astronautics, 1984, p 95-101. USAF-sponsored research; U.S. Department of Transportation. refs

(Contract DOT-FA79WA-4360)

(AIAA PAPER 84-2619)

The explanation capabilities (EC) of expert systems, the extent of computer understanding, and the artificial intelligence ability to reason about disparate knowledge are discussed in the context of air traffic control (ATC). EC is essential for humans to understand and interact with the results of computer reasoning. Questions of 'how' and 'why' certain actions are recommended can be satisfied by a display of the appropriate part of the computational process used to arrive at a conclusion, abstracted and expressed in a form amenable to the context of the question and intelligible to humans The knowledge base may be solutions to the aircraft equations of motion. It may be necessary for representations to be multi-leveled to reply successively until satisfying the questioner's level of sophistication in understanding, e.g., physics For ATC problems such as collision avoidance, the system must take into account operational aspects like other flight routes and flight economy Several examples are provided of means by which an expert system could search for an answer and be able to explain it. M.S.K

# A85-20400#

SYNERGY IN SPACE - MAN-ROBOT COOPERATION

S WALTERS Mechanical Engineering (ISSN 0025-6501), vol 107, Jan. 1985, p. 26-37

The forecast of U.S. national space strategy for the next 25 years and beyond, as announced by President Reagan in October, 1983, is concerned with the permanent occupation of space by man. In connection with plans for the implementation of such an occupation, NASA has considered the concept of a 'flotilla' with a manned base in the center, a utility core, a modular laboratory, and an orbital service station. The presence of man and machines, in particular computer-linked machines, is to provide possibilities for the continuous exploitation of space. Studies have identified automation, robotics, and machine intelligence systems (ARAMIS) as an important contributor to the productivity of orbital factories. Attention is given to aspects of 'telepresence', plans for 1995 and beyond, the orbital maneuvering vehicle (OMV), OMV applications, the support of materials-processing platforms,

telepresence technology, a stereo-optic vision system, manipulator arms, end-effectors, communications, and long-term plans and goals. G R.

## A85-21569#

# MESSAGE - AN EXPERT SYSTEM FOR AIRCRAFT CREW WORKLOAD ASSESSMENT

G. A. BOY and C. TESSIER (ONERA, Centre d'Etudes et de Recherches de Toulouse, Toulouse, France) IN Symposium on Aviation Psychology, 2nd, Columbus, OH, April 25-28, 1983, Proceedings . Columbus, OH, Ohio State University, 1984, p 207-222. refs

A system of Crew and Aircraft Subsystems Models for the Management of Aircraft Equipment (CASMMAE) is presented. The system is based on the results of human pilot modelling experiments carried out at ONERA since 1981. Individual interactive models of human performance in the operation of heavy transport aircraft are incorporated into the system, in order to simulate the data acquisition, planning, and execution processes which form the basis of pilot decision making Some preliminary results from experimental simulations with the system are discussed CASMMAE is written in PASCAL to facilitate the definition of structured data and file management An example of a recovery strategy tree used by the system is provided I.H.

# A85-23195#

# SPECIFYING AND COST ESTIMATING

G K. SWEET (United Space Boosters, Inc., Huntsville, Al) University of Alabama in Huntsville and University of Alabama in Birmingham, Annual Robotics Conference, 4th, University of Alabama, Huntsville, AL, Apr. 26, 1984, Paper. 27 p.

The successful purchase and installation of an industrial robot requires a suitable planning and implementation procedure. The entire process involves four general steps, related to planning, applications engineering, installation, and intergration. Planning, the first step, is to lead to a decision regarding the employment of a robot. In typical manufacturing operations, it appears to be indicated to conduct both a cost study and an audit of manufacturing operations. Attention is given to the selection of a group of individuals to carry out the implementation program, the importance of an active participation of management, the definition of objectives, the identification of robot application candidates, a review of robot equipment, the conduction of an economic analysis, categories of cost savings, details of cost analysis, initial application, initial application requirements, robot selection, initial applications of G.R.

# A85-23196# PRODUCIBILITY ENGINEERING FOR ROBOTIC MANUFACTURING

J. H. DONNELLY (U.S. Army, Production Engineering Div., Redstone Arsenal, AL) University of Alabama in Huntsville and University of Alabama in Birmingham, Annual Robotics Conference, 4th, University of Alabama, Huntsville, AL, Apr. 26, 1984, Paper. 23 p. refs

Producibility engineering is concerned with the development of a close relationship between product design and the processes proposed for its manufacture. Such a relationship is important for the selection of low-cost manufacturing processes. The present investigation has the objective to provide a producibility philosophy, a proven step-by-step methodology, and a management control procedure to ensure success in any manufacturing environment including a robotic one. It is pointed out that design for product producibility must be introduced early and intensively managed to achieve results. Producibility engineering considerations are discussed, taking into account design flexibility, proprietary components and processes, standardization, tolerances, materials, components, physical shape, test and inspection, uncluttered design, and manufacturing economy. Attention is also given to the importance of an identification of cost targets, manufacturing rates, and manufacturing locations G.R.

A SYSTEM-LEVEL APPROACH TO AUTOMATION RESEARCH F. W. HARRISON and N E ORLANDO (NASA, Langley Research Center, Flight Dynamics and Control Div., Hampton, VA) University of Alabama in Huntsville and University of Alabama in Birmingham, Annual Robotics Conference, 4th, University of Alabama, Huntsville, AL, Apr. 26, 1984, Paper. 17 p. refs

Automation is the application of self-regulating mechanical and electronic devices to processes that can be accomplished with the human organs of perception, decision, and actuation. The successful application of automation to a system process should reduce man/system interaction and the perceived complexity of the system, or should increase affordability, productivity, quality control, and safety. The expense, time constraints, and risk factors associated with extravehicular activities have led the Automation Technology Branch (ATB), as part of the NASA Automation Research and Technology Program, to investigate the use of robots and teleoperators as automation aids in the context of space operations. The ATB program addresses three major areas: (1) basic research in autonomous operations, (2) human factors research on man-machine interfaces with remote systems, and (3) the integration and analysis of automated systems. This paper reviews the current ATB research in the area of robotics and teleoperators. Author

# A85-23198#

# HUMAN FACTORS IN ROBOTICS

H. M. PARSONS (Essex Corp., Alexandria, VA; Lehigh University, Bethlehem, PA) University of Alabama in Huntsville and University of Alabama in Birmingham, Annual Robotics Conference, 4th, University of Alabama, Huntsville, AL, Apr. 26, 1984, Paper. 23 p refs

The present investigation is concerned with possible contributions of human factors engineering to robotics. Engelberger (1974) applied the term 'symbiosis' to robotics to indicate that humans were and would be working jointly with robots. Aspects of such a 'symbiosis' are discussed, and a description of human factors engineering techniques is presented, taking into account interface design, workplace layout, ambient conditions, safety, procedures and manuals, installation and testing, skill and training requirements, human factors engineering has been involved in robotics for no more than five years. Developments occurring in connection with such an involvement are discussed. G.R.

## A85-24035

# CERTAIN PROBLEMS IN THE AUTOMATED ASSESSMENT OF THE OPERATING EFFICIENCY OF MAN-MACHINE SYSTEMS [NEKOTORYE VOPROSY AVTOMATIZATSII OTSENKI EFFEKTIVNOSTI FUNKTSIONIROVANIIA SISTEM 'CHELOVEK-TEKHNIKA']

A. A. BEZBOGOV (Rizhskoe Vysshee Voennoe Aviatsionnoe Inzhenernoe Uchilishche, Riga, Latvian SSR) Kibernetika i Vychislitel'naia Tekhnika (ISSN 0454-9910), no. 61, 1984, p. 63-67. In Russian, refs

A generalized description is given of a man-machine system (MMS), its constituent parts (the human operator and the machine part), and their interactions. The problem of assessing the operating efficiency of MMSs is formulated, and the concept of objective assessment is defined. A classification of assessments of MMS operation is proposed, and structures of automated systems for the assessment of MMSs are presented. B.J.

# A85-30351#

# ACTIVE CONTROL OF MECHANICAL SYSTEMS - THE STATE-OF-THE-ART FOR ROBOTIC MANIPULATORS

S. DUBOWSKY (MIT, Cambridge, MA) IN: Structures, Structural Dynamics, and Materials Conference, 26th, Orlando, FL, April 15-17, 1985, Technical Papers. Part 2. New York, American Institute of Aeronautics and Astronautics, 1985, p 258-261. (AIAA PAPER 85-0683)

Active control is an important factor in developing future high performance intelligent mechanical systems. Robotic manipulators are an example of such systems which have received much attention recently. This paper briefly reviews the current state-of-the-art capabilities and limitations of the control systems for these devices It also discusses the areas which must be addressed if robotic manipulators are to achieve truly high levels of performance in the future. Author

# A85-31792

# DEVELOPMENTS IN DECISION SUPPORT SYSTEMS

R. H. BONCZEK, C. W. HOSAPPLE, and A. B. WHINSTON (Purdue University, West Lafayette, IN) IN: Advances in computers. Volume 23 Orlando, FL, Academic Press, Inc., 1984, p. 141-175. refs (Contract NSF IST-81-08519; NSF ECS-81-16135)

A 'Decision Support System' (DSS) is a computerized system which utilizes knowledge about a particular application area to help decision makers working in that area solve ill-structured problems. Ill-structured problems exist in applications related to financial planning, medical diagnosis, operations management, and market planning The concept and the activities of decision making are discussed. The information-processing system which makes a decision may be human (individual or group), machine, or a system having both human and machine participation. The latter type of decision-making system is of primary interest in the DSS field. The machine-based portion of the decision-making system constitutes typically a decision support for the human portion A DSS must possess at least one of the seven decision-making abilities and must exercise that ability in some stage of a decision process. Attention is given to the tools for building a DSS, the essential components of a DSS, trends in the DSS field, and future research directions G.R.

## A85-37566

EVALUATION OF THE EFFICIENCY OF OPERATOR WORK IN MAN-MACHINE SYSTEMS [OTSENKA EFFEKTIVNOSTI RABOTY OPERATORA V SISTEMAKH 'CHELOVEK-MASHINA'] E. V BORISOV Radiotekhnika (ISSN 0033-8486), April 1985, p. 91, 92. In Russian

A method for determining the efficiency of operator work in man-machine systems is proposed in which the necessary input data are specified in the form of fuzzy sets. This makes it possible to formalize the subjective representation of the researcher concerning the characteristics of the system and the operator, especially at the system design stage. BJ.

# A35-42892\*# Jet Propulsion Lab, California Inst of Tech., Pasadena.

# TOWARD THE FULLY CAPABLE AI SPACE MISSION PLANNER

S. GRENANDER (California Institute of Technology, Jet Propulsion Laboratory, Pasadena) Aerospace America (ISSN 0740-722X), vol. 23, Aug. 1985, p. 44-46.

The necessity of expending numerous ground-side manhours to write extremely concise command codes for deep-space probes in-flight, which carry limited on-board processing capabilities, is encouraging the development of AI modules to perform the same task. An experimental automated sequence planner, Deviser, has proven successful enough, when used on a mainframe computer, to continue with the next generation of the concept, PLAN-IT, an expert scheduler for spacecraft observation targets. The new system will provide the ground-based user with interactive graphic displays for choosing targets and generates an expected time-line. An updated Deviser, using the new modules, will be tested after the Voyager Uranus encounter, and PLAN-IT will be employed to formulate Spacelab activity schedules M.S K

# A85-45087

# TIMM - THE INTELLIGENT MACHINE MODEL

D. W COOPER (General Research Corp., Santa Barbara, CA) IN NAECON 1984; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 21-25, 1984. Volume 2 New York, IEEE, 1984, p. 802-807. refs

New York, IEEE, 1984, p. 802-807. refs The rationale behind TIMM (The Intelligent Machine Model), a domain independent expert system building tool, is discussed, and a description of TIMM's functions is given TIMM helps the expert describe both the problem domain and the set of possible solutions. It leads the expert through test cases, asking only about specific, real problems. TIMM generalizes the expert's knowledge, eventually attaining a sufficient degree of expertise to perform as well as the expert in the problem domain. Current deficiencies in TIMM and several in-house applications are described CD.

# A85-45902\*# TRW, Inc., Redondo Beach, Calif.

\* THE ROLE OF ROBOTICS IN SPACE SYSTEM OPERATIONS H F. MEISSINGER and V A. SPECTOR (TRW, Inc., Space and Technology Group, Redondo Beach, CA) IN: Guidance, Navigation and Control Conference, Snowmass, CO, August 19-21, 1985, Technical Papers New York, AIAA, 1985, p. 223-236. refs (Contract NAS8-35031)

(AIAA PAPER 85-1879),

The role of automation and robotics in support of man's activities in space is discussed, with emphasis given to satellite servicing functions 'on board the NASA Space Station (SS) or at remote locations. Consideration is given to four satellite servicing mission scenarios, including: low-earth-orbit (LEO) servicing of satellite in situ or on the Space Station following orbital transfer by means of an Orbital Maneuvering Vehicle (OMV); in situ servicing of a free-flving coorbiting materials processing platform: repair/refurbishment of Space Station payloads of substations, an in situ servicing of geostationary satellites by means of an Orbital Transfer Vehicle (OTV) The potential applications of three different automation technologies are examined, including: teleoperation; robotics, and artificial intelligence. Consideration is also given to the potential applications of the Space Station data system in support of servicing activities A list of the more common terms of automation technology is provided. TH.

## A85-47677

THE MODELING OF HUMAN COGNITIVE DECISION PROCESSES IN THE INTELLIGENT MACHINE MODEL (TIMM) R. E. PARKER and S. J. KISELEWICH (General Research Artificial Intelligence Laboratory, Santa Barbara, CA) IN 1984 American Control Conference, San Diego, CA, June 6-8, 1984, Proceedings. Volume 1 New York IEEE 1984 p. 1-5 refs

Volume 1 . New York, IEEE, 1984, p. 1-5. refs The Intelligent Machine Model (TIMM) is a software package that enables a user to build an 'expert system' - that is, a system which is capable of providing expert advice in some well-defined domain of expertise. To accomplish this, TIMM attempts to represent some of the analog character of the real world domain, in addition to a standard rule base. This extra information defines a metric over the rule base. This metric allows TIMM to model some distinctly human capabilities. TIMM is able to reach decisions for new, uncertain, and incompletely defined situations. TIMM is able to examine its own rule base and suggest new rules that seem appropriate for the domain. These are important capabilities for real world expert systems

# A85-49098

# ARTIFICIAL INTELLIGENCE - A NEW DIMENSION IN EW

T. H. GREER (Litton Applied Technology, Sunnyvale, CA) Defense Electronics (ISSN 0278-3479), vol. 17, Sept. 1985, p. 190, 191, 193 (8 ff.).

The concept of artificial intelligence (AI) is examined from the standpoint of the application of AI techniques to electronic warfare. The general design of a knowledge-based system and its components are then discussed, with attention given to the production pair, inferencing, the inference engine, search strategies, and knowledge representation. It is pointed out that applying AI techniques to threat warning systems will produce a more comprehensive, higher-level, contextual assessment of the current and projected threat situation. This assessment will contain more information and need less interpretation by the pilot than the mere categorization and display of the instantaneous signal environment. V.L

# A85-49563

# EXPERT SYSTEMS IN SOFTWARE MAINTAINABILITY

C. A. DYER (Digital Equipment Corp., Nashua, NH) IN. Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings . New York, IEEE, 1984, p 295-299.

The development of an expert system for planning for software maintainability is described. The factors which need to be considered in order to optimize the cost of maintaining software are given. Maintainability planning, which is a set of decisions about the level of support available for a product, and expert systems, which match inputs to rules stored in the system, are discussed An example which explains the functioning of the expert system is provided. An expert system utilizes human judgment, however, the system is not capable of drawing inferences or formulating new rules

N85-10372# LTV Aerospace Corp., Dallas, Tex. Aero Products Div.

ICAM (INTEGRATED COMPUTER AIDED MANUFACTURING) CONCEPTUAL DESIGN FOR COMPUTER-INTEGRATED MANUFACTURING. VOLUME 4, PART 6: TASK D. QUALITY ASSURANCE/QUALITY CONTROL/TECHNICAL REQUIREMENT/TASKS, QUALITY ASSURANCE MODELING AND ANALYSIS, QUALITY ASSURANCE PROGRAM MANAGEMENT STANDARD RECOMMENDATIONS (ISP) Final Technical Report, 1 Oct. 1981 - 29 Jun. 1984

R. H. WETTACH, B. R. SHEPHERD, and W. D. VINSON Wright-Patterson AFB, Ohio AFWAL 29 Jun 1984 304 p (Contract F33615-81-C-5119)

(AD-A144891; REPT-2-20150/4R-2-VOL-4-PT-6;

ISP110513000-VOL-4-PT-6; AFWAL-TR-84-4020-VOL-4-6) Avail: NTIS HC A14/MF A01 CSCL 14D

This document, Vol. IV, Part 6, of the Final Technical Report contains the Quality Assurance Program Management Standard Recommendations (ISP). This document presents recommendations for a new DoD Quality Assurance Standard and two alternative considerations for improving existing standards Background rationale and other supporting material, including analysis approach and survey results are presented.

Author (GRA)

# N85-11347# Applied Concepts Corp, Woodstock, Va ROBOTICS INVESTMENT DECISION MODEL USER'S MANUAL Report, 21 Feb. - 2 May 1982

J. A. SIMPSON 4 May 1984 88 p

(Contract F33615-83-C-5080)

(AD-A145467, BRMC-83-5080-2) Avail: NTIS HC A05/MF A01 CSCL 09B

This report describes how to use the Robotics Investment Decision Model (RIDM) RIDM is a computerized model for assessing the economic attractiveness of investments in robotics and/or flexible manufacturing systems. It is written as a template for Lotus 1-2-3, a popular microcomputer-based electronic spreadsheet program. RIDM models the nominal and discounted cash flows generated by the investment as compared to the existing method of manufacture, and provides the internal rate of return and net present value of the investment, both before and after taxes. Author (GRA)

# N85-11594# Rome Air Development Center, Griffiss AFB, N.Y. ARTIFICIAL INTELLIGENCE APPLICATIONS TO MAINTENANCE

A. COPPOLA *In* Denver Research Inst. Artificial Intelligence in Maintenance p 23-44 Jun 1984

(AD-P003914) Avail NTIS HC A22/MF A01 CSCL 05A

The maintenance of modern military systems employs a variety of automation. Built-In-Test provides on-line fault detection and some isolation, Automatic Test Equipment is indispensable at intermediate and depot repair stations, and automated maintenance aids and trainers abound These developments were designed to speed maintenance and to compensate for declining skill levels in the maintenance force. They are currently far from satisfactory. Modern maintenance is characterized by excessive false alarms and unnecessary removals at all levels of maintenance. The results of these deficiencies are long maintenance times, resources wasted in unnecessary for inefficient maintenance actions, and systems out of action which need not be. Correcting these problems would therefore provide both an economic advantage and a force multiplier. To create quantum improvements in maintenance will require the application of radical changes to the technology One possibility is the application of Artificial Intelligence (AI) techniques to maintenance. Al is beginning to see application to practical problems in many disciplines, and hence is potentially capable of relatively rapid implementation into military systems. At present, DoD efforts in applying AI to maintenance are small and exploratory. The task of the Artificial Intelligence Applications committee was to examine the opportunities for applying AI to maintenance, assess the costs, risks, and development time required, and provide recommendations to the DoD for action GRA

N85-11595# Navy Center for Applied Research in Artificial Intelligence, Washington, D C

ON APPLYING AI (ARTIFICIAL INTELLIGENCE) TO MAINTENANCE AND TROUBLESHOOTING

K DEJONG In Denver Research Inst Artificial Intelligence in Maintenance p 45-54 Jun 1984

(AD-P003915) Avail: NTIS HC A22/MF A01 CSCL 05A

This article describes artificial intelligence applications to maintenance and troubleshooting in the Navy GRA

# N85-11605# Stanford Univ , Calif. GUIDON

W. J. CLANCEY *In* Denver Research Inst Artificial Intelligence in Maintenance p 181-188 Jun 1984

(AD-P003925) Avail: NTIS HC A22/MF A01 CSCL 09B

GUIDON is an intelligent computer-aided instructional program for teaching diagnosis, such as medical diagnosis. The program is general Without reprogramming, the program can discuss with a student any diagnostic problem that it can solve on its own. Moreover, by substituting problem solving knowledge from other domains, the program can immediately discuss problems in those domains. This power derives from the use of Artificial Intelligence methods for representing both subject material and knowledge about how to teach. These are represented independently, so the teaching knowledge is general. There are teaching rules and procedures for: determining what the student knows, responding to his partial solution, providing hints, and opportunistically interrupting to test his understanding. Experience with GUIDON reveals the importance of separating out casual and strategic knowledge in order to explain diagnostic rules and to teach a reasoning approach These lessons are now guiding the development of new representations for teaching. Author (GRA)

N85-11606# Bolt, Beranek, and Newman, Inc., Cambridge, Mass

# DESIGNING AN EXPERT SYSTEM FOR TRAINING AUTOMOTIVE ELECTRICAL TROUBLESHOOTING

W. FEURZEIG and J FREDERIKSEN *In* Denver Research Inst. Artificial Intelligence in Maintenance p 189-192 Jun. 1984 (AD-P003926) Avail. NTIS HC A22/MF A01 CSCL 05A

Two key issues in the design and development of expert systems for maintenance training are the choice of an appropriate expert model and the function of the expert in instruction. We are confronting these issues in instructional research involving the design of an expert instructional system for automotive electrical troubleshooting. In studying expert troubleshooters and in examining troubleshooting procedures used in the military, we have encountered three distinctly different types of expertise. Each of these requires different forms of knowledge and produces qualitatively different troubleshooting behaviors. One kind of expert has established a large repertoire of symptom-fault associations through extensive experience in troubleshooting. Another kind of mechanic utilizes fixed troubleshooting procedures from shop manuals and various maintenance aids. A third kind of expert does extensive inferencing in attempting to diagnose faults.

GRA

# N85-11609# Arizona Univ., Tucson Dept. of Psychology THE PSYCHOLOGY OF TECHNICAL DEVICES AND TECHNICAL DISCOURSE

D. E KIERAS In Denver Research Inst. Artificial Intelligence in Maintenance p 227-255 Jun. 1984

(Contract N00014-81-C-0699; N00014-83-K-0224)

(AD-P003929) Avail: NTIS HC A22/MF A01 CSCL 06D

This paper is concerned with some issues in cognitive psychology that are relevant to the general question of what artificial intelligence techniques can do toward the solution of problems concerning equipment training and maintenance. Three topics will be discussed. The first is the nature of expertise in electronics, which is not very well understood. The second topic is the relation between instructions and expertise. The third topic is technical documentation GRA

# N85-11614# Army Research Inst for the Behavioral and Social Sciences, Alexandria, Va

# ARTIFICIAL INTELLIGENCE CONTRIBUTIONS TO TRAINING AND MAINTENANCE

J. PSOTKA In Denver Research Inst Artificial Intelligence in Maintenance p 305-315 Jun. 1984

(AD-P003934) Avail NTIS HC A22/MF A01 CSCL 06D

Artificial intelligence is rapidly becoming a practical and useful technology for training and maintenance. This paper provides an introduction to its uses in maintenance training, drawing on current research funded by the Army After a description of this work, a call is made to fund more exploratory research, expand the base of competent professionals in the field, and begin the complicated process of evaluating this new technology in order to diagnose its failings and hasten its development Author (GRA)

# N85-12792# Johns Hopkins Univ., Silver Spring, Md. PSYCHOLOGICAL ISSUES IN THE DESIGN OF EXPERT SYSTEMS

B W. HAMILL Jul. 1984 23 p

(Contract N00024-83-C-5301)

(AD-A146081, TR-ZEY-84-01) Avail: NTIS HC A02/MF A01 CSCL 05B

Recent advances in the artificial intelligence technology of knowledge-based expert systems have captivated the imaginations of designers, sponsors, and suppliers of computer-based systems in government and industry as well as researchers in university and non-profit laboratories where the technology originated An expert system is essentially a way to capture the knowledge and expertise of a subject-matter expert and transfer it to a computer program in hopes of creating an intelligent computer system that will emulate the problem-solving and decision-making performance of the expert. Such systems are being built to serve as intelligent advisors and decision aids in a wide variety of application areas. We discuss conceptual issues underlying expert system design, with references to current psychological and artificial intelligence literature, and urge consideration of these issues before undertaking development of expert systems. Author-assigned Keywords include Knowledge-based systems; Knowledge acquisition; Knowledge representation; Mental models; and Decision aids. GRA

N85-13688# Committee on Science and Technology (U. S. House).

MANUFACTURING SCIENCES AND ROBOTICS RESEARCH AND DEVELOPMENT ACT OF 1984

1984 18 p Rept. to accompany S 1286 presented by the Comm. on Sci. and Technol., 98th Congr., 2nd Sess, 25 Sep. 1984

(H-REPT-98-1078; GPO-31-006) Avail: US Capitol, House Document Room

Computer aided design; automated materials handling, processing, and assembly; automatic testing; machine adaptive learning, integrated manufacturing systems, machine and process control strategies; automated sensing machines; new metallurgical technology, practices and activities to implement improved manufacturing methods are considered. BG

# N85-14596 University of Southwestern Louisiana, Lafayette. KNOWLEDGE-BASED COMMUNICATION AND MANAGEMENT SUPPORT IN A SYSTEM DEVELOPMENT ENVIRONMENT B. I KEDZIERSKI 1983 228 p

Avail Univ Microfilms Order No DA8416778

The identification of project management and communication support as an important domain of an effective software development environment, and the application of speech act theory to that domain is considered. A framework, or paradigm, was designed for such an environment using a knowledge based, program synthesis approach from artificial intelligence. A pilot communication and management support environment (CMS) was implemented. Studies of system/user interaction helped form the theory that people, while interacting with a computer system, perform communication or management acts, such as questioning, informing, requesting, critiquing, or planning. An act taxonomy was created and the structure and relationships among some of these acts were formally represented. A representation of time as hierarchical periods was also created. Protocols were developed for project activity and formally represented as rules that refer to the project model and acts. Dissert Abstr

# N85-15176# Joint Publications Research Service, Arlington, Va. NEW CONCEPTS FOR INDUSTRIAL ROBOTS OUTLINED

H. SCHEIBNER In its East Europe Rept: Sci and Technol (JPRS-ESA-84-045) p 12-24 13 Dec. 1984 refs Transl into ENGLISH from Fertigungstech. (East Berlin), v. 34, no. 7, 1984 p 392-396

Avail. NTIS HC A04/MF A01

The automation in the small and medium production of machine construction which requires flexibility and high productivity and the expansion of CNC machine tools with equipment for automation of the flow of information and materials is discussed. With the introduction of numerically controlled machine tools and processing centers, the working process and tool changes were automated The manual procedures include workpiece handling, workpiece checking, and checking of tool fracture and wear. It is necessary to decrease the need of operators to run the machine tools. Modern CNC performs these functions automatically The advantages of these functions are: (1) reduction of auxiliary times; (2) better machine workload, (3) relieving the machine operator from monotonous and physically heavy work; and (4) increasing output while reducing operational and monitoring work F.A.K

N85-15448# Army Construction Engineering Research Lab., Champaign, III.

THE APPLICATION OF ARTIFICIAL INTELLIGENCE TO CONTRACT MANAGEMENT Final Report

T. A KRUPPENBACHER Aug. 1984 536 p (AD-A146681, CERL-TM-P-166) Avail: NTIS HC A23/MF A01 CSCL 09A

The area of contract management currently holds many opportunities for the development of expert systems which are capable of assuming the role of a legal consultant on matters pertaining to claim analysis. To demonstrate the feasibility of this type of expert system, the Differing Site Condition Analysis System (DSCAS) has been developed. DSCAS, built within the ROSIE

# 04 ROBOTICS AND EXPERT SYSTEMS

programming environment, is capable of performing the legal analysis of a differing site condition (DSC) claim. The DSCAS program is based on logic which is patterned after the decision process used by a lawyer to analyze the DSC claim. DSCAS provides a very user-friendly environment in which the analysis is performed and a number of desirable features. Two of the most desirable features are, its ability to make assumptions and continue the analysis if an answer is unknown and its ability to explain the reason behind concluding that the contractor will not be allowed entitlement. GRA

N85-16479# Pattern Analysis and Recognition Corp., McLean, Va

# MENTAL MODELS AND COOPERATIVE PROBLEM SOLVING WITH EXPERT SYSTEMS

P. E. LEHNER, F. W. ROOK, and L ADELMAN Sep 1984 48

(Contract N00014-83-C-0537)

AD-A147843; PAR-84-116) Avail NTIS HC A03/MF A01 CSCL 05H

A cognitive theory of user/expert system interaction is proposed that relates the quality of cooperative problem solving with an expert system to. (1) cognitive consistency--the degree of consistency between the rule-based system and the user's problem solving processes; and (2) mental model--the user's conceptual understanding of the basic principle of the system's problem solving processes. An experimental study is described that strongly supports the theoretical prediction. In particular, the results support the prediction that for users with an accurate mental model, increasing cognitive consistency significantly decreases user/expert system problem solving performance. Users not processing an accurate mental model reach higher performance when utilizing cognitive consistent procedures. The practical implications of this theory are briefly discussed. Originator-supplied keywords include. Human factors, and Man/machine interface. GRA

N85-16690# Ohio State Univ, Columbus. Dept of Computer and Information Science.

DISTRIBUTED KNOWLEDGE BASE SYSTEMS FOR DIAGNOSIS AND INFORMATION RETRIEVAL Annual Report, 1 Jul. 1983 -30 Jun. 1984

B. CHANDRASEKARAN Aug. 1984 115 p

(Contract AF-AFOSR-0255-82)

(AD-A146890; AFOSR-84-0864TR) Avail NTIS HC A06/MF A01 CSCL 09B

During the year progress was made in a number of directions. (1) The investigators developed in significant detail a language for representing an agent's understanding of aspects of how a device works, and also developed a compiler which can produce a diagnostic expert problem solving system from this deep level functional representation. (2) The researchers continued their investigation of how design knowledge can be organized as plans and design problem solving can be viewed as design refinement by plan selection and redesign. They have completed the construction of a prototype design expert system called AIR-CYL, which designs a moderately complex mechanical component called an aircylinder for a range of specifications. (3) They continued investigation of high-level languages for expert system construction; in particular they have refined their design of the CSRL language for diagnostic expert system, and implemented it in Interlisp for the Xerox family of Lisp machines. (4) They have initiated a new investigation in reasoning about the behavior of physical systems by qualitative simulation by using a novel technique called consolidation, which infers the behavior of a composite component from the behaviors of its subcomponents GRA

# N85-17177# Joint Publications Research Service, Arlington, Va. MAN-MACHINE COMMUNICATION RESEARCH FOR ROBOTICS REPORTED

K H. TEMPELHOF and R. MEYER In its East Europe Rept.: Sci. and Technol. (JPRS-ESA-84-046) p 1-3 26 Dec 1984 Transl. into ENGLISH from Volksstimme (Magdeburg), 18 May 1984 p 4

Avail: NTIS HC A03/MF A01

Speech recognition systems in robotics are reviewed. Future trends in speech communication processes are examined along with primary applications BG

# N85-17186# Joint Publications Research Service, Arlington, Va. FLEXIBLE MANUFACTURING SYSTEM CONCEPT FEATURES CACHE MEMORY Abstract Only

G STEHFEST In its East Europe Rept.: Sci. and Technol. (JPRS-ESA-84-047) p 12 28 Dec. 1984 Transl into ENGLISH from Freiheit (Halle), 19 Oct. 1984 p 8

Avail: NTIS HC A04/MF A01

Development technology with an emphasis on robotics, numerical control, and patents was discussed. BG.

N85-17365# Michigan Univ., Ann Arbor. Robot Systems Div COORDINATED RESEARCH IN ROBOTICS AND INTEGRATED MANUFACTURING Annual Report, 1 Aug. 1983 - 31 Jul. 1984 D. E ATKINS and R A. VOLZ 30 Oct 1984 138 p (Contract F49620-82-C-0089)

(AD-A148204; RSD-TR-12-84, AFOSR-84-1016TR) Avail: NTIS HC A07/MF A01 CSCL 13H

The research procured under this contract is oriented toward the understanding and development of the flexible robot based manufacturing cells or islands which will increasingly become basic blocks for the building of modern parts production and assembly facilities. Present work spans a hierarchy of sub-systems oriented toward the development and integration of high performance manipulators into flexible manufacturing cells. GRA

# N85-18571# Joint Publications Research Service, Arlington, Va. PROBLEMS OF PSYCHOLOGICAL SUPPORT OF AUTOMATED **ORGANIZATION CONTROL SYSTEMS Abstract Only**

B. S. BEREZKIN In its USSR Rept.: Life Sci. Biomed. and Behavioral Sci (JPRS-UBB-85-007) p 65-66 6 Feb 1985 Transl. into ENGLISH from Psikhologicheskiy Zh. (Moscow), v 5, no. 4, Jul. - Aug. 1984 p 74-82 Avail: NTIS HC A11

Hopes for improving the quality of administration by introducing automated systems have not been fully realized, primarily because the automation equipment has yet to become a true assistant to administrators at all levels. Automation is hardly used where it might be most effective, in decision support systems at high administrative levels. Many systems now in operation have underestimated the significance of man in modern administrative systems. The problems of psychological support of automatic organizational control systems can be defined as support of inter-organizational interactions as well as internal problems or organization of users, developers, and administrative system personnel Tasks include increasing the convenience of interaction of users with automation equipment, supporting training of users for interaction with automatic equipment, and assuring psychological safety for users as they work with automation equipment. Problems include the creation of the necessary psychological tool kit and development of new forms of interaction among academic, research, and development institutions Author

N85-19213# Joint Publications Research Service, Arlington, Va. DEAN OF KIEV STATE UNIVERSITY ON IMPACT OF ROBOTS I. I. LYASHKO In its USSR Rept.: Machine Tools and Metalworking Equipment (JPRS-UMM-85-003) p 6-11 12 Feb. 1985 Transl. into ENGLISH from Pod Znamenem Leninizma (Kiev), no. 16, Aug. 1984 p 67-69

# Avail NTIS HC A04

In the modern sense of the word, robots are a prospective means of complete automation and of solving pressing national economic and social problems, including the problem of manpower resources and improving working conditions. The role of robotics is discussed in its relationship to electronic components, manufacturing, productivity, and social impact. BG

N85-19873# Loughborough Univ. of Technology (England) Dept. of Civil Engineering

EXPERT SYSTEMS IN CONTRACT MANAGEMENT: A PILOT **STUDY Interim Report** 

E. G. TRIMBLE, R J. ALLWOOD, and F C. HARRIS Dec 1984 5 p

(Contract DAJA45-84-C-0024; DA PROJ. 1T1-61102-BH-57) (AD-A149363; AD-F300533) Avail. NTIS HC A02/MF A01 CSCL 05A

It is reported that Linking of an expert system and a planning program has been achieved; there are now four collaborating contractors; knowledge is being assembled within two of the collaborating companies; six system shells have been evaluated, extensions to the materials handling application have been explored; several important conclusions were drawn from a visit by Mr Frank Kearney; and a teach-in will be held for future expert system applications. **GRA** 

N85-20166# Joint Publications Research Service, Arlington, Va. **ROBOT PRODUCTION LINES IN OPERATION** 

In its East Europe Rept. Sci and Technol. (JPRS-ESA-85-009) p 1-2 26 Feb 1985 refs Transl into ENGLISH from Otlet (Budapest), 13 Dec. 1984 p 37

Avail NTIS HC A04/MF A01

Bulgaria today occupies a leading place within CEMA in the development of mechanical machine manufacture and electronics Two larger lines of products were manufactured in the Beroe factory. The first contains non-digital robots, mostly lifting robots, used to perform relatively simple operations. The other series consists of the so-called flexible, electronically controlled robots, which are suitable for performing a number of work phases. Robot applications and marketing strategies are covered.

### N85-20180# Joint Publications Research Service, Arlington, Va. PANEL MAKES SPECIFIC PROPOSALS FOR FRENCH ROBOTICS RESEARCH. CURRENT STATE OF FRENCH ROBOTICS

In its West Europe Rept. Sci. and Technol. (JPRS-WST-85-008) p 27-99 19 Feb. 1985 Transl. into ENGLISH from the book "Mission Robotique 1" Paris, 1984 p 27-29 Avail: NTIS HC A07/MF A01

Although because of the novelty of the products and the disparity of needs, it is difficult today to delimit the robotics sector and to precisely estimate the magnitude of its markets, the panel has found it useful to support its conclusions and guidelines with an analysis of current conditions. Four areas of consideration are adequate research level, recent market expansion; delicate and technologically dependent supply; lack of coordination and overall policy. BG

# N85-20383# Du Pont de Nemours (E. I.) and Co., Aiken, S C. **ROBOTICS AT SAVANNAH RIVER SITE: ACTIVITY REPORT** J. S. BYRD Sep. 1984 35 p

(Contract DE-AC09-76SR-00001)

(DE85-003657; DPST-84-736) Avail: NTIS HC A03/MF A01

The objectives of the Robotics Technology Group at the Savannah River Laboratory are to employ modern industrial robots and to develop unique automation and robotic systems to enhance process operations at the Savannah River site (SRP and SRD). The incentives are to improve safety, reduce personnel radiation exposure, improve product quality and productivity, and to reduce operating costs During the past year robotic systems have been installed to fill chemical dilution vials in a SRP laboratory at 772-F and remove radioactive waste materials in the SRL Californium Production Facility at 773-A A robotic system to lubricate an extrusion press was developed and demonstrated in the SRL robotics laboratory and is scheduled for installation at the 321-M fuel fabrication area. A mobile robot was employed by SRP for a

radiation monitoring task at a waste tank top in H-Area. Several other robots are installed in the SRL robotics laboratories and application development programs are underway. The status of these applications is presented DOF

N85-21316# United Kingdom Atomic Energy Authority, Harwell (England). Computer Science and Systems Div.

# THE APPLICATION OF EXPERT SYSTEMS TO CORROSION PROBLEMS

C. WESTCOTT, D. E. WILLIAMS, N. J. M. WILKINS, G. P. MARSH, J N. WANKLYN, and I F. CROALL Nov. 1984 12 p refs (AERE-M-3445) Avail: Issuing Activity

An expert system is explained and a case is made for developing and applying expert systems to corrosion problems. The nature and structure of expert-customer interactions and the implementation of similar dialogs between computer and user are considered. Problems associated with the user-interface to an expert system are addressed and examples of prototype systems are given. ARH

N85-24191# Joint Publications Research Service, Arlington, Va PLANS, DEVELOPMENTS IN ROBOTICS

K. G. KOCSIS In its East Europe Rept Sci and Technol. (JPRS-ESA-85-015) p 11-16 16 Apr. 1985 refs Transl into ENGLISH from Maglap Hirlap (Budapest), 28 Feb. p 7

Avail: NTIS HC A06/MF A01

Developments in robotics are described. Domestic manufacture is characterized in large part by isolated developments. In the mid 1970's, the moderately capable Robi was built Then the FER manipulators were developed and made into an automatic picture tube loading device. A new profile for automatic devices to test and check integrated circuits is being built. F.A.K.

N85-24842# Gordon Research Conferences, Inc., Kingston, R I. CONFERENCE GORDON ON FUNDAMENTALS OF CYBERNETICS Final Report, 1 Aug. - 31 Oct. 1984 L. STEG 31 Oct. 1984 12 p

(Contract N00014-84-G-0128; DA PROJ. RR0-4209)

(AD-A151074) Avail NTIS HC A02/MF A01 CSCL 06D

A conference was organized that brought together 110 research scientists of diverse specialities to address a comprehensive review of the relationship of cybernetics to relevant disciplines, including biochemistry, physiology, chemistry and information sciences, and to relevant conceptual areas, including interactive training, organizational autonomy and policy methodology Author (GRA)

N85-25605# Joint Publications Research Service, Arlington, Va. **ROBOT USE IN FRG INCREASES BUT SENSOR TECHNOLOGY** LAGS

p 30 21 Feb. 1984 Transl. into ENGLISH from VDI Nachr. (Duesseldorf) 6 Jan. 1984 p 1

Avail: NTIS HC A03/MF A01

More than 4.800 industrial robots were installed in Germany (FRG). Japan improved its leading position; the increases from 5,000 to a currently estimated 17,000 robots alone is just as great as the total utilization volume in the FRG. The greatest relative increase was recorded in the assembly field. So long as the periphery problems are not solved, an explosion in the assembly work sector is really impossible. This elminates a threat to many jobs. The expansion effort still fails because of the absence of sensors in casting cleaning and deburring. The robot industry continues to believe in its growth. By the end of 1984, 6,000 industrial robots in the FRG are predicted E.A.K.
#### N85-25641# Joint Publications Research Service, Arlington, Va. FRENCH FIRM PLANS RECAPTURE OF DOMESTIC CAD/CAM MARKET

In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-009) р 38-39 21 Mar 1984 Transl, into ENGLISH from Electron. Actualites (Paris), 13 Jan. 1984 p 3 Avail NTIS HC A04/MF A01

The plans of the French firm CISI to recapture the computer aided design/computer aided manufacturing (CAD/CAM) market are discussed CISI chose to invest as an overriding priority in CAD/CAM of industrial products, and is bringing out a STRIM Tridimensional System for the Mechanical Industry-100 line of software for the mechanical industry. With this plan, CISI is making its bid as a candidate for the recapture of the domestic CAD/CAM market, a market that is currently being covered to the extent of 80 percent by foreign products. CISI's decision to give priority to CAD/CAM as a development effort is based on the analysis made by the firm regarding the future of data processing. Whereas the activity of the data processing sector's industrial firms over the past 20 years centered essentially on the manipulation of alpha-numerical characters, CISI expects that, over the next 10 years, it will be centered on the operational handling of objects and of manufacturing plants; CISI emphasizes, moreover, that this second boom will be as substantial as the first. **BJF** 

N85-28187# Joint Publications Research Service, Arlington, Va. FUTURE DIRECTIONS OF ROBOTICS, AUTOMATION IN ITALY A. STRUMIA In its West Europe Rept.: Sci. and Technol (JPRS-WST-84-024) p 38-41 10 Jul 1984 Transl. into ENGLISH from ATA Ing. Automotoristica (Turin), Feb. 1984 p 123-126 Avail: NTIS HC A04/MF A01

The use of robots in Italy is discussed Robots are rarely being used in Italian industry due to lack of investment by both government and industry. A number of areas in which robots would be useful are cited. R J.F

#### N85-28875# Joint Publications Research Service, Arlington, Va. GENERAL LAWS OF DEVELOPMENT OF TECHNOLOGY

T LEKHTLA In its USSR Rept Sci. and Technol Policy (JPRS-UST-85-008) p 89-93 8 May 1985 Transl. into ENGLISH from Sovetskaya Estoniya (Tallinn), 2 Nov 1984 p 2 Avail. NTIS HC A06/MF A01

The general development of machines is outlined. How man and machines interact and affect each others existance is discussed. The development of technology follows the general laws of dialectics, and technical systems development proceed in a spiral. The understanding of the essence of what is happening help to make long range decisions and to identify mistakes in time. E.B.

#### N85-29088# Joint Publications Research Service, Arlington, Va. COMPONENT PROBLEMS PLAGUE FRENCH ROBOTICS INDUSTRY

M. DEFAUX In its West Europe Rept.: Sci. and Technol. (JPRS-WST-84-022) p 22-30 2 Jul. 1984 Transl. into ENGLISH from L'Usine Nouvelle (Paris), 17 May 1984 p 60-66 Avail NTIS HC A04/MF A01

The dependence of French manufacturers of industrial robots on foreign components is examined. The issue of price control in this industry is explored. The feasibility of using electric motorization over hydraulic motorization in robot assembly is discussed. B.W.

#### N85-29094# Joint Publications Research Service, Arlington, Va MULTINATIONAL PROGRAM TO DEVELOP INTELLIGENT ROBOTS

In its West Europe Rept.: Sci and Technol (JPRS-WST-84-031) p 33-36 Transl, into ENGLISH from AFP Sci 11 Sep. 1984 (Paris), 19 Apr 1984 p 1-2

Avail: NTIS HC A03/MF A01

Paris--French researchers and manufacturers will cooperate on the creation of a number of autonomous multipurpose robots (RAM) to be used in a large variety of environments. The RAM program is aimed at third generation robotics, namely intelligent, generally

mobile robots, which relieve workers from difficult, dangerous, or toxic tasks. GLC

N85-29561\*# Jet Propulsion Lab., California Inst. of Tech, Pasadena

## MAN-MACHINE TRADEOFF STUDY

A. FEINBERG and W. F. ZIMMERMAN In NASA. Ames Research Center Proc of the Seminar on Space Station Human Productivity 10 p Mar 1985 Avail. NTIS HC A99/MF E03 CSCL 05H

An automation assessment was conducted to determine which components of the space station should be selected for automation The exercise took the form of a man-machine tradeoff study.

G.L.C

N85-30721\*# California Univ., Santa Barbara APPLICATION OF ARTIFICIAL THE INTELLIGENCE TECHNIQUES TO LARGE DISTRIBUTED NETWORKS

R. DUBYAH, T. R. SMITH, and J L. STAR Apr 1985 15 p refs

(Contract NCA2-OR680-401)

(NASA-CR-177346, NAS 1.26.177346) Avail NTIS HC A02/MF A01 CSCL 09B

Data accessibility and transfer of information, including the land resources information system pilot, are structured as large computer information networks. These pilot efforts include the reduction of the difficulty to find and use data, reducing processing costs, and minimize incompatibility between data sources. Artificial Intelligence (AI) techniques were suggested to achieve these goals. The applicability of certain AI techniques are explored in the context of distributed problem solving systems and the pilot land data system (PLDS) The topics discussed include: PLDS and its data processing requirements, expert systems and PLDS, distributed problem solving systems, Al problem solving paradigms, query processing, and distributed data bases. FAK.

N85-30723# Los Alamos National Lab., N Mex. Atmospheric Sciences Group.

### EXPANDING EXPERTISE BY USE OF AN EXPERT SYSTEM

T. G. KYLE 1985 8 p Presented at the Conf. on Intelligent Systems and Machines, Rochester, Mich., 22 Apr. 1985 (Contract W-7405-ENG-36)

(DE85-010759; LA-UR-85-1312; CONF-8504117-1) Avail: NTIS HC A02/MF A01

By constructing an expert system as a research project proceeds it is possible to aid the development of expertise within the research project. When the project involves complex scientific phenomena the use of interconnected simple mathematical models is needed to properly express the relations. The ability of the models to represent the values of a field of parameters permits researchers to refer to the individual phenomena within the realm of the model without having to reexpress all the complex relationships the model approximates. The model is still useful even when the rules being input into the expert system involve modifications that must be applied to the model output in particular situations. DOF

## N85-32020 George Washington Univ., Washington, D.C. DETERMINING FUNCTIONAL REQUIREMENTS FOR NASA GODDARD'S COMMAND MANAGEMENT SYSTEM SOFTWARE **DESIGN USING EXPERT SYSTEMS Ph.D. Thesis** J. LIEBOWITZ 1985 389 p Avail Univ. Microfilms Order No. DA8506073

A new approach to an existing problem concerning the development of functional requirements for NASA-Goddard's Command Management System (CMS) software design was proposed. The CMS is part of the NASA Data System, which entails the downlink of science and engineering data from NASA near-Earth satellites to the user and the uplink of command and control data to the spacecraft. It presently takes 1 to 3 years to determine functional requirements for CMS software design An expert CMS system prototype was developed. The knowledge base was formulated through interactions with domain experts and was

N85-32134\*# SRI International Corp., Menlo Park, Calif Artificial Intelligence Center.

#### STATION AUTOMATION: NASA SPACE AI-BASED TECHNOLOGY REVIEW

O. FIRSCHEIN, M. P. GEORGEFF, W. PARK, P. NEUMANN, W. H. KAUTZ, K. N. LEVITT, R. J. ROM, and A. A. POGGIO 1 Apr. 1985 325 p refs Revised (Contract NAS2-11864, SRI PROJ. 7268)

(NASA-CR-176094, NAS 1.26 176094) Avail NTIS HC A14/MF CSCL 22B A01

Research and Development projects in automation for the Space Station are discussed. Artificial Intelligence (AI) based automation technologies are planned to enhance crew safety through reduced need for EVA, increase crew productivity through the reduction of routine operations, increase space station autonomy, and augment space station capability through the use of teleoperation and robotics. Al technology will also be developed for the servicing of satellites at the Space Station, system monitoring and diagnosis, space manufacturing, and the assembly of large space structures FM.R

#### N85-32219# Joint Publications Research Service, Arlington, Va IMPORTANCE AUTOMATION, ROBOTIZATION OF IN ECONOMY

A PREDOI In its East Europe Rept.: Sci and Technol JPRS-ESA-85-023 p 26-31 30 Jul 1985 Transl. into ENGLISH from Era Socialista (Bucharest), no. 8, 25 Apr. 1985 p 9-11 Avail. NTIS HC A03/MF A01

Two decades of Romanian progress in automation and robotization of industry are reviewed. Under the aegis of the institute for Scientific Research and Technical Engineering for Automation and Telecommunications, the automation equipment field has grown from one enterprise in 1965 to six in 1985, with the percentage of domestic needs being supplied by native products growing from 48 to 98.5% in the same period. The proportion of production achieved using mechanized and automated systems averages 65% in 1985, will be 70% in 1987, and over 90% in 1990 Contribution to the drive for increased industrial automation is a transition to computer-aided research and design and to computerized production control based on an integrated computer system. FM.R.

#### N85-33172\*# Boeing Aerospace Co., Seattle, Wash.

### SPACE STATION AUTOMATION AND ROBOTICS STUDY. **OPERATOR-SYSTEMS INTERFACE Final Report**

Nov. 1984 72 p refs Sponsored by NASA. Johnson Spacecraft Center Prepared in cooperation with Boeing Computer Services, Inc., Seattle

(NASA-CR-176095; NAS 1.26 176095, D483-10027-1,

DE85-902175) Avail: NTIS HC A04/MF A01 CSCL 22B

This is the final report of a Space Station Automation and Robotics Planning Study, which was a joint project of the Boeing Aerospace Company, Boeing Commercial Airplane Company, and Boeing Computer Services Company. The study is in support of the Advanced Technology Advisory Committee established by NASA in accordance with a mandate by the U.S. Congress. Boeing support complements that provided to the NASA Contractor study team by four aerospace contractors, the Stanford Research Institute (SRI), and the California Space Institute. This study identifies automation and robotics (A&R) technologies that can be advanced by requirements levied by the Space Station Program. The methodology used in the study is to establish functional requirements for the operator system interface (OSI), establish the technologies needed to meet these requirements, and to forecast the availability of these technologies. The OSI would perform path planning, tracking and control, object recognition, fault detection and correction, and plan modifications in connection with extravehicular (EV) robot operations. F.M.R.

## 05

### COMPUTERS AND INFORMATION MANAGEMENT

Theory, Includes Information Systems and Information Dissemination and Retrieval, Management Information Systems, Database Management Systems and Databases, Data Processing, Data Management, Communications and Communication Theory, Documentation and Information Presentation, Software, Software Acquisition, Software Engineering and Management, Computer Systems Design and Performance, Configuration Management (Computers), Networking, Office Automation, Information Security.

#### A85-11096

#### **REUSABILITY IN PROGRAMMING - A SURVEY OF THE STATE** OF THE ART

T. C JONES (Nolan, Norton and Co, Lexington, MA) IEEE Transactions on Software Engineering (ISSN 0098-5589), vol. SE-10, Sept. 1984, p 488-494 refs

On the basis of a study of computer programs, it is tentatively concluded that of all the code written in 1983, probably less than 15 percent is unique, novel, and specific to individual applications. The remaining 85 percent appears to be common, generic, and concerned with putting applications into computers. In studies regarding the utilization of reusable code, it is attempted to standardize code related to this 85 percent. The present investigation is concerned with five subtopics which are considered under the general heading of 'reusability'. These subtopics include reusable data, reusable architecture, reusable designs, reusable programs and common systems, and reusable modules It is found that for the creation of standard reusable modules, it will be necessary to overcome three major obstacles. Such a development will require the solution of the problems of data reusability, the creation of an architecture for reusability, and the establishment of reusable designs GR.

#### A85-11275

#### METHODS FOR IMPROVING THE QUALITY OF COMPUTER SOZDANIIA KACHESTVENNOGO SOFTWARE [METODY PROGRAMMNOGO OBESPECHENIIA EBM1

E. A. BUTAKOV Moscow, Energoatomizdat, 1984, 232 p. In Russian. refs

The most significant trends in software-quality improvement are examined with emphasis on questions of program reliability Consideration is given to the standardization of the development and generation of programs and documentation; and to design and documentation facilities. Techniques for improving program correctness are examined, with particular attention given to structured programming, program verification and debugging, and automated testing tools. BJ.

### A85-17826#

#### DEVELOPMENT TOOLS - CASE STUDY FOR LARGE SYSTEMS

K. HORNBACH (Lear Siegler, Inc, Instrument Div, Grand Rapids, MI) IN: Digital Avionics Systems Conference, 6th, Baltimore, MD, December 3-6, 1984, Proceedings New York, American Institute of Aeronautics and Astronautics, 1984, p 167-174. refs (AIAA PAPER 84-2635)

Software development tools can be an important aid in controlling the complexity of large digital avionics systems. This paper describes the successful application of modern software tools to the development of the Flight Management Computer

System for the 737-300 aircraft Tools were used to increase productivity and quality during the entire software life cycle. Source code management tools provided thorough, ongoing configuration management of code Static analysis and path coverage of the source aided in meeting stringent verification requirements. Fourth-generation language techniques were used to produce many of the tools cost-effectively and text-formatting tools were used to increase documentation productivity. These and other tools, some in use for the first time, helped in the production of a high quality software product on a very tight schedule. Special attention was paid to the problems of scaling up tools for use on a large project, and to careful tailoring of the tools to correspond to the specific ways the project chose to structure software development.

Author

#### A85-21457

### SOFTWARE DESIGN METHODS

W. J CULLYER (Royal Signals and Radar Establishment, Malvern, Worcs, England) IN Design and advanced concepts of avionics/weapons system integration; Proceedings of the Symposium, London, England, April 3, 4, 1984. London, Royal Aeronautical Society, 1984, 10 p. refs

Contemporary civil and military aircraft avionics systems comprise a large number of different, interconnected computers for air data gathering, inertial navigation, automatic flight direction, flight management and stores management; the assembly of such systems involves both mutual understanding as to design methods, and agreement on avionics interface standards, among companies located throughout Western Europe and North America. Attention is presently given to the CORE and MENTOR methods for automated assessment and integration of complex avionics requirements, as well as to the difficulties anticipated in conversion to the Ada high level programming language for military avionics. O.C.

#### A85-26784

## SOFTWARE TEST PROGRAM FOR COMPUTER HARDWARE DEVELOPMENTS

D. E. GACKE (Sperry Corp., Sperry Computer Systems, St. Paul, MN) IN. AUTOTESTCON '83, Proceedings of the Conference, Fort Worth, TX, November 1-3, 1983. New York, Institute of Electrical and Electronics Engineers, Inc., 1983, p. 55-60.

The development of a software test program for computer hardware development is discussed. Computer-hardware features and development planning considerations are examined. It is shown in a microprogrammable based computer-hardware that development, the software must be defined and developed concurrently with the hardware A summary of the hardware-software development process and its relationship to software testing, as well as the characteristics of an emulation processor, are presented The software test approach includes requirements for developmental testing, program performance testing, and system integration testing. Four different types of software: operational, design verification, performance evaluation, and factory acceptance test software; and their relationship with the hardware and with the other components are described. The identification of software test levels and the responsibility for each level of test is an important consideration in defining the software test approach. M.D.

#### A85-26793

## AUTOMATED TOOLS FOR SOFTWARE DEVELOPMENT

R. KARL (Emerson Electric Co, St Louis, MO) IN: AUTOTESTCON '83; Proceedings of the Conference, Fort Worth, TX, November 1-3, 1983. New York, Institute of Electrical and Electronics Engineers, Inc., p. 118-121. refs

Reformatting and status/integration software tools are proposed for improving the productivity of programmers and programming teams. The reformatting tool reformats the subroutine specification paragraphs into comment banners and places them into a database, thus saving much time and effort. The status/integration tool aids the programmer by creating command strings to compile subroutines and by interactively creating linkage editor link lists for subsystem testing The tool also updates the tested project library of object modules By using this tool, a log file can be kept on the processing that has occurred The data contained in the log file can be used to determine the status of the project. V.L.

#### A85-26794

### APPLICATION OF THE PERSONAL COMPUTER FOR COST EFFECTIVE ATE/TPS SUPPORT

T. L. DRAGER, P. D. FAULKNER (AAI Engineering Support, Inc., Baltimore, MD), and G. A. MILLES (AAI Corp., Baltimore, MD) IN: AUTOTESTCON '83, Proceedings of the Conference, Fort Worth, TX, November 1-3, 1983 . New York, Institute of Electrical and Electronics Engineers, Inc., 1983, p. 133-137.

The use of personal computers in various phases of test program set (TPS) development in both managerial and technical areas is discussed. The management tasks discussed include task budgets, proposal cost analysis, resource allocation, manpower scheduling, critical path analysis, and spreadsheets. With reference to technical applications, attention is given to digital simulation, analog analysis, instrumentation control, ATLAS generation, and machine code development. It is noted that while 8- and 16-bit processor based systems are well suited for managerial functions, 32-bit processors are required for large simulators, such as AAIDS, LASAR, or CAPS, to be implemented effectively. V.L.

#### A85-26807

## DATA BASE MANAGEMENT FOR ATE RELIABILITY ENHANCEMENT

W. R HORNEY (General Dynamics Corp., Electronics Div., San Diego, CA) IN: AUTOTESTCON '83; Proceedings of the Conference, Fort Worth, TX, November 1-3, 1983 . New York, Institute of Electrical and Electronics Engineers Inc, 1983, p. 240-245

This paper describes a program at the General Dynamics Electronics Division whereby multiple data sources were integraed into a useable management information system. This system is designed to track F-16 intermediate-level ATE field performance from the base to component level, identify and prioritize areas where product improvement efforts would pay the highest dividends, and then track the effectiveness of product improvement initiatives. Author

#### A85-26830

## TALLY - AN ATLAS PROGRAM STATISTICAL DATA GATHERING TOOL

J F BROWN (McDonnell Aircraft Co., St Louis, MO) IN: AUTOTESTCON '83; Proceedings of the Conference, Fort Worth, TX, November 1-3, 1983. New York, Institute of Electrical and Electronics Engineers, Inc, 1983, p 379-383.

To monitor Test Program Set (TPS) development on various F/A-18 Automatic Test Equipment (ATE) systems, Integration Status Accounting Program (ISAP) was developed to provide actual statistical data on various developmental phases of each Abbreviated Test Language for All Systems (ATLAS) TPS TALLY is a software tool installed on each compilation station which automatically extracts all necessary statistical data after a test program compilation, lists and creates input files suitable for ISAP. The statistical data collected for each test program includes the number of ATLAS statements within the test program, the preamble and the procedural sections, the number of analog, digital or non-ATLAS statements and the compilation time. Author

### A85-27900

#### CONFERENCE ON ADA APPLICATIONS AND ENVIRONMENTS, ST. PAUL, MN, OCTOBER 15-18, 1984, PROCEEDINGS

Conference sponsored by the Institute of Electrical and Electronics Engineers. Silver Spring, MD, IEEE Computer Society Press, 1984, 171 p. No individual items are abstracted in this volume

It is pointed out that the emerging Ada technology is having a significant impact on industry, academia, and government. The lectures reported provide information regarding the current status of research and development related to the Ada language and environments. Ada run-time models are discussed, taking into

account the design of an Ada run-time system, a run-time supervisor to support Ada task activation and execution, a capability architecture for Ada, and an efficient evaluation stack for Ada tasking programs Other topics discussed are related to Ada programming environments and tools, applications and the use of Ada, methodologies for Ada, and distributed implementations of Ada, Attention is given to a methodology for the design of Ada transformation tools in a Diana environment, an Ada environment for programming-in-the-large, Ada as a programming design language for a telematic services project, communication between Ada programs, and a message-based kernel to support Ada tasking. G R.

#### A85-28797

#### DESIGN PRINCIPLES FOR FINITE ELEMENTS (FE) PROGRAMS CONCERNED WITH INTENSELY NONLINEAR PROBLEMS [ENTWURFSPRINZIPIEN VON FE-PROGRAMMEN FUER HOCHGRADIG NICHTLINEARE PROBLEME]

P. HERMANN Stuttgart, Universitaet, Fakultaet fuer Luft- und Raumfahrttechnik, Dr.-Ing Dissertation, 1984, 150 p. In German. refs

A description is presented of the data management system 'Matrix Manager' (MM), taking into account applications, internal structures, processes, and expected future developments. The requirements which a program system for nonlinear calculations will have to satisfy are discussed, and software components for implementing suitable approaches are examined. Problems related to data input and output operations are also considered along with various aspects of system software acquisition and maintenance. In a discussion of input operations, the attempt is made to cover the needs of the entire class of nonlinear problem solutions on the basis of an employment of comparatively modest means. Concepts are presented for the output of very large quantities of data, and approaches for obtaining information regarding the proceeding computational operations are described. The problems considered include various degrees of inelastic behavior, plastic deformation up to the point of failure, and thermal, electrical, and hydrodynamic field problems. G.R.

#### A85-29401

### PROTOTYPING INFORMATION SYSTEMS ON MICROCOMPUTERS - A DESIGN PHILOSOPHY FOR ENGINEERING MANAGEMENT

J KRAUSHAAR and L. SHIRLAND (Vermont, University, Burlington, VT) Engineering Management International (ISSN 0167-5419), vol. 3, Feb. 1985, p. 73-84 refs

A framework for engineering managers interested in designing and using information systems to satisfy management needs for decision making and strategy formulation is suggested Guidelines for developing, maintaining, and controlling these systems are presented Recent microcomputer hardware and software developments that make integrated systems feasible and desirable are discussed, and several methods for obtaining an integrated system are described along with their advantages and disadvantages A particularly promising process for developing integrated systems is advocated and compared with the traditional system development process. A rationale for the success of this prototyping process is offered, and resource needs required by it are discussed. C.D

#### A85-30283#

#### A METHODOLOGY TO DESIGN DATABASES FOR FINITE ELEMENT ANALYSIS AND STRUCTURAL DESIGN OPTIMIZATION APPLICATIONS

J. S ARORA (Iowa, University, Iowa City, IA) and T. S. MURTHY IN: Structures, Structural Dynamics, and Materials Conference, 26th, Orlando, FL, April 15-17, 1985, Technical Papers. Part 1 . New York, American Institute of Aeronautics and Astronautics, 1985, p. 494-504. refs

(AIAA PAPER 85-0743)

A methodology to design databases for finite element analysis and structural design optimization is presented. The methodology considers three views of data organization conceptual, internal and external. Tabular and matrix forms of data are included. Relational data model is used in the database design Entity, relation, and attributes are considered to form a conceptual view of data. First, second and third normal form of data are suggested to design an internal model. Several aspects like processing, iterative needs, multiple views of data, efficiency of storage and access time, and transitive data are considered in the methodology. Author

#### A85-31209

## STEPS TO AN ADVANCED ADA PROGRAMMING ENVIRONMENT

R. N TAYLOR and T. A. STANDISH (California, University, Irvine, CA) IEEE Transactions on Software Engineering (ISSN 0098-5589), vol. SE-11, March 1985, p. 302-310. refs (Contract N00039-83-C-0567)

Conceptual simplicity, tight coupling of tools, and effective support of host-target software development will characterize advanced Ada programming support environments. Several important principles have been demonstrated in the Arcturus system, including template-assisted Ada editing, command completion using Ada as a command language, and combining the advantages of interpretation and compilation. Other principles, relating to analysis, testing, and debugging of concurrent Ada programs, have appeared in other contexts This paper discusses several of these topics, considers how they can be integrated, and argues for their inclusion in an environment appropriate for software development in the late 1980's. Author

#### A85-31791

### INFORMATION AND COMPUTATION

J. F. TRAUB (Columbia University, New York, NY) and H WOZNIAKOWSKI (Warszawa, Uniwersytet, Warsaw, Poland, Columbia University, New York, NY) IN: Advances in computers Volume 23. Orlando, FL, Academic Press, Inc., 1984, p. 35-92. refs

### (Contract NSF MCS-78-23676; N00039-82-C-0427)

It is pointed out that only partial or approximate information exists for most computational problems. Consequently such problems can be solved only with uncertainty in the answer Examples of such problems include computations arising in science and engineering, decision theory, remote sensing, and signal processing. The basic quantities have been identified for such seemingly unrelated problems The 'radius of information' measures the intrinsic uncertainty in the solution of a problem. The present article provides some examples of the many domains which can be unified by employing the concept of the radius of information. Fundamentals regarding the considered subject are discussed, taking into account problem formulation, algorithms, optimal algorithms, linear algorithms, optimal information, and computational complexity Attention is given to nonadaptive information and parallel computation, limitations of the algorithm-centered approach, the information-centered approach, and an abstract model. G.R.

A85-34128\* Jet Propulsion Lab., California Inst of Tech., Pasadena.

### AN AUTOMATED METHODOLOGY DEVELOPMENT

L. R. HAWLEY (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) IN: Simulation in Ada, Proceedings of the Eastern Simulation Conference, Norfolk, VA, March 3-8, 1985 San Diego, CA, Society for Computer Simulation, 1985, p. 1-5 Army-sponsored research refs

(Contract NAS7-918)

The design methodology employed in testing the applicability of Ada in large-scale combat simulations is described. Ada was considered as a substitute for FORTRAN to lower life cycle costs and ease the program development efforts. An object-oriented approach was taken, which featured definitions of military targets, the capability of manipulating their condition in real-time, and one-to-one correlation between the object states and real world states. The simulation design process was automated by the problem statement language (PSL)/problem statement analyzer (PSA). The PSL/PSA system accessed the problem data base directly to enhance the code efficiency by, e.g., eliminating non-used subroutines, and provided for automated report generation, besides allowing for functional and interface descriptions. The ways in which the methodology satisfied the responsiveness, reliability, transportability, modifiability, timeliness and efficiency goals are discussed. MSK.

### A85-34459

## MANAGEMENT AND CONTROL OF INTERCONNECTED COMMUNICATIONS NETWORKS

G. D. HINGORANI, F. J. POWERS, and L. K. WENTZ (Mitre Corp., Bedford, MA) IN Milcom '83; Proceedings of the Military Communications Conference, Washington, DC, October 31-November 2, 1983 Volume 1. New York, Institute of Electrical and Electronics Engineers, Inc., 1983, p. 41-46. refs

NATO is placing increased emphasis on the effective utilization of national military and PTT networks as an approach to achieve an early enhancement of the NATO Integrated Communications System (NICS) presently under implementation. Concepts for interconnection with national military transmission and switched networks are under active consideration to extend NICS services and enhance NICS survivability and flexibility. These concepts necessitate a much greater focus on interoperability aspects and on NATO/national interface arrangements across network boundaries for management and control This paper highlights network management and control issues raised by these different uses of national military systems to enhance NATO communications survivability and flexibility across the threat spectrum Author

#### A85-34919

PROBLEM-ORIENTED SYSTEMS FOR PROCESSING EXPERIMENTAL DATA [O PROBLEMNO-ORIENTIROVANNYKH SISTEMAKH OBRABOTKI EKSPERIMENTAL'NYKH DANNYKH] A N. TIKHONOV, V IA. ARSENIN, N. A MARCHENKO, A. KH. PERGAMENT, and M. I PERGAMENT (Akademua Nauk SSSR, Institut Prikladnoi Matematiki, Moscow, USSR) Akademua Nauk SSSR, Doklady (ISSN 0002-3264), vol. 281, no. 4, 1985, p 802-806. In Russian. refs

One of the possible approaches to the interpretation of experimental data consist in formulating inverse problems to determine the characteristics of an object from experimental data and using the regularization method to solve these problems. The algorithms and programs for solving these problems are used to develop problem-oriented systems for the automatic processing and interpretation of experimental data. Here, the principal structural features and the design of problem-oriented systems are examined, as are their main functions. These include data acquisition, primary data processing, which can include normalization, statistical processing, and conversion to a specific coordinate system, and data interpretation proper including determination of the quantitative characteristics of an object on the basis of experimental results and a solution to the inverse problem.

#### A85-38643

#### ELEMENTS OF THE THEORY OF MULTISTEP PROCESSES OF SEQUENTIAL DECISION MAKING [ELEMENTY TEORII MNOGOSHAGOVYKH PROTSESSOV POSLEDOVATEL'NOGO VYBORA RESHENII]

B. I. MODEL Moscow, Izdatel'stvo Nauka, 1985, 96 p. In Russian. refs

The general structural properties of a large class of sequential decision making processes are examined. The main theoretical premises of the dynamic programming method are extended from finite-step processes to infinite-step ones in the framework of this class. In particular, the sufficient condition of the existence of a unique epsilon-optimal strategy is established along with the validity of the Bellman functional equation. The results obtained are applied to differential games.

#### A85-41549

### ADA - A GOOD START, AN EXCITING FUTURE

C. L BRAUN (SofTech, Inc., Waltham, MA) Defense Electronics (ISSN 0278-3479), vol. 17, July 1985, p. 105, 106

An evaluation is made of the utility of the U.S. Department of Defense standard computer language, Ada, at the current stage of its development, and the further performance improvements that may be obtained in the course of its development history. It is noted that the full advantages that accrue to the comprehensive use of a single high order language by most Pentagon contractors will only begin to be realized as entirely new software-intensive projects are conceived, several major systems now entering service antedate Ada. It is not expected that fourth-generation high order languages incorporating refinements beyond those embodied in Ada will be ready in less than 10 years, which was the development period length for Ada itself OCC.

### A85-42592\*

PROTECTING INTELLECTUAL PROPERTY IN SPACE; PROCEEDINGS OF THE AEROSPACE COMPUTER SECURITY CONFERENCE, MCLEAN, VA, MARCH 20, 1985

Conference sponsored by NASA, AIAA, and Mitre Corp. New York, IEEE, 1985, 98 p For individual items see A85-42593 to A85-42600.

The primary purpose of the Aerospace Computer Security Conference was to bring together people and organizations which have a common interest in protecting intellectual property generated in space. Operational concerns are discussed, taking into account security implications of the space station information system, Space Shuttle security policies and programs, potential uses of probabilistic risk assessment techniques for space station development, key considerations in contingency planning for secure space flight ground control centers, a systematic method for evaluating security requirements compliance, and security engineering of secure ground stations. Subjects related to security technologies are also explored, giving attention to processing requirements of secure C3/I and battle management systems and the development of the Gemini trusted multiple microcomputer base, the Restricted Access Processor system as a security guard designed to protect classified information, and observations on local area network security. GR

#### A85-42593

## SECURITY IMPLICATIONS OF THE SPACE STATION INFORMATION SYSTEM

R. W. BURNS (ORI, Inc., Rockville, MD) IN Protecting intellectual property in space; Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985 New York, IEEE, 1985, p 3-10. refs

The present paper concentrates on aspects of the Space Station itself, all Space Station Program Elements (SSPE) that interact with the Space Station, and the telecommunications of the Space Station to the ground system through NASA's Tracking and Data Relay Satellite System (TDRSS). It is pointed out that one of the major concerns of potential commercial customers of the Space Station is NASA's ability to assure data privacy. A Space Station Information System (SSIS) overview is provided, and the types of user data are examined. Security implications are discussed, taking into account the SSIS environment, the protection of the physical assets of the SSIS, personnel security, computer hardware, computer software, procedural (operational) security, communications security, emanation security, and education and training regarding the security implications of the SSIS G.R.

A85-42597

#### A SYSTEMATIC METHOD FOR EVALUATING SECURITY **REQUIREMENTS COMPLIANCE**

N. W. TYRA and P. A MILES (ORI, Inc., Rockville, MD) Protecting intellectual property in space; Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985 New York, IEEE, 1985, p. 39-47 This paper introduces the Security Compliance Analysis Model

(SCAM) as a tool for evaluating the degree of security requirement satisfaction. The model provides a means for compiling independently derived compliance evaluations over the broad spectrum of security issues, Comsec, Opsec, Tempest and Red/Black, ADPE Security, Physical Security, Information Security, Industrial Security, and System Security Areas The model relates these broad security issues to their constituent parameters (partitioning, shielding, isolation, separation, etc.) via a hierarchical tree structure. Also provided is a means for assigning relational weighting factors which signify the parameter's relative significance to the overall security category. Finally, the model interprets compliance factors and proceeds through a mathematical algorithm to generate a series of scoring values which may be graphed over time. Author

#### A85-45141# A PRACTICAL APPROACH TOWARD ACHIEVING SOFTWARE RELIABILITY

M. D BATES (USAF, Institute of Technology, Wright-Patterson IN NAECON 1984; Proceedings of the National AFB, OH) Aerospace and Electronics Conference, Dayton, OH, May 21-25, 1984. Volume 2 New York, IEEE, 1984, p. 1224-1228 refs

The objective of this paper is to present a practical approach toward the achievement of a reliable software product. Needs for and the applications of a goal producing software reliability method are discussed. A brief summary of the history of software growth and future projections, along with future needs for improved software reliability practices are presented. Software cost data are provided to reinforce the need for improved software reliability practices. Hardware reliability concepts are compared with software reliability concepts and the basic differences and similarities are discussed as necessary. Emphasis is placed on software 'front-end' development planning as well as designing for change and using techniques and methods necessary to assure a more reliable software product. Author

A85-48511\* Jet Propulsion Lab., California Inst. of Tech., Pasadena.

#### METHODOLOGY FOR SYSTEM DESCRIPTION USING THE SOFTWARE DESIGN & DOCUMENTATION LANGUAGE

H. KLEINE (California Institute of Techology, Jet Propulsion Laboratory, Pasadena) IN: System description methodologies; Proceedings of the IFIP Conference, Kecskemet, Hungary, May 23-27, 1983. Amsterdam, North-Holland, 1985, p. 111-136 refs (Contract NAS7-100)

The Software Design and Documentation Language (SDDL) can be loosely characterized as a text processor with built-in knowledge of, and methods for handling the concepts of structure and abstraction which are essential for developing software and other information intensive systems. Several aspects of system descriptions to which SDDL has been applied are presented and specific SDDL methodologies developed for these applications are discussed. Author

Illinois Univ., Urbana N85-10685\*# Dept. of Computer Science.

#### SAGA: A PROJECT TO AUTOMATE THE MANAGEMENT OF SOFTWARE PRODUCTION SYSTEMS Progress Report, Jan. -Jun. 1984

R H. CAMPBELL, W BADGER, C. S. BECKMAN, G BESHERS, D HAMMERSLAG, J. KIMBALL, P A. KIRSLIS, H. RENDER, P. RICHARDS, and R. TERWILLIGER 1984 15 p

(Contract NAG1-138)

(NASA-CR-174017, NAS 1 26:174017) Avail NTIS HC A02/MF A01 CSCL 09B

The project to automate the management of software production systems is described. The SAGA system is a software environment that is designed to support most of the software development activities that occur in a software lifecycle. The system can be configured to support specific software development applications using given programming languages, tools, and methodologies Meta-tools are provided to ease configuration. Several major components of the SAGA system are completed to prototype form The construction methods are described MAC

#### N85-10694# Softech, Inc , Waltham, Mass. ADA (TRADEMARK) TRAINING CURRICULUM. REAL-TIME CONCEPTS L303 TEACHER'S GUIDE Jul. 1984 228 p

(Contract DAAB07-83-C-K514)

(AD-A145093) Avail NTIS HC A11/MF A01 CSCL 09B

The Ada training curriculum outlines the following points: Concurrent programming concepts; Ada tasking features, Fundamental Task Designs, and Improving Performance BW.

N85-10695# Softech, Inc., Waltham, Mass ADA (TRADEMARK) TRAINING CURRICULUM. SOFTWARE ENGINEERING FOR MANAGERS M101 TEACHER'S EXERCISE GUIDE

May 1984 24 p

(Contract DAAB07-83-C-K514)

AD-A145094) Avail NTIS HC A02/MF A01 CSCL 051

The instructor's guide is designed to illustrate the use of the engineering goals and principles that we have been discussing The class is split into four groups. Three with specific goals stated in the exercise, a fourth with no explicit goals. Each of the three groups has a different goal as follows: (1) The user must never fail to build the object, using the documentation (Reliability), (2) The user must build the object within one minute, using the documentation (Performance), (3) Once built, the user must be able to tear down and store the pieces, so the object can be rebuilt later (Maintainability) GRA

N85-10702# Office of Software Development, Falls Church, Va. Federal Software Testing Center. ESTABLISHING A SOFTWARE ENGINEERING TECHNOLOGY

(SET)

Jun. 1983 108 p (PB84-212141; OSD/FSTC-83/014) Avail: NTIS HC A06/MF

A01 CSCL 09B

An approach for establishing and implementing procedures for managing a software engineering program based upon software life cycles is defined. It provides the direction and structure upon which a detailed plan for managing and control of software by establishing and institutionalizing a software engineering technology (SET) for replacing manual tasks with automated procedures. The SET includes the development of software standards, quality assurance, training along with the acquisition and utilization of software tools and the integration of these elements into a suitable productive machine environment. GRA

**N85-10703**# Office of Software Development, Falls Church, Va. Federal Software Testing Center.

# FSTC (FEDERAL SOFTWARE TESTING CENTER) SOFTWARE TOOL CATALOG

Mar. 1984 60 p

(PB84-212158; OIT/FSTC-84/021) Avail NTIS HC A04/MF A01 CSCL 09B

The Federal Software Testing Center (FSTC) is making software tools available to Federal and State Government agencies (lease basis) for reducing the cost of the development and maintenance of computer software. Software tools are specifically designed computer programs used to increase programmer productivity. Software tools can be used to automate tasks that, when performed manually, are repetitive, boring and prone to error. These software tools have been acquired by the Center and are extensively tested before release The Center will provide periodic maintenance and enhancement to these software tools GRA

**N85-10704**# Office of Software Development, Falls Church, Va. Federal Software Testing Center.

## MICROCOMPUTER MANAGEMENT GUIDELINES

Nov. 1983 77 p refs

(PB84-212174, OIT/FSTC-83/019) Avail NTIS HC A05/MF A01 CSCL 09B

The microcomputer management guidelines describe the many steps involved in the selection, acquisition, and management of microcomputers. Microcomputing is rapidly proliferating throughout government organizations in many agencies, comprehensive policy on microcomputing has not yet been formulated. The technology changes almost daily and new users are eager to capitalize on the many benefits available from microcomputing. With the large number of possible system configurations available in the marketplace, users, anxious to acquire microcomputers, may configure systems having a high degree of incompatibility with other agency systems. The source of the problem can be either hardware, software, or a combination of the two. GRA

N85-10707# Software Systems Technologies, Inc., College Park, Md.

## PERFORMANCE EVALUATION OF DATABASE SYSTEMS: A BENCHMARK METHODOLOGY Final Report

S. B. YAO, A. R. HEVNER, and T. ROMEO May 1984 46 p refs

(Contract NB82-SBCA-1645)

(PB84-217504; NBS/GCR-84/467) Avail: NTIS HC A03/MF A01 CSCL 09B

A generalized performance analysis methodology for the benchmarking of database systems is presented. This methodology discusses criterial to be used in the design, execution, and analysis of a database system benchmark. This is a generalized methodology that can apply to any possible database system. By presenting a wide variety of possible considerations in the design and implementation of the benchmark, it is intended to make this methodology applicable to the evaluation, or to the comparison of several systems. GRA

**N85-10855**# National Research Inst. for Mathematical Sciences, Pretoria (South Africa).

## OPTIMIZING SEARCH WITH POSITIVE INFORMATION FEEDBACK

T. J. STEWART Sep 1983 27 p refs

(CSIR-TWISK-313) Avail: NTIS HC A03/MF A01

The design of search plans when positive information can be gained during the search regarding the target's location or movement, is considered. It is shown that rigorous maximization of detection probability is impracticable and unjustifiable. On the other hand, the information processing requirements are not difficult, which leads to a view of search planning as a statistical experimental design problem. In this context, a class of moving horizon rules is proposed. It is suggested that this approach is not merely convenient heuristic, but the more relevant practical search planning tool. Numerical examples illustrate that, even in the classical problem with no positive information feedback, a moving horizon rule can achieve 80 to 90% of the possible gain over myopic rules. A further example demonstrates that the experimental design approach can result in substantial gains in detection probability over the optimal plan which ignores the possibility of positive information feedback at the design stage Author

#### N85-10859# Naval Postgraduate School, Monterey, Calif DATA DICTIONARY SYSTEMS AND THEIR ROLE IN INFORMATION RESOURCE MANAGEMENT M.S. Thesis D. L. ROBERTSON Mar. 1984 93 p

(AD-A144905) Avail: NTIS HC A05/MF A01 CSCL 09B The explosive proliferation of computers has led to the increasing importance of developing and implementing various management concepts for effective and efficient operation and control. The complex data processing environment of today cannot be handled by hardware alone, but require an information system composed of hardware, software, data, personnel and procedures The vast storage capabilities of modern equipment had led to the development of databases for more effective and efficient use of memory capacity. The increasing importance of software and the cost of developing and maintaining it demands more and better management, giving rise to the software life cycle concept. With the automation of the functions of an organization, data and information become critical organizational resources. Information Resource Management provides effective and efficient management and control of these information resources. A key component in this management and control is the Data Dictionary System. Author (GRA)

#### N85-11575# Institute for Defense Analyses, Alexandria, Va DOD RELATED SOFTWARE TECHNOLOGY REQUIREMENTS, PRACTICES, AND PROSPECTS FOR THE FUTURE Final Report, Feb. - Jun. 1984

S T. REDWINE, J.R., L. G BECKER, A. B. MARMOR-SQUIRES, R J MARTIN, and S. H. NASH Jun. 1984  $\,$  351 p  $\,$ 

(Contract MDA903-84-C-0031)

(AD-A145493; AD-E500678, IDA-P-1788, IDA/HQ-84-28841) Avail NTIS HC A16/MF A01 CSCL 09B

This study investigates future DOD software requirements, current practices and approaches to software development, and the time it takes a software technology innovation to become widely used, and offers a glimpse of future possibilities in software technology GRA

#### N85-12606# Los Alamos Scientific Lab, N. Mex CONFIGURATION MANAGEMENT FOR MISSION-CRITICAL SOFTWARE: THE LOS ALAMOS SOLUTION

G. CORT and D M. BARRUS 1984 15 p Presented at the Softool Users Group Meeting, Santa Barbara, Calif., 10 Sep. 1984 (Contract W-7405-ENG-36)

(DE84-015515, LA-UR-84-2335, CONF-8409114-1) Avail NTIS HC A02/MF A01

An approach to the utilization of the Softool Change and Configuration Control (CCC) environment is described. The steps taken to develop a very powerful development/configuration management environment (incorporating CCC) are outlined and justified. The extension of the Los Alamos system to management of large-scale projects is discussed. DOE

**N85-12786**# Fondo Colombiano de Investigaciones Científicas y Proyectos Especiales, Bogota (Colombia)

PRIMER ON THE REGISTRATION OF TECHNICAL INFORMATION IN INDUSTRY [CARTILLA PARA EL REGISTRO DE LA INFORMACION TECNICA EN LA INDUSTRIA]

G. C. CARO and C. M GUTIERREZ 1983 131 p In SPANISH

Avail. NTIS HC A07/MF A01

Some methods of recording information about processes, raw materials, plans, models, and other factors germaine to industrial production in formats that are suitable for classification in accordance with the needs of the enterprise are presented. Pilot trials for information recording were carried out in the enterprises of Induacoples, Racores de Colombia, Metalfisher by Cervercena Andina. Deficient recordkeeping can result in lack of valid data for improving production processes and products, impossibility of controlling manufacturing costs; deficient infrastructure for acquiring technology available on the international market, impossibility of capitalizing on technological resources; and difficulty of adopting quality control systems. Other points analyzed are: prototypes, value analysis, and codification with sample forms for keeping records on machinery, tools, processes, etc. B.G

N85-12796# Interior Dept, Washington, D.C IRM (INFORMATION RESOURCES MANAGEMENT) LONG-RANGE PLAN: FISCAL YEAR 1984-1988 (UPDATE). VOLUME 2: ADP AND TELECOMMUNICATIONS ACQUISITION PLAN

May 1984 51 p

(PB84-229244) Avail. NTIS HC A04/MF A01 CSCL 05B

The IRM LRP provide guidance for improving management of the Interior Department's information resources. Data processing and telecommunications equipment acquisitions are discussed. The types of technology, services, and facility management are detailed. The budget formulation process is reviewed. E.R.

N85-12803# International Trade Administration, Washington, D.C.

## COMPETITIVE ASSESSMENT OF THE US INFORMATION SERVICES INDUSTRY Final Report

May 1984 77 p refs

(PB84-174804) Avail NTIS HC A05/MF A01 CSCL 05B

An operational definition of the four principal segments of the information services industry in the United States, database development, on-line information services, document supply services, and customized search and abstracting services are discussed. Major domestic firms are identified along with a discussion of the current state of information services in Europe and Japan Domestic markets and firms are discussed in terms of their characteristics and trends. Domestic and international competitive issues are identified. Return on investment is calculated for hypothetical data base development and on-line services projects, along with an analysis of the sensitivity of internal rate of return to changes in the most significant factors. Driving forces in the future of the industry are identified. A limited number of international and domestic options for maintaining the competitiveness of the domestic industry are discussed. Author

N85-13494# Royal Signals and Radar Establishment, Malvern (England).

### SOFTWARE CONFIGURATION MANAGEMENT ACROSS PROJECT BOUNDARIES AND IN DISTRIBUTED DEVELOPMENT ENVIRONMENTS

M. STANLEY Jan. 1984 31 p refs

(RSRE-MEMO-3704; BR92718; AD-A146662) Avail: NTIS HC A03/MF A01

The problems of software configuration management (SCM) when sharing software between projects and between host development systems, and between projects, using an integrated programming support environment (PSE) is discussed. An SCM data base and tools are outlined. For the proposed SCM schema and tools to work, access controls imposed by the data base management system must permit data base searches across project boundaries. If software development for a project is spread over a number of different host PSEs, separate SCM data bases should exist on each host. It is necessary to import and export software items to and from host PSEs. In order to control imported or exported software there should be relationships to entities representing the external host, so that tools searching for possible effects of proposed changes can indicate that other host PSEs should be considered. Author (ESA)

## 05 COMPUTERS AND INFORMATION MANAGEMENT

N85-13675# Pacific Northwest Lab , Richland, Wash. EXECUTIVE INFORMATION SYSTEM

M. VITULLO, C WINTER, and D. R. JOHNSON Jul. 1984 96 p

(Contract DE-AC06-76RL-01830)

(DE84-015355; PNL-5190) Avail: NTIS HC A05/MF A01

The Executive Information System (EIS) is a computer-based information handling system. The system was designed and implemented for energy conversion and utilization technologies to allow program managers easy access and tracking of certain types of reporting at various levels of management interaction, to simplify the handling of program-related data, and to streamline the preparation of reporting documents and responses to requests for information from the program The EIS is especially useful in assisting DOE program managers in the routine dissemination of reports and information. The characteristics of each component of the EIS are discussed A user's guide to the EIS is included.

DOE

N85-16498# Boeing Aerospace Co., Seattle, Wash Engineering Technology Div.

SOFTWARE TEST HANDBOOK Final Report, Mar. 1982 - Sep. 1983

E. PRESSON Griffiss AFB, N Y RADC Mar. 1984 58 p (Contract F30602-82-C-0059)

(AD-A146844; RADC-TR-84-53-VOL-1) Avail NTIS HC A04/MF A01 CSCL 09B

The purpose of the Software Test Handbook effort was to provide Air Force software developers with guidelines and methodology for the effective use of higher order language (HOL) software testing techniques and in the selection of automated tools for the testing of computer programs. The effort resulted in a two volume final technical report The total contractual effort including a project overview, summary for each of three technical tasks, and a bibliography. GRA

N85-16694# Air Force Human Resources Lab., Brooks AFB, Tex.

TECHNICAL ORDER MANAGERS HANDBOOK: UTILIZATION ASSESSMENT Final Report, Mar. 1983 - Mar. 1984

D. E BLAIR Oct. 1984 20 p

(Contract AF PROJ. 9991)

(AD-A147579, AFHRL-SR-84-15) Avail NTIS HC A02/MF A01 CSCL 05A

This report provides a utilization assessment of the Air Force Technical Order (TO) Managers Handbook The handbook was developed by the Air Force Human Resources Lab. to provide TO managers with guidelines for selection of the most appropriate format options and procurement of Air Force TOs. Although the primary user has been the Air Force Systems Command, the handbook has been distributed Air Force-wide to organizations having responsibilities for TO acquisition and management. A number of these organizations were contacted concerning their utilization of the handbook and the results indicated that the handbook is used as a quick reference source, especially for TO managers with limited experience. The handbook is also being used in the training environment where it has been a major source of information for the development of a formal TO acquisition and management course and is a useful tool for organizations that provide inhouse training. Whether the handbook is a guide for TO managers is debatable. A number of recommendations are provided for improving the content of the handbook and for maintaining its relevance when TO procedures, policies, and requirements change. Originator-supplied keywords include research and development product utilization, technical order acquisition, technical order development, and technical order management. GRA

N85-17592# Institute for Defense Analyses, Alexandria, Va. CONCEPT PAPER FOR THE DEVELOPMENT OF A DOD ADA (TRADEMARK) SOFTWARE ENGINEERING EDUCATION AND TRAINING PLAN Final Report

P R JORDAN, C. W. MCDONALD, and B SCHAAR Nov 1984 26 p

(Contract MDA903-84-C-0031)

(AD-A148774, AD-E500686; IDA-M-7; IDA/HQ-84-28940) Avail NTIS HC A03/MF A01 CSCL 09B

The Ada Joint Program Office (AJPO) was established in December 1980, to manage the Department of Defense (DOD) efforts to implement, introduce, and provide life-cycle support for Ada. As part of this charter, it is the role of the AJPO to address Ada education and training. The goal of this document is to set forth the concepts necessary for Ada software engineering education and training. These concepts will result in an effective use of Ada in the shortest time possible to realize cost savings and achieve reliability and adaptability in computer software development. The full potential of Ada cannot be realized without appropriate education and training GRA

N85-19236\*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

CONCEPTS AND TOOLS FOR THE SOFTWARE LIFE CYCLE R C. TAUSWORTHE *In its* The Telecommun. and Data Acquisition Rept p 103-120 15 Feb. 1985 refs

Avail NTIS HC A13/MF A01 CSCL 09B

The tools, techniques, and aids needed to engineer, manage, and administer a large software-intensive task are themselves parts of a large softwaare base, and are incurred only at great expense. The needs of the software life cycle in terms of such supporting tools and methodologies are highlighted. The concept of a distributed network for engineering, management, and administrative functions is outlined, and the key characteristics of localized subnets in high-communications-traffic areas of software activity are discussed A formal, deliberate, structured, systems-engineering approach for the construction of a uniform, coordinated tool set is proposed as a means to reduce development and maintenance costs, foster adaptability, enhance reliability, and promote standardization Author

**N85-19880#** Ad Hoc Committee on Depository Library Access to Federal Automated Data Bases.

PROVISION OF FEDERAL GOVERNMENT PUBLICATION IN ELECTRONIC FORMAT TO DEPOSITORY LIBRARIES

Washington GPO 1984 137 p Rept presented by the Ad Hoc Comm. on Depository Library Access to Federal Automated Data Bases to the Joint Comm. on Printing, 98th Congr., 2nd Sess, 1984

(S-PRT-98-260, GPO-37-868) Avail SOD HC as SN-052-070-05970-2

Federal Government information is increasingly being stored and retrieved through new technologies rather than through traditional formats of paper and microform (with the result) that an increasing amount of information in electronic format is not being provided to depository libraries. The feasibility and desirability of providing access to Federal Government information in electronic formats to the public through the congressional depository libraries was investigated Factors examined include: (1) the kind and amount of Federal Government information in electronic format; (2) whether depository libraries have the ability to access the new formats, and (3) the costs and benefits of providing information in electronic format Major policy areas which should be addressed in order to meet the intent of pertinent provisions of title 44, United States Code, to make Government information publicly vailable to citizens at no charge through the depository library system were also identified. A.R.H.

N85-19891# National Academy of Sciences - National Research Council, Washington, D C

### RESEARCH NEEDS ON THE INTERACTION BETWEEN INFORMATION SYSTEMS AND THEIR USERS: REPORT OF A WORKSHOP Final Report

Oct. 1984 47 p refs

(Contract NSF IST-83-03062)

(PB85-121523) Avail: NTIS HC A03/MF A01 CSCL 05B

Workshop participants were requested to define the characteristics of information systems that distinguish them in terms of purpose, function, and structure; to estimate the trends of future technological developments; to define the significant behavioral and cognitive issues involved, and to formulate recommendations and justification for basic research most necessary to improve user/information system interaction. The Recommendations are general in nature and not tied to specific information systems. They cover theoryorientation, the acquisition and of information, input-output bandwidth, user training and support, cognitive effects of programming, information technology and jobs, and attitudes and accommodation.

N85-20689\*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va

SPACE STATION SOFTWARE ISSUES

S VOIGT, ed. and S. BESKENIS, ed. (Kentron International, Inc., Hampton, Va.) Washington Feb. 1985 68 p refs Workshop held in Hampton, Va, 20-21 Aug 1984

(NASA-CP-2361; L-15945; NAS 1.55 2361) Avail NTIS HC A04/MF A01 CSCL 09B

issues in the development of software for the Space Station are discussed Software acquisition and management, software development environment, standards, information system support for software developers, and a future software advisory board are addressed.

N85-20693\*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va

INFORMATION SYSTEMS ISSUES

*In its* Space Sta. Software Issues p 37-40 Feb 1985 Avail: NTIS HC A04/MF A01 CSCL 09B

A Space Station Project-wide mechanism to document, control, and disseminate program design data required by subsystem implementation efforts is needed in evaluation software requirements at the subsystem implementation level, each software effort should be required to develop and maintain a list and schedule of supporting data needs to be provided by other elements in the Space Station Project A project-level scheme to coordinate and track these needs is essential to the success of these contributing subsystems. A project-wide information system should provide the response information via a computerized mechanism, providing a single controlled source for all such data. Such information may range in content from documentation to actual data base sets used directly as an input to the subsystem software. The Technical and Management Information System (TMIS), formerly known as the Management and Communication Data Systemn (MCDS), will be implemented by NASA to support its Space Station Program. M.G.

N85-20695\*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va.

SOFTWARE TECHNOLOGY WITHIN NASA

*In its* Space Sta. Software Issues p 47-57 Feb. 1985 refs Avail: NTIS HC A04/MF A01 CSCL 09B

NASA software technology is assessed in terms of a comparison of the state of practive (SOP) and the state of the art (SOA) The gap between SOP and SOA, the time lag for technology transfer, and the variance in practice of software technology are discussed. Issues regarding the impact of software technology on development cost/benefits are addressed. M.G.

#### N85-22258# Office of Naval Research, London (England). THE EEC'S INFORMATION TECHNOLOGY PROGRAM: AN UPDATE

J F BLACKBURN 18 Dec. 1984 11 p (AD-A150022; ONRL-R-13-84) Avail NTIS HC A02/MF A01 CSCL 09B

The primary goal of the European Strategic Program for Research and Development in Information Technology (ESPRIT) is to make the countries of the European Economic Community competitive in the world market for information technology. This report examines the five areas of the ESPRIT program for 1985 advanced microelectronics, software technology, advanced information processing, office systems, and computer-integrated manufacturing. GRA

N85-22259# California Univ., Berkeley Lawrence Berkeley Lab

**REQUIREMENTS FOR A DATABASE MANAGEMENT SYSTEM** J. D. LAWRENCE and J. MCCARTHY Sep. 1984 12 p refs (Contract DE-AC03-76SF-00098)

(DE85-004661, LBL-18504) Avail NTIS HC A02/MF A01

The requirements for a database management system that would satisfy the scientific needs of the Scientific Database Project are discussed Actual requirements, for each category, are identified as mandatory, important, and optional. A DBMS would not be considered unless it satisfies all mandatory requirements DOE

#### N85-23315# Los Alamos Scientific Lab., N Mex. BOTTLENECKOLOGY: EVALUATING SUPERCOMPUTERS J. WORLTON 1985 3 p refs Presented at the IEEE Spring

COMP/CON Meeting, San Francisco, 25 Feb. 1985 (Contract W-7405-ENG-36)

(DE85-005574; LA-UR-84-3942, CONF-850255-1) Avail: NTIS HC A02/MF A01

Evaluating supercomputer performance is more difficult than evaluating performance for other types of computers because of the wide range of performances encounted Depending on the purpose of the evaluation, methods of evaluation can be used that trade off level of effort and accuracy, including rules of thumb, analytical models, testing, and simulation. DOE

N85-23446 Colorado Univ., Boulder

#### PERSONAL DECISION MAKING: THE INFLUENCE OF PERCEIVED LOCUS OF CONTROL AND DEGREE OF RATIONALITY ON INFORMATION SEEKING STRATEGIES Ph.D. Thesis

N. S. F. JACKSON 1984 184 p

Avail: Univ. Microfilms Order No. DA8428659

Information seeking strategies that are used by persons making decisions were identified. A decision is defined as a choice among alternatives Using Janis' conflict model and the concept of reactance, five information seeking strategies are described. The strategies derive from the individual's perceived locus of control, degree of rationally and are titled vigilance avoidance, reactance, hypervigilance, and unconflicted. Strategies are related to information seeking in such a way that subjective uncertainty ratio will vary in predictable patterns as a function of the information seeking strategy used. The results show that only the strategy avoidance is significantly different from the others in terms of its overall variability Three major areas of value found in clarifying decision making issues are, the expansion of the decision making model for future research, exploration of the interaction of task and individual difference variables in decision making; and the use of subjective predictability of information use as a criteria for decision evaluation. Author N85-23449# Naval Postgraduate School, Monterey, Calif. Dept. of Computer Science.

## GENERAL DESIGN CONSIDERATIONS OF AN AIR FORCE INFORMATION SYSTEM M.S. Thesis

E AYTACER, JR Jun 1984 118 p

(AD-A150611) Avail: NTIS HC A06/MF A01 CSCL 09D

General design issues of an Air Force information system are considered in this thesis. The current structure of the system is presented with its requirements. Information storing, retrieving and updating procedures are described. An example of a logical database is designed. Networking issues are expressed in an undetailed way. Finally, a set of high-end minicomputers are evaluated to present the approximate cost of this system. And a general methodology for minicomputer selection process is presented. GRA

#### N85-24788 George Washington Univ , Washington, D.C. EVALUATING THE APPROPRIATENESS OF MICROCOMPUTERS FOR LITIGATION DOCUMENT MANAGEMENT USING THE ANALYTIC HIERARCHY PROCESS Ph.D. Thesis

H. A. AMIN 1984 229 p

Avail: Univ Microfilms Order No DA8428944

Attorneys involved in large cases have availed themselves of mainframe computers for speed and ease in document management. A modifiable evaluative methodology was developed that would enable a small to mid-sized law firm to evaluate whether the microcomputer, as compared to the manual method. could economically and technically manage case-related documents involved in its litigation support efforts. The Analytic Hierarchy Process (AHP) was applied to develop this evaluative methodology. The requirements of a litigation document management system were researched and specifications for the microcomputer and manual methods of necessary document management were developed. Expert Choice, a software package was used for automating the AHP. Data collection was accomplished through a questionnaire sent to size-relevant law firms, interviews with litigation support consultants, and working sessions with selected lawvers. Dissert Abstr

# N85-24793# National Bureau of Standards, Gaithersburg, Md. Center for Programming Science and Technology. SECURITY OF PERSONAL COMPUTER SYSTEMS: A

MANAGEMENT GUIDE Final Report

D D. STEINAUER Jan. 1985 66 p refs

(PB85-161040; NBS/SP-500/120; LC-84-601156) Avail: NTIS HC A04/MF A01, also available SOD HC as SN003-003-02627-1 CSCL 09B

This document is a security guide for managers and users of personal computer systems. It describes the nature of information security problems involved in the use of personal and other small computer systems and provides guidance for addressing those problems GRA

**N85-26167#** Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering

### CONTINUED DEVELOPMENT OF A DATA BASE MANAGEMENT SYSTEM PERFORMANCE MONITOR, VOLUME 2 M.S. Thesis

T D. BRUNER Dec 1984 295 p

(AD-A151714; AFIT/GCS/ENG/84D-6) Avail NTIS HC A13/MF A01 CSCL 09B

This investigation focuses on the problem of analyzing the performance data collected on a Data Base Management System (DBMS) The performance data parameters are categorized and presented to the user using a Data Support System (DSS). The generalized design for a DBMS performance monitor was used to design a user-friendly interface to DBMS performance data. The user interface ot the DBMS performance monitor uses menus to allow the user to select DBMS performance parameter values. The DBMS performance report. The design was implemented on a VAX 11/780 computer system using the VMS operating system. The TOTAL DBMS was used to collect performance data.

The performance values were collected using existing software monitors, job accounting, system error log, an a utility developed at AFIT to collect Data Manipulation Language (DML) response performance data. GRA

N85-26642# Naval Air Systems Command, Washington, D. C. DESIGN ADEQUACY: AN EFFECTIVENESS FACTOR A. R. HABAYEB In AGARD Cost Effective and Affordable

Guidance and Control Systems 16 p Feb. 1985 refs Avail: NTIS HC A13/MF A01

The concept of system effectiveness is reviewed and examined from the perspective of weapon systems consisting of launch platforms, targeting avionics, weapons, and targets. The application of system effectiveness to hardware systems is based on three effectiveness factors (1) reliability (dependability), (2) readiness (availability); and (3) design adequacy (capability). Design adequacy is a measure of how well a system performs its functions. It is the most desired factor in the definintion, design, and early stages of system development. A design adequacy quantification methodology is presented and the relationship between design limitation and adequacy is discussed. The design adequacy methodology is based on the measures of adequacy, system parameters, subsystem parameters and the employment phases of the system. In a weapon system context, the performance parameters of a guidance and control subsystem, are interdependent with the parameters of the remaining subsystems The paper deals with three employment phases of a weapon system. The three phases are (1) prelaunch phase; (2) free flight phase; and (3) end-game phase. Examples based on air-to-air missiles are given to illustrate these relationships and concepts B.W

#### N85-27550# Naval Postgraduate School, Monterey, Calif. MANAGEMENT ASPECTS OF SOFTWARE MAINTENANCE M.S. Thesis

B. J. HENDERSON and B J. SULLIVAN Sep 1984 116 p (AD-A152035) Avail: NTIS HC A06/MF A01 CSCL 09B

The Federal government depends upon software systems to fulfill its mission. These software systems must be maintained and improved to continue to meet the growing demands placed on them The process of software maintenance and improvement may be called software evolution. The software manager must be educated in the complex nature of software maintenance to be able to properly evaluate and manage the software maintenance effort. In this thesis, the authors explore software maintenance from a management perspective, highlighting topics of critical importance. These topics include forecasting software maintenance, estimating the resources required to perform software maintenance, managing maintenance personnel and effectively utilizing software tools. The synthesis of these topics forms a managerial paradigm for understanding the evolutionary nature of software maintenance GRA

#### N85-27551# Naval Postgraduate School, Monterey, Calif. A FRAMEWORK FOR SOFTWARE DEVELOPMENT M.S. Thesis

E. C HUGHLETT Sep. 1984 102 p

(AD-A152067) Avail: NTIS HC A06/MF A01 CSCL 09B

All sectors of society are confronted with what has been termed the software crisis. As the world's largest single buyer of software, the Department of Defense has undertaken major software initiatives to ameliorate software-related problems associated with major computer systems acquisition. This thesis provides an overview of common problems in both embedded and administrative software development and acquisition. It defines quality software in terms of its characteristics, and provides the project manager/acquisition agency with a set of accepted controls to assure that quality is built into software for improved maintainability. The difficulties and limitations of providing accurate estimates in software development are discussed in terms of software metrics. A number of DoD current and future standardization efforts are discussed, including the Army's

#### N85-27742# Naval Postgraduate School, Monterey, Calif. MANAGEMENT CONSIDERATIONS FOR AN INFORMATION CENTER M.S. Thesis

J. D. AUVIL Sep. 1984 52 p (AD-A151774) Avail<sup>.</sup> NTIS HC A04/MF A01 CSCL 09B

Recent studies have shown that the data processing industry has a very severe problem to solve in the next few years there is going to be an extensive increase in millions of instructions per second available due to increases in hardware technology. It is imperative that the software development industry find ways to utilize this capability increased programmer productivity is the key This thesis introduces the information. Center concept that will allow management to better utilize existing data processing capability by providing users the tools required for increased software productivity. An actual government installation is used as an example of using a modern Systems Analysis approach in the installation of an Information Center. Industry trends are discussed and the debate of centralization versus decentralization presented.

N85-28608\* Computer Software Management and Information Center, Athens, Ga.

#### COSMIC SOFTWARE CATALOG, 1985 EDITION 1985 499 p

(NASA-CR-174070; NAS 1.26:174070) Avail: Computer Software Management and Information Center, Barrows Hall, Univ. of Georgia, Athens, Georgia 30601 \$25 00 CSCL 09B

Abstracts containing descriptions of the software supplied by NASA's Computer Software Management and Information Center are given. Abstracts for 1,409 NASA sponsored computer programs are included. Topics include aeronautical engineering, spacecraft design, launch vehicles, composite materials, rocket propellants, geophysics, meteorology, computer programming, statistical analysis, plasma physics, and transportation R.J.F.

N85-28633# Oak Ridge Y-12 Plant, Tenn.

### EFFORTS AT OFFICE AUTOMATION AND INFORMATION SYSTEMS UTILIZATION AT MARTIN MARIETTA ENERGY SYSTEMS, INCORPORATED

C A REEVES, JR. 1 Mar. 1985 50 p refs Presented at 32nd PSI Ann Secretarial Inst., Knoxville, Tenn., 6 Mar. 1985 (Contract DE-AC05-84CS-21400)

(DE85-008154; Y/DL-914; CONF-8503118-1) Avail: NTIS HC A03/MF A01

A brief history is given of the efforts at utilization of mainframe computers, personal or desktop computers, standalone word processors, and other such devices at Martin Marietta Energy Systems in Oak Ridge, Tennessee. This discussion is concentrated on how these systems have been used in the office, both for purely technical and management oriented applications. Some detail is also given on how these systems have been used to solve some typical problems in offices, so that others might benefit from lessons learned. DOE

#### N85-28879# Advanced Technology, Inc., Reston, Va. DLA: DATA/DATA BASE ADMINISTRATION ANALYSIS Final Report

R. GIROUARD 26 Feb. 1985 134 p (Contract DLAH00-83-D-0225)

(AD-A153031) Avail NTIS HC A07/MF A01 CSCL 05B

The scope of this study addresses the following three questions: What Data/Data Base Administration (D/DBA) functions have to be performed to effectively manage the D/DBA environment in DLA? What tools are needed to support the D/DBA functions? What is the required organizational structure for the functions and tools and where should they be located throughout DLA? The goal of this study is to conduct an extensive review and assessment of existing Data/Data Base Administration methods and procedures to develop concepts, directions, and an organizational approach in accomplishing the management of automated information DLA wide. GRA

N85-29607# National Bureau of Standards, Gaithersburg, Md. Inst. for Computer Sciences and Technology.

ANNOTATED BIBLIOGRAPHY OF RECENT PAPERS ON SOFTWARE ENGINEERING ENVIRONMENTS Final Report R. C. HOUGHTON, JR and D R WALLACE Apr. 1985 25 p

refs (PB85-191385; NBSIR-85-3113) Avail: NTIS HC A02/MF A01

CSCL 09B

Abstracts are presented for fifty-five recent papers on software engineering environments. Several of these papers present an overview of software engineering environments. Other papers discuss issues to be considered in building software engineering environments. The remaining papers describe general software engineering environments, system development environments, and programming environments. GRA

N85-29852# Oak Ridge National Lab., Tenn. Environmental Sciences Div.

GENERIC DATA ENTRY QUALITY ASSURANCE TOOL A. E. ROSEN and P. KANCIRUK 1985 10 p refs Presented at the SUGI/SAS Users Group Intern. Conf, Reno, Nev., 10 Mar. 1985

(Contract DE-AC05-84OR-21400)

(DE85-008359; CONF-8503114-1) Avail: NTIS HC A02/MF A01 COMPARE is an important SAS guality assurance tool for data base management that is especially useful when the SAS Full-Screen Product (SAS/FSP) is used for data entry. A good way to check input data for typographical errors is to have the same information entered by two different people and compare the versions for differences. This has been standard practice for data entered via keypunch machine on cards; however, it has not been as easily accomplished for data entered using SAS/FSP, via terminal, directly into SAS data sets. To facilitate this procedure, a SAS macro, COMPARE, has been developed at Oak Ridge National Laboratory, as part of the US Environmental Protection Agency's National Surface Water Survey Data Base Management Project. Data are directly and independently entered into two SAS data sets COMPARE then automatically compares the data sets and prints out the observation number, variable name, and values for any nonmatching observations. COMPARE is generic in that it can compare values in any two identically defined SAS data sets, regardless of the number or type of variables or the number of observations. DOF

#### N85-30676# Logistics Management Inst., Bethesda, Md LOCAL AUTOMATION MODEL SOFTWARE BENCHMARKING: TEST PLAN

R. W. HARTT and D. J. OCONNOR Mar 1985 109 p (Contract MDA903-81-C-0166) (AD-A154349; LMI-DL401; DTIC/TR-85/3) Avail NTIS HC A06/MF A01 CSCL 05B

Sponsored by the Defense Technical Information Center, the Local Automation Model project encompasses requirements determination, system design, prototype system implementation, and production system acquisition for a fully resident integrated library system. The system is designed and will be made available for installation at Federal technical libraries and information centers. With the system, libraries will be able to share cataloging of technical reports with DTIC, relying on machine-aided translation of citations and an intelligent gateway to facilitate data transfer. The intelligent gateway also permits simultaneous searching of multiple, heterogeneous data bases, both Government-operated and commercial. In addition, the system supports full local collection management -- retrieval, cataloging, and circulation management and control. The prototype and production systems will be implemented with commercially available library automation software. The Test Plan is the fifth in a series of life-cycle documentation for the system. It contains criteria -- both performance and functional -- for selecting from among several packages recommended for benchmarking. Using the Test Plan,

test participants will exercise features in each of the six packages selected for benchmarking and score the package on how well each feature is performed. GRA

N85-30681# Naval Ship Research and Development Center, Bethesda, Md

COMPUTER CENTER POLICY

G. R. GRAY Mar 1985 32 p (AD-A154416; DTNSRDC/TM-18-85-03) Avail NTIS HC

A03/MF A01 CSCL 09B

This document describes the general policies and procedures governing the use of computer and related resources at the David W. Taylor Naval Ship Research and Development Center (DTNSRDC) general purpose Computer Center The overall policy is to make automatic scientific computer services available to users to the fullest extent and with the greatest flexibility possible under the existing federal and Navy regulations. GRA

#### N85-30715# RAND Corp., Santa Monica, Calif CODA: A CONCEPT ORGANIZATION AND DEVELOPMENT AID FOR THE RESEARCH ENVIRONMENT

J A. DEWAR and J. J. GILLOGLY Nov. 1984 20 p (AD-A154240; RAND/P-7035) Avail NTIS HC A02/MF A01 CSCL 20A

The hypothesis of this document is that computers can aid the policy research process by acting as a long term memory (storage and retrieval facility) for the researcher's growing data base and changing concepts. The realization of this hypothesis in the form of computer software specifications required constant referral back to the research process and an appreciation of the limitations of modern computers. The resulting system was called CODA (for concept organization and development aid) and that system is the topic of this paper. The authors describe the prototype system built for testing this hypothesis, the system's capabilities and limitations, some of the details of its user interface, what they have learned both from the building and testing of the system, and, finally, some thoughts on further capabilities that appear amenable to computer implementation and that might aid the policy researcher The CODA program most properly qualifies as a file management menu-driven system aimed at small data based and a very limited number of users. It is a system designed and implemented by users (policy researchers) for testing some concepts about the users' environment. As such, there are some specific things that CODA is NOT it is not a full data base management system for general use, it is not particularly suited for large data bases or numerical processing. GRA

### N85-30975# Oak Ridge National Lab , Tenn. METHODOLOGY FOR ASSESSING BENEFITS AND COSTS OF **GOVERNMENT INFORMATION COLLECTION**

S CANTOR Apr. 1985 36 p refs

(Contract DE-AC05-84OR-21400)

(DE85-010594, ORNL/TM-9510) Avail NTIS HC A03/MF A01 A new approach is described for assessing the benefits and costs of information collected primarily for governmental policy development, planning, and program evaluation. Benefits are assessed by quantifying two judgments of the importance of obtaining the needed information: (1) the importance assigned to a specific item of information by users (usually individuals in government) who bear a degree of responsibility for achieving or pursuing a specific governmental objective, and (2) the importance of that objective, relative to other objectives, pertaining to the information topic One can characterize these (dimensionless) benefits as an index of importance or as a measure of meaningfulness A cost assessment, also dimensionless, is derived from six factors (1) the number of respondents expected to supply the needed information; (2) the availability of data to the respondents; (3) the degree of accuracy required; (4) the frequency of data collection; (5) the level of disaggregation of the information, and (6) the time interval for transforming the raw data into (usually DOÉ published) information in a more useful form.

**N85-30976#** National Bureau of Standards, Gathersburg, Md. Center for Programming Science and Technology.

**GUIDE ON LOGICAL DATABASE DESIGN Final Report** 

E. N. FONG, M. W. HENDERSON, D. K JEFFERSON, and J. M SULLIVAN Feb 1985 119 p refs

(PB85-177970; NBS/SP-500/122, LC-85-600500) Avail. NTIS HC A06/MF A01, SOD HC \$4.50 as 003-005-02631-0 CSCL 09B

This report discusses an iterative methodology for Logical Database Design. The methodology includes four phases: (1) Local Information-flow Modeling, (2) Global information-flow Modeling; (3) Conceptual Schema Design; and (4) External Schema Modeling These phases are intended to make maximum use of available information and user expertise, including the use of a previous Needs Analysis, and to prepare a firm foundation for physical database design and system implementation. The methodology recommends analysis from different points of view - organization, function, and event - in order to ensure that the logical database design accurately reflects the requirements of the entire population of future users The methodology also recommends computer support from a data dictionary system, in order to conveniently and accurately handle the volume and complexity of design documentation and analysis. GRA

**N85-31146\***# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex

SPACE STATION REFERENCE CONFIGURATION DESCRIPTION

Aug. 1984 798 p refs

(NASA-TM-87493; JSC-19989; NAS 1 15:87493) Avail: NTIS HC A99/MF E03 CSCL 22B

The data generated by the Space Station Program Skunk Works over a period of 4 months which supports the definition of a Space Station reference configuration is documented. The data were generated to meet these objectives (1) provide a focal point for the definition and assessment of program requirements, (2) establish a basis for estimating program cost; and (3) define a reference configuration in sufficient detail to allow its inclusion in the definition phase Request for Proposal (RFP) GLC

N85-32807# Mitre Corp , Bedford, Mass.

DESIGN GUIDELINES FOR USER-SYSTEM INTERFACE SOFTWARE Final Report

S. L. SMITH and J N. MOSIER Sep 1984 458 p

(Contract F19628-84-C-0001)

(AD-A154907, MTR-9420; ESD-TR-84-190) Avail NTIS HC A20/MF A01 CSCL 09B

In computer-based information systems, special attention must be given to design of the user-system interface (USI) software. This report revises and expands previously published material, and proposes a more comprehensive set of guidelines for design of USI software in six functional areas: data entry; data display; sequence control, user guidance, data transmission, and data protection GRA

N85-33039# Naval Postgraduate School, Monterey, Calif. THE HUMAN RESOURCE MANAGEMENT INFORMATION NETWORK (HRMIN): A COST COMPARISON IN ACCORDANCE WITH OFFICE OF MANAGEMENT AND BUDGET (OMB) CIRCULAR NO. A-76, 5 APRIL 1979 M.S. Thesis G. M. MATYAS Dec. 1984 88 p

(AD-A154583) Avail: NTIS HC A05/MF A01 CSCL 05B

The Human Resource Management Information Network (HRMIN) was conceived and developed in-house by the Navy Military Personnel Command (NMPC) and the Navy Personnel Research and Development Center (NPRDC) This thesis is an attempt to ascertain the compliance of this in-house development with the Office of Management and Budget policy on the acquisition of commercial or industrial products and services needed by the government. A cost comparison of the in-house performance cost and the contract-out cost of providing the services required of HRMIN indicate that the present in-house performance is the most cost effective alternative. Therefore conversion to a contracted-out performance should not be undertaken. GRA

N85-33042# RAND Corp., Santa Monica, Calif.

INVESTIGATION OF DBMS (DATA BASE MANAGEMENT SYSTEMS) FOR USE IN A RESEARCH ENVIRONMENT M.S. Thesis - California State Univ., 6 Jul. 1984 P N ROSENFELD Feb. 1985 105 p

(AD-A154862; RAND/P-7002) Avail: NTIS HC A06/MF A01 CSCL 09B

This thesis is an investigative study on whether a data base management system has a place in a research environment. The study concentrated on the use of large social science data sets. The following topics were examined: (1) how social science data sets are used in a research environment; (2) the data usage and need of an existing research institution (The Rand Corporation); (3) the differences between research and business applications, (4) the possible DBMS configurations within a research environment, (5) the opinions of Rand computer users when rating importance of DBMS features, and (6) evaluation of commercial DBMS for use in a research environment. Conventional DBMS have been very successful with business/corporate data bases, but DBMS are not widely used with research data bases. There are significant differences between the business and research data management needs. These include different retrieval and update specifications, the need for statistical routines, and less financial data base support Much of research analysis requires the use of statistical procedures. Hence, a DBMS configuration within a research environment must include some access to statistical procedures. Given these reguirements, there are a few commercial DBMS which could be considered for a research environment. Author (GRA)

N85-33736# Sandia National Labs , Albuquerque, N. Mex INTEGRATION OF OFFICE AUTOMATION WITHIN COMPUTING

1985 19 p Presented at the DOE Conf. on Office Automation, Albuquerque, N Mex., 24 Apr 1985

(Contract DE-AC04-76DP-00789)

(DE85-010021, SAND-85-0925C; CONF-8504129-1) Avail NTIS HC A02/MF A01

An informal talk is given that focuses on the coupling between office automation efforts and the traditional fields of computing, particularly management information systems DOE

N85-34331# Ecole Nationale Superieure des Telecommunications, Paris (France). Dept. Informatique TELECOMMUNICATION MARKET RESEARCH PROCESSING Ph.D. Thesis - Rennes Univ. [TRAITEMENT D'ENQUETES POUR LES TELECOMMUNICATIONS]

J. F. DUPONT 9 Jun 1983 208 p refs In FRENCH (ENST-83E018; ISSN-0751-1353) Avail: NTIS HC A10

The data processing in two telecommunication market investigations is described One of the studies concerns the office applications of communication and the other the experiences with a videotex terminal. Statistical factorial analysis was performed on a large mass of data. A comparison between utilization intentions and effective utilization is made. Extensive rewriting of statistical analysis computer programs was required Author (ESA)

N85-34519\*# PRC Kentron, Inc., Hampton, Va. USER'S OPERATING PROCEDURES. VOLUME 2: SCOUT PROJECT FINANCIAL ANALYSIS PROGRAM

C. G. HARRIS and D K. HARIS Jul. 1985 171 p (Contract NAS1-18000)

(NASA-CR-177949; NAS 1.26 177949) Avail NTIS HC A08/MF A01 CSCL 09B

A review is presented of the user's operating procedures for the Scout Project Automatic Data system, called SPADS. SPADS is the result of the past seven years of software development on a Prime mini-computer located at the Scout Project Office, NASA Langley Research Center, Hampton, Virginia SPADS was developed as a single entry, multiple cross-reference data management and information retrieval system for the automation of Project office tasks, including engineering, financial, managerial, and clerical support. This volume, two (2) of three (3), provides the instructions to operate the Scout Project Financial Analysis program in data retrieval and file maintenance via the user friendly menu drivers. Author

#### N85-35645# Naval Postgraduate School, Monterey, Calif ATTACKING SOFTWARE CRISIS: A MACRO APPROACH M.S. Thesis

T. N. QURESHI Mar. 1985 87 p

(AD-A155846) Avail. NTIS HC A05/MF A01 CSCL 09B

The software crisis refers to a set of problems that are encountered in the development of computer software. The problems are not limited to software that does not function properly Rather the software crisis includes problems attached with the development of software, and keeping pace with the ever-increasing demand of software. The software crisis is characterized by many problems: Schedules and cost estimates are often grossly inaccurate, cost overruns of an order of magnitude have been experienced, schedules slip by months or years and software quality is often suspect. This thesis attempts to provide solutions to overcome the software crisis. The basic premise of this thesis is that unless the problems at the software industry level are solved, no number of technical and project management tools can be of much help in overcoming the software crisis The author examines the existence of the software crisis, its causes and its serious impact on every walk of life. The nature of software development is discussed, considering it as a craft and as an engineering discipline After evaluating various alternatives, a managerial approach is emphasized. Issues like education, professionalization, programmer's productivity, and human factors are discussed Action on these recommendations requires crossing organizational boundaries, and viewing the problem from a macro perspective. GRA

## 06

## **RESEARCH AND DEVELOPMENT**

Includes Contracts and Contract Management, Project Management, Program Management, Research Projects and Research Facilities, Scientific Research, Innovations and Inventions, Technology Transfer and Utilization, R & D Resources, Agency, National and International R & D.

#### A85-12501

### INTERNATIONAL SCIENTIFIC CONFERENCE ON SPACE, 23RD, ROME, ITALY, MARCH 24, 25, 1983, PROCEEDINGS [CONVEGNO INTERNAZIONALE SCIENTIFICO SULLO SPAZIO, 23RD, ROME, ITALY, MARCH 24, 25, 1983, ATTI]

Conference sponsored by the Ministero degli Affari Esteri, Ministero per il Coordinamento della Ricerca Scientifica e Tecnologica, CNR, et al. Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1984, 400 p in Italian, English, and French. For individual items see A85-12502 to A85-12524.

Political, economic, institutional, and technological aspects of space cooperation between industrialized and developing nations are examined in reviews, reports, and abstracts Topics addressed include satellite communications, the Spacelab program as an easy opportunity for developing-country (DC) participation, Italian cooperation with DCs in space development, economical domestic/regional satellite communication systems for DC, the activities of the Argentine National Commission on space research, the role of the UN, applications of space technology in Africa, the orbit-acquisition maneuver for the Lageos-II satellite, strap-on boosters for the Ariane-3 launcher, and the interpretation of thermal-IR imagery using multispectral and multitemporal information. Graphs, drawings, diagrams, and photographs are provided.

### A85-12994#

#### SPACE STATION RELATED INVESTIGATIONS IN EUROPE

W WIENSS (ERNO Raumfahrttechnik GmbH, Bremen, West Germany) and E. VALLERAIN (Aeritalia S p.A., Turin, Italy) International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct. 7-13, 1984. 29 p. (IAF PAPER 84-28)

Studies pertaining to the definition of Europe's role in the Space Station program are described, with consideration given to such elements as pressurized modules as laboratories for materials processing and life sciences, unpressurized elements, and service vehicles for on-orbit maintenance and repair activities Candidate elements were selected against such criteria as clean interfaces, the satisfaction of European user needs, new technology items, and European financial capabilities; and their technical and programmatic implications were examined. Different scenarios were considered, ranging from a fully Space-Station-dependent case to a completely autonomous, free-flying man-tendable configuration Recommendations on a collaboration between Europe and the United States are presented.

A85-13010\*# National Aeronautics and Space Administration, Washington, D C

## SPACE STATION - OPPORTUNITY FOR INTERNATIONAL COOPERATION AND UTILIZATION

K. S. PEDERSEN (NASA, Washington, DC) International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct. 7-13, 1984. 5 p.

(IAF PAPER 84-51)

In connection with his announcement regarding the development of a permanently manned Space Station, President Reagan invited the United States' friends and allies to join in the Space Station program. The President's invitation was preceded by more than two years of interaction between NASA and some of its potential partners in Space Station planning activities. Attention is given to international participation in Space Station, the guidelines for international cooperation, and the key challenges. Questions regarding quid pro quos are considered along with aspects of technology transfer, commercial use, problems of management, and the next steps concerning the Space Station program. G.R.

#### A85-13133#

## OPERATIONAL PREPARATION OF THE GERMAN SPACELAB MISSION D1

H STEIMLE and W. WYBORNY (Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Cologne, West Germany) International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct 7-13, 1984. 24 p.

(IAF PAPER 84-211)

Technological and organizational aspects of the preparations of the first German Spacelab mission D1 planned for October, 1985, are discussed The history of the project is traced; the scientific payloads for life sciences, material science and processing, fluid physics, and communication and navigation are characterized with their operational requirements; the work schedules for the 8-member crew are summarized; the training program for the payload crew and support team is described; the functions of the D1 payload operations center at Oberpfaffenhofen are defined, and the communications links to NASA facilities are considered Drawings, diagrams, flow charts, and tables are provided. T.K.

#### A85-13920

#### A SIMPLE METHOD FOR EVALUATION AND SELECTION OF R&D PROPOSALS FOR A COMPETITIVE GRANT FUND

I. SPHARIM (Agricultural Research Organization, Volcani Centre, Bet-Dagan, Israel) and R. SZAKONYI (Institute of Public Administration, Washington, DC) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-31, Nov. 1984, p. 184, 185. refs

A procedure for evaluating and selecting R&D proposals has been developed and applied by the Binational Agricultural Research and Development Fund, a joint United States-Israel venture. Some of the techniques employed may be useful to other competitive grant agencies, especially the employment of a card system for having the information on numerous R&D proposals visually displayed while selection by the committee is actually in progress. Author

#### A85-16088#

### THE EUROPEAN APPROACH TO A STANDARDIZED WORK BREAKDOWN STRUCTURE CONCEPT FOR EUROPEAN SCIENTIFIC SPACE SATELLITES

B. MADAUSS (Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn, West Germany) International Society of Parametric Analysts, Conference, San Francisco, CA, May 15-17, 1984, Paper. 22 p. refs

#### (MBB-UR-688-84-OE)

In order to improve the visibility of such management data as schedules, costs, technical performance levels, etc., in scientific satellite development work, ESA has applied the Work Breakdown Structure (WBS) technique. The three basic WBS configurations, which are respectively company/hardware-, task/hardware-, and task/model-oriented, were evaluated on the basis of results from six management effectiveness criteria groups The task/hardware WBS was chosen as the most useful for future satellite projects. This WBS calls for the implementation of a unified breakdown structure for ESA satellites, the application of a standardized coding concept, and the introduction of standardized WBS elements and work packages.

#### A85-16302

## FUTURE PROSPECTS IN SPACE ENVISAGED BY A FORUM OF EUROPEAN SPACE COMPANIES

M. TOUSSAINT (Eurospace, Paris, France) (European Space Symposium, 18th, London, England, June 8, 9, 1983) British Interplanetary Society, Journal (Space Technology) (ISSN 0007-084X), vol 37, Dec 1984, p. 537-540.

In June 1980, Eurospace, the Association of the European space industry, presented a paper based on a set of proposals for a European long term space program. A study of this paper shows that the effort devoted by Europe to space activities was decreasing The current situation (1983) is compared with the situation three years earlier. It is found that the ESA budget is slightly higher than in 1979. However, little attention has been paid to proposals regarding large space platforms and recoverable launchers. Now the Future Prospects Group representing the industrial interest in Eurospace has been set up, and the progress of this group is discussed. Attention is given to the level of Europe's space activities in a worldwide context, the mean annual value of governmental and commercial markets accessible to the European space industry, developments in the communication market, the Ariane market, the development of a new generation of launchers for 1992, and the space industrialization market G.R.

#### A85-23921

#### EUROPE'S SPACE ODYSSEY 2000

H. GAVAGHAN New Scientist (ISSN 0028-6664), vol. 105, Jan. 24, 1985, p 42-45.

Several important projects of Europe's space program have now been completed With the successful flight of Spacelab in 1983, the first few steps have been taken towards putting astronauts to work in space while an independent ability to launch satellites has been achieved. It is pointed out, however, that with Ariane 4's first flight in the second half of 1986, Europe will have achieved as much as it can with its existing rocket technology. At the next meeting called by the European Space Agency (ESA), the choice of a successor to Ariane 4 will be one of the questions to be discussed Other issues to be considered are related to Europe's response to the American invitation to participate in the permanent space station program, the allocation of money, and a new telecommunication program. In a discussion of new space projects, attention is also given to a suggestion that Europe should develop a pressurized module which carries astronauts, an unmanned space platform, and French proposals for a reusable spacecraft which could carry astronauts. G.R

A85-24525\* Jet Propulsion Lab., California Inst of Tech., Pasadena

#### COMPUTING AND INFORMATION SERVICES AT THE JET PROPULSION LABORATORY - A MANAGEMENT APPROACH TO A DIVERSITY OF NEEDS

F. H. FELBERG (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) IN: Jerusalem Conference on Information Technology, 4th, Jerusalem, Israel, May 20-25, 1984, Proceedings. Silver Spring, MD, IEEE Computer Society Press, 1984, p 691-695. NASA-supported research

The Jet Propulsion Laboratory, a research and development organization with about 5,000 employees, presents a complicated set of requirements for an institutional system of computing and informational services. The approach taken by JPL in meeting this challenge is one of controlled flexibility A central communications network is provided, together with selected computing facilities for common use. At the same time, staff members are given considerable discretion in choosing the miniand microcomputers that they believe will best serve their needs. Consultation services, computer education, and other support functions are also provided. Author

#### A85-25116

## DECISION ANALYSIS IN PROJECT MANAGEMENT - AN OVERVIEW

J M. BOOKER and M C BRYSON (Los Alamos National Laboratory, Los Alamos, NM) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-32, Feb. 1985, p. 3-9. refs

Decision theory encompasses of interacts with many different subject-matter fields. For the manager who requires some access to the literature in these diverse areas, this paper provides a broad overview of the subjects and a guide to further reading in decision theory, emphasizing its application to R&D project management. This paper includes very general topical summaries in utility theory, mathematical programming, statistical methods, scoring and ranking methods, and cognitive science together with a list of 96 references. A more complete reference list, organized by topic and individually annotated, is available from the authors. Author

#### A85-25856#

#### PLANNING FOR A JOINT SPACE STATION

R. REICHERT Dornier-Post (English Edition) (ISSN 0012-5563), no. 4, 1984, p 32-37.

ESA and NASA have begun to negotiate a memorandum of understanding concerning cooperation on а Space Shuttle-deployed Space Station. This Station will have, as its functions, manned use as an orbital laboratory and observatory, as a transportation node, as a satellite servicing and repair facility, and as a facility for further space system fabrication and assembly. Engineering research must be undertaken into distributed architecture hardware and fault-tolerant software, high capacity electrical power generation, cryogenic fluids management, thermal management, crew systems and life support, and extravehicular activities. O.C.

#### A85-26011

## EUROPE IN SPACE 1985-2000 [EUROPE SPATIALE 1985-2000]

P. LANGEREUX Air et Cosmos (ISSN 0044-6971), vol. 22, Feb 9, 1985, p. 45-47, 50, 53 (3 ff ). In French.

Projects planned by the 13-member ESA in the last part of the century are surveyed, with particular note taken of the West German and French views. The activities will proceed in the areas of science, remote sensing, telecommunications, microgravity materials processing, participation in the U.S. Space Station effort. and the development of new launch and space vehicles. A desire has been expressed to build the unmanned polar orbiting segment of the Space Station, the Columbus The member nations will all contribute to design studies for the mini-Shuttle, Hermes, a project up to now carried solely by France. Work will continue on the matching launch vehicle, the Ariane 5 and on free-flying platforms which will be visited only periodically and which will carry proof-of-technology experiments. The construction of modules for the U.S Space Station is hoped to provide a technology and manufacturing base for building a European space station at some unspecified epoch in the future. M.S K.

#### A85-31742

## RESEARCH AND DEVELOPMENT IN THE TECHNOLOGY OF TRANSPORTATION LET'S REACH FOR BLUE SKY

W. L. POLHEMUS (Polhemus Associates, Inc., Ann Arbor, MI) and R W LILLEY (Ohio University, Athens, OH) Navigation (ISSN 0028-1522), vol. 31, Fall 1984, p. 200-208.

Financial, technical, organizational, and philosophical aspects of improving the existing traffic management systems governing the airborne, sea, and land transport of the United States are considered. A number of targets to be attained in the time frame of 35 years are identified, including the elimination of airport departure and arrival delays and extended-range remote sensing for nighttime and instrument visibility conditions A need is expressed for an independent research agency similar in form and principle of operation to NASA, dedicated to evaluation development and testing of concepts, strategies, equipment, and systems for solving the transportation problems outlined L.T.

#### A85-34146

#### THE ESA SCIENCE PROGRAMME

G. WHITCOMB (ESA, Paris, France) Spaceflight (ISSN 0038-6340), vol. 27, May 1985, p 206-209 Scientific payloads planned by the ESA over the next 20 yr

Scientific payloads planned by the ESA over the next 20 yr are outlined. Four missions targeted for launch in the 1990s will include a Solar Terrestrial Physics spacecraft, a high throughput X-ray spectroscopy mission, a heterodyne spectroscopy satellite, and a primitive body mission which could be a multiple asteroid and comet rendezvous configuration. Cooperation with NASA might lead to the ESA furnishing a smart ion drive for the spacecraft. Cooperative missions which might follow are a primitive body sample return, Mercury orbiters, out-of-the-ecliptic large telescopes and solar probes. A 7 percent per annum funding increase is required to meet the mission development goals M.S K

#### A85-35448

### USAF NEGOTIATING CONTRACTS FOR F100, F110 IMPROVEMENTS

R. R. ROPELEWSKI Aviation Week and Space Technology (ISSN 0005-2175), vol. 122, May 20, 1985, p. 18, 19.

Competitive bidding is underway for fixed prices contracts to produce upgraded, more reliable, 29,000 lb and 29,500 lb thrust versions of the F100 and F110 engines for the F-15 and F-16 fighters. Initial test engines have demonstrated stall stagnation rates lower than specified, although still exceeding eventual goals The contracts will specify the man-hours required for maintenance, reasonable life cycle costs, and warranty terms. The \$454 million program will include funding for the development of improved engine materials, increased engine cycle lifetimes, higher fan pressure ratios, airflow levels, and compressor efficiency and an advanced afterburner Engine controls will be digitized. The first operational engine is scheduled for a 1989 delivery. MS.K.

A85-36421

## V-22 OSPREY DEVELOPMENT CONTRACT TESTS NEW PROCUREMENT POLICY

D. E. FINK Aviation Week and Space Technology (ISSN 0005-2175), vol 122, June 3, 1985, p 220, 223-225, 227.

Details of the contractual commitments being entered into by Bell Helicopters and Boeing Vertol to deliver 913 V-22 aircraft to the defense program are outlined The contract was won as a result of competitive bidding and is now in final approval review. The V-22 is to ascend like a helicopter, transition to turbo-prop horizontal flight, then land like a helicopter. The companies won the contract largely on the basis of their experience with the XV-15 aircraft. The two companies have established a joint design team and separated tasks such as the designs of he engine and tilt packages and the fuselage. The engines have not yet been chosen. A pilot run of 18 aircraft due by 1989 is expected to be built by identical production facilities one owned by each contractor. The full production order will be manufactured in 10 lots The engineering and design processes are automated and fuly accessed by personnel of both companies MSK

#### A85-36987

#### PROJECT MANAGEMENT: A MANAGERIAL APPROACH

J. R. MEREDITH and S. J. MANTEL, JR (Cincinnati, University, Cincinnati, OH) New York, John Wiley and Sons, 1985, 508 p. refs

This book is primarily intended to be a college textbook for teaching project management at the advanced undergraduate or master's level. The book is also intended for project managers and prospective project managers. Projects in contemporary organizations are examined, and aspects of project initiation are discussed along with questions of project implementation, and project termination. Attention is given to project evaluation and selection, the project manager, project organization, project planning, budgeting, scheduling, resource allocation, monitoring and information systems, project control, project evaluation and auditing, the several varieties of project termination, the present and future of project management, creativity and idea generation, and problems of technological forecasting.

#### A85-40334#

#### A SYSTEMS-ANALYSIS COMPARISON OF SPACE STATION PROJECTS [SYSTEMTECHNISCHER VERGLEICH VON RAUMSTATIONSPROJEKTEN]

E IGENBERGS (Muenchen, Technische Universitaet, Munich, West Germany) Deutsche Gesellschaft fuer Luft- und Raumfahrt, Jahrestagung, Hamburg, West Germany, Oct 1-3, 1984. 21 p. In German.

#### (DGLR PAPER 84-118)

Igenbergs (1984) has compared the benefits obtainable for Europe in the case of the development of a European space station with the advantages obtained in the case of a participation in the U.S. Space Station program. He found that the latter possibility represents the better solution. The present investigation is concerned with the conduction of a systems analysis regarding the characteristics of the various alternatives or scenarios which appear feasible Attention is given to the representation of the scenarios, the evaluation of the scenarios, the various elements and properties, details regarding the examined scenarios, and a description of the interaction matrices. A participation in the U.S. Space Station program according to two alternatives is considered, including one involving manned and unmanned elements, and another involving only unmanned elements. G.R. **A85-41098\*** National Aeronautics and Space Administration, Washington, D.C.

## THE US SPACE STATION PROGRAMME

J. D. HODGE (NASA, Office of Space Station, Washington, DC) (British Interplanetary Society, Space Station Symposium, London, England, Apr. 17, 1985) British Interplanetary Society, Journal (Space Stations) (ISSN 0007-084X), vol 38, July 1985, p 315-318.

The Manned Space Station (MSS) involves NASA, and other countries, in the operation, maintenance and expansion of a permanent space facility. The extensive use of automation and robotics will advance those fields, and experimentation will be carried out in scientific and potentially commercial projects. The MSS will provide a base for astronomical observations, spacecraft assembly, refurbishment and repair, transportation intersection, staging for interplanetary exploration, and storage Finally, MSS operations will be performed semi-autonomously from ground control. Phase B analysis is nearing completion, and precedes hardware development. Studies are being performed on generic advanced technologies which can reliably and flexibly be incorporated into the MSS, such as attitude control and stabilization, power, thermal, environmental and life support control, auxiliary propulsion, data management, etc. Guidelines are also being formulated regarding the areas of participation by other nations.

MS.K.

#### A85-42585

## RADSIM - A METHODOLOGY FOR LARGE-SCALE R&D PROGRAM ASSESSMENT

G A. HAZELRIGG, JR. and F. L. HUBAND (NSF, Div of Policy Research and Analysis, Washington, DC) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-32, Aug 1985, p. 106-115. NSF-DOE-supported research refs

This paper outlines a methodology for the assessment of large-scale research and development programs that involve multiple research phases and parallel approaches. Among its capabilities, the assessment methodology assists in the estimation of the effect of alternative budget levels, allocation of resources within the total budget, and alternative management strategies on various measures of program success. The methodology accounts for cost, schedule, and performance uncertainties in the research process, as well as decisions to continue or terminate each research effort. A major innovation of the methodology is to provide a means for assessing the likelihood and impact on the overall program of technological breakthroughs. To demonstrate the use of this methodology, it is applied to an assessement of magnetic confinement fusion research programs. The methodology is shown to provide valuable insights for the management of large-scale programs Author

#### A85-42694#

## SPACELAB AND EURECA AS A BASIS FOR EUROPEAN INVOLVEMENT IN THE SPACE STATION

R. MORY (ESA, Directorate of Space Transportation Systems, Paris, France) ESA Bulletin (ISSN 0376-4265), no. 42, May 1985, p. 30-38

The Eureka free-flyer and Spacelab are seen as major contributors to European participation in the Space Station program A consortium of European manufacturers has invested a billion dollars in Spacelab, which was developed with NASA guidance Spacelab supports experiments in tribology, fluid physics, crystal growth, biology and metallurgy. Eureka stays in orbit up to 6 mos before retrieval by the Shuttle, is capable of demonstrating the feasibility of Space Station components and technologies, provides co-orbiting unmanned platforms for the Space Station, and serves as a learning tool for payload preparation by European industries. Both the Spacelab and Eureka are prototype elements of the polar-orbiting Columbus component of the Space Station. The Columbus could include pressurized modules and could also co-orbit with the Space Station. M.S.K

### A85-43182#

### SOME INFORMAL REMARKS ON THE M-FORM SOCIETY

W. G. OUCHI (California, University, Los Angeles) IN. White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 37-45.

The paper describes the business-government relationship in Japan and compares it to similar relationships in the United States. In particular, the paper analyzes the impact that this relationship has on joint research and development in both defense and nondefense sectors. Author

A85-43206\*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex. CONTRACTOR AND GOVERNMENT - TEAMWORK AND

## COMMITMENT G D GRIFFIN (NASA, Johnson Space Center, Houston, TX) IN.

White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality, Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p 197-201

Procedures being implemented at NASA to improve cooperation with contractors and increase productivity are reviewed from the NASA point of view. The goals of the U.S. space program for the coming 25 years are listed, and the importance of the commercial utilization of space in these plans is stressed. Consideration is given to the ongoing American Productivity Center White-Collar Productivity-Improvement Project, the implementation of the recommendations of the 1984 NASA/Contractor Conferences in present and future contracts, and the use of incentive contracts to create situations in which both NASA and the contractor benefit from increased productivity. Future plans call for increased industry responsibility in managing and operating the STS; steamlining of Shuttle operations, advanced design-to-cost procedures, increased commonality, better NASA-contractor communications, and more use of CAD/CAM and robotics for the Space Station; and accommodation of greatly expanded private investment and exploitation of space T.K.

#### A85-48595

#### REPRESENTATION OF ACTIVITY KNOWLEDGE FOR PROJECT MANAGEMENT

A SATHI (Carnegie Group, Inc., Pittsburgh, PA), M S. FOX (Carnegie-Mellon University, Pittsburgh, PA), and M. GREENBERG (Massachusetts, University, Amherst) IEEE Transactions on Pattern Analysis and Machine Intelligence (ISSN 0162-8828), vol. PAMI-7, Sept. 1985, p. 531-552 Research supported by the Digital Equipment Corp. refs

Representation of activity knowledge is important to any application which must reason about activities such as new product management, factory scheduling, robot control, vehicle control, software engineering, and air traffic control This paper provides an integration of the underlying theories needed for modeling activities. Using the domain of large computer design projects as an example, the semantics of activity modeling is described. While the past research in knowledge representation has discovered most of the underlying concepts, this attempt is toward their integration. This includes the epistemological concepts for erecting the required knowledge structure; the concepts of activity, state, goal, and manifestation for the adequate description of the plan and the progress; and the concepts of time and causality to infer the progression among the activities. The issues which arise due to the integration of aggregation, time, and causality among activities and states are also addressed. Author

### A85-49049\* Texas Instruments, Inc., Lewisville. MONITORING SOFTWARE DEVELOPMENT THROUGH DYNAMIC VARIABLES

C W. DOERFLINGER (Texas Instruments, Inc, Lewisville) and V R BASILI (Maryland, University, College Park) IEEE Transactions on Software Engineering (ISSN 0098-5589), vol SE-11, Sept 1985, p. 978-985. Previously announced in STAR as N84-23139 refs (Contract NSG-5123)

Research conducted by the Software Engineering Laboratory (SEL) on the use of dynamic variables as a tool to monitor software development is described Project independent measures which may be used in a management tool for monitoring software development are identified Several FORTRAN projects with similar profiles are examined. The staff was experienced in developing these types of projects. The projects developed serve similar functions. Because these projects are similar some underlying relationships exist that are invariant between the projects. These relationships, once well defined, may be used to compare the development of different projects to determine whether they are evolving the same way previous projects in this environment evolved Author

#### A85-49556

## CONTRACTOR EXPERIENCE USING RADC ORACLE

C. W PLOTKIN (General Electric Co., Utica, NY) IN Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings . New York, IEEE, 1984, p 222-224

The initial use experience of one contractor who was required to perform a reliability prediction of the Optimized Reliability and Component Life Estimator (ORACLE), a computer implementation of MIL-HDBK-217 (Reliability Prediction of Electronic Equipment) is described Included in the paper are descriptions of ORACLE, the basic contractual requirements, the training session, the outputs available, and the initial startup problems and actual experience after the startup. The use of ORACLE resulted in a more efficient utilization of the Reliability Engineering resources, rendering complete and accurate predictions, and in significant labor savings.

N85-10929# Martin Marietta Aerospace, Washington, D.C. Air Traffic Control Div

#### SYSTEM ENGINEERING AND INTEGRATION CONTRACT FOR IMPLEMENTATION OF THE NATIONAL AIRSPACE SYSTEM PLAN. VOLUME 2: SECTION 5.0 NAS Plan Audit Report Aug 1984 211 p

(Contract DTFA01-84-C-00017)

(AD-A145710; ATC-84-0026-VOL-2) Avail: NTIS HC A10/MF A01 CSCL 17G

This section provides the detailed audit findings for each of the NAS Plan F&E projects The individual sections are arranged to follow the sequence and order of the technical program chapters in the NAS Plan. The text on each project is formatted to describe. (1) Project role in the National Airspace System. (2) The products that will be produced by the project. (3) The status of the project. (4) The major audit findings broken into technical, schedule, and cost if appropriate. (5) Recommendations to help achieve a successful project on schedule. GRA

**N85-11567**# Comptroller General of the United States, Washington, D.C.

### CONTRACTING FOR COMPUTER SOFTWARE DEVELOPMENT: SERIOUS PROBLEMS REQUIRE MANAGEMENT ATTENTION TO AVOID WASTING ADDITIONAL MILLIONS

9 Nov 1979 94 p

(FGMSD-80-4) Avail: NTIS HC A05/MF A01

The feasibility of using private firms to develop software for federal agencies is examined. GAO found that too many contracts for software development experience large cost overruns, lengthy delays, and dissatisfaction with the final product. Major causes of problems in contract software development are discussed. Conclusions and recommendations for improving software contracts are detailed. N85-11898# Duke Univ , Durham, N C School of Business DECISION PROCESS MODELS OF CONTRACTOR BEHAVIOR: THE DEVELOPMENT OF EFFECTIVE CONTRACT INCENTIVES Final Report, 17 Feb. 1981 - 11 Jun. 1984

A. Y. LEWIN, K. J. COHEN, and R. C. MOREY 11 Jun 1984 74 p

(Contract F33615-81-C-5034)

(AD-A145524, BRMC-81-5034) Avail: NTIS HC A04/MF A01 CSCL 05A

An objective of this research was to develop a capability to model the potential impact of various incentive schemes on the performance of defense contracts It was necessary to develop a computer simulation model such basic elements as DOD project goals, DOD incentive mechanisms, contractor goals, and contractor organizational response mechanisms. Each of these elements, which collectively determine the behavioral pattern of the decision process model (DPM), are decoupled and parameterized to facilitate analysis of different incentive schemes and/or behavioral assumptions The objective of this contract was to validate the DPM simulation and its application to developing and testing alternative incentive schemes. The major practical use of building a DPM type simulation is its ultimate application in answering what if type policy questions involving the design parameters of the contractual relationship between the DOD and defense contractors For example, the simulation results indicated that increasing the contractor's fee improves cost control performance. The DPM simulation results suggest that the higher the weight (including those assigned to the guality of the proposal) the better the cost control performance and social efficiency A simulation model of this type has other uses in the training or education of policy makers and or DOD project managers. In business education similar simulation models have been designed as management games. Such games, which can be extremely complex, are used as laboratories for training students to apply analytical tools and integrate functional area knowledge (marketing, production, accounting, financial planning, etc.) within a competitive decision making environment. GRA

**N85-12775**# Department of Defense, Washington, D C. Directorate for Information Operations and Reports

#### COMPANIES PARTICIPATING IN THE DEPARTMENT OF DEFENSE SUBCONTRACTING PROGRAM, FIRST THREE QUARTERS FISCAL YEAR 1984 1984 85 p

(AD-A146137, P14) Avail: NTIS HC A05/MF A01 CSCL 15E This report presents a variety of subcontract data collected from Department of Defense (DOD) large business firms that have received at least one award in excess of \$500,000 (\$1,000,000 for construction) Table II-1 shows the dollar amounts and percent distribution of awards from DOD contractors to large, small, and small disadvantaged businesses for first three quarters FY 1983 and first three guarters FY 1984 Table II-2 summarizes DOD subcontracting program commitments for first three quarters FY Tables II-3 and II-4 summarizes small and small 1984 disadvantages business subcontracting goals and achievements Detailed information from the Army, Navy, Air Force, and Defense Logistics Agency (DLA) is presented in Part 3, Sections 1 through GRA 4

**N85-13666\*#** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va

## PROJECT RESOURCES PLANNING AND CONTROL

C W. SIBBERS Nov. 1984 145 p refs

(NASA-TM-86339, NAS 1 15:86339) Avail: NTIS HC A07/MF A01 CSCL 05A

This report contains instructional guidelines for the resources planning and control of research and development (R&D) projects managed by NASA's Langley Research Center (LaRC). Although written to serve primarily as a practical guide and reference for those LaRC personnel who perform resources planning, analysis, control, and reporting functions, it should also be meaningful to other NASA personnel who are directly or indirectly involved in or affected by these functions, especially project technical managers

## 06 RESEARCH AND DEVELOPMENT

whose responsibilities include resources management. Certain sections should help Contractor personnel to better understand what resources information must usually be submitted on LaRC projects and what use is made of such information. The Project Manager of a large R&D project typically receives support from an Analyst in the area of resources management. The Analyst provides assistance in four functional areas: Planning, Analysis/Control, Administration, and Reporting Each of these functions are discussed in detail. Examples of techniques used effectively on LaRC projects have been included where applicable A considerable amount of information has been included on the use of Performance Measurement (Earned Value) Systems for contract cost control and reporting as little information is currently available on this subject in NASA publications. Author

N85-13689\*# National Aeronautics and Space Administration, Washington, D.C.

#### INTERNATIONAL COMPARATIVE STUDY OF SYSTEMS FOR THE GOVERNMENT ADVANCEMENT OF RESEARCH AND DEVELOPMENT

M RIPKE and R. FOERST Oct. 1984 298 p Transl. into ENGLISH of "International Vergleichende Untersuchung zu Verfahrensfragen bei der Staatlichen Forderung von Forschung und Entwicklung" rept. PLI-1268-1 Bundesministerium fuer Forschung und Technologie, Bonn, Nov. 1983 p 1-157 Transl. by Kanner (Leo) Associates, Redwood City, Calif

(Contract NASW-3541)

(NASA-TM-77589; NAS 1.15:77589; PLI-1268-1) Avail NTIS HC A13/MF A01 CSCL 05D

The reorganization, structure and instruments of government advancement of research in three countries was compared: France, Sweden and the USA. In France the powers are centralized; in Sweden and the USA, decentralized. Assistance to projects is provided with grants and contracts in all three countries France and Sweden also give loans with conditional waiving of reimbursement in case of failure. In all three countries indirect assistance is provided only with small tax breaks. EAK.

N85-15784# Office of Technology Assessment, Washington, D.C.

### A BUYER'S GUIDE TO SPACE INFRASTRUCTURE

In its Civilian Space Stations and the US Future in Space p 85-99 Nov 1984

Avail: SOD HC \$7 50

Various factors involved in acquiring a substantial amount of long-term space infrastructuree are considered. The roles of the private sector and international partners are discussed, and the degree to which new technology would be used is cited. The costs and capabilities of a number of possible infrastructure options are compared in a table format. The cost drivers associated with the listed options are discussed. Tradeoffs regarding the use of automation and people in a space station are considered Buyers may reasonably decide to acquire space infrastructure using an average annual funding rate rather than a lump sum approach Possible infrastructure that could be obtained using average annual funding rates of \$0.1, \$0.3, \$1, and \$3 billion (1984\$) are presented. The functions that NASA intends to provide in a space station are listed, and alternative infrastructures that could provide those functions are indicated. B.W.

N85-15785# Office of Technology Assessment, Washington, D.C.

## **BROADENING THE DEBATE**

*In its* Civilian Space Stations and the US Future in Space p 103-110 Nov. 1984

Avail. SOD HC \$7.50

The creation, a U.S. civilian space station program is described as a means to various ends rather than an end in itself. The ends proposed may be grouped into four categories: (1) industrial (e.g., manufacturing materials); (2) commercial (e.g., servicing satellites); (3) scientific (e.g., conducting experiments in the life sciences); and (4) national security (e.g., maintaining a permanent U.S manned presence). Potential users and potential suppliers of a U.S. space station program are discussed. The need for goals and objectives for a new U.S. civilian space effort is considered. The role of U.S. space policy in the evolution of the present day civilian space program is discussed President Reagan's call for a space station is addressed, and his directions on the nation's aspiration in regard to it are discussed. B.W

## N85-15790# Office of Technology Assessment, Washington, D.C

#### SYNOPSIS OF THE OTA WORKSHOP ON COST CONTAINMENT OF CIVILIAN INFRASTRUCTURE (CIVILIAN SPACE STATION) ELEMENTS

In its Civilian Space Stations and the US Future in Space  $\,p$  206-213  $\,$  Nov. 1984  $\,$ 

Avail: SOD HC \$7.50

The major cost issues related to a U.S. civilian space station are summarized and discussed in terms of management, technical, and procurement considerations. Incentive contracting and performance specifications are considered. R.S.F.

#### N85-16675# Information Spectrum, Inc , Arlington, Va. TECHNICAL PERFORMANCE MEASUREMENT HANDBOOK Final Report

T. B. SEARS and E. P. TAYLOR 31 Jul. 1984 115 p (Contract MDA903-82-G-0055)

(AD-A147314, ISIL-V-4062-05) Avail: NTIS HC A06/MF A01 CSCL 05A

TPM is defined as: the continuing prediction and demonstration of the degree of anticipated or actual achievement of selected technical objectives. Technical Performance Measurement (TPM) is an integral function of system engineering. For maximum utility, TPM must be compatible with other related program management activities (cost/schedule control system criteria, contract administration, production management, readiness functions). The function of this handbook is to provide program management personnel with insight into how technical performance is measured by the contractor, reported to the government and how this information can be effectively integrated with cost and schedule performance data. Chapters 2 and 3 provide overviews of TPM and C/SCSC taken from published documentation. Chapter 4 was developed using extensive interviews with engineering management personnel within government program offices and DOD contractors. It illustrates how technical, cost and schedule performance are actually being monitored and used to provide program control today The differences between the government program office and the contractor viewpoints are highlighted. Chapter 5 identifies the issues which must be considered in PMO implementation and execution of a TPM program. Author (GRA)

## N85-16683# Army Construction Engineering Research Lab., Champaign, III

#### PROJECT MANAGER'S HANDBOOK FOR SPECIAL PROJECTS Final Report

J. G. KIRBY Oct. 1984 79 p

(Contract DA PROJ. 4A1-62731-AT-41)

(AD-A147913; CERL-TR-P-85/01) Avail: NTIS HC A05/MF A01 CSCL 05A

This report identifies unique problem areas that a manager of Corps of Engineers construction project in a remote area is likely to encounter. The major problems identified from managers of past projects were: (1) procurement and purchasing, (2) planning and control, (3) engineering/design, (4) country-to-country agreement, (5) civilian personnel, (6) construction. (7) communications, (8) office/project manager operation, (9) Corps/contractor relations, and (10) transportation. Based on the results of questionnaires and meetings with former special project personnel, ways of solving or preventing these problems are proposed. It is recommended that the proposals presented in this report be used to supplement existing Corps guidance on special project management. GRA

Deutsche Lufthansa Aktiengesellschaft, Frankfurt N85-16686# am Main (West Germany).

ACTIVITIES REPORT OF THE AEROSPACE INDUSTRY IN WEST **GERMANY Annual Report, 1982 [DEUTSCHE LUFTHANSA** AKTIENGESELLSCHAFT GESCHAEFTSBERICHT 1982]

15 May 1983 In GERMAN 64 p Original contains color illustrations

(ISSN-0722-3838) Avail: NTIS HC A04/MF A01

Balance sheet, project and loss account, comments on capital conservation, investment programs and technical progress, surveys by the supervisory and executive board, and Lufthansa group report Author (ESA) are presented.

Deutsche Lufthansa Aktiengesellschaft, Frankfurt N85-16687# am Main (West Germany)

### ACTIVITIES REPORT OF THE AEROSPACE INDUSTRY IN WEST **GERMANY Annual Report, 1983 [DEUTSCHE LUFTHANSA** AKTIENGESELLSCHAFT GESCHAEFTSBERICHT 1983]

In GERMAN Original report contains 24 May 1984 69 p color illustrations

(ISSN-0722-3838) Avail. NTIS HC A04/MF A01

The day to day operations and financial status of the Lufthansa BG group are reviewed

### N85-17176# Joint Publications Research Service, Arlington, Va. EAST EUROPE REPORT: SCIENCE AND TECHNOLOGY

26 Dec. 1984 45 p refs Transl. into ENGLISH from various East European articles

(JPRS-ESA-84-046) Avail: NTIS HC A03/MF A01

News items, abstracts, and scientific reports on aspects of science and technology including robotics, man machine systems, artificial intelligence, telecommunications, microcomputers, laser, and genetic engineering are described.

## N85-17191# Joint Publications Research Service, Arlington, Va FRG STUDY LOOKS AT PARTICIPATION IN ESA, US SPACE STATION

G. WANGE In its West Europe Rept Sci and Technol. (JPRS-WST-85-001) p 1-3 2 Jan. 1985 Transl into ENGLISH from Flugrev. (Munich), Oct. 1984 p 30-31 Avail. NTIS HC A05/MF A01

International cooperation in space exploration was examined. The participation of the European Space Agency (ESA) in the US Space Station is discussed Joint technological ventures, economics, and costs are investigated. FAK

N85-17197# Joint Publications Research Service, Arlington, Va. UK, FRG, FRANCE: R AND D IN SENSORS, RELATED FIELDS T. JARNE, J. HELLSTEN, K G. NILSSON, and D. ANDREE In its West Europe Rept. Sci. and Technol. (JPRS-WST-85-001) p 2 Jan. 1985 Transl. into ENGLISH from Utlandsrappt 37-59 (Stockholm), no. 8402, Aug. 1984 p 43-71; 63-71; 78-88; 91-98 Avail: NTIS HC A05/MF A01

Progress in European sensor technology and the marketing of sensors is reported Fiber optics and fiberoptical transducers and their application to cable television are examined. Image processing development and application, fiberoptic sensors, electrochemical sensors and their use in the electronics industry are outlined.

E.A.K.

#### N85-17198# Joint Publications Research Service, Arlington, Va EAST EUROPE REPORT: SCIENCE AND TECHNOLOGY

3 Dec. 1984 59 p refs Transl. into ENGLISH from various east European articles

(JPRS-ESA-84-043) Avail: NTIS HC A04/MF A01

New items, abstracts and scientific reports on aspects of science and technology including microprocessors, nuclear reactors, robotics, microelectronics, and software engineering are described.

N85-17737# General Accounting Office, Washington, D C Resources Community and Economic Development Div OUTLOOK FOR EXPANDING THE FEDERAL RESEARCH IN **PROGRESS SYSTEM** 

22 Oct 1984 23 p

(AD-A148354, GAO/RCED-85-15) Avail NTIS HC A02/MF A01 CSCL 05A

A study of the Federal government's research and development (R&D) efforts in the areas of new materials, electronic devices, and biotechnology was requested There is concern about the lack of a central source of information on federal funding for these technologies and requested that GAO study the system that federal agencies use to catalogue ongoing R&D projects. GAO focused a review on the National Technical Information Service's (NTIS) Federal Research in Progress System (FEDRIP) and how the information systems of the major federal R&D agencies relate to FEDRIP. The overall objective was to review the outlook for making FEDRIP a comprehensive source of information on government-funded R&D. A more detailed description of the objectives, scope, and methodology is contained in enclosure 1. An expansion of FEDRIP could be difficult to achieve. To make FEDRIP a comprehensive R&D data base, all applicable agencies would have to report both project and funding information to NTIS Such a change would not necessarily make it easier to determine overall federal funding levels for particular areas of technology. Budget information and congressional correspondence is included GRA

#### N85-17745# Vermont Univ, Burlington.

EUROPEAN SCIENTIFIC NOTES. VOLUME 38, NUMBER 11 L. E SHAFFER, ed Nov 1984 39 p

(AD-A148228; ESN-38-11) Avail: NTIS HC A03/MF A01 CSCL 05B

European Scientific Notes (ESN) is a monthly publication with brief articles on recent developments in European scientific research. The publication is not intended to be part of the scientific literature The value of ESN articles to Americans is to call attention to current developments in European science and technology and to the institutions and people responsible for these efforts. ESN authors are primarily ONRL staff members. Occasionally articles are prepared by or in cooperation with staff members of the USAF European Office of Aerospace Research and Development or the US Army Research and Standardization Group Qualified US scientists travelling in Europe may also be invited to author an ESN article Author (GRA)

N85-17933 British Aerospace Aircraft Group, Kingston-upon-Thames (England)

#### INNOVATION IN BRITISH INDUSTRY (NOTABLY THE AIRCRAFT INDUSTRY) AND ITS VALUE: COLLECTED PAPERS

C L. BORE Aug. 1984 10 p refs (BAE-KRS-N-GEN-286) Avail: Issuing Activity

Aspects of innovation that most need improving in British industry are reviewed. The money values of technical innovations in the aircraft industry are discussed. Author (ESA)

N85-18086# Oak Ridge National Lab, Tenn.

#### EMERGING ROLE OF THE NATIONAL LABORATORY IN THE DEVELOPMENT AND TRANSFER OF MATERIALS TECHNOLOGY

refs Presented at 8th Biennial H. POSTMA 1984 15 p Conf. on Natl Mater. Policy, Fredricksburg, Va., 11 Sep. 1984 (Contract DE-AC05-84OR-21400)

(DE85-001252; CONF-8409156-1) Avail: NTIS HC A02/MF A01 The national laboratories are in a unique position to contribute the overall national effort in materials Research and Development The laboratories have the expertise and resources to construct and operate large national facilities for materials research. The laboratories provide a framework for integrating basic research and technology development activities at a common site. National laboratories play important roles in the development and transfer of materials technologies. DOE

N85-18946# Office of Naval Research, London (England) EUROPEAN SCIENTIFIC NOTES, VOLUME 38, NUMBER 12 **Monthly Publication** 

L. E SHAFFER Dec 1984 54 p

(AD-A148713; ESN-38-12) Avail NTIS HC A04/MF A01 CSCL 05B

European Scientific Notes (ESN) is a monthly publication with brief articles on recent developments in European scientific research. The publication is not intended to be part of the scientific literature. The value of ESN articles to Americans is to call attention to current developments in European science and technology and to the institutions and people responsible for these efforts. ESN authors are primarily ONRL staff members. Occasionally articles are prepared by or in cooperation with staff members of the USAF European Office of Aerospace Research and Development or the US Army Research and Standardization Group. Qualified US scientists travelling in Europe may also be invited to author an ESN article GRA

Deutsche Forschungs- und Versuchsanstalt fuer N85-18947# Luft- und Raumfahrt, Cologne (West Germany)

ACTIVITIES REPORT IN AEROSPACE IN WEST GERMANY Annual Report, 1983 [JAHRESBERICHT 1983]

H. THIMME, ed. Sep 1984 132 p In GERMAN Original contains illustrations

(ISSN-0070-3966) Avail: NTIS HC A07/MF A01

Air traffic control, aircraft design, turbofans and turbines, nonnuclear energy, satellite communications and monitoring, Earth observation (from space), and space systems are discussed. The organization of the agency is also described as well as its relationships with the government, business, and science communities. Author (ESA)

#### N85-19732# Office of Naval Research, London (England). FRENCH PLANS FOR FIFTH GENERATION COMPUTER SYSTEMS

J. F. BLACKBURN 7 Dec. 1984 10 p

(AD-A149435; AD-E500690, ONRL-R-12-84) Avail: NTIS HC A02/MF A01 CSCL 09B

Since the October 1981 announcement of Japan's Fifth Generation Project, the French scientific and industrial communities have shown an increased interest in artificial intelligence languages, expert systems, man-computer interaction, novel computer structures, and knowledge-based computer systems. This report describes the French effort and includes a survey of the various French initiatives in hardware and software technologies aimed toward fifth generation computer systems and applications. These separate projects are the National Projects, the Joint Research Projects, the Centre National de Recherche Scientifique Cooperative Research Groups, and the Thematic Research Program. GRA

N85-19919# Vermont Univ , Burlington. EUROPEAN SCIENTIFIC NOTES. VOLUME 39, NUMBER 2

L. E. SHAFFER, ed. Feb 1985 45 p

(AD-A148994; AD-E301513; ESN-39-2) Avail NTIS HC A03/MF A01 CSCL 05B

European Scientific Notes (ESN) is a monthly publication with brief articles on recent developments in European scientific research. The publication is not intended to be part of the scientific literature The value of ESN articles to Americans is to call attention to current developments in European science and technology and to the institutions and people responsible for these efforts. ESN authors are primarily ONRL staff members. Occasionally articles are prepared by or in cooperation with staff members of the USAF European Office of Aerospace Research and Development or the US Army Research and Standardization Group Qualified US scientists travelling in Europe may also be invited to author an ESN article. Author (GRA)

N85-20684# Joint Publications Research Service, Arlington, Va EAST EUROPE REPORT: SCIENTIFIC AFFAIRS

17 Feb 1984 98 p refs Transl. into ENGLISH from various East European articles

(JPRS-ESA-84-006) Avail NTIS HC A05/MF A01

News items, abstracts, and scientific reports on aspects of launching, scientific affairs including weather rocket microcomputers, telecommunication, computer centers, personal computers, computer disks and electrical engineering are described

N85-20933# Defense Systems Management School, Fort Belvoir, Va.

PROGRAM MANAGER: THE JOURNAL OF THE DEFENSE SYSTEMS MANAGEMENT COLLEGE. VOLUME 13, NUMBER 6, NOVEMBER-DECEMBER 1984

R W BALL Dec. 1984 42 p

(AD-A149546, DSMC-63) Avail: NTIS HC A03/MF A01 CSCL 15E

A variety of topics, many dealing with business, are given Program management, productivity improvement, spare parts, contracts, and government procurement are discussed. R.J.F.

N85-21105# Joint Publications Research Service, Arlington, Va. TRANSPORTATION

27 Feb. 1985 104 p Transl. into ENGLISH from various Russian articles

(JPRS-UTR-85-004) Avail: NTIS HC A06

This U.S.S.R report contains research in the area of transportation Quality control measures in civil aviation plants are investigated. The advantages of flight simulators as compared to conventional flight training methods are cited. The construction of airport facilities in Tenkeli are reported. The development and current applications of airships in the USS.R. are discussed.

#### N85-21418# Joint Publications Research Service, Arlington, Va SYSTEMS RESEARCH ON CHINA IN YEAR 2000

W HUIJIANG and L BOXI In its China Rept. Sci. and Technol. (JPRS-CST-85-008) p 37-50 27 Mar 1985 Transl, into ENGLISH from Xitong Gongcheng Lilun Yu Shijian (Beijing), no 2, 1984 p 15-23

Avail: NTIS HC A02/MF A01

The ideology for the research in and drafting of development strategy in China is reviewed and the application of generalized systems theory for establishing policies for achieving projected goals in the social, economic, and science and technology areas is examined. Particular emphasis is given to the organization in systems engineering including, input, structural composition, management, technical composition, ideological composition, coordination level, objectives and requirements, environment, and output The research structure envisioned for China by the year 2000 includes departmental and regional research organizations; topic, itemized, and summary reports; and interdependent, interdisciplinary academic societies ARH

N85-22246# Committee on Governmental Affairs (U. S. Senate)

## TRANSFER OF TECHNOLOGY

Washington GPO 1984 35 p Presented by the Perm. Subcomm. on Invest. of the Comm on Govt Affairs, 98th Congr, 2d Sess, 5 Oct 1984

(S-REPT-98-664; GPO-51-010) Avail US Capitol, Senate Document Room

Technology transfer and export control to the Soviet Union were discussed. Topics discussed include enforcement of the export administration act; organization of Pentagon in export control process; and views from technology exporting community.

E.A.K

N85-22264# Office of Technology Assessment, Washington, D.C

#### TECHNOLOGY TRANSFER TO THE MIDDLE EAST Sep 1984 615 p

(PB85-127744; OTA-ISC-173; LC-84-601109) Avail: NTIS HC A99/MF A01 CSCL 05A

The policy issues surrounding technology transfer to developing countries are discussed by highlighting tradeoffs among various commercial, political and development assistance policy goals, and by suggesting options for more consistent policies affecting technology transfer to developing countries. A region of great strategic importance where significant development efforts during the past decade involved the introduction of technology from the United States and other supplier countries were studied Competition among suppliers of technology, and problems the recipients face in effectively utilizing advanced civilian technologies in five sectors: petrochemical production, telecommunications systems, commercial aircraft support systems, medical services and nuclear power are presented The policy perspectives of the recipient and supplier countries are evaluated. US policy options in light of an evaluation of future prospects for Middle East technology trade are identified. GRA

N85-22403# Joint Publications Research Service, Arlington, Va USSR REPORT: SPACE

4 Feb 1985 128 p Transl into ENGLISH from various Russian articles

(JPRS-USP-85-001) Avail: NTIS HC A07

News items, abstracts, and scientific reports on aspects of space including life sciences, interplanetary sciences; space policy and administration; launch table; space applications; space sciences, and manned mission highlights are discussed.

**N85-22471\***# National Aeronautics and Space Administration, Washington, D.C.

#### SPACE STATION TECHNOLOGY PLANNING

R. E. SMYLIE *In* NASA. Lewis Research Center Spacecraft Environ. Interactions Technol, 1983 p 1-8 Mar 1985 Avail NTIS HC A99/MF E03 CSCL 22B

Technological requirements for Space Station design were discussed. The requirements are discussed in relation to the following areas: high voltage arrays; environmental interactions; energy management; power supplies; architecture; and modularity. B G.

#### N85-25651# Joint Publications Research Service, Arlington, Va CRITERIA FOR QUALIFYING FOR FRG FEDERAL CAD/CAM SUBSIDIES

*In its* West Europe Rept Sci and Technol (JPRS-WST-84-014) p 52-54 4 May 1984 Transl. into ENGLISH from Computerwoche (Munich), 27 Jan 1984 p 25

Avail: NTIS HC A04/MF A01

The use of CAD/CAM systems are outlined. Programs amendable to support manufacturing technology program (CAD/CAM) are divided in two phases. The first phase includes system analyses, training of workers, alternatives and feasibility studies and preparation of specification and performance catalogues. In the second phase the procurement of hardware and software, and third party develoment are studied. The CAM system is a dialogue oriented data processing system with the possibility of interactive processing of material in several functional domains such as production planning, materials control, and time control and contract schedule control. The CAD system is a dialogue oriented data processing in the functional domains of planning, development, and design EA.K. N85-26456# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

# LIFE CYCLE COSTING IN GOVERNMENT PROCUREMENT M.S. Thesis

D. H. SHAW May 1985 230 p

(AD-A151878; AFIT/CI/NR-85-30T) Avail: NTIS HC A11/MF A01 CSCL 15E

In the area of government procurement, Life Cycle Costing involves the consideration of post-acquisition costs, such as maintenance and operating expenses, in the making of decisions regarding the acquisition of goods and services. This thesis focuses on the use of life cycle costing techniques in determining the method of contracting and/or the determination of the recipient of a government contract in a competitive procurement in order to minimize the total cost of the acquisition from purchase to final disposal Emphasis is given to an examination of the interaction of the practical and legal constraints under which life cycle cost applications must operate. This examination is facilitated through a discussion of the concept and theory of life cycle costing and a review of the factors to be considered in deciding which procurements may benefit from its use. The development of evaluation criteria and its incorporation into a solicitation is also treated in detail. Finally, the use of mechanisms to prevent bidder from gaming such an evaluation is given concise treatment, including the use of post award price adjustment and warranty provisions to achieve this purpose. Within this organizational framework, the thesis deals with the current constraints on the use of life cycle costing arising from various statutory requirements and the procurement guidance issued via Comptroller General Decisions Although federal procurement materials form the basis for the majority of this work, treatment is also given to state procurement policies GRA

#### N85-26771# European Space Agency, Paris (France). EUROPEAN SPACE SCIENCE HORIZON 2000

N. LONGDON, ed Dec. 1984 143 p Original contains color illustrations

(ESA-SP-1070; ISSN-0039-6566; AD-A155773) Avail NTIS HC A07/MF A01

The ESA solar system science and space astronomy programs are outlined Mission trends and industrial benefits are considered. Areas covered include solar and heliospheric physics, space plasma physics and planetary research. Author (ESA)

N85-26833# Joint Publications Research Service, Arlington, Va EAST EUROPE REPORT: SCIENCE AND TECHNOLOGY

24 Aug. 1984 64 p refs Transl into ENGLISH from various East European articles

(JPRS-ESA-84-032) Avail: NTIS HC A04/MF A01

News items, abstracts, and scientific reports on aspects of science and technology including robotics, space research, nuclear power plants, laser applications, radioactive isotopes, computer techniques, mathematical modeling, and soldering are covered.

N85-27303# Joint Publications Research Service, Arlington, Va. ORGANIZING GEOLOGICAL WORK TASKS FOR 1985 OUTLINED

W JIABAO *In its* China Rept. Sci. and Technol (JPRS-CST-85-012) p 72-77 23 Apr. 1985 refs Transl. into ENGLISH from Zhongguo Dizhi (Beijing) no. 2, 13 Feb. 1985 p 1-4

Avail: NTIS HC A07/MF A01

Reforms in geological work systems are actively promoted to enliven the economy. Ways to more effectively employ the limited budget for geological exploration are discussed. BS

### N85-27745# Naval Postgraduate School, Monterey, Calif. AUTOMATION OF THE REPORTING AND TRACKING REQUIREMENTS OF ARCHITECT-ENGINEERING TYPE CONTRACTS M.S. Thesis

J T ETHERIDGE Sep. 1984 126 p

(AD-A152218) Avail: NTIS HC A07/MF A01 CSCL 15E

The Naval Facilities Engineering Command utilizes several automated systems in carrying out its mission These systems are presently geared toward the Headquarters and major Command levels of management and not toward the field activities and smaller offices. This thesis examines an Architect-Engineer type contracting management procedure and proposes an automated alternative of the contract administration process using micro-computer technology for field activities. A brief examination is made of the NAVFAC automated systems and of the structure of the NAVFAC contracting organization prior to the presentation of a proposed A-E Management Information System. The closing chapters discuss integration of the proposed system, automated tools which make the system possible and the interface designs utilized to make the system user friendly.

N85-27767#Committee on Foreign Relations (U. S. Senate)EAST-WEST COOPERATION IN OUTER SPACEWashingtonGPO1984122 prefsHearing on SJ. Res

Washington GPO 1984 122 p refs Hearing on S J. Res 236 before the Comm. on Foreign Relations, 98th Congr., 2nd Sess., 13 Sep. 1984

(S-HRG-98-1064, GPO-39-395) Avail Committee on Foreign Relations

A joint resolution was introduced to congress to extend the 1972-77 outer space cooperation agreement between the United States and Soviet union. GLC.

**N85-27795** Messerschmitt-Boelkow-Blohm G m.b.H., Bremen (West Germany).

THE HELIOS MISSIONS [DIE HELIOS-MISSIONENT]

A KUTZER In DFVLR Ten Years of Helios p 39-44 1984 In ENGLISH and GERMAN

Avail: Issuing Activity

Goals and objectives of the Helios project are reviewed The experiments investigate the properties and processes in interplanetary space by approaching the Sun to 0.30 AU Data obtained during the solar cycle contribute to the correlation required for an adequate understanding of complex space phenomena.

Author (ESA)

**N85-27808** Messerschmitt-Boelkow-Blohm G.m.b H., Bremen (West Germany).

THE SIGNIFICANCE OF HELIOS FOR EUROPE [DIE BEDEUTUNG VON HELIOS FUER EUROPA]

A. KUTZER *In* DFVLR Ten Years of Helios p 159-161 1984 In ENGLISH and GERMAN

Avail: Issuing Activity

The impact of the international cooperative satellite project Helios on Europe is described. The industrial effort was spread over a large number of contractors in several countries. The project exercised firm management control over the participating parties, while simultaneously assuring a degree of openness and communication among all participating groups. Highly skilled professional personnel was trained. The Helios mission was significant for German ground operations Important technical and managerial achievements are obtained. More than 20 projects benefitted from the transfer of processes, materials, techniques, technological advances and/or spin-offs, as well as from managerial procedures and methodologies first used in Europe on Helios. Author (ESA) N85-27809 Messerschmitt-Boelkow-Blohm G.m b H, Bremen (West Germany).

MANAGERIAL BENEFITS OF HELIOS FOR THE EUROPEAN INDUSTRY [GEWINN AN MANAGEMENTFAEHIGKEITEN DURCH HELIOS FUER DIE EUROPAETISCHE INDUSTRIE]

A. KUTZER and B J. MADAUSS *In* DFVLR Ten Years of Helios p 162-171 1984 In ENGLISH and GERMAN Original contains color illustrations

Avail. Issuing Activity

The benefits of the Helios project management procedures and methods for European industry are described. The know-how gained by cooperation in working groups and reviews, and the Helios project procedures and methodologies, now standard management tools in Europe, are presented. Project organization, specification system, work breakdown structure, project scheduling, action item control, project review, and career achievements of Helios personnel are described. Author (ESA)

#### N85-28649# Dynamics Research Corp., Wilmington, Mass. DEFENSE DATA NETWORK SUPPORT CONCEPT ANALYSIS Final Technical Report, Sep. - Dec. 1984

L COHEN, W J. MILLER, and S. A. GREENE 26 Dec. 1984 90 p

(Contract F19628-84-D-0016)

(AD-A153214; E-9597U) Avail NTIS HC A05/MF A01 CSCL 05A

This report contains an analysis of alternative support concepts for the evolving Defense Data Network. The alternatives analyzed were sole source contractor support, competitively procured contractor support, organic on-site and contractor off-site support, and organic support. The conclusions and recommendations regarding support concepts are based on estimates of incremental Operations and Support costs and subjective and other nonquantifiable factors. GRA

N85-28855# Air Force Wright Aeronautical Labs, Wright-Patterson AFB, Ohio. AIR FORCE TECHNICAL OBJECTIVE DOCUMENT FY 86

AIR FORCE TECHNICAL OBJECTIVE DOCUMENT FY 86 W. E WARD Dec. 1984 70 p Supersedes AD-A141 925 (AD-A152730; AD-E440275; AFWAL-TR-84-4000) Avail: NTIS HC A04/MF A01 CSCL 05A

This Technical Objective Document which was prepared by the Materials Laboratory, describes the technical program in materials to meet future Air Force operational needs. The technology program is divided into ten focal areas which encompass the full spectrum of materials capabilities required for future aircraft, missile, space and electronic systems. These ten areas are Thermal protection materials and structures; Metallic structural materials; Nonmetallic structural materials; Nondestructive evaluation, Aerospace propulsion materials, Nonstructural materials, Electromagnetic windows and electronic hardened materials; Computer materials: Laser aided manufacturing/Manufacturing R&D; and Systems support To ease the transition from previous format using Technology Planning Objectives (TPOs), the applicable TPO(s), and Task(s) are listed with each focal area GRA

#### N85-28859# RAND Corp., Santa Monica, Calif.

THE OUTLOOK FOR SOVIET ADVANCED TECHNOLOGIES

S KASSEL In Stanford Univ. Sci. and Technol in the Soviet Union p 53-69 31 Jan. 1985

(AD-P004564) Avail: NTIS HC A10/MF A01 CSCL 05A

The author believes that the future performance of Soviet advanced technologies depends to a large extent on a single organization, the Soviet Academy of Science, an R/D performer in the majority of areas significant to advanced technologies. He focuses on the Academy and the reasons why he considers it pivotal to Soviet technological development. This leads directly to the much discussed topic of industrial innovation and the impediments that characterize the Soviet R/D system. GRA

#### N85-28865# Commerce Dept., Washington, D.C. **R/D CONTRACTS IN THE SOVIET UNION**

J A. MARTENS In Stanford Univ Sci. and Technol in the Soviet Union p 155-178 31 Jan. 1985

(AD-P004569) Avail: NTIS HC A02/MF A01 CSCL 05A

This paper examines the evolution of research and development contracting in the post World War II Soviet Union. In particular, the paper analyzes the legal and economic discussions that accompanied numerous changes in the rules for R/D contracts in light of Soviet goals for improving the research, development and innovation performance of the economy. GRA

N85-28867# Michigan State Univ., East Lansing Dept. of Psychology.

## LABORATORY RESEARCH: A QUESTION OF WHEN, NOT IF **Interim Report**

D. R ILGEN Mar. 1985 28 p

(Contract N00014-83-K-0756)

(AD-A153298; TR-85-1, REPT-2006) Avail NTIS HC A03/MF A01 CSCL 05A

Laboratory research is discussed in terms of the contribution of laboratory research to knowledge at any given time Research is viewed as a process of trade-offs. When viewed from this perspective, it is argued that frequently laboratory research may have high utility for addressing problems relevant in the field. Dimensions or classes of trade-offs are addressed. These are: experimental setting fidelity, replication, constraints, threats to health and safety, research not possible in the field, and feasibility GRA

### N85-28959 Marconi Space Systems Ltd., Portsmouth (England) SPACE STATION STUDY Final Report

Sep. 1984 90 p (Contract A57A/1667)

(BL-6167) Avail: Issuing Activity

The benefits and disadvantages to British industry of participating in a NASA space station are discussed. The main station, free flying platforms, and transfer vehicles are described. Life science, Earth science, materials science, and astronomy applications are summarized The power, data management, communications, and remote sensing requirements of the space station are considered Author (ESA)

#### N85-29096# Joint Publications Research Service, Arlington, Va. NEW ESA DIRECTOR ON ARIANE, SPACE STATION, FUTURE TRENDS

In its West Europe Rept Sci. and Technol. (JPRS-WST-84-032) 25 Sep. 1984 p 1-4 Transl. into ENGLISH from Flug Rev. (Stuttgart), Jul. 1984 p 32-33

Avail NTIS HC A03/MF A01

An interview with the new general director of the European Space Agency (ESA) by a West Germany periodical is given. Thoughts on the policies and direction ESA will take under the new director are presented. Further development of Ariane, cooperation with NASA on the Space Station and budgeting directions are some areas explored. F.R

#### N85-29110# Joint Publications Research Service, Arlington, Va. FRG WEIGHS ESA PARTICIPATION, BUDGET ISSUES

In its West Europe Rept: Sci. and Technol. (JPRS-WST-84-037) p 15-18 27 Nov 1984 Transl. into ENGLISH from Handelsblatt (Duesseldorf), 10 Sep. 1984 p 10

Avail: NTIS HC A05/MF A01

Policies and expenditures for European space operations for many years to come are outlined The Europeans must decide in the very near future whether they want to participate in the construction of the large American space station. The decision has to be a session of the ministerial council of the European Space Agency (ESA). The construction of the large rocket suited for manned space travel, the Ariane-5, has to be decided on European finances are examined and European space expenditures are compared to the feasibility of the projects is analyzed.

E.A.K

N85-29834# Logistics Management Inst, Bethesda, Md COST SAVINGS FROM MULTIYEAR CONTRACTING Final Report, Oct. 1983 - Oct. 1984 J. S. DOMIN Oct 1984 44 p

(Contract MDA903-81-C-0166)

(AD-A153564; LMI-RE405) Avail: NTIS HC A03/MF A01 CSCL 05C

Two multilayer contracts are reviewed to determine the savings that are being realized over the cost of annual contracting for the same work, one is an Army contract with the Sikorsky Aircraft Division of United Technologies Corporation for the UH-60A BLACK HAWK helicopters and the other an Air Force contract with the General Dynamics Corporation for the F-16 multimission fighter aircraft Significant cost savings are being realized on both programs. The broadening of multiyear contracting to include requirements of all services for the same end items for spares. support equipment, and foreign military sales offers an opportunity to achieve even more cost savings than under the current contracting approach. The criteria for multiyear contracting, which include significant cost savings, stability of requirements and configuration, and confidence in contractor cost performance and capability, are found to be appropriate but vague After several years of cost experience are accumulated, multivear contract costs should be compared with those for prior annual contracts for the same systems in order to validate savings and to determine the extent to which engineering and requirements changes reduce them At that time, the criterion for stability of requirements and configuration should be tightened. GRA

#### N85-29836# North Atlantic Assembly, Brussels (Belgium). SUB-COMMITTEE ON ADVANCED TECHNOLOGY AND **TECHNOLOGY TRANSFER Interim Report** Nov. 1984 34 p

(AD-A153645) Avail NTIS HC A03/MF A01 CSCL 05D

This is the first report of the North Atlantic Assembly's Sub-Committee on Advanced Technology and Technology Transfer. The report begins with a description of the Sub-Committee's areas of interest, viz. technology transfer, high technology research, and high technology and economic growth This report concentrates on technology transfer, describing the flow of Western technology to the Eastern bloc and how this assists the Soviet Union and its allies The report then examines the differing views on East-West technology transfer and what effect this has on the transfer of technology between Alliance nations Next, there is a description of the relative technological performance of the United States and the Allies. Finally, the report draws together many of the themes raised in order to formulate some specific policy proposals intended to help resolve disagreements on technology transfer These proposals would involve reorganizing the way in which Alliance nations license high technology exports, and the creation of an Alliance technology agency both to streamline the Alliance's . exploitation of technology and to harmonize exportation policies

GRA

#### N85-29837# Naval Postgraduate School, Monterey, Calif. CAPITAL INVESTMENT MOTIVATIONAL TECHNIQUES USED BY PRIME CONTRACTORS ON SUBCONTRACTORS M.S. Thesis

K. S. HOLTSCLAW Dec 1984 177 p

(AD-A153660; AD-E401312) Avail: NTIS HC A09/MF A01 CSCL 05A

The current Acquisition Improvement Program (AIP) has focused a great deal of attention on many of the perceived management problems in the federal acquisition process. Included among these are the motivation of contractors to make productivity enhancing capital investments. Although this problem has been addressed previously by profit policy, the effect has been minimal. Most efforts have been directed at the prime contractor level with little effect to date This thesis examines the complex array of factors which result in productivity enhancing capital investment and raised the question of what has been accomplished at the subcontractor level. The research, through the use of a subcontractor survey, determined that little if any effort was expended at the prime

### 06 RESEARCH AND DEVELOPMENT

contractor level to motivate subcontractor to invest in productivity enhancing capital equipment. Until recently, subcontractors have been excluded from DOD efforts to incentivize capital investment GRA

#### N85-29841# Naval Postgraduate School, Monterey, Calif. USING INCENTIVES TO IMPROVE MAINTAINABILITY M.S. Thesis

L. FARNEN, JR. Dec. 1984 93 p

(AD-A153792) Avail: NTIS HC A05/MF A01 CSCL 05A

The objective of this thesis was to determine if contract incentives were appropriate for use in Dept. of Defense contracts for the purpose of motivating defense contractors to improve the maintainability of weapon systems under design. To accomplish the objective it was necessary to review the components of maintainability to determine appropriate targets for the incentives and to study the concepts and issues involved in the use of incentives to motivate contractor performance. The conclusions were based in part of the responses obtained during interviews conducted with Government representatives and engineering, contracting, and corporate and program management personnel from the defense industry. In addition, the incentive program in the case of the F/A-18 aircraft was reviewed and analyzed to determine the reason for its success. GRA

**N85-29979\***# National Aeronautics and Space Administration, Washington, D.C.

## INTERNATIONAL SPACE RESEARCH PERSPECTIVES OF COMMERCIALIZATION FOR GERMAN INDUSTRY

H. L. JORDAN Jul 1985 31 p Transl. into ENGLISH of "Weltraumforschung - perspektiven der kommerziellen nutzung für die deutsche industrie" Linder Hoehe, West Germany, 19 Oct. 1984 16 p Presented at Meeting of the Comm. for the Politics of Res. and Sci., Bonn, 19 Oct. 1984 Transl. by Scientific Translation Service, Santa Barbara, Calif Original document prepared by DFVLR, Linder Hoeh, West Germany (Contract NASW-4004)

(NASA-TM-77657, NAS 1 15 77657) Avail NTIS HC A03/MF A01 CSCL 22A

A brief overview of space flight activities is presented. West German contributions to satellite mapping, communication satellites, navigation, Spacelab, diffusion under weightlessness, crystal growth in space, metal bonding, and biochemistry are described. The future of the research in the space station is analyzed. B.W.

### N85-30500# Department of Energy, Washington, D C. Office of the Deputy Assistant Secretary for Renewable Energy. RENEWABLE TECHNOLOGIES PROGRAM SUMMARIES Nov. 1984 90 p

(DE85-001509, DOE/CE-0105) Avail NTIS HC A05/MF A01

The renewable energy research and development program supports development of a mix of technologies that can contribute to both energy supply and improved end-use efficiency. In allocating resources, this office is concentrating on applying federal funds only where they are most effective: in sponsoring research and development (R and D) where the potential payoff is high, but which private industry cannot be expected to pursue because the results are difficult to predict or a return on investment would require an exceptionally long time to be realized Research efforts in the following areas are summarized: active solar heating and cooling; passive and hybrid solar; photovoltaics; solar thermal; biofuels, wind; ocean energy technology, geothermal; and small-scale hydropower.

54

N85-30962\*# Gellman Research Associates, Inc., Jenkintown, Pa.

# THE ECONOMICS OF PRIVATE SECTOR R AND D DECISIONMAKING IN AERONAUTICS

20 Dec 1984 101 p refs Sponsored by NASA

(NASA-CR-176007; NAS 1.26.176007) Avail. NTIS HC A06/MF A01 CSCL 05A

Information which can be used in planning to insure commercial research and technology programs which are complementary to internally financed private sector activities are presented. The main concern is to identify the characteristics of productive projects in which firms are unlikely to invest. It is shown that: (1) if it is difficult to assess the commercial relevance of an R&D project or it it is characterized by high technical risk, or a relatively long payback period, private funding will be unlikely; and (2) if a project is large relative to the size of the firm, it is unlikely to be funded in the early stages of the R&D process. Firms tend to underinvest in projects with these characteristics.

#### N85-30964# Executive Office of the President, Washington, D. C. Office of Science and Technology Policy. NATIONAL AERONAUTICAL R AND D GOALS: TECHNOLOGY FOR AMERICA'S FUTURE

Mar 1985 10 p

Avail. NTIS HC A02/MF A01

Aeronautical research and development goals, particularly in the areas of subsonics, supersonics, and transatmospherics, are discussed. Boundary layer control, flight control, powder metallurgy, and composite aircraft structures are among the areas identified as requiring development. R.J.F

### N85-30980# Committee on Appropriations (U S House) NATIONAL AERONAUTICS AND SPACE ADMINISTRATION In its Dept. of Housing and Urban Develop.-Independent Agencies Appropriation Bill, 1986 p 41-47 1985

Avail: US Capitol, House Document Room

Research and development activities in the areas of remote sensing, space science, materials processing, spacecraft communication and agronautics technology are summarized Budget information is also presented for the construction of facilities and the space flight control and data communications effort.

B.W

 $\textbf{N85-31149}^{\star}\#$  National Aeronautics and Space Administration, Washington, D.C

## NASA SPACE CONTROLS RESEARCH AND TECHNOLOGY PROGRAM

D E MCIVER and R W KEY *In* JPL Proc. of the Workshop on Identification and Control of Flexible Space Struct., Vol. 1 p 1-11 1 Apr. 1985

Avail. NTIS HC A20/MF A01 CSCL 05A

The NASA technological organization is outlined. The Office of Aeronautics and Space Technology (OAST) is one of the four major technical offices that comprise NASA. The Office of Space Science and Applications administers programs directed towards using space-based or related techniques to further understanding of the total universe and to apply that understanding to practical applications in such areas as Astrophysics, Solar System exploration, Earth Sciences, Life Sciences, Communications and Information Systems. The Office of Space Flight administers the programs for all U.S. civil launch capability, plus Spacelab development and operations. The Office of Space Tracking & Data Systems administers the programs that operate and maintain a world-wide network of facilities for data acquisition, processing, and ground to spacecraft communications for all NASA missions. The OAST has primary responsibility within NASA for conducting space research and technology development to support commercial and military as well as NASA space interests EA.K.

N85-31215# Office of Technology Assessment, Washington, D.C.

# CIVILIAN SPACE STATIONS AND THE US FUTURE IN SPACE Summary Report

1985 34 p

(OTA-STI-242) Avail: NTIS HC A03/MF A01

The OTA assessment of Civilian Space Stations and the US Future in Space was studied. The study covered the essential technical issues surrounding the selection and acquisition of infrastructure in space, and enables Congress to look beyond these matters to the large context. A set of possible space goals and objectives that demonstrate the diverse opportunities open to us at this time was proposed. E.A.K.

N85-31217# Societe Nationale Industrielle Aerospatiale, Les Mureaux (France). Div. Systemes Balistiques et Spatiaux. STUDIES TOWARD A MANNED SPACE STATION: PARTICIPATION OF EUROPEAN INDUSTRY IN NASA SPACE STATION (MSS) Final Report

Paris ESA 5 Aug. 1983 69 p refs (Contract ESA-5307/82/F)

(SNIAS-S/DT-Y-25-212; ESA-CR(P)-2018) Avail NTIS HC A04/MF A01

Manned space station (MSS) mission analysis and the design of a small orbital transfer vehicle for a wide range of missions (rendezvous, servicing, retrieval) called the Self-Propelled Teleoperator (SPT) are summarized. The launching of a large cryogenic orbital transfer vehicle (OTV) from the MSS<sup>-</sup> fueling, mechanical handling, integration, check-out, and flight monitoring is discussed. Space station architecture and the establishment of design driver criteria are considered. The study shows that even where European technologies are comparable to American ones, cooperation must be limited to European firms acting as subcontractors to NASA or US firms, rather than at a transnational European level. At the European level, development of SPT and other teleoperated vehicles satisfies criteria for program size, interface definition, European ability, multiplicity of participants favoring money redistribution, and compatibility of planning schedules Commonality of mission with a European automatic platform is an advantage Author (ESA)

## **N85-31676**# Environmental Protection Agency, Washington, D.C. Office of Research and Development.

EPA (ENVIRONMENTAL PROTECTION AGENCY) RESEARCH PROGRAM GUIDE, FY-1985, OCTOBER 1, 1984 - SEPTEMBER 30, 1985

Oct. 1984 75 p

(PB85-181881; EPA-600/9-84-024) Avail NTIS HC A04/MF A01 CSCL 13B

The descriptions contained in this research program guide are organized by medium such as air, water, or hazardous waste. Each description is a broad summary of the research being done, where that research is being done, who to contact for more information about the program, and both the approximate total funding for that area, and the percentage of total funding which is reserved for in house research is spent through extramural contracts, grants and cooperative agreements. Author (GRA)

N85-31836# Research Inst. of National Defence, Stockholm (Sweden).

#### HUMAN FACTORS ENGINEERING CONTRACTS IN SWEDEN: AN OVERVIEW

H. FURUSTIG Dec. 1984 72 p In SWEDISH, ENGLISH summary Sponsored by National Defence Research Institute and Swedish Work Environment Fund

(FOA-C-56043-H2; ISSN-0347-7665) Avail: NTIS HC A04/MF A01

Mapping of human contacts in Sweden, and an inventory of important sources of human factors data, are reported Impressive human factors resources in Sweden are identified. Building up effective contact networks may decrease unnecessary duplication of work. Universities, institutes and centers, research authorities, supervising and regulating authorities, consultants and societies are covered. Author (ESA)

N85-32021 Elliott-Automation Space and Advanced Military Systems Ltd., Camberley (England) Weapons Systems Div. THE DEVELOPMENT OF COMPLEX SYSTEMS

D. ODWYER 1984 31 p Presented at Marconi 84, 30 Oct. - 1 Nov. 1984

Avail: Issuing Activity

The need for a well structured and carefully controlled development program to reduce the risks inherent in the development of complex systems is discussed Aspects of the Tornado avionics development program are illustrated

Author (ESA)

**N85-32034**# Van der Meer en Van Tilburg, Innovatie Adviesburo, Enschede (Netherlands)

#### SPIN-OFFS FROM TECHNICAL SCIENTIFIC INFRASTRUCTURES, NO. 1 [SPIN-OFFS UIT TECHNISCHE WETENSCHAPPELIJKE INFRASTRUCTURE]

J D VANDERMEER, J. J. VANTILBURG, and F. PRAKKE (TNO-Studiecentrum voor Technologie en Beleid) 1983 135 p refs In DUTCH, ENGLISH summary Sponsored by Netherlands Ministry of Economic Affairs 3 Vol

Avail: NTIS HC A07/MF A01

University activities and plans, hindrances, and possible governemental stimulation concerning university spin-offs, i.e., new firms of direct university origin, are investigated. In general the attitude of the universities is rather passive Only in universities with an accent on applied sciences or with a regional tie are activities developed, by a few highly motivated persons with limited resources Author (ESA)

**N85-32035**# Van der Meer en Van Tilburg, Innovatie Adviesburo, Enschede (Netherlands)

#### SPIN-OFFS FROM TECHNICAL COMMERCIAL INFRASTRUCTURES, NO. 2 [SPIN-OFFS 2 UIT TECHNISCHE KOMMERCIELE INFRASTRUKTUREN]

J. D VANDERMEER and J. J. VANTILBURG Feb. 1983 202 p Sponsored by Netherlands Ministry of Economic Affairs 3 Vol Avail NTIS HC A10/MF A01

Company activities and attitudes, problems, and possible governmental stimulation concerning spin-off enterprises from technical commercial infrastructures are investigated. One or more persons of 40 large companies were interviewed. Author (ESA)

**N85-32036**# Van der Meer en Van Tilburg, Innovatie Adviesburo, Enschede (Netherlands)

### SPIN-OFFS FROM TECHNICAL SCIENTIFIC RESEARCH ORGANIZATIONS, NO. 5 [SPIN-OFFS 3 UIT TECHNISCHE WETENSCHAPPELIJKE ONDERZOEKSORGANISATIES]

J. D VANDERMEER, F. KOWSOLEEA, and J. J. VANTILBURG Jun. 1983 139 p refs In DUTCH; ENGLISH summary Sponsored by Netherlands Ministry of Economic Affairs 3 Vol

Avail NTIS HC A07/MF A01

Technical/scientific research organization activities and attitudes, problems, and possible governmental stimulation concerning spin-offs, are investigated. Representatives of 13 companies were interviewed. Author (ESA)

#### N85-32802# Naval Postgraduate School, Monterey, Calif AN AUTOMATED QUALITY ASSURANCE SURVEILLANCE PLAN FOR ADP (AUTOMATED DATA PROCESSING) OPERATIONS UNDER THE NAVY'S COMMERCIAL ACTIVITIES PROGRAM M.S. Thesis

H. E. MORTON Dec. 1984 177 p

(AD-A154767) Avail. NTIS HC A09/MF A01 CSCL 09B

This thesis documents the process whereby a Navy Regional Data Automation Center implements an automated quality assurance program to ensure proper performance of a commercial service contract by a civilian contractor. The feasibility of implementing MIL-STD-105D on microcomputers is examined, along with the software tools necessary for that implementation. Finally, a system design and programs to effect such an implementation are proposed GRA

N85-33038# Office of Naval Research, London (England). SPACE RESEARCH IN THE UNITED KINGDOM: AN ASSESSMENT

N. F. NESS 19 Apr. 1985 6 p

(AD-A155334; ONRL-R-1-85) Avail NTIS HC A02/MF A01 CSCL 03A

This report examines the history and funding of UK (United Kingdom) space research, discusses work in disciplines such as astronomy and astrophysics, solar system studies, and terrestrial studies, and considers prospects for the future GRA

N85-34153\*# National Academy of Sciences - National Research Council, Washington, D. C. Commission on Engineering and Technical Systems.

SPACE STATION ENGINEERING AND TECHNOLOGY DEVELOPMENT: PROCEEDINGS OF THE PANEL ON IN-SPACE ENGINEERING RESEARCH AND TECHNOLOGY DEVELOPMENT

May 1985 194 p Proc. held in Hampton, Va., 21-22 May 1985 (Contract NASW-4003)

(NASA-CR-176110; NAS 1 26:176110) Avail: NTIS HC A09/MF A01 CSCL 22B

In 1984 the ad hoc committee on Space Station Engineering and Technology Development of the Aeronautics and Space Engineering Board (ASEB) conducted a review of the National Aeronautics and Space Administration's (NASA's) space station program planning. The review addressed the initial operating configuration (IOC) of the station. The ASEB has reconstituted the ad hoc committee which then established panels to address each specific related subject. The participants of the panels come from the committee, industry, and universities The proceedings of the Panel on In Space Engineering Research and Technology Development are presented in this report. Activities, and plans for identifying and developing R&T programs to be conducted by the space station and related in space support needs including module requirements are addressed. Consideration is given to use of the station for R&T for other government agencies, universities, and industry. B W

N85-34560# Sao Paulo Univ. (Brazil) Electrical Engineering Dept.

#### **PROJECT MANAGEMENT USING GRAPHICS**

F. PETTINATI In Canadian Information Processing Society Graphics Interface 1985 p 265-272 1985 refs Avail: NTIS HC A19/MF A01

The problem of lack of visualization most managers face when using computer-based project control systems is addressed Although highly relevant information is generated, usually no graphical output is produced A system called UniPert that automatically produces high quality drawings showing all activities present in a project and the relationship between them is presented. The UniPert's major components and algorithms are described and examples of its actual use are presented. The integration of many different techniques and concepts that led to the development of the UniPert system are outlined E.A.K.

N85-34718# Department of Energy, Washington, D. C. Office of Project and Facilities Management.

# ANALYZING PERFORMANCE OF SMALL PROJECTS USING URS AND PMAS, INFORMATION PAMPHLET

Mar. 1985 64 p

(DE85-011964; DOE/MA-0184) Avail: NTIS HC A04/MF A01

Some basic tools used in the analysis of small project performance, the Uniform Reporting System (URS) and the Performance Measurement Analysis System (PMAS) are addressed. The flexibility inherent in the URS allows DOE project managers the latitude to negotiate with contractors several key elements in contract performance measurement Through reviews of management systems documentation, analysis of reports, orientation briefings, and site visits, the project team can obtain a good understanding of how the contractor plans and controls work. This knowledge assists them in performing data analysis by understanding how the data is put together. The key performance measurement data, which are taken or calculated from the cost and schedule report, quantifies the overall effect of the small problems that the project manager frequently deals with. The PMAS easily permits management to periodically focus on contract performance trends and forecast contract cost at completion by using simple graphic displays and supporting reports. DOE

#### **N85-34721#** Committee on Appropriations (U. S. Senate). **NATIONAL AERONAUTICS AND SPACE ADMINISTRATION RESEARCH AND DEVELOPMENT: PROGRAM DESCRIPTION** *In its* Dept. of Housing and Urban Develop. Independent Agencies Appropriation Bill, 1986 p 62-71 1985

Avail US Capitol, Senate Document Room

Appropriations for various NASA research programs are discussed. Space science and applications, space shuttles, space stations, the Hubble space elescope, and spacecraft tracking are among the topics discussed. Funding recommendations of the Committee are given. R.J.F

 $\ensuremath{\texttt{N85-35145^*}\#}$  National Aeronautics and Space Administration, Washington, D.C.

#### MANAGEMENT OF LARGE-SCALE TECHNOLOGY

A. LEVINE *In its* A Spacefaring People p 39-53 1985 refs Avail NTIS HC A08/MF A01; also available SOD HC \$3 50 as 033-000-009-33-0 CSCL 05A

Two major themes are addressed in this assessment of the management of large-scale NASA programs (1) how a high technology agency was a decade marked by a rapid expansion of funds and manpower in the first half and almost as rapid contraction in the second, and (2) how NASA combined central planning and control with decentralized project execution R.J.F.

#### N85-35167# European Space Agency, Paris (France). RESEARCH REPORT PROGRAM OF THE US ARMY IN EUROPE

S H. LEHNIGK *In its* Lectures of a Flight Mech. Conf. (DFVLR-Mitt-83-05) p 18-24 Jul. 1984 Transl. into ENGLISH from "Vortraege eines Flugmechanik-Kolloquiums" rept. DFVLR-Mitt-83-05 DFVLR, Brunswick, Jul. 1983 p 21-27 Original language document was announced as N84-16122

Avail: NTIS HC A06/MF A01; original German version available from DFVLR, Cologne DM 39.20

The US research liaison office for in Europe is described. Activities include chemistry, biology, computer sciencs, electronics, mechanics, fluid mechanics, materials science, mathematics, physics, and behavioral science. Author (ESA)

#### N85-35168# European Space Agency, Paris (France) NEW TECHNOLOGIES AT THE FOREFRONT OF INDUSTRIAL DEVELOPMENTS

H. ULKE *In its* Lectures of a Flight Mech Conf. (DFVLR-Mitt-83-05) p 25-41 Jul. 1984 Transl. into ENGLISH from Vortraege eines Flugmechanik-Kolloquiums'' rept. DFVLR-Mitt-83-05 DFVLR, Brunswick, Jul. 1983 p 29-46 Original language document was announced as N84-16123

Avail NTIS HC A06/MF A01; original German version available from DFVLR, Cologne DM 39.20

Dornier's efforts to introduce the findings of aeronautics and astronautics into a broad spectrum of technical processes are described Development trends in electronics using microprocessors are reviewed. They result in a higher technical performance, a cost reduction, and savings of energy and raw materials. In the domain of energy technology, heat pipes developed for satellites are used in solar energy systems; an energy saving system to produce hydrogen from water using high temperature vapor phase electrolysis (Hot Elly) was developed Medical equipment for renal calculus therapy using shock waves Author (ESA) was developed.

N85-35810# DOD Product Engineering Services Office, Alexandria, Va

DOD VALUE ENGINEERING CONFERENCE REPORT. VALUE ENGINEERING (VE): A TOOL THAT BENEFITS LINE MANAGEMENT HELD AT LEESBURG, VIRGINIA ON 1-2 NOVEMBER 1984. PART 1. EXECUTIVE SUMMARY G. FRANK and L PAULSON Jun. 1985 17 p Conf. held at Leesburg, Va, 1-2 Nov 1984

(AD-A156067) Avail NTIS HC A02/MF A01 CSCL 05A

This Conference Report summarizes and consolidates the proceedings from the 1984 DOD Value Engineering Conference held 1 through 2 November in Leesburg, VA The findings and recommendations with supporting material from the five workshops are provided in addition to the complete plenary session presentations. An Executive Summary is presented in Part 1 Proposed actions include. Up-Front Funding, VECP Processing Time, VECP Approval/Disapproval, VE Training, Improvement of Communication, Accounting for VE Savings, and VE as Performance Review Item. GRA

N85-35811# DOD Product Engineering Services Office, Alexandria, Va

DOD VALUE ENGINEERING CONFERENCE REPORT. VALUE ENGINEERING (VE): A TOOL THAT BENEFITS LINE MANAGEMENT HELD AT LEESBURG, VIRGINIA ON 1-2 NOVEMBER 1984. PART 2. PLENARY SESSION

G FRANK and L. PAULSON Jun. 1985 246 p Conf. held at Leesburg, Va, 1-2 Nov. 1984

(AD-A156068) Avail: NTIS HC A11/MF A01 CSCL 05A

This Conference Report summarizes and consolidates the proceedings from the 1984 DOD Value Engineering Conference held 1 through 2 November in Leesburg, VA. The findings and recommendations with supporting material from the five workshops are provided in addition to the complete plenary session presentations. An Executive Summary is presented in Part 1. Plenary Session: Moving Value Engineering Conference, The Hughes Aircraft Company Approach to Value Engineering, E-3A Value Engineering, FMC Value Engineering Program, FAR/DoD FAR Supplement, VECPs - the IG View, Collateral Savings - The Real Challenge, Where's the Map?, and A Value Engineering Coordinator's Preception of the DOD Value Engineering material GRA

N85-35812# DOD Product Engineering Services Office, Alexandria, Va.

DOD VALUE ENGINEERING CONFERENCE REPORT. VALUE ENGINEERING (VE): A TOOL THAT BENEFITS LINE MANAGEMENT. PART 3, WORKSHOP A: VE IN THE PROGRAM OFFICE

G. FRANK and L PAULSON Jun. 1985 39 p Workshop held at Leesburg, Va., 1-2 Nov. 1984 7 Vol

(AD-A156069) Avail: NTIS HC A03/MF A01 CSCL 05A

Part 3 of the 1984 DOD Value Engineering (VE) Conference held 1 to 2 November in Leesburg, Va., included reports on VE Program Managers and 'VE and the R&D Engineer.' The first of these exhorts the VE manager to make vigorous use of VE methodology to reduce defense expenditures in this area of operation The second report recommends that the R&D Engineer share in the savings brought about through the implementation of VE. F.M.R

N85-35813# DOD Product Engineering Services Office, Alexandria, Va.

DOD VALUE ENGINEERING CONFERENCE REPORT. VALUE ENGINEERING (VE): A TOOL THAT BENEFITS LINE MANAGEMENT. PART 4, WORKSHOP B: VE ON SPARE PARTS

G FRANK and L. PAULSON Jun. 1985 190 p Workshop held at Leesburg, Va., 1-2 Nov 1984 7 Vol.

(AD-A156070) Avail: NTIS HC A09/MF A01 CSCL 05A

Part 4 of the 1984 DOD Value Engineering, (VE) Conference held 1 to 2 Nov in Leesburg, Va., included the following papers concerning the procurement and utilization of spare parts. Talking Paper on Spare Parts, Spare Parts Acquisition; Buy Our Spare Parts Smart (BOSS), Contracting and Manufacturing; DLA Value Engineering and Competition; Reverse Engineering, Standardization of 400 Volt input Power Cable, and, GIDEP/VEDISARS F.M.R.

**N85-35814**# DOD Product Engineering Services Office, Alexandria, Va.

DOD VALUE ENGINEERING CONFERENCE REPORT. VALUE ENGINEERING (VE): A TOOL THAT BENEFITS LINE MANAGEMENT. PART 5, WORKSHOP C: VEP/VECP ADMINISTRATION, NEGOTIATION, AND IMPLEMENTATION

G. FRANK and L PAULSON Jun 1985 24 p Workshop held at Lessburg, Va , 1-2 Nov. 1984 7 Vol.

(AD-A156071) Avail: NTIS HC A02/MF A01 CSCL 05A

Part 5 of the 1884 DOD Value Engineering (VE) Conference held 1 to 2 Nov. in Leesburg, Va., discussed Value Engineering Program (VEP)/ Value Engineering Change Concept (VECP) Administration, Negotiation, and implementation. The VECP is a proposal from a DOD VE Project Officer that a contractor modify and element of an ongoing defense contract with a view toward reducing the latter's cost to the country. F.M R.

**N85-35815**# DOD Product Engineering Services Office, Alexandria, Va.

DOD VALUE ENGINEERING CONFERENCE REPORT. VALUE ENGINEERING (VE): A TOOL THAT BENEFITS LINE MANAGEMENT. PART 6, WORKSHOP D: VE TRAINING-ORIENTATION

G. FRANK and L PAULSON Jun. 1985 29 p Workshop held at Leesburg, Va., 1-2 Nov 1984 7 Vol.

(AD-A156072) Avail: NTIS HC A03/MF A01 CSCL 05A

This Conference Report summarizes and consolidates the proceedings from the 1984 DoD Value Engineering Conference held 1 to 2 November in Leesburg, VA. The findings and recommendations with supporting material from the five workshops are provided in addition to the complete plenary session presentations. An Executive Summary is presented in Part 1. Part 6-Workshop D: VE Training/Orientation. GRA

**N85-35816**# DOD Product Engineering Services Office, Alexandria, Va.

DOD VALUE ENGINEERING CONFERENCE REPORT. VALUE ENGINEERING (VE): A TOOL THAT BENEFITS LINE MANAGEMENT. PART 7, WORKSHOP E: VE IN CONSTRUCTION AND ARCHITECT ENGINEER CONTRACTS

G. FRANK and L. PAULSON Jun. 1985 52 p Workshop held at Leesburg, Va, 1-2 Nov 1984 7 Vol.

(AD-A156073) Avail: NTIS HC A04/MF A01 CSCL 05A

This Conference Report summarizes and consolidates the proceedings from the 1984 DoD Value Engineering Conference held 1 to 2 November in Leesburg, VA. The findings and recommendations with supporting material from the five workshops are provided in addition to the complete plenary session presentations. An Executive Summary is presented in Part 1. Part 7-Workshop E VE in Construction and Architect Engineer Contracts papers include: Value Engineering Program, Scope of Work for Open-End Contract for Value Engineering Services, A/E Restrictions - Things Beyond His Control, DoD Directive 4245 8, FAR 52.248 With Recommended Changes, 1983 Annual Report of the Deputy Assistant Secretary of Defense Installations. GRA

N85-35829# Committee on Science and Technology (U. S. House).

THE 1986 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION

Washington GPO 1985 1543 p Hearings before the Subcomm. on Space Sci. and Appl of the Comm. on Sci. and Technol., 99th Congr., 1st Sess., 6, 19-21, 26, 28 Feb. and 5-7, 26 Mar 1985

(GPO-47-635) Avail: Subcommittee on Space Science and Applications

On Feb 6, 1985, Mr. James Beggs, NASA Administrator, presented the 1986 budget for his agency before the Subcommittee

## 07 ECONOMICS, COSTS AND MARKETS

of Space Science and Applications of the Committee on Science and Technology, U.S. House of Representatives. The total NASA request is \$7.9 billion, of which 2.9 billion is for research and development, 3.5 billion for space flight, control and data communications, 149 million of construction of facilities, and 1.3 billion for research and program management. This budget will provide for solid progress toward the aeronautics and space objectives of the Administration and the Congress F.M.R.

### 07

### ECONOMICS, COSTS AND MARKETS

Includes Costs and Cost Analysis, Cost Control and Cost Effectiveness, Productivity and Efficiency, Economics and Trade, Financial Management and Finance, Investments, Value and Risk (Monetary), Budgets and Budgeting, Marketing and Market Research, Consumerism, Purchasing, Sales, Commercialization, Competition, Accounting.

### A85-11349

#### DISTRIBUTED PHOTOVOLTAIC SYSTEM IMPACT UPON UTILITY LOAD/SUPPLY MANAGEMENT PRACTICES

G J. VACHTSEVANOS (Thrace, University, Xanthi, Greece; Georgia Institute of Technology, Atlanta, GA), A. P. MELIOPOULOS, and B. K. PARASKEVOPOULOS (Georgia Institute of Technology, Atlanta, GA) IN: Photovoltaic Solar Energy Conference, Proceedings of the Fifth International Conference, Athens, Greece, October 17-21, 1983. Dordrecht, D. Reidel Publishing Co, 1984, p. 383-387 refs

A methodology is described for simulation of the economic and technical factors of photovoltaic (PV) installations interfacing with utility load/management operations. A probabalistic technique is used to model the expected demand, reliability of the generating units, costs and profits from each unit, expected unserviced energy, and the loss of load probability. The available power from PV arrays is treated stochastically with statistical weighting on the basis of site meteorological data. The goal is to include the PV power while minimizing operational costs, taking into account the level of penetration of the total PV output. Two sample simulations for a utility with a diverse generating mix demonstrate that overall costs would decrease in both cases with PVs on-line through the emphasis on cheaper-fueled generators and peak-load shaving when possible. M.S.K

A85-11425\* Jet Propulsion Lab., California Inst of Tech., Pasadena.

#### POLYCRYSTALLINE SILICON MATERIAL AVAILABILITY AND MARKET PRICING OUTLOOK FOR 1980 THROUGH 1988

E. N. COSTOGUE and R. R. FERBER (California Institute of Technology, Jet Propulsion Laboratory, Photovoltaic Program Technology Development and Application Lead Center, Pasadena, CA) IN: Photovoltaic Solar Energy Conference, Proceedings of the Fifth International Conference, Athens, Greece, October 17-21, 1983. Dordrecht, D. Reidel Publishing Co., 1984, p. 1027-1031 Research sponsored by the U.S. Department of Energy and NASA.

The results of the second JPL update to an original report to assess the availability and prices of polycrystalline Si for solar cells in the 1983-88 interval are reported. It is noted that the demand for poly-Si for solar cells competes with the demand for the same material rejected from the semiconductors, although the solar cell industry can use material rejected for the 6 yr period, rising from 3224 metric tons to 10,220 metric tons in 1988, with prices dropping from the 1980 level of \$140/kg to \$25/kg. The price reduction and improved production are noted to be due in large part to DOE efforts at defining lower-cost production processes. M.S.K.

### A85-12502#

#### SPACE EXPLOITATION - SPACELAB AN EASY APPROACH FOR DEVELOPING COUNTRIES: PROSPECTIVES AND SUGGESTIONS BY AERITALIA

E VALLERANI (Aeritalia S p.A., Turin, Italy) IN: International Scientific Conference on Space, 23rd, Rome, Italy, March 24, 25, 1983, Proceedings . Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1984, p. 45-49.

The problem of access by developing countries to space information and resources is discussed from the Italian point of view. The international cooperation involved in the development of IRIS, Spacelab, and Eureca is considered, the ongoing commercialization of space in the STS, Anane, and Space Station programs is examined; and the need for careful planning and preparation in the developing countries to take advantage of future space-exploitation opportunities is stressed. It is proposed that Italian universities and industry provide assistance in training personnel and designing payloads to meet the needs of developing countries. T K.

A85-12507\*# National Aeronautics and Space Administration, Washington, D C

#### INTERNATIONAL COOPERATION IN THE COMMERCIAL ERA OF SPACE

R. F. ALLNUTT (NASA, Washington, DC) IN: International Scientific Conference on Space, 23rd, Rome, Italy, March 24, 25, 1983, Proceedings Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1984, p. 147-158

NASA plans permitting international participation in space activities are reviewed, with an emphasis on the increasing commercialization of these endeavors. The potential indicated by the recent success of the STS, long-term and large-scale Soviet missions, and the Ariane launcher is discussed; the development of the Space Station concept is traced; the increasing use of remote-sensing and telecommunications satellites is documented; currently planned space science missions are listed; and the NASA policy on international cooperation (full payment by the second nation, clean payload-spacecraft interfaces to prevent technology transfer, and open availability of scientific results) is outlined. It is argued that space activity, having passed through first and second phases dominated by exploration and military goals, respectively, will now soon enter a primarily commercial phase, with competition in telecommunications and remote-sensing services and private investment in space processing, manufacturing, and even launchers. T.K.

#### A85-12979# COST EFFECTIVE LAUNCH TECHNOLOGY FOR COMMUNICATIONS SATELLITES

T. C. TAYLOR (Taylor and Associates, Inc., Wrightwood, CA) and A. OVERMAN International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct 7-13, 1984 10 p. refs

(IAF PAPER 84-04)

The present investigation is concerned with the possibility to reduce the costs for placing satellites in orbit by making use of an 'Air Launch' system. It is pointed out that the launching of rockets to orbit from aircraft in flight has been done successfully. It is suggested to modify the existing technology for the purpose of launching communications satellites and other payloads to orbit. Thus, the Air Launch Concept combines aircraft and missile technologies to produce a method of transport to orbit. A heavy lift cargo aircraft is employed to fly a rocket and the satellite payload to a specific location at the service ceiling of the aircraft. Attention is given to aspects of cost reduction, commercial and technical benefits, the anticipated market, and technical details.

**A85-12991\***# National Aeronautics and Space Administration, Washington, D.C.

## SPACE STATION - AN OVERVIEW OF CURRENT U.S. ACTIVITIES

R. F. FREITAG (NASA, Office of Space Station, Policy and Plans Office, Washington, DC) International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct. 7-13, 1984. 11 p.

(IAF PAPER 84-22)

The National Aeronautics and Space Administration (NASA) has begun developing a permanently manned Space Station as mandated by President Reagan. The Space Station will be operational within a decade and is the 'Next Logical Step' in America's space program. This paper presents a summary of the Space Station status, current planning guidelines, and the possibilities for international participation in the program. The conceptual architecture and evolutionary development options for the Space Station are also briefly discussed Author

#### A85-13138#

## GOVERNMENT TOOLS FOR THE SUPPORT OF COMMERCIAL VENTURES

J S GREENBERG (Princeton Synergetics, Inc., Princeton, NJ) International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct. 7-13, 1984. 11 p. refs

#### (IAF PAPER 84-216)

A vast array of government programs are undertaken with the specific objective of developing technology and/or creating the environment which will lead to increased private sector investmeent and the formation of commercial ventures which are in the public interest. These include R&D and demonstration programs, taxation (including tax credits, depreciation rules and R&D limited partnerships), subsidization (including joint endeavor agreements, revenue subsidization, recoupment and pricing policies), low interest loans/bonds, loan guarantees, regulation, setting of standards, information dissemination, patents/proprietary rights and institutional arrangements. These are described and areas of influence are discussed. The assessment of joint endeavor agreements and divestitures is described in some detail from the point of view of establishing negotiating positions.

**A85-13139\*#** National Aeronautics and Space Administration, Washington, D.C.

NASA'S APPROACH TO THE COMMERCIAL USE OF SPACE I. T. GILLAM, IV (NASA, Washington, DC) International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct 7-13, 1984. 6 p. (IAF PAPER 84-217)

NASA planning activities in the area of commercial development of space resources are reviewed. Examples of specific types of commercial space ventures are given, according to three different categories: new commercial high-technology ventures, new commercial application of existing space technology, and commercial ventures resulting from the transfer of existing space programs to the private sector Basic objectives for reducing technical, financial and institutional risks for commercial space operations are considered. Attention is given to the cooperative working environment encouraged by Joint Endeavor Agreements (JEAs) and Technical Exchange Agreements (TEAs) between industrial organizations in the development of space systems. Benefits of the commercial development of space resources include the production of purer pharmaceuticals for the treatment of cancers, kidney diseases, and diabetes; and the development of ultra-pure semiconductor crystals for use in next generation electronic equipment. IH.

#### A85-13142#

## ACTIVITIES IN GERMANY FOR THE COMMERCIALIZATION OF SPACE

P KLEBER (Deutsche Forschungs- und Versuchsanstalt fuer Luftund Raumfahrt, Cologne, West Germany) International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct. 7-13, 1984 7 p (IAF PAPER 84-222)

The benefits space has to offer to industrial concerns are discussed with an eye to methods of arousing greater industrial participation. Future technological development hinges on exploitation of the microgravity environment, particularly the free fall produced by blancing the spacecraft velocity against the centripetal force Preliminary experimentation growing single crystals, studying diffusion in materials, the growth of living, cells, etc., must be expanded upon by inducing further trials by more industrial investigators Interest can be heightened through media advertizing, direct mailing, personal contact, and exhibits at industrial fairs. Industrial interest is most likely in the fields of metallic materials, electronics, chemistry, pharmaceuticals, and basic research. The promotions should be targeted at raising

M.S.K.

#### A85-13233#

### **ORIENTATION AND TRENDS IN EUROPEAN TECHNOLOGY**

executive-level awareness of the possibilities space offers

H. STOEWER (ESA, Systems Engineering Dept., Noordwijk, Netherlands) International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct. 7-13, 1984. 13 p.

(IAF PAPER 84-377)

The current status and future directions of technology development programs under the direction of the ESA Space Research and Technology Center and on a national level in the ESA member states are surveyed in a number of charts and tables and briefly characterized Areas examined include data handling, power generation, structures, controls, software, and robotics, to serve missions including earth-space telematics, the Telecom system, terrestrial remote sensing, deep-space exploration and observation, microgravity utilization, space platforms, and in-orbit operations.

#### A85-13914

#### THE FIRST SPACE PRODUCT

J BIRD Spaceflight (ISSN 0038-6340), vol 26, Nov. 1984, p. 422, 423

The processing and applications of the latex spheres manufactured in the monodisperse latex reactor (MLR) flown on six STS missions are described. Spheres of 2 microns diameter are first made on earth, then placed in the MLR on the Shuttle to begin heated chemical reactions, which are accelerated once the spacecraft is in space. Uniform batches of 30 microns diameter spheres have thus far been obtained. Spheres formed on earth lack uniformity, which is high enough with the space-processed spheres that they can be used to calibrate microscopes or be injected in blood to trace circulation. The spheres are about to be marketed at \$20,000/oz., and have been certified as reference material by the National Bureau of Standards. M.S.K.

### A85-14923

### FINANCING SPACE INDUSTRIALIZATION

S M COHN and C. A. COHN Space World (ISSN 0038-6332), vol. U-11-251, Nov. 1984, p. 4-9.

The components of an infrastructure for space industrialization and the methods of financing it are described. Phases of financing involve the government formation of a partnership between government and private industry and space industrialists operating independently The Taxpayer Stock Corporation, which may be an alternative to forced financial support of a space infrastructure, and the Space Industrialization Corporation are discussed An opinion survey on the many uses of space, part of which sampled the public at large regarding space industrialization, and the results of an experiment carried out on Space Shuttle flights, involving the production of uniform and precise latex particles to be used as a standard for calibrating sensitive scientific instruments, have been examined. M.D.

### A85-15463#

## INTELSAT BUSINESS SERVICES

J LEE, M. CUMMINS, S. JAMSHIDI, and L. PERILLAN (International Telecommunications Satellite Organization, Washington, DC) IN: International Conference on Digital Satellite Communications, 6th, Phoenix, AZ, September 19-23, 1983, Proceedings . New York, Institute of Electrical and Electronics Engineers, 1983, p. III-1 to III-11.

A new international digital business service will soon be introduced by Intelsat that will include videoconferencing, data transfer, high-speed facsimile, electronic mail, remote printing, and voice applications. This paper presents the background information concerning the development of the global Intelsat Business Services (IBS). It addresses the potential international market, service concept and service features. Considerations pertaining to system design such as space segment provision, network concepts and network interconnect architectures are discussed Finally, a transmission analysis relating to the Standard E and F earth stations, which would be used to carry IBS in the K-band and C-band, respectively, is presented.

### A85-16303

## COMMERCIAL UTILISATION OF SPACE - NEW BUSINESS OPPORTUNITIES

L. BELLAGAMBA and K. H. ROBINETT (Rockwell International Corp., Downey, CA) British Interplanetary Society, Journal (Space Technology) (ISSN 0007-084X), vol. 37, Dec. 1984, p. 541-546

This paper identifies exploitable space resources which allow for commercialization. Commercial utilization of space implies private industry ownership and operation of facilities in space to produce goods or to provide services for profit The tier structure of the industry and the forces creating this structure are explained The authors argue that widespread involvement should be welcomed by participants, as it lowers the entry risk to all. Simple. but useful, procedures are presented to estimate the development and operating costs of a new space business. To serve as illustrative examples, the charters, customers, products, facilities, and profitability potentials of several space station business opportunities are summarized The market, legal and institutional issues which may pose barriers to commercial utilization of space are discussed. Finally, some actions are recommended for managers interested in pursuing their own commercial space opportunities. Author

#### A85-17778

## A SURVEY OF TECHNOLOGY ASSESSMENT ACTIVITIES IN SELECTED U.S. CORPORATIONS

K. KAWAMURA (Vanderbilt University, Nashville, TN) Engineering Management International (ISSN 0167-5419), vol. 2, March 1984, p. 87-99.

This article presents the results of a survey on industrial practices of technology assessment (TA). The objective of the survey was to elicit qualitative responses to determine the role of technology assessment in corporate planning and decision making as applied by certain selected corporations in the U.S.A. Following the survey process used, the responses are summarized according to the questions used in the survey. Then the responses are analyzed in the following categories: technology assessment and corporate planning; organizational aspects of industrial practices; use of technology assessment results; and reasons for use or lack of use of TA. Finally some important characteristics are presented which show the way technology assessment is currently viewed and practiced in the corporations surveyed.

A85-20642#

COMMERCIALIZATION OF REMOTE SENSING DATA - ITS IMPACT ON THE CONTINUITY AND ACCESSIBILITY OF REMOTE SENSING DATA, INCLUDING RESPONSE TO STANDING ORDERS AS WELL AS ON THE STANDARDIZATION OF PRODUCTS

G. BRACHET (SPOT IMAGE, Toulouse, France) United Nations, International Meeting of Experts on Remote Sensing Information Systems, Feldafing and Oberpfaffenhoven, West Germany, May 7-11, 1984, Paper. 14 p

### A85-24653

## SPACE INDUSTRIALIZATION AND THE SOCIAL AGENDA

J. D SALMON (West Florida, University, Pensacola, FL) Space Solar Power Review (ISSN 0191-9067), vol 4, 1983, p. 273-283. refs

Design of a political and economic regime for exploitation of space resources is complicated by disputes, frequently ideological, over how or whether to combine private enterprise and governmental enterprise, national vs. international controls, and the relative roles of rich and poor nations. Historical experience in opening 'new worlds' suggests that combined governmental and private enterprise is the normal procedure Present international conditions suggest that unilateral development is infeasible. Poor nations are concerned with how space resources are developed and with assuring themselves access to a share of the benefits. Use of 'mixed models' combining private and governmental enterprise, incorporating methods to assure that the benefits of space industries do not accrue only to the already rich nations, requires forethought and a reduction in the ideological content of policy designs. Author

#### A85-25983

## TECHNOLOGY AND THE MARKET PLACE - A CHANGING AIR TRANSPORT EQUATION

J. MORRIS and L ROMBERG (Douglas Aircraft Co, Long Beach, CA) Society of Automotive Engineers, Aerospace Congress and Exposition, Long Beach, CA, Oct. 15-18, 1984. 14 p. (SAE PAPER 841545)

Air transportation is a technology sensitive field. The impressive growth that has taken place is reviewed and the interaction between technology and marketplace is examined. Future developments as suggested by current changes in the operating industry and technological trends are also discussed. It is concluded that technology will continue to support market growth in the foreseeable future, but cost effective applications increasingly present challenges to the manufacturing industry.

#### A85-26771#

#### THE COMMUNICATION-SATELLITE MARKET TO THE YEAR 2000 [DE COMMUNICATIESATELLIETMARKT TOT HET JAAR 2000]

R. J. VAN DUINEN (Fokker, Schiphol, Netherlands) Ruimtevaart, vol. 33, Aug.-Oct 1984, p. 130-141. In Dutch.

The developmental history of communication satellites (CSs) traced; the demands placed on industry by the increasing sophistication of CS payloads, the need to adapt the CS to different launchers (STS or Ariane), and the requirement of longer service life are reviewed; and the evolution of the markets for fixed (telephone, telex, and facsimile), video, business, and broadcasting service is projected over the period 1980-2000 and illustrated with tables and graphs. It is predicted that the worldwide market, expressed in terms of the demand for 36-Mhz transponders, will increase from 426 in 1980 to 1410 in 1985, 3100 in 1990, 5580 in 1995, and 9870 in 2000, with the main increase in transponders for voice communications. The potential for Netherlands participation in the growth of the CS market is evaluated, and the need for government leadership and for active promotion efforts is stressed. T.K.

#### A85-27375

## COMMERCIALIZATION OF SPACE - INCENTIVES, IMPEDIMENTS AND ALTERNATIVES

H. R. MARSHALL, JR. (U.S. Department of State, Bureau of Oceans and International Environmental and Scientific Affairs, Washington, DC) Journal of Space Law, vol. 12, Fall 1984, p. 163-173. refs

The major issues concerned with the development of commercial enterprises in space are considered Attention is given to the need to streamline redundant national and international regulations to permit greater cooperation between firms in the development of such projects as the NASA Space Station; the ELV, SPOT; and the Ariane ELV project. The possibility of impeding the growth of space enterprises through excessive concern for the political implications of technology transfer is discussed I.H.

#### A85-27648

#### WHAT ARE WE IN BUSINESS FOR? - AN ENGINEERING APPROACH TO PROJECT FINANCE

P. YOUNG (Rolls-Royce, Ltd., Bristol, England) Aeronautical Journal (ISSN 0001-9240), vol. 89, Jan. 1985, p. 21-33. refs

A simple econometric model is developed to describe the role of taxpayer investments in large-scale aerospace projects. It is shown that, because aerospace projects do not provide a commercial rate of return on initial investments, taxpayers are being asked more frequently to participate In this connection, a criterion for judging the worth of a large-scale aerospace project is proposed. The criterion is based on a self-financing ratio of the contribution of an initial project to the future self financing capability of an individual company. The quantifiable benefits of large-scale aerospace projects to the national economy are briefly summarized. I.H

#### A85-28824

### **BOEING'S AIRLINER LAUNCH CRITERIA**

C BIRKETT Flight International (ISSN 0015-3710), vol 127, March 9, 1985, p 30-32.

High R&D costs, market slump and the need for flexibility in any base design for a new aircraft are the factors which presently govern the development of new aircraft by manufacturers. The DC-9 baseline design, e.g., accommodates four fuselage stretches, wing and cockpit variants, and engines of different thrusts. The 767, 737, 737-300 and 747 are also adaptable. New starts are not made until a market is assured, keeping in mind that airlines in a deregulated industry have difficulty planning for fleet mixes more than 5 yr ahead. One result has been a high degree of standardization for interior furnishings. Another tactical mode of action now followed is to wait until one manufacturer develops a new aircraft which opens a new market, then produce a better aircraft which incorporates technological improvements to capitalize on the need for increased efficiencies in the new market. M S.K.

#### A85-29623

### **INSURANCE FOR SPACE SYSTEMS**

S. W. FORDYCE (Advanced Business Communications, Inc., McLean, VA) IEEE Journal on Selected Areas in Communications (ISSN 0733-8716), vol. SAC-3, Jan. 1985, p. 211-214.

This paper describes the practice of insurance of commerical communications satellites. A historical review of the insurance of previous satellites is included, starting with the initial Comsat coverage of Intelsat satellites and continuing with the coverage of domestic communications satellites of the United States and other administrations. The types of insurance offered and their typical associated rates are discussed, together with an explanation of the coverage, premiums, and losses which have occurred to date. In the wake of the 1984 losses, estimates are provided of the currently available rates. The characteristics associated with direct broadcasting (heavy and expensive spacecraft, large deployable solar arrays, and high-power transmitters) will affect the future insurance rates for these satellites.

#### A85-29669#

## ADA - WILL DOD'S NEW COMPUTER LANGUAGE CUT SOFTWARE COST?

E. J. LERNER Aerospace America (ISSN 0740-722X), vol. 23, April 1985, p. 58-60.

The key feature of the U.S. Department of Defense standard computer language, Ada, is its ability to structure a program out ot smaller parts that can be put together in different ways. Each part, or package, consists of subprograms, data, data types, and other information required for a certain procedure. A second important feature is its unique approach to parallel or concurrent processing, using the special feature called 'rendezvous' for intertask communications to ensure that tasks remain well synchronized. An important new application of Ada is in the digital flight control system for the F-15 fighter. Attention is given to the experience of this aircraft's manufacturer with Ada software.

O.C.

### A85-31981#

## NEW MODEL INTRODUCTION - THE OPERATORS' PERSPECTIVE

D. A FORD (Bell Helicopter Textron, Customer Support and Service Div., Fort Worth, TX) IN. American Helicopter Society, Annual Forum, 40th, Arlington, VA, May 16-18, 1984, Proceedings Alexandria, VA, American Helicopter Society, 1984, p. 319-323

During the design and introduction of a new model helicopter, it is crucial to the survival of that model for the manufacturer to focus on the needs of the operator This paper presents a case history of Bell Helicopter's most recent new model introduction, the Model 214ST Super Transport. With the aid of a little hindsight, specific actions taken are examined to determine if the requirements of the operator were in fact met. Particular emphasis is placed on the changing operator profile over the last decade and through the remainder of the 1980s. Author

#### A85-32573

## RECTIFYING INSPECTION FOR NONCONFORMING ITEMS AND THE HALD LINEAR COST MODEL

W. C. GUENTHER (Wyoming, University, Laramie, WY) Journal of Quality Technology (ISSN 0022-4065), vol. 17, April 1985, p 81-85.

The Hald linear cost model is discussed with and without a beta prior for the distribution of the fraction of nonconforming items in a lot. For both situations, average outgoing quality limit plans, limiting quality level (lot tolerance percent defective) plans, and outgoing quality plans are considered. When a prior is used in the model, Bayesian plans are also considered. Under any of these conditions, it is shown how the desired sampling plan can be easily found with a computer. Author

**A85-33429\*#** National Aeronautics and Space Administration, Washington, D.C.

## GROOMING THE SHUTTLE FOR COST-EFFECTIVE ACCESS TO SPACE

J. W. MOORE (NASA, Washington, DC) Aerospace America (ISSN 0740-722X), vol. 23, May 1985, p. 50-52, 54.

An assessment is made of the performance of the Space Shuttle-based Space Transportation System (STS) from the initial flights in 1981 to the present, which has involved the launching of 12 satellites and the retrieval of two. It is expected that the STS will soon be able to schedule 24 routine missions/year, upon the achievement of full operational status for the full fleet of four Space Shuttles and the completion of support facilities at both the Kennedy Space Center and Vandenberg Air Force Base. The prospects for space industrialization efforts based on STS are noted. O.C

#### A85-34192

#### THE OUTLOOK FOR SPACE COMMERCIALIZATION

J. J. HAGGERTY Space World (ISSN 0038-6332), vol. V-5-257, May 1985, p. 20-25.

An evaluation is made of the current status and outlook for space commercialization in five major areas of activity. The demand

## 07 ECONOMICS, COSTS AND MARKETS

for space-based communications relay has been increasing rapidly, and is being addressed by advanced technologies that allow greater numbers of transponders per satellite, more effective employment of existing wavebands, and transmissions in a new band that is not yet in use. The NASA Landsat system of earth resources remote sensing satellites will be augmented by the French-led SPOT Image Corporation. The ESA's Ariane launch vehicle is a strong competitor in NASA Space Shuttle markets for satellite launching. 'Upper stage' orbit transfer systems are under development. Studies indicate that there are about 500 materials that could be advantageously processed aboard orbiting industrial platforms, taking advantage of zero-g conditions. O.C.

#### A85-34215

### INVESTORS BALANCE ENTHUSIASM FOR NEW MARKET AGAINST RISK POTENTIAL

C. A. SHIFRIN Commercial Space (ISSN 8756-4831), vol 1, Spring 1985, p. 19-21

Although the interest in commercial space projects is increasing. the investment community shows caution and hesitancy regarding a commitment to such projects. The caution is a result of the particular situation which exists with respect to space-related commercial projects. They require generally a large amount of capital, the potential return on investment may be years off, and the risks, compared with other potential investments, appear greater. There are, however, a number of entrepreneurial companies which are finding capital for commercial space projects. One is developing Space Shuttle upper stages and vehicles to be used to launch commercial satellites, while another is concerned with the growing of crystals in space. A third company is developing a free-flying man-tended laboratory platform to be used for materials processing and other activities. Attention is also given to a number of Fortune 500 companies which are getting involved in commercial space projects G.R.

### A85-34216

## AN ASTRONAUT'S LOOK AT COMMERCIAL SPACE OPPORTUNITIES

M. COLLINS Commercial Space (ISSN 8756-4831), vol. 1, Spring 1985, p. 24-26.

The commercial opportunities provided by space are related to the unique qualities of the space environment. These qualities are discussed, taking into account weightlessness, a practically perfect vacuum, the great differences between hot and cold, the continuous supply of solar energy, the charged particles, good visibility, absence of noise, the practically infinite size of space, and the high costs of gaining access to it. These gualities make possible the production of very precise spheres for calibration purposes, and the manufacture of ultra-pure glass and other materials The production of rare pharmaceuticals in space is likely to have an early payoff, while the production of gallium-arsenide crystals for electronic devices is also very promising. However, the great risks involved in space ventures together with long payback times and the required large investments exert a retarding influence on space commercialization. Attention is given to the role of the government in space and opportunities provided by the Space Station GR

#### A85-34217

## WIDESPREAD CIVIL USES ENVISIONED FOR SATELLITE NAVIGATION SYSTEM

B. A. SMITH Commercial Space (ISSN 8756-4831), vol. 1, Spring 1985, p. 27-29

It is expected that the Defense Department's Navstar global positioning system (GPS) will be utilized by many civil users, taking into account trucks, emergency vehicles, pleasure boats, and commercial aircraft. An important factor regarding the realization of the expectations is the production of reliable and relatively low-cost receiver sets for the GPS signals. Some industry officials believe that the use of receivers will expand gradually during the next two to three years, and then accelerate rapidly once the satellite system has become operational The largest civilian market for receivers is expected to be land-based users, while the second largest segment of the civilian market involves marine applications. Attention is given to a number of applications of the GPS signals and the devices which have been or are being developed for these applications G R

### A85-34218

#### **REMOTE SENSING - A TORTUOUS TRIP TO MARKETPLACE** P. MANN Commercial Space (ISSN 8756-4831), vol. 1, Spring

1985, p 32, 33, 35-37.

Remote sensing represents a thirteen-year old U.S. government experiment in gathering earth surface images by satellite in outer space. If the experiment is transferred successfully from government to private sector, it might develop in the next decade into a data market worth billions of dollars. According to the most recent estimates, remote sensing's gross revenues might reach \$2 billion annually by the year 2000 for raw data sales alone. In 1983, President Reagan made the decision to accelerate transfer of remote sensing operations ahead of the schedule set forth by President Carter This decision was partly the result of Reagan's philosophy of removing government from the private economy, another factor was the need to reduce federal expenditures. The present status of remote sensing is discussed along with the services which are provided. A description of future developments is also presented G.R.

### A85-34219

## PROGRESS OF EUROPE'S ARIANE LAUNCHER CHALLENGES U.S. SHUTTLE ON COST ISSUE

J. M LENOROVITZ Commercial Space (ISSN 8756-4831), vol. 1, Spring 1985, p. 39, 42-44.

The Ariane family of European launch vehicles is discussed The final flight of an Ariane 1 is planned for a date between September and November 1985. Ariane 5 will begin operations in the mid-1990s. It will have the function to launch heavy-weight satellite payloads into a geostationary transfer orbit. This vehicle can also be employed to launch France's proposed small manned shuttle vehicle Hermes. Arianespace, the marketing/management organization for the Ariane, was established in 1980 by European manufacturers, European banks, and the French space agency. France with just under 60 percent of the shares is the organization's largest shareholder, while West Germany follows with slightly under 20 percent. Other shareholders include Italy, Spain, and the UK. Arianespace holds firm orders for orbiting 30 satellites. One half of the orders come from customers outside the European home market. G.R

#### A85-34220

## GERMANY CITES COMMERCIAL FALLOUT AS JUSTIFICATION FOR U.S. STATION INVOLVEMENT

M. FEAZEL Commercial Space (ISSN 8756-4831), vol. 1, Spring 1985, p. 47, 49, 51, 54.

In January, West Germany agreed to provide about \$1 billion to Columbus (total cost \$2.4 billion), which represents the European contribution to the U.S. Space Station project. The design of Columbus will be derived from the design of Spacelab, the European-built laboratory which is carried in the cargo bay of the Space Shuttle. The German contribution to Columbus was approved by the German Bundestag only on condition that the investment would result in a commercial return. Questions regarding the commercialization of the Space Station are discussed, taking into account also developments related to the flight of the SPAS with the Space Shuttle. G.R.

#### A85-34221

## STARSTRUCK'S PROBLEMS SPOTLIGHT RISKS, OPPORTUNITIES IN SPACE

R. G. OLONE Commercial Space (ISSN 8756-4831), vol. 1, Spring 1985, p. 60, 61, 63.

The present article is concerned with a new American company which was founded with the objective to build an inexpensive, reliable booster for customers who want to launch communications satellites but cannot afford the European Ariane or the U.S. Space Shuttle. The money provided by the investors permitted the new

firm to do what no other U.S. company had done, that is to design, test, and launch a space booster completely with private funds. The decisions made by the management of the company in the attempt to implement their plans are critically evaluated. In order to overcome difficulties related to the regulations regarding a land launch, it was decided to launch the booster from water. The Dolphin engine, consisting of the largest hybrid motor developed to date, was tested at a maximum of 42,000-lb thrust, and produced 35,000 lb during a successful launch. GR

#### A85-34538\* National Aeronautics and Space Administration Lyndon B. Johnson Space Center, Houston, Tex. COMMERCIAL USE OF SPACE - THE SPACE BUSINESS ERA

G D. GRIFFIN (NASA, Johnson Space Center, Houston, TX) (U.S. Space Technology Conference and Exhibition, Zurich, Switzerland, June 19-21, 1984) Space Solar Power Review (ISSN 0191-9067), vol. 5, no. 1, 1985, p 77-82

Progress and avenues being explored by NASA to hasten the commercialization of space are described. A task force has recommended that the effort begin at once, that bureaucratic barriers to commercial space activities be removed, and that a partnership between government and industry be seriously explored The government role is to establish links with private industry, invest in high-leverage technologies and space facilities which will be attractive to commercial ventures, and contribute to commercial enterprises where risks are high and significant economic benefits can be foreseen. The government/industry relationship can be legally evinced by MOUs, joint endeavor agreements, technical exchange agreements and industrial guest investigator arrangements. The Space Station is the first step in that it allows Americans to live and work in space. It is expected that international participation in Space Station development and utilization will accelerate the space business era. M.S.K.

#### A85-35314

#### COST REDUCTION POTENTIAL IN SPACE PROGRAM MANAGEMENT

A. O TISCHLER Acta Astronautica (ISSN 0094-5765), vol 11, Dec. 1984, p. 741-744.

Transforming space development efforts from adventure status to semi-routine endeavors requires the management of a variety of programs with finite budgets. NASA personnel learned a great deal during budgetary constraints and constant program shifts and cancellations experienced in the Shuttle program. It now takes fewer people to guide a program, especially people who have encountered the plethora of public funds managers who have appeared since the earlier, political priority days of the U.S. space program. One allocation is personnel overhead, which grows larger as approved projects are stretched out in time because of budget cuts and contractors needing funds to maintain technical staffs. Steps which will shorten project times to completion and thereby lower overall costs are greater definition at the outset, contingency planning, and ending adversary relationships between parties involved in each project. MSK

#### A85-35978#

### **U.S. INITIATIVES IN SPACE COMMERCIALIZATION**

J. M. LOGSDON (George Washington University, Washington, DC) International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct. 7-13, 1984. 5 p. refs (IAF PAPER 84-223)

A campaign has recently been conducted to promote space commercialization. The possibilities for the realization of the envisaged prospects in space technology are evaluated, taking into account sources of space revenues, the requirements for space commercialization, positive developments, and uncertain progress in relation to a number of crucial questions. The results of the evaluation suggest that the commercialization of space will be a long-term, slowly evolving enterprise. There is little doubt that eventually space business will be established and thrive However, there is little likelihood that such a situation will occur in the next ten years. G.R

#### A85-37256

#### HOMESTEADING THE NEW FRONTIER

T. F ROGERS Space World (ISSN 0038-6332), vol V-5-258, June 1985, p 4-7.

The use of large SST external tanks as habitation modules for an expanded U.S civilian presence in LEO is proposed. It is pointed out that these tanks could be placed in LEO (instead of being allowed to break up in the atmosphere) at relatively low cost to provide about 70,000 cu ft of pressurized space each, to be made usable by purging any remaining fuel and installing appropriate life-support systems. It is recommended that federal-government policy for making such modules available to private users be formulated by analogy to the homesteading legislation of the 19th century Photographs of the external tanks and drawings of various design concepts for LEO spacecraft are included TK.

#### A85-37954

#### THE PRIVATE SECTOR - A GLOBAL POOL OF TECHNICAL TALENT FOR REMOTE SENSING TRAINING AND PROGRAM SUPPORT

W. D. CARTER (Globex, Inc., Reston, VA) (COSPAR, IUGS, COSTED, and United Nations, Workshops on Remote Sensing from Satellites, 1st and 9th, and Topical Meeting, Graz, Austria, June 25-July 7, 1984) Advances in Space Research (ISSN 0273-1177), vol. 4, no 11, 1984, p 49-57

An overview of what has happened in space research and technology over the past 25 years, and an outlook for the future are presented. Consideration is given to weather, communications, and earth-resource satellites. It is demonstrated that there is a change from government-financed programs toward greater diversification and development of initiatives in the private sector resulting in cheaper products that are more available to the potential users of space-derived information. The private sector and its various elements and capabilities are discussed. A list of 150 space technology companies, their locations and products and/or services is given. MD

#### A85-38901

#### SYMPOSIUM ON INDUSTRIAL ACTIVITY IN SPACE. STRESA. ITALY, MAY 2-4, 1984, PROCEEDINGS

Symposium sponsored by the European Economic Community, ESA, Aeritalia S.p.A., et al. Paris, Eurospace, 1984, 492 p. For individual items see A85-38902 to A85-38917

European research and planning efforts for industrial and commercial activities in space are examined in reviews and reports and illustrated with graphs, diagrams, photographs, and drawings Topics discussed include the potential of the European space industry; processes for space use, applications to glass, ceramic, optical, pharmaceutical, and biological industries; applications to metallurgy, inorganic and organic chemistry, and physics, applications to electronics and electricity, novel uses of space; European space plans, and cooperation with the U.S. Also presented are round-table discussions on legal aspects of industrial space activity and on the use of microgravity for industrial and commercial purposes. T.K.

## A85-38902#

#### SPACE - THE CHALLENGE OF A NEW ENVIRONMENT

H L JORDAN (Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Cologne, West Germany) IN: Symposium on Industrial Activity in Space, Stresa, Italy, May 2-4, 1984, Proceedings . Paris, Eurospace, 1984, p. 5-26

The history, current status, and future plans for industrial activity in space are surveyed from a European perspective. Topics discussed include the early history of space flight; the progress of remote-sensing technology, the nature of the space environment at altitude 500 km; the effects of microgravity on physical processes of industrial importance; steps to be taken by industry to prepare to take advantage of space processing opportunities; the ongoing rocket-borne TEXUS and STS-borne MAUS, GAS, and Spacelab experiments in material science; legal and organizational aspects of space industrialization, and planned European participation in

the NASA Space Station. Photographs, drawings, diagrams, and graphs are provided. T.K.

### A85-38904#

## EUROPEAN SPACE INDUSTRY'S POTENTIAL

G. K. C. PARDOE (General Technology Systems, Ltd., London, England) IN: Symposium on Industrial Activity in Space, Stresa, Italy, May 2-4, 1984, Proceedings . Paris, Eurospace, 1984, p. 92-109.

The present role of the space industry in the economies of western Europe is surveyed, and strategies to maintain and increase it are proposed. The history of space utilization by earth-based industry and commerce is traced, including communications and navigation satellites, remote-sensing satellites, material-processing experiments, and already planned unmanned and manned processing facilities, and the earth-based technologies which have made these developments possible are discussed. The mechanism of space development is seen as a cyclic process in which enabling technologies lead to space research which advances technology and creates new demand for space facilities and physical or information products. It is argued that both coordinated marketing and educational efforts by government anad industry (to build an informed user community in Europe) and political support of space programs are necessary if the European space industry is to expand and compete in world markets. T.K.

#### A85-38917#

#### THE USE OF MICROGRAVITY FOR INDUSTRIAL AND COMMERCIAL PURPOSES

J P GODON (Aerospatiale, Paris, France) IN: Symposium on Industrial Activity in Space, Stresa, Italy, May 2-4, 1984, Proceedings . Paris, Eurospace, 1984, p. 464-475.

A European strategy for the development of space-based manufacturing facilities utilizing the advantages of microgravity is discussed. Topics considered include the kinds of activities required; ways to inform and involve the nonspace industries which form the potential user community; the progression from preliminary data surveys to R&D activities, processing and production, and marketing; cost and legal considerations; improvement of international channels of technical information, and selection of candidate projects. A list of recommended missions for an ESA/EEC microgravity task force is provided. T.K.

#### A85-39930#

#### COMMERCIALIZATION OF A SPACE STATION

T. J SHESKIN (Cleveland State University, Cleveland, OH) American Society of Mechanical Engineers, Winter Annual Meeting, New Orleans, LA, Dec. 9-14, 1984 5 p refs (ASME PAPER 84-WA/TS-3)

A Space Station will create new opportunities for commercial investment. This paper explores two of the most promising areas: materials processing in space, and the servicing and launching of communications satellites. Risks to commercial investors are identified. Recommendations are offered for providing incentives to private sector companies to invest in a Space Station. Author

#### A85-40905

#### CHINESE MODIFY CZ-2/3 ROCKET BOOSTERS, FOCUS ON COMMERCIAL LAUNCH MARKET

C. COVAULT Aviation Week and Space Technology (ISSN 0005-2175), vol. 123, July 22, 1985, p. 77, 79.

A program underway in the People's Republic of China to modify the Titan-class CZ-2/3 satellite-launch and ICBM boosters is described on the basis of a recent visit to the manufacturing plant in Shanghai. The present two-stage CZ-2 and three-stage CZ-3 can place 5000 lbs in LEO or 3080 lbs in GEO, respectively, and are produced on a custom basis with a delivery time of about 2 yrs. Modifications introduced include 4 x 6-ft fins and a pogo-suppression system for the four-engine first stage and a steel support band for the combustion chamber of the 80-ton-thrust second-stage main engine. T.K.

#### A85-41534

## HERMES - DOES EUROPE NEED ITS OWN SPACEPLANE?

C BULLOCH Interavia (ISSN 0020-5168), vol. 40, July 1985, p 815-817.

An assessment is made of the economic/commercial motivations and prospects for the Space Shuttle-like 'Hermes' vehicle of the ESA, which unlike the geostationary orbit-directed Ariane will exploit the emerging low earth orbit market potential for microgravity-production of various high tech products. Attention is given to the provisional design details of the Hermes Orbiter and to the prospective distribution of design, development and construction responsibilities among firms within ESA's political purview. A major motivation for desired European independence from the NASA Space Shuttle is the considerable workload already accumulated for future Space Shuttle commercial launches and the additional U.S. Department of Defense demands on these vehicles. 00

#### A85-41657

COMMERCIALIZATION OF REMOTE-SENSING TECHNOLOGY S. A. MORAIN (New Mexico, University, Albuquerque) International Journal of Remote Sensing (ISSN 0143-1161), vol 6, June 1985, p 837-846. refs

The Technology Application Center (TAC) of the University of New Mexico has accumulated a decade of experience in the transfer of remote sensing technology applications to assist commercialization efforts The present management and cost information for 48 completed projects sheds light on small businesses' expectations regarding the frequency and duration of such projects, their requisite level of effort, and before-profit revenues. The presently ascertained gross average salary per full time employee equivalent, which has averaged only \$10,500 since 1975, suggests that market forces have not yet generated sufficient demand to support the level of skills entailed by this technology. ŏс

#### A85-42553

#### REMARKS ON GERMAN SPACE POLICY - 1985 TO 1995

W. FINKE (BMFT, Bonn, West Germany) IN: From Spacelab to Space Station, Proceedings of the Fifth Symposium, Hamburg, West Germany, October 3-5, 1984 . San Diego, CA, Univelt, Inc., 1985, p. 3-15

(AAS PAPER 84-319)

The participation of the Federal Republic of Germany (FRG) in European and NASA space programs in the coming decade is discussed by a government official favoring such participation. Current FRG space R&D efforts (primarily in cooperation with the US and France) are surveyed; plans for the Columbus program (ESA's main contribution to the Space Station) and the follow-on development of the ESA Ariane launcher series (based on the HM-60 large cryogenic engine) are characterized; the projected costs of these programs (about 2.7 billion AU each) are indicated; the arguments for and against an extensive manned presence in space (for scientific and commercial missions) are reviewed, and the political consequences of an FRG decision for or against participation are considered. FRG goals with regard to the Space Station include clarification of its nonmilitary status, maintaining the option to use ESA components in an eventual European space station or to use Ariane for component launches, limitations and predictability vis-a-vis costs, and assurances of equal partnership (fair evaluation of services provided by each partner; guaranteed necessary transport, supply, and data-transmission services on most-favored-nation status; unrestricted scientific and commercial use of results; and unlimited technology transfer for development and commercial utilization). T.K.

### A85-42678

#### LIFE-CYCLE-COST-ORIENTED SYSTEM DESIGN IN WEAPON TECHNOLOGY [NUTZUNGSKOSTENORIENTIERTE SYSTEMAUSLEGUNG IN DER WEHRTECHNIK]

J. FEIERLEIN (Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn, West Germany) Deutscher Logistiker Kongress, Berlin, West Germany, Oct. 24-26, 1984, Paper. 49 p. In German. refs (MBB-UA-842-84-OE)

The importance of life-cycle costs (LCCs) in the planning of military-equipment budgets is discussed, and techniques for limiting LCCs beginning in the design phase are proposed, with a focus on the situation in West Germany. It is pointed out that the steep increase in military-systems budgets since 1955 has been driven mainly by LCCs rather than by the development and procurement costs, and the main factors contributing to LCCs (maintaining availability, maintaining a staff of trained personnel, and peacetime examined, taking both technical are and operations) logistic/organizational factors into account The application of computer models such as PRICE and ONSCOSTS to generate long-term predictions of LCCs from design inputs is considered in detail and illustrated with diagrams and flow charts, and the consistent implementation of an LCC-based strategy is recommended. T.K.

#### A85-43179#

#### UNDERSTANDING CHANGES IN THE U.S. COMPETITIVE POSITION INTERNATIONAL COMPETITIVENESS

R. E. COLE (Michigan, University, Ann Arbor) IN: White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984 New York, AIAA, 1985, p. 21-23.

Rather than focus on statistics showing the worsening of the American competitive position, the paper stresses problems in our competitive position resulting from shortages of and mode of deployment of engineers in American consumer goods industries Automotive industry is used as a case in point with specific comparisons between Japanese and U.S firms reported on ratio of engineers to administrative personnel and utilization of engineers Role of technical support personnel and role of engineers in employee involvement activities is also considered. Policy implications include the need to train more engineers, to train them more broadly, and to deploy them more effectively. Paper concludes with a discussion of the potential contribution of industrial policy and a call for a more pragmatic approach to formulating policies that will contribute to a restoration of American industrial strenath. Author

#### A85-43180#

#### **CHALLENGES FACING U.S. INDUSTRY**

R. W. FOXEN (Rockwell International Corp., Pittsburgh, PA) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 24-29.

The paper discusses five challenges facing U.S. industry: the technological revolution; low economic growth; changing patterns of labor demand; the global population explosion, and the new world financial system. In the context of 'challenge and response', it is argued that our most effective response will be to allow and even encourage enterprises to adapt flexibly to this new environment with a minimum of government intervention except to aid in the inevitable transitions U.S industry is said to have important competitive advantages in this contest, including an unmatched pool of science and technology; depth and breadth of industrial infrastructure, flexibility of capital markets; the size and strength of our domestic market, and above all, the entrepreneurial spirit of our people. The most effective way of making use of these resources will not be through an overall industrial policy or through individual protectionist measures but rather through the application of our inherent abilities to compete in the new world market economy. Author

#### A85-43181#

#### QUALITY AND COST COMPETITIVENESS

J A. MANOOGIAN (Ford Motor Co., Dearborn, MI) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 30-33.

Strategies for increasing the quality and cost competitiveness of U.S. industry are discussed on the basis of the recent experience of a major corporation. The strong connections among product, service, and process quality; productivity; and costs are explored. The need for improvements is indicated, and specific measures are suggested. Techniques considered include evaluation of customer needs, long-term commitment of management to quality/productivity goals, promotion of employee training and involvement, defect prevention, management reviews, and inclusion of suppliers and sales/service outlets in the productivityimprovement program. T.K.

#### A85-43187#

#### APPLYING PRODUCTIVITY PRINCIPLES TO NEW R&D PROGRAMS NASA/TRW GRO PROJECT

R. L WALQUIST (TRW, Inc., Space and Technology Group, Redondo Beach, CA) IN: White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p 71-74

Techniques for improving the productivity of aerospace R&D programs are discussed on the basis of experience gained in the development of the NASA Gamma-Ray Observatory (GRO) by TRW Measures examined include the introduction of CAD/CAM hardware and procedures, office automation, improved communication between TRW and NASA Goddard (PC networks and video conferencing), flexible computerized PERT networks permitting off-line evaluation of alternative structures, subcontractor involvement in the productivity program, motivation of individual employees, and the productivity-effectiveness-modification clause (providing additional contractor earnings for real productivity increases) in the NASA-TRW contract for GRO. T K

### A85-43188#

## PRODUCTIVITY IMPROVEMENT IN THE ACQUISITION ENVIRONMENT

J A MITTINO (U.S. Department of Defense, Office of the Secretary of Defense, Washington, DC) IN White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984 New York, AIAA, 1985, p. 75-84

The paper discusses DOD efforts to improve defense contractor productivity as a way to reduce acquisition costs. It provides a perspective on the magnitude of the challenge and examines the unique aspects of the environment that exists. The paper surveys and describes the broad range of initiatives, programs and activities under way aimed at fostering productivity improvement in the acquisition environment. Author

#### A85-43194#

## COUNTERACTING THE STIFLING EFFECTS OF A LARGE ORGANIZATION

H. WEISS and R. L. HILL (Digital Equipment Corp, Maynard, MA) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality. Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 121-125.

Techniques for improving productivity in a large organization are discussed using examples from a computer-manufacturing corporation. The measures examined and their applications are: thinking differently (redesign of a factory from conventional assembly line to assembly of the total product by a single worker), investing in people (installation of a company-wide electronic-mail network to lower costs and facilitate communication), and focusing
on the organizational mission (restructuring the organization, with establishment of regional management centers and emphasis on strategic rather than short-term goals) T.K.

#### A85-43195#

### **BUILDING TEAMS AND MAINTAINING TRUST**

L. L. HILL (U.S. Navy, Naval Surface Weapons Center, Dahlgren, VA) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 126-131

The techniques used to improve productivity and work quality at the Naval Surface Weapons Center, a large RTD&E facility responsible for science and technology, systems/subsystems development, and fleet support/in-service engineering, are reviewed. The organizational structure, current activities, and facilities of the Center are described; management and team productivity seminars, implementation assistance, quality circles, productivity steering committees, and work-unit-level productivity measurements are characterized; and strategic-planning measures such as fostering entrepreneurial spirit, building institutional values, defining strategic business units (of related technical programs), evaluating long-term needs, developing action plans, and establishing 1990 manpower goals are discussed. The extension of the industrial-funding concept to other government agencies is considered. тк

### A85-43196#

# BALANCING RISK TAKING AND ENCOURAGING ENTREPRENEURISM

G. E. SEEGERS (Citibank, New York, NY) IN: White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 132-136

#### A85-43199#

# PREVIEW OF THE PRESIDENT'S COMMISSION ON INDUSTRIAL COMPETITIVENESS

E. MILBERGS (Commission on Industrial Competitiveness, Washington, DC) IN. White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p 153-156.

#### A85-43201#

# HURDLES STIFLING THE FEDERAL MANAGER'S ABILITY TO IMPROVE PRODUCTIVITY

A. TRIPLETT (Office of Management and Budget, Washington, DC) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 161-164.

#### A85-43202#

# PRODUCTIVITY INITIATIVES AT USDA

J. J. FRANKE, JR. (U.S. Department of Agriculture, Washington, DC) IN: White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality: Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984 New York, AIAA, 1985, p. 165-168.

### A85-43203#

# SONY KEEPS HIGH QUALITY AND PRODUCTIVITY IN THE UNITED STATES

S WADA (Sony Corporation of America, New York, NY) IN White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 183-186.

#### A85-43204#

### **KEEPING THE BUREAUCRACY IN CHECK**

K. A BOLTE (Intec Corp., Hillsboro, OR) IN. White-collar productivity and quality issues; Proceedings of the Symposium on Productivity and Quality, Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984. New York, AIAA, 1985, p. 189-191.

Techniques used at Intel Corporation to decrease administrative costs by increasing productivity (measured as output units per employee hour) are described Measures instituted include establishment of an assembly-line-office concept, capacity planning and staff reduction by attrition, weekly review and planning by first-line managers, and top-down determination (by a small staff) of productivity goals to be implemented bottom-up and monitored by a highly visible reporting system The Intel program has saved \$17 million over a 4 5-year period, mainly by streamlining procedures and eliminating excess personnel. T.K.

#### A85-45118

# COST EFFECTIVENESS OF SIMULATED AIRCRAFT MAINTENANCE TRAINING SYSTEMS

D W. COUCH and E. H. STEVENS (Honeywell, Inc, West Covina, CA) IN. NAECON 1984; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 21-25, 1984. Volume 2 . New York, IEEE, 1984, p. 1038-1043.

Previous studies have shown that maintenance training using Simulated Aircraft Maintenance Trainers (SAMTs) produces technicians that are as adequately trained for Flight Line Maintenance as those that are trained using operational aircraft. Based on these findings, a model has been prepared to assess the cost effectiveness of the SAMTs. Data detailing actual equipment usage prior to F-15 and F-16 SAMT installation and usage after the SAMT installation is evaluated The results of this evaluation lead to a straightforward model that can be used to determine the cost savings that are realized through deployment of SAMTs to Air Force bases. Author

#### A85-45150#

#### A COMPARISON OF VARIOUS LIFE CYCLE COST MODELS

L R WELCH (USAF, Avionics Systems Div., Wright-Patterson AFB, OH) IN. NAECON 1984, Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 21-25, 1984. Volume 2. New York, IEEE, 1984, p. 1287-1292 refs

2 . New York, IEEE, 1984, p. 1287-1292 refs Life Cycle Cost (LCC) prediction has become an important step in the acquisition of avionics systems. Many models have been developed in an attempt to predict a system's LCC early in the acquisition process. This paper presents a synopsis of various LCC models which have been developed the Reliability, Maintainability and Cost Model (RMGM), the Freiman Analysis of Systems Technique Equipment Model (FAST-E), the Programmed Review of Information for Costing and Evaluation (PRICE) Model, the TI-59 Handheld Calculator Aircraft Top Level Life Cycle Cost (TI-59 ATL2C2) Model, and the Avionics Laboratory Predictive Operations and Support (ALPOS) Cost Model. Each synopsis discusses important aspects of the model, including a description of the model, a summary of model inputs and outputs, and the accessibility of the model. A table comparing the various characteristics of the models are also presented. Author

**A85-45817\*** National Aeronautics and Space Administration, Washington, D.C.

### SPACE - THE LONG-RANGE FUTURE

J. VON PUTTKAMER (NASA, Washington, DC) Spaceflight (ISSN 0038-6340), vol 27, Sept.-Oct 1985, p. 348-354. refs

The Space Shuttle/Space Transportation System (STS) provides the basis for future development toward permanent manned Space Stations, manned access to geostationary orbit (GEO), deployment of large space structures, development of closed-cycle life support systems, and the discovery of greater industrial applications in space. Research must continue in order to make an Orbital Transfer Vehicle (OTV) which would provide manned flights to GEO and the establishment of a lunar base a reality by the year 2000. Beyond the year 2000 there should be

advanced complexes in low-earth orbit (LEO), permanently manned scientific and communication stations in GEO, a permanent moon base, manned expeditions to Mars, and a geosynchronous facility. These goals can be achieved through international cooperation, cooperative programs will allow for more research at a faster pace due to joint funding. These advances could lead to improvements in the quality of life on earth and make comfortable space life a reality. 1 F

#### A85-47047

#### NASA APPROVES FLY-NOW, PAY-LATER PLANS FOR **ORBITING INDUSTRIAL FACILITY**

C. COVAULT Aviation Week and Space Technology (ISSN 0005-2175), vol 123, Aug. 26, 1985, p 16, 17

In a continuing effort to foster the commercialization of space. NASA has entered into an agreement with Space Industries, Inc. to furnish that company with two STS launches which will be paid for in the form of 12 percent of the revenues from the first five years of operation. The payload will be a Shuttle-tended unmanned module for materials processing. NASA also plans to benefit from access to the module and docking facility technologies which will be developed by the commercial organization. This will avoid in-house development costs for NASA. The first module will be 35 ft long and 14.5 ft wide and will cost from \$250-500 million to develop The initial launch is scheduled for 1992 Module power will be furnished by 100-ft long solar cell masts rated at 12 kW. The orbit will be selected to allow operations in concert with the Space Station orbit, thereby facilitating Orbiter visits. M.S.K.

#### A85-49913

### HOW MUCH DOES IT COST/HOW MUCH DOES IT WEIGH?

T. E. BRENTS, JR. (General Dynamics Corp., Fort Worth, TX) SAWE, Annual Conference, 43rd, Atlanta, GA, May 21-23, 1984. 30 p.

(SAWE PAPER 1593)

Attention is given to cost estimation method trends in the U.S. military aircraft industry, where weight-drive parametric estimation has been used for such products as the F-16 fighter in order to deliver firm prices on proposed changes. Parametric estimates are also used to provide customers with budgetary information. The engineering change proposal pricing practices presently detailed were first applied in the negotiation of a pricing agreement for tooling in 1980. OC.

N85-10907\*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va

FOREIGN CIVIL AVIATION COMPETITION: 1976 SUMMARY AND IMPLICATIONS

W. J ALFORD, JR. (comp.) and D. V. MADDALON (comp.) 17 Jun. 1976 48 p

(NASA-TM-X-73907; NAS 1 15 X-73907) Avail. NTIS HC A03/MF A01 CSCL 01B

A summary assessment is made of foreign civil aviation as it relates to the posture of the United States civil aviation industry. Major findings include: (1) Main competitors - European Economic Community (EEC) and Union of Soviet Socialist Republics (USSR). (2) Largest commercial market - Transport aircraft. (3) Current market status and projections - U.S. currently dominates the civil aviation market but foreign markets show greater growth trends (4) Competitive comparisons - Status comparisons are made in technology (aerodynamics, structures and materials, propulsion, avionics, systems, design coordination, and manufacturing). production runs; marketing, and postsales support The U.S. generally leads except in aerodynamics and propulsion. (5) Multinational ventures - Joint U.S industry/foreign government development of advanced technology engines is well developed, airframe industry discussions are now underway. (6) Implications -Although the U.S., is currently preeminent in most areas, this may be only a temporary condition. Past U.S. success in aviation has provided many benefits to the nation. These benefits may be lost. M.A C.

N85-11011\*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

# SECOND SYMPOSIUM ON SPACE INDUSTRIALIZATION

C. M. JERNIGAN, ed. Oct. 1984 427 p refs Symp. held in Huntsville, Ala., 13-15 Feb 1984 Sponsored in cooperation with AIAA and Alabama Univ

(NASA-CP-2313; M-464; NAS 1.55:2313) Avail. NTIS HC A19/MF A01 CSCL 22A

The policy, legal, and economic aspects of space industrialization are considered along with satellite communications, material processing, remote sensing, and the role of space carriers and a space station in space industrialization.

N85-11012\*# National Aeronautics and Space Administration, Washington, DC

### NON-US APPROACHES TO SPACE COMMERCIALIZATION

P G SMITH In NASA. Marshall Space Flight Center 2nd Symp. on Space Industrialization p 2-27 Oct. 1984 Avail: NTIS HC A19/MF A01 CSCL 22A

The approaches to the commercialization of space taken by the four foreign countries most active in the field - Canada, France, the Federal Republic of Germany, and Japan are described. National space program elements with commercial potential are examined in the context of national industrial and science policies. with special attention to objectives, timetables, and budgetary priority relative to other sectors. The role of the European Space Agency in attaining national and regional commercialization objectives is also examined Author

#### N85-11014\*# Coopers and Lybrand, Washington, D.C. FINANCIAL ISSUES FOR COMMERCIAL SPACE VENTURES: PAYING FOR THE DREAMS

J. J EGAN In NASA. Marshall Space Flight Center 2nd Symp. on Space Industrialization p 38-47 Oct. 1984

Avail: NTIS HC A19/MF A01 CSCL 05C

Various financial issues involved in commercial space enterprise are discussed. Particular emphasis is placed on the materials processing area: the current state of business plan and financial developments, what is needed for enhanced probability of success of future materials development efforts in attracting financial backing, and finally, the risks involved in this entire business area. BSE

N85-11015\*# Science Applications, Inc., McLean, Va. SPACE INDUSTRIALIZATION: A NATIONAL PERSPECTIVE V. H. REIS In NASA Marshall Space Flight Center 2nd Symp. on Space Industrialization p 48-51 Oct. 1984 Avail: NTIS HC A19/MF A01 CSCL 22A

Space industrialization (or commercialization) has the potential to be a major player in America's space program. If this potential is to be realized, however, industrialization efforts must be considered within the context of the other major portions of the space program: shuttle, space station, and civil remote sensing. Further, development efforts must be based upon a sound scientific and technical understanding of the products and processes, and there must be a trained cadre of dedicated individuals willing to devote time and effort to this effort. There remain considerable risks and uncertainties. Given all this, the best path to follow would seem to be a long term, balanced commitment, emphasizing government, industry, and academia partnerships. Several points are addressed: (1) the place of space industrialization in the overall national space program; (2) the meaning of space industrialization with respect to the historic, national aims of space, and (3) specifically what is being industrialized R.S.F.

**N85-11024\***# National Oceanic and Atmospheric Administration, Washington, D. C National Environmental Satellite, Data, and Information Service

# LAND REMOTE SENSING COMMERCIALIZATION: A STATUS REPORT

W. P. BISHOP and E. L HEACOCK *In* NASA. Marshall Space Flight Center 2nd Symp. on Space Industrialization p 87-95 Oct. 1984

Avail: NTIS HC A19/MF A01 CSCL 05B

The current offer by the United States Department of Commerce to transfer the U.S land remote sensing program to the private sector is described. A Request for Proposals (RFP) was issued, soliciting offers from U.S. firms to provide a commercial land remote sensing satellite system. Proposals must address a complete system including satellite, communications, and ground data processing systems Offerors are encouraged to propose to take over the Government LANDSAT system which consists of LANDSAT 4 and LANDSAT D'. Also required in proposals are the market development procedures and plans to ensure that commercialization is feasible and the business will become self-supporting at the earliest possible time. As a matter of Federal Policy, the solicitation is designed to protect both national security and foreign policy considerations. In keeping with these concerns, an offeror must be a U.S Firm. Requirements for data quality, quantity, distribution and delivery are met by current operational procedures. It is the Government's desire that the Offeror be prepared to develop and operate follow-on systems without Government subsidies. However, to facilitate rapid commercialization, an offeror may elect to include in his proposal mechanisms for short term government financial assistance.

M.G.

#### N85-11033\*# Space Vector Corp., Northridge, Calif. CONESTOGA 2: A LOW COST COMMERCIAL SPACE TRANSPORT SYSTEM

R. O. RASMUSSEN *In* NASA Marshall Space Flight Center 2nd Symp. on Space Industrialization p 169-195 Oct 1984 Avail: NTIS HC A19/MF A01 CSCL 22B

Conestoga 2 is currently under development. It is capable of inserting 500 Kg satellites into 800 Km circular polar orbits. Conestoga 2 makes maximum use of existing (developed) technology and hardware. Its commercial objective is to fill a need for low cost low Earth orbital transport not efficiently served by Shuttle or larger space transport systems Low Earth orbit markets, foreign participation, and launch site considerations are discussed along with technical and economic trade-offs Author

#### N85-11035\*# Booz-Allen and Hamilton, Inc., Arlington, Va CONCEPT FOR A COMMERCIAL SPACE STATION LABORATORY

P. W. WOOD and P. M. STARK *In* NASA. Marshall Space Flight Center 2nd Symp on Space Industrialization p 204-215 Oct. 1984

Avail: NTIS HC A19/MF A01 CSCL 22B

The concept of a privately owned and operated fee-for-service laboratory as an element of a civil manned space station, envisioned as the venture of a group of private investors and an experienced laboratory operator to be undertaken with the cooperation of NASA is discussed. This group would acquire, outfit, activate, and operate the labortory on a fee-for-service basis, providing laboratory services to commercial firms, universities, and government agencies, including NASA. This concept was developed to identify, stimulate, and assist potential commercial users of a manned space station. A number of the issues which would be related to the concept, including the terms under which NASA might consider permitting private ownership and operation of a major space station component, the policies with respect to international participation in the construction and use of the space station, the basis for charging users for services received from the space station, and the types of support that NASA might be willing to provide to assist private industry in carrying out such a venture are discussed. RJ.F.

N85-11039\*# Wyle Labs., Inc , Huntsville, Ala. COMMERCIAL SPACE SERVICES

D. L CHRISTENSEN *In* NASA. Marshall Space Flight Center 2nd Symp. on Space Industrialization p 272-274 Oct. 1984 Avail: NTIS HC A19/MF A01 CSCL 22A

An overview of space service opportunities as identified by a Wyle Laboratories' research team is given Through the use of a baseline space scenario, a variety of space hardware, services, and commercial activities are identified and related on a time-phased basis A model is presented to relate the potential functions of government and the private sector in a commercialized space environment during the period 1984 to 2004. Barriers, incentives and key issues are likewise identified and addressed to aid in the implementation of private sector activities for spacerelated programs. Broader awareness, legislative actions, incentive development and benefit analyses are considered in the presentation. The time-phased plan provides a useful planning and management tool, allows broader communication, and supports overall space commercialization program assessment. R.J.F.

N85-11044\*# Grumman Aerospace Corp., Bethpage, N.Y. DEVELOPING COMMERCIAL USERS OF SPACE Abstract Only L H. HEMMERDINGER // NASA. Marshall Space Flight Center 2nd Symp on Space Industrialization p 305 Oct. 1984 Avail: NTIS HC A19/MF A01 CSCL 05A

The use of low gravity in the development of new products is examined. Low gravity fundaments are presented clearly and simply. A display of past low gravity experiments highlights some of these precepts which are followed by a description of where and how the commercial user can fly his experiment or process.

#### N85-11052\*# SRI International Corp., Arlington, Va. SPACE COMMERCIALIZATION: ANALYSIS OF R AND D INVESTMENTS WITH LONG TIME HORIZONS

T P. SHEAHEN *In* NASA. Marshall Space Flight Center 2nd Symp. on Space Industrialization p 350-361 Oct. 1984 refs Avail NTIS HC A19/MF A01 CSCL 22A

By following a single hypothetical example through a series of variations, the way different potential investors might look at the opportunity to participate in space commercialization is described. The example itself is fairly typical of commercial opportunities in space. The chief characteristics are a steadily increasing requirement for capital infusion over an 8 year period, followed by a very generous stream of profits running another decade or more beyond. There is a decision point at 3 years, at the conclusion of laboratory R&D; and another at 6 years, following 2 initial space flights MAC.

N85-11055\*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala. OPPORTUNITIES FOR COMMERCIAL ORGANIZATIONS

Abstract Only W K. VARDAMAN, H. ATKINS, and K R. TAYLOR *In its* 2nd

W K. VARDAMAN, H. ATKINS, and K H. TAYLOR in its 2nd Symp on Space Industrialization p 369 Oct. 1984 Avail NTIS HC A19/MF A01 CSCL 05A

The possible applications of technology of materials processing in low gravity is discussed. A special office established by NASA to familiarize commercial organizations with materials processing in low gravity is described. This office provides information on present research and will, if requested, hold a seminar to present the technological and business aspects of joint investigations and joint endeavors to interested organizations. Arrangements can be made for visits to laboratories where ground based research is in progress M.A.C. N85-11056\*# TRW Space Technology Labs., Redondo Beach, Calif.

# SATELLITE SERVICING: A BUSINESS OPPORTUNITY? Abstract Only

R. E. WONG and E. H. MEDLER *In* NASA. Marshall Space Flight Center 2nd Symp. on Space Industrialization p 370 Oct. 1984

Avail. NTIS HC A19/MF A01 CSCL 05A

The possibilities of satellite servicing as a business opportunity are examined. The service rate which a user must be charged to yield a reasonable return is derived and then compared against the market's willingness to pay that rate Steps taken to provide the basis from which the service rate could be derived include. (1) constructing a hypothetical on orbit servicing business offering both on orbit and associated ground services; (2) estimating the total on orbit service business potential by analyzing mission models to the year 2000; and (3) setting up ground rules to bound the conduct of the business. Using this basic information service demand (business volume) cost to set up the business, costs for operation and maintenance tax rates and desired rate of return are estimated to determine the user charge. Sensitivity of the service rate to various parameters are also assessed. The time span for the business venture runs from 1986 through 2000 with service to 1991 provided via the orbiter and by a space station beyond 1991. This point analysis shows about five years of negative cash flow, with steady profits thereafter.

#### N85-11057\*# Booz-Allen and Hamilton, Inc., Arlington, Va. DOING BUSINESS IN SPACE: HOW TO GET THERE FROM HERE

P. W. WOOD and P. M STARK *In* NASA. Marshall Space Flight Center 2nd Symp. on Space Industrialization p 371-382 Oct. 1984

Avail: NTIS HC A19/MF A01 CSCL 05A

A step by step process is described through which an existing enterprise or an entrepreneurial venture can initiate and carry out a new space venture. Throughout this process the business and technical aspects must be advanced in parallel with each other Each depends on the other for its continued success, and companies may be unable to complete the venture if one or the other is neglected. The existing NASA programs and the experience of early trailblazers provide sufficient examples and opportunities for other firms to undertake new ventures with confidence. With the introduction of NASA's Commercial Space Policy, both the opportunities and the ease with which ventures can be carried out should increase significantly. M.A.C.

N85-11059# Committee on Science and Technology (U S House).

# STATEMENT OF HON. JAMES M. BEGGS, ADMINISTRATOR, NASA, WASHINGTON, DC

In its Initiatives to Promote Space Commercialization p 12-26 1984

Avail: Subcommittee on Space Science and Applications

NASA activities for the commercial use of space are discussed. Space shuttle payloads, space commercialization plans, launch costs, and government/industry cooperation are among the topics discussed. R.J.F.

#### N85-11556# Naval Postgraduate School, Monterey, Calif. SYSTEMS ANALYSIS FOR MICROCOMPUTER ACQUISITIONS M.S. Thesis H. P. RHOADES Mar. 1984 62 p

(AD-A145447; AD-E750943) Avail. NTIS HC A04/MF A01 CSCL 09B

This thesis outlines the procedures for an analysis to be conducted to assist in the acquisition of a microcomputer. It provides a methodology to analyze present system operations, determine technical and economic feasibility of a microcomputer, and select hardware and software to meet organizational requirements. The intent of this thesis is to assist a Division Officer, Branch Chief, or small unit Commanding Officer who wants to increase productivity of specific outputs and feels a microcomputer may be the answer. GRA

N85-11911# Committee on Science and Technology (U. S. House)

INTERNATIONAL COOPERATION AND COMPETITION IN SPACE

Washington GPO 1984 230 p refs Hearing before the Comm. on Sci. and Technol., 98th Congr., 2d Sess., No. 104, 25 Jul 1984

(GPO-38-001) Avail: Subcommittee on Space Science and Applications

Testimony and dialogue from a meeting of the House Subcommittee on Space Science and Applications are presented. The Subcommittee met to survey the status of and prospects for international cooperation and competition in space.

N85-11912# Committee on Science and Technology (U S. House).

# INTERNATIONAL COOPERATION AND COMPETITION IN SPACE. INTRODUCTION

*In its* Intern. Coop. and Competition in Space p 1-32 1984 refs

Avail Subcommittee on Space Science and Applications

Testimony given during a meeting of the House Subcommittee on Space Science and Applications is presented. The Subcommittee met to survey the status of and prospects for international cooperation and competition in space. Expendable launch vehicles and the space shuttle program were discussed The U.S. position vis-a-vis the U.N. Committee on the Peaceful Use of Outer Space (COPUOS) was addressed. R S F.

# N85-12805# Army Missile Command, Redstone Arsenal, Ala. ECONOMIC ANALYSIS HANDBOOK

J. L. GOSSETT Jun 1984 60 p

(AD-A146263; USAMICOM-RR-84-15) Avail NTIS HC A04/MF A01 CSCL 05C

This effort is provided as an aid in the preparation of an economic analysis Information extracted from various sources was identified in the references. Material and assistance were received from the US Army Armament, Munitions and Chemical Command. Contents are: Introduction, Documentation, Constant Dollars, Cost Analysis, Economic Life, Comparison and Ranking of Alternatives, Present Value of Money and Terminal Value. GRA

#### N85-13792# European Space Agency, Paris (France). GERMAN DOMESTIC SCHEDULED AIR TRANSPORT IN THE YEAR 2000

R. J. HAUPT May 1984 94 p refs Transl. into ENGLISH of "Innerdeut Linienluftverkehr des Jahres 2000', DFVLR, Cologne Rept. DFVLR-FB-83-03, 1983

(ESA-TT-828; DFVLR-FB-83-03) Avail: NTIS HC A05/MF A01; original German version available from DFVLR, Cologne DM 28.60

Supply alternatives for domestic scheduled air transport in Germany, based on the year 2000, are presented and evaluated. The financial effects of changes in the available services on an air transport company and on airports (altered revenue from landing charges) are shown, based on a forecast of the air transport market from a cost/revenue calculation model for this market. Substitution effects involving high-speed rail transport are presented. Author (ESA)

N85-15781# Office of Technology Assessment, Washington, D.C.

#### CIVILIAN SPACE STATIONS AND THE US FUTURE IN SPACE Nov. 1984 238 p refs

(OTA-STI-241; LC-84-601136) Avail SOD HC \$7.50

The U.S. aerospace industry is now beginning to position itself to provide space assets and services independently, and anticipates conducting in space investigations and commercial-industrial activities privately financed, either on its own or in combination with other business concerns. The leaders of the U.S. civilian space community have advanced the view that the next major logical step in space should be the acquisition of specific, permanent in space infrastructure: a civilian space station The following aspects involved in a shift to civilian space station are discussed: space infrastructure, buyer's guide, uses and functions, international concepts, federal budgets, cost containment, and policies

N85-15782# Office of Technology Assessment, Washington, D.C.

# **ISSUES AND FINDINGS**

In its Civilian Space Stations and the US Future in Space p Nov. 1984 refs 25-46

Avail: SOD HC \$7.50

Long-term space goals and objectives; international space cooperation; cost reductions; transitions from NASA to civilian management; low-Earth-orbit infrastructure; non-government policy studies; and creation of space policy study centers are discussed. BG

N85-16681# Analytics, Inc., Dayton, Ohio. EVALUATION OF THE EFFECTIVENESS OF THE WEIGHTED **GUIDELINES TO INDUCE CONTRACTOR'S INVESTMENT IN** COST REDUCING FACILITIES EQUIPMENT Final Report, Apr. 1983 - Aug. 1984

L. KOVICH and T. MCCANN 15 Aug 1984 62 p

(Contract MDA903-82-G-0053)

(AD-A147586, TR-1867-03) Avail: NTIS HC A04/MF A01 CSCL 15E

The main objective of this report was to determine the adequacy of the present Weighted Guidelines profit policy for improving the productivity of defense contractors and to assess whether or not the profit policy is providing a stimulus for strengthening the industrial base. The scope of the analysis consisted of the following approach: (1) Reviewed literature of all material which pertained to the Weighted Guidelines profit policy which had been published since 1976; (2) Developed an investment model as the foundation to understanding the process of corporate capital investments; (3) Compared analyses and tests which were presented in Profit '76 and Profit '82. (4) Used Weighted Guidelines profit policy information gained through contacts within the Services and industry; (5) Performed analyses on financial information obtained from various government profit centers. GRA

Air Force Inst. of Tech., Wright-Patterson AFB, N85-17580# Ohio. School of Systems and Logistics.

#### AN APPLICATION OF DISCRIMINANT ANALYSIS TO THE SELECTION OF SOFTWARE COST ESTIMATING MODELS M.S. Thesis

J. T STEIG Sep. 1984 97 p

(AD-A147632; AFIT/GSM/LSY/84S-26) Avail: NTIS HC A05/MF A01 CSCL 14A

Currently, no quantitative methods exist to quantitatively select the best software cost estimating model for a particular software type or environment. By identifying the characteristics of the software that each model was best able to estimate, those characteristics could be used as a basis for predicting the best model The analysis began by using selected models to concurrently estimate development costs for 25 known projects. Estimates from each model were compared and the most accurate model for each project was identified. The projects were assigned to the group of projects for which each model most accurately estimated development costs After grouping each project, discriminant analysis was used to identify those input variables from all the estimating models that best discriminated between the groups. The identified input variables were then used as determinant variables as a basis to predict which model was most likely to best estimate cost for each project. The unbiased prediction rate was 60%. Despite the high prediction rate, the overall estimating accuracy was not reduced. Results indicate that use of the pre-analysis determinants to select a model would not reduce estimating error more than a random selection of models GRA

#### AN ANALYSIS OF PRODUCTION COMPETITION AND AWARD **METHODOLOGY M.S. Thesis**

G T. SPARROW and J. A. STEVENS Sep. 1984 129 p (AD-A147775; AFIT/GLM/LSM/84S-60) Avail NTIS HC A07/MF A01 CSCL 05A

The injection of competition into the production phase of an acquisition is an important issue in todays defense acquisition environment Developing a second production source is the primary means of achieving this type of competition. Various techniques to accomplish production competition have been used with mixed results. This thesis reviews the theoretical basis for and the Government's policy reguarding production competition along with the determination of second source applicability to a given program In addition, this work reviews five methods of developing a second source, along with five methodologies for determining the award between two sources After the award methodologies are discussed, one method (the Solinsky Technique) was chosen for a more indepth analysis. GRA

Air Force Inst. of Tech, Wright-Patterson AFB, N85-17735# Ohio.

#### COST-PLUS-PERCENTAGE-OF-COSTS IN GOVERNMENT **CONTRACTS M.S. Thesis**

S. J ROSER Sep. 1984 143 p

(AD-A147779; AFIT/CI/NR-84-83T) Avail: NTIS HC A07/MF A01 CSCL 05A

Cost-percentage-of-cost (CPPC) is a method of contracting or a type of contract under which the contractor is not only reimbursed his performance costs but is also paid a stated percentage of his cost. World War I wrought havoc on traditional Government procurement practices The tremendous demand for war production, along with volatile labor and material prices, dictated a relaxing of the customary fixed price system of acquisition. Competitive bidding and fixed price contracts proved untenable because, not only did many contractors refuse to bid for war production contracts on a lump sum basis, those that did often factored in exorbitant contingencies. CPPC appeared to be the answer to Government prayer, since it seemed to solve the problem of reluctant or unventuresome contractors. Perhaps it was also apropos for that unsettled era, but in any event, CPPC soon became a virtual cornerstone of Government acquisition! GRA

N85-17750# Office of Technology Assessment, Washington, DC

#### INTERNATIONAL COOPERATION AND COMPETITION IN **CIVILIAN SPACE ACTIVITES Summary Report** Jul. 1984 35 p

(OTA-ISC-240) Avail. NTIS HC A03/MF A01

The state of international competition in civilian space activities is assessed, U.S. civilian objectives in space are explored, and alternative options are suggested for enhancing the overall U.S. position in space technologies and space science. Past, present, and projected international cooperative arrangements for space activities are investigated and their relationship to competition in space is examined. The relationship between space policy and foreign policy is examined with respect to the extent that they affect international civilian activities in space. Two major problems which dominate the organization and implementation of U.S. civilian policies towards space are identified, there is no national consensus about long term goals and activities, and the political and economic dimension of space activities now exceed the purview of any one government agency A.R.H.

N85-18030# Transportation Research Board, Washington, D.C. ISSUES IN AIR TRANSPORT

J. C. OCALLAHAN, D J BENNETT, G R. MORRISSEY, D. S. MCLEOD, R. D. SANDLER, E. T. DENHAM, J BLAIR, M L. FORD, R. SHIRACK, and M. M. ETSCHMAIER 1984 59 p refs (PB85-121374/GAR; TRB/TRR-958; ISBN-0-309-03704-2, LC-84-22804) Avail NTIS HC A04/MF A01 CSCL 01B

Some probable effects of deregulation on airline industry economics; discount fare market research, 1981 to 1983; airline cost trends as viewed by an airframe manufacturer; economic impact of general aviation in Florida: suggested method of analysis; estimating aircraft activity at nontowered airports: results of the aircraft activity counter demonstration projects, mission-oriented maintenance for military aircraft and implications for public transportation fleet maintenance; a model for determining the width of airport pedestrain corridors, and, aviation legislation and infrastructure, policy implications for the 1980s are discussed.

GRA

#### N85-19205# Joint Publications Research Service, Arlington, Va COMMERCIAL EUROPE SHOULD HAVE SPACE: INDEPENDENT STRATEGY

In its West Europe Rept.: Sci. and Technol (JPRS-WST-85-004) Transl into ENGLISH from Aarde and n 1-5 30 Jan. 1985 Kosmos (Netherlands), Nov. - Dec 1984 p 518-522 Avail NTIS HC A04/MF A01

The impact of space commercialization on Europe is discussed Advantages and disadvantages are discussed with emphasis on the following areas: competition, legal liabilities, economics, and development of European spacecraft BG

N85-23341# National Research Inst for Mathematical Sciences, Pretoria (South Africa)

# AN ANALYSIS OF A DYNAMIC PROJECT COST PROBLEM

A. MEHREZ and M SNIEDOVICH Nov 1983 30 p refs Submitted for publication

(CSIR-TWISK-338) Avail: NTIS HC A03/MF A01

A stochastic allocation model for a sequential financial problem involving the allocation of funds to uncertain future payments is presented. It is shown that under certain conditions the optimal allocation policies are piecewise linear with the budget available and that there exists an intimate relationship between these policies and the myopic policies obtained from the solution of a sequence of single-payment problems. Certain technical and methodological issues associated with a chance constrained version of the problem are also discussed. B.W.

#### N85-24810# IBM S.A. Proprietary Ltd., Johannesburg (South Africa). Industry Marketing.

### SELECTION CRITERIA FOR A CAD/CM SYSTEM

C. J. GRAHAM In CSIR Mini-Seminar on CAD/CAM 9 n Aug. 1983

Avail. NTIS HC A03/MF A01

The role of computer aided design/manufacturing (CAD/CAM in the product development process is reviewed and a CAD/CAM selection scenario is described. Criteria for system selection are identified and discussed Highly desirable characteristics of a good CAD system include: fast response time; efficient use of computer resources; draftsman and designer oriented; integrated data base (interactively accessible by each user discipline), and general purpose applications MG

#### N85-25616# Joint Publications Research Service, Arlington, Va. MBB COST-REDUCTION PLAN FOR AIRBUS CONSTRUCTION DESCRIBED

K. WIBORG In its West Europe Rept Sci and Technol 17 Aug. 1984 (JPRS-WST-84-027) p 18-20 Transl. into ENGLISH from Franfurter Allgem. Zeitung (Frankfurt am Main), 8 Jun 1984 p 18 Avail: NTIS HC A04/MF A01

The economics of designing and producing a competitive major passenger aircraft is explored Factors involved are producing an aircraft at economically acceptable cost and keeping pace with

competition in terms of quality as well as manufacturing hours and manufacturing cost The economics of manufacturing a plane in one or two plant site as opposed to several plant sites is examined. FR

N85-26457# Loughborough Univ of Technology (England). Dept. of Transport Technology

#### INFORMATION TECHNOLOGY APPLICATIONS IN VOLUNTARY SECTOR TRANSPORT OPERATIONS. SP1: OBJECTIVES AND **PROGRAMME OF WORK**

D. GILLINGWATER and J. SUTTON Mar. 1985 13 p refs (TT-8501) Avail: NTIS HC A02/MF A01

The practical application of information technology to improve the effectiveness of the operation of transport services organized by the voluntary sector is to be demonstrated and evaluated. The objectives are as follows to identify existing operational problems with and barriers to the application of information technology to voluntary sector transport initiatives; to demonstrate the scope and feasibility, and identify the limitations, of the use of personal computers in, for example, facilitating vehicle sharing and improving vehicle utilization; to evaluate, through selected case studies, the relative merits of mini- and micro-computer use in providing a more effective operation through the application of data base management, financial management, performance evaluation, and word processing facilities; and to disseminate the practical relevance and feasibility of information technology applications in voluntary sector transport initiative through the medium of intensive training packages for community transport managers and operators, and the provision of guidelines for agencies and groups funding such schemes. Author

### N85-26645# Singer Co , Wayne, N J

### DESIGN-TO-COST (DTC) METHODOLOGY TO ACHIEVE AFFORDABLE AVIONICS

A. J. SHAPIRO In AGARD Cost Effective and Affordable Guidance and Control Systems 18 p Feb. 1985 refs

Avail NTIS HC A13/MF A01

In response to the continual exponential growth in the complexity and cost of military weapon systems, especially the electronics portions, the United States Department of Defense has implemented a Design to Cost (DTC) procurement policy. The objective of this policy is to meet essential and desired operational requirements in the most cost effective manner by setting cost targets at the start of the procurement process. A methodology is described for developing electronic equipment to meet DTC requirements. Specific management action is required in establishing an appropriate organization as well as procedures and guidelines for the engineering development process and subsequent production to achieve the cost targets. The critical role of computer aided design in optimizing the electronic system design is highlighted. An example of a DTC program successfully applied to the Lightweight Doppler Navigation System (LDNS) AN/APN-128 is reviewed. Author

N85-26657# Bodenseewerk Geraetetechnik G.m.b.H., Ueberlingen (West Germany). Missile Div.

# SIMULATION: A TOOL FOR COST-EFFECTIVE SYSTEMS **DESIGN AND LIVE TEST REDUCTION**

R GAUGETT In AGARD Cost Effective and Affordable Guidance and Control Systems 9 p Feb. 1985 refs

Avail: NTIS HC A13/MF A01

Taking advanced passive infrared guided missiles as an example of missile system simulation - both software and realtime hardware-in-the-loop including background - is a valuable tool to find cost-effective system designs and also to drastically reduce costs of field testing and live firing trials. The development of complex missile systems becomes questionable from a cost standpoint if the majority of the increased test efforts for this type of missiles is not substituted by missile system simulation. The author addresses Bodenseewrk's missile system simulation philosophy, simulation methods, high level programming language and the interfaces between the involved hardware and software. An in-depth discussion of the influence of simulation onto the

flight testing requirements of missile developments and the resultant cost savings conclude this paper G.L.C.

N85-26842\*# Hoffman (F. E) and Associates, Montrose, Calif. COST PREDICTION MODEL FOR VARIOUS PAYLOADS AND INSTRUMENTS FOR THE SPACE SHUTTLE ORBITER Final Report

F. E. HOFFMAN 17 Aug. 1984 36 p refs Prepared for JPL (Contract NAS7-918)

(NASA-CR-175781; JPL-9950-1061; NAS 1.26.175781;

FEHA-84-08-01) Avail: NTIS HC A03/MF A01 CSCL 22B

The following cost parameters of the space shuttle were undertaken: (1) to develop a cost prediction model for various payload classes of instruments and experiments for the Space Shuttle Orbiter; and (2) to show the implications of various payload classes on the cost of: reliability analysis, quality assurance, environmental design requirements, documentation, parts selection, and other reliability enhancing activities. G.L.C

#### N85-32138# Congressional Budget Office, Washington, D. C. PRICING OPTIONS FOR THE SPACE SHUTTLE. SPECIAL STUDY

Mar 1985 58 p refs

Avail: NTIS HC A04/MF A01

The space shuttle is the most important means of placing satellites into orbit for scientific, commercial, and military purposes. The price which the National Aeronautics and Space Administration (NASA) charges foreign and commercial customers to use the shuttle's launch services has important implications for the development of space and for the future of the U.S. space program. Alternative shuttle prices, their relation to shuttle costs, and how alternative prices could affect the goals of the national space effort are analyzed. The costs of the shuttle system is analyzed, a set of pricing options is developed, the implications of these options for space policy objectives are explored E.A.K.

#### N85-32813# Naval Postgraduate School, Monterey, Calif. A MICROCOMPUTER TUTORIAL ON SPREADSHEETS AND DATABASES WITH A SIMULATED BUDGET PREPARATION M.S. Thesis

S T. COWEN, III Mar. 1985 116 p

(AD-A155516) Avail NTIS HC A06/MF A01 CSCL 05A

The objective of this thesis is to illustrate to financial managers in the Practical Comptrollership Course (PCC) some of the potential for microcomputers in budget preparation and execution. This will be accomplished through the use of a tutorial on electronic spreadsheets and databases, and a simulated budget generated using an electronic spreadsheet. The background of microcomputer implementation into the federal government and commercial industry and the problems encountered in this implementation are presented. The theory of tutorial development, along with a methodology which uses a layered procedure is discussed and used to develop the tutorial which resulted from this thesis. The tutorial manual is enclosed as Appendix A and the computer program is enclosed as a requirement for all PCC students. GRA

#### N85-34147\*# Wilson (James E), La Plata, Md. STUDY TO ENCOURAGE AND FACILITATE INDUSTRIAL INVESTMENT AND INVOLVEMENT IN SPACE Final Report J. E. WILSON 29 Feb. 1984 13 p

(Contract NASW-3873)

(NASA-CR-176152, NAS 1.26:176152) Avail. NTIS HC A02/MF A01 CSCL 22A

A simple and efficient means to alert the Director, Space Station Commercialization Task Force (DSCTF) and the equivalent director of a permanent office for the same function, to actions required to assure comprehensive support of the NASA objectives for commercial uses of space during the annual budget cycle is described. G.L.C.

# LOGISTICS AND OPERATIONS MANAGEMENT

Includes Inventory Management and Spare Parts, Materials Management and Handling, Resources Management, Resource Allocation, Procurement Management, Leasing, Contracting and Subcontracting, Maintenance and Repair, Transportation, Air Traffic Control, Fuel Conservation, Operations, Operational Programs

#### A85-14896

# R&M IMPLICATIONS OF THE DOD ACQUISITION IMPROVEMENT PROGRAM

H L. GILMORE (Pennsylvania State University, Middletown, PA) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-33, June 1984, p 138-144. refs

The objectives and procedures initiated after issuance of the DoD Acquisition Improvement Program, intended to hold down procurement costs while enhancing reliability and maintainability (R&M) of hardware and software, are described. Limits have been removed from costs while more thorough cost projections are required during project bidding. The inclusion of architectures (of electronic components) which are amenable to evolutionary changes has been mandated as a means to eventually achieve desired capabilities before they are defined. Additional definitions of R&M thresholds are required on the bases of operational readiness, mission success probabilities, maintenance, manpower costs and logistics support costs. Successive changes to long-term procurements must be incremental and meet the R&M goals.

M.S.K.

#### A85-21548\* College of William and Mary, Williamsburg, Va. OPTIMAL MAINTENANCE CENTER INVENTORIES FOR FAULT-TOLERANT REPAIRABLE SYSTEMS

S. H. LAWRENCE and M. K SCHAEFER (College of William and Mary, Williamsburg, VA) Journal of Operations Management (ISSN 0272-6963), vol. 4, Feb. 1984, p. 175-181. Research supported by the College of William and Mary. refs

(Contract NSG-1625)

A probabilistic approach is taken to determine the optimal repairable parts inventory for a maintenance center, servicing machines which contain several m-out-of-n systems of different parts, with a constraint on the total inventory investment. A model, based on the discrete Markov process, accounts for a typical ultrareliable avionics system, such as one presently being developed by NASA The dynamic programming algorithm for minimizing the stockout and holding costs is applied to an exemplary maintenance center, and solutions for single-item and multi-item cases are given. The computational burden is noted to be reasonable and a computer program is used to generate optimal solutions.

#### A85-25978

#### INTEGRATION OF MSG-3 INTO AIRLINE OPERATION

L F BRETT (Trans World Airlines, Inc., Kansas City, MO) Society of Automotive Engineers, Aerospace Congress and Exposition, Long Beach, CA, Oct. 15-18, 1984 5 p. (SAE PAPER 841483)

An airline operator's development of an initial maintenance program has its basis in the FAA's MSG-3 guidelines. The accuracy and clarity of the MSG-3 review process provide a smooth transition for the airline's manpower, parts, tooling, ground equipment, and other established systems, from a given aircraft to a new type. By clearly identifying maintenance tasks, MSG-3 makes manpower resource requirement forecasting easier, allowing determinations to be made of the level of skills that must be used in maintenance tasks. O.C.

# 08 LOGISTICS AND OPERATIONS MANAGEMENT

# A85-25979

# MSG-3 - A METHOD FOR MAINTENANCE PROGRAM PLANNING

J. A. PONTECORVO (FAA, Office of Airworthiness, Washington, DC) Society of Automotive Engineers, Aerospace Congress and Exposition, Long Beach, CA, Oct. 15-18, 1984. 6 p. (SAE PAPER 841485)

An account is given of the development of the Airliner/Manufacturer Maintenance Program Planning document, which, having been formulated by the FAA's Maintenance Steering Group-3 Task Force, is designated 'MSG-3'. Before any new model aircraft enters commercial service, the airline in question must have its maintenance and inspection program approved by the FAA. The airline develops a program for submission to the FAA which is in accord with MSG-3's general organization and decision process for determining the scheduled maintenance requirements projected for the life of both aircraft and powerplant.

#### A85-35073

#### COMMISSION STACKER - INCORPORATION IN A TOTAL LOGISTIC CONCEPT [KOMMISSIONIERSTAPLER -EINBINDUNG IN EIN LOGISTISCHES GESAMTKONZEPT]

P. ORLOWSKI (Messerschmitt-Boelkow-Blohm GmbH, Bremen, West Germany) Dortmunder Gespraeche '84 - Flexible Automatisierung von Flurfoerderzeugsystemen, Dortmund, West Germany, Mar. 28, 29, 1984, Paper. 5 p In German (MBB-UT-36-84-OE)

The increase in Airbus production rates and the necessity to improve the cost efficiency of production has led to changes in the structure of the manufacturing plants of a West German aerospace company. An important factor, in addition to the employment of new technologies and installations, was the economic solution of problems of integration. Concepts of logistics for use throughout the plant organization were developed, and, in part, already implemented. The storage of parts and devices needed in subsequent manufacturing and assembly operations is considered, taking into account the 'commissioning' or assignment of items required for a specific operation. The commissioning or assignment of items required for a specific operation. The commissioning was considered as a problem for which an optimal solution had to be obtained. It was found that the utilization of a 'commission stacker' was an important factor in a procedure providing such an optimal solution. Another important element in the envisaged procedure involves the employment of data processing techniques and a closed informational chain of loaistics. GR

### A85-37903

#### UNITS OF EQUIPMENT AVAILABLE USING CANNIBALIZATION FOR REPAIR-PART SUPPORT

D. L. BYRKETT (Miami University, Oxford, OH) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-34, April 1985, p. 25-28.

This paper presents a mathematical model to predict the number of units of equipment available in the future. The components of this equipment are subject to Poisson failures and replacements are obtained by cannibalization. A numerical example is presented, and some difficulties encountered in the practical application of this model are discussed. Author

#### A85-39070

# FAILURE MODES AND EFFECTS ANALYSIS METHOD FOR NEW PRODUCT INTRODUCTIONS

R. E. WARR (General Electric Co., Bridgeport, CT) IN Advances in aerospace propulsion; Proceedings of the Aerospace Congress and Exposition, Long Beach, CA, October 15-18, 1984 . Warrendale, PA, Society of Automotive Engineers, Inc., 1984, p. 145-150.

# (SAE PAPER 841600)

A different method of performing Failure Modes and Effects Analyses (FMEAs) is described that is beneficial in improving product quality and in avoidance of product problems in-house and in the field. The method is usefully applied to mechanical products since there is a dearth of mechanical failure rate data and is suitable for new product introductions during the concept or early design phase to help answer many of the quality, producibility, safety and reliability questions that arise concerning new product designs. The method is different from the traditional methods of performing FMEAs since it is accomplished without historical part failure rate data, an area that frequently creates significant problems to the analyst of new product introductions. The method of performing FMEAs allows for continuing update during a product design program since the analysis can be automated Author

#### A85-45148#

#### **DYNA-METRIC - NEW CAPABILITIES**

B J. WIELAND (USAF, Logistics Command, Wright-Patterson AFB, OH) IN: NAECON 1984; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 21-25, 1984. Volume 2 . New York, IEEE, 1984, p. 1280-1283 refs

Dyna-METRIC, a Dynamic Multiechelon Technique for Recoverable Item Control, is an analytical model developed by the Air Force to improve the management of multiindenture reparable spare parts. A general overview of the basic components of the Dyna-METRIC model is given, and some new features incorporated into the fourth version of the model are described. The improved features include: the ability to consider the depot as more than a supply of stock; sortie-based part failure determination; and greater flexibility in assigning part repair times. I.H.

A85-47683\* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif

### CONCEPTS AND ALGORITHMS FOR TERMINAL-AREA TRAFFIC MANAGEMENT

H. ERZBERGER and J. D. CHAPEL (NASA, Ames Research Center, Moffett Field, CA) IN. 1984 American Control Conference, San Diego, CA, June 6-8, 1984, Proceedings. Volume 1 . New York, IEEE, 1984, p 166-173. refs

The nation's air-traffic-control system is the subject of an extensive modernization program, including the planned introduction of advanced automation techniques. This paper gives an overview of a concept for automating terminal-area traffic management. Four-dimensional (4D) guidance techniques, which play an essential role in the automated system, are reviewed One technique, intended for on-board computer implementation, is based on application of optimal control theory. The second technique is a simplified approach to 4D guidance intended for ground computer implementation. It generates advisory messages to help the controller maintain scheduled landing times of aircraft not equipped with on-board 4D guidance systems. An operational system for the second technique, recently evaluated in a simulation, is also described

#### A85-48239\* College of William and Mary, Williamsburg, Va. OPTIMAL INVENTORIES FOR OVERHAUL OF REPAIRABLE REDUNDANT SYSTEMS - A MARKOV DECISION MODEL

M K. SCHAEFER (College of William and Mary, Williamsburg, VA) IN: Reliability theory and models: Stochastic failure models, optimal maintenance policies, life testing, and structures; Proceedings of the Symposium on Stochastic Failure Models, Replacement and Maintenance Policies, and Accelerated Life Testing, Charlotte, NC, June 24-26, 1983. Orlando, FL, Academic Press, Inc., 1984, p. 141-151. refs

(Contract NSG-1625)

A Markovian decision model was developed to calculate the optimal inventory of repairable spare parts for an avionics control system for commercial aircraft. Total expected shortage costs, repair costs, and holding costs are minimized for a machine containing a single system of redundant parts. Transition probabilities are calculated for each repair state and repair rate, and optimal spare parts inventory and repair strategies are determined through linear programming. The linear programming solutions are given in a table.

# THE IMPOSITION OF FLOW CONTROL AVOIDS ATC OVERLOADS

C. EIGL (International Civil Aviation Organization, Search and Rescue Section, Paris, France) ICAO Bulletin, vol. 40, Feb. 1985, p 13-16.

The Air Traffic Flow Management (ATFM) unit was organized by the European Air Navigation Planning Group (EANPG) to ensure that an overload of the air traffic control (ATC) in the ATFM Region (which covers all Europe and has a USSR unit) does not occur, and that the traffic flow restrictions are minimized. The most important task of the ATFM is to establish early the anticipated high airspace and landing demand/ATC capacity ratio, and undertake specific action within either the strategic (early planning and coordination) or tactical, short-time measures. In practice, full use of the available ATC capacity is made on a local scale through the allocation of time slots to individual flights, and the adaptation of traffic flow into a given area. A truly regionwide coordination awaits full development of a reliable common data base, the Central Data Bank, which is now in its early phases of operation. This and other activities of the ATFM are planned and coordinated at the periodic EUR meeting of EANPG.

#### A85-49171

#### AUTOMATION IN AIR TRAFFIC MANAGEMENT

S. RATCLIFFE Journal of Navigation (ISSN 0020-3009), vol. 38, Sept. 1985, p. 405-412. refs

ATC procedures are currently limited by the manpower-intensive nature of the work, the necessity for each ATC to find local solution instead of for the flight as a whole, and the practice of imposing standarized traffic patterns. Automating the critical ATC functions would require reliability at an expected accident potential of 1:1 billion. Computer hardware reliability could be assured with fault tolerant techniques. However, there is no experience base with the needed reliability which would be required of the real-time software required to handle the associated complex situations. Also, humans must be able to oversee the automatic processes. The FAA has announced intentions of automating the cruise flight phase ATC functions with the AERA plan The system would also, optimally, interface with aircraft on-board flight management computers to enhance flight efficiency. It is concluded that progress toward automation must be pursued cautiously, and at present ATC functions should continue to be in the control of humans aided by computers. MSK.

#### A85-49536 MAINTAINABILITY ASPECTS IN MAINTENANCE MANAGEMENT

W. R DOWNS (Wm. Downs Technical/Management Services, Rancho Palos Verdes, CA) IN: Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings . New York, IEEE, 1984, p. 62-66. refs

This paper discusses the need for the operator of equipment to continue the efforts of the manufacturer in the user environment in order to assure the maintainability performance potential built into the system The maintainability performance predicted for the system is usually based on an operations model that is assumed to be real but may differ in many ways from the actual operations environment. Downtime, availability, and maintenance manhours, the common maintainability performance criteria, can vary widely as a function of maintenance concepts and maintenance planning to control those elements that are crucial to the attainment of maintainability performance objectives. Data relating to operations are presented in regard to the maintainability performance parameters they affect, and analyses are presented as examples of the types of analyses system operators may perform in order to optimize maintainability performance in the field. Author

# R&M ANALYSIS TECHNIQUES FOR FAULT-TOLERANT SYSTEMS

M. H. VEATCH, A B. CALVO (Analytic Sciences Corp., Reading, MA), and J. L. MCMANUS (USAF, Logistics and Human Factors Div., Wright-Patterson AFB, OH) IN: Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings . New York, IEEE, 1984, p 530-536. refs

Reliability and logistics support analysis techniques for fault-tolerant avionics systems are presented. The systems considered contain integration and dynamic reconfigurability as part of their fault-tolerant design. These characteristics, combined with the need for analysis during the early stages of development, pose unique modeling requirements The techniques developed address this need by providing design criteria based on reliability and maintainability during the early stages of design. They are applicable to the Integrated Communication, Navigation and Identification Avionics (ICNIA) architectures which are currently entering the advanced development phase. Author

#### A85-49914

#### WEIGHT CONTROL - A PROCUREMENT AGENCY PERSPECTIVE

D. M CATE (U.S. Naval Air Systems Command, Washington, DC) SAWE, Annual Conference, 43rd, Atlanta, GA, May 21-23, 1984. 14 p.

(SAWE PAPER 1594)

A procurement agency perspective on the factors which make success in weight control efforts difficult to achieve is presented, with attention to technological uncertainty, psychological pressures toward optimistic estimates, insufficient resources, and competing priorities. It is suggested that these factors can be significantly balanced by undertaking weighings for estimate verification, by the use of derivation and modification programs, and by means of center-of-gravity control O.C.

# N85-11993# Naval Supply Center, San Diego, Calif. SUPPLY CENTER PROCESSES

A. SENHEN *In* Defense Systems Management Coli. DoD Robotics

Appl. Workshop Proc. p 438-461 1983 (AD-P004014) Avail: NTIS HC A21/MF A01 CSCL 15E

The Naval Supply Centers supply the material needs for the fleet and shore activities including virtually all parts, provisions, and fuel needed to sustain day-to-day operations (The Supply Centers are not responsible for maintaining or distributing ordnance) GRA

# N85-11996# General Accounting Office, Washington, D. C. National Security and International Affairs Div.

# LOGISTICS SUPPORT COSTS FOR THE B-1B AIRCRAFT CAN BE REDUCED

20 Sep. 1984 49 p

(AD-A145846; GAO/NSIAD-84-36) Avail: NTIS HC A03/MF A01 CSCL 14D

While the Air Force's logistics support planning for the B-1 bomber has been extensive, the inadequacy of the logistics data developed during research and development of the B-1B's predecessor-the B-1A-and the concurrent development and production schedule necessitated by a congressional mandate that the aircraft be operational not later than 1987 have forced Air Force planners to make logistics support decisions before they had sufficient data to support them. This has increased the risk that operating and support costs will be more than they would have been had normal Defense development procedures been employed before starting production. GAO has identified opportunities to reduce these costs which should be considered. They are: (1) combining the purchase of investment spares (components that can be repaired and reused) with the purchase of production components; (2) buying spares directly from the manufacturers instead of through the four B-1B contractors; (3) reducing the number of bases from four to three; and (4) centralizing all avionics maintenance repair at the B-1B airframe and engine

depot repair facility and not establishing any repair shops at the planned B-1B bases GRA

N85-12790# Lesley Coll., Cambridge, Mass.

MAINTENANCE MANAGEMENT INFORMATION AND CONTROL SYSTEM (MMICS): ADMINISTRATIVE BOON OR BURDEN T P. MURRAY Mar. 1984 59 p (AD-A145762) Avail: NTIS HC A04/MF A01 CSCL 05B

Thirteen years of Air Force design and development went into the Maintenance Management Information and Control System (MMICS), an automated maintenance information system, because maintenance managers need fast, up-to-date maintenance-related data. MMICS is an on-line computer system accessed through remote terminals located in the work area. These terminals communicate with a central base-level computer via telephone circuits. MMICS has wide application and provides automated managers of aircraft, missile Information to and communications-electronic organizations. MMICS is currently in operation at one hundred forty Air Force units located at more than one hundred bases. Approximately eight hundred remote terminals and five hundred line printers are installed and in use worldwide. In aircraft maintenance organizations, MMICS provides information on changing aircraft and equipment conditions, parts requirements, aircraft schedules, equipment status and personnel resources and training. Personnel training is an important aspect of a manager's job and is vital to any organization that must maintain a proficient and experienced work force. The purpose of the project is to examine, determine and evaluate the benefit of the MMICS to managers and supervisors in conducting and monitoring training and training programs within their sections

GRA

N85-16008# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.

A BIRD STRIKE HANDBOOK FOR BASE-LEVEL MANAGERS M.S. Thesis

R. P PAYSON and J. D. VANCE Sep. 1984 223 p (AD-A147928; AFIT/GLM/LSM/84S-52) Avail NTIS HC

A10/MF A01 CSCL 05A

To help develop more awareness about bird strikes and bird strike reduction techniques, this thesis compiled all relevant information through an extensive literature search, review of base-level documents, and personal interviews. The final product -- A Bird Strike Handbook for Base-Level Managers--provides information on bird strike statistics, methods to reduce the strike hazards, and means to obtain additional assistance. The handbook is organized for use by six major base agencies: Maintenance, Civil Engineering, Operations, Air Field Management, Safety, and Air Traffic Control. An appendix follows at the end. GRA

Air Force Inst. of Tech., Wright-Patterson AFB, N85-16673# Ohio School of Systems and Logistics.

AN EVALUATION OF THE EFFECT OF ESTABLISHING A MINIMUM ECONOMIC ORDER QUANTITY (EOQ) ON THE AIR FORCE EOQ ITEM MANAGEMENT SYSTEM M.S. Thesis T. E. DISZ Sep. 1984 93 p (AD-A147121, AFIT/GLM/LSM/84S-14) Avail NTIS HC

A05/MF A01 CSCL 15E

Policy decisions concerning the Air Force economic order quantity (EOQ) item management system affect thousands of items, billions of dollars, and the readiness of the Air Force This thesis was initiated as a result of a March 1983 Air Force audit Agency report finding potential waste of monies because of deviation from normal procurement cycle periods (PCPs). It evaluates different PCP policies and their affect on several system performance measures for the Air Force consumable item management system The evaluation was performed using simulation models and actual Air Force item data The results support the audit report showing increased cost and investment as a result of larger minimum PCPs. In the first year, larger minimum PCP policies require more stock fund dollars to fund inventory growth, approximately \$1211M, \$1311M, and \$1560M for the 3, 6, and 12 month policies respectively. After the inventory reaches its new level the differences in the annual commit dollar requirements between policies becomes insignificant. GRA

N85-16678# Air Force Inst of Tech. Wright-Patterson AFB. Ohio School of Systems and Logistics.

AN ANALYSIS OF THE EFFECT OF PROCESS CONTROLS ON PRODUCTIVITY AND WEAPON SYSTEM COSTS IN DOD PROCUREMENT M.S. Thesis

M. W OMEARA Sep. 1984 122 p

(AD-A147496, AD-F300490, AFIT/GLM/LSM/84S-50) Avail: NTIS HC A06/MF A01 CSCL 15E

This thesis was a preliminary evaluation of the relationships among quality assurance process controls, productivity and weapon system costs. The available literature indicated positive relationships should exist among the three elements examined, but little empirical evidence was presented to support the positions of the authors. As a result, a detailed interview method was developed to describe the relationships that exist at major DoD aerospace facilities. On-site interviews were conducted at five randomly selected aerospace facilities identified as DoD Plant Representative Offices The results of this initial study were inconclusive. The examined relationships appeared to be positive, but the cognizant DoD personnel had not validated the contractor data claiming increased productivity and reduced costs associated with adequate process controls. Recommendations are provided to improve the DoD surveillance methods Originator-supplied keywords include: Acquisition/Procurement costs. GRA

N85-21680# Stanford Univ., Calif.

ON MAXIMIZING THE EXPECTED LIFETIME OF REPLACEABLE SYSTEMS

M. M. PERKINS Dec 1984 80 p

(Contract N00014-84-K-0244)

(AD-A150003; TR-213) Avail: NTIS HC A05/MF A01 CSCL 15E

Consider the following model. A system has one vital component with n spares. When the vital component fails, the system fails. Derman, Lieberman, and Ross have considered the problem of maximizing the time until failure of the system. They obtained optimal schedules when the lifetime distributions of the spares were known. This paper treats several different cases of this model and finds optimal schedules together with their properties. Assuming only the first two moments of the spare component lifetime distributions are known, the minimax replacement schedules is obtained. These minimax replacement schedules are then compared with schedules based on different amounts of information. When the spares are different from each other, it must be decided in which order they should be used. A general sufficient condition is given under which the greedy order is maximal This condition applies when the complete lifetime distribution is known, or for any minimax schedule. Two special cases are also considered. The first is the case in which groups of spares may be used in parallel. In the second special case, an additional spare will become available at some future time.

Author (GRA)

N85-22349# Naval Postgraduate School, Monterey, Calif. Dept. of Administrative Science.

#### AVIATION MAINTENANCE COMPUTERIZED MANAGEMENT INFORMATION SYSTEMS: PERSPECTIVE FOR THE FUTURE M.S. Thesis

J. F DERRICK and T. A MILLER Jun. 1984 89 p

(AD-A150637) Avail: NTIS HC A05/MF A01 CSCL 01C

The Naval Aviation Logistics Command Management Information System (NALCOMIS) is the next generation solution to the information assimilation gap faced by Naval Aviation maintenance managers. This thesis examines the scope of the problem at the Organizational and Intermediate levels of maintenance, and the intended effect of NALCOMIS and three peripheral information systems. The underlying concepts of the four systems investigated are used to explore Artificial Intelligence as the logical augmentation or follow-on to the NALCOMIS program.

Recommendations regarding the implementation of AI and expert systems are made. GRA

#### N85-25169# RAND Corp., Santa Monica, Calif. MANAGING RECOVERABLE AIRCRAFT COMPONENTS IN THE PPB (PLANNING, PROGRAMMING AND BUDGETING) AND RELATED PROCESSES. TECHNICAL VOLUME Interim Report J. H. BIGELOW Jun. 1984 390 p

(Contract MDA903-81-C-0381)

(AD-A152014; RAND/R-3094-MIL) Avail: NTIS HC A17/MF A01 CSCL 05A

This report describes a methodology called ORACLE--Oversight of Resources and Capability for Logistics Effectiveness. ORACLE's purpose is to assess the effects of varying certain resource levels on the peacetime materiel readiness and wartime sustainability of U.S. Air Forces, so that resource requirements can be better estimated and justified. It is intended primarily for use in the Planning, Programming, and Budgeting (PPB) process, but it can also be useful during execution. The author concludes that by itself, ORACLE should have significant value for resource planning. In conjunction with an improved forecasting capability and an execution tracking and control system, ORACLE's value will only be enhanced. GRA

#### N85-25193# Joint Publications Research Service, Arlington, Va. ADMINISTRATION CHIEF ON AIR TRAFFIC CONTROL IMPROVEMENTS

A. A. KOLESNIKOV *In its* USSR Rept.: Transportation (JPRS-UTR-84-015) p 1-4 31 May 1984 Transl. into ENGLISH from Grazhdanskaya Aviats (Moscow), no 3, Mar. 1984 p 30-31 Avail NTIS HC A03

The implementation of a unified system of air traffic control in the Soviet Union, the introduction of automated air terminal and air routing systems, and the installation of unified air traffic controllers' consoles with modern radio and secondary radar equipment are discussed. The main link in the operation of the air traffic control system is the controller. Intense attention is being paid to raising the professional, ethical, and political level of these personnel through training at educational establishments, the use of special training equipment, and in-service training at aviation enterprises. More attention should be given to technical training and system work in the traffic control services themselves. The role of flight supervisors as the primary teachers for each shift is examined. A.R H

#### N85-26692# Federal Aviation Administration, Washington, D.C NATIONAL AIRSPACE SYSTEM PLAN: FACILITIES, EQUIPMENT AND ASSOCIATED DEVELOPMENT Apr. 1985 358 p

Avail: NTIS HC A16/MF A01

The National Airspace System (NAS), a mixture of equipment, techniques, and skills that evolved over 40 years is discussed. Improvements in the systems are outlined The need to accommodate safely the increasing demand for aviation services, constrain costs, and solve the problems of aging facilities is emphasized. The specific improvements required long-term capabilities, and the planned system evolution remains essentially unchanged from previous editions. However, four new projects were added. The FAA has put in place a formal and disciplined management process to monitor and control schedules and costs of the NAS Plan. The NAS system requirements specification for the NAS and the system-level design are documented, baselined, and placed under configuration control. Risk areas in the program are identified, and SEI technical resources are applied to assist NAS projects in achieving milestone schedules. The new program management controls, SEI resources in place, and most of the major contracts awarded, the outlook is very favorable for the successful execution of the NAS Program Plan. E.A.K.

#### N85-27744# Naval Material Command, Washington, D. C. NAVY PROGRAM MANAGER'S GUIDE, 1985 EDITION Final Report

G. S. HANDLER, G. HEMMERLE, and W. RUCKER Jan. 1985 277 p

(AD-A151925; NAVMAT-P-9494) Avail. NTIS HC A13/MF A01 CSCL 15E

The guide describes the Department of the Navy system acquisition process, leaning heavily on lessons learned in past acquisition programs. It outlines the system acquisition process, identifies participants and describes their roles, describes the procedures necessary to move the program from one milestone to the next, and identifies possible pitfalls along the way. The Guide, where possible outlines methodologies and strategies and directs the program manager to specific sources of assistance It is an introduction and ready reference to the Navy acquisition process, not a formal instruction. GRA

**N85-28711#** Technische Hogeschool, Delft (Netherlands). Dept of Mathematics and Informatics.

FUTURE DIRECTIONS IN OPERATIONS RESEARCH

L. FORTUIN (Nederlandse Philips Bedrijven B.V.) and F. A. LOOTSMA 1984 36 p refs Submitted for publication (REPT-84-24) Avail: NTIS HC A03/MF A01

The gap between Operations Research (OR) theoretical developments and the application of methods and techniques to analyze and solve real-life management problems is discussed. Developments of the mathematics of OR and of the application of OR in industrial practice are outlined. Author (ESA)

N85-28712# National Aerospace Lab., Amsterdam (Netherlands).

**OPERATIONS RESEARCH** 

1983 15 p In DUTCH, ENGLISH summary Sponsored by Netherlands Agency of Aerospace Programs (B8561897) Avail. NTIS HC A02/MF A01

Research projects were carried out to improve the effectiveness and safety of civil and military aircraft operations. Quantitative methods such as (computer) simulations (either on a deterministic or statistical basis), network planning, and linear programming are used. Intercontinental and continental civil aircraft traffic; air traffic in the vicinity of airports; and ground traffic at airports are discussed. Military flight path measurements, low level and ground attack missions, and electronic countermeasures are discussed.

Author (ESA)

N85-28997# National Bureau of Standards, Gaithersburg, Md. Center for Analytical Chemistry.

# PRINCIPLES OF QUALITY ASSURANCE OF CHEMICAL MEASUREMENTS

J. K. TAYLOR Feb. 1985 81 p refs

(PB85-177947, NBSIR-85-3105) Avail: NTIS HC A05/MF A01 CSCL 07D

The principles of quality assurance of chemical measurements are discussed. They may be classified as quality control - what is done to control the quality of the measurement process, and quality assessment - what is done to evaluate the quality of the data output. Quality assurance practices are considered as a hierarchy with levels progressing from the analyst, the laboratory, the project, to the program The activities of each level are different and depend upon the ones beneath it. Recommendations are presented for developing credible quality assurance practices at each level An appendix contains outlines that may be used to develop the various documents associated with a quality assurance program.

Author (GRA)

### 08 LOGISTICS AND OPERATIONS MANAGEMENT

N85-29840# Air Force Logistics Management Center, Gunter AFS, Ala.

### INVENTORY POLICY FOR HIGH BACKORDER ITEMS

D J BLAZER and C. CARTER Oct. 1984 24 p (AD-A153696, AD-F630670, AFLMC-LS840810) Avail: NTIS HC

A02/MF A01 CSCL 15E

In this study the item-by-item performance of the Standard Base Supply System (SBSS) is compared with the results of an aggregate model that minimizes backorders. We found that a small group of relatively inexpensive items generate nearly 90% of the units backordered in the SBSS in a year. By adding a lot size to the reorder point for those high backorder items, we can significantly reduce the number of units backordered. In this study we show how to identify these items, the theory behind the proposed inventory policy change, and the stock fund impact of implementing the policy change. GRA

N85-30965# Air Force Logistics Management Center, Gunter AFS, Ala

#### EOQ (ECONOMIC ORDER QUANTITY) RANGE MODEL

D. J. BLAZER, W. FAULKNER, and M. P. HAM Jan. 1985 47 p

(AD-A153709; AD-F630708, AFLMC-LS840612) Avail: NTIS HC A03/MF A01 CSCL 15E

In compliance with DOD Instruction 4140 45, the Air Force implemented range model in December 1981 that was based on economics This economic range model determines what items to stock at base level, by comparing the cost to stock the item to the cost to not stock the item The item is stocked if it is economical. In this report we determine the: (1) Performance of the current range model, (2) Sensitivity of the range model to cost, item, and other factors, and (3) Operational, stockage, and cost performance of an alternative method of determining the range of stock for base level. We measured the performance of the current range model and found we had increased the number of line items we stock, but we have not increased the unit issue effectiveness. We also found General Support Division items with large lot sizes and high unit prices have a lower likelihood of stocking with the current range model than they did before the model was implemented. The reason the unit issue effectiveness is low is because the current range model is a customer model; it favors individual customers rather than satisfying the quantity of individual items all customers - large and small - request. GRA

**N85-31096** Direction Generale de L'Aviation Civile, Toulouse (France). Section d'Etudes et de Coordination SAR

SEARCH AND RESCUE OF AIRCRAFT IN DISTRESS IN FRANCE. ORGANIZATION, MEANS [LA RECHERCHE ET SAUVETAGE DES AERONEFS EN DETRESSE EN FRANCE. ORGANISATION, MOYENS]

P. ROCHEFORT *In* CNES Satellite Aided Search and Rescue. Exptl Results and Operational Prospects p 65-72 1984 In FRENCH

Avail CEPADUES, Toulouse

The administration of France's air-sea rescue services is outlined. Marine and terrestrial (including mountain rescue) aspects are covered. The SARSAT/COSPAS system is mentioned

Author (ESA)

N85-31868# Urban Mass Transportation Administration, Washington, D.C. Methods Div.

MICROČOMPUTERS IN TRANSPORTATION: SOFTWARE AND SOURCE BOOK, FEBRUARY 1985

R JENSEN-FISHER Feb. 1985 202 p Supersedes PB84-230366; N85-13490

(PB85-181022, UMTA-URT-41-85-1; PB84-230366) Avail: NTIS HC A10/MF A01 CSCL 13B

The Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA) of the U.S. Department of Transportation provide trainin and technical assistance in the new and rapidly changing area of transportation application of microcomputers. These two agencies maintain up-to-date microcomputer references for transit and paratransit operators, transportation planners, and traffic engineers. This document contains information pertaining to: (1) Microcomputer references and training and; (2) descriptions of software in the areas of transit operations, transportation planning, traffic engineering and paratransit planning and operations GRA

N85-32244# Naval Postgraduate School, Monterey, Calif SECURITY CONTROLS IN THE STOCKPOINT LOGISTICS INTEGRATED COMMUNICATIONS ENVIRONMENT (SPLICE) M.S. Thesis

D. S. ARSENEAULT Mar. 1985 91 p

(AD-A155536) Avail. NTIS HC A05/MF A01 CSCL 09B

This thesis examines security controls specified and implemented in the Stock Point Logistics Integrated Communications Environment (SPLICE) project. Controls provided by the Defense Data Network and the Tandem operating system are reviewed Alternatives from current literature in areas of authentication, encryption, and dial-port protection are reviewed for the purpose of suggesting enhancements Issues discussed apply to most interactive/decentralized systems in operation today and include administrative as well as technical recommendations. GRA

N85-33036# Army Procurement Research Office, Fort Lee, Va. FEASIBILITY OF APPLICATIONS OF COMPETITION DECISION ASSIST PACKAGE (CDAP) TO SPARE PARTS Final Report V. G. LANKFORD and B. L. STEWART Jan. 1985 48 p (AD-A154716, APRO-84-13) Avail: NTIS HC A03/MF A01 CSCL 14A

Defense Acquisition Regulation Supplement No. 6, DOD Replenishment Parts Breakout Program, 1 June 1983, prescribes a screening of replenishment parts designed to reduce costs by breaking out parts for purchase from other than prime weapon system contractors. The US Army Audit Agency recommended that a cost model be constructed and implemented to: (1) estimate potential costs and price reductions attributable to breakout or increased competition, (2) compare the two figures, and (3) identify whether breakout or competition is cost effective. In September 1983, the Army Procurement Research Office (APRO) published the Competition Decision- Assist Package (CDAP), APRO Study Report 82-08, which described an automated model designed to calculate estimates of recurring costs associated with two producers involved in a competitive production effort. This model had been developed as a tool to assist in the economic evaluation of production competition for a major weapon system. The objective of this study was to determine if it is feasible and beneficial to modify the existing CDAP model so it can be applied to spare parts breakout or competition as an economic analysis model. While the CDAP model may be useful for some major assemblies/subassemblies where an extensive manpower effort for developing model input is warranted, it is impractical as a general purpose economic analysis model for spare parts breakout or competition. Other, more appropriate models exist. GRA

**N85-34719**# Rolls-Royce Ltd., Derby (England) Operational Research Group.

DISCRETE SIMULATION MODELS - THEIR ROLE IN THE DESIGN, DEVELOPMENT AND MANAGEMENT OF INVENTORY CONTROL SYSTEMS

T. COOPER 24 Jan. 1985 13 p Presented at BPICS Seminar, 24 Jan. 1985

(PNR-90249) Avail: NTIS HC A02/MF A01

Discrete event simulation models were used as testbeds for the design, development and management of computer-based inventory control/scheduling systems. Inventory management at Rolls-Royce, and a case study are described Author (ESA) N85-35819# Office of Science and Technology, Washington, D. C.

PROGRESS REPORT ON IMPLEMENTING THE RECOMMENDATIONS OF THE WHITE HOUSE SCIENCE COUNCIL'S FEDERAL LABORATORY REVIEW PANEL, VOLUME 1 Summary Report

Jul. 1984 35 p

(PB85-185072) Avail NTIS HC A03/MF A01 CSCL 14B

The White House Science Council's Federal Laboratory Review Panel looks at Federal laboratory missions, identifies any systemic impediments to performance, and determine whether this Nation is getting the optimum return on its substantial investment in talent and facilities at the Federal laboratories GRA

### 09

# RELIABILITY AND QUALITY CONTROL

Includes Fault Tolerance, Failure and Error Analysis, Reliability Engineering, Quality Assurance, Wear, Safety Management and Safety, Standards and Measurement, Tests and Testing Inspections, Specifications, Performance Tests, Certification.

#### A85-10055

# RELIABILITY AND MAINTAINABILITY CONSIDERATIONS IN COMPUTER PERFORMANCE EVALUATION

V. B. PATKI (Tata Engineering and Locomotive Co., Poona, India), A. B. PATKI (Centre for Reliability, Madras, India), and B. N. CHATTERJI (Indian Institute of Technology, Kharagpur, India) IEEE Transactions on Reliability (ISSN 0018-9529), vol R-32, Dec. 1983, p 433-436. refs

This paper describes the application of R&M concepts to computer performance evaluation. The relevance of reliability to maintenance cost of computer system is established. Although a simple reliability model is used, one can use more complex models. The mathematical model for maintenance cost analysis must be tailored for individual cases, depending upon the maintenance philosophy of the organization. The computer performance analysis from maintenance view points should examine software reliability and recovery procedures, which are relatively difficult in distributed processing Author

### A85-10057

### **GENERAL PROBABILITY OF SYSTEM FAILURE**

J. KARPINSKI (Polish Academy of Sciences, Systems Research Institute, Warsaw, Poland) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-32, Dec 1983, p. 444-449.

This paper presents a general method to determine probabilities of failure of any fixed subset of coherent system components under various conditions. The method uses a known reliability structure of the system and the known joint probability distribution of its component times-to-failure. This method is universal and can be applied in many cases. Nevertheless, for large systems it is troublesome. In practice a problem is solved using a numerical program. Author

#### A85-11351

### SYSTEM SIZING - THE THEORY AND THE PRACTICE

G. S. M. TEALE (Petroleum Development Oman LLC, Muscat, Oman) and P. R WOLFE (Solapak, Ltd., High Wycombe, Bucks., England) IN: Photovoltaic Solar Energy Conference; Proceedings of the Fifth International Conference, Athens, Greece, October 17-21, 1983. Dordrecht, D. Reidel Publishing Co., 1984, p 417-423.

System-sizing safety margins are developed for solar power arrays providing relatively small amounts of energy at remote locations, using theoretical models and empirical data obtained by the Ministry of Petroleum and Minerals of Oman. The availability requirements of typical loads (microwave chains, single-channel VHF repeaters, and pipeline cathodic protection systems) are characterized; generator parameters (including shadowing and dust-accumulation effects) are assessed, and corrections to be applied to typical sizing programs to take these phenomena into account are presented in tables and graphs. The need for users to perform careful analyses and specify safety factors themselves is stressed T.K.

#### A85-11666

#### FAILURE PREVENTION AND RELIABILITY - 1983; PROCEEDINGS OF THE FIFTH CONFERENCE, DEARBORN, MI, SEPTEMBER 11-14, 1983

G. M. KURAJIAN, ED. (Michigan, University, Dearborn, MI) Conference sponsored by the American Society of Mechanical Engineers. New York, American Society of Mechanical Engineers, 1983, 211 p. For individual items see A85-11667 to A85-11679

Various papers on failure prevention and reliability are presented. Case studies on reliability, failure analysis, and testing are reported. The general topics addressed include: fatigue failure and crack growth, procedures, programs, and techniques for failure prevention and reliability; failure and related concepts; and stress and failure analysis of components Individual subjects discussed include. probabilistic fatigue crack growth and design, fatigue crack growth analysis under random spectrum loading using the generalized Willenborg model; new method for determining threshold values of creep crack growth; study of elastic-plastic fracture problem using finite element technique; crack arrest in structural ceramics; fatigue behavior of notched thermoplastics. Also considered are fatigue failure warning method for fiber-reinforced composite structures; reliability improvement by aerothermal analysis of high-speed rotating machinery; reliability estimates through statistics of random response excursions; stress analysis applications to service failures of travelling wave tubes; role of stress analysis in failure prevention; probabilistic design criteria for cylinders and spheres under thermal stresses. C.D.

#### A85-12645

### **GROUP TESTING**

A. B. MUNDEL Journal of Quality Technology (ISSN 0022-4065), vol 16, Oct. 1984, p. 181-188. refs

Group testing, the simultaneous testing of more than one unit by one test, can provide substantial economies. Group testing can be done in two stages: the testing of groups followed by testing all units in groups that fail. This procedure can be optimized by selecting the most efficient group size for a process with a specific fraction nonconforming Greater efficiency can be obtained by multistage group testing, subdividing a group that fails acceptance into successively smaller subgroups, and eventually testing the individual units in the subgroups that fail. These procedures, as opposed to sampling, submit all units to acceptance tests rather than accepting a group whose samples pass an acceptance criterion. Author

#### A85-14101

TESTING, EVALUATION AND QUALITY CONTROL OF COMPOSITES; PROCEEDINGS OF THE INTERNATIONAL CONFERENCE, UNIVERSITY OF SURREY, GUILDFORD, SURREY, ENGLAND, SEPTEMBER 13, 14, 1983 T. FEEST, ED Sevenoaks, Kent, England, Butterworth Scientific,

T. FEEST, ED Sevenoaks, Kent, England, Butterworth Scientific, Ltd., 1983, 352 p. For individual items see A85-14102 to A85-14119.

The topics considered include the measurement of fiber/matrix interfacial bond shear strength, the fracture toughness of carbon/epoxy composites, the prediction of notch-tip energy absorption, the assessment of fatigue damage in carbon-reinforced plastic laminates, the X-ray radiography of delamination growth in notched carbon/epoxy laminates, the nondestructive testing of aircraft composite structures, acoustic emission studies in composites with rubber-toughened matrices, quality assurance in a production environment, and the thermo/hygro-response behavior and measurement of selected composite systems. Also discussed are microdamage development in composite laminates during fatigue loading, the dynamic behavior of brittle materials, pattern

# QUALITY ASSURANCE IN A PRODUCTION ENVIRONMENT

A W. THOMPSON (Bristol Composite Materials Engineering, Ltd., Bristol, England) IN: Testing, evaluation and quality control of composites; Proceedings of the International Conference, Guildford, Surrey, England, September 13, 14, 1983 Sevenoaks, Kent, England, Butterworth Scientific, Ltd., 1983, p. 127-136.

A development history is presented for the methods used to achieve consistently high quality in the fabrication of composite structures, at a major British manufacturing plant, over the course of 30 years. A series of recommendations are made on the basis of experience with numerous and varied aerospace and defence composites-manufacturing tasks. It is noted that workmen must have both adequate training and explanations justifying the procedures and methods to be employed. In order to keep complicated records systems, batches of components must remain clearly differentiated from others for all manufacturing and assembly operations. The recurrence of processing errors is best prevented by making the worker in question responsible for the remedial action required O.C

#### A85-16254

.

# APPLICATION OF A QUALITY ASSURANCE SYSTEM IN THE PRODUCTION OF MATERIALS AND COMPONENTS

 K H. BUCHNER and O PAAR (Vereinigte Edelstahlwerke AG, Ternitz and Kapfenberg, Austria) IN: Structural failure, product liability and technical insurance; Proceedings of the First International Conference, Vienna, Austria, September 26-29, 1983
 Amsterdam, North-Holland, 1984, p 149-158 refs The application of a strict quality-assurance system with

The application of a strict quality-assurance system with precisely defined written procedures and step-by-step documentation to the industrial fabrication of stainless-steel components for steam generators and nuclear reactors is discussed and illustrated with block diagrams, photographs, and tables It is found that the reduced flexibility imposed by this type of system is outweighed by the advantages of easy quality verification and system transparency (permitting the ongoing identification and correction of shortcomings during the manufacturing process).

т.к

#### A85-17779 THE MANAGEMENT OF FAILURE

J. D. GOODLETTE (Martin Marietta Aerospace, Denver, CO) Engineering Management International (ISSN 0167-5419), vol. 2, May 1984, p. 165-171.

The present investigation is mainly concerned with the full-scale engineering development of a product, which, according to definition, begins with the end of preliminary design. The role of testing in a development project is considered, and aspects related to failure management are discussed, taking into account expectations of failure, failure analysis and corrective action, unverified failure, generic failure, personnel error, software change, and heritage hardware. Particular attention is given to the importance of investigating a failure. The engineering manager must find a way to reproduce a failure which has occurred Such a reproduction will provide a basis for the detection of the physical cause of the failure, which in turn will lead to actions needed to prevent the problem from recurring. G.R.

#### A85-17833\*# Battelle Columbus Labs., Ohio A FAULT-TOLERANT SOFTWARE STRATEGY FOR DIGITAL SYSTEMS

E. F. HITT and J J WEBB (Battelle Columbus Laboratories, Columbus, OH) IN: Digital Avionics Systems Conference, 6th, Baltimore, MD, December 3-6, 1984, Proceedings . New York, American Institute of Aeronautics and Astronautics, 1984, p 211-216 refs

(Contract NAS1-17412)

# (AIAA PAPER 84-2646)

Techniques developed for producing fault-tolerant software are described. Tolerance is required because of the impossibility of defining fault-free software. Faults are caused by humans and can appear anywhere in the software life cycle. Tolerance is effected through error detection, damage assessment, recovery, and fault treatment, followed by return of the system to service Multiversion software comprises two or more versions of the software yielding solutions which are examined by a decision algorithm. Errors can also be detected by extrapolation from previous results or by the acceptability of results. Violations of timing specifications can reveal errors, or the system can roll back to an error-free state when a defect is detected. The software, when used in flight control systems, must not impinge on time-critical responses. Efforts are still needed to reduce the costs of developing the fault-tolerant systems. M.S.K.

### A85-17848#

VERIFICATION TECHNIQUES FOR IMPROVING SOFTWARE QUALITY THROUGH AUTOMATED REQUIREMENTS DATA BASES

G. LUEDERS (Sperry Corp , Sperry Flight Systems Div , Phoenix, AZ) IN Digital Avionics Systems Conference, 6th, Baltimore, MD, December 3-6, 1984, Proceedings . New York, American Institute of Aeronautics and Astronautics, 1984, p. 309-311. (AIAA PAPER 84-2669)

The verification testing problem posed by large systems is considered. It is pointed out that with thousands of requirements and multiple submodes and configurations, it may be very difficult to confirm that a test has been conducted on each requirement in the relevant mode or configuration. Traceability and coverage problems inherent in large systems were resolved on the 757/767 flight management computer (FMC) system, taking into account detailed verification testing by the use of automated requirements data bases. Attention is given to the 757/767 FMC system verification data base, the implementation of the system data base, the 757/767 detailed verification data bases, and the use of the thread matrix and function matrix data bases.

A85-17873\*# Draper (Charles Stark) Lab., Inc., Cambridge, Mass.

USING ADA FOR A DISTRIBUTED, FAULT TOLERANT SYSTEM

J B DEWOLF, N. M. SODANO, and R. S. WHITTREDGE (Charles Stark Draper Laboratory, Inc., Cambridge, MA) IN: Digital Avionics Systems Conference, 6th, Baltimore, MD, December 3-6, 1984, Proceedings New York, American Institute of Aeronautics and Astronautics, 1984, p. 477-484. refs

(Contract NAS9-16023; NASA TASK 84-18)

(AIAA PAPER 84-2703)

It is pointed out that advanced avionics applications increasingly require underlying machine architectures which are damage and fault tolerant, and which provide access to distributed sensors, effectors and high-throughput computational resources. The Advanced Information Processing System (AIPS), sponsored by NASA, is to provide an architecture which can meet the considered requirements. Ada was selected for implementing the AIPS system software. Advantages of Ada are related to its provisions for real-time programming, error detection, modularity and separate compilation, and standardization and portability. Chief drawbacks of this language are currently limited availability and maturity of language to real-time applications. The present investigation is concerned with current plans for employing Ada in the design of the software for AIPS. Attention is given to an overview of AIPS, AIPS software services, and representative design issues in each of four major software categories. G R.

#### A85-18440#

### MILITARY ELECTRONICS - WHY SO UNRELIABLE?

E. J. LERNER Aerospace America (ISSN 0740-722X), vol 23, Jan. 1985, p. 106-109.

The causes and remedies for unreliable electronics components procured by the DOD are examined. It is noted that the procurement agencies have in the recent past failed to specify the required lifetimes, have sacrificed reliability to lower costs, meet schedules or reach performance goals, and have not monitored the programs. The burden of reliability is to be left to reliability engineers, who have to review the works of designers before parts are manufactured for testing. Oversight is necessary to assure that all parts of an assembly actually meet mil-specs and are not commercial analogs or untested materials A different problem exists for aluminum in circuit components, which may experience electromigration during burn-in. It is recommended that manufacturers be required to answer questions of reliability assurance before bidding begins, rather than after awards of contracts. M.S.K.

#### A85-24084

# QUALITY MANAGEMENT TECHNOLOGY - PRACTICAL CONSIDERATIONS

E. F MILLER, J.R. (Software Research Associates, San Francisco, CA) Journal of Test and Evaluation, vol. 5, Oct. 1984, p. 13-19. refs

Methods are currently available for the testing of software and hardware systems. The present investigation is concerned with these methods, taking into account also relations between hardware and software testing problems A design level complexity comparison is conducted, giving attention to the 'tr' function, the search function, the central processor unit, and the complete computer system A software test methods survey is provided. and inspection methods are considered along with inspection method details, and aspects of experience and recommendations. Static analysis methods are discussed, and dynamic analysis methods are examined in a description of advanced testing methods, symbolic analysis methods and formal verification procedures are taken into account. Attention is given to ad hoc testing, structural testing, advanced path testing, and practical test certifications. G.R.

#### A85-25108

# PERFORMANCE/RELIABILITY MEASURES FOR FAULT-TOLERANT COMPUTING SYSTEMS

S. OSAKI (Hiroshima University, Higashi-Hiroshima, Japan) IEEE Transactions on Reliability (ISSN 0018-9529), vol R-33, Oct. 1984, p. 268-271. refs

Some fault-tolerant computing systems are discussed and existing reliability measures are explained Some performance/reliability measures are introduced Several systems are compared by using numerical examples with the new measures. Author

#### A85-25109

### SOME REMARKS ON OPTIMUM INSPECTION POLICIES

N. KAIO (Hiroshima Shudo University, Hiroshima, Japan) and S. OSAKI (Hiroshima University, Higashi-Hiroshima, Japan) IEEE Transactions on Reliability (ISSN 0018-9529), vol R-33, Oct. 1984, p. 277-279. refs

Optimum inspection policies are discussed, introducing the inspection density and using it to derive the optimum inspection policy. The models discussed are: the basic model, the basic model with checking time, and the basic model with imperfect inspection. For each model, the approximate optimum inspection policy minimizing the total s-expected cost is obtained by applying the calculus of variations. Author

#### A85-32010#

### SOFTWARE QUALITY ASSURANCE PROGRAM FOR THE AH-64 ADVANCED ATTACK HELICOPTER (AAH)

B R GANTZ, L KENISON, and S. D. KUCHLAK (Hughes Helicopters, Inc., Mesa, AZ) American Helicopter Society, Annual Forum, 40th, Arlington, VA, May 16-18, 1984, Paper. 18 p.

The importance of a Software Quality Assurance (SQA) Program is discussed, taking into account the need for such programs in connection with the requirements of the Department of Defense (DOD), specifications imposed by the DOD, and the Software Quality Assurance Organization. It is pointed out that an effective SQA organization develops a Software Quality Assurance Program Plan (SQAPP) which serves as a guide to monitor, audit, inspect, and report on all software developed. A description is given of the history of the SQA development in the organization of an American aerospace company. In mid-1981, with the first production contract for the AAH-64 in the negotiating stage, it became apparent that the U.S. Army was going to make software quality assurance a part of the production contract Attention is given to the various developments which led to a Software Quality Assurance Program Plan in December 1982, and its approval by January 1983. G.R.

#### A85-34449

### STATISTICAL ESTIMATION OF SOFTWARE RELIABILITY

S. M. ROSS (California, University, Berkeley, CA) IEEE Transactions on Software Engineering (ISSN 0098-5589), vol SE-11, May 1985, p. 479-483. refs (Contract AE AEOSE 81.0122)

(Contract AF-AFOSR-81-0122)

A procedure commonly used in the testing of new computer software packages is the package's application to a set of well known problems. Specific bugs that may be responsible for the errors observed are then sought, and the package is accordingly altered in order to model this process, it is presently supposed that the package contains an unknown number of bugs which generate errors in accordance with an independent Poisson process having unknown rates, and that the errors are independently detected with some known property. The error rate for the revised package is determined under a variety of assumptions as to what is learned when debugging occurs. O.C.

#### A85-34460

#### A FAULT TOLERANT MILITARY SATELLITE NETWORK MANAGEMENT SYSTEM

C. SCHIANO and A VAN NOSTRAND (Grumman Data Systems Corp, Calverton, NY) IN: Milcom '83, Proceedings of the Military Communications Conference, Washington, DC, October 31-November 2, 1983 Volume 1 New York, Institute of Electrical and Electronics Engineers, Inc., 1983, p. 47-59.

Defense Satellite Communications Systems are increasingly being structured as networks. It becomes, therefore, critical to be able to monitor and control the activity and performance of the network. Traditionally, this has been done through the use of ground station equipment manufacturer's standard monitor and control systems. The ground station ground communications equipment has been continually updated to provide redundance and fault tolerance. This paper provides a description of a Military Satellite Network Monitor and Control System which uses the most modern fault-tolerant computing techniques to provide continuous, correct network management. G.R

### A85-36291

### IMPLEMENTING FAULT-TOLERANT DISTRIBUTED OBJECTS

K P BIRMAN, T. A. JOSEPH, T. RAEUCHLE, and A. EL ABBADI (Cornell University, Ithaca, NY) IEEE Transactions on Software Engineering (ISSN 0098-5589), vol. SE-11, June 1985, p 502-508. Research supported by Sperry Corp. refs

This paper describes a technique for implementing k-resilient objects - distributed objects that remain available, and whose operations are guaranteed to progress to completion, despite up to k site failures. The implementation is derived from the object specification automatically, and does not require any information beyond what would be required for a nonresilient nondistributed

#### TECHNIQUE FOR ESTIMATING PERFORMANCE OF FAULT-TOLERANT PROGRAMS

R. D. SCHLICHTING (Arizona, University, Tucson, AZ) IFFF Transactions on Software Engineering (ISSN 0098-5589), vol. SE-11, June 1985, p 555-563. refs (Contract NSF MCS-82-02869)

A technique is presented for estimating the performance of programs written for execution on fail-stop procesors. It is based on modeling the program as a discrete-time Markov chain and then using z-transforms to derive a probability distribution for time to completion Author

#### A85-37901

#### THE LINEAR SOFTWARE RELIABILITY MODEL AND UNIFORM TESTING

M TRACHTENBERG (RCA, Missile and Surface Radar Div, Moorestown, NJ) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-34, April 1985, p. 8-16. refs

The Jelinski-Moranda, Shooman, and Musa software reliability models all predict that the software error detection rate in a software system is a linear function of the detected errors. The basic differences among the models are that the error rates are, respectively, in terms of calendar-time, manpower, and computer-time The models are simple to use for estimating the number of errors still in the tested software Published studies generally show that error rates during system testing correlate best with the Musa model, and progressively less with the Shooman, and Jelinski-Moranda models. Simulation shows that, with respect to the number of detected errors, (1) testing the functions of a software system in a random or round-robin order gives linearly decaying system-error rates, (2) testing each function exhaustively one at a time gives flat system-error rates, (3) testing different functions at widely different frequencies gives exponentially decaying system-error rates, and (4) testing strategies which result in linear decaying error rates tend to require the fewest tests to detect a given number of errors Author

#### A85-37904

#### A SYSTEM RELIABILITY MODEL WITH CLASSES OF FAILURES

A. HAC (Johns Hopkins University, Baltimore, MD) IEEE Transactions on Reliability (ISSN 0018-9529), vol. R-34, April 1985, p. 29-33. Research sponsored by the British Council. refs

This paper presents an approach to system reliability involving s-dependence of the workload as well as the system configuration Four classes of failures are described and then incorporated into the workload model. Mean time to failure and the system reliability are the functions of parameters estimated by monitoring a real system. The model allows multiple classes of users and priority requests to be represented. The model is validated using measurement data collected in an IBM installation. Author

### A85-38267#

### ECONOMIC CONSIDERATIONS IN SELECTING SPACECRAFT QUALITY ELECTRONIC PARTS

M L. ADAMS (Rockwell International Corp., Pittsburgh, PA) IN: Aerospace Testing Seminar, 8th, Los Angeles, CA, March 21-23, 1984, Proceedings . Mount Prospect, IL, Institute of Environmental Sciences, 1984, p 177-184. refs

The space industry is concerned with the continuous improvement of systems capability and reliability, and the prolongation of the useful life for space systems. It is highly important to achieve these goals in a cost-effective manner. Within the U.S. Air Force Space Division (AFSD) programs, two have received particular attention. One is the Class S program which involves the improvement of electronic piece part quality and reliability, while the other is concerned with the improvement of test requirements and criteria through use of MIL-STD-1540. The present paper focuses on the implementation of the Class S requirements in a particular case, taking into account applications to the space segment of the Global Positioning System (GPS). Attention is given to a Class S background, reliability improvements, Class S implementation on Navstar, and aspects of cost avoidance/savings. GR

### A85-40255

#### THE DEMING INSPECTION CRITERION FOR CHOOSING ZERO **OR 100 PERCENT INSPECTION**

E. P PAPADAKIS (Ford Motor Co., Detroit, MI) Journal of Quality Technology (ISSN 0022-4065), vol 17, July 1985, p. 121-127. refs

An analysis of Deming's (1981) inspection criterion (DIC) for choosing zero or 100 percent inspection is presented, based on examples from the inspection practices of a large U.S. automaker. The DIC is derived from statistical principles to express the cost to the firm of sampling incoming lots of material for statistical quality control (SQC). It is shown by the examples that practice was related to the DIC only in the specific cases cited, and cost savings and cost avoidance were obtained from 100 percent inspection only in those cases in which the DIC indicated 100 percent inspection was warranted. In four out of five of the cases studied, 100 percent inspection was mandated on the basis of the DIC, and slow progress in improving production processes did not permit the removal of the 100 percent inspection requirement after a period of six years IH.

#### A85-40333#

#### RELIABILITY FOR REAL-TIME SYSTEMS [ZUVERLAESSIGKEIT FUER REALZEITSYSTEME

S. OMLOR (Messerschmitt-Boelkow-Blohm GmbH, Munich, West Germany) Deutsche Gesellschaft fuer Luft- und Raumfahrt, Jahrestagung, Hamburg, West Germany, Oct. 1-3, 1984. 22 p In German. refs (DGLR PAPER 84-117)

A software reliability model is developed for use in the design of real-time control systems. The characteristics of real-time systems are reviewed; the criteria and models used to measure reliability are examined; and the need for a model which can be applied during the design phase is indicated. The present model is based on Markov processes, assuming that the reliability of each program subunit and the information flow are stochastic while the program structure is deterministic, and can be derived from a system configuration with structured analysis and modular design. In effect, the model permits an approximate simulation of the program reliability and identifies the critical program subunits for the test phase T.K.

A85-43176\* American Inst. of Aeronautics and Astronautics, New York.

WHITE-COLLAR PRODUCTIVITY AND QUALITY ISSUES; PROCEEDINGS OF THE SYMPOSIUM ON PRODUCTIVITY AND QUALITY: STRATEGIES FOR IMPROVING OPERATIONS IN INDUSTRY, WASHINGTON, GOVERNMENT AND DC. SEPTEMBER 25, 26, 1984

M GERARD, ED. and P. W EDWARDS, ED. (AIAA, New York) New York, AIAA, 1985, 252 p. For individual items see A85-43177 to A85-43207.

(Contract NASW-3977)

Techniques for improving the productivity of white-collar workers while maintaining high product quality are examined in reviews and reports The emphasis is on the application of strategies developed in the private sector to government-agency and aerospace-industry operations. Topics discussed include international competition, organizational attitudes and orientation, management practices, education and training, renewing large organizations, encouraging innovation, national initiatives, employee involvement, management involvement, and applications of new technology. T.K

# SPACE REACTOR SAFETY

D. F. BUNCH (DOE, Washington, DC) IN: IECEC '84 Advanced energy systems - Their role in our future; Proceedings of the Nineteenth Intersociety Energy Conversion Engineering Conference, San Francisco, CA, August 19-24, 1984 Volume 1 . La Grange Park, IL, American Nuclear Society, 1984, p 605-608. refs

Attention is given to spacecraft missions which have been identified as candidates for application of new-generation nuclear power systems, from the viewpoint of safety criteria. An evaluation is conducted of the SP-100 space nuclear reactor program, whose mass, power, service life and volume characteristics will have an impact of questions of safety. It is concluded that some relaxation of performance standards may be required in the course of design development in order to meet the requisite safety goals. O.C.

#### A85-49526

#### ANNUAL RELIABILITY AND MAINTAINABILITY SYMPOSIUM, SAN FRANCISCO, CA, JANUARY 24-26, 1984, PROCEEDINGS Symposium sponsored by IEEE, AIAA, ASME, et al New York, IEEE, 1984, 576 p. For individual items see A85-49527 to A85-49589

The present conference addresses topics in computer-aided reliability and maintainability, mechanical reliability, the management of reliability and maintainability (R&M), the status of the U.S. Department of Defense/industry R&M study, reliability assessment, testing, and screening, testability and automatic testing, dormant reliability, the use of R&M field data, software reliability, built-in testing (BIT), modeling and simulation methods, robotics and automation, operational readiness, reliability growth, and maintainability. Specific attention is given to electronic equipment thermal management, MTBF predictions, BIT self-verification, expert systems in software maintainability, spacecraft anomalies and lifetimes, fiber-optics reliability, and lower limits for total ship reliability. O.C.

#### A85-49539#

# ESTABLISHING REALISTIC REQUIREMENTS FOR RELIABILITY, MAINTAINABILITY, AND BUILT-IN-TEST

 R. C. TRAKAS (U.S. Navy, Naval Air Systems Command, Washington, DC) IN Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings New York, IEEE, 1984, p 103-107

Steps have been taken within the Naval Air Systems Command to provide a repeatable, logical approach to establishing realistic requirements for reliability, maintainability, and built-in-test (BIT) This approach prevents problems on programs under development where failure to meet specified requirements in the areas of reliability, maintainability, and BIT could be attributed to establishment of arbitrary, unrealistic requirements with little or no basis in fact. The approach taken ensures the proper relationship between the program thresholds within the Navy and the contractually specified requirements. This provides for a cost-effective and realistic method for ensuring that adequate inherent reliability, maintainability, and BIT capabilities are designed into the equipment to meet the stated operational requirements. Author

#### A85-49540

**RELIABILITY PREDICTION - IMPROVING THE CRYSTAL BALL** N. HARRIS and P. D. T OCONNOR (British Aerospace, PLC, Dynamics Group, Stevenage, England) IN: Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings New York, IEEE, 1984, p 108-113 refs

In principle, given sufficient knowledge of load and strength variations, it is possible to use statistical and probability theory to evaluate the failure probability of any component within a system, and therefore of the system itself. Even with complete knowledge of variations of the component and the load, however, very small changes in the distributional parameters may generate orders-of-magnitude changes in predicted reliability. The present treatment of these problems gives attention to system modeling

criteria, the limits of validity of a reliability model, the unique problems posed by consideration of microelectronics and software, and human factors in reliability prediction O.C.

#### A85-49541

### A MANAGEMENT GUIDE TO RELIABILITY PREDICTIONS

F. A. STOVALL (Lockheed-Georgia Co., Marietta, GA) IN: Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings New York, IEEE, 1984, p 114-116.

Although reasonably accurate reliability predictions are obtainable through the procedure contained in military standard MIL-HDBK-217, if enough is known about operational environment, equipment design, vendor manufacturing capability, and delivery schedule, a less costly procedure may sometimes be required for the assessment of vendor-claimed reliability levels or the estimation of probable equipment reliability level. Attention is presently given to a simplified prediction chart which, while not as accurate as MIL-HDBK-217, may nevertheless be useful in the preliminary determination pf probable need for part screening, thermal imaging, reliability growth tests, etc. OC.

#### A85-49543

# FIELD DATA - THE FINAL MEASURE

 H. S. BALABAN and R A. KOWALSKI (ARINC Research Corp , Annapolis, MD) IN: Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings
 New York, IEEE, 1984, p 123-128. refs This paper examines causes for differences between field

This paper examines causes for differences between field reliability measurements and estimates obtained from equipment predictions or development tests. It describes several characteristics of field data collection systems that affect the utility of the resulting data. Finally, it presents both graphic and analytic techniques for analyzing field reliability data to identify failure occurrence trends

#### A85-49562

#### SOFTWARE RELIABILITY - LET'S START DOING IT

D J. BEHUN (Honeywell, Inc., Military Avionics Div., Minneapolis, MN) IN Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings New York, IEEE, 1984, p. 289-294.

An examination is undertaken of the complete software development process cycle, with attention to the role of reliability engineering and illustrations drawn from the development of real time operation software for the Space Shuttle Main Engine Controller The interrelations among reliability engineering, system engineering, software engineering, software testing, and quality assurance engineering, are highlighted. O.C.

#### A85-49577

### SPARING CRITERIA - CLEAR MANAGEMENT APPROACH

Z. BLUVVBAND and S. SHAHAF (Israel Aircraft Industries, Ltd., Lod) IN: Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings . New York, IEEE, 1984, p. 446-451. refs

Reference is made in this paper to the possibility of defining logistic system parameters, allowing the Logistics Sensitive Operational Availability (LSOA) usage. To this end, a parameter of Back Order Probability (BOP) was introduced, allowing calculation of the Average Wait Time per Order (TWAIT), which together with the Weighted Demand Rate (WDR) expresses the Mean Logistic Down Time (MLDT). The mechanism of the effect of spares quantities on the Availability was analyzed, taking into account different Indenture Levels (IL) and different Levels Of Repair (LOR) in a multi-echelon case. Algorithms for calculation of BOP, TWAIT, LSOA and Operational Readiness (OR) were developed with consideration of the Poisson Distribution of demands. In addition, a proper technique for total cost constraints calculation, adequate for sparing applications, was established.

Author

#### A RELIABILITY GROWTH MODEL

S S. TUNG (Hughes Aircraft Co., El Segundo, CA) IN: Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings New York, IEEE, 1984, p 490-492

This paper describes a convenient alternative to traditional reliability growth models. This new reliability growth model utilizes Bayesian statistics. Equations for estimating MTBF, theta, or failure rate, lambda, and its confidence limits were derived by assuming that the prior density function of 1/theta is gamma. These equations can be used to periodically estimate MTBF and its confidence limit. A smooth growth curve can be obtained by best-fitting a function through the estimated points. This reliability growth model provides a simple and efficient tool to evaluate reliability growth of a system.

N85-10339# National Bureau of Standards, Washington, D.C. Office of Physical Measurement Services.

MEASUREMENT ASSURANCE PROGRAMS. PART 1: GENERAL INTRODUCTION Final Report

B. BELANGER May 1984 74 p refs 2 Vol.

(PB84-217868; NBS/SP-676/1-PT-1; LC-84-601030-PT-1) Avail: NTIS HC A04/MF A01; also available SOD CSCL 14B

This publication is Part 1 of a two part guide describing NBS Measurement Assurance Program (MAP) Services and how to use them for measurement quality control. Part 1 describes the general philosophy of MAP Services and how they are used; Part 2 (Development and Implementation, by C Croarkin) describes the statistical tools used in MAPs. MAPs constitute a more rigorous method for ascertaining and controlling measurement uncertainty than traditional NBS calibration services. GRA

N85-10676 Gesellschaft fuer Mathematik und Datenverarbeitung, Bonn (West Germany). Inst fuer Systemtechnik.

#### COMPARATIVE DESCRIPTIONS OF SOFTWARE QUALITY MEASURES

H HOECKER (Hochschule Bremen, West Germany), W D. ITZFELDT, M. SCHMIDT, and M. TIMM (Cologne Univ) Mar. 1984 146 p refs Sponsored by EEC Prepared in cooperation with National Computing Centre, Manchester, England (GMD-STUDIES-81; ISBN-3-88457-057-9; ISSN-0170-8120) Avail. Issuing Activity

Fifty software quality measures are compared Analysability, complexity; fault; modifiability, modularity, system independence; testability, and text comprehensibility are covered. Author (ESA)

N85-10943# Battelle Columbus Labs., Ohio. AVIONICS INTEGRITY PROGRAM (AVIP). VOLUME 1: PROCUREMENT PHASE ISSUES: DESIGN, MANUFACTURING, AND INTEGRATION Final Report, Sep. 1983 - Mar. 1984

D ELDRIDGE, E. F. HITT, R. K. THATCHER, and L. D SCURLOCK Mar. 1984 229 p

(Contract F33657-83-C-0229)

(AD-A145651, ASD-TR-84-5010-VOL-1) Avail NTIS HC A11/MF A01 CSCL 05A

This report addresses program phases of design, manufacturing and integration. It includes assessments of methodologies of work which can be used to develop a proven, tolerant product capable of withstanding the use environment. The goal of the process described is to eliminate defective piece parts, processes and final product, prior to delivery to the purchasing activity. A tolerable systems engineering process, dealing with activities that are known to take place during each phase can be developed through use of the material provided. GRA **N85-11646**# George Washington Univ., Washington, D.C. Inst. for Management Science and Engineering.

# ON SOME COMMON INTERESTS AMONG RELIABILITY, INVENTORY AND QUEUING

D. GROSS 13 Jun. 1984 18 p

(Contract N00014-83-K-0217; NSF ECS-82-00837)

(AD-A145595, GWU/IMSE/SERIAL-T-491/84) Avail NTIS HC A02/MF A01 CSCL 12B

Queuing networks can be used to model maintained systems. Under many conditions, closed queuing network theory can be applied to ascertain the availability of such systems. Multi-echelon repairable item inventory systems serve as one such class of examples. Problems of common interest to the reliability, queuing, and inventory communities are highlighted, and solution techniques for these problems presented. Author (GRA)

N85-12773# California Univ, Berkeley. Operations Research Center.

RESEARCH IN DATA MANAGEMENT AND SYSTEM RELIABILITY Interim Scientific Report, 1 Jun. 1983 - 31 May 1984

R E. BARLOW 20 Jul 1984 11 p

(Contract AF-AFOSR-0122-81)

(AD-A145498; AFOSR-84-0728TR) Avail: NTIS HC A02/MF A01 CSCL 05A

The report summarizes research during this period supported by the grant. Topics covered include system reliability, determining sample size for life test experiments, data extractions procedures, and acceptance sampline procedures. Abstracts of papers written during this period are included. Author (GRA)

N85-13257# Centre National d'Etudes Spatiales, Toulouse (France). Direction des Lanceurs

QUALITY ORGANIZATION [L'ORGANISATION DE LA QUALITE]

C. PETITDEMANGE Apr. 1983 139 p refs in FRENCH; ENGLISH summary

(CNES-NT-106) Avail: NTIS HC A07/MF A01

The goals, means and organization of quality control are discussed. Quality manuals, corrective and preventive actions, control planning, and quality audits are described. Author (ESA)

**N85-13259**# European Space Agency. European Space Research and Technology Center, ESTEC, Noordwijk (Netherlands). Product Assurance Div.

### THE ESA PRODUCT ASSURANCE SPECIFICATION SYSTEM: EXPLANATORY NOTE

6 Jul. 1984 15 p

Avail: NTIS HC A02/MF A01

The ESA product assurance specifications were rewritten and reidentified to fit into a three-level structure. The ESA PSS-01-0 contains the basic requirements for product assurance and is the only document in the top level, i.e., level 1. Level 2 comprises 9 disciplines, each of which expands into detailed requirements one of the major disciplines covered more generally in PSS-01-0. The remainder of the specifications are in level 3 and are intended as supporting specifications which cover methods, special processes, data, etc. They can be direct extensions of requirements in the level 2 specifications. Author (ESA)

N85-16745# LITEF, Freiburg (West Germany).

#### DOCUMENTATION AND SEPARATE TEST PROGRAM DEVELOPMENT IS MOST IMPORTANT FOR TEST/MAINTENANCE

B. GUSMANN and N. SANDNER *In* AGARD Design for Tactical Avionics Maintainability 11 p Oct 1984 refs Avail: NTIS HC A13/MF A01

Well defined development phases with standardized documentations supported by computer based tools are important for test and maintenance Systems for transport aircraft and military applications are discussed. Documentation is stressed throughout the life cycle and the independent testing. B G

N85-17601# Software Architecture and Engineering, Inc, Arlington, Va.

A UNIFIED MODEL FOR PERFORMANCE AND RELIABILITY OF FAULT-TOLERANT/MULTI-MODE SYSTEMS

V. G. KULKARNI, V. F. NICOLA, and K. S. TRIVEDI Nov. 1984 35 p

(Contract DAAG29-84-C-0045; AF-AFOSR-0132-84)

(AD-A148789, CS-1984-12; AFOSR-84-1094TR) Avail. NTIS HC A03/MF A01 CSCL 12A

This paper unifies different models and relates different performance and reliability measures that have been proposed for the analysis of fault-tolerant computer systems. We model the changes in the structure of the system due to different events (such as degradation, failure or repair) as a continuous time Markov chain. In particular, we consider the execution of a job on such a computer system where a service rate (or a reward rate) is associated with each structure-state. We allow different types of service-preemption interactions due to changes in the structure-state of the system. We derive the distribution of the completion time of a given job Although the developed techniques are suitable for the analysis of complex systems, we demonstrate their use through a simple switching server example. GRA

N85-18618# Rolls-Royce Ltd., Derby (England)

#### MATERIAL FLOW IN THE MANUFACTURING SYSTEM: FAULT-DIAGNOSIS SYSTEMS AS SUPPORT FOR THE MAINTENANCE OF HIGHLY AUTOMATED MANUFACTURING SYSTEMS

E. MATULL (MTU Motoren-u. Turbinen-Union Munchen GMBH) 14 Nov. 1984 10 p refs Transl into ENGLISH from Z. Wirt. Fertigung (Hanover), v. 77, no. 1, 1982 p 25-27 (PNR-90238; TRANS-16528/TLT-00916) Avail: NTIS HC A02/MF A01

Experience in a large commercial vehicle plant using advanced automation techniques is discussed. Maintenance services requirements can be met satisfactorily, provided the production and maintenance personnel involved are properly trained. The use of computer systems with efficient fault diagnosis is a prerequisite to ensure a high level of machine availability, particularly in complex manufacturing systems equipped with a large number of actuating elements. The exploitation of computer intelligence to support maintenance is increasingly important. Author (ESA)

**N85-19009\*#** Teledyne Brown Engineering, Huntsville, Ala. Space Integration Div.

DATA REQUIREMENT (DR) MA-03: PAYLOAD MISSIONS INTEGRATION Progress Report, 17 Nov. 1984 - 15 Jan. 1985 28 Jan. 1985 47 p

(Contract NAS8-32712)

(NASA-CR-171331, NAS 1.26:171331, PMIC-MA03-469-35)

Avail: NTIS HC A03/MF A01 CSCL 22B

Project management and payload integration requirements definition activities are reported. Mission peculiar equipment; systems integration; ground operations analysis and requirement definition, safety and quality assurance; and support systems development are examined for payloads planned for the following missions: EOM-1, SL-2, SI-3 Astro-1; MSL-2, EASE/ACCESS, MPESS; and the middeck ADSF flight. A.R H.

#### N85-19607# Joint Publications Research Service, Arlington, Va. HEALTH STANDARDS FOR GENERAL VIBRATION Abstract Only

G. Á. SUVOROV *In its* USSR Rept.: Life Sci. Biomed and Behavioral Sci. (JPRS-UBB-85-008) p 23 13 Feb. 1985 Transl. into ENGLISH from Gigiyena Tr. i Prof. Zabolevaniya (Moscow), no. 10, Oct. 1984 p 9-13

Avail: NTIS HC A05/MF A01

Theoretical considerations are presented for the assessment and health standardization of the various vibrations that may affect human health. Primary effort is directed at work-related vibrations and the potential of vibration sickness arising from various man-machine interactions. Regulations established by various governmental agencies on allowable vibration levels in different situations in relation to thresholds of perception are discussed. The different intensities and their physiological and health consequences for workers are discussed. In the USSR, effective limit values were established and are being enforced, but are subject to re-evaluation as new scientific data accumulate.

A R.H.

**N85-20691\*#** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SOFTWARE DEVELOPMENT ENVIRONMENT ISSUES In its Space Sta. Software Issues p 16-23 Feb. 1985 Avail: NTIS HC 04/MF A01 CSCL 09B

Issues related to the definition and provision of a standard environment for space station software development are examined The benefits of a uniform, central NASA software development environment and the impact of such an environment on contractors are adderessed. In addition, the control of environment maintainance and evolution over the 30 year lifetime is discussed. M G.

N85-20692\*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SOFTWARE STANDARDS ISSUES In its Space Sta. Software Issues p 24-37 Feb. 1985

Avail: NTIS HC A04/MF A01 CSCL 09B

Standardization requirements for the space station software development project are discussed. Major issues include the need for common terminology, software technology selection and portability, languages, project directives, and documentation. Essential considerations for each of the topics is outlined and recommendations are given.

N85-20936# Hanford Engineering Development Lab., Richland, Wash.

QUALITY OF SCIENTIFIC AND ENGINEERING DATA W L. DELVIN Jul. 1984 49 p refs

(Contract DE-AC06-76FF-02170)

(DE85-000294; HEDL-7471) Avail: NTIS HC A03/MF A01

Quality is a subject receiving much attention today within industry and government agencies. This attention focuses basically on the quality of products, which are the outputs of work activities. A primary product of research and development is data, the quality of which should be of concern to both users and the scientists and engineers producing data The literature offers only bits and pieces of information on the nature of quality as applied to data. Five characteristics of quality data were developed by refining and expanding several concepts found in the literature. These characteristics are validity, integrity, reliability, preservation, and retrievability and they collectively define quality as it relates to data The practices commonly used in research and development to assure quality of data are discussed and related to the five characteristics. This relationship between laboratory practices and the characteristics of quality is a basis for assessing the quality of DOE data.

#### N85-21106# Joint Publications Research Service, Arlington, Va AVIATION REPAIR PLANT DIRECTORS ON QUALITY CONTROL MEASURES

*In* USSR Rept.: Transportation (JPRS-UTR-85-004) p 1-4 27 Feb. 1985 Transl. into ENGLISH from Vozdushnyy Transport (Moscow), 29 Dec. 1984 and 3 Jan 1985 Avail: NTIS HC A06

Responses to an editorial concerning the quality of aircraft maintenance in he U.S S.R. are reported. Special plans and measures are developed in connection with the problems raised in the article. New reserves which make it possible to improve the quality of maintenance work are also introduced. Technical control measures are investigated. B.W.

N85-21135\*# National Aeronautics and Space Administration, Washington, D.C.

#### **AEROSPACE SAFETY ADVISORY PANEL Annual Report, 1983** Jan. 1984 80 p

(NASA-TM-87428, NAS 1.15:87428) Avail NTIS HC A05/MF A01 CSCL 13L

An assessment of NASA's safety performance for 1983 affirms that NASA Headquarters and Center management teams continue to hold the safety of manned flight to be their prime concern, and that essential effort and resources are allocated for maintaining safety in all of the development and operational programs. Those conclusions most worthy of NASA management concentration are given along with recommendations for action concerning; product quality and utility; space shuttle main engine; landing gear, logistics and management; orbiter structural loads, landing speed, and pitch control; the shuttle processing contractor, and the safety of flight operations. It appears that much needs to be done before the Space Transportation System can achieve the reliability necessary for safe, high rate, low cost operations. A.R.H.

Centre d'Essais Aeronautique Toulouse (France). N85-27237# Groupe de Travail Fiabilite.

GUIDE FOR THE EXECUTION OF RELIABILITY TESTS IN THE LABORATORY [GUIDE POUR LA REALISATION D'ESSAIS DE FIABILITE EN LABORATOIRE]

In FRENCH Sponsored by 10 Oct. 1984 208 p refs Delegation Generale pour l'Armement

Avail NTIS HC A10/MF A01 The guide includes reliability mathematics, reliability test

planning, administration aspects, experimental design, estimation of reliability parameters, report content and information storage and retrieval. Author (ESA)

N85-29593# Boeing Aerospace Co., Seattle, Wash SPECIFICATION OF SOFTWARE QUALITY ATTRIBUTES. VOLUME 1 Final Report, Aug. 1982 - Oct. 1984

T P. BOWEN, G B. WIGLE, and J. T TSAI Griffiss AFB, N.Y. RADC Feb. 1985 111 p 3 Vol.

(Contract F30602-82-C-0137; AF PROJ. 2527)

(AD-A153988; D182-11678-VOL-1; RADC-TR-85-37-VOL-1)

Avail: NTIS HC A06/MF A01 CSCL 09B

The methodology and framework elements was developed to focus on an Air Force software acquisition manager specifying quality requirements for embedded software that is part of a command and control application. This methodology and most of the framework elements are generally useful for other applications and different environments. Volume 1 describes the results of research efforts conducted under this contract, including recommendations for integrating quality metrics technology into the Air Force software acquisition management process, recommended changes to Air Force software and acquisition documentation, and summaries of software quality framework changes and specification methodology features. GRA

N85-29594# Boeing Aerospace Co , Seattle, Wash

SPECIFICATION OF SOFTWARE QUALITY ATTRIBUTES. VOLUME 2: SOFTWARE QUALITY SP GUIDEBOOK Final Report, Aug. 1982 - Oct. 1984 SPECIFICATION

T. P. BOWEN, G. B. WIGLE, and J. T TSAI Griffiss AFB, N.Y. RADC Feb. 1985 147 p 3 Vol. (Contract F30602-82-C-0137, AF PROJ 2527)

(AD-A153989, D182-11678-VOL-2, RADC-TR-85-37-VOL-2)

Avail: NTIS HC A07/MF A01 CSCL 09B

The methodology and framework elements was developed to focus on an Air Force software acquisition manager specifying quality requirements for embedded software that is part of a command and control application. Volume 2 and 3 describe the methodology for using quality metrics technology and include an overview of the software acquisition process using this technology and the quality frame work. Volume 2 describes methods for specifying software quality requirements and addresses the needs of the software acquisition manager. Volume 2 also describes procedures and techniques for specifying software quality

requirements in terms of quality factors and criteria. Factors interrelationships, relative costs to develop high guality levels, and an example for a command and control application are also described. Procedures for assessing compliance with specified requirements are included GRA

N85-29595# Boeing Aerospace Co, Seattle, Wash.

#### SPECIFICATION OF SOFTWARE QUALITY ATTRIBUTES. VOLUME 3: SOFTWARE QUALITY EVALUATION GUIDEBOOK Final Report, Aug. 1982 - Oct. 1984

T. P BOWEN, G. B. WIGLE, and J. T TSAI Griffiss AFB, N.Y RADC Feb. 1985 302 p 3 Vol. (Contract F30602-82-C-0137; AF PROJ. 2527)

(AD-A153990; D182-11678-VOL-3, RADC-TR-85-37-VOL-3)

Avail: NTIS HC A14/MF A01 CSCL 09B

The methodology and framework elements was developed to focus on an Air Force software acquisition manager specifying quality requirements for embedded software that is part of a command and control application This methodology and most of the framework elements are generally useful for other applications and different environments. Volume 3 describes methods for evaluating achieved quality levels of software products and addresses the needs of data collection and analysis personnel. Volume 3 also describes procedures and techniques for evaluating achieved quality levels of software products. Worksheets for collecting metric data by software lifecycle phase and score sheets for scoring each factor are provided in the appendixes. Detailed metric questions are nearly identical to questions in the Software Evaluation Reports proposed as part of the Software Technology for Adaptable Reliable Systems (STARS) Measurement data item descriptions GRA

N85-30665# California Univ, Berkeley. Operations Research Center.

#### STATISTICAL ESTIMATION OF SOFTWARE RELIABILITY S. M ROSS Mar. 1985 24 p

(Contract AF-AFOSR-0122-81)

(AD-A154097; ORC-85-3) Avail: NTIS HC A02/MF A01 CSCL 09B

When a new computer software package is developed, a testing procedure is often put into effect to eliminate the faults, or bugs, in the package. One common procedure is to try the package on a set of well known problems to try to see if any errors result. This goes on for some fixed time with all detected errors being noted Then the testing stops and the package is carefully checked to determine the specific bugs that were responsible for the observed errors, and the package is then altered to remove these bugs. A problem of great importance is the estimation of the error rate of this revised software package. To model the above, we suppose that initially the package contains m, an unknown number, of bugs which cause errors to occur in accordance with independent Poisson process having unknown rates lambda sub i , i = 1, ..., m. We suppose that the package is to be run for t time units and that each error is, independently, detected with some known probability p. At the end of this time, a careful check of the package is made to determine the specific bugs that caused the detected errors (that is, a debugging takes place) These bugs are then removed and the problem of interest is to determine the error rate for the revised package. In this paper we show how to estimate this quantity under a variety of assumptions as to what is learned when the debugging occur. GRA

N85-31005 Consiglio Nazionale delle Ricerche, Naples (Italy) Ist. Motori

NOTE FOR A RESEARCH FEASIBILITY PROJECT: HIGH RELIABILITY DESIGN IN THE AERONAUTICAL FIELD Final Progress Report [NOTE PER UN PROGETTO DI FATTIBILITA' DELLA RICERCA: PROGETTAZIONE AD ALTA AFFIDABILITA IN CAMPO AERONAUTICO1

P. ERTO and M. GUIDA 1984 15 p In ITALIAN

(REPT-84-RR-350) Avail Issuing Activity Knowledge and applications of reliability engineering to the aeronautical industry are reviewed Design, safety surveillance and maintenance are related to the general reliability problem A list of proposed research subjects is included. Author (ESA)

N85-35720# Sandia National Labs, Albuquerque, N. Mex. QUALITY ASSURANCE CONSIDERATIONS FOR THE IMPLEMENTATION OF A PULSED POWER R AND D PROJECT J P. FURAUS, G W. BARR, and C. G. SHIRLEY 1985 15 p Presented at the 5th IEEE Pulsed Power Conf., Washington, D.C., 10 Jun. 1985

(Contract DE-AC04-76DP-00789)

(DE85-012357, SAND-84-2538C; CONF-850616-3) Avail: NTIS HC A02/MF A01

The second generation Particle Beam Fusion Accelerator (PBFA II) at Sandia National Laboratories (SNLA) is a \$48.15M construction project that includes conventional facilities such as buildings as well as state-of-the-art pulsed power designs and special support systems. The project also includes considerations for longer term program goals, such as breakeven fusion reactions. This project started in May 1980 and is scheduled for completion in January 1986. Implementation of Quality Assurance (QA) policies, techniques and programs, although not a straightforward problem for this complex project, has been effective as demonstrated by progress thus far The discussion will describe key features of the QA program, their implementation and the results DOE

# N85-35817# Air Command and Staff Coll., Maxwell AFB, Ala. AERONAUTICAL SYSTEMS DIVISION MANUFACTURING/QUALITY ASSURANCE ORIENTATION W. F. LAESSIG and A. LAIRD Apr 1985 61 p

(AD-A156128, ACSC-85-1535) Avail: NTIS HC A04/MF A01 CSCL 13H

Aeronautical Systems Division (ASD) Manufacturing/Quality Assurance (Mfg/QA) Orientation (videotape) includes ASD organization, program management team concept, matrix management, generic acquisition milestones with associated Mfg/QA inputs, and general sources of expertise. Intended as an overview to enhance big picture understanding of new Mfg/QA managers. Mfg/QA Orientation for the Mfg/QA Managers (sound-on-slide) expands explanation of Mfg/QA inputs to the request for proposal (RFP), source selection participation, pre/post-award contact reviews and audits, and more specific on additional help. Intended to start the new Mfg/QA manager working. Mfg/QA Orientation for Program Managers (sound-on-slide) provides an overview covering Mfg/QA requirements, expected participation, and potential sources of help covering RFP preparation, source selection, and reviews and audits. GRA

# 10

### LEGALITY, LEGISLATION, AND POLICY

Includes Laws and Legality, Insurance and Liability, Patents and Licensing, Legislation and Government, Regulation, Appropriations and Federal Budgets, Local, National, and International Policy.

#### A85-10049

#### DESTRUCTION OF KOREAN AIR LINES BOEING 747 OVER SEA OF JAPAN, 31 AUGUST 1983

P. MARTIN (Frere Cholmeley, London, England) Air Law (ISSN 0165-2079), vol 9, no 3, 1984, p. 138-148. refs

The legal repercussions of the destruction of flight KE007 by a Soviet interceptor are examined. The provisions of the Chicago Convention of 1944 and of international customary law regarding the rights and obligations of territorial states in cases of intrusion of a commercial aircraft are reviewed, and the Soviet and ICAO reports on the KE007 incident are compared and found to be in sharp disagreement. With respect to the liability claims being litigated on behalf of the families of the victims against the airline, the manufacturers of the aircraft and navigation aids, and the US government (for neglecting to warn the air crew of its true location), it is argued that the US and manufacturers are probably not liable, while the airline liability depends on the applicability of the Warsaw Convention (to which the US is party) or the amended version Warsaw/Hague (to which Korea is a party) in the US courts and on the question of the USSR's compliance with Article 25 of the Chicago Convention (requiring states to assist aircraft in distress) T K

### A85-10050

#### US JURISDICTION AND BILATERAL AIR AGREEMENTS

H. A WASSENBERGH Air Law (ISSN 0165-2079), vol. 9, no. 3, 1984, p. 170-183. refs

The opinion of the US Court of Appeals in the case Laker vs Sabena/KLM in March, 1984, is examined in detail as an example of US legal doctrine with regard to bilateral air-transport agreements. The litigation history of the case is reviewed, and such aspects as immunity, jurisdiction, discrimination, interest balancing, and international comity are explored. The US view that free competition and antitrust control should coexist is found to be in disagreement with the practices of many other states.

T.K

# A85-10178#

# A CONGRESSIONAL VIEW OF NATIONAL POLICY DIRECTIONS IN REMOTE SENSING

R BYERLY, JR. (U.S. House of Representatives, Committee on Science and Technology, Washington, DC) IN: International Symposium on Remote Sensing of Environment, 17th, Ann Arbor, MI, May 9-13, 1983, Proceedings Volume 1 Ann Arbor, MI, Environmental Research Institute of Michigan, 1984, p. 21-30 refs

#### A85-11937

# A LEGAL ANALYSIS OF THE SHOOTING OF KOREAN AIRLINES FLIGHT 007 BY THE SOVIET UNION

F. HASSAN (Willamette University, Salem, OR; San Diego, University, San Diego, CA) Journal of Air Law and Commerce (ISSN 0021-8642), vol 49, no. 3, 1984, p. 555-588. refs

A legal analysis is offered examining the central issue in the controversy over the shooting of the Korean commercial airliner KAL 007 by the Soviet Union in 1983 the legal status of a trespassing civilian aircraft in the airspace of another country. The application of international law to this issue is considered, with emphasis given to the evolution of legal doctrine since the Chicago Convention of 1955 Attention is also given to a number of legal precedents upon which the general principle has been established that it is unlawful to fire upon an intruder civilian aircraft without first making an attempt to force the aircraft to land it is concluded on the basis of evidence now available about the KAL 007 incident, that the Soviet Union did act illegally in its response to the trespass of the foreign aircraft.

### A85-11938

#### FAA REGULATION OF ULTRALIGHT VEHICLES

S. THOMPSON Journal of Air Law and Commerce (ISSN 0021-8642), vol 49, no. 3, 1984, p. 591-620. refs

The development of FAA standards and operating regulations for ultralight aircraft is discussed. Particular emphasis is given to the definition of aircraft design characteristics, registration and flight certification requirements for ultralight pilots, as well as the operating rules governing right of way, and times and areas of legal operation. Attention is also given to the beneficial effects of self-regulation by the ultralight manufacturers and pilots in order to avoid what are considered to be the inhibiting aspects of FAA regulation. A complete list of proposed FAA regulations is provided in a series of footnotes.

### COLLOQUIUM ON THE LAW OF OUTER SPACE, 26TH, BUDAPEST, HUNGARY, OCTOBER 10-15, 1983, PROCEEDINGS

Colloquium sponsored by the International Astronautical Federation. New York, American Institute of Aeronautics and Astronautics, 1984, 366 p. No individual items are abstracted in this volume.

Various papers on the law of outer space are presented. The general topics discussed include: telecommunications and the geostationary orbit, the interrelationship between air and space law, responsibility for space activities, and legal aspects of international cooperation in space C D

#### A85-12644

### SPACE LAW - JUSTICE FOR THE NEW FRONTIER

C. Q CHRISTOL (Southern California, University, Los Angeles, CA) Sky and Telescope (ISSN 0037-6604), vol. 68, Nov. 1984, p 406-409.

The legal principles realized in the five international treaties on the use of outer space are reviewed Consideration is given to the roles of technological innovation and political pressure from the underdeveloped world in shaping U.N. space law. Among the specific areas of space law currently covered by U.N. treaties, there are: guarantees of equal opportunity in the exploitation of space resources; the return and rescue of astronauts and objects in outer space, and liability for damage caused by fallen space objects Issues currently under discussion include treaties on nuclear weapons in space, the legal status of DBS systems and remote sensing satellites, and the definition of the air-space boundary. I.H.

#### A85-13140#

# FEDERAL POLICY OPTIONS AND THE COMMERCIALIZATION OF SPACE

G. A. HAZELRIGG International Astronautical Federation, International Astronautical Congress, 35th, Lausanne, Switzerland, Oct. 7-13, 1984 14 p. refs

(IAF PAPER 84-218)

Private enterprise seeks to undertake virtually any activity that is institutionally and technologically feasible and which promises a high return on investment. Commercial activities in space would seem to be no exception. Indeed, it is reasonable to expect that, at some future date, commercial activities in space will overshadow government-sponsored research and military activities combined. But this date remains well into the future, it is highly uncertain, and it depends on government policies. Space is much like a less developed nation; before industrial development can occur, necessary infrastructures must be created A government could create these infrastructures and, by so doing, hasten the commercialization of space, assuring opportunities for its industries But this is not likely to happen. Instead, infrastructures are more likely to evolve on an ad hoc basis, forced by technology rather than policy. Author

#### A85-18469

# NASA FORMULATES POLICY TO SPUR PRIVATE INVESTMENT

C. COVAULT Aviation Week and Space Technology (ISSN 0005-2175), vol 121, Nov 26, 1984, p. 18, 19

Features of the new NASA commercial space policy are delineated. The policy is intended to stimulate commercial participation in space through research, facility sharing, clearly defined procedures, organization and outreach programs. NASA will provide seed money to industry, purchase commercial space products, make the Shuttle/Spacelab configuration available to industry once a year, and will invest in facilities in space that will be of use for commercial purposes. Legal research is being performed to ascertain if NASA's charter should be altered to permit several of the activities put forth in the policy statement Payload charges will be lowered for seed enterprises and NASA has made it policy to avoid a regulatory role in commercial space ventures Some benefits will not be available to companies who do not sign a Joint Endeavor Agreement with NASA. Attempts will be expended to increase the flow of NASA-developed technology and data to the private sector and to portray space as a new commercial frontier for the U.S. to the public. M.S.K

#### A85-20512

# ASTROBUSINESS: A GUIDE TO THE COMMERCE AND LAW OF OUTER SPACE

E. R. FINCH, JR. (Finch and Schaefler, New York, NY) and A. L. MOORE New York, Praeger, 1985, 157 p refs

This book documents the commercialization of outer space by the incredible growth of space-related opportunities for the private The commercial uses of space are related to sector communications, remote sensing, space manufacturing, and energy. Possibilities of a manufacture in space are considered for pharmaceuticals, electronics, glass, and metallurgy Structures for space discussed include Spacelab, space platforms, the Space Station, and space structures in geostationary orbit, a high orbit between the earth and the moon, and on the moon itself Attention is also given to space transportation services, space risks and liabilities, questions regarding the financing of business in space, the national space law, international space law, and the militarization of space. An outlook is provided regarding future commercial space business opportunities GR.

#### A85-21620

THE MANNED SPACE STATION - NASA'S LAST HURRAH?

W LASSER (Clemson University, Clemson, SC) Technology Review (ISSN 0040-1692), vol. 88, Feb.-Mar. 1985, p. 12, 13.

An evaluation is made of the changing cultural and political climate of the U.S., with a view to its impact on the funding of NASA's Space Shuttle program and the projected permanent Space Station Public interest in space exploration and exploitation activities is noted to have waned since the 1960s, when a widespread perception of the dependency of national prestige on space-related achievements existed and formed the basis of generous funding appropriations for NASA. An especially potent threat to the financial viability of the NASA Space Shuttle and Space Station programs comes from foreign payload launch services sector. OC

### A85-21621

# SCIENCE AND TECHNOLOGY POLICY - THE NEXT FOUR YEARS

G A. KEYWORTH, II (Office of Science and Technology Policy, Washington, DC) Technology Review (ISSN 0040-1692), vol. 88, Feb -Mar. 1985, p. 45, 46, 48, 50-53

The first four years of the Reagan administration, covering Federal fiscal years 1981-1985, were characterized by a reduction of funding for technology application-related research, such as that for energy projects, in order to substantially increase basic research funding. Overall, the U.S. will spend nearly \$8 billion in basic research during fiscal 1985, by comparison with \$5 billion in fiscal 1981. Beyond 1985, the five priorities of the Reagan administration's second term are identified as (1) continued basic research funding growth, especially at universities; (2) the fostering of technical education; (3) increased cooperation between university research programs and industry; (4) continued growth in defense-related R&D; and (5) a clear delineation of R&D responsibilities proper for the federal government and those of the private sector OC

#### A85-23799

#### ANNALS OF AIR AND SPACE LAW. VOLUME 8

N. M. MATTE, ED (McGill University, Montreal, Canada) Toronto/Paris, Carswell Co., Ltd./Editions A. Pedone, 1983, 586 p. In English and French. No individual items are abstracted in this volume.

Current problems in air and space law are discussed, and the activities of various international organizations during 1983 are surveyed Topics examined include the international unification of civil air law, liability problems in aircraft maintenance and repair, bilateral air-transport agreements, the orbit-spectrum issue, liability In space law, legal and policy aspects of space remote sensing, and the 'aerospace vehicle' as a legal concept; organizations surveyed are the ICAO, IFALPA, IATA, and Inmarsat. The texts of important court decisions from the US, Canada, and West Germany and of international and national legislation are provided. T.K

#### A85-24089

#### TRANSBORDER DIRECT-TO-HOME SATELLITE SERVICE

M. A ROTHBLATT (Martin A. Rothblatt Law Offices, Washington, DC) Telematics and Informatics (ISSN 0736-5853), vol. 1, no. 3, 1984, p 295-307. refs

Transborder receipt of direct-to-home satellite transmissions is a timely topic which has international implications. This article addresses some of these international implications, but for the most part, it focuses on transborder receipt of satellite services in the United States and the legal ramifications thereof under American law. Some legal terms and the regulatory nature of the aforementioned satellite service will first be discussed. Then, the role of the Federal Communications Commission in terms of its rulings and authority in transborder direct-to-home satellite service will be presented. Afterwards, the policy implications of foreign direct-to-home satellite service to the United States will be examined. Author

### A85-24709

#### RECENT DEVELOPMENTS IN AVIATION CASE LAW

D. R. ANDERSEN (Mozley, Finlayson, Wedge and Andersen, Atlanta, GA) Journal of Air Law and Commerce (ISSN 0021-8642), vol 49, no. 4, 1984, p. 707-769. refs

Eight aviation cases before the U.S. Supreme Court in 1983, three which received decisions, are reviewed, along with related materials. It has been decided that the FAA is the only valid registry for ownership of an aircraft, and no transfer of ownership is valid until filed in the registry. In another ruling, the Court decided that discriminatory taxes could be levied by states on out-of-state-based airlines who use in-state airports, the judgment residing on the premise that the monies are targeted for use at airports. Finally, the Court ruled that state law is supreme in establishing the health and safety standards of airport ground maintanance workers. Actions are still pending on 'in personam' jurisdiction in out-of-country aircraft accidents, liability procedures being decided in one state for accidents in another, and the validity of a manufacturer filing a claim with the federal government for indemnity claims filed by a federal employee against the manufacturer. Air carrier, insurance coverage, and damage extent and calculations rulings are also under consideration M.SK.

#### A85-24710

### FIRE SAFETY IN TRANSPORT CATEGORY AIRCRAFT -LITIGATING A POST-CRASH OR IN-FLIGHT AIRCRAFT FIRE

P. M. FOSS and R. D. TEPPER Journal of Air Law and Commerce (ISSN 0021-8642), vol. 49, no 4, 1984, p. 801-825. refs

The impact of Federal Aviation Regulations (FAR) on transport aircraft design, certification, accident investigations for liability, and the chances that passengers can survive specified accidents are discussed. The design must not be hazardous and must include doors that open from the inside or outside even if people are pressed against the inside. Ventilation must protect the crew and passengers from noxious gases and vapors. Materials should be fire suppressant or self-extinguishing and fire extinguishers and all compartments must be accessible to the crew. Fire zones which seal off flammable liquids must be installed, etc. The manufacturer may be liable even if the FAR are complied with. Techniques for conducting a post-accident fire investigation are delineated. It is noted that fire retardants in aircraft interior furnishings can generate gases more lethal than heat or other effects of cabin fires.

#### A85-27373

# THE COMMERCIALIZATION OF SPACE - TWENTY YEARS OF EXPERIENCE: SOME LESSONS LEARNED

J B GANTT (Counsel, Hunton and Williams, Washington, DC) Journal of Space Law, vol. 12, Fall 1984, p. 109-135. refs

A historical review of the legal issues concerned with global satellite communications is presented. Consideration is given to the important role of the COMSAT agreement (1961) in defining the relationship between government and industry in the promotion and regulation of satellite communications enterprises. The model of international cooperation exemplified by the INTELSAT consortium is also discussed. Some implications of the growing role of FCC regulation in determining economic conditions in the international satellite communications market are also examined.

A85-27374

# PROPOSED DRAFT CONVENTION ON THE SETTLEMENT OF SPACE LAW DISPUTES

K-H. BOECKSTIEGEL (Koeln, Universitaet, Cologne, West Germany) Journal of Space Law, vol. 12, Fall 1984, p. 136-162. refs

Attention is given to the growing need for a legal framework for the settlement of disputes arising from space activities. The history of international efforts to develop an international space law instrument are briefly reviewed, and the Draft Convention on the Settlement of Space Law Disputes of the International Law Association is presented as an example of a typical proposal. The text of the Draft Convention is reproduced in full I.H.

#### A85-27394

# PUNITIVE DAMAGES IN AVIATION PRODUCTS LIABILITY CASES

I. AWFORD (Barlow Lyde and Gilbert, Solicitors, London, England) Air Law (ISSN 0165-2079), vol. 10, Feb. 1985, p. 2-9.

Historical U.S. court decisions regarding punitive damages for air accidents are reviewed noting their potential impact on British air carriers and aircraft manufacturers. Punitive damages for various causes are permitted by law in 46 states. Juries can consider, e.g., the feasibility of safer design, manufacturer knowledge of defects, actual and potential injuries, intentionality with regards profits vs. costs vs. safety, and the wealth of the defendant corporation Manufacturers may be held liable even if the actions were performed by employees acting outside of company policy. It is recommended that British companies carry full insurance with British companies - to cover possible punitive awards to plaintiffs. Awards may be reduced in general if criminal charges, rather than liability assessments, are levied against companies and managers. M.S.K.

#### A85-27395

CARGO CLAIMS - FROM THE CARRIER'S POINT OF VIEW S. GATES (Beaumont and Son, London, England) Air Law (ISSN 0165-2079), vol 10, Feb. 1985, p. 10-14.

Techniques for avoiding litigation in British air freight claims are discussed, along with procedures most probably followed if litigation begins. Courteous and prompt handling of claims by airlines claims officers is recommended, although the chain of events may be upset by apathetic or hostile interim freight carriers. Full freight insurance is necessary in all cases. If litigation arises the petitioner needs to seek as many defendants as possible in order to exceed the limits of liability. The carrier then attempts to assign liability to the handling agent. A current trend is to accept that fault and responsibility are inseparable, and can extend to the Airport Authority, the aircraft manufacturer and the manufacturer of equipment which causes the damage. M.S.K.

### REGISTRATION AND NATIONALITY OF AIRCRAFT OPERATED BY INTERNATIONAL AGENCIES IN LAW AND PRACTICE

K. EL-HUSSAINY (Egyptian Civil Aviation Authority, Air Transport, Cairo, Egypt) Air Law (ISSN 0165-2079), vol. 10, Feb. 1985, p. 15-27. refs

The implications of the ICAO Regulation of 1967, which permits the registration of aircraft on other than a national basis, are discussed, particularly for the Arab Air Cargo (AAC) company. The Regulation applies only to States who are parties to the Chicago Convention of 1944 and treats the operating parties as a multinational entity. The entity must operate as if it were a State for the purposes of the Convention, and thereby is exempt from seizure on patient claims in States which are signatories. One of the entity States must be designated as the site of representations of the entire company The Resolution is vague, however, in terms of assigning the responsibility for air accidents. The Jordan-Iraq AAC petitioned for ICAO certification in 1982 and planned to use aircraft registered exclusively to one of the two partners. It was recommended that all the aircraft used by the AAC be regarded as the responsibility of Jordan, the designated responsible State. M.S.K.

#### A85-27397

# THE LIABILITY OF AIRCRAFT MANUFACTURERS AND CERTIFICATION AUTHORITIES IN THE UNITED KINGDOM

T. SCORER (Barlow Lyde and Gilbert, Solicitors, London, England) Air Law (ISSN 0165-2079), vol. 10, Feb. 1985, p. 28-43. refs

Fine points of an aircraft manufacturer's liability for the product are explored, noting differences which exist between contract and tort issues and procedures in the United Kingdom. Most claims against manufacturers are filed in the U.S., where most of the world's aircraft are manufactured Claims can be laid at any point in the chain of production and distribution once an article fails and causes damage to health, property or economic well-being British law requires that all goods are understood as warrantied when used for purposes for which they were sold, even if contractual terms 'unfairly' limit the liability. The existence of unfairness of negligence is left somewhat to the discretionary decision of British judges, and this is done on the bases of 'common sense'. Also, the British Civil Aviation Authority, responsible for certifying aircraft and personnel, may be held negligent if in the case of an accident the Authority is discovered not to have fully discharged their duties of inspection or certification investigation for flightworthiness M.S.K

#### A85-29025

#### COLLOQUIUM ON THE LAW OF OUTER SPACE, 27TH, LAUSANNE, SWITZERLAND, OCTOBER 7-13, 1984, PROCEEDINGS

Colloquium sponsored by the International Astronautical Federation New York, American Institute of Aeronautics and Astronautics, 1985, 426 p. No individual items are abstracted in this volume.

Selected aspects of space law are examined in reviews and reports. Topics discussed include space law and domestic law, space activities and intellectual property (including industrial property), nuclear power sources in outer space, legal aspects of large space structures, conditions essential for maintaining outer space for peaceful uses, and the impact of present and expected uses of outer space on the space environment. Consideration is given to U.S. law applying to land remote sensing, U.S -government authorization and supervision of nongovernmental space activities, space law and the concepts of Roman law, patent law activities of states in industrial-property technology cooperation, prospects for the demilitarization of manned space stations, jurisdiction problems of large space systems, large structures on the moon, legal measures for the prevention of an arms race in space, collision probabilities in the geostationary ring, and the indivisibility of environmental protection in vertical space T.K.

#### A85-29555

#### THE CONGRESSIONAL AUTHORIZATION PROCESS AS IT APPLIES TO AERONAUTICAL RESEARCH AND TECHNOLOGY

P. J LEGENDRE IN International Instrumentation Symposium, 29th, Albuquerque, NM, May 2-6, 1983, Proceedings . Research Triangle Park, NC, Instrument Society of America, 1983, p. 101-111. refs

The present paper provides a descriptioon of the political process as it affects the National Aeronautics and Space Administration (NASA) budget dealing with the fiscal year 1983 aeronautics technology programs funding. In connection with the budget process, the various congressional committees and joint committees must submit reports on the proposed budget within their jurisdictions to the Budget Committees on both Houses. Attention is given to NASA authorization hearings, an aeronautics hearing on April 1, 1982, a statement for the record, letters to Congress, House action, Senate action, a joint conference, and the NASA appropriations bill G.R.

#### A85-30014

#### JURISDICTION OVER AND SUPERVISION OF INTERNATIONAL CREWS IN SPACE [JURYSDYKCJA I KONTROLA NAD MIEDZYNARODOWA ZALOGA W PRZESTRZENI KOSMICZNEJ]

E. MIKOS-SKUZA (Warszawa, Uniwersytet, Warsaw, Poland) Postepy Astronautyki (ISSN 0373-5982), vol. 17, no 2, 1984, p. 21-37. In Polish. refs

The need for a multilateral international treaty regulating the legal problems that arise in connection with international manned space missions is examined. Particular attention is given to the problem of jurisdiction over and supervision of multinational crews in space. This problem includes determining the content and territorial limits of jurisdiction and control; defining the term 'crew'; and establishing the legal status of crew members leaving their spacecraft for performing various tasks in open space or on a celestial body and of crew members leaving their spacecraft to visit another spacecraft.

#### A85-30167

#### SELECTED AMERICAN DECISIONS ON THE WARSAW CONVENTION AND RELATED MATTERS - FEBRUARY 1981 TO JUNE 1984. I

R. MANKIEWICZ Zeitschrift fuer Luft- und Weltraumrecht (ISSN 0340-8329), vol 34, March 1985, p. 24-43

#### A85-30998

#### LAUNCHING THE ROCKET INDUSTRY IN THE UNITED STATES - DOMESTIC REGULATION OF PRIVATE EXPANDABLE LAUNCH VEHICLES

A. D. WEBBER (Baker and McKenzie, Washington, DC) Journal of Air Law and Commerce (ISSN 0021-8642), vol. 50, no. 1, 1984, p. 1-67. refs

The regulation of private expendable-launch-vehicle launches by agencies of the US government is characterized in a review of legal and administrative aspects The history of regulation is briefly traced, the roles of FAA, Department of State, NASA, DOD, Coast Guard, Department of Treasury (BATF), FCC, and NORAD in the current confused and overlapping regulatory structure are outlined; the experience of Space Services Incorporated and Starstruck in attempting to obtain permission for private launches is recounted; and the derivation of legal authority to regulate private launches from the Outer Space Treaty of 1967 is explained. A unified regulatory structure with the Department of Transportation as lead agency, clearly defined and realistic time limits, long-term licensing procedures, provision for foreign launches by US companies, payload regulations, public-safety guarantees, and specific rules for launches from government facilities is proposed. тк

#### TO REGULATE RESTRICTIVE COMMERCIAL ATTEMPT PRACTICES IN THE FIELD OF AIR TRANSPORTATION WITHIN A TRANSNATIONAL ANTITRUST LEGAL AND INSTITUTIONAL FRAMEWORK

J. K. BENTIL (La Trobe University, Melbourne, Australia) Journal of Air Law and Commerce (ISSN 0021-8642), vol. 50, no. 1, 1984, p. 69-120 refs

The legal and economic consequences of applying international antitrust law to the air-transport industry are examined, with a focus on the measures proposed to the EEC by the EC Commission in 1981. The range of anticompetitive or protectionist practices allowed under the current rule of national sovereignty and bilateral agreements is surveyed; the substantial and procedural provisions of EEC general antitrust law are summarized, and the strategies adopted by the EC Commission to overcome difficulties in applying them to air transportation are discussed. The scope of the proposed secondary legislation (applying to private comercial carriers but not national-government-controlled carriers) is found to limit its effectiveness, but its implementation and strict enforcement are recommended as first steps. тκ

#### A85-31968#

### CIVIL CERTIFICATION OF A U.S. GOVERNMENT PROCURED HELICOPTER

J. C. HART (Aerospatiale Helicopter Corp, Grand Prairie, TX) IN American Helicopter Society, Annual Forum, 40th, Arlington, VA, May 16-18, 1984, Proceedings Alexandria, VA, American Helicopter Society, 1984, p. 203-205. In June 1979, the U.S. Coast Guard awarded to an aerospace

company a contract for the production of 90 helicopters to replace the aging H-52. This new helicopter, the HH-65A, would be used in the Short Range Recovery rescue role which includes such objectives as drug interdiction, fishing law enforcement, and coastal patrol. The new helicopter was to be qualified according to both military and civil standards. In connection with these qualifications, it was found that with respect to certain items a conflict exists between the desires of the Coast Guard and the regular requirements of the Federal Aviation Agency (FAA) Difficulties arising in connection with the attempt to satisfy the various requirements are discussed, and the lessons learned are evaluated. G.R.

### A85-33872

# HOW DOES NASA PLAN TO HELP?

Interavia (ISSN 0020-5168), vol. 40, April 1985, p 390, 391.

NASA has assembled a task force assigned to the implementation of its space commercialization policy. The Commercial Space Policy has as its aim the reduction of risk levels for space industrial development to the point where they are comparable with conventional investments. This will be accomplished by providing seed funds for private sector R&D activities, by encouraging private sector development of products and services that NASA may need, by sharing patents with the U.S. private sector, and by facilitating the launching of experimental payloads at zero cost 00

#### A85-34214

#### EVOLVING GOVERNMENT POLICY EASES WAY FOR SPACE VENTURES

C COVAULT Commercial Space (ISSN 8756-4831), vol. 1, Spring 1985, p. 14-18.

It is pointed out that the formation of a commercial space policy at both the White House and NASA has introduced greater predictability into corporate planning for space ventures. As a consequence of this development, new groups have begun to show interest in commercial space endeavors. These groups include a broader cross section of finance and lending institutions, state and local governments interested in stimulating space business in their geographical areas, and more companies with innovative ideas. According to a new analysis, gross annual revenues for all commercial space endeavors should total between \$44.5 billion and \$53 billion by the year 2000. The key areas of NASA policy interest for the next two years are related to centers for commercial development, technology utilization, new NASA facilities, limited seed funding, and expanded agreements.

#### A85-34223

#### **REAGAN COMPETITIVE POLICY PLACES INTELSAT'S FUTURE** AT CROSSROADS

G R

P. J KLASS Commercial Space (ISSN 8756-4831), vol. 1, Spring 1985, p. 70, 71, 75-77

It is pointed out that the future of the International Telecommunications Satellite Organization and of international satellite communications in general is approaching a crucial crossroads as a result of the Reagan Administration's policy of encouraging limited, special-service competition with Intelsat At present, there are five companies which have filed for approval of Intelsat-competitive satellite systems. The international reaction to the new developments is discussed, taking into account comments coming from France, the Federal Republic of Germany, Switzerland, the United Kingdom, Tanzania, Cameroon, Zambia, and the People's Republic of China. Attention is given to the position of Intelsat to compete with the proposed independents, and other serious changes taking place in traditional telecommunications services and suppliers. G.R.

#### A85-36289

SATELLITE BROADCASTING AND THE USE OF THE **GEOSTATIONARY ORBIT - SOME INTERNATIONAL LEGAL** ASPECTS

A. GORBIEL (Lodz, Universytet, Lodz, Poland) Space Communication and Broadcasting (ISSN 0167-9368), vol. 3, March 1985, p. 61-66. refs

The positioning of artificial earth satellites in the geostationary orbit is of great importance for telecommunications. The maximum number of satellites which can be placed there is, however, limited for technical reasons. The international legal status of the geostationary orbit, labelled by the ITU a 'scarce natural resource', became the subject of a diplomatic controversy since a group of equatorial states in 1976 proclaimed national sovereignty over some segments of it situated over their territories. This paper analyses critically their claims to sovereignty. In conclusion, the author substantiates his opinion that any national appropriation of the geostationary orbit is categorically inadmissible whereas its use, for broadcasting purposes also, must be governed by special international regulation. Author

#### A85-36666

#### THE DEREGULATION OF INTERNATIONAL SATELLITE COMMUNICATIONS

L. MCKNIGHT (MIT. Cambridge, MA) IN: ICC '84 - Links for the future: Science, systems and services for communications; Proceedings of the International Conference on Communications, Amsterdam, Netherlands, May 14-17, 1984. Volume 3 . New York/Amsterdam, Institute of Electrical and Electronics Engineers, Inc /North-Holland, 1984, p. 1346-1351 refs Proposed changes in U.S. international satellite communications

policy intended to extend to the international market the presumed benefits of deregulation are analyzed. The effect of changes in the structure and mandate of Comsat, the definition of an authorized use of Comsat facilities, deregulating Intelsat earth station ownership, permitting additional firms to have direct access to Intelsat space segment, as well as proposals to bypass intelsat altogether by permitting private ownership of international communications satellites are discussed. Author

### A85-36997

#### INTERNATIONAL SPACE LAW

IU. KOLOSOV (Ministerstvo Inostrannykh Del SSSR, Moscow, USSR) and G. ZHUKOV New York, Praeger, 1984, 238 p. Translation. refs

The fundamental principles, historical development, and current problems of international space law (ISL) are reviewed from a Soviet perspective. Chapters are devoted to the concept and sources of ISL, the principles of ISL, the legal status of artificial space objects, international cooperation in the rescue of cosmonauts, international responsibility for space activities, international systems of space communications (Intersputnik, Intelsat, and Inmarsat), ISL of direct TV broadcasting via satellite, ISL of space meteorology, ISL of remote sensing, the delimitation of outer space, and the status of the moon and other celestial bodies of the solar system in ISL. The need for further legislation regarding national or international permanent manned space stations is indicated.

#### A85-37805#

# THE GLOBAL POSITIONING SYSTEM (GPS) DOD POLICY ISSUES

P. J. BAKER (U.S. Department of Defense, Washington, DC) IN: PLANS '84 - Position Location and Navigation Symposium, San Diego, CA, November 26-29, 1984, Record . New York, Institute of Electrical and Electronics Engineers, Inc., 1984, p. 46-50. DOD-supported research.

This paper covers the major policy issues of the Global Positioning System (GPS). The GPS is a space-based, worldwide, all-weather, continuous position/navigation system being developed by the Department of Defense and scheduled to be fully operational by the end of 1988. Major issues in the GPS Program will be covered. These issues include civil use of GPS, user charges, potential phase-out of other systems after the introduction of the GPS and accuracy enhancement techniques that are being investigated. Author

### A85-38699

#### INTERNATIONAL SPACE LAW [MEZHDUNARODNOE KOSMICHESKOE PRAVO]

A. S PIRADOV, I. P BLISHCHENKO, V. S. VERESHCHETIN, and IU. M. KOLOSOV Moscow, Izdatel'stvo Mezhdunarodnye Otnoshenila, 1985, 209 p. In Russian. refs

This textbook presents a systematic exposition of the main aspects of international space law (ISL), including current problems that are being discussed in the United Nations and other international organizations Topics discussed include the concept, nature, and basic features of ISL, the subjects and object of ISL, the legal regime of outer space, with emphasis on the legal status of astronauts and space objects, international-legal forms of cooperation in space exploration; problems related to the militarization of space; the codification and further evolution of ISL, and questions of legal responsibility. A brief history of ISL is also provided, and an appendix contains basic ISL documents.

#### BJ

#### A85-38914#

#### NEED FOR ALTERNATIVE SPACE LAUNCH SERVICES GIVEN NASA REFUSAL TO LAUNCH SPARX-01 MISSION UNDER STANDARD FORM COMMERCIAL LAUNCH SERVICES AGREEMENT

K. P HEISS IN: Symposium on Industrial Activity in Space, Stresa, Italy, May 2-4, 1984, Proceedings . Paris, Eurospace, 1984, p 355-368.

Legal, political, and economic implications of the refusal by NASA to launch the SPARX-01 commercial terrestrial-remote-sensing satellite under terms acceptable to SPARX are discussed from the SPARX perspective. The history of negotiations between SPARX and NASA since 1983 is recalled; the terms of the original Standard Form Commercial Launch Agreement and the new terms (based on the language of HR-5155, a remote-sensing bill passed by the U.S. House of Representatives) proposed by NASA in April 1984 are summarized; and the reasons for SPARX rejection of the new terms (exclusion of any proprietary rights to the remote-sensing data, subjection to U.S. licensing and regulation) are indicated. It is argued that the new terms are illegally imposed (since launch reservation fees were paid in 1983) and constitute a 'closed skies' policy resulting in a government monopoly on remote sensing, an infringement on the freedom to gather and disseminate information, and eventually in a loss of commercial launch business for NASA (since alternative launch possibilities are being developed; e.g., Ariane). T.K

#### A85-38916#

#### SOME LEGAL ASPECTS OF INDUSTRIAL ACTIVITY IN OUTER SPACE

M F. MURPHY (Aerospatiale, Paris, France) IN Symposium on Industrial Activity in Space, Stresa, Italy, May 2-4, 1984, Proceedings Paris, Eurospace, 1984, p 449-463 refs

The provisions of international public law and of U.S and European private law regarding the exploitation of outer space, and in particular, the rights of commercial users of space facilities to the intellectual and physical products of space activities, are reviewed The international space treaties are listed, the interpretations of the Common Heritage of Mankind doctrine are discussed; the limitations imposed by the NASA Technical Exchange Agreement, Industrial Guest Investigator contract, and Joint Endeavor Agreement are examined in detail; and the need for agreement among the national space agencies and ESA on European standards is indicated. It is argued that private investment in space activities and the European share in the world market for space products can be increased by adopting secrecy and property-rights policies more favorable to industry than those in force in the U.S. тκ

### A85-39093

### LEGAL ASPECTS OF SPACE ACTIVITIES

I. DIEDERIKS-VERSCHOOR (International Institute of Space Law, Baarn, Netherlands) (Universita di Napoli, Aeritalia S.p.A., ESA, and NASA, International Symposium on Spacelab 1 - Results, Implications and Perspectives, Naples and Capri, Italy, June 11-16, 1984) Earth-Oriented Applications of Space Technology (ISSN 0277-4488), vol 5, no. 1-2, 1985, p 123-127. refs

The application of international law to space activities is considered. The design of a legal apparatus to control the collection and dissemination of remote sensing data is discussed, and examples of such an apparatus in the Landsat Treaties (1982 and 1983), and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space are discussed. Legal problems created by the growth of technology in direct satellite telecommunications, the construction of large space structures, and solar power satellites are also considered I.H.

### A85-39731#

# ORBITAL VEHICLE TRANSPORTATION - ISSUES OF LAW AND INSURANCE

P. D. NESGOS (Johnson and Higgins, Space Systems Group, New York, NY) AIAA, SAE, ASME, and ASEE, Joint Propulsion Conference, 21st, Monterey, CA, July 8-10, 1985 8 p (AIAA PAPER 85-1337)

It is pointed out that the introduction of vehicles operating exclusively in space presents a host of novel legal and insurance issues. This form of transportation is subject to existing space law which was established prior to the notion of routine orbital operations. Applicable are general international and national law, and more specific regulations. Attention is given to international law issues, the principal space treaties, the principle of freedom to explore space, U.S regulation of space transportation, the liability for the conduct of orbital transportation, the management of risk by insurance, and new challenges for space insurers. G R

#### A85-44097

#### **OBTAINING TITLE AND FINANCING TRANSPORT CATEGORY AIRCRAFT NATIONAL AND INTERNATIONAL IMPLICATIONS** J. T. STEWART, JR (Zuckert, Scoutt, Rasenberger, and Johnson,

Washington, DC) Journal of Air Law and Commerce (ISSN 0021-8642), vol. 50, no 2, 1985, p. 191-218 refs

The most important elements of U.S. and international law relating to the possession of title to transport category aircraft are discussed with a view to their influence on lenders, purchasers, and sellers of such aircraft Security interests have influenced the adoption by almost all states of the U.S. of the Uniform Commercial Code (Louisiana is the only exception), and the Federal Aviation Act has been amended to accommodate the changing environment of deregulation The international community has amended international undertakings to recognize the viable use of aircraft

by permitting the delegation of authority from the countries of registry to the countries of the operators. It is suggested that computerized information services may be harnessed to effectively implement the international flow of aircraft registry and ownership data. O.C.

#### A85-44098

# A NEW PROPOSAL FOR THE REFORM OF COMMERICAL AIR CRASH LITIGATION

A. J. CHALK (Southern Methodist University, Dallas, TX) Journal of Air Law and Commerce (ISSN 0021-8642), vol. 50, no. 2, 1985, p. 219-252. refs

A critical evaluation is conducted of the current system of litigation for aircraft accidents, and its performance is compared with the features of a hypothetical insurance system which circumvents the shortcomings of current tort liability. While tort liability is a system suited to the resolution of conflict among separate parties, insurance is a contractual matter between parties who interact in advance. A carefully structured passenger insurance system would transfer the locus of decision-making authority to the consumer, thereby eliminating the problems associated with tort liability. O.C.

#### A85-44099

#### **AIRLINE DEREGULATION - ANOTHER LOOK**

E. A. MORASH (Kent State University, OH) Journal of Air Law and Commerce (ISSN 0021-8642), vol. 50, no. 2, 1985, p. 253-282. refs

It is noted that the poor capital market currently being encountered by U.S. airlines, at a time when they must raise capital to replace aging equipment, has increased their future debt costs relative to those of other industries and modes of transportation, these developments are presently attributed to the price competition unleashed by the Airline Deregulation Act of 1978. A policy of 'regulation by exceptions' is proposed which emphasizes regulatory involvement in rate setting only for significant departures from the norm. This is suggested to be capable of restraining destructive price wars. A degree of competition would be preserved while reducing excessive discounts, objectionable price discrimination, and industry instability. O.C.

# **A85-49971\*** National Aeronautics and Space Administration, Washington, D.C.

### NASA AND THE PRACTICE OF SPACE LAW

S. N. HOSENBALL (NASA, Washington, DC) Journal of Space Law, vol. 13, no. 1, 1985, p. 1-7. refs

The paper discusses the need for increased awareness in space law due to advances in space technology and a trend toward commercialization of space. A list of national and international treaties, conventions, agreements, laws, and regulations relevant to space activities is presented. NASA lawyers specialize in international and municipal laws that affect the NASA space mission; an example of the lawyers working with insurance companies in negotiating the first Space Shuttle liability policy is provided. The increased participation of the public sector in space activities, for example, the commercialization of the Space Shuttle transportation system, is examined.

#### A85-49972

#### INTELLECTUAL PROPERTY AND SPACE ACTIVITIES

B. LUXENBERG (U.S. Department of Commerce, Washington, DC) and G. J. MOSSINGHOFF (Pharmaceutical Manufacturers Association, Washington, DC) Journal of Space Law, vol. 13, no. 1, 1985, p. 8-21. refs

The need for protection of data, products, and ideas as the commercialization of space continues is discussed. Some of the international and national laws of space which govern proprietary information and commercialization are presented. The development of laws to protect copyrighted works transmitted by satellite and remote sensing is described. NASA's policy toward intellectual property rights is to protect proprietary interests and encourage industrial participation in commercial space activities. Explanations

of these policies are provided. The future property rights to possible inventions made by reimbursable users on the Space Shuttle and the Space Station are examined.

#### A85-49973

# CUSTOM AS A SOURCE OF INTERNATIONAL LAW OF OUTER SPACE

V. S VERESHCHETIN and G. M. DANILENKO (AN SSSR, Institut Gosudarstva I Prava, Moscow, USSR) Journal of Space Law, vol. 13, no. 1, 1985, p 22-35 refs

The role of custom in the maintenance of international law in outer space is discussed. Due to the continuous advances in space technology and the number of states participating in space development it is not possible for treaties to establish all the necessary laws, therefore, internatinal custom is used as a means of creating legal rights or obligations of states independent of any existing treatly regulation and can regulate the relations of states which are nonparticipants in codifying conventions. Some principles which have become customary norms are described. Examples of the implementation of customary rules to control outer space questions are presented. Interaction between custom and treatly occurs through the incorporation of existing customary laws into treaties and the use of treaties to regulate new problems or change existing norms; these areas of interaction are explained.

#### A85-50055

LEGAL ISSUES OF MANNED ORBITING SPACE STATIONS

A GORBIEL (Lodz, Uniwersytet, Poland) Postepy Astronautyki (ISSN 0373-5982), vol. 18, no. 1-2, 1985, p. 7-24. refs

A necessity is postulated for negotiating a special international agreement, in the framework of the United Nations, addressing a number of detailed legal issues connected with the use of orbiting space stations. The topics to be considered in such a document are investigated, and the views advanced in the space law literature concerning the international legal specificity of the manned space stations are analyzed Questions of jurisdiction concerning the space stations are examined, in particular the registration of a station constructed from two or more parts launched separately, and assembled later in space. The need for precise treaty regulations concerning the limits of authority of the station commander and the general relationships among the station personnel is emphasized. Finally, the problems concerning the personnel manning the space stations that belong to international organizations are discussed. 15.

#### A85-50056

# TOWARDS THE ENTIRE DEMILITARIZATION OF OUTER SPACE

A. GORBIEL (Lodz, Uniwersytet, Poland) Postepy Astronautyki (ISSN 0373-5982), vol 18, no. 1-2, 1985, p. 25-56. refs

The potential use of space-based destruction weapons and antisatellite weapons is discussed in the light of the January 27, 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies. This treaty stipulates total demilitarization of celestial bodies, but in outer space itself it bans only the mass destruction weapons. Discussions in the UN organs concerning the means to be undertaken for the prevention of outer space armament are summarized An opinion is expressed and motivated. that it is necessary to adopt a new international treaty banning the use of space for any military purposes whatever, expressly the testing, placing, and use of outer space weapons of any kind, rather than only weapons of mass destruction. In the context of this new treaty, the admissibility of using satellites for reconnaissance and communication is questioned. I.S.

#### N85-10870# Committee on Appropriations (U. S. Senate) DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, AND CERTAIN INDEPENDENT AGENCIES APPROPRIATIONS FOR FISCAL YEAR 1985, PART 2

Washington GPO 1984 883 p Hearings on H. R 5713 before a Subcomm of the Comm. on Appropriations, 98th Congr, 2nd Sess., 1, 29 Mar., 12 Apr., and 1 May 1984

(S-REPT-98-889-PT-2, GPO-31-248) Avail: Committee on Appropriations

Requests of \$1,501,792,000 for the National Science Foundation, \$7,491,400,000 for NASA, \$630,072,000 for the Federal Emergency Management Agency, \$67,428,000 for the Federal Home Loan Bank Board and \$10,500,000,000 for the Housing and Urban Development are justified. Office Technology Assessment findings on automatic and the civilian space station are included.

#### N85-10871# Committee on Appropriations (U S. Senate). NATIONAL AERONAUTICS AND SPACE ADMINISTRATION In its Department of Housing and Urban Development and Certain

Independent Agencies for Fiscal Year 1985, Pt. 2 p 1075-1241 Washington GPO 1984

Avail: Committee on Appropriations

Appropriations for the space station; space transportation capability development; space science and applications; technology utilization, aeronautical research and technology; space research and technology, tracking and data advanced system; shuttle production and operational capability; space and ground networks, communication and data systems; and construction of facilities are detailed B.G.

N85-11013\*# National Aeronautics and Space Administration, Washington, D.C.

LEGAL CONSIDERATIONS AND COOPERATIVE OPPORTUNITIES FOR SPACE COMMERCIAL ACTIVITIES S N. HOSENBALL /n NASA Marshall Space Flight Center 2nd Symp. on Space Industrialization p 28-37 Oct 1984 Avail: NTIS HC A19/MF A01 CSCL 05D

It is a national policy to make the capabilities of the Space Transportation System available to a wide range of potential users. This includes its availability as a space manufacturing facility for commercial activities, which may be carried out on a reimbursable basis or as a joint endeavor with NASA, but with substantial private investment. In any high risk, long lead-time research and development activity directed towards commercialization, the protection afforded the results of the research and development under the laws relating to intellectual property rights may provide an important incentive for private investment. The policies and practices of NASA directed towards the protection of privately-established intellectual property rights involved in STS use are reviewed with particular emphasis on reimbursable launch agreements and joint endeavor agreements. R S.F.

**N85-12806\*#** National Aeronautics and Space Administration, Washington, D.C.

#### THE STRUCTURES AND THE ROLE OF AN INTERNATIONAL AGENCY FOR THE CONTROL OF SATELLITES

R. J. DUPUY Jun. 1984 13 p refs Transl. into ENGLISH from Ann. of Air and Space Law (Montreal), v. 6, 1981 p 333-341 Original language document was announced as A82-37836 Transl. by Kanner (Leo) Associates, Redwood City, Calif

(Contract NASW-3541)

(NASA-TM-76765; NAS 1.15:76765) Avail: NTIS HC A02/MF A01 CSCL 05D

Legal questions involved in the liability of a proposed agency which would control internationally owned satellites for monitoring worldwide compliance with arms control agreements are discussed Difficulties in acquiring the signed consent of all the relevant nations, and guaranteeing satisfactory compliance with the terms of such an agreement are noted. Additional problems to be solved comprise the construction of the ground based facilities and the satellites, the funding for the venture, and the reconciliation of the functions of the proposed agency with the sovereignty of individual states. The agency would gather, treat, and format data for signatories of arms control agreements and provide technical assistance in crisis conditions. It is concluded that the existence and functioning of the agency would reduce the amount of classified information and would consequently reduce the level of international tensions.

N85-12919# Committee on Science and Technology (U S. House).

# THE EXPENDABLE LAUNCH VEHICLE COMMERCIALIZATION ACT

Washington GPO 1984 120 p Hearings before the Subcomm. on Space Sci. and Appl of the Comm. on Sci. and Technol, 98th Congr., 1st and 2nd Sess., No. 85, 18 Nov. 1983 and 29 Mar. 1984

(GPO-30-838) Avail Subcommittee on Space Science and Applications

The Department of Transportation will serve as the lead agency in the transfer of Expendable Launch Vehicles (ELV) to the private sector. The roles of the FAA, Coast Guard and materials Transportation Bureau were discussed B.G.

N85-13690# Committee on Commerce, Science, and Transportation (U. S Senate).

### COMMERCIAL SPACE LAUNCH ACT

Washington GPO 1984 72 p Hearing on S. 2931 before the Subcomm. on Sci., Technol and Space of the Comm on Com, Sci. and Transportation, 98th Congr., 1st Sess., 6 Sep. 1984

(GPO-39-613) Avail: Subcommittee on Science, Technology and Space

Several initiatives designed to develop the commercial potential of space through increased private sector investments and involvement are considered. The primary focus is on 2931 which seeks to facilitate private sector space launch activity by establishing the Department of Transportation as the lead Federal agency with licensing authority over private expandable launch vehicle operations and by providing a framework within which this new industry can most effectively operate Economic, regulatory, and legal incentives are covered as well as NASA support for commercial space ventures. A R H.

N85-14201# Committee on Commerce, Science, and Transportation (U. S Senate).

# LAND REMOTE-SENSING COMMERCIALIZATION ACT

Washington GPO 1984 35 p Rept. to accompany H. R. 5155 presented by the Comm. on Com., Sci., and Transportation, 98th Congr., 2nd Sess., 17 May 1984

(S-REPT-98-458) Avail: US Capitol, Senate Document Room

A bill is described which provides a framework for a phased, orderly commercialization of land remote sensing technologies The commercialization ramework includes provisions for appropriate Government regulation of private land remote sensing, continued Federal research and development in remote sensing, and continued Government archiving of land remote sensing data. A.R.H.

N85-15533# Executive Office of the President, Washington, D.

#### PUBLICATIONS OF THE EXECUTIVE OFFICE OF THE PRESIDENT: JANUARY 20, 1981 - JUNE 30, 1984 1984 7 D

(PB84-230671) Avail NTIS HC A02/MF A01 CSCL 05B

Over 140 documents issued by the components of the Executive Office of the President, and available for sale to the public are listed. GRA N85-15792# Office of Technology Assessment, Washington, D.C.

FINANCING CONSIDERATIONS AND FEDERAL BUDGET IMPACTS

In its Civilian Space Stations and the US Future in Space p Nov. 1984 refs 217-226

Avail: SOD HC \$7.50

Private sector funding and international funding of U.S. civilian space activities are discussed. The projected growth in private sector sales and related tax revenues is considered. Historical bases for a projection of sales growth in the private sector are given along with legal and experiential bases for Federal/private sector cooperation in economically directed research and development. Impacts on the Federal space budget are addressed **R.S F.** 

N85-16684# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.

### GOVERNMENT CONTRACT CONTINGENT LIABILITIES. THE ANTI-DEFICIENCY ACT, AND THE HOBGOBLIN OF LITTLE MINDS M.S. Thesis George Washington Univ.

S. D. HEDLUND Sep. 1984 197 p (AD-A147919; AFIT/CI/NR-84-82T) Avail. NTIS HC A09/MF A01 CSCL 05A

Contents: The Anti-Deficiency Act; (1) Overview of the Act, (2) Perceived Reasons for the Ineffectiveness of the Act; (3) Relevant Features and Applications of the Act; (4) What the Act means for Contingent Liabilities; The Problem of Statutory Authority in Contractually Assuming Contingent Risks, How the Government may Assume Contingent Obligations without Violating the Anti-Deficiency Act Contingencies in Fact, (1) Indemnity, (2) Clauses which may vary the Contract Price, (3) Constructive Changes and Differing Site Conditions, Termination Issues. GRA

N85-16697\*# National Aeronautics and Space Administration, Washington, DC

### OUTER SPACE LAW: A PROBLEM OF ASTRONAUTICS

V. MANDL Dec 1984 55 p Transl into ENGLISH of "Das weltraum-recht Ein problem der raumfahrt" Rept. Germany, 1983 48 p Transl. by Kanner (Leo) Associates, Redwood City, Calif.

(Contract NASW-4005)

(NASA-TM-77760, NAS 1.15 77760) Avail NTIS HC A04/MF A01 CSCL 05D

The theory of space law is discussed from the point of view of similarities and differences between hypothetical space law and current (1932) aviation law International legal aspects and economic and cultural effects are also addressed Author

Engineering and Economics Research, Inc., Falls N85-16852# Church, Va.

#### NATIONAL AIRSPACE REVIEW ENHANCEMENT PLAN, **REVISION 3**

19 Dec 1984 64 p

(AD-A150743) Avail. NTIS HC A04/MF A01

The National Airspace Review (NAR) Plan was retitled as the National Airspace Review Enhancement (NARE) Plan to reflect the expanded scope of this undertaking. The airspace allocation, procedural, and regulatory aspects of improvements scheduled under the National Airspace System (NAS) plan and the shift of program sponsorship from the Associate Administrator for Air Traffic to the Director of Management Systems are reviewed. BG

# N85-19309# Joint Publications Research Service, Arlington, Va. WORLDWIDE REPORT: TELECOMMUNICATIONS POLICY, **RESEARCH AND DEVELOPMENT**

24 Jan. 1985 63 p refs Transl into ENGLISH from various foreign articles

(JPRS-TTP-85-002) Avail NTIS HC A04/MF A01

Research topics in the area of telecommunication are covered in this Worldwide Report. The development and design of traveling wave tubes and optical fibers from Japan are discussed Chinese domestic satellite communications systems are also discussed.

#### N85-19314# Joint Publications Research Service, Arlington, Va WORLDWIDE REPORT: TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

26 Feb. 1985 64 p Transl into ENGLISH from various worldwide articles

(JPRS-TTP-85-006) Avail NTIS HC A04/MF A01

The development and utilization of various communications technologies in individual countries in Asia, sub-Saharan Africa, Latin America, Europe, and the Near-East are reported. Specifications for Brasilsat are included along with examples of international cooperation for technology transfer.

#### N85-20182# Joint Publications Research Service, Arlington, Va. FRENCH RESEARCH MINISTER ON POLICY, TECHNOLOGY TRANSFER

P. GRANGE and J. C. HANUS In its West Europe Rept: Sci. and Technol. (JPRS-WST-85-008) p 128-135 19 Feb 1985 Transl into ENGLISH from Micro et Robots (Paris), Nov. 1984 p 42-45

Avail. NTIS HC A07/MF A01

Technology transfer, relationship of science and politics; robotics; industry responsibility, research laboratories; and regionalization are discussed B.G.

National Aeronautics and Space Administration N85-21214\*# Goddard Space Flight Center, Greenbelt, Md.

#### DEBRIS IN THE GEOSTATIONARY ORBIT RING, THE ENDLESS SHOOTING GALLERY: THE NECESSITY FOR A DISPOSAL POLICY

D H SUDDETH In NASA Lyndon B Johnson Space Center Orbital Debris p 349-364 Mar. 1985

Avail NTIS HC A20/MF A01 CSCL 03C

NASA is considering establishing a policy for the limitation of the physical crowding of the geostationary orbit The proposed policy is intended to address the following issues: (1) deal only with geostationary altitudes; (2) illustrate the unique value and usefulness of the geostationary orbit ring; (3) describe the orbital dynamics as simply as possible, (4) describe the current spacecraft and debris situation; (5) briefly review current industry and agency policies, (6) project future trends of physical crowding with the present nonpolicy; (7) propose solutions that can be implemented in the near future; and (8) use previous work as much as desirable. GIC

N85-21218\*# Battelle Columbus Labs., Ohio. Space Systems and Applications.

#### **ORBITAL DEBRIS POLICY ISSUES: BATTELLE INVOLVEMENT** AND SOME PERSONAL OBSERVATIONS

D. S EDGECOMBE In NASA. Lyndon B Johnson Space Center Orbital Debris p 402-409 Mar. 1985 refs Avail: NTIS HC A20/MF A01 CSCL 22A

The possible hazards presented by orbital debris have been a matter of concern since the early 1960s. The area of initial concern was the potential hazard of the Earth from reentering debris. In the very early days of the space program, it was believed that only specially protected objects would survive reentry Subsequent events showed this to be incorrect. The recognition of the potential hazard of orbital debris to orbiting objects did not occur until the late 1970s. Concern over this potential hazard has increased, and has also given rise to a number of policy issues. These issues are, at present, largely unresolved GLC.

N85-21219\*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex.

### CONSIDERATIONS FOR POLICY ON MAN-MADE DEBRIS **PROPAGATION CONTROL**

D FIELDER In its Orbital Debris p 410-418 Mar. 1985 Avail NTIS HC A20/MF A01 CSCL 22A

The present rates of man-made, space object propagation are such that there is a real probability of self propagation which, if uncontrolled can lead to a serious limitation to future uses of spacecraft for beneficial purposes Effective control over the debris issue requires adoption and adherence to policy at a world wide level (any one nation's unknowing, selfish or deliberately adverse action can conceivably jeopardize other useful applications of space satellites for years into the future) The near-term environment may not seriously jeopardize the near-term missions. However, absence of control and/or nonadherence to a control policy in the near-term can result in a debris environment that can severely limit long - term mission opportunities. The data upon which these observations are based continues to be investigated. These investigations tend to validate the preceding observations and emphasize the need for near-term action to establish responsible control policy and implementation actions. Author

N85-21225# Committee on Commerce, Science, and Transportation (U S. Senate).

#### COMMERCIAL SPACE LAUNCHES

Washington GPO 1984 19 p Rept to accompany H R 3942 presented by the Comm. on Com., Sci , and Transportation, 98th Congr., 2nd Sess , 3 Oct 1984

(S-REPT-99-656; GPO-51-010) Avail US Capitol, Senate Document Room

This bill is to establish a framework within which expendable launch vehicles (ELVs) and their associated facilities and launch services may be licensed for commercial launches. This legislation also designates the Department of Transportation (DOT) as the lead Federal agency to facilitate and expedite the issuance and transfer of commercial space launch licenses Author

N85-22244# Committee on Science and Technology (U S House).

#### 1984 SCIENCE AND TECHNOLOGY POSTURE HEARING WITH THE DIRECTOR OF THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Washington GPO 1985 65 p Hearing before the Comm. on Sci and Technol, 98th Congr, 2nd Sess, No. 134, 1 Feb. 1984 (GPO-41-060) Avail: Committee on Science and Technology

The U.S. Government Science and technology policy is reviewed. Topics discussed include research and development, technology utilization, development of high quality technical talent, pursuit of excellence in research, and expansion and strengthening of partnership between government industry, and academia.

E.A.K.

N85-22245# Committee on Science and Technology (U. S. House).

# AN AGENDA FOR A STUDY OF GOVERNMENT SCIENCE POLICY

Washington GPO 1985 67 p Rept. presented by the Task Force on Sci. Policy to the Comm. on Sci and Technol., 98th Congr, 2nd Sess., Dec 1984

(GPO-40-860) Avail: Committee on Science and Technology

The proposed agenda was developed in response to the charge to focus on the issues of maintaining America's leadership in science in view of the changing environment facing us over the coming decades In developing the proposed agenda, the importance which science has come to play in our national life and in our international relations was considered. At the same time, the two factors which inevitably will affect American science in the future: the growing international strength in science and the urgent need to ensure that science expenditures, as an important component of a federal budget, be provided at optimum levels and be expended in the most effective manner, were considered. As a result, the proposed agenda is broad and raises questions about both the basic purposes of federal funding for scientific research and the specific practices of the governmental agencies for the expenditure of those funds G.L C.

**N85-22253**# President's Private Sector Survey on Cost Control, Washington, D.C

#### PRESIDENT'S PRIVATE SECTOR SURVEY ON COST CONTROL, REPORT ON RESEARCH AND DEVELOPMENT 1983 173 D

(PB84-173269) Avail. NTIS HC A08/MF A01 CSCL 05A

Results of the Research and Development Task Force of the President's Private Sector Survey on Cost Control in the Federal Government are presented Recommendations are made which, when fully implemented, could result in significant cost savings individual topics addressed include: strategic planning, R and D management and the budget process; privatization, administration of research grants to universities; NASA cost reporting; and research program reporting M.G

N85-22455# Joint Publications Research Service, Arlington, Va. U.S., SOVIET SPACE PROGRAM AIMS CONTRASTED

G S KHOZIN *In its* USSR Rept.: Space (JPRS-USP-85-001) p 104-110 4 Feb. 1985 Transl. into ENGLISH from Zemlya i Vselennaya (USSR), no. 2, Mar.-Apr. 1984 p 14-18 Avail. NTIS HC A07

International treaties and agreements which establish the principles for research and use of space for peaceful purposes are used to assess the U.S. and U.S.S.R. space programs B.G.

N85-23442# Joint Publications Research Service, Arlington, Va USSR REPORT: SCIENCE AND TECHNOLOGY POLICY

27 Feb. 1985 102 p refs Transl. into ENGLISH from various Russian articles

(JPRS-UST-85-002) Avail NTIS HC A06

Scientific and technological policies are presented and discussed Some areas covered are (1) Economic mechanism of integration of science and production; (2) Scientific and technical progress and factors of intensification of the economy; (3) Contributions of technical community to scientific and technical progress; (4) Coordination of regional management of scientific and technical activity, and (5) dissemination of information on advanced know how

N85-23452# Committee on Science and Technology (U S House)

AUTHORIZING APPROPRIATIONS TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FOR FISCAL YEAR 1986

Washington GPO 1985 223 p Presented to accompany H.R 1714 to the Comm of the Whole House on the State of the Union, 99th Congr., 1st Sess., 28 Mar. 1985

(H-REPT-99-32; GPO-44-360) Avail US Capitol, House Document Room

The authorization of appropriations for aerospace research and development were discussed. The appropriation concerned space flights, research and program management, control and data communications, and construction of facilities E A.K.

#### N85-23453# Naval Postgraduate School, Monterey, Calif. COPYRIGHT LAW, COMPUTER SOFTWARE, AND GOVERNMENT ACQUISITION M.S. Thesis P. R. DAUPHINIAS Sep. 1984 81 p

(AD-A150347) Avail NTIS HC A05/MF A01 CSCL 09B

This thesis examines copyright law as it relates to computer software and how this law affects the Government acquisition of computer software. Following a differentation of copyright law, patent law, and trade secrets, a brief history of the evolution of copyright law is presented Current Government software acquisition practices are examined with respect to copyright statutes The 1984 Betamax case is examined and related to software issues which concern the Government as an entity. Finally, considerations which influence software procurement and copyrights are examined GRA N85-25360# Joint Publications Research Service, Arlington, Va MILITARIZATION OF SPACE ACTIVITY IN UNITED STATES O. MIKHAYLOV *In its* USSR Rept.: Space (JPRS-USP-85-003) p 137-144 4 Mar. 1985 Transl into ENGLISH from Politicheskoye Samoobrazovaniye (USSR), no 6, Jun 1984 p 115-120 Avail: NTIS HC A08/MF A01

Policies of the Reagan administration adopted to achieve a strategic advantage over the U.S.S.R. are examined. Civilian departments in the United States are being increasingly drawn into the orbit of the space aspirations of the Pentagon. The expenditures of NASA on military space research are not less than one third of its budget and former military personnel are agency's activity. Space command and directing the reconnaissance systems are being developed and satellites are being used to intercept communications. The strategic aggressive antisatellite system is a violation of the 1972 agreement on antimissile defense systems. Space shuttle is becoming an important means for the testing, collection and in orbit servicing of promising space weapons, including an antimissile defense Variants of automatic and manned maneuverable system. spaceships of a lesser size and orbital stations are being actively investigated. The intention of the Washington political leaders to break the existing equilibrium of strategic forces by means of the militarization of space is a dangerous turn in the arms race which is a threat to all mankind. ARH

N85-27766# Committee on Energy and Commerce (U. S. House).

# NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION AUTHORIZATION

Washington GPO 1984 78 p Hearing on H. R. 5497 before the Subcomm. on Telecommun, Consumer Protection, and Finance of the Comm. on Energy and Com., 98th Congr., 2nd Sess, 24 Apr 1984

(GPO-38-660) Avail: Subcommittee on Telecommunications, Consumer Protection, and Finance

A bill to authorize appropriations for the National Telecommunications and Information Administration (NTIA) for the fiscal years 1985 and 1986 is given. The activities of the NTIA are discussed. R J F.

#### N85-27768# Committee on Appropriations (U.S. House). DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATIONS FOR 1986. PART 6: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington GPO 1985 1026 p refs Hearings before a subcomm. of the Comm. on Appropriations, 99th Congr., 1st Sess, 1985

(GPO-47-235) Avail: Committee on Appropriations CSCL 05A The president's budget for NASA of \$7.9 billion allocate \$2.9 billion for research and development, \$3.5 billion for space flight, control and data communications; \$149 million for construction of facilities; and \$1.3 billion for research and program management Space station and space shuttle budgetary requirements are explored in detail, along with space science, science and applications, commercial programs/technology utilization and aeronautics research and technology. E R.

#### N85-28860# American Univ., Washington, D. C. SOCIAL AND POLITICAL PROBLEMS IN SOVIET BASIC RESEARCH

L. L. LUBRANO In Stanford Univ. Sci. and Technol in the Soviet Union p 71-95 31 Jan. 1985

(AD-P004565) Avail NTIS HC A10/MF A01 CSCL 05A

The impact by social and political factors on Soviet based research is discussed Policy implications, decisionmaking in the USSR academy, and politics and furman flights are discussed.

GRA

N85-28885# Committee on Commerce, Science, and Transportation (U. S. Senate)

#### NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT, 1986

Washington GPO 1985 29 p H. R. 1714, an act, referred to the Comm. on Com., Sci., and Transportation, 99th Congr, 1st Sess., 16 Apr 1985

(S-REPT-99-91) Avail: US Capitol, Senate Document Room

An act to authorize appropriations for various NASA programs is given. Research and development, space flight, control and data communications, construction and maintenance of facilities, and project management are among the purposes for which the authorization was written. R.J.F.

**N85-28886**# Bundesministerium fuer Forschung und Technologie, Hamburg (West Germany).

DOCUMENTATION FOR THE WEST GERMAN FEDERAL CABINET'S SPACE POLICY DECISION [UNTERLAGEN ZUR ENTSCHEIDUNG DES BUNDESKABINETTS ZUR WELTRAUMPOLITIK]

GREGER Apr. 1985 33 p In GERMAN

Avail: NTIS HC A03/MF A01

The financial and technical contribution of the German government to the Columbus program and the HM 60/Ariane 5 program as well as the time schedule are presented. The different programs and the NASA space station are described. The importance of the NASA space station for Europe is studied in its scientific, technological, financial and political aspects.

Author (ESA)

N85-30978# Committee on Commerce, Science, and Transportation (U. S. Senate)

# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT, 1986

DANFORTH Washington GPO 1985 64 p Rept. to accompany H R 1714, presented by the Comm. on Com, Sci., and Transportation, 99th Congr., 1st Sess., 24 Jun. 1985 (S-REPT-99-91; GPO-51-010) Avail: US Capitol, Senate Document Room

The provisions of H.R 1714, a bill to authorize appropriations to the National Aeronautics and Space Administration for research and development, space flight, control and data communications, construction of facilities, and research and program management are given. Space stations, the Hubble Space Telescope, Spacelab, upper stages, tethered satellites, and the Gamma Ray Observatory are among the numerous projects discussed. R.J.F.

#### N85-30979# Committee on Appropriations (U. S. House) DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATION BILL, 1986

Washington GPO 1985 89 p Rept. to accompany H.R. 3038 presented by the Comm. on Appropriations, 99th Congr., 1st Sess., 18 Jul. 1985

(H-REPT-99-212; GPO-50-177) Avail: US Capitol, House Document Room

Appropriation hearings for the Department of Housing and Urban Development Independent Agencies are presented. Major agencies discussed include Environmental Protection Agency, Federal Emergency Management Agency, National Aeronautics and Space Administration, the National Credit Union Administration and the Veterans Administration. Salaries and expenses are presented for most organizations.

N85-32038# National Academy of Sciences - National Research Council, Washington, D. C.

NAVY INFORMATION SYSTEMS: PLANNING, POLICY, ORGANIZATION, AND MANAGEMENT Final Report Jan. 1985 60 p

(Contract N00014-80-C-0160)

(PB85-176113) Avail: NTIS HC A04/MF A01 CSCL 05B

The committee automatic data processing that reviewed Navy's management and planning of (ADP) systems presents its findings.

Committee recommends new thrust that focuses on information rather than transactional ADP systems; change ADP systems into information systems. The following specific recommendations were made: The Navy needs a strong advocate of information systems at Chief of Naval Operations-level (CNO), Create a new CNO division, Information Systems Division, under a flag officer to report to Command and Control. How well the Navy has implemented the committee's recommendations is discussed. GRA

N85-32039# Committee on Science and Technology (U S House).

#### NASA AUTHORIZATION, 1986, VOLUME 1

Washington GPO 1985 180 p Hearing before the Subcomm on Transporation, Aviation and Mater. of the Comm on Sci and Technol., 99th Congr., 1st Sess., No. 3, 5 Mar. 1985

(GPO-46-385) Avail. Subcomm. on Transportation, Aviation and Mater.

A congressional hearing was conducted wherein testimony was heard and evidence presented in support of NASA's civil aviation program. Of primary concern were budget considerations and appropriations it was stressed that this program benefits a broad segment of the population through its end applications. G.L.C.

#### N85-32041# Committee on Appropriations (U. S Senate). DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATION ACT, 1986

Washington GPO 1985 50 p H. R 3038 referred to the Comm. on Appropriations, 99th Congr., 1st Sess, 29 Jul. 1985 Avail US Capitol, House Document Room

Appropriations for the year ending September 30, 1986 as approved by the 99th congress are presented.

#### N85-32042# Committee on Appropriations (U. S. Senate). NATIONAL AERONAUTICS AND SPACE ADMINISTRATION RESEARCH AND DEVELOPMENT

*In its* Dept. of Housing and Urban Develop -Independent Agencies Appropriations Act, 1986 p 24-27 1985

Avail US Capitol, House Document Room

The department of Housing and Urban Development Independent Agencies Appropriations Act, 1986 contains appropriation guidelines for funding of NASA programs for the year ending September 30, 1986. The amount provided is \$2,756,800,000 G L.C

**N85-33173\*#** National Aeronautics and Space Administration Lyndon B. Johnson Space Center, Houston, Tex.

TESTIMONY OF ROBERT A. FROSCH BEFORE THE SUBCOMMITTEE ON HUD AND INDEPENDENT AGENCIES OF THE SENATE COMMITTEE ON APPROPRIATIONS

R. A. FROSCH 14 Mar. 1985 4 p

(NASA-TM-87496, NAS 1.15:87496) Avail: NTIS HC A02/MF A01 CSCL 22B

An agreement between NASA and the Congress was arranged as part of the activities supporting the establishment of NASA Policy on Automation and Robotics for the space station. This agreement is dicussed. A panel brought together experts from industry, universities, national laboratories, other government agencies, and NASA to perform an independent study of how NASA could use automation and robotics in the space station in ways that would be most useful to carrying out the mission of the station, and that would lead to useful benefits to the U.S. economy and industry on the ground.

#### N85-34720# Committee on Appropriations (U. S. Senate). DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT INDEPENDENT AGENCIES APPROPRIATION BILL, 1986

Washington GPO 1985 117 p Rept. to accompany H.R. 3038 presented by the Comm. on Appropriations to the 99th Congr., 1st Sess., 16 Jul. 1985

(S-REPT-99-129) Avail: US Capitol, Senate Document Room The Department of Housing and Urban Development-Independent Agencies Appropriations Bill, 1986 is discussed. Various amendments are presented and an explaination of the contents of the bill is given. NASA programs, Antarctic research, environment protection, and construction projects are discussed.

N85-35147\*# George Washington Univ., Washington, D.C. OPPORTUNITIES FOR POLICY HISTORIANS: THE EVOLUTION OF THE US CIVILIAN SPACE PROGRAM

J. LOGSDON *In* NASA, Washington A Spacefaring People p 81-107 1985 refs

Avail: NTIS HC A08/MF A01; also available SOD HC \$3.50 as 033-000-009-33-0 CSCL 05A

The evolution of U.S. civilian space policy and the institutional framework through which that policy was implemented are discussed Space policy principles the governed decision making between 1957 and 1962 are identified. The government/industry relations regarding space related research and development are discussed.

# SUBJECT INDEX

**APRIL 1986** 

### **Typical Subject Index Listing**



#### CONTROL THEORY

Hand controllers for teleoperation A state-of-the-art technology survey and evaluation [NASA-CR-175890]



The subject heading is a key to the subject content of the document. The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of the document content. the title extension is added, separated from the title by three hyphens. The (NASA or AIAA) accession number and the page number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable, a report number is also included as an aid in identifying the document. Under any one subject heading, the accession numbers are arranged in sequence with the AIAA accession numbers appearing first

# А

ABILITIES

Encouraging and maintaining an	innov	ative work
climate	p4	A85-43198
ACCOUNTING		
Management control systems and	interde	pendencies
An empirical study		
[AD-A152280]	p 17	N85-27746
Computer center policy		
[AD-A154416]	p 41	N85-30681
DOD Value Engineering Conference	се гер	ort Value
Engineering (VE) A tool that benefits	s line n	nanagement
held at Leesburg, Virginia on 1-2 Nov	ember	1984 Part
1 Executive summary		
[AD-A156067]	p 57	N85-35810
ACCURACY		
An application of discriminant analys	sis to tl	ne selection
of software cost estimating models		
[AD-A147632]	p 70	N85-17580
ACID RAIN		
EPA (Environmental Protection /	Agenc	y) research
program guide, FY-1985, October 1,	1984 -	September
30, 1985		
[PB85-181881]	p 55	N85-31676
ACQUISITION		
Systems analysis for microcomputer	acquis	ations
[AD-A145447]	p 69	N85-11556
Capital investment motivational tec	hnique	≥s used by
prime contractors on subcontractors		
[AD-A153660]	p 53	N85-29837
Producibility Engineering and Plannii	ng (PEF	<li>Program</li>
management guidelines		
[AD-A153730]	p 18	N85-30966
ACTIVE CONTROL		-
Active control of mechanical	systen	ns - The
state-of-the-art for robotic manipulators	s	
[AIAA PAPER 85-0683]	p 25	A85-30351
	ond	

NASA Space controls research p 54 N85-31149 program

#### ACTIVITY (BIOLOGY)

A	quantitative	evaluation	of	human	activity	ŝ
man-	machine syste	ems Russi	ian b	book		
				p 23	A85-135	599

- ADA (PROGRAMMING LANGUAGE)
- Using Ada for a distributed, fault tolerant system [AIAA PAPER 84-2703] p 79 A85p 79 A85-17873
- Conference on Ada Applications and Environments, St Paul, MN, October 15-18, 1984, Proceedings
- p 32 A85-27900 Ada - Will DOD's new computer language cut software
- p 61 A85-29669 cost? Steps to an advanced Ada programming environment p 33 A85-31209
- An automated methodology development --- software p 33 A85-34128 design for combat simulation
- Ada A good start, an exciting future p 34 A85-41549 Ada (trademark) training curriculum Real-time concepts
- 1303 teacher's guide p 35 N85-10694 [AD-A145093] Ada (trademark) training curriculum Software
- engineering for managers m101 teacher's exercise guide [AD-A145094] p 35 N85-10695 p 35 N85-10695 Concept paper for the development of a DOD Ada (trademark) software engineering education and training
- plan AD-A1487741 p 38 N85-17592 ADAPTIVE CONTROL
- Some principles for the construction of an adaptive p 3 A85-23279 training system NASA Space controls research and technology N85-31149 p 54 program AERONAUTICAL ENGINEERING
- Training and development of engineers at the Air Force Flight Test Center - An overview
- p 1 A85-13587 [AIAA PAPER 84-2528] The congressional authorization process as it applies
- to aeronautical research and technology p 89 A85-29555 Aeronautical systems technology needs Escape.
- rescue and survival, test facilities and test equipment and training-simulation equipment (AD-A145059) o 21 N85-10002
- Guide for the execution of reliability tests in the laboratory aeronautical equipment p 85 N85-27237
- Simulation for human factors research A central N85-29568 р9 question Fidelity The economics of private sector R and D decisionmaking
- in aeronautics [NASA-CR-176007] p 54 N85-30962
- Technology for National aeronautical R and D goals America's future p 54 N85-30964 AEROSPACE ENGINEERING
- Graduate education in propulsion [AIAA PAPER 85-1147]
- p 3 A85-39623 Activities report of the aerospace industry in West Germany [ISSN-0722-3838]
- p 49 N85-16686 Activities report of the aerospace industry in West
- Germany [ISSN-0722-3838] p 49 N85-16687 Space Station engineering and technology development
- [NASA-CR-174383] p 21 N85-18079 Activities report in aerospace in West Germany
- LISSN-0070-39661 p 50 N85-18947 Authorizing appropriations to the National Aeronautics and Space Administration for fiscal year 1986 p 95 N85-23452
- [H-REPT-99-32] A decision support methodology for space technology advocacy [AD-A151895] p 16 N85-25283
- Activities in aerospace p 22 N85 27821 AEROSPACE ENVIRONMENTS
- Space The challenge of a new environment p 63 A85-38902

#### AEROSPACE INDUSTRY

- NASA's approach to the commercial use of space [IAF PAPER 84-217] p 59 A85-13139
- What are we in business for? An engineering approach to project finance p 61 A85-27648

Commercial use of space - The s	pace bus	iness era
	p 63	A85-34538
US initiatives in space commerc	alization	
[IAF PAPER 84-223]	p 63	A85-35978
Integrated management for ae	rospace a	applications
	p 11	A85-37163
Symposium on Industrial Activity is	n Space,	Stresa, Italy,
May 2-4, 1984, Proceedings	p 63	A85-38901

- Management philosophies associated with leading p 12 A85-43177 successful organization Activities report in aerospace in West Germany
- p 50 N85-18947 [ISSN-0070-3966] Managerial benefits of Helios for the European industry p 52 N85-27809 Activities in aerospace p 22 N85-27821 Note for a research feasibility project High reliability
- design in the aeronautical field [REPT.84-RR-350] p 85 N85-31005 Investment justification of robotic technology in aerospace manufacturing User's manual p 85 N85-31005 p 23 N85-35410 AD-A1561931
- AEROSPACE MEDICINE Age and space flight p 4 A85-44624 AEROSPACE SYSTEMS
- Protecting intellectual property in space. Proceedings of the Aerospace Computer Security Conference, McLean, VA. March 20, 1985 p 34 A85-42592 Air Force technical objective document FY 86 p 52 N85-28855 [AD-A152730] Overhead management guide for aerospace
- procurements AD-A153626) p 18 N85-29835 AEROSPACE TECHNOLOGY TRANSFER
- International Scientific Conference on Space, 23rd. Rome, Italy, March 24, 25, 1983, Proceedings p 43 A85-12501
- International cooperation in the commercial era of p 58 A85-12507 space
- Commercialization of space Incentives, impediments p 61 A85-27375 and alternatives Remote sensing - A tortuous trip to marketplace
- p 62 A85-34218 Activities report in aerospace in West Germany
- p 50 N85-18947 [ISSN-0070-3966] Authorizing appropriations to the National Aeronautics
- and Space Administration for fiscal year 1986 p 95 N85-23452 (H-REPT-99-32)
- FRG weighs ESA participation, budget issues N85-29110 p 53 NASA Space controls research and technology
- program p 54 N85-31149 Civilian Space Stations and the US future in Space p 55 N85-31215 [OTA-STI-242]
- New technologies at the forefront of industrial p 56 N85-35168 developments
- AEROSPACEPLANES
  - Hermes Does Europe need its own spaceplane? p 64 A85-41534

#### AGE FACTOR

The functional age profile - ,	An objective decision criterion
for the assessment of pilot	performance capacities and
capabilities	p 2 A85-21588
Age and space flight	p 4 A85-44624

- AGREEMENTS The structures and the role of an international agency for the control of satellites
- [NASA-TM-76765] p 93 N85-12806 AH-64 HELICOPTER
- Software Quality Assurance Program for the AH-64 Advanced Attack Helicopter (AAH) p 80 A85-32010 AIR CARGO
  - Cargo claims From the carrier's point of view
- p 88 A85-27395 AIR DEFENSE
- A legal analysis of the shooting of Korean Airlines Flight 007 by the Soviet Union p 86 A85-11937 How much does it cost/how much does it weigh? [SAWE PAPER 1593] p 67 A85-49913
- AIR LAUNCHING
- Cost effective launch technology for communications sateilites [IAF PAPER 84-04] p 58 A85-12979

#### AIR LAW

AIR LAW Destruction of Korean Air Lines Boeing 747 over Sea of Japan, 31 August 1983 p 86 A85-10049 US jurisdiction and bilateral air agreements p 86 A85-10050 A legal analysis of the shooting of Korean Airlines Flight 007 by the Soviet Union p 86 A85-11937 FAA regulation of ultralight vehicles p 86 A85-11938 Annals of air and space law Volume 8 p 87 A85-23799 Recent developments in aviation case law p 88 A85-24709 Fire safety in transport category aircraft - Litigating a p 88 A85-24710 post-crash or in-flight aircraft fire Punitive damages in aviation products liability cases p 88 A85-27394 Cargo claims - From the carrier's point of view p 88 A85-27395 Registration and nationality of aircraft operated by international agencies in law and practice p 89 A85-27396 The liability of aircraft manufacturers and certification authorities in the United Kingdom p 89 A85-27397 Selected American decisions on the Warsaw Convention and related matters - February 1981 to June 1984 J p 89 A85-30167 Attempt to regulate restrictive commercial practices in the field of air transportation within a transnational antitrust legal and institutional framework p 90 A85-30999 Obtaining title and financing transport category aircraft National and international implications p 91 A85-44097 A new proposal for the reform of commerical air crash p 92 A85-44098 litigation AIR POLLUTION EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 - September 30. 1985 [PB85-181881] p 55 N85-31676 AIR TRAFFIC CONTROL Concepts and algorithms for terminal-area traffic management p 73 A85-47683 The imposition of flow control avoids ATC overloads p 74 A85-48851 Automation in air traffic management p 74 .A85-49171 System engineering and integration contract for implementation of the National Airspace System Plan Volume 2 Section 50 [AD-A145710] p 47 N85-10929 A bird strike handbook for base-level managers [AD-A147928] p 75 N85-16008 National airspace review enhancement plan, revision 3 (AD-A150743) p 94 N85-16852 Administration chief on air traffic control improvements p 76 N85-25193 National Airspace System Plan Facilities, equipment and associated development p 76 N85-26692 AIR TRAFFIC CONTROLLERS (PERSONNEL) New system for the selection of air traffic control personnel p 1 A85-18720 Psychological techniques for the selection and initial training of military air traffic controllers p 4 A85-44244 Administration chief on air traffic control improvements p 76 N85-25193 Construction of a job-oriented test for the selection of air traffic controllers (DFVLR-FB-84-51) p 9 N85-28558 AIR TRANSPORTATION US junsdiction and bilateral air agreements p 86 A85-10050 Technology and the market place - A changing air transport equation p 60 A85-25983 [SAE PAPER 841545] Attempt to regulate restrictive commercial practices in the field of air transportation within a transmational antitrust p 90 A85-30999 legal and institutional framework German domestic scheduled air transport in the year 2000 [ESA-TT-828] p 69 N85-13792 Issues in air transport [PB85-121374/GAR] p 71 N85-18030 AIRBORNE/SPACEBORNE COMPUTERS Using Ada for a distributed, fault tolerant system [AIAA PAPER 84-2703] p 79 A85-

[AIAA PAPER 84-2703] p 79 A85-17873 Software design methods --- for civil and multary aircraft avionics systems p 32 A85-21457 Software Quality Assurance Program for the AH-64 Advanced Attack Helicopter (AAH) p 80 A85-32010 Documentation and separate test program development is most important for test/maintenance

p 83 N85-16745

AIRCRAFT

Logistics support costs for the B-1B aircraft can be reduced (AD-A145846) p 74 N85-11996

[AD-A145846] p 74 N85-11996 AIRCRAFT ACCIDENT INVESTIGATION

Destruction of Korean Air Lines Boeing 747 over Sea of Japan, 31 August 1983 p 86 A85-10049 Punitive damages in aviation products liability cases p 88 A85-27394

The liability of aircraft manufacturers and certification authorities in the United Kingdom p 89 A85-27397 AIRCRAFT ACCIDENTS

- A new proposal for the reform of commencal air crash litigation p 92 A85-44098 AIRCRAFT APPROACH SPACING
- National airspace review enhancement plan, revision 3 [AD-A150743] p 94 N85-16852 AIRCRAFT DESIGN
- Boeing's airliner launch criteria p 61 A85-28824 Weight control - A procurement agency perspective [SAWE PAPER 1594] p 74 A85-49914 MBB cost-reduction plan for Airbus construction described p 71 N85-25616
- described p 71 N85 AIRCRAFT ENGINES USAF negotiating contracts for F100,
- Improvements p 45 A85-35448 AIRCRAFT EQUIPMENT Managing recoverable aircraft components in the PPB

F110

- (Planning, Programming and Budgeting) and related processes Technical volume [AD-A152014] p 76 N85-25169
- AIRCRAFT GUIDANCE Concepts and algorithms for terminal-area traffic management p 73 A85-47683
- A bird strike handbook for base-level managers
- [AD-A147928] p 75 N85-16008 AIRCRAFT INDUSTRY
- Punitive damages in aviation products liability cases p 88 A85-27394 The liability of aircraft manufacturers and certification authorities in the United Kingdom p 89 A85-27397 Innovation in British industry (notably the aircraft industry) and its value Collected papers [BAE-KRS-N-GEN-286] p 49 N85-17933 DOD Value Segment Conference report Value

DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 2 Plenary session (AD-A156068) p 57 N85-35811

- AIRCRAFT INSTRUMENTS Human factors in aviation I p 3 A85-39368 AIRCRAFT LANDING
- Automated performance measurement for Naval aviation - APARTS, a Landing Signal Officer training aid p 2 A85-21589

AIRCRAFT MAINTENANCE

- Aircraft maintenance --- Russian book p 19 A85-11245 Integration of MSG-3 into airline operation p 72 A85-25978 [SAE PAPER 841483] MSG-3 - A method for maintenance program planning [SAE PAPER 841485] D 73 A85-25979 Support program planning - Managing to get it supported ATE for avionics p 11 A85-26785 Simulators for training aircraft maintenance personnel p 3 A85-29863 Cost effectiveness of simulated aircraft maintenance training systems p 66 A85-45118 lies --- Dynamic Dyna-METRIC - New capabilities Multi-Echelon Technique for Recoverable Item Control p 73 A85-45148
- Maintainability aspects in maintenance management p 74 A85-49536
- Maintenance Management Information and Control System (MMICS) Administrative boon or burden [AD-A145762] p 75 N85-12790 Transportation
- [JPRS-UTR-85-004] p 50 N85-21105 Aviation repair plant directors on quality control measures p 84 N85-21106 Aviation maintenance computerized management
- Information systems Perspective for the future [AD-A150637] p 75 N85-22349 AIRCRAFT PILOTS
- Management training for cockpit crews at Piedmont flight p 6 N85-18013 AIRCRAFT PRODUCTION COSTS
- Commission stacker Incorporation in a total logistic concept --- for Airbus production [MBB-UT-36-84-OE] p 73 A85-35073
- AIRCRAFT RELIABILITY

A management guide to reliability predictions p 82 A85-49541

1986

SUBJECT INDEX

AIRCRAFT SAFETY

Fire safety in transport category a	aircraft	<ul> <li>Litigating a</li> </ul>
post-crash or in-flight aircraft fire	p 88	A85-24710
A DITO SUIKE HANDDOOK TOT DASE-IEN	vei man n 75	agers
AIRCRAFT STRUCTURES	p 75	1103-10006
Commission stacker - Incorporation	on in a	total logistic
concept for Airbus production	- 72	ARE 25072
AIRLINE OPERATIONS	p / 3	A60-300/3
US jurisdiction and bilateral air agri	eements	3
	p 86	A85-10050
Integration of MSG-3 into airline op	peration	
[SAE PAPER 841483]	p 72	A85-25978
Cargo claims - From the carrier's p	n 89	New
Registration and nationality of	aircraft	operated by
international agencies in law and pra-	ctice	405 07000
	p 89	A85-27396
Activities report of the serospace	p 92 Dundue	A85-44099
Germany	e muus	uy in west
[ISSN-0722-3838]	p 49	N85-16686
Activities report of the aerospa	ce indu	stry in West
Germany		-
[ISSN-0722-3838]	p 49	N85-16687
AIRSPACE		
of Japan 21 August 1992	oeing /	47 OVER Sea
A legal analysis of the shooting of K	μου Διοιομά	Indunes Flight
007 by the Soviet Union	n 86	A85-11937
System engineering and integr	ation c	contract for
implementation of the National Airs	pace Sy	stem Plan
Volume 2 Section 5.0		
[AD-A145710]	p 47	N85-10929
National airspace review enhancen	nent pla	n, revision 3
[AD-A150743]	p 94	N85-16852
ALGOHITHMS		
training cystom	101 01	An adaptive
Determining training device regi	uremer	Aco-23279
aviation systems	n 5 a	N85-14558
ALLOCATIONS		
An analysis of a dynamic project co	ost prob	lem
[CSIR-TWISK-338]	p 71	N85-23341
Criteria for qualifying for FRG	federal	CAD/CAM
subsidies	p 51	N85-25651
Development-Independent Agencies		Urban Act
1986	n 97	N85-32041
National Aeronautics and Space Adn	ninistrati	on research
and development	p 97	N85-32042
Progress report on implementing the	e recom	mendations
of the White House Science Council's	Federa	Laboratory
Review Panel, volume 1		
	p 78	N85-35819
ANALISIS OF VARIANCE	for	005060000
procurements	104	aerospace
[AD-A153626]	D 18	N85-29835
ANALYTICAL CHEMISTRY	P	
Principles of quality assuran	ce of	chemical
measurements		
[PB85-177947]	p 76	N85-28997
APPROACH CONTROL		
Concepts and algorithms for te	erminal-	area tramic
Construction of a inh-oriented test	for the	A05-47003
air traffic controllers		
[DFVLR-FB-84-51]	p 9	N85-28558
APPROPRIATIONS	•	
Department of Housing and Urban	Develo	pment, and
certain independent agencies appropria	ations fo	r fiscal year
1985, part 2	~~	
[S-REPT-98-889-PT-2]	p 93	N85-10870
An agenda for a study of governm	nent sci	ence policy
[GPU-40-860]	p 95	N85-22245
National lelecommunications	and	Information
[GPO-38-660]	n 96	N85.27766
National Aeronautics and En-	~ ~ ^~	ministration
Authorization Act 1986	Ce Au	nunusuauon
[S-REPT-99-91]	p 96	N85-28885
National Aeronautics and Spa	ce Ad	ministration
Authonzation Act, 1986		
[S-REPT-99-91]	p 96	N85-30978
Department of Housing	and	Urban
Development-Independent Agencies	Approp	nation Bill,
1986		NOT 000
[II-HEP1-99-212]	p 96	N85-30979
National Aeronautics and Space Ad	ministra	NINE 20000
Department of the sec	p 34	03609-2080
Development-Independent Agencies	Appron	riation Act

0.97

N85-32041

#### SUBJECT INDEX

National Aeronautics and Space Administration research
Testimopy of Robert A. Ereach before the Subcommittee
on HUD and Independent Agencies of the Senate
Committee on Appropriations
[NASA-TM-87496] p 97 N85-33173
Department of Housing and Urban Development
Independent Agencies Appropriation Bill, 1986 [S-REPT-99-129] p 97 N85-34720
National Aeronautics and Space Administration research
and development Program description
p 56 N85-34721
APPROXIMATION
Information and computation emphasizing problem solving with uncertainty and approximation
p 33 A85-31791
ARC WELDING
Welder training/welder testing
[BLL-WI-TRANS-683-(9312 57)] p 8 N85-27223
ARCHITECTURE (COMPUTERS)
information system
[AD-A150611] p 39 N85-23449
ARIANE LAUNCH VEHICLE
The outlook for space commercialization
p 61 A85-34192
Progress of Europe's Ariane launcher challenges U S
Documentation for the West German Federal Cabinet's
space policy decision p 96 N85-28886
FRG weighs ESA participation, budget issues
APMED EORCES (EOREICN)
Basic principles of the development and execution of
a system for the psychological selection of military
personnel p 3 A85-28024
ARMED FORCES (UNITED STATES)
program n.2 A85-21602
The Global Positioning System (GPS) DOD policy
issues p 91 A85-37805
Air Force technical objective document FY 86
[AD-A152/30] p 52 N85-28855 Example the production of Comparison Assist
Package (CDAP) to spare parts
[AD-A154716] p 77 N85-33036
ARTIFICIAL INTELLIGENCE
Cooperative control - The interface challenge for men
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-45087
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-45087 The modeling of human cognitive decision processes
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-45087 The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM)
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-45087 The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) p 25 A85-47677 Representation of activity knowledge for project
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-45087 The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) p 25 A85-47677 Representation of activity knowledge for project management p 46 A85-48595
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-45087 The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) p 25 A85-47677 Representation of activity knowledge for project management p 46 A85-48595 Artificial intelligence - A new dimension in EW
$\begin{array}{c} \mbox{Cooperative control} & The interface challenge for men and automated machines $p$ 23 A85-16093 $Model-based reasoning in expert systems - An application to enroute air traffic control $[AlAA PAPER 84-2619] $p$ 23 A85-17817 $Toward the fully capable AI space mission planner $p$ 25 A85-42892 $TIMM - The intelligent machine model $p$ 25 A85-42892 $TIMM - The intelligent machine model $p$ 25 A85-45087 $The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-47677 $Representation of activity knowledge for project management $p$ 46 A85-48595 $Artificial intelligence - A new dimension in EW $p$ 25 A85-49098 $P$
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-42892 The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM) p 25 A85-47677 Representation of activity knowledge for project management p 46 A85-48595 Artificial intelligence - A new dimension in EW p 25 A85-11594
Cooperative control - The interface challenge for men and automated machines $p 23 \ A85-16093$ Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] $p 23 \ A85-17817$ Toward the fully capable AI space mission planner $p 25 \ A85-42892$ TIMM - The intelligent machine model $p 25 \ A85-42892$ The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p 25 \ A85-47677$ Representation of activity knowledge for project management $p 46 \ A85-48595$ Artificial intelligence - A new dimension in EW $p 25 \ A85-49098$ Artificial intelligence applications to maintenance [AD-P003914] $p 26 \ M85-11594$ On applying AI (Artificial Intelligence) to maintenance
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] $p$ 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-42892 The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) p 25 A85-47677 Representation of activity knowledge for project management $p$ 46 A85-48595 Artificial intelligence - A new dimension in EW p 25 A85-49098 Artificial intelligence applications to maintenance [AD-P003914] $p$ 26 N85-11594 On applying AI (Artificial Intelligence) to maintenance and troubleshooting
$\begin{array}{c} \mbox{Cooperative control} & The interface challenge for men and automated machines $$p$ 23 A85-16093 $$Model-based reasoning in expert systems - An application to enroute air traffic control $$[AlAA PAPER 84-2619]$$p$ 23 A85-17817 $$Toward the fully capable AI space mission planner $$p$ 25 A85-42892 $$TIMM - The intelligent machine model $$p$ 25 A85-42892 $$TiMM - The intelligent machine model $$p$ 25 A85-42892 $$Timm - The intelligent machine model $$p$ 25 A85-45087 $$The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM) $$p$ 25 A85-47677 $$Representation of activity knowledge for project management $$p$ 46 A85-48595 $$Artificial intelligence - A new dimension in EW $$p$ 25 A85-49098 $$Artificial intelligence applications to maintenance $$[AD-P003914]$$$p$ 26 N85-11594 $$On applying AI (Artificial Intelligence) to maintenance and troubleshooting $$[AD-P003915]$$$$p$ 26 N85-11595 $$$$
Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-45087 The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM) p 25 A85-47677 Representation of activity knowledge for project management p 46 A85-48595 Artificial intelligence - A new dimension in EW p 25 A85-45098 Artificial intelligence applications to maintenance [AD-P003914] p 26 N85-11594 On applying AI (Artificial Intelligence) to maintenance and troubleshooting [AD-P003915] p 26 N85-11597
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892 $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-45087 $p$ 25 A85-45087The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for project management $p$ 46 A85-48998Artificial intelligence - A new dimension in EW $p$ 25 A85-49098Artificial intelligence applications to maintenance and troubleshooting (AD-P003915) $p$ 26 N85-11597Overview of training and aiding [AD-P003917] $p$ 5 N85-11597GUIDON $p$ 5 N85-11597
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner p 25 A85-42892 $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for project management $p$ 46 A85-48595Artificial intelligence - A new dimension in EW $p$ 25 A85-11594 $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance and troubleshooting [AD-P003915] $p$ 26 N85-11595 Overview of training and aiding [AD-P003925] $p$ 26 N85-11605
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892 $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for project management $p$ 46 A85-48999Artificial intelligence - A new dimension in EW $p$ 25 A85-49098Artificial intelligence applications to maintenance[AD-P003914] $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance and troubleshooting[AD-P003917] $p$ 26 N85-11595Overview of training and aiding[AD-P003925] $p$ 26 N85-11605Designing an expert system for training automotive
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892 $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for project management $p$ 26 A85-43098Artificial intelligence - A new dimension in EW $p$ 26 A85-43098Artificial intelligence applications to maintenance and troubleshooting $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance and troubleshooting $p$ 26 N85-11695Overview of training and aiding [AD-P003917] $p$ 26 N85-11695Designing an expert system for training automotive electrical troubleshooting (AD-P003925) $p$ 26 N85-11605Designing an expert system for training automotive electrical troubleshooting $p$ 26 N85-11605
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093         Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619] $p$ 23 A85-17817         Toward the fully capable AI space mission planner p 25 A85-42892 $p$ 25 A85-42892         TIMM - The intelligent machine model $p$ 25 A85-4607         The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-47677         Representation of activity knowledge for project management $p$ 26 A85-48993         Artificial intelligence - A new dimension in EW $p$ 26 A85-49098         Artificial intelligence applications to maintenance       [AD-P003914] $p$ 26 N85-11594         On applying AI (Artificial Intelligence) to maintenance and troubleshooting       [AD-P003917] $p$ 26 N85-11595         Overview of training and aiding       [AD-P003925] $p$ 26 N85-11605       Designing an expert system for training automotive electrical troubleshooting         [AD-P03925] $p$ 26 N85-11605       Designing an expert system for training automotive electrical troubleshooting
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892 $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for project managementmanagement $p$ 46 A85-48595Artificial intelligence - A new dimension in EW $p$ 25 A85-49098Artificial intelligence applications to maintenance and troubleshooting[AD-P003915] $p$ 26 N85-11595Overview of training and aiding (AD-P003917][AD-P003925] $p$ 26 N85-11605 Designing an expert system for training automotive electrical incubleshooting [AD-P003926][AD-P003926] $p$ 26 N85-11606 The psychology of technical devices and technical discourse
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892 $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-45087 $p$ 25 A85-47677The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for project management $p$ 46 A85-48595Artificial intelligence - A new dimension in EW $p$ 25 A85-47677On applying AI (Artificial Intelligence) to maintenance and troubleshooting[AD-P003914] $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance and troubleshooting[AD-P003915] $p$ 26 N85-11595Overview of training and aiding [AD-P003925][AD-P003926] $p$ 26 N85-11605 Designing an expert system for training automotive electrical troubleshooting [AD-P003926][AD-P003928] $p$ 27 N85-11606 The psychology of technical devices and technical discourse [AD-P003929] $p$ 27 N85-11609
Cooperative control - The interface challenge for menand automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - Anapplication to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processesin The intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for projectmanagement $p$ 26 A85-48998Artificial intelligence - A new dimension in EW $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance[AD-P003915] $p$ 26 N85-11595Overview of training and aiding[AD-P003917] $p$ 26 N85-11605Designing an expert system for training automotiveelectrical troubleshooting[AD-P003925] $p$ 26 N85-11605Designing an expert system for training automotiveelectrical troubleshooting[AD-P003926] $p$ 26 N85-11605Designing an expert system for training automotiveelectrical troubleshooting[AD-P003926] $p$ 26 N85-11606The psychology of technical devices and technicaldiscourse[AD-P003929] $p$ 27 N85-11609Artificial intelligence contributions to training automotive
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892TiMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-43087The modeling of human cognitive decision processes in The Intelligence - A new dimension in EW $p$ 25 A85-49098Artificial intelligence - A new dimension in EW $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance (AD-P003915) $p$ 26 N85-11595Overview of training and aiding [AD-P003925] $p$ 26 N85-11605 Designing an expert system for training automotive electncal troubleshooting [AD-P003926] $p$ 26 N85-11606 The psychology of technical devices and technical discourse [AD-P003929] $p$ 27 N85-11609 Artificial intelligence contributions to training and maintenance [AD-P003924] $(AD-P003924)$ $p$ 27 N85-11609 Artificial intelligence contributions to training and maintenance [AD-P003924]
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892TiMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-43087Representation of activity knowledge for project management $p$ 46 A85-48595Artificial intelligence - A new dimension in EW $p$ 25 A85-43098Artificial intelligence applications to maintenance[AD-P003914] $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance and troubleshooting[AD-P003915] $p$ 26 N85-11695Overview of training and aiding[AD-P003925] $p$ 26 N85-11605Designing an expert system for training automotive electrical troubleshooting[AD-P003926] $p$ 26 N85-11606The psychology of technical devices and technical discourse[AD-P003923] $p$ 27 N85-11609Artificial intelligence contributions to training and maintenance[AD-P003934] $p$ 27 N85-11614Psychological issues in the design of expert systems
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892 $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42697The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for project management $p$ 46 A85-48595Artificial intelligence - A new dimension in EW $p$ 25 A85-49098Artificial intelligence applications to maintenance[AD-P003914] $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance and trubleshooting[AD-P003915] $p$ 26 N85-11595Overview of training and aiding[AD-P003925] $p$ 26 N85-11605Designing an expert system for training automotive electrical troubleshooting[AD-P003926] $p$ 26 N85-11606The psychology of technical devices and technical discourse[AD-P003929] $p$ 27 N85-11609Artificial intelligence contributions to training and maintenance[AD-P003929] $p$ 27 N85-11604The psychology of technical devices and technical discourse[AD-P003929] $p$ 27 N85-11614Psychological issues in the design of expert systems [AD-A146081]P 27 N85-12792
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892 $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-46087 $p$ 25 A85-47677The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for project management $p$ 46 A85-48595Artificial intelligence - A new dimension in EW $p$ 26 A85-11594On applying AI (Artificial Intelligence) to maintenance and troubleshooting[AD-P003915] $p$ 26 N85-11595Overview of training and aiding [AD-P003917][AD-P003925] $p$ 26 N85-11605Designing an expert system for training automotive electrical incelligence contributions to training and discourse[AD-P003926] $p$ 26 N85-11606The psychology of technical devices and technical discourse[AD-P03928] $p$ 27 N85-11606The psychology of technical devices and technical discourse[AD-P03928] $p$ 27 N85-11614PSychological issues in the design of expert systems for A146081]P 27 N85-12792 Knowledge-based communication and management
Cooperative control - The interface challenge for men and automated machines       p 23 A85-16093         Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23 A85-17817         Toward the fully capable AI space mission planner       p 25 A85-42892       TIMM - The intelligent machine model         p 25 A85-42892       TIMM - The intelligent machine model       p 25 A85-42892         The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM)       p 25 A85-47677         Representation of activity knowledge for project management       p 46 A85-48595         Artificial intelligence applications to maintenance       [AD-P003914]         On applying AI (Artificial Intelligence) to maintenance       and troubleshooting         [AD-P003915]       p 26 N85-11595         Overview of training and aiding       [AD-P003915]         [AD-P003925]       p 26 N85-11605         Designing an expert system for training automotive electrical troubleshooting       [AD-P003926]         [AD-P003926]       p 26 N85-11606         The psychology of technical devices and technical discourse       [AD-P003929]         [AD-P003929]       p 27 N85-11609         Artificial intelligence contributions to training and maintenance       [AD-P003924]         [AD-P003929]       p 27 N85-11609         Ar
Cooperative control - The interface challenge for menand automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - Anapplication to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892TiMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processesin The intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for projectmanagement $p$ 25 A85-49098Artificial intelligence - A new dimension in EW $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance[AD-P003915] $p$ 26 N85-11595Overview of training and aiding[AD-P003917] $p$ 26 N85-11605Designing an expert system for training automotiveelectrical intelligence contributions to training and $discourse$ $[AD-P003926]$ $p$ 27 N85-11606The psychology of technical devices and technicaldiscourse $[AD-P003923]$ $p$ 27 N85-11614Psychological issues in the design of expert systems $[AD-P003934]$ $p$ 27 N85-11614Psychological issues in the design of expert systems $[AD-P003924]$ $p$ 27 N85-11614Psychological issues in the design of expert systems $[AD-P003924]$ $p$ 27 N85-1161
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892TiMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-47677Representation of activity knowledge for project management $p$ 46 A85-48993Artificial intelligence - A new dimension in EW $p$ 25 A85-49098Artificial intelligence applications to maintenance[AD-P003914] $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance and troubleshooting[AD-P003915] $p$ 26 N85-11597GUIDONGUIDON[AD-P003926] $p$ 26 N85-11605Designing an expert system for training automotive electrical troubleshooting[AD-P003926] $p$ 27 N85-11606The psychology of technical devices and technical discourse $p$ 27 N85-11609Artificial intelligence contributions to training and maintenance[AD-P003924] $p$ 27 N85-11614Psychological issues in the design of expert systems[AD-Ai46081] $p$ 27 N85-11614Psychological issues in the design of expert systems[AD-Ai46081] $p$ 27 N85-11614Psychological issues in the design of expert systems[AD-Ai46081] $p$ 27 N85-11614Psychological issues in the de
Cooperative control - The interface challenge for men and automated machines $p$ 23 A85-16093Model-based reasoning in expert systems - An application to enroute air traffic control[AIAA PAPER 84-2619] $p$ 23 A85-17817Toward the fully capable AI space mission planner $p$ 25 A85-42892 $p$ 25 A85-42892TIMM - The intelligent machine model $p$ 25 A85-42892The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-43087The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) $p$ 25 A85-43098Artificial intelligence - A new dimension in EW $p$ 25 A85-43098 $p$ 26 A85-43098Artificial intelligence applications to maintenance $[AD-P003914]$ $p$ 26 N85-11594On applying AI (Artificial Intelligence) to maintenance and troubleshooting $p$ 26 N85-11695Overview of training and aiding $[AD-P003915]$ $p$ 26 N85-11605Designing an expert system for training automotive electrical troubleshooting $p$ 27 N85-11606The psychology of technical devices and technical discourse $p$ 27 N85-11609Artificial intelligence contributions to training and maintenance $p$ 27 N85-11614Psychological issues in the design of expert systems $p$ 27 N85-11614Psychological issues in the design of expert systems $p$ 27 N85-11614Psychological issues in the design of expert systems $p$ 27 N85-11614Psychological issues in the design of expert systems $p$ 27 N85-11614Psychological issues in the design of expert systems $p$ 27 N85-11614Psychological
Cooperative control - The interface challenge for men and automated machines $p 23$ A85-16093 Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] $p 23$ A85-17817 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-42892 TiMM - The intelligent machine model p 25 A85-42897 The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) p 25 A85-47677 Representation of activity knowledge for project management $p 46$ A85-48998 Artificial intelligence - A new dimension in EW p 25 A85-49098 Artificial intelligence applications to maintenance [AD-P003914] $p 26$ N85-11594 On applying AI (Artificial Intelligence) to maintenance and troubleshooting [AD-P003915] $p 26$ N85-11595 Overview of training and aiding [AD-P003916] $p 26$ N85-11605 Designing an expert system for training automotive electrical troubleshooting [AD-P003926] $p 26$ N85-11606 The psychology of technical devices and technical discourse [AD-P003929] $p 27$ N85-11609 Artificial intelligence contributions to training and maintenance [AD-P003934] $p 27$ N85-11609 Artificial insumes in the design of expert systems [AD-P003934] $p 27$ N85-11614 Psychological issues in the design of expert systems [AD-A146081] $p 27$ N85-11614 Psychological issues in the design of expert systems [AD-A146081] $p 27$ N85-11614 Psychological issues in the design of expert systems [AD-A142547] $p 14$ N85-16474 East Europe report Science and technical [AD-A142547] $p 14$ N85-16474 East Europe report Science and technology

p 28 N85-19213 French plans for fifth generation computer systems [AD-A149435] p 50 N85-19732

Aviation maintenance computerized management information systems Perspective for the future p 75 N85-22349 [AD-A1506371 The application of artificial intelligence techniques to Inge distributed networks [NASA-CR-177346] p 30 N85-30721 Space station automation and robotics study Operator-systems interface [NASA-CR-176095] p 31 N85-33172 ASSEMBLING Robot use in FRG increases but sensor technology p 29 N85-25605 laos ASSURANCE Measurement assurance programs Part 1 General introduction [PB84-217868] p 83 N85-10339 The ESA product assurance specification system p 83 N85-13259 Explanatory note of quality assurance of chemical Principles measurements [PB85-177947] p 76 N85-28997 ASTRIONICS Economic considerations in selecting spacecraft quality p 81 A85-38267 electronic parts ASTRO MISSIONS (STS) The 1986 National Aeronautics and Space Administration authorization p 57 N85-35829 [GPO-47-635] ASTRONAUT PERFORMANCE The role of robotics in space system operations [AIAA PAPER 85-1879] p 25 A85-45902 ASTRONOMY Space research in the United Kingdom An assessment p 56 N85-33038 (AD-A155334) ASTROPHYSICS Space research in the United Kingdom An assessment [AD-A155334] p 56 N85-33038 ATTACKING (ASSAULTING) A legal analysis of the shooting of Korean Airlines Flight p 86 A85-11937 007 by the Soviet Union AUDITORY TASKS Communications skills for CRM training p 6 N85-18017 AUTOMATA THEORY Multinational program to develop intelligent robots p 30 N85-29094 p 30 N85-29561 Man-machine tradeoff study AUTOMATED EN ROUTE ATC Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 Automation in air traffic management p 74 A85-49171 AUTOMATIC CONTROL Automation in air traffic management n 74 A85-49171 Interaction of human cognitive models and computer based models in supervisory control [AD-A142547] n 14 N85-16474 Flexible manufacturing system concept features cache p 28 N85-17186 memory French panel makes specific proposals for robotics research Current state of French robotics p 29 N85-20180 p 29 N85-24191 Plans, developments in robotics Future directions of robotics, automation in Italy p 30 N85-28187 Applications of robots in machine tool industry p 22 N85-28189 reviewed Importance of automation robotization in economy p 31 N85-32219 Space station automation and robotics study Operator-systems interface [NASA-CR-176095] p 31 N85-33172 Testimony of Robert A Frosch before the Subcommittee on HUD and Independent Agencies of the Senate Committee on Appropriations [NASA-TM-87496] p 97 N85-33173 AUTOMATIC FLIGHT CONTROL Concepts and algorithms for terminal-area traffic management p 73 A85-47683 AUTOMATIC LANDING CONTROL Concepts and algorithms for terminal-area traffic p 73 A85-47683 management AUTOMATIC TEST EQUIPMENT Automated performance measurement for Naval aviation - APARTS, a Landing Signal Officer training aid p 2 A85-21589

Support program planning - Managing to get it supported --- ATE for avionics p 11 A85-26785 Management techniques in meeting requirements for integrating technical publications and training into ATE stations p 11 A85-26786

#### **BAYES THEOREM**

Application of the personal computer for cost effective
Data base management for ATE reliability
enhancement p 32 A85-26807 TALLY - An ATLAS program statistical data gathering
tool p 32 A85-26830
[AD-P003914] p 26 N85-11594
On applying AI (Artificial Intelligence) to maintenance and troubleshooting
[AD-P003915] p 26 N85-11595
Cooperative control - The interface challenge for men
A system-level approach to automation research
p 24 A85-23197 Machine vision The eyes of automation - A manager's
practical guide Book p 20 A85-35799 The role of robotics in space system operations
[AIAA PAPER 85-1879] p 25 A85-45902
An analysis of ergonomic systems Russian book
P 5 A85-40146
Problems of psychological support of automated
organization control systems p 28 N85-18571
P 29 N85-20166
Efforts at office automation and information systems
Incorporated
[DE85-008154] p 40 N85-28633
DLA Data/data base administration analysis
NASA space station automation Al-based technology
review [NASA-CB-176094] p.31_N85-32134
AUTOMOBILES
Robot production lines in operation p 29 N85-20166
VAILABILITY
VAILABILITY Units of equipment available using cannibalization for repair-part support p 73 A85-37903
VAILABILITY Units of equipment available using cannibalization for repair-part support p 73 A85-37903 Maintainability aspects in maintenance management p 74 A85-49536
VALABILITY Units of equipment available using cannibalization for repair-part support p 73 A85-37903 Maintainability aspects in maintenance management p 74 A85-49536 VIATION PSYCHOLOGY
VALABILITY Units of equipment available using cannibalization for repair-part support p 73 A85-37903 Maintainability aspects in maintenance management p 74 A85-49536 AVIATION PSYCHOLOGY Psychological techniques for the selection and initial training of buildage art table conclusions p. 4 A85-42244
VALABILITY Units of equipment available using cannibalization for repair-part support p 73 A85-37903 Maintainability aspects in maintenance management p 74 A85-49536 AVIATION PSYCHOLOGY Psychological techniques for the selection and initial training of military air traffic controllers p 4 A85-44244 VIONICS
VALABILITY Units of equipment available using cannibalization for repair-part support p 73 A85-37903 Maintainability aspects in maintenance management p 74 A85-49536 VIATION PSYCHOLOGY Psychological techniques for the selection and initial training of military air traffic controllers p 4 A85-44244 VIONICS Development tools - Case study for large systems of digital avionics
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       p 74       A85-49536         VIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VIONICS       Development tools - Case study for large systemsof digital avionics       p 31       A85-17826
VVALABILITY         Units of equipment available using cannibalization for repar-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         AVIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-49536         AVIATION PSYCHOLOGY       Development tools - Case study for large systemsof digital avionics       [AIAA PAFER 84-2635]       p 31       A85-17826         Software design methods for civil and military aircraft       Development tools for civil and military aircraft       Control civil and military aircraft
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         AVIATION PSYCHOLOGY       p 74       A85-49536         Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VVIONICS       Development tools - Case study for large systems of digital avionics       [AIAA PAPER 84-2635]       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21457
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       p 74       A85-49536         Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VIONICS       Development tools - Case study for large systems of digital avionics       [AIAA PAPER 84-2635]       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21457       Displays, deja vu avionics-human factors R&D         p 1       A85-21560
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73 A85-37903         Maintainability aspects in maintenance management p 74 A85-49536         VIATION PSYCHOLOGY         Psychological techniques for the selection and initial training of military air traffic controllers         VIONICS         Development tools - Case study for large systems of digital avionics         [AIAA PAPER 84-2635]       p 31 A85-17826         Software design methods for civil and military aircraft avionics systems       p 32 A85-21457         Displays, deja vu avionics-human factors R&D p 1 A85-21560       p 1 A85-21560
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73 A85-37903         Maintainability aspects in maintenance management p 74 A85-49536         VIATION PSYCHOLOGY         Psychological techniques for the selection and initial training of military air traffic controllers         VIONICS         Development tools - Case study for large systems of digital avionics         [AIAA PAPER 84-2635]       p 31 A85-17826         Software design methods for civil and military aircraft avionics systems       p 32 A85-21457         Displays, deja vu avionics-human factors R&D p 1 A85-25760       p 11 A85-26785         Support program planning - Managing to get it supported ATE for avionics       p 11 A85-26785
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         vIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-49536         VIONICS       Development tools - Case study for large systemsof digital avionics       [AIA PAPER 84-2635]       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21557       Displays, deja vu avionics-human factors R&D       p 1       A85-21560         Support program planning - Managing to get it supported
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       p 74       A85-49536         AVIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VIONICS       Development tools - Case study for large systems of digital avionics       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21560         Displays, deja vu avionics-human factors R&D       p 1       A85-21560
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73 A85-37903         Maintainability aspects in maintenance management       p 74 A85-49536         VIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4 A85-44244         VIONICS       Development tools - Case study for large systemsof digital avionics       [AIAA PAPER 84-2635]       p 31 A85-17826         Software design methods for civil and military aircraft avionics systems       p 1 A85-21560       Support program planning - Managing to get it supported
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73 A85-37903         Maintainability aspects in maintenance management       p 74 A85-49536         VIATION PSYCHOLOGY       p 74 A85-49536         Psychological techniques for the selection and initial training of military air traffic controllers       p 4 A85-44244         VIONICS       Development tools - Case study for large systemsof digital avionics         [AIAA PAPER 84-2635]       p 31 A85-17826         Software design methods for civil and military aircraft avionics systems       p 32 A85-21457         Displays, deja vu avionics-human factors R&D       p 1 A85-21560         Support program planning - Managing to get it supported       A1E for avionics
VALABILITY         Units of equipment available using cannibalization for repar-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       p 74       A85-49536         AVIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VIONICS       Development tools - Case study for large systems of digital avionics       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21560         Support program planning - Managing to get it supported
VALABILITY         Units of equipment available using cannibalization for repair-part support       p 73       A85-37903         Maintainability aspects in maintenance management p 74       A85-49536         VIATION PSYCHOLOGY       p 74       A85-49536         AVIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers p 4       A85-44244         VIONICS       Development tools - Case study for large systems of digital avionics       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21560         Displays, deja vu avionics-human factors R&D       p 1       A85-21565         A comparison of various Life Cycle Cost models in avionics systems acquisition       p 66       A85-45150         A management guide to reliability predictions p 82       A85-49541       R&M analysis techniques for fault-tolerant systems p 74       A85-49588         Avionics integrity program (Avip)       Volume 1       Procurement phase issues       Design, manufacturing, and integration
VVALABILITY         Units of equipment available using cannibalization for repar-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       p 74       A85-49536         AVIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VIONICS       Development tools - Case study for large systems of digital avionics       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 12       A85-21560         Support program planning - Managing to get it supported ATE for avionics       p 11       A85-21560         Support program planning - Managing to get it supported ATE for avionics       p 11       A85-26785         A comparison of vanous Life Cycle Cost models in avionics systems acquisition       p 66       A85-45150         A management guide to reliability predictions       p 74       A85-49541         R&M analysis techniques for fault-tolerant systems       p 74       A85-49588         Avionics integrity program (Avip)       Volume 1       Procurement phase issues       Design, manufacturing, and integration         (AD-A145651]       p 83       N85-10943
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       p 74       A85-49536         AVIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VIONICS       Development tools - Case study for large systems of digital avionics       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21560         Support program planning - Managing to get it supported ATE for avionics       p 11       A85-26785         A comparison of various Life Cycle Cost models in avionics systems acquisition       p 66       A85-49541         R&M analysis techniques for fault-tolerant systems p 74       A85-49588       Avionics integrity program (Avip)       Volume 1         Procurement phase issues       Design, manufacturing, and integration       p 83       N85-10943         Documentation and separate test program development is most important for test/maintenance       p 84       N85-10943
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73 A85-37903         Maintainability aspects in maintenance management       p 74 A85-49536         VIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers p 4 A85-44244         VVIONICS       Development tools - Case study for large systemsof digital avionics         [AIAA PAFER 84-2635]       p 31 A85-17826         Software design methods for civil and military aircraft avionics systems       p 32 A85-21457         Displays, deja vu avionics-human factors R&D       p 1 A85-21560         Support program planning - Managing to get it supported       ATE for avionics
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73 A85-37903         Maintainability aspects in maintenance management       p 74 A85-49536         VIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4 A85-49536         AVIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4 A85-4424         VVIONICS       Development tools - Case study for large systemsof digital avionics       [AIAA PAPER 84-2635]       p 31 A85-17826         Software design methods for civil and military aircraft avionics systems       p 32 A85-21457       Displays, deja vu avionics-human factors R&D         p 1 A85-21560       Support program planning - Managing to get it supported
VVALABILITYUnits of equipment available using cannibalization for repair-part supportp 73 A85-37903 Maintainability aspects in maintenance management p 74 A85-49536VIATION PSYCHOLOGYp 74 A85-49536Psychological techniques for the selection and initial training of military air traffic controllersp 4 A85-49536VIONICSDevelopment tools - Case study for large systems of digital avionicsp 31 A85-17826[AIAA PAFER 84-2635]p 31 A85-17826Software design methods for civil and military aircraft avionics systemsp 1 A85-21457Displays, deja vu avionics-human factors R&D p 1 A85-21560p 1 A85-26785 A 263-21560Support program planning - Managing to get it supported ATE for avionicsp 16 A85-45150 A 82-49541R&M analysis techniques for fault-tolerant systems p 74 A85-49588 Avionics integrity program (Avip) Volume 1 Procurement phase issues Design, manufacturing, and integration [AD-A145651]p 83 N85-16745 p 83 N85-16745 Design adequacy An effectiveness factor p 40 N85-26642 Design-To-Cost (DTC) methodology to achieve affordable avionics p 71 N85-26645
VVALABILITY         Units of equipment available using cannibalization for repar-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       P 74       A85-49536         AVIATION PSYCHOLOGY       P 8ychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VIONICS       Development tools - Case study for large systems of digital avionics       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21560         Support program planning - Managing to get it supported ATE for avionics       p 11       A85-21560         Support program planning - Managing to get it supported
VVALABILITY         Units of equipment available using cannibalization for repair-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       p 74       A85-49536         AVIATION PSYCHOLOGY       p 74       A85-49536         AVIATION PSYCHOLOGY       p 74       A85-49536         AVIATION PSYCHOLOGY       p 74       A85-44244         VIONICS       Development tools - Case study for large systemsof digital avonics       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21560         Support program planning - Managing to get it supported
VVALABILITY         Units of equipment available using cannibalization for repar-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-49536         AVIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VIONICS       Development tools - Case study for large systemsof digital avionics       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21560         Support program planning - Managing to get it supported
VVALABILITY         Units of equipment available using cannibalization for repar-part support       p 73       A85-37903         Maintainability aspects in maintenance management       p 74       A85-49536         VIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-49536         VIATION PSYCHOLOGY       Psychological techniques for the selection and initial training of military air traffic controllers       p 4       A85-44244         VIONICS       Development tools - Case study for large systemsof digital avionics       p 31       A85-17826         Software design methods for civil and military aircraft avionics systems       p 32       A85-21560         Support program planning - Managing to get it supported

#### В

- B-1 AIRCRAFT
  - Logistics support costs for the B-1B aircraft can be reduced [AD-A145846] p 74 N85-11996
- BATCH PROCESSING Work flow in manufacturing systems
- p 20 A85-19181 BAYES THEOREM
  - Rectifying inspection for nonconforming items and theHald linear cost modelp 61A reliability growth modelp 83A85-49580

#### BEHAVIOR

#### BEHAVIOR

Decision process models of contractor behavior The development of effective contract incentives [AD-A145524] p 47 N85-11898 BELL AIRCRAFT

New model introduction - The operators' perspective --- in helicopter industry p 61 A85-31981 BIBLIOGRAPHIES

An engineer's guide to books on statistics and data analysis p 10 A85-12647 Publications of the Executive Office of the President

- January 20, 1981 June 30, 1984 [PB84-230671] p 93 N85-15533
- Human factors department 1981 publications [BAE-BT-12685] p 8 N85-26147 Management A bibliography for NASA managers
- [NASA-SP-7500(19)] p 17 N85-26439 COSMIC Software Catalog, 1985 edition [NASA-CR-174070] p 40 N85-28608
- BIOLOGICAL MODELS (MATHEMATICS)
- Some perspectives on the study and improvement of the cognitive-creative activity of an individual and a group p2 A85-23276 The principles of experimental setup in models of
- complex human operator activities p 3 A85-23283 The modeling of human cognitive decision processes
- in The Intelligent Machine Model (TIMM) p 25 A85-47677 A research paradium for multi-human decision making
- P 13 A85-47678 BIOMASS ENERGY PRODUCTION
- Renewable technologies program summaries [DE85-001509] p 54 N85-30500
- BIOMETRICS Human-system performance measurement in training
- simulators p 5 A85-48752 BIOPROCESSING
- Second Symposium on Space Industrialization --- space commercialization [NASA-CP-2313] p 67 N85-11011
- BIOTECHNOLOGY Outlook for expanding the Federal research in progress
- system [AD-A148354] p 49 N85-17737
- BIRD-AIRCRAFT COLLISIONS A bird strike handbook for base-level managers
- [AD-A147928] p 75 \ N85-16008 BOEING AIRCRAFT
- Boeing's airliner launch criteria p 61 A85-28824 BOOSTER ROCKET ENGINES Starstruck's problems spotlight risks, opportunities in
- Space p62 A85-34221 Chinese modify CZ-2/3 rocket boosters, focus on commercial launch market p 64 A85-40905 BROADCASTING
- Satellite broadcasting and the use of the geostationary orbit - Some international legal aspects
- p 90 A85-36289
- The congressional authorization process as it applies to aeronautical research and technology p 89 A85-29555
- Strategic planning for investment in R&D using decision analysis and mathematical programming p 11 A85-33649
- RADSIM A methodology for large-scale R&D program assessment p 46 A85-42585 Life-cycle-cost-oriented system design in weapon
- technology [MBB-UA-842-84-OE] p 65 A85-42678 Activities report of the aerospace industry in West
- Germany [ISSN-0722-3838] p 49 N85-16686 Activities report of the aerospace industry in West
- [ISSN-0722-3838] p 49 N85-16687
- FRG study looks at participation in ESA, US space station p 49 N85-17191 Criteria for qualifying for FRG federal CAD/CAM
- subsidies p51 N85-25651 New ESA director on Anane, space station, future trends p53 N85-29096
- trends p 53 N85-29096 FRG weighs ESA participation, budget issues p 53 N85-29110
- Pricing options for the space shuttle Special study p 72 N85-32138 Space research in the United Kingdom An
- assessment [AD-A155334] p 56 N85-33038
- The 1986 National Aeronautics and Space Administration authorization [GPO-47-635] p 57 N85-35829
- BUDGETS
  - Non-US approaches to space commercialization p 67 N85-11012

- CANADIAN SPACE PROGRAM
- Non-US approaches to space commercialization p 67 N85-11012
- CATALOGS (PUBLICATIONS) FSTC (Federal Software Testing Center) software tool catalog
- (PB84-212158) p 36 N85-10703 CELESTIAL BODIES
- Towards the entire demilitanzation of outer space p 92 A85-50056 CERTIFICATION
- The liability of aircraft manufacturers and certification authorities in the United Kingdom p 89 A85-27397 Civil certification of a US government procured helicopter p 90 A85-31968
- CHINA Systems research on China in year 2000
  - p 50 N85-21418
- Chinese modify CZ-2/3 rocket boosters, focus on commercial launch market p 64 A85-40905
- CHIPS (ELECTRONICS) Military electronics - Why so unreliable?
- p 80 A85-18440
- A management guide to reliability predictions p 82 A85-49541
- Department of Housing and Urban Development Independent Agencies Appropriation Bill, 1986 [S-REPT-99-129] p 97 N85-34720
- CIVIL AVIATION Destruction of Korean Air Lines Boeing 747 over Sea of Japan, 31 August 1983 p 86 A85-10049 A legal analysis of the shooting of Korean Airlines Flight 007 by the Soviet Union p 86 A85-11937 Recent developments in aviation case law
- p 88 A85-24709 Registration and nationality of aircraft operated by international agencies in law and practice p 89 A85-27396
- The liability of aircraft manufacturers and certification authonties in the United Kingdom p 89 A65-27397 Attempt to regulate restrictive commercial practices in the field of air transportation within a transnational antitrust legal and institutional framework p 90 A85-30999 *Civil certification of a US* government procured helicopter p 90 A85-31968 Airline deregulation - Another look p 92 A85-31968
- Foreign civil aviation competition 1976 summary and implications [NASA-TM-X-73907] p 67 N85-10907
- Activities report of the aerospace industry in West Germany [ISSN-0722-3838] p 49 N85-16686
- Activities report of the aerospace industry in West Germany [ISSN-0722-3838] p 49 N85-16687
- Management training for cockpit crews at Piedmont flight p6 N85-18013 Transportation
- [JPRS-UTR-85-004] p 50 N85-21105 Aviation repair plant directors on quality control measures p 84 N85-21106 Improvements in personnel needed for better flight
- safety p 8 N85-23593 Administration chief on air traffic control improvements p 76 N85-25193
- Operations research [B8561897] p 76 N85-28712 NASA authorization, 1986, volume 1
- [GPO-46-385] p 97 N85-32039 CLASSIFICATIONS
- The European approach to a standardized work breakdown structure concept for European scientific space satellites
- [MBB-UR-688-84-OE] p 44 A85-16088 CLINICAL MEDICINE
- Technology transfer to the Middle East [PB85-127744] p 51 N85-22264 COCKPITS
- United Airlines' cockpit resource management training p 2 A85-21565
- Human factors in aviation 1 p 3 A85-39368 COGNITION
  - The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) p 25 A85-47677
- Interaction of human cognitive models and computer based models in supervisory control
- [AD-A142547] p 14 N85-16474 Study of cognitive styles of students in automated teaching system p 6 N85-19620

systems and their users Report of a workshop p 38 N85-19891 [PB85-121523] The acquisition of procedures from text production-system analysis of transfer of training AD-A151029] p 8 N85-24732 COGNITIVE PSYCHOLOGY Pilot judgment training - Past, present and future p 2 A85-21579 Some perspectives on the study and improvement of the cognitive-creative activity of an individual and a group p 2 A85-23276 Interrelationship between learning and development in the process of mastering an occupational activity p 3 A85-23285 The psychology of technical devices and technical discourse [AD-P003929] p 27 N85-11609 COLLATING Design of a scientific information collation and dissemination system, volumes 1 thru 3 p 14 N85-12791 [40-4146002] COLLISION AVOIDANCE A bird strike handbook for base-level managers [AD-A147928] p 75 N85-16008 COMBAT An automated methodology development --- software p 33 A85-34128 design for combat simulation COMBINATORIAL ANALYSIS Effects of redundancy management on reliability modelling COMMAND AND CONTROL p 13 A85-47795 A research paradigm for multi-human decision making p 13 A85-47678 A mathematical theory of command and control structures [AD-A145608] p 14 N85-11675 COMMAND GUIDANCE Determining functional requirements for NASA Goddard's command management system software p 30 N85-32020 design using expert systems COMMERCE Attempt to regulate restrictive commercial practices in the field of air transportation within a transnational antitrust legal and institutional framework p 90 A85-30999 Foreign civil aviation competition 1976 summary and implications p 67 N85-10907 [NASA-TM-X-73907] Commercial space services p 68 N85-11039 The Expendable Launch Vehicle Commercialization (GPO-30-8381 p.93 N85-12919 Spin-offs from technical commercial infrastructures, no p 55 N85-32035 COMMERCIAL AIRCRAFT Technology and the market place - A changing air transport equation (SAF PAPER 841545) p.60 A85-25983 A new proposal for the reform of commerical air crash litigation p 92 A85-44098 COMMERCIAL SPACECRAFT Astrobusiness A guide to the commerce and law of outer space --- Book p 87 A85-20512 The communication-satellite market to the year 2000 A85-26771 p 60 The commercialization of space -Twenty years of p 88 A85-27373 experience Some lessons learned Commercialization of space - Incentives, impediments and alternatives p 61 A85-27375 Insurance for space systems p 61 A85-29623 Launching the rocket industry in the United States -Domestic regulation of private expandable launch p 89 A85-30998 vehicles Commercial use of space - The space business era p 63 A85-34538 COMMUNICATING Communications skills for CRM training p 6 N85-18017 COMMUNICATION Second Symposium on Space Industrialization --- space commercialization [NASA-CP-2313] p 67 N85-11011 Management communication and financial modeling p 16 N85-26190 COMMUNICATION NETWORKS Transborder direct-to-home satellite service p 88 A85-24089 Reliability of communication flow in R&D organizations p 11 A85-33650 Reagan competitive policy places Intelsat's future at p 90 A85-34223 crossroads Management and control of interconnected

communications networks

The deregulation

communications

p 34 A85-34459

p 90 A85-36666

satellite

international

of

Research needs on the interaction between information
#### COMMUNICATION SATELLITES

International cooperation in the	comme	ercial era of
space	p 58	485-12507
Cost effective launch technology fe	or com	munications
IAF PAPER 84-04	p 58	A85-12979
Federal policy options and the con	nmerci	alization of
space	- 07	405 404 40
[IAF PAPER 84-218]	p 8/	A85-13140
The communication-satellite market	0 me	A85-26771
The commercialization of space	- Twee	nty years of
experience Some lessons learned	p 88	A85-27373
Insurance for space systems	p 61	A85-29623
The outlook for space commercialized	ation	A 95 24102
Starstruck's problems spotlight risk	s onn	ortunities in
space	p 62	A85-34221
Satellite broadcasting and the use o	f the g	eostationary
orbit - Some international legal aspect	s	105 00000
The deregulation of interr	p 90 Iational	A65-30209 satellite
communications	p 90	A85-36666
Commercial space Europe should	have i	ndependent
strategy	p 71	N85-19205
and development	ns pon	cy, research
[JPRS-TTP-85-002]	p 94	N85-19309
Worldwide report Telecommunication	ons poli	cy, research
and development	n 94	N85-19314
International space research	persp	ectives of
commercialization for German industry	· _ ·	
[NASA-TM-77657]	p 54	N85-29979
Knowledge-based communication	and n	nanagement
support in a system development envi	ronmer	nt
	p 27	N85-14596
COMPARISON Generic data entry quality assurance	tool	
[DE85-008359]	p 41	N85-29852
COMPETITION	•	
Understanding changes in the US c	ompeti	tive position
Preview of the President's Commis	poo sion o	n Industrial
Competitiveness	- 00	495.43100
Competitiveness	рюю	A00-40100
An analysis of production comp	etition	and award
An analysis of production comp methodology	p 66 etition	and award
An analysis of production comp methodology [AD-A147775] International cooperation and comp	p 66 etition p 70 petitior	N85-17733
An analysis of production comp methodology [AD-A147775] International cooperation and comp space activites	p 66 etition p 70 petition	N85-17733
An analysis of production comp methodology [AD-A147775] International cooperation and comp space activities [OTA-ISC-240]	p 66 etition p 70 petition p 70	N85-17733 N85-17733 N85-17750
An analysis of production comp methodology [AD-A147775] International cooperation and comp space activites [OTA-ISC-240] COMPILERS TAILY - An ATLAS program statisti	p 66 etition p 70 p 70 p 70 cal dat	N85-17733 N85-17733 N85-17750
An analysis of production comp methodology [AD-A147775] International cooperation and comp space activites [OTA-ISC-240] COMPILERS TALLY - An ATLAS program statisti tool	p 66 etition p 70 petition p 70 cal dat p 32	A85-17733 N85-17733 In civilian N85-17750 ta gathering A85-26830
An analysis of production comp methodology [AD-A147775] International cooperation and comp space activities [OTA-ISC-240] COMPILERS TALLY - A ATLAS program statistic tool	p 66 etition p 70 betition p 70 cal dat p 32	A65-45153 and award N85-17733 n in civilian N85-17750 ta gathering A85-26830
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activities [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital support	p 66 etition p 70 petition p 70 cal dat p 32 r large	N85-17733 n n civilian N85-17750 ta gathering A85-26830 systems
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activities [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAFER 84-2636]	p 66 etition p 70 petition p 70 cal dat p 32 r large p 31	A65-47153 and award N85-17733 n n civilian N85-17750 ta gathering A85-26830 systems A85-17826
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform	p 66 etition p 70 petition p 70 cal dat p 32 r large p 31 lance re	AB5-17733 and award N85-17733 n n civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements
An analysis of production comp methodology [AD-A147755] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems	p 66 etition p 70 p 70 p 70 cal dat p 32 r large p 31 cance re p 20	ABS-17733 N85-17733 n civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117
An analysis of production comp methodology [AD-A147775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Groun testing	p 66 etition p 70 p 70 p 70 cal dat p 32 r large p 31 cance re p 20	AB5-17733 N85-17733 N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117
An analysis of production comp methodology [AD-A147775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests	p 66 etition p 70 p 70 cal dat p 32 r large p 31 ance re p 20 mpone p 78	ABS-42169 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117
An analysis of production comp methodology [AD-A147775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using	p 56 etition p 70 p 70 cal dat p 32 r large p 31 ance re p 20 mpone p 78 cannib	ABS-17733 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117 ent reliability A85-12645 alization for
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPLERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support	p 66 etition p 70 betition p 70 cal dat p 32 r large p 31 tance re p 20 mpone p 78 cannib p 73	ABS-40169 N85-17733 In civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117 ent reliability A85-12645 alization for A85-37903
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] COMPLERS TALLY - An ATLAS program statisti tool COMPLEX SYSTEMS Development tools - Case study for of digital avionics [AIAA PAFER 84-2635] A methodology for organizing perform for complex dynamical systems COMPONENT RELIABILITY Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts	p 66 etition p 70 betition p 70 ical dat p 32 r large p 31 iance ra p 20 mpone p 78 cannib. p 73 g space p 81	AB5-17733 N85-17733 N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-17826 equirements A85-12645 alization for A85-37903 craft quality A85-38267
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the	p too etition p 70 p 70 ccal dai p 32 r large p 31 ance re p 20 mpone p 78 ccannib p 73 g space p 81 r crystal	AB5-17733 AB5-17733 AB5-17750 ta gathering AB5-26830 systems A85-17826 equirements A85-17826 equirements A85-12645 alization for A85-37903 craft quality A85-38267 ball
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the	p too etition p 70 petition p 70 cal dai p 32 r large p 31 ance re p 20 mpone p 78 cannib p 78 cannib p 73 s space crystal p 82	ABS-17733 ABS-17733 ABS-17750 ABS-17750 ABS-17750 ABS-17750 ABS-17826 equirements ABS-17826 equirements ABS-17826 equirements ABS-12645 alization for alization for alization for alization for alization for ball ABS-38267 ball ABS-49540
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou	p too etition p 70 p 70 cal dai p 32 r large p 31 mpone p 73 space p 73 space p 82 us pa3 space p 81 p 73 space p 10 p 73 space p 10 p 70 mpone p 70 p 70 mpone p 70 p 70 mpone p 70 p 70 mpone p 70 p 70 mpone p 70 p 70 mpone p 70 p 70 mpone p 70 mpone p 70 p 70 mpone p 70 p 70 mpone p 70 p 70 mpone p 70 mpone p 70 p 70 p 70 mpone p 70 p 70 p 70 mpone p 70 p 70 p 70 p 70 mpone p 70 p 70	ABS-17733 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-12645 alization for A85-32903 craft quality A85-33267 ball A85-49540 yloads and
An analysis of production comp methodology [AD-A147755] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repar-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781]	p too etition p 70 etition p 70 cal dai p 32 r large p 31 aance rr p 20 mpone p 73 space p 82 is pa3i ter p 72 p 82 is pa3i ter p 72	ABS-17733 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-17826 equirements A85-12645 alization for A85-32645 alization for ball A85-38267 ball N85-26842
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b>	p toto p 70 p 70 cal dai p 32 r large p 31 anoce rr p 73 space p 81 p 73 space p 81 crystal sp 82 sp 82 sp 82 sp 82 sp 83 terr p 73 sp 70 p 70	AB5-26832 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-26830 systems A85-17826 equirements A85-17826 equirements A85-17826 equirements A85-12645 alization for A85-37903 cirati quality A85-38267 ball A85-38267 ball A85-26842
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPLERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repar-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont	p tob etition p 70 oetition p 70 cal dai p 32 r large p 31 aance ric p 20 mpone p 78 cannib p 73 space p 81 crystal p 82 spase p 81 crystal s 5 spase r p 72 rol of r	ABS-40169 N85-17730 N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117 ent reliability A85-12645 alization for A85-37903 craft quality A85-32645 alization for A85-37903 craft quality A85-49540 yloads and N85-26842 composites, University
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] COMPILERS TALLY - An ATLAS program statisti tool COMPLEX SYSTEMS Development tools - Case study for of digital avionics [AIAA PAPER 84-2636] A methodology for organizing perform for complex dynamical systems COMPONENT RELIABILITY Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] COMPOSITE MATERIALS Testing, evaluation and quality cont Proceedings of the International Comi	p tobe elition p 70 p 70 p 70 ccal dai p 32 r large p 73 s space cannib p 73 s space crystal p 81 crystal p 81 crystal p 72 r large p 72 r ol of c erence	AB5-42153 AB5-17733 AB5-17750 ta gathering AB5-17750 ta gathering AB5-26830 systems AB5-17826 equirements AB5-25117 ent reliability AB5-32903 icraft quality AB5-38267 ball AB5-49540 /loads and NB5-26842 composites, , University ber 13, 14,
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAFER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONET RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repar-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Coni of Surrey, Guildford, Surrey, England, 3 1983	p tobe elition p 70 p 70 ccal dat p 32 r large p 31 r large p 78 r large p 78 r space r space p 78 r space r space p 78 r space p 78 r space p 78 r space p 70 r o r o r o r o r o r o r o r o r o r o	ABS-40169 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117 ent reliability A85-12645 alization for A85-37903 craft quality A85-49540 /loads and N85-26842 composites, , University ber 13, 14, A85-14101
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Conf of Surrey, Guildford, Surrey, England, 1 1983	p tob etition p 70 operation p 70 ceal dat p 32 r large p 31 aance re p 78 gaace p 81 aance re p 78 gaace p 81 gaace p 82 space p 82 space p 72 rol of 6 erence Septem p 78 space	ABS-40169 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117 ent reliability A85-12645 alization for A85-37903 craft quality A85-38267 ball A85-49540 vloads and N85-26842 composites, b, University ther 13, 14, A85-14101 ber 12
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Cond of Surrey, Guildford, Surrey, England, 3 1983 European Scientific Notes, volume 3 [AD-A148713]	p toto p 70 petition p 70 cal dai p 32 r large p 31 aance rr p 73 space p 81 space p 81 space p 83 space p 73 space p 73 space p 73 space p 70 r long p 73 r long p 75 r long	Abb-40169 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-17826 equirements A85-17826 equirements A85-17826 equirements A85-12645 alization for A85-37903 craft quality A85-38267 ball A85-49540 vloads and N85-26842 composites, c, University ber 13, 14, A85-14101 ber 12 N85-18946
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Conl of Surrey, Guildford, Surrey, England, 3 1983 European Scientific Notes, volume 3 [AD-A148713] <b>COMPUTATION</b> Information and computation em	p too etition p 70 p 70 cal dai p 32 r large p 73 r large p 73 r large p 73 r space p 73 p 73 r space p 73 p 74 p 73 p 75 p 75	Auto-Auto-Auto-Auto-Auto-Auto-Auto-Auto-
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Coni of Surrey, Guildford, Surrey, England, 3 1983 European Scientific Notes, volume 3 [AD-A148713] <b>COMPUTATION</b> Information and computation em solving with uncertainty and aproximati	p too etition p 70 p 70 cal dai p 32 r large p 31 ance rr p 20 r large p 73 g space p 81 g space p 81 g space p 73 g space g spac	ABS-40169 N85-17733 In civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-17826 equirements A85-25117 ent reliability A85-3267 ball A85-3903 beraft quality A85-38267 ball A85-49540 yloads and N85-26842 composites, , University ber 13, 14, A85-18946 ing problem
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPLERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Cond of Surrey, Guildford, Surrey, England, 1 1983 European Scientific Notes, volume 3 [AD-A148713] <b>COMPUTATION</b> Information and computation em solving with uncertainty and aproximati	p του etition p 70 vetition p 70 vetition p 70 vetition p 32 r large p 31 anace rr p 20 r p 31 anace rr p 78 cannib ρ 73 space p 81 space p 81 space p 78 space p 81 space p 78 space p 78 space p 79 space s p 10 of 0 d p 50 on p 50 on p 50 on p 33	ABS-40169 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-17826 equirements A85-17826 equirements A85-17826 equirements A85-17826 equirements A85-25117 ent reliability A85-3267 ball A85-49540 vloads and N85-26842 composites, ber 13, 14, A85-14101 ber 12 N85-18946 ing problem A85-31791
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repar-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for varior instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Conf of Surrey, Guildford, Surrey, England, 3 1983 European Scientific Notes, volume 3 [AD-A148713] <b>COMPUTATION</b> Information and computation em solving with uncertainty and aproximati	p too etition p 70 vetition p 70 cal dai p 32 r large p 31 r large p 31 r ance rr p 20 mpone p 78 cannib p 73 s space p 81 r ance rr p 70 p 31 s space p 70 p 70 p 31 s space p 70 p 70	N85-17733 N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117 ent reliability A85-12645 alization for A85-37903 icraft quality A85-38267 ball A85-39540 v/loads and N85-26842 composites, ,, University ber 13, 14, A85-14101 ber 12 N85-18946 ing problem A85-31791 int e element
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPLERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Conti of Surrey, Guildford, Surrey, England, 3 1983 European Scientific Notes, volume 3 [AD-A148713] <b>COMPUTATION</b> Information and computation em solving with uncertainty and aproximati <b>COMPUTER AIDED DESIGN</b> A methodology to design databases analysis and structural design optimi	p tob etition p 70 p 70 cal dai p 32 r large p 31 iance re p 78 p 32 r large p 32 r large p 33 space cannib p 78 space p 78 s 72 r large p 78 p 70 r large p 70 r large p 78 r large p 78 r large p 78 r large p 78 s 70 cal dai p 32 r large p 78 s 70 cal dai p 32 r large p 78 s 70 cal dai p 70 r large p 78 s 70 cal dai p 70 r large p 78 s 70 cal dai p 78 s 72 rol of d p 78 s 70 col of dai p 78 s 70 col dai	ABS-49159 N85-17730 In civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117 ent reliability A85-37903 craft quality A85-38267 ball A85-39540 /loads and N85-26842 composites, , University N85-18946 ing problem A85-31791 int element applications
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repair-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Cont of Surrey, Guildford, Surrey, England, 3 [AD-A148713] <b>COMPUTATION</b> Information and computation em solving with uncertainty and aproximati <b>COMPUTER AIDED DESIGN</b> A methodology to design databases analysis and structural design optimi [AIAA PAPER 85-0743]	p to be elition p 70 p 70 cal dat p 32 r large p 31 r large p 33 r large p 78 p 32 r large p 70 r large p 78 r l	ABS-40189 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-25117 ent reliability A85-12645 alization for A85-37903 craft quality A85-326842 composites, ball A85-49540 vloads and N85-26842 composites, Composites, Bas-18946 ing problem A85-31791 inte element applications A85-30283
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repar-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Coni of Surrey, Guildford, Surrey, England, 3 [AD-A148713] <b>COMPUTETION</b> Information and computation em solving with uncertainty and aproximate <b>COMPUTER AIDED DESIGN</b> A methodology to design databasees analysis and structural design optimi [AIAA PAPER 85-0743] Computer integration of enginee production A national computation.	p too etition p 70 p 70 ccal dat p 32 r large p 31 ance re p 78 p 32 r large p 78 p 32 r large p 78 p 32 r large p 78 p 32 r large p 78 p 70 r large p 78 p 70 r large p 78 p 70 r large p 78 p 70 r large p 78 p 79 p 70 r large p 78 p 70 r large p 78 p 70 r large p 78 p 70 r large p 78 p 78 r large p 78 p 79 p 79 r large p 78 p 79 p 73 r large p 78 p 78 r large p 78 p 79 p 72 r lof of eierence Septer p 73 p 33 c for fir r large p 33 c for fir p 78 c for fir fir p 78 c for fir fir p 33 c for fir fir fir fir fir fir fir fir	AB5-40169 AB5-40169 AB5-40169 AB5-17750 AB5-17750 AB5-17750 AB5-17750 AB5-26830 systems AB5-17826 equirements AB5-26842 composites, ball AB5-49540 vloads and N85-26842 composites, Comversity AB5-18946 ng problem A85-31791 bate element applications AB5-30283 fesign and
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONET RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repar-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Cond of Surrey, Guildford, Surrey, England, 1 1983 European Scientific Notes, volume 3 [AD-A148713] <b>COMPUTER AIDED DESIGN</b> A methodology to design databasee analysis and structural design optimi [AIAA PAPER 85-0743] Computer integration of enginee production A national opportunity [NASA-CR-175483]	p too etition p 70 p 70 cal dai p 32 r large p 73 r large p 73 r large p 73 r large p 73 p 70 r large p 73 r large p 73 p 70 r large p 70 r large p 73 space p 73 space p 75 r large p 73 space p 72 p 72 space p 73 space p 72 space p 73 space p 73 space	AB5-17733 AB5-17733 AB5-17750 ta gathering AB5-26830 systems A85-17826 equirements A85-26830 systems A85-17826 equirements A85-26817 ent reliability A85-37903 craft quality A85-38267 ball A85-49540 vloads and N85-26842 composites, b, University bber 12, 14, A85-18946 ing problem A85-31791 inte element A85-3283 design and N85-21414
An analysis of production comp methodology [AD-A14775] International cooperation and comp space activites [OTA-ISC-240] <b>COMPILERS</b> TALLY - An ATLAS program statisti tool <b>COMPLEX SYSTEMS</b> Development tools - Case study for of digital avionics [AIAA PAPER 84-2635] A methodology for organizing perform for complex dynamical systems <b>COMPONENT RELIABILITY</b> Group testing optimization of co acceptance tests Units of equipment available using repar-part support Economic considerations in selecting electronic parts Reliability prediction - Improving the Cost prediction model for variou instruments for the Space Shuttle Orbi [NASA-CR-175781] <b>COMPOSITE MATERIALS</b> Testing, evaluation and quality cont Proceedings of the International Cond of Surrey, Guildford, Surrey, England, 3 1983 European Scientific Notes, volume 3 [AD-A148713] <b>COMPUTER AIDED DESIGN</b> A methodology to design databases analysis and structural design optimi [AIAA PAPER 85-0743] Computer integration of enginee production A national opportunity [NASA-CR-17583] Selection criteria for a CAD/CM systi	p too etition p 70 p 70 cal dai p 32 r large p 73 r large p 73 r large p 73 r large p 73 r large p 73 r large p 73 r space p 33 r space p 33 r space p 32 r space p 33 r space p 33 r space p 33 r space p 33 r space p 33 r space p 32 r space p 33 r space p 21 em r space p 73 r space r	ABS-40189 and award N85-17733 in civilian N85-17750 ta gathering A85-26830 systems A85-17826 equirements A85-26830 systems A85-17826 equirements A85-17826 equirements A85-17826 alization for A85-37903 craft quality A85-12645 alization for A85-37903 craft quality A85-49540 vloads and N85-26842 composites, c, University ber 12, 14, A85-18946 ing problem A85-31791 inte element a85-30283 design and N85-21414

Criteria for qualifying for FRG federal CAD/CAM subsidies p 51 N85-25651 Computers and the consulting engineer p 22 N85-26184 Design-To-Cost (DTC) methodology to achieve p 71 N85-26645 affordable avionics Future directions of robotics, automation in Italy p 30 N85-28187 Manufacturing information system [AD-A152715] p 17 N85-28616 Importance of automation, robotization in economy p 31 N85-32219 COMPUTER AIDED MANUFACTURING ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing Volume 4, part 6 Task d Quality assurance/quality control/technical requirement/tasks, quality assurance modeling and analysis, quality assurance program management standard recommendations (ISP) [AD-A144891] p 26 N85-10372 Manufacturing Sciences and Robotics Research and Development Act of 1984 [H-REPT-98-1078] p 27 N85-13688 Coordinated research in robotics and integrated manufacturing p 28 N85-17365 [AD-A148204] Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] N85-18618 p 84 European Scientific Notes, volume 38, number 12 [AD-A148713] p 50 N85-18946 Computer integration of engineering design and production A national opportunity NASA-CR-1754831 p 21 N85-21414 The EEC's information technology program An undate [AD-A150022] o 39 N85-22258 French firm plans recapture of domestic CAD/CAM p 30 N85-25641 market Criteria for qualifying for FRG federal CAD/CAM p 51 N85-25651 subsidies Welding techniques in pressure part technology p 22 N85-25835 Manufacturing information system [AD-A152715] p 17 N85-28616 NASA space station automation Al-based technology review [NASA-CR-176094] p 31 N85-32134 Importance of automation, robotization in economy p 31 N85-32219 COMPUTER ASSISTED INSTRUCTION Some principles for the construction of an adaptive training system p 3 A85-23279 Factors critical to the implementation of self-paced instruction A background review [AD-A145143] p 5 N85-10648 GHIDON (AD-P0039251 p 26 N85-11605 Training capabilities test of Electronics Equipment Maintenance Trainer (EEMT) Findings and conclusions [AD-A146075] p 5 N85-12302 Study of cognitive styles of students in automated teaching system p 6 N85-19620 A microcomputer tutorial on spreadsheets and databases with a simulated budget preparation p 72 N85-32813 [AD-A155516] COMPUTER GRAPHICS Project management using graphics p 56 N85-34560 COMPUTER INFORMATION SECURITY Protection intellect Protecting intellectual property in space, Proceedings of the Aerospace Computer Security Conference, McLean VA, March 20, 1985 p 34 A85-42592 Security implications of the Space Station information p 34 A85-42593 system A systematic method for evaluating security auirements compliance p 35 A85-42597 requirements compliance Security of personal computer systems A management auide PB85-1610401 p 39 N85-24793 Computer center policy [AD-A154416] p 41 N85-30681 Security controls in the Stockpoint Logistics Integrated Communications Environment (SPLICE) [AD-A155536] p 77 N85-32244 Design guidelines for user-system interface software [AD-A154907] p 42 N85-32807 p 42 N85-32807 COMPUTER NETWORKS Computing and information services at the Jet Propulsion

Laboratory - A management approach to a diversity of p 44 A85-24525 Concepts and tools for the software life cycle

p 38 N85-19236 East Europe report Science and technology

[JPRS-ESA-84-032] p 51 N85-26833

COMPUTER PROGRAMS

The application of artificial intelligence techniques to large distributed networks p 30 N85-30721 [NASA-CR-177346] COMPUTER PROGRAM INTEGRITY A fault-tolerant software strategy for digital systems [AIAA PAPER 84-2646] p 79 A85-17833 Software Quality Assurance Program for the AH-64 p 80 A85-32010 Advanced Attack Helicopter (AAH) Security of personal computer systems A management auide [PB85-161040] p 39 N85-24793 Management aspects of software maintenance p 40 N85-27550 [AD-A152035] COMPUTER PROGRAMMING Reusability in programming - A survey of the state of p 31 A85-11096 the art Methods for improving the quality of computer software --- Russian book p 31 A85-11275 Automated tools for software development p 32 A85-26793 Ada - A good start, an exciting future p 34 A85-41549 Methodology for system description using the software design & documentation language p 35 A85-48511 Establishing a Software Engineering Technology (SET) p 35 N85-10702 [PB84-212141] FSTC (Federal Software Testing Center) software tool catalog IPB84-2121581 p 36 N85-10703 DOD related software technology requirements, practices, and prospects for the future [AD-A145493] p 36 N85-11575 GUIDON [AD-P0039251 p 26 N85-11605 Configuration management for mission-critical software The Los Alamos solution [DE84-015515] p 36 N85-12606 Concept paper for the development of a DOD Ada (trademark) software engineering education and training plan [AD-A148774] p 38 N85-17592 Space Station Software Issues [NASA-CP-2361] p 38 N85-20689 Software development environment issues --- space Software technology within NASA p 38 NA5-20691 Requirement for station software development Requirements for a database management system [DE85-004661] p 39 N85-22259 Continued development of a data base management system performance monitor, volume 2 p 39 N85-26167 [AD-A151714] A learning strategy approach for teaching novice computer programmers [AD-A151523] p 8 N85-26200 Management considerations for an information center [AD-A151774] p 40 N85-27742 Determining functional requirements for NASA Goddard's command management system software design using expert systems p 30 N85-32020 Design guidelines for user-system interface software [AD-A154907] p 42 N85-32807 COMPUTER PROGRAMS Reusability in programming - A survey of the state of the art p 31 A85-11096 Software design methods --- for civil and military aircraft p 32 A85-21457 gy - Practical avionics systems technology Quality management p 80 A85-24084 considerations Software test program for computer hardware evelopments p 32 A85-26784 developments Automated tools for software development p 32 A85-26793 RADSIM - A methodology for large-scale R&D program p 46 A85-42585 Software reliability - Let's start doing it p 82 A85-49562 Contracting for computer software development Serious problems require management attention to avoid wasting additional millions p 47 N85-11567 [FGMSD-80-4] DOD related software technology requirements, practices, and prospects for the future [AD-A145493] p 36 N85-11575 GUIDON [AD-P003925] p 26 N85-11605 Knowledge-based communication and management support in a system development environment p 27 N85-14596 Copyright law, computer software, and government acquisition [AD-A150347] p 95 N85-23453 Security of personal computer systems A management

auide [PB85-161040] p 39 N85-24793

#### COMPUTER SYSTEMS DESIGN

A decision support methodology for space technology advocacv [AD-A151895] p 16 N85-25283 An analysis of data dictionaries and their role in information resource management [AD-A152134] p 22 N85-27121 Management considerations for an information center [AD-A151774] p 40 N85-27742 COSMIC Software Catalog, 1985 edition p 40 N85-28608 [NASA-CR-174070] Specification of software quality attributes, volume 1 p 85 N85-29593 (AD-A153988) Specification of software quality attributes Volume 2 Software quality specification guidebook p 85 N85-29594 [AD-A153989] Specification of software quality attributes Volume 3 Software quality evaluation guidebook p 85 N85-29595 [AD-A153990] Annotated bibliography of recent papers on software engineering environments [PB85-191385] p 41 N85-29607 Generic data entry quality assurance tool N85-29852 [DE85-008359] p 41 Computer center policy [AD-A154416] p 41 N85-30681 Microcomputers in transportation Software and source book, February 1985 p 77 N85-31868 [PB85-181022] An automated quality assurance surveillance plan for ADP (Automated Data Processing) operations under the Navy's commercial activities program p 55 N85-32802 [AD-A154767] COMPUTER SYSTEMS DESIGN User and R&D specialist evaluation of decision-support ystems p 12 A85-38415 systems SAGA A project to automate the management of software production systems p 35 N85-10685 [NASA-CR-174017] Microcomputer management guidelines p 36 N85-10704 [PB84-212174] Systems analysis for microcomputer acquisitions [AD-A145447] N85-11556 p 69 Statistical estimation of software reliability [AD-A154097] N85-30665 D 85 functional requirements Determining for NASA Goddard's command management system software design using expert systems p 30 ,N85-32020 COMPUTER SYSTEMS PERFORMANCE Reliability and maintainability considerations in computer performance evaluation p 78 A85-10055 Performance/reliability measures for fault-tolerant omputing systems p 80 A85-25108 Software test program for computer hardware computing systems developments p 32 A85-26784 A technique for estimating performance of fault-tolerant p 81 A85-36297 programs A system reliability model with classes of failures p 81 A85-37904 Performance evaluation of database systems benchmark methodology [PB84-217504] p 36 N85-10707 Systems analysis for microcomputer acquisitions [AD-A145447] p 69 N85-11556 A unified model for performance and reliability of Fault-Tolerant/Multi-Mode systems [AD-A148789] p 84 N85-17601 Bottleneckology Evaluating supercomputers [DE85-005574] p 39 N85-23315 Selection criteria for a CAD/CM system p 71 N85-24810 Continued development of a data base management system performance monitor, volume 2 [AD-A151714] p 39 N85-26167 COMPUTER SYSTEMS PROGRAMS TALLY - An ATLAS program statistical data gathering p 32 A85-26830 tool Conference on Ada Applications and Environments, St Paul, MN, October 15-18, 1984, Proceedings p 32 A85-27900 Prototyping information systems on microcomputers -A design philosophy for engineering management p 33 A85-29401 User and R&D specialist evaluation of decision-support systems p 12 A85-38415 SAGA A project to automate the management of software production systems [NASA-CR-174017] p 35 N85-10685 An application of discriminant analysis to the selection of software cost estimating models [AD-A147632] p 70 N85-17580 Management aspects of software maintenance [AD-A152035] p 40 N85-27550

Specification of software quality attributes, volume 1 [AD-A153988] p 85 N85-29593

Specification of software quality attributes Volume 2 Software quality specification guidebook

p 85 N85-29594 [AD-A153989] Specification of software quality attributes Volume 3 Software quality evaluation guidebook p 85 N85-29595 [AD-A153990]

Local automation model software benchmarking Test [AD-A154349] p 41 N85-30676

Design guidelines for user-system interface software p 42 N85-32807 [AD-A154907] Attacking software crisis A macro approach

p 43 N85-35645 [AD-A155846] COMPUTER TECHNIQUES

Design principles for Finite Elements (FE) programs concerned with intensely nonlinear problems German p 33 A85-28797 thesis Decision Support System (DSS) A survey

p 14 N85-11896 [NRIMS-TWISK-317] A management workstation concept

[AD-A145617] p 14 N85-11906 Psychological issues in the design of expert systems p 27 N85-12792 [AD-A146081] Distributed knowledge base systems for diagnosis and

information retrieval p 28 N85-16690 [AD-A146890] A unified model for performance and reliability of

Fault-Tolerant/Multi-Mode systems [AD-A148789] French plans for fifth generation computer systems

The man-machine interface

The EEC's information technology program update

Aviation maintenance computerized management information systems Perspective for the future [AD-A150637]

Evaluating the appropriateness of microcomputers for litigation document management using the analytic p 39 N85-24788 hierarchy process Information technology applications in voluntary sector transport operations SP1 Objectives and programme

[TT-85011 p 71 N85-26457 Local automation model software benchmarking Test

p 41 N85-30676 Design guidelines for user-system interface software (AD-A154907) [AD-A154349]

Machine vision The eyes of automation - A manager's practical guide --- Book

An automated methodology development --- software design for combat simulation p 33 A85-34128 The SIMRAND methodology - Simulation of Research and Development Projects p 12 A85-41319 Robotics investment decision model user's manual AD-A145467] p 26 N85-11347 [AD-A145467] Decision process models of contractor behavior The development of effective contract incentives p 47 N85-11898 [AD-A1455241 Interaction of human cognitive models and computer based models in supervisory control [AD-A142547] p 14 N85-16474 Simulation A tool for cost-effective systems design and p 71 N85-26657 live test reduction Manufacturing information system p 17 N85-28616 [AD-A152715] Operations research [B8561897] p 76 N85-28712 Expanding expertise by use of an expert system p 30 N85-30723 Investment justification of robotic technology in [DE85-010759] aerospace manufacturing User's manual p 23 N85-35410 [AD-A156193] COMPUTERS Research and Modeling of Supervisory Control Behavior, report of a workshop [AD-A149621] p 16 N85-22248 Gordon Conference on Fundamentals of Cybernetic [AD-A151074] p 29 N85-24842 Computers and the consulting engineer p 22 N85-26184 Efforts at office automation and information systems utilization at Martin Marietta Energy Systems, Incorporated [DE85-008154] p 40 N85-28633 Integration of office automation within computing [DE85-010021] p 42 N85-33736 COMSAT PROGRAM The commercialization of space - Twenty years of p 88 A85-27373 experience Some lessons learned

CONCURBENT PROCESSING

Ada - Will DOD's new computer language cut software cost? p 61 A85-29669 CONFERENCES

Failure prevention and reliability - 1983, Proceedings of the Fifth Conference, Dearborn, MI, September 11-14, 1983 p 78 A85-11666

International Scientific Conference on Space, 23rd, Rome, Italy, March 24, 25, 1983, Proceedings p 43 A85-12501

Colloquium on the Law of Outer Space, 26th, Budapest, Hungary, October 10-15, 1983, Proceedings p 87 A85-12623

Testing, evaluation and quality control of composites, Proceedings of the International Conference, University of Surrey, Guildford, Surrey, England, September 13, 14, 1983 p 78 A85-14101

Conference on Ada Applications and Environments, St Paul, MN, October 15-18, 1984, Proceedings p 32 A85-27900 Colloquium on the Law of Outer Space, 27th, Lausanne,

Switzerland, October 7-13, 1984, Proceedings p 89 A85-29025

Symposium on Industrial Activity in Space, Stresa, Italy, May 2-4, 1984, Proceedings p 63 A85-38901 Spacelab to Space Station, Proceedings of the International Symposium on Spacelab 1 Results,

Implications and Perspectives, Naples and Capri, Italy, p 20 A85-39076 June 11-16, 1984 Protecting intellectual property in space, Proceedings

of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985 p 34 A85-42592 White-collar productivity and quality issues, Proceedings

of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984 p 81 A85-43176

Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings p 82 A85-49526

Second Symposium on Space Industrialization --- space commercialization n 67 N85-11011 [NASA-CP-2313]

Research and Modeling of Supervisory Control Behavior, report of a workshop

[AD-A149621] p 16 N85-22248 Space Station Engineering Technology and Development Proceedings of the Parel on In-Space Engineering Research and Technology Development [NASA-CR-176110] p 56 N85-34153

CONFIGURATION MANAGEMENT Configuration management for mission-critical software The Los Alamos solution

[DE84-015515] p 36 N85-12606 Software configuration management across project boundaries and in distributed development environments

[RSRE-MEMO-3704] p 37 N85-13494 Space Station Software Issues [NASA-CP-2361] p 38 N85-20689

Space Station reference configuration description [NASA-TM-87493] p 42 N85-3 p 42 N85-31146

CONGRESSIONAL REPORTS The congressional authorization process as it applies

to aeronautical research and technology . p 89 A85-29555

Department of Housing and Urban Development, and certain independent agencies appropriations for fiscal year 1985, part 2

[S-REPT-98-889-PT-2] p 93 N85-10870 National Aeronautics and Space Administration p 93 N85-10871 Statement of Hon James M Beggs, Administrator, NASA, Washington, DC p 69 N85-11059

p 69 N85-11059 The Expendable Launch Vehicle Commercialization Act

[GPO-30-838] p 93 N85-12919 Manufacturing Sciences and Robotics Research and

Development Act of 1984 [H-REPT-98-1078] p 27 N85-13688 Commercial Space Launch Act

[GPO-39-6131 p 93 N85-13690 Land Remote-Sensing Commercialization Act

[S-REPT-98-458] p 93 N85-14201 Civilian space stations and the US future in space

p 69 N85-15781 [OTA-STI-241] International cooperation and competition in civilian space activites

[OTA-ISC-240] p 70 N85-17750 Provision of Federal government publication in electronic

format to depository libraries [S-PRT-98-260] p 38 N85-19880

Commercial space launches p 95 N85-21225 [S-REPT-98-656]

1984 science and technology posture hearing with the director of the Office of Science and Technology Policy [GPO-41-060] p 95 N85-22244

p 84 N85-17601 p 50 N85-19732 [AD-A149435] p 22 N85-21989 [AD-A149971] Ап [AD-A150022] p 39 N85-22258 p 75 N85-22349

of work

COMPUTER VISION

p 20 A85-35799 COMPUTERIZED SIMULATION

An agenda for a study of government science policy p 95 N85-22245 [GPO-40-860] Transfer of technology [S-REPT-98-664] p 50 N85-22246 National Telecommunications Information and Administration authorization p 96 N85-27766 [GPO-38-660] East-West cooperation in outer space p 52 N85-27767 [S-HRG-98-1064] Housing Department of and Urban Development-independent agencies appropriations for National Aeronautics and Space 1986 Part 6 Administration p 96 N85-27768 [GPO-47-235] National Aeronautics and Space Administration Authorization Act. 1986 p 96 N85-28885 [S-REPT-99-91] National Aeronautics and Space Administration Authorization Act, 1986 [S-REPT-99-91] p 96 N85-30978 Housing and Urban Department of Development-Independent Agencies Appropriation Bill, 1986 [H-REPT-99-212] p 96 N85-30979 National Aeronautics and Space Administration p 54 N85-30980 NASA authorization, 1986, volume 1 p 97 N85-32039 [GPO-46-385] Housing Department of and Urban Development-Independent Agencies Appropriation Act, 1986 p 97 N85-32041 National Aeronautics and Space Administration research p 97 N85-32042 and development Department of Housing and Urban Development Independent Agencies Appropriation Bill, 1986 p 97 N85-34720 [S-REPT-99-129] National Aeronautics and Space Administration research and development Program description p 56 N85-34721 The 1986 National Aeronautics and Space Administration authorization [GPO-47-635] p 57 N85-35829 CONSTRUCTION Modelling the demand for construction [CSIR-TWISK-322] p 21 N85-10218 Engineering Space Station and Technology Development Proceedings of the Panel on In-Space Engineering Research and Technology Development p 56 N85-34153 [NASA-CR-176110] The 1986 National Aeronautics and Space Administration authorization p 57 N85-35829 [GPO-47-635] CONTINGENCY Software contingency planning p 13 A85-45079 The concept of fit in contingency theory p 18 N85-28854 [AD-A152603] CONTRACT INCENTIVES Decision process models of contractor behavior The development of effective contract incentives p 47 N85-11898 [AD-A145524] Using incentives to improve maintainability p 54 N85-29841 [AD-A153792] CONTRACT MANAGEMENT Productivity improvement in the acquisition environment p 65 A85-43188 Teamwork and Contractor and government p 46 A85-43206 commitment Establishing realistic requirements for reliability p 82 A85-49539 maintainability, and built-in-test Contractor experience using RADC ORACLE p 47 A85-49556 Contracting for computer software development Senous problems require management attention to avoid wasting additional millions [FGMSD-80-4] p 47 N85-11567 Decision process models of contractor behavior The development of effective contract incentives [AD-A145524] p 47 N85-11898 The application of artificial intelligence to contract management [AD-A146681] p 27 N85-15448 Technical performance measurement handbook AD-A147314] p 48 N85-16675 Evaluation of the effectiveness of the weighted [AD-A147314] guidelines to induce contractor's investment in cost reducing facilities equipment p 70 N85-16681 [AD-A147586] Government contract contingent liabilities The anti-deficiency act, and the hobgoblin of little minds [AD-A147919] p 94 N85-16684 Expert systems in contract management A pilot study

[AD-A149363] p 29 N85-19873

- Program manager The Journal of the Defense Systems Management College Volume 13, Number 6, November-December 1984 (AD-A140546)
- (AD-A149546) Life cycle costing in government procurement
- p 51 N85-26456 [AD-A151878] Automation of the reporting and tracking requirements of architect-engineering type contracts
- [AD-A152218] p 52 N85-27745 R/D contracts in the Soviet Union
- [AD-P004569] p 53 N85-28865 Cost savings from multiyear contracting AD-A153564] p 53 N85-29834
- [AD-A153564] Capital investment motivational techniques used by prime contractors on subcontractors
- [AD-A153660] p 53 N85-29837 Using incentives to improve maintainability
- p 54 N85-29841 [AD-A153792] Analyzing performance of small projects using URS and PMAS, information pamphlet
- [DE85-011964] p 56 N85-34718 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 4, Workshop B VE on spare parts
- p 57 N85-35813 [AD-A156070] DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 7, Workshop E VE in construction and architect
- engineer contracts [AD-A156073] p 57 N85-35816
- CONTRACT NEGOTIATION USAF negotiating contracts for F100, F110 p 45 A85-35448 improvements Osprey development contract tests new
- p 45 A85-36421 procurement policy p 45 Using incentives to improve maintainability AD-A1537921 p 54 N85-29841
- CONTRACTORS Decision process models of contractor behavior The
- development of effective contract incentives AD-A145524] p 47 N85-11898 Evaluation of the effectiveness of the weighted [AD-A1455241 guidelines to induce contractor's investment in cost
- reducing facilities equipment [AD-A147586] p 70 N85-16681 Capital investment motivational techniques used by prime contractors on subcontractors p 53 N85-29837 [AD-A153660]
- CONTRACTS
- Contracting for computer software development Serious problems require management attention to avoid wasting additional millions [FGMSD-80-4] p 47 N85-11567
- Companies participating in the Department of Defense Subcontracting Program, first three quarters fiscal year 1984
- [AD-A146137] p 47 N85-12775 Government contract contingent liabilities The anti-deficiency act, and the hobgoblin of little minds
- [AD-A147919] p 94 N85-16684 Cost-plus-percentage-of-costs ın government contracts
- [AD-A147779] p 70 N85-17735 R/D contracts in the Soviet Union
- p 53 N85-28865 [AD-P004569] Cost savings from multiyear contracting
- p 53 N85-29834 [AD-A153564] Progress report on implementing the recommendations of the White House Science Council's Federal Laboratory Review Panel, volume 1
- [PB85-185072] p 78 N85-35819 CONTROL
- Problems of psychological support of automated organization control systems p 28 N85-18571 Transfer of technology
- (S-REPT-98-664) p 50 N85-22246 CONTROL MOMENT GYROSCOPES
- Space station automation and robotics study Operator-systems interface
- [NASA-CR-176095] p 31 N85-33172 CONTROL SYSTEMS DESIGN
- Cooperative control The interface challenge for men and automated machines p 23 A85-16093 Active control of mechanical state-of-the-art for robotic manipulators systems The
- [AIAA PAPER 85-0683] p 25 A85-30351 Quality characteristic feedback control
- p 20 A85-35100 Reliability for real-time systems
- [DGLR PAPER 84-117] p 81 A85-40333 Design adequacy An effectiveness factor p 40 N85-26642
- Discrete simulation models their role in the design, development and management of inventory control systems [PNR-90249] p 77 N85-34719

- CONTROL THEORY
- Hand controllers for teleoperation A state-of-the-art technology survey and evaluation p 9 N85-28559 INASA-CR-1758901
- CONVENTIONS
- Proposed draft convention on the settlement of space law disputes p 88 A85-27374 CONVERSATION
- Communications skills for CRM training D 6 N85-18017
  - COOPERATION Labor-management cooperative programs
- p 4 A85-43200 COPYRIGHTS
- Copyright law, computer software, and government
- [AD-A1503471 p 95 N85-23453 CORRELATION
- Monitoring software development through dynamic p 47 variables A85-49049
- CORROSION The application of expert systems to corrosion
- problems p 29 N85-21316 [AERE-M-3445]
- COST ANALYSIS Distributed photovoltaic system impact upon utility load/supply management practices p 58 A85-11349
- Specifying and cost estimating --- for installing industrial robot p 24 Å85-23195 Rectifying inspection for nonconforming items and the ald linear cost model p 61 A85-32573
- Hald linear cost model Life-cycle-cost-oriented system design in weapon
- technology [MBB-UA-842-84-OE] p 65 A85-42678 A comparison of various Life Cycle Cost models --- I
- p 66 A85-45150 avionics systems acquisition Artificial intelligence applications to maintenance
- p 26 N85-11594 [AD-P003914] Economic analysis handbook
- [AD-A146263] p 69 N85-12805 Evaluation of the effectiveness of the weighted audelines to induce contractor's investment in cost
- reducing facilities equipment [AD-A147586] p 70 N85-16681
- An analysis of a dynamic project cost problem [CSIR-TWISK-338] p 71 N85-23341
- Design-To-Cost (DTC) methodology to achieve ffordable avionics p 71 N85-26645 affordable avionics Cost prediction model for various payloads and instruments for the Space Shuttle Orbiter
- [NASA-CR-175781] p 72 N85-26842 IASA-CR-175781 Cost savings from multiyear contracting D-A1535641 p 53 N85-29834
- [AD-A153564] Overhead management guide for aerospace
- rocurements p 18 N85-29835 [AD-A153626]
- Pricing options for the space shuttle Special study p 72 N85-32138
- Feasibility of applications of Competition Decision Assist Package (CDAP) to spare parts p 77 N85-33036 [AD-A154716]
- The Human Resource Management Information Network (HRMIN) A cost comparison in accordance with Office of Management and Budget (OMB) Circular no A-76, 5 April 1979
- [AD-A154583] p 42 N85-33039 Investment justification of robotic technology in aerospace manufacturing User's manual
- p 23 N85-35410 A1561931 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 3, Workshop A VE in the program office
- AD-A156069] p 57 N85-35812 DoD Value Engineering conference report Value [AD-A1560691
- Engineering (VE) A tool that benefits line management Part 5, Workshop C VEP/VECP administration, Part 5, Workshop C negotiation, and implementation
- [AD-A156071] p 57 N85-35814 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 6, Workshop D VE training-orientation
- p 57 N85-35815 [AD-A156072] COST EFFECTIVENESS
- Cost effective launch technology for communications satellites
- p 58 A85-12979 [IAF PAPER 84-04] Technology and the market place - A changing air transport equation
- p 60 A85-25983 [SAE PAPER 841545] Application of the personal computer for cost effective p 32 A85-26794 ATE/TPS support
- Ada Will DOD's new computer language cut software ost? p 61 A85-29669 cost? Grooming the Shuttle for cost-effective access to p 61 A85-33429 space

#### COST ESTIMATES

- Progress of Europe's Anane launcher challenges U S p 62 A85-34219 Shuttle on cost issue Commission stacker - Incorporation in a total logistic concept --- for Airbus production [MBB-UT-36-84-OE] n 73 A85-35073
- Cost effectiveness of simulated aircraft maintenance Low cost training aids and devices p 6 NR5-1905 Simulation A tool for cost training systems
- Simulation A tool for cost-effective systems design and p 71 N85-26657 live test reduction EOQ (Economic Order Quantity) range model p 77 N85-30965 [AD-A153709]
- Feasibility of applications of Competition Decision Assist Package (CDAP) to spare parts p 77 N85-33036
- [AD-A154716] The Human Resource Management Information Network (HRMIN) A cost comparison in accordance with Office of Management and Budget (OMB) Circular no A-76, 5 April 1979
- p 42 N85-33039 [AD-A154583] COST ESTIMATES
- Polycrystalline silicon material availability and market pricing outlook for 1980 through 1988 p 58 A85-11425
- Specifying and cost estimating --- for installing industrial p 24 A85-23195 robot
- How much does it cost/how much does it weigh? p 67 A85-49913 [SAWE PAPER 1593] Economic analysis handbook
- [AD-A146263] p 69 N85-12805 A buyer's guide to space infrastructure
- p 48 N85-15784 An application of discriminant analysis to the selection of software cost estimating models
- [AD-A147632] p 70 N85-17580 An agenda for a study of government science policy p 95 N85-22245 [GPO-40-860]
- Cost prediction model for various payloads and instruments for the Space Shuttle Orbiter [NASA-CR-175781] p 72 N85-26842
- Methodology for assessing benefits and costs of government information collection
- p 41 N85-30975 IDE85-0105941 Pricing options for the space shuttle Special study p 72 N85-32138
- Attacking software crisis A macro approach (AD-A155846) p 43 \N85-35645
- Progress report on implementing the recommendations of the White House Science Council's Federal Laboratory Review Panel, volume 1
- PB85-185072] p 78 N85-35819 COST INCENTIVES
- DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 3, Workshop A VE in the program office
- [AD-A156069] p 57 N85-35812 COST REDUCTION
- Cost reduction potential in space program p 63 A85-35314 management Keeping the bureaucracy in check p 66 A85-43204 Logistics support costs for the B-1B aircraft can be
- reduced
- [AD-A145846] p 74 N85-11996 President's private sector survey on cost control, report on research and development
- [PB84-173269] p 95 N85-22253 MBB cost-reduction plan for Airbus construction p 71 N85-25616 described
- Cost savings from multiyear contracting [AD-A153564] p 53 N85-29834
- DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 3, Workshop A VE in the program office p 57 N85-35812 [AD-A156069]
- DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 5, Workshop C VEP/VECP administration, administration. negotiation, and implementation
- p 57 N85-35814 [AD-A156071] DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 6, Workshop D VE training-orientation
- p 57 N85-35815 [AD-A1560721 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 7, Workshop E VE in construction and architect engineer contracts
- [AD-A156073] p 57 N85-35816 COSTS
- Quality and cost competitiveness p 65 A85-43181 Determining training device requirements in Army aviation systems p 5 N85-14558 Synopsis of the OTA Workshop on Cost Containment Civilian Infrastructure (Civilian Space Station) Elements p 48 N85-15790

- An analysis of the effect of process controls on productivity and weapon system costs IN procurement p 75 N85-16678 IAD-A1474961 Cost-plus-percentage-of-costs government ın contracts [AD-A147779] p 70 N85-17735 Status of the UK NDT industry today p 22 N85-24309 Cost savings from multiyear contracting
- p 53 N85-29834 [AD-A153564] Overhead management guide for aerospace procurements
- p 18 N85-29835 [AD-A153626] CREATIVITY
- Some perspectives on the study and improvement of the cognitive-creative activity of an individual and a p 2 A85-23276 group Encouraging and maintaining an innovative work p 4 A85-43198 climate
- Central problems in the management of innovation [AD-A152598] p 18 N85-28852 CRITERIA
- Personal decision making The influence of perceived locus of control and degree of rationality on information seeking strategies p 39 N85-23446 CROP INVENTORIES
- Overcoming project planning and timeliness problems to make Landsat useful for timely crop area estimate p 11 A85-32129
- CRYPTOGRAPHY
- Security controls in the Stockpoint Logistics Integrated Communications Environment (SPLICE) p 77 N85-32244 [AD-A155536]
- CRYSTAL GROWTH Investors balance enthusiasm for new market against risk potential p 62 A85-34215
- CYBERNETICS Elements of the theory of multistep processes of sequential decision making --- Russian book
- p 34 A85-38643 Gordon Conference on Fundamentals of Cybernetics [AD-A151074] p 29 N85-24842

# D

- DATA
- Quality of scientific and engineering data p 84 N85-20936 (DE85-000294) DATA ACQUISITION
- Monitoring software development through dynamic variables p 47 Research needs on the interaction between information systems and their users Report of a workshop
- p 38 N85-19891 [PB85-121523] Methodology for assessing benefits and costs of government information collection
- p 41 N85-30975 DE85-0105941 DATA BASE MANAGEMENT SYSTEMS ATE
- reliability Data base management for enhancement o 32 A85-26807 Design principles for Finite Elements (FE) programs concerned with intensely nonlinear problems --- German p 33 A85-28797 thesis A methodology to design databases for finite element analysis and structural design optimization applications [AIAA PAPER 85-0743] p 33 A85-30283 Performance evaluation of database systems A
- benchmark methodology [PB84-217504] p 36 N85-10707
- Business planning for information services under special consideration of German management information
- (BMFT-FB-ID-83-007) p 21 N85-11910 Competitive assessment of the US information services ndustry
- [PB84-174804] p 37 N85-12803 Requirements for a database management system [DE85-004661] p 39 N85-22259 Continued development of a data base management
- system performance monitor, volume 2 p 39 N85-26167 [AD-A151714] Defense data network support concept analysis
- [AD-A153214] p 52 N85-28649 DLA Data/data base administration analysis
- [AD-A153031] o 40 N85-28879 Generic data entry quality assurance tool [DE85-008359] p 41 N85-29852
- CODA A concept organization and development aid for the research environment p 41 N85-30715 [AD-A154240] Guide on logical database design
- [PB85-177970] p 42 N85-30976

[AD-A154862]	p 42 N85-33042
User's operating procedures Volu	me 2 Scout project
(NASA-CR-177949)	p.42 N85-34519
DATA BASES	p 42 1100 04010
Verification techniques for improvi	ing software quality
through automated requirements data	a bases
[AIAA PAPER 84-2669]	p 79 A85-17848
benchmark methodology	abase systems A
[PB84-217504]	p 36 N85-10707
Distributed knowledge base system	is for diagnosis and
information retrieval	-
[AD-A146890]	p 28 N85-16690
General design considerations	of an Air Force
Information system	D 20 NRE 02440
[AD-A150011]	p 39 1105-23449
information resource management	
[AD-A152134]	p 22 N85-27121
CODA A concept organization ar	nd development aid
for the research environment	
[AD-A154240]	p 41 N85-30715
Sustems) for use in a recearch enviro	base management
[AD-A154862]	n 42 N85-33042
DATA MANAGEMENT	p 42 1100 00042
Are decision support systems applic	cable to engineering
management?	p 19 A85-17780
Computing and information services	at the Jet Propulsion
Laboratory - A management approac	cn to a diversity of
Research in data management or	p 44 Ad5-24525
[AD-A145498]	D 83 N85-12773
Primer on the registration of tech	nical information in
industry	p 36 N85-12786
A proposed integration amo	ng organizational
information requirements, media rich	ness and structural
design	- 15 NOT 10001
[AD-A149317] Guide on logical database design	p 15 N85-19881
[PB85-177970]	p 42 N85-30976
DATA PROCESSING	
An engineer's guide to books on	statistics and data
analysis	p 10 A85-12647
Information and computation er	nnhasizing problem
	iprice problem
solving with uncertainty and aproxima	
solving with uncertainty and aproxima	tion p 33 A85-31791
solving with uncertainty and aproxima Problem-oriented systems for proce	p 33 A85-31791 essing experimental
solving with uncertainty and aproxima Problem-oriented systems for proce data	p 33 A85-31791 p 33 A85-31791 p 34 A85-34919 p 34 A85-34919
solving with uncertainty and aproxima Problem-oriented systems for proce data A mathematical theory of comm structures	p 33 A85-31791 p 33 A85-31791 essing experimental p 34 A85-34919 mand and control
solving with uncertainty and aproxima Problem-oriented systems for proce data A mathematical theory of comr structures [AD-A145508]	p 33 A85-31791 p 33 A85-31791 essing experimental p 34 A85-34919 mand and control p 14 N85-11675
solving with uncertainty and aproxima Problem-oriented systems for proce data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume	p 33 A85-31791 p 33 A85-31791 p 34 A85-34919 nand and control p 14 N85-11675 t 39, number 2
solving with uncertainty and aproxima Problem-oriented systems for proce data A mathematical theory of comm structures [AD-A145608] European Scientific Notes Volume [AD-A148994]	p 33 A85-31791 p 33 A85-31791 p 34 A85-34919 nand and control p 14 N85-11675 • 39, number 2 p 50 N85-19919
solving with uncertainty and aproxima Problem-oriented systems for proce data A mathematical theory of comm structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an	p 33 A85-31791 p 33 A85-31791 p 34 A85-34919 mand and control p 14 N85-11675 v39, number 2 p 50 N85-19919
solving with uncertainty and aproxima Problem-oriented systems for proce data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774]	p 33 A85-31791 p 33 A85-31791 assing expenmental p 34 A85-34919 mand and control p 14 N85-11675 i 39, number 2 p 50 N85-19919 information center p 40 N85-27742
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p	p 33 A85-31791 p 33 A85-31791 assing experimental p 34 A85-34919 mand and control p 14 N85-11675 39, number 2 p 50 N85-19919 anformation center p 40 N85-27742 papers on software
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of com- structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments	p 33 A85-31791 essing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 papers on software
solving with uncertainty and aproxima Problem-oriented systems for proce data A mathematical theory of comm structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385]	p 33 A85-31791 p 33 A85-31791 p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 papers on software p 41 N85-29607
solving with uncertainty and aproxima Problem-oriented systems for proce data A mathematical theory of comm structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b	p 33 A85-31791 p 33 A85-31791 p 34 A85-34919 mand and control p 14 N85-11675 o 39, number 2 p 50 N85-19919 o information center p 40 N85-27742 papers on software p 41 N85-29607 ienchmarking Test
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A14894] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349]	p 33 A85-31791 p 33 A85-31791 assing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 anformation center p 40 N85-27742 bapers on software p 41 N85-29607 menchmarking Test p 41 N85-30676
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191365] Local automation model software b plan [AD-A154349] Guide on workload forecasting	p 33 A85-31791 essing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 apapers on software p 41 N85-29607 renchmarking Test p 41 N85-30676
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of com- structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632]	p 33 A85-31791 essing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 orformation center p 40 N85-27742 papers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of com- structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191365] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si	p 13 A85-31791 p 33 A85-31791 p 34 A85-34919 nand and control p 14 N85-11675 a9, number 2 p 50 N85-19919 number 2 p 50 N85-19919 number 2 p 50 N85-19919 number 2 p 40 N85-27742 papers on software p 41 N85-29607 wenchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191365] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated Quality assurance si ADP (Automated Data Processing) of	p 33 A85-31791 p 33 A85-31791 p 34 A85-34919 mand and control p 14 N85-11675 9 50 N85-19919 p 16 Information center p 50 N85-19919 p 16 Information center p 40 N85-27742 papers on software p 41 N85-29607 renchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for perations under the
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated puality assurance si ADP (Automated Data Processing) of Navy's commercial activities program	p 13 A85-31791 assing experimental p 33 A85-31791 assing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 anformation center p 40 N85-27742 bapers on software p 41 N85-29607 menchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance sis ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767]	p 33 A85-31791 essing experimental p 33 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 papers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for perations under the p 55 N85-32802
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of com- structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177622] An automated quality assurance sis ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system	p 33 A85-31791 essing experimental p 33 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 orformation center p 40 N85-27742 papers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for perations under the p 55 N85-32802 interface software
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907]	p 33 A85-31791 p 33 A85-31791 p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 papers on software p 41 N85-29607 eenchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32807
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191365] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D percentings and expendences of approximated of approximates of approximated of approximates of a	p 33 A85-31791 p 33 A85-31791 essing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 bapers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32807 P application users' erational
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154307] Data processing professionals and D perceptions and expectations of openicat	p 33 A85-31791 p 33 A85-31791 essing experimental p 34 A85-34919 nand and control p 14 N85-11675 139, number 2 p 50 N85-19919 anformation center p 40 N85-27742 papers on software p 41 N85-29607 renchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32807 P application users' erational roles of jon user interface
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group	p 33 A85-31791 p 33 A85-31791 essing experimental p 34 A85-34919 mand and control p 14 N85-11675 i 39, number 2 p 50 N85-19919 information center p 40 N85-27742 papers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32807 erational roles of ion users' erational roles of ion user interface p 10 N85-35821
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance siz ADP (Automated Data Processing) or Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicati group DATA REDUCTION	p 34 A85-31791 essing experimental p 33 A85-31791 p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 onformation center p 40 N85-27742 papers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for perations under the p 55 N85-32802 interface software p 42 N85-32807 P application users entimation users interface p 10 N85-35821
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154367] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of	p 33 A85-31791 p 33 A85-31791 p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 a information center p 40 N85-27742 papers on software p 41 N85-29607 ienchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32807 P application users' erational roles of ion user interface p 10 N85-35821 systems reliability
Solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comm structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154307] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of	p 33 A85-31791 p 33 A85-31791 assing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 anformation center p 40 N85-27742 bapers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32802 interface software p 40 N85-35821 P application users' erational roles of ion user interface p 10 N85-35821 systems reliability p 82 A85-49543
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191365] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154307] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of The application of artificial intellige	p 33 A85-31791 p 33 A85-31791 assing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 bapers on software p 41 N85-2766 p 41 N85-30704 urvetlance plan for berations under the p 55 N85-32802 interface software p 42 N85-32807 P application users' erational roles of ion user interface p 10 N85-35821 5 systems reliability p 82 A85-49543 ance techniques to
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191365] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of The application of artificial intellige large distributed networks	p3 A85-31791 essing experimental p 33 A85-31791 essing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 papers on software p 41 N85-29607 enchmarking Test p 41 N85-29607 enchmarking Test p 41 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32802 interface software p 40 N85-32802 interface software p 40 N85-32802 interface software p 40 N85-32802 interface software p 42 N85-32802 interface software p 10 N85-35821 systems reliability p 82 A85-49543 ence techniques to
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance siz ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicati group DATA REDUCTION Field data - The final measure of The application of artificial intellige large distributed networks [INASA-CR-177346]	p 33 A85-31791 essing experimental p 33 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 orformation center p 40 N85-27742 papers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for perations under the p 55 N85-32802 interface software p 42 N85-32807 P application users interface software p 42 N85-32807 P application users interface software p 42 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32801 P application users interface p 10 N85-35821 isystems reliability p 82 A85-49543 ence techniques to p 30 N85-30721
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191365] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of The application of artificial intellige large distributed networks [NASA-CR-177346] DATA RETIEVAL	p 33 A85-31791 assing experimental p 33 A85-31791 assing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 anformation center p 40 N85-27742 bapers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32807 P application users' erational roles of ion user interface p 10 N85-35821 systems reliability p 82 A85-49543 ance techniques to p 30 N85-30721
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicating group DATA REDUCTION Field data - The final measure of The application of artificial intellige large distributed networks [NASA-CR-177346] DATA RETRIEVAL CODA A concept organization an for the research environment	p 33 A85-31791 p 33 A85-31791 assing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 anformation center p 40 N85-27742 papers on software p 41 N85-29607 renchmarking Test p 41 N85-30676 p 18 N85-30704 urvetlance plan for berations under the p 55 N85-32802 interface software p 42 N85-32802 interface software p 40 N85-35821 systems reliability p 82 A85-49543 ance techniques to p 30 N85-30721 ad development aid
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of The application of artificial intellige large distributed networks [NASA-CR-177346] DATA RETRIEVAL CODA A concept organization an for the research environment [AD-A1542401]	p 33 A85-31791 ssing experimental p 33 A85-31791 experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 apapers on software p 41 N85-29607 renchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32802 interface software p 40 N85-35821 is systems reliability p 82 A85-49543 ence techniques to p 30 N85-30721 id development aid p 41 N85-30715
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A1547907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of The application of artificial intellige large distributed networks [NASA-CR-177346] DATA RETRIEVAL CODA A concept organization an for the research environment [AD-A15420] DATA STORAGE	p 33 A85-31791 essing experimental p 33 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 antormation center p 40 N85-27742 papers on software p 41 N85-29607 enchmarking Test p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32802 interface software p 40 N85-35821 sectional roles of ion user interface p 10 N85-35821 sectional roles of ion user interface p 10 N85-35821 sectional roles of ion user interface p 10 N85-35821 sectional roles of p 30 N85-30721 d development aid p 41 N85-30715
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191365] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of The application of artificial intellige large distributed networks [NASA-CR-177346] DATA RETIEVAL CODA A concept organization an for the research environment [AD-A154240] DATA STORAGE General design considerations of	p 33 A85-31791 assing experimental p 33 A85-31791 assing experimental p 34 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 anformation center p 40 N85-27742 bapers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32807 P application users' erational roles of ion user interface p 10 N85-35821 5 systems reliability p 82 A85-49543 ance techniques to p 30 N85-30721 id development aid p 41 N85-30715 of an Air Force
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) og Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154907] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of The application of artificial intellige large distributed networks [NASA-CR-177346] DATA STORAGE General design considerations of	p 33 A85-31791 assing experimental p 33 A85-31791 assing experimental p 34 A85-34919 nand and control p 14 N85-11675 39 number 2 p 50 N85-19919 information center p 40 N85-27742 bapers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for barticle as a software p 55 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32802 interface software p 40 N85-35821 systems reliability p 82 A85-49543 ance techniques to p 30 N85-30715 of an Air Force
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145508] European Scientific Notes Volume [AD-A145994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Data Processing) of Navy's commercial activities program [AD-A154767] Design guidelines for user-system [AD-A154307] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicat group DATA REDUCTION Field data - The final measure of The application of artificial intellige large distributed networks [NASA-CR-177346] DATA RETRIEVAL CODA A concept organization an for the research environment [AD-A154260] DATA STORAGE General design considerations of [AD-A150611]	p 33 A85-31791 assing experimental p 33 A85-31791 assing experimental p 34 A85-34919 nand and control p 14 N85-11675 39 number 2 p 50 N85-19919 information center p 40 N85-27742 bapers on software p 41 N85-29607 renchmarking Test p 41 N85-30676 p 18 N85-30704 urveillance plan for berations under the p 55 N85-32802 interface software p 42 N85-32807 Papplication users' erational roles of ion user interface p 10 N85-35821 5 systems reliability p 82 A85-49543 ance techniques to p 30 N85-30715 of an Air Force p 39 N85-23449
solving with uncertainty and aproxima Problem-oriented systems for proce- data A mathematical theory of comr structures [AD-A145608] European Scientific Notes Volume [AD-A148994] Management considerations for an [AD-A151774] Annotated bibliography of recent p engineering environments [PB85-191385] Local automation model software b plan [AD-A154349] Guide on workload forecasting [PB85-177632] An automated quality assurance si ADP (Automated Quality assurance si (AD-A154767] Data processing professionals and D perceptions and expectations of op persons working in a DP/applicating arge distributed networks [NASA-CR-177346] DATA RETRIEVAL CODA A concept organization and for the research environment [AD-A150611] CODA A concept organization and for the research environment and the source of the sou	p 33 A85-31791 essing experimental p 33 A85-34919 nand and control p 14 N85-11675 39, number 2 p 50 N85-19919 information center p 40 N85-27742 appers on software p 41 N85-29607 enchmarking Test p 41 N85-30676 p 18 N85-30704 urvellance plan for operations under the p 55 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32802 interface software p 42 N85-32807 P application users' erational roles of ion user interface p 10 N85-35821 systems reliability p 82 A85-49543 ince techniques to p 30 N85-30715 of an Air Force p 39 N85-23449 id development aid

Investigation of DBMS (Data Base Management

Systems) for use in a research environment

DATA SYSTEMS Data dictionary systems and their role in information resource management p 36 N85-10859 [AD-A144905] Business planning for information services under special consideration of German management information systems (BMFT-FB-ID-83-007) p 21 N85-11910 General design considerations of an Air Force information system [AD-A150611] p 39 N85-23449 DATA TRANSMISSION p 60 A85-15463 Intelsat business services Worldwide report Telecommunications policy, research and development [JPRS-TTP-85-006] p 94 N85-19314 Authorizing appropriations to the National Aeronautics and Space Administration for fiscal year 1986 (H-BEPT-99-32) p 95 N85-23452 The application of artificial intelligence techniques to large distributed networks p 30 N85-30721 [NASA-CR-177346] Determining functional requirements for NASA Goddard's command management system software design using expert systems p 30 N85-32020 Design guidelines for user-system interface software p 42 N85-32807 [AD-A154907] **DECISION MAKING** A Congressional view of national policy directions in p 86 A85-10178 remote sensing Are decision support systems applicable to engineering p 19 A85-17780 management? The functional age profile - An objective decision criterion for the assessment of pilot performance capacities and p 2 A85-21588 capabilities Developments in decision support systems p 25 A85-31792 Strategic planning for investment in R&D using decision analysis and mathematical programming p 11 A85-33649 Elements of the theory of multistep processes of sequential decision making --- Russian book p 34 A85-38643 The SIMRAND methodology - Simulation of Research and Development Projects p 12 A85-41319 The multiple functions of formal aids to decision making in public agencies p 12 A85-42587 The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) p 25 A85-47677 A research paradium for multi-human decision making p 13 A85-47678 Artificial intelligence - A new dimension in EW p 25 A85-49098 Robotics investment decision model user's manual p 26 N85-11347 [AD-A145467] A mathematical theory of command and control structures [AD-A1456081 n 14 N85-11675 Decision Support System (DSS) A survey p 14 N85-11896 [NRIMS-TWISK-317] Decision process models of contractor behavior The development of effective contract incentives p 47 N85-11898 [AD-A145524] Psychological issues in the design of expert systems p 27 N85-12792 [AD-A146081] The application of artificial intelligence to contract management [AD-A146681] p 27 N85-15448 Broadening the debate p 48 N85-15785 Compatibility effects and preference reversals [AD-A148399] p 15 N85-17544 An application of discriminant analysis to the selection of software cost estimating models [AD-A147632] p 70 N85-17580 An analysis of production competition and award methodology [AD-A147775] p 70 N85-17733 Decision making in stressful conditions A model based on the coping perspective [FOA-C-55064-H3] p 15 N85-17738 A decision model for selection of microcomputers and operating systems [AD-A149076] p 15 N85-19694 Research needs on the interaction between information systems and their users Report of a workshop (PB85-121523) p 38 N85-19891 A statistical approach to vendor selection p 16 N85-22249 [AD-A149781] Personal decision making The influence of perceived locus of control and degree of rationality on information seeking strategies p 39 N85-23446 Gordon Conference on Fundamentals of Cybernetics

p 29 N85-24842 [AD-A151074]

Some applications of fuzzy sets and the analytical hierarchy process to decision making p 16 N85-24876 [AD-A150720]

A decision support methodology for space technology advocacy p 16 N85-25283 [AD-A151895]

Computers and the consulting engineer p 22 N85-26184

Management A [NASA-SP-7500(19)] A bibliography for NASA managers p 17 N85-26439 Design adequacy An effectiveness factor

p 40 N85-26642 Personal computer aided decision analysis p 17 N85-27743 [AD-A151911]

The interface with decision makers in interactive multiobjective linear programming p 17 N85-28637 (REPT-84-38)

Multicriteria decision analysis as an aid to strategic planning of energy research and development p 18 N85-28870 [REPT-84-02]

The economics of private sector R and D decisionmaking in aeronautics [NASA-CR-176007] p 54 N85-30962

Opportunities for policy historians The evolution of the p 97 N85-35147 US civilian space program DECISION THEORY

Decision analysis in project management -Δn p 44 A85-25116 overview User and R&D specialist evaluation of decision-support p 12 A85-38415 systems Optimal inventories for overhaul of repairable redundant systems - A Markov decision model p 73 A85-48239 Interaction of human cognitive models and computer

based models in supervisory control p 14 N85-16474 [AD-A142547]

Compatibility effects and preference reversals p 15 N85-17544 [AD-A148399] DECISIONS

Selected American decisions on the Warsaw Convention and related matters - February 1981 to June 1984 1

p 89 A85-30167 DEFENSE COMMUNICATIONS SATELLITE SYSTEM A fault tolerant military Satellite Network Management

p 80 A85-34460 System DEFENSE COMMUNICATIONS SYSTEM (DCS) Management and control of interconnected

communications networks p 34 A85-34459 DEFENSE INDUSTRY Companies participating in the Department of Defense

Subcontracting Program, first three quarters fiscal year 1984 [AD-A146137] p 47 N85-12775

**DEFENSE PROGRAM** 

R&M implications of the DoD acquisition improvement p 72 A85-14896 program Joint service acquisition management initiatives --- for DOD software p 13 A85-45157 DOD related software technology requirements, ractices, and prospects for the future

p 36 N85-11575 [AD-A145493] Companies participating in the Department of Defense Subcontracting Program, first three quarters fiscal year

1984 [AD-A146137] p 47 N85-12775 November-December 1984 [AD-A140440] Program manager The Journal of the Defense Systems

p 50 N85-20933 [AD-A149546]

Militarization of space activity in United States p 96 N85-25360

Defense data network support concept analysis p 52 N85-28649 [AD-A153214] DoD Value Engineering conference report Value

Engineering (VE) A tool that benefits line management Part 4, Workshop B VE on spare parts p 57 N85-35813 [AD-A156070] DoD Value Engineering conference report Value

Engineering (VE) A tool that benefits line management Part 7, Workshop E VE in construction and architect engineer contracts p 57 N85-35816 [AD-A156073]

DESIGN ANALYSIS The role of company boards in design leadership

p 10 A85-17777 New model introduction - The operators' perspective p 61 A85-31981 --- in helicopter industry An analysis of ergonomic systems --- Russian book

p 5 A85-46148 DESIGN TO COST Design-To-Cost (DTC) methodology to achieve

p 71 N85-26645 affordable avionics **DEVELOPING NATIONS** 

International Scientific Conference on Space, 23rd, Rome, Italy, March 24, 25, 1983, Proceedings p 43 A85-12501

Space exploitation - Spacelab an easy approach for developing countries Prospectives and suggestions by Aeritalia p 58 A85-12502 International cooperation in the commercial era of p 58 A85-12507 space DIAGNOSIS Distributed knowledge base systems for diagnosis and information retrieval [AD-A146890] p 28 N85-16690 DICTIONARIES An analysis of data dictionaries and their role in information resource management [AD-A152134] p 22 N85-27121 DIFFUSION International space research perspectives of commercialization for German industry p 54 N85-29979 [NASA-TM-77657] DIGITAL SYSTEMS A fault-tolerant software strategy for digital systems [AIAA PAPER 84-2646] p 79 A85-17833 DISARMAMENT The structures and the role of an international agency for the control of satellites [NASA-TM-76765] p 93 N85-12806 DISPLAY DEVICES Displays, deja vu --- avionics-human factors R&D p1 A85-21560 Design guidelines for user-system interface software [AD-A154907] p 42 N85-32807 DISTRIBUTED PARAMETER SYSTEMS Using Ada for a distributed, fault tolerant system [AIAA PAPER 84-2703] p 79 A85p 79 A85-17873 DISTRIBUTED PROCESSING Implementing fault-tolerant distributed objects p 80 A85-36291 DISTRIBUTION (PROPERTY) NASA Space controls research and technology program p 54 N85-31149 DOCUMENTATION Methodology for system description using the software design & documentation language p 35 A85-48511 Guide on logical database design [PB85-177970] p 42 N85-30976 DOCUMENTS Technical order managers handbook Utilization [AD-A147579] p 37 N85-16694 Provision of Federal government publication in electronic format to depository libraries [S-PRT-98-260] p 38 N85-19880 DYNAMICAL SYSTEMS A methodology for organizing performance requirements p 20 A85-25117 for complex dynamical systems Ε EARTH OBSERVATIONS (FROM SPACE) Commercialization of remote-sensing technology p 64 A85-41657 EARTH ORBITS p 48 N85-15785 Broadening the debate Debris in the geostationary orbit ring, the endless shooting gallery. The necessity for a disposal policy p 94 N85-21214 Considerations for policy on man-made debris propagation control p 94 N85-21219 EARTH RADIATION BUDGET EXPERIMENT The 1986 National Aeronautics and Space Administration authorization [GPO-47-635] p 57 N85-35829 ECONOMIC ANALYSIS What are we in business for? - An engineering approach to project finance p 61 A85-27648 Orbital vehicle transportation - Issues of law and insurance [AIAA PAPER 85-1337] Airline deregulation - Another look p 91 A85-39731 p 92 A85-44099 Foreign civil aviation competition 1976 summary and implications [NASA-TM-X-73907] p 67 N85-10907 Satellite servicing A business opportunity? p 69 N85-11056 Doing business in space How to get there from here p 69 N85-11057 Robotics investment decision model user's manual [AD-A145467] p 26 N85-11347

Economic analysis handbook [AD-A146263] p 69 N85-12805 Life cycle cost management master plan for the Defense Communications Agency

p 14 N85-16668 [AD-A146876] A decision model for selection of microcomputers and

erating systems p 15 N85-19694 [AD-A149076]

A-9

#### ECONOMIC DEVELOPMENT

Transportation		
[JPRS-UTR-85-004]	p 50	N85-21105
Investment justification of robot	pzz uc teo	chnoloav in
aerospace manufacturing User's mai	nual	
[AD-A156193]	p 23	N85-35410
ECONOMIC DEVELOPMENT	2000	
Systems research on china in year	p 50	N85-21418
Spin-offs from technical scientific int	frastruc	tures, no 1
•	p 55	N85-32034
Spin-offs from technical commercial	Infrast	ructures, no
2 Spin offer from technical ec	p 55	N85-32035
organizations, no 5	p 55	N85-32036
Testimony of Robert A Frosch before	the Su	ibcommittee
on HUD and Independent Agencie	s of	the Senate
Committee on Appropriations	n 97	N85-33173
ECONOMIC FACTORS	p 0,	1100 00170
Economic considerations in selecting	g space	ecraft quality
electronic parts	p 81	A85-38267
Second Symposium on Space Industry	poo nalizati	A65-43160
commercialization		
[NA\$A-CP-2313]	p 67	N85-11011
Satellite servicing A business oppo	rtunity'	NOE 11056
USSB report Science and technologic	n oa In ooli	1465-11050
[JPRS-UST-85-002]	p 95	N85-23442
ECONOMIC IMPACT		
Distributed photovoltaic system	mpact	upon utility
FCONOMICS	p 58	A85-11349
International cooperation and comp	etitior	n in space
Introduction	p 69	N85-11912
An evaluation of the effect of estab	lishing	a minimum
tem management system	ne Air	Force EOU
[AD-A147121]	p 75	N85-16673
FRG study looks at participation i	n ESA	, US space
station	p 49	N85-17191
Issues in air transport	n 71	N85-18030
USSB report Science and technolo	av noli	1465-16030
[JPRS-UST-85-002]	p 95	N85-23442
EQQ (Economic Order Quantity) ran	ge moo	del
[AD-A153709]	p 77	N85-30965
[AD-A153709] ECONOMY Ouglity analysis	р 77 п 22	N85-30965
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS)	р 77 р 22	N85-30965 N85-32785
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the	p 77 p 22 mana	N85-30965 N85-32785 gement of
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA or 174013]	p 77 p 22 mana	N85-30965 N85-32785 gement of
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDIJCATION	p 77 p 22 mana p 35	N85-30965 N85-32785 gement of N85-10685
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee	p77 p22 mana p35 ersattf	N85-30965 N85-32785 gement of N85-10685 ne Air Force
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview	p77 p22 mana p35 ersatth	N85-30965 N85-32785 gement of N85-10685 ne Air Force
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528]	p77 p22 mana p35 ersattr p1	N85-30965 N85-32785 gement of N85-10685 he Air Force A85-13587
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs	p 77 p 22 mana p 35 ers at th p 1 as aid:	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical material	p77 p22 mana p35 ersattr p1 asaide anagen	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-17776
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mil-	p 77 p 22 mana p 35 ers at th p 1 as aid: anagen p 19 group	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-17776 learning
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical speciality to technical mi- Interpersonal activity in conditions of	p 77 p 22 mana p 35 ers at th p 1 as aide anagen p 19 group p 2	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-17776 learning A85-23278
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specially to technical mi- Interpersonal activity in conditions of Interrelationship between learning ai	p 77 p 22 mana p 35 ers at th p 1 as aid: anagen p 19 group p 2 nd devi	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-17776 learning A85-23278 elopment in
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mil- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupatio	p 77 p 22 mana p 35 ers at th p 1 as aid: anagen p 19 group p 2 nd devinal act	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-17776 learning A85-17776 learning A85-23278 elopment in ivity
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical speciality to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupatio The periode sector - A global pool	p 77 p 22 mana p 35 ers at th p 1 as aidi anagen p 19 group p 2 nd devinal act p 3 of text	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving A85-23278 elopment in ivity A85-23285
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engined Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mi- Interpersonal activity in conditions of Interrelationship between learning ai the process of mastering an occupatio The private sector - A global pool for remote sensing training and program	p 77 p 22 mana p 35 ers at th p 1 as aide anagen p 19 group p 2 nd devinal act p 3 of tech	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 learning A85-23278 elopment in ivity A85-23285 inical talent oort
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mi- Interpersonal activity in conditions of Interrelationship between learning ai the process of mastering an occupatio The private sector - A global pool for remote sensing training and programs	p 77 p 22 mana p 35 ers at the p 3 group p 2 nd deven nal act p 3 of tech p 63	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13776 learning A85-23278 elopment in ivity A85-23285 nincal talent cort A85-37954
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical speciality to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupatio The private sector - A global pool for remote sensing training and programs Graduate education in propulsion	p 77 p 22 mana p 35 ers at th p 1 as add group group p 2 nd devinal act p 3 of tech m supp p 63	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-137776 learning A85-23278 elopment in ivity A85-23285 anical talent oort A85-37954
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specially to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupatio The private sector - A global pool for remote sensing training and programs Graduate education in propulsion [AIAA PAPER 85-1147]	p 77 p 22 mana p 35 ers at th p 1 group p 2 nal act p 3 of tech m supp p 63 p 3	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23285 nincal talent oort A85-37954 A85-39623
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupatio The private sector - A global pool for remote sensing training and programs [AIAA PAPER 85-1147] Training Task Hierarchy developm	p 77 p 22 mana p 35 ers at th p 1 as aid: anager p 19 p 2 nd device p 3 of tech m supp p 63 p 3 nent -	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23285 mincal talent cort A85-37954 A85-39623 in flight
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical m. Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupatio The private sector - A global pool for remote sensing training and progra: Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews	p 77 p 22 mana p 35 ers at th p 1 as aid: anager p 19 group p 2 nd dev p 3 of tech m supp p 63 p 3 nent - p 4	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving a85-13587 s in moving A85-13587 s in moving A85-32285 deopment in ivity A85-32285 anical talent bort A85-37954 A85-39623 in flight A85-45122
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical speciality to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupatio The private sector - A global pool for remote sensing training and prograi Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [E85-10013]	p 77 p 22 mana p 35 ers at th p 1 as add group p 2 p 3 of tech p 3 of tech p 63 p 3 nent - p 4 Fortal n 5	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving A85-23278 elopment in ivity A85-23285 nnical talent oort A85-37954 A85-39623 in flight A85-45122 eza (Ceara) N85-11426
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical speciality to technical mi- Interpersonal activity in conditions of Interrelationship between learning an the process of mastering an occupatio The private sector - A global pool for remote sensing training and progra: Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [E85-10013] Designing an expert system for th	p 77 p 22 mana p 35 ers at th p 1 group p 2 group p 2 group p 2 group p 2 group p 3 of tech m supp p 63 p 3 of tech Fortal p 5	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23285 ninical talent bort A85-37954 A85-39623 in flight A85-45122 eza (Ceara) N85-11426 automotive
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical speciality to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupation The private sector - A global pool for remote sensing training and programs Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [E85-10013] Designing an expert system for the leactrical troubleshooting	p 77 p 22 mana p 35 ers at th p 1 as add- anager p 19 group p 2 md devt p 3 of tech m supp p 63 p 3 nent - p 4 Fortal p 5 Fortal	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-17776 learning A85-23278 elopment in wity A85-23285 nincal talent oort A85-37954 A85-45122 eza (Ceara) N85-11426 automotive
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engined Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupation The private sector - A global pool for remote sensing training and programs Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [85-10013] Designing an expert system for tr lefoctrical troubleshooting [AD-P003926]	p 77 p 22 mana p 35 ers at th p 1 as audianager p 19 group p 2 f 2 of tech m supp p 63 p 3 enent - p 4 F Fortal p 5 sauning p 26	N85-30965 N85-32785 gement of N85-10685 he Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-32784 A85-32784 A85-32855 nincal talent oort A85-37954 A85-37954 A85-39623 in flight A85-39623 in flight A85-11426 automotive N85-11606
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engined Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupation The private sector - A global pool for remote sensing training and programs Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [E85-10013] Designing an expert system for te electrical troubleshooting [AD-PO03926] Human factors and training res	p 77 p 22 mana p 35 ers at th p 1 as aid: anager p 19 group p 2 group p 2 group g g g g g g g g g g g g g g g g g g g	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23278 elopment in ivity A85-23285 mical talent port A85-37954 A85-37954 A85-37954 A85-37954 A85-39623 in flight A85-39623 automotive N85-11426 automotive N85-11606 in military
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupatio The private sector - A global pool for remote sensing training and progra Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [E85-10013] Designing an expert system for the electrical troubleshooting [AD-Pat68921]	p 77 p 22 mana p 35 rrs at th p 1 as addi p 1 as addi p 1 9 group p 2 group p 2 group p 2 d dev malact p 3 soft dech m supp p 5 group p 2 f 3 nent - p 5 soft d dev nalact p 5 soft d dev f 5 soft d d dev f 5 soft d d dev f 5 soft d d d d d d d d d d d d d d d d d d d	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in Nty A85-23278 elopment in Nty A85-23285 mical talent ort A85-37954 A85-37954 A85-39623 in flight A85-45122 eza (Ceara) N85-11426 automotive N85-11606 in military N85-16475
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mi- Interpersonal activity in conditions of Interrelationship between learning ai the process of mastering an occupatio The private sector - A global pool - for remote sensing training and progra. Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [E85-10013] Designing an expert system for ti electincal troubleshooting [AD-A146832] Training nucle for scientific and em-	p 77 p 22 mana p 35 ers at th p 1 as addianagen p 19 group p 2 group p 2 of tech m supp p 63 p 3 neent - p 4 Fortal p 5 Fortal p 5 eaarch p 5 group p 2 for supp p 2 for supp for supp f	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elearning A85-23278 elearning A85-23285 nical talent oort A85-37954 A85-37954 A85-37954 A85-37954 A85-45122 eza (Ceara) N85-11426 automotive N85-11606 in military N85-16475 on frainees
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical speciality to technical mi- Interpersonal activity in conditions of Interrelationship between learning ai the process of mastering an occupatio The private sector - A global pool for remote sensing training and progra: Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [E85-10013] Designing an expert system for ti electrical troubleshooting [AD-P003926] Human factors and training resi organizations and systems [AD-A146832] Training guide for scientific and en- 1984	p 77 p 22 mana p 35 ers at th p 1 as add anager p 19 group p 2 group p 2 of tech m supp p 63 p 3 nent - p 4 Fortal p 5 saning p 26 earch p 5 signeen	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23285 nincal talent iort A85-37954 A85-37954 A85-39623 in flight A85-37954 automotive N85-11426 automotive N85-116475 in military N85-16475 ng trainees
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupatio The private sector - A global pool for remote sensing training and programs Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for arcrews A report on the training course at [E85-10013] Designing an expert system for tu electrical troubleshooting [AD-P003926] Human factors and training res organizations and systems [AD-A146832] Training guide for scientific and en- 1884 [AD-A147963]	p 77 p 22 mana p 35 ers at ff p 1 as add anager p 1 group p 2 f group p 2 f group p 2 d dev p 3 nent - p 3 nent - p 4 Fortal p 5 saining p 26 earch p 5 guneening p 26 p 3 nent - p 4 Fortal p 5 saining p 26 p 3 f 5 f 7 f 7 f 7 f 7 f 7 f 7 f 7 f 7 f 7 f 7	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23285 anical talent oort A85-23285 A85-37954 A85-45122 eza (Ceara) N85-11426 automotive N85-11606 in military N85-16475 ng trainees N85-17542
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical speciality to technical mi- interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupation The private sector - A global pool for remote sensing training and programs Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for arcrews A report on the training course at [E85-10013] Designing an expert system for the leectrical troubleshooting [AD-P003926] Human factors and training resi organizations and systems [AD-A146832] Training guide for scientific and en- 1984	p 77 p 22 mana p 35 ers at th p 1 as add anager p 19 group p 20 ers at th p 1 as add p 3 of tech m supp p 6 a p 5 earch p 5 guneenu p 5 earch p 5 guneenu p 5 earch p 5 earch p 5 earch p 5 earch p 5 earch p 5 earch p 7 earch p 7 earch earch p 7 earch p 7 e a a a a a a a a a a a a a a a a a a	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in wity A85-23285 onical talent ovit A85-37954 A85-37954 A85-45122 eza (Ceara) N85-11426 automotive N85-11606 in military N85-16475 ng trainees N85-17542 a DOD Ada
[AD-A153709] ECONOMY Quality analysis EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017] EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical specialty to technical mi- Interpersonal activity in conditions of Interrelationship between learning and the process of mastering an occupation The private sector - A global pool for remote sensing training and prograi Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [85-10013] Designing an expert system for tr electrical troubleshooting [AD-P003926] Human factors and training resi organizations and systems [AD-A147963] Concept paper for the developme (trademark) software engineering educ plan	p 77 p 22 mana p 35 ers at th p 1 as audianager p 19 group p 20 f tech m supp p 63 p 3 of tech m supp p 63 p 4 F Fortal p 5 guneen p 5 guneen p 5 guneen p 5 at the fortal p 5 earch a for a for a for a fortal p 5 guneen p 6 a for a for a for a fortal p 6 a for a fortal for a fortal p 5 guneen p 6 a fortal fortal p 5 guneen p 6 a fortal fortal fortal fortal fortal p 6 a fortal f	N85-30965 N85-32785 gement of N85-10685 he Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23285 nincal talent ovit A85-339623 in flight A85-39623 in flight A85-45122 eza (Ceara) N85-11426 automotive N85-11606 in military N85-16475 ng trainees N85-17542 a DOD Ada and training
<ul> <li>[AD-A153709]</li> <li>ECONOMY Quality analysis</li> <li>EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [INASA-CR-174017]</li> <li>EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528]</li> <li>Engineering management programs from technical specially to technical mi- interpersonal activity in conditions of Interrelationship between learning an the process of mastering an occupation [AIAA PAPER 85-1147]</li> <li>Training Task Hierarchy developm simulation for aircrews A report on the training course at [85-10013]</li> <li>Designing an expert system for til electrical troubleshooting [AD-A146832]</li> <li>Training guide for scientific and en- 1984</li> <li>[AD-A147963]</li> <li>Concept paper for the developme (trademark) software engineering educ plan</li> </ul>	p 77 p 22 mana p 35 ers at th p 1 as add p 35 ers at th p 1 as add p 1 as add p 1 group p 2 for an p 2 for a b p 3 nent - p 4 Fortal p 5 guneen p 2 for a b p 4 Fortal p 5 for a c p 4 Fortal p 5 for a c p 4 for a c p 5 guneen p 2 for a b for a c p 5 for a c for	N85-30965 N85-32785 gement of N85-10685 he Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-32784 A85-3285 nincal talent port A85-37954 A85-37954 A85-39623 in flight A85-39623 in flight A85-39623 in flight A85-11426 automotive N85-11606 in military N85-16475 ng trainees N85-17542 a DOD Ada and training N85-17592
<ul> <li>[AD-A153709]</li> <li>ECONOMY Quality analysis</li> <li>EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017]</li> <li>EDUCATION Training and development of engineer Flight Test Center - An overview [AIAA PAPER 84-2528]</li> <li>Engineering management programs from technical specialty to technical millinterpersonal activity in conditions of interrelationship between learning an the process of mastering an occupation [AIAA PAPER 85-1147]</li> <li>Training Task Hierarchy developmismulation for aircrews</li> <li>A report on the training course at [E85-10013]</li> <li>Designing an expert system for tr electrical troubleshooting [AD-P003926]</li> <li>Human factors and training resorganizations and systems</li> <li>[AD-A147963]</li> <li>Concept paper for the developme (trademark) software engineering educ plan</li> <li>[AD-A148774]</li> <li>Pilot education and safety awarenesis</li> </ul>	p 77 p 22 mana p 35 rrs at th p 1 as addi p 35 rs at th p 1 as addi p 1 group p 2 group p 3 group p 3 group group p 3 group g g g g g g g g g g g g g	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23285 elopment in ivity A85-23285 elopment in ivity A85-23285 anical talent ort A85-37954 A85-37954 A85-39623 in flight A85-39623 in flight A85-39623 automotive N85-11426 automotive N85-116475 ng trainees N85-17542 and training N85-17592 ams
[AD-A153709]         ECONOMY         Quality analysis         EDITING ROUTINES (COMPUTERS)         SAGA A project to automate the software production systems         [NASA-CR-174017]         EDUCATION         Training and development of engineer Flight Test Center - An overview         [AIAA PAPER 84-2528]         Engineering management programs from technical speciality to technical minimum technical and systems         [AD-A146832]       Training guide for scientific and eminimation speciality and systems         [AD-A147963]       Concept paper for the developmering educing plan         [AD-A148774]       Pilot education and safety awareness	p $77$ p $22$ mana p $35$ ers at th p $35$ ers at th p $1$ as addianager p $19$ group p $2$ of tech p $p$ d devices p $2$ of tech p $p$ of tech p $p$ f $3$ nent - $p$ f $3$ n	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23285 nincal talent out A85-339623 a. in flight A85-37954 A85-39623 automotive N85-11426 automotive N85-11426 in military N85-11406 in military N85-11406 in military N85-11426 automotive N85-11592 ams N85-18026
<ul> <li>[AD-A153709]</li> <li>ECONOMY Ouality analysis</li> <li>EDITING ROUTINES (COMPUTERS) SAGA A project to automate the         software production systems         [NASA-CR-174017]</li> <li>EDUCATION Training and development of enginee         Fight Test Center - An overview         [AIAA PAPER 84-2528]         Engineering management programs         from technical speciality to technical mi         Interpersonal activity in conditions of         Interrelationship between learning an         the process of mastering an occupatio         The private sector - A global pool         for remote sensing training and program         Graduate education in propulsion         [AIAA PAPER 85-1147]         Training Task Hierarchy developm         simulation for arcrews         A report on the training course at         [E85-10013]         Designing an expert system for tu         electrical troubleshooting         [AD-A146832]         Training guide for scientific and en         1984         [AD-A146832]         Concept paper for the developme         (trademark) software engineering educ         plan         [AD-A148774]         Pilot education and safety awareness         Innovative approaches to recurrent to         [Innovative approaches to recurrent to         [Anovative approaches to recurrent to         [Innovative approaches to recurrent to         [Innovative approaches to recurrent to         [Innovative approaches         [Innovative approaches</li></ul>	p 77 p 22 mana p 35 ers at ff p 1 group p 2 f 2 group p 2 f 3 group p 2 f 3 n a add p 3 of tech m supp p 6 a f 3 n ent - p 4 Fortal p 5 guneen p 4 Fortal p 5 earch a f 6 f 7 f 7 f 7 f 7 f 7 f 7 f 7 f 7 f 7 f 7	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-23278 elopment in ivity A85-23285 dopment in ivity A85-23285 anical talent oort A85-37954 A85-45122 eza (Ceara) N85-11426 automotive N85-11606 in military N85-16475 ng trainees N85-17542 a DOD Ada and training N85-17592 ams
<ul> <li>[AD-A153709]</li> <li>ECONOMY Quality analysis</li> <li>EDITING ROUTINES (COMPUTERS) SAGA A project to automate the software production systems [NASA-CR-174017]</li> <li>EDUCATION Training and development of enginee Flight Test Center - An overview [AIAA PAPER 84-2528] Engineering management programs from technical speciality to technical mi Interpersonal activity in conditions of Interrelationship between learning an ithe process of mastering an occupatio The private sector - A global pool for remote sensing training and prograt Graduate education in propulsion [AIAA PAPER 85-1147] Training Task Hierarchy developm simulation for aircrews A report on the training course at [E85-10013] Designing an expert system for tr electrical troubleshooting [AD-P003926] Human factors and training res organizations and systems [AD-A146832] Training guide for scientific and en 1984 [AD-A147963] Concept paper for the developme (trademark) software engineering educ plan [AD-A148774] Pilot education and safety awareness Innovative approaches to recurrent to Study of computers bytics of a sinders </li> </ul>	p 77 p 22 mana p 35 ers at th p 1 as add- anager p 19 group p 29 p 2 md devch p 3 of tech m supp p 6 group p 6 group p 2 p 3 soft tech m supp p 5 soft tech p 5 soft tech p 5 group p 6 group p 2 p 3 soft tech p 5 soft tech p 6 soft tech p 5 soft tech p 6 soft tech p 7 soft tech p 6 soft tech p 7 soft tech p 7	N85-30965 N85-32785 gement of N85-10685 ne Air Force A85-13587 s in moving nent A85-13587 s in moving nent A85-13587 elopment in nivity A85-23285 elopment in nivity A85-32784 A85-45122 eza (Ceara) N85-11426 automotive N85-11606 in military N85-16475 ng frainees N85-17592 ams N85-18028 N85-18028

The acquisition of procedures from text production-system analysis of transfer of training p 8 N85-24732 LAD-A1510291 Administration chief on air traffic control improvements

p 76 N85-25193 A learning strategy approach for teaching novice

computer programmers [AD-A151523] p 8 N85-26200 A review of safety practices and safety training for the explosives field

[AD-A152295] p 8 N85-27028 EFFICIENCY

Maintenance Management Information and Control System (MMICS) Administrative boon or burden p 75 N85-12790 [AD-A145762]

ELECTRICAL ENGINEERING

East Europe report Scientific affairs [JPRS-ESA-84-006] p 50 N85-20684 ELECTRICITY

Designing an expert system for training automotive electrical troubleshooting p 26 N85-11606 [AD-P003926]

ELECTROMAGNETIC FIELDS

European Scientific Notes, volume 38, number 12 p 50 N85-18946 [AD-A148713] ELECTRONIC AIRCRAFT

DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 2 Plenary session

p 57 N85-35811 AD-A1560681 ELECTRONIC EQUIPMENT Contractor experience using RADC ORACLE

p 47 A85-49556 How much does it cost/how much does it weigh? [SAWE PAPER 1593] p 67 A85-49913 The psychology of technical devices and technical discourse

[AD-P003929] p 27 N85-11609 Training capabilities test of Electronics Equipment Maintenance Trainer (EEMT) Findings and conclusions [AD-A146075] p 5 N85-12302 Outlook for expanding the Federal research in progress

evetern [AD-A148354] p 49 N85-17737 ELECTRONIC EQUIPMENT TESTS

Development tools - Case study for large systems --of digital avionics

[AIAA PAPER 84-2635] p 31 A85-17826 Military electronics - Why so unreliable? p 80 A85-18440

Support program planning - Managing to get it supported D 11 A85-26785 ATE for avionics ELECTRONIC TRANSDUCERS

Robot use in FRG increases but sensor technology p 29 N85-25605 lane ELECTRONIC WARFARE

Artificial intelligence - A new dimension in EW p 25 A85-49098

EMBEDDED COMPUTER SYSTEMS Ada - A good start, an exciting future p 34 A85-41549

Software reliability - Let's start doing it p 82 A85-49562

EMERGENCIES Design of a scientific information collation and

dissemination system, volumes 1 thru 3 p 14 N85-12791 [AD-A146002]

Fire service emergency management handbook [AD-A155780] p 19 N85-35313 EMOTIONAL FACTORS

Decision making in stressful conditions A model based on the coping perspective [FOA-C-55064-H31

p 15 N85-17738 EMPLOYEE RELATIONS

Labor-management cooperative programs p 4 A85-43200 Sony keeps high quality and productivity in the United

p 66 A85-43203 States Data processing professionals and DP application users' perceptions and expectations of operational roles of persons working in a DP/application user interfac p 10 N85-35821 Iroup EMPLOYMENT

New technology implications on the work force p 21 A85-43189

ENERGY POLICY

The multiple functions of formal aids to decision making p 12 A85-42587 in public adencies ENERGY TECHNOLOGY

Executive information system

p 37 N85-13675 [DE84-015355] Emerging role of the national laboratory in the development and transfer of materials technology p 49 N85-18086 (DE85-001252)

Multicriteria decision analysis as an aid to strategic planning of energy research and development REPT-84-021 p 18 N85-28870 New technologies at the forefront of industrial p 56 N85-35168 developments ENGINEERING MANAGEMENT Aircraft maintenance --- Russian book p 19 A85-11245 Engineering management programs as aids in moving from technical specialty to technical management p 19 A85-17776 The management of failure p 79 A85-17779 Are decision support systems applicable to engineering management? p 19 A85-17780 Report-reading patterns of technical managers and p 10 A85-21540 A methodology for organizing performance requirements for complex dynamical systems p 20 A85-25117 Prototyping information systems on microcomputers -A design philosophy for engineering management p 33 A85-29401 Computers and the consulting engineer p 22 N85-26184 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 4, Workshop B VE on spare parts [AD-A156070] p 57 N85-35813 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 7, Workshop E VE in construction and architect engineer contracts [AD-A156073] p 57 N85-35816 ENVIRONMENT MANAGEMENT A guide for new environmental coordinators [AD-A156327] p 19 N85-35498 **ENVIRONMENT PROTECTION** A guide for new environmental coordinators [AD-A156327] p 19 N85-35498 ERROR ANALYSIS

nonmanagers

Measurement assurance programs Part 1 General introduction [PB84-217868] p 83 N85-10339

ERROR CORRECTING CODES A fault-tolerant software strategy for digital systems AIAA PAPER 84-2646 p 79 A85-17833 ERBOR DETECTION CODES

The linear software reliability model and uniform testing p 81 A85-37901 ESCAPE SYSTEMS

Aeronautical systems technology needs Escape. rescue and survival, test facilities and test equipment and

training-simulation equipment [AD-A145059] p 21 N85-10002 ESTIMATING

Statistical estimation of software reliability

p 80 A85-34449 EURECA (ESA) Spacelab and Eureca as a basis for European

nvolvement in the Space Station p 46 A85-42694 EUROPE European scientific notes Volume 38, number 11

[AD-A148228] p 49 N85-17745

East Europe report Science and technology PRS-ESA-84-032] p 51 N85-26833 [JPRS-ESA-84-032] EUROPEAN AIRBUS

Commission stacker - Incorporation in a total logistic concept --- for Airbus production

[MBB-UT-36-84-OE] p 73 A85-35073 MBB cost-reduction plan for Airbus construction escribed p 71 N85-25616 described

EUROPEAN SPACE AGENCY Orientation and trends in European technology --- space programs

. [IAF PAPER 84-377] p 59 A85-13233 The European approach to a standardized work breakdown structure concept for European scientific space

satellites [MBB-UR-688-84-OE] p 44 A85-16088

Europe's space odyssey 2000 p 44 A85-23921 Europe in space 1985-2000 p 45 A85-26011

The ESA science programme p 45 A85-34146 Non-US approaches to space commercialization

p 67 N85-11012

The ESA product assurance specification system Explanatory note p 83 N85-13259

FRG study looks at participation in ESA, US space

station p 49 N85-17191 Commercial space Europe should have independent

strategy p 71 N85-19205 European space science horizon 2000

p 51 N85-26771 [ESA-SP-1070] Documentation for the West German Federal Cabinet's space policy decision

p 96 N85-28886

New ESA director on Anane, space station, future trends p 53 N85-29096

FRG weighs ESA participation, budget issues
ELIBODEAN SPACE PROGRAMS
Space station related investigations in Europe
[IAF PAPER 84-28] p 43 A85-12994
Future prospects in space envisaged by a forum of
European space companies p 44 A85-16302
Europe's space odyssey 2000 p 44 A85-23921
Furancing for a joint space station p 44 A85-25856
The ESA science programme p 45 A85-2001
Progress of Europe's Agape Jauncher challenges U.S.
Shuttle on cost issue p 62 A85-34219
Germany cites commercial fallout as justification for U S
Station involvement p 62 A85-34220
Symposium on Industrial Activity in Space, Stresa, Italy,
May 2-4, 1984, Proceedings p 63 A85-38901 Space - The challenge of a new convergement
n 63 A85-38902
European space industry's potential
p 64 A85-38904
A systems-analysis comparison of space station
[DGLB PAPER 84-118] 0 45 A85-40334
Hermes - Does Europe need its own spaceplane?
p 64 A85-41534
Remarks on German space policy - 1985 to 1995
[AAS PAPER 84-319] D 64 A85-42553 Specelab and European as a basis for European
involvement in the Space Station o 46 A85-42694
Non-US approaches to space commercialization
p 67 N85-11012
European space science horizon 2000
[ESA-SP-1070] p 51 N85-26771
space policy decision p 96 N85-28886
Space station study
[BL-6167] p 53 N85-28959
Studies toward a manned space station Participation
of European industry in NASA space station (MSS)
The Expendable Launch Vehicle Commercialization
Act
[CBO 20 828] - 02 NRE 12010
[GEO-00-000] b ao 1400-12010
Commercial space launches
[Groups - 201030]         p 93         N85-12919           Commercial space launches         [S-REPT-98-656]         p 95         N85-21225           EXPERIMENT DESIGN         P 95         N85-21225
Commercial space launches         p.95         N85-1215           Commercial space launches         [S-REPT-98-656]         p.95         N85-21225           EXPERIMENT DESIGN         An engineer's guide to books on statistics and data
[Groupsdag     p 93     N85-12919       Commercial space launches     [S-REPT-98-656]     p 95     N85-21225       EXPERIMENT DESIGN     An engineer's guide to books on statistics and data analysis     p 10     A85-12647
(Groupsdag)     p 93     N85-12919       Commercial space launches     [S-REPT-98-656]     p 95     N85-21225       EXPERIMENT DESIGN     An engineer's guide to books on statistics and data analysis     p 10     A85-12647       Laboratory research     A question of when, not if     p 10     A85-12647
[GP-00-050-805]     p 95     N85-12919       Commercial space launches     [S-REPT-98-656]     p 95     N85-21225       EXPERIMENT DESIGN     An engineer's guide to books on statistics and data analysis     p 10     A85-12647       Laboratory research     A question of when, not if     [AD-A153298]     p 53     N85-26867
(GP-00-050-805)     p.95     N85-12919       Commercial space launches     [S-REPT-98-656]     p.95     N85-21225       EXPERIMENT DESIGN     An engineer's guide to books on statistics and data analysis     p.10     A85-12647       Laboratory research     A question of when, not if     [AD-A153298]     p.53     N85-28867       EXPERT SYSTEMS     Model-based reasoning in event evidems - An
(Groupsdag)       p 93       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A153298]       p 53       N85-28667         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       An       An
(Groupsdag)     p 93     N85-12919       Commercial space launches     [S-REPT-98-656]     p 95     N85-21225       EXPERIMENT DESIGN     An engineer's guide to books on statistics and data analysis     p 10     A85-12647       Laboratory research     A question of when, not if     (AD-A15298)     p 53     N85-28867       EXPERT SYSTEMS     Model-based reasoning in expert systems - An application to enroute air traffic control     A85-17817
(Groupsdag)       p 93       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A153298]       p 53       N85-28867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload       P 30       R85-28867
(Groupsdage)       p 95       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A153298]       p 53       N85-28867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload assessment       p 24       A85-21569
(Groupsdag)       p 95       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [A-A153298]       p 53       N85-26867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload assessment       p 24       A85-21569       Developments in decision support systems
(Dr.00-00-000)       p 95       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A153298]       p 53       N85-28667         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for arcraft crew workload assessment       p 24       A85-21569         Developments in decision support systems       p 25       A85-31792         Toward the fully capable Al space mission planner
(Groupsdag)       p 93       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A15298]       p 53       N85-28667         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for arcraft crew workload assessment       p 24       A85-21569         Developments in decision support systems       p 25       A85-31792         Toward the fully capable AI space mission planner       p 25       A85-42892
(GP-00-00-00)       p 93       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       (AD-A15298)       p 53       N85-28867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload assessment       p 24       A85-21569       Developments in decision support systems         Toward the fully capable Al space mission planner       p 25       A85-42892         TIMM - The intelligent machine model       p 24       A85-42892
(Drosoresci)       p 93       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A153298]       p 53       N85-28867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload assessment       p 24       A85-21569       Developments in decision support systems         P 25       A85-31792       Toward the fully capable Al space mission planner       p 25       A85-42892         TIMM - The intelligent machine model       p 25       A85-45087
(Droso-soll)       p 93       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A153298]       p 53       N85-28867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload assessment       p 24       A85-21569       Developments in decision support systems         Developments in decision support systems       p 25       A85-42892       TIMM - The intelligent machine model         The modeling of human cognitive decision processes in The intelligent machine model       p 25       A85-45087
(Drosorsol)       p 95       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A153298]       p 53       N85-26867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload assessment       p 24       A85-21569         Developments in decision support systems       p 25       A85-31792         Toward the fully capable Al space mission planner       p 25       A85-45087         The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM)       p 25       A85-45087
(Drosoress)       p 95       N85-12315         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A15298]       p 53       N85-28667         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for arcraft crew workload assessment       p 24       A85-21569         Developments in decision support systems       p 25       A85-31792         Toward the fully capable Al space mission planner       p 25       A85-42892         TIMM - The intelligent machine model       p 25       A85-45087         The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM)       p 25       A85-47677         Representation of activity knowledge for project       A85-47677       Representation of activity knowledge for project
(Coroco-solo)       p 93       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       (AD-A15298]       p 53       N85-26867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload assessment       p 24       A85-21569         Developments in decision support systems       p 25       A85-31792         Toward the fully capable AI space mission planner       p 25       A85-42892         TIMM - The intelligent machine model       p 25       A85-45087         The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM)       p 25       A85-47677         Representation of activity knowledge for project management       p 46       A85-48595
(Corborosol)       p 93       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       (AD-A15298)       p 53       N85-28867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload assessment       p 24       A85-21569         Developments in decision support systems       p 25       A85-4892         Toward the fully capable AI space mission planner       p 25       A85-45087         The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM)       p 25       A85-45087         The modeling of activity knowledge for project management       p 46       A85-47677         Representation of activity knowledge for project management       p 46       A85-48595         Expert systems in software maintainability       p 26       A85-485-95
(Dr.00-00-00-00)       p 93       N85-12919         Commercial space launches       [S-REPT-98-656]       p 95       N85-21225         EXPERIMENT DESIGN       An engineer's guide to books on statistics and data analysis       p 10       A85-12647         Laboratory research       A question of when, not if       [AD-A15298]       p 53       N85-28867         EXPERT SYSTEMS       Model-based reasoning in expert systems - An application to enroute air traffic control       [AIAA PAPER 84-2619]       p 23       A85-17817         MESSAGE - An expert system for aircraft crew workload assessment       p 24       A85-21569         Developments in decision support systems       p 25       A85-42892         TIMM - The intelligent machine model       p 25       A85-43087         The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM)       p 25       A85-47677         Representation of activity knowledge for project management       p 46       A85-43563         Expert systems in software maintainability       p 26       A85-43563         Expert systems in software maintainability       p 26       A85-43563
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$
$ \begin{array}{llllllllllllllllllllllllllllllllllll$
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$
[S-REPT-98-656] p 95 N85-12319 Commercial space launches [S-REPT-98-656] p 95 N85-21225 EXPERIMENT DESIGN An engineer's guide to books on statistics and data analysis p 10 A85-12647 Laboratory research A question of when, not if (AD-A15298] p 53 N85-26867 EXPERT SYSTEMS Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 MESSAGE - An expert system for aircraft crew workload assessment p 24 A85-21569 Developments in decision support systems p 25 A85-31792 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-45087 The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) p 25 A85-47677 Representation of activity knowledge for project management p 46 A85-48595 Expert systems in software maintanability p 26 A85-49563 Designing an expert system for training automotive electrical troubleshooting [AD-P003926] p 26 N85-11606 Psychological issues in the design of expert systems [AD-A146081] p 27 N85-12792
$ \begin{array}{llllllllllllllllllllllllllllllllllll$
[S-REPT-98-656] p 95 N85-12415 Commercial space launches [S-REPT-98-656] p 95 N85-21225 EXPERIMENT DESIGN An engineer's guide to books on statistics and data analysis p 10 A85-12647 Laboratory research A question of when, not if [AD-A153298] p 53 N85-28667 EXPERT SYSTEMS Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 MESSAGE - An expert system for aircraft crew workload assessment p 24 A85-21569 Developments in decision support systems p 25 A85-31792 Toward the fully capable AI space mission planner p 25 A85-42892 TIMM - The intelligent machine model p 25 A85-45087 The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM) p 25 A85-47677 Representation of activity knowledge for project management p 26 A85-49563 Designing an expert system for training automotive electrical troubleshooting [AD-A146081] p 27 N85-12792 The application of artificial intelligence to contract management [AD-A146681] p 27 N85-15448
$ \begin{array}{llllllllllllllllllllllllllllllllllll$
$ \begin{array}{llllllllllllllllllllllllllllllllllll$
$ \begin{array}{llllllllllllllllllllllllllllllllllll$
$ \begin{array}{llllllllllllllllllllllllllllllllllll$
$ \begin{array}{llllllllllllllllllllllllllllllllllll$
[S-REPT-98-656] p 95 N85-12315 Commercial space launches [S-REPT-98-656] p 95 N85-21225 EXPERIMENT DESIGN An engineer's guide to books on statistics and data analysis p 10 A85-12647 Laboratory research A question of when, not if [AD-A153298] p 53 N85-28667 EXPERT SYSTEMS Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 MESSAGE - An expert system for aircraft crew workload assessment p 24 A85-21569 Developments in decision support systems p 25 A85-1792 Toward the fully capable AI space mission planner p 25 A85-45087 The modeling of human cognitive decision processes in The intelligent machine model p 25 A85-45087 The modeling of human cognitive decision processes in The intelligent Machine Model (TIMM) p 26 A85-4563 Designing an expert system for training automotive electrical troubleshooting [AD-P003926] p 26 N85-11606 Psychological issues in the design of expert systems [AD-814681] p 27 N85-15448 Mental models and cooperative problem solving with expert systems in contract management [AD-146681] p 27 N85-15448 Mental models and cooperative problem solving with expert systems in contract management A pilot study [AD-149363] p 29 N85-16479 Expert systems in contract management A pilot study [AD-A151074] p 29 N85-21316 Gordon Conference on Fundamentals of Cybernetics [AD-A151074] p 29 N85-24842 Expanding experts system sol en expert systems to corrosion problems [AD-A151074] p 29 N85-24842 Expanding experts by use of an expert system?

EXPLOSIVES

A review of safety practices and safety training for the explosives field [AD-A152295] p 8 N85-27028

- EXTRAVEHICULAR ACTIVITY Space station automation and robotics study Operator-systems interface
- [NASA-CR-176095] p 31 N85-33172 EXTREME ULTRAVIOLET EXPLORER SATELLITE The 1986 National Aeronautics and Space Administration authorization
  - [GPO-47-635] p 57 N85-35829

# F

- F-15 AIRCRAFT
- USAF negotiating contracts for F100. F110 improvements p 45 A85-35448 F-16 AIRCRAFT USAF negotiating contracts for F100. F110 p 45 A85-35448 Improvements FACTOR ANALYSIS Telecommunication market research processing [ENST-83E018] p 42 N85-34331 FAILURE ANALYSIS General probability of system failure p 78 A85-10057
  - The management of failure p 79 A85.17779 A system reliability model with classes of failures p 81 A85-37904
  - Field data The final measure --- of systems reliability p 82 A85-49543
  - Material flow in the manufacturing system
- Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618
- FAILURE MODES Failure modes and effects analysis method for new
- product introductions [SAE PAPER 841600] p 73 A85-39070
- FATIGUE (MATERIALS)
- Failure prevention and reliability 1983, Proceedings of the Fifth Conference, Dearborn, MJ, September 11-14, 1983
   p 78

   FAULT TOLERANCE
   p 78
   A85-11666

   A fault-tolerant software strategy for digital systems [AIAA PAPER 84-2646]
   p 79
   A85-17833

   Using Ada for a distributed, fault tolerant system [AIAA PAPER 84-2703]
   p 79
   A85-17873

   Optimal maintenance center inventories for fault-tolerant repairable systems
   p 72
   A85-21548
- Performance/reliability measures for fault-tolerant computing systems p 80 A85-25108 A fault tolerant military Satellite Network Management System p 80 A85-34460
- Implementing fault-tolerant distributed objects p 80 A85-36291 A technique for estimating performance of fault-tolerant
- programs p 81 A85-36297
- Effects of redundancy management on reliability modelling p 13 A85-47795 R&M analysis techniques for fault-tolerant systems p 74 A85-49588
- A unified model for performance and reliability of Fault-Tolerant/Multi-Mode systems [AD-A148789] p 84 N85-17601
- EASIBILITY ANALYSIS U S initiatives in space commercialization
- U S initiatives in space commercialization [IAF PAPER 84-223] p 63 A85-35978 Robotics investment decision model user's manual [AD-A145467] p 26 N85-11347 Note for a research feasibility project High reliability design in the aeronautical field [REPT-84-RR-350] p 85 N85-31005
- Feasibility of applications of Competition Decision Assist Package (CDAP) to spare parts [AD-A154716] p 77 N85-33036
- FEDERAL BUDGETS
- Department of Housing and Urban Development, and certain independent agencies appropriations for fiscal year 1985, part 2
- [S-REPT-98-889-PT-2] p 93 N85-10870 National Aeronautics and Space Administration p 93 N85-10871
- Financing considerations and Federal budget impacts p 94 N85-15792
- Outlook for expanding the Federal research in progress system [AD-A148354] p 49 N85-17737 1984 science and technology posture hearing with the director of the Office of Science and Technology Policy [GPO-41-060] p 95 N85-22244
- An agenda for a study of government science policy [GPO-40-860] p 95 N85-22245

FINANCIAL MANAGEMENT

President's private sector survey on cost control, report on research and development p 95 N85-22253 [PB84-173269] Department of Housing and Urban Development-independent agencies appropriations for 1986 Part 6 National Aeronautics and Space Administration [GPO-47-235] p 96 N85-27768 Department of Housing Urban and Development-Independent Agencies Appropriation Bill, 1986 [H-REPT-99-212] p 96 N85-30979 National Aeronautics and Space Administration p 54 N85-30980 NASA authorization, 1986, volume 1 [GPO-46-385] p 97 N85-32039 Department of Housing and Urban Development-Independent Agencies Appropriation Act, 1986 p 97 N85-32041 National Aeronautics and Space Administration research p 97 N85-32042 and development Testimony of Robert A Frosch before the Subcommittee on HUD and Independent Agencies of the Senate Committee on Appropriations [NASA-TM-87496] p 97 N85-33173 Department of Housing and Urban Development Independent Agencies Appropriation Bill, 1986 [S-REPT-99-129] p 97 N85-34720 National Aeronautics and Space Administration research and development Program description p 56 N85-34721 Progress report on implementing the recommendations of the White House Science Council's Federal Laboratory Review Panel, volume 1 [PB85-185072] p 78 N85-35819 FEEDBACK Optimizing search with positive information feedback [CSIR-TWISK-313] p 36 N85-10855 p 36 N85-10855 FEEDBACK CONTROL Quality characteristic feedback control p 20 A85-35100 Human-system performance measurement in training simulators p 5 A85-48752 FIBER OPTICS UK, FRG, France R and D in sensors, related fields p 49 N85-17197 Worldwide report Telecommunications policy, research and development p 94 N85-19309 [.IPBS.TTP.85.0021 FILE MAINTENANCE (COMPUTERS) TALLY - An ATLAS program statistical data gathering tool p 32 A85-26830 FINANCE Balancing taking risk d encouraging p 66 A85-43196 and entrepreneurism Financial issues for commercial space ventures Paving p 67 N85-11014 for the dreams A microcomputer tutorial on spreadsheets and databases with a simulated budget preparation [AD-A155516] p 72 N85-32813 FINANCIAL MANAGEMENT A simple method for evaluation and selection of R&D proposals for a competitive grant fund p 44 A85-13920 p 59 A85-14923 Financing space industrialization What are we in business for? - An engineering approach to project finance p 61 A85-27648 The congressional authorization process as it applies to aeronautical research and technology p 89 A85-29555 Obtaining title and financing transport category aircraft National and international implications p 91 A85-44097 Space commercialization Analysis of R and D p 68 N85-11052 investments with long time horizons Satellite servicing A business opportunity? p 69 N85-11056 Evaluation of the effectiveness of the weighted auidelines to induce contractor's investment in cost reducing facilities equipment [AD-A147586] p 70 N85-16681 Activities report of the aerospace industry in West Germany [ISSN-0722-3838] p 49 N85-16686 Activities report of the aerospace industry in West [ISSN-0722-38381 p 49 N85-16687 An analysis of a dynamic project cost problem (CSIR-TWISK-338) p 71 N85-23341 Management communication and financial modeling p 16 N85-26190 Information technology applications in voluntary sector transport operations SP1 Objectives and programme of work

p 71 N85-26457

[TT-8501]

A-11

microcomputer tutorial on spreadsheets and databases with a simulated budget preparation p 72 N85-32813 [AD-A155516]

User's operating procedures Volume 2 Scout project financial analysis program [NASA-CR-177949] p 42 N85-34519

FINITE ELEMENT METHOD Design principles for Finite Elements (FE) programs

concerned with intensely nonlinear problems --- German thesis p 33 A85-28797 thesis A methodology to design databases for finite element

analysis and structural design optimization applications p 33 A85-30283 [AIAA PAPER 85-0743] FIRES

Fire safety in transport category aircraft - Litigating a p 88 A85-24710 post-crash or in-flight aircraft fire FLIGHT CREWS

United Airlines' cockpit resource management training n 2 A85-21565 MESSAGE - An expert system for aircraft crew workload assessment p 24 A85-21569 Training Task Hierarchy development --- in flight p 4 A85-45122 simulation for aircrews Guidelines of the Federal Minister of Transportation for the formation and examination of airline personnel, part p 9 N85 28556

#### FLIGHT MANAGEMENT SYSTEMS Development tools - Case study for large systems ---

of digital avionics p 31 A85-17826 [AIAA PAPER 84-2635] Venfication techniques for improving software quality through automated requirements data bases p 79 A85-17848 [AIAA PAPER 84-2669]

Software design methods --- for civil and military aircraft avionics systems p 32 A85-21457 Concepts and algorithms for terminal-area traffic p 73 A85-47683 management FLIGHT SAFETY

- Pilot education and safety awareness programs p 6 N85-18026
- Aerospace Safety Advisory Panel p 85 N85-21135 [NASA-TM-87428] Improvements in personnel needed for better flight N85-23693 safety p 8

#### FLIGHT SIMULATION

- Training Task Hierarchy development --- in flight simulation for aircrews D 4 A85-45122 Initiative uses of aircraft for flight training p 6 N85-18027
- Innovative approaches to recurrent training N85-18028 р6 FLIGHT SIMULATORS

#### Simulators/training devices for commuter airlines p 1 A85-17232 Possible applications of simulators in various areas p 3 A85-29865 Training Task Hierarchy development --- in flight p 4 A85-45122 simulation for aircrews Determining training device requirements in Army p 5 N85-14558 aviation systems Low cost training aids and devices 06 N85-18025 Transportation p 50 N85-21105 [JPRS-UTR-85-0041 FLIGHT TESTS

Training and development of engineers at the Air Force Flight Test Center - An overview [AIAA PAPER 84-2528] p 1 A85-13587

- FLIGHT TRAINING The Myers-Briggs type indicator as a tool to identify flight p 2 A85-21581 student's learning styles T-45 training system - Concept and acquisition
- strategy [SAE PAPER 841588] р 3 A85-25986 Management training for cockpit crews at Piedmont
- p 6 N85-18013 flight Low cost training aids and devices р 6 N85-18025 Initiative uses of aircraft for flight training p 6 N85-18027

Innovative approaches to recurrent training p 6 N85-18028 Guidelines of the Federal Minister of Transportation for the formation and examination of airline personnel, part p 9 N85-28556

- FOOD PROCESSING Food service management p 16 N85-24736 FORECASTING
- Life cycle cost management master plan for the Defense Communications Agency [AD-A1468761 p 14 N85-16668
- Study to encourage and facilitate industrial investment and involvement in space [NASA-CR-176152] p 72 N85-34147 FORMAT
- Technical order managers handbook Utilization assessmen [AD-A147579] p.37 N85-16694

FRACTURE MECHANICS

- European Scientific Notes Volume 39, number 2 p 50 N85-19919 [AD-A148994] FRANCE
- French panel makes specific proposals for robotics research Current state of French robotics N85-20180
- p 29 French research minister on policy, technology transfer p 94 N85-20182 Search and rescue of aircraft in distress in France
- Organization, means p 77 N85-31096 FRENCH SPACE PROGRAMS
- Non-US approaches to space commercialization p 67 N85-11012 FUNCTIONS
- DLA Data/data base administration analysis
- [AD-A153031] p 40 N85-28879 FUZZY SETS
- Evaluation of the efficiency of operator work in man-machine systems p 25 A85-37566 Some applications of fuzzy sets and the analytical hierarchy process to decision making
- [AD-A150720] p 16 N85-24876

# G

- **GALILEO PROJECT** The 1986 National Aeronautics and
- Space Administration authorization (GPO-47-635) p 57 N85-35829
- GALLIUM ARSENIDES
- NASA space station automation Al-based technology 01/101
- [NASA-CR-176094] p 31 N85-32134 GAME THEORY
- Elements of the theory of multistep processes of sequential decision making --- Russian book
- p 34 A85-38643 GEOLOGY
- Organizing geological work tasks for 1985 outlined p 51 N85-27303 GEOPHYSICS
- European scientific notes Volume 38, number 11 p 49 N85-17745 D-A1482281
- GEOSYNCHRONOUS ORBITS Satellite broadcasting and the use of the geostationary orbit - Some international legal aspects
- p 90 A85-36289 Debris in the geostationary orbit ring, the endless shooting gallery The necessity for a disposal policy
- p 94 N85-21214 Civilian Space Stations and the US future in Space
- [OTA-STI-242] p 55 N85-31215 GLOBAL POSITIONING SYSTEM
- Widespread civil uses envisioned for satellite navigation p 62 A85-34217 svstem The Global Positioning System (GPS) DOD policy ISSUES p 91 A85-37805
- GOALS Broadening the debate p 48 N85-15785 National aeronautical R and D goals Technology for
- merica's future p 54 N85-30964 GOVERNMENT PROCUREMENT Government tools for the support of commercial
- entures [IAF PAPER 84-216] p 59 A85-13138 R&M implications of the DoD acquisition improvement program p 72 A85-14896 Civil certification of a US government procured helicopter p 90 A85-31968 V-22 Osprey development tests contract nev procurement policy D 45 A85-36421
- Productivity improvement the acquisition p 65 A85-43188 environment Hurdles stifling the federal manager's ability to improve p 66 A85-43201 productivity
- Contractor and government Teamwork and commitment p 46 A85-43206 Joint service acquisition management initiatives p 13 A85-45157 DOD software Establishing realistic requirements for reliability.
- maintainability, and built-in-test p 82 A85-49539 A buyer's guide to space infrastructure p 48 N85-15784
- Synopsis of the OTA Workshop on Cost Containment of Civilian Infrastructure (Civilian Space Station) p 48 N85-15790 Elements An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ
- item management system [AD-A147121] p 75 N85-16673 Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost educing facilities equipment
- p 70 N85-16681 [AD-A1475861

SUBJECT INDEX An analysis of production competition and award p 70 N85-17733 government Cost-plus-percentage-of-costs ın p 70 N85-17735 November-December 1984 Program manager The Journal of the Defense Systems 6. p 50 N85-20933

Copyright law, computer software, and government acquisition

methodology

contracts

AD-A1477751

[AD-A147779]

[AD-A149546]

- [AD-A150347] p 95 N85-23453 Life cycle costing in government procurement
- [AD-A151878] p 51 N85-26456 Navy program manager's guide, 1985 edition
- p 76 N85-27744 [AD-A151925] Automation of the reporting and tracking requirements
- of architect-engineering type contracts [AD-A152218] p 52 N85-27745
- Cost savings from multiyear contracting p 53 N85-29834 [AD-A153564]
- guide for Overhead management aerospace procurements
- [AD-A153626] p 18 N85-29835 Capital investment motivational techniques used by
- prime contractors on subcontractors [AD-A1536601 p 53 N85-29837
- Using incentives to improve maintainability p 54 N85-29841 [AD-A153792]
- Civilian Space Stations and the US future in Space [OTA-STI-242] p 55 N85-31215
- Feasibility of applications of Competition Decision Assist Package (CDAP) to spare parts
- p 77 N85-33036 [AD-A154716]
- GOVERNMENT/INDUSTRY RELATIONS US jurisdiction and bilateral air agreements
- p 86 A85-10050
- FAA regulation of ultralight vehicles p 86 A85-11938 NASA's approach to the commercial use of space
- [IAF PAPER 84-217] p 59 A85-13139 Federal policy options and the commercialization of
- [IAF PAPER 84-218] p 87 A85-13140 NASA formulates policy to spur private investment p 87 A85-18469 p 44 A85-23921 Europe's space odyssey 2000 The commercialization of space - Twenty years of
- p 88 A85-27373 experience Some lessons learned
- Commercialization of space Incentives, impediments p 61 A85-27375 and alternatives
- Registration and nationality of aircraft operated by international agencies in law and practice
  - p 89 A85-27396
- What are we in business for? An engineering approach to project finance project finance p 61 A85-27648 Launching the rocket industry in the United States -
- Domestic regulation of private expandable p 89 A85-30998 vehicles Attempt to regulate restrictive commercial practices in
- the field of air transportation within a transnational antitrust p 90 A85-30999 legal and institutional framework
- p 90 A85-33872 How does NASA plan to help? Evolving government policy eases way for space
- ventures p 90 A85-34214 An astronaut's look at commercial space opportunities p 62 A85-34216
- Remote sensing A tortuous trip to marketplace p 62 A85-34218
- USAF negotiating contracts F100 F110 for p 45 A85-35448 improvements
- development contract tests new Osprev p 45 A85-36421 procurement policy
- Need for alternative space launch services given NASA refusal to launch SPARX-01 mission under standard form
- commercial launch services agreement p 91 A85-38914
  - Some informal remarks on the M-form society p 46 A85-43182
- Preview of the President's Commission on Industrial Competitiveness p 66 A85-43199 Labor-management cooperative programs
  - p 4 A85-43200 p 66 A85-43202 Productivity initiatives at USDA

p 93 N85-11013

p 68 N85-11024

- Contractor and government Teamwork and commitment p 46 A85-43206
- Second Symposium on Space Industrialization --- space commercialization
- [NASA-CP-2313] p 67 N85-11011 Non-US approaches to space commercialization p 67 N85-11012 Legal considerations and cooperative opportunities for

Land remote sensing commercialization A status

space commercial activities

report

Concept for a commercial space station laboratory p 68 N85-11035 p 68 N85-11039 Commercial space services Analysis of R and D Space commercialization p 68 N85-11052 investments with long time horizons Doing business in space How to get there from here p 69 N85-11057 Contracting for computer software development Serious problems require management attention to avoid wasting additional millions [FGMSD-80-4] p 47 N85-11567 Land Remote-Sensing Commercialization Act p 93 N85-14201 [S-REPT-98-458] Financing considerations and Federal budget impacts p 94 N85-15792 Activities report in aerospace in West Germany p 50 N85-18947 [ISSN-0070-3966] 1984 science and technology posture hearing with the director of the Office of Science and Technology Policy p 95 N85-22244 [GPO-41-060] Transfer of technology p 50 N85-22246 [S-REPT-98-664] Status of the U K N D T industry today p 22 N85-24309 Criteria for qualifying for FRG federal CAD/CAM p 51 N85-25651 subsidies GOVERNMENTS International cooperation and competition in space GPO-38-001] GPO-38-001] p 69 N85-11911 International comparative study of systems for the government advancement of research and development p 48 N85-13689 [NASA-TM-77589] Publications of the Executive Office of the President January 20, 1981 - June 30, 1984 [PB84-230671] PB84-230671] p 93 N85-15533 Government contract contingent liabilities The anti-deficiency act, and the hobgoblin of little minds p 94 N85-16684 [AD-A1479191 Provision of Federal government publication in electronic format to depository libraries p 38 N85-19880 [S-PRT-98-260] 1984 science and technology posture hearing with the director of the Office of Science and Technology Policy p 95 N85-22244 [GPO-41-060] Methodology for assessing benefits and costs of government information collection p 41 N85-30975 [DE85-010594] GREAT LAKES (NORTH AMERICA) EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 - September 30, 1985 [P885-181881] p 55 N85-31676 GROUND WATER EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 - September 30. 1985 [PB85-181881] p 55 N85-31676 GROUP DYNAMICS Some perspectives on the study and improvement of the cognitive-creative activity of an individual and a p 2 A85-23276 group Interpersonal activity in conditions of group learning p 2 A85-23278 A research paradigm for multi-human decision making p 13 A85-47678 Research opportunities in human behavior and performance [NASA-CR-175473] n.6 N85-19640 Team dimensions Their identity, their measurement and their relationships [AD-A149662] p.8 N85-21978 Individual characteristics and unit performance. A review of research and methods [AD-A153145] p 9 N85-28550 Symbolic and interactional perspectives on leadership An integrative framework [AD-A155247] p 19 N85-32769 GROUP THEORY Group testing --- optimization of component reliability p 78 A85-12645 acceptance tests Н

HALLEY'S		т				
		•				~
Ihe	1986	National	Aeronaut	ics a	ind	Space
Adminis	tration a	uthorizatior	ו			
[GPO-4	7-635]			p 57	N85	-35829
HAND (AI	MOTAN	Y)				
Hand	controll	ers for tele	operation	A sta	ate-of	-the-art
technolo	ogy surv	ey and eval	luation			
[NASA-	CR-1758	390]		р9	N85	-28559
HANDBO	OKS					
Econo	omic ana	ilysis handt	book			
[AD-A14	46263]	-		p 69	N85	-12805

Project manager's handbook for special projects p 48 N85-16683 [AD-A147913] Technical order managers handbook Utilization assessment [AD-A147579] p 37 N85-16694 Fire service emergency management handbook [AD-A155780] p 19 N85-35313 A guide for new environmental coordinators p 19 N85-35498 AD-A156327] HANG GLIDERS FAA regulation of ultralight vehicles p 86 A85-11938 HARDWARE Software test program for computer hardware developments p 32 A85-26784 HARRIER AIRCRAFT AV-8B Harner II training capabilities p 3 A85-40554 [AIAA PAPER 85-1734] HAZARDS Orbital debris policy issues Battelle involvement and some personal observations p 94 N85-21218 A review of safety practices and safety training for the explosives field [AD-A152295] p 8 N85-27028 Fire service emergency management handbook p 19 N85-35313 [AD-A155780] HEALTH Health standards for general vibration p 84 N85-19607 HELICOPTER DESIGN New model introduction - The operators' perspective p 61 A85-31981 in helicopter industry HELICOPTERS Civil certification of a US government procured helicopter p 90 A85-31968 HELIOS PROJECT The Helios missions p 52 N85-27795 The significance of Helios for Europe p 52 N85-27808 Managerial benefits of Helios for the European p 52 N85-27809 industry p 17 N85-27812 Helios project support HERMES MANNED SPACEPLANE Hermes - Does Europe need its own spaceplane? p 64 A85-41534 HIERARCHIES Some applications of fuzzy sets and the analytical hierarchy process to decision making p 16 N85-24876 [AD-A150720] Models for multidimensional tests and hierarchically structured training materials [AD-A155231] p 10 N85-32768 HIGH LEVEL LANGUAGES Software test handbook [AD-A146844] p 37 N85-16498 HISTORIES Space research in the United Kingdom An assessment p 56 N85-33038 [AD-A155334] Opportunities for policy historians The evolution of the p 97 N85-35147 US civilian space program HUMAN BEHAVIOR Compatibility effects and preference reversals [AD-A148399] p 15 N85-17544 European scientific notes Volume 38, number 11 p 49 N85-17745 [AD-A148228] Communications skills for CRM training p6 N85-18017 European Scientific Notes, volume 38, number 12 p 50 N85-18946 [AD-A148713] Research opportunities in human behavior and performance [NASA-CR-175473] p 6 N85-19640 Individual characteristics and unit performance A review of research and methods [AD-A153145] p 9 N85-28550 HUMAN BODY Health standards for general vibration p 84 N85-19607 HUMAN FACTORS ENGINEERING A quantitative evaluation of human activity in man-machine systems --- Russian book p 23 A85-13599 Displays, deja vu --- avionics-human factors R&D p 1 A85-21560 Human factors in robotics p 24 A85-23198 Human factors in aviation 1 p 3 A85-39368 An analysis of ergonomic systems ---Russian book p 5 A85-46148

A management workstation concept [AD-A145617] p 14 N85-11906 Human factors and training research in military organizations and systems [AD-A146832] p 5 N85-16475

#### expert systems [AD-A147843] p 28 N85-16479 Role of engineering psychology p 6 N85-18561 European Scientific Notes, volume 38, number 12 [AD-A148713] p 50 N85-18946 European Scientific Notes Volume 39, number 2 [AD-A148994] p 50 N85-19919 Human factors department 1981 publications p 8 N85-26147 [BAE-BT-12685] Hand controllers for teleoperation A state-of-the-art technology survey and evaluation [NASA-CR-175890] p 9 N85-28559 p 30 N85-29561 Man-machine tradeoff study Some ideas and questions regarding space station p 9 N85-29562 design for human use Customer and mission influence on space station p 9 N85-29567 architecture Simulation for human factors research A central question Fidelity p 9 N85-29568 Human factors engineering contracts in Sweden An [FOA-C-56043-H2] p 55 N85-31836 Design guidelines for user-system interface software [AD-A154907] p 42 N85-32807 p 42 N85-32807 Attacking software crisis A macro approach p 43 N85-35645 [AD-A155846] HUMAN PERFORMANCE Analytical models of performance of procedures p 4 A85-45094 Human-system performance measurement in training simulators p 5 A85-48752 Ada (trademark) training curriculum Software engineering for managers m101 teacher's exercise guide [AD-A145094] p 35 N85-10695 Overview of training and aiding p 5 N85-11597 [AD-P003917] Decision making in stressful conditions A model based on the coping perspective [FOA-C-55064-H3] p 15 N85-17738 Research opportunities in human behavior and performance [NASA-CR-175473] p 6 N85-19640 Team dimensions Their identity, their measurement and their relationships [AD-A149662] p 8 N85-21978 The man-machine interface [AD-A149971] p 22 N85-21989 Personal decision making The influence of perceived locus of control and degree of rationality on information p 39 N85-23446 seeking strategies Individual characteristics and unit performance. A review of research and methods [AD-A153145] p 9 N85-28550 HUMAN REACTIONS A quantitative evaluation of human activity in man-machine systems --- Russian book p 23 A85-13599 Interpersonal activity in conditions of group learning p 2 A85-23278 HUMAN RELATIONS Interpersonal activity in conditions of group learning p 2 A85-23278 HUMAN RESOURCES The USAF pilot selection and classification research program p 2 A85-21602 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 1 [AD-A149398] p 7 N85-19874 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 2 p 7 N85-19875 [AD-A149399] Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 3 [AD-A149400] p 7 N85-19876 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues Methodological appendix p 7 N85-19877 [AD-A149401] The Human Resource Management Information Network (HRMIN) A cost comparison in accordance with Office of Management and Budget (OMB) Circular no

A-76, 5 April 1979 [AD-A154583] p 42 N85-33039 HYDROLOGY

Organizing geological work tasks for 1985 outlined p 51 N85-27303

#### HYDROLOGY

Mental models and cooperative problem solving with

IMAGE ANALYSIS

#### 1

Machine vision The eyes of automation - A manager's practical guide --- Book p 20 A85-35799 IMAGE PROCESSING Machine vision The eyes of automation - A manager's practical guide --- Book p 20 A85-35799 UK, FRG, France R and D in sensors, related fields p 49 N85-17197 INCENTIVE TECHNIQUES Are incentives right for U.S. white collar organizations? p 12 A85-43185 INDUSTRIAL MANAGEMENT Polycrystalline silicon material availability and market pricing outlook for 1980 through 1988 p 58 A85-11425 Strategic management of industrial technology - A review of the issues p 19 A85-13921 The role of company boards in design leadership p 10 A85-17777 A survey of technology assessment activities in selected p 60 A85-17778 US corporations Managing projects for high performance [ASME PAPER 84-MGT-8] p 2 p 20 A85-21298 Specifying and cost estimating --- for installing industrial robot p 24 A85-23195 R&D project termination in high-tech industries p 20 A85-25118 Understanding changes in the U.S. competitive position p 65 A85-43179 International competitiveness Some informal remarks on the M-form society p 46 A85-43182 Why wrestle with jellyfish? --- management approaches in developing employee participation p 4 A85-43183 Japanese management in U.S. p 12 A85-43184 Are incentives right for U.S. white collar organizations? p 12 A85-43185 p 13 A85-43186 Quality in practice at IBM New technology implications on the work force p 21 A85-43189 of a large Counteracting the stifling effects p 65 A85-43194 organization Making the 'Z' concept work p 13 A85-43197 Preview of the President's Commission on Industrial Competitiveness p 66 A85-43199 Labor-management cooperative programs p 4 A85-43200 Sony keeps high quality and productivity in the United p 66 A85-43203 States Business planning for information services under special consideration of German management information systems [BMFT-FB-ID-83-007] p 21 N85-11910 Primer on the registration of technical information in industry p 36 N85-12786 Value analysis --- industrial competition p 21 N85-13684 [CNES-NT-110] Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment [AD-A147586] p 70 N85-16681 p 29 N85-24191 Plans, developments in robotics Status of the UK NDT industry today p 22 N85-24309 Robot use in FRG increases but sensor technology p 29 N85-25605 lags The development and implementation of advanced welding technology p 22 N85-25824 Welding techniques in pressure part technology p 22 N85-25835 p 22 N85-32785 Quality analysis DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part Executive summary p 57 N85-35810 [AD-A156067] DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 2 Plenary session [AD-A156068] p 57 N85-35811 INDUSTRIAL PLANTS French panel makes specific proposals for robotics research Current state of French robotics p 29 N85-20180 Aviation repair plant directors on quality control measures p 84 N85-21106 Robot use in FRG increases but sensor technology p 29 N85-25605 lags Component problems plague French robotics industry p 30 N85-29088

Multinational program to develop intelligent robots p 30 N85-29094

INDUSTRIAL SAFETY Health standards for general vibration p 84 N85-19607 INDUSTRIES Challenges facing U.S. industry p 65 A85-43180 Space commercialization Analysis of R and D nvestments with long time horizons p 68 N85-11052 New concepts for industrial robots outlined N85-15176 D 27 Space station study p 53 N85-28959 [BL-6167] Spin-offs from technical commercial infrastructures, no p 55 N85-32035 2 Quality analysis p 22 N85-32785 INFORMATION proposed integration among organizational information requirements, media richness and structural design p 15 N85-19881 [AD-A149317] National Telecommunications and Information Administration authorization GPO-38-660] p 96 N85-27766 INFORMATION DISSEMINATION Opportunities for commercial organizations p 68 N85-11055 Design of a scientific information collation and dissemination system, volumes 1 thru 3 p 14 N85-12791 [AD-A146002] Outlook for expanding the Federal research in progress system p 49 N85-17737 (AD-A148354) Provision of Federal government publication in electronic format to depository libraries p 38 N85-19880 [S-PRT-98-260] French research minister on policy. technology transfer p 94 N85-20182 Information systems issues p 38 N85-20693 Evaluating the appropriateness of microcomputers for litigation document management using the analytic p 39 N85-24788 hierarchy process Management communication and financial modeling p 16 N85-26190 Defense data network support concept analysis (AD-A153214) p 52 N85-28649 The application of artificial intelligence techniques to large distributed networks [NASA-CR-177346] p 30 N85-30721 Human factors engineering contracts in Sweden An overview p 55 N85-31836 [FOA-C-56043-H2] The Human Resource Management Information Network (HRMIN) A cost comparison in accordance with Office of Management and Budget (OMB) Circular no A-76, 5 April 1979 [AD-A154583] n 42 N85-33039 INFORMATION FLOW Reliability of communication flow in R&D organizations p 11 A85-33650 The application of artificial intelligence techniques to large distributed networks [NASA-CR-177346] p 30 N85-30721 INFORMATION MANAGEMENT Data dictionary systems and their role in information resource management [AD-A144905] p 36 N85-10859 A management workstation concept [AD-A145617] p 14 N85-11906 Business planning for information services under special consideration of German management information systems p 21 N85-11910 [BMFT-FB-ID-83-007] IRM (Information Resources Management) long-range plan Fiscal year 1984-1988 (update) Volume 2 ADP and telecommunications acquisition plan p 37 N85-12796 [PB84-229244] Executive information system p 37 N85-13675 [DE84-015355] Organizations and information processing A field study of research and development units within the United States Air Force Systems Command [AD-A147381] p 21 N85-16691 Research report program of the US Army in Europe p 56 N85-35167 INFORMATION RETRIEVAL Distributed knowledge base systems for diagnosis and information retrieval [AD-A146890] p 28 N85-16690 The EEC's information technology program uodate [AD-A150022] p 39 N85-22258

General design considerations of an Air Force

Evaluating the appropriateness of microcomputers for

litigation document management using the analytic

p 39 N85-23449

p 39 N85-24788

information system

hierarchy process

[AD-A150611]

SUBJECT INDEX

Commercialization of remote sensing data - Its impact on the continuity and accessibility of remote sensing data, including response to standing orders as well as on the standardization of products p 60 A85-20642 Prototyping information systems on microcomputers -A design philosophy for engineering management p 33 A85-29401 Security implications of the Space Station information system p 34 A85-42593 Design of a scientific information collation and dissemination system, volumes 1 thru 3 (AD-A146002) p 14 N85-12791 IRM (Information Resources Management) long-range plan Fiscal year 1984-1988 (update) Volume 2 ADP and telecommunications acquisition plan [PB84-229244] p 37 N85-12796 Competitive assessment of the US information services industry [PB84-174804] p 37 N85-12803 UK, FRG, France R and D in sensors, related fields p 49 N85-17197 Concepts and tools for the software life cycle N85-19236 D 38 Research needs on the interaction between information systems and their users Report of a workshop [PB85-121523] p 38 N85-19891 Information systems issues p 38 N85-20693 The EEC's information technology program An undate [AD-A150022] p 39 N85-22258 Information technology applications in voluntary sector transport operations SP1 Objectives and programme of work [TT-85011 p 71 N85-26457 Efforts at office automation and information systems utilization at Martin Manetta Energy Systems. Incorporated p 40 N85-28633 [DE85-008154] Local automation model software benchmarking Test plan [AD-A1543491 p 41 N85-30676 Navy information systems Planning, policy, organization, and management p 96 N85-32038 [PB85-176113] Design guidelines for user-system interface software p 42 N85-32807 [AD-A154907] User's operating procedures Volume 2 Scout project financial analysis program (NASA-CR-177949) p 42 N85-34519 INFORMATION THEORY Information and computation --- emphasizing problem solving with uncertainty and aproximation p 33 A85-31791 Optimizing search with positive information feedback [CSIR-TWISK-313] p 36 N85-10855 A mathematical theory of command and control structures p 14 N85-11675 [AD-A145608] INFRARED ASTRONOMY SATELLITE The 1986 National Aeronautics and Space Administration authorization [GPO-47-635] p 57 N85-35829 INSPECTION The Deming inspection criterion for choosing zero or 100 percent inspection p 81 A85-40255 INTEGRATED CIRCUITS p 29 N85-24191 Plans, developments in robotics INTELLIGENCE Transfer of technology [S-REPT-98-664] p 50 N85-22246 INTELSAT SATELLITES Intelsat business services p 60 A85-15463 Reagan competitive policy places Intelsat's future at p 90 A85-34223 INTERFACES Cooperative control - The interface challenge for men ind automated machines p 23 A85-16093 INTERNATIONAL COOPERATION International Scientific Conference on Space, 23rd, Rome, Italy, March 24, 25, 1983, Proceedings p 43 A85-12501 Space exploitation - Spacelab an easy approach for developing countries Prospectives and suggestions by p 58 A85-12502 Aentalia International cooperation in the commercial era of space p 58 A85-12507 Space station related investigations in Europe p 43 A85-12994 [IAF PAPER 84-28] Space Station - Opportunity for international cooperation and utilization p 43 A85-13010 [IAF PAPER 84-51] Proposed draft convention on the settlement of space p 88 A85-27374 law disputes Commercialization of space - Incentives, impediments p 61 A85-27375 and alternatives

Registration and nationality of aircraft operated by international agencies in law and practice p 89 A85-27396 Junsdiction over and supervision of international crews p 89 A85-30014 in space Germany cites commercial fallout as justification for U S p 62 A85-34220 Station involvement international satellite The deregulation of p 90 A85-36666 communications A systems-analysis comparison of space station nrojects p 45 A85-40334 [DGLR PAPER 84-118] Spacelab and Eureca as a basis for European involvement in the Space Station p 46 A85-42694 Legal issues of manned orbiting space stations p 92 A85-50055 International cooperation and competition in space [GPO-38-001] p 69 N85-11911 International cooperation and competition in space p 69 N85-11912 Introduction Competitive assessment of the US information services industry p 37 N85-12803 [PB84-174804] The structures and the role of an international agency for the control of satellites p 93 N85-12806 [NASA-TM-76765] Broadening the debate p 48 N85-15785 FRG study looks at participation in ESA, US space p 49 N85-17191 station UK, FRG, France R and D in sensors, related fields p 49 N85-17197 International cooperation and competition in civilian space activites [OTA-ISC-240] p 70 N85-17750 East-West cooperation in outer space p 52 N85-27767 [S-HRG-98-1064] New ESA director on Ariane, space station, future p 53 N85-29096 trends FRG weighs ESA participation, budget issues p 53 N85-29110 Studies toward a manned space station Participation of European industry in NASA space station (MSS) [SNIAS-S/DT-Y-25-212] p 55 N85-31217 Research report program of the US Army in Europe p 56 N85-35167 INTERNATIONAL LAW Destruction of Korean Air Lines Boeing 747 over Sea of Japan, 31 August 1983 p 86 A85-10049 US jurisdiction and bilateral air agreements p 86 A85-10050 A legal analysis of the shooting of Korean Airlines Flight 007 by the Soviet Union p 86 A85-11937 Annals of air and space law Volume 8 p 87 A85-23799 Transborder direct-to-home satellite service p 88 A85-24089 Proposed draft convention on the settlement of space p 88 A85-27374 law disputes Registration and nationality of aircraft operated by international agencies in law and practice p 89 A85-27396 Selected American decisions on the Warsaw Convention and related matters - February 1981 to June 1984 I p 89 A85-30167 Attempt to regulate restrictive commercial practices in the field of air transportation within a transnational antitrust legal and institutional framework p 90 A85-30999 Satellite broadcasting and the use of the geostationary orbit - Some international legal aspects p 90 A85-36289 The deregulation of International satellite communications p 90 A85-36666 International space law --- Russian textbook p 91 A85-38699 Some legal aspects of industrial activity in outer space p 91 A85-38916 Legal aspects of space activities p 91 A85-39093 Obtaining title and financing transport category aircraft National and international implications p 91 A85-44097 Custom as a source of international law of outer p 92 A85-49973 space Legal issues of manned orbiting space stations p 92 A85-50055 INTERNATIONAL RELATIONS Technology transfer to the Middle East p 51 N85-22264 [PB85-127744] East-West cooperation in outer space p 52 N85-27767 [S-HRG-98-1064] Sub-committee on advanced technology and technology transfer [AD-A153645] p 53 N85-29836 INTERNATIONAL TRADE Understanding changes in the U.S. competitive position

Understanding changes in the US competitive position International competitiveness p 65 A85-43179

Transfer of technology [S-REPT-98-664] p 50 N85-22246 Sub-committee on advanced technology and technology transfer [AD-A153645] p 53 N85-29836 INTERPLANETARY SPACECRAFT Toward the fully capable AI space mission planner p 25 A85-42892 INTERPROCESSOR COMMUNICATION Computer center policy [AD-A154416] p 41 N85-30681 INVENTORIES On some common interests among reliability, inventory nd queuina [AD-A145595] p 83 N85-11646 Inventory policy for high backorder items AD-A153696] p 77 N85-29840 INVENTORY CONTROLS EOQ (Economic Order Quantity) range model p 77 N85-30965 [AD-A153709] Discrete simulation models - their role in the design. development and management of inventory control systems [PNR-90249] p 77 N85-34719 INVENTORY MANAGEMENT Optimal maintenance center inventories for fault-tolerant repairable systems p 72 A85-21548 Optimal inventories for overhaul of repairable redundant p 73 A85-48239 systems - A Markov decision model An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system p 75 N85-16673 [AD-A147121] Inventory policy for high backorder items p 77 N85-29840 [AD-A153696] EOQ (Economic Order Quantity) range model p 77 N85-30965 (AD-A153709) INVESTMENTS What are we in business for? - An engineering approach to project finance p 61 A85-27648 Investors balance enthusiasm for new market against risk potential p 62 A85-34215 Starstruck's problems spotlight risks, opportunities in space p 62 A85-34221 Capital investment motivational techniques used by prime contractors on subcontractors p 53 N85-29837 AD-A1536601 ITALIAN SPACE PROGRAM International Scientific Conference on Space, 23rd, Rome, Italy, March 24, 25, 1983, Proceedings p 43 A85-12501 Space exploitation - Spacelab an easy approach for developing countries Prospectives and suggestions by Aeritalia p 58 A85-12502 ITERATION Guide on logical database

Guide on logical database design		
[PB85-177970]	p 42	N85-30976

# J

JAPANESE SPACE PROGRAM Non-US approaches to space commercialization p 67 N85-11012

JUPITER (PLANET) The 1986 National Aeronautics and Space Administration authorization (GPO-47-635) p.57 N85-35829

# Κ

KNOWLEDGE

Representation of activity knowledge for project management p 46 A85-48595 Distributed knowledge base systems for diagnosis and information retrieval

p 28 N85-16690

#### LABORATORIES

[AD-A146890]

Emerging role of the national laboratory in the development and transfer of materials technology [DE85-001252] p 49 N85-18086

Guide for the execution of reliability tests in the laboratory --- aeronautical equipment p 85 N85-27237 Laboratory research A question of when, not if

[AD-A153298] p 53 N85-28867 Progress report on implementing the recommendations of the White House Science Council's Federal Laboratory Review Panel, volume 1

[PB85-185072] p 78 N85-35819 LABORATORY EQUIPMENT Robotics at Savannah River site Activity report

 Robotics at Savannah River site
 Activity report

 [DE85-003657]
 p 29
 N85-20383

LANDSAT SATELLITES Overcoming project planning and timeliness problems to make Landsat useful for timely crop area estimates p 11 A85-32129 Land remote sensing commercialization A status report p 68 N85-11024 LARGE SPACE STRUCTURES Broadening the debate p 48 N85-15785 NASA space station automation Al-based technology review [NASA-CR-176094] p 31 N85-32134 Space Station Engineering Technology and Development Proceedings of the Panel on In-Space Engineering Research and Technology Development [NASA-CR-176110] p 56 N85-34153 LATEX The first space product p 59 A85-13914 LAUNCH VEHICLES Cost effective launch technology for communications atellites [IAF PAPER 84-04] p 58 A85-12979 Launching the rocket industry in the United States -Domestic regulation of private expandable launch vehicles p 89 A85-30998 Second Symposium on Space Industrialization --- space commercialization [NASA-CP-2313] p 67 N85-11011 Conestoga 2 A low cost commercial space transport system p 68 N85-11033 International cooperation and competition in space Introduction p 69 N85-11912 The Expendable Launch Vehicle Commercialization Act [GPO-30-838] p 93 N85-12919 Commercial Space Launch Act [GPO-39-613] p 93 N85-13690 Commercial space launches [S-REPT-98-656] p 95 N85-21225 LAW (JURISPRUDENCE) Annals of air and space law Volume 8 p 87 A85-23799 Recent developments in aviation case law p 88 A85-24709 Need for alternative space launch services given NASA refusal to launch SPARX-01 mission under standard form commercial launch services agreement p 91 A85-38914 Second Symposium on Space Industrialization --- space commercialization [NASA-CP-2313] p 67 N85-11011 Legal considerations and cooperative opportunities for bace commercial activities p 93 N85-11013 Government contract contingent liabilities The space commercial activities anti-deficiency act, and the hobgoblin of little minds p 94 N85-16684 [AD-A147919] National Aeronautics and Space Administration Authorization Act, 1986 [S-REPT-99-91] p 96 N85-30978 LEADERSHIP Making the 'Z' concept work p 13 A85-43197 Individual characteristics and unit performance. A review of research and methods [AD-A153145] p 9 N85-28550 Central problems in the management of innovation [AD-A152598] p 18 N85-28852 Symbolic and interactional perspectives on leadership An integrative framework [AD-A155247] p 19 N85-32769 LEARNING The acquisition of procedures from text Α roduction-system analysis of transfer of training AD-A1510291 p 8 N85-24732 LEARNING THEORY Models for multidimensional tests and hierarchically structured training materials p 10 N85-32768 (AD-A155231 LEGAL LIABILITY Recent developments in aviation case law p 88 A85-24709 Fire safety in transport category aircraft - Litigating a post-crash or in-flight aircraft fire p 88 A85-24710 Punitive damages in aviation products liability cases p 88 A85-27394 Cardo claims - From the carrier's point of view p 88 A85-27395 The liability of aircraft manufacturers and certification authorities in the United Kingdom p 89 A85-27397 A new proposal for the reform of commerical air crash p 92 A85-44098 litigation

Legal issues of manned orbiting space stations

for the control of satellites

[NASA-TM-76765]

The structures and the role of an international agency

p 92 A85-50055

p 93 N85-12806

#### LIABILITIES Government contract contingent liabilities anti-deficiency act, and the hobgoblin of little minds p 94 N85-16684 [AD-A147919] LIBRARIES Provision of Federal government publication in electronic format to depository libraries p 38 N85-19880 [S-PRT-98-260] Local automation model software benchmarking Test Plan p 41 N85-30676 [AD-A154349] LICENSING Commercial space launches p 95 N85-21225 [S-REPT-98-656] LIFE CYCLE COSTS Reliability and maintainability considerations in computer performance evaluation p 78 A85-10055 Strategic management of industrial technology - A review p 19 A85-13921 of the issues Life-cycle-cost-oriented system design in weapon technology [MBB-UA-842-84-OE] p 65 A85-42678 A practical approach toward achieving software enability p 35 A85-45141 reliability A comparison of various Life Cycle Cost models --- in avionics systems acquisition p 66 A85-45150 Life cycle cost management master plan for the Defense Communications Agency [AD-A146876] p 14 N85-16668 Concept paper for the development of a DOD Ada (trademark) software engineering education and training Dian [AD-A148774] p 38 N85-17592 Life cycle costing in government procurement [AD-A151878] p 51 N85-26456 LIFE SUPPORT SYSTEMS Aeronautical systems technology needs Escape, escue and survival, test facilities and test equipment and training-simulation equipment [AD-A145059] p 21 N85-10002 LINEAR PROGRAMMING The interface with decision makers in interactive multiobjective linear programming [REPT-84-38] p 17 N85-28637 Operations research [88561897] p 76 N85-28712 LITERATURE European Scientific Notes, volume 38, number 12 [AD-A148713] p 50 N85-18946 LOCKHEED AIRCRAFT Intercompany technology task forces promote cooperation at Lockheed p 11 A85-26847 LOGISTICS Supply center processes [AD-P004014] p 74 N85-11993 Logistics support costs for the B-1B aircraft can be reduced p 74 N85-11996 [AD-A145846] EOQ (Economic Order Quantity) range model [AD-A153709] p 77 N85-30965 LOGISTICS MANAGEMENT Commission stacker - Incorporation in a total logistic concept --- for Airbus production p 73 A85-35073 [MBB-UT-36-84-OE] Dyna-METRIC - New capabilities --- Dynamic Multi-Echelon Technique for Recoverable Item Control p 73 A85-45148 Sparing criteria - Clear management approach p 82 A85-49577 R&M analysis techniques for fault-tolerant systems p 74 A85-49588 On maximizing the expected lifetime of replaceable Systems [AD-A150003] p 75 N85-21680 Managing recoverable aircraft components in the PPB (Planning, Programming and Budgeting) and related Technical volume Processes p 76 N85-25169 [AD-A152014] Security controls in the Stockpoint Logistics Integrated Communications Environment (SPLICE) [AD-A155536] p 77 N85-32244 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 4, Workshop 8 VE on spare parts p 57 N85-35813 [AD-A156070]

LORAN C National Airspace System Plan and associated development LOW GRAVITY MANUFACTURING The first space product D 59 A85-13914

# M

MACHINE TOOLS New concepts for industrial robots outlined
Dean of Kiev State University on impact of robots
Applications of robots in machine tool industry reviewed p 22 N85-28189
Manufacturing information system [AD-A152715] p 17 N85-28616
MACHINE TRANSLATION Local automation model software benchmarking Test
[AD-A154349] p 41 N85-30676 MAGNETIC TAPES
Aeronautical Systems Division Manufacturing/Quality assurance orientation
[AD-A156128] p 86 N85-35817 MAINTAINABILITY
Reliability and maintainability considerations in computer performance evaluation p 78 A85-10055
R&M implications of the DoD acquisition improvement program p 72 A85-14896
A comparison of various Life Cycle Cost models in avionics systems acquisition p 66 A85-45150
Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings
p 82 A85-49526 Maintainability aspects in maintenance management
Establishing realistic requirements for reliability,
Expert systems in software maintainability p 26 A85-49539
Ada (trademark) training curriculum Software
[AD-A145094] p 35 N85-10695 A framework for software development
[AD-A152067] p 40 N85-27551
Optimal maintenance center inventories for fault-tolerant renarable systems p 72 A85-21548
Units of equipment available using cannibalization for
Optimal inventories for overhaul of repairable redundant
Systems - A Markov decision model p 73 A85-48239 Field data - The final measure of systems reliability
Artificial intelligence applications to maintenance
On applying AI (Artificial Intelligence) to maintenance and troubleshooting
(AD-P003915) p 26 N85-11595 Overview of training and aiding
[AD-P003917] p 5 N85-11597 Designing an expert system for training automotive
electrical troubleshooting [AD-P003926] p 26 N85-11606
reduced [AD_A145846] p.74_N85_11996
Material flow in the manufacturing system Fault-diagnosis systems as support for the manufacturing
of highly automated manufacturing systems (PNR-90238) p.84 N85-18618
Management aspects of software maintenance [AD-A152035] p 40 N85-27550
Quality assurance considerations for the implementation of a pulsed power R and D project
[DE85-012357] p 86 N85-35720 MAINTENANCE TRAINING
Simulators for training aircraft maintenance personnel p 3 A85-29863
Cost effectiveness of simulated aircraft maintenance training systems p 66 A85-45118
The psychology of technical devices and technical discourse
[AD-P003929] p 27 N85-11609 Artificial intelligence contributions to training and
maintenance [AD-P003934] p 27 N85-11614
Maintenance training simulators prime item development specification Model specification and handbook
[AD-A154108] p 10 N85-30628 MAN MACHINE SYSTEMS
A quantitative evaluation of human activity in man-machine systems Russian book
p 23 A85-13599 Cooperative control - The interface challenge for men
and automated machines p 23 A85-16093 Synergy in space - Man-robot cooperation
p 23 A85-20400

Displays, deja vu --- avionics-human factors R&D p 1 A85-21560

United Airlines' cockpit resource management training p 2 A85-21565 MESSAGE - An expert system for aircraft crew workload assessment p 24 A85-21569 A system-level approach to automation research p 24 A85-23197 p 24 A85-23198 Human factors in robotics The principles of experimental setup in models of p 3 A85-23283 complex human operator activities Certain problems in the automated assessment of the operating efficiency of man-machine systems p 24 A85-24035 Evaluation of the efficiency of operator work in p 25 A85-37566 man-machine systems Human factors in aviation 1 p 3 A85-39368 The role of robotics in space system operations p 25 A85-45902 [AIAA PAPER 85-1879] An analysis of ergonomic systems --- Russian book p 5 A85-46148 Decision Support System (DSS) A survey [NRIMS-TWISK-317] p 14 p 14 N85-11896 A management workstation concept [AD-A145617] p 14 N85-11906 Interaction of human cognitive models and computer p 14 N85-11906 based models in supervisory control p 14 N85-16474 [AD-A142547] Mental models and cooperative problem solving with expert systems p 28 N85-16479 [AD-A147843] East Europe report Science and technology JPRS-ESA-84-046] p 49 N85-17176 [JPRS-ESA-84-046] Man-machine communication research for robotics reported p 28 N85-17177 p 6 N85-18561 Role of engineering psychology Problems of psychological support of automated rganization control systems p 28 N85-18571 organization control systems flow in the manufacturing Material system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems p 84 N85-18618 [PNR-90238] Dean of Kiev State University on impact of robots p 28 N85-19213 Health standards for general vibration p 84 N85-19607 French plans for fifth generation computer systems [AD-A149435] p 50 N85-19732 The man-machine interface (AD-A149971) p 22 N85-21989 Research and Modeling of Supervisory Control Behavior, report of a workshop [AD-A149621] p 16 N85-22248 USSR report Space [JPRS-USP-85-001] p 51 N85-22403 The acquisition of procedures from text production-system analysis of transfer of training [AD-A151029] p 8 N85-24732 Human factors department 1981 publications p 8 N85-26147 [BAE-BT-12685] Automation of the reporting and tracking requirements of architect-engineering type contracts p 52 N85-27745 [AD-A152218] Hand controllers for teleoperation A state-of-the-art technology survey and evaluation [NASA-CR-175890] p 9 N85-28559 Efforts at office automation and information systems utilization at Martin Manetta Energy Systems, Incorporated [DE85-008154] p 40 N85-28633 The interface with decision makers in interactive multiobjective linear programming [REPT-84-38] p 17 N85-28637 General laws of development of technology p 30 N85-28875 Man-machine tradeoff study p 30 N85-29561 Some ideas and questions regarding space station esign for human use p 9 N85-29562 design for human use Importance of automation, robotization in economy p 31 N85-32219 Design guidelines for user-system interface software [AD-A154907] p 42 N85-32807 Space station automation and robotics study Operator-systems interface p 31 N85-33172 [NASA-CR-176095] MANAGEMENT Synopsis of the OTA Workshop on Cost Containment of Civilian Infrastructure (Civilian Space Station) Elements p 48 N85-15790 Technical order managers handbook Utilization assessment [AD-A147579] p 37 N85-16694 Management training for cockpit crews at Piedmont p.6 N85-18013 flight Management A bibliography for NASA managers [NASA-SP-7500(19)] p 17 N85-26439

Central problems in the management of innovation [AD-A152598] p 18 N85-28852

DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part Executive summary [AD-A156067] b 57 N85-35810 DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 2 Plenary session [AD-A156068] p 57 N85-35811 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 5, Workshop C VEP/VECP administration, negotiation, and implementation [AD-A156071] p 57 N85-35814 MANAGEMENT ANALYSIS Project management A managerial approach -Textbook p 45 A85-36987 Integrated management --- for aerospace applications p 11 A85-37163 Doing business in space How to get there from here b 69 N85-11057 Aviation maintenance computerized management information systems Perspective for the future [AD-A150637] p 75 N85-22349 Food service management p 16 N85-24736 Guide on workload forecasting [PB85-177632] p 18 N85-30704 MANAGEMENT INFORMATION SYSTEMS Are decision support systems applicable to engineering p 19 A85-17780 management? Developments in decision support systems p 25 A85-31792 A systematic method for evaluating security p 35 A85-42597 requirements compliance Data dictionary systems and their role in information resource management [AD-A144905] p 36 N85-10859 A management workstation concept [AD-A145617] p 14 N85-11906 Primer on the registration of technical information in p 36 N85-12786 industry Maintenance Management Information and Control System (MMICS) Administrative boon or burden [AD-A145762] p 75 N85-12790 Executive information system [DE84-015355] p 37 N85-13675 Aviation maintenance computerized management information systems Perspective for the future [AD-A150637] p 75 N85-22349 General design considerations of an Air Force information system [AD-A150611] p 39 N85-23449 An analysis of data dictionaries and their role in information resource management [AD-A152134] p 22 N85-27121 Manufacturing information system [AD-A152715] p 17 N85-28616 DLA Data/data base administration analysis [AD-A153031] p 40 N85-28879 The Human Resource Management Information Network (HRMIN) A cost comparison in accordance with Office of Management and Budget (OMB) Circular no A-76, 5 April 1979 p 42 N85-33039 [AD-A154583] Integration of office automation within computing p 42 N85-33736 [DE85-010021] MANAGEMENT METHODS A simple method for evaluation and selection of R&D proposals for a competitive grant fund p 44 A85-13920 The European approach to a standardized work breakdown structure concept for European scientific space satellites [MBB-UR-688-84-OE] p 44 A85-16088 Report-reading patterns of technical managers and nonmanagers p 10 A85-21540 Producibility engineering for robotic manufacturing p 24 A85-23196 Computing and information services at the Jet Propulsion Laboratory - A management approach to a diversity of p 44 A85-24525 needs Intercompany technology task forces promote cooperation at Lockheed p 11 A85-26847 Cost reduction potential in

Cost reduction potential in space program management p 63 A85-35314 Project management A managenal approach ---Textbook p 45 A85-36987 The SIMRAND methodology - Simulation of Research and Development Projects p 12 A85-41319

and Development Projects p 12 A85-41319 RADSIM - A methodology for large-scale R&D program assessment p 46 A85-42585

White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984 D 81 A85-43176 Management philosophies associated with leading a successful organization p 12 A85-43177 p 65 A85-43181 Quality and cost competitiveness Some informal remarks on the M-form society p 46 A85-43182 Why wrestle with jellyfish? --- management approaches A85-43183 in developing employee participation p 4 Japanese management in U S p 12 A85-43184 Are incentives right for U S white collar organizations? p 12 A85-43184 p 12 A85-43185 Quality in practice at IBM p 13 A85-43186 p4 A85-43193 Renewing large organizations Counteracting the stifling effects of a large p 65 A85-43194 organization Building teams and maintaining trust p 66 A85-43195 Balancing risk taking and encouraging p 66 A85-43196 entrepreneurism p 13 A85-43197 Making the 'Z' concept work Encouraging and maintaining an innovative work p 4 A85-43198 climate Hurdles stifting the federal manager's ability to improve p 66 A85-43201 p 66 A85-43202 productivity Productivity initiatives at USDA Keeping the bureaucracy in check p 66 A85-43204 The Dana style - Participation builds the climate for p 13 A85-43205 roductivity Dvna-METRIC - New capabilities --- Dynamic Multi-Echelon Technique for Recoverable Item Control p 73 A85-45148 Joint service acquisition management initiatives --- for DOD software p 13 A85-45157 The imposition of flow control avoids ATC overloads p 74 A85-48851 Automation in air traffic management p 74 A85-49171 Sparing criteria - Clear management approach p 82 A85-49577 Decision Support System (DSS) A survey p 14 N85-11896 [NRIMS-TWISK-317] Maintenance Management Information and Control System (MMICS) Administrative boon or burden [AD-A145762] p 75 N85-12790 Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A1460021 AD-A146002] p 14 N85-12791 International comparative study of systems for the overnment advancement of research and development [NASA-TM-77589] p 48 N85-13689 Manufacturing costs, equipment needs and technological opportunities among small and medium-size manufacturers p 15 N85-18193 [DE85-0004791 Security of personal computer systems A management auide [PB85-161040] p 39 N85-24793 The development and implementation of advanced welding technology p 22 N85-25824 Welding techniques in pressure part technology p 22 N85-25835 Management communication and financial modeling p 16 N85-26190 Management A bibliography for NASA managers [NASA-SP-7500(19)] p 17 N85-26439 Management aspects of software maintenance p 40 N85-27550 [AD-A152035] The significance of Helios for Europe p 52 N85-27808 Managenal benefits of Helios for the European dustry p 52 N85-27809 industry p 17 N85-27812 Helios project support Integrating quality assurance and research and development p 17 N85-28392 [DE85-007974] Future directions in operations research [REPT-84-24] p 76 N85-28711 Multicriteria decision analysis as an aid to strategic planning of energy research and development [REPT-84-02] p 18 N85-28870 Guide on workload forecasting p 18 N85-30704 [PB85-177632] Discrete simulation models - their role in the design, development and management of inventory control systems [PNR-90249] p 77 N85-34719 Fire service emergency management handbook [AD-A155780] p 19 N85-35313 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 6, Workshop D VE training-orientation [AD-A156072] p 57 N85-35815

#### MANAGEMENT SYSTEMS

Aeronautical Systems Division Manufacturing/Quality assurance orientation p 86 N85-35817 [AD-A156128] MANAGEMENT PLANNING Strategic management of industrial technology - A review of the issues p 19 A85-13921 The role of company boards in design leadership p 10 A85-17777 Integration of MSG-3 into airline operation p 72 A85-25978 [SAE PAPER 841483] MSG-3 - A method for maintenance program planning [SAE PAPER 841485] p 73 A85-25979 Support program planning - Managing to get it supported p 11 A85-26785 --- ATE for avionics Multilevel monitoring system for a central research and p 11 A85-29402 development agency Matrix organizations Overcoming the disadvantages [AD-A145318] p 14 N85-12772 IRM (Information Resources Management) long-range plan Fiscal year 1984-1988 (update) Volume 2 ADF and telecommunications acquisition plan p 37 N85-12796 [PB84-229244] The management of research institutions A look at government laboratories p 14 N85-16665 [NASA-SP-481] Life cycle cost management master plan for the Defense Communications Agency [AD-A146876] p 14 N85-16668 An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system [AD-A147121] p 75 N85-16673 Project manager's handbook for special projects p 48 N85-16683 [AD-A147913] Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 1 [AD-A149398] N85-19874 D 7 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 2 p7 N85-19875 [AD-A149399] Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 3 [AD-A149400] p 7 N85-19876 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues Methodological appendix **p** 7 [AD-A149401] N85-19877 Software management issues --- space station software p 16 N85-20690 development Program manager The Journal of the Defense Systems November-December 1984 [AD-A149546] p 50 N85-20933 Personal computer aided decision analysis N85-27743 [AD-A151911] p 17 Navy program manager's guide, 1985 edition p 76 N85-27744 [AD-A151925] Management control systems and interdependencies An empirical study p 17 N85-27746 [AD-A152280] The concept of fit in contingency theory p 18 N85-28854 [AD-A152603] Documentation for the West German Federal Cabinet's p 96 N85-28886 space policy decision Overhead management guide for aerospace procurements p 18 N85-29835 [AD-A153626] Guide on workload forecasting p 18 N85-30704 [PB85-177632] EOQ (Economic Order Quantity) range model p 77 N85-30965 [AD-A153709] Producibility Engineering and Planning (PEP) Program management guidelines [AD-A153730] p 18 N85-30966 p 22 N85-32785 Quality analysis Study to encourage and facilitate industrial investment and involvement in space [NASA-CR-176152] p 72 N85-34147 Analyzing performance of small projects using URS and PMAS, information pamphlet [DE85-011964] p 56 N85-34718 Aeronautical Systems Division Manufacturing/Quality assurance orientation p 86 N85-35817 [AD-A156128] MANAGEMENT SYSTEMS Work flow in manufacturing systems p 20 A85-19181 technology forces promote p 11 A85-26847 Intercompany task cooperation at Lockheed An evaluation of the effect of establishing a minimum

Economic Order Quantity (EOQ) on the Air Force EOQ

item management system

[AD-A147121]

p 75 N85-16673

#### MANIPULATORS

National Airspace System Plan Facilities, equipment p 76 N85-26692 and associated development Management control systems and interdependencies An empirical study [AD-A152280] p 17 N85-27746 The economics of private sector R and D decisionmaking in aeronautics p 54 [NASA-CR-176007] N85-30962 NASA Space controls research and technology p 54 N85-31149 program Determining functional requirements for NASA Goddard's command management system software design using expert systems p 30 N85-32020 Symbolic and interactional perspectives on leadership An integrative framework p 19 N85-32769 [AD-A155247] DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 1 Executive summary p 57 N85-35810 [AD-A156067] DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 2 Plenary session AD-A1560681 p 57 N85-35811 MANIPULATORS Dean of Kiev State University on impact of robots p 28 N85-19213 Plans, developments in robotics MANNED ORBITAL LABORATORIES p 29 N85-24191 Space station related investigations in Europe p 43 A85-12994 [IAF PAPER 84-28] Space Station - Opportunity for international cooperation utilization p 43 A85-13010 [IAF PAPER 84-51] Legal issues of manned orbiting space stations A85-50055 p 92 MANNED ORBITAL RESEARCH LABORATORIES Concept for a commercial space station laboratory p 68 N85-11035 MANNED SPACE FLIGHT Jurisdiction over and supervision of international crews A85-30014 in space p 89 Space - The long-range future p 66 A85-45817 USSR report Space p 51 ' N85-22403 MANNED SPACECRAFT The manned Space Station - NASA's last hurrah? p 87 A85-21620 MANUALS Management techniques in meeting requirements for integrating technical publications and training into ATE stations p 11 A85-26786 Ada (trademark) training curriculum Real-time concepts 1303 teacher's guide [AD-A1450931] p 35 N85-10694 Ada (trademark) training curriculum Software engineering for managers m101 teacher's exercise guide [AD-A145094] p 35 N85-10695 MANUFACTURING Work flow in manufacturing systems p 20 A85-19181 Producibility engineering for robotic manufacturing p 24 A85-23196 Quality organization --- quality control [CNES-NT-106] p 83 N85-13257 Manufacturing costs. equipment needs and technological opportunities among small and medium-size manufacturers p 15 N85-18193 [DE85-0004791 Robot production lines in operation p 29 N85-20166 Computer integration of engineering design and roduction A national opportunity p 21 N85-21414 [NASA-CR-175483] Status of the UK NDT industry today p<sup>22</sup> N85-24309 Criteria for qualifying for FRG federal CAD/CAM ubsidies p 51 N85-25651 subsidies Future directions of robotics, automation in Italy p 30 N85-28187 Component problems plague French robotics industry D 30 N85-29088 Producibility Engineering and Planning (PEP) Program management guidelines (AD-A153730) p 18 N85-30966 MARKET RESEARCH Polycrystalline silicon material availability and market pricing outlook for 1980 through 1988 p 58 A85-11425 The communication-satellite market to the year 2000 p 60 A85-26771 p 61 A85-28824 Boeing's airliner launch criteria Investors balance enthusiasm for new market against nsk potential p 62 A85-34215

New technologies at the forefront of industrial p 56 N85-35168 p 25 A85-47677

Telecommunication market research processing p 42 N85-34331 (ENST-83E018) MARKETING Future prospects in space envisaged by a forum of p 44 A85-16302 European space companies Commercial utilisation of space - New business

p 62 A85-34218

p 67 N85-10907

p 69 N85-13792

p.60 A85-16303 opportunities Technology and the market place - A changing air transport equation

Remote sensing - A tortuous trip to marketplace

mplications

[ESA-TT-828]

2000

[NASA-TM-X-739071

Foreign civil aviation competition 1976 summary and

German domestic scheduled air transport in the year

[SAE PAPER 841545] p 60 A85-25983 Financial issues for commercial space ventures Paying p 67 N85-11014 for the dreams UK, FRG, France R and D in sensors, related fields

p 49 N85-17197 French panel makes specific proposals for robotics

research Current state of French robotics p 29 N85-20180

MBB cost-reduction plan for Airbus construction described p 71 N85-25616 French firm plans recapture of domestic CAD/CAM p 30 N85-25641

market MARKOV CHAINS

A technique for estimating performance of fault-tolerant p 81 A85-36297 programs Effects of redundancy management on reliability p 13 A85-47795 modelling

MARKOV PROCESSES Optimal inventories for overhaul of repairable redundant

systems - A Markov decision model p 73 A85-48239 A unified model for performance and reliability of Fault-Tolerant/Multi-Mode systems [AD-A148789] p 84 N85-17601

MATERIALS HANDLING Work flow in manufacturing systems

p 20 A85-19181 Supply center processes

[AD-P004014] p 74 N85-11993 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems p 84 N85-18618 PNR-902381

MATERIALS TESTS Testing, evaluation and quality control of composites, Proceedings of the International Conference, University of Surrey, Guildford, Surrey, England, September 13, 14, 1983 p 78 A85-14101

- MATHEMATICAL MODELS The linear software reliability model and uniform p 81 A85-37901 testing Units of equipment available using cannibalization for
- p 73 A85-37903 repair-part support A system reliability model with classes of failures p 81 A85-37904

Reliability prediction - Improving the crystal ball A85-49540 0 82 A reliability growth model p 83 A85-49580

Modelling the demand for construction CSIR-TWISK-3221 p 21 N85-10218

Satellite servicing A business opportunity? p 69 N85-11056

A mathematical theory of command and control structures p 14 N85-11675

[AD-A145608] Expanding expertise by use of an expert system p 30 N85-30723 [DE85-010759]

Feasibility of applications of Competition Decision Assist Package (CDAP) to spare parts [AD-A154716] p 77 N85-33036

MATHEMATICAL PROGRAMMING Strategic planning for investment in R&D using decision

analysis and mathematical programming p 11 A85-33649

MATRIX MANAGEMENT Design principles for Finite Elements (FE) programs concerned with intensely nonlinear problems p 33 A85-28797 theese MEASUREMENT

Measurement assurance programs Part 1 General introduction

[PB84-217868] p 83 N85-10339 Principles of quality assurance of chemical measurements [PB85-177947] p 76 N85-28997 MECHANIZATION

Importance of automation, robotization in economy p 31 N85-32219 stations

maintainability, and built-in-test

MEMORY (COMPUTERS) The modeling of human cognitive decision processes in The Intelligent Machine Model (TIMM) MENTAL PERFORMANCE The functional age profile - An objective decision criterion for the assessment of pilot performance capacities and p 2 A85-21588 capabilities The principles of experimental setup in models of p 3 A85-23283 complex human operator activities MICROCOMPUTERS Application of the personal computer for cost effective ATE/TPS support p 32 A85-26794 p 32 A85-26794 Prototyping information systems on microcomputers -A design philosophy for engineering management p 33 A85-29401 Microcomputer management guidelines [PB84-212174] p 36 N85-10704 Systems analysis for microcomputer acquisitions [AD-A145447] p 69 N85-11556 A decision model for selection of microcomputers and operating systems [AD-A149076] p 15 N85-19694 East Europe report Scientific affairs [JPRS-ESA-84-006] n 50 N85-20684 Evaluating the appropriateness of microcomputers for litigation document management using the analytic hierarchy process p 39 N85-24788 Automation of the reporting and tracking requirements of architect-engineering type contracts p 52 N85-27745 JAD-A1522181 Microcomputers in transportation Software and source book, February 1985 [PB85-181022] p 77 N85-31868 An automated quality assurance surveillance plan for ADP (Automated Data Processing) operations under the Navy's commercial activities program p 55 N85-32802 AD-A1547671 MICROFI ECTRONICS Flexible manufacturing system concept features cache memory p 28 N85-17186 East Europe report Science and technology p 49 N85-17198 [JPRS-ESA-84-043] MICROGRAVITY APPLICATIONS Symposium on Industrial Activity in Space, Stresa, Italy, p 63 A85-38901 May 2-4, 1984, Proceedings The use of microgravity for industrial and commercial purposes p 64 A85-38917 Spacelab to Space Station, Proceedings of the International Symposium on Spacelab 1 - Results, Implications and Perspectives, Naples and Capi, Italy, p 20 A85-39076 June 11-16, 1984 MICROPROCESSORS New technologies at the forefront of industrial p 56 N85-35168 developments MILITARY AIR FACILITIES Supply center processes [AD-P004014] p 74 N85-11993 MILITARY AIRCRAFT How much does it cost/how much does it weigh? [SAWE PAPER 1593] p 67 A85-49913 Determining training device requirements in Army p 5 N85-14558 aviation systems Operations research [B8561897] p 76 N85-28712 MILITARY AVIATION Determining training device requirements in Army aviation systems p 5 N85-14558 MILITARY OPERATIONS On applying AI (Artificial Intelligence) to maintenance and troubleshooting [AD-P003915] p 26 N85-11595 Overview of training and aiding [AD-P003917] p 5 N85-11597 The structures and the role of an international agency for the control of satellites [NASA-TM-76765] p 93 N85-12806 MILITARY PSYCHOLOGY Psychological techniques for the selection and initial training of military air traffic controllers p 4 A85-44244 MILITARY SPACECRAFT Militarization of space activity in United States p 96 N85-25360 MILITARY TECHNOLOGY Military electronics - Why so unreliable? p 80 A85-18440 Software test program for computer hardware p 32 A85-26784 developments Management techniques in meeting requirements for integrating technical publications and training into ATE

p 11 A85-26786

p 82 A85-49539

Establishing realistic requirements for reliability,

MEDICAL EQUIPMENT

developments

Documentation and separate test program development is most important for test/maintenance p 83 N85-16745 U.S., Soviet space program aims contrasted p 95 N85-22455 Personal computer aided decision analysis p 17 N85-27743 [AD-A151911] MINERAL EXPLORATION Organizing geological work tasks for 1985 outlined p 51 N85-27303 MINICOMPUTERS Management considerations for an information center [AD-A151774] p 40 N85-27742 MINIMAX TECHNIQUE On maximizing the expected lifetime of replaceable systems p 75 N85-21680 [AD-A150003] MINORITIES Companies participating in the Department of Defense Subcontracting Program, first three quarters fiscal year 1984 [AD-A146137] p 47 N85-12775 MISSILE DESIGN Simulation A tool for cost-effective systems design and p 71 N85-26657 live test reduction **MISSILE SYSTEMS** Simulation A tool for cost-effective systems design and live test reduction p 71 N85-26657 MISSION PLANNING Space station related investigations in Europe [IAF PAPER 84-28] p 43 A85-12994 Operational preparation of the German Spacelab Mission D1 [IAF PAPER 84-211] p 43 A85-13133 Orientation and trends in European technology --- space programs [IAF PAPER 84-377] p 59 A85-13233 Planning for a joint space station The ESA science programme p 44 A85-25856 p 45 A85-34146 Toward the fully capable AI space mission planner A85-42892 p 25 Station engineering technology Space and development [NASA-CR-174383] p 21 N85-18079 Data Requirement (DR) MA-03 Payload missions integration --- Spacelab payloads [NASA-CR-171331] p 84 N85-19009 European space science horizon 2000 p 51 N85-26771 [ESA-SP-1070] Customer and mission influence on space station architecture p 9 N85-29567 Space Station reference configuration description [NASA-TM-87493] p 42 N85-31146 Studies toward a manned space station Participation of European industry in NASA space station (MSS) [SNIAS-S/DT-Y-25-212] p 55 N85p 55 N85-31217 Station Engineering and Technology Space Development Proceedings of the Panel on In-Space Engineering Research and Technology Development [NÅSA-CR-176110] p 56 N85-34153 MOBILITY Robotics at Savannah River site Activity report p 29 N85-20383 [DE85-003657] MODELS Analytical models of performance of procedures p 4 A85-45094 A decision model for selection of microcomputers and operating systems [AD-A149076] p 15 N85-19694 Management communication and financial modeling p 16 N85-26190 Investment justification of robotic technology in aerospace manufacturing User's manual [AD-A156193] p 23 N85-35410 MONITORS The structures and the role of an international agency for the control of satellites [NASA-TM-76765] p 93 N85-12806 Continued development of a data base management system performance monitor, volume 2 [AD-A151714] p 39 N85-26167 MŤBF General probability of system failure p 78 A85-10057 A management guide to reliability predictions p 82 A85-49541 MULTISTAGE ROCKET VEHICLES Conestoga 2 A low cost commercial space transport p 68 N85-11033 system

# Ν

#### NASA PROGRAMS

Space Station - An overview of current U.S. activities HAF PAPER 84-221 p 59 A85-12991

Space Station - Opportunity for international cooperation and utilization [IAF PAPER 84-51] p 43 A85-13010 Government tools for the support of commercial ventures [IAF PAPER 84-216] p 59 A85-13138 NASA's approach to the commercial use of space p 59 A85-13139 [IAF PAPER 84-217] NASA formulates policy to spur private investment p 87 A85-18469 The manned Space Station - NASA's last hurrah? p 87 A85-21620 p 44 A85-25856 Planning for a joint space station The congressional authorization process as it applies to aeronautical research and technology p 89 A85-29555 How does NASA plan to help? o 90 A85-33872 Evolving government policy eases way for space The US Space Station programme p 46 A85-34214 Applying productivity principles to new R&D programs NASA/TRW GRO project p 65 A85-43187 p 66 A85-45817 Space - The long-range future NASA approves fly-now, pay-later plans for orbiting p 67 A85-47047 industrial facility NASA and the practice of space law p 92 A85-49971 Department of Housing and Urban Development, and certain independent agencies appropriations for fiscal year 1985, part 2 p 93 N85-10870 [S-REPT-98-889-PT-2] National Aeronautics and Space Administration p 93 N85-10871 Statement of Hon James M Beggs, Administrator, NASA, Washington, DC p 69 N85-11059 p 69 N85-11059 Issues and findings p 70 N85-15782 Financing considerations and Federal budget impacts p 94 N85-15792 Aerospace Safety Advisory Panel [NASA-TM-87428] p 85 N85-21135 U.S., Soviet space program aims contrasted p 95 N85-22455 Authorizing appropriations to the National Aeronautics and Space Administration for fiscal year 1986 p 95 N85-23452 [H-REPT-99-32] Militarization of space activity in United States p 96 N85-25360 Management A bibliography for NASA managers [NASA-ŠP-7500(19)] p 17 N85-26439 Department Urban of Housing and Development-independent agencies appropriations for Part 6 National Aeronautics and Space 1986 Administration [GPO-47-235] p 96 N85-27768 National Aeronautics and Space Administration Authorization Act, 1986 p 96 N85-28885 [S-REPT-99-91] Space station study [BL-6167] p 53 N85-28959 National Aeronautics and Space Administration Authorization Act, 1986 p 96 N85-30978 [S-REPT-99-91] Studies toward a manned space station Participation of European industry in NASA space station (MSS) [SNIAS-S/DT-Y-25-212] p 55 N85-31217 NASA authorization, 1986, volume 1 [GPO-46-385] p 97 N85-32039 Testimony of Robert A. Frosch before the Subcommittee on HUD and Independent Agencies of the Senate Committee on Appropriations [NASA-TM-87496] p 97 N85-33173 Department of Housing and Urban Development Independent Agencies Appropriation Bill, 1986 p 97 N85-34720 [S-REPT-99-129] National Aeronautics and Space Administration research and development Program description p 56 N85-34721 Management of large-scale technology p 56 N85-35145 NATIONAL AIRSPACE SYSTEM System engineering and integration contract for implementation of the National Airspace System Plan Volume 2 Section 5 0 [AD-A145710] p 47 N85-10929 National airspace review enhancement plan, revision 3 [AD-A150743] p 94 N85 16852 National Airspace System Plan Facilities, equipment and associated development p 76 N85-26692 NATURAL LANGUAGE (COMPUTERS) French plans for fifth generation computer systems [AD-A149435] p 50 N85-19732 NAVSTAR SATELLITES Widespread civil uses envisioned for satellite navigation p 62 A85-34217 system

#### **OPERATOR PERFORMANCE**

NAVY

Navy program manager's guide, 1985 edition [AD-A151925] p 76 N p 76 N85-27744 NEPTUNE (PLANET) 1986 National Aeronautics and Space The Administration authorization p 57 N85-35829 [GPO-47-635] NETWORK ANALYSIS

Defense data network support concept analysis [AD-A153214] p 52 N85-28649

NETWORK CONTROL Management and communications networks control of interconnected p 34 A85-34459 A fault tolerant military Satellite Network Management System p 80 A85-34460

NONDESTRUCTIVE TESTS Status of the U.K. N.D.T. industry today

p 22 N85-24309 NONLINEAR SYSTEMS

Design principles for Finite Elements (FE) programs concerned with intensely nonlinear problems --- German thesis p 33 A85-28797 NUCLEAR ELECTRIC POWER GENERATION

Technology transfer to the Middle East

[PB85-127744] p 51 N85-22264 NUMERICAL CONTROL

Research and Modeling of Supervisory Control Behavior, report of a workshop

[AD-A1496211 p 16 N85-22248 Project management using graphics p 56 N85-34560

# 0

# **OBJECT PROGRAMS**

Implementing fault-tolerant distributed objects p 80 A85-36291

- OCEAN THERMAL ENERGY CONVERSION Renewable technologies program summaries [DE85-001509] p 54 N85-30500
- ON-LINE SYSTEMS Maintenance Management Information and Control
- System (MMICS) Administrative boon or burden [AD-A145762] p 75 N85-12790

Provision of Federal government publication in electronic format to depository libraries p 38 N85-19880 (S-PRT-98-260)

OPERATING COSTS Activities report of the aerospace industry in West

Germany [ISSN-0722-38381 p 49 N85-16686

Activities report of the aerospace industry in West Germany

[ISSN-0722-3838] p 49 N85-16687 **OPERATING SYSTEMS (COMPUTERS)** 

- A technique for estimating performance of fault-tolerant p 81 A85-36297 programs A unified model for performance and reliability of
- Fault-Tolerant/Multi-Mode systems [AD-A148789] p 84 N85-17601 A decision model for selection of microcomputers and

operating systems [AD-A149076] p 15 N85-19694

OPERATIONS RESEARCH

Maintainability aspects in maintenance management

p 74 A85-49536 Contractor experience using RADC ORACLE Optimizing search with positive information feedback

- (CSIR-TWISK-313) p 36 N85-10855 European scientific notes Volume 38, number 11
- p 49 N85-17745 [AD-A148228]

European Scientific Notes, volume 38, number 12 p 50 N85-18946 [AD-A148713] proposed integration among organizational

information requirements, media richness and structural desian

[AD-A149317] p 15 N85-19881 European Scientific Notes Volume 39, number 2 [AD-A148994] p 50 N85-1

p 50 N85-19919 A decision support methodology for space technology advocacy

[AD-A151895] p 16 N85-25283 Management control systems and interdependencies An empirical study

[AD-A152280] p 17 N85-27746 Future directions in operations research

p 76 N85-28711 (REPT-84-241 Operations research

[B8561897] p 76 N85-28712 OPERATOR PERFORMANCE

Some perspectives on the study and improvement of the cognitive-creative activity of an individual and a p 2 A85-23276 aroup

#### **OPERATORS (PERSONNEL)**

The principles of experimental setup in models of p 3 A85-23283 complex human operator activities Interrelationship between learning and development in the process of mastering an occupational activity p 3 A85-23285 Certain problems in the automated assessment of the operating efficiency of man-machine systems p 24 A85-24035 Evaluation of the efficiency of operator work p 25 A85-37566 man-machine systems An analysis of ergonomic systems --- Russian book A85-46148 p 5 **OPERATORS (PERSONNEL)** Research and Modeling of Supervisory Control Behavior, report of a workshop p 16 N85-22248 [AD-A149621] Computer center policy [AD-A154416] p 41 N85-30681 OPTIMIZATION A methodology to design databases for finite element analysis and structural design optimization applications p 33 A85-30283 [AIAA PAPER 85-0743] Contractor experience using RADC ORACLE p 47 A85-49556 Optimizing search with positive information feedback [CSIR-TWISK-313] p 36 N85-10855 p 36 N85-10855 On maximizing the expected lifetime of replaceable systems [AD-A150003] p 75 N85-21680 ORBIT SPECTRUM UTILIZATION Satellite broadcasting and the use of the geostationary orbit - Some international legal aspects p 90 A85-36289 **ORBIT TRANSFER VEHICLES** Orbital vehicle transportation - issues of law and insurance [AIAA PAPER 85-1337] p 91 A85-39731 Space Station technology planning p 51 N85-22471 ORBITAL ASSEMBLY NASA space station automation Al-based technology review [NASA-CR-176094] p 31 N85-32134 ORBITAL MANEUVERING VEHICLES Orbital vehicle transportation - Issues of law and insurance [AIAA PAPER 85-1337] n 91 A85-39731 NASA space station automation Al-based technology review INASA-CR-1760941 p 31 N85-32134 Space station automation and robotics study Operator-systems interface p 31 N85-33172 INASA-CB-1760951 ORBITAL MECHANICS Debris in the geostationary orbit ring, the endless shooting gallery The necessity for a disposal policy p 94 N85-21214 ORBITAL SERVICING Commercialization of a Space Station ASME PAPER 84-WA/TS-3] p 64 A85-39930 ORBITAL SPACE STATIONS Space station related investigations in Europe [IAF PAPER 84-28] p 43 A85-12994 Synergy in space - Man-robot cooperation p 23 A85-20400 Planning for a joint space station p 44 A85-25856 An astronaut's look at commercial space opportunities p 62 A85-34216 Germany cites commercial fallout as justification for U S p 62 A85-34220 Station involvement Commercialization of a Space Station [ASME PAPER 84-WA/TS-3] p 64 A85-39930 Spacelab and Eureca as a basis for European involvement in the Space Station p 46 A85-42694 Space Station Software Issues [NASA-CP-2361] p 38 N85-20689 Software management issues --- space station software development p 16 N85-20690 Software development environment issues --- space p 84 N85-20691 station software development Software standards issues --space station software development p 84 N85-20692 p 38 Information systems issues N85-20693 Computer integration of engineering design and production A national opportunity [NASA-CR-175483] p 21 N85-21414 Space station study [BL-6167] p 53 N85-28959 Studies toward a manned space station Participation of European industry in NASA space station (MSS) [SNIAS-S/DT-Y-25-212] p 55 N85p 55 N85-31217 ORGANIZATIONS Reliability of communication flow in R&D organizations A85-33650 p 11 Renewing large organizations p4 A85-43193 Counteracting the stifling effects of

organization

Encouraging and maintaining an innovative work p 4 A85-43198 climate Productivity initiatives at USDA p 66 A85-43202 Keeping the bureaucracy in check p 66 A85-43204 A mathematical theory of command and control structures [AD-A145608] p 14 N85-11675 Matrix organizations Overcoming the disadvantages [AD-A145318] p 14 N85-12772 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 1 p 7 N85-19874 [AD-A149398] Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 2 [AD-A1493991 p 7 N85-19875 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 3 [AD-A149400] p 7 N85-19876 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues Methodological appendix p7 N85-19877 [AD-A149401] A proposed integration among organizational information requirements, media richness and structural design design [AD-A149317] National Telecommunications p 15 N85-19881 and Information Administration authorization (GPO-38-660) p 96 N85-27766 The concept of fit in contingency theory AD-A152603] p 18 N85-28854 ORGANIZING Quality organization --- quality control [CNES-NT-106] p 83 N85-13257 Navy information systems Planning, policy, organization, and management (PB85-176113) p 96 N85-32038 OUTER SPACE TREATY Colloquium on the Law of Outer Space, 26th, Budapest, Hungary, October 10-15, 1983, Proceedings p 87 A85-12623 Space law - Justice for the new frontier p 87 A85-12644 Colloguum on the Law of Outer Space, 27th, Lausanne, Switzerland, October 7-13, 1984, Proceedings p 89 A85-29025 Towards the entire demilitarization of outer space p 92 A85-50056 The structures and the role of an international agency for the control of satellites [NASA-TM-76765] p 93 N85-12806 U.S., Soviet space program aims contrasted p 95 N85-22455 Ρ PARALLEL PROCESSING (COMPUTERS) Ada - Will DOD's new computer language cut software cost' p 61 A85-29669 PARAMETER IDENTIFICATION Expanding expertise by use of an expert system [DE85-010759] p 30 N85p 30 N85-30723 PARSING ALGORITHMS Project management using graphics p 56 N85-34560 PARTICLE ACCELERATORS Quality assurance considerations for the implementation of a pulsed power R and D project (DE85-0123571 p 86 N85-35720 PASSENGER AIRCRAFT Simulators/training devices for commuter airlines p 1 A85-17232 Boeing's airliner launch criteria p 61 A85-28824 PAYLOAD INTEGRATION PLAN Operational preparation of the German Spacelab

Mission D1 [IAF PAPER 84-211] p 43 A85-13133 Data Requirement (DR) MA-03 Payload missions integration --- Spacelab payloads [NASA-CR-171331] p 84 N85-19009 PENALTIES. Punitive damages in aviation products liability cases

p 88 A85-27394 PERCEPTION

The psychology of technical devices and technical discourse p 27 N85-11609 [AD-P003929]

PERFORMANCE PREDICTION Analytical models of performance of procedures

a large

p 65 A85-43194

p 4 A85-45094 Maintainability aspects in maintenance management p 74 A85-49536

#### SUBJECT INDEX

Reliability prediction - Improving the crystal ball p 82 A85-49540 A management guide to reliability predictions p 82 A85-49541 Field data - The final measure --- of systems reliability p 82 A85-49543 Technical performance measurement handbook [AD-A147314] p 48 N85-16675 Simulation A tool for cost-effective systems design and p 71 N85-26657 live test reduction PERFORMANCE TESTS Field data - The final measure --- of systems reliability p 82 A85-49543 Specification of software quality attributes Volume 3 Software quality evaluation guidebook p 85 N85-29595 [AD-A153990] PERSONAL COMPUTERS Application of the personal computer for cost effective ATE/TPS support p 32 A85-26794 Personal computer aided decision analysis p 17 N85-27743 [AD-A151911] PERSONALITY Interrelationship between learning and development in the process of mastering an occupational activity p 3 A85-23285 Individual characteristics and unit performance. A review of research and methods p 9 N85-28550 (AD-A153145) PERSONALITY TESTS The Myers-Briggs type indicator as a tool to identify flight student's learning styles p 2 A85-21581 PERSONNEL Maintenance Management Information and Control System (MMICS) Administrative boon or burden p 75 N85-12790 [AD-A145762] Project manager's handbook for special projects p 48 N85-16683 [AD-A147913] European Scientific Notes, volume 38, number 12 [AD-A148713] p 50 N85-18946 Data processing professionals and DP application users' perceptions and expectations of operational roles of persons working in a DP/application user interface p 10 N85-35821 group PERSONNEL DEVELOPMENT Interrelationship between learning and development in the process of mastering an occupational activity p 3 A85-23285 Training guide for scientific and engineering trainees 1984 [AD-A147963] p 6 N85-17542 Improvements in personnel needed for better flight p 8 N85-23693 safety Administration chief on air traffic control improvements p 76 N85-25193 Guidelines of the Federal Minister of Transportation for the formation and examination of airline personnel, part p 9 N85-28556 PERSONNEL MANAGEMENT p 79 A85-17779 The management of failure Quality circles - Square deal for productivity A85-17781 p 1 Managing projects for high performance [ASME PAPER 84-MGT-8] p 20 A85-21298 Interaction of human cognitive models and computer based models in supervisory control p 14 N85-16474 [AD-A142547] Communications skills for CRM training p 6 N85-18017 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 1 [AD-A149398] p7 N85-19874 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 2 [AD-A149399] p 7 N85-19875 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 3 [AD-A149400] p 7 N85-19876 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues Methodological appendix

[AD-A149401] p 7 N85-19877 PERSONNEL SELECTION New system for the selection of air traffic control

p 1 A85-18720 personnel Basic principles of the development and execution of a system for the psychological selection of military

personnel p 3 A85-28024 Psychological techniques for the selection and initial training of military air traffic controllers p 4 A85-44244

Construction of a job-oriented test for the selection of air traffic controllers [DFVLR-FB-84-51] p 9 N85-28558

#### PESTICIDES EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 - September 30. 1985 [PB85-181881] p 55 N85-31676 PHILOSOPHY Outer space law A problem of astronautics [NASA-TM-77760] p 94 p 94 N85-16697 PHOTOVOLTAIC CONVERSION Distributed photovoltaic system impact upon utility p 58 A85-11349 load/supply management practices Polycrystalline silicon material availability and market pricing outlook for 1980 through 1988 p 58 A85-11425 PHYSICAL FITNESS Human factors and training research in military organizations and systems [AD-A146832] p 5 N85-16475 PHYSICAL WORK Psychological issues in the design of expert systems [AD-A146081] p 27 N85-12792 PICTURE TUBES Plans, developments in robotics p 29 N85-24191 PILOT PERFORMANCE MESSAGE - An expert system for aircraft crew workload p 24 A85-21569 assessment The functional age profile - An objective decision criterion for the assessment of pilot performance capacities and p 2 A85-21588 capabilities Automated performance measurement for Naval aviation - APARTS, a Landing Signal Officer training aid p 2 A85-21589 PILOT SELECTION The USAF pilot selection and classification research p 2 A85-21602 p 4 A85-44624 program Age and space flight PILOT TRAINING United Airlines' cockpit resource management training p 2 A85-21565 Pilot judgment training - Past, present and future p 2 A85-21579 Automated performance measurement for Naval aviation - APARTS, a Landing Signal Officer training aid p 2 A85-21589 Some principles for the construction of an adaptive p 3 A85-23279 training system Possible applications of simulators in various areas p 3 A85-29865 AV-8B Harrier II training capabilities [AIAA PAPER 85-1734] p 3 A85-40554 Determining training device requirements in Army p 5 N85-14558 aviation systems Management training for cockpit crews at Piedmont p 6 N85-18013 flight Guidelines of the Federal Minister of Transportation for the formation and examination of airline personnel, part p 9 N85-28556 PILOTS (PERSONNEL) Communications skills for CRM training p 6 N85-18017 Pilot education and safety awareness programs n 6 N85-18026 Innovative approaches to recurrent training p 6 N85-18028 PLANNING Navy information systems Planning, policy, organization, and management p 96 N85-32038 (PB85-1761131 Quality assurance considerations for the implementation of a pulsed power R and D project p 86 N85-35720 [DE85-012357] POISSON DENSITY FUNCTIONS Statistical estimation of software reliability p 80 A85-34449 POLICIES A Congressional view of national policy directions in emote sensing p 86 A85-10178 remote sensing Federal policy options and the commercialization of space [IAF PAPER 84-218] p 87 A85-13140 Science and technology policy - The next four years p 87 A85-21621 Evolving government policy eases way for space A85-34214 p 90 Reagan competitive policy places intelsat's future at p 90 A85-34223 crossroads

- The Global Positioning System (GPS) DOD policy issues p 1 A85-37805 Remarks on German space policy - 1985 to 1995 [AAS PAPER 84-319] p 64 A85-42553
- Second Symposium on Space Industrialization --- space commercialization [NASA-CP-2313] p 67 N85-11011
- Legal considerations and cooperative opportunities for space commercial activities p 93 N85-11013

The Expendable Launch Vehicle Commercialization Act

[GPO-30-838] p 93 N85-12919 Publications of the Executive Office of the President January 20, 1981 - June 30, 1984

 [PB84-230671]
 p 93
 N85-15533

 Issues and findings
 p 70
 N85-15782

 An evaluation of the effect of establishing a minimum
 Economic Order Quantity (EOQ) on the Air Force EOQ item management system

[AD-A147121] p 75 N85-16673 Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment

[AD-A147586] p 70 N85-16681 Technical order managers handbook Utilization assessment

[AD-A147579] p 37 N85-16694 National airspace review enhancement plan, revision 3 [AD-A150743] p 94 N85-16852 An analysis of production competition and award

[AD-A147775] p 70 N85-17733 International cooperation and competition in civilian

space activites (OTA-ISC-240) p 70 N85-17750 Worldwide report Telecommunications policy, research and development

[JPRS-TTP-85-002] p 94 N85-19309 Worldwide report Telecommunications policy, research and development

[JPRS-TTP-85-006] p 94 N85-19314 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 3

 [AD-A149400]
 p 7
 N85-19876

 Strategic management for organizational effectiveness
 The effect of human resource planning on retention and related issues
 Methodological appendix

 [AD-A149401]
 p 7
 N85-19877

 French research minister on policy, transfer
 p 94
 N85-20182

Debris in the geostationary orbit ring, the endless shooting gallery The necessity for a disposal policy p 94 N85-21214

Orbital debris policy issues Battelle involvement and some personal observations p 94 N85-21218 Considerations for policy on man-made debris propagation control p 94 N85-21218 M85-21218

Systems research on China in year 2000 p 50 N85-21418 1984 science and technology posture hearing with the

GPC-41-060] p 95 N85-22244 USSR report Space

[JPRS-USP-85-001] p 51 N85-22403 USSR report Science and technology policy

[JPRS-UST-85-002] p 95 N85-23442 Militarization of space activity in United States p 96 N85-25360

Social and political problems in Soviet basic research [AD-P004565] p 96 N85-28860 New ESA director on Ariane, space station, future

trends p 53 N85-29096 Inventory policy for high backorder items

[AD-A153696] p 77 N85-29840 Computer center policy

[AD-A154416] p 41 N85-30681

Methodology for assessing benefits and costs of government information collection

[DE85-010594] p 41 N85-30975 Navy information systems Planning, policy, organization, and management

 [PB85-176113]
 p 96
 N85-32038

 Opportunities for policy historians
 The evolution of the US civilian space program
 p 97
 N85-35147

A guide for new environmental coordinators [AD-A156327] p 19 N85-35498

POLITICS International cooperation and competition in space [GPO-38-001] p 69 N85-11911

Outer space law A problem of astronautics [NASA-TM-77760] p 94 N85-16697 Social and political problems in Soviet basic research

[AD-P004565] p 96 N85-28860 POLLUTION CONTROL Considerations for policy on man-made debris propagation control p 94 N85-21219

propagation control p 94 N85-21219 EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 - September 30, 1985 [P885-181881] p 55 N85-31676

[PB85-181881] p 55 N85-31676 A guide for new environmental coordinators

[AD-A156327] p 19 N85-35498

p 47 A85-49556 An application of discriminant analysis to the selection of software cost estimating models [AD-A147632] p 70 N85-17580 PRESIDENTIAL REPORTS Preview of the President's Commission on Industrial Competitiveness p 66 A85-43199 Publications of the Executive Office of the President January 20, 1981 - June 30, 1984 p 93 N85-15533 [PB84-2306711 President's private sector survey on cost control, report on research and development [PB84-173269] p 95 N85-22253 National aeronautical R and D goals Technology for America's future p 54 N85-30964 PRESSURE WELDING Welding techniques in pressure part technology p 22 N85-25835 PROBABILITY DISTRIBUTION FUNCTIONS A technique for estimating performance of fault-tolerant programs p 81 A85-36297 PROBABILITY THEORY General probability of system failure p 78 A85-10057 Information and computation --- emphasizing problem solving with uncertainty and aproximation p 33 A85-31791 RADSIM - A methodology for large-scale R&D program assessment p 46 A85-42585 A statistical approach to vendor selection p 16 N85-22249 [AD-A149781] PROBLEM SOLVING Model-based reasoning in expert systems - An application to enroute air traffic control p 23 A85-17817 [AIAA PAPER 84-2619] Information and computation --- emphasizing problem solving with uncertainty and aproximation p 33 A85-31791 Problem-oriented systems for processing experimental p 34 A85-34919 data On some common interests among reliability, inventory and queuing [AD-A145595] p 83 N85-11646 Psychological issues in the design of expert systems [AD-A146081] p 27 N85-12792 Economic analysis handbook [AD-A146263] p 69 N85-12805 Mental models and cooperative problem solving with xpert systems p 28 N85-16479 [AD-A147843] Distributed knowledge base systems for diagnosis and information retrieval p 28 N85-16690 [AD-A146890] Flexible manufacturing system concept features cache memory p 28 N85-17186 East Europe report Scientific affairs p 50 N85-20684 [JPRS-ESA-84-006] The application of expert systems to corrosion problems [AERE-M-34451 p 29 N85-21316 Personal decision making The influence of perceived locus of control and degree of rationality on information seeking strategies p 39 N85-23446 Expanding expertise by use of an expert system [DE85-010759] p 30 N85p 30 N85-30723 PROCEDURES Analytical models of performance of procedures p 4 A85-45094 The acquisition of procedures from text production-system analysis of transfer of training [AD-A151029] p 8 N85-24732 Guide for the execution of reliability tests in the laboratory p 85 N85-27237 --- aeronautical equipment PROCESS CONTROL (INDUSTRY) Quality characteristic feedback control p 20 A85-35100 An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement AD-A147496 p 75 N85-16678 PROCUREMENT An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement [AD-A147496] p 75 N85-16678

Technical order managers handbook Utilization assessment [AD-A147579] p.37 N85-16694

A statistical approach to vendor selection [AD-A149781] p 16 N85-22249

National Aeronautics and Space Administration research and development p 97 N85-32042

PREDICTION ANALYSIS TECHNIQUES

Contractor experience using RADC ORACLE

#### **PROCUREMENT MANAGEMENT**

#### PROCUREMENT MANAGEMENT

R&M implications of the DoD acquisition improvement p 72 A85-14896 program Weight control - A procurement agency perspective [SAWE PAPER 1594] p 74 A85-49914 Navy program manager's guide, 1985 edition AD-A1519251 p 76 N85-27744 Documentation for the West German Federal Cabinet's space policy decision p 96 N85-28886 Progress report on implementing the recommendations of the White House Science Council's Federal Laboratory Review Panel, volume 1 p 78 N85-35819 (PB85-185072) PRODUCT DEVELOPMENT Strategic management of industrial technology - A revie p 19 A85-13921 of the issues Application of a quality assurance system in the production of materials and components p 79 A85-16254 A85-17779 o 79 The management of failure Development tools - Case study for large systems of digital avionics [AIAA PAPER 84-2635] p 31 A85-17826 Automated tools for software development p 32 A85-26793 New model introduction - The operators' perspective A85-31981 - in helicopter industry p 61 Failure modes and effects analysis method for new product introductions [SAE PAPER 841600] p 73 A85-39070 A practical approach toward achieving software liability p 35 A85-45141 reliability Software configuration management across project boundaries and in distributed development environments [RSRE-MEMO-3704] p 37 N85-13494 Value analysis --- industrial competition p 21 N85-13684 [CNES-NT-110] Component problems plague French robotics industry p 30 N85-29088 Studies toward a manned space station Participation of European industry in NASA space station (MSS) [SNIAS-S/DT-Y-25-212] p 55 N85-31217 The development of complex systems p 55 N85-32021 Spin-offs from technical scientific infrastructures, no 1 p 55 N85-32034 Spin-offs from technical commercial infrastructures, no p 55 N85-32035 2 Som-offs from technical scientific research organizations, no 5 p 55 N85-32036 New technologies at the forefront of industrial p 56 N85-35168 developments PRODUCTION An analysis of production competition and award methodology AD-A147775 p 70 N85-17733 PRODUCTION COSTS Quality characteristic feedback control p 20 A85-35100 A buyer's guide to space infrastructure p 48 N85-15784 PRODUCTION ENGINEERING Quality assurance in a production environment p 79 A85-14109 Producibility engineering for robotic manufacturing p 24 A85-23196 Manufacturing Sciences and Robotics Research and Development Act of 1984 [H-REPT-98-1078] o 27 N85-13688 Coordinated research in robotics and integrated manufacturing [AD-A148204] p 28 N85-17365 Role of engineering psychology p 6 N85-18561 Manufacturing information system [AD-A152715] p 17 N85-28616 Producibility Engineering and Planning (PEP) Program management guidelines [AD-A153730] p 18 N85-30966 **PRODUCTION MANAGEMENT** Application of a quality assurance system in the production of materials and components p 79 A85-16254 Quality circles - Square deal for productivity A85-17781 p 1 Work flow in manufacturing systems p 20 A85-19181 Sony keeps high quality and productivity in the United States p 66 A85-43203 Robot production lines in operation p 29 N85-20166 USSR report Science and technology policy [JPRS-UST-85-002] p 95 N85-23442 Design-To-Cost (DTC) methodology achieve to p 71 N85-26645 affordable avionics

#### **PRODUCTION PLANNING**

- Specifying and cost estimating --- for installing industrial robot p 24 A85-23195 USSR report Science and technology policy
  - [JPRS-UST-85-002] p 95 N85-23442 PRODUCTIVITY Quality circles - Square deal for productivity p 1 A85-17781

White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984

p 81 A85-43176 Management philosophies associated with leading a p 12 A85-43177 successful organization Quality and cost competitiveness p 65 A85-43181 Applying productivity principles to new R&D programs NASA/TRW GRO project p 65 A85-43187 Improvement the Productivity រោ acquisition p 65 A85-43188 environment Building teams and maintaining trust p 66 A85-43195 Hurdles stifling the federal manager's ability to improve p 66 AB5-43201 productivity Productivity initiatives at USDA p 66 A85-43202 Sony keeps high quality and productivity in the United p 66 A85-43203 States Keeping the bureaucracy in check p 66 A85-43204 The Dana style - Participation builds the climate for p 13 A85-43205 productivity Evaluation of the effectiveness of the weighted quidelines to induce contractor's investment in cost reducing facilities equipment [AD-A147586] p 70 N85-16681 Management considerations for an information center [AD-A151774] n 40 N85-27742 Capital investment motivational techniques used by prime contractors on subcontractors AD-A1536601 p 53 N85-29837 PROGRAM VERIFICATION (COMPUTERS) Methods for improving the quality of computer software p 31 A85-11275 - Russian book Verification techniques for improving software quality through automated requirements data bases [AIAA PAPER 84-2669] p 79 A85-17848 Quality management Practical technology p 80 A85-24084 considerations Statistical estimation of software reliability p 80 A85-34449 The linear software reliability model and uniform p 81 A85-37901 testina Software test handbook p 37 N85-16498 [AD-A146844] Requirements for a database management system p 39 N85-22259 1DE85-0046611 Specification of software quality attributes Volume 2 Software quality specification guidebook [AD-A1539891 p 85 N85-29594 Specification of software quality attributes Volume 3 Software quality evaluation guidebook [AD-A1539901 p 85 N85-29595 Statistical estimation of software reliability AD-A154097) p 85 N85-30665 PROGRAMMED INSTRUCTION Factors critical to the implementation of self-paced instruction A background review p 5 N85-10648 [AD-A145143] PROGRAMMERS Concept paper for the development of a DOD Ada (trademark) software engineering education and training olan [AD-A148774] p 38 N85-17592 A learning strategy approach for teaching novice computer programmers p 8 N85-26200 AD-A1515231 Data processing professionals and DP application users perceptions and expectations of operational roles of persons working in a DP/application user interface aroup o 10 N85-35821 PROGRAMMING LANGUAGES Software standards issues --- space station software p 84 N85-20692 development PROJECT MANAGEMENT The European approach to a standardized work breakdown structure concept for European scientific space atellites [MBB-UB-688-84-OF] n 44 A85-16088 The management of failure p 79 A85-17779 Managing projects for high performance p 20 A85-21298 [ASME PAPER 84-MGT-8] Decision analysis in project management p 44 A85-25116 R&D project termination in high-tech industries

p 20

Integration of MSG-3 into airline operation

[SAE PAPER 841483]

A85-25118

p 72 A85-25978

Project management A managerial approach Textbook p 45 A85-36987 The SIMRAND methodology - Simulation of Research and Development Projects p 12 A85-41319 The multiple functions of formal aids to decision making p 12 A85-42587 in public agencies Applying productivity principles to new R&D programs NASA/TRW GRO project p 65 A85-43187 Representation of activity knowledge for project management p 46 A85-48595 Monitoring software development through dynamic variables p 47 A85-49049 Developing commercial users of space p 68 N85-11044 Project resources planning and control p 47 N85-13666 [NASA-TM-86339] Knowledge-based communication and management support in a system development environment N85-14596 p 27 The management of research institutions A look at government laboratories [NASA-SP-481] p 14 N85-16665 National airspace review enhancement plan, revision 3 p 94 N85-16852 (AD-A1507431 Space Station Software Issues [NASA-CP-2361] p 38 N85-20689 Software development environment issues --- space station software development p 84 N85-20691 Computer integration of engineering design and production A national opportunity [NASA-CR-175483] p 21 N85-21414 p 51 N85-22471 Space Station technology planning Organizing geological work tasks for 1985 outlined p 51 N85-27303 The Helios missions 52 N85-27795 Managerial benefits of Helios for the European industry p 52 N85-27809 p 17 N85-27812 Helios project support Space station study [BL-6167] p 53 N85-28959 The development of complex systems p 55 N85-32021 Project management using graphics p 56 N85-34560 Analyzing performance of small projects using URS and PMAS, information pamphlet [DE85-011964] p 56 N85-34718 Management of large-scale technology p 56 N85-35145 PROJECT PLANNING Europe in space 1985-2000 p 45 A85-26011 Overcoming project planning and timeliness problems to make Landsat useful for timely crop area estimates p 11 A85-32129 Strategic planning for investment in R&D using decision analysis and mathematical programming A85-33649 p 11 p 13 A85-45079 Software contingency planning Ada (trademark) training curnculum Software engineering for managers m101 teacher's exercise guide [AD-A145094] N85-10695 p 35 Project resources planning and control p 47 [NASA-TM-86339] N85-13666 Systems research on China in year 2000 N85-21418 p 50 Space Station technology planning p 51 N85-22471 National Airspace System Plan Facilities, equipment and associated development p 76 N85-26692 Organizing geological work tasks for 1985 outlined p 51 N85-27303 The significance of Helios for Europe p 52 N85-27808 Documentation for the West German Federal Cabinet's space policy decision p 96 N85-28886 Management of large-scale technology p 56 N85-35145 PROJECTS Project manager's handbook for special projects [AD-A147913] p 48 N85-16683 PROPULSION Graduate education in propulsion [AIAA PAPER 85-1147] p 3 A85-39623 PROTOTYPES Prototyping information systems on microcomputers -A design philosophy for engineering management p 33 A85-29401 User and R&D specialist evaluation of decision-support p 12 A85-38415 systems SAGA A project to automate the management of vare production systems [NASA-CB-174017] p 35 N85-10685

p 73 A85-25979

n 61 A85-27648

MSG-3 - A method for maintenance program planning

What are we in business for? - An engineering approach

[SAE PAPER 841485]

to project finance.

#### PSYCHOLOGICAL FACTORS

The Myers-Briggs type indicator as a tool to identify flight p 2 A85-21581 student's learning styles The principles of experimental setup in models of p 3 A85-23283 complex human operator activities Basic principles of the development and execution of a system for the psychological selection of military p 3 A85-28024 personnel Management training for cockpit crews at Piedmont p6 N85-18013 flight Research opportunities in human behavior and performance p 6 N85-19640 [NASA-CR-175473] **PSYCHOLOGICAL TESTS** Psychological techniques for the selection and initial training of military air traffic controllers p 4 A85-44244 Construction of a job-oriented test for the selection of air traffic controllers p 9 N85-28558 [DFVLR-FB-84-51] PUBLIC LAW Some legal aspects of industrial activity in outer space

PULSE GENERATONS		
Quality assurance considerations for	the imp	emntation
of a pulsed power R and D project		
[DE85-012357]	p 86	N85-35720
PURPOSES		
Broadening the debate	p 48	N85-15785

p 91 A85-38916

#### Q

#### Q FACTORS Quality circles - Square deal for productivity

Guanty circles - Oquare ocu	a for production	,
	p1	A85-17781
Comparative descriptions of	f software quali	ty measures
[GMD-STUDIES-81]	p 83	N85-10676
OUAL ITATIVE ANAL VSIS	-	

A quantitative evaluation of human activity in man-machine systems --- Russian book p 23 A85-13599

QUALITY White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984

p 81 A85-43176 Quality and cost competitiveness p 65 A85-43181 Quality in practice at IBM p 13 A85-43186 QUALITY CONTROL

Group testing --- optimization of component reliability acceptance tests p 78 A85-12645 An engineer's guide to books on statistics and data analysis p 10 A85-12647 Testing, evaluation and quality control of composites, Proceedings of the International Conferenco, University of Surrey, Guildford, Surrey, England, September 13, 14, 1983 p 78 A85-14101 Quality assurance in a production environment p 79 A85-14109 Application of a quality assurance system in the

production of materials and components p 79 A85-16254 Quality management technology - Practical considerations p 80 A85-24084 Some remarks on optimum inspection policies p 80 A85-25109

Software Quality Assurance Program for the AH-64 Advanced Attack Helicopter (AAH) p 80 A85-32010

Rectifying inspection for nonconforming items and the Hald linear cost model p 61 A85-32573 Quality characteristic feedback control

p 20 A85-35100 Failure modes and effects analysis method for new product introductions

[SAE PAPER 841600] p 73 A85-39070 The Deming inspection criterion for choosing zero or 100 percent inspection criterion p 81 A85-40255 Sony keeps high quality and productivity in the United States p 66 A85-43203

States p 66 A85-43203 Measurement assurance programs Part 1 General introduction

[P884-217868] p 83 N85-10339 ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing Volume 4, part 6 Task d Quality assurance/quality control/technical requirement/tasks, quality assurance modeling and analysis, quality assurance program management standard recommendations (ISP) [AD-A144891] p 26 N85-10372

[AD-A144891] p 26 N85-10372 Comparative descriptions of software quality measures [GMD-STUDIES-81] p 83 N85-10676 Avionics integrity program (Avip) Volume 1 Procurement phase issues Design, manufacturing, and integration

[AD-A145651] p 83 N85-10943

Quality organization --- quality control [CNES-NT-106] p 83 N85-13257

The ESA product assurance specification system Explanatory note p 83 N85-13259 An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement [AD-A147496] p 75 N85-16678

Robotics at Savannah River site Activity report [DE85-003657] p 29 N85-20383 Quality of scientific and engineering data

[DE85-000294] p 84 N85-20936 Transportation [JPRS-UTR-85-004] p 50 N85-21105

- Aviation repair plant directors on quality control measures p 84 N85-21106
- A statistical approach to vendor selection [AD-A149781] p 16 N85-22249 Administration chief on air traffic control improvements p 76 N85-25193
- Cost prediction model for various payloads and instruments for the Space Shuttle Orbiter
- [NASA-CR-175781]
   p 72
   N85-26842

   A framework for software development
   [AD-A152067]
   p 40
   N85-27551
- Integrating quality assurance and research and development [DE85-007974] p.17 N85-28392
- Principles of quality assurance of chemical measurements [PB85-177947] p 76 N85-28997
- [PB85-177947] p 76 N85-28997 Specification of software quality attributes, volume 1 [AD-A153988] p 85 N85-29593 Specification of software quality attributes Volume 2
- Software quality specification guidebook [AD-A153989] p 85 N85-29594 Specification of software guality attributes Volume 3
- Software quality evaluation guidebook [AD-A153990] p 85 N85-29595
- Generic data entry quality assurance tool [DE85-008359] p 41 N85-29852
- Quality analysis p 22 N85-32785 An automated quality assurance surveillance plan for ADP (Automated Data Processing) operations under the Navy's commercial activities program
- [AD-A154767] p 55 N85-32802 Quality assurance considerations for the implementation
- of a pulsed power R and D project [DE85-012357] p 86 N85-35720 Aeronautical Systems Division Manufacturing/Quality
- assurance orientation [AD-A156128] p 86 N85-35817 QUEUEING THEORY
- On some common interests among reliability, inventory and queuing
- [AD-A145595] p 83 N85-11646

# R

n n		EOHOMEM	-
<b>۱</b> .	АΠ.	EQUIPMEN	

R/

maining capabilities test of Electronics Equipment	
Maintenance Trainer (EEMT) Findings and conclusions	
[AD-A146075] p 5 N85-12302	
RADIATION DOSAGE	
Robotics at Savannah River site Activity report	
[DE85-003657] p 29 N85-20383	
RADIO ASTRONOMY	
USSR report Space	
[JPRS-USP-85-001] p 51 N85-22403	
RADIO SPECTRA	
National Telecommunications and Information	
Administration authorization	
[GPO-38-660] p 96 N85-27766	
RADIOACTIVE CONTAMINANTS	
EPA (Environmental Protection Agency) research	
program quide, EY-1985, October 1, 1984 - September	
program galact, i i rece, e clober i, recet Copielinder	
30, 1985	
30, 1985 [PB85-181881] p 55 N85-31676	
30, 1985 [PB85-181881] p 55 N85-31676 RADIOBIOLOGY	
30, 1985 [PB85-181881] p 55 N85-31676 RADIOBIOLOGY European scientific notes Volume 38, number 11	
30, 1985         11, 1967         Deptimizer           30, 1985         [PB85-181861]         p 55         N85-31676           RADIOBIOLOGY         European scientific notes         Volume 38, number 11           [AD-A148228]         p 49         N85-17745	
30, 1985         [PB85-181881]         p 55         N85-31676           RADIOBIOLOGY         European scientific notes         Volume 38, number 11           [AD-A148228]         p 49         N85-17745           RANGE (EXTREMES)         Extremesting         Page 2010	
30, 1985         11, 1967         Deptiline           30, 1985         [PB85-181881]         p 55         N85-31676           RADIOBIOLOGY         European scientific notes         Volume 38, number 11           [AD-A148228]         p 49         N85-17745           RANGE (EXTREMES)         EOQ (Economic Order Quantity) range model	
30, 1985         11, 1967         Objective         Objective           30, 1985         [PB85-181881]         p 55         N85-31676           RADIOBIOLOGY         European scientific notes         Volume 38, number 11           [AD-A148228]         p 49         N85-17745           RANGE (EXTREMES)         EOO (Economic Order Quantity) range model           [AD-A153709]         p 77         N85-30965	
30, 1985         1         p 55         N85-31676           RADIOBIOLOGY         European scientific notes         Volume 38, number 11           [AD-A148228]         p 49         N85-17745           RANGE (EXTREMES)         EOQ (Economic Order Quantity) range model         [AD-A153709]           [AD-AT53709]         p 77         N85-30965	
30, 1985         11, 1957         Deptilizer           30, 1985         [PB85-181881]         p 55         N85-31676           RADIOBIOLOGY         European scientific notes         Volume 38, number 11           [AD-A148228]         p 49         N85-17745           RANGE (EXTREMES)         EOO (Economic Order Quantity) range model         [AD-A153709]         p 77         N85-30965           REACTOR SAFETY         Space reactor safety         p 82         A85-45433	
30, 198         11, 1964         Colored and the second	
30, 1985         11, 1957         Objective           30, 1985         [PB85-181881]         p 55         N85-31676           RADIOBIOLOGY         European scientific notes         Volume 38, number 11           [AD-A148228]         p 49         N85-17745           RANGE (EXTREMES)         EOQ (Economic Order Quantity) range model         [AD-A153709]         p 77           RACTOR SAFETY         p 77         N85-30965         REACTOR SAFETY           Space reactor safety         p 82         A85-45433           REACTOR TECHNOLOGY         East Europe report         Science and technology	
30, 1985         11, 1001         0000001         000000000000000000000000000000000000	

Report-reading patterns of technical managers and nonmanagers p 10 A85-21540 REAL TIME OPERATION

Reliability for real-time systems

[DGLR PAPER 84-117]	p 81	A85-40333

Ada (trademark) training curriculum Real-time concepts 1303 teacher's guide [AD-A145093] p 35 N85-10694 RECORDS Primer on the registration of technical information in p 36 N85-12786 industry REDUCED GRAVITY Activities in Germany for the commercialization of [IAF PAPER 84-222] p 59 A85-13142 Second Symposium on Space Industrialization --- space commercialization [NASA-CP-2313] p 67 N85-11011 REDUNDANCY Effects of redundancy management on reliability modelling p 13 A85-47795 REDUNDANCY ENCODING A fault-tolerant software strategy for digital systems p 79 A85-17833 [AIAA PAPER 84-2646] REDUNDANT COMPONENTS Optimal maintenance center inventories for fault-tolerant repairable systems p 72 A85-21548 Optimal inventories for overhaul of repairable redundant p 73 A85-48239 systems · A Markov decision model REGULATIONS FAA regulation of ultralight vehicles p 86 A85-11938 Launching the rocket industry in the United States -Domestic regulation of private expandable launch A85-30998 p 89 vehicles Airline deregulation - Another look p 92 A85-44099 Commercial Space Launch Act [GPO-39-613] p 93 N85-13690 RELIABILITY Ada (trademark) training curriculum Software AD-A145094] p 35 N85-10695 [AD-A1450941 On some common interests among reliability, inventory and queuing [AD-A1455951 o 83 N85-11646 Specification of software quality attributes Volume 3 Software quality evaluation guidebook p 85 N85-29595 [AD-A153990] RELIABILITY ANALYSIS Reliability and maintainability considerations in computer performance evaluation p 78 A85-10055 General probability of system failure p 78 A85-10057 Distributed photovoltaic system impact upon utility p 58 A85-11349 load/supply management practices Group testing --- optimization of component reliability cceptance tests p 78 A85-12645 R&M implications of the DoD acquisition improvement acceptance tests rogram p 72 A85-14896 Military electronics - Why so unreliable? p 80 A85-18440 Performance/reliability measures for fault-tolerant computing systems p 80 A85-25108 Some remarks on optimum inspection policies p 80 A85-25109 Reliability of communication flow in R&D organizations p 11 A85-33650 Statistical estimation of software reliability p 80 A85-34449 The linear software reliability model and uniform p 81 A85-37901 testing A system reliability model with classes of failures p 81 A85-37904 Failure modes and effects analysis method for new product introductions [SAE PAPER 841600] p 73 A85-39070 Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings Establishing realistic requirements for reliability, maintainability, and built-in-test p 82 A85-49530 Reliability prediction Reliability prediction - Improving the crystal ball p 82 A85-49540 A management guide to reliability predictions p 82 A85-49541 Field data - The final measure --- of systems reliability p 82 A85-49543 R&M analysis techniques for fault-tolerant systems p 74 A85-49588 Research in data management and system reliability [AD-A1454981 p 83 N85-12773 Cost prediction model for various pavloads and struments for the Space Shuttle Orbiter p 72 N85-26842 [NASA-CB-175781] Statistical estimation of software reliability p 85 N85-30665 AD-A154097] RELIABILITY ENGINEERING

ELIABILITY ENGINEERING Failure prevention and reliability - 1983, Proceedings

of the Fifth Conference, Dearborn, MI, September 11-14, 1983 p 78 A85-11666

### RELIABILITY ENGINEERING

French research minister on policy, technology p 94 N85-20182 transfer An agenda for a study of government science policy [GPO-40-860] p 95 N85-22245 President's private sector survey on cost control, report on research and development [PB84-173269] p 95 N85-22253 East Europe report Science and technology JPRS-ESA-84-0321 p 51 N85-26833 [JPRS-ESA-84-032] p 22 N85-27821 Activities in aerospace Integrating quality assurance and research and development [DE85-007974] p 17 N85-28392 Multicriteria decision analysis as an aid to strategic planning of energy research and development p 44 A85-13920 [REPT-84-02] p 18 N85-28870 Space station study [BL-6167] p 53 N85-28959 The economics of private sector R and D decisionmaking p 1 A85-21560 in aeronautics [NASA-CR-176007] o 54 N85-30962 p 2 A85-21602 National Aeronautics and Space Administration p 54 N85-30980 p 87 A85-21621 Note for a research feasibility project High reliability design in the aeronautical field p 85 N85-31005 p 24 A85-23197 [REPT-84-88-350] NASA Space controls research and technology p 54 N85-31149 program Spin-offs from technical scientific infrastructures, no 1 - Δn p 55 N85-32034 Spin-offs from technical scientific research p 55 N85-32036 organizations, no 5 Quality assurance considerations for the implementation of a pulseu po... [DE85-012357] 1986 National a pulsed power R and D project p 86 N85-35720 Aeronautics and Space Administration authorization p 57 N85-35829 promote [GPO-47-635] RESEARCH FACILITIES The management of research institutions A look at novernment laboratories [NASA-SP-481] p 14 N85-16665 RESEARCH MANAGEMENT A simple method for evaluation and selection of R&D proposals for a competitive grant fund p 44 A85-13920 Decision analysis in project management p 44 A85-25116 overview Research and development in the technology of transportation Let's reach for blue sky A85-33650 p 45 A85-31742 Strategic planning for investment in R&D using decision analysis and mathematical programming ion-support p 11 A85-33649 international comparative study of systems for the government advancement of research and development [NASA-TM-77589] p 48 N85-13689 Organizations and information processing A field study of research and development units within the United States Air Force Systems Command [AD-A147381] p 21 N85-16691 UK, FRG, France R and D in sensors, related fields p 49 N85-17197 Autonomy in the industrial R and D lab p 15 N85-17736 [AD-A148075] Outlook for expanding the Federal research in progress system [AD-A148354] p 49 N85-17737 Emerging role of the national laboratory in the development and transfer of materials technology p 49 N85-18086 [DE85-001252] European Scientific Notes, volume 38, number 12 [AD-A1487131 p 50 N85-18946 Systems research on China in year 2000 p 50 N85-21418 p 14 N85-16665 Authorizing appropriations to the National Aeronautics and Space Administration for fiscal year 1986 [H-REPT-99-32] p 95 N85-23452 Air Force technical objective document FY 86 p 52 N85-28855 [AD-A152730] The outlook for Soviet advanced technologies [AD-P004564] p 52 N85-28859 Social and political problems in Soviet basic research [AD-P004565] p 96 N85-28860 R/D contracts in the Soviet Union [AD-P004569] p 53 N85-28865 Laboratory research A question of when, not if [AD-A153298] p 53 N85-28867 EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 - September 1985 [PB85-181881] p 55 N85-31676 Human factors engineering contracts in Sweden An OVERVIEW [FOA-C-56043-H2] p 55 N85-31836

REMOTE REGIONS Automated tools for software development p 32 A85-26793 ATE Data base management for rehability A85-26807 p 32 enhancement Units of equipment available using cannibalization for p 73 A85-37903 repair-part support Reliability for real-time systems [DGLR PAPER 84-117] p 81 A85-40333 A practical approach toward achieving software eliability p 35 A85-45141 reliability A companison of various Life Cycle Cost models --- in avionics systems acquisition p 66 A85-45150 Effects of redundancy management on reliability p 13 A85-47795 modelling Annual Reliability and Maintainability Symposium, San Francisco, CA, January 24-26, 1984, Proceedings p 82 A85-49526 Contractor experience using RADC ORACLE p 47 A85-49556 Software reliability - Let's start doing it p 82 A85-49562 p 83 A85-49580 A reliability growth model A unified model for performance and reliability of Fault-Tolerant/Multi-Mode systems p 84 N85-17601 [AD-A148789] Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618 Guide for the execution of reliability tests in the laboratory p 85 N85-27237 --- aeronautical equipment Note for a research feasibility project High reliability design in the aeronautical field [REPT-84-RR-350] p 85 N85-31005 REMOTE REGIONS Project manager's handbook for special projects (AD-A1479131 p 48 N85-16683 REMOTE SENSING A Congressional view of national policy directions in p 86 A85-10178 remote sensing International cooperation in the commercial era of p 58 A85-12507 space Commercialization of remote sensing data - Its impact on the continuity and accessibility of remote sensing data, including response to standing orders as well as on the standardization of products p 60 A85-20642 Overcoming project planning and timeliness problems to make Landsat useful for timely crop area estimates p 11 A85-32129 Remote sensing - A tortuous trip to marketplace p 62 A85-34218 The private sector - A global pool of technical talent for remote sensing training and program support p 63 A85-37954 Need for alternative space launch services given NASA refusal to launch SPARX-01 mission under standard form commercial launch services agreement p 91 A85-38914 Commercialization of remote-sensing technology p 64 A85-41657 Second Symposium on Space Industrialization --- space commercialization [NASA-CP-2313] p 67 N85-11011 Land remote sensing commercialization A status p 68 N85-11024 report Land Remote-Sensing Commercialization Act p 93 N85-14201 [S-REPT-98-458] USSR report Space [JPRS-USP-85-001] p 51 N85-22403 REPLACING On maximizing the expected lifetime of replaceable systems [AD-A150003] p 75 N85-21680 REPLENISHMENT Feasibility of applications of Competition Decision Assist Package (CDAP) to spare parts 154716] p 77 N85-33036 REPORTS Report-reading patterns of technical managers and nonmanagers p 10 A85-21540

Transportation [JPRS-UTR-85-004] p 50 N85-21105 REQUIREMENTS

DOD related software technology requirements, practices, and prospects for the future

[AD-A145493] p 36 N85-11575 Design of a scientific information collation and ssemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791

A proposed integration among organizational information requirements, media richness and structural design [AD-A149317] p 15 N85-19881

**RESCUE OPERATIONS** 

Search and rescue of aircraft in distress in France Organization, means p 77 N85-31096 RESEARCH

- Artificial intelligence applications to maintenance p 26 N85-11594 [AD-P003914]
- Laboratory research A question of when, not if p 53 N85-28867 [AD-A1532981

Investigation of DBMS (Data Base Management Systems) for use in a research environment p 42 N85-33042 [AD-A154862]

RESEARCH AND DEVELOPMENT Government tools for the support of commercial

anturas [IAF PAPER 84-216] o 59 A85-13138

A simple method for evaluation and selection of B&D proposals for a competitive grant fund

Strategic management of industrial technology - A review p 19 A85-13921 of the issues Displays, deja vu --- avionics-human factors R&D

The USAF pilot selection and classification research

program Science and technology policy - The next four years

A system-level approach to automation research

Computing and information services at the Jet Propulsion Laboratory - A management approach to a diversity of p 44 A85-24525 needs

Decision analysis in project management p 44 A85-25116 overview R&D project termination in high-tech industries

p 20 A85-25118 Integration of MSG-3 into airline operation

[SAE PAPER 841483] p 72 A85-25978 MSG-3 - A method for maintenance program planning [SAE PAPER 841485] p 73 A85-25979 forces Intercompany technology task cooperation at Lockheed p 11 A85-26847 The congressional authorization process as it applies

to aeronautical research and technology p 89 A85-29555 Research and development in the technology of transportation Let's reach for blue sky n 45 A85-31742

Strategic planning for investment in R&D using decision analysis and mathematical programming n 11 A85-33649 Reliability of communication flow in R&D organizations

p 11 US initiatives in space commercialization (IAF PAPER 84-223) p 63 A85-35978

User and R&D specialist evaluation of decision systems p 12 A85-38415 The SIMRAND methodology - Simulation of Research and Development Projects p 12 A85-41319 RADSIM - A methodology for large-scale R&D program p 46 A85-42585 assessment The multiple functions of formal aids to decision making in public agencies o 12 A85-42587 Some informal remarks on the M-form society

p 46 A85-43182 Applying productivity principles to new R&D programs NASA/TRW GRO project p 65 A85-43187 Human-system performance measurement in training

simulators p 5 A85-48752 Space commercialization Analysis of R and D p 68 N85-11052 investments with long time horizons

Project resources planning and control p 47 N85-13666 [NASA-TM-86339] International comparative study of systems for the

government advancement of research and development [NASA-TM-77589] p 48 N85-13689 The management of research institutions A look at government laboratories

[NASA-SP-481] Organizations and information processing A field study of research and development units within the United States

Air Force Systems Command [AD-A147381] p 21 N85-16691

Autonomy in the industrial R and D lab p 15 N85-17736 [AD-A148075] Outlook for expanding the Federal research in progress

system [AD-A148354] p 49 N85-17737

Innovation in British industry (notably the aircraft industry) and its value Collected papers [BAE-KRS-N-GEN-286] p 49 N85-17933

Emerging role of the national laboratory in the evelopment and transfer of materials technology p 49 N85-18086 [DE85-001252]

Activities report in aerospace in West Germany p 50 N85-18947 [ISSN-0070-3966] Worldwide report Telecommunications policy, research and development

[JPRS-TTP-85-002] p 94 N85-19309

- The Human Resource Management Information Network (HRMIN) A cost comparison in accordance with Office of Management and Budget (OMB) Circular no A-76, 5 April 1979 [AD-A154583] p 42 N85-33039
- Investigation of DBMS (Data Base Management Systems) for use in a research environment p 42 N85-33042 [AD-A154862]
- Research report program of the US Army in Europe p 56 N85-35167
- DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 3, Workshop A VE in the program office
- p 57 N85-35812 [AD-A156069] RESEARCH PROJECTS International comparative study of systems for the
- overnment advancement of research and development p 48 N85-13689 [NASA-TM-77589] RESOURCE ALLOCATION
- A research paradigm for multi-human decision making p 13 A85-47678

#### **RESOURCES MANAGEMENT**

- United Airlines' cockpit resource management training p 2 A85-21565 Space industrialization and the social agenda
- p 60 A85-24653 Project resources planning and control
- p 47 N85-13666 [NASA-TM-863391 Managing recoverable aircraft components in the PPB (Planning, Programming and Budgeting) and related processes Technical volume
- [AD-A152014] p 76 N85-25169 RESPONSES
- Models for multidimensional tests and hierarchically structured training materials [AD-A155231] p 10 N85-32768
- RETRAINING Data processing professionals and DP application users
- perceptions and expectations of operational roles of persons working in a DP/application user interface p 10 N85-35821 aroup REVENUE
- Financing considerations and Federal budget impacts p 94 N85-15792 RISK
- Investors balance enthusiasm for new market against risk potentia p 62 A85-34215 Starstruck's problems spotlight risks, opportunities in p 62 A85-34221 space
- Balancing taking risk and encouraging p 66 A85-43196 entrepreneunsm
- Fire service emergency management handbook [AD-A155780] p 19 N85-35313 ROBOTICS
- Producibility engineering for robotic manufacturing
- p 24 A85-23196 p 24 A85-23198 Human factors in robotics
- Machine vision The eyes of automation A manager's practical guide --- Book p 20 A85-35799
- The role of robotics in space system operations [AIAA PAPER 85-1879] p 25 A85-45902
- Robotics investment decision model user's manual p 26 N85-11347 [AD-A1454671
- Supply center processes [AD-P004014] p 74 N85-11993 Manufacturing Sciences and Robotics Research and Development Act of 1984
- [H-REPT-98-1078]
- L-REPT-98-1078] East Europe report Science and technology p 49 N85-17176 [JPRS-ESA-84-046] Man-machine communication research for robotics
- p 28 N85-17177 reported Flexible manufacturing system concept features cache p 28 N85-17186 memory
- East Europe report Science and technology [JPRS-ESA-84-043] N85-17198 p 49
- Coordinated research in robotics and integrated manufacturing p 28 N85-17365 [AD-A148204]
- Dean of Kiev State University on impact of robots p 28 N85-19213
- French panel makes specific proposals for robotics research Current state of French robotics
- p 29 N85-20180 Robotics at Savannah River site Activity report [DE85-003657] N85.20383 p 29
- Plans, developments in robotics p 29 N85-24191 East Europe report Science and technology p 51 N85-26833 [JPRS-ESA-84-032]
- p 22 N85-28189 reviewed Component problems plague French robotics industry
- Multinational program to develop intelligent robots
- Applications of robots in machine tool industry
- p 30 N85-29088
- p 30 N85-29094

NASA space station automation Al-based technology review [NASA-CR-176094] p 31 N85-32134 Importance of automation, robotization in economy p 31 N85-32219 Space station automation and robotics study

- Operator-systems interface [NASA-CR-176095] p 31 N85-33172 Testimony of Robert A Frosch before the Subcommittee on HUD and Independent Agencies of the Senate
- Committee on Appropriations p 97 N85-33173 [NASA-TM-87496] Investment justification of robotic technology in aerospace manufacturing User's manual
- p 23 N85-35410 [AD-A156193] ROBOTS
  - Synergy in space Man-robot cooperation p 23 A85-20400 Specifying and cost estimating --- for installing industrial p 24 A85-23195 robot
  - A system-level approach to automation research p 24 A85-23197 The
- systems -Active control of mechanical state-of-the-art for robotic manipulators p 25 A85-30351 [AIAA PAPER 85-0683] New concepts for industrial robots outlined
- p 27 N85-15176 Robot production lines in operation
- p 29 N85-20166 Robotics at Savannah River site Activity report N85-20383 [DE85-003657] p 29
- Robot use in FRG increases but sensor technology p 29 N85-25605 lags Future directions of robotics, automation in Italy
- p 30 N85-28187 Component problems plague French robotics industry p 30 N85-29088
- Multinational program to develop intelligent robots p 30 N85-29094
- Space station automation and robotics study Operator-systems interface
- p 31 N85-33172 [NASA-CR-176095]

# S

- SAFETY A review of safety practices and safety training for the explosives field [AD-A152295] p.8 N85-27028 SAFETY MANAGEMENT System sizing - The theory and the practice --- for solar p 78 A85-11351 generators Space reactor safety p 82 A85-45433 Aerospace Safety Advisory Panel [NASA-TM-87428] p 85 N85-21135 SAMPLING Rectifying inspection for nonconforming items and the p 61 A85-32573 Hald linear cost model The Deming inspection criterion for choosing zero or p 81 A85-40255 100 percent inspection SATELLITE DESIGN The European approach to a standardized work breakdown structure concept for European scientific space satellite [MBB-UR-688-84-OE] p 44 A85-16088 SATELLITE GROUND SUPPORT Commercialization of remote sensing data - Its impact on the continuity and accessibility of remote sensing data, including response to standing orders as well as on the standardization of products p 60 A85-20642 SATELLITE IMAGERY Overcoming project planning and timeliness problems to make Landsat useful for timely crop area estimates p 11 A85-32129 Remote sensing - A tortuous trip to marketplace p 62 A85-34218 SATELLITE NAVIGATION SYSTEMS Widespread civil uses envisioned for satellite navigation p 62 A85-34217 system SATELLITE NETWORKS Intelsat business services p 60 A85-15463 Transborder direct-to-home satellite service p 88 A85-24089 A fault tolerant military Satellite Network Management p 80 A85-34460 System satellite The deregulation international of p 90 A85-36666 communications SATELLITE OBSERVATION A report on the training course at Fortaleza (Ceara)
- [E85-10013] p 5 N85-11426 The structures and the role of an international agency for the control of satellites [NASA-TM-76765] p 93 N85-12806

#### SOFTWARE ENGINEERING

SATELLITE TRANSMISSION
n 88 A85-24089
SCHEDULING
systems
[ÅD-A150003] p 75 N85-21680
Information technology applications in voluntary sector
of work
[TT-8501] p 71 N85-26457
European Scientific Notes, volume 38, number 12
[AD-A148713] p 50 N85-18946 SCIENTIFIC SATELLITES
The European approach to a standardized work breakdown structure concept for European scientific space
satellites
[MBB-UR-688-84-OE] p 44 A85-16088
SCIENTISTS
Training guide for scientific and engineering trainees
1984 [AD-4147963] D.6 N85-17542
SCOUT PROJECT
User's operating procedures Volume 2 Scout project
financial analysis program [NASA-CR-177949] p.42 N85-34519
SEARCHING
Optimizing search with positive information feedback
[CSIR-TWISK-313] p 36 N85-10855
Search and rescue of aircraft in distress in France
SELECTION
Selection criteria for a CAD/CM system
p 71 N85-24810
SELECTIVE DISSEMINATION OF INFORMATION
system 0.34 A85-42593
SEMICONDUCTORS (MATERIALS)
Polycrystalline silicon material availability and market
phong bullook for 1980 through 1968 p 58 A85-11425
SERVICE LIFE
On maximizing the expected lifetime of replaceable systems
[AD-A150003] p 75 N85-21680
Ecod service management p 16 N85-24736
SERVOMOTORS Pabot use in EPG increases but sensor technology
lags p 29 N85-25605
SILICON
Polycrystalline silicon material availability and market pricing outlook for 1980 through 1988
p 58 A85-11425
Simulation for human factors research A central
guestion Fidelity p 9 N85-29568
SIZING (SHAPING) System sizing - The theory and the practice for solar
generators p 78 A85-11351
SOCIAL FACTORS
United Ainines' cockpit resource management training o 2 A85-21565
Interpersonal activity in conditions of group learning
p 2 A85-23278 Space industrialization and the social agenda
p 60 A85-24653 Social and political problems in Soviet basic research
[AD-P004565] provisins in coviet basic research
Symbolic and interactional perspectives on leadership
An integrative framework
[AD-A15524/] p 19 N85-32769 SOFTWARE ENGINEERING
Reusability in programming - A survey of the state of
the art p 31 A85-11096

- A fault-tolerant software strategy for digital systems [AIAA PAPER 84-2646] p 79 A85-17833 Using Ada for a distributed, fault tolerant system p 79 A85-17873 [AIAA PAPER 84-2703] Software design methods --- for civil and military aircraft p 32 A85-21457 avionics systems Application of the personal computer for cost effective p 32 A85-26794 ATE/TPS support Conference on Ada Applications and Environments, St Paul, MN, October 15-18, 1984, Proceedings
- p 32 A85-27900 Ada - Will DOD's new computer language cut software
- p 61 A85-29669 cost? A methodology to design databases for finite element analysis and structural design optimization applications [AIAA PAPER 85-0743] p 33 A85-30283 Steps to an advanced Ada program ning environment p 33 A85-31209

Germany cites commercial fallout as justification for U S p 62 A85-34220 Station involvement Starstruck's problems spotlight risks, opportunities in p 62 A85-34221 space Commercial use of space - The space business era p 63 A85-34538 US initiatives in space commercialization p 63 A85-35978 [IAF PAPER 84-223] Homesteading the new frontier p 63 A85-37256 The private sector - A global pool of technical talent for remote sensing training and program support p 63 A85-37954 Symposium on Industrial Activity in Space, Stresa, Italy, May 2-4, 1984, Proceedings p 63 A85-38901 Space - The challenge of a new environment p 63 A85-38902 European space industry's potential p 64 A85-38904 Need for alternative space launch services given NASA refusal to launch SPARX-01 mission under standard form commercial launch services agreement p 91 A85-38914 The use of microgravity for industrial and commercial p 64 A85-38917 purposes Commercialization of a Space Station [ASME PAPER 84-WA/TS-3] p 64 A85-39930 Commercialization of remote-sensing technology p 64 A85-41657 Security implications of the Space Station information system p 34 A85-42593 Space . The long-range future p 66 A85-45817 NASA and the practice of space law p 92 A85-49971 Intellectual property and space activities p 92 A85-49972 Second Symposium on Space Industrialization --- space commercialization [NASA-CP-2313] p 67 N85-11011 Non-US approaches to space commercialization p 67 N85-11012 Legal considerations and cooperative opportunities for space commercial activities p 93 N85-11013 Financial issues for commercial space ventures Paying p 67 N85-11014 for the dreams Space industrialization A national perspective p 67 N85-11015 Land remote sensing commercialization A status eport p 68 N85-11024 report Space commercialization Analysis of R and D investments with long time horizons p 68 N85-11052 Opportunities for commercial organizations p 68 N85-11055 Doing business in space How to get there from here p 69 N85-11057 Statement of Hon James M Beggs, Administrator, NASA, Washington, DC p 69 N85-11059 International cooperation and competition in space [GPO-38-001] p 69 N85-11911 International cooperation and competition in space Introduction p 69 N85-11912 Commercial Space Launch Act [GPO-39-613] p 93 N85-13690 Land Remote-Sensing Commercialization Act p 93 N85-14201 [S-REPT-98-458] Civilian space stations and the US future in space [OTA-STI-241] p 69 N85-15781 p 70 N85-15782 Issues and findings International cooperation and competition in civilian space activites [OTA-ISC-240] p 70 N85-17750 Commercial space Europe should have independent p 71 N85-19205 strategy Commercial space launches [S-REPT-98-656] International space research p 95 N85-21225 perspectives of commercialization for German industry [NASA-TM-77657] p 54 N85-29979 Study to encourage and facilitate industrial investment and involvement in space [NASA-CR-176152] p 72 N85-34147 SPACE COMMUNICATION Protecting intellectual property in space, Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985 p 34 A85-42592 Intellectual property and space activities p 92 A85-49972 SPACE DEBRIS Orbital debris policy issues Battelle involvement and some personal observations p 94 N85-21218 Considerations for policy man-made debris propagation control p 94 N85-21219 SPACE EXPLORATION International space law --- Book p 90 A85-36997 International cooperation and competition in space

An automated methodology development --- software p 33 A85-34128 design for combat simulation Implementing fault-tolerant distributed objects p 80 A85-36291 The linear software reliability model and uniform p 81 A85-37901 testing Ada - A good start, an exciting future p 34 A85-41549 p 13 A85-45079 Software contingency planning A practical approach toward achieving software p 35 A85-45141 reliability Joint service acquisition management initiatives --- for p 13 A85-45157 DOD software Methodology for system description using the software p 35 A85-48511 design & documentation language Monitoring software development through dynamic p 47 A85-49049 variables Software reliability - Let's start doing it p 82 A85-49562 Expert systems in software maintainability p 26 A85-49563 Comparative descriptions of software quality measures p 83 N85-10676 [GMD-STUDIES-81] SAGA A project to automate the management of software production systems [NASA-CR-174017] p 35 N85-10685 Ada (trademark) training curriculum Software engineering for managers m101 teacher's exercise guide p 35 N85-10695 [AD-A145094] Establishing a Software Engineering Technology (SET) P884-212141] p 35 N85-10702 [PB84-212141] DOD related software technology requirements, practices, and prospects for the future [AD-A145493] p 36 N85-11575 Configuration management for mission-critical software The Los Alamos solution [DE84-015515] p 36 N85-12606 Software configuration management across project boundaries and in distributed development environments [RSRE-MEMO-3704] p 37 N85-13494 Software test handbook p 37 N85-16498 [AD-A146844] Documentation and separate test program development is most important for test/maintenance p 83 N85-16745 East Europe report Science and technology p 49 N85-17198 [JPRS-ESA-84-043] Concept paper for the development of a DOD Ada (trademark) software engineering education and training nlan [AD-A148774] p 38 N85-17592 Concepts and tools for the software life cycle p 38 N85-19236 Space Station Software Issues p 38 N85-20689 [NASA-CP-2361] Software management issues --- space station software p 16 N85-20690 development Software development environment issues --- space p 84 N85-20691 station software development Software standards issues --- space station software p 84 N85-20692 development p 38 N85-20693 Information systems issues Software technology within NASA p 38 N85-20695 Computers and the consulting engineer p 22 N85-26184 A learning strategy approach for teaching novice computer programmers p 8 N85-26200 [AD-A151523] East Europe report Science and technology p 51 N85-26833 [JPRS-ESA-84-032] A framework for software development p 40 N85-27551 [AD-A152067] COSMIC Software Catalog, 1985 edition [NASA-CR-174070] p 40 N85-28608 Annotated bibliography of recent papers on software engineering environments (PB85-191385) p 41 N85-29607 Statistical estimation of software reliability [AD-A154097] p 85 N85-30665 Guide on logical database design [PB85-177970] p 42 N85-30976 Determining functional requirements for NASA Goddard's command management system software design using expert systems p 30 N85-32020 Attacking software crisis A macro approach [AD-A155846] p 43 N85-35645 SOFTWARE TOOLS Methods for improving the quality of computer software --- Russian book p 31 A85-11275 Development tools - Case study for large systems --of digital avionics [AIAA PAPER 84-26351 p 31 A85-17826 Venfication techniques for improving software quality through automated requirements data bases

through automated requirements data bases [AIAA PAPER 84-2669] p 79 A85-17848 Software test program for computer hardware developments p 32 A85-26784 Automated tools for software development p 32 A85-26793 TALLY - An ATLAS program statistical data gathering tool p 32 A85-26830

Steps to an advanced Ada programming environment p 33 A85-31209 Developments in decision support systems p 25 A85-31792

Software Quality Assurance Program for the AH-64 Advanced Attack Helicopter (AAH) p 80 A85-32010

An automated methodology development --- software design for combat simulation p 33 A85-34128 Statistical estimation of software reliability

p 80 A85-34449 The linear software reliability model and uniform testing p 81 A85-37901 TIMM - The intelligent machine model

p 25 A85-45087 FSTC (Federal Software Testing Center) software tool catalog

[PB84-212158] p 36 N85-10703 Concepts and tools for the software life cycle

p 38 N85-19236 COSMIC Software Catalog, 1985 edition [NASA-CR-174070] p 40 N85-28608

Attacking software crisis A macro approach [AD-A155846] p 43 N85-35645 SOLAR ENERGY

Renewable technologies program summaries [DE85-001509] p 54 N85-30500 SOLAR GENERATORS

SULAR GENERATORS System sizing - The theory and the practice --- for solar generators p 78 A85-11351 SOLAR MAXIMUM MISSION

SOLAR MAXIMUM MISSION The 1986 National Aeronautics and Space Administration authorization [GPO-47-635] p 57 N85-35829

SOLAR SYSTEM European space science horizon 2000 [ESA-SP-1070] p 51 N85-26771 Space research in the United Kingdom An assessment [AD-A155334] p 56 N85-33038

SPACE COMMERCIALIZATION Space exploitation - Spacelab an easy approach for developing countries Prospectives and suggestions by Aeritalia p 58 A85-12502 International cooperation in the commercial era of o 58 A85-12507 space NASA's approach to the commercial use of space p 59 A85-13139 [IAF PAPER 84-217] Federal policy options and the commercialization of p 87 A85-13140 [IAE PAPER 84-218] Activities in Germany for the commercialization of [IAE PAPER 84-222] p 59 A85-13142 The first space product p 59 A85-13914 Financing space industrialization p 59 A85-14923 Commercial utilisation of space -- New business p 60 A85-16303 opportunities NASA formulates policy to spur private investment p 87 A85 18469 Astrobusiness A guide to the commerce and law of outer space --- Book p 87 A85-20512 Commercialization of remote sensing data - Its impact on the continuity and accessibility of remote sensing data, including response to standing orders as well as on the standardization of products p 60 A85-20642 The manned Space Station - NASA's last hurrah? p 87 A85-21620 The communication-satellite market to the year 2000 p 60 A85-26771 The commercialization of space -Twenty years of p 88 A85-27373 experience Some lessons learned Commercialization of space - Incentives, impediments and alternatives p 61 A85-27375 p 61 A85-29623 Insurance for space systems How does NASA plan to help? p 90 A85-33872 The outlook for space commercialization p 61 A85-34192 Evolving government policy eases way for space p 90 A85-34214 ventures Investors balance enthusiasm for new market against p 62 A85-34215 risk potential An astronaut's look at commercial space opportunities p 62 A85-34216

p 62 A85-34216 Widespread civil uses envisioned for satellite navigation system p 62 A85-34217 Remote sensing - A tortuous trip to marketplace

p 62 A85-34218 Progress of Europe's Anane launcher challenges U S Shuttle on cost issue p 62 A85-34219

[GPO-38-001]

.

p 69 N85-11911

East-West cooperation in outer space p 52 N85-27767 [S-HRG-98-1064] SPACE FLIGHT STRESS p 4 A85-44624 Age and space flight Research opportunities in human behavior and performance p 6 N85-19640 [NASA-CR-175473] SPACE INDUSTRIALIZATION Space exploitation - Spacelab an easy approach for developing countries Prospectives and suggestions by p 58 A85-12502 Aeritalia NASA's approach to the commercial use of space [IAF PAPER 84-217] p 59 A85-13139 Activities in Germany for the commercialization of space [IAF PAPER 84-222] p 59 A85-13142 p 59 Financing space industrialization A85-14923 Synergy in space - Man-robot cooperation p 23 A85-20400 Astrobusiness A guide to the commerce and law of outer space --- Book p 87 A85-20512 A85-20512 Space industrialization and the social agenda p 60 A85-24653 A85-37256 Homesteading the new frontier p 63 Symposium on Industrial Activity in Space, Stresa, Italy p 63 A85-38901 May 2-4, 1984, Proceedings Space - The challenge of a new environment p 63 A85-38902 European space industry's potential p 64 A85-38904 Some legal aspects of industrial activity in outer space p 91 A85-38916 The use of microgravity for industrial and commercial p 64 A85-38917 NASA approves fly-now, pay-later plans for orbiting p 67 A85-47047 industrial facility Second Symposium on Space Industrialization --- space commercialization p 67 N85-11011 [NASA-CP-2313] Space industrialization A national perspective p 67 N85-11015 Commercial space services p 68 N85-11039 Developing commercial users of space p 68 N85-11044 SPACE LABORATORIES Documentation for the West German Federal Cabinet's p 96 N85-28886 space policy decision SPACE LAW Colloquium on the Law of Outer Space, 26th, Budapest, Hungary, October 10-15, 1983, Proceedings p 87 A85-12623 Space law - Justice for the new frontier D 87 A85-12644 Astrobusiness A guide to the commerce and law of outer space --- Book p 87 A85-20512 Annals of air and space law Volume 8 p 87 A85-23799 The commercialization of space -Twenty years of p 88 A85-27373 experience Some lessons learned Proposed draft convention on the settlement of space p 88 A85-27374 law disputes Commercialization of space - Incentives, impediments p 61 A85-27375 and alternatives Colloquium on the Law of Outer Space, 27th, Lausanne, Switzerland, October 7-13, 1984, Proceedings p 89 A85-29025 Jurisdiction over and supervision of international crews p 89 A85-30014 in space Satellite broadcasting and the use of the geostationary orbit - Some international legal aspects p 90 A85-36289 International space law --- Book p 90 A85-36997 International space law --- Russian textbook p 91 A85-38699 Some legal aspects of industrial activity in outer space p 91 A85-38916 Legal aspects of space activities A85-39093 p 91 Orbital vehicle transportation - Issues of law and insurance [AIAA PAPER 85-1337] p 91 A85-39731 NASA and the practice of space law p 92 A85-49971 Intellectual property and space activities p 92 A85-49972 Custom as a source of international law of outer p 92 A85-49973 space Legal issues of manned orbiting space stations p 92 A85-50055 Outer space law A problem of astronautics p 94 N85-16697 [NASA-TM-77760] Militarization of space activity in United States p 96 N85-25360 SPACE MANUFACTURING

Activities in Germany for the commercialization of space [IAF PAPER 84-222] p 59 A85-13142

The outlook for space commercialization A85-34192 p 61 An astronaut's look at commercial space opportui p 62 A85-34216 Commercial use of space - The space business era p 63 A85-34538 U.S. initiatives in space commercialization A85-35978 TIAF PAPER 84-2231 D 63 Non-US approaches to space com mercialization p 67 N85-11012 Developing commercial users of space p 68 N85-11044 Statement of Hon James M Beggs, Administrator, NASA, Washington, DC p 69 N85-11059 International space research perspectives of commercialization for German industry p 54 N85-29979 [NASA-TM-77657] Investment justification of robotic technology in aerospace manufacturing User's manual [AD-A156193] p 23 N85-35410 SPACE MISSIONS A system-level approach to automation research p 24 A85-23197 Data Requirement (DR) MA-03 Payload missions integration --- Spacelab payloads [NASA-CR-171331] p 84 N85-19009 European space science horizon 2000 [ESA-SP-1070] p p 51 N85-26771 SPACE POWER REACTORS Space reactor safety SPACE PROCESSING p 82 A85-45433 Activities in Germany for the commercialization of space [IAF PAPER 84-222] p 59 A85-13142 A85-13914 The first space product p 59 Investors balance enthusiasm for new market against p 62 A85-34215 risk ootential An astronaut's look at commercial space opportunities p 62 A85-34216 Commercialization of a Space Station [ASME PAPER 84-WA/TS-3] p 64 A85-39930 NASA approves fly-now, pay-later plans for orbiting industrial facility p 67 A85-47047 industrial facility Second Symposium on Space Industrialization --- space commercialization p 67 N85-11011 [NASA-CP-2313] Financial issues for commercial space ventures Paying p 67 N85-11014 for the dreams Opportunities for commercial organizations p 68 N85-11055 SPACE PROGRAMS International Scientific Conference on Space, 23rd, Rome, Italy, March 24, 25, 1983, Proceedings p 43 A85-12501 Orientation and trends in European technology --- space programs [IAF PAPER 84-377] p 59 A85-13233 Science and technology policy - The next four years p 87 A85-21621 space program p 63 A85-35314 Cost reduction potential in management p 63 A85-37256 Homesteading the new frontier A buyer's guide to space infrastructure p 48 N85-15784 Broadening the debate p 48 N85-15785 East Europe report Science and technology [JPRS-ESA-84-032] p 51 N85-26833 and Department of Housing Urban Development-independent agencies appropriations for National Aeronautics and Space 1986 Part 6 Administration p 96 N85-27768 [GPO-47-2351 Opportunities for policy historians The evolution of the US civilian space progra p 97 N85-35147 SPACE SHUTTLE MISSIONS Homesteading the new frontier p 63 A85-37256 SPACE SHUTTLE PAYLOADS p 59 A85-13914 The first space product Homesteading the new frontier p 63 A85-37256 Need for alternative space launch services given NASA refusal to launch SPARX-01 mission under standard form commercial launch services agreement p 91 A85-38914 NASA approves fly-now, pay-later plans for orbiting p 67 A85-47047 industrial facility Commercial space Europe should have independent p 71 N85 19205 strategy SPACE SHUTTLE UPPER STAGES The outlook for space commercialization p 61 A85-34192 SPACE SHUTTLES Progress of Europe's Ariane launcher challenges U S p 62 A85-34219 Shuttle on cost issue

international cooperation and competition in space

[GPO-38-001]

p 69 N85-11911

International cooperation and competition in space p 69 N85-11912 Introduction Issues and findings p 70 N85-15782 A buyer's guide to space infrastructure N85-15784 p 48 Aerospace Safety Advisory Panel p 85 N85-21135 [NASA-TM-87428] Space Station technology planning p 51 N85-22471 Cost prediction model for various payloads and instruments for the Space Shuttle Orbiter [NASA-CR-175781] p 72 N85-26842 Civilian Space Stations and the US future in Space [OTA-STI-242] p 55 N85-31215 Pricing options for the space shuttle Special study p 72 N85-32138 The 1986 National Aeronautics and Space Administration authorization [GPO-47-635] p 57 N85-35829 SPACE STATIONS Space Station - An overview of current U.S. activities [IAF PAPER 84-22] p 59 A85-12991 Space Station - Opportunity for international cooperation and utilization HAF PAPER 84-511 p 43 A85-13010 The manned Space Station - NASA's last hurrah? A85-21620 p 87 Homesteading the new frontier p 63 A85-37256 A systems-analysis comparison of space station roject [DGLR PAPER 84-118] p 45 A85-40334 p 46 A85-41098 The US Space Station programme Security implications of the Space Station information system p 34 A85-42593 Space - The long-range future A85-45817 p 66 The role of robotics in space system operations [AIAA PAPER 85-1879] p 25 A85-45902 Legal issues of manned orbiting space stations p 92 A85-50055 Second Symposium on Space Industrialization --- space commercialization p 67 N85-11011 [NASA-CP-2313] p 68 N85-11039 Commercial space services International cooperation and competition in space [GPO-38-001] p 69 N85-11911 Civilian space stations and the US future in space p 69 N85-15781 [OTA-STI-241] Issues and findings p 70 N85-15782 A buyer's guide to space infrastructure p 48 N85-15784 Broadening the debate p 48 N85-15785 Synopsis of the OTA Workshop on Cost Containment Civilian Infrastructure (Civilian Space Station) Elements p.48 N85-15790 Financing considerations and Federal budget impacts N85-15792 р 94 FRG study looks at participation in ESA, US space N85-17191 p 49 station Space Station engineering and technology development [NASA-CR-174383] N85-18079 p 21 Commercial space Europe should have independent p 71 N85-19205 strategy Space Station technology planning p 51 N85-22471 N85-24736 Food service management p 16 Documentation for the West German Federal Cabinet's space policy decision p 96 N85-28886 FRG weighs ESA participation, budget issues p 53 N85-29110 Man-machine tradeoff study p 30 N85-29561 Some ideas and questions regarding space station design for human use p 9 N85-29562 Customer and mission influence on space station p 9 N85-29567 architecture International space research perspectives of commercialization for German industry p 54 N85-29979 [NASA-TM-77657] of Department Housing and Urban Development-Independent Agencies Appropriation Bill, 1986 [H-REPT-99-212] o 96 N85-30979 Space Station reference configuration description p 42 N85-31146 [NASA-TM-87493] Civilian Space Stations and the US future in Space [OTA STI-242] p 55 N85-31215 NASA space station automation Al-based technology review

[NASA-CR-176094] p 31 N85-32134 Space station automation and robotics study Operator-systems interface

[NASA-CR-176095] p 31 N85-33172 Testimony of Robert A Frosch before the Subcommittee on HUD and Independent Agencies of the Senate Committee on Appropriations [NASA TM-87496]

p 97 N85-33173

Study to encourage and facilitate industrial investment and involvement in space p 72 N85-34147 [NASA-CR-176152] Technology Engineering Space Station and Development Proceedings of the Panel on In-Space Engineering Research and Technology Development [NASA-CR-176110] p 56 N85-34153 The 1986 National Aeronautics and Space Administration authorization p 57 N85-35829 (GPO-47-635) SPACE TRANSPORTATION Orbital vehicle transportation - issues of law and insurance p 91 A85-39731 [AIAA PAPER 85-1337] Conestoga 2 A low cost commercial space transport p 68 N85-11033 system SPACE TRANSPORTATION SYSTEM Grooming the Shuttle for cost-effective access to p 61 A85-33429 space National Aeronautics and Space Administration p 93 N85-10871 Legal considerations and cooperative opportunities for p 93 N85-11013 space commercial activities SPACE WEAPONS Towards the entire demilitarization of outer space p 92 A85-50056 SPACEBORNE ASTRONOMY European space science horizon 2000 p 51 N85-26771 [ESA-SP-1070] SPACEBORNE EXPERIMENTS Spacelab to Space Station, Proceedings of the International Symposium on Spacelab 1 - Results, Implications and Perspectives, Naples and Capri, Italy, Results. p 20 A85-39076 June 11-16, 1984 SPACECRAFT CONFIGURATIONS Space Station reference configuration description [NASA-TM-87493] p 42 N85-31146 SPACECRAFT DESIGN

Hermes - Does Europe need its own spaceplane p 64 A85-41534 Customer and mission influence on space station

p 9 N85-29567 architecture Studies toward a manned space station Participation of European industry in NASA space station (MSS) [SNIAS-S/DT-Y-25-212] p 55 N85-3 p 55 N85-31217

SPACECRAFT ELECTRONIC EQUIPMENT Economic considerations in selecting spacecraft quality

electronic parts p 81 A85-38267 SPACECRAFT ENVIRONMENTS

A buyer's guide to space infrastructure

p 48 N85-15784 Some ideas and questions regarding space station p 9 N85-29562 design for human use SPACECRAFT LAUNCHING

Cost effective launch technology for communications satellites p 58 A85-12979

[IAF PAPER 84-04] Starstruck's problems spotlight risks, opportunities in p 62 A85-34221 space Need for alternative space launch services given NASA

refusal to launch SPARX-01 mission under standard form commercial launch services agreement n 91 A85-38914

	por	703-30314
Commercial Space Launch Act		
[GPO-39-613]	p 93	N85-13690

Pricing options for the space shuttle	<ul> <li>Spec</li> </ul>	Special study	
	p 72	N85-32138	
SPACECRAFT MAINTENANCE			

Satellite servicing A business opportunity?

	p 69	N85-11056
SPACECRAFT RELIABILITY	-	
Insurance for space systems	p 61	A85-29623
Economic considerations in selecting	space	craft quality
electronic parts	p 81	A85-38267
Space reactor safety	p 82	A85-45433
SPACECREWS		

Junsdiction over and supervision of international crews p 89 A85-30014 in space SPACELAB

Space exploitation - Spacelab an easy approach for developing countries Prospectives and suggestions by Aentalia p 58 A85-12502 Operational preparation of the German Spacelab Mission D1

[IAF PAPER 84-211] p 43 A85-13133 Germany cites commercial fallout as justification for U S Station involvement p 62 A85-34220 Spacelab to Space Station, Proceedings of the International Symposium on Spacelab 1 - Results, Implications and Perspectives, Naples and Capri, Italy, June 11-16, 1984 p 20 A85-39076 Spacelab and Eureca as a basis for European involvement in the Space Station p 46 A85-42694 International space research perspectives of commercialization for German industry p 54 N85-29979 INASA-TM-776571

(CSIR-TWISK-338) STRESS (PSYCHOLOGY)

Analytical models of performance of procedures

p 4 A85-45094

p 15 N85-17738

p.6 N85-19640

p 78 A85-11666

p 33 A85-28797

p 78 A85-11666

p 67 A85-49913

p 26 N85-11606

p 6 N85-17542

p 39 N85-23315

p 25 A85-31792

p 55 N85-32802

p 15 N85-18193

p 55 N85-31836

p 34 A85-34459

p 94 N85-21214

p 20 A85-19181

p 24 A85-24035

p 60 A85-24653

p 25 A85-37566

p 81 A85-37904

p 75 N85-12790

p 7 N85-19874

p 7 N85-19875

p 78 A85-10057

p 80 A85-25109

p 81 A85-37904

interconnected

control of

and

needs

Germ

The 1986 National Aeronautics and Space Decision making in stressful conditions A model based on the coping perspective [FOA-C-55064-H3] Administration authorization [GPO-47-635] p 57 N85-35829 Research opportunities in human behavior and SPACELAB PAYLOADS nerformance Space station related investigations in Europe [NASA-CR-175473] p 43 A85-12994 [IAF PAPER 84-28] STRESS ANALYSIS Data Requirement (DR) MA-03 Payload missions Failure prevention and reliability - 1983, Proceedings integration --- Spacelab payloads of the Fifth Conference, Dearborn, MI, September 11-14, [NASA-CR-171331] p 84 N85-19009 1083 SPARE PARTS STRUCTURAL ANALYSIS Units of equipment available using cannibalization for Design principles for Finite Elements (FE) programs repair-part support p 73 A85-37903 concerned with intensely nonlinear problems Dyna-METRIC - New capabilities --- Dynamic thesis Multi-Echelon Technique for Recoverable Item Control STRUCTURAL DESIGN p 73 A85-45148 A methodology to design databases for finite element On maximizing the expected lifetime of replaceable analysis and structural design optimization applications [AIAA PAPER 85-0743] p 33 A85-30283 systems [AD-A150003] p 75 N85-21680 STRUCTURAL FAILURE Managing recoverable aircraft components in the PPB Failure prevention and reliability - 1983, Proceedings (Planning, Programming and Budgeting) and related processes Technical volume of the Fifth Conference, Dearborn, MI, September 11-14, 1083 [AD-A152014] p 76 N85-25169 STRUCTURAL WEIGHT Feasibility of applications of Competition Decision Assist How much does it cost/how much does it weigh? Package (CDAP) to spare parts [SAWE PAPER 1593] [AD-A154716] p 77 N85-33036 STUDENTS DoD Value Engineering conference report Value Designing an expert system for training automotive Engineering (VE) A tool that benefits line management Part 4, Workshop B VE on spare parts electrical troubleshooting [AD-P003926] p 57 N85-35813 [AD-A156070] Training guide for scientific and engineering trainees SPECIFICATIONS 1984 [AD-A147963] Quality organization --- quality control [CNES-NT-106] p 83 N85-13257 SUPERCOMPUTERS Bottleneckology Evaluating supercomputers The ESA product assurance specification system p 83 N85-13259 Explanatory note [DE85-005574] A buyer's guide to space infrastructure SUPPORT SYSTEMS p 48 N85-15784 Developments in decision support systems Requirements for a database management system [DE85-004661] p 39 N85-22259 SURVEILLANCE An automated quality assurance surveillance plan for ADP (Automated Data Processing) operations under the Specification of software quality attributes, volume 1 [AD-A153988] p 85 N85-29593 Navy's commercial activities program Specification of software quality attributes Volume 2 [AD-A154767] Software quality specification guidebook [AD-A153989] p 85 N85-29594 SURVEYS Manufacturing costs, equipment Maintenance training simulators prime item development technological opportunities among small and medium-size specification Model specification and handbook p 10 N85-30628 manufacturers [AD-A154108] [DE85-000479] An automated quality assurance surveillance plan for SWEDEN ADP (Automated Data Processing) operations under the Human factors engineering contracts in Sweden An Navy's commercial activities program overview (AD-A154767) p 55 N85-32802 [FOA-C-56043-H2] SPEECH RECOGNITION SWITCHING CIRCUITS Man-machine communication research for robotics p 28 N85-17177 reported Management and SPOT (FRENCH SATELLITE) communications networks Commercialization of remote sensing data - Its impact SYNCHRONOUS SATELLITES on the continuity and accessibility of remote sensing data, Debris in the geostationary orbit ring, the endless including response to standing orders as well as on the shooting gallery The necessity for a disposal policy standardization of products p 60 A85-20642 STANDARDIZATION SYSTEM FEFECTIVENESS An analysis of data dictionaries and their role in information resource management Work flow in manufacturing systems [AD-A152134] p 22 N85-27121 Certain problems in the automated assessment of the STANDARDS operating efficiency of man-machine systems Monitoring software development through dynamic variables p 47 A85-49049 Space industrialization and the social agenda Measurement assurance programs Part 1 General introduction p 83 N85-10339 Evaluation of the efficiency of operator work in (PB84-217868) man-machine systems Health standards for general vibration p 84 N85-19607 A system reliability model with classes of failures Software standards issues --- space station software p 84 N85-20692 Maintenance Management Information and Control development STATISTICAL ANALYSIS System (MMICS) Administrative boon or burden An engineer's guide to books on statistics and data [AD-A145762] p 10 A85-12647 analysis Strategic management for organizational effectiveness TALLY - An ATLAS program statistical data gathering The effect of human resource planning on retention and p 32 A85-26830 related issues, volume 1 tool Optimizing search with positive information feedback [AD-A149398] [CSIR-TWISK-313] p 36 N85-10855 Strategic management for organizational effectiveness A statistical approach to vendor selection The effect of human resource planning on retention and [AD-A149781] p 16 N85-22249 related issues, volume 2 STATISTICAL TESTS [AD-A149399] Group testing --- optimization of component reliability SYSTEM FAILURES acceptance tests p 78 A85-12645 General probability of system failure The Deming inspection criterion for choosing zero or 100 percent inspection p 81 A85-40255 Some remarks on optimum inspection policies STOCHASTIC PROCESSES Statistical estimation of software reliability

A system reliability model with classes of failures p 80 A85-34449 An analysis of a dynamic project cost problem p 71 N85-23341

Reliability for real-time systems [DGLR PAPER 84-117] p 81 A85-40333

Effects of redundancy management on reliability modelling p 13 A85-47795

Matenal flow in the manufacturing system
Fault-diagnosis systems as support for the maintenance
of highly automated manufacturing systems
[PNR-90238] p 84 N85-18618
SYSTEMS ANALYSIS
development aconcer of a central research and
A systems applying comparison of space station
A systems-analysis comparison of space station
[DGLR PAPER 84-118] p 45 A85-40334
A systematic method for evaluating security
requirements compliance p 35 A85-42597
Analytical models of performance of procedures
p 4 A85-45094
An analysis of ergonomic systems Russian book
p 5 A85-46148
Modelling the demand for construction
[CSIR-TWISK-322] p 21 N85-10218
Systems analysis for microcomputer acquisitions
[AD-A145447] p 69 N85-11556
Design of a scientific information collation and
[AD_A146002] D 14 N85.12791
A decision model for selection of microcomputers and
operating systems
[AD-A149076] p 15 N85-19694
The concept of fit in contingency theory
[AD-A152603] p 18 N85-28854
SYSTEMS ENGINEERING
System sizing - The theory and the practice for solar
The role of company boards in design leadership
n 10 485-17777
A methodology for organizing performance requirements
for complex dynamical systems p 20 A85-25117
Multilevel monitoring system for a central research and
development agency p 11 A85-29402
A fault tolerant military Satellite Network Management
System p 80 A85-34460
design & documentation language p 25 A85.48511
System engineering and integration contract for
implementation of the National Airspace System Plan
Volume 2 Section 50
[AD-A145710] p 47 N85-10929
Software test handbook
[AD-A146844] p 37 N85-16498
I ecnnical performance measurement handbook
Systems research on China in year 2000
p 50 N85-21418
Design adequacy An effectiveness factor
p 40 N85-26642
Simulation A tool for cost-effective systems design and
live test reduction p 71 N85-26657
Annotated bibliography of recent papers on software
[PR85-191385] n.41 N85-29607
The development of complex systems
p 55 N85-32021
Space Station Engineering and Technology
Development Proceedings of the Panel on In-Space
Engineering Research and Technology Development
[NASA-CH-1/6110] p 56 N85-34153
Software design methods for civil and military aircraft
avionics systems p. 32 A85-21457
Prototyping information systems on microcomputers -
A design philosophy for engineering management
p 33 A85-29401
Management and control of interconnected
communications networks p 34 A85-34459
Ham analysis techniques for fault-tolerant systems
Coordinated research in robotics and integrated
manufacturing
[AD-A148204] p 28 N85-17365
Data Requirement (DR) MA-03 Payload missions
integration Spacelab payloads
[NASA-CR-171331] p 84 N85-19009
Computers and the consulting engineer
p 22 N85-26184
nian
[AD-A154349] n 41 N85-30676
SYSTEMS MANAGEMENT
Distributed photovoltaic system impact upon utility
load/supply management practices p 58 A85-11349
A methodology for organizing performance requirements
for complex dynamical systems p 20 A85-25117
multilevel monitoring system for a central research and
Active control of mechanical systems - The
Active control of mechanical systems - the
state-of-the-art for robotic manipulators

On some common interests among reliability, inventory and queuing p 83 N85-11646 [AD-A145595] Research in data management and system reliability p 83 N85-12773 [AD-A145498] Training guide for scientific and engineering trainees 1984 p 6 N85-17542 [AD-A147963] Research and Modeling of Supervisory Control Behavior, report of a workshop [AD-A149621] p 16 N85-22248 Management aspects of software maintenance [AD-A152035] p 40 N85 p 40 N85-27550 Management control systems and interdependencies An empirical study [AD-A152280] p 17 N85-27746 Cost savings from multiyear contracting p 53 N85-29834 [AD-A153564] NASA Space controls research and technology p 54 N85-31149 program Navy information systems organization, and management Planning, policy, [PB85-176113] p 96 N85-32038 NASA space station automation Al-based technology review [NASA-CR-176094] p 31 N85-32134 SYSTEMS SIMULATION Distributed photovoltaic system impact upon utility load/supply management practices p 58 A85-11349 Multilevel monitoring system for a central research and development agency p 11 A85-29402 Reliability prediction - Improving the crystal ball p 82 A85-49540 Optimizing search with positive information feedback [CSIR-TWISK-313] p 36 N85-10855 Simulation A tool for cost-effective systems design and live test reduction p 71 N85-26657 Discrete simulation models - their role in the design development and management of inventory control systems p 77 N85-34719 [PNR-90249] Т TACTICS Human factors and training research in military organizations and systems [AD-A146832] p 5 N85-16475 TARGET RECOGNITION Human factors and training research in military organizations and systems [AD-A146832] p 5 N85-16475 Design adequacy An effectiveness factor p 40 N85-26642 TASK COMPLEXITY The functional age profile - An objective decision criterion for the assessment of pilot performance capacities and p 2 A85-21588 capabilities The principles of experimental setup in models of omplex human operator activities p 3 M85-23283 Training Task Hierarchy development --- in flight mulation for aircrews p 4 A85-45122 complex human operator activities simulation for aircrews A research paradigm for multi-human decision making p 13 A85-47678 TASKS Ada (trademark) training curriculum Real-time concepts I303 teacher's guide [AD-A145093] p 35 N85-10694 TEACHING MACHINES Some principles for the construction of an adaptive training system p 3 A85-23279 TEAMS Team dimensions Their identity, their measurement and their relationships [AD-A149662] p8 N85-21978 TECHNICAL WRITING Management techniques in meeting requirements for integrating technical publications and training into ATE p 11 A85-26786 stations TECHNOLOGICAL FORECASTING Synergy in space - Man-robot cooperation p 23 A85-20400 Science and technology policy - The next four years p 87 A85-21621 Research and development in the technology of transportation Let's reach for blue sky p 45 A85-31742 The outlook for space commercialization p 61 A85-34192

Management and control of

A fault tolerant military Satellite Network Management

communications networks

System

interconnected

p 34 A85-34459

p 80 A85-34460

An astronaut's look at commercial space opportunities p 62 A85-34216

#### **TECHNOLOGY TRANSFER**

Reagan competitive policy places	Intelsa	t's future at
crossroads Space - The long range future	p 90	A85-34223
Software technology within NASA	p 38	N85-20695
A decision support methodology fo advocacy	r space	technology
[AD-A151895]	p 16	N85-25283
Air Force technical objective docum (AD-A1527301	ent FY	86 N85-28855
TECHNOLOGIES	p 52	1403-20000
Primer on the registration of techi industry	nical in p.36	formation in N85-12786
The development and implementa	tion of	advanced
welding technology The outlook for Soviet advanced te	p 22 chnolor	N85-25824
[AD-P004564]	p 52	N85-28859
Management of large-scale technol	ogy p 56	N85-35145
TECHNOLOGY ASSESSMENT Cost effective launch technology f	or com	munications
satellites		
[IAF PAPER 84-04] Orientation and trends in European t	p 58 echnolo	A85-12979 gy space
programs [IAF PAPER 84-377]	o 59	A85-13233
A survey of technology assessment	activitie	s in selected
US corporations Technology and the market plac	р60 е-А(	A85-17778 changing air
transport equation		
Intercompany technology task	force:	A85-25983 s promote
cooperation at Lockheed	p 11	A85-26847
transportation Let's reach for blue sky	ihe teo /	chnology of
The private sector - A global pool	p 45	A85-31742
for remote sensing training and progra	am supp	ort
New technology implications on the	p 63	A85-37954
New technology implications of the	p 21	A85-43189
Foreign civil aviation competition	1976 si	ummary and
[NASA-TM-X-73907]	p 67	N85-10907
Developing commercial users of spa	ace D 68	N85-11044
Opportunities for commercial organi	zations	
	n 68	N85-11055
Doing business in space How to g	p 68 et there	N85-11055 from here
Doing business in space How to g A report on the training course a	p 68 et there p 69 t Fortal	N85-11055 from here N85-11057 leza (Ceara)
Doing business in space How to g A report on the training course a [E85-10013] DOD related software technolic	p 68 et there p 69 t Fortal p 5	N85-11055 from here N85-11057 leza (Ceara) N85-11426
Doing business in space How to g A report on the training course a [E85-10013] DOD related software technolic practices, and prospects for the future	p 68 et there p 69 t Fortal p 5 ogy re	N85-11055 from here N85-11057 leza (Ceara) N85-11426 equirements,
Doing business in space How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Additional intellivence applications to	p 68 et there p 69 t Fortal p 5 ogy re p 36 manter	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575
Doing business in space How to g A report on the training course a [E85-10013] DOD related software technolic practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914]	p 68 et there p 69 t Fortal p 5 ogy re p 36 mainter p 26	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 nance N85-11594
Doing business in space How to g A report on the training course a [E85-10013] DOD related software technoli practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competi [CNES-NT-110]	p 68 et there p 69 t Fortal p 5 ogy re p 36 maintei p 26 tion p 21	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 nance N85-11594
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolic practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] 	p 68 et there p 69 t Fortal p 5 ogy re p 36 mainter p 26 tion p 21 juture in	N85-11055 e) from here N85-11057 leza (Ceara) N85-11426 quirements, N85-11575 nance N85-11594 N85-13684 e) space
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Givilian space stations and the US f [OTA-STI-241] Software technology within NASA	p 68 et there p 69 t Fortal p 5 ogy re p 36 manter p 26 tion p 21 future in p 69 p 38	N85-11055 9 from here N85-11057 leza (Ceara) N85-11426 quirements, N85-11575 nance N85-11594 N85-13684 9 space N85-15781 N85-20695
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Givilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu	p 68 et there p 69 t Fortal p 5 ogy re p 36 maintei p 26 tion p 21 future ir p 69 p 38 ire heai	N85-11055 a from here N85-11057 leza (Ceara) N85-11426 quirements, N85-11575 nance N85-11594 N85-13684 a space N85-15781 N85-20695 ang with the
Doing business in space. How to g A report on the training course a [885-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPD-41.060]	p 68 et there p 69 t Fortal p 5 ogy re p 36 mainted p 26 tion p 21 iuture in p 69 p 38 ire hear Techn p 9	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 N85-11575 N85-13684 9 space N85-15781 N85-20695 ang with the ology Policy N85-22244
Doing business in space. How to g A report on the training course a [885-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Givilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part	p 68 et there p 69 t Fortal p 5 gy re p 36 maintei p 26 tion p 21 future in p 69 p 38 ire heai Techn p 95 t techno	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 N85-11575 N85-13684 9 space N85-15781 N85-20695 ing with the ology Policy N85-22244 bology
Doing business in space. How to g A report on the training course a [885-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Givilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions	p 68 et there p 69 t Fortal p 50 p 36 maintei p 26 tion p 21 uture in p 38 ire heai Techn p 95 t techno p 22 p 52	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 N85-11575 N85-11575 N85-13684 9 space N85-15781 N85-2695 ing with the ology Policy N85-22244 blogy N85-25835 N85-27795
Doing business in space. How to g A report on the training course a [885-10013] DOD related software technolic practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec	p 68 et there p 69 t Fortal p 5 ggy re p 36 maintei p 26 tion p 21 ruture in p 69 p 38 ire heau Techno p 95 t techno p 22 hnolog	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 N85-11575 N85-13684 9 space N85-15781 N85-2695 ing with the ology Policy N85-22244 blogy N85-22244
Doing business in space. How to g A report on the training course a [885-10013] DOD related software technolic practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tech	p 68 et there p 69 t Fortal p 5 p 36 maintei p 26 tion p 21 uture in p 69 p 38 ire heas Techn p 95 t technog p 52 hnolog p 30 ogy ano g 30 ogy ano g 30 ogy ano p 10 total p 21	N85-11055 from here N85-11057 leza (Ceara) N85-11426 quirements, N85-11575 nance N85-11594 N85-11594 N85-13684 N85-13684 N85-13684 N85-13684 N85-13684 N85-20695 nng with the ology Policy N85-22244 Jogy N85-25835 N85-27795 y N85-28875 technology
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolic practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tech Sub-committee on advanced technol transfer	p 68 p 69 p 69 p 69 p 7 p 7 p 7 p 7 p 7 p 7 p 7 p 7 p 7 p 7	N85-11055 from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 nance N85-11594 N85-11594 N85-13684 N85-13684 N85-13684 N85-13684 N85-13684 N85-13684 N85-20695 ngs uith the ology Policy N85-22244 jogy N85-28835 N85-28835 lechnology N85-28875 lechnology
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolic practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technoli transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b>	$\begin{array}{c} p \ 68\\ p \ 69\\ t \ Forta \\ p \ 59\\ p \ 56\\ p \ 56\\ t \ 50\\ t \ 50\ t \ 50\ t \ 50\ t \$	N85-11055 from here N85-11057 leza (Ceara) N85-11575 nance N85-11576 N85-11594 N85-11594 N85-13684 N85-13684 N85-13684 N85-13684 N85-13684 N85-13684 N85-28835 N85-22244 Jogy N85-28835 N85-28835 Itechnology N85-29836
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tech Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin	p 68 ret there p 69 t Fortal p 55 p 36 re heau p 26 toon p 21 tuture in p 69 p 38 re heau T Sechnology p 30 g technic p 53	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 nance N85-11594 N85-13684 9 space N85-13684 9 space N85-13684 9 space N85-13684 N85-20695 Ing with the ology Policy N85-22244 ology N85-22835 N85-27755 N85-28875 Hechnology N85-29836
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competi [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors cruical to the implementat	p 68 p 69 t t there p 69 t Fortal p 56 p 36 t p 76 p 76 p 76 p 76 p 76 p 77 p 77	N85-11055
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competi [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tect Sub-committee on advanced technol transfer [AD-A135645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementat instruction A background review [AD-A15142]	p 68 p 69 tet there p 69 t Fortal p 55 p 36 toon p 21 totre in p 26 toon p 21 totre in p 26 toon p 21 Techn p 92 t technot p 22 t technot p 53 g techri p 53	N85-11055
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementati instruction A background review [AD-A145143] Opportunities for commercial organi	p 68 p 69 tet there p 69 p 15 p 26 toon p 21 toon p 21 toon p 21 toon p 29 p 38 technology p 30 ogy and p 53 g techrin p 64 toon of p 5 zations	N85-11055
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementat instruction A background review [AD-A15143] Opportunities for commercial organi	p 68 p 69 p 69 t Fortal p 55 p 36 t Fortal p 52 t p 36 ton p 21 t p 29 p 32 t technot p 92 p 32 t technotogy p 30 ogy and p 53 g technr p 64 ton of p 53 g technr p 64 ton of p 53 t technotogy p 64 ton of p 53 to technotogy p 64 to technotogy p 64 to technotogy p 75 to technotogy p 64 to technotogy p 75 to technotogy p 64 to technotogy p 64 to technotogy p 64 to technotogy p 75 to technotogy p 64 to technotogy p 64 to technotogy p 64 to technotogy p 64 to technotogy to techn	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 nance N85-11574 N85-11594 N85-13684 e space N85-15781 N85-22845 N85-228835 N85-228835 N85-228836 lechnology N85-29836 bology N85-29836 bology N85-29836 bology N85-29836 bology N85-10648 N85-11055 bot
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementat instruction A background review [AD-A145143] Opportunities for commercial organi	$\begin{array}{c} p \ 68\\ p \ 69\\ t \ Fortal \\ p \ 5\\ p \ 36\\ t \ 5\\ t \ $	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 N85-11575 N85-13684 9 space N85-15781 N85-22244 9 logy N85-22244 9 logy N85-25835 N85-25835 1 technology N85-29836 1 technology N85-29836 1 technology N85-29836 N85-10648 N85-11055 ct N85-14201
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementat instruction A background review [AD-A145143] Opportunities for commercial organi Land Remote-Sensing Commercial [S-REPT-98-458] Emerging role of the national development and transfer of materials	p 68 p 69 t Ethere p 69 p 36 p 36 bon p 26 bon p 27 p 30 p 28 re heaa Techn p 95 p 38 re heaa Techn p 95 p 38 re heaa Techn p 95 g techr p 64 p 64 p 64 p 64 p 64 p 64 p 64 p 64	N85-11055 e from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 nance N85-15781 N85-15781 N85-20695 ng with the ology Policy N85-22244 ology N85-25835 N85-28875 i technology N85-29836 bology N85-29836 bology N85-29836 technology N85-29836 bology N85-11055 ct N85-14201 ory in the bloav
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tect Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementat instruction A background review [AD-A145143] Opportunities for commercial organi Land Remote-Sensing Commercials [S-REPT-98-458] Emerging role of the national development and transfer of mateinals [DE85-001252]	p 68 p 69 t Et there p 69 p 36 p 36 bon p 26 bon p 27 p 30 p 21 t Uture in p 69 p 38 ire heau Techn p 22 p 52 p 53 g techn p 53 g technol p 53 g technol p 53 laborat t technol p 5 zations p 64 p 5 zations p 6 zation z 1 zation f z 2 zations p 6 zation p 7 zations p 6 zation p 7 zations p 6 zation p 7 zations p 6 zation p 7 zations p 6 zation p 7 zations p 6 zation f z 2 zation f z 2 zations p 6 z zation f z 2 zations p 6 zation f z 2 zations p 6 zations p 6 zations p 6 zations p 6 zations p 6 z zations z 2 zations z zations z z z z z z z z z z z z z z z z z z z	N85-11055 b from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 hance N85-15781 N85-15781 N85-20695 ang with the ology Policy N85-25835 N85-22244 N85-25835 N85-228875 itechnology N85-28836 lechnology N85-29836 lechnology N85-29836 N85-11055 ct N85-11055 ct N85-14201 ory in the N85-18086
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Givilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Instruction A background review [AD-A145143] Opportunities for commercial organi Land Remote-Sensing Commercials [DE85-001252] French research minister on p	p 68 p 69 t t there p 69 p 36 p 36 p 36 p 36 p 36 p 36 p 21 t Utture II p 69 p 38 re heau Techn p 95 g 30 ogy and p 53 g techn p 53 g techn p 64 ion of p 5 zations p 64 ion of p 5 zations p 30 aborati techno p 4 p 30 p 5 zations p 5 zations p 6 p 30 p 5 zations p 5 zations p 6 p 30 p 5 zations p 5 z zations p 5 z zations p 5 z zations p 5 z z z z z z z z z z z z z z z z z z z	N85-11055 b from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 nance N85-11576 N85-13684 b space N85-15781 N85-20695 ng with the ology Policy N85-22244 N85-228835 litechnology N85-29836 litechnology N85-29836 N85-11055 ct N85-11055 ct N85-14201 ory in the logy N85-18086 technology N85-2182
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Givilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementat instruction A background review [AD-A145143] Opportunities for commercial organi Land Remote-Sensing Commercials [DE85-001252] French research minister on p transfer Transfer of technology (5 DE01 de esci	p 68 p 69 p 69 t Fortal p 55 p 36 p 36 p 36 p 36 p 36 p 37 p 42 p 52 p 52 p 52 p 52 p 52 p 52 p 52 p 5	N85-11055 b from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 nance N85-11576 N85-13684 b space N85-15781 N85-20695 ng with the ology Policy N85-25835 N85-22244 N85-28835 1echnology N85-29836 lechnology N85-11055 tet N85-11055 tet N85-11055 tet N85-11055 tet N85-11055 tet N85-11055 tet N85-11055 tet N85-120182 N85-18086 technology N85-20182
Doing business in space. How to g A report on the training course a [E85-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementati instruction A background review [AD-A145143] Opportunities for commercial organi Land Remote-Sensing Commercials [DE85-001252] French research minister on p transfer Transfer of technology [S-REPT-98-664] Technology transfer to the Middle E	p 68 p 69 tet there p 69 p 15 p 36 p 36 p 36 p 36 p 36 p 21 tuture in p 52 toon p 21 tuture in p 53 g techn p 53 g techn p 53 g techn p 53 g techn p 64 toon of p 5 zations p 40 p 50 g techn p 5 zations p 40 p 50 g techn p 5 zations p 40 p 5 zations p 5 zations zations p 5 zations z 2 zations p 5 zations p 5 zations p 5 zations z 2 zations p 5 zations z 2 zations p 5 zations p 5 zations z 2 zations p 5 zations z 2 zations p 5 zations z 2 zations z 2 z z 2 z z z z z z z z z z z z z z z	N85-11055 b from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 N85-11575 N85-11576 N85-11576 N85-13684 b space N85-15781 N85-20895 N85-22244 ology N85-28835 N85-28835 Hechnology N85-29836 ology A85-41657 self-paced N85-11055 ct N85-11055 ct N85-14201 N85-18086 technology N85-20182 N85-22246
Doing business in space. How to g A report on the training course a [885-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementat instruction A background review [AD-A145143] Opportunities for commercial organi Land Remote-Sensing Commercialis [DE85-001252] French research minister on p transfer Transfer of technology [S-REPT-98-64] Technology tansfer to the Middle E [PB5-127744] The supplificance of Haling for Europ	p 68 p 69 p 69 p 50 p 50 p 36 p 36 p 36 p 21 tuture in p 22 p 52 p 53 technic p 25 technic p 43 p 38 re hear Technic p 39 p 30 ogy anc p 53 g techri p 64 toon of p 5 stations A p 55 stations A p 55 stations A p 50 station A p 53 g techri p 64 technic p 45 p 55 stations A p 50 station A p 53 stations A p 55 stations A p 56 stations	N85-11055 b from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 N85-11575 N85-11575 N85-13684 Space N85-15781 N85-2264 N85-228835 N85-228835 N85-228835 N85-29836 ology N85-29836 N85-29836 N85-10648 N85-11055 lechnology N85-14201 Ory in the logy N85-22246 N85-22246 N85-22246
Doing business in space. How to g A report on the training course a [885-10013] DOD related software technolo practices, and prospects for the future [AD-A145493] Artificial intelligence applications to [AD-P003914] Value analysis industrial competir [CNES-NT-110] Civilian space stations and the US f [OTA-STI-241] Software technology within NASA 1984 science and technology postu- director of the Office of Science and [GPO-41-060] Welding techniques in pressure part The Helios missions General laws of development of tec Sub-committee on advanced technol transfer [AD-A153645] <b>TECHNOLOGY TRANSFER</b> Commercialization of remote-sensin Factors critical to the implementati instruction A background review [AD-A15143] Opportunities for commercial organi Land Remote-Sensing Commercialis [DE5-001252] French research minister on p transfer Transfer of technology [S-REPT-98-654] Technology transfer to the Middle E [PB85-127744] The significance of Helios for Europ	$ \begin{array}{l} p \ 68 \\ p \ 69 \\ ret there \\ p \ 69 \\ ret \\ p \ 50 \\ ret \\ p \ 50 \\ ret \\ ret \\ p \ 26 \\ ret \\ p \ 27 \\ ret \\ ret \\ p \ 28 \\ ret $	N85-11055 b from here N85-11057 leza (Ceara) N85-11426 equirements, N85-11575 N85-11575 N85-11575 N85-13684 b space N85-15781 N85-22244 N85-28835 N85-28835 N85-28835 N85-28835 N85-28835 N85-28836 N85-29836 n00gy N85-29836 N85-10648 N85-11055 technology N85-14201 ory in the logy N85-22246 N85-22246 N85-22246 N85-22264 N85-27808

[AD-A153645] p 53 N85-29836

#### **TECHNOLOGY UTILIZATION**

Soin-offs from technical scientific infrastructures, no 1 p 55 N85-32034 Spin-offs from technical commercial infrastructures, no p 55 N85-32035 2 TECHNOLOGY UTILIZATION MESSAGE - An expert system for aircraft crew workload p 24 A85-21569 assessment Evolving government policy eases way for space A85-34214 p 90 ventures Widespread civil uses envisioned for satellite navigation system o 62 A85-34217 Machine vision The eyes of automation - A manager's p 20 A85-35799 Teamwork and practical guide --- Book Contractor and government p 46 A85-43206 commitment A report on the training course at Fortaleza (Ceara) [E85-10013] p 5 N85-11426 On applying AI (Artificial Intelligence) to maintenance and troubleshooting [AD-P003915] p 26 N85-11595 costs, equipment needs and Manufacturing technological opportunities among small and medium-size manufacturers [DE85-000479] p 15 N85-18193 Applications of robots in machine tool industry evidence p 22 N85-28189 reviewed General laws of development of technology p 30 N85-28875 TELECOMMUNICATION Life cycle cost management master plan for the Defense Communications Agency p 14 N85-16668 [AD-A146876] East Europe report Science and technology [JPRS-ESA-84-046] p 49 N85-17176 Worldwide report Telecommunications policy, research and development [JPRS-TTP-85-0021 p 94 N85-19309 Worldwide report Telecommunications policy, research and development [JPRS-TTP-85-0061 p 94 N85-19314 East Europe report Scientific affairs [JPRS-ESA-84-006] p 50 N85-20684 Technology transfer to the Middle East [PB85-127744] p1 p 51 N85-22264 National Telecommunications and Information Administration authorization p 96 N85-27766 [GPO-38-6601 Security controls in the Stockpoint Logistics Integrated Communications Environment (SPLICE) p 77 N85-32244 [AD-A155536] Telecommunication market research processing p 42 N85-34331 [ENST-83E018] TELECONFERENCING Intelsat business services p 60 A85-15463 TELEOPERATORS A system-level approach to automation research p 24 A85-23197 Hand controllers for teleoperation A state-of-the-art technology survey and evaluation [NASA-CR-175890] p 9 N85-28559 NASA space station automation Al-based technology review [NASA-CR-176094] p 31 N85-32134 Space station automation and robotics study Operator-systems interface [NASA-CR-176095] p 31 N85-33172 TELEVISION EQUIPMENT Welder training/welder testing [BLL-WI-TRANS-683-(9312 57)] p 8 N85-27223 TEST FACILITIES Aeronautical systems technology needs Escape, rescue and survival, test facilities and test equipment and training-simulation equipment [AD-A1450591 p 21 N85-10002 TEXTS The acquisition of procedures from text Α production-system analysis of transfer of training p 8 N85-24732 [AD-A151029] THEMATIC MAPPING A report on the training course at Fortaleza (Ceara) [E85-10013] p 5 N85-11426 TOXICOLOGY EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 - September 30, 1985 [PB85-181881] p 55 N85-31676 TRAINING AIRCRAFT T-45 training system - Concept and acquisition strategy [SAE PAPER 841588] p 3 A85-25986 TRAINING ANALYSIS Training and development of engineers at the Air Force Flight Test Center - An overview

p 1 A85-13587 [AIAA PAPER 84-2528]

T-45 training system - Concept and acquisition strategy [SAE PAPER 841588] p 3 A85-25986 Management techniques in meeting requirements for integrating technical publications and training into ATE p 11 A85-26786 stations Graduate education in propulsion [AIAA PAPER 85-1147] p 3 A85-39623 Factors critical to the implementation of self-paced nstruction A background review [AD-A145143] p 5 N85-10648 Artificial intelligence contributions to training and maintenance p 27 N85-11614 [AD-P003934] Pilot education and safety awareness programs p 6 N85-18026 TRAINING DEVICES Simulators/training devices for commuter airlines p 1 A85-17232 Automated performance measurement for Naval aviation - APARTS, a Landing Signal Officer training aid p 2 A85-21589 Aeronautical systems technology needs Escape, rescue and survival, test facilities and test equipment and training-simulation equipment p 21 N85-10002 [AD-A145059] Factors critical to the implementation of self-paced instruction A background review [AD-A145143] p 5 N85-10648 Ada (trademark) training curriculum Real-time concepts 1303 teacher's guide [AD-A145093] p 35 N85-10694 Software Ada (trademark) training curriculum ngineering for managers m101 teacher's exercise guide p 35 N85-10695 [AD-A145094] GUIDON p 26 N85-11605 [AD-P003925] Designing an expert system for training automotive electrical troubleshooting p 26 N85-11606 [AD-P0039261 The psychology of technical devices and technical discourse [AD-P003929] p 27 N85-11609 Artificial intelligence contributions to training and maintenance [AD-P003934] p 27 N85-11614 Training capabilities test of Electronics Equipment Maintenance Trainer (EEMT) Findings and conclusions p 5 N85-12302 [AD-A146075] Determining training device requirements in Army aviation systems p 5 N85-14558 p 6 N85-18025 Low cost training aids and devices Pilot education and safety awareness programs p.6 N85-18026 Initiative uses of aircraft for flight training p 6 N85-18027 Study of cognitive styles of students in automated p 6 N85-19620 teaching system Maintenance training simulators prime item development specification Model specification and handbook [AD-A154108] p 10 N85-30628 Models for multidimensional tests and hierarchically structured training materials AD-A155231] p 10 N85-32768 TRAINING EVALUATION Pilot judgment training - Past, present and future p 2 A85-21579 The Myers-Briggs type indicator as a tool to identify flight p 2 A85-21581 student's learning styles p 2 A85-21581 Factors critical to the implementation of self-paced Instruction A background review [AD-A145143] p 5 N85-10648 Overview of training and aiding [AD-P003917] p 5 N85-11597 Concept paper for the development of a DOD Ada (trademark) software engineering education and training plan [AD-A148774] p 38 N85-17592 p 6 N85-18025 Low cost training aids and devices Innovative approaches to recurrent training p 6 N85-18028 Research needs on the interaction between information systems and their users Report of a workshop [PB85-121523] p 38 N85-19891 A review of safety practices and safety training for the explosives field [AD-A152295] p 8 N85-27028 Welder training/welder testing [BLL-WI-TRANS-683-(9312 57)] o 8 N85-27223

Guidelines of the Federal Minister of Transportation for the formation and examination of airline personnel, part p.9 N85-28556

Simulation for human factors research A central p 9 N85-29568 question Fidelity

Microcomputers in transportation Software and source book, February 1985 PB85-1810221 p 77 N85-31868 TRAINING SIMULATORS Some principles for the construction of an adaptive training system p 3 A85-23279 Simulators for training aircraft maintenance personnel p 3 A85-29863 Possible applications of simulators in various areas p 3 A85-29865 AV-8B Harrier II training capabilities [AIAA PAPER 85-1734] p 3 A85-40554 Cost effectiveness of simulated aircraft maintenance training systems p 66 A85-45118 Training Task Hierarchy development --in flight p 4 A85-45122 simulation for aircrews Human-system performance measurement in training p 5 A85-48752 simulators Maintenance training simulators prime item development specification Model specification and handbook AD-A154108] p 10 N85-30628 TRANSFER OF TRAINING The acquisition of procedures from text Α production-system analysis of transfer of training p 8 N85-24732 AD-41510291 TRANSOCEANIC COMMUNICATION Reagan competitive policy places Intelsat's future at p 90 A85-34223 crossroade TRANSPORT AIRCRAFT Fire safety in transport category aircraft - Litigating a p 88 A85-24710 post-crash or in-flight aircraft fire Obtaining title and financing transport category aircraft National and international implications p 91 A85-44097 Documentation and separate test program development is most important for test/maintenance p 83 N85-16745 Initiative uses of aircraft for flight training p 6 N85-18027 TRANSPORTATION Research and development in the technology of transportation Let's reach for blue sky p 45 A85-31742 Determining training device requirements in Army aviation systems p 5 N85-14558 Transportation [JPRS-UTR-85-004] p 50 N85-21105 Microcomputers in transportation Software and source book, February 1985 [PB85-181022] p 77 N85-31868 TRANSPORTATION NETWORKS Research and development in the technology of transportation Let's reach for blue sky p 45 A85-31742 Information technology applications in voluntary sector transport operations SP1 Objectives and programme of work [TT-8501] p 71 N85-26457 TRENDS Future directions in operations research p 76 N85-28711 [REPT-84-24] U U.S.S.R. Transportation [JPRS-UTR-85-004] n 50 N85-21105 Improvements in personnel needed for better flight safety p 8 N85-23693 The outlook for Soviet advanced technologies [AD-P004564] p 52 N85-28859 Social and political problems in Soviet basic research (AD-P004565) p 96 N85-28860 R/D contracts in the Soviet Union p 53 N85-28865 [AD-P004569] U.S.S.R. SPACE PROGRAM U.S., Soviet space program aims contrasted

p 95 N85-22455

ULTRALIGHT AIRCRAFT FAA regulation of ultralight vehicles p 86 A85-11938

UNCONTROLLED REENTRY (SPACECRAFT) Orbital debris policy issues Battelle involvement and p 94 N85-21218 some personal observations UNITED KINGDOM

Punitive damages in aviation products liability cases p 88 A85-27394

Cargo claims - From the carrier's point of view p 88 A85-27395 The liability of aircraft manufacturers and certification authorities in the United Kingdom

p 89 A85-27397 Innovation in British industry (notably the aircraft industry) and its value Collected papers

p 49 N85-17933 [BAE-KRS-N-GEN-286]

Information technology applications in voluntary sector transport operations SP1 Objectives and programme
of work
[TT-8501] p 71 N85-26457
Commercialization of remote sensing data . Its impact
on the continuity and accessibility of remote sensing data,
including response to standing orders as well as on the
standardization of products p 60 A85-20642
Understanding changes in the U.S. competitive position
International competitiveness p 65 A85-43179
Challenges facing US industry p 65 A85-43180
International cooperation and competition in space
Synopsis of the OTA Workshop on Cost Containment
of Civilian Infrastructure (Civilian Space Station)
Elements p 48 N85-15790
Financing considerations and Federal budget impacts
Government contract contingent liabilities The
anti-deficiency act, and the hobgoblin of little minds
[AD-A147919] p 94 N85-16684
system
[ÁD-A148354] p 49 N85-17737
Militarization of space activity in United States
ρ 96 N85-25360
Graduate education in propulsion
[AIAA PAPER 85-1147] p 3 A85-39623
Spin-offs from technical scientific infrastructures, no 1
UNIVERSITY PROGRAM
Engineering management programs as aids in moving
from technical specialty to technical management
URBAN DEVELOPMENT
Department of Housing and Urban Development, and
certain independent agencies appropriations for fiscal year
[S-REPT-98-889-PT-2] p 93 N85-10870
National Aeronautics and Space Administration
p 93 N85-10871
COSMIC Software Catalog, 1985 edition
[NASA-CR-174070] p 40 N85-28608
User's operating procedures Volume 2 Scout project financial analysis program
[NASA-CR-177949] p 42 N85-34519
USER REQUIREMENTS
new model introduction - The operators' perspective
User and R&D specialist evaluation of decision-support
systems p 12 A85-38415
maintainability aspects in maintenance management p 74 A85-49536
Microcomputer management guidelines
[PB84-212174] p.36_N85-10704
Design of a countifie information collector
Design of a scientific information collation and dissemination system, volumes 1 thru 3
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147843] p 28 N85-16479
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147843] p 28 N85-16479 Space Station engineering and technology
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147843] p 28 N85-16479 Space Station engineering and technology development [NASA-CR-174393] p 21 N85 19079
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147843] p 28 N85-16479 Space Station engineering and technology development [NASA-CR-174383] p 21 N85-18079 Research needs on the interaction between information
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147843] p 28 N85-16479 Space Station engineering and technology development [NASA-CR-174383] p 21 N85-18079 Research needs on the interaction between information systems and their users Report of a workshop
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147843] p 28 N85-16479 Space Station engineering and technology development [NASA-CR-174383] p 21 N85-18079 Research needs on the interaction between information systems and their users Report of a workshop [PB85-121523] p 38 N85-19891 Management considerations for an information conter
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147843] p 28 N85-16479 Space Station engineering and technology development [NASA-CR-174383] p 21 N85-18079 Research needs on the interaction between information systems and their users Report of a workshop [PB85-121523] p 38 N85-19891 Management considerations for an information center [AD-A151774] p 40 N85-27742
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147843] p 28 N85-16479 Space Station engineering and technology development [NASA-CR-174383] p 21 N85-18079 Research needs on the interaction between information systems and their users Report of a workshop [PB85-121523] p 38 N85-19891 Management considerations for an information center [AD-A151774] p 40 N85-27742 Personal computer aided decision analysis
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147643] p 28 N85-16479 Space Station engineering and technology development [NASA-CR-174383] p 21 N85-18079 Research needs on the interaction between information systems and their users Report of a workshop [PB85-121523] p 38 N85-19891 Management considerations for an information center [AD-A151774] p 40 N85-27742 Personal computer aided decision analysis [AD-A151911] p 17 N85-27743
Design of a scientific information collation and dissemination system, volumes 1 thru 3         [AD-A146002]       p 14       N85-12791         Mental models and cooperative problem solving with expert systems       [AD-A147643]       p 28       N85-16479         Space       Station engineering and technology development       [NASA-CR-174383]       p 21       N85-18079         Research needs on the interaction between information systems and their users       Report of a workshop       [PB85-121523]       p 38       N85-19891         Management considerations for an information center       [AD-A151774]       p 40       N85-27742         Personal computer aided decision analysis       [AD-A15191]       p 17       N85-27743         Design guidelines for user-system interface software [AD-A154907]       p 42       N85-32807
Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002] p 14 N85-12791 Mental models and cooperative problem solving with expert systems [AD-A147643] p 28 N85-16479 Space Station engineering and technology development [NASA-CR-174383] p 21 N85-18079 Research needs on the interaction between information systems and their users Report of a workshop [PB85-121523] p 38 N85-19891 Management considerations for an information center [AD-A151774] p 40 N85-27742 Personal computer aided decision analysis [AD-A151774] p 17 N85-27743 Design guidelines for user-system interface software [AD-A154907] p 42 N85-32807 UTILIZATION
Design of a scientific information collation and dissemination system, volumes 1 thru 3         [AD-A146002]         Mental models and cooperative problem solving with expert systems         [AD-A147643]       p 28         [AD-A147643]       p 21         [AB-A147643]       p 21         [AB-A147643]       p 21         [AB-A174383]       p 21         [N85-16079]       Research needs on the interaction between information systems and their users         [BB5-121523]       p 38         [MB5-121523]       p 38         [MB5-121523]       p 40         [MB5-27742]       Personal computer aided decision analysis         [AD-A151911]       p 17         Design guidelines for user-system interface software (AD-A1514907]       p 42         MB5-32807       UTILIZATION         Technical order managers handbook       Utilization assessment
Design of a scientific information collation and dissemination system, volumes 1 thru 3         [AD-A146002]         Mental models and cooperative problem solving with expert systems         [AD-A147643]       p 28         [AD-A147643]       p 21         [AB-A147643]       p 21         [AB-A147643]       p 21         [AB-ACR-174383]       p 21         [B85-121523]       p 38         [B85-121523]       p 38         [AD-A151774]       p 40         Personal computer aided decision analysis         [AD-A151911]       p 17         Design guidelines for user-system interface software (AD-A1514907)       p 42         W85-32807       UTILIZATION         Technical order managers handbook       Utilization assessment (AD-A147579]         [AD-A147579]       p 37

٧/	
v	

VALUE ENGINEERING

[AD-A156067]

Quality characteristic feedback control

p 20 A85-35100 Value analysis --- industrial competition [CNES-NT-110] p 21 N85-13664 DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 1 Executive summary

, р. 57 N85-35810 DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 2 Plenary session

 [AD-A156068]
 p 57
 N85-35811

 DoD Value Engineering conference report
 Value

 Engineering (VE)
 A tool that benefits line management

 Part 3, Workshop A
 VE in the program office

 (AD-A156069)
 p 57

 N85-35812

DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 4, Workshop B VE on spare parts

(AD-A156070) p 57 N85-35813 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 5, Workshop C VEP/VECP administration, negotiation, and implementation

[AD-A156071] p 57 N85-35814 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 6, Workshop D VE training-orientation

[AD-A156072] p 57 N85-35815 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 7, Workshop E VE in construction and architect engineer contracts [AD-A156073] p 57 N85-35816

VEGA PROJECT		
USSR report Space		
[JPRS-USP-85-001]	p 51	N85-22403
VERTICAL TAKEOFF AIRCRAFT		
V-22 Osprey development	contract	tests new
procurement policy	p 45	A85-36421
VIBRATION	-	
Health standards for general vit	oration	
·	р 84	N85-19607
VIDEO COMMUNICATION		
Intelsat business services	p 60	A85-15463
VIDEO DATA	•	
Aeronautical Systems Division	Manufactu	ring/Quality
assurance orientation		• •
[AD-A156128]	p 86	N85-35817
VOICE COMMUNICATION		

Intelsat business services p 60 A85-15463 Man-machine communication research for robotics reported p 28 N85-17177

### W

WARFARE Towards the entire demilitarization of outer space p 92 A85-50056 WARNING SYSTEMS Artificial intelligence - A new dimension in EW p 25 A85-49098 WASTE WATER EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 - September 30 1985 [PB85-181881] p 55 N85-31676 WATER QUALITY EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 - September 30, 1985 [PB85-181881] p 55 N85-31676 WEAPON SYSTEM MANAGEMENT Building teams and maintaining trust p 66 A85-43195 WEAPON SYSTEMS Military electronics - Why so unreliable? p 80 A85-18440 Life-cycle-cost-oriented system design in weapon technology [MBB-UA-842-84-OE] p 65 A85-42678 Establishing realistic requirements for reliability, maintainability, and built-in-test p 82 A85-49539 p 82 A85-49539 Artificial intelligence applications to maintenance p 26 N85-11594 [AD-P003914] An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement p 75 N85-16678 [AD-A147496] Design adequacy An effectiveness factor p 40 N85-26642 Design-To-Cost (DTC) methodology to achieve ffordable avionics p 71 N85-26645 affordable avionics Producibility Engineering and Planning (PEP) Program management guidelines [AD-A153730] p 18 N85-30966 WEIGHT REDUCTION Weight control - A procurement agency perspective [SAWE PAPER 1594] p 74 A85-49914 WEIGHTLESSNESS

Developing commercial users of space p 68 N85-11044 WORKLOADS (PSYCHOPHYSIOLOGY)

WELD TESTS

Welder training/welder testing [BLL-WI-TRANS-683-(9312 57)] p 8 N85-27223 WELDING

The development and implementation of advanced welding technology p 22 N85-25824 WEST GERMANY

German domestic scheduled air transport in the year  $2000\,$ 

 [ESA-TT-828]
 p 69
 N85-13792

 Activities report in aerospace in West Germany
 [ISSN-0070-3966]
 p 50
 N85-18947

Documentation for the West German Federal Cabinet's space policy decision p 96 N85-28886

International space research perspectives of commercialization for German industry [NASA-TM-77657] p 54 N85-29979

WINDPOWER UTILIZATION Renewable technologies program summaries

[DE85-001509] p 54 N85-30500 WORK CAPACITY

Interrelationship between learning and development in the process of mastering an occupational activity p 3 A85-23285

WORKLOADS (PSYCHOPHYSIOLOGY) MESSAGE - An expert system for aircraft crew workload

- assessment p 24 A85-21569 Guide on workload forecasting
- [PB85-177632] p 18 N85-30704

# PERSONAL AUTHOR INDEX

# MANAGEMENT / A Bibliography for NASA Managers

# **APRIL 1986**

### **Typical Personal Author Index Listing**



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter The report number helps to indicate the type of document listed (e.g., NASA report, translation, NASA contractor report). The page and accession numbers are located beneath and to the right of the title. Under any one author's name the accession numbers are arranged in sequence with the AIAA accession numbers appearing first.

# Α

ADAMS, M. L.	
Economic considerations in selecting spacecraft	quality
electronic parts p 81 A85-	38267
ADELMAN, L.	
User and R&D specialist evaluation of decision-si	upport
systems p 12 A85-	38415
Mental models and cooperative problem solving	a with
expert systems	a
[AD-A147843] p 28 N85-	16479
ADLER E.I	
Life cycle cost management master plan for the De	fense
Communications Agency	
[AD-A146876] p 14 N85-	16668
Producibility Engineering and Planning (PEP) Re	oorem
management quidelines	ogram
[AD-A153730] n 18 N85.	30066
	00000
Producibility Engineering and Planning (DER) Dr.	ogram
monogement suddlass	ogram
(AD A152720) and M95	20066
	30900
Foreign civil system competition 1976 summar	or and
mplications	iy anu
[NASA-TM-Y.73907] D 67 N85.	10007
	10307
Manufacturing information system	
[AD-A152715] p 17 N85-	28616
	20010
International cooperation in the commercial e	era of
space p 58 A85-	12507
ALLWOOD, R. J.	
	tolia A
Expert systems in contract management	
Expert systems in contract management A study	
Expert systems in contract management A study [AD-A149363] p 29 N85-	19873
Expert systems in contract management A study [AD-A149363] p 29 N85- AMIN. H. A.	19873
Expert systems in contract management A study [AD-A149363] p 29 N85- AMIN, H. A. Evaluating the appropriateness of microcompute	19873 ers for
Expert systems in contract management A study [AD-A149363] p 29 N85- AMIN, H. A. Evaluating the appropriateness of microcompute litigation document management using the an	19873 ers for alytic
Expert systems in contract management A study [AD-A149363] p 29 N85- AMIN, H. A. Evaluating the appropriateness of microcompute litigation document management using the an hierarchy process p 39 N85-	19873 ers for alytic 24788
Expert systems in contract management A study [AD-A149363] p 29 N85- AMIN, H. A. Evaluating the appropriateness of microcompute litigation document management using the an hierarchy process p 39 N85- ANDERSEN, D. R.	19873 ers for alytic 24788
Expert systems in contract management A study [AD-A149363] p 29 N85- AMIN, H. A. Evaluating the appropriateness of microcompute litigation document management using the an hierarchy process p 39 N85- ANDERSEN, D. R. Recent developments in aviation case law	19873 ers for alytic 24788
Expert systems in contract management A study [AD-A149363] p 29 N85- AMIN, H. A. Evaluating the appropriateness of microcompute litigation document management using the an hierarchy process p 39 N85- ANDERSEN, D. R. Recent developments in aviation case law p 88 A85-	19873 ers for ealytic 24788
Expert systems in contract management A study [AD-A149363] p 29 N85- AMIN, H. A. Evaluating the appropriateness of microcompute litigation document management using the an hierarchy process p 39 N85- ANDERSEN, D. R. Recent developments in aviation case law p 88 A85- ANDREE, D.	19873 ers for palytic 24788 24709

p 49 N85-17197

ANIKIN, N. V. Aircraft maintenance	n 19	A85-11245	BASII
ARORA, J. S	- ( (u		vari
analysis and structural design optim	ization	applications	AIE
ARSENEAULT, D. S. Security controls in the Stocknoint I	naistic	s Integrated	BECK
Communications Environment (SPLICI	E) 77	N85-32244	prac
ARSENIN, V. IA.		woormontal	BECK
data	p 34	A85-34919	soft
Coordinated research in robotic	s and	integrated	BEGL
[AD-A148204] ATKINS. H.	p 28	N85-17365	com
Opportunities for commercial organi	zations p 68	N85-11055	BEHU
AUVIL, J. D.	•		
Management considerations for an [AD-A151774]	inform p 40	N85-27742	BEJC
AWFORD, I. Bupting demograp in synation produc	te liabi	hty cacoe	tech
AYRES, R. U.	p 88	A85-27394	BELA
The man-machine interface [AD-A149971]	p 22	N85-21989	intro [PB
AYTACER, E., JR. General design considerations of	of an	Air Force	BELL
[AD-A150611]	p 39	N85-23449	opp BENN
-			is (PB
В			BENT
BABEL, P. S.			the
Joint service acquisition manageme	nt initia	11VES	lega
BACK, S. M.	pro ation o	f self-naced	BERE
Instruction A background review	p 5	N85-10648	syst
BADGER, W. SAGA A project to automate the	mana	agement of	BERE
software production systems	~~		orga
BAETGE, M.	p 35	10685-10685	BERG M
Initiative uses of aircraft for flight tra	uning D B	N85-18027	[AD
BAILYN, L.	μv	100-1002/	BEHK
Autonomy in the industrial R and D	lab		[AD
[AD-A148075] BAKER, P. J.	p 15	N85-17736	BESH
The Global Positioning System i	(GPS)	A85.37805	SOT
BALABAN, H. S.	p 90	ARE 40543	BESK
BALACHANDRA R	µ ₀2	A00-49043	[NA
R&D project termination in high-tech	n indust	nes	BEZB
BALL R.W	p 20	A85-25118	oper
Program manager The Journal of the	e Defer	nse Systems	
Management College Volume November-December 1984	13, 1	Number 6,	M
[AD-A149546] BARBOSA, M. P.	p 50	N85-20933	BIGEL
A report on the training course at [E85-10013]	Fortal	eza (Ceara) N85-11426	(Plai proc
BARLOW, R. E. Besearch in data management on	d svet	m reliability	[AD
[AD-A145498] BADD C W	p 83	N85-12773	BIRD, Ti
Quality assurance considerations for	the imp	fementation	BIRKE
of a pulsed power R and D project			BIRM
[DE85-012357]	p 86	N85-35720	In

- BARRUS, D. M. Configuration management for mission-critical software
- The Los Alamos solution [DE84-015515] p 36 N85-12606

BASILI, V. R.
Monitoring software development through dynamic
variables p 47 A85-49049
A practical approach toward achieving software
reliability p 35 A85-45141
BECKER, L. G.
DOD related software technology requirements, practices and prospects for the future
[AD-A145493] D 36 N85-11575
BECKMAN, C S
SAGA A project to automate the management of
Software production systems
BEGLEY, D. D.
A learning strategy approach for teaching novice
computer programmers
[AU-A151523] p 8 N85-26200
Software reliability - Let's start doing it
p 82 A85-49562
BEJCZY, A. K.
technology survey and evaluation
[NASA-CR-175890] p 9 N85-28559
BELANGER, B.
Measurement assurance programs Part 1 General
[PB84-217868] n 83 N85-10339
BELLAGAMBA, L.
Commercial utilisation of space New business
opportunities p 60 A85-16303
Issues in air transport
[PB85-121374/GAR] p 71 N85-18030
BENTIL, J. K
Attempt to regulate restrictive commercial practices in the field of air transportation within a transportational antitrust
legal and institutional framework p 90 A85-30999
BERENS, L.
Business planning for information services under special
consideration of German management information
[BMFT-FB-ID-83-007] p 21 N85-11910
BEREZKIN, B. S.
Problems of psychological support of automated
Organization control systems p 28 N85-185/1
Matrix organizations Overcoming the disadvantages
[AD-A145318] p 14 N85-12772
BERKOWITZ, S
A management workstation concept
BESHERS, G.
SAGA A project to automate the management of
software production systems
[NASA-CH-174017] p 35 N85-10685 BESKENIS S
Space Station Software Issues
[NASA-CP-2361] p 38 N85-20689
BEZBOGOV, A A.
operating efficiency of man-machine systems
p 24 A85-24035
BHATNAGAR, D. K.
Multilevel monitoring system for a central research and
BIGELOW, J. H.
Managing recoverable aircraft components in the PPB
(Planning, Programming and Budgeting) and related
processes lectinical volume
BIRD. J
The first space product p 59 A85-13914
BIRKETT, C.
Bipman K P
Implementing fault-tolerant distributed objects
p 80 A85-36291
BIRNBAUM, P. H
Strategic management of industrial technology - A review

BISHOP, W. P.		
Land remote sensing commerci	alizatio	n A status
report	p 68	N85-11024
BLACKBURN, J. F.		
French plans for fifth generation	comp	uter systems
[AD-A149435]	p 50	N85-19732
The EEC's information technolog	gy pro	gram An
update		-
[AD-A150022]	p 39	N85-22258
BLAIR, D. E.		
Technical order managers hand	book	Utilization
assessment		
(AD-A147579)	p 37	N85-16694
BLAIR, J.		
Issues in air transport		
[PB85-121374/GAR]	p 71	N85-18030
BLAZER, D. J.	•	
Inventory policy for high backorder i	tems	
[AD-A153696]	p 77	N85-29840
EOQ (Economic Order Quantity) ran	ige mo	del
[AD-A153709]	p 77	N85-30965
BLISHCHENKO, I P.	•	
International space law	p 91	A85-38699
BLUVVBAND, Z.	•	
Sparing criteria - Clear management	appro	ach
,	p 82	A85-49577
BODROV, V. A.		
Basic principles of the developmen	t and (	execution of
a system for the psychological se	lection	n of military
personnel	o 3	A85-28024
BOECKSTIEGEL, KH.	•	
Proposed draft convention on the se	ettleme	ent of space
law disputes	p 88	A85-27374
BOGDASHEVSKII, R. B.	•	
Some perspectives on the study ar	nd impi	rovement of
the cognitive-creative activity of an	indivi	dual and a
group	p 2	A85-23276
BOLTE, K. A	•	
Keeping the bureaucracy in check	p 66	A85-43204
BONCZEK, R. H.	•	
Developments in decision support sy	vstems	
	p 25	A85-31792
BOOKER, J. M.		
Decision analysis in project ma	anagen	nent - An
overview	p 44	A85-25116
BORE, C, L.	•	
Innovation in British industry (no	tably '	the aircraft

BROOKS, T. L.

BROWN, J. F.

[AD-A151714]

teaching system

BRYSON, M. C.

overview BUCHNER, K. H.

BULLOCH, C.

BUNCH, D. F.

BURNS, R W.

BUTAKOV. E. A.

BYERLY, R., JR.

remote sensing

[DE85-003657]

repair-part support

BYRKETT, D. L.

CALVO. A. B.

CANTOR, S.

CARO, G. C.

industry

CARSON, N

CARTER. C.

CAMPBELL, R. H.

[NASA-CR-174017]

[DE85-010594]

[AD-A146002]

[AD-A153696]

CARTER, W. D.

CARTER, W P.

CATLETT, W. J.

CHALK, A. J.

litigation

CATE, D. M.

welding technology

SAWE PAPER 1594]

strategy [SAE PAPER 841588]

CHANDRASEKARAN, B.

information retrieval

[AD-A146890]

CHAPMAN, R. W.

[AD-A151895]

CHAPEL, J. D.

advocacv

software production systems

system

software

BYRD. J. S.

Space reactor safety

BRUTSENTSOVA, T. A.

tool BRUNER, T D.

[NASA-CR-175890]

technology survey and evaluation

system performance monitor, volume 2

production of materials and components

Hand controllers for teleoperation A state-of-the-art

TALLY - An ATLAS program statistical data gathering

Continued development of a data base management

Study of cognitive styles of students in automated

Application of a quality assurance system in the

Hermes - Does Europe need its own spaceplane?

Security implications of the Space Station information

Methods for improving the quality of computer

A Congressional view of national policy directions in emote sensing p 86 A85-10178

Units of equipment available using cannibalization for

С

R&M analysis techniques for fault-tolerant systems

SAGA A project to automate the management of

Methodology for assessing benefits and costs of government information collection

Primer on the registration of technical information in

Design of a scientific information collation and

The private sector - A global pool of technical talent

The development and implementation of advanced

Weight control - A procurement agency perspective SAWE PAPER 1594] p 74 A85-49914

T-45 training system - Concept and acquisition

A new proposal for the reform of commerical air crash

Distributed knowledge base systems for diagnosis and

Concepts and algorithms for terminal-area traffic management p 73 A85-47683

A decision support methodology for space technology

dissemination system, volumes 1 thru 3

Inventory policy for high backorder items

for remote sensing training and program support

Robotics at Savannah River site Activity report

Decision analysis in project management

industry) and its value Collected papers [BAE-KRS-N-GEN-286] p 49 N85-17933 BORISOV, E V

- Evaluation of the efficiency of operator work in man-machine systems p 25 A85-37566 BOVAIR, S.
- The acquisition of procedures from text production-system analysis of transfer of training [AD-A151029] p 8 N85-24732
- BOWEN, T. P. Specification of software quality attributes, volume 1 AD-A153988] p 85 N85-29593 [AD-A153988] Specification of software quality attributes Volume 2
- Software quality specification guidebook [AD-A153989] p 85 N85-29594 Specification of software quality attributes Volume 3

Software quality evaluation guidebook p 85 N85-29595 [AD-A153990] BOXI. L.

- Systems research on China in year 2000 p 50 N85-21418
- BOY, G. A. MESSAGE - An expert system for aircraft crew workload p 24 A85-21569 assessment BOYLE, R. J

Why wrestle with jellyfish? p 4 A85-43183 BRACHET, G.

- Commercialization of remote sensing data Its impact on the continuity and accessibility of remote sensing data, including response to standing orders as well as on the standardization of products p 60 A85-20642 BRAUN, C. L.
- Ada A good start, an exciting future p 34 A85-41549
- BRAUNE, R. J. The functional age profile - An objective decision criterion for the assessment of pilot performance capacities and capabilities p 2 A85-21588
- BRENTS, T. E., JR. How much does it cost/how much does it weigh? [SAWE PAPER 1593] p 67 A85-49913
- BRETT, L. F. Integration of MSG-3 into airline operation [SAE PAPER 841483] p 72 A85-25978
- BRICTSON, C A.
- Automated performance measurement for Naval aviation APARTS, a Landing Signal Officer training aid p 2 A85-21589

p 9 N85-28559

p 32 A85-26830

p 39 N85-26167

p 6 N85-19620

p 44 A85-25116

p 79 A85-16254

p 64 A85-41534

p 82 A85-45433

p 34 A85-42593

p 31 A85-11275

p 29 N85-20383

p 73 A85-37903

p 74 A85-49588

p 35 N85-10685

p 41 N85-30975

p 36 N85-12786

p 14 N85-12791

p 77 N85-29840

p 63 A85-37954

p 22 N85-25824

p 3 A85-25986

p 92 A85-44098

p 28 N85-16690

p 73 A85-47683

p 16 N85-25283

Ал

- CHATTERJI, B N. Reliability and maintainability considerations in computer performance evaluation p 78 A85-10055 CHERNOV, K. A. The principles of experimental setup in models of complex human operator activities p 3 A85-23283 CHRISTENSEN, D. L. Commercial space services CHRISTENSEN, J M. p 68 N85-11039 Research opportunities in human behavior and performance [NASA-CR-175473] p 6 N85-19640 CHRISTOL, C. Q. Space law - Justice for the new frontier p 87 A85-12644 CICCHINELLI, L. F. Training capabilities test of Electronics Equipment Maintenance Trainer (EEMT) Findings and conclusions p 5 N85-12302 [AD-A146075] CLANCEY, W. J. GUIDON [AD-P003925] p 26 N85-11605 CLAPP. R. Training Task Hierarchy development p 4 A85-45122 COHEN, K. J. Decision process models of contractor behavior The development of effective contract incentives p 47 N85-11898 [AD-A145524] COHEN. L. Defense data network support concept analysis [AD-A153214] p 52 N85-28649 CÒHN, C. A. p 59 A85-14923 Financing space industrialization COHN. S. M. Financing space industrialization p 59 A85-14923 COLE, R. E. Understanding changes in the U.S. competitive position p 65 A85-43179 International competitiveness COLLIE, R. L. Simulators/training devices for commuter airlines p 1 A85-17232 COLLINS, M. An astronaut's look at commercial space opportunities p 62 A85-34216 COOPER, D. W. TIMM - The intelligent machine model p 25 A85-45087 COOPER, T. Discrete simulation models - their role in the design, development and management of inventory control systems [PNR-90249] p 77 N85-34719 COPPOLA, A. Artificial intelligence applications to maintenance [AD-P003914] p 26 N85-11594 CORDLE, V M. Report-reading patterns of technical managers and p 10 A85-21540 nonmanagers CORT, G Configuration management for mission-critical software The Los Alamos solution [DE84-015515] p 36 N85-12606 COSTOGUE, E. N Polycrystalline silicon material availability and market pricing outlook for 1980 through 1988 p 58 A85-11425 COUCH. D. W. Cost effectiveness of simulated aircraft maintenance training systems p 66 A85-45118 COVAULT. C. NASA formulates policy to spur private investment p 87 A85-18469 Evolving government policy eases way for space p 90 A85-34214 ventures Chinese modify CZ-2/3 rocket boosters, focus on commercial launch market p 64 A85-40905 NASA approves fly-now, pay-later plans for orbiting industrial facility p67 A85-47047 COWEN, S. T., III A microcomputer tutorial on spreadsheets and databases with a simulated budget preparation [AD-A155516] p 72 N85-32813 CROALL, I. F. The application of expert systems to corrosion problems [AERE-M-3445] p 29 N85-21316 CROOPNICK, S. R. A methodology for organizing performance requirements for complex dynamical systems p 20 A85-25117 CROSS, S. E. Model-based reasoning in expert systems - An application to enroute air traffic control [AIAA PAPER 84-2619] p 23 A85-17817 CULLYER, W. J.
  - Software design methods p 32 A85-21457

CUMMINS, M		
Intelsat business services	p 60	A85-154
D		
DAFT, R. L. A proposed integration a	mona o	roanizatior
information requirements, media r design	chness a	nd structu
[AD-A149317] Management control systems a	p 15 nd interde	N85-198 pendencie
An empirical study [AD-A152280] DALE. B. G.	p 17	N85-277
Work flow in manufacturing syste	ems p 20	A85-191
DANFORTH National Aeronautics and S	Space A	dministratio
Authonzation Act, 1986 [S-REPT-99-91]	p 96	N85-309
DANILENKO, G. M. Custom as a source of interr	national I	aw of out
space DAUPHINIAS, P R.	p 92	A85-4991
Copyright law, computer softwa acquisition	re, and g	jovernme
[AD-A150347] DEAN, B. V.	p 95	N85-234
Strategic planning for investment analysis and mathematical program	t in R&D us nming	sing decisi
DEFAUX, M.	p 11	A85-336
Component problems plague Fre	ench robot p 30	N85-290
On applying AI (Artificial Intellig	ence) to r	naintenan
and troubleshooting [AD-P003915]	p 26	N85-115
DELVIN, W. L. Quality of scientific and engineer [DE85-000294]	ring data	N85-209
DENHAM, E T. Issues in air transport	p	
[PB85-121374/GAR] DERRICK, J. F.	p 71	N85-180
Aviation maintenance computer information systems Perspective for the systems of the systems of the system of the	terized m for the futu	lanageme Jre
[AD-A150637] DEWAR, J. A.	p 75	N85-223
CODA A concept organization for the research environment	and deve	lopment a
[AD-A154240] DEWOLF, J. B.	p 41	N85-307
Using Ada for a distributed, fault [AIAA PAPER 84-2703]	tolerant s p 79	ystem A85-178
Legal aspects of space activities	s p91	A85-390
Overhead management gui	de for	aerospa
[AD-A153626]	p 18	N85-298
An evaluation of the effect of e	stablishing	a minimu
item management system	o 75	N85-166
DOBBINS, R. Overcoming project planning an	nd timeline	ss probler
to make Landsat useful for timely of	croparea	estimates A85-321
DOERFLINGER, C. W. Monitoring software developme	ent throug	ah dvnam
variables	p 47	A85-490
Life cycle cost management mast Communications Agency	er plan for	the Defen
[AD-A146876] Cost savings from multivear cont	p 14 tracting	N85-166
[AD-A153564]	p 53	N85-298
Producibility engineering for robo	ptic manufa p 24	Acturing A85-231
DOWNS, W. R. Maintainability aspects in mainte	nance ma	nagement
DRAGER, T. L.	p 74	A85-495
Application of the personal comp ATE/TPS support	puter for c p 32	Ost effectiv A85-2679
The concept of fit in contingency	theory	
[AD-A152603]	p 18	N85-288

Integrating quality assurance and research and development [DE85-007974] p 17 N85-28392

DRUZHININ, G. V. An analysis of ergonomic systems p 5 A85-46148 DUBOWSKÝ, S. Active control of mechanical systems - The state-of-the-art for robotic manipulators p 25 A85-30351 [AIAA PAPER 85-0683] DUBYAH, R. The application of artificial intelligence techniques to large distributed networks p 30 N85-30721 [NASA-CR-177346] DUPONT, J. F. Telecommunication market research processing ENST-83E018] p 42 N85-34331

- DUPUY, R. J. The structures and the role of an international agency
- for the control of satellites [NASA-TM-76765] p 93 N85-12806 DYER. C A.

Expert systems in software maintainability p 26 A85-49563

### E

EDGECOMBE, D. S.

- Orbital debris policy issues Battelle involvement and some personal observations p 94 N85-21218 EDMONDSON, H E. Encouraging and maintaining an innovative work climate p 4 A85-43198 EDWARDS, E. Human factors in aviation I p 3 A85-39368 EDWARDS, P W
- White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984 p 81 A85-43176
- EGAN, J J Financial issues for commercial space ventures Paying for the dreams p 67 N85-11014 EIGL, C.
- The imposition of flow control avoids ATC overloads p 74 A85-48851 EL ABBADI, A.
- Implementing fault-tolerant distributed objects p 80 A85-36291
- EL-HUSSAINY, K. Registration and nationality of aircraft operated by international agencies in law and practice p 89 A85-27396
- ELDRIDGE, D.
- Avionics integrity program (Avip) Volume 1 Procurement phase issues Design, manufacturing, and integration
- [AD-A145651] p 83 N85-10943 ERTO, P.
- Note for a research feasibility project High reliability design in the aeronautical field {REPT-84-RR-350} p 85 N85-31005
- ERZBERGER, H. Concepts and algorithms for terminal-area traffic
- management p 73 A85-47683 ETHERIDGE, J. T.
- Automation of the reporting and tracking requirements of architect-engineering type contracts [AD-A152218] p 52 N85-27745 ETSCHMAIER, M. M.
- Issues in air transport [PB85-121374/GAR] p 71 N85-18030
- EVANS, J. L. Human factors department 1981 publications
- [BAE-BT-12685] p 8 N85-26147 EVANS, M. W.
- Software contingency planning p 13 A85-45079

- FARNEN, L., JR Using incentives to improve maintainability
- [AD-A153792] p 54 N85-29841 FAULKNER, P. D.
- Application of the personal computer for cost effective ATE/TPS support p 32 A85-26794 FAULKNER, W.
- EOQ (Economic Order Quantity) range model [AD-A153709] p 77 N85-30965 FEAZEL. M.
- Germany cites commercial fallout as justification for U S Station involvement p 62 A85-34220 FEEST. T.

Testing, evaluation and quality control of composites, Proceedings of the International Conference, University of Surrey, Guildford, Surrey, England, September 13, 14, 1983 p 78 A85-14101

[MBB-UA-842-84-OE] p 65 A85-42678 FEINBERG. A Man-machine tradeoff study p 30 N85-29561 FELBERG, F. H. Computing and information services at the Jet Propulsion Laboratory - A management approach to a diversity of p 44 A85-24525 FERBER, R. R. Polycrystalline silicon material availability and market pricing outlook for 1980 through 1988 p 58 A85-11425 FEURZEIG, W. Designing an expert system for training automotive electrical troubleshooting [AD-P003926] p 26 N85-11606 FIELDER, D Considerations for policy on man-made debris propagation control p 94 N85-21219 FINCH, E. R , JR Astrobusiness A guide to the commerce and law of p 87 A85-20512 outer space FINK, D. E. V-22 Osprey development contract tests new p 45 A85-36421 procurement policy FINKE, W Remarks on German space policy - 1985 to 1995 AAS PAPER 84-319] p 64 A85-42553 FIRSCHEIN, O. NASA space station automation Al-based technology view [NASA-CR-176094] p 31 N85-32134 FITZPATRICK, J. A. Maintenance training simulators prime item development specification Model specification and handbook p 10 N85-30628 [AD-A154108] FLEISHMAN, E. A. Team dimensions Their identity, their measurement and their relationships AD-A149662) p 8 N85-21978 FOERST, R

Life-cycle-cost-oriented system design in weapon

FEIERLEIN, J.

technology

- International comparative study of systems for the government advancement of research and development [NASA-TM-77589] p 48 N85-13689 FONG, E. N.
- Guide on logical database design
- [PB85-177970] p 42 N85-30976 FORD, D. A. New model introduction - The operators' perspective
- p 61 A85-31981 FORD, M. L.
- Issues in air transport [PB85-121374/GAR] p 71 N85-18030 FORDYCE, S. W.
- Insurance for space systems p 61 A85-29623 FORTUIN, L.
- Future directions in operations research [REPT-84-24] p 76 N85-28711 FOSS. P. M.
- Fire safety in transport category aircraft Litigating a post-crash or in-flight aircraft fire p 88 A85-24710
- FOX, M. S. Representation of activity knowledge for project management p 46 A85-48595
- FOXEN, R. W. Challenges facing U S industry p 65 A85-43180 FRANK. G.
- DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 1 Executive summary
- [AD-A156067] p 57 N85-35810 DOD Value Engineering Conference report Value Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part 2 Plenary session
- [AD-A156068] p 57 N85-35811 DOD Value Engineering conference report Value
- DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 3, Workshop A VE in the program office (AD-A155069) p 57 N85-35812
- AD-A156069] p 57 N85-35812 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 4, Workshop B VE on spare parts [AD-A156070] p 57 N85-35813
- [AD-A156070] p 57 N85-35813 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 5, Workshop C VEP/VECP administration, negotiation, and implementation
- [AD-A156071] p 57 N85-35814 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 6, Workshop D VE training-orientation [AD-A156072] p 57 N85-35815
  - **B-**3

DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 7, Workshop E VE in construction and architect engineer contracts

- [AD-A156073] p 57 N85-35816 FRANKE, J. J., JR. p 66 A85-43202 Productivity initiatives at USDA
- FREDERIKSEN, J. Designing an expert system for training automotive
- electrical troubleshooting [AD-P003926] p 26 N85-11606
- FREITAG, R. F. Space Station - An overview of current U.S. activities
- [IAF PAPER 84-22] p 59 A85-12991 FROSCH, R. A.
- Testimony of Robert A Frosch before the Subcommittee on HUD and Independent Agencies of the Senate Committee on Appropriations p 97 N85-33173
- [NASA-TM-87496] FURAUS, J. P.
- Quality assurance considerations for the implementation of a pulsed power R and D project [DE85-012357] p 86 N85-35720
- FURUSTIG, H. Human factors engineering contracts in Sweden An
- overview [FOA-C-56043-H2] p 55 N85-31836
  - G
- GACKE, D. E.
- Software test program for computer hardware developments p 32 A85-26784 GAI. E. Effects of redundancy management on reliability
- modelling p 13 A85-47795 GANTT. J. B. The commercialization of space - Twenty years of
- p 88 A85-27373 experience Some lessons learned GANTZ. B. R.
- Software Quality Assurance Program for the AH-64 p 80 A85-32010 Advanced Attack Helicopter (AAH) GARRY, F. W.
- New technology implications on the work force p 21 A85-43189 GATES, S.
- Cargo claims From the carrier's point of view p 88 A85-27395 GAUGETT, R.
- Simulation A tool for cost-effective systems design and live test reduction p 71 N85-26657 GAVAGHAN, H.
- Europe's space odyssey 2000 GEORGEFF, M. P. p 44 A85-23921 NASA space station automation Al-based technology
- [NASA-CR-176094] p 31 N85-32134 GERARD, M.
- White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984
- p 81 A85-43176 GILLAM, I. T., IV NASA's approach to the commercial use of space
- [IAF PAPER 84-217] p 59 A85-13139 GILLINGWATER, D.
- Information technology applications in voluntary sector transport operations SP1 Objectives and programme Objectives and programme of work ITT-85011 p 71 N85-26457
- GILLOGLY, J. J. CODA A concept organization and development aid
- for the research environment [AD-A154240] p 41 N85-30715 GILMORE, H. L.
- R&M implications of the DoD acquisition improvement program p 72 A85-14896
- GIROUARD, R.
- DLA Data/data base administration analysis [AD-A153031] p 40 N85-28879 GLASS, D. V.
- Producibility Engineering and Planning (PEP) Program management guidelines
- p 18 N85-30966 [AD-A153730] GLASSMAN. M.
- Report-reading patterns of technical managers and p 10 A85-21540 nonmanagers GODON. J. P.
- The use of microgravity for industrial and commercial purposes p 64 A85-38917 GOETHERT, B. H.
- Graduate education in propulsion
- p 3 A85-39623 [AIAA PAPER 85-1147]

- GONZALEZ, J. Managing projects for high performance [ASME PAPER 84-MGT-8] p 2 p 20 A85-21298 GOODLETTE, J. D. p 79 A85-17779 The management of failure GORBIEL, A. Satellite broadcasting and the use of the geostationary orbit - Some international legal aspects p 90 A85-36289 Legal issues of manned orbiting space stations p 92 A85-50055 Towards the entire demilitarization of outer space p 92 A85-50056 GOSSETT, J. L. Economic analysis handbook [AD-A146263] p 69 N85-12805 GRAHAM, C. J. Selection criteria for a CAD/CM system p 71 N85-24810 GRANGE, P. technology French research minister on policy, N85-20182 transfer p 94 GRAY. G. R. Computer center policy p 41 N85-30681 [AD-A154416] GREENBERG, J. S. Government tools for the support of commercial ventures [IAF PAPER 84-216] p 59 A85-13138 GREENBERG, M. Representation of activity knowledge for project p 46 A85-48595 management GREENĚ, S. A. Defense data network support concept analysis p 52 N85-28649 [AD-A153214] GREER, T. H Artificial intelligence - A new dimension in EW p 25 A85-49098 GREGER Documentation for the West German Federal Cabinet's space policy decision p 96 N85-28886 GRENANDER, S. Toward the fully capable AI space mission planner p 25 A85-42892 GRIFFIN, G. D. Commercial use of space - The space business era p 63 A85-34538 Contractor and government -Teamwork and p 46 A85-43206 commitment GRIFFIN, R. W. Symbolic and interactional perspectives on leadership An integrative framework p 19 N85-32769 [AD-A155247] GRIMAK, L. P. Some principles for the construction of an adaptive p 3 A85-23279 training system GROSS, D On some common interests among reliability, inventory and queuing p 83 N85-11646 [AD-A1455951 GROWER, R. G. T-45 training system - Concept and acquisition strategy [SAE PAPER 841588] p 3 A85-25986 GUENTHER, W C. Rectifying inspection for nonconforming items and the Hald linear cost model p 61 A85-32573 GUIDA, M. Note for a research feasibility project High reliability design in the aeronautical field [REPT-84-RR-350] p 85 N85-31005 GUNKEL, R. A. Producibility Engineering and Planning (PEP) Program management guidelines [AD-A153730] p 18 N85-30966 GUPTA, S. S. A statistical approach to vendor selection p 16 N85-22249 [AD-A149781] GUSMANN, B
- Documentation and separate test program development is most important for test/maintenance p 83 N85-16745 **GUTIERREZ, C. M**
- Primer on the registration of technical information in p 36 N85-12786 industry

# н

- HABAYEB. A. R.
- Design adequacy An effectiveness factor p 40 N85-26642 HAC. A.
- A system reliability model with classes of failures p 81 A85-37904

HAGGERTY J J The outlook for space commercialization p 61 A85-34192 HAHN, G. J. An engineer's guide to books on statistics and data p 10 A85-12647 HALFF. H. Overview of training and aiding p 5 N85-11597 [AD-P003917] HAM. M. P. EOQ (Economic Order Quantity) range model [AD-A153709] p 77 N85-30965 HAMILL, B. W Psychological issues in the design of expert systems [AD-A146081] p 27 N85-12792 HAMMERSLAG, D. SAGA A project to automate the management of software production systems (NASA-CR-174017) p 35 N85-10685 HANDLER. G. S. Navy program manager's guide, 1985 edition [AD-A151925] p 76 N85-27744 HANKINS, W. W., III Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 HANSS. E. J. Are decision support systems applicable to engineering management? p 19 A85-17780 HANUS, J. C. French research minister on policy, technology transfer p 94 N85-20182 HARIS, D. K. User's operating procedures Volume 2 Scout project financial analysis program [NASA-CR-177949] p 42 N85-34519 HARMON, K. R. Training capabilities test of Electronics Equipment Maintenance Trainer (EEMT) Findings and conclusions [AD-A146075] p 5 N85-12302 HARRIS. C. G. User's operating procedures Volume 2 Scout project financial analysis program (NASA-CR-177949) p 42 N85-34519 HARRIS, F. C. Expert systems in contract management A pilot study [AD-A149363] p 29 N85-19873 HÀRRIS, N. Reliability prediction - Improving the crystal ball p 82 A85-49540 HARRISON, F. W. A system-level approach to automation research p 24 A85-23197 HART, J. C. Civil certification of a US government procured p 90 A85-31968 helicopter HART, R. E. Training and development of engineers at the Air Force Flight Test Center - An overview [AIAA PAPER 84-2528] p 1 A85-13587 HARTT, R. W. Local automation model software benchmarking Test plan [AD-A154349] p 41 N85-30676 HÀSSAN, F. A legal analysis of the shooting of Korean Airlines Flight 007 by the Soviet Union p 86 A85-11937 HAUPT, R. J. German domestic scheduled air transport in the year 2000 [ESA-TT-828] p 69 N85-13792 HAWLEY, L. R. An automated methodology development p 33 A85-34128 HAZELRIGG, G. A. Federal policy options and the commercialization of space [IAF PAPER 84-218] p 87 A85-13140 HAZELRIGG, G. A., JR. RADSIM - A methodology for large-scale R&D program assessment p 46 A85-42585 HEACOCK, E. L. Land remote sensing commercialization A status p 68 N85-11024 report HEDLUND, S. D. Government contract contingent liabilities The anti-deficiency act, and the hobgoblin of little minds [AD-A147919] p 94 N85-16684 HEIMBOLD, R. L. Intercompany technology task forces promote cooperation at Lockheed p 11 A85-26847 HEISS, K. P.

- Need for alternative space launch services given NASA refusal to launch SPARX-01 mission under standard form commercial launch services agreement
  - p 91 A85-38914

### PERSONAL AUTHOR INDEX

HELLSTEN, J. UK, FRG, France R and D in sensors, related fields
P 49 N85-1/197 HEMMERDINGER, L. H. Developing commercial users of space
P 68 N85-11044
(AD-A151925) p 76 N85-27744 HENDERSON, B. J
Management aspects of software maintenance [AD-A152035] p 40 N85-27550 HENDERSON. M. W.
Guide on logical database design [PB85-177970] p 42 N85-30976 HENNESSY B T
Research and Modeling of Supervisory Control Behavior,
[AD-A149621] p 16 N85-22248
Design principles for Finite Elements (FE) programs concerned with intensely nonlinear problems
HERSHKOWITZ, J.
A review of safety practices and safety training for the explosives field
[AD-A152295] p 8 N85-27028 HEVNER, A. R.
Performance evaluation of database systems A benchmark methodology
(PB84-217504) p 36 N85-10707 HIGHFILL, K. G.
A decision model for selection of microcomputers and
[AD-A149076] p 15 N85-19694
Building teams and maintaining trust p 66 A85-43195
HILL, R. L. Counteracting the stifling effects of a large
organization p 65 A85-43194 HINGORANI, G. D. Management and control of interconnected
communications networks p 34 A85-34459 HIRSCH, C. H.
productivity p 13 A85-43205 HITT, E. F.
A fault-tolerant software strategy for digital systems [AIAA PAPER 84-2646] p 79 A85-17833 Avionics integrity program (Avip) Volume 1
integration
[AD-A145651] p 83 N85-10943 HODGE, J. D.
The US Space Station programme p 46 A85-41098 HOECKER, H.
[GMD-STUDIES-81] p 83 N85-10676
Business planning for information services under special consideration of German management information
systems (BMFT-FB-ID-83-007) 0.21 N85-11910
HOETMER, G. J. Design of a scientific information collation and
dissemination system, volumes 1 thru 3 (AD-A146002)
HOFFMAN, F. E.
instruments for the Space Shuttle Orbiter
(NASA-CH-1/5/81) p /2 N85-26842 HOFFMANN, JJ.
training of military air traffic controllers p 4 A85-44244 HOLLINGUM, J.
Machine vision The eyes of automation - A manager's practical guide p 20 A85-35799 HOLTSCLAW. K. S.
Capital investment motivational techniques used by nrme contractors on subcontractors
[AD-A153660] p 53 N85-29837 HORNBACH, K.
Development tools - Case study for large systems
HORNEY, W. R. Data base management for ATF reliability
enhancement p 32 A85-26807 HOSAPPLE, C. W.
Developments in decision support systems p 25 A85-31792
HOSENBALL, S. N. NASA and the practice of space law

	p 92 A85-49971
Legal considerations and	cooperative opportunities for
space commercial activities	p 93 N85-11013

HOSKOVEC, J. Possible applications of simulators in various areas p 3 A85-29865 HOUGHTON, R. C., JR. Annotated bibliography of recent papers on software engineering environments [PB85-191385] p 41 N85-29607 HRITZ R .I Maintenance training simulators prime item development specification Model specification and handbook [AD-A154108] p 10 N85-30628 HUBAND, F. L. RADSIM - A methodology for large-scale R&D program assessment p 46 A85-42585 HUGHLETT, E C. A framework for software development p 40 N85-27551 [AD-A152067] HUIJIANG, W. Systems research on China in year 2000 p 50 N85-21418 HUNT, B. Quality circles - Square deal for productivity p 1 A85-17781 HUNTOON, R. B. p 1 A85-21560

- Displays, deja vu HYMAN, S. D. Strategic management for organizational effectiveness
- The effect of human resource planning on retention and related issues, volume 1 [AD-A149398] p 7 N85-19874
- Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 2 p 7 N85-19875
- [AD-A149399] Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 3 [AD-A149400]
- p 7 N85-19876 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues Methodological appendix
- [AD-A149401] p 7 N85-19877

# 

- IGENBERGS. E.
- A systems-analysis comparison of space station projects [DGLR PAPER 84-118] p 45 A85-40334
- ILGEN. D. R. Laboratory research A question of when, not if
- p 53 N85-28867 [AD-A153298] ITTMANN, H. W.
- Decision Support System (DSS) A survey [NRIMS-TWISK-317] p 14 p 14 N85-11896
- ITZFELDT, W. D. Comparative descriptions of software quality measures
- [GMD-STUDIES-81] p 83 N85-10676 .

JACKSON, D. L. United Airlines' cockpit resource management training p 2 A85-21565 JACKSON, J. B. Quality in practice at IBM p 13 A85-43186 JACKSON, N. S. F. Personal decision making The influence of perceived locus of control and degree of rationality on information seeking strategies p 39 N85-23446 JAMSHIDI, S. Intelsat business services p.60 A85-15463 JARNE, T. UK, FRG, France R and D in sensors, related fields p 49 N85-17197 JEFFERSON, D. K. Guide on logical database design [PB85-177970] p 42 N85-30976 JEFTMAN, K Helios project support p 17 N85-27812 JENSEN-FISHER, R. Microcomputers in transportation Software and source book, February 1985 [PB85-181022] p 77 N85-31868 JERNIGAN, C. M. Second Symposium on Space Industrialization [NASA-CP-2313] p 67 N85-11011 JIABAO, W. Organizing geological work tasks for 1985 outlined p 51 N85-27303 JOHNSON, D. R. Executive information system [DE84-015355] p 37 N85-13675

JOINER, C. W , JR. Making the 'Z' concept work p 13 A85-43197 JONES. T. C. Reusability in programming - A survey of the state of the art p 31 A85-11096 JORDAN, H. L. Space - The challenge of a new environment p 63 A85-38902 International space research commercialization for German industry perspectives of

- [NASA-TM-77657] p 54 N85-29979 JORDAN, P. R.
- Concept paper for the development of a DOD Ada (trademark) software engineering education and training plan [AD-A148774]
- p 38 N85-17592 JOSEPH, T A.

Implementing fault-tolerant distributed objects p 80 A85-36291

# Κ

- KAHAN J P. Individual characteristics and unit performance A review of research and methods [AD-A1531451 p.9 N85-28550
- KAIO, N Some remarks on optimum inspection policies
  - p 80 A85-25109 KANCIRUK, P
- Generic data entry quality assurance tool {DE85-008359} p 41 N85-29852
- KANTOR, J. E The USAF pilot selection and classification research
- p 2 A85-21602 program KARASEK, J. F. A quide for new environmental coordinators
- [AD-A156327] p 19 N85-35498 KARL, R.
  - Automated tools for software development
- p 32 A85-26793 KARPINSKI, J.
- General probability of system failure p 78 A85-10057 KASSEL, S.
- The outlook for Soviet advanced technologies AD-P004564] p 52 N85-28859 [AD-P004564] KAUTZ, W H.
- NASA space station automation Al-based technology review
- [NASA-CR-176094] p 31 N85-32134 KAWAMURA, K.
- A survey of technology assessment activities in selected US corporations p 60 A85-17778 KEDZIERSKI, B. I.
- Knowledge-based communication and management support in a system development environment p 27 N85-14596
- KELLER, R. A. Training capabilities test of Electronics Equipment Maintenance Trainer (EEMT) Findings and conclusions [AD-A146075] p 5 N85-12302 KENISON, L.
- Software Quality Assurance Program for the AH-64 Advanced Attack Helicopter (AAH) p 80 A85-32010 KEY, R. W.
- NASA Space controls research and technology p 54 N85-31149 program KEYWORTH, G. A, II
- Science and technology policy The next four years p 87 A85-21621
- KHOZIN, G. S. US, Soviet space program aims contrasted p 95 N85-22455
- KHVOSTOV, K. A. Interpersonal activity in conditions of group learning
- p 2 A85-23278 KIERAS, D. E.
  - The psychology of technical devices and technical discourse
- [AD-P003929] p 27 N85-11609 The acquisition of procedures from text A production-system analysis of transfer of training p 8 N85-24732 [AD-A151029]
- KIMBALL, J. SAGA A project to automate the management of
- software production systems [NASA-CR-174017] p 35 N85-10685
- KIRBY, J. G.
- Project manager's handbook for special projects [AD-A147913] p 48 N85-16683

Manufacturing costs, equipr	ment needs and
technological opportunities among s	mali and medium-size
(DE85-000479)	p 15 N85-18193
KIRSLIS, P. A.	·
SAGA A project to automate	the management of
software production systems	
[NASA-CR-174017]	p 35 N85-10685
The modeling of burgan cognitive	e decision processes
in The Intelligent Machine Model (T	IMM)
	p 25 A85-47677
KITTINGER, D. C.	
Aeronautical systems technolog	y needs Escape,
rescue and survival, test facilities an	to test equipment and
(AD-A1450591	p 21 N85-10002
KLASS. P. J.	, -
Reagan competitive policy place	es Intelsat's future at
crossroads	p 90 A85-34223
KLEBER, P.	
Activities in Germany for the co	ommercialization of
[IAF PAPER 84-222]	p 59 A85-13142
KLEINE, H.	,
Methodology for system description	on using the software
design & documentation language	p 35 A85-48511
KLEINMAN, D. L.	
A résearch paradigm for multi-hur	nan decision making
KOCAOGUU D. E	pis A65-4/6/8
Formeering management program	ns as aids in movino
from technical specialty to technical	management
·····	p 19 A85-17776
KOCSIS, K. G.	
Plans, developments in robotics	p 29 N85-24191
KOK, M.	
The interface with decision m	akers in interactive
(REPT-84-38)	n 17 N85-28637
KOLESNIKOV. A. A.	p 11 1100 20001
Administration chief on air traffic o	control improvements
	p 76 N85-25193
KOLESNIKOV, Y.	,
Improvements in personnel nee	eded for better flight
<i>i</i> .	
safety	p 8 N85-23693
safety KOLOSOV, IU.	p 8 N85-23693
safety KOLOSOV, IU. International space law KOLOSOV, IU. M	p 8 N85-23693 p 90 A85-36997
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law	р8 N85-23693 р90 А85-36997 р91 А85-38699
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L.	p8 N85-23693 p90 A85-36997 p91 A85-38699
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes:	p8 N85-23693 p90 A85-36997 p91 A85-38699 s of the weighted
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's	p 8 N85-23693 p 90 A85-36997 p 91 A85-38699 s of the weighted investment in cost
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment	p 8 N85-23693 p 90 A85-36997 p 91 A85-36899 s of the weighted investment in cost
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWAI SKI B. A	p 8 N85-23693 p 90 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure	p 8 N85-23693 p 90 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA. F.	p 8 N85-23693 p 90 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147588] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical	p 8 N85-23693 p 90 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical si organizations, no 5	p 8 N85-23693 p 90 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A.	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Destingtion of the fill of the f	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design ophilospohy for engineeron	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical - organizations, no 5 KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A.	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter-	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical in organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681]	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical is organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681] KUBALA, A. L. Human factors and training for	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical - organizations, no 5 KRAUFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical is organizations, no 5 KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter management [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832]	p 8 N85-23693 p 90 A85-36997 p 91 A85-36699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectivenes: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial intermanagement [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832] KUCHLAK, S. D.	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832] KUCHLAK, S. D. Software Quality Assurance Prog	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 irram for the AH-64
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical so organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial interma management [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH)	p 8         N85-23693           p 90         A85-36997           p 91         A85-38699           s of the weighted investment in cost         p           p 70         N85-16681           p 82         A85-49543           scientific         research           p 55         N85-32036           p 12         A85-43184           on microcomputers - management p 33         A85-29401           elligence to contract         p 27           p 27         N85-15448           esearch in military         p 5           p 5         N85-16475           iram for the AH-64         p 80
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical - organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARNI, V. G.	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 iram for the AH-64 p 80 A85-32010 C8 and reliability of
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness: guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical - organizations, no 5 KRAUSTHAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial intermanagement [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARNI, V. G. A unified model for performan Fault-Tolerant/Multi-Mode systems	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 irram for the AH-64 p 80 A85-32010 ce and reliability of
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUSPENBACHER, T. A. The application of artificial intermanagement [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARNI, V. G. A unified model for performan Fault-Tolerant/Multu-Mode systems [AD-A148789]	p 8 N85-23693 p 90 A85-36997 p 91 A85-36699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 iram for the AH-64 p 80 A85-32010 ce and reliability of p 84 N85-17601
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical in organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A1466832] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARN, V. G. A unified model for performan Fault-Tolerant/Multi-Mode systems [AD-A148789] KURAJIAN, G. M.	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 irram for the AH-64 p 80 A85-32010 ce and reliability of p 84 N85-17601
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial intermanagement [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARNI, V. G. A unitied model for performan Fault-Tolerant/Multi-Mode systems [AD-A148789] KURAJIAN, G. M. Failure prevention and reliability	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 irram for the AH-64 p 80 A85-32010 ce and reliability of p 84 N85-17601 - 1983, Proceedings
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical in organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARNI, V. G. A unified model for performan Fault-Tolerant/Multi-Mode systems [AD-A148789] KURAJIAN, G. M. Failure prevention and reliability of the Fifth Conference, Dearborn, N 1922	p 8 N85-23693 p 90 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 iram for the AH-64 p 80 A85-32010 ce and reliability of p 84 N85-17601 - 1983, Proceedings II, September 11-14, - 100
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical - organizations, no 5 KRAIFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146682] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARNI, V. G. A unified model for performan Fault-Tolerant/Multi-Mode systems [AD-A148789] KURAJIAN, G. M. Failure prevention and reliability of the Fifth Conference, Dearborn, N 1983	p 8 N85-23693 p 90 A85-36997 p 91 A85-36699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 irram for the AH-64 p 80 A85-32010 ce and reliability of p 84 N85-11666
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPENBACHER, T. A. The application of artificial inter- management [AD-A146682] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146682] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARNI, V. G. A unified model for performan Faulti-Tolerant/Multi-Mode systems [AD-A148789] KURAJIAN, G. M. Failure prevention and reliability of the Fifth Conference, Dearborn, N 1983 KUTZER, A. The Helios missiones	p 8 N85-23693 p 90 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 rram for the AH-64 p 80 A85-32010 ce and reliability of p 84 N85-17601 - 1983, Proceedings II, September 11-14, p 78 A85-11666
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical in organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681]] KUBALA, A. L. Human factors and training r organizations and systems [AD-A1466832] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARN, V. G. A unified model for performan Fault-Tolerant/Multi-Mode systems [AD-A148789] KURAJIAN, G. M. Failure prevention and reliability of the Fifth Conference, Dearborn, N 1983 KUTZER, A. The Helios missions The singlifeance of Moles for First	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 irram for the AH-64 p 80 A85-32010 ce and reliability of p 84 N85-17601 - 1983, Proceedings II, September 11-14, p 78 A85-21795 N85-27795
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial intermanagement [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146832] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARNI, V. G. A unitied model for performan Fault-Tolerant/Multi-Mode systems [AD-A148789] KURAJAN, G. M. Failure prevention and reliability of the Frith Conference, Dearborn, N 1983 KUTZER, A. The Helios missions The significance of Helios for Euro	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 tram for the AH-64 p 80 A85-32010 ce and reliability of p 84 N85-17601 - 1983, Proceedings II, September 11-14, p 78 A85-11666 p 52 N85-27808
safety KOLOSOV, IU. International space law KOLOSOV, IU. M. International space law KOVICH, L. Evaluation of the effectiveness guidelines to induce contractor's reducing facilities equipment [AD-A147586] KOWALSKI, R. A. Field data - The final measure KOWSOLEEA, F. Spin-offs from technical so organizations, no 5 KRAFT, R. A. Japanese management in U S KRAUSHAAR, J. Prototyping information systems of A design philosophy for engineering KRUPPENBACHER, T. A. The application of artificial inter- management [AD-A146681] KUBALA, A. L. Human factors and training r organizations and systems [AD-A146682] KUCHLAK, S. D. Software Quality Assurance Prog Advanced Attack Helicopter (AAH) KULKARNI, V. G. A unified model for performan Fault-Tolerant/Multi-Mode systems [AD-A148789] KURAJIAN, G. M. Failure prevention and reliability of the Fifth Conference, Dearborn, N 1983 KUTZEF, A. The Helios missions The significance of Helios for Euro Managenal benefits of Helios	p 8 N85-23693 p 90 A85-36997 p 91 A85-36997 p 91 A85-38699 s of the weighted investment in cost p 70 N85-16681 p 82 A85-49543 scientific research p 55 N85-32036 p 12 A85-43184 on microcomputers - management p 33 A85-29401 elligence to contract p 27 N85-15448 esearch in military p 5 N85-16475 irram for the AH-64 p 80 A85-32010 ce and reliability of p 84 N85-17601 - 1983, Proceedings II, September 11-14, p 78 A85-11666 p 52 N85-27808 for the European

KYDD. C. T.

- Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 1
- IAD-A1493981 p 7 N85-19874 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 2
- p 7 N85-19875 [AD-A149399] Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 3
- p 7 N85-19876 [AD-A149400] Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues Methodological appendix p 7 N85-19877 [AD-A149401]
- KÝJOVSKY, P. p 22 N85-32785 Quality analysis KYLE, T. G
- Expanding expertise by use of an expert system [DE85-010759] p 30 N85-30723

# L

- LAESSIG. W. F. Aeronautical Systems Division Manufacturing/Quality assurance orientation p 86 N85-35817 [AD-A156128] LAIRD, A. Aeronautical Systems Division Manufacturing/Quality assurance orientation [AD-A156128] p 86 N85-35817 LANDIN, S. L. An analysis of data dictionaries and their role in information resource management [AD-A152134] p 22 N85-27121 LANGEREUX, P. Europe in space 1985-2000 p 45 A85-26011 LANKFORD, V. G. Feasibility of applications of Competition Decision Assist Package (CDAP) to spare parts p 77 N85-33036 [AD-A154716] LARSSON. G. Decision making in stressful conditions A model based on the coping perspective p 15 N85-17738 [FOA-C-55064-H3] LASSER. W. The manned Space Station - NASA's last hurrah? p 87 A85-21620 LAWRENCE, J. D. Requirements for a database management system [DE85-004661] p 39 N85-22259 LAWRENCE, S H. Optimal maintenance center inventories for fault-tolerant repairable systems p 72 A85-21548 LAWVER, J Low cost training aids and devices p 6 N85-18025 LEBLANC-COOKE, J Overcoming project planning and timeliness problems to make Landsat useful for timely crop area estimates p 11 A85-32129 LEE, A. Low cost training aids and devices p 6 N85-18025 LEE. J. Intelsat business services p 60 A85-15463 LEGENDRE, P. J The congressional authorization process as it applies to aeronautical research and technology p 89 A85-29555 LEHNER, P. E. User and R&D specialist evaluation of decision-support p 12 A85-38415 systems Mental models and cooperative problem solving with expert systems p 28 N85-16479 [AD-A147843] LEHNIGK, S. H. Research report program of the US Army in Europe p 56 N85-35167 LEHR, L. W. p 4 A85-43193 Renewing large organizations LEKHTLA, T. General laws of development of technology p 30 N85-28875 LENGEL, R. A proposed integration among organizational information requirements, media richness and structural design [AD-A149317] p 15 N85-19881 LENOROVITZ, J. M. Progress of Europe's Anane launcher challenges U.S. p 62 A85-34219 Shuttle on cost issue
- LERNER, E. J. Military electronics - Why so unreliable? p 80 A85-18440

#### PERSONAL AUTHOR INDEX

Ada - Will DOD's new computer la	inguage cut software
COST?	p 61 A85-29669
Guide on workload forecasting	- 40 - 100
[PB85-177632] LEVINE, A.	p 18 N85-30704
The management of research ins	stitutions A look at
[NASA-SP-481]	p 14 N85-16665
Management of large-scale technol	p 56 N85-35145
LEVIS, A. H. A mathematical theory of con	mand and control
structures [AD-A145608]	p14 N85-11675
LEVITT, K. N. NASA space station automation	Al-based technology
review [NASA-CR-176094]	p 31 N85-32134
LEWIN, A. Y. Decision process models of contr	actor behavior The
development of effective contract in	centives
[AD-A145524] LIEBOWITZ, J.	p 47 N85-11898
Determining functional require	ments for NASA
design using expert systems	p 30 N85-32020
LILLEY, R W. Research and development in	the technology of
transportation Let's reach for blue sk	y 45 A85-31742
LIVACK, G. S.	p 40 1100-01142
Pilot judgment training - Past, pres	p 2 A85-21579
LLOYD, E. A. Status of the U.K. N.D.T. industry t	odav
	p 22 N85-24309
Welding techniques in pressure pa	rt technology
LOGSDON	p 22 N85-25835
Opportunities for policy historians	The evolution of the
US civilian space program LOGSDON, J. M.	p 97 N85-35147
U S initiatives in space commercia [IAF PAPER 84-223]	lization p 63 A85-35978
European space science horizon 2	000
[ESA-SP-1070] LOOTSMA. F. A.	p 51 N85-26771
Future directions in operations resi	earch
[REPT-84-24] Multicriteria decision analysis as	p 76 N85-28711 an aid to strategic
planning of energy research and dev	elopment
[REPT-84-02]	p 18 N85-28870
Food service management	p 16 N85-24736
Social and political problems in S	oviet basic research
[AD-P004565] LUEDERS, G.	p 96 N85-28860
Venification techniques for improv through automated requirements data	ing software quality a bases
[AIAA PAPER 84-2669]	p 79 A85-17848
A research paradigm for multi-hum	an decision making
LUPPOLD, R. H.	µ13 A65-4/6/8
Effects of redundancy manage	ment on reliability
LUXENBERG, B	p 13 Ad3-47733
Intellectual property and space act	p 92 A85-49972
LYASHKO, I. I.	
Dean of Nev State University on In	p 28 N85-19213
Μ	
MACINTOSH, N. B. Management control systems and	Interdependencies
An empincal study	
[AD-A152280] MADAUSS, B.	p1/ N85-27746

- MA The European approach to a standardized work breakdown structure concept for European scientific space satellites p 44 A85-16088 [MBB-UR-688-84-OE]
- MADAUSS, B. J. Managenal benefits of Helios for the European p 52 N85-27809 industry
- MADDALON, D. V. Foreign civil aviation competition 1976 summary and implications
- [NASA-TM-X-73907] p 67 N85-10907

#### PERSONAL AUTHOR INDEX

#### MADEY, G. R. Strategic planning for investment in R&D using decision analysis and mathematical programming p 11 A85-33649 MALCHOW, H. L. A methodology for organizing performance requirements for complex dynamical systems p 20 A85-25117 MANDL. V. Outer space law A problem of astronautics [NASA-TM-77760] p 94 N85-16697 MANGANELLI, R. L. Management techniques in meeting requirements for integrating technical publications and training into ATE stations p 11 A85-26786 MANKIEWICZ, R. Selected American decisions on the Warsaw Convention and related matters - February 1981 to June 1984 I p 89 A85-30167 MANN. P. Remote sensing - A tortuous trip to marketplace p 62 A85-34218 MANOOGIAN, J A. Quality and cost competitiveness p 65 A85-43181 MANTEL, S J., JR. Project management A managerial approach p 45 A85-36987 MARCHENKO, N. A. Problem-oriented systems for processing experimental data p 34 A85-34919 MARK, H. The management of research institutions A look at government laboratories p 14 N85-16665 [NASA-SP-481] MARMOR-SQUIRES, A. B. DOD related software technology requirements, practices, and prospects for the future p 36 N85-11575 [AD-A145493] MARSH. G. P The application of expert systems to corrosion problems [AERE-M-3445] p 29 N85-21316 MARSHALL, H. R., JR. Commercialization of space - Incentives, impediments and alternatives p 61 A85-27375 MARTENS, J. A. R/D contracts in the Soviet Union p 53 N85-28865 [AD-P004569] MARTIN, P. Destruction of Korean Air Lines Boeing 747 over Sea p 86 A85-10049 of Japan, 31 August 1983 MARTIN, R. J. DOD related software technology requirements, practices, and prospects for the future p 36 N85-11575 [AD-A145493] MATTE, N. M. Annals of air and space law Volume 8 p 87 A85-23799 MATULL, E Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems PNR-902381 p 84 N85-18618 MATYAS, G. M. The Human Resource Management Information Network (HRMIN) A cost comparison in accordance with Office of Management and Budget (OMB) Circular no A-76, 5 April 1979 [AD-A154583] p 42 N85-33039 MCCANN, T. Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment [AD-A147586] p 70 N85-16681 MCCARTHY, J. Requirements for a database management system [DE85-004661] p 39 N85-22259 MCCOMBS, B. L. Factors critical to the implementation of self-paced instruction A background review [AD-A145143] p 5 N85-10648 MCDONALD, C. W. Concept paper for the development of a DOD Ada (trademark) software engineering education and training plan AD-A1487741 p 38 N85-17592 MCDONALD. G. C. A statistical approach to vendor selection [AD-A149781] p 16 N85-22249 MCIVER. D. E. NASA Space controls research and technology p 54 N85-31149 program MCKNIGHT, L. The deregulation of international satellite communications p 90 A85-36666

MCLEOD, D. S.		
Issues in air transport [PB85-121374/GAB]	0.71	N85-18030
MCMANUS, J L. R&M analysis techniques for fault-t	olerant	systems
MEDLER, E. H. Satellite servicing A business opp	p 74 ortunity	A85-49588 ?
MEEKER, W. Q., JR.	p 69	N85-11056
analysis MEHREZ, A.	p 10	A85-12647
An analysis of a dynamic project co [CSIR-TWISK-338] MEISNER, J.	p 71	olem N85-23341
Multicriteria decision analysis as a	in aid	to strategic
[REPT-84-02]	p 18	N85-28870
The role of robotics in space system [AIAA PAPER 85-1879]	m opera p 25	ations A85-45902
MELIOPOULOS, A. P. Distributed photovoltaic system	Impact	upon utility
MEREDITH, J. R Project management A managerial	approa	A65-11349
MEYER, R	p 45	A85-36987
Man-machine communication rest reported	earch p 28	for robotics N85-17177
Militarization of space activity in Un	ited Sta	ates
MIKOS-SKUZA, E	p 96	N85-25360
Jurisdiction over and supervision of in space	p 89	A85-30014
Preview of the President's Comm Competitiveness	p 66	on Industrial A85-43199
MILES, P. A. A systematic method for e	valuatir	ng security
requirements compliance MILES, R F, JR.	p 35	A85-42597
The SIMRAND methodology - Simi and Development Projects	p 12	of Research A85-41319
Quality management technolo considerations	рду - р80	Practical A85-24084
MILLER, T. A. Aviation maintenance computeri	zed m	anagement
[AD-A150637] MILLER. W. J.	p 75	N85-22349
Defense data network support conc [AD-A153214]	eptana p 52	alysis N85-28649
MILLES, G A. Application of the personal compute ATE/TPS support	er for c	ost effective
MITTINO, J. A. Productivity improvement in	the	acquisition
environment MODEL, B. I.	p 65	A85-43188
Elements of the theory of multi- sequential decision making	p 34	A85-38643
Age and space flight	p 4	A85-44624
Astrobusiness A guide to the corr outer space	nmerce p 87	and law of A85-20512
MOORE, J W. Grooming the Shuttle for cost-ef	fective	access to
Symbolic and interactional perspect	p 61	A85-33429
An integrative framework		
[AD-A155247] MORAIN, S. A.	p 19	N85-32769
Commercialization of remote-sensin	g techr p 64	iology A85-41657
Airline deregulation - Another look MOREY, R C.	p 92	A85-44099
Decision process models of contract development of effective contract ince	ctor bei entives	navior The
[AD-A145524] MORRIS .I	p 47	N85-11898
Technology and the market place transport equation	e - A c	changing air
[SAE PAPER 841545] MORRISSEY, G. R	p 60	A85-25983
Issues in air transport [PB85-121374/GAR]	p 71	N85-18030

MORTON, H. E. An automated quality assurance surveillance plan for ADP (Automated Data Processing) operations under the Navy's commercial activities program [AD-A154767] p 55 N85-32802 MORY, R. Spacelab and Eureca as a basis for European involvement in the Space Station p 46 A85-42694 MOSIER, J. N Design guidelines for user-system interface software [AD-A154907] p 42 N85-32807 MOSSINGHOFF, G. J. Intellectual property and space activities p 92 A85-49972 MUFFLER, R. J. AV-88 Harner II training capabilities [AIAA PAPER 85-1734] p 3 A85-40554 MUNDEL, A. B. Group testing p 78 A85-12645 MURPHY, M. Innovative approaches to recurrent training p 6 N85-18028 MURPHY, M. F. Some legal aspects of industrial activity in outer space p 91 A85-38916 MURRAY, T P. Maintenance Management Information and Control System (MMICS) Administrative boon or burden p 75 N85-12790 [AD-A145762] MURTHY, T S. A methodology to design databases for finite element analysis and structural design optimization applications [AIAA PAPER 85-0743] p 33 A85-30283 Ν NAGEL. D Simulation for human factors research A central question Fidelity p 9 N85-29568 NAGPAUL, P. S. Multilevel monitoring system for a central research and development agency p 11 A85-29402 NAPOLITANO, L. G. Spacelab to Space Station, Proceedings of the International Symposium on Spacelab 1 - Results, Implications and Perspectives, Naples and Capri, Italy, June 11-16, 1984 p 20 A85-39076 NASH, S. H. DOD related software technology requirements, practices, and prospects for the future AD-A1454931 p 36 N85-11575 NAVARRO, R. A. Support program planning - Managing to get it supported p 11 A85-26785 NAZAROV. IU. V. Aircraft maintenance p 19 A85-11245 NEMOV, R. S. Interpersonal activity in conditions of group learning p 2 A85-23278 NESGOS, P. D. Orbital vehicle transportation - Issues of law and nsurance p 91 A85-39731 [AIAA PAPER 85-1337] NESS. N. F. Space research in the United Kingdom An assessment (AD-A155334) p 56 N85-33038 NEUMANN, P NASA space station automation AI-based technology review NASA-CR-176094] p 31 N85-32134 NICOLA, V. F. A unified model for performance and reliability of Fault-Tolerant/Multi-Mode systems [AD-A148789] p 84 N85-17601 NIÈVA, V. F. Team dimensions Their identity, their measurement and their relationships [AD-A149662] p 8 N85-21978 NILSSON. K. G UK, FRG, France R and D in sensors, related fields p 49 N85-17197 NOON, H. Innovative approaches to recurrent training p 6 N85-18028

0

OBERMAYER, R. W. Human-system performance	measurement	in training
simulators	p 5	A85-48752
OCALLAHAN, J. C.		
Issues in air transport		
[PB85-121374/GAR]	p 71	N85-18030

OCONNOR, D. J.	PAUL, A. C.
Local automation model software benchmarking Test	Design of a scientific information collation and
plan	dissemination system, volumes 1 thru 3
[AU-A154349] p 41 No5-30070	[AU-A146002] p 14 1105-12791
Reliability prediction - Improving the crystal ball	DOD Value Engineering Conference report Value
p 82 A85-49540	Engineering (VE) A tool that benefits line management
ODWYER, D.	beld at Leeshurg Virginia on 1-2 November 1984 Part
The development of complex systems	1 Executive summary
p 55 N85-32021	[AD-A156067] p 57 N85-35810
OLONE, R. G.	DOD Value Engineering Conference report Value
Starstruck's problems spotlight risks, opportunities in	Engineering (VE) A tool that benefits line management
space p 62 A85-34221	held at Leesburg, Virginia on 1-2 November 1984 Part
OMEARA, M. W.	2 Plenary session
An analysis of the effect of process controls on	[AD-A156068] p 57 N85-35811
productivity and weapon system costs in DOD	DoD Value Engineering conterence report Value
(AD A147496) 0.75 N85-16678	Engineering (VE) A tool that benefits the management
	[AD_A156060] n 57 N85-35812
Reliability for real-time systems	DoD Value Engineering conference report Value
[DGLR PAPER 84-117] p 81 A85-40333	Engineering (VE) A tool that benefits line management
OPPENHEIM, L. S.	Part 4, Workshop B VE on spare parts
Strategic management for organizational effectiveness	[AD-A156070] p 57 N85-35813
The effect of human resource planning on retention and	DoD Value Engineering conference report Value
related issues, volume 1	Engineering (VE) A tool that benefits line management
[AD-A149398] p / N85-198/4	Part 5, Workshop C VEP/VECP administration,
Strategic management for organizational effectiveness	negotiation, and implementation
the effect of numan resource planning on retention and	[AD-A156071] p 57 N85-35814
[AD_A149399] 0.7 N85-19875	Engineering conference report value
Strategic management for organizational effectiveness	Part 6 Workshop D. VE training-orientation
The effect of human resource planning on retention and	(AD-A156072) p. 57 N85-35815
related issues, volume 3	DoD Value Engineering conference report Value
[AD-A149400] p 7 N85-19876	Engineering (VE) A tool that benefits line management
Strategic management for organizational effectiveness	Part 7, Workshop E VE in construction and architect
The effect of human resource planning on retention and	engineer contracts
related issues Methodological appendix	[AD-A156073] p 57 N85-35816
[AD-A149401] p / N85-198//	PAYSON, R. P.
OHLANDO, N. E.	A bird strike handbook for base-level managers
and automated machines n 23 A85-16093	[AD-A14/928] p /5 N85-16008
A system-level approach to automation research	PEDERSEN, N. S. Space Station Opportunity for international cooperation
p 24 A85-23197	and utilization
ORLOWSKI, P.	(IAF PAPER 84-51) p 43 A85-13010
Commission stacker - Incorporation in a total logistic	PELLS, H. N. P.
concept	Management communication and financial modeling
[MBB-UT-36-84-OE] p 73 A85-35073	p 16 N85-26190
OSAKI, S.	PERGAMENT, A. KH.
Performance/reliability measures for fault-tolerant	Problem-oriented systems for processing experimental
Computing systems p au A85-25106	data p 34 A85-34919
n 80 A85-25109	PERGAMENT, M. I.
OUCHI, W. G.	data p 34 A85-34919
Some informal remarks on the M-form society	PERILLAN I
p 46 A85-43182	Intelsat business services p 60 A85-15463
OVERMAN, A.	PERKINS, M. M.
Cost effective launch technology for communications	On maximizing the expected lifetime of replaceable
satellites	systems
[IAF PAPER 84-04] p 58 A85-12979	[AD-A150003] p 75 N85-21680
Owens, n. L.	PETITDEMANGE, C.
An analysis of data dictionalies and their role in	Quality organization
(AD-A152134) p 22 N85-27121	[UNES-N1-106] p 63 N05-13257
	[CNES.NT.110] 0.21 N85-13684
0	PETTINATI E.
F	Project management using graphics
R440 0	p 56 N85-34560
Application of a quality assurance system in the	PINELLI, T. E.
production of materials and components	Report-reading patterns of technical managers and
p 79 A85-16254	nonmanagers p 10 A85-21540
PAPADAKIS, E. P.	International space law p. 01 APE 22500
The Deming inspection criterion for choosing zero or	PLOTKIN C W P 31 A85-38699
100 percent inspection p 81 A85-40255	Contractor experience using BADC OBACLE
PARASKEVOPOULOS, B. K.	p 47 A85-49556
Distributed photovoltaic system impact upon utility	POGGIO, A. A.
IDAD/SUPPLY management practices p 58 A85-11349	NASA space station automation Al-based technology
ranuve, w. n. v.	
European space industry's optential	review
European space industry's potential p 64 A85-38904	review [NASA-CR-176094] p 31 N85-32134
European space industry's potential p 64 A85-38904 PARK, W.	review [NASA-CR-176094] p 31 N85-32134 POLHEMUS, W. L. Property and development in the technology of

o 31 N85-32134

p 25 A85-47677

p 24 A85-23198

p 78 A85-10055

p 78 A85-10055

The modeling of human cognitive decision processes

Reliability and maintainability considerations in computer

Reliability and maintainability considerations in computer

in The Intelligent Machine Model (TIMM)

Human factors in robotics

performance evaluation

performance evaluation

- of technical managers and p 10 A85-21540 p 91 A85-38699 RADC ORACLE p 47 A85-49556 tion Al-based technology p 31 N85-32134
  - opment in the technology of arch and devel transportation Let's reach for blue sky p 45 A85-31742
  - PONTECORVO, J. A. MSG-3 - A method for maintenance program planning p 73 A85-25979 [SAE PAPER 841485] POSTMA, H.
  - Emerging role of the national laboratory in the development and transfer of materials technology [DE85-001252] p 49 N85-18086 POUMADE. M. L.
  - Determining training device requirements in Army aviation systems p 5 N85-14558 POWERS, A. C.
  - The Myers-Briggs type indicator as a tool to identify flight p 2 A85-21581 student's learning styles

POWERS, F. J.

opportunities

- Management and control of interconnected communications networks p 34 A85-34459 PRAKKE, F.
- Spin-offs from technical scientific infrastructures, no 1 p 55 N85-32034
- PREDOL A. Importance of automation, robotization in economy p 31 N85-32219
- PRESSON, E. Software test handbook [AD-A146844] p 37 N85-16498 PSOTKA, J Artificial intelligence contributions to training and
  - maintenance [AD-P003934] p 27 N85-11614
- PURIFOY, G. R., JR.
- Maintenance training simulators prime item development specification Model specification and handbook [AD-A154108] p 10 N85-30628

# Q

QURESHI, T N. Attacking software cnsis A macro approach [AD-A155846] p 43 N85-35645

# R

RAELIN, J. A. R&D project termination in high-tech industries p 20 A85-25118 RAEUCHLE. T. Implementing fault-tolerant distributed objects p 80 A85-36291 RAPPOLE, C. L. Food service management p 16 N85-24736 RASMUSSEN, R. O. Conestoga 2 A low cost commercial space transport p 68 N85-11033 svetom RATCLIFFE, S. Automation in air traffic management p 74 A85-49171 RECKASE, M. D. Models for multidimensional tests and hierarchically structured training materials p 10 N85-32768 [AD-A155231] REDWINE, S. T., JR. DOD related software technology requirements, practices, and prospects for the future AD-A145493] p 36 N85-11575 REEVES, C. A., JR. Efforts at office automation and information systems utilization at Martin Manetta Energy Systems, Incorporated p 40 N85-28633 [DE85-008154] REICHERT. R. Planning for a joint space station p 44 A85-25856 REIS, V. H. Space industrialization A national perspective p 67 N85-11015 RENDER, H. SAGA A project to automate the management of software production systems [NASA-CR-174017] p 35 N85-10685 RENSEMA, P. H. A decision support methodology for space technology advocacv p 16 N85-25283 [AD-A151895] REYNARD, W. D. Pilot education and safety awareness programs p 6 N85-18026 RHOADES, H. P. Systems analysis for microcomputer acquisitions [AD-A145447] p 69 N85-11556 RICHARDS, P. SAGA A project to automate the management of software production systems p 35 N85-10685 [NASA-CR-174017] RIECK, A. Team dimensions Their identity, their measurement and their relationships [AD-A149662] p 8 N85-21978 RIPKE, M. International comparative study of systems for the government advancement of research and development p 48 N85-13689 [NASA-TM-77589] ROBERTSON, D. L. Data dictionary systems and their role in information resource management [AD-A144905] p 36 N85-10859 ROBINETT, K. H. Commercial utilisation of space - New business opportunities p 60 A85-16303

#### **B-8**

review

PARKER, R. E.

PARSONS, H. M.

PATKI, A. B.

PATKI, V. B.

[NASA-CR-176094]

#### PERSONAL AUTHOR INDEX

ROCHEFORT, P Search and rescue of aircraft in distress in France p 77 N85-31096 Organization, means ROESSNER J. D. The multiple functions of formal aids to decision making p 12 A85-42587 in public agencies ROGERS, T F. p 63 A85-37256 Homesteading the new frontier ROM R J NASA space station automation Al-based technology [NASA-CR-176094] p.31 N85-32134 ROMBERG, L. Technology and the market place - A changing air transport equation [SAE PAPER 841545] n 60 A85-25983 ROMEO, T. Performance evaluation of database systems A benchmark methodology [PB84-217504] p.36 N85-10707 ROOK F. W. User and R&D specialist evaluation of decision-support p 12 A85-38415 systems Mental models and cooperative problem solving with expert systems [AD-A147843] p 28 N85-16479 ROPELEWSKI, R. R. USAF negotiating contracts for F100, F110 improvements p 45 A85-35448 ROSAS. A. C. Some applications of fuzzy sets and the analytical hierarchy process to decision making [AD-A150720] p 16 N85-24876 ROSEN, A. E. Generic data entry quality assurance tool (DE85-008359) p 41 N85-29852 ROSENFELD, P. N. Investigation of DBMS (Data Base Management Systems) for use in a research environment p 42 N85-33042 [AD-A154862] ROSER, S. J. Cost-plus-percentage-of-costs government ın contracts [AD-A147779] p 70 N85-17735 ROSS. S. M. Statistical estimation of software reliability p 80 A85-34449 Statistical estimation of software reliability [AD-A154097] p 85 N85-30665 ROTHBLATT, M. A. Transborder direct-to-home satellite service p 88 A85-24089 RUCKER, W. Navy program manager's guide, 1985 edition [AD-A151925] p 76 N85-27744 RUNGE, F. C. Customer and mission influence on space station architecture p 9 N85-29567 RYERSON, R.

Overcoming project planning and timeliness problems to make Landsat useful for timely crop area estimates p 11 A85-32129

RYSAKOVA, S. L. The principles of experimental setup in models of p 3 A85-23283 complex human operator activities

S

SALMON, J. D.		
Space industrialization and the social agenda		
p	60	A85-24653
SANDLER, R. D.		
Issues in air transport		
[PB85-121374/GAR] p	71	N85-18030
SANDNER, N.		
Documentation and separate test progra	im c	levelopment
is most important for test/maintenance		•
D	83	N85-16745
SATHI, A.		
Representation of activity knowledge	ge	for project
management p	46	A85-48595
SAVAYĂN, A.		
Role of engineering psychology	6 (	N85-18561
SCHAAR, B.		
Concept paper for the development	of	a DOD Ada
(trademark) software engineering educati	ion	and training
plan		-
[AD-A148774] p	38	N85-17592

- SCHAEFER, M. K. Optimal maintenance center inventories for fault-tolerant repairable systems p 72 A85-21548
- Optimal inventories for overhaul of repairable redundant systems - A Markov decision model p 73 A85-48239

SCHEIBNER, H

New concepts for industrial robots outlined p 27 N85-15176

SCHELLEMANS, F Multicriteria decision analysis as an aid to strategic planning of energy research and development p 18 N85-28870 [REPT-84-02] SCHIANO C

A fault tolerant military Satellite Network Management p 80 A85-34460 System SCHLICHTING B D

- A technique for estimating performance of fault-tolerant p 81 A85-36297 programs SCHMIDT. M
- Comparative descriptions of software quality measures p 83 N85-10676 [GMD-STUDIES-81] SCORER, T.
- The liability of aircraft manufacturers and certification p 89 A85-27397 authorities in the United Kingdom SCUBLOCK, L. D.
- Avionics integrity program (Avip) Volume 1 Procurement phase issues Design, manufacturing, and integration [AD-A145651] p 83 N85-10943
- SEARS. T. B.
- Technical performance measurement handbook (AD-A1473141 p 48 N85-16675 SEEGERS, G. E.
- Balancing risk taking and encouraging p 66 A85-43196 entrepreneurism SELE. M.
- Initiative uses of aircraft for flight training p 6 N85-18027
- SENHEN, A. Supply center processes [AD-P004014]
- p 74 N85-11993 SERFATY. D. A research paradium for multi-human decision making
- p 13 A85-47678 SHADRIKOV, V. D.
- Interrelationship between learning and development in the process of mastering an occupational activity p 3 A85-23285
- SHAFFER. L. E. European scientific notes Volume 38, number 11 p 49 N85-17745 [AD-A148228]
- European Scientific Notes, volume 38, number 12 p 50 N85-18946 [AD-A148713] European Scientific Notes Volume 39, number 2
- p 50 N85-19919 [AD-A148994] SHAHAF. S.
- Sparing criteria Clear management approach p 82 A85-49577
- SHAPIRO, A. J. Design-To-Cost (DTC) methodology to achieve ffordable avionics p 71 N85-26645 affordable avionics
- SHAVELSON, R. J. Individual characteristics and unit performance A review of research and methods
- [AD-A153145] p 9 N85-28550 SHAW. D H.
- Life cycle costing in government procurement [AD-A151878] p 51 N85-26456
- SHEAHEN, T. P. Analysis of R and D Space commercialization
- investments with long time horizons p 68 N85-11052 SHEARER. M.
- Communications skills for CRM training p 6 N85-18017
- Pilot education and safety awareness programs p 6 N85-18026
- SHEPARD, H
- Managing projects for high performance [ASME PAPER 84-MGT-8] p 2 p 20 A85-21298 SHEPHERD, B. R.
- ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing Volume 4, part 6 Task d Quality assurance/quality control/technical requirement/tasks, quality assurance modeling and analysis, quality assurance program management standard recommendations (ISP) [AD-A144891] p 26 N85-10372
- SHERIDAN, T. B.
- Interaction of human cognitive models and computer based models in supervisory control [AD-A142547] p 14 N85-16474
- Research and Modeling of Supervisory Control Behavior, report of a workshop
- p 16 N85-22248 [AD-A149621] SHESKIN, T. J
- Commercialization of a Space Station [ASME PAPER 84-WA/TS-3] p 64 A85-39930 SHIBANOV, G. P.
- A quantitative evaluation of human activity in p 23 A85-13599 man-machine systems

Investors balance enthusiasm for new market against p 62 A85-34215 risk potential SHIRACK, R. Issues in air transport [PB85-121374/GAR] p 71 N85-18030 SHIRI AND I Prototyping information systems on microcomputers -A design philosophy for engineering management p 33 A85-29401 SHIRLEY, C. G. Quality assurance considerations for the implementation of a pulsed power R and D project (DE85-012357) p.86 N85-35720 SHKALIKOV, V. L. Interrelationship between learning and development in the process of mastering an occupational activity p 3 A85-23285 SIBBERS, C. W. Project resources planning and control [NASA-TM-86339] p 47 N85-13666 SIFFORD, J. C. Management training for cockpit crews at Piedmont flight o 6 N85-18013 SIMPSON, J. A. Robotics investment decision model user's manual [AD-A145467] p 26 N85-11347 Investment justification of robotic technology in aerospace manufacturing User's manual [AD-A156193] p 23 N85-35410 SKIVINGTON, K. D. Symbolic and interactional perspectives on leadership An integrative framework [AD-A155247] p 19 N85-32769 SKOLNICK, S. Some ideas and questions regarding space station design for human use p 9 N85-29562 SLOVIC P. Compatibility effects and preference reversals [AD-A148399] p 15 N85-17544 SMART, M. J. Manufacturing information system

- [AD-A152715] p 17 N85-28616 SMITH B A.
- Widespread civil uses envisioned for satellite navigation p 62 A85-34217 system SMITH P.G.
- Non-US approaches to space commercialization p 67 N85-11012
- SMITH. P. R. Manufacturing information system
- p 17 N85-28616 [AD-A152715] SMITH, S. L.
- Design guidelines for user-system interface software [AD-A154907] p 42 N85-32807 SMITH. T. R.
- The application of artificial intelligence techniques to large distributed networks
- [NASA-CR-177346] p 30 N85-30721 SMYLIE, R. E.
- Space Station technology planning p 51 N85-22471 SNIEDOVICH, M.
- An analysis of a dynamic project cost problem {CSIR-TWISK-338} p 71 N8 p 71 N85-23341 SODANO, N. M
- Using Ada for a distributed, fault tolerant system [AIAA PAPER 84-2703] p 79 A85p 79 A85-17873
- SÓLI, O. A. Integrated management SPARROW, G. T. p 11 A85-37163
- An analysis of production competition and award methodology p 70 N85-17733
- [AD-A147775] SPECTOR, V. A.
- The role of robotics in space system operations p 25 A85-45902 [AIAA PAPER 85-1879] SPHARIM, I.
- A simple method for evaluation and selection of R&D proposals for a competitive grant fund p 44 A85-13920
- SPOHRER, T. Construction of a job-oriented test for the selection of
  - air traffic controllers [DEVI B-FB-84-511] p.9 N85-28558
- STAMPER, M. T Management philosophies associated with leading a p 12 A85-43177 successful organization
- STANDISH. T. A. Steps to an advanced Ada programming environment
- p 33 A85-31209 STANLEY. M.
- Software configuration management across project boundaries and in distributed development environments [RSRE-MEMO-3704] p 37 N85-13494

SHIFRIN, C. A.
STAR, J. L.		
The application of artificial intellig	ence te	echniques to
[NASA-CR-177346]	p 30	N85-30721
STARK, P. M.		
Concept for a commercial space st	ation la	boratory
Doing business in coace. How to a	p 68 101 thor	N85-11035
Doing business in space How to g	p 69	N85-11057
STARRIN, B	,	
Decision making in stressful condition	ons A	model based
on the coping perspective	a 15	NOE 17700
STEG. L.	p 15	103-17730
Gordon Conference on Fundamer	itals of	Cybernetics
[AD-A151074]	p 29	N85-24842
STEHFEST, G. Elevible manufacturing system cond	ont for	atures cache
memory	p 28	N85-17186
STEIG, J. T.		
An application of discriminant analy	isis to 1	the selection
[AD-A147632]	p 70	N85-17580
STEIMLE, H.		
Operational preparation of the (	Germa	n Spacelab
(IAF PAPER 84-211)	n 43	A85-13133
STEINAUER, D. D.	P 70	
Security of personal computer system	ms Ar	nanagement
guide [PB85-161040]	n 20	N85 04700
STEINBRECHER, W.	h 2a	1103-247 53
Business planning for information se	rvices u	inder special
consideration of German manage	ement	information
(BMFT-FB-ID-83-007)	0.21	N85-11910
STEININGER, K.	P 21	1003-11010
New system for the selection of	f air tr	affic control
personnel	p 1	A85-18720
Labor-management cooperative pro	arams	
	p 4	A85-43200
STEVENS, E. H.		
LOSI Effectiveness of simulated an		
trainino systems	n 66	A85-45118
training systems STEVENS, J. A.	p 66	A85-45118
training systems STEVENS, J. A. An analysis of production comp	p 66 etition	A85-45118 and award
training systems STEVENS, J. A. An analysis of production comp methodology (AD_A147775)	p 66 etition	A85-45118 and award
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L.	p 66 etition p 70	A85-45118 and award N85-17733
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi	p 66 etition p 70 tion De	A85-45118 and award N85-17733 cision Assist
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154715]	p 66 etition p 70 tion De	A85-45118 and award N85-17733 cision Assist
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR.	p 66 etition p 70 tion De p 77	A85-45118 and award N85-17733 cision Assist N85-33036
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpo	p 66 etition p 70 tion De p 77 p 77	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications	p 66 etition p 70 tion De p 77 ort cate	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J.	p 66 etition p 70 tion De p 77 ort cate p 91	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive infi	p 66 etition p 70 tion De p 77 ort cate p 91	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T. JR. Obtaining title and financing transpon National and international implications STEWART, T. J. Optimizing search with positive inf [CSIR-TWISK-313]	p 66 etition p 70 tion De p 77 ort cate p 91 ormatic p 36	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T. JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive int [CSIR-TWISK-313] STICHA, P. J. Analytical models of pademeneous of	p 66 etition p 70 tion De p 77 ort cate p 91 formatic p 36	A85-45118 and award N85-17733 crsion Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T. JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive inf [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of	p 66 etition p 70 tion De p 77 ort cate p 91 ormatic p 36 procee	A85-45118 and award N85-17733 crsion Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T. JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive int [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J.	p 66 etition p 70 tion De p 77 ort cate p 91 formatic p 36 f procee p 4	A85-45118 and award N85-17733 crsion Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T. JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive int [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in	p 66 etition p 70 tion De p 77 ort cate p 91 formatic p 36 f procee p 4	A85-45118 and award N85-17733 crsion Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 is areas
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive inf [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H.	p 66 etition p 70 tion De p 77 ort cate p 91 formatic p 36 f procee p 4 n vanor p 3	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 is areas A85-29865
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T. J. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive infi [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European	p 66 etition p 70 tion De p 77 rrt cate p 91 iormatic p 91 iormatic p 36 f procee p 4 n varioi p 3	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 us areas A85-29865 logy
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive inti [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377]	p 66 p 70 p 70 titon De p 77 rt cate p 91 ormatu p 91 ormatu p 36 f procee p 4 n vanou p 3 techno p 59	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 us areas A85-29865 logy A85-13233
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive inf [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Onentation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual Characteristics and using one	p 66 p 70 thon De p 77 p 77 p 77 p 77 p 77 p 77 p 77 p 7	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 us areas A85-29865 logy A85-13233
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive infi [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit performed and the performance of the search and methods	p 66 p 70 tuon De p 77 rt cate p 91 formatic p 36 f proceip 4 n variou p 3 techno p 59	A85-45118 and award N85-17733 crsion Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 is areas A85-29865 logy A85-13233 ce A review
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive infi [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit perf of research and methods [AD-A153145]	p 96 etition p 70 tuon De p 77 rt cate p 91 formatic p 36 f procee p 4 n varioi p 3 techno p 59 formanic	A85-45118           A85-45118           and award           N85-17733           crsion Assist           N85-33036           gory aircraft           A85-44097           on feedback           N85-10855           dures           A85-45094           is areas           A85-13233           ce A review           N85-28550
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive infi [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit perf of research and methods [AD-A153145] STOVALL, F. A. A management fulled to calcibility of	p 66 etition p 70 tuon De p 77 rt cate p 91 ormatic p 36 f procee p 3 f procee p 3 f p 59 formanic p 59	A85-45118 and award N85-17733 crsion Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 Jis areas A85-29865 logy A85-13233 ce A review N85-28550
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive inf [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit perf of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr	p 66 etition p 70 toon De p 77 rt cate p 91 ormatic p 36 f proceid p 36 f proceid p 36 f proceid p 59 formanic p 59 formanic p 9 formanic p 9	A85-45118 A85-45118 and award N85-17733 CISION ASSIST N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 JIS areas A85-28865 logy A85-13233 CE A review N85-28550 ns A85-49541
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive inf [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit perf of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr	p 66 etition p 70 toon De p 77 rt cate p 91 ormatic p 91 ormatic p 36 f proceid p 4 n vanoi p 59 formanic p 59 formanic p 9 g 82	A85-45118 and award N85-17733 Cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 Jis areas A85-29865 logy A85-13233 ce A review N85-28550 ns A85-49541
training systems strevens, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competi Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive inf [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit performance of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr	p 66 etition p 70 toon De p 77 rrt cate p 91 ormatic p 91 ormatic p 36 f proceie p 4 n varioi p 59 formanic p 59 formanic p 59 formanic p 9 formanic	A85-45118 A85-45118 and award N85-17733 Cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 Js areas A85-45094 Js areas A85-29865 logy A85-13233 Ce A review N85-28550 ns A85-49541 Italy
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive inf [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit perf of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr STRUMIA, A. Future directions of robotics, automatics SUDDETH, D. H.	p 66 etition p 70 tion De p 77 rrt cate p 91 ormatic p 91 ormatic p 36 f proceie p 4 n varioi p 59 formanic p 59 formanic p 9 ediction on p 9 ediction on p 9 atton ne p 9 formanic p 9 formanic for	A85-45118 and award N85-17733 CISION ASSIST N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 JS areas A85-45094 JS areas A85-29865 logy A85-13233 CE A review N85-28550 ns A85-49541 Italy N85-28187
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, J. J., JR. Optimizing search with positive inf [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit perf of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr STRUMIA, A. Future directions of robotics, automatic SUDDETH, D. H. Debns in the geostationary orbit	p 66 etition p 70 tion De p 77 rrt cate p 91 ormatic p 91 ormatic p 36 f procee p 4 n varioi p 59 formanic p 59 formanic p 59 formanic p 9 formanic p 9 formanic form	A85-45118 A85-45118 and award N85-17733 CISION ASSIST N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 JS areas A85-45094 JS areas A85-29865 logy A85-13233 CE A review N85-28550 ns A85-49541 Italy N85-28187 ne endless
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T. J. Obtaining title and financing transpor National and international implications STEWART, J. T. J. Optimizing search with positive inti [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit perf of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr STRUMIA, A. Future directions of robotics, automic SUDDETH, D. H. Debns in the geostationary orbit shooting gallery The necessity for a directional Store and the constant of a single s	rinn n p 66 etition p 70 tion De p 77 ort cate p 91 ormatic p 91 ormatic p 93 techno p 59 tormanic p 9 ediction p 82 ation in p 30 tion De p 9 techno p 30 techno p 9 techno p 9 techno	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 us areas A85-45094 us areas A85-29865 logy A85-13233 ce A review N85-28550 ns A85-49541 Italy N85-28187 ne endless I policy
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive inti [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenistics and unit perf of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr STRUMIA, A. Future directions of robotics, automatics SUDDETH, D. H. Debins in the geostationary orbit shooting gallery The necessity for a comparison SUDDETH, D. H.	ring, til dispose p 91 formatic p 91 formatic p 91 formatic p 91 formatic p 91 formatic p 91 formatic p 91 formatic p 91 formatic p 91 formatic p 93 formatic p 93 formatic p 93	A85-45118 A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 is areas A85-45094 is areas A85-29865 logy A85-13233 ce A review N85-28550 ns A85-49541 Italy N85-28187 he endless I policy N85-21214
training systems stevens, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive infi [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Orientation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit perf of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr STRUMIA, A. Future directions of robotics, automa SUDDETH, D. H. Debns in the geostationary orbit shooting gallery The necessity for a of SULLIVAN, B. J. Management aspects of software m	ring, till singstate	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-45094 is areas A85-29865 logy A85-13233 ce A review N85-28550 ns A85-49541 ltaly N85-28187 ne endless i policy N85-21214
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive infi [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Onentation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit performance of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr STRUMIA, A. Future directions of robotics, automa SUDDETH, D. H. Debns in the geostationary orbit shooting gallery The necessity for a of SULLIVAN, B. J. Management aspects of software m [AD-A152035]	relation in p 66 etition p 70 toon De p 77 rt cate p 91 formatic p 36 f procee p 4 n variou p 59 formanic p 59 formanic p 9 ediction in p 9 ediction in p 30 formanic p 9 attion nu p 30 formanic p 9 formanic p 9 formanic f	A85-45118 and award N85-17733 crsion Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-10855 dures A85-45094 is areas A85-29865 logy A85-29865 logy N85-28187 ne endless a policy N85-21214 ince N85-27550
training systems STEVENS, J. A. An analysis of production comp methodology [AD-A147775] STEWART, B. L. Feasibility of applications of Competir Package (CDAP) to spare parts [AD-A154716] STEWART, J. T., JR. Obtaining title and financing transpor National and international implications STEWART, T. J. Optimizing search with positive infi [CSIR-TWISK-313] STICHA, P. J. Analytical models of performance of STIKAR, J. Possible applications of simulators in STOEWER, H. Onentation and trends in European [IAF PAPER 84-377] STOLZENBERG, R M Individual charactenstics and unit perf of research and methods [AD-A153145] STOVALL, F. A. A management guide to reliability pr STRUMIA, A. Future directions of robotics, automa SUDETH, D. H. Debns in the geostationary orbit shooting gallery The necessity for a of SULLIVAN, B. J. Management aspects of software im [AD-A152035] SULLIVAN, J. M.	craft n $p$ 66 etition $p$ 70 tuon De $p$ 77 rt cate p 91 formatic p 36 f proceip 93 formanic p 59 formanic p 59 formanic p 59 formanic p 9 ediction in $p$ 59 formanic p 9 atton n $p$ 9 atton n $p$ 9 p 4 atton n $p$ 9 p 4 p 40	A85-45118 and award N85-17733 cision Assist N85-33036 gory aircraft A85-44097 on feedback N85-10855 dures A85-10855 dures A85-45094 is areas A85-29865 logy A85-13233 ce A review N85-28187 ne endless a policy N85-21214 ince

Reliability of communication flow in R&D organizations

p 11 A85-33650

SULLO, P.

SUTTON, J

Information technology applications in voluntary sector			
transport operations	SP1	Objectives and	programme
of work			
[TT-8501]		p 71	N85-26457

SUVOROV, G. A.

Health standards for general vibration p 84 N85-19607 SWEET. G. K.

Specifying and cost estimating p 24 A85-23195 SZAKONYI, R.

A simple method for evaluation and selection of R&D proposals for a competitive grant fund p 44 A85-13920

SZYPERSKI, N Business planning for information services under special consideration of German management information systems [BMFT-FB-ID-83-007] p 21 N85-11910

### Т

- TAGUCHI. G. Quality characteristic feedback control p 20 A85-35100 TALBOT, J. M. Research opportunities in human behavior and
- performance [NASA-CR-175473] p 6 N85-19640
- TAUSWORTHE, R. C. Concepts and tools for the software life cycle p 38 N85-19236
- TAYLOR, E. P. Technical performance measurement handbook [AD-A147314] p 48 N85-16675
- TAYLOR, J. K. Principles of quality assurance of chemical measurements [PB85-177947] p 76 N85-28997
- TAYLOR, K. R. Opportunities for commercial organizations
- p 68 N85-11055 TAYLOR, R. N.
- Steps to an advanced Ada programming environment p 33 A85-31209 TAYLOR, T. C.
- Cost effective launch technology for communications satellites HAF PAPER 84-041 p 58 A85-12979
- TEALE, G. S. M. System sizing - The theory and the practice
- p 78 A85-11351 TEMPELHOF, K H.
- Man-machine communication research for robotics p 28 N85-17177 reported TEPPER, R. D.
- Fire safety in transport category aircraft Litigating a p 88 A85-24710 post-crash or in-flight aircraft fire TERWILLIGER, R
- SAGA A project to automate the management of software production systems p 35 N85-10685 [NASA-CR-174017]
- TESSIER, C. MESSAGE - An expert system for aircraft crew workload assessment p 24 A85-21569
- THATCHER, R. K. Avionics integrity program (Avip) Volume 1
- Procurement phase issues Design, manufacturing, and Integration [AD-A145651] p 83 N85-10943
- THIMME, H. Activities report in aerospace in West Germany
- [ISSN-0070-3966] p 50 N85-18947 THOMPSON, A. W.
- Quality assurance in a production environment p 79 A85-14109 THOMPSON, S.
- FAA regulation of ultralight vehicles p 86 A85-11938
- TIKHONOV, A. N. Problem-oriented systems for processing experimental data p 34 A85-34919
- TIMM. M. Comparative descriptions of software quality measures [GMD-STUDIES-81] p 83 N85-10676
- TISCHLER, A. O. Cost reduction potential in space program management p 63 A85-35314
- TOPALIAN, A. The role of company boards in design leadership p 10 A85-17777
- TOUSSAINT, M. Future prospects in space envisaged by a forum of p 44 A85-16302 European space companies

#### TRACHTENBERG, M. The linear software reliability model and uniform p 81 A85-37901 testina TRAKAŠ, R. C. Establishing realistic requirements for reliability, maintainability, and built-in-test p 82 A85-49539 TRAUB, J. F. Information and computation p 33 A85-31791 TRIMBLE, E. G. Expert systems in contract management A pilot studv [AD-A149363] p 29 N85-19873 TRIPLETT. A. Hurdles stifling the federal manager's ability to improve nroductivity p 66 A85-43201 TRISCARI, T., JR. Reliability of communication flow in R&D organizations p 11 A85-33650 Organizations and information processing A field study of research and development units within the United States Air Force Systems Command [AD-A147381] p 21 N85-16691 TRIVEDI, K. S. A unified model for performance and reliability of Fault-Tolerant/Multi-Mode systems [AD-A148789] p 84 N85-17601 TSAI, J. T Specification of software quality attributes, volume 1 [AD-A153988] p 85 N85-29593 Specification of software quality attributes Volume 2 Software quality specification guidebook [AD-A153989] p 85 N85-29594 Specification of software quality attributes Volume 3 Software quality evaluation guidebook AD-A153990] p 85 N85-29595 TUFF. A. D. Computers and the consulting engineer p 22 N85-26184 TUMA, J. Simulators for training aircraft maintenance personnel p 3 A85-29863 TUNG, S. S. A reliability growth model p 83 A85-49580 TVERSKY, A. Compatibility effects and preference reversals [AD-A148399] p 15 N85-17544 TYRA, N. W. A systematic method for evaluating security p 35 A85-42597 requirements compliance TYURIN, N. Applications of robots in machine tool industry eviewed p 22 N85-28189 reviewed U

ULKE, H. New technologies at the forefront of industrial p 56 N85-35168 developments

VACHTSEVANOS, G. J Distributed photovoltaic system impact upon utility load/supply management practices p 58 A85-11349 VALLERAIN. E. Space station related investigations in Europe [IAF PAPER 84-28] p 43 A8 p 43 A85-12994 VALLERANI, E. Space exploitation - Spacelab an easy approach for developing countries Prospectives and suggestions by Aentalia p 58 A85-12502 VAN DUINEN, R. J. The communication-satellite market to the year 2000 p 60 A85-26771 VAN NOSTRAND. A. A fault tolerant military Satellite Network Management System p 80 A85-34460 VANCE, J. D. A bird strike handbook for base-level managers [AD-A147928] p 75 N85-16008 VANDERMEER, J. D. Spin-offs from technical scientific infrastructures, no 1 p 55 N85-32034 Spin-offs from technical commercial infrastructures, no p 55 N85-32035 Som-offs from technical scientific research p 55 N85-32036 organizations, no 5

VANDEVAN, A. H Central problems in the management of innovation

2

[AD-A152598] p 18 N85-28852 The concept of fit in contingency theory [AD-A152603] p 18 N85-28854

#### PERSONAL AUTHOR INDEX

VANTILBURG, J. J.		
Spin-offs from technical scientific	: infrastruc	tures, no 1
	p 55	N85-32034
Spin-offs from technical commerce 2	cial infrasti p 55	N85-32035
Spin-offs from technical	scientific	research
organizations, no 5	p 55	N85-32036
VARDAMAN, W. K		
Opportunities for commercial org	anizations	
	p 68	N85-11055
VASILETS, V. M.		
Some principles for the constru-	uction of	an adaptive
training system	р 3	A85-23279
VEATCH, M. H.		
R&M analysis techniques for faul	t-tolerant	systems
	p 74	A85-49588
VERESHCHETIN, V. S.		
International space law	p 91	A85-38699
Custom as a source of intern	ational la	w of outer
space	p 92	A85-49973
VERON, G.		
Psychological techniques for the	e selectio	n and initial
VINSON, W. D.	ers p4	A85-44244
ICAM (Internated Computer A)		
ional (integrated compater A	ided Man	ufacturing)
conceptual design for computer-inte	ided Man grated ma	ufacturing) inufacturing
conceptual design for computer-inte Volume 4, part 6 Task d Qua	ided Man igrated ma ility assura	ufacturing) inufacturing ance/quality
conceptual design for computer inte Volume 4, part 6 Task d Qua control/technical requirement/task	ided Man grated ma ility assura s, quality	ufacturing) inufacturing ance/quality assurance
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality	ided Man grated ma llity assura s, quality assurance	ufacturing) anufacturing ance/quality assurance e program
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend	ided Man igrated ma liity assura s, quality assuranc ations (ISF	ufacturing) inufacturing ance/quality assurance e program 2)
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend [AD-A144891]	ided Man grated ma lity assura s, quality assuranc ations (ISF p 26	ufacturing) inufacturing ance/quality assurance e program P) N85-10372
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommendi [AD-A144891] VITULLO, M	ided Man egrated ma llity assura s, quality assuranc ations (ISF p 26	ufacturing) inufacturing ance/quality assurance e program P) N85-10372
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend [AD-A144891] VITULLO, M Executive information system	ided Man egrated ma lity assura s, quality assuranc ations (ISF p 26	ufacturing) inufacturing ance/quality assurance e program P) N85-10372
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend [AD-A144891] VITULLO, M Executive information system [DE84-015355]	ided Man ograted ma s, quality assuranc ations (ISF p 26 p 37	Nufacturing) Inufacturing ance/quality assurance program N85-10372 N85-13675
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend [AD-A144891] VITULLO, M Executive information system [DE84-015355] VOIGT, S.	ided Man ograted ma s, quality assuranc ations (ISF p 26 p 37	ufacturing) inufacturing ance/quality assurance e program P) N85-10372 N85-13675
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommendi [AD-A144891] VITULLO, M Executive information system [DE84-015355] VOIGT, S. Space Station Software Issues	ided Man igrated ma lity assura s, quality assuranc ations (ISF p 26 p 37	ufacturing) inufacturing ance/quality assurance e program P) N85-10372 N85-13675
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend [AD-A144891] VITULLO, M Executive information system [DE84-015355] VOIGT, S. Space Station Software Issues [NASA-CP-2361]	ided Man igrated ma lity assura s, quality assuranc ations (ISF p 26 p 37 p 38	ufacturing) inufacturing ance/quality assurance e program <sup>2</sup> ) N85-10372 N85-13675 N85-20689
<ul> <li>Conceptual design for computer-intervalues of the computer of the value of the value of the values of</li></ul>	ided Man igrated ma lity assura s, quality assuranc ations (ISF p 26 p 37 p 38	ufacturing) inufacturing ance/quality assurance e program <sup>2</sup> ) N85-10372 N85-13675 N85-20689
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend: [AD-A144891] VITULLO, M Executive information system [DE84-015355] VOIGT, S. Space Station Software Issues [NASA-CP-2381] VOLZ, R. A Coordinated research in robo	ided Man igrated ma lity assura s, quality assuranc ations (ISF p 26 p 37 p 38 p 38	ufacturing) inufacturing ance/quality assurance e program N85-10372 N85-13675 N85-20689 integrated
<ul> <li>Conceptual design for computer-interval conceptual design for computer-interval volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend: [AD-A144891]</li> <li>VITULLO, M Executive information system [DE84-015355]</li> <li>VOIGT, S. Space Station Software Issues [NASA-CP-2361]</li> <li>VOLZ, R. A Coordinated research in robomanufacturing</li> </ul>	ided Man grated ma lifty assura sasuranc ations (ISF p 26 p 37 p 38 p 38	ufacturing) inufacturing ance/quality assurance e program o) N85-10372 N85-13675 N85-20689 integrated
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend [AD-A144891] VITULLO, M Executive information system [DE84-015355] VOIGT, S. Space Station Software Issues [NASA-CP-2361] VOLZ, R. A Coordinated research in robo manifacturing [AD-A148204]	ided Man grated ma lifty assura s, quality assuranc ations (ISF p 26 p 37 p 38 otics and p 28	ufacturing) inufacturing ance/quality assurance e program >) N85-10372 N85-13675 N85-20689 integrated N85-17365
<ul> <li>Conceptual design for computer-intervalues of the conceptual design for computer-intervalues of the conceptual design for computer-intervalues of the conceptual design for computer-intervalues modeling and analysis, quality management standard recommend [AD-A144891]</li> <li>VITULLO, M</li> <li>Executive information system [DE84-015355]</li> <li>VOIGT, S.</li> <li>Space Station Software Issues [NASA-CP-2361]</li> <li>VOLZ, R. A</li> <li>Coordinated research in robor manufacturing (AD-A148204)</li> <li>VON PUTTKAMER, J.</li> </ul>	ided Man igrated ma ility assuranc ations (ISF p 37 p 38 p 38 p 28	ufacturing) inufacturing ance/quality assurance e program <sup>5)</sup> N85-10372 N85-13675 N85-20689 integrated N85-17365
<ul> <li>conceptual design for computer-intervalume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend. [AD-A144891]</li> <li>VITULLO, M Executive information system [DE84-015355]</li> <li>VOIGT, S. Space Station Software Issues [NASA-CP-2361]</li> <li>VOLGT, R. A Coordinated research in robor manufacturing [AD-A148204]</li> <li>VON PUTTKAMER, J. Space - The long-range future</li> </ul>	Ided Man Idea Man Idea Man Idea Suranc assuranc ations (ISF p 37 p 38 p 38 otics and p 28 p 66	ufacturing) inufacturing ance/quality assurance e program o) N85-10372 N85-13675 N85-20689 integrated N85-17365 A85-45817
conceptual design for computer-inte Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend [AD-A144891] VITULLO, M Executive information system [DE84-015355] VOIGT, S. Space Station Software Issues [NASA-CP-2361] VOLZ, R. A Coordinated research in robo manufacturing [AD-A148204] VON PUTTKAMER, J. Space - The long-range future VONDRAN, R. F., JR.	ided Man iggrated ma ility assuranc ations (ISP p 37 p 38 p 38 p 28 p 66	ufacturing) inufacturing ance/quality assurance e program o) N85-10372 N85-13675 N85-20689 integrated N85-17365 A85-45817
<ul> <li>Conceptual design for computer-intervalues of the computer of the values of the values</li></ul>	ided Man iggrated ma ility assuranc ations (ISF p 37 p 38 p 38 p 38 p 28 p 66 chnical ma	ufacturing) inufacturing ance/quality assurance e program N85-10372 N85-13675 N85-20689 integrated N85-17365 A85-45817 inagers and
<ul> <li>Conceptual design for computer-intervalume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommendi [AD-A144891]</li> <li>VITULLO, M         Executive information system [DE84-015355]     </li> <li>VOIGT, S.         Space Station Software Issues [NASA-CP-2361]     </li> <li>VOLZ, R. A         Coordinated research in robic manufacturing [AD-A144804]     </li> <li>VON PUTTKAMER, J.         Space - The long-range future VONDRAN, R. F., JR.         Report-reading patterns of technomanagers     </li> </ul>	ided Man ggrated ma ility assuranc assuranc p 26 p 37 p 38 p 38 p 28 p 66 chnical ma p 10	ufacturing) inufacturing ance/quality assurance e program o) N85-10372 N85-13675 N85-20689 integrated N85-17365 A85-45817 inagers and <i>A85-21540</i>
<ul> <li>Conceptual design for computer intervention (in general design for computer intervention)</li> <li>Volume 4, part 6 Task d Qua control/technical requirement/task modeling and analysis, quality management standard recommend. [AD-A144891]</li> <li>VITULLO, M Executive information system [DE84-015355]</li> <li>VOIGT, S. Space Station Software Issues [NASA-CP-2361]</li> <li>VOLGT, R. A Coordinated research in robor manufacturing [AD-A148204]</li> <li>VON PUTTKAMER, J. Space - The long-range future VONDRAN, R. F., JR. Report-reading patterns of technomanagers</li> <li>VREULS, D.</li> </ul>	ided Man iggrated ma ility assuranc ations (ISF) p 26 p 37 p 38 p 38 p 46 p 66 chnical ma p 10	ufacturing) inufacturing ance/quality assurance e program ) N85-10372 N85-13675 N85-20689 integrated N85-20689 integrated N85-17365 A85-45817 inagers and <i>A85-21540</i>
<ul> <li>Conceptual design for computer-intervalues of the conceptual design for computer-intervalues of the computer-intervalues of the computer-intervalues of the computer-intervalues of the computer of the computer</li></ul>	ided Man iggrated ma ility assuranc ations (ISF p 37 p 38 p 37 p 38 p 66 shnical ma p 10 asurement	ufacturing) inufacturing ance/quality assurance e program 5) N85-10372 N85-13675 N85-20689 integrated N85-17365 A85-45817 inagers and <i>A85-21540</i> in training

### W

WADA, S. Sony keeps high quality and productivity in the United States p 66 A85-43203 WALKER, B. K. Effects of redundancy management on reliability p 13 A85-47795 modellina WALLACE, D. R. Annotated bibliography of recent papers on software engineering environments [PB85-191385] p 41 N85-29607 WALLACE, F. B. Are incentives right for US white collar organizations? p 12 A85-43185 WALLACE, W. A. Reliability of communication flow in R&D organizations p 11 A85-33650 WALQUIST, R L. Applying productivity principles to new R&D programs NASA/TRW GRO project p 65 A85-43187 WALTER, K. F. Overhead management guide for aerospace rocurements [AD-A153626] p 18 N85-29835 WALTERS, S. Synergy in space - Man-robot cooperation p 23 A85-20400 WANGE, G. FRG study looks at participation in ESA, US space p 49 N85-17191 station WANKLYN, J. N. The application of expert systems to corrosion oroblems [AERE-M-3445] p 29 N85-21316 WARD, W. E. Air Force technical objective document FY 86 [AD-A152730] p 52 N85-28855 WARR, R. E. Failure modes and effects analysis method for new product introductions SAE PAPER 841600] p 73 A85-39070 WASSENBERGH, H. A. US jurisdiction and bilateral air agreements p 86 A85-10050 WEBB, J. J.

- A fault-tolerant software strategy for digital systems [AIAA PAPER 84-2646] p 79 A85-17833 WEBB. N.
- Individual characteristics and unit performance. A review of research and methods
- p 9 N85-28550 AD-A153145] WEBBER, A. D.
- Launching the rocket industry in the United States -Domestic regulation of private expandable launch p 89 A85-30998 vehicles WEISS, H.
- Counteracting the stifling effects of a large p 65 A85-43194 organization WEISTROFFER, H. R.
- Modelling the demand for construction [CSIR-TWISK-322] p 21 N85-10218
- WELCH, L. R. A comparison of various Life Cycle Cost models
- p 66 A85-45150 WENTZ, L. K.
- Management and control of interconnected communications networks p 34 A85-34459 WESTCOTT, C
- The application of expert systems to corrosion problems
- [AERE-M-3445] p 29 N85-21316 WETTACH, R. H.
- ICAM (Integrated Computer Aided Manufacturing) conceptual design for computer-integrated manufacturing Volume 4, part 6 Task d Quality assurance/quality control/technical requirement/tasks, quality assurance modeling and analysis, quality assurance program management standard recommendations (ISP) p 26 N85-10372 [AD-A144891]
- WHINSTON, A. B. Developments in decision support systems
- p 25 A85-31792 WHITCOMB, G.
- p 45 A85-34146 The ESA science programme WHITE, G. R.
- Personal computer aided decision analysis p 17 N85-27743 [AD-A151911] WHITTREDGE, R. S.
- Using Ada for a distributed, fault tolerant system [AIAA PAPER 84-2703] p 79 A85p 79 A85-17873 WIBORG, K.
- MBB cost-reduction plan for Airbus construction escribed p 71 N85-25616 described WICKENS, C. D.
- The functional age profile An objective decision criterion for the assessment of pilot performance capacities and p 2 A85-21588 capabilities
- WIELAND, B. J. Dyna-METRIC - New capabilities
- p 73 A85-45148 WIENSS, W.
- Space station related investigations in Europe [IAF PAPER 84-28] p 43 A8 p 43 A85-12994 WIGLE, G. B.
- Specification of software quality attributes, volume 1 D-A1539881 p 85 N85-29593 [AD-A153988] Specification of software quality attributes Volume 2 Software quality specification guidebook
- p 85 N85-29594 [AD-A153989] Specification of software quality attributes Volume 3 Software quality evaluation guidebook
- [AD-A153990] p 85 N85-29595 WILKINS, N. J. M. The application of expert systems to corrosion
- problems [AERE-M-3445] p 29 N85-21316
- WILLIAMS, D E. The application of expert systems to corrosion problems
- [AERE-M-3445] p 29 N85-21316 WILSON, J. E
- Study to encourage and facilitate industrial investment and involvement in space p 72 N85-34147
- [NASA-CR-176152] WINTER, C. Executive information system
- [DE84-015355] p 37 N85-13675 WOLF, M. K.
- Data processing professionals and DP application users' perceptions and expectations of operational roles of persons working in a DP/application user interface p 10 N85-35821 group
- WOLFE, P. R. System sizing - The theory and the practice
- p 78 A85-11351 WOLFF. M.
- Business planning for information services under special consideration of German management information systems
- p 21 N85-11910 [BMFT-FB-ID-83-007]

WONG, R. E.

- Satellite servicing A business opportunity? p 69 N85-11056
- Concept for a commercial space station laboratory p 68 N85-11035
- p 69 N85-11057
- Bottleneckology Evaluating supercomputers p 39 N85-23315 IDE85-0055741
- Information and computation p 33 A85-31791 WYBORNY, W.
- Operational preparation of the German Spacelab Mission D1
- [IAF PAPER 84-211] p 43 A85-13133 γ

YAO, S B				
Performance eva	luation of a	database s	ystems	A
benchmark methodol	ogy			
[PB84-217504]	•••	p 36	N85-107	07
VOLING P				

What are we in business for? - An engineering approach to project finance p 61 A85-27648

## Z

- ZAMALETDINOV, I. S.
- Some perspectives on the study and improvement of the cognitive-creative activity of an individual and a aroup p 2 A85-23276
- ZARAKOVSKII, G. M. The principles of experimental setup in models of omplex human operator activities p 3 A85-23283 complex human operator activities ZHERNAVKOV, V. F.
- Some principles for the construction of an adaptive training system p 3 A85-23279 ZHUKOV, G.
- International space law p 90 A85-36997 ZIMMERMAN, W. F.
- Man-machine tradeoff study p 30 N85-29561

WOOD, P. W. Doing business in space How to get there from here WORLTON, J.

# WOZNIAKOWSKI, H.

# CORPORATE SOURCE INDEX

[AD-P003934]

### MANAGEMENT / A Bibliography for NASA Managers

**APRIL 1986** 

**Typical Corporate Source** Index Listing



Listings in this index are arranged alphabetically by corporate source. The title of the document is used to provide a brief description of the subject matter. The page number and the accession number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable, a report number is also included as an aid in identifying the document

## Δ

- Ad Hoc Committee on Depository Library Access to Federal Automated Data Bases.
- Provision of Federal government publication in electronic format to depository libraries [S-PRT-98-260] p 38 N85-19880
- Advanced Research Resources Organization,
- Bethesda, Md.
- Team dimensions Their identity, their measurement and their relationships
- [AD-A149662] p8 N85-21978 Advanced Technology, Inc., Reston, Va.
- DLA Data/data base administration analysis p 40 N85-28879 [AD-A153031]
- Aeronautical Systems Div., Wright-Patterson AFB, Ohio.
- Aeronautical systems technology needs Escape, rescue and survival, test facilities and test equipment and training-simulation equipment
- p 21 N85-10002 [AD-A145059] Air Command and Staff Coll., Maxwell AFB, Ala,
- Matrix organizations Overcoming the disadvantages [AD-A145318] p 14 N85-12772 A guide for new environmental coordinators
- p 19 N85-35498 [AD-A156327] Aeronautical Systems Division Manufacturing/Quality assurance orientation
- [AD-A156128] p 86 N85-35817 Air Force Human Resources Lab., Brooks AFB, Tex. Technical order managers handbook Utilization assessment
- p 37 N85-16694 [AD-A147579] Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. A bird strike handbook for base-level managers AD-A147928 p 75 N85-16008 [AD-A147928]
- An evaluation of the effect of establishing a minimum Economic Order Quantity (EOQ) on the Air Force EOQ item management system [AD-A1471211 p 75 N85-16673

An analysis of the effect of process controls on productivity and weapon system costs in DoD procurement

- p 75 N85-16678 [AD-A147496] Government contract contingent liabilities The anti-deficiency act, and the hobgoblin of little minds
- p 94 N85-16684 Organizations and information processing A field study of research and development units within the United States
- [AD-A147381] p 21 N85-16691 An application of discriminant analysis to the selection
- of software cost estimating models p 70 N85-17580 [AD-A147632]
- p 70 N85-17733
- Cost-plus-percentage-of-costs In government contracts
- A decision support methodology for space technology advocacv
- Continued development of a data base management
- [AD-A151714] p 39 N85-26167
- Personal computer aided decision analysis p 17 N85-27743 [AD-A151911]
- Air Force Logistics Management Center, Gunter AFS, Ala.
- Inventory policy for high backorder items [AD-A153696] p 77 p 77 N85-29840
- EOQ (Economic Order Quantity) range model p 77 N85-30965 [AD-A153709]
- Air Force Wright Aeronautical Labs., Wright-Patterson AFB, Ohio.
- Air Force technical objective document FY 86 p 52 N85-28855 [AD-A152730] Air Midwest, Inc., Wichita, Kans,
- Communications skills for CRM training
- p 6 N85-18017 Pilot education and safety awareness programs
- p 6 N85-18026
- Air Wisconsin, Inc , Appleton Initiative uses of aircraft for flight training p 6 N85-18027
- American Coll. Testing Program, Iowa city, Iowa. Models for multidimensional tests and hierarchically
- structured training materials [AD-A155231] p 10 N85-32768
- American Inst of Aeronautics and Astronautics, New York

White-collar productivity and quality issues, Proceedings of the Symposium on Productivity and Quality Strategies for Improving Operations in Government and Industry, Washington, DC, September 25, 26, 1984

- p 81 A85-43176 American Univ., Washington, D. C.
- Social and political problems in Soviet basic research [AD-P004565] p 96 N85-28860 Analytics, Inc , Dayton, Ohio.

Evaluation of the effectiveness of the weighted guidelines to induce contractor's investment in cost reducing facilities equipment

- [AD-A147586] p 70 N85-16681 Applied Concepts Corp., Woodstock, Va.
- Robotics investment decision model user's manual [AD-A145467] p 26 N85-11347 Investment justification of robotic technology in aerospace manufacturing User's manual p 23 N85-35410 [AD-A156193]
- Applied Science Associates, Inc., Valencia, Pa. Maintenance training simulators prime item development specification Model specification and handbook
- p 10 N85-30628 [AD-A154108] Arizona Univ., Tucson
- The psychology of technical devices and technical discourse [AD-P0039291 p 27 N85-11609

- Army Aviation Center, Fort Rucker, Ala.
- Determining training device requirements in Army aviation systems p 5 N85-14558 Army Construction Engineering Research Lab.,
- Champaign, Ill.
- The application of artificial intelligence to contract management
- [AD-A146681] p 27 N85-15448 Project manager's handbook for special projects
- [AD-A147913] p 48 N85-16683 Army Missile Command, Redstone Arsenal, Ala.
- Economic analysis handbook
- p 69 N85-12805 [AD-A146263] Army Procurement Research Office, Fort Lee, Va.
- Feasibility of applications of Competition Decision Assist Package (CDAP) to spare parts [AD-A154716] p 77 N85-33036
- Army Research Inst. for the Behavioral and Social Sciences, Alexandria, Va.
- Artificial intelligence contributions to training and maintenance
  - p 27 N85-11614

### В

- Babcock Power Ltd., London (England). Welding techniques in pressure part technology p 22 N85-25835 Ballistic Research Labs., Aberdeen Proving Ground, Md A review of safety practices and safety training for the explosives field p 8 N85-27028 [AD-A152295] Battelle Columbus Labs., Ohio, A fault-tolerant software strategy for digital systems [AIAA PAPER 84-2646] p 79 A85-17833 Avionics integrity program (Avip) Volume 1 Procurement phase issues Design, manufacturing, and integration [AD-A145651] p 83 N85-10943 Orbital debris policy issues Battelle involvement and some personal observations p 94 N85-21218 Bodenseewerk Geraetetechnik G.m.b.H., Ueberlingen (West Germany). Simulation A tool for cost-effective systems design and p 71 N85-26657 live test reduction Boeing Aerospace Co., Seattle, Wash. Software test handbook [AD-A146844] p 37 N85-16498 Specification of software quality attributes, volume 1 p 85 N85-29593 [AD-A153988] Specification of software quality attributes Volume 2 Software quality specification guidebook p 85 N85-29594 [AD-A153989] Specification of software quality attributes Volume 3 Software quality evaluation guidebook p 85 N85-29595 [AD-A153990] Space station automation and robotics study Operator-systems interface p 31 N85-33172 [NASA-CR-176095] Boeing Computer Services Co., Seattle, Wash. Space station automation and robotics study Operator-systems interface [NASA-CR-176095] p 31 N85-33172 Bolt, Beranek, and Newman, Inc., Cambridge, Mass. Designing an expert system for training automotive electrical troubleshooting
- p 26 N85-11606 [AD-P003926] Booz-Allen and Hamilton, Inc., Arlington, Va.
  - Concept for a commercial space station laboratory

p 68 N85-11035 Doing business in space How to get there from here p 69 N85-11057

Brigham Young Univ., Provo, Utah. Strategic management for organizational effectiveness The effect of human resource planning on retention and elated issues, volume 1 [AD-A149398]

- [AD-A147919] Air Force Systems Command
  - An analysis of production competition and award
    - methodology [AD-A147775]
      - [AD-A147779] p 70 N85-17735
      - [AD-A151895] p 16 N85-25283
      - system performance monitor, volume 2
    - Life cycle costing in government procurement [AD-A151878] p 51 Ne p 51 N85-26456

#### British Aerospace Aircraft Group, Kingston-upon-Thames (England).

#### Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 2

[AD-A149399] p 7 N85-19875 Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues, volume 3

p 7 N85-19876 [AD-A149400] Strategic management for organizational effectiveness The effect of human resource planning on retention and related issues Methodological appendix

p 7 N85-19877 [AD-A149401] Manufacturing information system p 17 N85-28616

[AD-A152715] British Aerospace Aircraft Group,

Kingston-upon-Thames (England).

Innovation in British industry (notably the aircraft industry) and its value Collected papers [BAE-KRS-N-GEN-286] p 49 N85-17933

- British Aerospace Dynamics Group, Bristol (England). Human factors department 1981 publications p8 N85-26147 [BAE-BT-12685]
- Bundesanstalt fuer Flugsicherung, Frankfurt am Main (West Germany).

Guidelines of the Federal Minister of Transportation for the formation and examination of airline personnel, part o 9 N85-28556

Bundesministerium fuer Forschung und Technologie, Hamburg (West Germany).

Documentation for the West German Federal Cabinet's p 96 N85-28886 space policy decision

### С

- California Univ., Berkeley
- Research in data management and system reliability [AD-A1454981 p 83 N85-12773 Statistical estimation of software reliability

[AD-A154097] p 85 N85-30665 California Univ, Berkeley. Lawrence Berkeley Lab. Requirements for a database management system p 39 N85-22259 [DE85-004661]

- California Univ., Santa Barbara. The application of artificial intelligence techniques to large distributed networks
- [NASA-CR-177346] p 30 N85-30721 Carnegie-Mellon Univ., Pittsburgh, Pa.
- The man-machine interface [AD-A149971] p 22 N85-21989
- Catholic Univ. of America, Washington, D C. Report-reading patterns of technical managers and nonmanagers p 10 A85-21540
- Centre d'Essais Aeronautique Toulouse (France). Guide for the execution of reliability tests in the p 85 N85-27237 laboratory
- Centre National d'Etudes Spatiales, Toulouse (France) Quality organization [CNES-NT-106] p 83 N85-13257
- Value analysis ICNES-NT-1101 p 21 N85-13684
- College of William and Mary, Williamsburg, Va. Optimal maintenance center inventories for fault-tolerant
- repairable systems p 72 A85-21548 Optimal inventories for overhaul of repairable redundant p 73 A85-48239 systems - A Markov decision model

Cologne Univ. (West Germany). Business planning for information services under special consideration of German management information systems

- [BMFT-FB-ID-83-007] p 21 N85-11910 Colorado Univ., Boulder.
- Personal decision making The influence of perceived locus of control and degree of rationality on information seeking strategies p 39 N85-23446 Command Airways, Wappingers Falls, N.Y.
- Innovative approaches to recurrent training p 6 N85-18028

Commerce Dept., Washington, D.C. R/D contracts in the Soviet Union

- [AD-P004569] p 53 N85-28865 Committee on Appropriations (U. S. House). Housing Department of and Urban Development-independent agencies appropriations for
- Part 6 1986 National Aeronautics and Space Administration [GPO-47-235] p 96 N85-27768
- Department of Housing and Urban Development-Independent Agencies Appropriation Bill, 1986 [H-REPT-99-212] p 96 N85-30979
- National Aeronautics and Space Administration p 54 N85-30980

C-2

Committee on Appropriations (U. S. Senate).

- Department of Housing and Urban Development, and certain independent agencies appropriations for fiscal year 1985, part 2
- p 93 N85-10870 [S-REPT-98-889-PT-2]
- National Aeronautics and Space Administration p 93 N85-10871
- Department of Housing and Urban Development-Independent Agencies Appropriation Act, p 97 N85-32041 1986
- National Aeronautics and Space Administration research and development p 97 N85-32042 Department of Housing and Urban Development
- Independent Agencies Appropriation Bill, 1986 p 97 N85-34720 [S-REPT-99-129]
- National Aeronautics and Space Administration research and development Program description p 56 N85-34721
- Committee on Commerce, Science, and Transportation (U. S Senate).
- Commercial Space Launch Act p 93 N85-13690 (GPO-39-613)
- Land Remote-Sensing Commercialization Act p 93 N85-14201 [S-REPT-98-458]
- Commercial space launches [S-REPT-98-656] p 95 N85-21225
- National Aeronautics and Space Administration Authorization Act, 1986
- [S-REPT-99-91] p 96 N85-28885 National Aeronautics and Space Administration
- Authorization Act, 1986 p 96 N85-30978 [S-REPT-99-91] Committee on Energy and Commerce (U. S. House).
- National Telecommunications Information and Administration authorization p 96 N85-27766 [GPO-38-660]
- Committee on Foreign Relations (U. S. Senate) East-West cooperation in outer space
- [S-HRG-98-1064] p 52 N85-27767 Committee on Governmental Affairs (U S. Senate)
- Transfer of technology (S-REPT-98-664) p 50 N85-22246
- Committee on Science and Technology (U. S. House). Statement of Hon James M Beggs, Administrator,
- NASA, Washington, DC p 69 N85-11059 International cooperation and competition in space p 69 N85-11911 [GPO-38-001]
- International cooperation and competition in space p 69 N85-11912 Introduction
- The Expendable Launch Vehicle Commercialization Act
- p 93 N85-12919 [GPO-30-838] Manufacturing Sciences and Robotics Research and Development Act of 1984
- p 27 N85-13688 [H-REPT-98-1078] 1984 science and technology posture hearing with the
- director of the Office of Science and Technology Policy p 95 N85-22244 [GPO-41-060]
- An agenda for a study of government science policy [GPO-40-860] p 95 N85-22245 Authorizing appropriations to the National Aeronautics
- and Space Administration for fiscal year 1986 p 95 N85-23452 [H-REPT-99-32]
- NASA authorization, 1986, volume 1 p 97 N85-32039 [GPO-46-385]
- The 1986 National Aeronautics and Space Administration authorization [GPO-47-635] p 57 N85-35829
- Comptroller General of the United States, Washington, D.Ċ.
- Contracting for computer software development Serious problems require management attention to avoid wasting additional millions p 47 N85-11567
- [FGMSD-80-4] **Computer Software Management and Information**
- Center, Athens, Ga. COSMIC Software Catalog, 1985 edition
- [NASA-CR-174070] p 40 N85-28608 Congressional Budget Office, Washington, D. C
- Pricing options for the space shuttle Special study p 72 N85-32138 Consiglio Nazionale delle Ricerche, Naples (Italy).
- Note for a research feasibility project High reliability design in the aeronautical field
- [REPT-84-RR-350] p 85 N85-31005 Coopers and Lybrand, Washington, D.C
- Financial issues for commercial space ventures Paving p 67 N85-11014 for the dreams

November-December 1984 IAD-4145 10 IAD-415 [AD-A1495461 p 50 N85-20933 Denver Research Inst., Colo. Factors critical to the implementation of self-paced instruction A background review [AD-A145143] p 5 N85-10648 Training capabilities test of Electronics Equipment Maintenance Trainer (EEMT) Findings and conclusions [AD-A146075] p 5 N85-12302 Department of Defense, Washington, D. C.

D

Program manager The Journal of the Defense Systems

Defense Systems Management School, Fort Belvoir,

- Companies participating in the Department of Defense Subcontracting Program, first three quarters fiscal year 1984 [AD-A1461371 p 47 N85-12775
- Department of Energy, Washington, D. C. Renewable technologies program summaries
- p 54 N85-30500 [DE85-001509] Analyzing performance of small projects using URS and PMAS, information pamphlet
- p 56 N85-34718 [DE85-011964] Deutsche Forschungs- und Versuchsanstalt fuer Luft-
- und Raumfahrt, Cologne (West Germany) Activities report in aerospace in West Germany
- [ISSN-0070-3966] p 50 N85-18947 Deutsche Forschungs- und Versuchsanstalt fuer Luft-
- und Raumfahrt, Hamburg (West Germany) Construction of a job-oriented test for the selection of air traffic controllers
- [DFVLR-FB-84-51] p 9 N85-28558 Deutsche Lufthansa Aktiengesellschaft, Frankfurt am Main (West Germany).
  - Activities report of the aerospace industry in West Germany
  - [ISSN-0722-3838] p 49 N85-16686 Activities report of the aerospace industry in West
  - Germany [ISSN-0722-3838] p 49 N85-16687
- Direction Generale de L'Aviation Civile, Toulouse (France).
- Search and rescue of aircraft in distress in France Organization, means p 77 N85-31096 DOD Product Engineering Services Office, Alexandria, ٧a
  - DOD Value Engineering Conference report Value A tool that benefits line management Engineering (VE) held at Leesburg, Virginia on 1-2 November 1984 Part Executive summary
- [AD-A156067] p 57 N85-35810 DOD Value Engineering Conference report Value
- Engineering (VE) A tool that benefits line management held at Leesburg, Virginia on 1-2 November 1984 Part Plenary session [AD-A1560681 p 57 N85-35811
- DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 3, Workshop A VE in the program office p 57 N85-35812 (AD-A1560691
- DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 4, Workshop B VE on spare parts
- [AD-A156070] p 57 N85-35813 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management. Part 5, Workshop C VEP/VECP administration, negotiation, and implementation
- [AD-A156071] p 57 N85-35814 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 6, Workshop D VE training-orientation
- [AD-A156072] p 57 N85-35815 DoD Value Engineering conference report Value Engineering (VE) A tool that benefits line management Part 7, Workshop E VE in construction and architect engineer contracts
- [AD-A156073] p 57 N85-35816 Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
- Using Ada for a distributed, fault tolerant system [AIAA PAPER 84-2703] p 79 A85p 79 A85-17873 Du Pont de Nemours (E. I.) and Co., Aiken, S.C.
- Robotics at Savannah River site Activity report (DE85-003657) p 29 N85-20383

Defense data network support concept analysis

development of effective contract incentives

Dynamics Research Corp., Wilmington, Mass.

Decision process models of contractor behavior The

p 47 N85-11898

p 52 N85-28649

Duke Univ., Durham, N. C.

[AD-A145524]

[AD-A153214]

### E

- Ecole Nationale Superieure des Telecommunications, Paris (France). Telecommunication market research processing
- [ENST-83E018] p 42 N85-34331 Electronic Systems Div., Hanscom AFB, Mass.
- Training guide for scientific and engineering trainees 1984 [AD-A147963] p 6 N85-17542
- Elliott-Automation Space and Advanced Military Systems Ltd., Camberley (England).
- The development of complex systems

p 55 N85-32021 Engineering and Economics Research, Inc., Falls

- Church, Va.
- National airspace review enhancement plan, revision 3 [AD-A150743] p 94 N85-16852 Environmental Protection Agency, Washington, D.C.
- EPA (Environmental Protection Agency) research program guide, FY-1985, October 1, 1984 September 30, 1985
- p 55 N85-31676 [PB85-181881] ESCOM, Cleveland (South Africa). Status of the U K N D T industry today
- p 22 N85-24309
- European Space Agency, Paris (France). German domestic scheduled air transport in the year 2000
- [ESA-TT-828] p 69 N85-13792 European space science horizon 2000
- p 51 N85-26771 [ESA-SP-1070] Research report program of the US Army in Europe
- p 56 N85-35167 New technologies at the forefront of industrial p 56 N85-35168 developments
- European Space Agency European Space Operations Center, Darmstadt (West Germany)
- p 17 N85-27812 Helios project support European Space Agency. European Space Research and Technology Center, ESTEC, Noordwijk
- (Netherlands).
- The ESA product assurance specification system Explanatory note p 83 N85-13259
- Executive Office of the President, Washington, D. C. Publications of the Executive Office of the President January 20, 1981 - June 30, 1984
- [PB84-230671] p 93 N85-15533 National aeronautical R and D goals Technology for
- America's future p 54 N85-30964

## F

- Federal Aviation Administration, Washington, D.C. National Airspace System Plan Facilities, equipment p 76 N85-26692 and associated development
- Federation of American Societies for Experimental Biology, Bethesda, Md. Research opportunities in human behavior and
- performance [NASA-CR-175473] p 6 N85-19640
- Fondo Colombiano de Investigaciones Clentificas y Proyectos Especiales, Bogota (Colombia).
- Primer on the registration of technical information in p 36 N85-12786 industry

### G

- Gellman Research Associates, Inc., Jenkintown, Pa. The economics of private sector R and D decisionmaking in aeronautics
- [NASA-CR-176007] p 54 N85-30962 General Accounting Office, Washington, D. C
- Logistics support costs for the B-1B aircraft can be reduced [AD-A145846] p 74 N85-11996
- Outlook for expanding the Federal research in progress system
- [AD-A148354] p 49 N85-17737 George Washington Univ., Washington, D.C. On some common interests among reliability, inventory
- and queuing [AD-A145595] p 83 N85-11646
- Evaluating the appropriateness of microcomputers for litigation document management using the analytic hierarchy process p 39 N85-24788 Determining functional requirements for NASA Goddard's command management system software
- p 30 N85-32020 design using expert systems Opportunities for policy historians The evolution of the US civilian space program p 97 N85-35147

- Data processing professionals and DP application users' perceptions and expectations of operational roles of persons working in a DP/application user interface p 10 N85-35821 group Gesellschaft fuer Mathematik und Datenverarbeitung,
- Bonn (West Germany). Comparative descriptions of software quality measures
- [GMD-STUDIES-81] p 83 N85-10676 Gordon Research Conferences, Inc., Kingston, R.I. Gordon Conference on Fundamentals of Cybernetics
- p 29 N85-24842 [AD-A151074] Grumman Aerospace Corp., Bethpage, N.Y. Developing commercial users of space

p 68 N85-11044

### н

Hanford Engineering Development Lab., Richland, Wash.

- Quality of scientific and engineering data [DE85-000294] p 84 N85-20936 Hill Kaplan Scott, Inc. (South Africa).
- Computers and the consulting engineer p 22 N85-26184 Hilton (Conrad N.) Coll. of Hotel and Restaurant
- Management, Houston, Tex.
- Food service management p 16 N85-24736 Hoffman (F. E.) and Associates, Montrose, Calif. Cost prediction model for various payloads and instruments for the Space Shuttle Orbiter
- p 72 N85-26842 [NASA-CB-175781] Human Resources Research Organization, Alexandria, Va.
- Human factors and training research in military organizations and systems [AD-A146832] p 5 N85-16475

IBM S.A. Proprietary Ltd., Johannesburg (South Africa) Selection criteria for a CAD/CM system p 71 N85-24810 Illinois Univ., Urbana. SAGA A project to automate the management of software production systems [NASA-CR-174017] p 35 N85-10685 Information Spectrum, Inc., Arlington, Va. Technical performance measurement handbook [AD-A147314] p 48 N85 p 48 N85-16675 Institute for Defense Analyses, Alexandria, Va. DOD related software technology requirements, practices, and prospects for the future p 36 N85-11575 [AD-A145493] Concept paper for the development of a DOD Ada

- (trademark) software engineering education and training AD-A1487741 p 38 N85-17592
- Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil). A report on the training course at Fortaleza (Ceara)
- p 5 N85-11426 [E85-10013] Interior Dept., Washington, D.C.
- IBM (Information Resources Management) long-range plan Fiscal year 1984-1988 (update) Volume 2 ADP and telecommunications acquisition plan
- p 37 N85-12796 [P884-229244] International Association of Fire Chiefs, Washington, D.C.
- Fire service emergency management handbook [AD-A155780] p 19 N85-35313

International City Management Association, Washington, D.C.

- Design of a scientific information collation and dissemination system, volumes 1 thru 3 [AD-A146002]
- p 14 N85-12791 International Trade Administration, Washington, D.C. Competitive assessment of the US information services ndustrv

[PB84-174804] p 37 N85-12803

### J

- Jet Propulsion Lab., California Inst. of Tech., Pasadena.
- Polycrystalline silicon material availability and market pricing outlook for 1980 through 1988
- p 58 A85-11425 Computing and information services at the Jet Propulsion Laboratory - A management approach to a diversity of p 44 A85-24525 needs
  - An automated methodology development p 33 A85-34128

### Joint Publications Research Service, Arlington, Va.

The SIMRAND methodology - Simulation of Research and Development Projects p 12 A85-41319 Toward the fully capable AI space mission planner p 25 A85-42892 Methodology for system description using the software p 35 A85-48511 design & documentation language Concepts and tools for the software life cycle p 38 N85-19236 Cost prediction model for various payloads and instruments for the Space Shuttle Orbiter [NASA-CR-175781] p 72 N85-26842 Hand controllers for teleoperation A state-of-the-art technology survey and evaluation [NASA-CR-175890] р9 N85-28559 Johns Hopkins Univ., Silver Spring, Md. Psychological inserver and the server and Psychological issues in the design of expert systems [AD-A146081] p 27 N85-12792 Joint Publications Research Service, Arlington, Va. New concepts for industrial robots outlined p 27 N85-15176 East Europe report Science and technology p 49 N85-17176 [JPRS-ESA-84-046] Man-machine communication research for robotics aported p 28 N85-17177 reported Flexible manufacturing system concept features cache p 28 N85-17186 memory FRG study looks at participation in ESA, US space p 49 station N85-17191 UK, FRG, France R and D in sensors, related fields p 49 N85-17197 East Europe report Science and technology PRS-ESA-84-043] p 49 N85-17198 [JPRS-ESA-84-043] Role of engineering psychology p 6 N85-18561 Problems of psychological support of automated p 28 N85-18571 organization control systems Commercial space Europe should have independent strategy p 71 N85-19205 Dean of Kiev State University on impact of robots p 28 N85-19213 Worldwide report Telecommunications policy, research and development [JPRS-TTP-85-002] p 94 N85-19309 Worldwide report Telecommunications policy, research and development [JPRS-TTP-85-006] p 94 N85-19314 Health standards for general vibration p 84 N85-19607 Study of cognitive styles of students in automated p 6 N85-19620 teaching system Robot production lines in operation p 29 N85-20166 French panel makes specific proposals for robotics research Current state of French robotics p 29 N85-20180 technology French research minister on policy, p 94 N85-20182 transfer East Europe report Scientific affairs [JPRS-ESA-84-006] p 50 N85-20684 Transportation p 50 N85-21105 [JPRS-UTR-85-004] Aviation repair plant directors on quality control p 84 N85-21106 measures Systems research on China in year 2000 p 50 N85-21418 USSR report Space [JPRS-USP-85-001] p 51 N85-22403 U.S., Soviet space program aims contrasted p 95 N85-22455 USSR report Science and technology policy [JPRS-UST-85-002] p 95 N p 95 N85-23442 Improvements in personnel needed for better flight p 8 N85-23693 safety Plans, developments in robotics p 29 N85-24191 Administration chief on air traffic control improvements p 76 N85-25193 Militarization of space activity in United States p 96 N85-25360 Robot use in FRG increases but sensor technology laos p 29 N85-25605 MBB cost-reduction plan for Airbus construction p 71 N85-25616 described French firm plans recapture of domestic CAD/CAM p 30 N85-25641 market Criteria for qualifying for FRG federal CAD/CAM p 51 N85-25651 subsidies East Europe report Science and technology [JPRS-ESA-84-032] p 51 N85-26833 Organizing geological work tasks for 1985 outlined p 51 N85-27303 Future directions of robotics, automation in Italy p 30 N85-28187 Applications of robots in machine tool industry

- p 22 N85-28189 reviewed General laws of development of technology
  - p 30 N85-28875

### Lawrence Livermore National Lab., Calif.

- Component problems plague French robotics industry p 30 N85-29088 Multinational program to develop intelligent robots p 30 N85-29094 New ESA director on Anane, space station, future p 53 N85-29096 trends FRG weighs ESA participation, budget issues p 53 N85-29110
- Importance of automation, robotization in economy p 31 N85-32219 p 22 N85-32785 Quality analysis

### L

- Lawrence Livermore National Lab., Calif. Integrating quality assurance and research and development
- p 17 N85-28392 [DE85-007974] sley Coll., Cambridge, Mass. Maintenance Management Information and Control
- System (MMICS) Administrative boon or burden p 75 N85-12790 [AD-A145762]
- LITEF, Freiburg (West Germany). Documentation and separate test program development is most important for test/maintenance
- p 83 N85-16745 Logistics Management Inst., Bethesda, Md.
- Cost savings from multiyear contracting [AD-A153564] p 53 N85-29834
- Local automation model software benchmarking Test olan [AD-A154349] p 41 N85-30676
- Producibility Engineering and Planning (PEP) Program management guidelines [AD-A153730] p 18 N85-30966
- Logistics Management Inst., Washington, D. C. Life cycle cost management master plan for the Defense Communications Agency
- p 14 N85-16668 [AD-A146876] Los Alamos National Lab., N. Mex.
- Expanding expertise by use of an expert system p 30 N85-30723 [DE85-010759]
- Los Alamos Scientífic Lab., N. Mex. Configuration management for mission-critical software The Los Alamos solution
- p 36 N85-12606 [DE84-015515] Bottleneckology Evaluating supercomputers
- p 39 N85-23315 [DE85-005574] Loughborough Univ. of Technology (England). Expert systems in contract management A pilot
- study [AD-A149363] p 29 N85-19873
- Information technology applications in voluntary sector transport operations SP1 Objectives and programme of work p 71 N85-26457 [TT-8501]
- LTV Aerospace Corp., Dallas, Tex. ICAM (Integrated Computer Aided Manufacturing) Conceptual design for computer-integrated manufacturing Volume 4, part 6 Task d Quality assurance/quality control/technical requirement/tasks, quality assurance modeling and analysis, quality assurance program management standard recommendations (ISP) [AD-A144891] p 26 N85-10372

### М

- Marconi Space Systems Ltd., Portsmouth (England). Space station study
- [BL-6167] p 53 N85-28959 Martin Marietta Aerospace, Washington, D.C. System engineering and integration contract for implementation of the National Airspace System Plan
- Volume 2 Section 50 [AD-A145710] p 47 N85-10929
- Maryland Univ., College Park. Monitoring software development through dynamic p 47 A85-49049 variables
- Massachusetts Inst. of Tech., Cambridge. A mathematical theory of command and control structures
- [AD-A145608] p 14 N85-11675 Interaction of human cognitive models and computer based models in supervisory control
- [AD-A142547] p 14 N85-16474 Autonomy in the industrial R and D lab p 15 N85-17736 [AD-A148075]
- McDonnell Aircraft Co., St. Louis, Mo. Customer and mission influence on space station
- p 9 N85-29567 architecture Messerschmitt-Boelkow-Blohm G.m.b.H., Bremen

The Helios missions	p 52	N85-27795
	•	

The significance of Helios for Europe

- p 52 N85-27808 Managerial benefits of Helios for the European industry p 52 N85-27809
- Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany).
- Activities in aerospace p 22 N85-27821 Michigan State Univ., East Lansing.
- Laboratory research A question of when, not if p 53 N85-28867 [AD-A153298]
- Michigan Univ., Ann Arbor. Coordinated research in robotics and integrated manufacturing
- [AD-A148204] p 28 N85-17365 The acquisition of procedures from text Α production-system analysis of transfer of training
- [AD-A151029] p 8 N85-24732 Minnesota Univ., Minneapolis.
- Central problems in the management of innovation [AD-A152598] p 18 N85-28852 The concept of fit in contingency theory p 18 N85-28854 [AD-A152603]
- Mitre Corp., Bedford, Mass.
- Design guidelines for user-system interface software [AD-A154907] p 42 N85-32807

### Ν

Naples Univ. (Italy).

- Spacelab to Space Station, Proceedings of the International Symposium on Spacelab 1 Results, Implications and Perspectives, Naples and Capri, Italy, June 11-16, 1984 p 20 A85-39076
- National Computing Centre, Manchester (England). Comparative descriptions of software quality measures p 83 N85-10676
- [GMD-STUDIES-81] National Academy of Sciences - National Research Council, Washington, D. C.
- Space Station engineering and technology development
- [NASA-CR-174383] p 21 N85-18079 Research needs on the interaction between information systems and their users Report of a workshop
- p 38 N85-19891 [PB85-121523] Computer integration of engineering design and production A national opportunity
- [NASA-CR-175483] p 21 N85-21414 Research and Modeling of Supervisory Control Behavior, report of a workshop
- [AD-A149621] p 16 N85-22248 Navy information systems organization, and management Planning, policy,
- p 96 N85-32038 [PB85-176113] Space Station Engineering and Technology Development Proceedings of the Panel on In-Space Engineering Research and Technology Development [NASA-CR-176110] p 56 N85-34153
- National Aeronautics and Space Administration, Washington, D.C. International cooperation in the commercial era of space p 58 A85-12507 Space Station - An overview of current US activities [IAF PAPER 84-22] p 59 A85-12991 Space Station - Opportunity for international cooperation and utilization
- [IAF PAPER 84-51] p 43 A85-13010 NASA's approach to the commercial use of space [IAF PAPER 84-217] p 59 A85-13139
- Grooming the Shuttle for cost-effective access to p 61 A85-33429 p 46 A85-41098 space The US Space Station programme p 66 A85-45817 Space · The long-range future NASA and the practice of space law
- p 92 A85-49971 Non-US approaches to space commercialization p 67 N85-11012
- Legal considerations and cooperative opportunities for space commercial activities p 93 N85-11013 The structures and the role of an international agency
- for the control of satellites [NASA-TM-76765] p 93 N85-12806
- International comparative study of systems for the government advancement of research and development [NASA-TM-77589] p 48 N85-13689 The management of research institutions A look at
- overnment laboratories [NASA-SP-481] p 14 N85-16665
- Outer space law A problem of astronautics p 94 N85-16697 [NASA-TM-77760] Aerospace Safety Advisory Panel
- [NASA-TM-87428] p 85 N85-21135
- Space Station technology planning p 51 N85-22471 Management A bibliography for NASA managers [NASA-SP-7500(19)] p 17 N85-26439

- International space research perspectives of commercialization for German industry [NASA-TM-77657] p 54 N85-29979 NASA Space controls research and technology rogram p 54 N85-31149 program Management of large-scale technology p 56 N85-35145 National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif. Concepts and algorithms for terminal-area traffic management p 73 A85-47683 Some ideas and questions regarding space station design for human use p 9 N85-29562 Simulation for human factors research A central p 9 N85-29568 question Fidelity National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md. Debris in the geostationary orbit ring, the endless shooting gallery The necessity for a disposal policy p 94 N85-21214 National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex. Commercial use of space - The space business era p 63 A85-34538 Contractor and government -Teamwork and p 46 A85-43206 commitment Considerations for policy on man-made debris p 94 N85-21219 propagation control Space Station reference configuration description [NASA-TM-87493] p 42 N85-31146 Testimony of Robert A Frosch before the Subcommittee on HUD and Independent Agencies of the Senate Committee on Appropriations [NASA-TM-87496] p 97 N85 National Aeronautics and Space Administration. p 97 N85-33173 Langley Research Center, Hampton, Va. Cooperative control - The interface challenge for men and automated machines p 23 A85-16093 Report-reading patterns of technical managers and p 10 A85-21540 nonmanagers A system-level approach to automation research p 24 A85-23197 Foreign civil aviation competition 1976 summary and Implications [NASA-TM-X-73907] p 67 N85-10907 Project resources planning and control [NASA-TM-86339] pp 47 N85-13666 Space Station Software Issues [NASA-CP-2361] n 38 N85-20689 Software management issues p 16 N85-20690 Software development environment issues N85-20691 p 84 Software standards issues p 84 N85-20692 p 38 Information systems issues N85-20693 Software technology within NASA p 38 N85-20695 National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala. Second Symposium on Space Industrialization [NASA-CP-2313] p 67 N85-11011 Opportunities for commercial organizations p 68 N85-11055 National Aerospace Lab., Amsterdam (Netherlands). Operations research [88561897] p 76 N85-28712 National Bureau of Standards, Gaithersburg, Md. Security of personal computer systems A management auide p 39 N85-24793 [PB85-161040] Principles of quality assurance of chemical measurements [PB85-177947] p 76 N85-28997 Annotated bibliography of recent papers on software engineering environments [PB85-191385] p 41 N85-29607
- Guide on workload forecasting [PB85-177632] p 18 N85-30704
- Guide on logical database design [PB85-177970] p 42 N85-30976 National Bureau of Standards, Washington, D.C.
- Measurement assurance programs Part 1 General introduction [PB84-217868] p 83 N85-10339
- National Oceanic and Atmospheric Administration, Washington, D. C.
- Land remote sensing commercialization A status p 68 N85-11024 report
- National Research Inst. for Mathematical Sciences, Pretoria (South Africa).
- Modelling the demand for construction [CSIR-TWISK-322] p
- p 21 N85-10218 Optimizing search with positive information feedback
- CSIR-TWISK-313
   p 36
   N85-10855

   Decision Support System (DSS)
   A survey

   [NRIMS-TWISK-317]
   p 14
   N85-11896
- An analysis of a dynamic project cost problem [CSIR-TWISK-338] p 71 N85-23341

#### CORPORATE SOURCE

Naval Air Systems Command, Washington, D. C. Design adequacy An effectiveness factor p 40 N85-26642 Naval Material Command, Washington, D. C. Navy program manager's guide, 1985 edition [AD-A151925] p 76 N85-27744 Naval Postgraduate School, Monterey, Calif. Data dictionary systems and their role in information resource management [AD-A144905] p 36 N85-10859 Systems analysis for microcomputer acquisitions [AD-A145447] p 69 N85-11556 A decision model for selection of microcomputers and operating systems [AD-A149076] p 15 N85-19694 Aviation maintenance computerized management information systems Perspective for the future [AD-A150637] AD-A150637] p 75 N85-22349 General design considerations of an Air Force information system [AD-A150611] p 39 N85-23449 Copyright law, computer software, and government acquisition [AD-A150347] p 95 N85-23453 Some applications of fuzzy sets and the analytical hierarchy process to decision making [AD-A150720] p 16 N85-24876 A learning strategy approach for teaching novice computer programmers [AD-A151523] p 8 N85-26200 An analysis of data dictionaries and their role in information resource management [AD-A152134] p 22 N85-27121 Management aspects of software maintenance [AD-A152035] p.40 N85-27550 A framework for software development p 40 N85-27551 [AD-A152067] Management considerations for an information center p 40 N85-27742 [AD-A151774] Automation of the reporting and tracking requirements of architect-engineering type contracts [AD-A152218] p 52 N85-27745 Overhead management guide for aerospace procurements [AD-A153626] p 18 N85-29835 Capital investment motivational techniques used by prime contractors on subcontractors [AD-A153660] p 53 N85-29837 Using incentives to improve maintainability AD-A153792] p 54 N85-29841 [AD-A153792] Security controls in the Stockpoint Logistics Integrated Communications Environment (SPLICE) , p77 N85-32244 [AD-A155536] An automated quality assurance surveillance plan for ADP (Automated Data Processing) operations under the Navy's commercial activities program [AD-A154767] p 55 N85-32802 A microcomputer tutorial on spreadsheets and databases with a simulated budget preparation [AD-A155516] p 72 N85-32813 The Human Resource Management Information Network (HRMIN) A cost comparison in accordance with Office of Management and Budget (OMB) Circular no A-76, 5 April 1979 [AD-A154583] p 42 N85-33039 Attacking software crisis A macro approach [AD-A155846] p 43 N85-35645 Naval Ship Research and Development Center, Bethesda, Md. A management workstation concept [AD-A145617] p 14 N85-11906 Computer center policy [AD-A154416] p 41 N85-30681 Naval Supply Center, San Diego, Calif. Supply center processes [AD-P004014] p 74 N85-11993 Navy Center for Applied Research in Artificial intelligence, Washington, D.C. On applying AI (Artificial Intelligence) to maintenance and troubleshooting p 26 N85-11595 [AD-P003915] Ninham Shand, Inc (South Africa). Management communication and financial modeling p 16 N85-26190 North Atlantic Assembly, Brussels (Belgium). Sub-committee on advanced technology and technology transfer [AD-A153645] p 53 N85-29836 0

Oak Ridge National Lab., Tenn.

Emerging role of the national laboratory in the development and transfer of materials technology p 49 N85-18086 (DE85-001252)

Generic data entry quality assurance tool p 41 N85-29852 [DE85-008359] Methodology for assessing benefits and costs of government information collection [DE85-010594] p 41 N85-30975 Oak Ridge Y-12 Plant, Tenn. Efforts at office automation and information systems utilization at Martin Marietta Energy Systems, Incorporated p 40 N85-28633 [DE85-008154] Office of Naval Research, Arlington, Va. Overview of training and aiding [AD-P003917] p 5 N85-11597 Office of Naval Research, London (England) European Scientific Notes, volume 38, number 12 p 50 N85-18946 [AD-A148713] French plans for fifth generation computer systems p 50 N85-19732 [AD-A149435] The EEC's information technology program An update [AD-A150022] p 39 N85-22258 Space research in the United Kingdom An assessment p 56 N85-33038 [AD-A155334] Office of Science and Technology, Washington, D. C. Progress report on implementing the recommendations of the White House Science Council's Federal Laboratory Review Panel, volume 1 [PB85-185072] p 78 N85-35819 Office of Software Development, Falls Church, Va. Establishing a Software Engineering Technology (SET) p 35 N85-10702 [PB84-212141] FSTC (Federal Software Testing Center) software tool catalog [PB84-212158] p 36 N85-10703 Microcomputer management guidelines [PB84-212174] p 36 N85-10704 Office of Technology Assessment, Washington, D.C. Civilian space stations and the US future in space p 69 N85-15781 [OTA-STI-241] Issues and findings p 70 N85-15782 A buyer's guide to space infrastructure p 48 N85-15784 p 48 N85-15785 Broadening the debate Synopsis of the OTA Workshop on Cost Containment Civilian Infrastructure (Civilian Space Station) of Elements p 48 N85-15790 Financing considerations and Federal budget impacts p 94 N85-15792 International cooperation and competition in civilian space activites p 70 N85-17750 [OTA-ISC-240] Technology transfer to the Middle East [PB85-127744] p 51 N85-22264 Civilian Space Stations and the US future in Space p 55 N85-31215 [OTA-STI-242] Ohio State Univ., Columbus. Distributed knowledge base systems for diagnosis and information retrieval p 28 N85-16690 [AD-A146890] Old Dominion Univ., Norfolk, Va. Report-reading patterns of technical managers and p 10 A85-21540 nonmanagers P Pacific Northwest Lab., Richland, Wash. Executive information system

[DE84-015355] p 37 N85-13675 Pattern Analysis and Recognition Corp., McLean, Va. Mental models and cooperative problem solving with expert systems

[AD-A147843] p 28 N85-16479 Perceptronics, Inc., Woodland Hills, Calif.

Compatibility effects and preference reversals [AD-A1483991 p 15 N85-17544 Piedmont Aviation, Inc., Winston-Salem, N. C.

Management training for cockpit crews at Piedmont p 6 N85-18013 flight PRC Kentron, Inc., Hampton, Va.

User's operating procedures Volume 2 Scout project financial analysis program p 42 N85-34519

[NASA-CR-177949] President's Private Sector Survey on Cost Control, Washington, D.C.

President's private sector survey on cost control, report on research and development p 95 N85-22253

[PB84-1732691 Purdue Univ., West Lafayette, Ind. A statistical approach to vendor selection

p 16 N85-22249 [AD-A149781]

#### SRI International Corp., Menio Park, Calif.

R

RAND Corp., Santa Monica, Calif. Managing recoverable aircraft components in the PPB (Planning, Programming and Budgeting) and related processes Technical volume [AD-A152014] p 76 N85-25169 Individual characteristics and unit performance. A review of research and methods p 9 N85-28550 [AD-A153145] The outlook for Soviet advanced technologies p 52 N85-28859 [AD-P004564] CODA A concept organization and development aid for the research environment [AD-A154240] p 41 N85-30715 Investigation of DBMS (Data Base Management Systems) for use in a research environment [AD-A154862] p 42 N85-33042 Research Inst. of National Defence, Stockholm (Sweden). Decision making in stressful conditions A model based on the coping perspective [FOA-C-55064-H3] p 15 N85-17738 Human factors engineering contracts in Sweden An overview [FOA-C-56043-H2] p 55 N85-31836 Rolls-Royce Ltd , Derby (England). Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618 Discrete simulation models - their role in the design, development and management of inventory control systems [PNR-90249] p 77 N85-34719 Rome Air Development Center, Griffiss AFB, N.Y. Artificial intelligence applications to maintenance AD-P003914] p 26 N85-11594 [AD-P003914] Royal Signals and Radar Establishment, Malvern (England), Software configuration management across project boundaries and in distributed development environments p 37 N85-13494 [RSRE-MEMO-3704] S Sandia National Labs., Albuquerque, N. Mex. Integration of office automation within computing [DE85-010021] p 42 N85-33736 Quality assurance considerations for the implementation of a pulsed power R and D project p 86 N85-35720 (DE85-012357) Sao Paulo Univ. (Brazil). Project management using graphics p 56 N85-34560 Scenic Air Lines, Inc., Las Vegas, Nev. p6 N85-18025 Low cost training aids and devices Science Applications, Inc., McLean, Va. Space industrialization A national perspective p 67 N85-11015 Singer Co., Wayne, N. J. Design-To-Cost (DTC) methodology to achieve affordable avionics p 71 N85-26645 Societe Nationale Industrielle Aerospatiale, Les Mureaux (France). Studies toward a manned space station Participation of European industry in NASA space station (MSS) p 55 N85-31217 [SNIAS-S/DT-Y-25-212] Softech, Inc., Waltham, Mass. Ada (trademark) training curriculum Real-time concepts 1303 teacher's guide p 35 N85-10694 [AD-A145093] Ada (trademark) training curriculum Software ngineering for managers m101 teacher's exercise guide [AD-A145094] p 35 N85-10695

Software Architecture and Engineering, Inc., Arlington, Va.

A unified model for performance and reliability of Fault-Tolerant/Multi-Mode systems p 84 N85-17601 [AD-A148789]

Software Systems Technologies, Inc , College Park, Md.

Performance evaluation of database systems A benchmark methodology p 36 N85-10707 [PB84-217504]

Space Vector Corp., Northridge, Calif Conestoga 2 A low cost commercial space transport

p 68 N85-11033 system SRI International Corp., Arlington, Va.

Space commercialization Analysis of R and D investments with long time horizons p 68 N85-11052 SRI International Corp., Menlo Park, Calif.

NASA space station automation Al-based technology [NASA-CR-176094] p 31 N85-32134

C-5

CORPORATE SOURCE

Stanford Univ., Calif.			Wilson (James E.), La Plata, Md.
GUIDON			Study to encourage and facilit
[AD-P003925]	p 26	N85-11605	and involvement in space
On maximizing the	expected lifetime of	replaceable	[NASA-CR-176152]
systems	·		Wyle Labs., Inc , Huntsville, Ala.
[AD-A150003]	р 75	N85-21680	Commercial space services

to encourage and facilitate industrial investment

p 72 N85-34147

p 68 N85-11039

Т

Technische Hogeschool, Delft (Netherlands).

- The interface with decision makers in interactive multiobjective linear programming p 17 N85-28637 [REPT-84-38]
- Future directions in operations research p 76 N85-28711 [REPT-84-24] Multicriteria decision analysis as an aid to strategic planning of energy research and development [REPT-84-02] p 18
- p 18 N85-28870 Teledyne Brown Engineering, Huntsville, Ala Data Requirement (DR) MA-03 Payload missions
- integration [NASA-CR-171331] p 84 N85-19009
- Texas A&M Univ., College Station. A proposed integration among organizational information requirements, media richness and structural
- desian [AD-A149317] p 15 N85-19881 Management control systems and interdependencies An empirical study
- [AD-A152280] p 17 N85-27746 Symbolic and interactional perspectives on leadership
- An integrative framework p 19 N85-32769 [AD-A155247]
- Texas Instruments, Inc., Lewisville. Monitoring software development through dynamic
- p 47 A85-49049 variables Transportation Research Board, Washington, D.C. Issues in air transport
- [PB85-121374/GAR] p 71 N85-18030 TRW, Inc., Redondo Beach, Calif.
- The role of robotics in space system operations
- [AIAA PAPER 85-1879]
   p 25
   A85-45902

   TRW Space Technology Labs., Redondo Beach, Calif. Satellite servicing A business opportunity?

p 69 , N85-11056

### U

- United Kingdom Atomic Energy Authority, Harwell (England).
- The application of expert systems to corrosion problems
- p 29 N85-21316 [AERE-M-3445] University City Science Center, Philadelphia, Pa. Manufacturing costs, equipment needs and
- technological opportunities among small and medium-size manufacturers [DE85-000479] p 15 N85-18193
- University of Southwestern Louisiana, Lafayette Knowledge-based communication and management support in a system development environment
- p 27 N85-14596 **Urban Mass Transportation Administration,**
- Washington, D.C. Microcomputers in transportation Software and source book, February 1985 p 77 N85-31868

[PB85-181022]

### V

- Van der Meer en Van Tilburg, Innovatie Adviesburo, Enschede (Netherlands). Spin-offs from technical scientific infrastructures, no 1 p 55 N85-32034 Spin-offs from technical commercial infrastructures, no 2 p 55 N85-32035 Spin-offs from technical scientific research p 55 N85-32036 organizations, no 5 Vermont Univ., Burlington. European scientific notes Volume 38, number 11 [AD-A148228] p 49 N85-17745 European Scientific Notes Volume 39, number 2
- [AD-A148994] p 50 N85-19919

### W

Welding Inst., Cambridge (England). Welder training/welder testing [BLL-WI-TRANS-683-(9312 57)] p 8 N85-27223 Whessoe Ltd., Darlington (England). The development and implementation of advanced welding technology p 22 N85-25824

# FOREIGN TECHNOLOGY INDEX

### MANAGEMENT / A Bibliography for NASA Managers

**APRIL 1986** 

### **Typical Foreign Technology** Index Listing



Listings in this index are arranged alphabetically by country of intellectual origin. The title of the document is used to provide a brief description of the subject matter. The page number and the accession number are included in each entry to assist the user in locating the citation in the abstract section

## A

AUSTRALIA

- Attempt to regulate restrictive commercial practices in the field of air transportation within a transnational antitrus legal and institutional framework p 90 A85-30999 AUSTRIA
- Application of a quality assurance system in the production of materials and components p 79 A85-16254

## B

- BRAZIL
- A report on the training course at Fortaleza (Ceara) p 5 N85-11426 [E85-10013] BULGARIA
- East Europe report Scientific affairs
- p 50 N85-20684 [JPRS-ESA-84-006] East Europe report Science and technology
- [JPRS-ESA-84-032] N85-26833 p 51 RURMA
  - Project management using graphics p 56 N85-34560
    - С

#### CANADA

Annals of air and space law Volume 8

- p 87 A85-23799 Selected American decisions on the Warsaw Convention and related matters - February 1981 to June 1984 I
- p 89 A85-30167 Overcoming project planning and timeliness problems to make Landsat useful for timely crop area estimates
- p 11 A85-32129 The structures and the role of an international agency for the control of satellites
- p 93 N85-12806 [NASA-TM-76765]

Systems research on Cl	hına ın year 2000	
	p 50	N85-21418
Organizing geological w	ork tasks for 1985	outlined
	p 51	N85-27303
OMBIA		
Primer on the registrat	ion of technical in	formation in
lustry	р 36	N85-12786
CHOSLOVAKIA		
Simulators for training a	ircraft maintenance	e personnel
	р 3	A85-29863
Possible applications of	simulators in vario	us areas
	, p 3	A85-29865
East Europe report Sci	ence and technolo	gy
PRS-ESA-84-043]	р 49	N85-17198

#### Quality analysis p 22 N85-32785 F

CHINA, PEOPLE'S REPUBLIC OF

COL

100 CZE

[J

FRANCE Future prospects in space envisaged by a forum of p 44 A85-16302 European space companies Commercialization of remote sensing data - Its impact on the continuity and accessibility of remote sensing data, including response to standing orders as well as on the p 60 A85-20642 standardization of products MESSAGE - An expert system for aircraft crew workload p 24 A85-21569 assessment Europe in space 1985-2000 p 45 A85-26011 Some legal aspects of industrial activity in outer space p 91 A85-38916 The use of microgravity for industrial and commercial p 64 A85-38917 purposes Psychological techniques for the selection and initial training of military air traffic controllers p 4 A85-44244 Quality organization n 83 N85-13257 [CNES-NT-106] Value analysis p 21 N85-13684 [CNES-NT-110] French panel makes specific proposals for robotics research Current state of French robotics p 29 N85-20180 French research minister on policy, technology p 94 N85-20182 transfer French firm plans recapture of domestic CAD/CAM market p 30 N85-25641 European space science horizon 2000 p 51 N85-26771 [ESA-SP-1070] Guide for the execution of reliability tests in the p 85 laboratory N85-27237 Component problems plague French robotics industry p 30 N85-29088 Multinational program to develop intelligent robots p 30 N85-29094 Search and rescue of aircraft in distress in France

- Organization, means p 77 N85-31096 Studies toward a manned space station Participation of European industry in NASA space station (MSS)
- [SNIAS-S/DT-Y-25-212] N85-31217 p 55 Telecommunication market research processing NST-83E018] p 42 N85-34331 [ENST-83E018]

### G

GERMANY, FEDERAL REPUBLIC OF Space station related investigations in Europe [IAF PAPER 84-28] p 43 A85-12994

- Operational preparation of the German Spacelab Mission D1 [IAF PAPER 84-211] p 43 A85-13133 Activities in Germany for the commercialization of
- space [IAF PAPER 84-222] p 59 A85-13142 The European approach to a standardized work breakdown structure concept for European scientific space
- satellites [MBB-UR-688-84-OE] p 44 A85-16088 New system for the selection of air traffic control
- p 1 A85-18720 personnel p 44 A85-25856 Planning for a joint space station

Proposed draft convention on the settlement of space
Design principles for Finite Elements (FE) programs
p 33 A85-28797
Commission stacker - Incorporation in a total logistic
concept (MRR.UT.36-84-OE) p.73_485-35073
Space - The challenge of a new environment
p 63 A85-38902
Reliability for real-time systems
A systems-analysis comparison of space station
projects
[DGLR PAPER 84-118] p 45 A85-40334 Remarks on German space policy - 1985 to 1995
[AAS PAPER 84-319] p 64 A85-42553
Life-cycle-cost-oriented system design in weapon
technology [MBB:114-842-84-OE] p 65 A85 42678
Comparative descriptions of software quality measures
[GMD-STUDIES-81] p 83 N85-10676
Business planning for information services under special
consideration of German management information systems
[BMFT-FB-ID-83-007] p 21 N85-11910
International comparative study of systems for the
government advancement of research and development
German domestic scheduled air transport in the year
2000
[ESA-TT-828] p 69 N85-13792
Activities report of the aerospace industry in West
[ISSN-0722-3838] p 49 N85-16686
Activities report of the aerospace industry in West
Germany
Outer space law A problem of astronautics
[NASA-TM-77760] p 94 N85-16697
Documentation and separate test program development
is most important for test/maintenance
000 100-10740
FRG study looks at participation in ESA, US space
FRG study looks at participation in ESA, US space station p 49 N85-17191
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618 Activities report in aerospace in West Germany
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618 Activities report in aerospace in West Germany [ISSN-0070-3966] p 50 N85-18947 Robot use in FRG increases but sensor technology
FRG study looks at participation in ESA, US space station       p 49       N85-17191         Matenal flow in the manufacturing system         Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems         [PNR-90238]       p 84       N85-18618         Activities report in aerospace in West Germany         [ISSN-0070-3966]       p 50       N85-18947         Robot use in FRG increases but sensor technology         lags       p 29       N85-25605
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618 Activities report in aerospace in West Germany [ISSN-0070-3966] p 50 N85-18947 Robot use in FRG increases but sensor technology lags p 29 N85-25605 MBB cost-reduction plan for Arbus construction
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 64 N85-18618 Activities report in aerospace in West Germany [ISSN-0070-3966] p 50 N85-18947 Robot use in FRG increases but sensor technology lags p 29 N85-25605 MBB cost-reduction plan for Airbus construction described p 71 N85-25616
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618 Activities report in aerospace in West Germany [ISSN-0070-3966] p 50 N85-18947 Robot use in FRG increases but sensor technology lags p 29 N85-25605 MBB cost-reduction plan for Airbus construction described p 71 N85-25616 Criteria for qualifying for FRG federal CAD/CAM subsidies p 51 N85-25615
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618 Activities report in aerospace in West Germany [ISN-0070-3966] p 50 N85-18947 Robot use in FRG increases but sensor technology lags p 29 N85-25605 MBB cost-reduction plan for Airbus construction described p 71 N85-25616 Criteria for qualifying for FRG federal CAD/CAM subsidies p 51 N85-25651 Simulation A tool for cost-effective systems design and
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618 Activities report in aerospace in West Germany [ISSN-0070-3966] p 50 N85-18947 Robot use in FRG increases but sensor technology lags p 29 N85-25605 MBB cost-reduction plan for Airbus construction described p 71 N85-25616 Criteria for qualifying for FRG federal CAD/CAM subsidies p 51 N85-25651 Simulation A tool for cost-effective systems design and live test reduction p 71 N85-26657 Welder training/welder testing
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 84 N85-18618 Activities report in aerospace in West Germany [ISSN-0070-3966] p 50 N85-18947 Robot use in FRG increases but sensor technology lags p 29 N85-25605 MBB cost-reduction plan for Airbus construction described p 71 N85-25616 Criteria for qualifying for FRG federal CAD/CAM subsidies p 51 N85-25651 Simulation A tool for cost-effective systems design and live test reduction p 71 N85-26657 Welder training/welder testing [BLL-WI-TRANS-683-(9312 57)] p 8 N85-27223
FRG study looks at participation in ESA, US space station       p 49       N85-17191         Matenal flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems       p 84       N85-18618         Activities report in aerospace in West Germany       p 84       N85-18618         ISSN-0070-3966       p 50       N85-18618         Activities report in aerospace in West Germany       [ISSN-0070-3966]       p 50         IBS cost-reduction plan for Airbus construction described       p 71       N85-25605         MBB cost-reduction plan for Airbus construction described       p 51       N85-25616         Criteria for qualifying for FRG federal CAD/CAM subsidies       p 51       N85-25651         Simulation A tool for cost-effective systems design and live test reduction       p 71       N85-26657         Welder training/welder testing       [BLL-Wi-TRANS-683-(9312 57)]       p 8       N85-27223         The Helios missions       p 52       N85-27795       The optimizers of Helios (r Europe
FRG study looks at participation in ESA, US space station p 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] p 54 N85-18618 Activities report in aerospace in West Germany [ISSN-007-03966] p 50 N85-18947 Robot use in FRG increases but sensor technology lags p 29 N85-25605 MBB cost-reduction plan for Airbus construction described p 71 N85-25616 Criteria for qualifying for FRG federal CAD/CAM subsidies p 51 N85-25651 Simulation A tool for cost-effective systems design and live test reduction plan for J1 N85-2657 Welder training/welder testing [BLL-WI-TRANS-683-(9312 57)] p 8 N85-27233 The Helios missions p 52 N85-27795 The significance of Helios for Europe p 52 N85-27808
FRG study looks at participation in ESA, US space station       p 49       N85-17191         Material flow in the manufacturing system         Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems         [PNR-90238]       p 64       N85-18618         Activities report in aerospace in West Germany         [ISSN-007-03966]       p 50       N85-18947         Robot use in FRG increases but sensor technology         lags       p 29       N85-25605         MBB cost-reduction plan for Airbus construction         described       p 71       N85-25616         Criteria for qualifying for FRG federal CAD/CAM         subsidies       p 51       N85-25651         Simulation A tool for cost-effective systems design and         live test reduction       p 71       N85-26657         Welder training/welder testing       [BLL-WI-TRANS-683-(9312 57)]       p 8       N85-27223         The Helios missions       p 52       N85-27808       Managerial benefits of Helios for the European
FRG study looks at participation in ESA, US space station       p 49       N85-17191         Material flow in the manufacturing system         Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems         [PNR-90238]       p 84       N85-18618         Activities report in aerospace in West Germany         [ISSN-0070-3966]       p 50       N85-18947         Robot use in FRG increases but sensor technology         lags       p 29       N85-25605         MBB cost-reduction plan for Airbus construction         described       p 71       N85-25616         Criteria for qualifying for FRG federal CAD/CAM         subsidies       p 51       N85-26657         Welder training/welder testing       [BLL-WI-TRANS-683-(9312 57)]       p 8       N85-27223         The Helios missions       p 52       N85-27808       Managerial benefits of Helios for the European industry         p 52       N85-27808       Managerial benefits of Helios for the European industry       p 52       N85-27808
FRG study looks at participation in ESA, US space station       p 49       N85-17191         Matenal flow in the manufacturing system         Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems         [PNR-90238]       p 84       N85-18618         Activities report in aerospace in West Germany         [ISSN-0070-3966]       p 50       N85-18947         Robot use in FRG increases but sensor technology         lags       p 29       N85-25605         MBB cost-reduction plan for Airbus construction         described       p 71       N85-25616         Criteria for qualifying for FRG federal CAD/CAM         subsidies       p 51       N85-25657         Welder training/welder testing       [BLL-WI-TRANS-683-(9312 57)]       p 8       N85-27223         The Helios missions       p 52       N85-27808       Managerial benefits of Helios for the European industry       p 52       N85-27809         Helios project support       p 17       N85-27809       p 17       N85-27809
FRG study looks at participation in ESA, US space station       p 49       N85-17191         Matenal flow in the manufacturing system         Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems         [PNR-90238]       p 84       N85-18618         Activities report in aerospace in West Germany         [ISSN-0070-3966]       p 50       N85-18947         Robot use in FRG increases but sensor technology         lags       p 29       N85-25605         MBB cost-reduction plan for Airbus construction         described       p 71       N85-25615         Simulation A tool for cost-effective systems design and         live test reduction       p 71       N85-25657         Welder training/welder testing       [BLL-WI-TRANS-683-(9312 57)]       p 8       N85-27223         The Helios missions       p 52       N85-27795       The significance of Helios for Europe       p 52       N85-27808         Managerial benefits of Helios for the European industry       p 52       N85-27809       Helios project support       p 17       N85-27812         Guidelines of the Federal Minister of Transportation for       p 17       N85-27812
FRG study looks at participation in ESA, US space station       p 49       N85-17191         Material flow in the manufacturing system       p 49       N85-17191         Material flow in the manufacturing system       support for the maintenance of highly automated manufacturing systems       p 84       N85-17191         Material flow in the manufacturing systems       p 84       N85-17191       p 84       N85-17191         Material flow in the manufacturing systems       p 84       N85-18618       Activities report in aerospace in West Germany         [ISN-0070-3966]       p 50       N85-18947       Robot use in FRG increases but sensor technology         gas       p 29       N85-25605       MBB cost-reduction plan for Airbus construction         described       p 71       N85-25661         Simulation A tool for cost-effective systems design and       N85-26657         Welder training/welder testing       [BLL-WI-TRANS-683-(9312 57)]       p 8       N85-27823         The Helios missions       p 52       N85-27805       The significance of Helios for Europe         magerial benefits of Helios for the European       ndustry       p 52       N85-27809         Helios project support       p 17       N85-27812       Activities in aerospace       p 22       N85-27821         Helios project support       p 17
FRG study looks at participation in ESA, US space station       p 49       N85-17191         Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems       p 84       N85-17191         Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems       p 84       N85-18618         Activities report in aerospace in West Germany [ISN-0070-3966]       p 50       N85-18618         Activities report in aerospace in West Germany [ISN-0070-3966]       p 50       N85-18947         Robot use in FRG increases but sensor technology lags       p 29       N85-25605         MBB cost-reduction plan for Airbus construction described       p 71       N85-25616         Criteria for qualifying for FRG federal CAD/CAM subsidies       p 51       N85-26651         Simulation A tool for cost-effective systems design and live test reduction       p 71       N85-26657         Welder training/welder testing       [BLL-WI-TRANS-683-(9312 57)]       p 8       N85-27795         The significance of Helios for Europe industry       p 52       N85-27808         Managerial benefits of Helios for the European industry       p 17       N85-27812         Activities in aerospace       p 22       N85-27812         Activities in aerospace       p 21       N85-27812
FRG study looks at participation in ESA, US space station       p 49       N85-17191         Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems       PS-17191         Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems       PS-17191         Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems       PS-17191         Material flow in the manufacturing systems       p 50       N85-18618         Activities report in aerospace in West Germany [ISSN-0070-3966]       p 50       N85-18618         Activities report in aerospace but sensor technology lags       p 29       N85-25605         MBB cost-reduction plan for Airbus construction described       p 71       N85-25651         Simulation A tool for cost-effective systems design and live test reduction       p 71       N85-26657         Welder training/welder testing       [BLL-WI-TRANS-683-(9312 57)]       p 8       N85-27223         The Helios missions       p 52       N85-27808         Managerial benefits of Helios for the European industry       p 52       N85-27809         Managerial benefits of Helios for the European industry       p 28       N85-278212         Activities in aerospace       p 22       N85-278212<
FRG study looks at participation in ESA, US space station $p$ 49 N85-17191 Material flow in the manufacturing system Fault-diagnosis systems as support for the maintenance of highly automated manufacturing systems [PNR-90238] $p$ 84 N85-18618 Activities report in aerospace in West Germany [ISN-0070-3966] $p$ 50 N85-18618 Activities report in aerospace in West Germany [ISN-0070-3966] $p$ 50 N85-18618 MBB cost-reduction plan for Airbus construction described $p$ 71 N85-25605 MBB cost-reduction plan for Airbus construction described $p$ 71 N85-25651 Simulation A tool for cost-effective systems design and live test reduction $p$ 71 N85-2657 Welder training/welder testing [BLL-WI-TRANS-683-(9312 57)] $p$ 8 N85-27233 The Helios missions $p$ 52 N85-27808 Managerial benefits of Helios for the European industry $p$ 52 N85-27808 Managerial benefits of Helios for the European industry $p$ 52 N85-27809 Helios project support $p$ 17 N85-27801 Guidelines of the Federal Minister of Transportation for the formation and examination of airline personnel, part 4 $p$ 9 N85-28556 Construction of a job-oriented test for the selection of air traffic controllers [DFVLR-FB-84-51] $p$ 9 N85-28556

space policy decision p 96 N85-28886 New ESA director on Ariane, space station, future p 53 N85-29096 trends

FRG weighs ESA participation, budget issues p 53 N85-29110

### GERMANY, PEOPLES DEMOCRATIC REPUBLIC OF

International space research perspectives of commercialization for German industry p 54 N85-29979 INASA-TM-776571 Research report program of the US Army in Europe p 56 N85-35167 New technologies at the forefront of industrial p 56 N85-35168 developments GERMANY, PEOPLES DEMOCRATIC REPUBLIC OF New concepts for industrial robots outlined n 27 N85-15176 East Europe report Science and technology p 49 N85-17176 [JPRS-ESA-84-046] Man-machine communication research for robotics

reported p 28 N85-17177 Flexible manufacturing system concept features cache memory p 28 N85-17186

### Η

Robot production lines in operation			
	p 29	N85-20166	
Plans, developments in robotics	p 29	N85-24191	

#### INDIA

Reliability and maintainability considerations in computer performance evaluation p 78 A85-10055 Multilievel monitoring system for a central research and development agency p 11 A85-29402 INTERNATIONAL ORGANIZATION Orientation and trends in European technology UNE DAGED 21 2727

[IAF PAPER 64-3//]	p 59	A02-12233
Intelsat business services	p 60	A85-15463
Simulators/training devices for cor	nmuter a	ırlınes
-	р 1	A85-17232
The ESA science programme	p 45	A85-34146
Symposium on Industrial Activity in	Space, S	Stresa, Italy,
May 2-4, 1984, Proceedings	p 63	A85-38901
Legal aspects of space activities	p 91	A85-39093
Spacelab and Eureca as a b	asis for	European

Involvement in the Space Station p 46 A85-42694 The imposition of flow control avoids ATC, overloads p 74 A85-48851

Sub-committee on advanced techno	ology and	d technology
transfer		
[AD-A153645]	p 53	N85-29836

[RD-A155045] p 53 (865-2965)

A simple method for evaluation and selection of R&D proposals for a competitive grant fund p 44 A85-13920

Sparing criteria - Clear management approach p 82 A85-49577

#### ITALY

International Scientific Conference on Space, 23rd, Rome, Italy, March 24, 25, 1983, Proceedings p 43 A85-12501

Space exploitation - Spacelab an easy approach for developing countries Prospectives and suggestions by Aeritalia p 58 A65-12502 Spacelab to Space Station, Proceedings of the International Symposium on Spacelab 1 - Results, Implications and Perspectives, Naples and Capri, Italy, June 11-16, 1984 p 20 A85-39076

Future directions of robotics, automation in Italy p 30 N85-28187 Note for a research feasibility project High reliability

design in the aeronautical field [REPT-84-RR-350] p 85 N85-31005

### J

- JAPAN
- Performance/reliability measures for fault-tolerant computing systems p 80 A85-25108 Some remarks on optimum inspection policies p 80 A85-25109 Quality charactenstic feedback control
- p 20 A85-35100 Worldwide report Telecommunications policy, research and development
- [JPRS-TTP-85-006] p 94 N85-19314

### L

#### LATVIA

Certain problems in the automated assessment of the operating efficiency of man-machine systems p 24 A85-24035 N

#### NETHERLANDS US jurisdiction and bilateral air agreements p 86 A85-10050 The communication-satellite market to the year 2000 p 60 A85-26771 The ESA product assurance specification system p 83 N85-13259 Explanatory note Commercial space Europe should have independent p 71 N85-19205 strategy The interface with decision makers in interactive multiobjective linear programming [REPT-84-38] p 17 N85-28637 Future directions in operations research p 76 N85-28711 (REPT-84-24) Operations research [B8561897] p 76 N85-28712 Multicriteria decision analysis as an aid to strategic planning of energy research and development [REPT-84-02] o 18 N85-28870 Spin-offs from technical scientific infrastructures, no 1 p 55 N85-32034 Spin-offs from technical commercial infrastructures, no p 55 N85-32035 2 Som-offs from technical scientific research N85-32036 organizations, no 5 p 55

### 0

OTHER System sizing - The theory and the practice p 78 A85-11351

### Ρ

#### POLAND

General probability of system failure

- p 78 A85-10057 Jurisdiction over and supervision of international crews in space p 89 A85-30014 Satellite broadcasting and the use of the geostationary
- orbit Some international legal aspects p 90 A85-36289 Legal issues of manned orbiting space stations
- p 92 A85-50055 Towards the entire demilitarization of outer space p 92 A85-50056

### R

#### ROMANIA (RUMANIA)

Importance of automation, robotization in economy p 31 N85-32219

### S

- SOUTH AFRICA, REPUBLIC OF
  - Modelling the demand for construction

     [CSIR-TWISK-322]
     p 21
     N85-10218

     Optimizing search with positive information feedback
     [CSIR-TWISK-313]
     p 36
     N85-10855

     Decision Support System (DSS)
     A survey
  - [NRIMS-TWISK-317] p 14 N85-11896 An analysis of a dynamic project cost problem [CSIR-TWISK-338] p 71 N85-23341
  - Status of the U K N D T industry today p 22 N85-24309 Computers and the consulting engineer
  - p 22 N85-26184 Management communication and financial modeling
- SWEDEN p 16 N85-26190 UK, FRG, France R and D in sensors, related fields p 49 N85-17197
- Decision making in stressful conditions A model based on the coping perspective [FOA-C-55064-H3] p 15 N85-17738 Human factors engineering contracts in Sweden An
- overview [FOA-C-56043-H2] p 55 N85-31836
- SWITZERLAND How does NASA plan to help? p 90 A85-33872 Hermes - Does Europe need its own spaceplane? p 64 A85-41534

### U

U.S.S.R. Arcraft maintenance p 19 A85-11245 Methods for improving the quality of computer software p 31 A85-11275

#### FOREIGN TECHNOLOGY INDEX

A quantitative evaluation of human activity p 23 A85-13599 man-machine systems Some perspectives on the study and improvement of the cognitive-creative activity of an individual and a p 2 A85-23276 group Interpersonal activity in conditions of group learning p 2 A85-23278 Some principles for the construction of an adaptive training system p.3 A85-23279 The principles of experimental setup in models of complex human operator activities p 3 A85-23283 Interrelationship between learning and development in the process of mastering an occupational activity p 3 A85-23285 Basic principles of the development and execution of a system for the psychological selection of military personnel p 3 A85-28024 Problem-onented systems for processing experimental ata p 34 A85-34919 data p 90 A85-36997 International space law Evaluation of the efficiency of operator work in man-machine systems p 25 A85-37566 Elements of the theory of multistep processes of sequential decision making p 34 A85-38643 p 91 A85-38699 International space law An analysis of ergonomic systems p 5 A85-46148 Custom as a source of international law of outer p 92 A85-49973 space Role of engineering psychology p 6 N85-18561 Problems of psychological support of automated organization control systems p 28 N85-18571 Dean of Kiev State University on impact of robots p 28 N85-19213 Worldwide report Telecommunications policy, research and development [JPRS-TTP-85-002] n 94 N85-19309 Health standards for general vibration p 84 N85-19607 Study of cognitive styles of students in automated p 6 N85-19620 teaching system Transportation [JPRS-UTR-85-004] p 50 N85-21105 Aviation repair plant directors on quality control p 84 N85-21106 measures USSR report Space [JPRS-USP-85-001] p 51 N85-22403 US, Soviet space program aims contrasted p 95 N85-22455 USSR report Science and technology policy [JPRS-UST-85-002] 95 N85-23442 Improvements in personnel needed for better flight afety p 8 N85-23693 safety Administration chief on air traffic control improvements p 76 N85-25193 Militarization of space activity in United States p 96 N85-25360 Applications of robots in machine tool industry p 22 N85-28189 reviewed General laws of development of technology p 30 N85-28875 UNITED ARAB REPUBLIC Registration and nationality of aircraft operated by international agencies in law and practice p 89 A85-27396 UNITED KINGDOM Destruction of Korean Air Lines Boeing 747 over Sea of Japan, 31 August 1983 p 86 A85-10049 p 59 A85-13914 The first space product Testing, evaluation and guality control of composites. Proceedings of the International Conference, University of Surrey, Guildford, Surrey, England, September 13, 14 p 78 A85-14101 1983 Quality assurance in a production environment p 79 A85-14109 The role of company boards in design leadership p 10 A85-17777 Work flow in manufacturing systems p 20 A85-19181 Software design methods p 32 A85-21457 Europe's space odyssey 2000 . p 44 A85-23921 Punitive damages in aviation products liability cases p 88 A85-27394 Cargo claims - From the carrier's point of view p 88 A85-27395 The liability of aircraft manufacturers and certification authorities in the United Kingdom p 89 A85-27397 What are we in business for? - An engineering approach to project finance p 61 A85-27648 Boeing's airliner launch criteria p 61 A85-28824 Machine vision The eyes of automation - A manager's p 20 A85-35799 practical quide European space industry's potential p 64 A85-38904 p 3 A85-39368 Human factors in aviation 1

- Automation in air traffic management
  - p 74 A85-49171

### FOREIGN TECHNOLOGY INDEX

Reliability prediction - Improving the crystal ball Software configuration management across project boundaries and in distributed development environments [RSRE-MEMO-3704] [RSRE-MEMO-3704] p 37 N85-13494 
 [RSRE-MEMO-3704]
 p. or.

 Innovation in British industry (notably the aircraft industry) and its value. Collected papers

 [BAE-KRS-N-GEN-286]
 p.49

 N85-17933
 [BAE-KRS-N-GEN-286] p 49 N85-17933 Expert systems in contract management A pilot study [AD-A149363] p 29 N85-19873 The application of expert systems to corrosion problems [AERE-M-3445] p 29 N85-2 The EEC's information technology program p 29 N85-21316 Ап update [AD-A150022] p 39 N85-22258 The development and implementation of advanced velding technology p 22 N85-25824 Welding techniques in pressure part technology p 22 N85-25835 welding technology 
 Human factors department 1981 publications

 [BAE-BT-12685]
 p 8

 Information technology applications in voluntary sector transport operations

 SP1
 Objectives and programme
 of work [TT-8501] p 71 N85-26457 Space station study [BL-6167] p 53 N85-28959 The development of complex systems

p 55 N85-32021 Discrete simulation models - their role in the design, development and management of inventory control systems [PNR-90249]

p 77 N85-34719

# **CONTRACT NUMBER INDEX**

### MANAGEMENT / A Bibliography for NASA Managers

**APRIL 1986** 

### Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number, the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the AIAA accession numbers appearing first. The accession number denotes the number by which the citation is identified in the abstract section. Preceding the accession number is the page number on which the citation may be found

AF PROJ 2527	p 85	N85-29593
	p 85	N85-29594
	p 85	N85-29595
AF PROJ 9991	p 37	N85-16694
AF-AFOSR-0122-81	p 83	N85-12773
	, p 85	N85-30665
AF-AFOSR-0132-84	p 84	N85-17601
AF-AFOSR-0229-80	D 14	N85-11675
AF-AFOSR-0253-82	0.17	N85-28616
AF-AFOSB-0255-82	n 28	N85-16690
AF-AFOSR-81-0122	p 80	A85-34449
A57A/1667	p 53	N85-28959
DA PROJ RR0-4209	p 29	N85-24842
DA PROJ 1L1-61102-AH-43	58	N85-27028
DA PROJ 1L1-62618-AH-80	p 8	N85-27028
DA PROJ 1T1-61102-BH-57	p 29	N85-19873
DA PROJ 202-62717-A-765	p 5	N85-16475
DA PROJ 202-62731-A-792	p 5	N85-16475
DA PROJ 4A1-62731-AT-41	p 48	N85-16683
DAAB07-83-C-K514	p 35	N85-10694
	p 35	N85-10695
DAAG29-84-C-0045	p 84	N85-17601
DAHC19-78-C-0001	p 8	N85-21978
DAJA45-84-C-0024	p 29	N85-19873
DE-AC03-76SF-00098	p 39	N85-22259
DE-AC04-76DP-00789	p 42	N85-33736
	p 86	N85-35720
DE-AC05-84CS-21400	p 40	N85-28633
DE-AC05-84OR-21400	p 49	N85-18086
	p 41	N85-29852
	p 41	N85-30975
DE-AC06-76FF-02170	p 84	N85-20936
DE-AC06-76RL-01830	p 37	N85-13675
DE-AC09-76SR-00001	p 29	N85-20383
DE-AI01-76E1-20356	p 12	A85-41319
DE-FC01-83CE-40654	p 15	N85-18193
DLAH00-83-D-0225	p 40	N85-28879
DO1-FA79WA-4360	p 23	A85-17817
DTFA01-84-C-00017	p 4/	N85-10929
EMW-C-0743	p 19	N85-35313
EMW-C-0877	p 14	N85-12/91
ESA-530//82/F	p 55	N85-31217
F19628-84-C-0001	p 42	N85-32807
F 19626-64-D-0016	p 52	1085-28649
F30602-81-0-0203	p 12	A85-38415
F30602-62-0-0039	p 37	NOD-10490
F30002-82-0-013/	0 85	NOD-29093
	p 65	NOD-29094
E20602 82 C 0154	p 65	1103-29393
F30002-03-0-0134	p 12	A03-30415
F33013-70-0-0019	più	1100-30028

F33615-81-C-5034 F33615-81-C-5119 F33615-83-C-5080
F33657-83-C-0229 F49620-82-C-0089 MDA903-79-C-0191 MDA903-81-C-0166
MDA903-81-C-0381 MDA903-81-C-0517 MDA903-82-G-0053 MDA903-82-G-0055 MDA903-83-C-0047 MDA903-83-C-0031
NAG1-138 NASA TASK RE-152 NASA TASK 84-18 NASW-3455 NASW-3541
NASW-3811 NASW-3873 NASW-3924 NASW-4003 NASW-4004 NASW-4005 NAS1-17412 NAS1-18000 NAS2-11864 NAS7-100 NAS7-918
NAS8-32712 NAS8-35031 NAS9-16023 NB82-SBCA-1645 NCA2-OR680-401 NR PROJ 170-911 NSF ECS-81-16135 NSF ECS-82-00837 NSF IST-81-06519 NSF IST-81-06519 NSF MCS-78-23676 NSF MCS-78-23676 NSF MCS-82-02869 NSF PRA-81-0558 NSF 78-16414 NSG-1625
NSG-5123 N00014-75-C-0455 N00014-80-C-0160 N00014-81-C-0017 N00014-81-C-0699 N00014-81-C-0699 N00014-81-K-0817 N00014-82-C-0643 N00014-82-C-0803
N00014-83-C-0025
N00014-83-C-0537 N00014-83-K-0193 N00014-83-K-0217 N00014-83-K-0224 N00014-83-K-0756 N00014-84-C-0167 N00014-84-C-0167 N00014-84-K-0016
N00014-84-K-0244 N00014-84-K-0731 N00024-83-C-5301 N00039-82-C-0427

F33615-81-C-0007

	NOC 40040
p 5	N85-10648
p 47	N85-11898
p 26	N85-10372
p 26	N85-11347
o 23	N85-35410
0.83	N85-10943
p 00	NOS-10040
p 26	N05-17305
р 5	N85-16475
p 14	N85-16668
o 53	N85-29834
n 41	N85-30676
p 41	NOS 20066
p 10	1103-30900
p 76	N85-25169
p 4	A85-45094
p 70	N85-16681
n 48	N85-16675
р <del>1</del> 0	NOE DOEED
ha	N05-20550
р 36	N85-115/5
p 38	N85-17592
p 35	N85-10685
p 12	A85-41319
n 79	485-17873
- 01	NOS-10070
p 21	1005-100/9
p 93	N85-12806
р 48	N85-13689
p 21	N85-21414
n 79	N85-34147
	N85 10640
P 0	AGE 40470
p 81	A85-43176
р 56	N85-34153
p 54	N85-29979
p 94	N85-16697
D 70	485.17833
p / 3	NOS-11000
p 42	1105-34519
p 31	N85-32134
р 35	A85-48511
p 33	A85-34128
p 72	N85-26842
	NR5 28550
p 9	NOC 40000
p 84	N85-19009
p 25	A85-45902
p 79	A85-17873
p 36	N85-10707
n 30	N85-30721
p 00	NOE 17726
p 15	105-17730
p 25	A85-31792
p 83	N85-11646
p 25	A85-31792
n 38	N85-19891
0.33	485-31701
p 00	ADE 06007
p 81	A60-30297
p 20	A85-25118
p 11	A85-33650
p 72	A85-21548
p 73	A85-48239
n 47	A85-49049
0.16	NO5 20240
p 10	1103-22249
p 96	N85-32038
p 15	N85-17736
p 16	N85-22248
p 27	N85-11609
p 10	N85-32768
0.15	N85-17544
p 15	NO5 10974
p/	1902-19874
p 7	N85-19875
p 7	N85-19876
p 7	N85-19877
p 15	N85-19881
n 17	N85-27746
P 17	NIDE 00760
p 19	100-J2/09
p 28	N85-164/9
p 14	N85-16474
p 83	N85-11646
p 27	N85-11609
n 50	N85-28867
p 33	NIDE 00040
p 16	1000-22249
p 29	N85-24842
р 18	N85-28852
p 18	
-	N85-28854
n 75	N85-28854 N85-21680
p 75	N85-28854 N85-21680
р75 р8	N85-28854 N85-21680 N85-24732
р 75 р 8 р 27	N85-28854 N85-21680 N85-24732 N85-12792
p 75 p 8 p 27 p 33	N85-28854 N85-21680 N85-24732 N85-12792 A85-31791

8	N00039-83-C-0567	p 33	A85-31209
8	N00204-82-C-0113	p 2	A85-21588
2	N61339-81-C-0126	p 5	N85-12302
7	RR0-4204	p 10	N85-32768
0	SRI PROJ 7268	p 31	N85-32134
3	W-7405-ENG-36	p 36	N85-12606
5		р 39	N85-23315
'5		р 30	N85-30723
8	W-7405-ENG-48	p 17	N85-28392
4	023-10-01-01	p 47	N85-13666
6	482-58-13-02	p 38	N85-20689
6	563-22-69-88	p 42	N85-34519
9	656-13-50	p 30	N85-30721

# **REPORT NUMBER INDEX**

### MANAGEMENT / A Bibliography for NASA Managers

**APRIL 1986** 

### Typical Report Number Index Listing

	·									
	NASA			_						
	ACCESSION MICROFI	ICHE	AD-A148399	p 15	N85-17544	#	AD-A156072	p 57	N85-35815	#
NUMBER	NUMBER SYMBO	or I	AD-A148713	p 50	N85-18946	#	AD-A156073	p 57	N85-35816	#
<u> </u>	I	ليه	AD-A148774	p 38	N85-17592	#	AD-A156128	p 86	N85-35817	#
	L		AD-A148789	p 84	N85-17601	#	AD-A156193	p 23	N85-35410	#
NASA-CR-168570	D 5 N85-11426	• #	AD-A148994	p 50	N85-19919	#	AD-A156327	p 19	N85-35498	#
11404-011-1003/0	1005-11420	ı″	AD-A149076	p 15	N85-19694	#		,		"
			AD-A149317	p 15	N85-19881	#	AD 5001512	- 50	NOC 40010	"
			AD-A149363	p 29	N85-19873	#	AD-E301513	p 50	N85-19919	Ŧ
	PAGE NASA		AD-A149398	р/	N85-19874	#	AD-E401312	p 53	N85-29837	#
	NUMBER DOCUME	INT	AD-A149399	p 7	N85-19875	#	AD-E440275	p 52	N85-28855	#
	I SYMBO	ռլ	AD-A149400	p <u>7</u>	N85-19876	#	AD-E500678	p 36	N85-11575	#
			AD-A149401	p /	N85-19877	#	AD-E500686	p 38	N85-17592	#
			AD-A149435	p 50	N85-19732	#	AD-E500690	D 50	N85-19732	#
			AD-A149546	p 50	N85-20933	#	AD-E750943	0.69	N85-11556	#
Listings in this inde	ex are arranged alph	na-	AD-A149621	p 16	N85-22248	#		P 00		"
numerically by report n	umber The page numb	per	AD-A149662	b R	N85-21978	#	AD-F300490	p 75	N85-16678	#
indicates the page on w	hich the citation is locate	ed	AD-A149781	p 16	N85-22249	#	AD-F300533	p 29	N85-19873	#
The approximation outplot	denotes the ourshes		AD-A1499/1	p 22	N05-21989	#	AD-F300588	p 8	N85-27028	#
The accession number	denotes the number	Uy	AD-A150003	p / 5	N85-21060	#	AD-F630670	p 77	N85-29840	#
which the citation is	identified An asterisk	(^)	AU-A150022	p 39	N85-22258	Ħ	AD-F630708	p 77	N85-30965	#
indicates that the item i	s a NASA report A pou	ind	AD-A150347	p 95	N85-23453	#				
sign (#) indicates that	the item is available	00	AD-A150611	p 39	1N80-23449	#	AD-P003914	p 26	N85-11594	#
sign (#) indicates that	the term is available	011	AD-A150637	p / 5	N85-22349	Ħ	AD-P003915	p 26	N85-11595	#
microfiche			AD-A150720	p 16	N85-24876	Ħ	AD-P003917	p 5	N85-11597	#
			AU-A150743	. p.94	N85-16852	#	AD-P003925	p 26	N85-11605	#
			AD-A151029	р 8 — 00	N85-24/32	Ħ	AD-P003926	p 26	N85-11606	#
			AD-A1510/4	p 29	N85-24842	Ħ	AD-P003929	0 27	N85-11609	#
	- 64 ARE 40550	4	AD-A151523	рв	N85-26200	#	AD-P003934	p 27	N85-11614	#
AAS PAPER 84-319	ρ 64 Αδ5-42553	ĦF	AU-A151/14	p 39	N85-26167	Ħ	AD-P004014	p 74	N85-11993	Ű#
			AD-A151/74	p 40	N85-27742	#	AD-P004564	p 52	N85-28859	#
ACSC-84-0225	p 14 N85-12772	#	AD-A151878	p 51	N85-26456	#	AD-P004565	p 96	N85-28860	#
ACSC-85-1405	p 19 N85-35498	#	AD-A151895	p 16	N85-25283	#	AD-P004569	p 53	N85-28865	#
ACSC-85-1535	p 86 N85-35817	#	AD-A151911	p 1/	N85-27743	#		P		"
			AD-A151925	p /6	N85-27744	Ħ	AERE-M-3445	p 29	N85-21316	#
AD-A142547	p 14 N85-16474	#	AD-A152014	p /6	N85-25169	Ħ		•		
AD-A144891	p 26 N85-10372	#	AD-A152035	p 40	N85-27550	#	AFHRL-SR-84-15	p 37	N85-16694	#
AD-A144905	p 36 N85-10859	#	AD-A152067	p 40	N85-2/551	Ħ				
AD-A145059	p 21 N85-10002	#	AD-A152134	p 22	N85-2/121	Ħ	AFHRL-TP-84-24	p 5	N85-10648	#
AD-A145093	p 35 N85-10694	#	AD-A152218	p 52	N85-2//45	#	AFHRL-TP-84-44	p 10	N85-30628	#
AD-A145094	p 35 N85-10695	#	AU-A152280	p 17	N85-27746	Ŧ		•		
AD-A145143	p 5 N85-10648	#	AD-A152295	p e	N85-27028	Ħ	AFIT/CI/NR-84-68D	p 21	N85-16691	#
AD-A145318	p 14 N85-12772	#	AD-A152598	p 18	N85-28852	Ŧ	AFIT/CI/NR-84-82T	p 94	N85-16684	#
AD-A145447	p 69 N85-11556	#	AD-A152603	p 18	N85-28854	#	AFIT/CI/NR-84-83T	p 70	N85-17735	#
AD-A145467	p 26 N85-11347	#	AD-A152715	p 1/	N85-28616	#	AFIT/CI/NR-85-30T	p 51	N85-26456	#
AD-A145493	p 36 N85-11575	#	AD-A152730	p 52	N85-28855	#		F		"
AD-A145498	p 83 N85-12773	#	AD-A153031	p 40	N85-28879	#	AFIT/GCS/ENG/84D-6	p 39	N85-26167	#
AD-A145524	p 47 N85-11898	#	AD-A153145	p 9	N85-28550	#				
AD-A145595	p 83 N85-11646	#	AD-A153214	p 52	N85-28649	Ħ	AFIT/GLM/LSM/84S-14	p 75	N85-16673	#
AD-A145608	p 14 N85-11675	#	AD-A153298	p 53	N85-28867	#	AFIT/GLM/LSM/84S-50	p 75	N85-16678	#
AD-A145617	p 14 N85-11906	#	AD-A153564	p 53	N85-29834	Ŧ	AFIT/GLM/LSM/84S-52	р р75	N85-16008	#
AD-A145651	p 83 N85-10943	#	AD-A153626	p 18	N85-29835	Ŧ	AFIT/GLM/LSM/84S-60	D 70	N85-17733	#
AD-A145710	p 47 N85-10929	#	AD-A153645	p 53	N85-29836	#				
AD-A145762	p 75 N85-12790	#	AD-A153660	p 53	N85-29637	#	AFIT/GSM/LSY/84S-26	p 70	N85-17580	#
AD-A145846	p 74 N85-11996	#	AD-A153696	p //	N85-29040	#		•		
AD-A146002	p 14 N85-12791	#	AD-A153709	p //	N85-30965	Ħ	AFIT/GSO/OS/84D-8	p 17	N85-27743	#
AD-A146075	p 5 N85-12302	#	AD-A153730	p 18	N85-30966	#				
AD-A146081	p 27 N85-12792	#	AD-A153792	p 54	N65-29641	#	AFIT/GS0/OS/84D-3	p 16	N85-25283	#
AD-A146137	p 47 N85-12775	#	AD-A153988	p 85	N85-29593	#		•		
AD-A146263	p 69 N85-12805	#	AD A150000	h 92	NOD-29394	#	AFLMC-LS840612	p 77	N85-30965	#
AD-A146662	p 37 N85-13494	#	AD-A153990	p 65	N85-29595	#	AFLMC-LS840810	p 77	N85-29840	#
AD-A146681	p 27 N85-15448	#	AD-A10409/	p 85	NIRE 20605	# #				
AD-A146832	p 5 N85-16475	#	AD-A154108	p 10	N85-30628	Ħ	AFOSR-84-0728TR	p 83	N85-12773	#
AD-A146844	p 37 N85-16498	#	AD-A154240	p 41	N85-30/15	#	AFOSR-84-0830TR	p 14	N85-11675	#
AD-A146876	p 14 N85-16668	#	AD-A154349	p 41	N85-30676	#	AFOSR-84-0864TR	p 28	N85-16690	#
AD-A146890	p 28 N85-16690	#	AD-A154416	p 41	N85-30681	#	AFOSR-84-1016TR	p 28	N85-17365	#
AD-A147121	p 75 N85-16673	#	AD-A154583	p 42	N85-33039	#	AFOSR-84-1094TR	p 84	N85-17601	#
AD-A147314	p 48 N85-16675	#	AD-A154716	p //	N85-33036	#	AFOSR-85-0275TR	p 17	N85-28616	#
AD-A147381	p 21 N85-16691	#	AD-A154/6/	p 55	NOJ-J2002	# #				
AD-A147496	p 75 N85-16678	#	AD-A154662	p 42	N85-33042	# #	AFWAL-TR-84-4000	p 52	N85-28855	#
AD-A147579	p 37 N85-16694	#	AD A155001	p 42	N05-32807	#	AFWAL-TR-84-4020-VOL-4-6	p 26	N85-10372	#
AD-A147586	p 70 N85-16681	#	AD-A100231	p 10	N02-32/08	# #				
AD-A147632	p 70 N85-17580	#	AD-A10024/	p 19	N85-32/69	#	AIAA PAPER 84-2528	p 1	A85-13587	#
AD-A147775	p 70 N85-17733	#	AD-A155334	p 56	N85-33038	Ħ	AIAA PAPER 84-2619	p 23	A85-17817	#
AD-A147779	p 70 N85-17735	#	AD-A100010	p /2	IN02-32813	Ħ #	AIAA PAPER 84-2635	p 31	A85-17826	#
AD-A147843	p 28 N85-16479	#	AD-A100036	p /7	N85-32244	#	AIAA PAPER 84-2646	p 79	A85-17833	• #
AD-A147913	p 48 N85-16683	#	AD-A100//3	p 51	N85-26771	#	AIAA PAPER 84-2669	p 79	A85-17848	#
AD-A147919	p 94 N85-16684	#	AD-A100/80	p 19	NOD-35313	Ħ 4	AIAA PAPER 84-2703	p 79	A85-17873	• #
AD-A147928	p 75 N85-16008	#	AU-A100846	p 43	N85-35645	#	AIAA PAPER 85-0683	p 25	A85-30351	#
AD-A147963	p 6 N85-17542	#	AD-A15006/	p 57	185-35810	Ħ	AIAA PAPER 85-0743	p 33	A85-30283	#
AD-A148075	p 15 N85-17736	#	AD-A156068	p 57	N85-35811	#	AIAA PAPER 85-1147	p 3	A85-39623	#
AD-A148204	p 28 N85-17365	#	AD-A156069	p 57	N85-35812	#	AIAA PAPER 85-1337	p 91	A85-39731	#
AD-A148228	p 49 N85-17745	#	AD-A156070	p 57	N85-35813	#	AIAA PAPER 85-1734	p 3	A85-40554	#
AD-A148354	p 49 N85-17737	#	AD-A156071	p 57	N85-35814	#	AIAA PAPER 85-1879	p 25	A85-45902	• #

F-1

### APRO-84-13

### REPORT NUMBER INDEX

APRO-84-13	p 77	N85-33036	#	DTNSRDC/CMLD-84-17	р 14	N85-11906 #	ŧ	ISIL-V-4062-05	p 48	N85-16675	#
ARI-RN-84-124 ARI-RN-85-12	р 5 р 8	N85-16475 N85-21978	# #	DTNSRDC/TM-18-85-03	p 41	N85-30681 #	ŧ	ISP110513000-VOL-4-PT-6	p 26	N85-10372	#
ACD TO 04 5005	n 21	NR5 10002	#	D182-11678-VOL-1	p 85	N85-29593 #	ŧ	ISSN-0039-6566	p 51	N85-26771	#
ASD-TR-84-5000	D 83	N85-10943	# #	D182-11678-VOL-2	p 85	N85-29594 #	ŧ	ISSN-0070-3900	p 83	N85-10676	#
A3D-111-04-3010-102-1	p		"	D182-11678-VOL-3	p 85	N85-29595 #	ŧ	ISSN-0170-8996	p 21	N85-11910	#
ASD/(ENE)-TR-84-5003	p 21	N85-10002	#	D483-10027-1	p 31	N85-33172 * #	ŧ	ISSN-0171-1342	p 9	N85-28558	#
								ISSN-0347-7665	p 15	N85-17738	#
ASME PAPER 84-MGT-8	p 20	A85-21298	#	E-9597U	p 52	N85-28649 #	ŧ	ISSN-0347-7665	p 55	N85-31836	#
ASME PAPER 84-WA/TS-3	p 64	A85-39930	#					ISSN-0722-3838	p 49	N85-16686	#
ATC-84-0026-VOL-2	p 47	N85-10929	#	ENS1-83E018	p 42	N85-34331 #		ISSN-0722-3638 ISSN-0751-1353	p 49 p 42	N85-34331	# #
BAE-BT-12685	р 8	N85-26147	#	EI A-0007 3-04-024	p 55	105-51070 #		JPL-PUB-85-11	р9	N85-28559 *	'#
DAC KOC N CEN 286	n 49	N85-17033	#	ESA-CR(P)-2018	p 55	N85-31217 #	ŧ	IPL .0050 1061	n 72	N95 26942 *	. 4
DAE-WAS-IN-GEIN-200	p 43	100-17000	n	ESA-SP-1070	p 51	N85-26771 #	,	01 2-3330-1001	p / 2	103-20042	π
BL-6167	p 53	N85-28959	#	ESA TT 999	o 60	NOE 19709 #		JPRS-ESA-84-006	р 50 р 51	N85-20684	#
BLL-WI-TRANS-683-(9312 57)	p 8	N85-27223	#	ESD-TR-84-184	p 63	N85-17542 #		JPRS-ESA-84-043 JPRS-ESA-84-046	p 49 p 49	N85-17198	" #
BMFT-FB-ID-83-007	p 21	N85-11910	#	ESD-TR-84-190	p 42	N85-32807 #					
BRL-TR-2635	p 8	N85-27028	#	ESN-38-11	n 49	N85-17745 #		JPRS-TTP-85-002 JPRS-TTP-85-006	p 94 p 94	N85-19309 N85-19314	# #
				ESN-38-12	p 50	N85-18946 #			•		
BRMC-81-5034	p 47	N85-11898	#	ESN-39-2	p 50	N85-19919 #		JPRS-USP-85-001	p 51	N85-22403	#
BRMC-83-5080-2 BRMC-83-5080-3	p 26 p 23	N85-11347 N85-35410	# #	E85-10013	n 5	N85-11426 * #		JPRS-UST-85-002	p 95	N85-23442	#
PD02718	0.37	N85-13494	#		p 70	NOC 26942 * #		IPRS-11TR-85-004	n 50	N85-21105	
0192710	p 37	100-10404	π	FERA-04-00-01	p 72	1185-20042 #		0110-011-00-004	h 20	1405-21105	Ħ
B8561897	p 76	N85-28712	#	FGMSD-80-4	p 47	N85-11567 #		JSC-19989	p 42	N85-31146 *	#
CERL-TM-P-166	p 27	N85-15448	#	FOA-C-55064-H3	p 15	N85-17738 #		L-15945	p 38	N85-20689 *	#
CERL-TR-P-85/01	p 48	N85-16683	#	FUA-0-30043-112	p 55	1100-31030 #		LA-UR-84-2335	p 36	N85-12606	#
CMULDI TD 84-26	n 22	N85-21080	#	GAO/NSIAD-84-36	p 74	N85-11996 #		LA-UR-84-3942	p 39	N85-23315	#
	<i>р 22</i>	100-21303	π	GAO/RCED-85-15	p 49	N85-17737 #		01-01-00-1012	p 30	1403-30723	π
CNES-NT-106	p 83	N85-13257	#		- 00	NOT 40070 #		LBL-18504	p 39	N85-22259	#
CNES-N1-110	p 21	1100-10004	#	GMD-STUDIES-81	p 83	N85-10676 #		LC-84-22804	p 71	N85-18030	#
CONF-8409114-1	p 36	N85-12606	#	GPO-30-838	p 93	N85-12919 #		LC-84-601030-PT-1	p 83	N85-10339	#
CONF-8409156-1	p 49	N85-18086	#	GPO-31-006	p 27	N85-13688 #		LC-84-601109	p 51	N85-22264	#
CONF-850255-1	p 39	N85-23315	#	GPO-31-248	p 93	N85-10870 #		LC-84-601136	p 69	N85-15781	#
CONF-8503107-1	p 17	N85-28392	#	GPO-37-868	p 38	N85-19880 #		LC-84-601156	p 39	N85-24793	#
CONF-8503114-1	p 41	N85-29852	#	GPO-38-001	p 69	N85-11911 #		LC-85-600500	p 42	N85-30976	#
CONF-8503118-1	p 40	N85-28633	#	GPO-38-660	p 96	N85-27766 #		LC-85-600504	p 18	N85-30704	#
CONF-8504117-1	p 30	N85-33726	#	GPO-39-395	p 52	N85-27767 #		LIDS.ED 1202	0.14	N95 11675	#
CONF-850616-3	n 86	N85-35720	π #	GPO-39-613	p 93	N85-13690 #		LID3-FH-1393	P 14	103-110/5	π
	p 00	100 00120	"	GPO-41-060	p 95	N85-22243 #		LMI-DC301-B	p 14	N85-16668	#
CS-1984-12	p 84	N85-17601	#	GPO-44-360	p 95	N85-23452 #					
				GPO-46-385	p 97	N85-32039 #		LMI-DL401	p 41	N85-30676	#
CSIR-TWISK-313	p 36	N85-10855	#	GPO-47-235	p 96	N85-27768 #					
CSIR-TWISK-322	p 21	N85-10218	#	GPO-47-635	p 57	N85-35829 #		LMI-RE403	p 18	N85-30966	#
CSIR-TWISK-338	p / 1	N85-23341	#	GPO-50-177	p 96	N85-30979 #		LMI-RE405 .	p 53	N85-29834	#
DE84-015355	n 37	N85-13675	#	GPO-51-010 GPO 51 010	p 95	N85-21225 #		M-464	n 67	N85-11011 *	#
DE84-015515	p 36	N85-12606	#	GPO-51-010	p 96	N85-30978 #			p 01	1100-11011	"
DE85-000294	p 84	N85-20936	#		p 00	1105 00070 #		MBB-UA-842-84-OE	p 65	A85-42678	#
DE85-000479	p 15	N85-18193	#	GWU/IMSE/SERIAL-T-491/84	p 83	N85-11646 #			•		
DE85-001252	p 49	N85-18086	#		·			MBB-UR-688-84-OE	p 44	A85-16088	#
DE85-001509	p 54	N85-30500	#	H-REPT-98-1078	p 27	N85-13688 #					
DE85-00365/	p 29	N85-20383	#	H-REPT-99-212	p 96	N85-30979 #		MBB-U1-36-84-OE	p 73	A85-35073	#
DE85-005574	0.30 h 9.8	N85-22259	# #	H-HEP1-99-32	p 95	N85-23452 #		MTR-9420	n /2	N85,22807	#
DE85-007974	p 17	N85-28392	#	HEDI -7471	n 84	N85-20936 #		1111-3420	p 42	1103-32007	π
DE85-008154	p 40	N85-28633	 #		P 04	1103-20300 #		NAS 1 15 X-73907	p 67	N85-10907 *	#
DE85-008359	p 41	N85-29852	#	HUMRRO-FR-MTRD(TX)-80-9	p 5	N85-16475 #		NAS 1 15 76765	p 93	N85-12806 *	#
DE85-010021	p 42	N85-33736	#			"		NAS 1 15 77589	p 48	N85-13689 *	#
DE85-010594	p 41	N85-30975	#	IAF PAPER 84-04	p 58	A85-12979 #		NAS 1 15 77657	p 54	N85-29979 *	#
DE85-010759	р 30	N85-30723	#	IAF PAPER 84-211	p 43	A85-13133 #		NAS 1 15 77760	p 94	N85-16697 *	#
DE85-011964	p 56	N85-34718	#	IAF PAPER 84-216	p 59	A85-13138 #		NAS 1 15 86339	p 47	N85-13666 *	#
DE85-012357	p 86	N85-35720	#	IAF PAPER 84-217	p 59	A85-13139 * #		NAS 1 15 87428	p 85	N85-21135	#
UE85-902175	p 31	N85-33172	Ħ	IAF PAPER 84-218	p 87	A85-13140 #		NAS 1 15 87493 NAS 1 15 87496	p 42	N85-31146 *	# #
DEVLB-EB-83-03	p 69	N85-13792	#	AF PAPER 84-222	0 63 h 28	A03-13142 #		NAS 1 21 481	p 37	N85-16665 *	π #
DEVLR-FB-84-51	p 9	N85-28558	#	IAE PAPER 84-22	p 59	A85-12991 * #		NAS 1 21 7500(19)	p 17	N85-26439 *	#
	•	-		IAF PAPER 84-28	p 43	A85-12994 #		NAS 1 26 168570	р5	N85-11426 *	#
DGLR PAPER 84-117	p 81	A85-40333	#	IAF PAPER 84-377	р 59	A85-13233 #		NAS 1 26 171331	p 84	N85-19009 *	#
DGLR PAPER 84-118	p 45	A85-40334	#	IAF PAPER 84-51	p 43	A85-13010 * #		NAS 1 26 174017	p 35	N85-10685	#
DOC 105 0105	- 54	NOF 00500	4					NAS 1 26 174070	p 40	N85-28608	#
DOE/CE-0103	μ 54 n 15	N85-18102	# #	IUA-M-7	p 38	N85-1/592 #		NAS 1 26 175473	p 21 n 6	N85-100/9 *	# #
552/02-40054/11	619	1103-10193	π	IDA-P-1788	n 36	N85-11575 #		NAS 1 26 175483	p 0 p 21	N85-21414 *	π #
DOF/MA-0184	n 56	N85-34718	#		P 00			NAS 1 26 175781	p 72	N85-26842 *	#
00C/11/1-010-	p 30		"	IDA/HQ-84-28841	p 36	N85-11575 #		NAS 1 26 175890	p 9	N85-28559 *	#
DPST-84-736	n 20	N85-20383	#	IDA/HQ-84-28940	p 38	N85-17592 #		NAS 1 26 176007	p 54	N85-30962 *	#
5. 51-0-100	P 23		n					NAS 1 26 176094	p 31	N85-32134 *	#
DSMC-63	o 50	N85-20933	#	INPE-2989-RPE/453	р5	N85-11426 * #		NAS 1 26 176095	p 31	N85-33172 *	# #
	р 50		"	ISBN-0-309-03704-2	n 71	N85-18030 #		NAS 1 26 176152	p 56 p 72	N85-34153	# #
DTIC/TR-85/3	p 41	N85-30676	#	ISBN-3-88457-057-9	p 83	N85-10676 #		NAS 1 26 177346	p 30	N85-30721 *	#

F-2

/

### REPORT NUMBER INDEX

## Y/DL-914

NAS 1 06 177040	n 42	NRE 24510	• #	DD95 177633	n 18	N85-30704	#
NAS 1 26 17/949	p 42	1003-34519	#	PB05-177032	p 10	NIDE 20007	#
NAS 1 55 2313	p 67	N85-11011	#	PD03-1//94/	μ / O	NOS-20337	#
NAS 1 55 2361	p 38	N85-20689 '	*#	PB85-177970	p 42	N85-30976	#
				PB85-181022	p 77	N85-31868	#
NASA-CP-2313	p 67	N85-11011	• #	PB85-181881	p 55	N85-31676	#
NASA-CP-2361	o 38	N85-20689 1	• #	PB85-185072	p 78	N85-35819	#
2001	<b>-</b>		.,	PB85-191385	p 41	N85-29607	#
NASA CD 169570	n 5	N85-11426	• #		•		
NASA-CH-1003/U	p 3	NO5-11420	<i>#</i>	PETR-1127-94-9	n 15	N85-17544	#
NASA-CH-171331	p 84	N85-19009	- #	FF1h-112/-04-0	P 13	1103-17544	π
NASA-CR-174017	p 35	N85-10685	• #				
NASA-CR-174070	p 40	N85-28608	•#	PLI-1268-1	p 48	N85-13689	#
NASA-CR-174383	p 21	N85-18079 '	• #				
NASA-CB-175473	p 6	N85-19640	• #	PMIC-MA03-469-35	p 84	N85-19009 *	'#
NASA_CB.175483	n 21	N85-21414	• #				
NASA OD 175701	0.70	NO5 20040	• #	PNI -5190	n 37	N85-13675	#
NA3A-CH-173781	p / c	NO5-20042					"
NASA-CH-175890	p 9	N85-28559	- #	DND 00029	n 94	NOE 10610	#
NASA-CR-176007	p 54	N85-30962	•#	FINR-90236	p 04	NO5-10010	Ħ
NASA-CR-176094	p 31	N85-32134 '	• #	PNH-90249	р//	N85-34/19	#
NASA-CR-176095	p 31	N85-33172 '	•#				
NASA-CR-176110	p 56	N85-34153	• #	P14	p 47	N85-12775	#
NASA-CB-176152	0.72	N85-34147	• #				
NASA.CB.177346	6 30	N85-30721	• #	RADC-TR-84-53-VOL-1	p 37	N85-16498	#
NAGA-OR-177340	p 30	NO5-00721	т • <u> </u>	BADC-TB-85-37-VOL-1	n 85	N85-29593	#
NASA-CR-177949	p 42	N85-34519	Ħ	DADC TR SE 07 VOL 0		NRE 20504	#
				RADC-TR-65-37-VOL-2	- 05	N05-29394	#
NASA-SP-481	p 14	N85-16665	•#	HADG-TH-85-37-VOL-3	p 85	N85-29595	#
NASA-SP-7500(19)	p 17	N85-26439	• #				
				RAND/P-7002	ρ42	N85-33042	#
NASA-TM-X-73907	n 67	N85-10907	• #	RAND/P-7035	p 41	N85-30715	#
	P 01		"		•		
NACA TH 20205	- 00	NIDE 40000	• #	BAND/B-3094-MII	n 76	N85-25160	#
NASA-IM-/6/65	p 93	N85-12806	Ŧ		- 0	NO5-20100	т 
NASA-TM-77589	p 48	N85-13689 '	•#	RAND/R-3194-MIL	рэ	N85-28550	#
NASA-TM-77657	p 54	N85-29979 '	• #				
NASA-TM-77760	p 94	N85-16697 '	• #	REPT-2-20150/4R-2-VOL-4-PT-6	p 26	N85-10372	#
NASA TM 86229	n 47	N85-13666	• #	REPT-2006	p 53	N85-28867	#
NACA THEODOJS		NO5-10000	• "	BEPT-84-BB-350	n 85	N85-31005	#
NASA-1M-87428	h 92	1105-21135	. #	DEDT 94 00	p 19	N95 29970	#
NASA-TM-87493	p 42	N85-31146	-#	REF1-04-02	p 10	NO5-20070	# 
NASA-TM-87496	p 97	N85-33173	*#	REP1-84-24	p / 6	N85-28/11	Ħ
				REPT-84-38	p 17	N85-28637	#
NAVMAT-P-9494	o 76	N85-27744	#				
				BB-85-1-ONB	p 10	N85-32768	#
	- 26	NOE 10707	4		F		
NB5/GCH-64/46/	p 30	10/07	Ħ	DED TO 10.04	o 29	NIDE 17966	#
				H3D-1H-12-04	p 20	1405-17305	Ħ
NBS/SP-500/120	p 39	N85-24793	#				
NBS/SP-500/122	p 42	N85-30976	#	RSRE-MEMO-3704	p 37	N85-13494	#
NBS/SP-500/123	D 18	N85-30704	#				
NBS/SP.676/1.PT.1	0.83	N85-10339	#	S-HRG-98-1064	p 52	N85-27767	#
NB3/3F-0/0/1-F1-1	p 65	1000-10000	π		p		"
				C DDT 09 060	a 20	NO5 10000	#
NBSIR-85-3105	p 76	N85-28997	#	5-PR1-96-260	p 36	19990	Ħ
NBSIR-85-3113	p 41	N85-29607	#				
				S-REPT-98-458	p 93	N85-14201	#
NRIMS-TWISK-317	n 14	N85-11896	#	S-REPT-98-656	p 95	N85-21225	#
	P 14	1100-11000	"	S-BEPT-98-664	n 50	N85-22246	#
	- 00	NOT 40704		C DEDT 09 990 DT 2	6 02	N85 10970	#
OIT/FSTC-83/019	p 36	N85-10704	Ħ	0 DEDT 00 400	p 53	NOC 04700	π
OIT/FSTC-84/021	p 36	N85-10703	#	S-REPT-99-129	p 9/	N85-34720	Ħ
				S-REPT-99-91	p 96	N85-28885	#
ONR-FR-1-APP	p7	N85-19877	#	S-REPT-99-91	p 96	N85-30978	#
ONB-EB-1-VOL-1	0.7	N85-19874	#				
ONR ER 1 VOL 2	57	NR5-10875	#	SAE PAPER 841483	p 72	A85-25978	#
	27	NO5-19075	π 	SAE DADED 841485	0.73	A85-25070	#
UNR-FR-1-VUL-3	p/	N82-19876	Ħ		- 60	AGE 05000	т 
				SAE PAPEH 841545	p 60	A65-25983	Ħ
ONR-TR-16	p 8	N85-24732	#	SAE PAPER 841588	р3	A85-25986	#
				SAE PAPER 841600	p 73	A85-39070	#
ONBL-B-1-85	p 56	N85-33038	#				
ONBL-R-12-84	n 50	N85-10732	#	SAND-84-2538C	p 86	N85-35720	#
ONRI _R.13.94	0.30	N85 22250	#	SAND-85-0925C	D 42	N85-33736	#
014116-01-10-04	h 2a	1103-22230	π		F E		
000 05 0		NOT 0000-		SAME DADED 1502	0.67	495 40012	#
UHU-82-3	p 85	N85-30665	Ħ	CAME PAPER 1090	P 0/	AGE 4004 -	π #
				SAWE PAPER 1594	p /4	A65-49914	Ħ
ORNL/TM-9510	p 41	N85-30975	#				
				SMRC-DP-19	p 18	N85-28854	#
OSD/FSTC-83/014	p 35	N85-10702	#	SMRC-DP-21	p 18	N85-28852	#
					•		
OTA-ISC 179	0 51	NR5 00064	#	SNIAS-S/DT-Y-25-212	n 55	N85-31217	#
01A-100-173	h 21	N00-22204	#		P 33	100-01211	"
UTA-ISC-240	p /0	N85-17750	#			Nor toooc	щ
				IAEG-IH-158	p 5	N85-12302	#
OTA-STI-241	p 69	N85-15781	#				
OTA-STI-242	p 55	N85-31215	#	TR-ONR-DG-10	p 15	N85-19881	#
				TR-ONR-DG-13	p 17	N85-27746	#
PAR-94-116	n 20	N85 16470	#	TB-ONB-DG-15	p 19	N85-32769	#
170-04-110	h 50	1103-10479	π		P 10		"
BB04 470040				TD 75V 84 04	n 07	NRE 10700	#
PB84-173269	p 95	N85-22253	#	IN-2ET-04-01	p 2/	1400-12/92	#
PB84-174804	р 37	N85-12803	#				
P884-212141	p 35	N85-10702	#	TR-1867-03	р 70	N85-16681	#
PB84-212158	0.36	N85-10703	#	TR-213	p 75	N85-21680	#
DB94.010174	5 26	NB5-10703	#	TR-30-ONR	D 15	N85-17736	#
F004-2121/4	P 30	NOJ-10/04	π 	TB-5-ONB	L 10	N85-29954	#
PB84-21/504	p 36	N85-10707	#		h 10	1103-20854	#
PB84-217868	p 83	N85-10339	#		p 18	N05-28852	#
PB84-229244	p 37	N85-12796	#	I H-83-44	p 16	N85-22249	#
PB84-230366	p 77	N85-31868	#	TR-85-1	p 53	N85-28867	#
PB84-230671	p 93	N85-15533	#	TR-85	p 8	N85-24732	#
PB85.121374/GAP	n 71	N85-18020	#		•		
DD95 101500	0.20	NIGE 100004	π #	TRANS-16528/TI T-00016	n 84	N85-18618	#
F 000-121023	p 38	NOC-19891	#		P 04		n
PB65-12//44	p 51	N85-22264	Ħ.		n 74	NOF 40000	#
PB85-128429	p 21	N85-21414	#	1HD/1HH-958	p /1	N85-18030	Ħ
PB85-161040	p 39	N85-24793	#				
1 200-1010-10	•						
PB85-176113	p 96	N85-32038	#	TT-8501	p 71	N85-26457	#

UCRL-92210	p 17	N85-28392	#
UMTA-URT-41-85-1	p 77	N85-31868	#
USAMICOM-RR-84-15	p 69	N85-12805	#
Y/DL-914	p 40	N85-28633	#

# **ACCESSION NUMBER INDEX**

MANAGEMENT / A Bibliography for NASA Managers

**APRIL 1986** 

### **Typical Accession Number Index Listing**



Listings in this index are arranged alphanumerically by accession number. The page number listed to the right indicates the page on which the citation is located An asterisk (\*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche

A85-10049 #	p 86	A85-17833 *#	p 79
A85-10050 #	p 86	A85-17848 #	р 79
A85-10055 #	p 78	A85-17873 *#	p 79
A85-10057 #	n 78	A85-18440 #	р 80
A05-10037 #	p 10	A85-18469 #	p 87
A03-10170 #	- 01	A85-18720 #	p 1
A85-11096 #	p 31	A85-19181 #	p 20
A85-11245 #	b 19	A85-20400 #	p 23
A85-11275 #	p 31	A85-20512 #	p 87
A85-11349 #	p 38	A85-20642 #	p 60
A85-11351 #	p / 6	A85-21298 #	p 20
A85-11425 #	p 56	A85-21457 #	p 32
A05-11000 #	p / 6	A85-21540 * #	p 10
A05-11937 #	p 86	A85-21548 * #	p / 2
A05-11950 #	p 60	A85-21560 #	p 1
A05-12501 #	0.58	A85-21565 #	p 2
A05-12502 #	p 50 p 58	A85-21569 #	p 24
A05-12507 #	n 87	A85-215/9 #	p 2
A95-12644 #	n 87	A85-21581 #	p 2
A85-12645 #	p 78	A85-21588 #	p 2
A85-12647 #	p 10	A05-21589 #	p 2
AR5-12979 #	0.58	A05-21002 #	p 2 5 97
A85-12991 *#	p 59	A03-21020 #	p 87
A85-12994 #	p 43	A05-21021 #	p 0/
A85-13010 *#	0 43	A05-23195 #	p 24
A85-13133 #	p 43	A95 22107 * #	p 24
A85-13138 #	р 59	A85-23108 #	n 24
A85-13139 *#	p 59	A85-23276 #	02
A85-13140 #	p 87	A85-23278 #	n 2
A85-13142 #	p 59	A85-23279 #	n 3
A85-13233 #	p 59	A85-23283 #	63
A85-13587 #	p 1	A85-23285 #	<b>D</b> 3
A85-13599 #	p 23	A85-23799 #	p 87
A85-13914 #	p 59	A85-23921 #	p 44
A85-13920 #	p 44	A85-24035 #	p 24
A85-13921 #	p 19	A85-24084 #	p 80
A85-14101 #	p 78	A85-24089 #	p 88
A85-14109 #	p 79	A85-24525 * #	p 44
A85-14896 #	p 72	A85-24653 #	p 60
A85-14923 #	p 59	A85-24709 #	p 88
A85-15463 #	p 60	A85-24710 #	p 88
A85-16088 #	p 44	A85-25108 #	р 80
A85-16093 #	p 23	A85-25109 #	p 80
A85-16254 #	b \a	A85-25116 #	p 44
A85-16302 #	p 44	A85-25117 #	ρ20
A85-16303 #	p 60	A85-25118 #	p 20
A05-1/232 #	p 10	A85-25856 #	p 44
A03-1///0 #	p 10	A85-25978 #	p 72
ADD-1//// #	p 10	A85-25979 #	p 73
A03-1///0 #	p 30	A85-25983 #	p 60
A03-1//9 #	0.19	A85-25986 #	<b>р</b> 3
A03-1//00 #	n 1	A85-26011 #	p 45
A85-17817 #	n 23	A85-26771 #	p 60
A85-17826 #	n 31	A85-26784 #	p 32
	F ~ '		P

	щ		
A85-20/05	#	P 11	
A85-26786	#	p 11	
A85-26793	#	p 32	
A85-26794	#	p 32	
ARE 26907	#	0.32	
ABE 06920	#	p 32	
A05-20030	#	p 32	
A85-26847	Ŧ	p 11	
A85-27373	#	p 88	
A85-27374	#	p 88	
A85-27375	#	p 61	
A85-27394	#	p 88	
A85-27395	#	p 88	
A85-27396	#	p 89	
A85-27397	#	p 89	
485-27648	#	n 61	
A95 27000	#	n 32	
ADE 00004	π	p 02	
A05-20024	#	p 3	
A62-26/9/	#	p 33	
A85-28824	#	p 61	
A85-29025	#	p 89	
A85-29401	#	p 33	
A85-29402	#	p 11	
A85-29555	#	p 89	
A85-29623	#	p 61	
A85.20669	<i>"#</i>	n 61	
AGE 20962	"#	50.	
A05-29000	π #	22	
A85-29665	#	pa	
A85-30014	#	p 89	
A85-30167	#	p 89	
A85-30283	#	p 33	
A85-30351	#	p 25	
A85-30998	#	p 89	
A85-30999	#	p 90	
485-31209	#	6.33	
A95 21742	#	p 46	
ADE 01701	<i>"</i>	- 00	
A05-31791	#	p 33	
A85-31792	#	p 25	
A85-31968	#	p 90	
A85-31981	#	p 61	
A85-32010	#	p 80	
A85-32129	#	0 11	
A85-32573	#	0.61	
485-33429	• "#	0.61	
ADE 32640	#	p 01	
A05-33049	#	P 11	
A85-33650	#	pii	
A85-33872	#	p 90	
A85-34128	•#	p 33	
A85-34146	#	p 45	
A85-34192	#	p 61	
A85-34214	#	p 90	
A85-34215	#	p 62	
A85-34216	#	0.62	
485-34217	#	0.62	
AGE 24210	#	p 02	
A05-34210	#	- CO	
A65-34219	Ŧ	p 62	
A85-34220	#	p 62	
A85-34221	#	p 62	
A85-34223	#	p 90	
A85-34449	#	p 80	
A85-34459	#	p 34	
A85-34460	#	p 80	
A85-34538	• #	p 63	
A85-34919	#	n 34	
A85-35073	#	0.73	
A05-35073	#	p / 3	
A65-35100	#	p 20	
M03-35314	Ŧ	p 63	
A85-35448	#	p 45	
A85-35799	#	p 20	
A85-35978	#	p 63	
A85-36289	#	p 90	
A85-36291	#	p 80	
A85-36297	#	D 81	
A85-36421	<i>#</i>	D 45	
ARE 2000	#	P 40	
ADE 00000	#	h a0	
A65-36987	#	p 45	
A65-36997	#	p 90	
A85-37163	#	p 11	
A85-37256	#	p 63	
A85-37566	#	p 25	
A85-37805	#	p 91	
A85-37901	#	p 81	
A85-37903	#	p 73	
485-37904	#	n 81	
		~ ~ .	

A85-37954	#	p 63	
A85-38267	#	p 81	
A85-38415	#	p 12	
A85-38643	#	n 34	
485.38699	<i>#</i>	6 01	
A05-00000	т ш	- 60	
A65-36901	#	p 63	
A85-38902	#	p 63	
A85-38904	#	p 64	
A85-38914	#	p 91	
495.29016	#	n 01	
A05-00017	т ц	- 04	
A85-38917	Ħ.	p 64	
A85-39070	#	p 73	
A85-39076	•#	p 20	
A85-39093	#	0.91	
A85.20368	<i>"</i> #	63	
A05-35300	TT.	P 3	
A85-39623	#	рз	
A85-39731	#	p 91	
A85-39930	#	p 64	
A85-40255	#	n 81	
ADE 40200	<i>"</i>	- 01	
A85-40333	Ħ	p 81	
A85-40334	#	p 45	
A85-40554	#	pЗ	
A85-40905	#	0.64	
A85-41098	• #	0.46	
ADE 41210	• <u>"</u>	- 10	
A05-41319	#	p 12	
A85-41534	#	p 64	
A85-41549	#	p 34	
A85-41657	#	p 64	
485 42553	#	64	
A05-42555	<b></b>	p 04	
A85-42585	Ŧ	p 46	
A85-42587	#	p 12	
A85-42592	*#	p 34	
A85-42593	#	0.34	
485.42597	#	0.35	
ADE 40670	""	- 65	
A03-420/0	#	pos	
A85-42694	#	p 46	
A85-42892	*#	p 25	
A85-43176	•#	p 81	
485-43177		n 12	
A05-40170	т ш		
A85-431/9	#	p 05	
A85-43180	#	p 65	
A85-43181	#	p 65	
A85-43182	#	p 46	
A95 42192	<b>"</b> #		
A05-40100	<i></i>	14	
A85-43184	#	p 12	
A85-43185	#	p 12	
A85-43186	#	p 13	
A85-43187	#	n 65	
AOE 40100	<i>"</i> #	- 65	
A05-40100	π.	p 00	
A85-43189	#	p 21	
A85-43193	#	p 4	
A85-43194	#	p 65	
A85-43195	#	o 66	
AGE 40106	<i>"</i> #		
A05-43190	#	p 00	
A85-4319/	#	p 13	
A85-43198	#	p4	
A85-43199	#	p 66	
A85-43200	#	04	
AGE 402001	"#		
A03-43201	<i>π</i>	- 00	
A85-43202	Ħ	p 66	
A85-43203	#	p 66	
A85-43204	#	p 66	
A85-43205	#	p 13	
A85-43206	*#	n 46	
AGE 44007	"#	0.01	
A03-44097	#	h ai	
A85-44098	Ħ	p 92	
A85-44099	#	p 92	
A85-44244	#	p 4	
A85-44624	#	p 4	
A85.45070	<i>"</i> #	6 10	
A05-450/9	#	P 13	
A85-45087	#	p 25	
A85-45094	#	р4	
A85-45118	#	p 66	
A85.45122	#	n 4	
ADE 45122	л "ц	D 25	
A02-45141	#	p 35	
A85-45148	#	p 73	
A85-45150	#	p 66	
A85-45157	#	p 13	
A85-45433	#	0.82	
	, <i>п</i>		
A85-45817	÷#	p 66	
A85-45902	*#	p 25	
485.46149	#	n 5	
/100-40140	nr "		

A85-47677 A85-47678 A85-47795 A85-48239 • A85-48511 • A85-48511 A85-48511 A85-48556 A85-49049 • A85-49049 • A85-49049 • A85-49049 • A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49540 A85-49577 A85-49511 A85-49911 A85-49971 • A85-49973 A85-50055 A85-50056	# # # # # # # # # # # # # # # # # # # #	р 25 3 р р р р р р р р р р р р р р р 7 3 3 6 р р р 7 4 7 5 7 4 2 5 7 4 2 5 7 4 2 5 7 4 2 5 7 4 2 5 7 4 2 5 6 7 4 7 5 2 5 7 4 2 5 6 7 4 7 5 7 4 2 5 6 7 7 9 2 9 2 9 2 9 9 9 9 9 9 9 9 9 9 9 9
N85-1002 N85-10218 N85-10339 N85-10339 N85-10372 N85-10646 N85-10685 N85-10695 N85-10695 N85-10695 N85-10695 N85-10702 N85-10702 N85-10703 N85-10707 N85-10707 N85-10855 N85-10859 N85-10870 N85-10870 N85-10870 N85-10870 N85-10870 N85-10870 N85-10870 N85-11012 N85-11012 N85-11015 N85-11015 N85-11035 N85-11035 N85-11035 N85-11059 N85-11059 N85-11556 N85-11556 N85-11557 N85-11557 N85-11557 N85-11556 N85-11557 N85-11556 N85-11557 N85-11556 N85-11557 N85-11556 N85-11557 N85-11556 N85-11556 N85-11557 N85-11556 N85-11605 N85-11645 N85-11646 N85-11896 N85-11896 N85-11896	**************	P         P

**G-1** 

**400000-02** 

### N85-11906

#### ACCESSION NUMBER INDEX

NOE 11006 #	0.14	N85-18946 #	n 50	N85-26642 #
N85-11910 #	n 21	N85-18947 #	n 50	N85-26645 #
N85-11911 #	p 69	N95-1000 * #	0.84	N85-26657 #
N85-11912 #	p 69	NRE 10205 #	p 84	N85-26692 #
N85-11993 #	p 74	N85-19205 #	p / 1	N85-26771 #
N85-11996 #	p 74	N85-19213 #	p 28	N85-26833 #
N85-12302 #	p 5	N85-19230 #	p 36	N85-26842 * #
N85-12606 #	p 36	N85-19309 #	p 94	N85-27028 #
N85-12772 #	p 14	N05-19314 #	p 94	N85-27121 #
N85-12773 #	p 83	N95 10620 #	p 04 0 6	N85-27223 #
N85-12775 #	p 47	N95-19620 #	p 6	N85-27237 #
N85-12786 #	р 36	N85-19694 #	0.15	N85-27303 #
N85-12790 #	р 75	N85-19732 #	p 50	N85-27550 #
N85-12791 #	p 14	N85-19873 #	p 29	N85-27551 #
N85-12792 #	p 27	N85-19874 #	p 7	N85-27742 #
N85-12796 #	p 37	N85-19875 #	07	N85-27743 #
N85-12803 #	p 37	N85-19876 #	ρ7	N05-2/744 #
N85-12805 #	p 69	N85-19877 #	p7	N85-27746 #
N85-12600 #	p 93	N85-19880 #	p 38	N85-27766 #
N85-13257 #	p 83	N85-19881 #	p 15	N85-27767 #
N85-13259 #	n 83	N85-19891 #	р 38	N85-27768 #
N85-13494 #	p 37	N85-19919 #	p 50	N85-27795 #
N85-13666 * #	p 47	N85-20166 #	p 29	N85-27808 #
N85-13675 #	p 37	N85-20180 #	p 29	N85-27809 #
N85-13684 #	p 21	N85-20182 #	p 94	N85-27812 #
N85-13688 #	p 27	N85-20383 #	p 29	N85-27821 #
N85-13689 * #	p 48	N85-20684 #	p 50	N85-28187 #
N85-13690 #	p 93	N05-20009 #	p 36	N85-28189 #
N85-13792 #	p 69	NR5-20090 #	p 16	N85-28392 #
N85-14201 #	p 93	N85-20691 #	p 84	N85-28550 #
N85-14558 * #	p 5	N85-20693 * #	p 38	N85-28556 #
N85-14596 #	p 27	N85-20695 * #	p 38	N85-28558 #
N85-15176 #	p 27	N85-20933 #	p 50	N85-28559 * #
N85-15448 #	p 27	N85-20936 #	p 84	N85-28608 * #
N85-15533 #	p 93	N85-21105 #	p 50	N85-28616 #
N85-15781 #	p 69	N85-21106 #	p 84	NOD-20033 #
N85-15/82 #	p /0	N85-21135 * #	p 85	N85-20037 #
N95 15795 #	p 46	N85-21214 *#	p 94	N85-28711 #
N95-15700 #	0.48	N85-21218 *#	p 94	N85-28712 #
N85.15792 #	n 94	N85-21219 *#	p 94	N85-28852 #
N85-16008 #	p 75	N85-21225 #	p 95	N85-28854 #
N85-16474 #	p 14	N85-21316 #	p 29	N85-28855 #
N85-16475 #	p 5	N85-21414 #	p 21	N85-28859 #
N85-16479 #	p 28	N85-21418 #	p 50	N85-28860 #
N85-16498 #	p 37	N85-21680 #	p /5	N85-28865 #
N85-16665 * #	p 14	N85-21978 #	p 8	N85-28867 #
N85-16668 #	p 14	N95-22244 #	p 22 p 95	N85-28870 #
N85-16673 #	p 75	N85.22245 #	p 95 p 95	N85-28875 #
N85-16675 #	p 48	N85-22246 #	n 50	N85-28879 #
N85-16678 #	p 75	N85-22248 #	n 16	N85-28885 #
N85-16681 #	p 70	N85-22249 #	p 16	N85-28886 #
N85-16683 #	p 48	N85-22253 #	p 95	N85-28959 #
N85-16684 #	p 94	N85-22258 #	p 39	N85-28997 #
N05-10000 #	p 49 p 49	N85-22259 #	р 39	NR5 20004 #
N85-16600 #	p 45 p 28	N85-22264 #	p 51	N85.29094 #
N85-16691 #	p 20	N85-22349 #	p 75	N85-29110 #
N85-16694 #	p 37	N85-22403 #	p 51	N85-29561 * #
N85-16697 * #	p 94	N85-22455 #	p 95	N85-29562 * #
N85-16745 #	p 83	N85-22471 * #	p 51	N85-29567 * #
N85-16852 #	р 94	N85-23315 #	p 39	N85-29568 * #
N85-17176 #	р 49	N85-23341 #	p /1	N85-29593 #
N85-17177 #	p 28	N85-23442 #	p 95	N85-29594 #
N85-17186 #	p 28	NR5 23440 #	p 39	N85-29595 #
N85-17191 #	p 49	N85-23452 #	p 95	N85-29607 #
N85-17197 #	p 49	N85-23453 #	p 95	N85-29834 #
N85-17198 #	p 49	N85-23693 #	p 8	N85-29835 #
N85-1/365 #	p 28	N85-24191 #	p 29	N85-29836 #
N05-1/542 #	μο 5.15	N85-24309 #	p 22	N05-2903/ #
N85-17590 #	p 15	N85-24732 #	p 8	N85_20040 #
N85-17500 #	p /0 n 38	N85-24736 * #	р 16	N85.20852 #
N85-17601 #	n 84	N85-24788 #	р 39	N85-29979 * #
N85-17733 #	p 70	N85-24793 #	p 39	N85-30500 #
N85-17735 #	p 70	N85-24810 #	p 71	N85-30628 #
N85-17736 #	p 15	N85-24842 #	p 29	N85-30665 #
N85-17737 #	p 49	N85-24876 #	p 16	N85-30676 #
N85-17738 #	р 15	N85-25169 #	p 76	N85-30681 #
N85-17745 #	р 49	N85-25193 #	p /6	N85-30704 #
N85-17750 #	p 70	N85-25283 #	p 10 n 06	N85-30715 #
N85-17933 #	p 49	N03-2330U #	p 30 p 20	N85-30721 *#
N85-18013 * #	p 6	N85-25616 #	p 20 n 71	N85-30723 #
N85-18017 #	p 6	N85-25641 #	D 30	N85-30962 *#
N85-18025 * #	p 6	N85-25651 #	p 50	N85-30964 #
N85-18026 * #	р <del>6</del>	N85-25824 #	p 22	N85-30965 #
N85-18027 #	ръ	N85-25835 #	p 22	N85-30966 #
N85-18028 #	ро 571	N85-26147 #	p 8	N85-30975 #
N85-18030 #	p / 1 p 21	N85-26167 #	р 39	NR5 20070 #
N85-19079 #	p 21	N85-26184 #	p 22	N85-20070 #
NOS-10000 #	p 49 o 15	N85-26190 #	p 16	NPE 20090 #
NOD-10193 #	р 15 о 6	N85-26200 #	p 8	NOS-30960 #
N85-18561 #	р о - 00	N85-26439 * #	p 17	N85-31005 #
N85-18571 #	p 28	N85-26456 #	p 51	N85-31096 #
N85-18618 #	p 84	N85-26457 #	p 71	N85-31146 *#

NOT 04440	• //	
N85-31149	Ħ	p 54
N85-31215	#	p 55
N85-31217	#	p 55
N85-31676	#	D 55
N85-31836		0.55
NO5-01000	<b></b>	- 77
N85-31868	Ħ	p//
N85-32020	#	р 30
N85-32021	#	p 55
N85-32034	#	n 55
NOC 02004	л 	p 33
1005-32035	#	p 55
N85-32036	#	p 55
N85-32038	#	p 96
N85-32039	#	D 97
N85-32041	#	0.97
NIGE 22042	"	- 07
1103-32042	.#	p 9/
N85-32134	-#	p 31
N85-32138	#	p 72
N85-32219	#	p 31
N85-32244	#	n 77
NOC 02244	"	- 10
1105-32700	#	piu
N85-32769	#	p 19
N85-32785	#	p 22
N85-32802	#	o 55
N85-32807	#	n 42
NOE 22012	"#	- 72
NO5-32013	т 	P 72
N85-33030	Ŧ	p //
N85-33038	#	ρ 56
N85-33039	#	p 42
N85-33042	#	p 42
N85-33172	* #	D 31
N85-33173	*#	0 97
NIDE 00770	л Ш	n 40
1105-33730	. #	P 42
N85-34147	7#	p /2
N85-34153	•#	p 56
N85-34331	#	p 42
N85-34519	• #	p 42
N85-34560	#	n 56
NIR5 04719	#	5.56
NOC 04710	π	- 77
1185-34719	Ŧ	p //
N85-34720	#	p 97
N85-34721	#	p 56
N85-35145	•#	p 56
N85-35147	• #	p 97
N85-35167	#	56
N95 25169	#	0.66
NO5-35108	Ħ,	p 50
N85-35313	Ħ	p 19
N85-35410	#	p 23
N85-35498	#	p 19
N85-35645	#	p 43
N85-35720	#	D 86
N85,25910	#	n 57
NOS-05010	π #	p 57
1100-30011	Ħ	h 21
N85-35812	#	p 57
N85-35813	#	p 57
N85-35814	#	p 57
N85-35815	#	p 57
N85-35816	#	n 57
N95.25017	#	0.86
NOC-30017	#	p 00
1185-35819	Ŧ	p /8
N85-35821	#	p 10
N85-35829	#	p 57

p 40

p 54 p 77 p 18

p 41 p 42 p 96 p 96 p 54

p 85 #

p 77

p 42

# AVAILABILITY OF CITED PUBLICATIONS

### IAA ENTRIES (A85-10000 Series)

Publications announced in *IAA* are available from the AIAA Technical Information Service as follows: Paper copies of accessions are available at \$10.00 per document (up to 50 pages), additional pages \$0.25 each. Microfiche<sup>(1)</sup> of documents announced in *IAA* are available at the rate of \$4.00 per microfiche on demand. Standing order microfiche are available at the rate of \$1.45 per microfiche for *IAA* source documents and \$1.75 per microfiche for AIAA meeting papers.

Minimum air-mail postage to foreign countries is \$2.50. All foreign orders are shipped on payment of pro-forma invoices.

All inquiries and requests should be addressed to: Technical Information Service, American Institute of Aeronautics and Astronautics, 555 West 57th Street, New York, NY 10019. Please refer to the accession number when requesting publications.

### STAR ENTRIES (N85-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code preceded by the letters HC or MF in the *STAR* citation. Current values for the price codes are given in the tables on NTIS PRICE SCHEDULES.

Documents on microfiche are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, Va. 22161.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the \* symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

- Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, as indicated above, for those documents identified by a # symbol.)
- Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Document Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

(1) A microfiche is a transparent sheet of film, 105 by 148 mm in size containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26.1 reduction)

- Avail: DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.
- Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.
- Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.
- Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.
- Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)
- Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).
- Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.
- Avail: U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of \$1.50 each, postage free.
- Avail: ESDU. Pricing information on specific data, computer programs, and details on ESDU topic categories can be obtained from ESDU International Ltd. Requesters in North America should use the Virginia address while all other requesters should use the London address.
- Other availabilities: If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

### PUBLIC COLLECTIONS OF NASA DOCUMENTS

**DOMESTIC:** NASA and NASA-sponsored documents and a large number of aerospace publications are available to the public for reference purposes at the library maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

**EUROPEAN:** An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England for public access. The British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols # and \* from ESA — Information Retrieval Service European Space Agency, 8-10 rue Mario-Nikis, 75738 CEDEX 15, France.

### FEDERAL DEPOSITORY LIBRARY PROGRAM

In order to provide the general public with greater access to U.S. Government publications, Congress established the Federal Depository Library Program under the Government Printing Office (GPO), with 50 regional depositories responsible for permanent retention of material, inter-library loan, and reference services. At least one copy of nearly every NASA and NASA-sponsored publication, either in printed or microfiche format, is received and retained by the 50 regional depositories. A list of the regional GPO libraries, arranged alphabetically by state, appears on the inside back cover. These libraries are *not* sales outlets. A local library can contact a Regional Depository to help locate specific reports, or direct contact may be made by an individual.

## ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics and Astronautics Technical Information Service 555 West 57th Street, 12th Floor New York, New York 10019

British Library, Lending Division, Boston Spa, Wetherby, Yorkshire, England

Commissioner of Patents and Trademarks U.S. Patent and Trademark Office Washington, D.C. 20231

Department of Energy Technical Information Center P.O. Box 62 Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service ESRIN Via Galileo Galilei 00044 Frascati (Rome) Italy

ESDU International, Ltd. 1495 Chain Bridge Road McLean, Virginia 22101

ESDU International, Ltd. 251-259 Regent Street London, W1R 7AD, England

Fachinformationszentrum Energie, Physik, Mathematik GMBH 7514 Eggenstein Leopoldshafen Federal Republic of Germany

Her Majesty's Stationery Office P.O. Box 569, S.E. 1 London, England

NASA Scientific and Technical Information Facility P.O. Box 8757 B.W.I. Airport, Maryland 21240 National Aeronautics and Space Administration Scientific and Technical Information Branch (NIT-1) Washington, D.C. 20546

National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161

Pendragon House, Inc. 899 Broadway Avenue Redwood City, California 94063

Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402

University Microfilms A Xerox Company 300 North Zeeb Road Ann Arbor, Michigan 48106

University Microfilms, Ltd. Tylers Green London, England

U.S. Geological Survey Library National Center – MS 950 12201 Sunrise Valley Drive Reston, Virginia 22092

U.S. Geological Survey Library 2255 North Gemini Drive Flagstaff, Arizona 86001

U.S. Geological Survey 345 Middlefield Road Menlo Park, California 94025

U.S. Geological Survey Library Box 25046 Denver Federal Center, MS 914 Denver, Colorado 80225

# **NTIS PRICE SCHEDULES**

(Effective October 1, 1985)

### Schedule A STANDARD PRICE DOCUMENTS AND MICROFICHE

PRICE CODE	PAGE RANGE	NORTH AMERICAN PRICE	FOREIGN PRICE
A01	Microfiche	\$ 5.95	\$11.90
A02-A03	001-050	9.95	19.90
A04-A05	051-100	11.95	23.90
A06-A09	101-200	16.95	33.90
A10-A13	201-300	22.95	45.90
A14-A17	301-400	28.95	57.90
A18-A21	401-500	34.95	69.90
A22-A25	501-600	40.95	81.90
A99	601-up	*	*
NO1		\$40.00	70.00
NO2		40.00	70 00

### Schedule E EXCEPTION PRICE DOCUMENTS AND MICROFICHE

PRICE CODE	NORTH AMERICAN PRICE	FOREIGN PRICE	
E01	\$ 7.50	15.00	
E02	10.00	20 00	
E03	11.00	22.00	
E04	13 50	27 00	
E05	15.50	31.00	
E06	18 00	36.00	
E07	20.50	41 00	
E08	23.00	46.00	
E09	25.50	51.00	
E10	28 00	56.00	
E11	30.50	61 00	
E12	33.00	66.00	
E13	35 50	71.00	
E14	38.50	77.00	
E15	42.00	84.00	
E16	46.00	92.00	
E17	50.00	100 00	
E18	54.00	108 00	
E19	60.00	120.00	
E20	70.00	140.00	
E99	•	*	

\*Contact NTIS for price quote

### **IMPORTANT NOTICE**

NTIS Shipping and Handling Charges (effective June 1, 1985) U.S., Canada, Mexico — ADD \$3.00 per TOTAL ORDER All Other Countries — ADD \$4.00 per TOTAL ORDER

Exceptions — Does NOT apply to: ORDERS REQUESTING NTIS RUSH HANDLING ORDERS FOR SUBSCRIPTION OR STANDING ORDER PRODUCTS ONLY

NOTE: Each additional delivery address on an order requires a separate shipping and handling charge.

# **TYPICAL CITATION AND ABSTRACT FROM STAR**

NASA SPONSORED		AVAILABLE ON MICROFICHE
NASA ACCESSION NUMBER	Pasadena. HAND CONTROLLERS FOR TELEOPERATION. A STATE-OF-THE-ART TECHNOLOGY SURVEY AND	CORPORATE SOURCE
TITLE	EVALUATION     T. L. BROOKS and A. K. BEJCZY 1 Mar. 1985 94 p refs	PUBLICATION DATE
AUTHORS	(Contract NAS7-918) (NASA-CR-175890; JPL-PUB-85-11; NAS 1 26:175890) Avail:	CONTRACT
REPORT NUMBERS	Hand controller technology for teleoperation is surveyed in three major catagories: (1) hand grip design, (2) control input devices.	OR GRANT
ABSTRACT	and (3) control strategies. In the first category, 14 hand grip designs are reviewed and evaluated in light of human factor considerations.	CODE
	In the second, 12 hand controller input devices are evaluated in terms of task performance, configuration and force feedback, controller/slave correspondence, operating volume, operator workload, human limitations, cross coupling, singularities, anthropomorphic characteristics, physical complexity.	AVAILABILITY SOURCE
	control/display interference, accuracy, technological base, cost, and reliability. In the third catagory, control strategies, commonly called control modes, are surveyed and evaluated. The report contains a bibliography with 189 select references on hand controller technology. Author	

# **TYPICAL CITATION AND ABSTRACT FROM IAA**

NASA SPONSORED		AVAILABLE ON
		MICHOFICHE
		AUTHOR'S
AUTHORS	W W. HANKINS, III and N. E. ORLANDO (NASA, Langley Research	AFFILIATION
	Center, Automation Technology Branch, Hampton, VA) American	
CONFERENCE	- Society of Mechanical Engineers, International Computers in	CONFERENCE
	Engineering Conference and Exhibit, Las Vegas, NV, Aug 12-16,	DATE
ABSTRACT	1984, Paper. 9 p. rets	
	and independence of machines and their evolving relationships to	
	numan beings are explored. The research, conducted by Langley	
	Hesearch Center (LaHC), will produce a new social work order in	
	which the complementary attributes of robots and human beings,	
	which include robots' greater strength and precision and humans'	
	greater physical and intellectual dexterity, are necessary for	
	systems of cooperation. Attention is given to the tools for	
	performing the research, including the Intelligent Systems Research	
	Laboratory (ISRL) and industrial manipulators, as well as to the	
	research approaches taken by the Automation Technology Branch	
	(ATB) of LaRC to achieve high automation levels. The ATB is	
	focusing on artificial intelligence research through DAISIE, a system o	
	which tends to organize its environment into hierarchical	
	controller/planner abstractions. M D.	

MANA SF-7200 (20)       1         4. Tite and Subtritie       5. Report Date         ANAGEMENT       A Sibiliography for NASA Managers       6. Performing Organization Code         7. Author(s)       8. Performing Organization Report No.         9. Performing Organization Name and Address       10. Work Unit No.         National Aeronautics and Space Administration       11. Contract or Grant No.         12. Sponsoring Agency Name and Address       13. Type of Report and Period Covered         13. Supplementary Notes       14. Sponsoring Agency Code         14. Abstract       14. Sponsoring Agency Code         15. Supplementary Notes       14. Sponsoring Agency Code         16. Abstract       14. Sponsoring Agency Code         17. Net Words (Suggested by Author(s))       18. Distribution Statement         18. Supplementary Notes       14. Sponsoring Agency Code         19. Security Casel, (of this report)       18. Distribution Statement         19. Security Casel, (of this report)       18. Distribution Statement         19. Security Casel, (of this report)       18. Distribution Statement         19. Security Casel, (of this report)       10. Security Casel, (of this page)       21. No. of Page         19. Security Casel, (of this report)       20. Security Casel, (of this page)       21. No. of Page       22. Price*	1. Report No.	2 Government Access	ion No.	3. Recipient's Catalog	No.
4. Tite and Substrie       Security Classified       Security Classified       Security Classified       Security Classified       22. Price*         10. Security Classified       10. Security Classified       11. Distribution Statement       11. Distribution Statement         11. Security Classified       12. Security Classified       13. Distribution Statement       10. Unclassified         12. Security Classified       10. Security Classified       11. Contract or Page       22. Price*	NASA SP-7500 (20)				
MANAGEMENT       Bibliography for NASA Managers       B. Performing Organization Code         2. Author(s)       B. Performing Organization Report No.         9. Performing Organization Name and Address       II. Centract or Grant No.         National Aeronautics and Space Administration       II. Centract or Grant No.         12. Sponsoring Agency Name and Address       II. Centract or Grant No.         13. Sponsoring Agency Name and Address       II. Centract or Grant No.         14. Sponsoring Agency Name and Address       II. Centract or Grant No.         15. Supplementary Notes       II. Sponsoring Agency Code         16. Abstract       II. Sponsoring Agency Code         17. Supplementary Notes       II. Sponsoring Agency Code         18. Abstract       II. Supplementary Notes         19. Abstract       II. Sponsoring Agency Code         19. Supplementary Notes       Information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnell issues; management theory and technique; industrial management and manufacturing; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         19. New Works (Suggested by Author(s))       II. Distribution Statement         Bibliographies       Management Mathods         Management Matho	4. Title and Subtitle			5. Report Date April 1986	
7. Author(a)       8. Performing Organization Report No.         9. Performing Organization Name and Address       10. Work Unit No.         12. Spontoring Agency Name and Address       11. Contract or Grant No.         12. Spontoring Agency Name and Address       11. Contract or Grant No.         13. Type of Report and Period Covered       14. Sponsoring Agency Code         14. Sponsoring Agency Name and Address       14. Sponsoring Agency Code         15. Supplementary Notes       14. Sponsoring Agency Code         16. Abstract       15. Supplementary Notes         17. Hay Words Scientific and technical Information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into the subject categories: Inhuman factoriar, research and development; economics, costs, and markets: logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Kwy Words (Suggested by Author(9)       18. Diaribution Statement         19. Security Caself, (othis report)       20. Security Caself, (of this page)       21. No. of Page       22. Price*         19. Security Caself, idouts report)       20. Security Caself, (of this page)       21. No. of Page       22. Price*	MANAGEMENT A Bibliography for NASA Manag	gers	F	6. Performing Organiz	ation Code
9. Performing Organization Name and Address       10. Work Unit No.         12. Sponsoring Agency Name and Address       11. Contract or Grant No.         12. Sponsoring Agency Name and Address       13. Type of Report and Period Covered         13. Supplementary Notes       14. Sponsoring Agency Code         15. Supplementary Notes       14. Sponsoring Agency Code         16. Abstract       14. Sponsoring Agency Code         17. Supplementary Notes       14. Sponsoring Agency Code         18. Abstract       15. Supplementary Notes         19. Mark Mich Contract on the Chinical Information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; industrial imanagement and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Management Planning         19. Security Classified       20. Security Classified         19. Security Classified       12. No. of Page         22. Price*       Unclassified	7. Author(s)	<u>, , , , , , , , , , , , , , , , , , , </u>		8. Performing Organiza	ation Report No.
9. Performing Organization Name and Address       11. Contract or Grant No.         National Aeronautics and Space Administration Washington, D.C. 20546       11. Contract or Grant No.         12. Sponsoring Agency Name and Address       13. Type of Report and Period Covered         13. Supplementary Notes       14. Sponsoring Agency Code         16. Abstract       14. Sponsoring Agency Code         17. Supplementary Notes       14. Sponsoring Agency Code         18. Abstract       15. Supplementary Notes         19. Abstract       19. Abstract         11. Contract or Grant No.       19. Sponsoring Agency Code         11. Contract or Grant No.       11. Contract or Grant No.         11. Supplementary Notes       11. Sponsoring Agency Code         12. Abstract       14. Sponsoring Agency Code         13. Type of Report and Period Covered       13. Type of Report and Period Covered         14. Sponsoring Agency Name and Address       14. Sponsoring Agency Code         15. Supplementary Notes       11. Entities to the management in the order of the management is a manager.         16. Abstract       This bibliographies Management Planning       18. Distribution Statement         17. Key Words (Suggested by Author(s))       18. Distribution Statement       19. Security Classif. (of this page)         17. Key Words (Suggested by Author(s))       10. Security Classif. (of this			F	10. Work Unit No.	
National Aeronautics and Space Administration       11. Contract or Greet No.         Washington, D.C. 20546       13. Type of Report and Period Covered         12. Sponsoring Agency Name and Address       14. Sponsoring Agency Code         15. Supplementary Notes       14. Sponsoring Agency Code         15. Abstract       This bibliography lists 707 reports, articles and other documents introduced into the MASA scientific and technical information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s))       18. Distribution Statement         18. bibliographies       Unclassified         Management Planning       20. Security Cassified       21. No. of Pages       22. Price*         Unclassified       Unclassified       174. Apg	9. Performing Organization Name and Address				
12. Sponsoring Agency Name and Address       13. Type of Report and Period Covered         12. Sponsoring Agency Name and Address       14. Sponsoring Agency Code         15. Supplementary Notes       14. Sponsoring Agency Code         16. Abstract       15. Supplementary Notes         17. This bibliography lists 707 reports, articles and other documents introduced into the NASA scientific and technical information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(N))       18. Distribution Statement         Bibliographies       Unclassified       Unclassified       21. No. of Pages       22. Pric*         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Pric*	National Aeronautics and Space Administration Washington, D.C. 20546		n	11. Contract or Grant No.	
14. Sponsoring Agency Code         15. Supplementary Notes         16. Abstract         This bibliography lists 707 reports, articles and other documents introduced into the NASA scientific and technical information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issus; management theory and techniques; industrial management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(N) Bibliographies Management Management Planning       18. Distribution Statement Unclassified         19. Security Classif. (of this report) Unclassified       20. Security Classif. (of this page)       21. No. of Pages       22. Price*	12. Sponsoring Agency Name and Address			13. Type of Report an	d Period Covered
15. Supplementary Notes         16. Abstract         This bibliography lists 707 reports, articles and other documents introduced into the NASA scientific and technical information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management; and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s)) Bibliographies Management Management Planning       18. Distribution Statement Unclassified - Unlimited         19. Security Classif. (of this report) Unclassified       20. Security Classif. (of this page)       21. No. of Pages       22. Price*				14. Sponsoring Agency	Code
16. Abstract         This bibliography lists 707 reports, articles and other documents introduced into the NASA scientific and technical information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s)) Bibliographies Management Management Methods Management Planning       18. Distribution Statement Unclassified         19. Security Classif. (of this page) Unclassified       20. Security Classif. (of this page) Unclassified       21. No. of Pages 21. No. of Pages 21. Ya       22. Price* Aug	15. Supplementary Notes		╶┈┈╴╴┈┉┉┈╴╴╵┈┈┈╻	- <u>·····</u> ····	- <u></u>
16. Abstract         This bibliography lists 707 reports, articles and other documents introduced into the NASA scientific and technical information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s)) Bibliographies Management Management Methods Management Planning       18. Distribution Statement Unclassified         19. Security Classif. (of this report) Unclassified       20. Security Classif. (of this page) Unclassified       21. No. of Pages       22. Price* A08					
This bibliography lists 707 reports, articles and other documents introduced into the NASA scientific and technical information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Clitations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s))       I8. Distribution Statement         Bibliographies       Unclassified         Management Planning       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       17.4       A08	16. Abstract				<u> </u>
This bibliography lists 707 reports, articles and other documents introduced into the NASA scientific and technical information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified         Management Methods       Management Planning         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       17.4       A08					
11to the MAAA Scientific and technical information system in 1955. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified         Management Planning       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08	This bibliography lists 707	eports, article	s and other docume	ents introduced	
17. Key Words (Suggested by Author(s))       18. Distribution Statement         17. Key Words (Suggested by Author(s))       18. Distribution Statement         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         19. Security Classif. ied       Unclassified       174       A08	into the NASA scientific and	technical infor	mation system in winess to the mana	1985. Items ar	e
issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s))       Its. Distribution Statement         Bibliographies       Unclassified         Management Methods       Management Planning         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08	Citations are grouped into te	n subject cated	ories: human fact	ors and person	• nel
robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s))       Is. Distribution Statement         Bibliographies       Unclassified         Management       Unclassified         19. Security Classif. (of this report)       20. Security Classif. (of this page)         17. Key Words Single to this page       17. Key Words (Suggested by Author(s))         Bibliographies       Is. Distribution Statement         Unclassified       Unclassified	issues; management theory and	d techniques; in	dustrial managemen	it and manufact	uring;
development; economics, costs, and markets; logistics and operations management;         reliability and quality control; and legality, legislation, and policy.         17. Key Words (Suggested by Author(s))         Bibliographies         Management         Management Methods         Management Planning         19. Security Classif. (of this report)         Unclassified         Unclassified	robotics and expert systems;	computers and i	nformation managem	ment; research a	and
17. Key Words (Suggested by Author(s))       18. Distribution Statement         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       17.4       A08	development; economics, cost	, and markets;	logistics and open	ations managem	ent;
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08	reliability and quality contr	ol; and legalit	y, legislation, ar	nd policy.	
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       17/4       A08	1				
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         Management Planning       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         Management Planning       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         Management Planning       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         Management Planning       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
17. Key Words (Suggested by Author(s))       18. Distribution Statement         Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         Management Planning       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08					
Bibliographies       Unclassified - Unlimited         Management       Unclassified - Unlimited         Management Methods       Management Planning         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08	17. Key Words (Suggested by Author(s))		18. Distribution Statement	<u></u>	
Management Management Methods Management PlanningUnclassified - Unlimited19. Security Classif. (of this report) Unclassified20. Security Classif. (of this page)21. No. of Pages 21. No. of Pages22. Price* A08	Bibliographies	1			
Management Methods         Management Planning         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08	Management		Unclassified	- Unlimited	
Management Planning         19. Security Classif. (of this report)       20. Security Classif. (of this page)       21. No. of Pages       22. Price*         Unclassified       Unclassified       174       A08	Management Methods				
19. Security Classif. (of this report)20. Security Classif. (of this page)21. No. of Pages22. Price*UnclassifiedUnclassified174A08	management Planning				
Unclassified Unclassified 174 A08	19. Security Classif. (of this report)	20. Security Classif. (c	f this page)	21. No. of Pages	22. Price*
	Unclassified	Unclassifie	d	174	A08

For sale by the National Technical Information Service, Springfield, Virginia 22161 NASA-Langley, 1986

National Aeronautics and Space Administration Code NIT-4

Washington, D.C. 20546-0001

Official Business Penalty for Private Use, \$300 SPECIAL FOURTH-CLASS RATE POSTAGE & FEES PAID NASA Permit No. G-27

7 I SP-7500, 860513 S90569ASR860701 NASA SCIEN & TECH INFO FACILITY ATTN: ACCESSIONING DEPT P O BOX 8757 BWI ARPRT BALTIMORE MD 21240

.

-



POSTMASTER: If Undeliverable (Section 158 Postal Manual) Do Not Return

# FEDERAL DEPOSITORY LIBRARIES

### ALABAMA

AUBURN UNIV. AT MONTGOMERY LIBRARY Documents Department Montgomery, AL 36193 (205) 279-9110, ext 253

UNIV. OF ALABAMA LIBRARY Documents Dept —Box S University, AL 35486 (205) 348-7369

### ARIZONA

DEPT. OF LIBRARY, ARCHIVES AND PUBLIC RECORDS Third Floor—State Cap 1700 West Washington Phoenix, AZ 85007 (602) 255-4121

UNIVERSITY OF ARIZONA LIB. Government Documents Dept Tucson, AZ 85721 (602) 626-5233

### ARKANSAS

ARKANSAS STATE LIBRARY One Capitol Mall Little Rock, AR 72201 (501) 371-2326

### CALIFORNIA

CALIFORNIA STATE LIBRARY Govt Publications Section P O Box 2037 Sacramento, CA 95809 (916) 322-4572

### COLORADO

UNIV. OF COLORADO LIB. Government Pub Division Campus Box 184 Boulder, CO 80309 (303) 492-8834

DENVER PUBLIC LIBRARY Govt Pub Department 1357 Broadway Denver, CO 80203 (303) 571-2131

CONNECTICUT CONNECTICUT STATE LIBRARY Government Documents Unit 231 Capitol Avenue Hantford, CT 06106 (203) 566-4971

FLORIDA UNIV. OF FLORIDA LIBRARIES Library West Documents Department Gamesville, FL 32611 (904) 392-0367

#### GEORGIA

UNIV. OF GEORGIA LIBRARIES Government Reference Dept Athens, Ga 30602 (404) 542-8951

#### HAWAII

UNIV. OF HAWAII LIBRARY Govt Documents Collection 2550 The Mall Honolulu, HI 96822 (808) 948-8230

### IDAHO

UNIV. OF IDAHO LIBRARY Documents Section Moscow, ID 83843 (208) 885-6344

#### ILLINOIS

ILLINOIS STATE LIBRARY Information Services Branch Centennial Building Springfield, IL 62706 (217) 782-5185

### INDIANA

INDIANA STATE LIBRARY Senals Documents Section 140 North Senate Avenue Indianapolis, IN 46204 (317) 232-3686

### IOWA

UNIV. OF IOWA LIBRARIES Govt Documents Department Iowa City, IA 52242 (319) 353-3318

#### KANSAS

UNIVERSITY OF KANSAS Doc Collect—Spencer Lib Lawrence, KS 66045 (913) 864-4662

### KENTUCKY

UNIV. OF KENTUCKY LIBRARIES Govt Pub Department Lexington, KY 40506 (606) 257-3139

### LOUISIANA

LOUISIANA STATE UNIVERSITY Middleton Library Govt Docs Dept Baton Rouge, LA 70803 (504) 388-2570

LOUISIANA TECHNICAL UNIV. LIBRARY Documents Department Ruston, LA 71272 (318) 257-4962

### MAINE

UNIVERSITY OF MAINE Raymond H Fogler Library Trn-State Regional Documents Depository Orono, ME 04469 (207) 581-1680

# MARYLAND

McKeldin Lib —Doc Div College Park, MD 20742 (301) 454-3034

### MASSACHUSETTS

BOSTON PUBLIC LIBRARY Government Docs Dept Boston, MA 02117 (617) 536-5400 ext 226

### MICHIGAN

DETROIT PUBLIC LIBRARY Sociology Department 5201 Woodward Avenue Detroit, MI 48202 (313) 833-1409

MICHIGAN STATE LIBRARY P O Box 30007 Lansing, MI 48909 (517) 373-0640

### MINNESOTA

UNIVERSITY OF MINNESOTA Government Pubs Drvision 409 Wilson Library 309 19th Avenue South Minneapolis, MN 55455 (612) 373-7813

### MISSISSIPPI

UNIV. OF MISSISSIPPI LIB. Documents Department University, MS 38677 (601) 232-5857

### MONTANA

UNIV. OF MONTANA Mansfield Library Documents Drvision Missoula, MT 59812 (406) 243-6700

### NEBRASKA

NEBRASKA LIBRARY COMM. Federal Documents 1420 P Street Lincoln, NE 68508 (402) 471-2045 In cooperation with University of Nebraska-Lincoln

#### NEVADA

UNIVERSITY OF NEVADA LIB. Govt Pub Department Reno, NV 89557 (702) 784-6579

#### NEW JERSEY

NEWARK PUBLIC LIBRARY 5 Washington Street Newark, NJ 07101 (201) 733-7812

#### NEW MEXICO

UNIVERSITY OF NEW MEXICO Zımmerman Lıbrary Government Pub Dept Albuquerque, NM 87131 (505) 277-5441

NEW MEXICO STATE LIBRARY Reference Department 325 Don Gaspar Avenue Santa Fe, NM 87501 (505) 827-2033, ext 22

### NEW YORK NEW YORK STATE LIBRARY

Empire State Plaza Albany, NY 12230 (518) 474-5563

### NORTH CAROLINA UNIVERSITY OF NORTH CAROLINA

AT CHAPEL HILL Wilson Library BA/SS Documents Division Chapel Hill, NC 27515 (919) 962-1321

### NORTH DAKOTA

UNIVERSITY OF NORTH DAKOTA Chester Fritz Library Documents Department Grand Forks, ND 58202 (701) 777-2617, ext 27 (In cooperation with North Dakota State Univ Library)

#### ΟΗΙΟ

STATE LIBRARY OF OHIO Documents Department 65 South Front Street Columbus, OH 43215 (614) 462-7051

### OKLAHOMA

OKLAHOMA DEPT. OF LIB. Government Documents 200 NE 18th Street Oklahoma Crty, OK 73105 (405) 521-2502 OKLAHOMA STATE UNIV. LIB. Documents Department Stillwater, OK 74078 (405) 624-6546

### OREGON

PORTLAND STATE UNIV. LIB. Documents Department P O Box 1151 Portland, OR 97207 (503) 229-3673

### PENNSYLVANIA

STATE LIBRARY OF PENN. Government Pub Section P O Box 1601 Harnsburg, PA 17105 (717) 787-3752

### TEXAS

TEXAS STATE LIBRARY Public Services Department P O Box 12927—Cap Sta Austin, TX 78753 (512) 471-2996

TEXAS TECH UNIV. LIBRARY Govt Documents Department Lubbock, TX 79409 (806) 742-2268

#### UTAH

UTAH STATE UNIVERSITY Merrill Library, U M C 30 Logan, UT 84322 (801) 750-2682

#### VIRGINIA

UNIVERSITY OF VIRGINIA Alderman Lib —Public Doc Charlottesville, VA 22901 (804) 924-3133

#### WASHINGTON

WASHINGTON STATE LIBRARY Documents Section Olympia, WA 98504 (206) 753-4027

#### WEST VIRGINIA

WEST VIRGINIA UNIV. LIB. Documents Department Morgantown, WV 26506 (304) 293-3640

#### WISCONSIN

MILWAUKEE PUBLIC LIBRARY 814 West Wisconsin Avenue Milwaukee, WI 53233 (414) 278-3000

ST. HIST LIB. OF WISCONSIN Government Pub Section 816 State Street Madison, WI 53706 (608) 262-4347

### **WYOMING**

WYOMING STATE LIBRARY Supreme Ct & Library Bld Cheyenne, WY 82002 (307) 777-6344