NASA SP-7500 (08)

MANAGEMENT

A CONTINUING LITERATURE SURVEY

– With Indexes –

MARCH 1974

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

PREVIOUS ISSUES IN THIS SERIES

DOCUMENT NUMBER	DATE	COVERAGE	SCOPE
NASA SP-7500	March 1968	1962-1967	Documents generated or sponsored by NASA
NASA SP-7500 (02)	May 1968	1962-1967	Documents generated or sponsored by non-NASA organizations
NASA SP-7500 (03)	June 1969	1968	NASA and non-NASA documents
NASA SP-7500 (04)	June 1970	1969	NASA and non-NASA documents, with special DOD section
NASA SP-7500 (05)	May 1971	1970	NASA and non-NASA documents, with special DOD section
NASA SP-7500 (06)	March 1972	1971	NASA and non-NASA documents
NASA SP-7500 (07)	March 1973	1972	NASA and non-NASA documents

The first issue and the supplements which followed are available from:

National Technical Information Service (NTIS)
Springfield, Virginia 22151

For copies to be mailed to addresses outside the United States, please add $2.50 for each copy.

This bibliography was prepared by the NASA Scientific and Technical Information Facility, operated for the National Aeronautics and Space Administration by Informatics Tisco, Inc.

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA SP-7500 (08)		

4. Title and Subtitle	5. Report Date
MANAGEMENT A Continuing Literature Survey	March 1974
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
	10. Work Unit No.
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546	11. Contract or Grant No.
	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This special bibliography lists 597 reports, articles, and other documents introduced into the NASA scientific and technical information system in 1973.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Bibliographies Management Management Methods Management Planning	Unclassified - Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	157	$5.50

For sale by the National Technical Information Service, Springfield, Virginia 22151

* U.S. GOVERNMENT PRINTING OFFICE: 1974—739-162/145

NASA SP-7500 (08)

MANAGEMENT

A CONTINUING LITERATURE SURVEY

– With Indexes –

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA Scientific and Technical Information System during 1973.

Scientific and Technical Information Office
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MARCH 1974
Washington, D. C.

This document is available from the National Technical Information Service (NTIS), Springfield, Virginia 22151 for $5.50. For copies mailed to addresses outside the United States, add $2.50 per copy for handling and postage.

INTRODUCTION

COVERAGE

Management is a compilation of references to selected reports, journal articles, and other documents on the subject of management. This publication lists 597 documents originally announced in the 1973 issues of *Scientific and Technical Aerospace Reports (STAR)* or *International Aerospace Abstracts (IAA)*.

SCOPE

This publication series includes references on the management of: research and development, contracts, production, logistics, personnel, safety, reliability and quality control. It also includes references on: program, project and systems management; management policy, philosophy, tools, and techniques; decision-making processes for managers; technology assessment; management of urban problems; and information for managers on federal resources, expenditures, financing, and budgeting.

ORGANIZATION

Each entry in this bibliography consists of a bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two sections: *IAA* entries and *STAR* entries, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Following the abstract sections, three indexes are included: subject, personal author, and corporate source.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A73-10000 series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies are available at $5.00 per document up to a maximum of 20 pages. The charge for each additional page is 25 cents. Microfiche [1] are available at the rate of $1.00 per microfiche for documents identified by the # symbol following the accession number. A number of publications, because of their special characteristics, are available only for reference in the AIAA Technical Information Service Library. Minimum airmail postage to foreign countries is $1.00. Please refer to the accession number, e.g. A73-17640, when requesting publications.

STAR ENTRIES (N73-10000 Series)

A source from which a publication abstracted in this Section is available to the public is ordinarily given on the last line of the citation, e.g., Avail: NTIS. The following are the most commonly indicated sources (full addresses of these organizations are listed at the end of this introduction):

Avail: NTIS. Sold by the National Technical Information Service at the price shown in the citation. If no price is shown in a current *STAR* citation, it may be ascertained by referring to *Government Reports Announcements* or to NTIS. Beginning with documents announced in Issue 21, 1973, "stocked" reports, such as printed NASA reports are priced on a step schedule ranging irregularly from $3.00 for a 1-to-25 page report to $11.00 for 576 to 600 pages, plus $2.00 for each additional 100-page increment. Demand print reports (those for which a facsimile reproduction will be made to fill orders) are priced at $4.00 for the first 20 pages plus 25 cents for each five pages or portions thereof. These prices are not applied retroactively; i.e., reports previously announced at a certain price continue to be sold at that price. If "Avail: NTIS" without a price appeared in the citation of a NASA report (asterisked) it is sold at $3.00 whether printed copy or facsimile is supplied. Because of price changes and possible surcharges, it is recommended that for any document announced in *STAR* before July 1970, NTIS be queried as to the price. Document prices are subject to change without notice. See "Avail: SOD" below for documents available from both the Superintendent of Documents and NTIS.

Microfiche. Microfiche is available from NTIS at a standard price of $1.45 (regardless of age) for those documents identified by the # sign following the accession number (e.g., N73-10636#) and having an NTIS availability shown in the citation. Standing orders for microfiche of (1) the full collection of NTIS-available documents announced in *STAR* with the # symbol, (2) NASA reports only (identified by an asterisk (*)), (3) NASA-accessioned non-NASA reports only (for those who wish to maintain an integrated microfiche file of aerospace documents by the "N" accession number), or (4) any of these classes within one or more *STAR* categories, also may be placed with NTIS at greatly reduced prices per title (e.g., 45 cents) over individual requests. Inquiries concerning NTIS Selective Categories in Microfiche should be addressed to the Subscription Unit, National Technical Information Service.

Deposit Accounts and Customers Outside U.S. NTIS encourages its customers to open deposit accounts to facilitate the purchase of its documents now that prices vary so greatly.

NTIS customers outside the United States are reminded that they should add the following handling and postage charges to the standard or announced prices:

(1) A microfiche is a transparent sheet of film, 105 x 148 mm in size, containing up to 98 pages of information reduced to micro images (not to exceed 24:1 reduction).

hard (paper) copy, $2.50 each document; microfiche, $1.50 each document. For subscribers outside the United States who receive microfiche through the Selective Categories in Microfiche program, NTIS will add 15 cents for each title shipped.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The price is given following the availability line. (An order received by NTIS for one of these documents will be filled at the SOD price if hard copy is requested. NTIS will also fill microfiche requests, at the standard $1.45 price, 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 Documents 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 Mississippi Test Facility, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

Avail: NASA Scientific and Technical Information Office. Documents with this availability are usually news releases or informational brochures available without charge in paper copy.

Avail: AEC Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of U.S. Atomic Energy Commission reports, usually in microfiche form, are listed in *Nuclear Science Abstracts*. Services available from the USAEC and its depositories are described in a booklet, *Science Information Available from the Atomic Energy Commission* (TID-4550), which may be obtained without charge from the USAEC 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) at $10.00 each and microfilm at $4.00 each, regardless of the length of the manuscript. Handling and shipping charges are additional. All requests should cite the author and the Order Number as they appear in the citation.

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 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 BLL).

Avail: ZLDI. Sold by the Zentralstelle für Luftfahrtdokumentation und -Information, Munich, 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 Office. Sold by Commissioner of Patents, U.S. Patent Office, at the standard price of $.50 each, postage free.

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.

GENERAL AVAILABILITY

All publications abstracted in this bibliography are available to the public through the sources as indicated in the *STAR Entries* and *IAA Entries* sections. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publication inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA. A listing of public collections of NASA documents is included on the inside back cover.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics
and Astronautics
Technical Information Service
750 Third Ave.
New York, N.Y. 10017

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents
U.S. Patent Office
Washington, D.C. 20231

Engineering Sciences Data Unit Ltd.
251–259 Regent Street
London W1R 7AD, England

ESRO/ELDO Space Documentation Service
European Space Research Organization
114, av. Charles de Gaulle
92-Neuilly-sur-Seine, France

Her Majesty's Stationery Office
P.O. Box 569, S.E. 1
London, England

NASA Scientific and Technical Information
Facility
P.O. Box 33
College Park, Maryland 20740

National Aeronautics and Space
Administration
Scientific and Technical Information
Office (KSI)
Washington, D.C. 20546

National Technical Information Service
Springfield, Virginia 22151

Pendragon House, Inc.
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

University Microfilms, Inc.
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

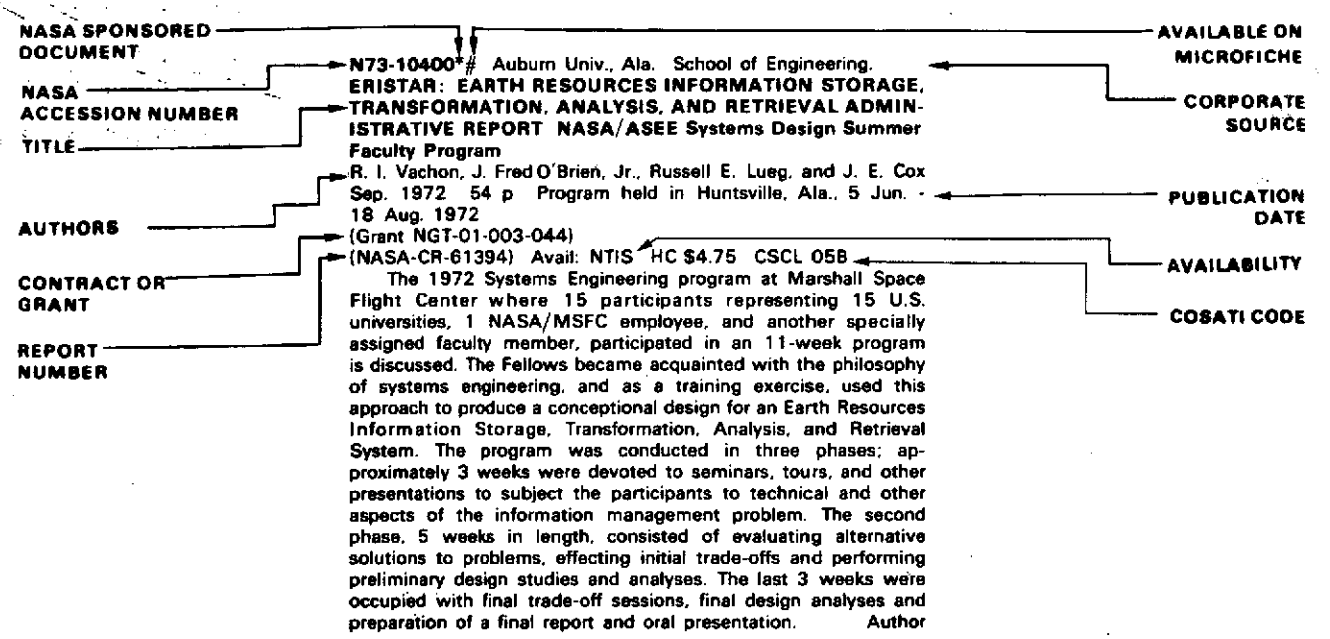
University Microfilms, Inc.
Tylers Green
London, England

U.S. Atomic Energy Commission
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

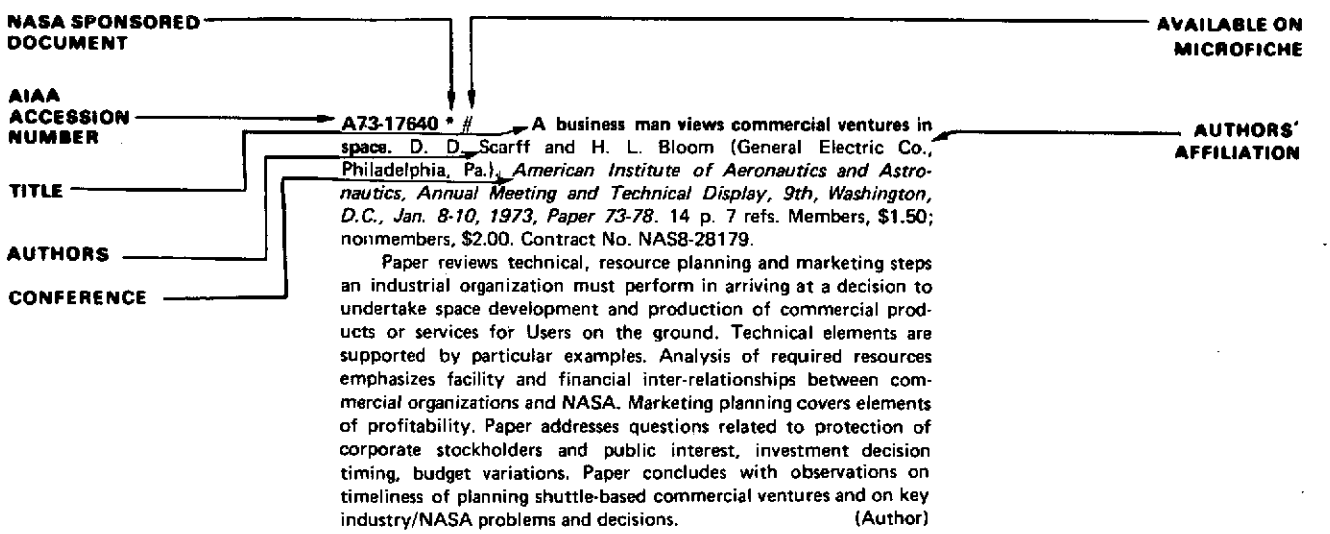
Zentralstelle für Luftfahrtdoku-
mentation und-Information
8 München 86
Postfach 880
Federal Republic of Germany

TABLE OF CONTENTS

TYPICAL CITATION AND ABSTRACT FROM STAR



TYPICAL CITATION AND ABSTRACT FROM IAA



NASA

MANAGEMENT

a continuing literature survey

MARCH 1974

IAA ENTRIES

A73-10825 **Management system for aviation safety.** H. D. Kysor and L. Benner. *Business and Commercial Aviation,* vol. 31, Oct. 1972, p. 56-59, 73.

Management procedures for determining an acceptable degree of exposure to incident or accident (level of risk) are described for the benefit of business enterprises operating corporate or executive aircraft. The procedures constitute a general plan for implementing effective methods of achieving an acceptable risk level while monitoring the operation to ensure that this level does not rise unexpectedly. Federal Aviation Regulations relating to safety requirements in maintenance and operation are evaluated, and risk identification procedures are outlined. T.M.

A73-11007 * **GREMEX - A management game for the new public administration.** E. B. McGregor (Maryland, University, College Park, Md.) and R. F. Baker (NASA, Washington, D.C.). *Public Administration Review,* vol. 32, Jan.-Feb. 1972, p. 24-32. 18 refs.

This is a critique of a new management game being used in the federal government - Goddard Research Engineering Management Exercise (GREMEX). The exercise involves teams of players who act as managers of a research and development project - the orbiting optical observatory - of the National Aeronautics and Space Administration. During this exercise a computer and the referee-instructor together provide the realistic environment within which the team participants make their decisions affecting the course of the project. The article discusses the place of GREMEX in a tradition of games and simulations, and notes the similarities and differences between GREMEX and other management games currently in use for business training. Some of the actual decisions being made by the GREMEX teams are described to illustrate the nature of the exercise. (Author)

A73-11069 **Review of the past brightens the future.** R. C. Seamans, Jr. (USAF, Washington, D.C.). *Defense Management Journal,* vol. 8, Oct. 1972, p. 60-65.

The developments and alterations in the progress of the C-5 program are reviewed in terms of defense needs, development problems, and costs. Also considered are the objectives and prospects of the F-15 and B-1 programs. Some details are given on new management policies and subsystem development in the B-1 program. V.Z.

A73-11252 **SAGESS /Analytical System for Managing Space Assemblies and Systems/ - A management system applicable to CNES (SAGESS /Système Analytique de Gestion des Ensembles et Systèmes Spatiaux/ - Un système de gestion applicable au CNES).** *La Recherche Spatiale,* vol. 11, Sept.-Oct. 1972, p. 1-8. In French.

Description of a system designed to facilitate and rationalize the operations of a national space research center. After a brief analysis of the activity of the center involved and of the main problems connected with the management of this activity, a management system is proposed in which the basic information required for efficient management is acquired at the level of the operational units from a data card divided into three zones - an operation zone, a budgeting zone, and a resource prediction and utilization zone. A number of criteria for judging performance in selected cases are proposed. A.B.K.

A73-11253 **Implementation of the annual program by budgeting (La mise en oeuvre du programme annuel par la budgétisation).** *La Recherche Spatiale,* vol. 11, Sept.-Oct. 1972, p. 8-15. In French.

Consideration of the role of budgeting in the development and implementation of a five-year plan of operations at a space research center. A concept of budgeting is described which is recommended for practical implementation at the research center and for integration into the overall framework of budget management, where it will be preceded by a prediction phase and followed by an indispensable phase of monitoring and execution of operations. It is shown how the budgeted physical program resulting in a budget is elaborated at the research center, and some summary data are provided concerning the budgets of this research center for 1972. A.B.K.

A73-11254 **Space research and the Sixth Plan (La recherche spatiale et le VIe Plan).** *La Recherche Spatiale,* vol. 11, Sept.-Oct. 1972, p. 16-22. In French.

Description of the physical contents and financial underpinning of the various space research programs to be carried out during the Sixth Plan. The orientation of the space activity to be carried out during this plan is reviewed, including the development of a meteorology program, the development of a satellite communication program and the associated boosters, the implementation of a scientific and technological satellite program with the aid of the Diamant booster, and the pursuit of a research and development program oriented toward the preparation of future objectives. The distribution of financing over various sectoral groups and major programs is indicated, and a financial analysis is made of these major programs, which include a European program, a bilateral program, a national program, a research and development program, and a general support program. A.B.K.

A73-11860 **Predicting design costs.** D. J. Leech and D. L. Earthrowl (Swansea, University College, Swansea, Wales). *Aeronautical Journal,* vol. 76, Sept. 1972, p. 575-577.

An investigation of design procedures and the prediction of design and development costs in the aircraft component industry is discussed on the basis of 32 manufactured items for which the originally predicted man hours required for design and development and the hours actually used where known. A Monte Carlo simulation of a year's design and development work is proposed which will give a symmetric distribution of design and development costs for use in the company's development plan. V.P.

A73-11883 **Applied maintainability engineering.** C. E. Cunningham and W. Cox (Philco-Ford Corp., Palo Alto, Calif.). New York, Wiley-Interscience, 1972. 427 p. 79 refs. $19.95.

Aspects of maintainability program management are examined, giving attention to maintainability function objectives, the location of the maintainability function, maintainability responsibilities and authorities, staffing the maintainability function, and maintainability functional interfaces. The maintainability program plan is considered together with the maintainability analysis, the maintenance concept, maintainability design criteria, maintainability design tradeoffs, and questions of maintainability prediction. Other subjects discussed include vendor and subcontractor maintainability efforts, the integration of other items, a design review, maintainability demonstration, maintainability status reports, and human factors in maintainability. The problems of data collection and analysis are also investigated together with details concerning a corrective action system. G.R.

A73-12348 **A method for re-allocating funds to meet a reduced budget.** P. S. Nagpaul (Central Electronics Engineering Research Institute, Pilani, Rajasthan, India). *Research Management*, vol. 15, Nov. 1972, p. 35-42. 5 refs.

The method considered provides an approach to find out which projects should be held in abeyance and which projects should be carried out at reduced levels of expenditure so as to meet the new budget constraint. It is assumed that a project can be carried out at different levels of expenditure within certain limits. As a rule, the higher the level of expenditure on a project, the faster it will be completed. The effect of change in the level of expenditure on the expected completion date is indicated in a graph. An R and D project is characterized by three parameters, including time, cost, and value. An estimation of these parameters is essential for deciding whether a certain project should be dropped or its level of expenditure reduced. G.R.

A73-12349 **Reducing the cost of the R&D proposal process.** W. D. Putt (Holograph Corp., East Hartford, Conn.). *Research Management*, vol. 15, Nov. 1972, p. 43-52. Research supported by the Ford Foundation.

The study discussed examines the cost effectiveness of the proposal solicitation process for research and development procurements. This process is considered to consist of the elicitation from companies of a decision to submit a proposal and the actual preparation of that proposal. It does not include the contract performance phase of the procurement cycle. Investigations of the bid decision and proposal preparation process within companies were undertaken to determine whether the effectiveness criteria are fulfilled in government competitions, particularly in applied research. Possibilities for improvement are considered on the basis of the studies. G.R.

A73-13048 **Organization and management for adhesive bonding aircraft structures.** F. B. Yarborough (Lockheed-Georgia Co., Marietta, Ga.). In: Non-metallic materials selection, processing and environmental behavior; Proceedings of the Fourth National Technical Conference and Exhibition, Palo Alto, Calif., October 17-19, 1972. Azusa, Calif., Society of Aerospace Material and Process Engineers, 1972, p. 553-561. 14 refs.

A survey conducted of six bonding facilities showed that there was unanimous agreement that close coordination between all disciplines of Bonded Structures was essential. The study revealed that the lack of proper coordination between Production, Tooling, Engineering, and Planning was the chief contributor to discrepancies and schedule delays. A plan for ensuring proper coordination with each organization to keep the fabrication of components on schedule, of high quality, and within the predicted cost perimeters is presented. (Author)

A73-13238 # **Problems of rational design of the data system for the constructive development process (Probleme einer rationellen Gestaltung des Informationssystems für den konstruktiven Entwicklungsprozess).** S. Harhoff and W. Schölling (Dresden, Technische Universität, Dresden, East Germany). *Wissenschaftliche Zeitschrift*, vol. 21, no. 2, 1972, p. 293-308. 14 refs. In German.

Development of a rational data system for the solution of the data supply problem for the constructive development process. Starting from the function of such a system, a functionally oriented classification of data systems in general, and the structure of the data preparation process to be realized, fundamental aspects of the system design are indicated, concepts regarding the storage structure of the data system for the constructive development process are developed, preliminary calculations for its realization are presented, and essential questions involved in the determination of the efficiency of data systems in general and the data system for the constructive development process in particular are discussed. A.B.K.

A73-13240 # **Theoretical foundations of the development of a system of automated information processing for the problems of manufacturing-process design in the metalworking industry (Theoretische Grundlagen der Entwicklung eines Systems der automatisierten Informationsverarbeitung für die Aufgaben der Fertigungsprozessgestaltung in der metallverarbeitenden Industrie).** D. Kochan (Dresden, Technische Universität, Dresden, East Germany). *Wissenschaftliche Zeitschrift*, vol. 21, no. 2, 1972, p. 396-406. In German.

A73-13575 **Improving load factor control.** J. Monbeig and A. Sypkens (McKinsey and Co., Inc., Washington, D.C.). *Interavia*, vol. 27, Nov. 1972, p. 1205-1207. 5 refs.

It is suggested that airlines could increase their load factors, without impairing their service to the public, by clearly defining the relationship between the quality of that service and the average passenger load factor. The current industry uncertainties on the size of required capacity adjustments are reviewed, followed by description of how better load factor control can be achieved by relating quality of service to average passenger load factor. Some observations are made concerning the need for cooperation and/or coordination between airlines for successful load factor planning. F.R.L.

A73-13897 **The Pentagon enters its era of austerity.** C. J. V. Murphy. *Fortune*, vol. 86, Dec. 1972, p. 142-146, 148, 150.

Financial problems in connection with the development and the production of aircraft and ships for the Defense Department are discussed, giving attention to the C-5A, the Cheyenne helicopter, and the DD-963 class of highly automated destroyers. Approaches for solving these problems include a reduction in force levels, a decreased rate in the development of systems based on novel technologies, and a relaxation in the insistence on the utmost in performance. The military procurement mechanism introduced by Packard is discussed, togehter with the development of the B-1 supersonic bomber, the F-15 fighter program, and the problems experienced in connection with the F-14 fighter. G.R.

A73-13901 **Satellite charges for a mixed pre-demand-assigned system.** B. G. Evans and E. Farell (Essex, University, Colchester, Essex, England). *IEEE Transactions on Aerospace and Electronic Systems*, vol. AES-8, Sept. 1972, p. 583-590. 15 refs.

The problems of satellite charges with reduced G/T stations for different pre-assigned and demand-assigned modes of operation are considered. A mixed pre-assigned demand-assigned operation is assumed as a model, in which large standard stations use the demand-assigned system for their overflow traffic. Determination of the optimum percentage of overflow for each link and of the global satellite revenue and occupancy, in terms of a general traffic matrix, is carried out and then used in the specific case of the Atlantic satellites to establish demand-assignment and pre-assignment charges as a function of G/T, based on a cost per unit bandwidth criterion. The effects of various demand-assignment systems on the economic balance are also considered. (Author)

A73-14469 **Scar tissue and aircraft propulsion development.** E. C. Simpson (USAF, Aero Propulsion Laboratory, Wright-

Patterson AFB, Ohio). *Aeronautical Journal*, vol. 76, Oct. 1972, p. 607-612.

An attempt is made to provide guidance in creating an environment to encourage success in aircraft propulsion development, with a view to alleviation of mental stress, among the personnel involved. The basic resources for aircraft engine development are money, manpower, facilities, and knowledge. The general size and importance of the problem, and the resources to be applied are defined. The problems of organization are outlined, followed by a definition of the rules of procedure. The problems line people must overcome are discussed, followed by what to expect and where to inspect for problems. An approach to the technical portion of the problem is suggested. F.R.L.

A73-14729 * Transferring technology to the public sector. M. E. Alper (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Western Electronic Show and Convention, Los Angeles, Calif., September 19-22, 1972, Proceedings. North Hollywood, Calif., Western Periodicals Co., 1972, p. 5/1-1 to 5/1-6. 17 refs.

Approximately four years ago the Jet Propulsion Laboratory, under NASA sponsorship, began to devote some of its resources to examining ways to transfer space technology to the civil sector. As experience accumulated under this program, certain principles basic to success in technology transfer became apparent. An adequate definition of each problem must be developed before any substantial effort is expended on a solution. In most instances, a source of funds other than the potential user is required to support the problem definition phase of the work. Sensitivity to the user's concerns and effective interpersonal communications between the user and technical personnel are essential to success. (Author)

A73-14823 # Principles of organization and logistical support for systems of automating scientific investigations (Printsipi organizatsii i tekhnichnogo zabezpechennia sistem avtomatizatsii naukovikh doslidzhen'). B. M. Malinovs'kii. *Akademiia Nauk Ukrains'koi RSR, Visnik*, vol. 36, Sept. 1972, p. 66-76. In Ukrainian.

A73-14894 Aircraft noise as a continuing national problem. L. Hinton (Metropolitan Aircraft Sound Abatement Council, Minneapolis, Minn.). In: International Conference on Transportation and the Environment, Washington, D.C., May 31-June 2, 1972, Proceedings. Part 1. New York, Society of Automotive Engineers, Inc., 1972, p. 134-147. 23 refs.

The problem of aircraft noise was already recognized at the time of the appointment of the President's Airport Commission by President Truman in February 1952. Aspects of early congressional interest in aircraft noise questions are considered together with views expressed by the Environmental Protection Agency (EPA) and by NASA. Effects of aircraft operation on community noise and possible noise abatement takeoff procedures were studied by individual airlines. The enactment of legislation by Congress is proposed to accomplish immediate alleviation in noise problems on a short term basis and to authorize the EPA to develop national guidelines for the establishment of noise exposure contours at all airports on a long term basis. G.R.

A73-14895 Air transportation system planning - Progress in noise reduction. A. L. McPike (Douglas Aircraft Co., Long Beach, Calif.). In: International Conference on Transportation and the Environment, Washington, D.C., May 31-June 2, 1972, Proceedings. Part 1. New York, Society of Automotive Engineers, Inc., 1972, p. 402-407.

Brief examination of how community noise considerations affect the development of new commercial transport aircraft. The general noise level goals of the manufacturer are discussed, and information is provided to show that, contrary to popular opinion, the noise levels of succeeding generations of jet transports have generally been lower than those of their predecessors. Some of the evaluation procedures available for minimizing community noise are examined, along with some of the constraints the aircraft manufacturer faces in the design process. A brief assessment of what the future trends in community noise levels will be is presented. (Author)

A73-15965 # Organization and planning of production at aircraft-construction plants (Organizatsiia i planirovanie proizvodstva na aviadvigatelestroitel'nykh zavodakh). V. I. Tikhomirov, F. I. Paramonov, D. E. Starik, V. V. Chernyshev, M. I. Markov, G. B. Deich, B. I. Panfilov, P. F. Derunov, A. P. Kolesnikov, and V. I. Omel'chenko. Moscow, Izdatel'stvo Mashinostroenie, 1972. 449 p. 51 refs. In Russian.

The special features of the production process at an aircraft-construction plant are considered, as well as the production and organizational structure of the plant, methods of controlling production with the aid of computers and of mechanizing the labor of engineers and technicians, the organization of the design and technological preparation of production, methods of monitoring the production quality, systems of organization of technical maintenance of production using complex mechanization and automation of maintenance and auxiliary operations, the organization of technical-economic and operative-calendar planning of production, and the basic trends of development of nonindustrial plant activity promoting the growth of labor productivity of plant workers, raising their cultural level, and improving everyday maintenance. A.B.K.

A73-16351 Management of engineering design. D. J. Leech (Swansea, University College, Swansea, Wales). London, John Wiley and Sons, Ltd., 1972. 264 p. 46 refs. $16.95.

The various aspects involved in defining the problem are considered, giving attention to the design situation, the system, the starting of the design, objectives, resources, environment, and design specifications. The process concerned with finding feasible solutions to the problems posed by the design specifications is discussed together with the structure of the design team, questions of communications, critical path methods, and accounting. Models and tools of analysis are also examined, taking into account failure analysis, reliability, component life, confidence levels, optimization studies, linear programming, and the man/machine interface. G.R.

A73-16360 The local service airline experiment. G. C. Eads (George Washington University, Washington, D.C.). Research supported by the Ford Foundation. Washington, D.C., Brookings Institution (Studies in the Regulation of Economic Activity, No. 6), 1972. 234 p. 325 refs. $7.95.

Questions regarding the demand for short-haul air service are investigated, giving attention to the demand for passenger transportation, the size of the short-haul air travel market, and the factors affecting the demand for short-haul air service. The costs of short-haul air service are discussed together with aspects of local service, route strengthening, transition to trunkline status, and policy options open to the federal government. Questions of the quality of 'local' air service and its cost to the government are also examined. It is concluded that on economic grounds a strong case can be made for ending the local service subsidy altogether. G.R.

A73-16619 # What's wrong with the air traffic control system. P. Hirsch. *CATCA Journal*, vol. 4, Fall 1972, p. 8, 9, 34-36, 6.

The air traffic control automation program is critically evaluated. A study commissioned by the FAA indicates that the entire development of the en route system has begun plagued by technical and management problems. The report states that the quasi-obsolescent hardware, the outdated design of the software, the inadequate production and testing facilities, the ever-increasing use of hardware resources, and the lack of a plan to deploy a quality-assured product, are manifestations of a development without sufficient control. F.R.L.

A73-16627 **U.S. Army's 1500-shp demonstrator engine program - Some lessons learned.** N. C. Kailos and P. Chesser (U.S. Army, Air Mobility Research and Development Laboratory, Fort Eustis, Va.). *Society of Automotive Engineers, National Aerospace Engineering and Manufacturing Meeting, San Diego, Calif., Oct. 2-5, 1972, Paper 720828.* 8 p. Members, $1.25; nonmembers, $2.00.

Review of some of the technical and nontechnical lessons learned from a program for the development of 1500-shp advanced-technology demonstrator engines, initiated in 1967. Encountered problem areas are analyzed, and a number of important 'hindsight' findings are reflected as 'feedback' for use in future programs of a similar nature. M.V.E.

A73-16664 **Flight simulator development in parallel with aircraft flight test - A case study of the American Airlines DC-10 program.** F. A. Wirth (American Airlines, Inc., New York, N.Y.). *Society of Automotive Engineers, National Aerospace Engineering and Manufacturing Meeting, San Diego, Calif., Oct. 2-5, 1972, Paper 720858.* 8 p. Members, $1.25; nonmembers, $2.00.

A73-17127 * **Considerations and techniques for incorporating remotely sensed imagery into the land resource management process.** W. G. Brooner and D. A. Nichols (California, University, Riverside, Calif.). In: Remote sensing of earth resources; Proceedings of the Conference on Earth Resources Observation and Information Analysis Systems, Tullahoma, Tenn., March 13, 14, 1972. Volume 1. Tullahoma, Tenn., F. Shahrokhi, University of Tennessee, 1972, p. 1-24. 17 refs. Grant No. NGL-05-003-404.

Development of a scheme for utilizing remote sensing technology in an operational program for regional land use planning and land resource management program applications. The scheme utilizes remote sensing imagery as one of several potential inputs to derive desired and necessary data, and considers several alternative approaches to the expansion and/or reduction and analysis of data, using automated data handling techniques. Within this scheme is a five-stage program development which includes: (1) preliminary coordination, (2) interpretation and encoding, (3) creation of data base files, (4) data analysis and generation of desired products, and (5) applications. A.B.K.

A73-17511 **Discovery problems in aviation litigation.** J. B. Sales. *Journal of Air Law and Commerce*, vol. 38, Summer 1972, p. 297-324. 70 refs.

Attention is given to discovery in general, with particular reference to aircraft cases on questions of privileged material and relevancy under general discovery procedures. The scope and application of the particular discovery techniques of interrogatories and preduction, including governmental documents and depositions, as well as depositions of FAA investigators, are reviewed. Litigation arising from aircraft disasters involves many complex and unique problems. The difficulties inherent in pretrial discovery are directly proportionate to the complexities of establishing the causative factors of the accident. Particularly important in the discovery process is the technical evaluation undertaken by various governmental agencies, both independently and in conjunction with private industry. F.R.L.

A73-17609 # **Concorde inaugurates the supersonic era.** E. H. Burgess (British Aircraft Corp., Ltd., Filton, Bristol, England). *American Institute of Aeronautics and Astronautics, Annual Meeting and Technical Display, 9th, Washington, D.C., Jan. 8-10, 1973, Paper 73-16.* 10 p. Members, $1.50; nonmembers, $2.00.

It is shown that there is going to be a 'supersonic era' and that this revolution in air transport will be spearheaded by the Concorde. The SST's speed advantage is so great that it becomes virtually a different type of vehicle, complementing rather than supplementing the large subsonic transports. The present status of the Concorde project is outlined, and its development history is given. Market prospects are that 200 to 250 Concordes will be sold. Environmental factors, such as high altitude effects, noise, air pollution, and depletion of resources are considered. F.R.L.

A73-17613 # **Structural design of future commercial transports.** P. L. Sandoz (Boeing Co., Everett, Wash.). *American Institute of Aeronautics and Astronautics, Annual Meeting and Technical Display, 9th, Washington, D.C., Jan. 8-10, 1973, Paper 73-20.* 13 p. Members, $1.50; nonmembers, $2.00.

This paper explores potential applications of structural research and development to the design of future commercial transports. Advanced structural systems are evaluated relative to cost and value for use in commercial transports. The levels of structural fail-safeness and durability available in current transports will be maintained as requirements for future designs. The value of durability is low structural maintenance cost and airplane availability for high daily utilization rates. Airline acceptance of new structural systems will be influenced by these factors through assessments of return on investment and the effect on direct operating cost. (Author)

A73-17624 # **AEROSAT - An aeronautical communications satellite for oceanic areas.** D. R. Israel (FAA, Washington, D.C.). *American Institute of Aeronautics and Astronautics, Annual Meeting and Technical Display, 9th, Washington, D.C., Jan. 8-10, 1973, Paper 73-46.* 10 p. Members, $1.50; nonmembers, $2.00.

The AEROSAT program and some of its technical highlights and matters of organization, financing, production-sharing, and ownership are reviewed. The continuing growth of oceanic air traffic is saturating, and will shortly exceed, the capacity of the available ground-to-air communications over the oceanic areas. It is shown that a communications relay capability by a system of geostationary satellites offers the best solution to the problem. The general concept is that the satellite, or space segment of the system, should be a general purpose high-fidelity repeater of messages with only the frequency translation necessary to avoid self-interference. F.R.L.

A73-17640 * # **A business man views commercial ventures in space.** D. D. Scarff and H. L. Bloom (General Electric Co., Philadelphia, Pa.). *American Institute of Aeronautics and Astronautics, Annual Meeting and Technical Display, 9th, Washington, D.C., Jan. 8-10, 1973, Paper 73-78.* 14 p. 7 refs. Members, $1.50; nonmembers, $2.00. Contract No. NAS8-28179.

Paper reviews technical, resource planning and marketing steps an industrial organization must perform in arriving at a decision to undertake space development and production of commercial products or services for Users on the ground. Technical elements are supported by particular examples. Analysis of required resources emphasizes facility and financial inter-relationships between commercial organizations and NASA. Marketing planning covers elements of profitability. Paper addresses questions related to protection of corporate stockholders and public interest, investment decision timing, budget variations. Paper concludes with observations on timeliness of planning shuttle-based commercial ventures and on key industry/NASA problems and decisions. (Author)

A73-17862 **The international rules of route rentals. I (Le régime international des redevances de route. I).** R. Goy (Rouen, Université, Rouen, France). *Revue Générale de l'Air et de l'Espace*, vol. 35, no. 3, 1972, p. 257-278. 151 refs. In French.

The concept of route rental is the payment for the use by aircraft in flight of route installations and services such as navigation aids, air traffic control, flight information and warnings, meteorology, and search and rescue. However, the application of route rentals has for long been opposed by operators, while rental charges at airports have been considered normal. Because of the rising costs of complex equipment, the financing of route services cannot always be assumed by the state alone. Many states already collect route rentals. It is considered that, in establishing and collecting rentals, universal rules should be set up, based on various national and international conventions and agreements. F.R.L.

A73-17866 **Quality costing systems.** B. J. Mandel. *Quality Progress*, vol. 5, Dec. 1972, p. 11-13. 5 refs.

Discussion of the basic elements of random time sampling as a costing procedure which meets the requirements of quality costing in terms of relevance, accuracy, simplicity, and economy. The method is currently used in the U.S. Postal Service, the Social Security Administration, and the Bureau of Customs. It is believed that this costing procedure is well suitable in the management field as a quality costing system and a time control and productivity analysis system. Some alternative costing systems are also discussed briefly. V.Z.

A73-17998 **Aircraft for business trips - Yes or no. II (Geschäftsreiseflugzeug - Ja oder nein. II).** H. G. Wellmann. *Flug Revue/Flugwelt International*, Jan. 1973, p. 33, 34. In German.

An evaluation of the costs of aircraft operation is discussed, giving attention to maintenance and repair work. In order to reduce expenses it is recommended to select firms for motor repair work needed on an international basis. Details regarding the determination of the operational condition of the aircraft are discussed together with questions of the depreciation of the aircraft. G.R.

A73-18514 **The use of model building in a production environment.** D. Fleming and R. M. Laing. *Aeronautical Journal*, vol. 76, Nov. 1972, p. 675-681.

Decision making problems regarding production tend to fall into two categories which are called strategic and operating. Three problems of the operating type and one of the strategic variety are discussed together with a particular problem of economic purchasing. The model developed makes use of a comprehensive production data processing system. Batching routines are considered together with risk horizons, price breaks, and the implementation of a pilot scheme. It is estimated that the new approach will result in a reduction in inventory of somewhat less than 15%. G.R.

A73-18917 **M.O.S. built-in reliability production line.** J. Pollard (Société Européenne de Semiconducteurs et de Microélectronique, Paris, France). In: French space technology. Volume 1. Paris, Information Propagande Françaises, Editeur; Centre National d'Etudes Spatiales, 1971, p. 199-204. In English and French.

Description of the construction of a special MOS production line to ensure reliability of each individual manufacturing operation and the proper incorporation of each operation into a complete flow process. The new production line is based on the principle of fundamental analysis of causes of failure, perfection of the process, strict control of all production stages, and experimental verification of reliability. Items subject to material control are indicated, and the specifications imposed on control operations are reviewed, noting the importance of checking reliability in intermediate products. A.B.K.

A73-18920 **Development of space components.** M. Guyonnet (Compagnie Européenne de Composants Electroniques, Montreuil-sous-Bois, Seine-St-Denis, France). In: French space technology. Volume 1. Paris, Information Propagande Françaises, Editeur; Centre National d'Etudes Spatiales, 1971, p. 233-240. In English and French.

Discussion of the role of quality control in the development of space components. The philosophy underlying the Concerto aerospace parts procurement program is reviewed, and available laboratory equipment which can be used for quality control purposes is cited. Procedures which have been developed to obtain controlled-reliability components within a reasonable time are described for the case of multilayer ceramic capacitors and for thermistors. A.B.K.

A73-19008 **Reliability dynamism at the Deutsch Company.** B. Geoffroy. In: French space technology. Volume 2. Paris, Information Propagande Françaises, Editeur; Centre National d'Etudes Spatiales, 1972, p. 537-540. In English and French.

Proposed guidelines for improving the reliability of manufactured products emphasize the need for incorporating qualification-test data and field-use experience in the design and production phases. Dynamic feedback of information on device operation under actual service conditions is discussed along with measures for ensuring the active usage of this information to produce meaningful effects on the resulting product while satisfying economic constraints. T.M.

A73-19126 # **Optimal planning of technological systems maintenance according to a reliability criterion (Optimal'noe planirovanie obsluzhivaniia tekhnicheskikh sistem po kriteriiu nadezhnosti).** G. A. Siros and S. A. Ibragimkhodzhaev (Tashkentskii Elektrotekhnicheskii Institut Sviazi, Tashkent, Uzbek SSR). *Akademiia Nauk Uzbekskoi SSR, Izvestiia, Seriia Tekhnicheskikh Nauk*, vol. 16, no. 5, 1972, p. 8-11. In Russian.

Discussion of a mathematical model of optimal-reliability maintenance for electronic control systems and radio communications systems with a prescribed smooth-operation time distribution function. Expressions are derived for optimal time intervals between successive inspections and maintenance operations when the frequency and amount of system-element failures are monotonic functions of time. V.Z.

A73-19139 # **Communications Satellites and the international communications industry.** C. R. Hume and D. S. Bond (RCA, Astro-Electronics Div., Princeton, N.J). *British Interplanetary Society, Journal*, vol. 26, Feb. 1973, p. 65-76.

Outline of how the communications industry operates on the United States side of the Atlantic, tracing the history of co-operation between the privately-owned United States common carriers and the European government agencies. An attempt is made to give an understanding of why new policies regarding communications satellites are generally slowly assimilated in the international communications industry. The policy-making role of the Office of Telecommunications Policy and the Federal Communications Commission is discussed, with particular application to the traditional United States approach to international communications. (Author)

A73-19174 # **The Aerosat programme.** D. Lennertz (ESRO, Paris, France). *Industries Atomiques et Spatiales*, vol. 16, Nov.-Dec. 1972, p. 60-67.

The objectives of the Aerosat (aeronautical satellite) program are outlined. The system will consist of a space segment (spacecraft, launchers), an air segment (avionics), and a ground segment (satellite control facilities and users' ground stations). The two principal functions of the Aerosat system are relay of air/ground voice and data messages, and experiments on 'independent surveillance' (aircraft position determination). Both functions can be provided by a system comprising two properly spaced geostationary satellites per area. Attention is given to the management scheme and the program costs. F.R.L.

A73-19182 # **Collection and processing of data for the establishment of route charges.** L. Putz. *Eurocontrol*, vol. 2, no. 6, 1972, p. 4-8. Translation.

A73-19185 **The role of basic research in the total R&D process.** G. L. Bryan (U.S. Navy, Office of Naval Research, Washington, D.C.). *Research Management*, vol. 16, Jan. 1973, p. 29-33.

Five different descriptive models of the research, development, test, and evaluation process are examined. The type of contribution that fundamental research is called upon to make in each model is indicated. The models examined are the linear production model, the modified linear model, the departmental model, the project model, and the organic model. A comparative analysis of these organizational systems shows that the organic model is more flexible than the other models, and that it provides a better environment for fundamental research. V.P.

A73-19414 # **Statistical diagnostics and information synthesis relating to the reliability and maintenance of an equipment (Diagnostic statistique et synthese des informations relatives à la fiabilité et à la maintenance d'un matériel).** L. F. Pau (Ecole Nationale Supérieure de l'Aéronautique et de l'Espace, Toulouse, France; Danmarks Tekniske Hojskole, Lyngby, Denmark). In: National Congress on Reliability, Perros-Guirec, Côtes-du-Nord, France, September 20-22, 1972, Text of the Lectures. Paris, Centre National d'Etudes des Télécommunications, 1972, p. 237-250. 18 refs. In French.

The purpose of any diagnostic procedure is to identify and localize a breakdown or a syndrome of breakdowns, starting from information concerning the history of the equipment (in particular the maintenance carried out and the conditions of operational use), and information on the conditions existing during the breakdown (visual observations of the equipment, results of nondestructive tests). Two applications of the theory of the recognition of forms for control of maintenance, and the automation of the diagnostic are described. The analysis of correspondences, used as a method of data compression, serves for analysis of card indexes of equipment follow-up; it is thus possible to represent graphically the causality relations between the various parameters affecting the operational behavior of the equipment. F.R.L.

A73-19484 **Civil aviation medicine in the coming decade.** C. R. Harper (Aviation Insurance Agency, Inc., Atlanta, Ga.). *(International Congress of Aviation and Space Medicine, 19th, Tel Aviv, Israel, Oct. 25-29, 1971.) Aerospace Medicine*, vol. 44, Jan. 1973, p. 74-77. 5 refs.

A73-20407 **Superconducting a.c. machines - An approach to development.** D. F. Warne and M. E. Hadlow (Electrical Research Association, Leatherhead, Surrey, England). In: International Cryogenic Engineering Conference, 4th, Eindhoven, Netherlands, May 24-26, 1972, Proceedings. Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1972, p. 239-242.

The findings are reviewed of a study concerned with the evolution and evaluation of alternative configurations of superconducting ac machines, the comparison, in terms of weight, cost, and volume, with conventional machines at various points in the power spectrum, and an appraisal of the justification for development expenditure in the commercial (or market potential) context. It is shown that planar air gap machines are attractive (particularly in terms of specific volume) for medium power machines (about 20 MW), while cylindrical air gap machines show potential advantages across the full power spectrum. V.P.

A73-20686 **Automatic test equipment software configuration management.** D. L. Wood (Software Enterprises Corp., Canoga Park, Calif.). In: Automatic support systems for advanced maintainability; Symposium, Philadelphia, Pa., November 13-15, 1972, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1972, p. 110-117. 8 refs.

Discussion of the configuration management of software for automatic test systems in terms of software configuration identification, control, and accounting. Some of the many implications and problems related to implementation of software configuration management - e.g., the plan, baselines, configuration audits, change proposals, what to control and when, organizational interfaces, control during validation, release, records and reports, and data banks - are touched upon. The functional aspects of software configuration management which are basic to automatic test system applications are discussed, and an example of an automatic test system software configuration management life cycle is presented. The need for software configuration management planning, standards and guidelines, and automation is pointed out. (Author)

A73-20958 # **Expectation of contract incentives.** J. A. Finchum, Jr. (Standard Oil Co., Chicago, Ill.). *Naval Research Logistics Quarterly*, vol. 19, June 1972, p. 389-397. 11 refs.

The application of statistical expectation to risk density functions and fee/incentive-element relationships is shown to be useful in structuring contract incentives. A mathematical procedure for calculating the expected value of fee for a given risk/incentive arrangement is described along with cost examples and related sensitivity analyses. The structuring of equivalent incentives is demonstrated by the use of the contracting procedure used for procuring the C-5A aircraft. (Author)

A73-20970 **The use of dynamic programming techniques for determining resource allocations among R/D projects - An example.** C. E. Kepler and A. W. Blackman (United Aircraft Research Laboratories, East Hartford, Conn.). *IEEE Transactions on Engineering Management*, vol. EM-20, Feb. 1973, p. 2-5. 5 refs.

A73-20971 **Performance control in government R&D projects - The measurable effects of performing required management and engineering techniques.** E. A. Gerloff (Texas, University, Arlington, Tex.). *IEEE Transactions on Engineering Management*, vol. EM-20, Feb. 1973, p. 6-14. 17 refs.

A73-20972 **A dynamic model of some multistage aspects of research and development portfolios.** A. E. Gear (Open University, Bletchley, Bucks., England) and A. G. Lockett (Manchester, Victoria University, Manchester, England). *(Operational Research Society, National Conference, Lancaster, Lancs., England, Sept. 19-22, 1971.) IEEE Transactions on Engineering Management*, vol. EM-20, Feb. 1973, p. 22-29. 16 refs.

Many models of research and development projects do not consider the intermediate outcomes and decisions that may be foreseen to arise during their evolution through the technical and commercial stages. Consideration of the sequential aspects of allocating scarce resources to a set of projects may make a great difference to the solution of the problem in terms of the optimum subset of projects to work on in the immediate future. An approach is described based on the application of a stochastic linear-programming formulation to a portfolio of projects, each planned using a form of the decision-tree structure called a 'project tree.' A series of elementary examples are presented as a means of gaining insight into the method. (Author)

A73-20973 **Toward the implementation of R&D resource allocation models.** R. Radosevich and R. L. Hayes (Vanderbilt University, Nashville, Tenn.). *IEEE Transactions on Engineering Management*, vol. EM-20, Feb. 1973, p. 32, 33.

The allocation of organizational resources to the research and development function remains one of the most complex and least rational decision processes of management. The purpose of this note is to examine the process and the implied attributes required of formal prescriptive models which will improve the process. Characteristics of the allocation problem are discussed briefly. This provides a rationale for listing those attributes which formal models should exhibit in order to contribute meaningfully to the rationality of the allocation process. (Author)

A73-21077 **Non-destructive testing in industry - Non-ferrous metals.** P. M. Reynolds (British Non-Ferrous Metals Research Association, London, England). *Non-Destructive Testing*, vol. 5, Dec. 1972, p. 344-347. 8 refs.

The main characteristics of the nonferrous metals industry are large capital investment, dear raw materials, low added value after processing. Nondestructive testing thus has an important role in cutting costs without lowering quality. The tendencies are towards inspection early in the process and towards automatic inspection for faster production. Systems must be robust, simple to operate and calibrate and give unambiguous signals. These requirements are difficult to achieve and are generally reached only for large-scale, specialized manufacture. (Author)

A73-21245 **Displays - Some early impressions of a Pentagon newcomer.** G. H. Heilmeier (U.S. Department of Defense, Washington, D.C.). In: Conference on Display Devices, New York, N.Y., October 11, 12, 1972, Conference Record. (A73-21244 08-14) New York, Institute of Electrical and Electronics Engineers, Inc., 1972, p. 6-10.

Electronic display devices for military applications are discussed in a manner intended to provide insight into specific areas of application, device requirements, and procurement practices. Displays required for command, monitoring, surveillance, simulation, and training functions are characterized in terms of reliability, cost, size, and performance specifications, and examples of currently employed systems are considered. An attempt is made to illucidate the philosophy underlying decisions in support of a particular technology. T.M.

A73-21699 **Strategic planning. III - Objectives and program options.** W. L. Swager (Battelle Columbus Laboratories, Columbus, Ohio). *Technological Forecasting and Social Change*, vol. 4, no. 3, 1973, p. 283-300. 14 refs.

Attention is given to the role of technological forecasting as an aid in strategy formulation, the identification of program options, and the selection of programs for funding. Technological forecasting is employed in the establishment of priorities among perceived threats and opportunities. Forecasts of the external environment have to be combined with a deep feeling for the organization and its people. The employment of objective trees is discussed together with the chronological development of the structuring of objectives. Examples of objectives-tree structures are also described. G.R.

A73-21837 **Civil aviation development - A policy and operations analysis.** R. C. Fraser, A. D. Donheiser, and T. G. Miller, Jr. (Arthur D. Little, Inc., Cambridge, Mass.). Research supported by the U.S. Department of Transportation; Contract No. DOT-OS-00083. New York, Praeger Publishers, Inc., 1972. 213 p. $12.50.

Research findings are synthesized and enumerated, and the most comprehensive constraints and broad classes of options are discussed, followed by examination in greater detail of more specific constraints and options. The R & D problem is defined, and ways are indicated in which government and industry are not meeting the research challenge. The commercial airlines industry and its key interfaces with government are examined in order to evaluate the R & D implications of an historically close-knit private-public sector operation. The question of airport development is discussed. An examination of commercial helicopter operations, air cargo, STOL, and general aviation provides numerous examples of the difficulties facing civil aviation R & D. F.R.L.

A73-21898 * **Apollo management: A key to the solution of the social-economical dilemma - The transferability of space-travel managerial techniques to the civil sector (Apollo-Management: Schlüssel zum Ausweg aus dem sozio-ökonomischen Dilemma - Zur Übertragbarkeit von Raumfahrt-Führungstechniken auf den zivilen Sektor).** J. v. Puttkamer (NASA, Marshall Space Flight Center, Center Plans and Resources Control Office, Huntsville, Ala.). *VDI-Z*, vol. 115, no. 2, Feb. 1973, p. 89-99. 11 refs. In German.

An analysis has been conducted to find out whether the management techniques developed in connection with the Apollo project could be used for dealing with such urgent problems of modern society as the crisis of the cities, the increasing environmental pollution, and the steadily growing traffic. Basic concepts and definitions of program and system management are discussed together with details regarding the employment of these concepts in connection with the solution of the problems of the Apollo program. Principles and significance of a systems approach are considered, giving attention to planning, system analysis, system integration, and project management. An application of the methods of project management to the problems of the civil sector is possible if the special characteristics of each particular case are taken into account. G.R.

A73-21946 **An analysis of frustration - The RFP-proposal cycle.** A. L. Esposito (USAF, Washington, D.C.). *Defense Management Journal*, vol. 9, Jan. 1973, p. 8-12.

The request for proposal (RFP) is a request to industry to propose a product or service to a buyer. The RFP process is critically examined, giving attention to questions regarding the reasonableness of requiring the full scope of program definition. Other questions are concerned with the ability of the buyer to anticipate and define the extensive program data requirements adequately and the ability of the seller to respond realistically to the request for detailed program requirements. G.R.

A73-21947 **Source selection process faces winds of change.** J. T. Stewart (USAF, Aeronautical Systems Div., Wright-Patterson AFB, Ohio). *Defense Management Journal*, vol. 9, Jan. 1973, p. 13-16.

Experiences of the Aeronautical Systems Division of the Air Force Systems Command regarding the lightweight fighter acquisition process are used to illustrate efforts to simplify requests for proposals (RFP) and streamline the source selection process. Straightforward RFPs are discussed together with benefits of limited size, data sources, questions of proposal scoring, and aspects of future use. G.R.

A73-21948 **'Communications effectiveness' needed in RFP-proposal-contract award cycle.** S. Morris. *Defense Management Journal*, vol. 9, Jan. 1973, p. 17-25.

It is pointed out that poor proposals are frequently the result of poor requests for proposals (RFPs). The combination of an ineffective RFP and poor responding proposals compounds the problems of the source selection evaluation board in making the best contractor selection. Aspects of RFP communications are discussed together with questions concerning the proposal problem, the organization of the RFP, technical and management requirements, evaluation criteria, and the importance of proposal size limitation. G.R.

A73-22539 # **The WAVR file.** W. E. McConnell (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aerospace Medicine*, vol. 44, Feb. 1973, p. 210-213. 10 refs.

The USAF WAVR File, a recently established data repository on medically waivered pilots and navigators, is described. Utilizing the USAF School of Aerospace Medicine Computer at Brooks Air Force Base, Tx, a unique computer program enables the maintenance of a continually updated, very flexible, epidemiologic tool. Present stages of development, existing data on Air Force waivers and future directions of the WAVR File are discussed. (Author)

A73-22551 # **Problems in optimizing the order for introducing elements of a large system (Voprosy optimizatsii poriadka vvoda ob'ektov bol'shoi sistemy).** I. N. Kuznetsov. *Akademiia Nauk SSSR, Izvestiia, Tekhnicheskaia Kibernetika*, Sept.-Oct. 1972, p. 13-26. 9 refs. In Russian.

The problem of optimizing the sequence in which individual elements of a large industrial plant (or other system) should be brought into an operational state is formulated. The proposed method of solution is as follows. For each system element at all levels of the system's hierarchical structure, one constructs (beginning with the last level) a locally optimal sequence for introducing lower-level elements associated with the given element, and one determines an efficiency function based on a resource-allocation cost criterion. In order to determine the locally optimal sequence for introducing elements associated with an element at a given level, it is necessary to know only the sequence of introduction and the efficiency functions for elements at a preceding level. The locally optimal sequence for an element at the initial level corresponds to the optimal sequence for the system as a whole. T.M.

A73-22553 # **A principle for control of the technical status of complex systems (O printsipe upravleniia tekhnicheskim sostoianiem slozhnykh sistem).** E. Iu. Barzilovich and A. N. Loginov. *Akademiia Nauk SSSR, Izvestiia, Tekhnicheskaia Kibernetika,* Sept.-Oct. 1972, p. 86-90. In Russian.

Description of a general scheme for planning and supervision of maintenance and repair operations in a complex system where discrete sampling (observation) of the operational status is employed. A basic natural assumption is that the system performance deteriorates with time in the absence of preventive maintenance operations. Series-parallel and hierarchical-branched configurations of system elements are considered. T.M.

A73-22644 **Methodology for Value Engineering.** I. Dlugatch (Hughes Aircraft Co., Culver City, Calif.). *IEEE Transactions on Reliability,* vol. R-22, Apr. 1973, p. 20-23. 9 refs.

This paper attempts to provide a methodology for selecting the product to which to apply Value Engineering (VE). It briefly summarizes existing VE methodology and points up the deficiencies. The technique is a sensitivity analysis of diagrams of networks which indicate the cost interdependencies of the product. By determining the areas with the highest cost reduction potential, VE efforts can be concentrated on these. Thus, VE can be made more cost-effective. (Author)

A73-22775 * **An approach to performance assessment and management of a large solar array/battery power system.** M. S. Imamura, H. S. Nassen (Martin Marietta Corp., Denver, Colo.), and J. D. Stroud (NASA, Marshall Space Flight Center, Huntsville, Ala.). In: Intersociety Energy Conversion Engineering Conference, 7th, San Diego, Calif., September 25-29, 1972, Proceedings. Washington, D.C., American Chemical Society, 1972, p. 373-383. 5 refs.

A73-22915 # **Management aspects of the development of the Ariel 4 satellite.** R. F. Maurice (Ministry of Defence, London, England). *(British Interplanetary Society, Symposium on Ariel 4 and Prospero, University College, London, England, Sept. 27, 1972.) British Interplanetary Society, Journal,* vol. 26, Mar. 1973, p. 129-134.

The organizational structure of management operations in the development of the Ariel 4 scientific satellite is described along with consecutive program phases involving feasibility studies, project definition, procurement, manufacture, and launching. Coordination among various technical authorities and support agencies involved in this joint U.S./UK effort is discussed, and overall conclusions evaluate the success of the program on the basis of cost- and schedule-related criteria. T.M.

A73-23123 **Co-existence of scheduled and charter services in public air transport.** J. G. Thomka-Gazdik. *Aeronautical Journal,* vol. 77, Jan. 1973, p. 32-40. 15 refs.

It is considered that there is a need to provide low cost air transportation for the substantial segment of the traveling public which is finding its requirements met by the so-called charter services. Equally there is a need to maintain regular line services on which governments, trade, and commerce inevitably rely. It is suggested that it is not feasible to regulate bilaterally two-thirds of public transport (scheduled services) while leaving the remainder under unilateral supervision or uncontrolled. Governments have a responsibility to devise a coherent and satisfactory framework for the regulation of all international air services. F.R.L.

A73-23243 # **Economic management.** G. D. Peacock (Monarch Airlines, Ltd.; Airline Engineering, Ltd., Luton, Beds., England). In: International Federation of Airworthiness Technology and Engineering, Symposium, Tunbridge Wells, Kent, England, August 31-September 2, 1972, Proceedings. Kingston on Thames, Surrey, England, International Federation of Airworthiness Technology and Engineering, 1972, p. 10.1-10.4.

The subject is dealt with in terms of the operational and commercial pattern, the basic philosophy and objectives of production planning and control, the application of the principles to Airline Engineering Ltd., and budget control and analysis of results. It is recommended that every individual job be timed and controlled, and that material costings should never get more than twenty-four hours behind. F.R.L.

A73-23521 # **Manufactured-in-house or subcontracted - Finding the economic balance.** D. A. Lessware (SARMA, England). *Aircraft Engineering,* vol. 45, Feb. 1973, p. 4-8.

The example of a mechanical flight control strut is used to demonstrate technical, financial, and other commercial advantages which may be gained by an aircraft manufacturer in subcontracting the fabrication of certain specialized components. Arguments in favor of subcontracting are based on several factors of interest to management. These include structural efficiency; reliability; safety; costs in development, design, tooling, and production; administrative aspects; cash flow considerations; and manpower requirements. T.M.

A73-23655 **Development of maintenance policies in the operation of aircraft (Evolution des politiques de maintenance dans l'exploitation des matériels aériens).** A. Mihail and G. Martin (Bureau Véritas, Paris, France). *L'Aéronautique et l'Astronautique,* Jan.-Feb. 1973, p. 21-31. In French.

A73-24553 **Aircraft noise abatement.** C. R. Foster (U.S. Department of Transportation, Washington, D.C.). In: EASCON '72; Electronics and Aerospace Systems Convention, Washington, D.C., October 16-18, 1972, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1972, p. 16-21.

The problem of aircraft noise and the individual noise sources are identified. The programs within the Federal Government addressing aircraft noise abatement are delineated. The technology and its application for aircraft noise suppression as well as aircraft noise certification standards are presented. Pertinent federal laws and regulations pertaining to aircraft noise control are reviewed. (Author)

A73-24632 **Living with less R & D.** G. L. Laserson and J. Sperling (American Management Association, Inc., New York, N.Y.). *Research Management,* vol. 16, Mar. 1973, p. 10-15.

Problems occurring in connection with a decline in the funds for research and development in American industry have been investigated by sending out a questionnaire to 1535 companies. It is pointed out that under certain conditions a reduced research and development output is even desirable. Thus, if general economic conditions preclude the investment required to bring a new product to market, there is no point to develop the product in the first place. Various approaches to minimize or solve problems created by research and development cutbacks are discussed. G.R.

A73-24633 **Maintaining vitality and productivity in R & D - Steps to maintain high level staff performance.** W. D. Decker and C. M. Van Atta (California, University, Livermore, Calif.). *Research Management,* vol. 16, Mar. 1973, p. 20-23.

Steps for acquiring a productive staff are discussed, giving attention to hiring for new technology and recent training, an adequate turnover rate, lateral transfers from more basic work areas, term employment, and postdoctoral programs. Approaches for creating conditions conducive to optimum performance include a critical evaluation of the results produced by an employee, the provision of continuing education, the rotation of assignments, the institution of an early retirement option, and improved salary management. G.R.

A73-24634 **Project analysis - An evaluation tool for positive development direction.** F. X. Werber. *Research Management*, vol. 16, Mar. 1973, p. 29-32.

Project analysis is a systematic activity, carried out by a designated group of people, whose main job is the compilation and analysis of material relative to projects. Organizationally, project analysis should functionally report directly to the top research and development executive. The top project analyst is likely to be an engineer. Three categories of projects can normally be distinguished. Case histories are presented to illustrate these categories. An exploratory investigation was to search for new textile fibers resistant to temperatures above 500 C. Another study explored a new approach to the manufacture of an apparel fabric, based on direct conversion of staple fibers to a fabric. The third case history illustrates an approach taken with a development in a market area new to the company. G.R.

A73-24646 **Adrift on the air ocean - The future of air commerce /61st Wilbur and Orville Wright Memorial Lecture/.** S. D. Browne. *Aeronautical Journal*, vol. 77, Feb. 1973, p. 69-73.

The air transport system is discussed, taking into account all aspects from manufacturers, to carriers, passengers, shippers and governments. Particular attention is given to the future of mass transport, the international rates and fares problem, the international exchange of rights, questions of security, and the future of technology. The problem of continual progress has to be solved without polluting the environment. G.R.

A73-24650 **Selling high cost capital equipment.** H. B. Cundall (Rolls-Royce, Ltd., Derby, England). *Aeronautical Journal*, vol. 77, Feb. 1973, p. 107-119. 16 refs.

A reasoned analysis is provided of the tasks, the functions, and the organization of a sales team. The marketing objectives are discussed together with the problems involved in launching a new product, the sales campaign, and the sales costs. General sales considerations are investigated, giving attention to nontechnical factors affecting sales, the understanding of business ethics, aspects of selling in the U.S., the Common Market effect on sales activities, and the national involvement in sales. G.R.

A73-24711 # **Post-crash survival.** A. W. Brunetti (Flying Tiger Line, Inc., Los Angeles, Calif.). In: Human threats to air safety; Proceedings of the Twenty-fifth Annual International Air Safety Seminar, Washington, D.C., October 16-18, 1972. Arlington, Va., Flight Safety Foundation, Inc., 1972, p. 123-136. 17 refs.

It is considered that there is a strong argument for playing down preoccupation with food-water-medical requirements in a survival situation. It appears that major attention should be given to the more important need of enhancing the passengers' chances of surviving the crash and of being rescued without delay. Preparation and control of passengers, and crew member training are of utmost importance. All air carriers should make a critical review of their practices and materials. Some items, notably those designed to support life over extended periods, can safely be eliminated. Signalling devices to facilitate prompt location and rescue should be substituted. F.R.L.

A73-24714 # **Influence of airport design and management on ground damage to aircraft.** C. W. Pace, Jr. (FAA, Airports Service, Washington, D.C.). In: Human threats to air safety; Proceedings of the Twenty-fifth Annual International Air Safety Seminar, Washington, D.C., October 16-18, 1972. Arlington, Va., Flight Safety Foundation, Inc., 1972, p. 155-162.

FAA Rule FAR Part 139 requires that each airport serving CAB-certificated air carriers meets prescribed minimum safety standards. These standards are examined to show how each will improve airport safety levels. The rules are concerned with pavement and safety areas, marking and lighting, fire fighting and rescue services, Navaids, airport condition assessment and reporting, fueling arrangements, and many other aspects. Steps being taken by the FAA to correct the deficiencies are discussed. F.R.L.

A73-24924 # **Network planning and control of air transportation (Setevoe planirovanie i upravlenie na vozdushnom transporte).** A. V. Miroshnikov, A. S. Kravets, and A. N. Khizhniak. Moscow, Izdatel'stvo Transport, 1971. 112 p. 12 refs. In Russian.

Discussion of the theory and implementation of civil aviation network planning and management procedures, covering their applications in aircraft maintenance, air traffic control, airport operations, labor and materials distribution, aircraft production, operations management, and cost analysis. Details are given on the application of network diagrams in a number of specific aircraft maintenance and servicing operations. Computer applications and the potential of the diagrammatic method as an instrument of optimization are also considered. V.Z.

A73-25208 **Airports promote Ireland.** J. M. Rieck. *Airport Forum*, Mar. 1973, p. 61, 63-66, (7 ff.). In English and German.

In the 1971/1972 fiscal year Ireland's three commercial airports, Dublin, Shannon, and Cork handled over 3,300,000 passengers. The airports are managed by Aer Rianta, a State-sponsored company. Plans are in hand to construct in 11,000-ft runway for Dublin airport to make possible departures by long-range aircraft with a full fuel load. The Dublin terminal building and its operational procedures are described. Although Shannon airport has ceased to be merely a refuelling stop, half of its million passengers are in transit. Cork airport is used almost exclusively by medium-range and general aviation aircraft. F.R.L.

A73-25450 * **Logistics planning for phased programs.** W. H. Cook (NASA, Washington, D.C.). *Logistics Spectrum*, vol. 7, Spring 1973, p. 2-5, 40.

It is pointed out that the proper and early integration of logistics planning into the phased program planning process will drastically reduce these logistics costs. Phased project planning is a phased approach to the planning, approval, and conduct of major research and development activity. A progressive build-up of knowledge of all aspects of the program is provided. Elements of logistics are discussed together with aspects of integrated logistics support, logistics program planning, and logistics activities for phased programs. Continuing logistics support can only be assured if there is a comprehensive sequential listing of all logistics activities tied to the program schedule and a real-time inventory of assets. G.R.

A73-26262 # **The role of the Project Manager in the management of satellite projects.** P. J. Conchie (Hawker Siddeley Dynamics, Ltd., Stevenage, Herts., England). *British Interplanetary Society, Journal*, vol. 26, Apr. 1973, p. 242-245.

The role of the Project Manager, his task, and how he achieves it are considered with reference to a typical task (the ESRO IV spacecraft), the environment in which he operates, and the problems of achieving his objective. Cost objectives and basic forms of organization are considered. There are two such forms: project and matrix. The latter is considered to be the most appropriate where several projects are being carried out in the same plant. The Project Manager has to establish team identification with the project, as well as loyalty to the project and to the line departments. F.R.L.

A73-26420 # **Europe and space /1962-1972/.** Brussels, Secretariat of State for Science Policy and Planning, 1972. 44 p.

The activity of the two European organizations - ELDO and ESRO - (one dealing with launchers and the other with satellites) over the last decade is reviewed, and the question whether the European space effort can be carried on efficiently in this duality is examined. The necessity of a greater cohesion among the partners is pointed out. The European Economic Community is seen to be the framework in which the priorities the European countries will assign themselves can be established. V.P.

A73-27066 # **Air cargo transport - When and how much (Aerotrasporto merci - Quando e quanto conviene).** R. Vannutelli. *Istituto Internazionale delle Comunicazioni, Convegno Internazionale delle Comunicazioni, 20th, Genoa, Italy, Oct. 8-13, 1972, Paper.* 22 p. In Italian.

After a brief survey of cargo air transport development, individual advantages are discussed. These include not only those resulting from rapidity but also other ones (such as shorter routes, less packing, fewer transfers, lower insurance costs, etc.) all of which, if properly evaluated, often counterbalance the high rate disadvantage. When a decision has to be taken between the air and another kind of transport, an estimate should be made taking into account all pros and cons duly worked out in figures. For this purpose, a procedure is indicated and a ready comparison form is provided, which summarizes and facilitates the above estimate. Methods for the economic evaluation of the time savings are also suggested. For a generic assessment of cases, a simplified calculation is outlined, in which few elements are needed to roughly know when and how much air transportation is worthwhile. (Author)

A73-27070 # **Methodologies for the analysis of transport requirements with particular regard to the aeronautic case (Metodologie per l'analisi della domanda di trasporto con particolare riguardo al caso aeronautico).** V. Correnti (Palermo, Università, Palermo, Italy). *Istituto Internazionale delle Comunicazioni, Convegno Internazionale delle Comunicazioni, 20th, Genoa, Italy, Oct. 8-13, 1972, Paper.*43 p. In Italian.

A73-27081 # **Dynamic prediction model and optimal control of a commercial plant (Dinamicheskaia model' prognozirovaniia i optimal'noe upravlenie ekonomicheskim ob'ektom).** T. K. Sirazetdinov. *Aviatsionnaia Tekhnika*, vol. 15, no. 4, 1972, p. 32-38. In Russian.

A model for planning the operation of a commercial establishment is constructed with the aid of some progressive ideas in automatic control theory. The parameters of the model are interpreted, and methods for their experimental determination are proposed. The problem of satisfying a demand in the shortest possible time in the presence of constraints is solved by deriving relations between the input and output of the plant, deriving equations which describe the production process, and determining the coefficients of the equations. The model proposed is applicable to production processes in the aircraft industry, to production processes of electronic and control systems, and similar processes. V.P.

A73-27361 # **General aviation and the National Aviation System.** V. J. Kayne (Aircraft Owners and Pilots Association, Washington, D.C.). In: Radio Technical Commission for Aeronautics, Annual Assembly Meeting, Washington, D.C., November 9, 10, 1972, Proceedings. (A73-27360 12-21) Washington, D.C., Radio Technical Commission for Aeronautics, 1972. 9 p.

General aviation's needs vary from the sophisticated requirements of the business jet to the crop duster that requires only a small grass strip. The basic services required are airports, weather, briefing (including NOTAMS), navigation aids, air/ground communications, traffic advisories, airport information, separation, and flight plan service. Although many facilities and services within the National Aviation System are provided by the federal government, many are provided by private individuals and companies at no cost to the government. An element of government activity that is needed by general aviation is research and development. F.R.L.

A73-27362 # **How to think more clearly about future air traffic systems or a handful of rules-of-thumb.** D. R. Israel (FAA, Washington, D.C.). In: Radio Technical Commission for Aeronautics, Annual Assembly Meeting, Washington, D.C., November 9, 10, 1972, Proceedings. (A73-27360 12-21) Washington, D.C., Radio Technical Commission for Aeronautics, 1972. 16 p.

The data acquisition process for planning and engineering of an improved air traffic system is first considered, since the design of this process is fundamental to the successful achievement of the operational system. Several of the more important design aspects are examined, and comments are provided on the system design itself. It is considered that an improved air traffic system will be a long and costly endeavor, without any foreseeable shortcuts. Since piecemeal evolution is inevitable, preparation should be made for this effort, adopting a frame of mind and acquisition process which recognizes these facts. F.R.L.

A73-27363 # **Status of funded improvements to the National Aviation System and planned improvements not yet funded.** R. W. Pulling (FAA, Washington, D.C.). In: Radio Technical Commission for Aeronautics, Annual Assembly Meeting, Washington, D.C., November 9, 10, 1972, Proceedings. (A73-27360 12-21) Washington, D.C., Radio Technical Commission for Aeronautics, 1972. 17 p.

A73-27364 # **Improvements in the use of FAA resources for system performance assurance.** D. F. Babcock (Stanford Research Institute, Menlo Park, Calif.). In: Radio Technical Commission for Aeronautics, Annual Assembly Meeting, Washington, D.C., November 9, 10, 1972, Proceedings. (A73-27360 12-21) Washington, D.C., Radio Technical Commission for Aeronautics, 1972. 12 p.

Methods are needed for assessing system performance and for estimating system costs. What is sought is a means for giving adequate visibility to the salient features of the system that require attention either from a performance or cost viewpoint. In general, it is feasible to prepare a definition and description of the National Airspace System (NAS) and to create performance measures and set goals for NAS performance. It is recommended that life cycle models for all major system elements should be established and maintained, that system criticality be analyzed, and that a plan should be formulated to allocate resources. F.R.L.

A73-27366 # **An appraisal of the funding provisions of the Airport and Airways Development Act of 1970 to implement system improvements.** J. J. O'Donnell (Air Line Pilots Association, Washington, D.C.). In: Radio Technical Commission for Aeronautics, Annual Assembly Meeting, Washington, D.C., November 9, 10, 1972, Proceedings. (A73-27360 12-21) Washington, D.C., Radio Technical Commission for Aeronautics, 1972. 10 p.

The Air Line Pilots Association (ALPA) has strongly demanded that funds which are being accumulated and not spent must be programmed to obtain the minimum airport facilities which ALPA has recommended be installed by Oct., 1973. It is increasingly important that installation priorities be established that will be acceptable to the aviation community. Attention is given to the airport and related facilities, the ALL Instrument Landing System (ILS) components, including lighting, and the air traffic control system. F.R.L.

A73-27367 # **An appraisal of the funding provisions of the Airport and Airway Development Act of 1970 in relation to implementing system improvements.** T. S. Miles (National Air Transportation Conference, Inc., Washington, D.C.). In: Radio Technical Commission for Aeronautics, Annual Assembly Meeting, Washington, D.C., November 9, 10, 1972, Proceedings. (A73-27360 12-21) Washington, D.C., Radio Technical Commission for Aeronautics, 1972. 11 p.

The Trust Fund created by the Airport and Airway Development Act of 1970 is building up an 'uncommitted surplus' which is the difference between user tax revenues and appropriations. Expenditures from the Trust Fund can only be made as appropriated by the Congress. It is suggested that the aviation community should have a more effective voice on a continuing consultative basis with

respect to user tax fund expenditures in advance of FAA programming. Another important action needed to expedite improvements is to provide some sort of incentive plan for the airspace users. F.R.L.

A73-27384 # **Systems analysis in aerospace projects (La 'systems analysis' nei progetti aerospaziali).** G. Chiara (Fiat S.p.A., Divisione Aviazione, Turin, Italy). In: Italian contributions to present aerospace activities; Conference, 2nd, Turin, Italy, June 9, 10, 1972, Proceedings. Turin, Italy, Società Ingegneri ed Architetti di Torino, 1972, p. 53-55. In Italian.

Review of the fundamental parameters and purposes of systems analysis in the evaluation and optimization of aerospace systems. The main parameters defining the performance of a system are discussed, including capability, dependability, and availability, and a multistage procedure for carrying out a complete and accurate analysis of a system is outlined. Various applications of systems analysis are cited. A.B.K.

A73-27398 Reliability concepts in engineering manufacture. R. H. W. Brook. New York, Halsted Press, 1972. 139 p. 28 refs. $8.75.

New developments regarding reliability questions are considered together with material properties and distributed phenomena, and criteria for achieving a reliable design. The employment of failure analysis and mathematical models is explored, taking into account the aims of failure analysis, approaches for its conduction, aspects of reliability logic, and the use of reliability logic in the absence of data. Other subjects discussed include the development stage and test program design, maintainability and reliability interaction, the analysis of service data, and questions of modelling and simulation. G.R.

A73-27400 The Polaris system development: Bureaucratic and programmatic success in government. H. M. Sapolsky (MIT, Cambridge, Mass.). Cambridge, Mass., Harvard University Press, 1972, 275 p. 767 refs. $9.95.

The book attempts to explain the requirements of success in government. It is maintained that in order for a program to be successful it must be protected by its proponents from the challenges of competitors and the intervention of review agencies. Strategies in bureaucratic politics are a vital factor. The four strategies used by the Polaris proponents include differentiation, moderation, cooptation, and managerial innovation. Particular attention is given to the role that management mythologizing played in the success of the Polaris program. Problems in the acquisition of weapons are also considered, taking into account government-contractor relations, the control of uncertainties, project and functional structures, and the use of incentive contracts. G.R.

A73-27599 How real are the pilot's problems. C. Balfour and I. G. Smith (University College, Cardiff, Wales). *New Scientist*, vol. 57, Mar. 22, 1973, p. 672, 673.

An attempt is made to distinguish the special aspects of the pilot's work from the general trade union demand which a powerful group can make on the employer through pressure on the public. Pilots are victims of technological change since they have, to a large extent, become systems monitors. Pilots face a long seniority ladder, and it may take 20 or more years to become a captain. A union shop and high membership put pilots in a strong negotiating position. However, they complain of lack of job security and inattentiveness on the part of management. F.R.L.

A73-27653 The institutional bottlenecks affecting mobile satellite communications. D. O. Fraser (British Aircraft Corp., Bristol, England). In: Satellite systems for mobile communications and surveillance; Proceedings of the International Conference, London, England, March 13-15, 1973. London, Institution of Electrical Engineers, 1973, p. 1-8.

Discussion of the constraints on the establishment of mobile satellite communication systems resulting from the difficulty of reaching the necessary agreements on the organization required for their management, procurement, and operation. At the time of writing, the Aerosat project has foundered on institutional rocks. The Aerosat conflict is primarily a transatlantic one between the West European governments collectively and the United States, and differences have been polarized to such an extent that there is a widespread lack of mutual understanding. The attempt is made to restore understanding by analyzing the sources and causes of the present differences. M.V.E.

A73-27671 Long haul airlines and satellite communications. N. G. Anslow and J. O. Clark. In: Satellite systems for mobile communications and surveillance; Proceedings of the International Conference, London, England, March 13-15, 1973. London, Institution of Electrical Engineers, 1973, p. 116-124.

The political, operational, technical, and economic problems which will require solution prior to there being a viable operational satellite communications system for aviation purposes are outlined. Operators, who will eventually be required to provide capital running costs, do not accept many of the system proposals being thrust upon them. A need is recognized for future improvements in long distance air-to-ground communications, and it would appear that relay by synchronous satellite would offer the best prospect for achieving such improvements, but at great cost. One major systems engineering problem concerns the choice of frequency band; another is the need to consider independent surveillance. F.R.L.

A73-28177 Two approaches to aircraft development - The USA and Europe. R. Perry (Technology Service Corp., Santa Monica, Calif.). *Interavia*, vol. 28, Apr. 1973, p. 322-324.

Comparison of military-aircraft development, procurement, and production programs as practiced by major firms in the United States and in Europe. An attempt is made to correlate final costs of an aircraft with the organization and management of initial design and prototype-construction phases of the project. It is argued that the use of small, relatively cheap design and acquisition programs by European firms provides them with the capability of carrying out quick and inexpensive program modifications in response to unanticipated technical problems or changes in requirements. Larger American programs, manned by thousands of people and characterized by production commitments, are difficult and costly to slow or redirect. T.M.

A73-28788 # **Materiel management in industry.** H. Heydrich. *Dornier-Post* (English Edition), no. 1, 1973, p. 26-29.

The industrial necessities of ordering material, detail requirements of the various departments concerned and material identification in the factory are discussed. The effort, costs, and benefit of material identification, the limits of material description in present numbering and standardization systems, and uniform commodity description are treated. F.R.L.

A73-28789 # **Training activities at Dornier.** A. Brehm, G. Oehl, K. Schiller, and J. Schauenburg. *Dornier-Post* (English Edition), no. 1, 1973, p. 30-33.

The trouble-free introduction of aircraft systems by the user is no longer conceivable without the accompaniment of intensive training measures. Dornier has been engaged on didactical and technical training problems for some time past. The cost-effective employment of technically complex products requires soundly trained personnel for its operation and maintenance. This applies quite clearly to civil and military aircraft, as well as to most other kinds of military weapons systems. The result is a close link between development, logistic and training problems and necessarily an active commitment for manufacturers and systems companies in the matter of training. (Author)

A73-28902 **The test and evaluation evolution.** L. C. Watt (U.S. Marine Corps, Quantico, Va.). *Society of Experimental Test Pilots, Technical Review*, vol. 11, no. 3, 1973, p. 50-57.

The sources of the present research, development, testing, and evaluation philosophy are described in order to aid in understanding the testing and evaluation (T and E) community's role in the process of acquiring weapons systems. It is considered that the T and E community is to play a more important role in weapon system acquisition processes because tests will be in time to effect 'go/no go' decisions, and because the results of hardware tests are to carry much more weight than they have in recent years. F.R.L.

A73-28926 **A simple approach to post-evaluation of research.** D. W. Collier (Borg-Warner Corp., Chicago, Ill.) and R. E. Gee (Du Pont de Nemours and Co., Inc., Wilmington, Del.). *Research Management*, vol. 16, May 1973, p. 12-17.

Postevaluation of research should be separated into two distinct steps, including the evaluation of the technical performance of the research staff and the evaluation of the potential value or worth of what the research staff has produced. It is recommended to conduct a separate evaluation of each of three categories of research, taking into account support of existing business research, new high risk business research, and exploratory research. G.R.

A73-29108 # **Status of short haul air transportation.** In: Airports: Challenges of the future; Proceedings of the Airports Specialty Conference, Dallas, Tex., March 7-9, 1973. New York, American Society of Civil Engineers, 1973, p. 107-130.

The history of the development of the short-haul air transportation system is reviewed. The current status of the system is assessed in the light of some recent developments in aircraft technology and air transportation service. The results of a market study that shed light on the potential for short-haul transportation are examined. Particular attention is given to STOL aircraft development, but other aircraft concepts, such as the QTOL (quiet takeoff and landing) and the RTOL (reduced takeoff and landing) are also considered. V.P.

A73-29110 # **Engineering management for the Dallas/Fort Worth Airport.** G. T. McCarthy (Tippetts-Abbett-McCarthy-Stratton, New York, N.Y.). In: Airports: Challenges of the future; Proceedings of the Airports Specialty Conference, Dallas, Tex., March 7-9, 1973. New York, American Society of Civil Engineers, 1973, p. 165-179.

Engineering management concepts are outlined, whose application ensured sound management of the Dallas/Fort Worth Airport project. This activity included a site selection study, a financial feasibility study, an airport master plan report, and an airport layout plan report. The recommendations contained in these reports (which were part of some forty planning and design studies accomplished between 1965 and 1969) are generally embodied in the airport project, and have provided the basic parameters for the present airport design and construction programs. Using these engineering concepts, the management knows where the project stands at all times in terms of time and money, and also knows the reasons for any deviation from the schedule, should it occur. V.P.

A73-29111 # **Trends in airport planning.** R. J. Sutherland (American Airlines, Inc., New York, N.Y.). In: Airports: Challenges of the future; Proceedings of the Airports Specialty Conference, Dallas, Tex., March 7-9, 1973. New York, American Society of Civil Engineers, 1973, p. 193-213.

Some of the principal problems that must be considered in the planning of future airport facilities are discussed, and airport planning trends based on recent experience at many major airports are examined. Among the important advances is the application of systems analysis to the solution of planning problems, and the use of sound engineering principles (rather than empirically derived charts) in airport pavement design. Another trend is the designing of terminal facilities on a modular basis. Major problems are airport costs, which have escalated to the point where economic self-sufficiency may no longer be achievable. V.P.

A73-29384 **The management of the MRCA /16th Henson and Stringfellow Memorial Lecture/.** W. Stewart (Ministry of Defence, London, England). *Aeronautical Journal*, vol. 77, Mar. 1973, p. 130-135.

Discussion of the managerial aspects of the Multi-Role Combat Aircraft Program, a joint project of the UK, Germany and Italy, undertaken in 1969 under a NATO charter. The remarkable extent to which the staffs of the three countries have merged into an international team in their cooperativeness is noted. V.Z.

A73-29573 # **Evaluation of logistics support in five dimensions.** J. M. Perkins (U.S. Navy, Naval Missile Center, Point Mugu, Calif.). In: Society of Logistics Engineers, Annual Convention, 7th, Long Beach, Calif., August 21-23, 1972, Proceedings. Los Angeles, Society of Logistics Engineers, 1972, p. 58-65.

The five dimensions describing the effectiveness of the logistic support include manhours (shipboard), space (shipboard), availability/operational, logistic operating costs, and availability/inventory. The steps necessary to transform logistic characteristics into these five dimensions involve a system evaluation, a real-world definition, and a systems analysis. It is pointed out that the application of computer technology combined with the experience and knowledge of the practical logistician can provide a measurement of the effectiveness of the logistic support stated in real-life meaningful terms. G.R.

A73-29574 # **Resources management logistics support of research and development laboratories.** J. L. Quinn, J. S. Ason, and R. D. Libbert, II (USAF, Washington, D.C.). In: Society of Logistics Engineers, Annual Convention, 7th, Long Beach, Calif., August 21-23, 1972, Proceedings. Los Angeles, Society of Logistics Engineers, 1972, p. 66-75. 15 refs.

The adequacy of the supply and procurement support services for the Air Force in-house R and D laboratories is investigated. The scope of the study is discussed together with research questions, the methodology of investigation, the standard supply system support, the base procurement system support, and the interface of supply procedures. Other subjects considered include the logistics support division, questions of laboratory supply support activity, and aspects of functional relationships. G.R.

A73-29876 **Overview - The role of communication systems in air traffic management.** L. W. Roberts (U.S. Department of Transportation, Transportation Systems Center, Cambridge, Mass.), G. E. Lundquist (FAA, Washington, D.C.), and D. E. Findley (U.S. Department of Transportation, Washington, D.C.). *IEEE Transactions on Communications*, vol. COM-21, May 1973, p. 346-363.

This paper considers the fundamental and pervasive role of communications in the operation of the current air traffic control system and in the planning of the advanced systems of the future. The authors discuss the evolution of the present system through its successive generations and present the major features of the proposed upgraded third-generation system, with emphasis on the communications requirements imposed by the elements of the upgraded third. Advanced systems concepts, both satellite and ground based, applicable to oceanic as well as continental service, are discussed. The overview concludes with a discussion of communications in relation to automation. (Author)

A73-29878 **Formulation of the air traffic system as a management problem.** W. B. Cotton (Sky-Paltz, Ltd., New Paltz,

N.Y.). *IEEE Transactions on Communications*, vol. COM-21, May 1973, p. 375-382. 6 refs.

The functioning of the national air traffic management system is postulated using aircraft operating economies and mission flexibility as the primary goals. The management functions of enroute separation, sequencing for landing, and spacing of aircraft are discussed in an environment of near universal area navigation capability and rapid discreet communications. (Author)

A73-29941 * # **Low cost space.** A. O. Tischler (NASA, Washington, D.C.). *Astronautics and Aeronautics*, vol. 11, May 1973, p. 22, 23.

It is pointed out that a contradiction between boundless space and limited resources has put the space program in the distressing position of cutting good and worthy projects from its activities during this decade. One approach to ameliorate the situation is to increase the productivity of space activities by greater utilization of the equipment developed for its projects. The Space Shuttle constitutes the first big step in that direction. The reusable character of the Shuttle orbiter will cut operational costs by permitting recovery and reuse of payload equipment through routine round-trip operations to space. G.R.

A73-29943 * # **Space science plans for the shuttle era.** J. E. Naugle and R. W. Johnson (NASA, Office of Space Science and Applications, Washington, D.C.). *Astronautics and Aeronautics*, vol. 11, May 1973, p. 34-39.

Three separate and distinct modes of using the space shuttle system have been identified. These modes include the boost of a spacecraft plus one or more propulsion stages into earth orbit or parking orbit, the establishment and maintenance of automated observatories in space, and the support of exploratory research and instrument development. Studies show that approximately 60% of all planned NASA missions require a shuttle third stage. Illustrations are presented to show how the largest spacecraft, Viking, and its propulsion system, Centaur, and a communications satellite, with an Agena stage to place it into a geostationary orbit, would fit into the shuttle. Results of the NASA Shuttle Sortie Workshop studies are discussed together with prospects of European cooperation in future workshop experiments. G.R.

A73-29949 The politics and technology of satellite communications. J. F. Galloway (Lake Forest College, Lake Forest, Ill.). Lexington, Mass., Lexington Books, 1972. 251 p. 195 refs. $15.

Aspects of traditional communications policy which led to the National Aeronautics and Space Act of 1958 are analyzed, and early developments in space communications are examined, giving attention to frequency allocations, civil-military relations, government-industry relations, attitudes in business, attitudes in the executive branch, congressional attitudes, and demands for communications satellite service. Other subjects considered include the passage of the communications satellite act of 1962, the interim arrangements for a global commercial communications satellite system, and questions of space communications and national security. American-Soviet relations concerning space communication are also discussed together with the transition between the interim and definitive arrangements for INTELSAT. G.R.

A73-30077 # **Management of the equatorial base of ELDO.** K. Iserland (European Space Vehicle Launcher Development Organization, Kourou, French Guiana). In: Launching bases; International Conference, Kourou, French Guiana, November 22-28, 1972, Proceedings. (A73-30076 14-11) Paris, Centre National d'Etudes Spatiales, 1972, p. 9-18.

The technical reasons which led ELDO to build its equatorial base at Kourou in French Guiana are briefly considered, giving attention to the use of EUROPA II in a geostationary orbit. Organizational questions of the management of ELDO facilities in South America are discussed. These facilities include in addition to the EUROPA II launch site also a complete telemetry station at Fortaleza in Brazil and a LOX/LN production plant at Kourou. G.R.

A73-30080 # **General concept of a launch base (Conception générale d'une base de lancement).** I. C. A. Reymond (Direction des Recherches et Moyens d'Essais, Centre d'Essais de la Méditerranée, Toulon Naval, France). In: Launching bases; International Conference, Kourou, French Guiana, November 22-28, 1972, Proceedings. (A73-30076 14-11) Paris, Centre National d'Etudes Spatiales, 1972, p. 35-46. In French.

An attempt is made to analyze the process of creating a launch base, and to regard it from an economic angle. The comments are based on eight years of experience with the conception and fitting out of launch bases, and three and one-half years in the operation of these centers. Considerations of firing safety, scientific requirements, and the financial investments involved form a group of criteria of choice. F.R.L.

A73-30086 # **Organization and optimization of launch operations (Organisation et optimisation des operations de lancement).** P. Quemarec (Centre National d'Etudes Spatiales, Kourou, French Guiana). In: Launching bases; International Conference, Kourou, French Guiana, November 22-28, 1972, Proceedings. (A73-30076 14-11) Paris, Centre National d'Etudes Spatiales, 1972, p. 97-104. In French.

A launch base should be considered as an establishment for performance of specialized services in the organization of launchings and in the supply of information relating to the launchings. The organization of a launch brings two human groups in contact, the one having a mission to be accomplished, the other being in charge of the means capable of contributing to the success of the mission. Optimization can be defined as the result of a rational adaptation, at a predetermined instant, under economic, technical (performance, reliability), and operational aspects, of means for a given mission. This concept is basic from the first contacts between the client and the launch base. F.R.L.

A73-30293 Legal consequences resulting from transportation in airline traffic in the case of missing, deficient or not coverage-equivalent contractual basis (Rechtsfolgen aus Beförderungen im Fluglinienverkehr bei fehlender, mangelhafter oder nicht deckungsgleicher vertraglicher Grundlage). A. Rudolf. *Zeitschrift für Luftrecht und Weltraumrechtsfragen*, vol. 22, Apr. 1, 1973, p. 81-99. 55 refs. In German.

A73-30294 Commercial air transportation in France - National administration and aviation enterprises (Der gewerbliche Luftverkehr in Frankreich - Staatliche Verwaltung und Luftfahrtunternehmen). M. A. Dauses (Ecole Nationale d'Administration, Paris, France). *Zeitschrift für Luftrecht und Weltraumrechtsfragen*, vol. 22, Apr. 1, 1973, p. 100-117. 82 refs. In German.

The objectives of the national administration of air transportation are examined, giving attention to the admission of air transportation enterprises and their supervision. The organization of the national air transportation administration is discussed together with national and private aviation companies. Attention is given to the characteristics of Air France as a national company, including provisions ensuring the control of the airline by the state. G.R.

A73-31224 A procedure for the minimization of the costs of a project in the case of a given project duration (Ein Verfahren zur Minimierung der Kosten eines Projektes bei vorgegebener Projektdauer). M. Morlock and K. Neumann (Karlsruhe, Universität, Karlsruhe, West Germany). *Angewandte Informatik*, Apr. 1973, p. 135-140. 5 refs. In German.

A network with one source and one sink is assigned to the project considered. The processes of the project are identified with the arrows and the events with the nodes of the network. An optimization problem is obtained. The problem can be reduced to a

flow problem. The flow problem is solved with the aid of a suitable modification of an approach described by Elmaghraby (1970). A summarizing presentation of the algorithm of the problem solution is provided, giving attention to the preparatory step, the determination of permissible flow, the testing of the optimality criterion, a labelling process, and aspects of flow change. G.R.

A73-31527 # **Design considerations for offshore airports.** D. R. Miller (Daniel, Mann, Johnson, and Mendenhall and Associates, Los Angeles, Calif.). In: International Conference on Offshore Airport Technology, 1st, Bethesda, Md., April 29-May 2, 1973, Proceedings. Volume 1. New York, American Institute of Aeronautics and Astronautics, Inc., 1973, p. 1-3. 6 refs.

Definition of the airport designer's role in an offshore airport program, and review of the functions to be considered. A design approach is suggested that analyzes the interfaces and constraints involved in a major offshore airport, and a procedure is outlined for the implementation of such a program. M.V.E.

A73-31537 # **Progress reports on off shore airport projects. I - Copenhagen: The ordeal of political decision.** H. T. Molgaard (Copenhagen Airports Authority, Copenhagen, Denmark). In: International Conference on Offshore Airport Technology, 1st, Bethesda, Md., April 29-May 2, 1973, Proceedings. Volume 1. New York, American Institute of Aeronautics and Astronautics, Inc., 1973, p. 94-99.

Review of the historical background and present status of Denmark's offshore airport project focused on the island of Saltholm near Copenhagen and connected with the other long considered project of a bridge-tunnel link between Denmark and Sweden. After more than 10 years of political efforts, legislation for firm action has now been presented in Parliament for consideration and enactment. M.V.E.

A73-31540 # **An offshore airport for Los Angeles - A case study.** W. M. Schoenfeld (Los Angeles Department of Airports, Los Angeles, Calif.). In: International Conference on Offshore Airport Technology, 1st, Bethesda, Md., April 29-May 2, 1973, Proceedings. Volume 1. New York, American Institute of Aeronautics and Astronautics, Inc., 1973, p. 114-116.

As an opening for the offshore airport subject, a brief history of commercial aviation in Los Angeles is given. An early study for the need of an offshore airport was made, deeming such construction to be technically feasible. A subsequent consultant's report prepared for the Federal Aviation Administration questioned some of the design aspects, logistics problems, and declared the costs to be prohibitively exorbitant. The paper covers airspace and environmental considerations peculiar to the Southern California area, compares costs, and discusses plans now being implemented for the development of the Palmdale Intercontinental Airport to take care of future transportation needs. (Author)

A73-31545 # **Toronto's new airport - The bureaucracy of government.** J. C. Crang (MRAIC, Toronto, Canada). In: International Conference on Offshore Airport Technology, 1st, Bethesda, Md., April 29-May 2, 1973, Proceedings. Volume 1. New York, American Institute of Aeronautics and Astronautics, Inc., 1973, p. 157-161.

The Canadian Government's intention to proceed with the construction of a second land-based jetport in the Toronto area in spite of environmental and community objections is deplored, and the merits of an offshore airport alternative are examined. Since Lake Ontario is a fresh deep water lake with a dense urban population surrounding it, it is believed to be the ideal place for an offshore airport. M.V.E.

A73-31577 * **Interorganizational decision making.** Research supported by NASA; Grant No. NGL-14-007-058. Edited by M. Tuite (Northwestern University, Evanston, Ill.), R. Chisholm (Memphis State University, Memphis, Tenn.), and M. Radnor (Northwestern University, Evanston, Ill.). Chicago, Aldine Publishing Co., 1972. 305 p. $12.95.

The papers are both theoretical and applied. They include contributions from a spectrum of academic specializations and from practitioners representing several organizations. The papers are divided into theoretical and applied groupings reflecting a variety of systems levels and institutional examples, and into those papers which emphasized the organization structure requirements of interorganizational decision making, those that emphasized the behavioral requirements of interorganizational decision making, and those that developed decision technologies for interorganizational decision making. F.R.L.

A73-32448 **MADAP - Implementation of a large size real time data processing system.** R. Ehrmanntraut (Eurocontrol, Beek, Netherlands). In: Electronics and civil aviation; International Conference, Paris, France, June 26-30, 1972, Reports. Volume 1. Paris, Editions Chiron, 1972, p. 247-258.

Some historical facts and the purpose of the MADAP system are given. The operational, technical, and software characteristics of the system are explained in a way, so that the auditor may get an impression on the size of the system and the real-time software task. It is rather aimed at characterizing the system than describing it. After this, the different phases of the MADAP implementation are discussed, whereby false estimations at the beginning and the necessary remedy actions are highlighted. Some statistics are given concerning the staff situation, work allocation and usage of computer time. Finally it is tried to make an analysis of some events of the contract which may be considered as being successful. (Author)

A73-32496 **AIDS and operational flight control (A.I.D.S. et controle opérationnel des vols).** M. Rohou (Air France, Direction du Matériel, Orly, Val-de-Marne, France). In: Electronics and civil aviation; International Conference, Paris, France, June 26-30, 1972, Reports. Volume 2. Paris, Editions Chiron, 1972, p. 891-894. In French.

Discussion of the merits of aircraft integrated data systems (AIDS) for use on commercial passenger aircraft. Assessed as a means for verifying the soundness of each aircraft system's utilization, for studying incidents affecting flight safety and control, and for gathering data for flight statistics, AIDS is shown to be a valuable tool for optimizing the operation of commercial aircraft. M.V.E.

A73-32554 **History, evolution, and role of the Civil Aviation Secretariat General (Histoire, évolution et rôle du Secrétariat général à l'Aviation civile).** C. Collet. *Secrétariat Général à l'Aviation Civile, Revue,* May 15, 1973, p. 41-52. In French.

Review of the genesis, evolution, and current status of the office of Secretary General for Civil Aviation since its inception in 1920. Special attention is given to the present organization of the administrative, technical, and advisory services and to the data processing systems and management structure. M.V.E.

A73-32851 **European Electro-Optics Markets and Technology Conference, 1st, Geneva, Switzerland, September 13-15, 1972, Proceedings.** Conference sponsored by the Institut für technische Physik. Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1973. 477 p. In English, French, and German. $35.80.

New electrooptical techniques and equipment for applications in medicine, communications, pollution control, information processing, and enhancement of productivity are described not only in terms of technical aspects but also from the viewpoint of social and commercial consequences for the contemporary society in Europe. Major topics considered include radiation detectors, lasers, electro-optical crystals, atmospheric and water pollution control equipment,

IR and low-light-level imaging, electrooptical storage and memories, electrooptical modulators, testing and measuring systems, computer displays, waveguides and fibers, integrated optics systems, optoelectronic devices, optical communications, development of new markets, audio-visual recording systems, and electrooptical advances in medical practice.

T.M.

A73-32971 The international regime of route rentals. II - Regional systems (Le régime international des redevances de route. II - Les systèmes régionaux). R. Goy (Rouen, Université, Rouen, France). *Revue Générale de l'Air et de l'Espace*, vol. 36, no. 1, 1973, p. 29-65. 126 refs. In French.

If more and more states immediately institute rentals for the use of installations and route services, and if they prefer a national system to a regional system, certain among them will encounter increasing difficulties to provide themselves the installations and services because of the slenderness of their airspace at a period of long international flights, and of the paucity of their resources in regard to the technical necessities and the costs of management imposed. Also they are forced to undertake a regional collaboration in this field. If ICAO recommends an international tariff of route rentals, it will not fail to encourage initiative of this type. A regional integrated system, ASECNA (agency for safety of air navigation in Africa and Madagascar) is discussed in detail. The sources of the system, and the elements of the system of rentals are extensively treated. F.R.L.

A73-33143 # Design and service environment standardization /Military electronic equipment/. J. H. Renshaw (Westinghouse Electric Corp., Pittsburgh, Pa.). In: Realism in environmental testing and control; Proceedings of the Nineteenth Annual Technical Meeting, Anaheim, Calif., April 2-5, 1973.
Mount Prospect, Ill., Institute of Environmental Sciences, 1973, p. 371-379.

Description of the objectives, participants, working procedures, and benefits of the Uniformity Program initiated in 1960 and aimed at the standardization of military electronic equipment design and servicing. Since its inception, the electronic industry has accumulated approximately 35 million dollars in savings. M.V.E.

A73-33160 Industrial work rhythms. K. F. H. Murrell (University of Wales Institute of Science and Technology, Cardiff, Wales). In: Biological rhythms and human performance.
London and New York, Academic Press, 1971, p. 241-272. 47 refs.

Results of industrial work rhythm studies, including laboratory research into work rhythms, obtained over the period from 1920 to 1969 are summarized and reviewed. Special attention is given to industrial-record and experimental studies of between-day fluctuations. M.V.E.

A73-33179 # Developments in the management and utilization of airspace. G. E. Lundquist (FAA, Washington, D.C.). In: Anglo-American Aeronautical Conference, 13th, London, England, June 4-8, 1973, Proceedings. London, Royal Aeronautical Society, 1973. 12 p.

Description of a major program launched by the FAA to improve its air traffic control system. An upgraded third-generation ATC system is described which is intended to enhance the capabilities of the present ARTS III and NAS Stage A systems and includes such features as a discrete address beacon system, an electronic voice switching system, a microwave landing system, and aeronautical satellites. The possibility of incorporating intermittent positive control in the upgraded third-generation ATC system, once the discrete address beacon system is complete, is considered. The potential of area navigation and practical means for implementing it in the national airspace system are evaluated. A.B.K.

A73-33181 # Unsiting a major airport - A Canadian snafu. I. M. Hamer. In: Anglo-American Aeronautical Conference, 13th, London, England, June 4-8, 1973, Proceedings.
London, Royal Aeronautical Society, 1973. 19 p. 42 refs.

Review of the various decisions leading to the selection of a new airport for the Toronto area. Four areas of primary concern to the Province of Ontario in choosing the site for a second Toronto International Airport are cited. It is shown how government decisions moved from merely expanding the existing Malton airport, to the possible construction of two new airports, and then finally settling on one new site northeast of Toronto (At Pickering). However, owing to strong resistance on the part of local residents, the future of the projected new airport is in doubt, and the very need for it is being questioned. A.B.K.

A73-33207 # Integrated product support - Its contribution to simulator uptime. E. F. H. Reddell and D. C. Paskins (Singer Co. /U.K./, Ltd., England). In: Flight Simulation Symposium, 2nd, London, England, May 16, 17, 1973, Proceedings.
London, Royal Aeronautical Society, 1973. 15 p. 9 refs.

The operational profile of a complex repairable electronic system demonstrates a random transition from the operational to the failed state from which point repair of the failed system enables return to the operational state. The time available for operation (system uptime) is demonstrably a function of these random failures and related repairs and therefore it becomes possible to increase the time available for operation if the number of failures in a given period can be reduced, or if the rate at which the system can be repaired is increased. F.R.L.

A73-33601 Annual Reliability and Maintainability Symposium, Philadelphia, Pa., January 23-25, 1973, Proceedings. Symposium sponsored by IEEE, AIAA, AIIE, ASME, ASM, ASQC, and IES. New York, Institute of Electrical and Electronics Engineers, Inc. (Annals of Assurance Sciences. Volume 6, No. 1), 1973. 657 p. $10.00.

Topics discussed include mathematical modeling, effectiveness and acceptance testing, Aegis weapon system reliability, mechanical reliability, parts reliability, logistics, airborne vs ground checkout tradeoffs, reliability methods for material engineering, safety, cost modeling, atomic energy, and computer applications. Also discussed are sequential probability ratio tests, accelerated testing of guided missiles, failure rate functions, product liability prevention, failure analysis of unequal size samples, and system engineering aspects of the man-machine interface. A.B.K.

A73-33617 Product liability prevention via a controlled system. A. Sternberg. In: Annual Reliability and Maintainability Symposium, Philadelphia, Pa., January 23-25, 1973, Proceedings.
New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 160-166.

Current techniques in the field are integrated into a single control system to assist in resolving existing product liability problems and minimize the occurrence of such problems in the future. Suggestions are given as to how the system should be used by management to prevent a product liability litigation. V.Z.

A73-33627 Increase reliability of operational systems /IROS/. E. D. Hendricks (USAF, Logistics Command, McClellan AFB, Calif.) and A. K. Olsen (USAF, Quality Management Div., Kelly AFB, Tex.). In: Annual Reliability and Maintainability Symposium, Philadelphia, Pa., January 23-25, 1973, Proceedings.
New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 250-259. 6 refs.

This paper describes the development and implementation of the Air Force Increase Reliability of Operational Systems (IROS)

Program. Explanations of purpose and program direction, along with a sketch of the program history, are given. Activities of the Air Force Logistics Command's Reliability/IROS Working Group have resulted in the application of computerized math models which interface with Air Force data systems to establish resource allocation priorities in the areas of reliability, logistic support cost, operational availability, and system safety. Multiple discipline teams at both the working and management levels are utilized to assure effectiveness. Economic resource allocations and cost effective system modifications are achieved through the IROS concept as applied to operational systems. (Author)

A73-33635 Specifying maintainability-demonstration-test parameters. H. Balaban (ARINC Research Corp., Annapolis, Md.). In: Annual Reliability and Maintainability Symposium, Philadelphia, Pa., January 23-25, 1973, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 341-346. 5 refs.

The task of specifying the maintainability characteristics associated with a maintainability-demonstration test is considered, and the assessment of the corresponding test risks is discussed. Specifically, guidelines are provided for determining: (1) the type of maintainability index to specify, (2) the acceptable and unacceptable values for this index, and (3) the risks associated with the statistical tests. M.V.E.

A73-33638 Marketing reliability programs in the 70's. J. L. Hesse (Safeguard System Evaluation Agency, Kwajalein, Marshall Islands). In: Annual Reliability and Maintainability Symposium, Philadelphia, Pa., January 23-25, 1973, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 388-390. 8 refs.

A method is sought whereby assurance technology could exert its proper influence on managers better versed in costs and performance than in reliability engineering. The solution arrived at is to develop, and if possible validate, two disjoint but closely related models. As in any mathematical modeling technique, it is essential that good judgment be applied to the problem of assessing output validity on the basis of data quantity and quality as well as configuration management principles. M.V.E.

A73-33640 Application of safety disciplines to SRAM program. R. D. Craig (Boeing Co., Seattle, Wash.). In: Annual Reliability and Maintainability Symposium Philadelphia, Pa., January 23-25, 1973, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 397-402.

This paper discusses the successful application of system safety disciplines to a missile (SRAM) program. SRAM (Short Range Attack Missile) has been designed, developed and evaluated by The Boeing Company for the Air Force's Aeronautical Systems Division at Wright-Patterson Air Force Base, Dayton, Ohio. The nuclear missile is a strategic weapon planned for use on the FB-111 fighter-bomber and late model B-52's. It is designed to be launched from these strategic Air Force bombers against ground targets. Since it is a rocket-propelled air-launched missile that can fly at supersonic speeds, it provides a stand-off capability which will assist in the penetration of sophisticated enemy defense systems. (Author)

A73-33646 Developing reliability in a developing country. J. Hilman (Israel Aircraft Industries, Ltd., Lod Airport, Israel). In: Annual Reliability and Maintainability Symposium, Philadelphia, Pa., January 23-25, 1973, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 463-468. 7 refs.

Developing reliability in a developing country is shown to involve most of the problems encountered in a more mature industrial society, plus many others due to local methods, customs, attitudes, and working conditions. Optimal approaches to introduction of the most effective reliability techniques in developing countries are discussed. M.V.E.

A73-33653 Model to make Army decisions. L. Neri (U.S. Army, Reliability and Maintainability Div., St. Louis, Mo.) and H. Wiebe (Missouri, University, Rolla, Mo.). In: Annual Reliability and Maintainability Symposium, Philadelphia, Pa., January 23-25, 1973, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 554-557. 11 refs.

The Engineering management decision technique currently in use by the Army's Aviation Project Engineers, to determine which Equipment Improvement Recommendation or EIR case should be evaluated first, has been studied and a computer program designed to perform this function. Four significant parameters - reliability, availability, total annual inventory cost and total annual cost to live with the problem - have been developed and used to accomplish this. The objective of this study was to computerize the manual and mental process and evaluation of the EIRs relative to the four parameters and arrive at the decision as to which EIR has the highest priority. (Author)

A73-34078 # Man and machine - Systems for safety. E. Edwards (Loughborough University of Technology, Loughborough, Leics., England). In: Outlook on safety; Proceedings of the Thirteenth Annual Technical Symposium, London, England, November 14-16, 1972. Hayes, Middx., England, British Air Line Pilots Association, 1973, p. 21-36. 10 refs.

Systems are composed of three basic types of element: hardware (e.g., engines, airframes), software (e.g., organizational and operational procedures), and liveware (e.g., flight crew). These three component parts exist in an environment (physical, social, economic) which acts upon the elements in a variety of ways. In the development of a new system, these components are normally considered in the sequence environment-hardware-software-liveware. The competitive environment creates a need. Thereafter, the development of the system is dominated by the current state of the art in hardware. The design of the aircraft and its systems gives rise to a software requirement, in terms of routines to manage the various systems. These two components then dictate what is required from the crew, who must cope as best they can with the remaining parts of the system. Attention is given to the study of accidents, human factors in system design, and the implementation of human factors. F.R.L.

A73-34093 Military specifications provisions regarding load transfer. J. Lerner (U.S. Naval Air Systems Command, Washington, D.C.) and R. V. Leyden (U.S. Naval Air Systems Engineering Center, Philadelphia, Pa.). In: Annual National Relay Conference, 21st, Stillwater, Okla., May 1, 2, 1973, Proceedings. Scottsdale, Ariz., National Association of Relay Manufacturers, 1973, p. 8-1 to 8-13.

A73-34300 * # The Apollo Experience Reports. D. N. Holman (NASA, Johnson Space Center, Houston, Tex.). *Society for Technical Communication, International Technical Communications Conference, 20th, Houston, Tex., May 9-12, 1973, Paper.* 4 p.

This paper presents some of the problems and procedures in producing the Apollo Experience Reports, a series of about 121 documents covering the major technical system and subsystem experience in the design concepts for the Apollo Project, NASA's manned lunar landing program. This series of documents replaced technical conferences to document Apollo experience, and met the need to document crew/hardware interface experience. The purpose of these reports is to provide guidance for future programs of the magnitude and complexity of the Apollo Project and to convey very specific information to a selective segment of the engineering and technical management sectors of the aerospace community. (Author)

A73-34473 **Satellite broadcasting.** A. Chayes (Harvard University, Cambridge, Mass.), J. Fawcett (Royal Institute of International Affairs, London, England), M. Ito (Tokyo, University, Tokyo, Japan), and A.-C. Kiss (Strasbourg, Université, Strasbourg, France). Research sponsored by the International Broadcast Institute. London, Oxford University Press, 1973. 166 p. 102 refs. $16.

The results of a questionnaire submitted to study groups in France, Japan, the United Kingdom, and the United States regarding legal aspects of satellite broadcasting are presented. Six questions are presented and answered regarding the means of promoting and extending freedom of information provided by direct satellite broadcasting to developing countries; ways of limiting or preventing hostile propaganda, programs tending to disturb or erode religious, cultural, or social life, and advertising; protection of the individual from defamation or false statements and from invasion of privacy; protection of performers and producers of broadcast programs, and producers of phonograms, with respect to their economic interests in the broadcast and the intellectual and artistic integrity of their contribution; problems raised by direct or semidirect broadcasting to developing countries with regard to copyright matters; and the correlation of direct satellite broadcasting with other systems of satellite communications. A.B.K.

A73-34495 # **Tasks of a noise abatement official (Aus der Arbeit eines Lärmschutzbeauftragten).** H. Borsdorff. *Deutsche Gesellschaft für Luft- und Raumfahrt and Deutsche Gesellschaft für Ortung und Navigation, Symposium über neue Anflugverfahren, Düsseldorf, West Germany, May 2-4, 1973, DGLR Paper 73-022.* 13 p. In German.

Description of the history and functions of the office of noise abatement supervisor in the Federal Republic of Germany, and consideration of some significant aspects of aircraft noise control on the regional, national, and European level. The author's personal experience, as the Stuttgart Airport's noise abatement supervisor since 1969, is discussed in terms of the procedures used, problems encountered, and improvements achieved in the course of noise abatement efforts. Specific recommendations are presented for enhancing the effectiveness of noise abatement efforts in Germany and throughout Europe. M.V.E.

A73-34534 **The financing of aircraft procurement.** R. S. Sowter. *Aeronautical Journal*, vol. 77, Apr. 1973, p. 171-174.

It is suggested that for aerospace manufacturers, governments should fund civil projects or provide research and development through defense projects, preferably on an international competitive tender basis. Risk capital by the manufacturers must be provided alongside government funds for civil projects. Governments should consider providing domestic funds for the purchase of aircraft on the lines of the shipping industries loans in the U.K. For airlines, IATA should be considered as the airline operators' association for all levels of air travel. Governments must endorse and enforce decisions on fare structures taken by representatives of all airlines. The fare levels must permit airlines to earn a reasonable return on investment, depending upon the type of operation. F.R.L.

A73-34535 **The financing of essential communication, navigation and terminal aids.** F. J. H. Johnston (International Air Transport Association, Geneva, Switzerland). *Aeronautical Journal*, vol. 77, Apr. 1973, p. 175-180.

The communications networks used to enable the international air transport industry to function are, first, company owned circuits which enable each airline to fulfil its normal commercial requirements. Second are airline jointly owned organizations such as ARINC in the U.S. and International Aeradio elsewhere. Third are the government financed networks termed by ICAO as the Aeronautical Fixed and Aeronautical Mobile systems. Determination of costs and their allocation, recovery of costs, and solution of the global problem are discussed. It is considered that the financing problem can only be solved ultimately through a worldwide approach. F.R.L.

A73-34731 **Failure analysis used to vindicate JANTX components.** R. K. Peoples (Westinghouse Defense and Electronic Systems Center, Baltimore, Md.). In: Electronic Components Conference, 23rd, Washington, D.C., May 14-16, 1973, Proceedings. (A73-34726 17-09) New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 349-354.

With increased emphasis on reliability in government contracted systems, more stringent requirements have been placed on semiconductor components, resulting in the MIL-S-19500-JANTX, MIL-S-38510, and MIL-STD-883 specifications. These specifications add processing and power conditioning to 100% of the components in a lot submitted for acceptance as a JANTX type prior to inspection tests to verify Lot Tolerance Percent Defective (LTPD). The post mortem examination of JANTX component rejection occurring during the various stages of test in the manufacturing of an airborne electronics system has shown that the failures were mainly associated with circuit design, manufacturing, and test problems, and these were resolved through appropriate corrective action. Analysis of these failures played a central role in determining the most effective corrective action, and in verifying that the corrective action had achieved the desired result. F.R.L.

A73-34930 # **The use of remote sensing for the detection of natural resources - Definition of the platforms, technical-organizational considerations (L'uso del telerilevamento per l'individuazione delle risorse naturali - Definizione delle piattaforme, considerazioni tecnico-organizzative).** G. Barresi and A. Fornò (Compagnia Industriale Aerospaziale S.p.A., Rome, Italy). In: The control of the terrestrial environment from space: International collaboration, methods and technologies; International Conference on Space, 13th, Rome, Italy, March 22-24, 1973, Proceedings. Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1973, p. 75, 77-99. In Italian.

A73-34952 # **Problems and possibilities of earth resource satellite systems.** G. K. C. Pardoe (Hawker Siddeley Dynamics, Ltd., Stevenage, Herts., England). In: The control of the terrestrial environment from space: International collaboration, methods and technologies; International Conference on Space, 13th, Rome, Italy, March 22-24, 1973, Proceedings. Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1973, p. 349, 351-358.

The technical aspects involved in the satellite survey are considered, taking into account the current performance of the ERTS satellite. Forestry has been particularly well served by the ERTS measurements obtained so far, with considerable success in classifying various types of trees. Organization and administration of earth resource satellite programmes are discussed, giving attention to the keen interest shown by the United Nations Organization to this aspect of space work. G.R.

A73-35058 **Establishing a designer's cost target.** M. Dubey and A. R. Yackle (Lockheed-California Co., Burbank, Calif.). *American Helicopter Society, Annual National Forum, 29th, Washington, D.C., May 9-11, 1973, Preprint 712.* 9 p. Members, $1.50; nonmembers, $2.00.

The foundation of a good design-to-a-cost program is an early start. Once the design is under way it is often too late to correct bad guesses. The second criteria for setting cost targets is a good data bank, based on past programs, supplier quotations, government documents, and cost estimating practices. Third, the cost of providing functional requirements should be correlated with hardware costs, so that a rationale can be developed concerning the reasonable cost of the requirement. And finally, a responsive and dynamic method for tallying and tracking the costs is necessary if the target is to be achieved and verified when the production items are delivered. (Author)

A73-35201 **NAECON 73; Proceedings of the National Aerospace Electronics Conference, Dayton, Ohio, May 14-16, 1973.** Conference sponsored by the Institute of Electrical and Electronics Engineers. New York, Institute of Electrical and Electronics Engineers, Inc., 1973. 478 p. Members, $12.; nonmembers, $15.

Recent progress in the theory and implementation of aerospace electronics systems is described in papers covering major categories of digital avionics, electronic warfare, navigation, engineering management, signal and sensor processing, digital flight control, integrated electronics, modeling of the human visual system, aerospace systems electrical interfaces, high-power airborne electrical systems, reliability and cost effectiveness, air vehicle related electronics, and airborne reconnaissance. Topics included cover new sensors, antennas, inertial navigation systems, system architecture concepts, on-board digital computers, software development, and design procedures.

T.M.

A73-35214 **Authority perceptions of aerospace project managers.** R. J. Lucas (USAF, Institute of Technology, Wright-Patterson AFB, Ohio). In: NAECON 73; Proceedings of the National Aerospace Electronics Conference, Dayton, Ohio, May 14-16, 1973. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 102-107.

This paper reports on a recent research effort in which aerospace project managers identified the relative importance of both de jure (formal) and de facto (informal) sources of their authority in dealing with project and support personnel. The findings suggest that project managers employ their various facets of authority based upon an assessment of situational factors surrounding each decision. Results of this empirical investigation with thirty-four project managers from Massachusetts, New York, and California based aerospace companies have implications for both top management as well as project managers who are working in the dynamic and challenging project setting. (Author)

A73-35215 **Data base use by management.** G. G. Hays (Westinghouse Electric Corp., Pittsburgh, Pa.). In: NAECON 73; Proceedings of the National Aerospace Electronics Conference, Dayton, Ohio, May 14-16, 1973. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 113-116.

The biggest payoff in using a computer data base is the ability of information to permeate all departments. This coordinates all the functions (design, development, manufacturing, testing, and documentation) such that better communication and control of the overall system is achieved. Hence, management by data base allows coordination of management of definition, development, manufacturing, and testing via computer-aided design system, central control and measurement of objectives capabilities, complete and fast communications channels via a data base, and retention of accurate data across various engineering, manufacturing, and documentation functions. (Author)

A73-35216 **A survey of behavioral science contributions to laboratory management.** J. P. Martino (USAF, Avionics Laboratory, Wright-Patterson AFB, Ohio). In: NAECON 73; Proceedings of the National Aerospace Electronics Conference, Dayton, Ohio, May 14-16, 1973. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 117-123. 45 refs.

The results of a survey of the behavioral science literature pertinent to the performance of scientists and engineers is presented. The manager desiring to make use of existing behavioral science findings to achieve specific results within his organization is provided with a guide to those items in the literature which provide relevant information. (Author)

A73-35217 **The engineer and project management.** R. H. McIntire (USAF, Institute of Technology, Wright-Patterson AFB, Ohio). In: NAECON 73; Proceedings of the National Aerospace Electronics Conference, Dayton, Ohio, May 14-16, 1973. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 124-135. 44 refs.

An attempt is made to review the evolution of the project form of organization and to highlight some of the more important factors responsible for its widespread adoption for managing innovation. The technological explosion is outlined, together with current research and development trends. The impact of technology on organizational structure is stressed. The discussion then turns to the characteristics of projects that may have an impact on the perceived career progression of scientist-engineers assigned to those projects. The characteristics discussed are: the technical content of project work, the structure of projects, leadership styles in projects in the light of professional values of scientist-engineers in projects, and personal security aspects of assignment to projects. (Author)

A73-35218 **Management approach to integration of B-1 avionics system.** T. C. Hall (USAF, Aeronautical Systems Div., Wright-Patterson AFB, Ohio). In: NAECON 73; Proceedings of the National Aerospace Electronics Conference, Dayton, Ohio, May 14-16, 1973. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 136-142.

Brief discussion of the management approach to integration of avionics subsystems into the B-1 strategic bomber, integration activities, and associated engineering management problems. Interface requirements such as electronic multiplex, avionics multiplex, cooling, central integrated test systems, etc., are discussed with emphasis on the data base and the need for better definition of interface requirements. The effects of transition from newly developed equipment to government-furnished-equipments are also discussed. The avionics flight test program management is described. (Author)

A73-35260 **Parts standardization - A computerized approach.** G. W. Wood (Aerojet Electrosystems Co., Azusa, Calif.). In: NAECON 73; Proceedings of the National Aerospace Electronics Conference, Dayton, Ohio, May 14-16, 1973.
New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 443-451.

Standardization of parts and components for new design purposes is one of the most practical approaches for satisfying current pressures for reduced cost of procurement, increased reliability, and reduced logistics and warehousing problems. Optimal selection of parts and components for new designs now requires a comprehensive but systematic approach such as a large computer makes possible. A computerized approach suitable for a medium-sized company is discussed, including the establishment of selection criteria, preparation of raw data, processing, and final parts selections. Relative costs, availability information, performance feedback, handling of nonstandard parts, and updating of selections are also covered. A sample of a computerized data search tab run is included and described. (Author)

A73-35261 **Reliability costing exercise.** V. R. Rehg (USAF, Institute of Technology, Wright-Patterson AFB, Ohio). In: NAECON 73; Proceedings of the National Aerospace Electronics Conference, Dayton, Ohio, May 14-16, 1973.
New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 452-455. 19 refs.

This paper describes the activities in a training simulation design to illustrate the relationship between system reliability and life cycle cost and to provide the individual with an opportunity to actually make system trade-offs in a life like environment. The lessons learned in such a exercise are expected to be carried over to the real world so that cost effective decisions can be realized. The simulation was developed as part of a reliability training course currently being offered by the Air Force Institute's School of Systems and Logistics. A unique feature of the exercise is the graphical display of a Monte Carlo simulation on a cathode ray tube. (Author)

A73-35300 * **Evolution of the satellite telemetry data processing facility at the Goddard Space Flight Center.** F. A. Keipert and R. C. Lee (NASA, Goddard Space Flight Center, Greenbelt, Md.). In: Institute of Electrical and Electronics Engineers, International Convention and Exposition, New York, N.Y., March 26-30, 1973, Technical Papers. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 11/2-1 to 11/2-3. 5 refs.

Data from scientific and application satellites managed by the NASA Goddard Space Flight Center are acquired through the world-wide Spacecraft Tracking and Data Network (STDN). These data are forwarded to a central telemetry data processing facility whose primary objective is the timely provision of the data to users in a form suitable for their analysis. In a successful evolution, a satellite data processing facility must adapt to changing support requirements while operationally supporting active spacecraft. Advances in the technology of data transmission, data storage systems, and file management make it feasible to implement a third-generation system which will be able to satisfy experimenter requirements for the next ten years. F.R.L.

A73-35301 * **Station Data Acquisition and Control System.** J. W. Kiebler (NASA, Goddard Space Flight Center, Greenbelt, Md.). In: Institute of Electrical and Electronics Engineers, International Convention and Exposition, New York, N.Y., March 26-30, 1973, Technical Papers. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 11/3-1 to 11/3-4.

The Station Data Acquisition and Control System (STADAC), a multicomputer data handling and control system, is expected to be installed in six network stations, the first station to be established at Goddard Space Flight Center. Network control data, in the form of schedules and acquisition pointing data, flow from the Network Control Center to the stations, while station status data flow in the other direction. The system will format spacecraft telemetry data for real-time transmission of control and status data to the project operations control centers and for transmission of experiment data to the data processing facilities. The system will also schedule station equipment resources, perform prepass tests to assure data quality, and automatically set up selected station equipment. F.R.L.

A73-35572 **Systems concepts: Lectures on contemporary approaches to systems.** Edited by R. F. Miles, Jr. (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). New York, Wiley-Interscience, 1973. 236 p. $13.50.

Collection of papers dealing with the application of systems concepts to a wide range of disciplines. The topics include systems definitions and designs, models for systems engineering, the evolution of the JPL, systems concepts in lunar and planetary projects, civil systems projects, and Apollo program evaluation. V.Z.

A73-35574 * **Systems engineering at the Jet Propulsion Laboratory.** W. H. Pickering (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Systems concepts: Lectures on contemporary approaches to systems. New York, Wiley-Interscience, 1973, p. 125-149. 10 refs.

Work at the JPL in systems engineering is surveyed with the emphasis on practical experience with large hardware and software systems. Systems concepts in lunar and planetary projects, in the Morgantown project, and in the Urban Health Systems Task are discussed. Goal definition, problem statement, objective and criteria development, and synthesis, analysis, selection and implementation of systems are considered as successive steps in the optimization of the overall system. V.Z.

A73-35674 **Zero-base budgeting: A practical management tool for evaluating expenses.** P. A. Pyhrr (Management Analysis Center, Inc., Cambridge, Mass.). New York, Wiley-Interscience, 1973. 245 p. $13.95.

This book contains a description of zero-base budgeting - a new planning and budgeting technique which makes it possible to improve the efficiency of management at reduced expences by redirecting efforts and funds from lower priority current programs to higher priority new programs. Basic in this technique is the requirement that the entire budget request for both current and new activities be analyzed in detail, allowing an evaluation of both alternatives. Detailed suggestions are given to managers as to how this new budgeting technique can be implemented. V.Z.

A73-35836 # **A fundamental methodology for planning and management of research and development programmes.** G. W. Hoover. *British Interplanetary Society, Journal*, vol. 26, July 1973, p. 421-426.

A73-36077 * # **Providing satellite systems for the national weather satellite services.** W. G. Stroud, H. Press, and R. A. Stampfl (NASA, Goddard Space Flight Center, Greenbelt, Md.). *AIAA, ASME, and SAE, Joint Space Mission Planning and Execution Meeting, Denver, Colo., July 10-12, 1973, AIAA Paper 73-586.* 8 p. Members, $1.50; nonmembers, $2.00.

Discussion of cooperative arrangements and agreements among NASA, the Department of Commerce, and other governmental agencies in developing and operating meteorological satellite systems. The development of present interagency agreements and their conditions are discussed along with differences from the usual NASA program introduced by the supplier-client relationship between NASA and NOAA (National Oceanic and Atmospheric Administration). T.M.

A73-36079 * # **The impact of launch vehicle reliability on the financial risks associated with multiple payload space functions.** R. J. Christie (Mathematica, Inc., Princeton, N.J.) and J. S. Greenberg (Princeton University, Princeton, N.J.). *AIAA, ASME, and SAE, Joint Space Mission Planning and Execution Meeting, Denver, Colo., July 10-12, 1973, AIAA Paper 73-591.* 13 p. 5 refs. Members, $1.50; nonmembers, $2.00. NASA-AEC-supported research.

A73-36090 * # **Vehicle management and mission planning in support of shuttle operations.** W. R. Pruett and J. A. Bell (NASA, Johnson Space Center, Houston, Tex.). *AIAA, ASME, and SAE, Joint Space Mission Planning and Execution Meeting, Denver, Colo., July 10-12, 1973, AIAA Paper 73-612.* 10 p. Members, $1.50; nonmembers, $2.00.

An operational approach to shuttle mission planning during high flight frequency years (20 or more flights per year) is described wherein diverse mission planning functions interface via an interactive computer system and common data base. The Vehicle Management and Mission Planning System (VMMPS) is proposed as a means of helping to accomplish the mission planning function. The VMMPS will link together into an interactive system the major mission planning areas such as trajectory, crew, vehicle performance, and launch operations. A common data base will be an integral part of the system and the concept of standard mission types and phases will be used to minimize mission to mission uniqueness. The use of this system will eliminate much redundancy and replanning, shorten interface times between functions, and provide a means to evaluate unplanned events and modify schedules. (Author)

A73-36841 **Airport simulations.** R. Brodsky (Brodsky, Hopf and Adler Architects and Engineers Professional Corp., New York, N.Y.). In: Summer Computer Simulation Conference, Montreal, Canada, July 17-19, 1973, Proceedings. Volume 2. La Jolla, Calif., Society for Computer Simulation, Inc., 1973, p. 885-890.

Discussion of a simulation program for a major airport aimed at providing detailed estimates of the expected load on the various airport facilities. The simulation is expected to provide meaningful measures of the expected performances of each facility in any given

set of operating circumstances. This simulation was used for testing the alternate design for the new Dallas/Fort Worth Airport and was instrumental in providing solutions to roadway, parking, curb length, and other critical areas within the airport. M.V.E.

A73-36970 **Mechanical reliability.** A. D. S. Carter (Royal Military College of Science, Shrivenham, Wilts., England). New York, Halsted Press, 1972. 152 p. 47 refs. $17.50.

Three essential features which appear constantly in various definitions of reliability are: (1) a quality of performance is expected, (2) this is expected over a period of time, and (3) reliability is expressed as a statistical probability. The book is concerned essentially with mechanical systems and has been prepared as a general introduction to the subject. Fundamental aspects of reliability are first discussed, followed by examination of the role of design and the roles of the manufacturers and of the user in achieving reliability. Random failures receive attention, and management aspects of reliability are treated. F.R.L.

A73-37142 **Requirements of an economic approach to maintenance.** R. B. McLeod (Raytheon Co., Bedford, Mass.). *IEEE Transactions on Engineering Management*, vol. EM-20, Aug. 1973, p. 75-80.

The concept of applying basic economic principles to minimize the life-cycle cost of product or system development is outlined. The costs and benefits of alternative programs during the design phase are considered and the economic impact of reliability, maintainability, and availability is included. The activities necessary to maintain a finished system are then considered and an approach for maximizing the return on the maintenance investment is outlined. The paper concludes with general comments on system deployment and some organizational considerations. (Author)

A73-37462 # **Managerial implications of computerized aircraft design synthesis.** W. L. Straub, Jr. (LTV Aerospace Corp., Dallas, Tex.). *American Institute of Aeronautics and Astronautics, Aircraft Design, Flight Test and Operations Meeting, 5th, St. Louis, Mo., Aug. 6-8, 1973, Paper 73-799.* 10 p. 16 refs. Members, $1.50; nonmembers, $2.00.

A summary of the managerial aspects of starting the aerospace vehicle design synthesis programs is presented in two tables. Feasibility studies are discussed together with computer systems. System developments in the case of a number of American aerospace firms and of NASA are considered. It is found that the use and the development of synthesis or parametric analysis programs have substantially aided interdisciplinary communications. Modular program construction with open ended capability for revision/update is either used or sought by all program developers. The success of a design synthesis model is strongly dependent upon the cooperation and effective working relationship between the synthesis group and the technology groups. G.R.

A73-37686 **ACLS equipped vehicles in inter-city transportation.** D. R. Miller and N. J. Sinclair (Daniel, Mann, Johnson, and Mendenhall, Los Angeles, Calif.). In: Air cushion landing systems; Proceedings of the First Conference, Miami Beach, Fla., December 12-14, 1972. Tullahoma, Tenn., University of Tennessee, 1973, p. 240-248.

A possible solution to the problems of transportation congestion is the use of air cushion landing system (ACLS) equipped STOL aircraft, such as the CC115 Buffalo. The nature of the problems is analyzed, and the transportation modes currently being utilized are reviewed. The potentials of ACLS-equipped aircraft as a substitute or supplemental mode for intercity travel are examined in the light of environmental and financial constraints to be encountered. Recommendations for demonstration projects are developed as a test for the feasibility and efficacy of ACLS-equipped vehicles in intercity service. F.R.L.

A73-37745 # **Financing the new generation of airports.** W. Jakobsberg (Centers for Study, Inc., Rockville, Md.). In: International Conference on Offshore Airport Technology, 1st, Bethesda, Md., April 29-May 2, 1973, Proceedings. Volume 2. New York, American Institute of Aeronautics and Astronautics, Inc., 1973, p. 29-34.

The coming generation of metropolitan airports are larger, more complicated and much more expensive to build than the preceding generation of airports. The three factors that must be taken into consideration in selecting a financing mechanism are (1) ownership policy, (2) funding level, and (3) design complexity. The financing of the proposed New York Offshore Airport is an example of how high cost and an unorthodox location for the airport introduce the need for unconventional financing methods. The most promising of these has as its keystone the creation of a fund to which all interested airport developers could contribute and which would be used to guarantee bonds issued by those developers for the construction of their airports. The integrity of the fund would in turn be guaranteed by the Federal Government thus doubly protecting bond holders against default. (Author)

A73-37803 # **The Federal Aviation Administration program to improve terminal area traffic control.** W. F. Flener (FAA, Washington, D.C.). *American Institute of Aeronautics and Astronautics and Gosudarstvennyi Komitet po Nauke i Tekhnike, USSR/US Aeronautical Technology Symposium, Moscow, USSR, July 23-27, 1973, Paper.* 4 p.

A73-37805 # **Recent improvements in ILS Category I, II, and III cost, integrity, and siting.** R. M. Lockerd and V. W. Fisher (Texas Instruments, Inc., Dallas, Tex.). *American Institute of Aeronautics and Astronautics and Gosudarstvennyi Komitet po Nauke i Tekhnike, USSR/US Aeronautical Technology Symposium, Moscow, USSR, July 23-27, 1973, Paper.* 15 p.

Summary of United States Government and industry efforts to improve critical performance factors in the integrity, cost, and siting immunity of ICAO Instrument Landing Systems. The programs and systems discussed include both Category II and Category III implementation at U.S. sites, together with smaller programs aimed at piecewise improvement of ILS through the upgrading of major system components. The presentation accepts without discussion the basic operational need for higher category systems and discusses cost and effectiveness only in terms of achieving the desired objectives of Category II and Category III operations. The major subelements of the cost, integrity, and site sensitivity factors are presented, and historical ILS problem areas are described. The basic 'block diagram' elements and features of ILS equipment are identified, with emphasis on those areas which have received recent improvement efforts. (Author)

A73-37807 # **Area navigation systems for air transport aircraft.** T. J. Newman (AMBAC Industries, Inc., Garden City, N.Y.). *American Institute of Aeronautics and Astronautics and Gosudarstvennyi Komitet po Nauke i Tekhnike, USSR/US Aeronautical Technology Symposium, Moscow, USSR, July 23-27, 1973, Paper.* 23 p.

Distinctive features of area navigation are considered together with questions regarding the benefits of area navigation. Typical air navigation systems presently in use are examined, taking into account variations in system configuration, area navigation computers, route data storage techniques, control and display units, pictorial displays for area navigation, airline activities to standardize area navigation system characteristics, and present area navigation operations of U.S. airlines. Area navigation activities of the FAA are also investigated, giving attention to the FAA ten-year plan for area navigation and the present status of area navigation in the U.S. G.R.

A73-37812 # **Noise and pollution - The Federal Aviation Administration's views.** R. P. Skully (FAA, Washington, D.C.).

American Institute of Aeronautics and Astronautics and Gosudarstvennyi Komitet po Nauke i Tekhnike, USSR/US Aeronautical Technology Symposium, Moscow, USSR, July 23-27, 1973, Paper. 6 p.

Recent programs conducted by the Federal Aviation Administration concerning the control and reduction of aircraft pollutants are discussed. Information concerning noise reduction through new technology, acoustical treatment of power plants, and operational procedures is covered with appropriate charts. It is stressed that while progress has been made, particularly in the reduction of aircraft noise, the U.S. Government is committed and dedicated to even further improvement of the environmental impact of aviation. (Author)

A73-38074 **Water resources systems modelling today and its research opportunities.** W. S. Butcher (Texas, University, Austin, Tex.). In: Joint Automatic Control Conference, 14th, Columbus, Ohio, June 20-22, 1973, Preprints of Technical Papers. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 812-814. 11 refs.

The present status of the field of water resources is surveyed with respect to its objectives and problems, management and planning, as well as operation and maintenance routines. Some of the changes in this field in the ten years of its existence are shown to include: (1) the development of satisfactory stream flow synthesis techniques; (2) the refinement of rainfall-runoff models, and (3) the thorough exploration of the use of formal optimization methods in solving water problems. M.V.E.

A73-38121 # **Calculation of the plan for the transportation performance with the aid of electronic data processing (Berechnung des Planes der Transportleistungen mit Hilfe der elektronischen Datenverarbeitung).** E. Klaembt. *Technisch-ökonomische Informationen der zivilen Luftfahrt,* vol. 9, no. 3, 1973, p. 167-170. In German.

A73-38369 # **Maximum air transportation service with minimum community noise.** A. L. McPike (Douglas Aircraft Co., Long Beach, Calif.). *American Institute of Aeronautics and Astronautics, Aircraft Design, Flight Test and Operations Meeting, 5th, St. Louis, Mo., Aug. 6-8, 1973, Paper 73-796.* 9 p.

Comparisons of the noise levels of several different transport aircraft are discussed, and a concept is proposed for helping achieve maximum air transportation at a minimum of community-inconveniencing noise. The proposed concept is developed around the noise levels of Part 36 of the Federal Aviation Regulations. Eight current aircraft, covering a wide variety of range and passenger capacity capabilities, are examined. Wide-bodied aircraft powered by the new high-bypass-ratio turbofan engines produce much less noise exposure when providing a given amount of transportation service than the smaller narrow-bodied aircraft powered by low-bypass-ratio turbofan engines. It is pointed out that the wide-bodied aircraft are superior because they incorporate more advanced noise-suppression features rather than because of their size. Smaller aircraft incorporating the same level of technology should receive a comparable rating by the proposed specific noise level system. M.V.E.

A73-38472 # **Today's challenge - Optimizing the air traffic controller's role.** L. B. Barnes and D. L. Dickson (System Development Corp., Santa Monica, Calif.). In: Air Traffic Control Association, Annual Meeting and Technical Program, 17th, Chicago, Ill., October 9-11, 1972, Proceedings. Washington, D.C., Air Traffic Control Association, 1973, p. 60-62.

Development of an evaluation system for assessing air traffic controller performance. After determining if available FAA data were usable for determining controller tasks and their measures and performing a complete and detailed analysis of air traffic functions, a test performance evaluation package was designed and was tested in the field. The problem of optimizing the increasingly important manager/monitor function of the air traffic controller is considered from the selection and training standpoints. A.B.K.

A73-38576 # **Educational television in India.** U. R. Rao (Indian Scientific Satellite Project, Bangalore; Physical Research Laboratory, Ahmedabad, India). *American Astronautical Society, Annual Meeting, 19th, Dallas, Tex., June 19-21, 1973, Paper 73-106.* 15 p. 6 refs.

Application of space technology, particularly in the field of communication, is of great relevance to the needs of a developing country like India. The use of this powerful mass medium on a nationwide scale in providing educational instruction, related to family planning, health, hygiene, and improved agricultural practices is of great practical significance to our country, a large section of whose population is distributed in remote and inaccessible rural areas. We discuss, in this paper, the efforts and plans of the Indian Space Research Organisation to establish the necessary infrastructures within the country to build indegeneous capability in space technology. We then describe the necessity of establishing a hybrid system for TV broadcasting - direct reception community sets to serve remote rural population and a conventional system through rediffusion to serve urban population. A conceptual design for an Indian National Satellite (INSAT) to provide a follow-up to the SITE experiment is discussed. (Author)

A73-38592 # **Environmental data - From sensors to users.** T. S. Austin (NOAA, Environmental Data Service, Washington, D.C.). *American Astronautical Society, Annual Meeting, 19th, Dallas, Tex., June 19-21, 1973, Paper 73-138.* 10 p. 8 refs.

Examination of both traditional and evolving relationships between data collector, data manager, and secondary user. It is postulated that an environmental data management system must be concerned with the entire data cycle from the concept that motivates the original collection through instrument design and deployment, operational programs, and primary or 'mission' analyses, as well as the traditional data management functions that begin once the data are turned over to the archives. The implementation of this concept in the conduct of large-scale (research) data collection programs is described. Finally, some degree of standardization, as well as the development of environmental data inventory and referral systems are urged to make the data management system as responsive as possible to the needs of the user, particularly the secondary user. (Author)

A73-38770 **A rational basis for determining the EMC capability of a system.** R. B. Schulz (Southwest Research Institute, San Antonio, Tex.). In: International Conference on Communications, Seattle, Wash., June 11-13, 1973, Conference Record. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 54-1 to 54-8. Research supported by the Southwest Research Institute.

A logical procedure is presented for determining the electromagnetic capability (EMC) of a system, based upon an analytical approach developed earlier. The procedure is illustrated using as a system an aircraft with a manageable number of electrical/electronic subsystems. The result is a single number which can be used in a weapon system effectiveness equation and is generally useful not only to EMC engineers, but also to other electronic engineers and managers. Byproducts of the procedure are enhanced highlighting of critical parameters for design purposes and a means for economic evaluation of EMC efforts. (Author)

A73-39108 **Comparison of the job attitudes of personnel in three air traffic control specialties.** R. C. Smith (FAA, Civil Aeromedical Institute, Oklahoma City, Okla.). *Aerospace Medicine,* vol. 44, Aug. 1973, p. 918-927. 15 refs.

A73-39212 # **Ground safety panel presentation.** J. M. Rives. In: Annual Corporate Aircraft Safety Seminar, 18th, Arlington, Va., April 1-3, 1973, Proceedings. Arlington, Va., Flight Safety Foundation, Inc., 1973, p. 18-21.

The areas considered necessary to assure safe flying, highly skilled personnel, and good maintenance are discussed. These areas are safety equipment, initial training, recurrent training, protective clothing and shelter from inclement weather, proper maintenance scheduling and long extended work periods, discrepancy reporting and communication between flight personnel and maintenance personnel, and test and servicing equipment. F.R.L.

A73-39214 # **Presentation for the ground safety panel.** C. E. Smith (Pan American World Airways, Inc., Teterboro Airport, N.J.). In: Annual Corporate Aircraft Safety Seminar, 18th, Arlington, Va., April 1-3, 1973, Proceedings. Arlington, Va., Flight Safety Foundation, Inc., 1973, p. 26, 27.

Application of the National Fire Protection Association pamphlet 409, which covers aircraft hangars, is discussed. The insurance rates for hangars are predicated on the type of construction and the degree of fire protection provided. The provision of fire protection in a hangar on an airport where sufficient water is available to support such systems can most often pay for itself over the term of occupancy by reduced insurance premiums. F.R.L.

A73-39216 # **Crew coordination and cockpit discipline panel.** E. C. Montgomery (National Transportation Safety Board, Washington, D.C.). In: Annual Corporate Aircraft Safety Seminar, 18th, Arlington, Va., April 1-3, 1973, Proceedings. Arlington, Va., Flight Safety Foundation, Inc., 1973, p. 35-38.

The professional pilot and his relationship to the cause factor in aircraft accidents is discussed, and the safety records for air taxi, air carrier, and corporate/executive pilots are reviewed. The dilemma of the professional pilot is reflected in causal factors where he must operate with a contradiction of attitudes, i.e., safety is demanded but delays are not tolerated. The accident rate for corporate/executive flying in 1970 was 3.92 times that of the air carriers. It is suggested that the differential can be narrowed by more exacting training and the development of greater cockpit discipline. F.R.L.

A73-39217 # **Crew coordination and cockpit discipline panel.** W. Moran (American Airlines, Inc., New York, N.Y.). In: Annual Corporate Aircraft Safety Seminar, 18th, Arlington, Va., April 1-3, 1973, Proceedings. Arlington, Va., Flight Safety Foundation, Inc., 1973, p. 39-42.

American Airlines' philosophy on crew coordination and discipline during approach is described. What is needed is to create a climate wherein the facts, if they are worthwhile, are expressed in such a way that self-discipline will result. Procedures are taught to a specified level of proficiency, and this carries through ground school to the cockpit procedures trainer, to the flight simulator, into the airplane locally, on to the line during the line-training phase, and then through recurrent training to proficiency. F.R.L.

A73-39274 **Discourse on comparisons between commercial and military aircraft logistics.** J. F. McDonald (Flying Tiger Line, Inc., Los Angeles, Calif.). *Logistics Spectrum*, vol. 7, Fall 1973, p. 19-26, 37.

Logistics planning operations in commercial and military aviation are compared in terms of support and maintenance practices dictated by different operational environments. The evolution of various logistics skills as dictated by increasing complexity of aircraft and their uses is summarized, and explanations are provided for such categories of maintenance as scheduled overhaul, on-condition inspection, and condition monitoring. Differences between military and civil aviation are pointed out with respect to avoidance of vehicle and system complexity through fundamental design analysis, economic aspects of optimum spare engine quantities, progressive divergence of basic designs, and the use of built-in test equipment. T.M.

A73-39910 * # **Interdisciplinary research on the application of ERTS-1 data to the regional land use planning process.** J. L. Clapp, R. W. Kiefer, M. M. McCarthy, and B. J. Niemann, Jr. (Wisconsin, University, Madison, Wis.). In: International Symposium on Remote Sensing of Environment, 8th, Ann Arbor, Mich., October 2-6, 1972, Proceedings. Volume 2. Ann Arbor, Mich., Environmental Research Institute of Michigan, 1973, p. 1429-1463. Contract No. NAS5-21754.

Although the degree to which ERTS-1 imagery can satisfy regional land use planning data needs is not yet known, it appears to offer means by which the data acquisition process can be immeasurably improved. This paper documents the initial experiences of an interdisciplinary group attempting to formulate ways of analyzing the effectiveness of ERTS-1 imagery as a base for environmental monitoring and the resolution of regional land allocation problems. Because of the need to describe and depict regional resource complexity in an interrelatable state, certain resources within the geographical regions have been inventoried and stored in a two-dimensional computer-based map form. Computer oriented processes were developed to provide for the economical storage, analysis and spatial display of natural and cultural data for regional land use planning purposes. Statistical programs have been developed that correlate interpreted data with stored data, both spatially and numerically. (Author)

A73-40052 # **A survey of satellite-based systems for navigation, position surveillance, traffic control and collision avoidance.** K. D. McDonald (U.S. Department of Defense, Washington, D.C.). In: National Aerospace Meeting, Washington, D.C., March 13, 14, 1973, Proceedings. Addendum. Washington, D.C., Institute of Navigation, 1973. 16 p.

Summary of the satellite system concepts, orbital deployments, and measurement techniques on which the accomplishment of various recent applications is based. The systems and system concepts discussed include: Transit, the Navy Navigation Satellite System; the expanded Transit and Transit improvement program concepts; the Two-in-View configuration; the Defense Navigation Satellite System, including the System 621B and the Timation system concepts; the NASA Position Location and Communication Equipment (PLACE) experiment: the Maritime Satellite program of the Department of Commerce's Maritime Administration; the DOT/FAA Aeronautical Satellite Program; the Location, Identification by Transmission (LIT) and Satellite ATC and Navigation (SATAN) systems; the DOT's Advanced Air Traffic Management System concepts; and the FAA's recently developed ASTRO–DABS concept. (Author)

A73-40833 **Experiences with an augmented human intellect system - Computer mediated communication.** J. H. Bair (USAF, Rome Air Development Center, Griffiss AFB, Ohio). *Society for Information Display, Proceedings*, vol. 14, 2nd Quarter, 1973, p. 42-51. 16 refs. USAF-sponsored research.

The implementation of the Augmented Human Intellect System (AHI), developed by the Stanford Research Institute, has permitted a new avenue for interaction: that of computer mediated communication. This paper is a description of experiences with this novel alternative to conventional ways of thinking and communicating in an organizational environment. The AHI system was designed to facilitate communication among knowledge workers who may accomplish their entire job utilizing this advanced technology. The system has the capability to deliver messages or other information to geographically distributed users. It permits access to and modification of stored information by a number of persons concurrently or independently. The effects of the system in a research and

development office were an increase in the effectiveness of the individual, a higher level of consensus in teams, and a collaborative openness in the organization. (Author)

A73-41173 # **Philosophy of international cooperation.** D. R. Heebner. *RAeS, AIAA, and CASI, Anglo-American Aeronautical Conference, 13th, London, England, June 4-8, 1973, Paper.* 12 p.

A strong plea is made for bilateral Anglo-American and also broader international cooperation within NATO in the development of weapons systems. The interdependence of weapons systems developments within the NATO alliance is stressed, and the damage caused to every one by duplicative weapons developments is pointed out. Special attention is given to the effectiveness prerequisites of joint international weapons development endeavors. M.V.E.

A73-41204 # **DOD aircraft.** J. C. Sindt (Honeywell, Inc., Minneapolis, Minn.). In: The role of testing in achieving aerospace systems effectiveness. New York, American Institute of Aeronautics and Astronautics, Inc., 1973, p. 4-1 to 4-21.

Twenty-one responses were received from component, subsystem, and system suppliers. Most of the major (current and recent) Department of Defense (DOD) aircraft programs, as listed in the products/programs item of the questionnaire, form the basis of this chapter. In tabulating the responses, some trends appeared to be possibly related to the supplier level (component, subsystem, or system). As much raw data is provided as possible to permit the reader to make his own analysis, comparisons, and conclusions. F.R.L.

A73-41697 # **EMC for a modern aircraft.** M. L. Jarvis (Royal Aircraft Establishment, Farnborough, Hants., England) and D. Ramsbottom (British Aircraft Corp., Ltd., Warton, Lancs., England). In: Symposium on Electromagnetic Interference in Aircraft, London, England, February 15, 1973, Proceedings. London, Institution of Electrical Engineers, 1973. 14 p.

The reasons for initiating an electromagnetic compatibility (EMC) program are examined. It has become recognized that adequate and careful consideration of compatibility questions in the initial design will obviate the necessity for costly aircraft and equipment redesign. System engineering aspects are considered together with questions regarding the education of specialists and equipment suppliers. The system EMC control plan is discussed along with EM interference specifications, aspects of cable separation, final aircraft testing, and an EMC systems rig. G.R.

A73-41790 **Overview of Department of Defense Electromagnetic Radiation Hazards Standardization Program.** S. Caine (U.S. Naval Electronic Systems Command, Washington, D.C.). In: International Electromagnetic Compatibility Symposium, New York, N.Y., June 20-22, 1973, Record. New York, Institute of Electrical and Electronics Engineers, Inc., 1973, p. 127-131.

The continuing trends of radar, communications and other communications-electronics (C-E) equipments toward greater effective radiated powers and expanded frequency coverages have resulted in a growing concern over the effects of electromagnetic radiation (EMR). This paper provides an introduction to the problem of EMR hazards to weapons systems, ordnance, and electroexplosive devices and summarizes the activities of the Department of Defense Electromagnetic Compatibility Standardization Program (EMCS) in the aforementioned hazards area. In addition, other efforts in the area, such as those of the American National Standards C95 Committee on Radio Frequency Radiation Hazards are outlined. (Author)

A73-42198 * **Assuring reliability program effectiveness.** L. W. Ball (NASA, Marshall Space Flight Center, Safety and Manned Flight Awareness Office, Huntsville, Ala.). *Quality Progress*, vol. 6, Sept. 1973, p. 23-27.

An attempt is made to provide simple identification and description of techniques that have proved to be most useful either in developing a new product or in improving reliability of an established product. The first reliability task is obtaining and organizing parts failure rate data. Other tasks are parts screening, tabulation of general failure rates, preventive maintenance, prediction of new product reliability, and statistical demonstration of achieved reliability. Five principal tasks for improving reliability involve the physics of failure research, derating of internal stresses, control of external stresses, functional redundancy, and failure effects control. A final task is the training and motivation of reliability specialist engineers. F.R.L.

A73-42324 **Time, space, and energy management in the airways traffic control medium.** C. W. Vietor (American Airlines, Inc., Los Angeles, Calif.). *Navigation*, vol. 20, Summer 1973, p. 159-170. 11 refs.

This paper presents a philosophy and concept for sloped airways path design and derives mathematical formulas from which the fundamental requirements for instrumentation design for vertical navigation for time, space, and energy management requirements can be derived. (Author)

A73-42866 # **Estimation of general aviation air traffic.** K. A. Brewer, S. L. Ring, and R. L. Carstens (Iowa State University of Science and Technology, Ames, Iowa). *American Society of Civil Engineers, National Transportation Engineering Meeting, Tulsa, Okla., July 9-12, 1973, Preprint 2041.* 26 p. $0.50. FAA-supported research.

A method is developed for estimating general aviation traffic activity at airports serving populations of 250,000 persons or less, comparing this method with existing estimating procedures. The method has been applied in the development of the Iowa State Airport System Plan (ISASP). ISASP estimates general aviation activity by determining the based aircraft at each system candidate airport, estimating the annual operations per based aircraft, estimating the percentage of the total annual operations that are itinerant, estimating air taxi operations, and estimating the general aviation peak-hour operations activity. F.R.L.

A73-42945 # **Sideline measurement of aircraft noise - Is it necessary.** J. W. Vogel (Lockheed-California Co., Burbank, Calif.). *Acoustical Society of America, Meeting, 85th, Boston, Mass., Apr. 10-13, 1973, Paper.* 18 p.

Discussion of some of the problems associated with sideline noise measurements on takeoff and approach that are designed to enforce the observance of community noise limits in accordance with Federal Aviation Regulations on aircraft type certification. Various alleviation possibilities for these problems are reviewed, and some are recommended. M.V.E.

A73-42969 **Reliability management.** F. A. Stovall (Lockheed-Georgia Co., Marietta, Ga.). *IEEE Transactions on Reliability*, vol. R-22, Oct. 1973, p. 232-237. 11 refs.

This paper provides management with an overview of product reliability and related areas. Charts are provided which show the expected relation of part count to laboratory test results and the expected relation of laboratory test results to operational performance. These charts are followed by laboratory and operational material used in the development of the overview charts. (Author)

A73-43494 # **Economics of airport system planning.** J. A. Neiss (Aerospace Corp., Los Angeles, Calif.). *Intersociety Conference on Transportation, 2nd, Denver, Colo., Sept. 23-27, 1973, ASME Paper 73-ICT-33.* 8 p. Members, $1.00; nonmembers, $3.00.

An airport system plan generally defines the developmental needs and requirements that are necessary to meet five-, ten-, and twenty-year aeronautical activity forecasts. Unfortunately, these system plans do not adequately address or meet the current economic needs of many of the nation's airports with respect to economics of operation, ownership, and finance. An analysis is made of the economics of airport operation, ownership, and finance, and the economic criteria that should be integrated into airport system planning to produce a viable plan are indicated. (Author)

A73-43495 # **Reducing the threat of mid-air collisions.** T. M. Johnston (FAA, Technical Programs Div., Washington, D.C.). *Intersociety Conference on Transportation, 2nd, Denver, Colo., Sept. 23-27, 1973, ASME Paper 73-ICT-49.* 7 p. Members, $1.00; nonmembers, $3.00.

A much discussed but poorly understood problem, associated with air travel, is the threat of midair collision by the ever-increasing number of planes utilizing the air space over the United States. This problem is put in the proper perspective, and current efforts by Government and industry to advance the state-of-the-art in collision avoidance systems and to develop a timely solution to the midair collision problem are discussed. (Author)

A73-44053 # **Management and control of flight test programs of the Western Region FAA.** C. E. Richards (FAA, Aircraft Engineering Div., Los Angeles, Calif.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 30 p.

The mission performed by the Aircraft Engineering Division of the Federal Aviation Administration (FAA) is considered. As a service organization, the Aircraft Engineering Division influences the management and planning of a manufacturer's test program but does not directly manage it. Basically, the Aircraft Engineering Division certificates the aircraft which use the airports and airways. The specialties involved in certifying a modern complex aircraft are examined. The certification requires a close coordination of the Manufacturing Inspection Branch, the Airframe Branch, the Systems and Equipment Branch, the Propulsion Branch, and the Flight Test Branch. Questions regarding the general philosophy behind the certification program are discussed and sample pages from a typical flight test program are provided. G.R.

A73-44054 # **Management and control of flight test programs at U.S. Army Aviation Systems Command.** C. C. Crawford, Jr. (U.S. Army, Washington, D.C.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 28 p.

Organizational questions are considered, giving attention to the Contractor's Development and Airworthiness Qualification Program. The tests are done entirely by industry and witnessed to varying extents by Army technical specialists. Specifications are provided to industry regarding the tests required to convince the Army that the aircraft is in fact airworthy. Tests carried out by industry are supplemented with tests conducted by the Army within the framework of an Army Preliminary Evaluation (APE). The APE's are generally short two week evaluations. A typical program would involve one APE early for performance assessment. Other investigations include a flying qualities evaluation and an evaluation of key subsystems on the aircraft. These tests are followed by endurance tests, flight characteristics tests, climatic laboratory tests, and a service test. G.R.

A73-44055 # **Management of Air Force test and evaluation activities.** J. P. Streit (USAF, Systems Command, Andrews AFB, Washington, D.C.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 51 p.

The Air Force manages a wide variety of testing activities beginning with such tasks as the examination of the smallest pieces or components undergoing environmental or qualification testing and extending to the assessment of the relative effectiveness of different tactical applications of entire new weapon systems. In addition, there are other testing programs related to basic research and technology advancement. The current Air Force test and evaluation (T and E) management concepts are discussed, giving attention to the evolution of these concepts in the period since about 1967. The total Air Force test and evaluation work effort is now divided into three broad classes, including R and D T and E, acquisition T and E, and engineering services T and E. G.R.

A73-44056 # **Management and control of flight test programs of the Naval Air Systems Command.** F. H. Baughman (U.S. Naval Air Systems Command, Washington, D.C.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 17 p.

The planning and setting up of a flight test program for a major Navy weapons systems development are discussed, giving attention to Navy project manager reporting relationships. The S-3A Viking contractor flight test program considered consists of three interlocking phases, including a detailed laboratory test integration and evaluation program. The second phase, the flying test bed, is an intermediate step between the laboratory and aircraft tests. The third phase is the normal aircraft flight test program itself. Questions of avionics development and testing are explored together with aspects of the S-3A initial operational test and evaluation. G.R.

A73-44057 # **Management and control of commercial flight test programs.** H. W. Zimmerman (Boeing Co., Flight Operations Dept., Seattle, Wash.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 33 p.

The historical evolution of commercial flight test programs is discussed, giving attention to advances occurring in response to the changes which took place since 1963 in the commercial transport market. Various aspects regarding the development of the Boeing 747 are considered, taking into account special design problems and aerodynamic testing conducted with the aid of an onboard electronic calculator. Questions of specific program responsibilities are investigated. Details of aircraft control are discussed together with the responsibilities of the product division, the technology staff of the group engineering, and the flight operations department. The manufacturing preflight is considered along with the results of the Boeing 747 flight test program. G.R.

A73-44058 # **Management and control of military and commercial flight test programs at Bell Helicopter Company.** R. H. Wheelock (Bell Helicopter Co., Fort Worth, Tex.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 13 p.

Problem areas which have to be investigated are related to torsional stability, power management, fuel control characteristics, preflight ground endurance, components fatigue life, static and dynamic stability of the machine, cooling, and throttle response. Aspects of management procedures are considered, taking into account general technical measurements, instruction influence, data management, and cost-time schedule performance. Questions of instrumentation are discussed together with approaches for the efficient evaluation of test data. The responsibilities of various experts involved in the analysis of the test are examined. Attention is given to cost-schedule performance control methods designed to avoid major cost overruns in the development of the aircraft. G.R.

A73-44059 # **Management and control of military flight test programs at McDonnell Douglas St. Louis, Missouri.** R. L. Tuttle (McDonnell Douglas Corp., St. Louis, Mo.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 26 p.

A contractor must thoroughly understand the objective of the weapon system and must design and test it for the most probable critical service environments. Testing requires sound management techniques. Basic considerations peculiar to test program management are discussed. In the development phase, fatigue testing will investigate the life of the system. The various phases of flight testing are described. Questions of test effectiveness are examined along with test program plans and requirements of test support. G.R.

A73-44060 # **SFTE Symposium 12 October 1972.** F. G. Edwards (Grumman Aerospace Corp., Bethpage, N.Y.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 52 p.

A number of basic questions regarding the objectives of flight tests are examined, giving attention to the responsibility to the customer, obligations to the corporation, and organizational relations. A flight test system was developed through the integration of five elements, including detailed planning, advanced test techniques, supporting facilities, integrated flight operations, and control. The heart of the flight test system is an Automated Telemetry Station (ATS). ATS test operations are discussed together with ATS real time benefits, integrated flight operations, budget considerations, and plans for improvements. G.R.

A73-44061 # **Air Force Prototype Program management.** R. E. Whelan (USAF, Prototype Program Office, Wright-Patterson AFB, Ohio). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 34 p.

The Charter of the AF Advanced Prototype Program Office basically delineates a low cost advanced development effort for the development of advanced prototype aircraft and subsystems for technical evaluation against anticipated operational needs. The factors which characterize adaptive management as applied to advanced prototype programs are discussed. The prototype program concept is considered together with questions of prototype program office organization, the responsibilities of Air Force and other government agencies, aspects of program control, engineering, procurement/financial management, and logistics. The lightweight fighter prototype project is examined as one of the major programs to result from the prototype study. G.R.

A73-44062 # **The role of a military flight test engineer in test management.** J. K. Potts (USAF, Aeronautical Systems Div., Wright-Patterson AFB, Ohio). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 16 p.

Test and evaluation is the single largest task of the Air Force Systems Command. The Air Force flight test engineer has the background to play an important role in flight test management beyond the actual testing operations. The flight test engineer at the Air Force Flight Test Center is not a specialist. He reads film, prepares test plans, develops data reduction routines, flies in the test aircraft and plots and analyzes the test data. If he demonstrates the necessary competence he will become a project engineer responsible for an entire flight test program. After one or two major projects the project engineer will become a flight test manager at the test center level. The genesis of an engineering development program is discussed, giving particular attention to the role of the flight test manager. G.R.

A73-44064 # **The capabilities of army test facilities.** S. G. Cockerham (U.S. Army, Washington, D.C.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 55 p.

The Army test capabilities which are dedicated to aircraft testing are discussed, giving attention to the people, the locations, and the equipment which provide these capabilities. Questions of organizational relations are considered. The Aviation Systems Command is responsible for aircraft procurement, engineering, engineering flight tests, and logistics support. The Test and Evaluation Command tests and evaluates all Army Materiel Command material with the exception of aircraft. Important installations include the Electronic Proving Ground, the Yuma Proving Ground, the Tropic Test Center, and the Central Ground Station. G.R.

A73-44065 # **The capabilities of government test facilities at the Air Force Systems Command.** J. N. Steingasser (USAF, Systems Command, Andrews AFB, Washington, D.C.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 23 p.

The installations which are under direct control of the Air Force Systems Command Headquarters are considered. The Systems Command mission is to advance aerospace technology, adapt it into operational aerospace systems, and acquire qualitatively superior aerospace systems and materiel needed to accomplish the Air Force mission. The installations include the Armament Development and Test Center, the Arnold Engineering Development Center, the Air Force Flight Test Center, and the Air Force Special Weapons Center. The facilities provided at the various installations are discussed together with the major development, test, and research activities which are being pursued. G.R.

A73-44066 # **Remarks before the Third National Symposium Society of Flight Test Engineers 13 September 1972.** R. M. Isaman (U.S. Naval Air Test Center, Patuxent River, Md.). In: Society of Flight Test Engineers, National Symposium, 3rd, Arlington, Tex., September 11-14, 1972, Proceedings. California, Md., Society of Flight Test Engineers, 1973. 12 p.

The Navy's capabilities for the test and evaluation of aircraft are examined, giving attention to organizational relationships. The Naval Civil Engineering Laboratory, the Naval Electronics Laboratory Center, the Naval Ordnance Laboratory, and the Naval Undersea Center are oriented along technology lines. The Naval Air Development Center and the Naval Ship Research and Development Center are concerned with associated technologies such as the materials, structures, fluid dynamics, and control problems of aircraft and ships. The Naval Weapons Laboratory and the Naval Weapons Center are focused on surface warfare, air warfare, and air-launched weapons. G.R.

A73-44218 **Technological forecasting and assessment - Science and/or mythology.** I. I. Mitroff (Pittsburgh, University, Pittsburgh, Pa.) and M. Turoff (Newark College of Engineering, Newark, N.J.). *Technological Forecasting and Social Change*, vol. 5, no. 2, 1973, p. 113-134. 27 refs.

A number of radically distinct models (inquiry systems) are described. The models derive from C. West Churchman's recent characterization of the history of Western epistemology. It is argued that only a few of these models are appropriate for technological forecasting problems. Most technological forecasting methodologies rest on a dubious philosophical foundation. They unreflectively assume that the inquiry systems which are appropriate for 'well-structured' problems are also appropriate for 'ill-structured' problems. It is argued that technological forecasting is an inherently ill-structured problem and therefore requires a methodology which is uniquely suited to such problems. The Dialectical and Singerian

Inquiring Systems are proposed as particularly appropriate for ill-structured problems. (Author)

A73-44575 **The translantic charter policy of the United States.** L. S. Keyes. *Journal of Air Law and Commerce,* vol. 39, Spring 1973, p. 215-248. 81 refs.

In 1972, the governments of both the U.S. and the UK abandoned longstanding restrictive attitudes toward the air transportation of passengers by charter carriers and by charters operated by scheduled carriers. The early policy of extreme caution on the part of the U.S. toward independent international charter air carriage is considered together with the change in policy and its impact on IATA fares. Questions of the expansion of charter traffic and the renewal of certificates are examined. Recent moves towards liberalization are discussed, giving attention to the disapproval of resolution 045, the adoption of nonaffinity charter regulations, and efforts to regularize charter landing rights. G.R.

A73-44778 **Information seeking with multiple sources of conflicting and unreliable information.** J. M. Levine (American Institutes for Research, Washington, D.C.) and M. G. Samet (U.S. Army, Behavior and Systems Research Laboratory, Arlington, Va.). *Human Factors,* vol. 15, Aug. 1973, p. 407-419. 12 refs. NIH-supported research; Grant No. DAHC19-71-C-0030.

The reported study was designed to articulate more clearly the operational definitions of conflicts. Sixteen U.S. Army enlisted men served as subjects. The experimental task was an abstracted version of a tactical decision problem similar to that used by Levine (1973). The task required the subject to determine which one of eight friendly locations was the target of a hypothetical enemy advance. Information was supplied in the form of slides showing 'pathways' connecting discrete enemy positions as reported by each of three intelligence sources. The results obtained in the study are discussed, giving attention to dependent variables, first decisions, questions of accuracy, correct decisions, second decisions, third decisions, and information sampling latency. G.R.

A73-45346 **The development of civil air navigation in the People's Republic of China - Agreements with other states as well as the tasks and the position of the China Civil Aviation Corporation /CAAC/ (Le développement de la navigation aérienne civile en République populaire de Chine - Les accords avec d'autres Etats ainsi que les tâches et la position de la compagnie aérienne CAAC).** J. L. Kneifel. *Revue Française de Droit Aérien,* vol. 27, July-Sept. 1973, p. 261-283. 16 refs. In French.

A73-45373 **Noise - Maplin and the new technology.** P. G. Masefield. *Flight International,* vol. 104, Aug. 16, 1973, p. 301-309.

The history and controversy surrounding the proposed third London airport at Maplin are reviewed. Maplin is seen as a planned development to reduce noise and to add runway capacity. The questions of whether the assumptions are correct about Maplin's potential benefit in relief of noise, whether there is a real requirement for more runway capacity, and Maplin's alleged environmental advantages are evaluated. In general, it is considered that the choice of Maplin would not be satisfactory. F.R.L.

STAR ENTRIES

N73-10104*# National Aeronautics and Space Administration, Washington, D.C.
SEVENTH ANNUAL CONFERENCE ON MANUAL CONTROL
1972 354 p refs Conf. held at Los Angeles, 2-4 Jun. 1971
(NASA-SP-281) Avail: NTIS; SOD $3.25 CSCL 05E

Manual control theory and systems are applied to man machine environments. Considered are human operator modeling and display systems in automobile driving, air traffic control, and industrial management.

N73-10114* Massachusetts Inst. of Tech., Cambridge.
SUPERVISORY SAMPLING AND CONTROL: SOURCES OF SUBOPTIMALITY IN A PREDICTION TASK
Thomas B. Sheridan and William B. Rouse *In* NASA, Washington 7th Ann. Conf. on Manual Control 1972 p 81-88 refs

CSCL 05E

A process supervisor is defined as a person who decides when to sample the process input and what values of a control variable to specify in order to maximize (minimize) a given value function of input sampling period, control setting, and process state. Presented experimental data in such a process where the value function is a time-averaged sampling cost plus mean squared difference between input and control variable. The task was unpaced prediction of the output of a second order filter driven by white noise. Experimental results, when compared to the optical strategy, reveal several consistently suboptimal behaviors. One is a tendency not to choose a long prediction interval even though the optimal strategy dictates that one should. Some results are also interpreted in terms of those input parameters according to which each subjects' behavior would have been nearest optimal. Differences of those parameters from actual input parameters served to quantify how subjects' prediction behavior differed from optimal. Author

N73-10115* California Univ., Los Angeles.
MANUAL CONTROL MODELS OF INDUSTRIAL MANAGEMENT
E. R. F. W. Crossman *In* NASA, Washington 7th Ann. Conf. on Manual Control 1972 p 89-100 refs

(Contract N00014-69-A-0200-1043)
CSCL 05E

The industrial engineer is often required to design and implement control systems and organization for manufacturing and service facilities, to optimize quality, delivery, and yield, and minimize cost. Despite progress in computer science most such systems still employ human operators and managers as real-time control elements. Manual control theory should therefore be applicable to at least some aspects of industrial system design and operations. Formulation of adequate model structures is an essential prerequisite to progress in this area; since real-world production systems invariably include multilevel and multiloop control, and are implemented by timeshared human effort. A modular structure incorporating certain new types of functional element, has been developed. This forms the basis for analysis of an industrial process operation. In this case it appears that managerial controllers operate in a discrete predictive mode based on fast time modelling, with sampling interval related to plant dynamics. Successive aggregation causes reduced response bandwidth and hence increased sampling interval as a function of level. Author

N73-10159# American Inst. of Aeronautics and Astronautics, New York.
AIAA EMPLOYMENT WORKSHOPS. VOLUME 2: AN ANALYTIC REPORT ON SOME EFFECTS OF TWENTY-TWO WORKSHOPS Final Report, 1 Sep. 1970 - 31 Dec. 1971
Leonard Smith Jan. 1972 72 p
(Contract DL-82-36-71-01)
(PB-209367; DLMA-82-36-71-01-2-Vol-2) Avail: NTIS HC $3.00 CSCL 05I

Volume 2 of a two volume report is a detailed analysis made of attendees of 22 selected employment workshops put on by the American Institute of Aeronautics and Astronautics, the purpose of which was to teach unemployed aerospace and defense engineers and scientists how to look for work competitively. The attendees were surveyed during and at the conclusion of the three session workshops, two months after the conclusion of the workshop and six months after the conclusion of the workshop. The volume reports in detail on the profile of the attendees, their attitudes and their successes and failures in job hunting, what kinds of jobs they sought and found, and to what those who were successful attributed that success. GRA

N73-10168# American Inst. of Aeronautics and Astronautics, New York.
AIAA EMPLOYMENT WORKSHOPS, VOLUME 1 Final Report, 1 Sep. 1970 - 31 Dec. 1971
Geoffrey A. Potter Jan. 1972 50 p
(Contract DL-82-36-71-01)
(PB-209366; DLMA-82-36-71-01-1-Vol-1) Avail: NTIS $3.00 CSCL 05I

The report shows how and why AIAA devised and then operated 175 employment workshops for 14,600 unemployed engineers and scientists from the defense and aerospace industry in 43 cities across the country. Discussed are the successes and failures of the program and why AIAA thinks they happened. The workshops were designed to help unemployed professionals unaccustomed to having to look for work competitively to do so by teaching them through a peer group discussion technique how to understand the market situation. GRA

N73-10400*# Auburn Univ., Ala. School of Engineering.
ERISTAR: EARTH RESOURCES INFORMATION STORAGE, TRANSFORMATION, ANALYSIS, AND RETRIEVAL ADMINISTRATIVE REPORT NASA/ASEE Systems Design Summer Faculty Program
R. I. Vachon, J. Fred O'Brien, Jr., Russell E. Lueg, and J. E. Cox Sep. 1972 54 p Program held in Huntsville, Ala., 5 Jun. - 18 Aug. 1972
(Grant NGT-01-003-044)
(NASA-CR-61394) Avail: NTIS HC $4.75 CSCL 05B

The 1972 Systems Engineering program at Marshall Space Flight Center where 15 participants representing 15 U.S. universities, 1 NASA/MSFC employee, and another specialty assigned faculty member, participated in an 11-week program is discussed. The Fellows became acquainted with the philosophy of systems engineering, and as a training exercise, used this approach to produce a conceptional design for an Earth Resources Information Storage, Transformation, Analysis, and Retrieval System. The program was conducted in three phases: approximately 3 weeks were devoted to seminars, tours, and other presentations to subject the participants to technical and other aspects of the information management problem. The second phase, 5 weeks in length, consisted of evaluating alternative solutions to problems, effecting initial trade-offs and performing preliminary design studies and analyses. The last 3 weeks were occupied with final trade-off sessions, final design analyses and preparation of a final report and oral presentation. Author

N73-10636# Stanford Research Inst., Menlo Park, Calif.
REGIONAL AIR POLLUTION STUDY: A PROSPECTUS.

PART 1: SUMMARY Final Report
Jan. 1972 102 p
(Contract EPA-68-02-0207; SRI Proj. 1365)
(PB-210017; APTD-1122-Pt-1) Avail: NTIS HC $5.45 CSCL 13B

The problem of effectively managing air quality within the framework of current legislation on a regional basis is extensive and complex. The need to evaluate and improve control strategies already adopted or to identify new approaches must be considered on this basis. By effectively coordinating efforts on a number of interrelated problems, a combination of resources can be brought to bear on the problems of air quality management. It is the purpose of the Prospectus to identify the separate elements constituting such an undertaking and to describe how it can be carried out. The major concept of RAPS (regional air pollution study) is presented, with an outline description of the research plan, the facility, and the management plan (which includes budgetary information). GRA

N73-10637# Stanford Research Inst., Menlo Park, Calif.
REGIONAL AIR POLLUTION STUDY: A PROSPECTUS. PART 2: RESEARCH PLAN Final Report
Jan. 1972 280 p refs
(Contract EPA-68-02-0207; SRI Proj. 1365)
(PB-210018; APTD-1123-Pt-2) Avail: NTIS HC $6.75 CSCL 13B

The report describes the research plan to be used in the regional air pollution study which is being developed to aid in improving and controlling regional air quality. A comprehensive overview is provided of the three principal components contained in the process of air pollution: meteorological processes; atmospheric chemistry and transformation processes; and the emissions sources. The specific research tasks to be carried out are defined. The contents include: overview of air pollution modeling; meteorological processes; atmospheric chemistry and transformation processes; emission estimates; economic and social impact studies; and technology transfer. GRA

N73-10639# Stanford Research Inst., Menlo Park, Calif.
REGIONAL AIR POLLUTION STUDY: A PROSPECTUS. PART 4: MANAGEMENT PLAN Final Report
Jan. 1972 174 p
(Contract EPA-68-02-0207; SRI Proj. 1365)
(PB-210020; APTD-1125-Pt-4) Avail: NTIS HC $6.00 CSCL 13B

Findings largely applicable to the scheduling, management and staffing, and the estimated costs of the St. Louis regional air pollution study facility are presented. The planning factors are regarded as having an accuracy and reliability suitable for planning purposes and for the purpose of providing a working format for additional and more detailed planning efforts. The contents include: implementation schedule of the St. Louis facility; permanent management and staffing; St. Louis facility initial costs, and annual operating costs; and research plan costs.
Author (GRA)

N73-10749# Army Logistics Management Center, Fort Lee, Va.
DOD AIRCRAFT ENGINE REQUIREMENTS STUDY Final Report
W. Karl Kruse Mar. 1972 45 p refs
(AD-745396) Avail: NTIS CSCL 21/5

The report investigates two questions posed by the DOD task group on aircraft engine requirements. The first question concerned whether the Poisson distribution as used by the DOD stockage methodology was valid. Analysis of Air Force removal data indicated that it is not. The second question was whether a better stockage computation methodology than the DOD methodology existed. While no definite conclusion could be drawn, attempts to answer the question indicated the importance of recognizing and accounting for forecast error in the methodology. Author (GRA)

N73-10989# Committee on Appropriations (U. S. House).
DEPARTMENT OF TRANSPORTATION AND RELATED AGENCIES APPROPRIATIONS FOR 1973. PART 3: DEPARTMENT OF TRANSPORTATION: FEDERAL AVIATION ADMINISTRATION, FEDERAL RAILROAD ADMINISTRATION, OFFICE OF THE SECRETARY; TESTIMONY OF MEMBERS OF CONGRESS AND OTHER INDIVIDUALS AND ORGANIZATIONS
Washington GPO 1972 1454 p refs Hearings before Comm. on Appropriations, 92d Congr., 2d Sess., 13-24 Apr. 1972
Avail: Subcommittee on Dept. of Transportation and Related Agencies Appropriations

Department of Transportation and related agencies appropriations for the fiscal year 1973 are considered. Budget estimates are presented for the Federal Aviation Administration, the Federal Railroad Adminstration, and the Office of the Secretary. G.G.

N73-10992*# Auburn Univ., Ala.
THE 1972 NASA-ASEE SUMMER FACULTY FELLOWSHIP RESEARCH PROGRAM Final Report
J. Fred OBrien, Jr., Donald C. Raney, and Marion I. Kent Sep. 1972 56 p refs Program, 9th Ann., held in Huntsville, Ala., 5 Jun. - 11 Aug. 1972; sponsored by the Am. Soc. for Eng. Educ. and NASA, Washington, D. C.
(Grant NGT-01-003-045)
(NASA-CR-61395) Avail: NTIS HC $5.00 CSCL 05I

The planning, administration, description, and evaluation of the MSFC/Auburn U/U of Alabama research program are briefly outlined. Abstracts of fellows' research activities are included.
N.E.N.

N73-10994# European Space Research and Technology Center, Noordwijk (Netherlands).
THE PMC SYSTEM. PART 1: AN EXPLANATION FOR INITIATORS
31 Aug. 1970 17 p
(ESRO-PSS-02/PMC-01) Avail: NTIS HC $3.00

The PMC system is a management tool for monitoring the compilation and execution of the ESRO budget and program. A set of computer-printed reports are produced at monthly intervals, showing the actual situation compared with the plan. These reports assist in the process of revising the plan and reallocating finances to the best advantage. The operation of the system is outlined.
Author (ESRO)

N73-10995# European Space Research and Technology Center, Noordwijk (Netherlands).
THE PMC SYSTEM. PART 2: CONCEPTS AND APPLICATIONS
Oct. 1970 48 p
(ESRO-PSS-03/PMC-02-Pt-2) Avail: NTIS HC 4.50

The PMC system is a management tool for monitoring the compilation and execution of the ESRO budget and program. A set of computer-printed reports are produced at monthly intervals, showing the actual situation compared with the plan. These reports assist in the process of revising the plan and reallocating finances to the best advantage. The reports are discussed.
Author (ESRO)

N73-10996# European Space Research and Technology Center, Noordwijk (Netherlands).
PLANNING AND CONTROL FOR EUROPEAN SPACE SATELLITE PROJECTS. A SYSTEMS APPROACH TO PROJECT CONTROL AT ESTEC
Hellmuth Gehriger Paris ESRO Jul. 1972 109 p refs
(ESRO-SP-70) Avail: NTIS HC $7.50

The practical application of modern project management and control techniques to meet the demands of an international organization operating on government funds and executing multimillion dollar projects of a highly complex nature are considered. The individual techniques are described of critical path network analysis, work package cost control and phased project planning have been integrated into a comprehensive project control system and successfully implemented and applied to the

various satellite projects of the European Space Research Organisation. The contractual implementation of the system is emphasized, and particular consideration is given to the human factors, which are so crucial to the success of any system operation. With only slight modification, the project control system described here can be applied with equal success to projects in other fields. Author (ESRO)

N73-11034# Navy Fleet Material Support Office, Mechanicsburg, Pa. Operations Analysis Dept.
THE 3M AVIATION USAGE RATE SYSTEM USER'S MANUAL
J. W. Sari and Samuel W. Fisher 3 Aug. 1972 49 p ref
(AD-746482) Avail: NTIS CSCL 15/5

Usage rates for aviation items are a basic input to the computation of the range and depth of spare parts carried in support of deployed aircraft. The 3M Aviation Usage Rate System was developed to provide these rates. Following an extensive evaluation, the Aviation Supply Office recently implemented this system to serve as the primary source of data for updating aviation equipment support requirements. This user's manual describes the operation of this usage rate system and its application in the aviation allowance function. Author (GRA)

N73-11176# Research Inst. of National Defence, Stockholm (Sweden).
PROCESS COMPUTER PROJECTS: PROJECT TECHNOLOGY AND PROJECT WORK
Lars-Ake Larsson Sep. 1971 24 p refs In SWEDISH; ENGLISH summary
(FOA-2-C-2485-E5) Avail: NTIS HC $3.25

Relatively cheap small computer systems are being used in greater numbers for automation in industry. The choice of the degree of automation and the consequent size of computer system, is determined partly by how much profit can be obtained by different alternative investments and partly by the costs of equivalents. There are two degrees of automation; dedicated computer control and process computer control. For process identification and model construction a medium sized computer system can be used (lab-computer system). Author

N73-11178# RAND Corp., Santa Monica, Calif.
PRIVACY AND SECURITY IN DATABANK SYSTEMS: MEASURES OF EFFECTIVENESS, COSTS, AND PROTECTOR-INTRUDER INTERACTIONS
Rein Turn and Norman Z. Shapiro Jul. 1972 37 p refs Proposed for presentation at the 1972 AFIPS Fall Joint Computer Conf., Anaheim, Calif., 5-7 Dec. 1972
(Grant NSF GI-29943)
(P-4871) Avail: NTIS HC $4.00

A structural model of databank systems is formulated, the roles of its elements in providing, or threatening, of data privacy and security are discussed, and a suitable classification system is established. Withing this framework, a model of the economic interactions of the databank protector and potential intruders is developed. The variables of this model are the value of information to the subjects, protector and intruders; expenditures by the protector and the intruder; and effectiveness of data security as well as intrusion techniques. Various relevant characteristics of these variables and their relationships are discussed. Author

N73-11314*# Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
REMOTE SENSING IN RESOURCE EVALUATION, PLANNING, PROTECTION AND MANAGEMENT
Robert C. Heller, Arthur M. Woll, Principal Investigators (Bur. of Indian Affairs, Washington, D. C.), and Benjamin Spada 18 Oct. 1972 12 p Presented at 7th World Forestry Congr., Buenos Aires, 4-18 Oct. 1972
(NASA Order S-70251-AG)
(E72-10220; NASA-CR-129088) Avail: NTIS HC $3.00 CSCL 02F

There are no author-identified significant results in this report.

N73-11684# Federal Aviation Administration, Washington, D.C.
ENGINEERING AND DEVELOPMENT PROGRAM PLAN: EN ROUTE AUTOMATION Interim Report
Jun. 1972 155 p
(FAA-ED-12-2) Avail: NTIS HC $9.75

The functions of an automated system for processing flight data and surveillance functions are described. The need to improve the system capability to meet forecast demands is discussed. The program development plan to provide the required improvements is presented. The program goals, approach, development activities, expected results, and resource requirements are analyzed. Author

N73-11887*# Aerospace Corp., El Segundo, Calif. Advanced Vehicle Systems Directorate.
ANALYSIS OF SPACE TUG OPERATING TECHNIQUES SUPPLEMENTAL REPORT (STUDY 2.4)
Oct. 1972 49 p refs
(Contract NASw-2301)
(NASA-CR-129163; ATR-73(7314)-2) Avail: NTIS HC $4.50 CSCL 22B

An analysis of space tug operating techniques is presented. The subjects discussed are: (1) sustaining engineering requirements, (2) off-site facility requirements, (3) evaluation of tug checkout alternatives, and (4) spares provisioning. Tables of data are included to clarify the written presentation. Author

N73-11985*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EMPLOYEE COMMUNICATION AT THE NASA LANGLEY RESEARCH CENTER M.S. Thesis - Coll. of William and Mary
Richard J. Bendura 1972 110 p refs
(NASA-TM-X-68854) Avail: NTIS HC $7.50

The means of employee communication at the NASA Langley Research Center are reported, and their effectiveness evaluated. The history, purpose, and structure of the organization as well as the employee educational background and salary status are discussed. Some of the approaches used by Langley Research Center management in communicating with their men are addressed and compared with recommendations of experts in employee communication. The results of personal interviews involving both employee and management assessment of management-employee communication are presented and evaluated. Employees need a great deal more recommunication from management providing rationale behind the cancellation of existing projects or the disapproval of proposed research projects. Also NASA management needs to establish a policy and guidelines for the rapid and simultaneous dissemination of all non-restricted information to employees during organizational activities having potential adverse effects on large numbers of personnel. Finally some improvements should be made in employee orientation procedures. Author

N73-12048# Army Agency for Aviation Safety, Fort Rucker, Ala.
PREPARATION OF A SYSTEM SAFETY PROGRAM PLAN FOR AVIATION SYSTEMS DEVELOPMENT Final Report
Jul. 1972 42 p refs Revised
(AD-746995; USAAAVS-TR-72-8-Rev) Avail: NTIS CSCL 01/2

As an essential part of the Army Aviation Accident Prevention Program, System Safety is dedicated to before the fact elimination of hazards from aircraft systems by the application of management, science, and technology principles. MIL-STD-882 gives the general requirements for System Safety Programs. Army experience in attempting to apply the provisions of MIL-STD-882

directly in aircraft development programs has indicated that there is a significant gap between the requirements as stated in the standard and practical, realistic System Safety Program. The statements of philosophy and theory of the System Safety concept in the standard and other System Safety literature alone are insufficient to produce adequate System Safety Programs for aircraft development. The purpose of the report is to identify specific areas of concern which lie between the philosophical and the practical applications of System Safety. Author (GRA)

N73-12183*# Aerospace Corp., El Segundo, Calif. Vehicle Analysis Programming Dept.

DORCA 2 COMPUTER PROGRAM. VOLUME 1: USER'S GUIDE

Stanley T. Wray, Jr. 31 Aug. 1972 154 p ref

(Contract NASw-2301)

(NASA-CR-129263; ATR-73(7315)-1-Vol-1) Avail: NTIS HC $9.75 CSCL 09B

The Dynamic Operational Requirements and Cost Analysis Program (DORCA 2) is described. The computer program provides a top level analysis tool for NASA and relies on a man machine interaction to optimize results based on external criteria. The computer program relies heavily on outside sources to provide cost information and vehicle parameters. Given data describing mission, vehicles, payloads, containers, space facilities, schedules, cost values, and costing procedures, the program computes flight schedules, cargo manifests, vehicle fleet requirements, acquisition schedules, and cost summaries. The program is designed to consider earth orbit, lunar, interplanetary, and automated satellite missions. Author

N73-12188*# Aerospace Corp., El Segundo, Calif. Systems Engineering Operations.

DORCA COMPUTER PROGRAM. VOLUME 1: USER'S GUIDE

Stanley T. Wray, Jr. 15 Oct. 1971 98 p

(Contract NASw-2129)

(NASA-CR-123378; ATR-72(7236)-1-Vol-1) Avail: NTIS HC $7.00 CSCL 09B

The Dynamic Operational Requirements and Cost Analysis Program (DORCA) was written to provide a top level analysis tool for NASA. DORCA relies on a man-machine interaction to optimize results based on external criteria. DORCA relies heavily on outside sources to provide cost information and vehicle performance parameters as the program does not determine these quantities but rather uses them. Given data describing missions, vehicles, payloads, containers, space facilities, schedules, cost values and costing procedures, the program computes flight schedules, cargo manifests, vehicle fleet requirements, acquisition schedules and cost summaries. The program is designed to consider the Earth Orbit, Lunar, Interplanetary and Automated Satellite Programs. A general outline of the capabilities of the program are provided. Author

N73-12195# Brussels Univ. (Belgium). Lab. for Logical and Numerical Systems.

APPLICATION OF CELLULAR STRUCTURE COMPUTER TO THE PROCESSING OF PLANNING PROBLEMS IN INDUSTRY [APPLICATION DES CALCULATEURS LOGIQUES CELLULAIRES AU TRAITEMENT DE PROBLEMES DE PLANIFICATION DANS LES ENTREPRISES]

D. Tant Toulouse CNRS 1972 7 p In FRENCH Presented at the Intern. Collog. on Conception et Maintenance des Automatismes Logiques, Toulouse, 27-28 Sep. 1972

Avail: NTIS

A special purpose computer with a cellular structure is proposed to reduce the computing time of PERT planning sequences. The modern methods of scientific planning make use of complex heuristic algorithms which require an often prohibitive computing time on general purpose computers. The proposed special purpose computer with a cellular structure allows a reduction in a 1/1000 to 1/5000 ratio of the computing time for solving the main sequence of these iterative algorithms. ESRO

N73-12669# World Meteorological Organization, Geneva (Switzerland).

REPORT OF THE PLANNING CONFERENCE ON THE FIRST GARP GLOBAL EXPERIMENT

1972 78 p Conf. held at Geneva, Sep. 1972 Prepared jointly with Intern. Council of Sci. Unions

(GARP-Spec-Rept-8) Avail: NTIS HC $6.00

The general plan is reviewed for the first GARP global experiment, noting such aspects as the satellite subsystem, data management, and oceanographic programs. The role of other experiments during the first GARP global experiment (monsoon, polar, and air-mass transformation) are considered. Possible national contributions are given, and institutional arrangements are studied. Author (ESRO)

N73-12703# Comptroller General of the United States, Washington, D.C.

MANAGEMENT OF THE ATOMIC ENERGY COMMISSION'S CONTROLLED THERMONUCLEAR RESEARCH PROGRAM

Elmer B. Staats 8 Dec. 1972 51 p refs

(B-159687) Avail: NTIS HC $4.75

The implementation of an AEC procedure is advocated that requires CTR laboratories to give notification, along with a cost estimate, prior to fabrication of any device estimated to cost less than $500,000. It is recommended that any proposed device which is a revision or modification of a previously disapproved device is also subject to review and approval by AEC. G.G.

N73-12896*# Aerospace Corp., El Segundo, Calif. Systems Engineering Operations.

INTEGRATED OPERATIONS/PAYLOADS/FLEET ANALYSIS (EXECUTIVE SUMMARY) Final Report

Feb. 1972 20 p

(Contract NASw-2129)

(NASA-CR-125847; ATR-72(7231)-3) Avail: NTIS HC $3.00 CSCL 22A

The Integrated Operations/Payloads/Fleet Analysis predicts total national space program costs and launch vehicle traffic assuming either an expendable, a partially reusable or a fully reusable launch vehicle fleet. The payload system costs are estimated and reported for each payload program at the subsystem level, payload program level, user level and national level, providing complete system cost traceability. The analysis determines the primary changes to be expected for space payload programs and space operations in the space shuttle era. When the space shuttle becomes fully operational, not only will launch costs be reduced but refurbished satellite units will be flown instead of new units and maintenance will be performed on failing satellites. It is possible to implement the concepts of satellite refurbishment and maintenance because of the space shuttle's capability to retrieve and return payloads to the earth's surface. The two-way satellite transportation capability is extended to high energy orbits by use of the space shuttle/space tug combination. Author

N73-12978*# National Aeronautics and Space Administration, Washington, D.C.

RESEARCH AND TECHNOLOGY OPERATING PLAN SUMMARY: FISCAL YEAR 1973 RESEARCH AND TECHNOLOGY PROGRAM

1972 230 p refs

(NASA-TM-X-68856) Avail: NTIS HC $3.00 CSCL 05B

Abstracts are presented of each of the Research and Technology Operating Plans (RTOP) used for management review and control of research currently in progress throughout NASA. This RTOP Summary is designed to facilitate communication and coordination among concerned technical personnel in government, industry, and universities. The summary is arranged in five sections consisting of citations and abstracts of the RTOPs and subject, technical monitor, responsible NASA organization, and RTOP number indexes. Author

N73-12991# Committee on Science and Astronautics (U. S. House).
NATIONAL SCIENCE POLICY AND PRIORITIES ACT OF 1972
Washington GPO 1972 211 p refs Hearings on S. 32 before Comm. on Sci. and Astronaut., 92d Congr., 2d Sess., No. 25, 26-27 Sep. 1972
Avail: Subcomm. on Sci., Res., and Develop.

A Congressional hearing to establish the National Science Policy and Priorities Act of 1972 is presented. The purpose of the act is to establish a framework of national science policy and to focus the Nation's scientific talent and resources on its priority problems. The research and engineering priorities are defined. The organization for conducting the program is proposed. The transition of technical manpower of civilian programs is examined. Statements of various witnesses appearing before the committee are included. P.N.F.

N73-12997# Center for Naval Analyses, Arlington, Va. Naval Warfare Analysis Group.
THE USE OF SIMULTANEOUS EQUATION MODELS FOR DECISIONS PERTAINING TO THE BEST MIX BETWEEN AIRCRAFT, SPACE PARTS, SUPPORT EQUIPMENT, AND SUPPORT PERSONNEL
Chantee Lewis May 1972 126 p refs
(Contract N00014-68-A-0091)
(AD-747972; NWAG-Res-Contrib-206) Avail: NTIS CSCL 15/5

The report contains a study of the application of production functions to sea-based tactical air resources: aircraft, spare parts, support equipment, and support personnel. The goal is to develop objective criteria for allocating money among these competing demands using sorties or aircraft ready hours as the output.
Author (GRA)

N73-13191*# Massachusetts Inst. of Tech., Cambridge. Alfred P. Sloan School of Management.
COMPUTERIZED MANAGEMENT INFORMATION SYSTEMS AND ORGANIZATIONAL STRUCTURES
Zenon S. Zannetos and Murat R. Sertel Sep. 1970 27 p refs
(Grant NGL-22-009-309)
(Rept-486-70) Avail: NTIS HC $3.50 CSCL 09B

The computerized management of information systems and organizational structures is discussed. The subjects presented are: (1) critical factors favoring centralization and decentralization of organizations, (2) classification of organizations by relative structure, (3) attempts to measure change in organization structure, and (4) impact of information technology developments on organizational structure changes. P.N.F.

N73-13192*# Massachusetts Inst. of Tech., Cambridge. Sloan School of Management.
DESIGN OF AN INTERACTIVE ACCOUNTING TUTOR M.S. Thesis
John Macko Sep. 1970 215 p refs
(Grant NGL-22-009-309)
(NASA-CR-129674) Avail: NTIS HC $12.75 CSCL 05I

A project to design an interactive program to teach accounting techniques is described. The four major goals of the project are discussed and a review of the literature on teaching machines and computer-assisted-instruction is included. The system is implemented on the CTSS time sharing system at M.I.T. and uses an ARDS graphic display. The software design of the system is described in detail. A typical session with the tutor is also described. Appendices include complete system documentation.
Author

N73-13349*# Wisconsin Univ., Madison.
INTERDISCIPLINARY RESEARCH ON THE APPLICATION OF ERTS-1 DATA TO THE REGIONAL LAND USE PLANNING PROCESS
James L. Clapp, Principal Investigator, R. W. Kiefer, M. M. McCarthy, and B. J. Niemann, Jr. 4 Oct. 1972 35 p Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Avenue, Sioux Falls, S. D. 57198
(Contract NAS5-21754)
(E72-10299; NASA-CR-129548) Avail: NTIS HC $3.75 CSCL 08G

The author has identified the following significant results. Although the degree to which ERTS-1 imagery can satisfy regional land use planning data needs is not yet known, it appears to offer means by which the data acquisition process can be immeasurably improved. The initial experiences of an interdisciplinary group attempting to formulate ways of analyzing the effectiveness of ERTS-1 imagery as a base for environmental monitoring and the resolution of regional land allocation problems are documented. Application of imagery to the regional planning process consists of utilizing representative geographical regions within the state of Wisconsin. Because of the need to describe and depict regional resource complexity in an interrelatable state, certain resources within the geographical regions have been inventoried and stored in a two-dimensional computer-based map form. Computer oriented processes were developed to provide for the economical storage, analysis, and spatial display of natural and cultural data for regional land use planning purposes. The authors are optimistic that the imagery will provide revelant data for land use decision making at regional levels.

N73-13591*# Massachusetts Inst. of Tech., Cambridge. Alfred P. Sloan School of Management.
SEMILINEAR (TOPOLOGICAL) SPACES AND APPLICATIONS Working Paper
Prem Prakash and Murat R. Sertel Jun. 1971 43 p refs Revised
(Grant NGL-22-009-309)
(NASA-CR-129591; Rept-525-71-Rev) Avail: NTIS HC $4.25 CSCL 12A

Semivector spaces are defined and some of their algebraic aspects are developed including some structure theory. These spaces are then topogized to obtain semilinear topological spaces for which a hierarchy of local convexity axioms is identified. A number of fixed point and minmax theorems for spaces with various local convexity properties are established. The spaces of concern arise naturally as various hyperspaces of linear and semilinear (topological) spaces. It is indicated briefly how all this can be applied in socio-economic analysis and optimization.
Author

N73-13829*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SPACE FOR MANKIND'S BENEFIT
Jesco VonPuttkamer, ed. and Thomas J. McCullough, ed. Washington 1972 415 p refs A Space Congr. held at Huntsville, Ala., 15-19 Nov. 1971; sponsored by the Huntsville Assoc. of Tech. Soc. Original contains color illustrations
(NASA-SP-313; LC-72-600236) Avail: NTIS; SOD $4.50 CSCL 03B

The proceedings of a space congress held at Huntsville, Alabama during November 1971 are presented. The theme of the conference was Space for Mankind's Benefit. The subjects discussed were: (1) man in near-earth space, (2) fundamental benefits of the space program, (3) benefits of orbital surveys and space technology to environmental protection, (4) benefits to telecommunications, navigation and information systems, (5) benefits to future power generations and energy production, and (6) general technology utilization in the public sector.

N73-13834* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APPLICATION OF NASA MANAGEMENT APPROACH TO SOLVE COMPLEX PROBLEMS ON EARTH
John S. Potate *In its* Space for Mankind's Benefit 1972 p 83-92
CSCL 05A

The application of NASA management approach to solving

complex problems on earth is discussed. The management of the Apollo program is presented as an example of effective management techniques. Four key elements of effective management are analyzed. Photographs of the Cape Kennedy launch sites and supporting equipment are included to support the discussions. P.N.F.

N73-13908*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
SPACE SHUTTLE MAINTENANCE PROGRAM PLANNING DOCUMENT
Darwin V. Brown 17 Jul. 1972 30 p
(NASA-TM-X-69004; KSC-TR-1187) Avail: NTIS HC $3.50 CSCL 22B

A means for developing a space shuttle maintenance program which will be acceptable to the development centers, the operators (KSC and AF), and the manufacturer is presented. The general organization and decision processes for determining the essential scheduled maintenance requirements for the space shuttle orbiter are outlined. The development of initial scheduled maintenance programs is discussed. The remaining maintenance, that is non-scheduled or non-routine maintenance, is directed by the findings of the scheduled maintenance program and the normal operation of the shuttle. The remaining maintenance consists of maintenance actions to correct discrepancies noted during scheduled maintenance tasks, nonscheduled maintenance, normal operation, or condition monitoring. Author

N73-13971*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif. Biotechnology and Power Dept.
COST ANALYSIS OF CARBON DIOXIDE CONCENTRATORS
M. M. Yakut 31 Aug. 1972 60 p refs
(Contract NAS8-28377)
(NASA-CR-123960; MDC-G3830) Avail: NTIS HC $5.00 CSCL 05C

A methodology is developed to predict the relevant contributions of the more intangible cost elements encountered in the development of flight-qualified hardware and is used to predict the costs of three carbon dioxide concentration systems. The cost and performance data from Gemini, Skylab, and other programs are utilized as a basis for establishing the cost estimating relationships. The concentration systems analyzed are the molecular sieves C02 concentrator, the hydrogen-depolarized concentrator, and the regenerable solid desiccant concentrator. Besides the cost estimates for each system, their comparative criteria including relative characteristics, operational differences, and development status are considered. Author

N73-13973*# National Academy of Public Administration, Washington, D.C.
UNMANNED SPACE PROJECT MANAGEMENT: SURVEYOR AND LUNAR ORBITER
Erasmus H. Kloman NASA 1972 49 p Sponsored by NASA
(NASA-SP-4901; LC-72-600225) Avail: NTIS; SOD $0.45 CSCL 05A

An analysis of the management of two major NASA projects, Surveyor and Lunar Orbiter is presented. The analysis reflects the comments and criticisms of many NASA officials who were responsible for various phases of the projects as well as comments by knowledgeable persons outside NASA. Findings are submitted with respect to: (1) environment, (2) role of individuals, (3) teamwork, (4) roles and missions, (5) organization, and (6) cost performance. P.N.F.

N73-13986*# Massachusetts Inst. of Tech., Cambridge. Alfred P. Sloan School of Management.
AN EXPERIMENT WITH INTERACTIVE PLANNING MODELS Working Paper
James Beville, John H. Wagner, and Zenon S. Zannetos Dec. 1970 30 p refs Supported in part by the Army Mater. Command, the Land Educ. Develop. grant, and by IBM
(Grant NGL-22-009-309)
(NASA-CR-129592; Rept-503-70) Avail: NTIS HC $3.50 CSCL 05A

Experiments on decision making in planning problems are described. Executives were tested in dealing with capital investments and competitive pricing decisions under conditions of uncertainty. A software package, the interactive risk analysis model system, was developed, and two controlled experiments were conducted. It is concluded that planning models can aid management, and predicted uses of the models are as a central tool, as an educational tool, to improve consistency in decision making, to improve communications, and as a tool for consensus decision making. N.E.N.

N73-13993*# Massachusetts Inst. of Tech., Cambridge. Sloan School of Management.
THE MANAGEMENT PROCESS, MANAGEMENT INFORMATION AND CONTROL SYSTEMS, AND CYBERNETICS
Zenon S. Zannetos and Jarrod W. Wilcox [1972] 26 p refs
(Grant NGL-22-009-309)
(NASA-CR-129728) Avail: NTIS HC $3.50 CSCL 05A

An attempt has been made to analyze the strengths and weaknesses of the cybernetics approach as applied to management. The conclusion is that cybernetics can serve not only as a conceptual philosophical aid, but also as an operational tool in both managerial planning and control. So far, however, most of its promise is yet unrealized, especially in the planning sphere. Only in the area of control of operations has the impact of this promising field shown tangible results. Author

N73-13994# General Accounting Office, Washington, D.C.
MEANS FOR INCREASING THE USE OF DEFENSE TECHNOLOGY FOR URGENT PUBLIC PROBLEMS
Elmer B. Staats 29 Dec. 1972 63 p refs
(B-175132) Avail: NTIS HC $5.25

The transfer of technology resulting from defense research and development to the solution of urgent public problems is discussed. The secondary application of technology to fill a different need in another environment is the basic consideration. The subjects discussed are: (1) relative roles and responsibilities of the Department of Defense and Federal civil agencies in the transfer process, (2) legislative and organizational factors which influence the transfer, and (3) assessment of need for improved policies and procedures to enhance technology transfer. Author

N73-14103# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.
BIBLIOGRAPHY OF RESEARCH REPORTS AND PUBLICATIONS ISSUED BY THE HUMAN ENGINEERING DIVISION, APRIL 1946 - DECEMBER 1970
Sandra A. Stevenson May 1972 190 p refs
(AF Proj. 7183; AF Proj. 7184)
(AD-749933) Avail: NTIS CSCL 05/5

The bibliography contains the titles, authors and publication/source information for the technical reports and articles published by the Human Engineering Division of the Aerospace Medical Research Laboratory between April 1946 and December 1970. The bibliography is divided into 16 technical areas: Guides and handbooks applicable to system development; Physical anthropology; Apparatus; Control design and arrangement; Environmental stress, vigilance, and work/rest cycles; Human engineering applications, descriptions, and evaluations; Maintenance; Methodology and statistics; Personnel and manning requirements; Presentation and information; Simulation techniques; Systems research; Tracking and servo analysis; Training and learning; Zero-G studies; Miscellaneous. Author (GRA)

N73-14188*# Auerbach Associates, Inc., Arlington, Va.
ALTERNATIVES IN THE COMPLEMENT AND STRUCTURE OF NASA TELEPROCESSING RESOURCES
30 Aug. 1972 74 p refs
(Contract NASw-2285)

(NASA-CR-129825; TR-1958-100-TR-004) Avail: NTIS HC $5.75 CSCL 09B

The results are presented of a program to identify technical innovations which would have an impact on NASA data processing and describe as fully as possible the development work necessary to exploit them. Seven of these options for NASA development, as the opportunities to participate in and enhance the advancing information system technology were called, are reported. A detailed treatment is given of three of the options, involving minicomputers, mass storage devices and software development techniques. These areas were picked by NASA as having the most potential for improving their operations. Author

N73-14190*# Auerbach Associates, Inc., Arlington, Va.
DATA STORAGE TECHNOLOGY: HARDWARE AND SOFTWARE, APPENDIX B
Jerome D. Sable 24 Aug. 1972 60 p refs
(Contract NASw-2285)
(NASA-CR-129817; TR-1958-100-TR-004-App-B) Avail: NTIS HC $5.00 CSCL 09B

This project involves the development of more economical ways of integrating and interfacing new storage devices and data processing programs into a computer system. It involves developing interface standards and a software/hardware architecture which will make it possible to develop machine independent devices and programs. These will interface with the machine dependent operating systems of particular computers. The development project will not be to develop the software which would ordinarily be the responsibility of the manufacturer to supply, but to develop the standards with which that software is expected to confirm in providing an interface with the user or storage system. Author

N73-14191*# Auerbach Associates, Inc., Arlington, Va.
THE SYSTEMATIC EVOLUTION OF A NASA SOFTWARE TECHNOLOGY, APPENDIX C
M. P. Deregt and John E. Dulfer 24 Aug. 1972 109 p refs
(Contract NASw-2285)
(NASA-CR-129818; TR-1958-100-TR-004-App-C) Avail: NTIS HC $7.50 CSCL 09B

A long range program is described whose ultimate purpose is to make possible the production of software in NASA within predictable schedule and budget constraints and with major characteristics such as size, run-time, and correctness predictable within reasonable tolerances. As part of the program a pilot NASA computer center will be chosen to apply software development and management techniques systematically and determine a set which is effective. The techniques will be developed by a Technology Group, which will guide the pilot project and be responsible for its success. The application of the technology will involve a sequence of NASA programming tasks graduated from simpler ones at first to complex systems in late phases of the project. The evaluation of the technology will be made by monitoring the operation of the software at the users' installations. In this way a coherent discipline for software design, production maintenance, and management will be evolved. Author

N73-14259# National Bureau of Standards, Washington, D.C.
NBS: AN OVERVIEW
1972 67 p Supersedes NBS-Misc-Publ-282 and NBS-SP-360 (NBS-SP-367; NBS-Misc-Publ-282; NBS-SP-360) Avail: SOD $1.00 as C13.10:367

The history, organization, and functions of the National Bureau of Standards are presented. The activities of the four institutes of the bureau are described. Examples of test equipment and facilities to conduct investigations are illustrated. Author

N73-14266# Kaisers Engineers, Los Angeles, Calif.
HIGH SPEED GROUND TRANSPORTATION. DOCUMENTATION OF PRELIMINARY ENGINEERING, LOS ANGELES INTERNATIONAL AIRPORT AND THE SAN FERNANDO VALLEY
Apr. 1972 175 p refs
(Contract DOT-UT-312)
(PB-211833; UMTA-CA-09-0010-72-2; Rept-72-1-RE) Avail: NTIS HC $3.00 CSCL 13F

Work completed under Phase 3 of a project to construct a high speed ground rapid transit access facility between Los Angeles International Airport and the San Fernando Valley is discussed. Service in this corridor will be provided by tracked air-cushion vehicles running on a special guideway. Phase 3 of the project included preliminary engineering studies and continued development of the route and structures. GRA

N73-14705# Mitre Corp., McLean, Va.
ENGINEERING AND DEVELOPMENT PROGRAM PLAN - PROGRAM STRUCTURE AND OBJECTIVES
Jul. 1972 44 p
(Contract DOT-FA70WA-2448)
(AD-750224) Avail: NTIS CSCL 17/7

The Office of Systems Engineering Management (OSEM) has initiated an activity for the preparation of Program Plans covering the present twenty-one engineering and development programs within the Federal Aviation Administration (FAA). These plans are required to provide more detailed information on the objectives, goals, program structure, technical approach, resources, possible implementation, and a number of other aspects for each of these programs. This planning process has been formalized in order to provide a record of the status and availability of each plan. The document presents an introductory background to the planning process, the objectives in each of the program areas, and an index of the plans, available or under preparation. Author (GRA)

N73-14864*# National Aeronautics and Space Administration, Washington, D.C.
THE INTERPLANETARY PIONEERS. VOLUME 1: SUMMARY
William R. Corliss 1972 135 p refs
(NASA-SP-278; LC-74-176234) Avail: NTIS MF $0.95; SOD HC $1.25 CSCL 22B

The Pioneer Space Probe Project is explained to document the events which occurred during the project. The subjects discussed are: (1) origin and history of interplanetary Pioneer program, (2) Pioneer system development and design, (3) Pioneer flight operations, and (4) Pioneer scientific results. Line drawings, circuit diagrams, illustrations, and photographs are included to augment the written material. P.N.F.

N73-14966# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
ACTIVITIES, 1971
1971 177 p refs In ENGLISH and FRENCH
Avail: NTIS HC $11.00

Research projects of the National Institute for Aerospace Studies and Research are presented. The functions and organization of the research facility are explained. Descriptions of typical activities which led to noticeable results during calendar year 1971 are reported. Additional information concerning patents, news releases, scientific publications, technical memoranda, and films is included. Author

N73-14968*# George Washington Univ., Washington, D.C.
SOCIAL IMPACT EVALUATION: SOME IMPLICATIONS OF THE SPECIFIC DECISIONAL CONTEXT APPROACH FOR ANTICIPATORY PROJECT ASSESSMENT WITH SPECIAL REFERENCE TO AVAILABLE ALTERNATIVES AND TO TECHNIQUES OF EVALUATING THE SOCIAL IMPACTS OF THE ANTICIPATED EFFECTS OF SUCH ALTERNATIVES
Louis H. Mayo Nov. 1972 54 p refs Presented at the NATO Advanced Study Inst. on Tech. Assessment, Gardone Riviera, Italy, 18-29 Sep. 1972, sponsored jointly by Inst. for the Management of Tech. and NSF
(Grant NGL-09-010-030)

(NASA-CR-129830; GWPS-OP-14) Avail: NTIS HC $4.75 CSCL 05K

The implications are explored of the specific decision context approach to anticipatory project assessment. More specifically, it is hypothesized that with respect to any given effect of a proposed project or action (mobility, job opportunities, air pollution, population distribution, etc.) such effect will likely differ in probability and/or magnitude from one decisional context to another; that the social desirability or undesirability of a given effect is a function (will differ with) each specific decisional context; that therefore the social impact of such effect will in all likelihood differ with each specific decisional context; and that the social significance of even the same social impact of a given effect will vary from one decisional context to another when such social impact interacts with (competes with or reinforces) the social impacts of other effects. It also follows from this analysis that the respective roles of scientific method (demonstrable data) and adversarial system will not only differ with each specific decisional context but with each alternative course of action available to the decisional entity in each specific context. Author

N73-14969# National Science Foundation, Washington, D.C.
SCIENTISTS, ENGINEERS, AND PHYSICIANS FROM ABROAD: TRENDS THROUGH FISCAL YEAR 1970
Jun. 1972 52 p refs
(NSF-72-312) Avail: SOD $1.00

Data on the inflows of scientists, engineers, and physicians to the United States from abroad are presented. The data are used to assess the trends in terms of numbers, occupations, and national backgrounds of these personnel. Both immigrant and nonimmigrant components of scientific and technical manpower from abroad are considered. Overall trends between 1949 and 1970 in admission of foreign professionals are reported and the results of the October 1965 revisions in the national immigration law are examined. Author

N73-14973# European Space Research and Technology Center, Noordwijk (Netherlands).
A SYSTEMS APPROACH TO PROJECT CONTROL
H. Gehriger 1972 14 p refs Presented at the 3rd Intern. Cong. on Proj. Planning by Network Tech., Stockholm, 15-19 May 1972
Avail: NTIS HC $3.00

A project control system is described which has been implemented and successfully applied to several ESRO satellite projects. The system consists essentially of ensuring that all project phases, all project participants, all satellite system constituents and all management control functions are fully covered and interpreted through clearly established interfaces.
Author (ESRO)

N73-15041*# McDonnell Aircraft Co., St. Louis, Mo. Aircraft Advanced Engineering Group.
CONCEPTUAL DESIGN OF A V/STOL LIFT FAN COMMERCIAL SHORT HAUL TRANSPORT Summary Report
Washington NASA Jan. 1973 88 p refs
(Contract NAS2-5499)
(NASA-CR-2184) Avail: NTIS HC $3.00 CSCL 01C

Conceptual designs of V/STOL lift-fan commercial short-haul transport aircraft for the 1980-85 time period were studied to determine their technical and economic feasibility. Engine concepts studied included both integral remote fans. The scope of the study included definition of the hover control concept for each propulsion system, aircraft design, aircraft mass properties, cruise performance noise, and ride qualities evaluation. Economic evaluation was also studied on a basis of direct operating cost and route structure. Author

N73-15195*# Scientific Translation Service, Santa Barbara, Calif.
DISCUSSION AND PLANNING OF A SYSTEM FOR A TELEVISION TRANSMITTING SATELLITE
H. Billig Washington NASA Jan. 1973 21 p refs Transl. into ENGLISH of DGN, Porz-Wahn, West Germany, report 72-051 "Systemauslegung und Planung fuer einen Fernsehrundfunksatelliten" Oct. 1972 18 p
(Contract NASw-2483)
(NASA-TT-F-14660; DGW-72-051) Avail: NTIS HC$3.25 CSCL 09F

The requirements of the Federal Post Office for more television programs in the forseeable future can be met by a satellite television system. This is particularly attractive in combination with local cable systems. Author

N73-15365*# State of Ohio Dept. of Development, Columbus.
RELEVANCE OF ERTS-1 TO THE STATE OF OHIO Semiannual Progress Report, Jul. - Dec. 1972
David C. Sweet, Principal Investigator, T. L. Wells, and G. E. Wukelic 15 Jan. 1973 41 p Prepared for Battelle Columbus Labs. Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Avenue, Sioux Falls, S. D. 57198
(Contracts NAS5-21782; BCL-72-17/G-1793)
(E73-10032; NASA-CR-129985; SAPR-1) Avail: NTIS HC $4.25 CSCL 08F

The author has identified the following significant results. To date, only one significant result has been reported for the Ohio ERTS program. This result relates to the proven usefulness of ERTS-1 imagery for mapping and inventorying strip-mined areas in southeastern Ohio. ERTS provides a tool for rapidly and economically acquiring an up-to-date inventory of strip-mined lands for state planning purposes which was not previously possible.

N73-15473*# Iowa Univ., Iowa City. Inst. of Urban and Regional Research.
THE APPLICATION OF REMOTE SENSING TECHNIQUES TO INTER AND INTRA URBAN ANALYSIS Final Report
Frank E. Horton May 1972 253 p refs
(NASA Order W-13165; USGS-14-08-0001-12505)
(NASA-CR-130290; USGS-IR-NASA-250; USGS-DO-73-002)
Avail: NTIS HC $14.75 CSCL 14E

This is an effort to assess the applicability of air and spaceborne photography toward providing data inputs to urban and regional planning, management, and research. Through evaluation of remote sensing inputs to urban change detection systems, analyzing an effort to replicate an existing urban land use data file using remotely sensed data, estimating population and dwelling units from imagery, and by identifying and evaluating a system of urban places utilizing space photography, it was determined that remote sensing can provide data concerning land use, changes in commercial structure, data for transportation planning, housing quality, residential dynamics, and population density. Author

N73-15642*# Wisconsin Univ., Madison. Space Science and Engineering Center.
MULTIDISCIPLINARY STUDIES OF THE SOCIAL ECONOMIC AND POLITICAL IMPACT RESULTING FROM RECENT ADVANCES IN SATELLITE METEOROLOGY, VOLUME 4 Interim Report
Verner E. Suomi and Delbert D. Smith Aug. 1972 206 p refs
(Grant NGL-50-002-114)
(NASA-CR-130000) Avail: NTIS HC $12.50

Summaries, covering southern corn leaf blight, severe thunderstorms and tornadoes, and management of satellite data, are presented.

N73-15643* Wisconsin Univ., Madison.
A STUDY OF THE WEATHER SATELLITE PROGRAM MANAGEMENT AND ORGANIZATION SYSTEMS
Andre Delbeco and Alan Filley *In its* Multidisciplinary Studies of the Social, Econ. and Political Impact Resulting from Recent Advan. in Satellite Meteorol., Vol. 4 Aug. 1972 p 1-174 refs

A description is given of the management and organizational system utilized by the Meteorological Satellite Program at NASA. The study focuses on the structure, process, and functioning of the program, making possible the successful linking of multiple systems of space science technology. By explicating the methods used and the conditions surrounding their usage it is expected that the lessons learned from this program will be of benefit to other organizations concerned with complex, developmental planning. Author

N73-15680# Federal Aviation Administration, Washington, D.C. Systems Research and Development Service.
ENGINEERING AND DEVELOPMENT PROGRAM PLAN: ALL WEATHER LANDING Final Report, period ending 1 Oct. 1972
Oct. 1972 40 p refs
(FAA-ED-07-3) Avail: NTIS HC $4.00

This plan describes all FAA development activities funded in the all weather landing program including electronic and visual guidance, airborne systems, and data collection. It also discusses related projects funded in other programs. The related projects include weather measurement, ground guidance and control, and fog dispersal. The program includes investigation of advanced technology as continuing and long term development, including work on advanced cockpit displays, airport lighting techniques and continued recording of actual Category III experience. Related long term efforts include applications of the MLS to all weather landing operations, advanced weather measuring and fog dispersal techniques. Author

N73-15688# Boeing Co., Seattle, Wash. Commercial Airplane Group.
STUDY AND CONCEPT FORMULATION OF A FOURTH-GENERATION AIR TRAFFIC CONTROL SYSTEM. VOLUME 1: STUDY REPORT Final Report
Apr. 1972 222 p refs 5 Vol.
(Contract DOT-TSC-145; DOT-TSC-306)
(PB-212178; D6-26058-1) Avail: NTIS HC $3.00 CSCL 17G

The operational concept, projected passenger demand, ATC system performance tradeoff data, and subsystem technological alternatives were evaluated to select the two most promising candidate systems for a fourth-generation (1995) ATC system. These two candidates and the upgraded third-generation system were then compared and a final recommended fourth-generation ATC system selected. The recommended system was described as to technology, operation, implementation plan, and required research and development. Author (GRA)

N73-15689# Boeing Co., Seattle, Wash. Commercial Airplane Group.
STUDY AND CONCEPT FORMULATION OF A FOURTH-GENERATION AIR TRAFFIC CONTROL SYSTEM. VOLUME 2: TECHNOLOGICAL ALTERNATIVES Final Report
Apr. 1972 492 p refs 5 Vol.
(Contracts DOT-TSC-145; DOT-TSC-306)
(PB-212179; D6-26058-2) Avail: NTIS HC $6.00 CSCL 17G

The document presents the results of studies of alternative subsystem approaches applicable to the Fourth Generation Air Traffic Control System. Equipment currently in operation, that planned for near future implementation, and various techniques proposed as possible future solutions to ATC requirements are included. Numerous ground-based and satellite-borne systems are discussed for providing the required navigation, surveillance, and communications functions. In addition the ground-based data processing and control equipment along with the required airborne equipment are treated. Author (GRA)

N73-15690# Boeing Co., Seattle, Wash. Commercial Airplane Group.
STUDY AND CONCEPT FORMULATION OF A FOURTH-GENERATION AIR TRAFFIC CONTROL SYSTEM. VOLUME 3: DEMAND AND TRADE STUDY Final Report
Apr. 1972 355 p refs
(Contracts DOT-TSC-145; DOT-TSC-306)
(PB-212180; D6-26058-3) Avail: NTIS HC $6.00 CSCL 17G

Techniques and resulting data are developed in the areas of demand, data acquisition, traffic management, and communications. Each area is subdivided to reflect the geographical region of operation as oceanic, domestic enroute, terminal area, and airport. ATC performance tradeoff information is developed parametrically to encompass a wide range of possibilities for the 1995 time period. Data are presented for STOL, CTOL, and SST/CTOL airplane mix configurations. Separation criteria to meet potential demands, resulting impact on safety, and required improvements for surveillance, navigation, procedure, and communications are included. The effect of airport and runway splits are discussed and parallel runway separation requirements are analyzed. Various mixes of voice and digital communications are considered. Principal computer models used in this study are discussed. Author (GRA)

N73-15691# Boeing Co., Seattle, Wash. Commercial Airplane Group.
STUDY AND CONCEPT FORMULATION OF A FOURTH-GENERATION AIR TRAFFIC CONTROL SYSTEM. VOLUME 4: SYSTEM SELECTION Final Report
Apr. 1972 354 p refs 5 Vol.
(Contracts DOT-TSC-145; DOT-TSC-306)
(PB-212181; D6-26058-4) Avail: NTIS HC $6.00 CSCL 17G

The volume describes the methodology used in selecting a fourth generation Air Traffic Control System consistent with U.S. air transportation needs in 1995, and provides a summary of the results. It includes the derivation and use of the computerized evaluation model, including the computer program for it's implementation, the cost model and supporting cost data, implementation plans, the initial and final system selection processes and results, and recommendations for further study. Author (GRA)

N73-15692# Boeing Co., Seattle, Wash. Commercial Airplane Group.
STUDY AND CONCEPT FORMULATION OF A FOURTH-GENERATION AIR TRAFFIC CONTROL SYSTEM. VOLUME 5: RECOMMENDED RESEARCH AND DEVELOPMENT Final Report
Apr. 1972 187 p refs 5 Vol.
(Contracts DOT-TSC-145; DOT-TSC-306)
(PB-212182; D6-26058-5) Avail: NTIS HC $3.00 CSCL 17G

Research and development needed to support the fourth-generation ATC system implementation is described. A methodology and program plan for operational concept evaluation, a requirements plan for a surface guidance system, and a testing and evaluation schedule for subsystem technical feasibility are described. The impact of future developments on subsystem changes and overall system characteristics is described. Finally, the time phasing of system implementation is also discussed together with the basic criteria used in ATC implementation planning. Author (GRA)

N73-15968# Advisory Group for Aerospace Research and Development, Paris (France).
THE VON KARMAN LECTURE. LESSONS LEARNED AND FUTURE DIRECTIONS IN THE MANAGEMENT OF TECHNICAL PROGRAMS
Robert C. Seamans Sep. 1972 36 p Lecture held at Brussels, 28 Sep. 1972
Avail: NTIS HC $4.00

Advances in technology management, learned at NASA and DOD, are briefly reviewed. The NASA programs involved feedback from the customer, accurate assessment and control using detailed schedules of tasks and costs, and a three-way balance between performance, schedule, and cost. The defense management added

the condition that new systems must also be produced and operated in large numbers. Illustrations are given using major new weapon/aircraft systems. Competitive prototyping and future directions in military programs are described, along with the application of aerospace technology to civil needs. It is concluded that NATO countries must look for better ways to provide effective defense forces and meet growing civil needs. Improved technology management is of critical importance, and proptotype programs must be carefully selected with a minimum of duplication. Papers on the challenge facing NATO, the future of defense cooperation among NATO nations, and technical cooperation among NATO nations are appended. N.E.N.

N73-15971# CONSAD Research Corp., Pittsburgh, Pa.
A COMMUNITY/AIRPORT ECONOMIC DEVELOPMENT MODEL. VOLUME 3: USER'S MANUAL Final Report, Apr. 1971 - May 1972
Jere J. Hinkle May 1972 209 p
(Contract DOT-FA71WA-2565)
(FAA-EQ-72-3-Vol-3) Avail: NTIS HC $12.50

A description of the operations of the Community/Airport Economic Development Model is presented. Information is given in both narrative and graphic form regarding the kind of input that is required to be provided by the user of the program. The options that are available within the program and the format and ordering of the data that are required for program operation are given. Sample outputs are included. Author

N73-15974# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of System and Logistics.
AN EVALUATION OF THE COST EFFECTIVENESS OF TRANSPORTING AIR ELIGIBLE CARGO BY AIR VERSUS SURFACE MODES OF TRANSPORTATION M.S. Thesis
Forrest H. Bennett, Jr. and Charles H. Abel 15 Sep. 1972 104 p refs
(AD-750848; SLSR-26-72B) Avail: NTIS CSCL 15/5

Transportation priority 1 and 2 air eligible cargo is being moved from the AFCL Air Materiel Areas to CONUS on-line LOGAIR stations by surface modes. An arbitrary limit of one LOGAIR flight per station per day imposed a ceiling on the daily capability of the LOGAIR system. The increased pipeline intransit time resulting from use of the surface modes forces a set level of inventory investment. The procurement of additional LOGAIR capability reduces the overall transportation priority 1 and 2 cargo pipeline intransit time and therefore reduces the inventory investment. The thesis proposes a method to offset the increased costs of procuring additional airlift through a reduction in inventory investment. Author (GRA)

N73-15975# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A STUDY OF THE F-15 CONTRACT STRUCTURE AND ITS CONTRIBUTION TO EFFECTIVE PROGRAM MANAGEMENT M.S. Thesis
Gerald A. Christenson and James C. Klorne 15 Sep. 1972 172 p refs
(AD-750849; SLSR-27-72B) Avail: NTIS CSCL 15/5

Government contracting personnel have had a history of accepting a procurement procedure which appeared to be successful in past program and erroneously applying those same procedures to new and different programs. The F-15 contract contains some new and some uniquely applied standard contract clauses. These clauses were described, analyzed, and presented independently in the thesis. After the independent study of the clauses, a summary of the interrelatedness of these clauses was presented. The author's interpretation of what external factors influenced the F-15 contract and how the F-15 contract philosophy evolved are also presented. The authors have made recommendations which apply to the future use of the F-15 contract clauses. Author (GRA)

N73-15977# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio.
THE INTERRELATION OF LOGISTICS COSTS IN MANAGING THE NICKEL CADMIUM BATTERY PROGRAM M.S. Thesis
Frank R. Bartlett and Leo J. Brennan 15 Sep. 1972 88 p refs
(AD-750907; SLSR-3-72B) Avail: NTIS CSCL 15/5

Logistics costs are the summation of all costs associated with the four facets of logistics: procurement, supply, transportation and maintenance. Optimization of one of these logistic facets can result in the suboptimization of total logistics costs. The thesis evaluates the effect of a change in maintenance concept in the management of nickel cadmium batteries. It evaluates logistics costs during two phases of management and projects costs based upon a third management concept. Graphic presentations serve to illustrate the effect of these management changes on total logistics costs. Conclusions are drawn and recommendations made to improve logistics management. Author (GRA)

N73-16216 Stanford Univ., Calif.
MODELING OF A SATELLITE AIRPORT SYSTEM FOR LARGE METROPOLITAN AREAS: A SYSTEMS ANALYSIS Ph.D. Thesis
Inder Kumar Sud 1971 195 p
Avail: Univ. Microfilms Order No. 72-11674

The satellite airport system is presented as a possible solution to the growing congestion problem at the major metropolitan airports. The system visualizes a large airport as the hub of a ring of satellites around it. The satellite airport system includes conventional take-off and landing (CTOL) airports, short take-off and landing (STOL) ports, and collection-ports linked to the main airport by means of transportation links. It is proposed that the short-haul and some of the medium-haul passengers would be handled by the satellite airports and the remaining passengers would enter the system at one of the satellite collection-ports, and then would be transported to the main airport. A system approach is proposed to analyze the satellite airport concept for large metropolitan areas. Various socioeconomic factors that influence the airport location are considered. A mathematical model formulates the problem as a fixed charge selection-allocation problem. Dissert. Abstr.

N73-16224# Federal Council for Science and Technology, Washington, D.C. Committee on Scientific and Technical Information.
MANAGEMENT OF INFORMATION ANALYSIS CENTERS
William A. Smith, ed. Jan. 1972 203 p refs Conf. held at Gaithersburg, Md., 17-19 May 1971 Sponsored by AEC and NSF
(COSATI-72-1; Conf-710550) Avail: NTIS

Three general papers were presented in session 1 on information analysis centers and automatic data processing, abstracting and indexing services, and marketing. Session 2, on automatic data processing operations and applications, includes papers on establishing a computerized file, information processing techniques for small semi-automated, scientifically-oriented data centers, user acceptance of an interactive retrieval system, inputting techniques, and computer usage in a larger data center. The third session, on abstracting and indexing services, includes case studies of ERIC/CLIS and the Air Force Machinability Center, the role of secondary services, a profile of scientific-technical tape information services, NSIC computerized information techniques, and the trends in services. Session 4, marketing, includes case studies of DoD, Copper Data Center, Plastics Technical Evaluation Center, and information analysis centers' liaison with professional organizations, commercial firms, and the private sector. Author

N73-16350* Geological Survey, Washington, D.C.
A LOFTY VIEW OF THE WORLD AROUND US
W. T. Pecora *In* NASA, Washington Intern. Workshop on Earth Resources Surv. Systems, Vol. 1 1972 p 11-14

CSCL 08E

Efforts to obtain an improved understanding of earth resources and the limits of the earth's surface are discussed. The efforts are described with respect to: (1) mapping, (2) human needs, (3) minerals, (4) water, (5) food, and (6) planning. The contributions to be made by satellites and remote sensors are reported. P.N.F.

N73-16362* Organization of American States. Office of Regional Development.
SOME CRITERIA FOR MAKING DECISIONS TO INVEST IN RESOURCE SURVEYS, WITH SPECIAL EMPHASIS ON DEVELOPING COUNTRIES
Kirk P. Rogers *In* NASA, Washington Intern. Workshop on Earth Resources Surv. Systems, Vol. 1 1972 p 179-182

CSCL 08F
The political, institutional, and economic aspects of incorporating earth resources surveys into developing countires is discussed. Additional consideration is given to the: (1) geographic factors (2) data handling capabilities, and (3) identification of clearly established purpose in conducting surveys. Concepts of Latin American data collection experience are analyzed. P.N.F

N73-16363* United Nations Development Program.
BENEFIT ANALYSES AND DECISION MODELS
M. Michael Gucovsky *In* NASA, Washington Intern. Workshop on Earth Resources Surv. Systems, Vol. 1 1973 p 183-184

CSCL 14B
Decision models for choosing techniques and procedures to obtain information in the field of natural resources development are discussed. Two types of models: (1) type A for natural resources development and (2) type B for management of existing resources are examined. Factors affecting the efficient application of earth resources data are reported. P.N.F.

N73-16364* Comissao Nacional de Atividades Espaciais, Sao Jose Dos Campos (Brazil).
BRAZILIAN PROGRAM FOR REMOTE SENSING OF EARTH RESOURCES (PROJECT SERE)
Joao Botelho Machado *In* NASA, Washington Intern. Workshop on Earth Resources Surv. Systems, Vol. 1 1972 p 189-193 refs
CSCL 08G
A description of the remote sensing of earth resources program being implemented in Brazil is presented. The causes of the complexity of the program are identified. The human resources and material resources assigned to the project are reported. A schematic diagram of the organizational structure is provided. Proposals for future developments are discussed. P.N.F.

N73-16371* Department of Energy, Mines and Resources, Ottawa (Ontario).
CANADA'S APPROACH TO REMOTE SENSING
L. W. Morley *In* NASA, Washington Intern. Workshop on Earth Resources Surv. Systems, Vol. 1 1972 p 223-234

CSCL 14B
The development of remote sensing in Canada at the federal and provincial levels is discussed. The five point program being followed to insure an adequate program are reported. An organizational chart of the interim planning committee on resource satellites and remote airborne sensing is included. The details of a proposal to NASA for earth resources project cooperation are presented. Author

N73-16372* Centre National d'Etudes Spatiales, Paris (France).
THE FRENCH TELEDETECTION PROGRAM
Aime Alouges *In* NASA, Washington Interim Workshop on Earth Resources Surv. Systems, Vol. 1 1972 p 235-236

CSCL 14B
Organizations for conducting remote sensing and earth resources projects in France are identified. Emphasis is placed on the aerial photography and photointerpretation of data for selected areas of Europe. The location of various test sites is identified and the nature of their activities is reported. P.N.F.

N73-16835*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SPACE PROGRAM PAYLOAD COSTS AND THEIR POSSIBLE REDUCTION
Edgar M. VanVleck, Jerry M. Deerwebster, Susan M. Norman, and Larry R. Alton Washington Jan. 1973 68 p refs
(NASA-TM-X-62223) Avail: NTIS HC $5.50 CSCL 22A
The possible ways by which NASA payload costs might be reduced in the future were studied. The major historical reasons for payload costs being as they were, and if there are technologies (hard and soft), or criteria for technology advances, that could significantly reduce total costs of payloads were examined. Payload costs are placed in historical context. Some historical cost breakdowns for unmanned NASA payloads are presented to suggest where future cost reductions could be most significant. Space programs of NOAA, DoD and COMSAT are then examined to ascertain if payload reductions have been brought about by the operational (as opposed to developmental) nature of such programs, economies of scale, the ability to rely on previously developed technology, or by differing management structures and attitudes. The potential impact was investigated of NASA aircraft-type management on spacecraft program costs, and some examples relating previous costs associated with aircraft costs on the one hand and manned and unmanned costs on the other are included. Author

N73-16941*# Denver Research Inst., Colo. Industrial Economics Div.
PROGRAM FOR TRANSFER RESEARCH AND IMPACT STUDIES Semiannual Report, 1 Jan. - 30 Jun. 1972
James P. Kottenstelle, Jerome J. Rusnak, and Eileen R. Staskin Nov. 1972 101 p
(Contract NASw-2362)
(NASA-CR-130302) Avail: NTIS $7.25 CSCL 05B
The progress made in achieving TRIS research objectives during the first six months of 1972 is reviewed. The Tech Brief-Technical Support Package Program and technology transfer profiles are presented along with summaries of technology transfer in nondestructive testing, and visual display systems. F.O.S.

N73-17052* National Aeronautics and Space Administration, Washington, D.C.
EXPERIENCE FACTORS IN PERFORMING PERIODIC PHYSICAL EVALUATIONS
Archie A. Hoffman *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1969 p 16-22 refs
CSCL 06P
The lack of scientific basis in the so-called periodic health examinations on military personnel inclusive of the Executive Health Program is outlined. This latter program can well represent a management tool of the company involved in addition to being a status symbol. A multiphasic screening technique is proposed in conjunction with an automated medical history questionnaire for preventive occupational medicine methodology. The need to collate early sickness consultation or clinic visit histories with screening techniques is emphasized. Author

N73-17066* National Aeronautics and Space Administration, Washington, D.C.
LEAVE TAKING AND OVERTIME BEHAVIOR AS RELATED TO DEMOGRAPHIC, HEALTH, AND JOB VARIABLES
Louis B. Arnoldi and John C. Townsend *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1969 p 73-94

CSCL 06P
An intra-installation model is formulated that correlates demographic, health and job related variables to the various types and amounts of leave and overtime taking behavior of employees.

Statistical comparison of composite health ratings assigned to subjects based upon clinical criteria and bio-statistical data show that those employees who take the most annual leave as well as sick leave are the ones that have the poorest health ratings; employees who put in the most overtime have also the poorest health records. Stress effects of peak activity periods increase use of sick leave immediately after peak activity but not the use of annual leave. G.G.

N73-17056* National Aeronautics and Space Administration, Washington, D.C.
ENVIRONMENTAL HEALTH PROGRAM IN NASA
Rudolph M. Marrazzo *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1969 p 95-106
CSCL 06P

The NASA policy on environmental health uses medical and environmental concepts to: (1) Determine the health status of employees; (2) prevent illness and promote good health among employees; and (3) identify and control factors that affect the health of personnel and quality of environment. Evaluation and control of physical, chemical, radiological and biological factors surrounding personnel and which represent physiological and psychological stresses and impairment are considered. G.G.

N73-17057* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ENVIRONMENTAL HEALTH PROGRAM ACTIVITIES
Charles P. Bergtholdt *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1969 p 107-110
CSCL 06P

Activities reported include studies on toxic air contaminants, excessive noise, poor lighting, food sanitation, water pollution, and exposure to nonionizing radiation as health hazards. Formulations for a radiological health manual provide guidance to personnel in the procurement and safe handling of radiation producing equipment and Apollo mission planning. A literature search and development of a water analysis laboratory are outlined to obtain information regarding microbiological problems involving potable water, waste management, and personal hygiene. G.G.

N73-17060* National Aeronautics and Space Administration. Electronics Research Center, Cambridge, Mass.
PRELIMINARY REPORT ON USE OF LAHEY CLINIC AUTOMATED HISTORY IN AN INDUSTRIAL COMPLEX

B. O. Leonardson *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1969 p 121-123
CSCL 05B

A questionnaire has been developed and used extensively as an aid to the appointment office in determining what department a patient should be referred to and what time for special consultations should be reserved. It has helped to maintain a balanced case load and informs the physician in advance about the patients he will see. By coordinating appointments so that the patient can visit two or more of the specialty departments in one day rather than having to return a number of times to see different doctors, it has increased efficiency. The questionnaire screens for important symptoms or trouble spots to which the computer is programmed to assign scoring values which in turn point out the clinic division or section to which the patient should initially be referred. Author

N73-17061* National Aeronautics and Space Administration. Wallops Station, Wallops Island, Va.
REVIEW OF A SERIES OF PROCTOSIGMOIDOSCOPIES DONE AT WALLOPS STATION, VIRGINIA
Edward White *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1969 p 124-126
CSCL 06E

Routine proctosigmoidoscopic examinations for incidence of polyps in NASA installation asymptomatic personnel establish the value of this method in detecting cancer without invasion beyond the stalk and resulting in curative operation at greater survival rates than in later detections. G.G.

N73-17064*# National Aeronautics and Space Administration, Washington, D.C.
PROCEEDINGS OF THE ANNUAL CONFERENCE OF NASA CLINIC DIRECTORS, ENVIRONMENTAL HEALTH OFFICIALS AND MEDICAL PROGRAM ADVISORS
1970 184 p refs Conf. held at Cambridge, Mass., 13-15 Oct. 1970
(NASA-TM-X-69073) Avail: NTIS HC $11.25 CSCL 06E

Medical problems common to NASA and aviation industry facilities are discussed. The focus centers on preventive counselling, environmental control, and physical and mental health measures.

N73-17068* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MEDICAL AUTOMATION SYSTEM AT THE MARSHALL SPACE FLIGHT CENTER
James H. Spraul *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1970 p 39-51
CSCL 06E

A computer system is reported for scheduling and coordinating physical examinations for groups of people who work with chemicals, lasers, X-rays, isotopic sources, toxic fuels, adhesives, and exotic metals. Complete medical data on the examined population are continuously updated for a broad medical master file. Statistical methods are employed to project progressive changes in the health status of these employees for possible clinical interventions. G.G.

N73-17069* Public Health Service, Washington, D.C.
PERSONAL BENEFITS OF A HEALTH EVALUATION AND ENHANCEMENT PROGRAM
Fred Heinzelmann and Donald C. Durbeck *In* NASA, Washington Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1970 p 52-79 refs

CSCL 06E

A study was made of the benefits reported by participants in a health evaluation and enhancement program dealing with physical activity. Program benefits were identified and defined in regard to three major areas: program effects on work; program effects on health; and program effects on habits and behavior. A strong positive and consistent relationship was found between reported benefits in each of these areas and measures of improvement in cardiovascular functioning based on treadmill performance. Significant differences in these measures of improvement were also found between participants who reported program benefits and those persons who did not. These findings provide a meaningful profile of the pattern of benefits generated by this kind of health program. Author

N73-17072* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE VALUE OF CONTINUED FOLLOWUP IN A PREVENTIVE MEDICINE PROGRAM
Carlos Villafana and Jean Mockbee *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1970 p 96-119

CSCL 06E

Continued monitoring of hypertension and cholesterol levels in NASA employees by regularly scheduled medical examinations prevents an increase in employee disability and cardiovascular mortality rates. Adequate therapeutic control for younger hypertensive employees is demonstrated by records on mortality and heart diseases over a period of 28 months. It confirmed the importance of systolic blood pressure as diagnostic tool for the inherent risk factor. The prevalence of additional coronary

risk factors among employees with hypercholesterolemia is considerably less than in employees with hypertension. G.G.

N73-17076* Trans World Airlines, Inc., Kansas City, Mo. Medical Service.
FLIGHT CREW HEALTH MAINTENANCE
Charles C. Gullett *In* NASA, Washington Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1970 p 172-177

CSCL 06E

The health maintenance program for commercial flight crew personnel includes diet, weight control, and exercise to prevent heart disease development and disability grounding. The very high correlation between hypertension and overweight in cardiovascular diseases significantly influences the prognosis for a coronary prone individual and results in a high rejection rate of active military pilots applying for civilian jobs. In addition to physical fitness the major items stressed in pilot selection are: emotional maturity, glucose tolerance, and family health history. G.G.

N73-17077* Boeing Co., Seattle, Wash.
OCCUPATIONAL MEDICAL TRENDS IN THE 70'S FROM INDUSTRIAL VIEW
Sherman M. Williamson *In* NASA, Washington Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1970 p 178-180

CSCL 06E

Industrial health measures to ensure worker productivity constitute physical examinations as well as environmental control systems. Considered are automatic record keeping facilities for case histories, preventive medical and mental counselling, development of safety standards, and health insurance and disability benefit plans. Cooperation of industry health programs with community health aspects is required to eliminate the loss of manpower capability through alcoholism or mental disease. G.G.

N73-17078*# National Aeronautics and Space Administration, Washington, D.C.
PROCEEDINGS OF THE ANNUAL CONFERENCE OF NASA CLINIC DIRECTORS, ENVIRONMENTAL HEALTH OFFICIALS AND MEDICAL PROGRAM ADVISORS
1971 274 p refs Conf. held at Charleston, S. C., 12-14 Oct. 1971
(NASA-TM-X-69074) Avail: NTIS HC $15.75 CSCL 06E

Data covering techniques and types of services provided to NASA employees in occupational medicine and environmental health are outlined. Specific summaries are given for coronary disease, chronic disease, and occupation induced disorders. Numerous other topics, procedures, and medical equipment are also discussed.

N73-17079* National Aeronautics and Space Administration, Washington, D.C.
THE MANAGEMENT OF NASA EMPLOYEE HEALTH PROBLEM: STATUS 1971
Louis B. Arnoldi *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1971 p 1-16
CSCL 06E

A system for assessing employee health problems is introduced. The automated billing system is based on an input format including cost of medical services by user and measures in dollars, that portion of resources spent on preventive techniques versus therapeutic techniques. The system is capable of printing long term medical histories of any employee. E.H.W.

N73-17081* Catholic Univ. of America, Washington, D.C.
THE MOTIVATING INFLUENCE OF RETEST AND REPEATED DIETARY COUNSELING ON CHOLESTEROL REDUCTION
Paul Taylor, John C. Townsend, Carlos Villafana, and Louis B. Arnoldi *In* NASA, Washington Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1971 p 29-49 refs

CSCL 06E

An analysis was made of retest and followup counselling effects on the reduction of hypercholesterolemia levels in NASA employees. Criteria used to measure such control include motivation, age of patient, personality of patient, job stress, and physical exercise. E.H.W.

N73-17084* Kettering Memorial Hospital, Dayton, Ohio.
THE CORONARY PATIENT IN INDUSTRY
Benjamin Schuster *In* NASA, Washington Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1971 p 86-99

CSCL 06E

The coronary patient, as he pertains to industry particularly NASA, is discussed. Concepts of precoronary care, acute attacks which may develop while on the job, and the return of the cardiac patient to work are covered. Major emphasis was on the prevention of sudden death due to coronary disease. Author

N73-17086* SysteMed Corp., Dayton, Ohio.
THE MANAGEMENT OF CHRONIC DISEASE: A STUDY OF EMPLOYEE MORBIDITY AND MORTALITY AT THE NASA, GODDARD SPACE FLIGHT CENTER, 1966 - 1971
Carlos Villafana and Jean Mockbee *In* NASA, Washington Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1971 p 108-134

CSCL 06E

Several approaches to studying chronic disease patterns in the employee population at Goddard Space Flight Center from 1966 to 1970 are presented. Attempts were made to summarize preliminary data for 1971 and relate this data to specific programs and events which may have had some causative influence. Investigative data for the study cover records of periodic and return to work examinations, injury and illness visit reports, mortality data, and health trends with and without external influences. E.H.W.

N73-17091* Public Health Service, Rockville, Md.
THE NASA-USPHS HEALTH EVALUATION AND ENHANCEMENT PROGRAM
D. C. Durbeck, F. Heinzelmann, R. T. Moxley, III, J. Schacther, G. H. Payne, D. D. Limoncelli, S. M. Fox, III, and Louis B. Arnoldi *In* NASA, Washington Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1972 p 173-195 refs

CSCL 06E

An exercise program was initiated to assess the feasibility of an on the job health evaluation and enhancement program, as well as to identify the factors which influenced volunteering, adherence, and effectiveness of the program. The program was utilized by 237 of the 998 eligible Federal employees, with a mean attendance of 1.3 days per week. Those who volunteered perceived a need for increased physical activity, felt they had sufficient time to participate, and derived subjective as well as objective benefits. Significant improvements were found in heart rate response to the standard exercise test, body weight, skinfold measurements, and triglycerides. A consistent relationship was found between subjectively reported effects of the program on work, health habits, and behavior, and improvement in cardiovascular function, based on treadmill performance. Numerous personal and programmatic factors influencing volunteering and participation were identified. Author

N73-17093* National Aeronautics and Space Administration, Flight Research Center, Edwards, Calif.
AN OPERATING ENVIRONMENTAL HEALTH PROGRAM

Jose G. Lipana, Richard L. Masters (Lovelace Found. for Med. Educ. and Res.), and William R. Winter *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1971 p 204-223

CSCL 06E

Some concepts of an operational program for medical and environmental health are outlined. Medical services of this program are primarily concerned with emergency care, laboratory examinations, advice to private physicians with patient permission, medical monitoring activities, and suggestions for treatment or control of the malfunction. E.H.W.

N73-17095* National Aeronautics and Space Administration, Washington, D.C.
HAZARD PAY: AN EFFECTIVE ANTAGONIST
R. E. Alexander *In its* Proc. of the Ann. Conf. of NASA Clinic Directors, Environ. Health Offic. and Med. Program Advisors 1971 p 241-248
CSCL 05C

Procedures for allocating hazardous pay to employees are outlined. According to the guidelines, only top level management can authorize hazardous tasks and decide if said task is indeed hazardous. The guidelines also state that hazardous jobs may be performed only if it is essential to finish a project and cannot be adequately safeguarded. E.H.W.

N73-17295*# Brevard County Planning Dept., Titusville, Fla.
URBAN AND REGIONAL PLANNING PROPOSAL NO. Y-10-068-001 Progress Report, 1 Sep. 1972 - 31 Jan. 1973
John W. Hannah and Garland L. Thomas, Principal Investigators 31 Jan. 1973 21 p
(Contract NAS5-21847)
(E73-10083; NASA-CR-130281) Avail: NTIS HC $3.25 CSCL 05K

There are no author-identified significant results in this report. A program has been completed to print out the radiance values for any specified combination of the four MSS bands for a specified sector of an image. A program to map intensities for any band is being written. An investigation of the characteristics of cities in the Brevard County area, as seen by ERTS-1, has been started. Investigation has not been completed; however, results initially obtained are presented. A Digicol viewer was used to determine the relative reflectance of cities (and other developed sectors) in the area. This was done by a combination of two methods: (1) varying the offset control so that the brightest spot appeared first, followed by the second brightest spot; and (2) reading the relative light transmissions at selected positions. A band 5 image was used and the results, in order of maximum reflectance apparent within the sector, are given. A.L.

N73-17484*# Alaska Univ., Palmer. Inst. of Agricultural Sciences.
IDENTIFICATION OF PHENOLOGICAL STAGES AND VEGETATIVE TYPES FOR LAND USE CLASSIFICATION Semiannual Report, Jul. 1972 - Jan. 1973
C. Ivan Branton, Principal Investigator and J. D. McKendrick 20 Feb. 1973 13 p
(Contract NAS5-21833)
(E73-10276; NASA-CR-130559) Avail: NTIS HC $3.00 CSCL 08F

There are no author-identified significant results in this report.

N73-17567*# Radio Corp. of America, Burlington, Mass. Aerospace Systems Div.
LASER ALTIMETER Final Report
[1972] 100 p refs
(Contract NAS9-10600)
(NASA-CR-128738; CR-72-588-001-L) Avail: NTIS HC $7.00 CSCL 14B

The development of a laser altimeter for use in the Apollo Lunar Orbital Experiments mission is discussed. The altimeter provides precise measurement of an Apollo vehicle above the lunar surface from an orbit of 40 to 80 nautical miles. The technical characteristics of the altimeter are described. Management of the altimeter development program is analyzed. Author

N73-17584*# Kentucky Univ., Lexington. Coll. of Engineering.
THE INTERNATIONAL SYSTEM OF UNITS (SI) AND WHAT IT INVOLVES, PROCEEDINGS
Jul. 1972 147 p refs Conf. held at Lexington, Ky., 27-29 Sep. 1972 Sponsored by NASA and Metric Assoc., Inc.
(NASA-CR-130534; PB-212232; UKY-TR-56-72-ME-13) Avail: NTIS HC $9.50 CSCL 14B

The major aspects of metrication are discussed. Representatives from multinational corporations who have converted to metric units point out problems other industries may eliminate during the conversion. Cost of conversion is discussed. Other topics include: Fasteners in an SI environment; metric conversion of machine tools, tooling and gaging; legal and legislative implications of metrication; consumer conversion; educating for SI conversion; adoption progress in the United Kingdom; and many more. Arguments are also presented opposing compulsory conversion to metric units. Author (GRA)

N73-17980*# Northwestern Univ., Evanston, Ill. Dept. of Organizational Behavior and Industrial Relations.
TOP MANAGEMENT AND MANAGEMENT SCIENCE: AN EXPLORATORY STUDY IN 15 FEDERAL CIVILIAN AGENCIES
Michael J. White Feb. 1971 16 p refs Presented at the Spec. Conf. Paper Format at the Natl. Conf. of the Am. Soc. for Public Admin., Denver, 18-21 Apr. 1971
(Grant NGL-14-007-058)
(NASA-CR-130668; Publ-71-3) Avail: NTIS HC $3.00 CSCL 05A

A study of the relation between top managers in Federal agencies and the operations research and management science (OR/MS) group is reported. Sixteen managers were questioned about the following characteristics: closeness of top managers to OR/MS groups; top managers' attitudes toward the OR/MS activities; relation between closeness and these attitudes; and top managers' use of OR/MS groups. It is concluded that OR/MS is relevant to many top managers and that OR/MS has begun to play a role in decisions. Top management attitudes and actions are not related in obvious ways. The consequences to top management's use of and closeness to an OR/MS group need not be the success of the group as a professional, innovative, research-oriented unit. N.E.N.

N73-17981*# Northwestern Univ., Evanston, Ill. Dept. of Organizational Behavior and Industrial Relations.
THE IMPACT OF MANAGEMENT SCIENCE ON POLITICAL DECISION MAKING
Michael J. White Mar. 1971 42 p refs Submitted for publication
(Grant NGL-14-007-058)
(NASA-CR-130667; Publ-71-2) Avail: NTIS HC $4.25 CSCL 05A

The possible impact on public policy and organizational decision making of operations research/management science (OR/MS) is discussed. Criticisms based on the assumption that OR/MS will have influence on decision making and criticisms based on the assumption that it will have no influence are described. New directions in the analysis of analysis and in thinking about policy making are also considered. N.E.N.

N73-17982*# Northwestern Univ., Evanston, Ill.
THE POLICY-FORMATION PROCESS: A CONCEPTUAL FRAMEWORK FOR ANALYSIS Ph.D. Thesis
Eliezer Fuchs Aug. 1972 456 p refs
(Grant NGL-14-007-058)
(NASA-CR-130669) Avail: NTIS HC $20.00 CSCL 05A

A conceptual framework for analysis which is intended to assist both the policy analyst and the policy researcher in their empirical investigations into policy phenomena is developed. It

is meant to facilitate understanding of the policy formation process by focusing attention on the basic forces shaping the main features of policy formation as a dynamic social-political-organizational process. The primary contribution of the framework lies in its capability to suggest useful ways of looking at policy formation reality. It provides the analyst and the researcher with a group of indicators which suggest where to look and what to look for when attempting to analyze and understand the mix of forces which energize, maintain, and direct the operation of strategic level policy systems. The framework also highlights interconnections, linkage, and relational patterns between and among important variables. The framework offers an integrated set of conceptual tools which facilitate understanding of and research on the complex and dynamic set of variables which interact in any major strategic level policy formation process. Author

N73-17994*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SELECTED TECHNICAL SPIN-OFFS FROM THE SPACE PROGRAM
Herman L. Gilmore Dec. 1970 23 p refs Prepared in cooperation with Air War Coll., Maxwell AFB, Ala.
(NASA-TM-X-68943; AD-722090; Rept-4130) Avail: NTIS HC $3.25 CSCL 05/1

The report describes some of the problems which the National Aeronautics and Space Administration has encountered in getting people to understand how the general public has profited from the technical discoveries of the space program. Next, it describes NASA's Technology Utilization Program and comments on it. It then describes some of the many spin-offs from the space program. These include examples from management technology, communications, aeronautics, medicine, fabrics, highway safety, and weather forecasting. Author

N73-17995# Dayton Univ. Research Inst., Ohio.
DETERMINATION OF THE CONSISTENCY OF RELEVANCE JUDGMENTS AND THE RELIABILITY OF SEARCH STRATEGIES AMONG INFORMATION SPECIALISTS FOR THE AEROSPACE MATERIALS INFORMATION CENTER Final Summary Report, 1 Dec. 1970 - 30 Nov. 1971
Frederic L. Scheffler and Jacqueline F. March Apr. 1972 102 p
(Contract F33615-71-C-1069; AF Proj. 7381)
(AD-751977; UDRI-TR-72-14; AFML-TR-72-51) Avail: NTIS CSCL 05/2

The ability of various AMIC information specialists to prepare search strategies for document retrieval was studied by providing ten typical search request statements to seven information specialists. Each specialist prepared search strategies independently. Significant variations occurred among the strategies, although even with these variations, reasonably consistent document returns resulted. The experiment indicated that the proper interpretation of a search request and the conversion of the request to an appropriate search strategy even with a well-established thesaurus is a considerably more difficult task than indexing. In another experiment, the consistency of relevance judgments among information specialists was examined. Relevance judgment is more difficult than indexing and search strategy preparation. Author (GRA)

N73-18057# Logistics Management Inst., Washington, D.C.
OPTIMUM SERVICE LIFE DETERMINATION TECHNIQUE
Nov. 1972 70 p refs
(Contract SD-271; SD Proj. 271-168)
(AD-752747; LMI-72-12) Avail: NTIS CSCL 01/3

The report describes efforts by LMI to determine feasible methods of attaining the following dual interrelated objectives: to improved long-range predictions of the safe remaining structural life of groups of Naval aircraft (e.g., all Navy F-4Bs) to be used statistically to facilitate and support decisions regarding major structural modification programs, programmed aircraft model service life and service life extensions, and planning of the future military role to be filled by given aircraft models, and to improved short-range predictions of the structural condition of individual Naval aircraft, which can be used to develop a maintenance strategy (e.g., inspection intervals) which would increase the probability of aircraft meeting operational commitments without major structural problems. Author (GRA)

N73-18062# Northrop Corp., Palos Verdes Peninsula, Calif. Electronics Div.
CONCEPT FORMULATION STUDY FOR AUTOMATIC INSPECTION, DIAGNOSTIC AND PROGNOSTIC SYSTEMS (AIDAPS). VOLUME 1: SUMMARY Final Report
Sep. 1972 72 p refs
(Contract DAAJ01-71-C-0503)
(AD-752882; NORT-71-292A-Vol-1;
USAAVSCOM-TR-72-20-Vol-1) Avail: NTIS CSCL 01/3

The report presents the results of a concept formulation study for an Automatic Inspection, Diagnostic and Prognostic System (AIDAPS) for Army aircraft. The purpose of the study was to satisfy the prerequisites of contract definition as defined in the life cycle management model for Army systems. The study results conclusively demonstrate that these prerequisites were satisfied. Author (GRA)

N73-18141# Defense Documentation Center, Alexandria, Va.
MAN MACHINE INTERACTION Report Bibliography, Dec. 1953 - Mar. 1972
Nov. 1972 241 p refs
(AD-752800; DDC-TAS-72-71) Avail: NTIS CSCL 05/8

The annotated references include reports which study the human factors involved in solving and learning man-machine interactions, as well as the effective use of men in system design. The indexes included are Corporate Author-Monitoring Agency, and Subject. Author (GRA)

N73-18410*# California Univ., Riverside. Dept. of Geography.
STUDIES IN REMOTE SENSING APPLICATIONS. BARRIERS TO INNOVATION: THE EXAMPLE OF REMOTE SENSING IN URBAN AND REGIONAL PLANNING IN THE LOS ANGLES METROPOLIS. INTERFACING REMOTE SENSING AND AUTOMATED GEOGRAPHIC INFORMATION SYSTEMS
Darryl R. Roehring, Jene S. McKnight, David A. Nicholas, and William G. Brooner Sep. 1972 70 p refs
(Grant NGL-05-003-404; Contract N00014-69-A-0200-5001)
(NASA-CR-130969; AD-752058; TR-T-72-2; TR-T-72-3) Avail: NTIS HC $5.50 CSCL 08B

Some items are presented in a five stage approach which are deemed necessary for employment of remote sensing and automated information systems in a land management program. The approach synthesizes research which has recently led to the development of operational systems. Author (GRA)

N73-18858*# Chrysler Corp., New Orleans, La. Space Div.
SINGLE STAGE EARTH ORBITAL REUSABLE VEHICLE. VOLUME 6: RESOURCES Final Report
30 Jun. 1971 235 p
(Contract NAS8-26341)
(NASA-CR-124091; TR-AP-71-4-Vol-6) Avail: NTIS HC $3.75 CSCL 22B

The results of a conceptual study of the resource requirements for a single-stage earth-orbital vehicle are presented. All aspects of program costs for the design, manufacture, test, transportation, launch, and facility modifications were considered. The following program costs are discussed: configuration definition, cost groundrules and assumptions, program requirements; work breakdown structure, cost estimation methods, and cost analysis. High cost areas are identified. F.O.S.

N73-18980# National Science Foundation, Washington, D.C.
FEDERAL FUNDS FOR RESEARCH DEVELOPMENT AND OTHER SCIENTIFIC ACTIVITIES, FISCAL YEARS 1971,

1972, AND 1973, VOLUME 21
1973 210 p refs
(NSF-72-317-Vol-21) Avail: SOD $2.75

A broad picture is presented of the distribution of Federal R and D funds to major areas of effort. The information presented includes levels and trends, character of work, and geographical distribution. F.O.S.

N73-18987# National Science Foundation, Washington, D.C.
AN ANALYSIS OF FEDERAL R AND D FUNDING BY FUNCTION, FISCAL YEARS 1963-1973
Jun. 1972 93 p refs
(NSF-72-313) Avail: SOD $2.50

Graphs and tables are presented of the R and D funding by budget function and by a proposed alternative system. As previously arranged, the agency R and D programs are distributed according to the functional categories of the Federal budget, and R and D expenditures within each function are compared with total outlays for that function. The alternative classification system relates expenditures more closely to the national purposes and objectives they are designed to support. N.E.N.

N73-18988# National Science Foundation, Washington, D.C.
[NATIONAL AND INTERNATIONAL RESEARCH AND EDUCATION PROJECTS] Annual Report for Fiscal Year 1972
1972 112 p
(NSF-73-1; AR-22) Avail: SOD $2.50

The research activities supported by the National Science Foundation are reported. The activities reported include the research project support areas, national and international programs, research applications, science education, and institutional programs. F.O.S.

N73-18990# Gesellschaft fuer Weltraumforschung m.b.H., Porz (West Germany).
EXPERIENCE GAINED FROM THE GERMAN SCIENTIFIC SPACECRAFT PROGRAM [BISHERIGE ERFAHRUNGEN AUS DEM DEUTSCHEN WISSENSCHAFTLICHEN RAUMFAHRZEUGPROGRAMM]
Ants Kutzer 1972 22 p In GERMAN Presented at the 5th DGLR Ann. Meeting, Berlin, 4-6 Oct. 1972
(DGLR-Paper-72-052) Avail: NTIS HC $3.25

The project management organization by the German Society for Space Research, which is the contracting authority for the Azur, Aeros, Dial and Helios satellites, is surveyed. Management problems during the different development stages are discussed. Internal management organization and methods are described. Experience gained on cost, performance, and delay analysis will be used in the future for setting up management teams. ESRO

N73-19209* Computer Sciences Corp., Los Angeles, Calif.
THE INTEGRATION OF SYSTEM SPECIFICATIONS AND PROGRAM CODING
William R. Luebke *In* NASA. Goddard Space Flight Center Automated Methods of Computer Program Doc. Nov. 1970 p 61-74
CSCL 09B

Experience in maintaining up-to-date documentation for one module of the large-scale Medical Literature Analysis and Retrieval System 2 (MEDLARS 2) is described. Several innovative techniques were explored in the development of this system's data management environment, particularly those that use PL/I as an automatic documenter. The PL/I data description section can provide automatic documentation by means of a master description of data elements that has long and highly meaningful mnemonic names and a formalized technique for the production of descriptive commentary. The techniques discussed are practical methods that employ the computer during system development in a manner that assists system implementation, provides interim documentation for customer review, and satisfies some of the deliverable documentation requirements. Author

N73-19210* National Bureau of Standards, Washington, D.C.
VIEWS ON COMPUTER PROGRAM DOCUMENTATION AND AUTOMATION
Herbert R. Grosch *In* NASA. Goddard Space Flight Center Automated Methods of Computer Program Doc. Nov. 1970 p 77-79
CSCL 09B

Various aspects of the problem of program documentation and description are discussed. Particular emphasis is placed on the problem of semantics. It is pointed out that the information produced by documentation of a program, if presented to several different groups, may mean entirely different things to these groups. Recognition of the fact that people look at problems differently is proposed as a more practical approach to the problem of documentation rather than extensive use of standards or strict formatting. The difficulties involved in searching for ways to provide a common ground for the transmission and use of information are discussed. D.L.G.

N73-19625 Arbeitsgemeinschaft Deutscher Verkehrsflughaefen, Stuttgart (West Germany).
AIRPORTS TODAY: SIGNIFICANCE AND PROBLEMS OF AIRPORTS IN TODAYS AIR TRAFFIC [FLUGHAEFEN HEUTE BEDEUTUNG UND PROBLEME DER FLUGHAEFEN IM HEUTIGEN LUFTVERKEHR]
Udo Wolffram *In* DGLR Report on the DGLR-Symp. on Air Traffic Operation Dec. 1972 p 15-24 In GERMAN

A summary of airports constructed in various European countries and England which comprise a commercial air traffic net is presented. The functions performed by commercial airports are described. The effects of airport operations on the environment are analyzed. The preliminary planning of airports to insure their ability to accomodate the transportation demands is discussed. Methods for improving flight operations and the application of new technologies to airport development are examined.
Transl. by P.N.F.

N73-19868*# Smithsonian Astrophysical Observatory, Cambridge, Mass.
A STUDY PROGRAM FOR GEODETIC SATELLITE APPLICATIONS Final Report
Michael R. Pearlman Oct. 1972 58 p
(Grant NGR-09-015-002)
(NASA-CR-130180) Avail: NTIS HC $5.00 CSCL 22B

The work is reported on support of the GEOS-C Program, National Geodetic Satellite program, and the Earth Physics Program. The statement of work and a description of the GEOS-C are presented along with the trip reports, and the Earth and Ocean Physics Application program. F.O.S.

N73-19958*# National Academy of Public Administration, Washington, D.C.
NASA SEMINAR ON ORGANIZATION AND MANAGEMENT
R. W. Crawley and E. H. Kloman Aug. 1972 71 p refs
(Contract NSR-09-046-001)
(NASA-CR-131087) Avail: NTIS HC $5.75 CSCL 05A

The proceedings of a seminar series of current problems and organization of NASA are presented. The seminar was designed to provide a comparative basis for understanding such recurring problems as delegation of authority; resource allocation and decision making patterns; headquarters organization; systems of program control and evaluation; roles and relations of scientists, engineers, and administrators; headquarters-field center relationships; and the overall management philosophy of the headquarters and field centers. Author

N73-19975*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
JPL QUARTERLY TECHNICAL REVIEW, VOLUME 2, NUMBER 4
1973 192 p refs
(Contract NAS7-100)
(NASA-CR-131152) Avail: NTIS HC $11.75 CSCL 05B

Papers and abstracts of scientific and technical reports are presented.

N73-19982* Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Data Systems Div.
INFORMATION MANAGEMENT SYSTEM FOR THE CALIFORNIA STATE WATER RESOURCES CONTROL BOARD (SWRCB)
T. C. Heald and G. H. Redmann *In its* JPL Quart. Tech. Rev., Vol. 2, No. 4 1973 p 53-61

CSCL 05B

A study was made to establish the requirements for an integrated state-wide information management system for water quality control and water quality rights for the State of California. The data sources and end requirements were analyzed for the data collected and used by the numerous agencies, both State and Federal, as well as the nine Regional Boards under the jurisdiction of the State Board. The report details the data interfaces and outlines the system design. A program plan and statement of work for implementation of the project is included. Author

N73-19985* Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Data Systems Div.
THE MESA ARIZONA PUPIL TRACKING SYSTEM
D. L. Wright *In its* JPL Quart. Tech. Rev., Vol. 2, No. 4 1973 p 87-92
CSCL 05E

A computer-based Pupil Tracking/Teacher Monitoring System was designed for Mesa Public Schools, Mesa, Arizona. The established objectives of the system were to: (1) facilitate the economical collection and storage of student performance data necessary to objectively evaluate the relative effectiveness of teachers, instructional methods, materials, and applied concepts; and (2) identify, on a daily basis, those students requiring special attention in specific subject areas. The system encompasses computer hardware/software and integrated curricula progression/administration devices. It provides daily evaluation and monitoring of performance as students progress at class or individualized rates. In the process, it notifies the student and collects information necessary to validate or invalidate subject presentation devices, methods, materials, and measurement devices in terms of direct benefit to the students. The system utilizes a small-scale computer (e.g., IBM 1130) to assure low-cost replicability, and may be used for many subjects of instruction. Author

N73-19988# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany).
[ORGANIZATION OF DFVLR AND RESEARCH ACTIVITIES DURING 1971] Annual Report, 1971
1971 494 p refs In GERMAN
Avail: NTIS HC $26.75

The organization and management of the society are outlined and research work is reported in the following faculties: fluid mechanics, aeromechanics and flight control, solid materials and construction methods, propulsion and energy, electronics, aerospace physics, space simulation, and aerospace medicine. Transl. by G.G.

N73-20273*# TRW Systems Group, Redondo Beach, Calif.
DEFINITION OF EXPERIMENTS AND INSTRUMENTS FOR A COMMUNICATION/NAVIGATION RESEARCH LABORATORY. VOLUME 1: EXECUTIVE SUMMARY
Dec. 1972 49 p refs 4 Vol.
(Contract NAS8-27540)
(NASA-CR-124136; TRW-20405-6001-R0-81-Vol-1) Avail: NTIS HC $4.50 CSCL 14B

This study was undertaken to develop conceptual designs for a manned, space shuttle sortie mission laboratory capable of supporting a wide variety of experiments in conjunction with communications and navigation research. This space/laboratory would be one in which man may effectively increase experiment efficiency by certain observations, modifications, setup, calibration, and limited maintenance steps. In addition, man may monitor experiment progress and perform preliminary data evaluation to verify proper equipment functioning and may terminate or redirect experiments to obtain the most desirable end results. The flexibility and unique capabilities of man as an experimenter in such a laboratory will add greatly to the simplification of space experiments and this provides the basis for commonality in many of the supportive subsystems, thus reaping the benefits of reusability and reduced experiment costs. Author

N73-20280# Saphier, Lerner, Schindler, Environetics, Inc., New York.
NEW YORK OFFSHORE AIRPORT FEASIBILITY STUDY
Lawrence Lerner and Marshall A. Graham Washington FAA Mar. 1973 31 p
(Contract DOT-FA71WA-2626)
(FAA-RD-73-45) Avail: NTIS HC $3.50

The technical and economic feasibility of an offshore airport for the New York Metropolitan region are discussed. The study included analyses of a series of major tasks and subtasks which affect airport planning including: (1) air traffic projections, (2) air traffic control, (3) meteorology, airport design and layout, (4) oceanographic and geologic factors, (5) facilities engineering and construction (with particular emphasis on the special factors due to the site on water), (6) ground access systems, and (7) environmental factors such as marine ecology, noise and air pollution, solid waste disposal and radioactivity. A multimodal concept was considered including a deep-draft harbor at the selected location. Review of these program areas led to the conclusion that the selected site should be south of the barrier beaches of Long Island and that the development of this offshore airport is feasible. Author

N73-20387*# Delaware Univ., Newark. Coll. of Marine Studies.
APPLICATION OF ECOLOGICAL, GEOLOGICAL AND OCEANOGRAPHIC ERTS-1 IMAGERY TO DELAWARE'S COASTAL RESOURCES PLANNING Progress Report, Jan. - Feb. 1973
V. Klemas 29 Mar. 1973 7 p refs
(Contract NAS5-21837)
(E73-10426; NASA-CR-131216) Avail: NTIS HC $3.00 CSCL 08A

The author has identified the following significant results. Communities containing four different coastal vegetation species, developed marshlands, and fresh water impoundments have been identified in ERTS-1 images. Ground measurements of suspended sediment load have been correlated with tonal variations in band 5.

N73-20482# Committee on Science and Astronautics (U. S. House).
FOURTH ANNUAL REPORT OF THE NATIONAL SCIENCE BOARD
Washington GPO 1972 118 p refs Hearing before Comm. on Sci. and Astron., 92d Congr., 2d Sess., No. 21, 26 Apr. 1972
Avail: Comm. on Sci. and Astronaut

The social implications of governmental involvement in aerospace research and development are discussed. The testimony of various members of the National Science Board as to the advantages and disadvantages of increased governmental control in this discipline as well as in the other sciences is included. This testimony was aimed at a development of an up-to-date national technology policy to provide the most effective methods to ensure the continuation of top quality scientific research and development. J.M.M.

N73-20720# Federal Aviation Administration, Washington, D.C.
AN OVERVIEW OF THE FAA ENGINEERING AND DEVELOPMENT PROGRAMS, 1973 - 1974

Mar. 1973 64 p refs
(FAA-EM-73-2) Avail: NTIS HC $5.25

FAA efforts to improve aircraft traffic control on the ground, near the airport, and en route are discussed. The engineering and development programs described in this document are intended to assist all airport users and operators, including general aviation, air carriers, and military. The programs will improve the safety and efficiency of air travel and thereby increase its public acceptance. They will benefit passengers, pilots, the airlines, airport operators and aircraft owners alike. Author

N73-20886*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SCIENTIFIC INVOLVEMENT IN SKYLAB BY THE SPACE SCIENCES LABORATORY OF THE MARSHALL SPACE FLIGHT CENTER
Carl E. Winkler, ed. 28 Feb. 1973 124 p refs
(NASA-TM-X-64725) Avail: NTIS HC $8.25 CSCL 22B

The involvement of the Marshall Space Flight Center's Space Sciences Laboratory in the Skylab program from the early feasibility studies through the analysis and publication of flight scientific and technical results is described. This includes mission operations support, the Apollo telescope mount, materials science/manufacturing in space, optical contamination, environmental and thermal criteria, and several corollary measurements and experiments. Author

N73-20955# Deutsche Gesellschaft fuer Luft- und Raumfahrt, Porz (West Germany).
MANAGEMENT IN SCIENCE AND TECHNOLOGY. PUBLICATION IN HONOR OF THEODOR BENECKE [MANAGEMENT IN WISSENSCHAFT UND TECHNIK. FESTSCHRIFT FUER THEODOR BENECKE]
Sep. 1971 295 p refs In GERMAN; partly in ENGLISH and ITALIAN
Avail: NTIS HC $16.75

A historical review on organizational developments of the German aeronautical societies is followed by a description of management methods for modern aerospace research facilities.

N73-20960 National Aero- and Astronautical Research Inst., Amsterdam (Netherlands).
SOME GUIDELINES ON DIRECTION, MANAGEMENT, AND ACTIVITIES OF THE NLR [EINIGE HAUPTLINIEN VON LEITUNG, MANAGEMENT UND TAETIGKEITSFELD DER NATIONALEN LUFT-UND RAUMFAHRTVERSUCHSANSTALT IN DEN NIEDERLANDEN]
Hendricus I. VanderMaas and Anthonie Marx *In* DFVLR Management in Sci. and Technol. Sep. 1971 p 88-113 In GERMAN

Organization, management, and activities at the National Institute for Aerospace Research of the Netherlands are reported. Scientific projects consider the development of lightweight aircraft configurations with good aerodynamic properties for civilian as well as military applications. Technological research is limited to guidance and control of rockets, systems analyses, materials and construction for aerospace environments, and space simulation. Cooperation of the institute with AGARD members contributes to general scientific and technical aerospace developments.
Transl. by G.G.

N73-20962 Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany).
SOME THOUGHTS ON RESEARCH MANAGEMENT TODAY [EINIGE GEDANKEN ZUR FORSCHUNGSFUEHRUNG HEUTE]
Karl Doetsch *In its* Management in Sci. and Technol. Sep. 1971 p 147-161 refs In GERMAN

Successful organizational management of a large research institute requires the cooperation between scientists and administration personnel. The institute director contributes to the selection and assignment of scientific personnel, initiates and supports additional training, improves the working environment, and furthers scientific exchanges between the institute and other research centers. One of the most difficult problems constitutes funding and the distribution of moneys available. Transl. by G.G.

N73-20963 Air Force Systems Command, Washington, D.C.
EFFECTS OF DEFICIENCY IN FUNDING OF RESEARCH AND DEVELOPMENT
Georg E. Knausenberger *In* DFVLR Management in Sci. and Technol. Sep. 1971 p 163-175 refs

Using available statistical data for quantitative reasoning, the expense increase of technological systems due to cuts in research and development funds is broadly argued. Author

N73-20964 Institute for Defense Analyses, Washington, D.C.
COST AND ECONOMIC FACTORS IN AEROSPACE SYSTEM DEVELOPMENT
Alexander H. Flax *In* DFVLR Management in Sci. and Technol. Sep. 1971 p 176-209 refs

The advancement of technology in aerospace systems increases cost of development and production of such systems depending on the rate at which the new technology is introduced. Control of the technology introduction rate and proper assessment of cost and cost uncertainties are important functions of systems management. G.G.

N73-20966 Institut Franco-Allemand de Recherches, St. Louis (France).
ON THE IMPORTANCE OF MODERN MANAGEMENT [ZUR BEDEUTUNG DES MODERNEN MANAGEMENTS]
Rudi Schall *In* DFVLR Management in Sci. and Technol. Sep. 1971 p 219-225 refs In GERMAN

Operational management is responsible for technological progress and the productivity and economic growth of a society. The manager is part of the selection process that evaluates new developments and technologies before industralization for their useful and damaging effects. It is concluded that managers form a creative element that influences the future of society.
Transl. by G.G.

N73-20967 Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany).
MANAGEMENT IN RESEARCH [MANAGEMENT IN DER FORSCHUNG]
Heinz Busch *In* DFVLR Management in Sci. and Technol. Sep. 1971 p 226-241 In GERMAN

Management of basic and applied research as basis for technological applications is the crucial factor in economic and social developments. Exact long term planning of research project timetables and costs as well as control and evaluation of required modern management methods are adapted to the special problems involved. Transl. by G.G.

N73-20968 Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Cologne (West Germany).
FUTURISTIC VIEWPOINTS FOR MANAGING A MAJOR RESEARCH FACILITY [ZUKUNFTSORIENTIERTE GESICHTSPUNKTE BEIM FUEHREN EINER GROSSFORSCHUNGS-EINRICHTUNG (MIT HINWEISEN AUF DIE LUFT- UND RAUMFAHRTFORSCHUNG)]
Manfred Schroeder *In its* Management in Sci. and Technol. Sep. 1971 p 242-256 refs In GERMAN

Advanced automation and the application of modern technologies require close cooperation between research management, university, industry, and government. Successful management of a large research organization considers goal

definition, public relations, motivation, education, and co-determination as primary tools. It is suggested that advanced co-determination models are developed that provide input from institute scientists and engineers into the management process and the selection of research projects. Computer and nuclear technologies are also valuable contributors to technical developments in aerospace research. Transl. by G.G.

N73-20976# Committee on Commerce (U. S. Senate).
ENERGY RESEARCH AND DEVELOPMENT
Washington GPO 1972 380 p refs Hearings on Amendment 364 to S. 1684 before Comm. on Com., 92d Congr., 2d Sess., 15-16 Mar. 1972
Avail: Comm. on Com.

Senate hearings on the research and development of electric power production and related industries are reported. The objectives are to survey the need for and to appraise the workability of a Federal power research and development program and to assist private industry in ecologically constructive efforts to guarantee the present and future power needs of the U.S.
J.M.M.

N73-20994# Institute for Defense Analyses, Arlington, Va. Science and Technology Div.
DESCRIPTION AND CRITIQUE OF QUANTITATIVE METHODS FOR THE ALLOCATION OF EXPLORATORY DEVELOPMENT RESOURCES
Charles L. Trozzo May 1972 189 p refs
(Contract DAHC15-67-C-0011)
(AD-753817; P-731; IDA/HQ-72-13903) Avail: NTIS CSCL 05/1

The paper analyzes ten methods for planning the allocation of resources among projects within the exploratory development category of the Defense research, development, test and evaluation program. Each method is described in terms of a general framework of planning methods and of the factors that influence the allocation of development resources. A comparative analysis is made of the relative strengths and weaknesses of these methods. The more quantitative methods are considered complex and difficult to apply. The less quantitative methods, frameworks for recording and transmitting information, are seen as less likely to mislead program management than the more quantitative ones. Consequently, managers may find some one of these to be a convenient framework for organizing the information that they need in deciding the allocation of development resources.
Author (GRA)

N73-21076# Defense Documentation Center, Alexandria, Va.
SUPERSONIC TRANSPORTS Report Bibliography, Oct. 1971 - Dec. 1971
Feb. 1973 172 p refs
(AD-755600; DDC-TAS-72-72) Avail: NTIS CSCL 01/3

The bibliography is a compilation of references on Supersonic Transports. Citations are numerically sequenced within each of the following thirteen major headings: I. General and Comprehensive Studies; II. Program Management and Financial Analysis; III. Airport Compatibility, Ground Operations, and Air Traffic Control; IV. Sonic Boom, Aircraft and Engine Noise; V. Aerodynamics; VI. Airframes: Structural Design and Analysis; VII. Airframes: Materials and Coatings; VIII. Systems: Electronic and Electrical; IX. Systems: Hydraulic; X. Systems: Environmental and Safety; XI. Systems: Engine Intake and Exhaust; XII. Systems: Engine Fuel, Control and Lubrication; and XIII. Engines. This document supersedes AD-853100 and AD-501950. Corporate Author-Monitoring Agency, Subject, Title, Personal Author, Contract, Report Number, and AD - Number Indexes are included. Author (GRA)

N73-21348* California Univ., Berkeley.
INTRODUCTION
Robert N. Colwell *In its* An Integrated Study of Earth Resources in the State of Calif. Using Remote Sensing Tech. 1 Feb. 1971 8 p
CSCL 08F

Management of earth resources requires accurate knowledge of inventories. Developments of improved remote sensing devices and vehicles for their transport, and automatic data processing equipment and techniques are important management tools for an integrated earth resources survey in California. G.G.

N73-21349* California Univ., Berkeley. Social Sciences Group.
DEFINITION OF EARTH RESOURCE POLICY AND MANAGEMENT PROBLEMS IN CALIFORNIA
C. West Churchman and Ibrohim Clark *In its* An Integrated Study of Earth Resources in the State of Calif. Using Remote Sensing Tech. 1 Feb. 1971 10 p

CSCL 05A

Management planning for the California water survey considers the use of satellite and airplane remote sensing information on water-source, -center, and -sink geographies. A model is developed for estimating the social benefit of water resource information and to identify the most important types of resource information relevant to regulatory agencies and the private sector. G.G.

N73-21512 Joint Publications Research Service, Arlington, Va.
CONSERVATION OF LAKE BAYKAL
Yu. A. Izrael and A. A. Zenin *In its* Meteorol. and Hydrol., No. 1, Jan. 1973 15 Mar. 1973 p 16-22

The modern state of Lake Baykal, Russia, and the measures to protect the lake under the conditions of intense economic development of its basin are described. Data are presented on the effect of the purified discharges of the Baykal cellulose plant on the composition of the lake water. Some approaches to standardizing the discharge of polluted material into bodies of water are indicated. Author

N73-21877 George Washington Univ., Washington, D.C.
IMPROVING COST ESTIMATING AND ANALYSIS IN DOD AND NASA Ph.D. Thesis
Bruce Nelson Baker 1972 193 p
Avail: Univ. Microfilms Order No. 72-19736

A critique of cost estimating techniques and procedures in NASA and DOD is presented emphasizing the major factors contributing to cost overruns. Research interviews were conducted with appropriate government officials to determine personal attitudes toward present and possible future cost estimating techniques. These interviews, in addition to questionnaires, showed that a majority of respondents distrust the parametric approach to cost estimating, but favor detailed engineering methods to reduce overruns. It is pointed out that since the Blue Ribbon Defense Panel urged the adoption of parametric approaches, either a widespread change in the prevailing attitude or a policy revision will be necessary in the near future. Dissert. Abstr.

N73-21879*# Syracuse Univ., N.Y.
MANNED SPACE FLIGHT IN TRANSITION Final Report
Eugene E. Drucker, William S. Pooler, David L. Wilemon, and Bernard D. Wood Mar. 1973 74 p
(Grant NGR-33-022-139)
(NASA-CR-131931) Avail: NTIS HC $5.75 CSCL 05A

A study was conducted to analyze the reorientation of NASA programs in the post-Apollo period. The study is an external view of NASA by unbiased observers as an input to and aid in the decision making process concerning near and long term planning. The subjects discussed are: (1) the near-term NASA scenario; (2) organization of field centers; (3) planning activities; and (4) operational activities. A summary of the recommendations arising as a result of the study is presented. Author

N73-21880*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ADAPTING THE GODDARD RESEARCH AND ENGINEER-

ING MANAGEMENT EXERCISE (GREMEX) TO NONSPACECRAFT ENVIRONMENTS
Robert O. Wales Washington Apr. 1973 66 p
(NASA-TN-D-7238; G-1080) Avail: NTIS HC $3.00 CSCL 05A

A computerized training aid for all levels of research and development managers is presented. The computer model used for NASA training simulates development of a spacecraft. Operation of the model is described together with instructions for changing the input-data cards to alter the nomenclature and response of the model for use in other training environments. Author

N73-21884# Joint Publications Research Service, Arlington, Va.
DETERMINING ECONOMIC EFFECTIVENESS OF INDUSTRIAL AUTOMATIC CONTROL SYSTEMS
6 Apr. 1973 9 p Transl. into ENGLISH from Ekon. Gazeta (Moscow), no. 8, Feb. 1973 p 22
(JPRS-58680) Avail: NTIS HC $3.00

The economic effectiveness of planned industrial automatic control systems is discussed in terms of increased labor productivity, optimal reserves of material resources, increased production of goods, and more effective management. Specific methods are recommended for the reduction of industrial costs, as well as for quality improvement measures in a wide variety of industrial parameters. J.M.M.

N73-21887# Joint Publications Research Service, Arlington, Va.
ROLE OF USSR SCIENTIFIC CENTERS IN ECONOMIC DEVELOPMENT OUTLINED
V. I. Duzhenkov 9 Apr. 1973 15 p Transl. into ENGLISH from Priroda (Moscow), no. 11, 1972 p 2-7
(JPRS-58683) Avail: NTIS HC $3.00

An analysis is presented of the problems of the formation, development and placement of scientific centers and their role in the study and development of the productive forces of the country. Author

N73-21893# Stanford Research Inst., Menlo Park, Calif.
SUPPORT OF ENVIRONMENTAL PROGRAM PLANNING Final Report
James L. Mackin Oct. 1972 447 p refs
(Contract N00014-72-C-0445; ARPA Order 2195; NR Proj. 089-091; SRI Proj. 1878)
(AD-754784) Avail: NTIS CSCL 13/2

Principal environmental problem areas of importance to the Department of Defense were identified and possible approaches to advanced research projects directed toward solutions of these problems were suggested to provide partial source material in support of Defense Advanced Research Projects Agency's research program planning. Topics regarding environmental impact analysis, resources management, air quality, water quality, materials handling and disposal, data management and special problems were included. For each topic, information was organized according to statement of the problem, state of the art, present activities and organization, implications for the DOD, and recommendations for further studies. Author (GRA)

N73-21917# Aviation Advisory Commission, Washington, D.C.
THE LONG RANGE NEEDS OF AVIATION
1 Jan. 1973 256 p refs
Avail: NTIS HC $15.00

An investigation is made of a wide range of problems affecting civil aviation in the United States today. Among these are: the airport environment; air and ground congestion; the need for service to small communities; the role of private aviation; the multijurisdictional process; the ailing aerospace manufacturing industry; the ensnarled regulatory process; and safety. Recommendations aimed at equitable solutions for these problems are provided. J.M.M.

N73-21977# National Bureau of Standards, Washington, D.C. Technical Analysis Div.
PROJECT SOAP: A SYSTEMS APPROACH TO BIOMEDICAL RESEARCH PROGRAM MANAGEMENT, A CASE STUDY Final Report
Robert S. Cutler Apr. 1973 74 p refs
(NBS Proj. 4310900)
(NBS-TN-761) Avail: SOD $0.95 domestic postpaid or $0.70 GPO Bookstore as C13.46:761

A description is made of the activities of an interagency task group that applied systems analysis to improve management controls within a biomedical research agency of the federal government. The results were the formulation and implementation of a discipline for program management which explicitly makes use of multiple criteria in arriving at resource allocation decisions. The text details the necesssry preliminary analysis describing operational activities, information flows, and key decision points within the organization. It goes on to identify the techniques employed and the difficulties encountered while attempting to improve the decision-making process for selecting research projects, under conditions of reduced funding. A procedure which organizes relevant information for research program planning and evaluation is presented, and extension of this recommended procedure to wider use by science administrators elsewhere in government is discussed. Author

N73-22049# Defence Research Analysis Establishment, Ottawa (Ontario).
SOME RESULTS OF A TEST AT CANADIAN FORCES BASE UPLANDS OF A MEASURE OF WORK AND RESPONSIBILITY
D. R. Hansen Feb. 1973 33 p refs
(DRAE-M45) Avail: NTIS HC $3.75

A pilot study has shown time-span of discretion to be applicable as a measure of military work and responsibility. Based on this measure, the median value of work level for each military rank except three, showed a significant and systematic upward progression with increased rank. The three exceptions proved to be the ones which were either known or suspected to constitute anomalies in the rank structure. The uniformity of the progression of time-span with rank lends support to those who contend that time-span of discretion is the measure used intuitively by everyone to assess level of work. The results of the study indicate that more extensive testing of these methods is merited. Author

N73-22132# Hamburg Univ. (West Germany). Fachbereichs Mathematik.
BAYES DYNAMIC DECISION AND STOP MODELS Ph.D. Thesis [BAYESSOHE DYNAMISCHE ENTSCHEIDUNGS- UND STOPPMODELLE]
Ulrich Rieder 1972 141 p refs In GERMAN
Avail: NTIS HC $9.25

The application of Bayes dynamics for optimal decision and stop models containing an unknown factor is described. Model calculations for a decision process that can be stopped at anytime at one point and delivers the terminal gain for that point, are presented. Transl. by G.G.

N73-22200# British European Airways, London (England). Corporate Planning Dept.
THE COST OF AIRPORT CONGESTION
J. Richard Graham 1972 31 p refs Presented at the ITA Symp., 29 Nov. 1972
(Rept-73-00315) Avail: NTIS HC $3.75

An account is made of conditions which foster civil airport congestion and flight delays which result in lost resources, wasted time, and inconvenience to paying air passengers. An air industry economic analysis is used to demonstrate the unfeasibility of new airports to cope with the conditions owing to adverse social and environmental factors. It rather is interpreted to conclude that the most viable method of dealing with congestion and delay must involve investment, on the part of the airlines, in larger aircraft to provide improved efficiency using already existing facilities. J.M.M.

N73-22207# Federal Aviation Administration, Washington, D.C. Aviation Forecast Div.
PROFILES OF SCHEDULED AIR CARRIER AIRPORT OPERATIONS. TOP 100 US AIRPORTS, FRIDAY 3 NOVEMBER 1972
Jan. 1973 308 p
(Rept-73-00328) Avail: NTIS HC $17.50

Data are provided for total scheduled air carrier aircraft operations by hour of the day for Friday, 3 November 1972, for the top 100 airports within the 50 states of the United States, the District of Columbia, and Puerto Rico. The selection of the top 100 airports was based on a ranking by number of air carrier passenger enplanements in domestic and international service. For each airport, two graphs are provided which depict total arrivals and departures by hour, and detail by hour for domestic trunk, local service, and international (U.S. and foreign flag) passenger operations, plus air taxi and all-cargo operations. Tabular listings of these data are also included. Author

N73-22208# Association of Bay Area Governments, Berkeley, Calif.
REGIONAL AIRPORT SYSTEMS STUDY, FINAL PLAN
Walter E. Gillfillan Jun. 1972 265 p refs Sponsored in part by HUD
(Rept-73-00316) Avail: NTIS HC $15.25

Recommendations for airport planning in the San Francisco Bay Area are presented in terms of projected annual passenger capacities through 1990. Workable plans for a comprehensive regional airport cooperative system include elements of citizen input, organizational influences, goals, decision criteria, and alternatives involved in air traffic policy making as set forth by the Association of Bay Area Governments. Cost estimates, implementation procedures, and long term forcasts of community impact constitute the thrust of the report. J.M.M.

N73-22376# Ocean and Atmospheric Science, Inc., Dobbs Ferry, N.Y.
ENVIRONMENTAL IMPACT STUDY Final Technical Report, 14 Apr. - 31 Oct. 1972
Julius Woolf 8 Nov. 1972 422 p refs
(Contract N00014-72-C-0425; ARPA Order 2195; NR Proj. 089-090)
(AD-754458; OAS-TR-72-116) Avail: NTIS CSCL 13/2

The Defense Advanced Research Projects Agency's (ARPA) Environmental Impact Program is directed toward identifying those scientific and technical areas necessary to achieve satisfactory evaluation and abatement of the environmental impacts of Department of Defense (DOD) activities. The report discusses research from this program and involves high technology problems for which there are current voids not being adequately addressed by others and for which the environmental evaluations require considerable inter-service and inter-agency participation. Presented are recommendations for new facilities and techniques. These include: An Environmental Impact Prediction Facility to assist in evaluating impact on the environment and to provide a data base; Implementation of a model base facility in which all the environmental factors and natural resources could be well controlled; Development of sensor and instrumentation techniques for environmental monitoring; Study of critical materials to assure a DOD supply; Environmental management so that DOD's pollution efforts will be recognized by the civilian community; and Pilot project to achieve insight and know-how prior to the start of the actual Environmental Impact Prediction Facility. Also described is an effort toward identifying research needed to support future environmental impact statements. Assessment and evaluation of current impact statements were used to determine potential difficulties. GRA

N73-22778*# McDonnell-Douglas Corp., Huntington Beach, Calif.
EARTH ORBITAL EXPERIMENT PROGRAM AND REQUIREMENTS STUDY, VOLUME 1, SECTIONS 1 - 6
[1971] 793 p refs 8 Vol.
(Contract NAS1-9464)
(NASA-CR-112325) Avail: NTIS HC $41.75 CSCL 22A

A reference manual for planners of manned earth-orbital research activity is presented. The manual serves as a systems approach to experiment and mission planning based on an integrated consideration of candidate research programs and the appropriate vehicle, mission, and technology development requirements. Long range goals and objectives for NASA activities during the 1970 to 1980 time period are analyzed. The useful and proper roles of manned and automated spacecraft for implementing NASA experiments are described. An integrated consideration of NASA long range goals and objectives, the system and mission requirements, and the alternative implementation plans are developed. Specific areas of investigation are: (1) manned space flight requirements, (2) space biology, (3) spaceborne astronomy, (4) space communications and navigation, (5) earth observation, (6) supporting technology development requirements, (7) data management system matrices, (8) instrumentation matrices, and (9) biotechnology laboratory experiments. Author

N73-22857# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Space Div.
THE ESTABLISHMENT OF REQUIREMENTS AND RECOMMENDATIONS FOR SPACECRAFT STRUCTURES Final Report
30 Nov. 1972 129 p
(Contract ESTEC-1535/71-HP; MBB Proj. 6.608.7)
(ESRO-CR(P)-200) Avail: NTIS HC $8.50

The establishment of procedures for the compilation of a guide to spacecraft structural design requirements is presented. An organization and management scheme to generate the ultimate guide document is described and a method of data collection and analysis is outlined. A program plan describing the flow of work is given and various cost breakdowns are included. A preliminary specification for the guide is given in an appendix. ESRO

N73-22858# Hawker Siddeley Dynamics, Ltd., Hatfield (England). Space Div.
REPORT ON A STUDY OF THE COMPILATION OF AN ESRO STRUCTURES AND MECHANISMS DESIGN REQUIREMENT DOCUMENT FOR SPACECRAFT
J. K. Bennett, comp. Dec. 1972 61 p
(Contract ESTEC-1536/71-HP)
(HSD-TP-7363; ESRO-CR(P)-224) Avail: NTIS HC $5.25

The compilation of guidelines for the requirements of spacecraft structural design is discussed and the methods used for a preliminary study detailed. Contents and chapter headings of the guide are proposed and the grouping and inter-relation of subjects discussed. Possible methods of compilation are given, together with costs and time scales. A recommended solution is considered. ESRO

N73-22911# Office of the Secretary of Transportation, Washington, D.C.
NATIONAL TRANSPORTATION REPORT; 1972: PRESENT STATUS, FUTURE ALTERNATIVES
Jul. 1972 449 p refs
(Rept-72-02328) Avail: NTIS MF $0.95; SOD HC $3.25

A comprehensive overview and future outlook of transportation are presented. Estimates of investment needs and program priorities as seen by states, local governments, and the private sector are included along with analyses of selected issues in urban and intercity transportation. Guidelines for future action by federal, state, and local governments, and the private sector are provided. Author

N73-22927# Committee on Science and Astronautics, (U. S. House).
SCIENCE, TECHNOLOGY, AND THE ECONOMY Interim Report of the Subcommittee on Science, Research, and Development

John W. Davis Washington GPO Feb. 1972 44 p refs Presented by Subcomm. on Sci., Res., and Develop. to the Comm. on Sci. and Astronaut., 92d Congr., 2d Sess., 16 Feb. 1972
Avail: US Capitol, House Document Room

A detailed study by the Subcommittee on Science, Research, and Development concerning the relationship between science, technology, and the economy is presented. The objective is to answer two questions: what total resources should the United States invest in research and development in both the public and private sectors, and what are the optimum ways for making these investments? This interim report reviews the progress of the study and identifies those legislative issues which the subcommittee feels deserve further considerations by the Congress. Author

N73-22928# Committee on Science and Astronautics (U. S. House).
THE FEDERAL GOVERNMENT AND ENERGY RESEARCH AND DEVELOPMENT HISTORICAL BACKGROUND
Washington GPO Mar. 1973 111 p refs Presented by Subcomm. on Energy to the Comm. on Sci. and Astronaut., 93d Congr., 1st Sess., 20 Mar. 1973 Prepared by Library of Congr.
Avail: US Capitol, House Document Room

A congressional study is reported on the history of American energy production methods and techniques aimed at a comprehensive national energy research and development policy. Pertinent testimony was obtained from such authorities as the Department of the Interior, the National Bureau of Standards, the Federal Power Commission, the Tennessee Valley Authority, NASA, and sources from private industry. Results of the study revealed the need for a unified national policy directly sensitive to increased present and future power requirements. J.M.M.

N73-22929# Committee on Science and Astronautics (U. S. House).
AUTHORIZING APPROPRIATIONS TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Olin E. Teague Washington GPO 1973 191 p Rept. on H.R. 7528 presented by Comm. on Sci. and Astronaut. to the Comm. of the Whole House on the State of the Union, 93d Congr., 1st Sess., 9 May 1973
(H-Rept-93-171) Avail: US Capitol, House Document Room

The authorized appropriation for fiscal year 1974 to NASA for research and development, constructions of facilities, and research and program management are reported. The R and D appropriation includes space flight operations, space shuttle, advanced missions, physics and astronomy, lunar and planetary exploration, launch vehicle procurement, space applications, aeronautical research and technology, tracking and data acquisition, and technology utilization. The construction/modification projects are listed along with the research and program management appropriations for government installations. F.O.S.

N73-22932*# California Univ., Berkeley. Inst. of Transportation and Traffic Engineering.
FORECASTING THE DEMAND POTENTIAL FOR STOL AIR TRANSPORTATION
Shing-Leung Fan, Robert Horonjeff, Adib Kanafani, and Abdollah Mogharabi Feb. 1973 127 p refs
(Contract NAS2-6717)
(NASA-CR-114572) Avail: NTIS HC $8.50 CSCL 05C

A process for predicting the potential demand for STOL aircraft was investigated to provide a conceptual framework, and an analytical methodology for estimating the STOL air transportation market. It was found that: (1) schedule frequency has the strongest effect on the traveler's choice among available routes, (2) work related business constitutes approximately 50% of total travel volume, and (3) air travel demand follows economic trends. F.O.S.

N73-22933# Federal Aviation Administration, Washington, D.C.
A LOOK AT TOURISM POTENTIAL, PART 3
R. B. Bratbak May 1972 26 p
Avail: NTIS HC $3.50

A survey of U.S. tourism potential is presented. Hypotheses concerning the economic stages of nations and individual travel preferences are discussed. F.O.S.

N73-22934# Committee on Armed Services (U. S. Senate).
WEAPON SYSTEMS ACQUISITION PROCESS
Washington GPO 1972 46 p Hearing before Comm. on Armed Serv., 92d Congr., 2d Sess., 12 May 1972
Avail: Comm. on Armed Serv.

The Committee on Armed Services for the United States Congress considers the development of a prototype lightweight fighter aircraft. Weapon systems acquisition aspects of funding, planning, and management are discussed. G.G.

N73-22939*# George Washington Univ., Washington, D.C. Program of Policy Studies in Science and Technology.
TECHNOLOGY AND PUBLIC POLICY: THE PROCESS OF TECHNOLOGY ASSESSMENT IN THE FEDERAL GOVERNMENT. SUMMARY REPORT
Vary T. Coates Jul. 1972 50 p 3 Vol.
(Grants NGL-09-010-030; NSF GI-30422)
(NASA-CR-131846; PB-211455) Avail: NTIS HC $4.50 CSCL 05A

The report describing the process of planning, programming, and evaluating technological projects and programs as carried out by offices within federal executive agencies is summarized. Author (GRA)

N73-22940*# George Washington Univ., Washington, D.C. Programs of Policy Studies in Science and Technology.
TECHNOLOGY AND PUBLIC POLICY: THE PROCESS OF TECHNOLOGY ASSESSMENT IN THE FEDERAL GOVERNMENT. VOLUME 1: FINAL REPORT
Vary T. Coates Jul. 1972 355 p refs 3 Vol.
(Grants NGL-09-010-030; NSF GI-30422)
(NASA-CR-131848; PB-211453) Avail: NTIS HC $19.75 CSCL 05A

A descriptive and analytical study was made of the process of planning, programming, and evaluation of technological projects and programs as carried out by 86 offices within federal executive agencies. The focus is on the extent to which techniques of technology assessment are used, based on interviews with 115 officials. Ninety-seven illustrative studies are analyzed as to their initiation, sponsors, research teams, methodology, duration, level of effort, and dissemination. The report considers technology assessment activity in the areas of food and fibers, housing, biomedical, water resources, power generation, minerals extraction, and transportation technology. It concludes that the federal technology assessment process has been broadened in the last five years to give increased attention to secondary consequences of technology but that the improvement is slow and differs from agency to agency. Recommendations for further improvement are offered. A bibliography on technology assessment is included. Author (GRA)

N73-22941*# George Washington Univ., Washington, D.C. Program of Policy Studies in Science and Technology.
TECHNOLOGY AND PUBLIC POLICY: THE PROCESS OF TECHNOLOGY ASSESSMENT IN THE FEDERAL GOVERNMENT. VOLUME 2: APPENDICES
Vary T. Coates Jul. 1972 263 p refs 3 Vol.
(Grants NGL-09-010-030; NSF GI-30422)
(NASA-CR-131847; PB-211454) Avail: NTIS HC $15.25 CSCL 05A

Volume 2 (Appendices) includes: Descriptions of 86 offices within federal executive agencies, with brief details of mission and responsibilities, technology assessment activities, future research, staff, special techniques used, coordination with other offices and agencies, effect on workload of Nat. Environmental Policy Act of 1969; Data sheets describing 97 illustrative examples of federal technology assessment and closely related research; List of interviews; Questions used in interviewing. Author (GRA)

N73-23206 System Development Corp., Santa Monica, Calif.
A VOCAL DATA MANAGEMENT SYSTEM
Jeffrey Barnett *In* IEEE The 1972 Conf. on Speech Commun. and Process. 22 Feb. 1972 p 340-343 refs

(Contract DAHC15-67-C-0149)

An implementation strategy for a vocal data management system (VDMS) is described. VDMS will accept connected speech of a language describable by 25 to 50 phrase equations and having a vocabulary of approximately 1000 words formed from about 100 data records. The strategy is based on the concept of predictive linguistic constraints (PLC). The present concepts of fixed directionality in parsing are replaced by a more generalized approach. To facilitate this flexibility, the system comprises a set of near-independent co-routines that are interconnected by a software bussing structure. The VDMS acoustic processors verify the predictions. Very loose matching criteria are used for locating the predicted words. Special attention is given to word segments that are experimentally determined to be most invariant. Author

N73-23296* Hughes Aircraft Co., Newport Beach, Calif.
CABLE MANUFACTURE
Paul Gamble *In* NASA. Marshall Space Flight Center Flat Conductor Cable Symp. 8 Dec. 1972 22 p refs

CSCL 09A

A survey is presented of flat electrical cable manufacturing, with particular reference to patented processes. The economics of manufacture based on an analysis of material and operating costs is considered for the various methods. Attention is given to the competitive advantages of the several processes and their resulting products. The historical area of flat cable manufacture is presented to give a frame of reference for the survey. Author

N73-23312* North American Rockwell Corp., Downey, Calif.
STATUS AND AVAILABILITY OF FCC HARDWARE
G. K. Romriell *In* NASA. Marshall Space Flight Center Flat Conductor Cable Symp. 8 Dec. 1973 5 p

CSCL 09A

The source availability of FCC and/or FCC connectors was surveyed. The results for the following areas are presented: (1) cost of FCC versus standard round cable, (2) qualification status, (3) size of wire available in FCC, (4) availability of hermetic connectors for FCC, (5) conversion from flat cable to round cable and visa versa, (6) availability of shielded flat cable for RF usage, (7) termination techniques, and (8) repair techniques. F.O.S.

N73-23442*# Minnesota State Planning Agency, St. Paul.
LAND USE MANAGEMENT IN MINNESOTA Progress Report, 1 Mar. - 30 Apr. 1973
Joseph E. Sizer, Principal Investigator 30 Apr. 1973 6 p ERTS (Contract NAS5-21801)
(E73-10581; NASA-CR-131885) Avail: NTIS HC $3.00 CSCL 08B

There are no author-identified significant results in this report.

N73-23840*# IIT Research Inst., Chicago, Ill. Astro Sciences Center.
COST ESTIMATION FOR UNMANNED LUNAR AND PLANETARY PROGRAMS
J. H. Dunkin, P. R. Pekar, D. J. Spadoni, and C. A. Stone Jan. 1973 115 p
(NASA-CR-131897; C-10) Avail: NTIS HC $7.75 CSCL 22A

A basic model is presented for estimating the cost of unmanned lunar and planetary programs. Cost data were collected and analyzed for eight lunar and planetary programs. Total cost was separated into the following components: labor, overhead, materials, and technical support. The study determined that direct labor cost of unmanned lunar and planetary programs comprises 30 percent of the total program cost. Twelve program categories were defined for modeling: six spacecraft subsystem categories (science, structure, propulsion, electrical power, communications, and guidance and integration, test and quality assurance, launch and flight operations, ground equipment, systems analysis and engineering, and program management). An analysis showed that on a percentage basis, direct labor cost and direct labor manhours compare on a one-to-one ratio. Therefore, direct labor hours is used as the parameter for predicting cost, with the advantage of eliminating the effect of inflation on the analysis. Author

N73-23882 Massachusetts Inst. of Tech., Cambridge.
MAN'S ROLE IN INTEGRATED CONTROL AND INFORMATION MANAGEMENT SYSTEMS
J. L. Nevins and I. S. Johnson *In* AGARD Automation in Manned Aerospace Systems Mar. 1973 7 p refs

An information processing and data management system is reported that relieves man's role in such tasks as pre-flight subsystem checkout and periodic system status checks. The prototype generalized display and command technique outlined features a pushplate interactive control scheme with graphic display in connection with an airborne computer. G.G.

N73-23960# Committee on Aeronautical and Space Sciences (U. S. Senate).
NASA AUTHORIZATION FOR FISCAL YEAR 1974, PART 2
Washington GPO 1973 809 p refs Hearings on S. 880 before Comm. on Aeron. and Space Sci., 93d Sess., 1st Sess., 12, 14-15, and 21-22 Mar. 1973
Avail: Comm. on Aeron. and Space Sci.

The hearings concerning the budget requirements for NASA activities during fiscal year 1974 are reported. The accomplishments by OSS during 1972 are reviewed, and the status of current programs is discussed along with planned projects. F.O.S.

N73-23964# Comptroller General of the United States, Washington, D.C.
OBSERVATIONS OF VARIOUS ORGANIZATIONS AND INDIVIDUALS ON CERTAIN ASPECTS OF FEDERAL SUPPORT OF PROBLEM-ORIENTED RESEARCH
Elmer B. Staats 28 Mar. 1972 73 p
(B-133183) Avail: NTIS HC $5.75

The NSF Research Applied to National Needs program is described. Views on sponsoring and performing problem oriented research are included for federal, state, and local governments; academic institutions; and industrial organizations. Observations concerning federally sponsored research are presented. F.O.S.

N73-23981# Human Engineering Labs., Aberdeen Proving Ground, Md.
MILITARY REQUIREMENTS FOR RESEARCH ON CONTINUOUS OPERATIONS
David C. Hodge Apr. 1972 207 p refs Conf. held at Lubbock, Tex., 28-29 Sep. 1971
(AD-744782; HEL-TM-12-72; Rept-73-00840) Avail: NTIS HC $12.50 CSCL 05/9

Reports on human performance under sustained work conditions are presented along with papers on interdisciplinary research in graduate programs.

N73-23982 Office of the Chief of Research and Development (Army), Washington, D.C.
REMARKS ON RESEARCH REQUIREMENTS FOR CONTINUOUS OPERATIONS
Jacob L. Barber *In* Human Eng. Labs. Mil. Requirements for Res. on Continuous Operations Apr. 1972 p 1-7 refs

Factors that are important for determining the most useful directions for military research are discussed. The solution to the problem of seeing at night is presented as an example of

using devices that are within or pushing the current state-of-the-art. The army field operations categories of combat, combat support, and combat service support are discussed. F.O.S.

N73-23983 Army Combat Developments Command, Fort Bliss, Tex.
TRENDS IN CURRENT RESEARCH
Louise B. Speck *In* Human Eng. Labs. Mil. Requirements for Res. on Continuous Operations Apr. 1972 p 8-19

On-going research which is relevant to the concept of continuous operations is discussed with emphasis on brain research. Methods to improve human performance in sustained operations are also discussed. F.O.S.

N73-23984 Texas Technological Univ., Lubbock.
UNIVERSITY INTERDISCIPLINARY RESEARCH PANEL
J. Knox Jones, Lawrence L. Graves, and John R. Bradford *In* Human Eng. Labs. Mil. Requirements for Res. on Continuous Operations Apr. 1972 p 20-38

The aspects of interdisciplinary research in graduate programs are discussed. Reducing the number of required courses, and prerequisites are suggested as a means of adapting programs to the individual requirements of the student. F.O.S.

N73-23991 George Washington Univ., Washington, D.C.
THE CONFERENCE SUMMARY
Carl James Lange *In* Human Eng. Labs. Mil. Requirements for Res. on Continuous Operations Apr. 1973 p 188-194

The need for a precise definition of continuous operations, and research strategy are discussed. Suggestions for definite schedules of topics for future conferences are included. F.O.S.

N73-23992*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
A PILOT DEMONSTRATION PROJECT OF TECHNOLOGY APPLICATION FROM THE AEROSPACE INDUSTRY TO CITY MANAGEMENT (FOUR CITIES PROGRAM) Annual Report, 1 Jul. 1971 - Oct. 1972
George F. Ervin and Llyod S. Blomeyer 13 Nov. 1972 51 p Sponsored in part by NSF
(Contract NAS7-100)
(NASA-CR-131918; PB-213836/0; JPL-650-159; AR-1) Avail: NTIS CSCL 05A

The Four Cities Program has completed the first year of the planned two-year program. At the beginning of the first year, a variety of program initiation activities were accomplished. Contracts were negotiated; science and technology advisors were interviewed, selected and assigned; general indoctrination and integration of the advisors into city affairs occurred; technical needs were identified and related projects pursued; pilot projects for the second year were identified; inter-city coordination on technical problems began to emerge; and the general soundness of the four cities program seems to have been established. Above all, the inter-personal relationships between the advisors and their interfaces in city government appear to be functioning smoothly. The establishment of such mutual respect, trusts, and confidences are believed essential to the success of the program. Author (GRA)

N73-24143# Singer Co., Binghamton, N.Y. Simulation Products Div.
NAVAL PILOT TRAINING SYSTEM STUDY. VOLUME 1: BASIC REPORT Final Report
Harry W. Erickson, Duncan W. Simpson, Edward A. Stark, T. R. Dailey, and Banjamin Schohan Orlando, Fla. Naval Training Equipment Center Dec. 1972 585 p refs Prepared in cooperation with N. Am. Aviation, Columbus, Ohio 3 Vol.
(Contracts N61339-72-C-0049; N61339-72-C-0136)
(AD-756638; NAVTRAEQUIPC-72-C-0049-1-Vol-1) Avail: NTIS HC $10.50/set of 3 reports as AD-756638-set CSCL 05/9

The study defined a cost effective program for training Naval fixed-wing pilots during the 1974-1986 time frame. It identified requirements for the Undergraduate Pilot Training program anticipated for that period, and evaluated elements of the current program, and the education and training technologies for their ability to economically fulfill them. The behavior objectives of the future program were defined through the analysis of the flight tasks trained in the present program, likely to be relevant in the future. Major system elements having significant impact on the development of these objectives were identified, and recommendations developed for restructuring the program to reduce cost while maintaining current levels of pilot proficiency. (Author Modified Abstract) GRA

N73-24144# Singer Co., Binghamton, N.Y. Simulation Products Div.
NAVAL PILOT TRAINING SYSTEM STUDY. VOLUME 2: APPENDICES A, B, C, AND D. Final Report
Harry W. Erickson Orlando, Fla. Naval Training Equipment Center Dec. 1972 38 p refs Prepared in cooperation with N. Am. Aviation, Columbus, Ohio 3 Vol.
(Contracts N61339-72-C-0049; N61339-70-C-0136)
(AD-756639; NAVTRAEQUIPC-72-C-0049-1-Vol-2) Avail: NTIS HC $10.50/set of 3 reports as AD-756638-set CSCL 05/9

Contents: Current system definition; Discussion of training objectives; Recommendations; Costs. GRA

N73-24145# Singer Co., Binghamton, N.Y. Simulation Products Div.
NAVAL PILOT TRAINING SYSTEM STUDY. VOLUME 3: EXECUTIVE SUMMARY Final Report
Harry W. Erickson Orlando, Fla. Naval Training Equipment Center Dec. 1972 38 p refs Prepared in cooperation with N. Am. Aviation, Columbus, Ohio 3 Vol.
(Contracts N61339-72-C-0049; N61339-70-C-0136)
(AD-756640; NAVTRAEQUIPC-72-C-0049-1-Vol-3) Avail: NTIS HC $10.50/set of 3 reports as AD-756638-set CSCL 05/9

The study investigated the Naval Undergraduate Pilot (fixed-wing) Training (UPT) Program and produced recommendations for the modification of the program to reduce cost while maintaining the current level of graduate quality. The study analyzed the capabilities of elements of the current system, the pilot training requirements anticipated for the 1974-1986 time period, and capabilities within the pilot training state of the art for economically fulfilling those requirements. Six training system elements, selected for their discrete impact on system cost, training effectiveness and susceptibility to analysis and improvement were evaluated. Two criteria were established for the evaluation of each system element and for the selection of new or modified elements. They are training effectiveness and training cost. GRA

N73-24175 National Lending Library for Science and Technology, Boston Spa (England).
THE DAY OF ELECTRONICS
R. Galley 8 Apr. 1973 6 p refs Transl. into ENGLISH from Postes Telecommun. (Paris), v. 17, no. 197, May 1972 p 3-4 (NLL-PO-2957-(9022.81)) Avail: Natl. Lending Library, Boston Spa, Engl.: 1 NLL photocopy coupon

The industrialization and massive introduction of electronic switching in the telephone network of France is projected. Positive results from an experimental electronic telephone exchange operation are outlined. G.G.

N73-24203 SACLANT ASW Research Center, La Spezia (Italy).
ESTABLISHING SMALL INFORMATION CENTRES IN INDUSTRY
John P. Bethell *In* AGARD Governmental Assistance for Tech. Inform. in Ind. and Simple Mechanization for Small Inform. Centres Mar. 1973 7 p refs

The function of a small information center in mediating between its community and the wider information network is explained, using the analogy of small medical centers. The

differences between the information requirements of industry and those of science are emphasized and the desirability of clearly evaluating an industry's need for information before establishing an information center is indicated. Some of the specific duties of an industrial information center are described and it is stressed that these can now be most efficiently performed by requiring that the senior staff of the center have a broad education in information and its applications. It is recommended that the attitude of the center's staff and its organizational and physical location should be such as to maximize the center's orientation towards its users. Management is warned that some time must elapse before an information center becomes fully effective.
Author

N73-24209 Defence Scientific Information Service, Ottawa (Ontario).
PRESENTING A DEVELOPMENT PLAN FOR APPROVAL
A. C. Jones. *In* AGARD Governmental Assistance for Tech. Inform. in Ind. and Simple Mechanization for Small Inform. Centres Mar. 1973, 5 p refs
The impact of various ways of presenting proposals for creating and developing a new information facility on higher management are reviewed. Some of the difficulties of establishing and presenting user needs are explored, and an analogy is offered on surveying of commodity marketing and salesmanship. Careful tailoring was made to the proposal to suit the management functions and facilitate evaluation. Suggestions are made on objective facility development and proposal merits. Author

N73-24873*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT: GUIDANCE AND CONTROL SYSTEMS. ENGINEERING SIMULATION PROGRAM
David W. Gilbert Washington, Jun. 1973 14 p
(NASA-TN-D-7287; MSC-S-318) Avail: NTIS HC $3.00 CSCL 22B
The Apollo Program experience from early 1962 to July 1969 with respect to the engineering-simulation support and the problems encountered is summarized in this report. Engineering simulation in support of the Apollo guidance and control system is discussed in terms of design analysis and verification, certification of hardware in closed-loop operation, verification of hardware/software compatibility, and verification of both software and procedures for each mission. The magnitude, time, and cost of the engineering simulations are described with respect to hardware availability, NASA and contractor facilities (for verification of the command module, the lunar module, and the primary guidance, navigation, and control system), and scheduling and planning considerations. Recommendations are made regarding implementation of similar, large-scale simulations for future programs. Author

N73-24946*+ National Aeronautics and Space Administration, Washington, D.C.
MANAGEMENT: A CONTINUING LITERATURE SURVEY WITH INDEXES, MARCH 1973
Mar. 1973 116 p refs
(NASA-SP-7500(07)) Avail: NTIS HC $3.00 CSCL 05A
This special bibliography lists 389 reports, articles, and other documents introduced into the NASA scientific and technical information system in 1972. Author

N73-24950# Committee on Aeronautical and Space Sciences (U. S. Senate).
NASA AUTHORIZATION FOR FISCAL YEAR 1974
Frank E. Moss Washington GPO 1973 126 p Report to accompany H.R. 7528 presented by Comm. on Aeron. and Space Sci. at the 93d Congr., 1 Sess., 30 May 1973
(S-Rept-93-179) Avail: NTIS Avail: US Capitol, Senate Document Room
The report is presented concerning the 1974 appropriations to NASA for R and D, construction of facilities, research and program management, and for other purposes. Modifications to existing facilities and rehabilitation projects are included. F.O.S.

N73-24951# Joint Publications Research Service, Arlington, Va.
DEVELOPMENT AND PRACTICAL APPLICATION OF SYSTEMS ANALYSIS
V. I. Bohdanovych, V. T. Kulyk, and A. I. Uyomov 7 May 1973 11 p refs Transl. into ENGLISH from Filosofska Dumka (kiev), no. 1, 1973 p 10-16
(JPRS-58935) Avail: NTIS HC $3.00
Discussion is made of the general characteristics of problems inherent in the planning and management of the Soviet national economy in terms of the application of systems analysis. Author

N73-24952# Joint Publications Research Service, Arlington, Va.
IMPROVING CONTROL OF SCIENTIFIC-TECHNICAL PROGRESS
M. Vilenskiy 9 May 1973 22 p refs Transl. into ENGLISH from Vop. Ekon. (Moscow), no. 2, Feb. 1973 p 109-120
(JPRS-58976) Avail: NTIS HC $3.25
The problems involved in the control of the Soviet national economy as it is affected by the acceleration of scientific-technical progress are discussed. Author

N73-24956*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.
A SYSTEMS APPROACH TO THE MANAGEMENT OF LARGE PROJECTS: REVIEW OF NASA EXPERIENCE WITH SOCIETAL IMPLICATIONS
Michael J. Vaccaro May 1973 11 p refs
(NASA-TM-X-66251; X-100-73-146) Avail: NTIS HC $3.00 CSCL 05A
The application of the NASA type management approach to achieve objectives in other fields is considered. The NASA management outlook and the influences of the NASA environment are discussed along with project organization and management, and applications to socio-economic projects. F.O.S.

N73-24958# National Science Foundation, Washington, D.C.
FEDERAL FUNDS FOR RESEARCH DEVELOPMENT AND OTHER SCIENTIFIC ACTIVITIES, FISCAL YEARS 1971 - 1973, VOLUME 21
Jane Pugh 1972 210 p
(NSF-72-317) Avail: SOD $2.75
Comprehensive statistical information is provided on the size and scope of Federal funding for research and development and on the types of institutions and purposes to which such funds are directed. This information is intended for makers of science policy in and out of government, those who study scientific trends, and all others interested in the role of science in the nation. Author

N73-24960# National Science Foundation, Washington, D.C.
NATIONAL PATTERNS OF RESEARCH AND DEVELOPMENT RESOURCES: FUNDS AND MANPOWER IN THE UNITED STATES, 1953 - 1973
1973 46 p refs
(NSF-73-303) Avail: SOD $0.80 Domestic Postpaid or $0.55 GPO Bookstore
A summary is presented of the national patterns of R and D funding and manpower allocations attributed to the four sectors of the economy - Federal Government, industry, universities and colleges, and other nonprofit institutions. Time series data on R and D funds, over the period from 1953-73; manpower data begin with 1954. R and D funding data used were obtained from various NSF surveys, generally conducted on an annual or biennial basis. Author

N73-24962# European Space Research Organization, Paris (France).
PROJECT MANAGEMENT AND PROJECT CONTROL
Jan. 1972 428 p refs Partly in ENGLISH and partly in FRENCH Proc. of the 10th ESRO Summer School, Frascati, Italy, Sep. 1972
(ESRO-SP-90) Avail: NTIS HC $23.50

To encourage and promote the further advancement of the state of the art in systematic project management a forum for the exchange of the relevant knowledge and experience was provided. The sessions cover the following topics: introduction to project management and project control; project management; systems engineering; phased project management; project planning and control; contract management; and future trends in project management.

N73-24963 European Space Research and Technology Center, Noordwijk (Netherlands).
INTRODUCTION TO PROJECT MANAGEMENT AND PROJECT CONTROL
O. Hammarstroem *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 5-14

The need for project management is discussed and important aspects of the project manager's duties are outlined. The vertical and horizontal reporting lines are discussed and the integration of a project management organization into a company described. The functions of the project team are considered and the goals, objectives and tasks of the project management established. Project control is also briefly reviewed. ESRO

N73-24964 Kernforschungsanlage, Juelich (West Germany).
MOTIVATION, PLANNING AND MANAGEMENT OF RESEARCH AND DEVELOPMENT PROGRAMMES
Hermann L. Jordan *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 15-24

In many fields of science and technology, progress has led to a rapid expansion of research and development potential and a growing demand for funds and facilities. Particularly in Government financed areas of research and advanced technology the aspects of relevance, priorities and efficient use of limited resources have become of steadily growing importance. Based on experience in larger research and development programs, the lecture deals with strategy, setting of objectives and the evaluation of such programs with a particular emphasis on the aspects of innovation, relevance, use of limited resources and the motivation of scientific and technological personnel. Since in many such efforts international cooperation is necessary, additional potentialities and constraints of international programs are also considered. The European community program on controlled thermonuclear fusion is cited as example.
Author (ESRO)

N73-24965 Paris Univ., Orsay (France).
INTEGRATING PROJECTS AND CONTRACTS INTO THE PROGRAMME OF A RESEARCH AND DEVELOPMENT CENTRE
J. Gueron *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 25-31

The problems encountered by a research center director and/or project manager in adjusting their retrospective jobs, in separating the R & D subjects to be assigned to outside contractors from those to be tackled internally and in selecting contractors, are discussed using as examples nuclear graphite manufacture, and the Dragon and Orgel projects. ESRO

N73-24966 Eurosat S.A., Geneva (Switzerland).
THE CONCEPT OF PROJECT MANAGEMENT
P. Blassel *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 33-41

The basic concept of project management is described and the definition and acceptance of the mission objectives, definition of project approach and evaluation of resources were discussed. The data collection system and the processing and presenting of the information are considered. The preparation, making and executing of decisions are also stressed. ESRO

N73-24967 European Space Research and Technology Center, Noordwijk (Netherlands).
PROJECT MANAGEMENT IN THE AEROSPACE INDUSTRY
O. Hammarstroem *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 43-53

The aerospace industry has been a pioneer in the field of project management and many of the concepts and methods currently used in the management of R and D and production projects have been developed in aerospace work. The particular aspects of project management in the aerospace industry are discussed together with the scope of programs necessitating a high degree of delegation of responsibility. The project management organization especially with regard to multinational projects is considered and customer requirements are taken into account. ESRO

N73-24968 European Space Research and Technology Center, Noordwijk (Netherlands).
PROJECT MANAGEMENT AND THE HUMAN FACTOR: A SYSTEMS APPROACH
D. E. Mullinger *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 55-69

The project management system and application of the management method is discussed. The method includes definition of objectives and overall system, project requirements and implementation. The management structure is described and management tools are summarized. Problems and their solving are considered and the benefits accruing from the project are emphasized. ESRO

N73-24969 European Organization for Nuclear Research, Geneva (Switzerland).
ORGANISATION AND MANAGEMENT OF THE CERN/ISR PROJECT
C. J. Zilverschoon *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 71-76

Credit for the success of the CERN intersecting storage rings project was due to the nature, structure, personnel and financial procedures in the organization; the integration of industry into the program; the organization of the project group and project control. A short description of each of these points is given.
ESRO

N73-24970 European Space Research and Technology Center, Noordwijk (Netherlands).
ORGANIZATION AND MANAGEMENT OF THE ESRO 4 SATELLITE PROJECT
Jean-Francois Lafay *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 77-87

After some general information on the main characteristics of the ESRO 4 project, the organization of the project within ESRO is discussed. The ESRO 4 project group and its relationships with specialized divisions of ESTEC or other ESRO establishments, the launching agency and the scientific experimenters are considered. The industrial organization of the ESRO 4 project is briefly covered and the relationship between the ESRO 4 project group and the prime contractor is outlined. The management plan is presented, defining the various responsibilities and the procedures for the technical control, schedule control and modification control. The influence on the management of the type of contract with the prime contractor is analyzed. Special emphasis is placed on the interfaces with the prime contractor for equipment under direct control of ESRO. The difficulties which can be encountered in this type of management are outlined and possible solutions are suggested. Author (ESRO)

N73-24971 Elliott-Automation Space and Advanced Military Systems, Ltd., Camberley (England).
PROJECT MANAGEMENT COMPARISON
L. A. Mitchell *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 89-100

A brief description of EASAMS Ltd. and of the type of project undertaken there is followed by an analysis of the principle

on which the management of the company and the project management are based: delegation of appropriate authority; careful pre-planning; control of commitment; and identification of cost centers. A comparison of the various management factors in two different types of project - a military development project and civil engineering projects - is then developed with particular reference to selection of objectives, organization for management, choice of the management staff, and effectiveness of the different procedures. Finally, a summary of the planning processes is given with examples of problems and solutions, bringing out the similarity of management problems in widely differing projects.
Author (ESRO)

N73-24972 General Electric Co., Philadelphia, Pa. Space Div.
SYSTEMS ENGINEERING AS A DECISION MAKING TOOL
Francis W. Pfluger *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 101-107

A definition of the objectives of the systems engineering function is given followed by a general description of the method of achieving these objectives. A definition is then given of the qualifications of a systems engineer and his specific function during each of the various phases of a space systems project is discussed.
ESRO

N73-24973 European Space Research and Technology Center, Noordwijk (Netherlands). Satellites and Sounding Rockets Dept.
SYSTEMS ENGINEERING AND PROJECT MANAGEMENT OF THE ESRO 1 SATELLITE
Manfred G. Grensemann *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 109-128

After a brief summary of the ESRO 1 satellite mission objectives and technical design, detailed consideration is given to the development phase of the ESRO 1 satellite and the solutions adopted to overcome technical and planning problems. The planning methods used, such as PERT and bar charts, and the reporting system are described.
Author (ESRO)

N73-24974 TRW Systems International, Inc., Brussels (Belgium).
MANAGING A CONTRACT (PROJECT) SPECIFICATION SYSTEM FOR SATELLITE PROJECTS
Dale Eugene Miller *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 129-142

A model scheme of a cost effective contract specifications management program is presented to effect understanding of project specification management needs. It emphasizes the lessons learned from past satellite projects and reflects the future ESRO approach.
ESRO

N73-24975 European Space Research Inst., Frascati (Italy).
SPACE POLITICS OF THE EUROPEAN SPACE RESEARCH ORGANIZATION [LA POLITIQUE INDUSTRIELLE DU CERS]
J. Dinkespiler *In its* Proj. Management and Proj. Control Jan. 1973 p 143-161 In FRENCH

After a resume of the reasons why an industrial policy is necessary and important for ESRO the objectives and means of realization of such a policy are described. The following principal subjects are broached and commented on: geographical distribution of contract; formation of multinational consortia; technological research; and the relevant procedures. In conclusion, the importance of a European industrial potential in space matters is underlined by the changing attitude of the United States towards cooperation with Europe.
ESRO

N73-24976 European Space Research Inst., Frascati (Italy).
THE EUROPEAN SCIENTIFIC COMMUNITY AS USERS OF ESRO SATELLITE SYSTEMS
J. Ortner *In its* Proj. Management and Proj. Control Jan. 1973 p 163-172

The principles and objectives of the European space research organization are discussed. These give scientists the opportunity of placing their experiments onboard satellites, having them integrated, tested and launched, and then collecting the data obtained by them. The relationship between ESRO and the scientist is traced and the procedures for experiment proposals are outlined.
ESRO

N73-24977 European Space Research and Technology Center, Noordwijk (Netherlands). Systems Studies Div.
WHY PLAN AND MANAGE IN PHASES?
J. B. Lagarde *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 173-176

Definitions of the meaning of plan, manage and phases are given. The reasons are then analyzed why an overall task is divided in subtasks or phases, and the drawbacks of this partitioning concept are emphasized.
ESRO

N73-24978* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PHASED PROJECT PLANNING AND DEVELOPMENT IN ANTICIPATION OF OPERATIONAL PROGRAMS
W. G. Stroud *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 177-187 refs

The impact of future operational status on the planning and execution of the research and development activities for major space flight projects is assessed. These projects, within NASA, are part of the Applications Program involving communications and meteorology. The NASA management approach to these projects is determined by national policies governing the responsibilities and relationships among the various government agencies and private industries.
ESRO

N73-24979 European Space Operations Center, Darmstadt (West Germany). Programme Management Div.
THE PHASED PREPARATION OF GROUND FACILITIES FOR SATELLITE MISSIONS
Louis Antony Potter *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 189-200

A general description of the ESOC ground facilities (network of stations, control center, computer center) and the organization required for their design, preparation, operation and management is given. The various phases of the preparation of the facilities for a new mission are then discussed, followed by an account of the planning and management procedures used at ESOC. Emphasis is then placed on the problems of achieving satisfactory relationships between the various phases of the different projects, both in manpower resources and availability of facilities. Details of the procedures utilized are presented. In conclusion, examples are given of various phases in the life of a control center as the various projects progress through preparation and operation.
Author (ESRO)

N73-24980 Philips Electrologica N.V., Apeldoorn (Netherlands).
THE PHASED DEVELOPMENT OF NEW INDUSTRIAL PRODUCTS
K. T. A. Halbertsma *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 201-224 refs

Almost all new industrial products pass through seven phases: conception, definition, design, prototype, manufacturing, sales, and operation. Committing so many years to the development of a new product before marketing can begin implies high risks and high investments in capital and human resources, thus rigid planning and control are essential. The human resources consist of talented and educated people, demanding a relatively high degree of individual responsibility, authority, leeway and professional satisfaction. These requirements can be met by systems management within a functionally structured organization. The planning and control at corporate level are limited to, and focussed at, the baselines separating the phases. The project managers and the supporting departments work in a matrix configuration, providing the flexibility to allocate authorities, responsibilities and leadership in an optimum way according to the different phases.
Author (ESRO)

N73-24981 European Space Research and Technology Center, Noordwijk (Netherlands).
WHY PROJECT CONTROL?
Hellmuth Gehriger *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 215-224 refs

Project control is focussed on two very important management control parameters: time and cost. It must encompass all project phases, from conception of a system to its acquisition and start of operations. Plans covering all project phases ahead are developed very early and are progressively detailed and refined as the system to be acquired passes through and evolves from the various project phases. At the end of each phase, detailed and accepted control plans, such as project networks, manpower budgets and cost estimates, are available which can be used to monitor the evolution of the project elements, to detect unfavorable trends early and to warn management such that corrective action can be taken in good time and with a high chance of success. Project control wants to ensure that the project initiator gets value for money. The specific techniques and methods used to achieve this goal are explained in detail. A review is given of the total project control system in operation at ESTEC, as well as a description of how the individual techniques of project network analysis, phased project planning, work package cost control and contracts management have been integrated into a self-contained operational entity and successfully applied to several projects. Author (ESRO)

N73-24982 European Space Research and Technology Center, Noordwijk (Netherlands).
ASPECTS OF PROJECT CONTROL FIELD OPERATIONS
Peter D. Biggs *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 225-239

The organization of a project control field team is described by indicating the requirements and functions of ESRO project control in comparison with industrial companies. Details are given on the requirements and tasks to be performed in the various types of projects during advanced phases. Particular attention is drawn to the selection of PC personnel, their qualifications and relationship with the project group. The importance of the physical location of a PC team is substantiated. The specific techniques and methods used by ESRO for monitoring work progress, manpower consumption and cost evaluation are explained. Special consideration is given for the delicate problems of PC, such as: the handling of project participants who lack management systems experience; how to cope with inadequate baseline plans and estimates; how to overcome poor reporting, and etc. All essential factors in running effective PC field operations are pointed out using practical examples from the latest online experience in an advanced ESRO satellite project. Author (ESRO)

N73-24983 European Space Research and Technology Center, Noordwijk (Netherlands).
DATA PROCESSING IN PROJECT CONTROL
P. R. Knight *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 241-258

After a brief introduction on electronic data processing and its major hardware and software constituents, the sectors in project control which are preferable targets for automation are outlined, such as: network analysis and updating, cost analysis and control, resource allocation and leveling, trend analysis and extrapolation, condensation and formatting of management information, documentation control, configuration control, simulation, and etc. The reasons for their selection are indicated. Criteria and their importance when having to select the optimum data processing system are discussed. The requirements to be imposed on the users are enumerated and their coherence explained. Finally, the coming data processing demands in project control systems are outlined. Author (ESRO)

N73-24984 Messerschmitt-Boelkow-Blohm G.m.b.H., Munich (West Germany). Space Div.
COST ESTIMATING AND PRICE ANALYSIS IN SATELLITE PROJECTS
A. Franzke and K. Niebisch *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 259-287 refs

The latest state-of-the-art methods techniques and practices used for systematic cost and price analysis in European aerospace activities are comprehensively reviewed. A survey of several statistical spacecraft cost formulae is given and a new formula with increased prediction accuracy is presented. The topics discussed include: definition of the baseline documentation required for manpower and cost estimating when tendering; work breakdown structures; types of cost; stages of cost evolution; statistics; handling of cost escalation factors; and influence of reliability requirements on spacecraft cost. Using some practical examples the application of a number of specific estimating techniques and analysis is demonstrated including the use of projected correction factors derived from previous contracts, and the evaluation by means of a matrix system based on existing, modified, or new technologies. Author (ESRO)

N73-24985 European Space Operations Center, Darmstadt (West Germany). Programmes and Mission Management Dept.
INTEGRATED PROJECT CONTROL IN A MATRIX ORGANIZATION
Jerry Asger Jensen *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 289-298

The European Space Operations Centre (ESOC) is responsible for the provision of the ground segments in ESRO satellite projects as well as for operating the space satellite systems once the satellites are launched. The complexity of such a program puts rather a high demand on the management structure and the project control system in use. This was the basis for developing the requirements for an ideal planning and management system, which is constantly pursued. The approach in project control for meeting these requirements is outlined and the application of the chosen project control system to the HEOS-A2 and TD-1 satellite mission readiness is described. How the control plans were developed from the baselines, and the difficulties encountered are indicated and the appropriate remedies which were successfully applied are described in some detail. The present state of affairs after the recent introduction of the PMS-360 resource allocation computer program is outlined.
Author (ESRO)

N73-24986 European Space Research and Technology Center, Noordwijk (Netherlands). Telecommunications Satellite Div.
MODIFICATION CONTROL IN AEROSPACE
Albert L. Moratti *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 299-314

Large, complex R and D projects where the probability of redirection is extremely high, are described. The resultant strong potential effect on cost, schedule and documentation requires strict control of modifications. The various aspects involved are highlighted and particular attention is given to the following points: the need for modification control in documentation, cost, and schedule; flexibility of modifications in different types of contracts from contractors and customers point of view; types of changes; basic steps involved in modifications; and requirements for a solid working base in the evaluation of changes. Author (ESRO)

N73-24987 European Space Research and Technology Center, Noordwijk (Netherlands). Contracts Div.
CONTRACTS MANAGEMENT AT ESTEC
W. Thoma *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 315-319

The ESRO tender requirements on projects are presented under the specific aspect of analysis and clarity required. The basic idea being that a good tender preparation saves many negotiations at a later stage. The specific contract provisions required to keep the project transparent are discussed: clear definition of responsibilities, reporting, modification control, and motivation of the contractor to keep his commitments.
Author (ESRO)

N73-24988 Kienbaum Unternehmensberatung, Gummersbach (West Germany).
DEGREE OF INNOVATION, RISK MANAGEMENT AND CONTRACTING

Karl-Heinz Ruesberg *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 321-332 refs

The risks and possible consequences inherent in modern technology projects are made apparent and quantifiable. A distinction is made according to whether projects use entirely available technology or require the development of entirely or partially new technology. The project is considered in its entirety as an organism, bearing in mind all the relevant technical, economical, sociological and ecological parameters. For projects with a high degree of innovation, it's not appropriate to select total package procurement (as opposed to phased procurement). Instead, each phase of the project should be made the subject of separate but coherent contracts, in order to enable the project being redirected or modified without difficulties.
Author (ESRO)

N73-24989 European Space Research and Technology Center, Noordwijk (Netherlands).
INCENTIVE SCHEMES AS A CONTRACT MANAGEMENT TOOL
L. Vandaput *In* ESRO Proj. Management and Proj. control Jan. 1973 p 333-348 refs

The users of project management techniques show a great interest in, and develop a continuing sophistication of incentive schemes. The organization is interested in a product to be developed within a given budget and delivered at a given time, according to the initial specifications. If the contractor has fulfilled these conditions, the organisation is prepared to pay him a reward, the amount of which has to be negotiated between both parties - keeping in mind the three parameters, cost, delivery and performance, to form the basis of each incentive system. The incentive scheme used in the ESRO-4 satellite contract is presented in order to show the practical application of such a system. Emphasis is put on the elaboration phase of the system and on the analysis of the contractor's proposal. Author (ESRO)

N73-24990 European Space Research Organization, Paris (France).
PROJECT MANAGEMENT INFORMATION REQUIREMENTS IN AN INTERNATIONAL ORGANISATION
Roy Gibson *In its* Proj. Management and Proj. Control Jan. 1973 p 349-352

Only the case of international organizations which have the direct responsibility for a major R and D project is considered. The requirements of member states are examined, as is the need to steer a course between unnecessary interference in the day-to-day control of the project and lack of viability into the cost, schedule and even the real utility of the project on the part of those who are paying for it. The role of the secretariat is discussed, and in particular the extent to which it is permissible for the secretariat to develop aims in its own right. The danger is noted of the secretariat not always being wholly aware of the motivations of its project managers. The international organizations' relations with industry in the conduct of a major project and the difficulties involved in retaining the initiative necessary to ensure a successful project, are discussed with some final remarks on the practical importance of human aspects in project management. Author (ESRO)

N73-24991 Eurosat S.A., Geneva (Switzerland).
FUNCTIONAL SUPPORT DEMANDS IN A MULTI-PROJECT INSTITUTION
P. Blassel *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 353-361

The organization of the work for the execution of a project taken in isolation calls for a delicate balance between project oriented tasks, performed by project personnel, and specialized contributions, provided by functional support groups. In a multi-project institution, functional support groups have to serve at the same time and from limited resources several projects of varying degrees of complexity and at various stages of advancement. A close loop information and management system is described which is intended to assist the functional support group in planning ahead the possibilities of their resources with a view to limiting a priori possibilities of conflict between projects. The presentation shows the danger of an inadequate functional support base in a multi-project institution. Author (ESRO)

N73-24992 General Electric Co., Philadelphia, Pa. Space Div.
FUTURE TRENDS IN PROJECT MANAGEMENT
Francis W. Pfluger *In* ESRO Proj. Management and Proj. Control Jan. 1973 p 363-372

The objectives of the management function are defined and a logical derivation of the requirements for an effective control system are given. These include the planning, communication and analysis subsystems. The degree to which current systems fulfill these requirements are noted. The factors which have impeded the implementation of the optimum system are identified and methods by which these impediments can be overcome are discussed. A prediction of the advancements in technique which can be expected in the future is made. ESRO

N73-25067*# Scripta Technica, Inc., Washington, D.C.
GRID PLANNING AND MANAGEMENT IN AIR TRANSPORT
A. V. Miroshnikov, A. S. Kravets, and A. N. Zhizhnyak. NASA May 1973 119 p refs Transl. into ENGLISH of the book "Setevoye Planirovaniye i Upravleniye na Vozdushnom Transporte" Moscow, Transport Press, 1971 112 p
(Contract NASw-2036)
(NASA-TT-F-742) Avail: NTIS HC $3.00 CSCL 05C

The essentials, importance, range of application, and advantages of grid planning and management (U.S. usage: PERT (Program Evaluation and Review Technique)) systems as applied to air transport are presented. The basic concepts of the grid planning and management system are set forth and the rules for construction of various types of grid diagrams (U.S. usage: critical diagrams or PERT charts) and the procedure for calculation of their parameters are described. Methods of optimizing grid models and operations-management methods in work from grid diagrams in civil aviation are reported. Author

N73-25069*# Scripta Technica, Inc., Washington, D.C.
THE ECONOMICS OF AIR TRANSPORT
N. N. Gromov, Ye. V. Mukhordykh, Ye. A. Ovrutskiy, G. A. Parsegov, B. M. Parakhonskiy, Ya. I. Prutkin, and L. A. Tsekhanovich. NASA May 1973 265 p refs Transl. into ENGLISH of the book "Ekonomika Vozdushnogo Transporta" Moscow, Transport Press, 1971 p 1-245
(Contract NASw-2036)
(NASA-TT-F-741) Avail: NTIS HC $3.00 CSCL 05C

A brief exposition of the basic problems of air-transport economics is presented. On the basis of analysis of a large amount of factual material and generalization of scientific data, the authors cast light on the basic economic patterns in the development of air transport. Problems of increasing the efficiency of air-transport utilization and improving management and planning occupy a central position in the book in accord with the resolutions of the September (1965) Plenary Session of the Central Committee of the Communist Party of the Soviet Union (CC CPSU), the Twenty-Third Party Congress, and the December (1969) Plenary Session of the CC CPSU. Areas requiring improvement are brought out in analyses of specific problems, and prospects for the development of air transport are set forth. Author

N73-25187# Teleconsult, Inc., Washington, D.C.
TOWARDS IMPROVING US-LATIN AMERICA TELECOMMUNICATIONS RELATIONS
Oct. 1972 230 p
(Contract OTP-SE-72-117)
(PB-214619/9; OTP-SP-12) Avail: NTIS HC $3.00 CSCL 17B

The present relationships between U.S. and Latin American telecommunication policy level institutions are reviewed. Appropriate initiatives for establishing substantive and continuing relations with institutions and individuals responsible for policies,

regulations and International Telecommunication Union (ITU) relationships are recommended. GRA

N73-25211*# Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
TOP DOWN, BOTTOM UP STRUCTURED PROGRAMMING AND PROGRAM STRUCTURING
M. Hamilton and S. Zeldin Dec. 1972 99 p refs
(Contract NAS9-4065; DSR Proj. 55-23890)
(NASA-CR-128971; E-2728-Rev-1) Avail: NTIS HC$7.00 CSCL 09B

New design and programming techniques for shuttle software. Based on previous Apollo experience, recommendations are made to apply top-down structured programming techniques to shuttle software. New software verification techniques for large software systems are recommended. HAL, the higher order language selected for the shuttle flight code, is discussed and found to be adequate for implementing these techniques. Recommendations are made to apply the workable combination of top-down, bottom-up methods in the management of shuttle software. Program structuring is discussed relevant to both programming and management techniques. Author

N73-25253# Polytechnic of Central London (England). Transport Studies Group.
THE ECONOMICS OF BRITISH AIRPORTS
R. S. Doganis and G. F. Thompson May 1973 242 p refs Sponsored by Social Sci. Res. Council
(Rept-73-01210) Avail: NTIS HC $14.25

An analysis is presented on the economics and finances of airports, as industrial units, to develop a theory of airport economics, with special reference to airport pricing. Recommendations were made on the following major issues: (1) the financial structure of airports, (2) measures of airport profitability and efficiency, (3) the scope and effect of management decisions on airport finances, and (4) possible improvements in current pricing and charging policies. Data are presented in the form of tables and graphs to show airport practices and operations from a financial standpoint. Author

N73-25494# Department of Housing and Urban Development, Washington, D.C.
[MAPPING, AERIAL PHOTOGRAPHY, AND GROUND SURVEYING RELATED TO URBAN PLANNING AND COMMUNITY DEVELOPMENT] Final Report
15 Dec. 1972 115 p refs
(PB-214305/5) Avail: NTIS HC $3.00 CSCL 13B

The report contains information on urban mapping activities assisted in FY 1972 by the Department of Housing and Urban Development. At the request of the Office of Mangement and Budget, HUD has cooperated in a study by the Federal Mapping Task Force on how best to use government resources to fulfill present and future unmet needs in mapping, aerial photography, and ground surveying in connection with urban planning and community development. Author (GRA)

N73-25507*# Johns Hopkins Univ., Baltimore, Md. Dept. of Physics.
TECHNICAL SUPPORTING STUDIES PLAN, REVISION A. TASK 1: PRINCIPAL INVESTIGATOR SERVICES
15 Mar. 1972 16 p
(Contract NAS9-11528)
(NASA-CR-128547; T72-19299) Avail: NTIS HC $3.00 CSCL 14B

Proposed supporting studies for the Apollo 17 UV spectrometer include analyses of existing data and theories to construct lunar atmosphere models; acquisition of information on UV albedo of moon; engineering performance data for prototype Apollo 17 UV spectrometer; UV absolute calibration; and data reduction program interface with lunar atmosphere analysis program. Author

N73-25725*# Stanford Research Inst., Menlo Park, Calif.
A PILOT LEVEL DECISION ANALYSIS OF THERMIONIC REACTOR DEVELOPMENT STRATEGY FOR NUCLEAR ELECTRIC PROPULSION Final Report
Michael M. Menke and Bruce R. Judd May 1973 113 p refs Prepared for JPL
(Contracts NAS7-100; JPL-953435; SRI Proj. MSD-2006)
(NASA-CR-133035) Avail: NTIS HC $7.75 CSCL 21F

The development policy for thermionic reactors to provide electric propulsion and power for space exploration was analyzed to develop a logical procedure for selecting development alternatives that reflect the technical feasibility, JPL/NASA project objectives, and the economic environment of the project. The partial evolution of a decision model from the underlying philosophy of decision analysis to a deterministic pilot phase is presented, and the general manner in which this decision model can be employed to examine propulsion development alternatives is illustrated. Author

N73-25978# Committee on Appropriations (U. S. House).
HUD-SPACE-SCIENCE-VETERANS APPROPRIATIONS FOR 1974. PART 2: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, NATIONAL SCIENCE FOUNDATION
Washington GPO 1973 1440 p refs Hearings before Comm. on Appropriations, 93d Congr., 1st Sess., 14 Mar. and 2 Apr. 1973
Avail: Subcomm. on HUD-Space-Sci.-Veterans

The hearings before a subcommittee of the Committee on Appropriations of the House of Representatives of the Ninety-Third Congress are presented. The 1974 appropriations for the Housing and Urban Development, National Science Foundation, and Veterans organizations are discussed. The proposed activities of the organizations are presented to justify the request for government funds to accomplish these activities. P.N.F.

N73-25981# Alpha Inst., Huntsville, Ala.
PATENT SURVEY: SEARCH OF US GOVERNMENT-OWNED PATENTS, CLEVELAND, OHIO
David J. Kieselbach 1 Jun. 1973 123 p
(Contract PO-3-45631)
Avail: NTIS HC $8.25

The billions of dollars spent on space exploration research and development has resulted in a large quantity of patents. The applicability of the technological advances identified with these patents is considered in terms of economic progress in the private sector. A large selection of these patents is presented along with their specifications and status of availability. J.M.M.

N73-25984*# National Academy of Public Administration, Washington, D.C.
MEETING THE NEEDS OF TOMORROW'S PUBLIC SERVICE: GUIDELINES FOR PROFESSIONAL EDUCATION IN PUBLIC ADMINISTRATION
Richard L. Chapman and Frederic N. Cleaveland Jan. 1973 78 p refs
(Contract NSR-09-046-001)
(NASA-CR-133036) Avail: NTIS HC $6.00 CSCL 05A

The educational programs for public administration were studied to develop guidelines for meeting the requirements of public service in the 1980's. The current state of education for public service is discussed along with a prospective view of the service over the next decade. Criteria for evaluating graduate programs are presented. F.O.S.

N73-25990*# Denver Research Inst., Colo. Industrial Economics Div.
THE NASA ROLE IN MAJOR AREAS OF HUMAN CONCERN: TRANSPORTATION
Feb. 1973 14 p refs
(Contract NASw-2362)
(NASA-CR-133050) Avail: NTIS HC $3.00 CSCL 13F

After introducing some of the general factors that have affected progress in the transportation area, NASA program elements are examined to illustrate relevant points of contact. Interpretive steps are taken throughout the statement to show a few of the more important ways people's lives have been affected as a result of the work of NASA and other organizations functioning in this area. The principal documents used and interviews conducted are identified after the conclusion of this statement. This statement, it should be noted, is incomplete in many respects, primarily because it reflects only a small number of the technical, economic, and social forces affecting American life. Taken as a summary statement, however, it hopefully will provide a useful basis for better understanding NASA's role in the national attempt to upgrade the quality of transportation services. Author

N73-25994# Temple, Barker and Sloane, Inc., Wellesley Hills, Mass.
GOVERNMENT ORGANIZATION FOR CIVIL AVIATION
Paul W. Cherington 9 Aug. 1972 28 p
(PB-215426/8; AAC-SPI-71-1) Avail: NTIS HC $3.00 CSCL 01B

A brief analysis is presented of what appears to be some of the present shortcomings in the federal organization area as it relates to aviation. A short history of the development of that subject is followed by a description of what appears to be the main organizational options and an analysis of those options in the light of what seem likely to be the major problems and issues of civil aviation. Author (GRA)

N73-26019# Federal Aviation Administration, Washington, D.C. Aviation Forecast Div.
TERMINAL AREA FORECAST, 1974-1984
Oct. 1972 387 p
Avail: NTIS $21.50

Forecasts for fiscal years 1974, 1975, 1976, and 1984 of the key measures of aviation activity at selected airports are presented. The total Terminal Area Forecast includes 1,201 airports which meet at least one of the following criteria: (1) existing tower airport, (2) candidate for a tower, (3) 50 or more based aircraft, (4) receives certificated route air carrier service, and (5) 20,000 or more general aviation itinerant operations. The forecasts are prepared to meet the needs of planning personnel in FAA offices and services with future traffic levels at these airports. The report is organized by FAA region and within each region by state. National and regional summaries are included in the introduction. The airports in each state are listed in the alphabetical order of the communities they serve. Location identifiers for all existing tower airports are shown in large bold-face type. All other known airport location identifiers are shown in standard typewriter style. Airports currently planned for new, first-time towers are identified by a planned commissioning date directly beneath their location identifier (76 airports). Author

N73-26025# Battelle Columbus Labs., Ohio.
A PROGRAM DEFINITION STUDY FOR THE IMPROVEMENT OF SHORT HAUL AIR TRANSPORTATION. VOLUME 1: RECOMMENDED PROGRAM PLAN Final Report
Jan. 1973 154 p refs
(Contract DOT-FA72WA-2820)
(FAA-QS-73-1-Vol-1) Avail: NTIS HC $9.75

A recommended program plan for Federal-initiative in the Government's continued pursuit of an improved short-haul air transportation system is presented. The plan was developed in response to the broad program requirements set forth in the contract statement of work and, more specifically, was based on the system development needs, opportunities, and constraints identified in the course of performing the study. It provides the responsible Government departments and agencies with a resource they can use in the formulation and adoption of an official plan for short-haul air transportation development. Author

N73-26026# Urban Systems Research and Engineering, Inc., Cambridge, Mass.
A PLAN FOR THE IMPROVEMENT OF SHORT-HAUL AIR TRANSPORTATION Final Report
Mar. 1973 251 p
(Contract DOT-FA72WA-2816)
(FAA-QS-73-2) Avail: NTIS HC $14.75

A plan for fostering the improvement and development of the national short haul air transportation system through the year 1976 is developed. In addition, promising areas for short haul improvement are identified for the period 1972 through 1990. The plan and recommendations are based on a computer simulation comparison of alternative short haul concepts which include various combinations of vehicle types and airport configurations. Measures such as air travel demand, operating costs, revenues, noise impact, and congestion relief are utilized in making these comparisons. Author

N73-26035# Elliott-Automation Space and Advanced Military Systems, Ltd., Camberley (England).
A STUDY TO DEFINE AN EXPERIMENTAL AIRCRAFT FOR EARTH RESOURCE SURVEYS. VOLUME 1: SUMMARY Final Report
Jul. 1972 97 p Prepared jointly with Fairey Surveys
(Contract ESTEC-1516/71-EL)
(ESRO-CR(P)-128) Avail: NTIS HC $7.00

The results of a study of a proposed Earth Resources Aircraft Facility (ERAF) to develop a European capability in the remote sensing of earth resources are presented. The objectives are first discussed followed by a description of missions and sensors. The reasons leading to the selection of the Fokker F-27 are given together with a description of the aircraft. The support facilities are noted and ownership and organization discussed. The program for aircraft procurement, conversion and testing is outlined along with the program of operations. Finally, costs and potential problem areas are defined. ESRO

N73-26253# Federal Aviation Administration, Washington, D.C. Office of Aviation Policy and Plans.
AN EVALUATION STUDY OF THE AIRPORT DEVELOPMENT-AID PROGRAM, FY 1971 - 1972 Final Report
Raymond T. Uhl Sep. 1972 256 p
(FAA-AV-72-4) Avail: NTIS HC $15.00

This report reviews and analyzes air carrier/reliever airport grant allocations made in the first two years of the operation of the Airport Development-aid Program (Fiscal Years 1971-1972) in an attempt to determine the effectiveness of the program. In doing so, it looks at the nature of aeronautical demand, national airport system requirements, reviews ADAP program procedures, and analyzes the characteristics of airport grant allocations. Finally, the report considers the program with respect to congestion relief and suggests potential program adjustments to increase the effectiveness of the program. Author

N73-26331*# Environmental Research Inst. of Michigan, Ann Arbor.
STUDY OF RECREATIONAL LAND AND OPEN SPACE USING SKYLAB IMAGERY Monthly Report, 7-31 May 1973
I. J. Sattinger, Principal Investigator 11 Jun. 1973 2 p EREP
(Contract NAS9-13283)
(E73-10724; NASA-CR-133068; MR-1) Avail: NTIS HC $3.00 CSCL 08B

There are no author-identified results in this report.

N73-26359*# Environmental Research Inst. of Michigan, Ann Arbor.
[SL-2 PLANS]
Lester V. Manderscheid, Principal Investigator 8 Jun. 1973 1 p EREP
(Contract NAS9-13332)

(E73-10759; NASA-CR-133127) Avail: NTIS HC $3.00 CSCL 05B

There are no author-identified significant results in this report.

N73-26970# National Research Council of Canada, Ottawa (Ontario).

QUARTERLY BULLETIN OF THE DIVISION OF MECHANICAL ENGINEERING AND THE NATIONAL AERONAUTICAL ESTABLISHMENT, 1 JANUARY - 31 MARCH 1973

31 Mar. 1973 92 p refs

(DME/NAE-1973(1)) Avail: NTIS HC $6.75

Research projects conducted by the National Aeronautical Establishment and the Divison of Engineering in Canada are discussed. The specific items presented are: (1) subspan oscillation of bundled power conductors, (2) jet fuel specifications, (3) very low frequency navigation developments, and (4) dispersion of airborne pollutants in the lower atmosphere. A listing of projects being conducted in various laboratories of the organization is included.

N73-26980# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Apparate.

RELIABILITY ASSURANCE FOR COMPLEX SYSTEMS AEROSPACE EXPERIENCE) ZUVERLAESSIGKEITSSICHERUNG BEI KOMPLEXEN SYSTEMEN - ERFAHRUNG AUS DER LUFT- UND RAUMFAHRT)

Ingo Jaschke 8 Mar. 1972 32 p refs In GERMAN Presented at the Course on Planning, Management and Production in Modern Shipbuilding, 8 Mar. 1972

(MBB-UA-60-72-0) Avail: NTIS HC $3.75

A management concept for reliability assurance is presented. This system was applied successfully to complex aerospace systems and seems suited to modern shipbuilding. The functions of the contractor and contractee, and their collaboration in a large assurance system, are described. ESRO

N73-26986# Defense Documentation Center, Alexandria, Va.

MANAGEMENT INFORMATION Report Bibliography, Nov. 1969 - Oct. 1972

Apr. 1973 268 p refs

(AD-758900; DDC-TAS-73-5) Avail: NTIS CSCL 05/1

The bibliography comprises citations of unclassified reports dealing with management planning and information systems. The following references are on some of the topics dealing with the subject: information systems, management engineering, and management planning. Author (GRA)

N73-27129# Yale Univ., New Haven, Conn. Dept. of Administrative Sciences.

INTERACTIVE MAN-MACHINE COMMUNICATION Annual Report, 1 Feb. 1972 - 31 Jan. 1973

James H. Carlisle and Robert B. Fetter Mar. 1973 70 p refs (Contract N00014-67-A-0097-0010; NR Proj. 049-293)

(AD-760010; TR-66) Avail: NTIS CSCL 17/2

To demonstrate that, for users with varying psychological characteristics, alternative modes of man-computer dialogue should be provided for a given task, an experimental design has been formulated. The research on specific hypotheses involves conceptual complexity and environmental complexity. To facilitate the design of alternative modes of man-computer dialogue, a technique of protocol analysis for information system design is adapted from that used in artificial intelligence research. A description of this new technique is included. Two papers outline some of the objectives and methodologies currently in use. GRA

N73-27179# Parsons, Brinckerhoff, Quade and Douglas, New York.

ELEVATED STOL PORT TEST FACILITY CONCEPTUAL DEVELOPMENT AND COST STUDY Technical Report, 30 Jun. 1972 - 31 Jan. 1973

S. Rottenberg and A. H. Degraw Apr. 1973 56 p (Contract DOT-FA72WA-3114)

(FAA-RD-73-15) Avail: NTIS HC $5.00

A cost analysis was conducted on construction of an elevated short takeoff and landing test facility. A suitable structural scheme was selected, cost estimates were prepared, and the location at the National Aviation Facilities Experimental Center was recommended. A similar analysis was conducted for a test facility located in a hypothetical metropolitan environment. The facility was conceptualized with the added consideration of future expansion to a passenger carrying facility. A comparision of the two test facilities was made based on structural, cost, and einvironmental considerations. Author

N73-27189# Metcalf and Eddy, Inc., Boston, Mass.

ANALYSIS OF AIRPORT SOLID WASTES AND COLLECTION SYSTEMS: SAN FRANCISCO INTERNATIONAL AIRPORT Final Report

1973 149 p Prepared for San Francisco City and county Airports Comm., Calif.

(Grant EC-00294)

(PB-219372/0; EPA-SW-48D-73) Avail: NTIS HC $5.45 CSCL 13B

The study develops basic information on solid wastes generated at San Francisco International Airport and alternative collection, transfer, and transportation systems that might demonstrate engineering feasibility and economic benefit. The weight and composition of solid wastes were derived from field data gathered from passenger terminals, air freight areas, including mail service facilities, aircraft service centers, and aircraft maintenance bases. Questionnaires were sent to national airports to determine their operating levels and the levels were then compared to those at San Francisco to ascertain whether the data derived there would be applicable on a nationwide basis. The report describes two collection systems of potential economic benefit to the airport complex that were selected from various alternatives evaluated. GRA

N73-27192# Iowa State Univ. of Science and Technology, Ames. Engineering Research Inst.

IOWA STATE AIRPORT SYSTEM PLAN, VOLUME 1: SUMMARY REPORT Final Report, 1971 - 1972

R. L. Carstens Nov. 1972 53 p Sponsored in part by FAA

(PB-217531/3; ISU-EIR-AMES-72249-1) Avail: NTIS HC $3.00 CSCL 13B

The report sets forth a State Airport System Plan (SASP) for Iowa and suggests means for implementing those actions necessary to develop such a system. The recommended system includes 117 airports. An appropriate expectation is that the designated system should better satisfy the economic and social goals of the State of Iowa than any alternative system, whether that alternative consists of the same number, a lessor number, or a greater number of airports. Author (GRA)

N73-27193# Iowa State Univ. of Science and Technology, Ames. Engineering Research Inst.

IOWA STATE AIRCRAFT SYSTEM PLAN, VOLUME 2: TECHNICAL SUPPLEMENT Final Report, 1971 - 1972

R. L. Carstens Nov. 1972 424 p refs Sponsored in part by FAA

(PB-217532/1; ISU-ERI-AMES-72249-2) Avail: NTIS HC $6.00 CSCL 13B

by simultaneous photographic and Doppler observations from a satellite. A formula is suggested for a prior estimate of accuracy of chord length and, based on an analysis of it, recommendations are made about optimal dimensions and shape of the figure. A method is suggested for leveling the triangulation observations considered, by means of conditions with additional unknowns. Author (GRA)

N73-27565# California State Div. of Highways, Sacramento.

AIR QUALITY MANUAL. VOLUME 4: MATHEMATICAL APPROACH TO ESTIMATING HIGHWAY IMPACT ON AIR

QUALITY Interim Report, Jun. 1971 - Apr. 1972
John L. Beaton, Andrew J. Ranzieri, Earl C. Shirley, and John B. Skog Apr. 1972 71 p refs
(Contract DOT-FH-11-7730)
(PB-219814/1; CA-HWY-MR6570825(4)-72-08; FHWA-RD-72-36) Avail: NTIS HC $4.50; paper copy also available from NTIS $28.40/set of 8 reports as PB-219810-set CSCL 13B

Highway engineers have to consider a variety of factors in the environmental impact of any highway project. This manual explains a method of predicting pollutant concentrations within an area of study with and without the new highway. The prediction analysis includes both the highway corridor and the mesoscale. The highway corridor is defined as a region extending from the point where the pollutants are generated by traffic (the highway) downwind to the point where ambient pollutant levels are again reached. The mesoscale area is defined as the area throughout which traffic volumes on the surface traffic network are significantly affected by the construction of a new highway.
GRA

N73-27573# Army War Coll., Carlisle Barracks, Pa.
AIRSPACE COORDINATION - WHO NEEDS IT?
James A. Kilgore 14 Feb. 1973 28 p refs
(AD-761034) Avail: NTIS CSCL 01/2

The theme is based upon the Army's need to coordinate airspace. Data were gathered using a literature search. The airspace above the combat zone is used by all services and by all combat branches within the Army. History indicates control of the airspace became a problem during World War I. Between World War I and World War II new concepts for integration of air into the land battle scheme were developed. Korea brought new innovations and produced combat experience in the helicopter for the Army. The Vietnam War produced the concept of airmobility that further increased airspace control problems. There is no current agreement on joint use of the airspace. Doctrine provides for an Airspace Coordination Element (ACE) that, currently, is not authorized on most TOEs. The ACE, although a workable solution, is restricted by being only a planning and management facility with limited capability. Air Defense Artillery has recommended consolidation of selected equipment with aviation to help solve the airspace problem. (Author Modified Abstract)
GRA

N73-27814 Pittsburgh Univ., Pa.
NASA AND THE AEROSPACE INDUSTRY: A STUDY OF FEDERAL INFLUENCES ON INDUSTRIAL LOCATION Ph.D. Thesis
David Albert Smith 1972 138 p
Avail: Univ. Microfilms Order No. 73-4986

This dissertation examines the pattern of federal expenditures to the aerospace industry as a case study of the influence of government as a factor of industrial location. The objective is to determine the factors that explain the spatial distribution of NASA expenditures to the aerospace industry. Dissert. Abstr.

N73-27815# Defence Research Analysis Establishment, Ottawa (Ontario).
THE DEFENCE PROGRAM AND NATIONAL INDUSTRIAL DEVELOPMENT (A BACKGROUND PAPER FOR DEFENCE PLANNERS)
C. F. W. Pound Apr. 1973 65 p refs
(DRAE-34) Avail: NTIS HC $5.25

A number of the environmental factors which influence industrial growth in Canada are explored. These include the dominance of the United States in defense technology, uneven rates of economic growth, and the influence of multinational firms in Canadian industry. Canadian factors include the environment for technological innovation, attitudes of Canadians, the government procurement process, and the conflicts which arise between policies for industrial expansion and those for the elimination of regional economic disparities. Author

N73-27869# Battelle Columbus Labs., Ohio.
A PROGRAM DEFINITION STUDY FOR THE IMPROVEMENT OF SHORT-HAUL AIR TRANSPORTATION. VOLUME 2: WORKING PAPERS Final Report
Jan. 1973 527 p refs
(Contract DOT-FA72WA-2820)
(FAA-QS-73-1-Vol-2) Avail: NTIS HC-$28.50

A program definition study for the improvement of short haul air transportation is presented. The subjects discussed are: (1) patterns of future short haul demand, (2) airport development requirements, (3) private sector constraints, and (4) local community constraints. The study was performed to provide a background for the formulation of a program plan and to define and extend the understanding of the short haul air transportation development plan. Author

N73-27872# Committee on Appropriations (U. S. House).
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT, 1974
Washington GPO 23 Jul. 1973 5 p refs H.R. 75828 enacted into law by the 93d Congr., 23 Jul. 1973
(Pub-Law-91-556; GPO-99-139) Avail: US Capitol, House Document Room

An Act which authorizes appropriations, to the National Aeronautics and Space Administration for research and development, construction of facilities, research program management, and various other purposes is presented. Author

N73-27900*# Douglas Aircraft Co., Inc., Long Beach, Calif.
STUDY OF QUIET TURBOFAN STOL AIRCRAFT FOR SHORT-HAUL TRANSPORTATION. VOLUME 3: AIRPORTS Final Report
Jun. 1973 523 p refs
(Contract NAS2-6994)
(NASA-CR-114608; MDC-J4371-Vol-3) Avail: NTIS HC $28.25 CSCL 01C

The airport siting, design, cost, operation, and implementation aspects of a short takeoff aircraft transportation system are analyzed. Problem areas are identified and alternative solutions or actions required to achieve system implementation by the early 1980's are recommended. Factors associated with the ultimate community acceptance of the STOL program, such as noise, emissions, and congestion, are given special emphasis.
Author

N73-27903*# Douglas Aircraft Co., Inc., Long Beach, Calif.
STUDY OF QUIET TURBOFAN STOL AIRCRAFT FOR SHORT-HAUL TRANSPORTATION. VOLUME 6: SYSTEMS ANALYSIS Final Report
Jun. 1973 534 p refs
(Contract NAS2-6994)
(NASA-CR-114611; MDC-J4371-Vol-6) Avail: NTIS HC $28.75 CSCL 01C

A systems analysis of the quiet turbofan aircraft for short-haul transportation was conducted. The purpose of the study was to integrate the representative data generated by aircraft, market, and economic analyses. Activities of the study were to develop the approach and to refine the methodologies for analytic tradeoff, and sensitivity studies of propulsive lift conceptual aircraft and their performance in simulated regional airlines. The operations of appropriate airlines in each of six geographic regions of the United States were simulated. The offshore domestic regions were evaluated to provide a complete domestic evaluation of the STOL concept applicability. Author

N73-27950*# Virginia Univ., Charlottesville. Transportation Div.
ANALYSIS OF PASSENGER ACCEPTANCE OF COMMERCIAL FLIGHTS HAVING CHARACTERISTICS SIMILAR TO STOL
A. R. Kuhlthau and I. D. Jacobson Mar. 1973 37 p refs Presented at Flight Test Symp., Ottawa, 7-8 Mar. 1973
(Grant NGR-47-005-181)
(NASA-CR-132282; TR-403208) Avail: NTIS HC $4.00 CSCL 05E

Previous work in the development of quantitative models for the prediction of passenger reaction to motion and vehicle

environment parameters in flight was extended to include a class of aircraft appropriate for low-density, short-haul service. The results indicate that it is possible to obtain quantitative response inputs from an usually small special test-subject group which will be representative of the general traveling public. Additional data which indicate the importance of comfort as a factor in evaluating ride quality was obtained, and identification of the factors which contribute to judgments regarding comfort level was improved. Seat comfort and seat spacing is very vital in the smaller aircraft. Mathematical modeling applied in conjuction with passenger reaction data was shown to be very useful for establishing ride-quality design criteria. Author

N73-28057# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
THE ORGANIZATION OF AN INFORMATION COMPUTER CENTER IN AUTOMATIC SYSTEMS CONTROLLING ENTERPRISES
N. I. Kirilyuk and A. G. Sirchenko 21 May 1973 15 p Transl. into ENGLISH from Kibern. Vychislitelnaya Tekhn. (USSR), no. 12, 1971 p 120-124
(AD-761480; FTD-HT-23-461-73) Avail: NTIS CSCL 09/2

The functional composition of subdivisions of the ICC is determined proceeding from the technological process of information processing. Their numerical composition depends on the volume and complexity of the production produced by the enterprise, the changeability of operation of the enterprise, the quantity and frequency of the solution of the system problems, the quantity of technical means of the ASCE and subdivisions of the enterprise covered by its service, and the readiness of the enterprise for operation under conditions of functioning of the ASCE. GRA

N73-28135# Naval Postgraduate School, Monterey, Calif.
ESTIMATION OF A COST FUNCTION FOR A NAVAL AIR REWORK FACILITY M.S. Thesis
W. C. Trafton Mar. 1973 76 p refs
(AD-761475) Avail: NTIS CSCL 15/5

The objective of the study was to estimate a cost function from a Constant Elasticity of Substitution production function and a Cobb-Douglas production function for the aircraft rework and engine repair programs at the Naval Air Rework Facility, North Island, San Diego, California. The cost functions were estimated by multiple regression analysis from data aggregated from actual data taken from production records of the two programs. An attempt was made to validate the two cost functions that were obtained, and a methodology was outlined for comparing predicted costs to actual production costs at the Naval Air Rework Facility. Author (GRA)

N73-28540# Naval Postgraduate School, Monterey, Calif.
QUALITY ASSURANCE - POLICY AND RELATED CONSIDERATIONS M.S. Thesis
Leonard Harrison Passmore Mar. 1973 71 p refs
(AD-762000) Avail: NTIS CSCL 15/5

The purpose of the paper is to examine DoD quality assurance policies and their application to Weapon System Acquisition Management. The paper is divided into six sections--Elements of Policy, DoD Quality Assurance Policy, Quality Assurance During System Procurement, Areas Needing Improvement, Project Management, and Conclusions and Recommendations. (Modified Author Abstract) GRA

N73-28937*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE PROJECT MANAGEMENT ROLE IN SAFETY
R. C. Callaway 20 Jul. 1973 28 p refs
(NASA-TM-X-64764) Avail: NTIS HC $3.50 CSCL 13L

Techniques to be utilized by project management in the planning, implementation, and administration of a project safety program are presented. Safety functional responsibilities are classified into two categories: safety management and safety engineering. The emphasis is on the safety management role, and how safety activities are to be integrated throughout the project and made visible in the work breakdown structure and cost accounting and reporting. Safety inputs into the RFP, contractor program plans, etc., constitute an effective method of safety achievement. Author

N73-28939# National Science Foundation, Washington, D.C. National Science Board
SCIENCE INDICATORS, 1972 Annual Report No. 5
1973 150 p refs Submitted to the President of the United States, 31 Jan. 1973, in accordance with Section 4(g) of National Science Foundation Act as amended by Public Act 90-407
(NSB73-1; AR-5) Avail: SOD $3.35 Domestic Postpaid or $3.00 GPO Bookstore

A system of indicators for describing the state of science in the United States was developed for setting priorities in allocating resources. The indicators range from measures of basic research activity and industrial R and D to productivity and the U.S. balance of trade. The position and performance of science and technology in the U.S. is compared with that of other major R and D performing nations through a variety of indicators. Indicators discussed include: financial and human resources employed in R an D, basic research, growth of the national pool of scientists and engineers, and institutional capabilities. A Delphi experiment is also described. F.O.S.

N73-28945# Naval Postgraduate School, Monterey, Calif.
ALLOCATION OF RESEARCH LABORATORY RESOURCES: A STUDY OF RESOURCES ALLOCATION USING CRITERIA OF MILITARY SIGNIFICANCE AND INVESTMENT RISK M.S. Thesis
Warren James Millard Mar. 1973 62 p refs
(AD-761392) Avail: NTIS CSCL 12/2

The problem is defined as examining a list of the research projects presently sponsored by the Department of the Navy under GOR-43 and analyze the ordered project listings as ranked by panels composed of persons with interest in those projects. Data consisted of project priority rankings of 193 judges composing 9 separate panels, each judge ranking the projects twice in priority order; once considering the practical significance of the project and once considering the possibility of a successful research effort. Project rankings of judges within each panel were scaled using the FORD procedure and the 9 panel rankings then investigated for similarities using methods of cluster analysis. (Modified Author Abstract) GRA

N73-28946# Naval Postgraduate School, Monterey, Calif.
A STATISTICAL ANALYSIS OF DEVIATIONS FROM TARGET COST IN NAVAIRSYSCOMHQ FIXED-PRICE INCENTIVE CONTRACTS DURING THE 1949-1965 TIME FRAME M.S. Thesis
Wayne Dixon Mar. 1973 58 p refs
(AD-761396) Avail: NTIS CSCL 15/5

The paper statistically analyzes 15 years of Naval Air Systems Command Headquarters fixed-price incentive contract experience in the aircraft and missile procurement field. The relation of basic contract parameters to contract outcome is explored through regression and analysis of variance techniques. The inferences arising from the statistical analysis are combined with other information to draw conclusions regarding incentive contracting. The most important of these is that there is no evidence that the negotiated sharing ratio has any influence on the contractor during the performance of the contract. Author (GRA)

N73-28947# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
MAINTENANCE SCHEDULING LIMITATIONS
Joseph E. Boyett, Jr. 24 Apr. 1973 26 p
(AD-761494; AU-AFIT-SL-2-73) Avail: NTIS CSCL 15/5

The paper discusses maintenance scheduling problems which must be resolved during phase 2 of the STALOG development. Performance measures associated with scheduling are identified as being extremely critical since they must be clearly established prior to developing specific scheduling techniques. A brief review

of sequencing techniques allows the reader to visualize how different heuristics might be used in a dispatching model developed for specific applications. Recommendations are tentative since very little research has been conducted on complex problems of this type. Author (GRA)

N73-28949# Army War Coll., Carlisle Barracks, Pa.
BURDENSOME PROCEDURES INVOLVED IN AWARDING RESEARCH AND DEVELOPMENT CONTRACTS
Howard K. Hostler 7 Mar. 1973 27 p refs
(AD-761443) Avail: NTIS CSCL 15/5

The article briefly examines Department of Defense (DOD) and the US Army's new weapons systems acquisition policies and guidelines. It appears that the new DOD guidelines will increase the time that elapses between the inception of a Required Operational Capability (ROC), and the resulting availability of a new weapon system. Therefore, the source selection process, which is a significant part of the acquisition system, is examined in detail. The process is made to: (1) determine if it is burdensome and time-consuming, and (2) make recommendations for improving the process. (Modified Author Abstract) GRA

N73-28951# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Systems and Logistics.
A HIERARCHY OF OBJECTIVES AND RELATED PERFORMANCE INDICATORS FOR AIRCRAFT MAINTENANCE ORGANIZATIONS. M.S. Thesis
Larry L. Ultrey and Clark R. Penas 15 Sep. 1972 176 p refs
(AD-762270; SLSR-18-72) Avail: NTIS CSCL 01/3

There were three main objectives which the authors intended to accomplish in the thesis. The first thesis objective was to formulate the hierarchy of maintenance objectives by determining the primary objective of the base level aircraft maintenance organization and the subordinate objective which must be achieved prior to the achievement of the primary maintenance objective. The second thesis objective was to identify those measurable performance indicators that would permit maintenance managers to monitor, via the exception principle, progress toward the accomplishment of the maintenance objectives. The third and final thesis objective was to establish the frequency with which the identified performance indicators should be observed to insure timely correction of out-of-tolerance performance. GRA

N73-28966# George Washington Univ., Washington, D.C. School of Engineering and Applied Science.
FAILURE-RATE PREDICTION AND WEAROUT DETECTION
Carl M. Harris, William G. Marchal, and Shelemyahu Zacks 11 May 1973 54 p refs
(Contract N00014-67-A-0214-0001; NR Proj. 347-020)
(AD-762417; Serial-T-282) Avail: NTIS CSCL 15/5

The paper is divided into four specific technical sections. The first presents two classical approaches to the detection of the commencement of wearout of a device, the primary one being the F technique. These methods are essentially ones for testing for constantness in the failure rate and as such can therefore also be used to detect the end of burn-in. The use of the F procedure is then illustrated on some Navy data. The second technical section presents a Bayes-type approach to the same problem and illustrates its use via a similated problem. The next two sections get back to more classical methods, with the first outlining some direct approaches to the estimation of the hazard-rate function itself, and the second indicating a simple method for incorporating the estimating procedure into the determination of an optimal economic replacement interval. (Modified Author Abstract) GRA

N73-29099*# Stanford Univ., Calif.
LEGAL ASPECTS OF SATELLITE TELECONFERENCING
Delbert D. Smith Oct. 1971 219 p refs
(Grant NGR-05-020-517)
(NASA-CR-133592) Avail: NTIS HC $13.00 CSCL 17B

The application of satellite communications for teleconferencing purposes is discussed. The legal framework within which such a system or series of systems could be developed is considered. The analysis is based on: (1) satellite teleconferencing regulation, (2) the options available for such a system, (3) regulatory alternatives, and (4) ownership and management aspects. The system is designed to provide a capability for professional education, remote medical diagnosis, business conferences, and computer techniques. Author

N73-29820*# Thiokol Chemical Corp., Brigham City, Utah. Wasatch Div.
STUDY OF SOLID ROCKET MOTORS FOR A SPACE SHUTTLE BOOSTER. VOLUME 1: EXECUTIVE SUMMARY Final Report
15 Mar. 1972 32 p refs
(Contract NAS8-28430)
(NASA-CR-124236; TWR-5672-Vol-1; Publ-0372-36174; A09995) Avail: NTIS HC $3.75 CSCL 21H

An analysis of the solid propellant rocket engines for use with the space shuttle booster was conducted. A definition of the specific solid propellant rocket engine stage designs, development program requirements, production requirements, launch requirements, and cost data for each program phase were developed. Author

N73-29821*# Thiokol Chemical Corp., Brigham City, Utah. Wasatch Div.
STUDY OF SOLID ROCKET MOTOR FOR SPACE SHUTTLE BOOSTER, VOLUME 3: PROGRAM ACQUISITION PLANNING Final Report
15 Mar. 1972 420 p
(Contract NAS8-28430)
(NASA-CR-124238; TWR-5672-Vol-3; Publ-0372-36176; A10738) Avail: NTIS HC $23.00 CSCL 21H

The program planning acquisition functions for the development of the solid propellant rocket engine for the space shuttle booster is presented. The subjects discussed are: (1) program management, (2) contracts administration, (3) systems engineering, (4) configuration management, and (5) maintenance engineering. The plans for manufacturing, testing, and operations support are included. Author

N73-29989*# Mississippi State Univ., State College. Dept. of Civil Engineering.
REMOTE SENSING APPLICATIONS FOR TRANSPORTATION AND TRAFFIC ENGINEERING STUDIES: A REVIEW OF THE LITERATURE
James W. Epps Jun. 1973 70 p refs
(Contract NAS8-29036)
(NASA-CR-129011) Avail: NTIS HC $5.50 CSCL 13F

Current references were surveyed for the application of remote sensing to traffic and transportation studies. The major problems are presented that concern traffic engineers and transportation managers, and the literature references that discuss remote sensing applications are summarized. Author

N73-30008# Federal Aviation Administration, Washington, D.C. Aircraft and Noise Abatement Div.
ENGINEERING AND DEVELOPMENT PROGRAM PLAN: AIRCRAFT SAFETY Program Plan as of Apr. 1973
Apr. 1973 44 p refs
(FAA-ED-18-1) Avail: NTIS HC $4.25

The objectives, scope of work, and funding requirements for a research project in aircraft safety improvement during the 1973 to 1982 time period are discussed. The subjects covered are: (1) fire safety, (2) general aviation aircraft safety, (3) transport safety, (4) quiet short haul air transport, and (5) aviation security. Author

N73-30074# Indian National Scientific Documentation Centre, New Delhi.
SCIENTIFIC CREATIVITY, PART 1

1972 282 p refs Transl. into ENGLISH from the publ. "Nauchnoe Tvorchestvo" Moscow, Nauka, 1969 p 1-277 Sponsored by NSF 3 Vol.
(TT-70-57147-1) Avail: NTIS HC $3.00 CSCL 05K

Papers and lectures compiled at the 1967 U.S.S.R. symposium on the psychology of scientific and technical creativity are reported. The theory of scientific discovery as an essential part of the general theory of science, and discussions on general problems are included. Articles on methodology and historical problems; presentations covering psychological models, cybernetics, methodology, and applications to teaching are reviewed. T.M.R.

N73-30075# Indian National Scientific Documentation Centre, New Delhi.
SCIENTIFIC CREATIVITY, PART 2
1972 300 p refs Transl. into ENGLISH from the publ. "Nauchnoe Tvorchestvo" Moscow, Nauka, 1969 p 278-576 Sponsored by NSF 3 Vol.
(TT-70-57147-2) Avail: NTIS HC $3.00 CSCL 05K

N73-30214*# National Academy of Public Administration, Washington, D.C.
THE ADMINISTRATION OF THE NASA SPACE TRACKING SYSTEM AND THE NASA SPACE TRACKING SYSTEM IN AUSTRALIA
Neil Hollander 31 Jan. 1973 92 p refs
(Contract NSR-09-046-001)
(NASA-CR-133828) Avail: NTIS HC $6.75 CSCL 14B

The international activities of the NASA space program were studied with emphasis on the development and maintenance of tracking stations in Australia. The history and administration of the tracking organization and the manning policies for the stations are discussed, and factors affecting station operation are appraised. A field study of the Australian tracking network is included. F.O.S.

N73-30662# Portland General Electric Co., Oreg.
EVALUATION OF AIRCRAFT HAZARDS AT THE BOARDMAN NUCLEAR PLANT SITE Final Report
K. Hornyik (Oregon State Univ.), A. H. Robinson (Oregon State Univ.), and J. E. Grund May 1973 174 p refs
(PB-220715/7; PGE-2001) Avail: NTIS HC $3.00 CSCL 18E

An assessment is presented of the probability of aircraft crashing into a proposed nuclear power generating plant located near Boardman in Morrow County, Oregon. Quantitative estimates of crash probabilities into the proposed plant are based on analyses of operations of commercial aircraft using Federal airways and the U.S. Navy aircraft use of a nearby Navy weapons System Training Facility. GRA

N73-30892# Committee on Appropriations (U. S. House).
NASA AUTHORIZATION OF APPROPRIATIONS FOR FISCAL YEAR 1974
Olin E. Teague Washington GPO 28 Jun. 1973 12 p Report to accompany H.R. 7528 presented by the Comm. of Conf. at the 93d Congr., 1st Sess., 28 Jun. 1973
(H-Rept-93-353) Avail: US Capitol, House Document Room

The report of a Congressional committee to resolve disagreement concerning the NASA appropriations for Fiscal Year 1974 is submitted. Amounts for research and development projects, test facilities, training devices, and installations are specified. The fiscal points in disagreement are identified and the recommendations for resolving the problem are developed. Author

N73-30907# Committee on Aeronautical and Space Sciences (U. S. Senate).
NASA AUTHORIZATION FOR FISCAL YEAR 1974, PART 3
Washington GPO 1973 446 p refs Hearings on S.880 before Comm. on Aeron. and Space Sci., 93d Congr., 1st Sess., 3-4 and 10 Apr. 1973 3 Vol.
Avail: SOD HC $2.60 Domestic Postpaid or $2.25 GPO Bookstore

Congressional hearings concerning appropriations for NASA operations during Fiscal Year 1974 are presented. The subjects discussed are: (1) Soviet space activities in 1972, (2) Department of Defense Space activities, (3) Department of Defense Aeronautical activities, and (4) coordination and cooperation with NASA. The data consist primarily of testimony by selected witnesses to substantiate claims for funds. Author

N73-30915*# Drexel Univ., Philadelphia, Pa.
INTERVENTION INTO A TURBULENT URBAN SITUATION: A CASE STUDY Ph.D. Thesis
G. Mason Caldwell, Jr. Jun. 1973 187 p refs
(Grant NGL-39-004-020)
(NASA-CR-133830) Avail: NTIS HC $11.50 CSCL 05K

The application is reported of NASA management philosophy and techniques within New Castle County, Delaware, to meet actual problems of community violence. It resulted in restructuring the county approach to problems of this nature, and development of a comprehensive system for planning, based on the NASA planning process. The method involved federal, state, and local resources with community representatives in solving the problems. The concept of a turbulent environment is presented with parallels drawn between NASA management experience and problems of management within an urban arena. Author

N73-30918# Federal Aviation Administration, Washington, D.C.
ENGINEERING AND DEVELOPMENT PROGRAM PLAN: PROGRAM STRUCTURE AND OBJECTIVES
1 Jul. 1973 40 p
(FAA-ED-00-A) Avail: NTIS $4.00

Program plans are presented covering the present twenty-two engineering and development programs within the Federal Aviation Administration. These plans are required to provide more detailed information on the objectives, goals, program structure, technical approach, resources, possible implementation, and a number of other aspects for each of these programs. This planning process has been formalized in order to provide a record of the status and availability of each plan. An introductory background is presented to the planning process, the objectives in each of the program areas, and an index of the plans, available or under preparation. Author

N73-30920# Committee on Commerce (U. S. Senate).
METRIC CONVERSION
Washington GPO 1972 330 p refs Hearing on S. 2483 and S. J. Res. 219 before Comm. on Com., 92d Congr., 2d Sess., 29 Feb. - 1 Mar. 1972
Avail: SOD HC $1.25

A Congressional committee hearing on conversion to metric units is presented. The purpose of the hearing was to provide a national program in order to make the international metric system the official and standard system of measurement in the United States. The legislation is also designed to provide for converting to the general use of metric system within ten years after the date of enactment of the law. The findings of the committee are primarily based on testimony provided by experts in the field of metrology. Author

N73-30921# Committee on Science and Astronautics (U. S. House).
NASA AUTHORIZATION, 1974: INDEX FOR PARTS 1, 2, 3, AND 4
Washington GPO 1973 285 p refs Index for hearings on H.R. 4567 (superseded by H.R. 7528) before Comm. on Sci. and Astronaut., 93d Congr., 1st Sess.
Avail: Comm. on Sci. and Astronaut.

An index of the subjects discussed in the Congressional hearings for the NASA appropriation for Fiscal Year 1974 is submitted. All on-going and proposed research and development programs are identified. All subjects covered during the testimony of selected witnesses are indexed. P.N.F.

N73-30922# Committee on Science and Astronautics (U. S. House).
CONVERSION TO THE METRIC SYSTEM OF WEIGHTS AND MEASURES
Washington GPO 1973 671 p refs Hearings before Comm. on Sci. and Astronaut., 93d Congr., 1st Sess., No. 3, 19-22 Mar. and 9-10 May 1973
Avail: Subcomm. on Sci., Res., and Develop.

Congressional hearings to determine the feasibility and desirability of converting to the metric system in United States industry are presented. The bill to establish a national policy relating to conversion to the metric system is reported. The establishment of a national metric conversion board is proposed and its functions are defined. Applications of the metric system and comparisons with the English system are explained. The hearings consist primarily of testimony by recognized experts in the field of metrology and industry. Author

N73-31140# National Bureau of Standards, Washington, D.C. Computer Systems Section.
ANNOTATED BIBLIOGRAPHY OF THE LITERATURE ON RESOURCE SHARING COMPUTER NETWORKS Interim Report, Fourth Quarter, 1973
R. P. Blanc, I. W. Cotton, T. N. Pyke, Jr., and S. W. Watkins Sep. 1973 96 p refs
(Grant NSF AG-350; NBS Proj. 6502372)
(NBS-SP-384; LC-73-600268) Avail: SOD HC $1.25 as C13.10:384

A bibliography consisting of references with critical annotations to the literature on computer networks is presented. A classification scheme was developed to place each annotation in a category reflective of its content. Five indexes to the bibliography are included: author index, corporate author index, network index, key word out of context index, and report number index. Author

N73-31729*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
STUDY OF AIRBORNE SCIENCE EXPERIMENT MANAGEMENT CONCEPTS FOR APPLICATION TO SPACE SHUTTLE, VOLUME 2
Donald R. Mulholland, John O. Reller, Jr., Carr B. Neel, and Louis C. Haughney Jul. 1973 132 p refs
(NASA-TM-X-62287) Avail: NTIS HC $8.75 CSCL 22A

Airborne research management and shuttle sortie planning at the Ames Research Center are reported. Topics discussed include: basic criteria and procedures for the formulation and approval of airborne missions; ASO management structure and procedures; experiment design, development, and testing aircract characteristics and experiment interfaces; information handling for airborne science missions; mission documentation requirements; and airborne science methods and shuttle sortie planning. F.O.S.

N73-31916# Committee on Science and Astronautics (U. S. House).
GAO REPORT ON ANALYSIS OF COST OF SPACE SHUTTLE PROGRAM
GPO Washington 1973 119 p refs Hearings, with Committee's summary and conclusions, before Comm. on Sci. and Astron., 93d Congr., 1st Sess., No. 5, 26 Jun. 1973
Avail: Subcomm. on Manned Space Flight

A Congressional hearing on the cost of the space shuttle program is presented. The findings of the Government Accounting Office are compared with the projected NASA programs to determine areas of agreement and disagreement. The information is presented in the form of testimony by knowledgeable witnesses. Statements of the witnesses are substantiated by tabulated data and bar graphs. The appendix contains a chapter by chapter refutation by NASA of the Government Accounting Office claims where discrepancies exist. Author

N73-31921# Army War Coll., Carlisle Barracks, Pa.
THE US AEROSPACE/DEFENSE INDUSTRY: A CURRENT ANALYSIS Individual Research Report
Anthony Carroll 2 Apr. 1973 36 p refs
(AD-763242) Avail: NTIS CSCL 05/3

Contents: The aerospace industry and the national economy; Competition increasing in the international market; Research and development in the aerospace industry; What are defense industry profits; Detailed analysis of the Lockheed Aircraft Corporation; GRA

N73-32066# Office Radiodiffusion et Television Francaise, Paris. Service de la Recherche.
NEW MEANS OF AUDIOVISUAL MESSAGE TRANSMISSION: VOLUME C: VIDEO CASSETTES [NOUVEAUX MOYENS DE DIFFUSION DE MESSAGES AUDIO-VISUELS VOLUME C VIDEO-CASSETTES]
Henri False and Serge Gregory-Brive Apr. 1972 167 p In FRENCH 3 Vol.
Avail: NTIS HC $10.50

A review of existing systems and future technical developments for video-cassette recording devices is presented. Read only systems, such as helicoidal magnetoscopes and super 8 telecinemas, are described and compared. The market situation and property rights problems are analyzed. The activities of various commercial organizations in a number of nations are reviewed. ESRO

N73-32103# Air Force Academy, Colo. Dept. of Astronautics and Computer Science.
GENERALIZED DATA BASE MANAGEMENT SYSTEMS AND SELECTED AIR FORCE APPLICATIONS Final Report
Anthony J. Winkler, Paul P. Rhymer, Jonathan A. Singer, John A. Lacash, Robert K. Miller, and Karl Starkloff Apr. 1973 173 p refs
(AD-765203; DFACS-73-CS-2) Avail: NTIS CSCL 05/1

The report discusses the generalized data base management systems (GDBMS) with case studies to illustrate the concepts discussed in the tutorial section. An introduction to the functional components of a GDBMS, their interrelationship and their purpose is presented. Data and storage structures and their influence on the GDBMS and its associated operating system are discussed. There is a discussion on the GDBMS user environment and operational considerations. Included also are questions related to the rationale/requirements problem of GDBMSs. The case studies are all Air Force related GDBMSs. Systems discussed are the Headquarters USAF Military Personnel System - System 2.5, the Machine Independent Data Management System (MIDMS), the Program Assisted Concole Evaluation and Review System (PACER), the SACCS Force Management Information System, and the Strategic Air Command Generalized Information System. Author (GRA)

N73-32104# Air Force Academy, Colo. Dept. of Astronautics and Computer Science.
PROCEEDINGS OF THE 3D ANNUAL WORLDWIDE DATA BASE MANAGEMENT SYSTEM SYMPOSIUM Final Report
Anthony J. Winkler and Gordon M. Gerson Jan. 1973 255 p refs Conf. held at AF Acad., Colo., 24-26 Jan. 1973
(AD-765204; DFACS-73-CS-1) Avail: NTIS CSCL 09/2

Contents: An evolutionary approach to the development of data base management systems; Special purpose design - a human factor approach; The Air Force computer selection process; Information systems research for the future; The application of a GDBMS to support the data administrator functions; The ADPS/BLMPS tailored data management system; Data element reconciliation and file structuring technique for MAC's WWMCCS on-line data base; Air Force on-line data system; Status of the system survey team. GRA

N73-32372*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROPOSED RELIABILITY COST MODEL
Leon M. Delionback 1 Aug. 1973 44 p refs
(NASA-TM-X-64777) Avail: NTIS HC $4.25 CSCL 14D

The research investigations which were involved in the study include: cost analysis/allocation, reliability and product assurance,

forecasting methodology, systems analysis, and model-building. This is a classic example of an interdisciplinary problem, since the model-building requirements include the need for understanding and communication between technical disciplines on one hand, and the financial/accounting skill categories on the other. The systems approach is utilized within this context to establish a clearer and more objective relationship between reliability assurance and the subcategories (or subelements) that provide, or reenforce, the reliability assurance for a system. Subcategories are further subdivided as illustrated by a tree diagram. The reliability assurance elements can be seen to be potential alternative strategies, or approaches, depending on the *specific goals/objectives of the trade studies. The scope was* limited to the establishment of a proposed reliability cost-model format. The model format/approach is dependent upon the use of a series of subsystem-oriented CER's and sometimes possible CTR's, in devising a suitable cost-effective policy. Author

N73-32388# Defense Documentation Center, Alexandria, Va.
MACHINE SHOP PRACTICE Report Bibliography, May 1956 - Dec. 1972
Aug. 1973 162 p refs
(AD-765400; DDC-TAS-73-54) Avail: NTIS CSCL 13/6

The bibliography is a collection of 117 references relating to techniques, procedures, manufacturing methods, time studies and shop layout in machine shop practice. The performance capabilities and effectiveness of machine cutting, drilling, grinding, reaming, forming, spinning and shearing are discussed. Author (GRA)

N73-32480 North Carolina Univ., Chapel Hill.
A MULTI-CRITERIA RESOURCE ALLOCATION DECISION AID Ph.D. Thesis
Belinda Hill Adams 1972 144 p
Avail: Univ. Microfilms Order No. 73-16444

The methodology developed is intended to serve as a resource allocation decision aid in situations where a multi-criteria evaluation of alternatives is appropriate. In order to accomplish an improvement in these areas, the methodology structures the real world problem in a manner which facilitates the use of an *unusual judgment coordination* procedure and which permits an organization to utilize the specialized expertise of its personnel to obtain a composite organizational value for each proposed alternative. This, in turn, facilitates the application of mathematical optimization techniques, making it possible to identify a combination of proposed alternatives which maximizes research package value. The Space Shuttle Program of the National Aeronautics and Space Administration afforded an opportunity for coupling the theoretical development with the testing of the model under conditions in which model simplifications were unusually applicable. Specifically, the methodology was applied to the selection of a space shuttle experiment package. Though the methodology is particularly suited to R and D resource allocation decisions, certain minor modifications are suggested which will significantly broaden the applicability of the approach.
Dissert. Abstr.

N73-32488# Centre National de la Recherche Scientifique, Toulouse (France). Lab. d'Automatique et d'Analyse des Systemes.
GENERAL PROBLEMS ON THE JOB-SHOP SCHEDULING. DEFINITIONS, CRITERIA, PRINCIPAL METHODS [PROBLEM GENERAL DE L'ORDONNANCEMENT D'ATELIER. DEFINITIONS, CRITERES, PRINCIPALES METHODES]
J. Erschler, F. Roubellat, and J. P. Vernhes Jun. 1973 22 p refs In FRENCH
(LAAS-OD-73-I-21) Avail: NTIS HC $3.25

An application of the set and probability theory to general job-shop scheduling is presented. Basic hypothesis, processes, and scheduling variables are described. Performance measurement, stockpiling, execution time and scheduling problem classification are discussed. Active, semi-active, no delay scheduling and scheduling generation procedures are defined, and examples of statistical studies given. An optimal solution for the case of n tasks on m machines with specified movement of products in the job-shop is presented using linear programming. ESRO

N73-32842*# Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.
STUDIES IN SHORT HAUL AIR TRANSPORTATION IN THE CALIFORNIA CORRIDOR: EFFECTS OF DESIGN RUNWAY LENGTH; COMMUNITY ACCEPTANCE; IMPACT OF RETURN ON INVESTMENT AND FUEL COST INCREASES, VOLUME 1
Richard S. Shevell and David W. Jones, Jr. Jul. 1973 207 p refs 2 Vol.
(Contract NAS2-7199)
(NASA-CR-114634; SUDAAR-460-Vol-1) Avail: NTIS HC $12.50 CSCL 01E

The impact of design runway length on the economics and traffic demand of a 1985 short haul air transportation system in the California Corridor was investigated. The community acceptance of new commercial airports for short haul service was studied. The following subjects were analyzed: (1) travel demand, (2) vehicle technology, (3) infrastructure, (4) systems analysis, and (5) effects on the community. The operation of the short haul system is compared with conventional airline operations. Author

N73-32847*# Denver Research Inst., Colo. Industrial Economics Div.
PROGRAM FOR TRANSFER RESEARCH AND IMPACT STUDIES Semiannual Report, 1 Jul. - 31 Dec. 1972
Jerome J. Rusnak, James E. Freeman, Joanne M. Hartley, James P. Kottenstette, and Eileen R. Staskin Jul. 1973 27 p refs
(Contract NASw-2362)
(NASA-CR-135720) Avail: NTIS HC $3.50 CSCL 05A

Research activities conducted under the Program for Transfer Research and Impact Studies (TRIS) during 1972 included: (1) preparation of 10,196 TSP requests for TRIS application analysis; (2) interviews with over 500 individuals concerning the technical, economic, and social impacts of NASA-generated technology; (3) preparation of 38 new technology transfer example files and 101 new transfer cases; and (4) maintenance of a technology transfer library containing more than 2,900 titles. Six different modes of technology utilization are used to illustrate the pervasiveness of the transfer and diffusion of aerospace innovations. These modes also provide a basis for distinguishing the unique characteristics of the NASA Technology Utilization Program. An examination is reported of the ways in which NASA-generated technology is contributing to beneficial social change in five major areas of human concern: health, environement, safety, transportation, and communication. Author

N73-32848*# Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
PROCEEDINGS OF THE NASA/MIT WORKSHOP ON AIRLINE SYSTEMS ANALYSIS, VOLUME 1
Joseph F. Vittek, ed. Jul. 1972 744 p refs Workshop held at Waterville Valley, New Hampshire, 10-21 Jul. 1972 2 Vol.
(Contract NASw-2412)
(NASA-CR-135634; FTL-R72-7-Vol-1) Avail: NTIS HC $39.25 CSCL 05C

Economic principles, financial aspects, forecast and demand, and marketing in the development of an air transport industry are considered.

N73-32849* Massachusetts Inst. of Tech., Cambridge.
DEVELOPMENT OF THE AIR TRANSPORT INDUSTRY
Nawal Taneja *In its* Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 p 1-44 refs 23-34)
CSCL 05C

The major developments are outlined in the U.S. scheduled air transport industry both domestic and international, together with a brief history of the European air transport system. The role and formulation of the U.S. Civil Aeronautics Board, International Civil Aviation Organization, and International Air Transport Association are also covered. Author

N73-32850* Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.

THE ROLE OF THE FEDERAL GOVERNMENT IN THE DEVELOPMENT OF THE US AIR TRANSPORTATION SYSTEM
Joseph F. Vittek *In its* Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 27 p

CSCL 05A

Reviewed are the roles of the various Federal agencies in the regulation, control, and development of the Air System, with major emphasis on the Department of Transportation (Office of the Secretary, Federal Aviation Administration, and National Transportation Safety Board) and the Civil Aeronautics Board. Author

N73-32851* Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
AN ANALYSIS OF AIRLINE COSTS. LECTURE NOTES FOR MIT COURSES. THE 16.73 AIRLINE MANAGEMENT AND MARKETING
Robert W. Simpson *In its* Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 43 p refs

CSCL 05A

The cost analyst must understand the operations of the airline and how the activities of the airline are measured, as well as how the costs are incurred and recorded. The data source is usually a cost accounting process. This provides data on the cumulated expenses in various categories over a time period like a quarter, or year, and must be correlated by the analyst with cumulated measures of airline activity which seem to be causing this expense. Author

N73-32854* Harvard Univ., Cambridge, Mass. Dept. of Economics.
BASIC ECONOMIC PRINCIPLES
T. Nicholaus Tideman *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 7 p refs

CSCL 05C

An economic approach to design efficient transportation systems involves maximizing an objective function that reflects both goals and costs. A demand curve can be derived by finding the quantities of a good that solve the maximization problem as one varies the price of that commodity, holding income and the prices of all other goods constant. A supply curve is derived by applying the idea of profit maximization of firms. The production function determines the relationship between input and output. G.G.

N73-32855* Massachusetts Inst. of Tech., Cambridge.
BASIC TRANSPORTATION ECONOMICS
James T. Kneafsey *In its* Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 18 p refs

CSCL 05C

Transportation economics is an integral part of all transportation activities. Refined, detailed, and careful economic analyses consider conduct-performance methodology and the specifications of production, cost and demand functions. Author

N73-32856* Texas A&M Univ., College Station.
DETERMINATION OF FARES: PRICING THEORY AND ECONOMIC EFFICIENCY
James C. Miller, III *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 30 p refs

CSCL 05C

The concept of economic efficiency is described, its application to the pricing of air transport services, and its relevance as a policy objective are outlined. The first two sections discuss economic efficiency in general terms, whereas the third applies this norm to several airline pricing problems. The final section emphasizes the importance of industry behavior as a parameter in policy analysis. Author

N73-32857* United Air Lines, Inc., Chicago, Ill.
DIFFERENTIAL PRICING POLICY
J. B. Gebhardt *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 15 p

CSCL 05C

Differential pricing is a valid means of improving profits, keeping the total cost of air transportation down, and making it possible for more people to use air transportation. Author

N73-32859* Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab
BASIC FINANCE
Joseph F. Vittek *In its* Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 66 p

CSCL 05C

A discussion of the basic measures of corporate financial strength, and the sources of the information is reported. Considered are: balance sheet, income statement, funds and cash flow, and financial ratios. Author

N73-32860* Air Transport Association of America, Washington, D.C.
CAPITAL REQUIREMENTS FOR THE AIR TRANSPORT INDUSTRY
George W. James *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 13 p

CSCL 05C

In recent years the U.S. scheduled airline industry has been involved in the largest re-equipment program that involves the addition of hundreds of new aircraft to the airline fleet. The costs associated with the purchase of this new equipment, along with the other costs involving such matters as the environment and security, are presenting the carriers with significant financial challenges. Author

N73-32861* American Airlines, Inc., New York.
FINANCING THE AIR TRANSPORTATION INDUSTRY
D. J. Lloyd-Jones *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 50 p

CSCL 05C

The basic characteristics of the air transportation industry are outlined and it is shown how they affect financing requirements and patterns of production. The choice of financial timing is imperative in order to get the best interest rates available and to insure a fair return to investors. The fact that the industry cannot store its products has a fairly major effect on the amount of equipment to purchase, the amount of capital investment required, and the amount of return required to offset industry depriciation. G.G.

N73-32862* Export-Import Bank, Washington, D.C.
THE ROLE OF THE EXPORT-IMPORT BANK IN DEVELOPING THE EXPORT POTENTIAL OF AIRCRAFT SALES
Chosei Kuge *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 1972 11 p

CSCL 05C

A description of the current patterns, terms, and conditions of Eximbank commercial jet aircraft export financing is given. Some discussion of the factors affecting export financing will be noted. Author

N73-32863* Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
THE MARKET DEMAND FOR AIR TRANSPORTATION
Nawal Taneja *In its* Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 65 p refs

CSCL 05C

Although the presentation will touch upon the areas of market for air transportation, the theoretical foundations of the

demand function, the demand models, and model selection and evaluation, the emphasis of the presentation will be on a qualitative description of the factors affecting the demand for air transportation. The presentation will rely heavily on the results of market surveys carried out by the Port of New York Authority, the University of Michigan, and Census of Transportation. Author

N73-32864* Massachusetts Inst. of Tech., Cambridge. Flight *Transportation* Lab.
TECHNIQUES FOR FORECASTING AIR PASSENGER TRAFFIC
Nawal Taneja *In its* Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 16 p refs

CSCL 05A

The basic techniques of forecasting the air passenger traffic are outlined. These techniques can be broadly classified into four categories: judgmental, time-series analysis, market analysis and analytical. The differences between these methods exist, in part, due to the degree of formalization of the forecasting procedure. Emphasis is placed on describing the analytical method. Author

N73-32866* American Airlines, Inc., New York.
AMERICAN AIRLINES PROPELLER STOL TRANSPORT ECONOMIC RISK ANALYSIS
Bob Ransone *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 27 p

CSCL 05C

A Monte Carlo risk analysis on the economics of STOL transports in air passenger traffic established the probability of making the expected internal rate of financial return, or better, in a hypothetical regular Washington/New York intercity operation. G.G.

N73-32869* Harvard Univ., Cambridge, Mass.
DETERMINANTS OF MARKET STRUCTURE AND THE AIRLINE INDUSTRY
William Raduchel *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 20 p

CSCL 05A

The general economic determinants of market structure are outlined with special reference to the airline industry. Included are the following facets: absolute size of firms; distributions of firms by size; concentration; entry barriers; product and service differentiation; diversification; degrees of competition; vertical integration; market boundaries; and economies of scale. Also examined are the static and dynamic properties of market structure in terms of mergers, government policies, and economic growth conditions. Author

N73-32870* Massachusetts Inst. of Tech., Cambridge.
OBJECTIVES OF THE AIRLINE FIRM: THEORY
James T. Kneafsey *In its* Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 14 p

CSCL 05A

Theoretical models are formulated for airline firm operations that revolve around alternative formulations of managerial goals which these firms are persuing in practice. Consideration is given to the different objective functions which the companies are following in lieu of profit maximization. G.G.

N73-32871* North Carolina Univ., Chapel Hill.
PROBLEMS OF EXCESS CAPACITY
George Douglas *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 15 p

CSCL 05A

The problems of excess capacity in the airline industry are discussed with focus on the following topics: load factors; fair rate of return on investment; service-quality rivalry among airlines; pricing (fare) policies; aircraft production; and the impacts of excess capacity on operating costs. Also included is a discussion of the interrelationships among these topics. Author

N73-32873* Pan American World Airways, Inc., New York.
CONSUMER MARKETING AND THE AIRLINE INDUSTRY
William R. Roy *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 21 p

CSCL 05A

The fundamentals of consumer marketing as applied to the airline industry are considered. An attempt is made to boil down the mystique and jargon which frequently surround the subject of marketing. Topics covered include: (1) The marketing concept; (2) consumer expectations from airlines; (3) planning of marketing strategy; and (4) the roles of advertising, sales, and middlemen. Author

N73-32874* Pan American World Airways, Inc., New York.
FUTURE DIRECTION IN AIRLINE MARKETING
Dan A. Colussy *In* MIT Proc. of the NASA/MIT Workshop on Airline Systems Analysis, Vol. 1 Jul. 1972 20 p

CSCL 05A

The rapid growth and broadening of the air travel market, coupled with a more sophisticated consumer, will dramatically change airline marketing over the next decade. Discussed is the direction this change is likely to take and its implications for companies within the industry. New conceptualization approaches are required if the full potential of this expanding market is to be fully realized. Marketing strategies are developed that will enable various elements of the travel industry to compete not only against each other but also with other products that are competing for the consumer's discretionary income. Author

N73-32875*# Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
MIT-NASA WORKSHOP AIRLINE SYSTEMS ANALYSIS, VOLUME 2
Jul. 1972 602 p refs
(Contract NASw-2412)
(NASA-CR-135635; FTL-R72-7-Vol-2) Avail: NTIS HC $32.25 CSCL 05A

The proceedings of a conference on the Air Transport Industry are presented. The subjects discussed are: (1) analysis of airline costs, (2) transportation economics, (3) airline financing, (4) market demand for air transportation, (5) planning, management, and economics of airport operation, (6) air cargo operations, (7) commuter aircraft operations, (8) regulation of air traffic rates, (9) airline merger policies, and (10) international air transportation operations.

N73-32877* Massachusetts Inst. of Tech., Cambridge.
PLANNING, MANAGEMENT, AND ECONOMICS OF AIRPORT OPERATION
John Wiley *In its* MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 Jul. 1972 18 p

CSCL 05A

An overview of the role of the airport in the transportation complex and in the community is presented. The establishment of the airport including its requirements in regional planning and the operation of the airport as a social and economic force are discussed. Author

N73-32878* Port of New York Authority, N.Y.
AIRPORT ECONOMICS: MANAGEMENT CONTROL FINANCIAL REPORTING SYSTEMS
Allen Buchbinder *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 Jul. 1972 16 p

CSCL 05B

The development of management control financial reporting systems for airport operation is discussed. The operation of the

system to provide the reports required for determining the specific revenue producing facilities of airports is described. The organization of the cost reporting centers to show the types of information provided by the system is analyzed. Author

N73-32879* Port of New York Authority, N.Y. Aviation Economics Div.
AIR TRAFFIC FORECASTING AT THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY
Johannes G. Augustine *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 Jul. 1972 23 p refs

CSCL 05A

Procedures for conducting air traffic forecasts with specific application to the Port Authority of New York and New Jersey are discussed. The procedure relates air travel growth to detailed socio-economic and demographic characteristics of the U.S. population rather than to aggregate economic data such as Gross National Product, personal income, and industrial production. Charts are presented to show the relationship between various selected characteristics and the use of air transportation facilities. Author

N73-32880* Massachusetts Port Authority, Boston.
ROUTE AWARD CONSIDERATIONS
Wilson D. Rogers, Jr. *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 Jul. 1972 22 p

CSCL 05A

The organization, responsibilities, and functions of the Civil Aeronautics Board are discussed. Several examples of decisions made by the Civil Aeronautics Board on the award of specific air routes to competing air lines are presented. The manner in which route proceedings are initiated and examined is explained. Recommendations are made concerning actions which can be taken to improve the services provided to the flying public. Author

N73-32883* Civil Aeronautics Board, Washington, D.C.
CURRENT PROBLEMS AND ISSUES IN AIR FREIGHT RATES
Alfred R. Stout *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 Jul. 1972 21 p

CSCL 05C

Actions of the Civil Aeronautics Board in determining air freight rates are discussed. The tariff filings by domestic airlines for making basic changes in domestic fares and rates are reported. The roles of the carriers and the Civil Aeronautics Board in establishing freight rates are defined. Specific examples of areas of controversy in establishing freight rates are included. Methods for improving the air cargo and freight rate situation are proposed. Author

N73-32884* Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
THE FUTURE OF THE US DOMESTIC AIR FREIGHT INDUSTRY
Lewis M. Schneider *In its* MIT-NASA Workshop on Airlines Systems Analysis, Vol. 2 Jul. 1972 21 p refs

CSCL 05A

A research project on the future of U.S. domestic air freight operations was conducted. The two main subjects of the project were: (1) during the 1965 to 1969 time period, when the airlines introduced jet freighters into domestic service and air freight traffic growth continued at a high rate, what strategies were employed by management and with what results and (2) what are the opportunities and problems confronting the domestic air freight industry during the 1970 and 1980 time period. The results of the analysis are presented in the form of graphs and tables. Author

N73-32885* Massachusetts Inst. of Tech., Cambridge.
TRENDS IN COMMUTER AIR CARRIER OPERATIONS
William Swan *In its* MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 Jul. 1972 17 p

CSCL 05B

The market for commuter air service is analyzed. Methods for reducing the costs of short haul air transportation are discussed. The problems facing the operators of short haul air transport services are identified. Proposed changes in commuter air carrier regulation are submitted. Author

N73-32886* Civil Aeronautics Board, Washington, D.C.
SERVICE TO SMALL COMMUNITIES
Monte Lazarus *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 Jul. 1973 10 p

CSCL 05A

The problems involved in the operation of low cost local service air carriers are analyzed. Four specific situations which created the operating difficulties of the local air carriers are defined. Proposals of federal and local subsidies for short haul air transportation are presented. Author

N73-32888* George Washington Univ., Washington, D.C.
THIRD LEVEL AIR CARRIER SERVICE
George Eads *In* MIT MIT-NASA Workshop on Airline Systems analysis, Vol. 2 Jul. 1972 28 p

CSCL 05A

A proposed Civil Aviation Board approach to regulating commuter air transportation services is discussed. Operating problems of specific air lines are used as examples. Inadequacies in the present service for short haul commuter air transportation are defined. Methods by which improvements in the commuter air transport service are proposed. Author

N73-32889* Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
THE RIGHT TO REGULATE
Joseph F. Vittek *In its* MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 19 Jul. 1972 19 p

CSCL 05A

An introduction to the historical and constitutional framework of industry regulation by local and Federal Governments is presented. Problems of the confiscation of private property without due process, government control and the rights and duties of the regulated industry are discussed. Author

N73-32890* Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
BASIC RATE MAKING
Joseph F. Vittek *In its* MIT-NASA Workshop on Airline Systems Analysis, Vol 2 19 Jul. 1972 14 p

CSCL 05A

The manner in which the rates charged by airlines are determined is explained. The topics include: (1) the determination of a fair rate of return, (2) the rate base, (3) allowable expenses, (4) load factors, and (5) seating configurations. Author

N73-32891* Texas A&M Univ., College Station. Dept. of Economics.
A CRITIQUE OF CAB REGULATORY POLICY
James C. Miller, III *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 21 Jul. 1972 31 p refs

CSCL 05A

The regulatory policies of the Civil Aviation Board are discussed. The objectives of the Civil Aviation Board are defined. Specific actions of the Civil Aviation Board with respect to passenger fares, rate levels, and load factors are presented. The decisions on successful and unsuccessful mergers of airlines during the 1938 to 1972 time period are analyzed. Tables of data are presented to show the economic aspects of airline operations during 1955, 1960, and 1970. Author

N73-32892* York Univ., Toronto (Ontario).
SURVIVAL, PROFITS AND RESOURCE UTILIZATION
William Jordan *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 14 Jul. 1972 81 p

CSCL 05C

The intertwining of CAB regulation and airline operations makes it impossible to use operating and financial data from the regulated airlines to determine the extent to which regulation affects costs. The essentially nonregulated, but otherwise, similar, intrastate airlines operating wholly within California (and thus beyond the CAB's jurisdiction) provide a benchmark with which to compare the performance of regulated airlines and thus measure the effects of CAB regulation. This comparison, shows that the nonregulated environment within California has been a much sterner disciplinarian of airline operations than the regulated environment of interstate air transportation. Issues of survival, profits, efficiency, fares, and the impacts of CAB regulation on costs are examined. Author

N73-32893* Harbridge House, Inc., Boston, Mass.
FEDERAL REGULATORY TRENDS AND THE EMERGING PROFILES OF AIR TRANSPORTATION
Charles D. Baker *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 21 Jul. 1972 6 p

CSCL 05A

The economic aspects of Federal regulation of airlines are discussed. The problems involved in obtaining capital resources for airline operations and expansion are analyzed. The functions of various agencies and their impact on the economic status of the airlines are explained. Author

N73-32894* Harvard Univ., Cambridge, Mass. Harvard Business School.
THE FUTURE OF REGULATION IN THE AIRLINE INDUSTRY
Paul W. Cherington and James J. Hill *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 21 Jul. 1972 5 p
CSCL 05A

The Federal regulation of airlines is analyzed to predict the amount of regulation to be expected in the future. It is stated that the regulatory powers will increase because of the advantages that such regulation provides to the airlines. Six propositions are submitted as guidelines for future airlines regulation. The loss of revenue experienced by the airlines is examined and methods for improving the economic situation are defined. Author

N73-32895* Civil Aeronautics Board, Washington, D.C.
MERGERS AND ANTI-TRUST ISSUES IN RECENT CAB CASES
A. M. Andrews *In* MIT MIT-NASA Workshop on Airline System Analysis, Vol. 2 19 Jul. 1972 10 p

CSCL 05A

The airline industry is surveyed-particularly domestic trunk-lines-in relation to collective approaches to industry concerns. These actions are classified by the apparent degree of anti-trust issue present. Recent route merger cases are considered from the CAB staff viewpoint. Author

N73-32896* Department of Transportation, Washington, D.C.
DEPARTMENT OF TRANSPORTATION MERGER POLICY
John Gitlick *In* MIT MIT-NASA Workshop Workshop on Airline System Analysis, Vol. 2 19 Jul. 1972 23 p

CSCL 05A

The policy of the Department of Transportation with respect to evaluating airline mergers is discussed. The subjects presented are: (1) statutory responsibilities of the Department of Transportation, (2) interrelationship of airline merger policy and overall airline policy, (3) executive branch criteria for domestic airline merger proposals, and position of Department of Transportation on several merger proceedings. Author

N73-32897* Department of Justice, Washington, D.C.
JUSTICE DEPARTMENT AIRLINE MERGER POLICY
Donald A. Farmer *In* MIT MIT-NASA Workshop on Airline System Analysis, Vol. 2 19 Jul. 1972 20 p refs

CSCL 05A

Justice Department airline merger policy is developed within the context of the Federal Aviation Act, in which there is an unusually explicit reliance on competition as a means of fulfilling statutory goals. The economics of the airline industry appear to indicate that low concentration and vigorous competition are particularly viable and desirable. Several factors, including existing regulatory policy, create incentives for airlines to merge whether or not an individual merger promotes or conflicts with the public interest. Specific benefits to the public should be identified and shown to clearly outweight the detriments, including adverse competitive impact, in order for airline mergers to be approved. Author

N73-32898* Allegheny Airlines, Inc., Washington, D.C. Legal Affairs and Marketing Services.
ONE AIRLINE'S VIEW OF MERGERS
Edwin I. Colodny *In* MIT MIT-NASA Workshop on Airline System Analysis, Vol. 2 19 Jul. 1972 14 p

CSCL 05A

Specific cases of airline mergers are discussed to show the legal aspects involved and the procedures followed. The effects of the mergers on the airlines involved are analyzed. The impact of the mergers on management, personnel, and the overall airline operations is reported. Author

N73-32899* Civil Aeronautics Board, Washington, D.C.
INTERNATIONAL AIR TRANSPORT POLICY
Charles Butler *In* MIT MIT-NASA Workshop on Airline System Analysis, Vol. 2 21 Jul. 1972 31 p

CSCL 05A

The actions of the Civil Aviation Board in providing assistance and advice to the State Department regarding international air transport policy are discussed. The policies and guidelines of the Civil Aviation Board are defined. The relationship with the policies of the Executive Branch of the Government and the interpretations of the Department of Transportation are reported. Author

N73-32900* Aerospace Industries Association of America, Inc., Washington, D.C.
COMMERCIAL AIRCRAFT DEVELOPMENT AND THE EXPORT MARKET
Joseph Snodgrass *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 20 Jul. 1972 20 p refs

CSCL 05C

The various factors which endanger the future of commercial aircraft development are defined. The factors discussed are: (1) a decline in federally funded research and development programs, (2) a general decline in the economic health of the domestic airlines, (3) the increased cost of development which may be several times the net worth of the company, (4) the development overseas of common market and manufacturing consortia, and (5) foreign manufacturers receiving significant financial support from their national governments. It is stated that unless immediate and innovative solutions to combat these factors are found, the commercial aviation industry will be in serious difficulty. Author

N73-32901* Trans World Airlines, Inc., New York.
SCHEDULING FOR PUBLIC SERVICE IN INTERNATIONAL OPERATIONS
Melvin A. Brenner *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 18 Jul. 1972 19 p

CSCL 05A

The factors involved in scheduling airline services for international operations are discussed. Charts are presented to show the transatlantic pattern of flights for a typical airline during the summer and winter months. The operations of a domestic airline operating overseas and a foreign airline operating to the United States are compared. Author

N73-32902* Department of Transportation, Washington, D.C.
INTERNATIONAL AIR TRANSPORT AND FEDERAL POLICY
Robert Henri Binder *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 21 Jul. 1972 12 p

CSCL 05A

The Federal policy which establishes guidelines for future U.S. participation in the international air transportation industry is discussed. The policy issues discussed include the following: (1) aircraft hijacking, both foreign and domestic, (2) relationship of scheduled services and charter services, (3) capacity problems, and (4) rate regulation. Author

N73-32903* Air Transport Association of America, Washington, D.C.
UNITED STATES INTERNATIONAL AIR TRANSPORT POLICY, THE PROMISE AND THE REALITY
James E. Landry and Gabriel Phillips *In* MIT MIT-NASA Workshop on Airline Systems Analysis, Vol. 2 21 Jul. 1972 32 p

CSCL 05A

The United States international air transportation policy is discussed. The major departure of the current policy lies in the relationship between scheduled and charter services. Various provisions of the transportation charter are analyzed to show the restrictions as well as the benefits the legislation holds for commercial aviation. It is stated that a group of full service carriers can meet the full spectrum of demands for air transportation more efficiently than two or more groups. Author

N73-32913*# George Washington Univ., Washington, D.C. Program of Policy Studies in Science and Technology.
TECHNOLOGY ASSESSMENT: WHAT SHOULD IT BE?
Guy Black Jun. 1971 57 p refs
(Grant NGL-09-010-030)
(NASA-CR-135783; GWPS-SDP-211) Avail: NTIS HC $5.00 CSCL 05B

A report on technology assessment (TA) is presented. Topics discussed include: the nature of TA, TA used as an analytical method for natural and social sciences, and the uncertain consequences of TA. K.M.M.

N73-32914*# George Washington Univ., Washington, D.C. Program of Policy Studies in Science and Technology.
SOME IMPLICATIONS OF THE TECHNOLOGY ASSESSMENT FUNCTION FOR THE EFFECTIVE PUBLIC DECISION-MAKING PROCESS
Louis H. Mayo May 1971 36 p refs
(Grant NGL-09-010-030)
(NASA-CR-135782; Occasional-Paper-12) Avail: NTIS HC $4.00 CSCL 05A

A preliminary provisional assessment of the prospects for the establishment of an adequate technology assessment function and the implications of the assessment function for the public decision process are presented. Effects of the technology assessment function on each phase of the public decision process and briefly explored. Significant implications during the next decade are projected with respect to the following phases: invention and development of alternative means (technological configurations); evaluation, selection and promotion of preferred courses of action; and modification of statutory scheme or social action program as an outcome of continuing monitoring and appraisal. Author

N73-32915# Centre National de la Recherche Scientifique, Marseilles (France). Lab. d'Astronomie Spatiale.
WORK PROGRAM FOR 1973 [PROJET DE PROGRAMME 1973]
Sep. 1972 45 p In FRENCH
(AD-03-72) Avail: NTIS HC $4.25

The 1973 budget forecast for the French Laboratoire d'Astronomie Spatiale (LAS) is presented. Equipment needed for the ATLAS S183 and UVL balloon experiments are discussed. Personnel complements and expenses, mission costs, equipment costs, running expenses, and the LAS organigram are detailed. ESRO

N73-32936* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FUTURE SHORT-FIELD AIRCRAFT
Thomas L. Galloway *In its* STOL Technol. 1972 p 9-22 ref
(For availability see N73-32934 24-02)
CSCL 01C

The application of short takeoff and landing aircraft for improving short-haul air transportation is examined. The contracts with industry to study quiet turbofan short-field aircraft in the short-haul air transportation system are identified. Studies of appropriate propulsion systems are conducted in parallel with the aircraft studies. The objectives of the studies are to: (1) determine economic and social viability of short-haul air transportation, (2) identify critical technology and technology-related problems, (3) define representative aircraft configurations and characteristics to include development and operational costs, and (4) to establish desirable technology advances for improving short-haul transportation systems. Author

N73-33513# Nauka Press, Moscow (USSR).
PLANNING OF AN EXPERIMENT IN CONDITIONS OF HETEROGENEITY [PLANIROVANIYE EKSPERIMENTA V USLOVIYAKH NEODNORODNOSTEY]
Ye. V. Markova and A. N. Lisenkov 1973 219 p refs In RUSSIAN
Avail: NTIS HC $13.00

One of the subdivisions of the theory of multifactor experiments is considered, which is the methodology of planning an experiment under nonuniform conditions. Methods of planning are described in detail, as well as: (1) the evaluation of the effect of discrete drift with a combinatorial scheme of the Latin type, (2) hyper-Greek-Latin squares, right angles, and cubes, (3) BIB and PBIB schemes, (4) complex nonsymmetric plans, and (5) problems of utilizing combinatorial schemes for constructing second-order plans and a subsequent filtering experiment. Methods are outlined for planning under conditions of constant drift. The planning methods are represented as special procedures with bounds on the randomization of the conditions under which the experiment is conducted. Transl. by K.P.D.

N73-33577 Health Physics Associates, Highland Park, Ill.
PERSONNEL MONITORING
William B. Rivkin *In* Bur. of Radiol. Health Radiation Safety and Protect. in Ind. Appl. Oct. 1972 p 39-94 refs

The development, application, and characteristics of personnel protection devices for use in hazardous areas where radioactive industry processes are discussed. A chronology of the acceptance and application of radiation measuring instruments is developed. The advantages and disadvantages of film dosimetry are analyzed. Special problems with measuring low exposures to radiation are identified. Graphs of the performance of various types of dosimeters are included. P.N.F.

N73-33830*# URS/Matrix Co., Huntsville, Ala.
DEVELOPMENT OF FLIGHT EXPERIMENT WORK PERFORMANCE AND WORKSTATION INTERFACE REQUIREMENTS. PART 2: APPENDIX H Final Report
Richard G. Hatterick 31 Aug. 1973 288 p
(Contract NAS8-28359)
(NASA-CR-124452; PRL-415-Pt-2) Avail: NTIS HC $16.50 CSCL 22B

A skill requirement definition method was applied to the

problem of determining, at an early stage in system/mission definition, the skills required of on-orbit crew personnel whose activities will be related to the conduct or support of earth-orbital research. The experiment data base was selected from proposed experiments in NASA's Earth Orbital Research and Application Investigation program as related to space shuttle missions, specifically those being considered for sortie lab. Activities during the study, include indentification of basic functions dealing with man's research and/or servicing activities on orbit. A crew function taxonomy was prepared relative to these activities. Likely candidate experiments for shuttle sortie missions were selected through extensive review of experiment and mission descriptions. Crew functions and tasks were initially identified for more than fifty representative earth orbital experiments, and a comprehensive task analysis was conducted on these tasks for selected payloads. Author

N73-33924# Committee on Science and Astronautics (U. S. House).
FEDERAL POLICY, PLANS, AND ORGANIZATION FOR SCIENCE AND TECHNOLOGY
Washington GPO 1973 182 p Hearings before Comm. on Sci. and Astronaut., 93d Congr., 1st Sess., No. 8, 17, 19, 23 and 24 Jul. 1973
Avail: Comm. on Sci. and Astronaut.

Discussions in the House of Representatives Committee on Science and Astronauts, concerning Federal policy, plans, and organization for the support and utilization of science and technology are presented. The historical background of Federal policy on science and technology is discussed, and a view of present goals, programs, and organization is derived. K.M.M.

N73-33925*# Linguistic Systems, Inc., Cambridge, Mass.
THE BIMODAL SYSTEM
A. Morand Washington NASA Oct. 1973 30 p Transl. into ENGLISH from "Le Systeme Bi-Mode" Rueil, France, Tregie Press, May 1973 32 p
(Contract NASw-2482)
(NASA-TT-F-15056) Avail: NTIS HC $3.50 CSCL 13F

The Bimodal System currently under development is an answer to municipal transportation problems of jammed streets with consequently poor service, coupled with rising costs. The Bimodal system aims at improving comfort in the bus, building up the system for existing vehicle and expressway techniques and designing and building a nonpolluting engine fueled with liquified natural gas. It also plans the construction of private rights-of-way, leading to the possibility of electrifying the vehicles and automating driving functions with a guidance system, which would eventually eliminate the driver altogether over special route sections. Author

N73-33930# Eurosat S.A., Geneva (Switzerland).
AIMS, PROSPECTS, ORGANISATION, AND FINANCING
Aug. 1972 30 p
Avail: NTIS HC $3.50

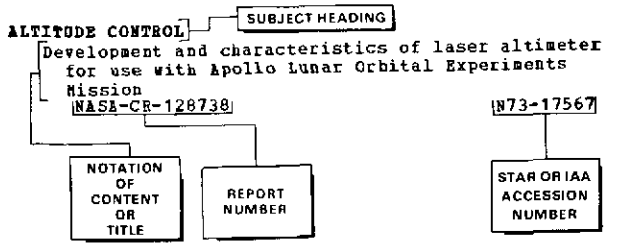
The aims, prospects, organization, and financing of EUROSAT S.A. are presented. EUROSAT S.A. was founded in January 1972 to cooperate with public authorites to ensure economical use of the possibilities offered by space techniques. Emphasis was placed on satisfying European requirements in ATC, navigation, and meteorological and communication satellites. ESRO

N73-33931# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Hauptabteilung Wissenschaft und Technik.
COST ACCOUNTING IN LARGE RESEARCH CENTERS
Thesis - Tech. Hochschule Aachen
Juergen Schulte-hillen 25 Apr. 1973 223 p refs In GERMAN; ENGLISH summary
(DLR-FB-73-64) Avail: NTIS HC $13.25; DFVLR, Porz, West Ger. 82,30 DM

The results of cost accounting as used in large German research centers are presented. After examining the legal aspects, the goals and tasks of cost accounting in large research institutions are defined. Various production processes, as well as the resulting cost theory consequences, are discussed. The problems of main parameters which influence the cost behavior of research work are out lined, along with cost accounting methods applicable to the research centers. Author (ESRO)

Subject Index

Typical Subject Index Listing



A Notation of Content (NOC), rather than the title of the document, usually appears under each subject heading; it is listed under several headings to provide multiple access to the subject content. (AIAA occasionally uses the title in lieu of the NOC.) The *STAR* and *IAA* accession number is located beneath and to the right of the Notation of Content, e.g., N73-17567. Under any one subject heading, these accession numbers are listed in ascending order in each series.

A

AC GENERATORS
Superconducting a.c. machines - An approach to development.
A73-20407

ACCIDENT PREVENTION
Man machine systems for flight safety, studying accidents, human factors in system design and implementation of personnel
A73-34078
System safety program plan for aviation accident prevention
[AD-746995] N73-12048
Objectives, scope of work, and funding requirements of research project for improvement of aircraft safety
[FAA-ED-18-1] N73-30008

ACOUSTIC MEASUREMENTS
Runway sideline aircraft noise measurements on takeoff and approach for enforcing community noise levels based on FAA aircraft type certification, noting associated problems
A73-42945

ADHESIVE BONDING
Organization and management for adhesive bonding aircraft structures.
A73-13048

AERIAL PHOTOGRAPHY
Application of aerial and spaceborne photography to urban, regional, and management planning
[NASA-CR-130290] N73-15473
Identification of organizations and activities concerning French programs in aerial photography and earth resources technology
N73-16372
Operational system for employment of remote sensing and automated information in urban land management
[NASA-CR-130969] N73-18410
Urban mapping activities assisted by aerial photography and ground surveying in connection with urban planning and community development
[PB-214305/5] N73-25494

AERODYNAMIC CHARACTERISTICS
Objectives and findings of study to determine applicability of short takeoff aircraft for short-haul air transportation systems
N73-32936

AERODYNAMIC CONFIGURATIONS
Bibliography of supersonic transport aircraft data to include program management, systems engineering, aircraft structures, and operational considerations
[AD-755600] N73-21076

AERONAUTICAL ENGINEERING
Management and control of commercial flight test programs.
A73-44057
Management and control of military and commercial flight test programs at Bell Helicopter Company.
A73-44058
Air Force Prototype Program management.
A73-44061
The role of a military flight test engineer in test management.
A73-44062
The capabilities of army test facilities.
A73-44064
Naval test and evaluation capabilities for aircraft, emphasizing organizational relationships
A73-44066
Congressional assessment of governmental role in industrial and social aspects of aerospace and related technology
N73-20482

AERONAUTICS
Management and organization in aerospace science and technology research
N73-20955

AEROSPACE ENGINEERING
Apollo Experience Reports contents and development, detailing engineering, life sciences, flight crew operations, flight control safety and applications
A73-34300
The capabilities of government test facilities at the Air Force Systems Command.
A73-44065
Research activities for technology transfer and impact studies
[NASA-CR-135720] N73-32847

AEROSPACE INDUSTRY
Aerospace industry project managers and support personnel authority perceptions based on assessment of situational factors surrounding decision making, tabulating empirical investigation statistics
A73-35214
Results from employment workshop program for unemployed aerospace engineers and scientists
[PB-209366] N73-10168
Research projects conducted by French research facility during 1971 with application to aerospace industry
N73-14966
Pilot program for transfer of aerospace technology to city management
[NASA-CR-131918] N73-23992
Project management in aerospace industry
N73-24967
Industrial policy of ESRO noting distribution of contracts, relations with industry, multinational consortiums, and technological research
N73-24975
Effects of NASA expenditures to aerospace industry as factor of industrial location
N73-27814
Economic analysis of US aerospace/defense industry
[AD-763242] N73-31921

AEROSPACE MEDICINE
Civil aviation medicine in the coming decade.
A73-19484
Medical concepts and functional management in NASA Environmental Health Program
N73-17056

AIRPORT PLANNING

B

C

D

E

F

G

H

M

N

O

P

Q

R

S

T

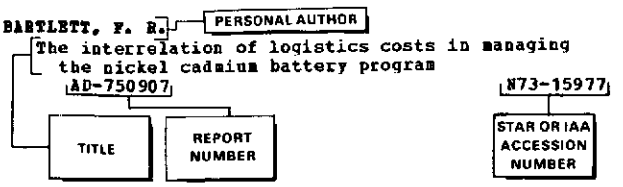
U

V

W

Personal Author Index

Typical Personal Author Index Listing



The *STAR* or *IAA* accession number is located beneath and to the right of the title, e.g., N73-15977. Under any one author's name, these accession numbers are listed in ascending order in each series.

A

B

C

D

E

F

G

H

K

L

M

Q

R

S

T

U

V

W

Y

A73-13048

Z

Typical Corporate Source Index Listing

The *STAR* accession number is located beneath and to the right of the title, e.g., N73-12048. Under any one corporate source, these accession numbers are listed in ascending order in each series. IAA items do not show a corporate source.

A

ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT, PARIS (FRANCE).
The von Karman lecture. Lessons learned and future directions in the management of technical programs
N73-15968

AEROSPACE CORP., EL SEGUNDO, CALIF.
Analysis of space tug operating techniques supplemental report (study 2.4)
[NASA-CR-129163] N73-11887
DORCA 2 computer program. Volume 1: User's guide
[NASA-CR-129263] N73-12183
DORCA computer program. Volume 1: User's guide
[NASA-CR-123378] N73-12188
Integrated operations/payloads/fleet analysis (executive summary)
[NASA-CR-125847] N73-12896

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC., WASHINGTON, D.C.
Commercial aircraft development and the export market
N73-32900

AEROSPACE MEDICAL RESEARCH LABS., WRIGHT-PATTERSON AFB, OHIO.
Bibliography of research reports and publications issued by the Human Engineering Division, April 1946 - December 1970
[AD-749933] N73-14103

AIR FORCE ACADEMY, COLO.
Generalized data base management systems and selected Air Force applications
[AD-765203] N73-32103
Proceedings of the 3D Annual Worldwide Data Base Management System Symposium
[AD-765204] N73-32104

AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OHIO.
An evaluation of the cost effectiveness of transporting air eligible cargo by air versus surface modes of transportation
[AD-750848] N73-15974
A study of the F-15 contract structure and its contribution to effective program management
[AD-750849] N73-15975
The interrelation of logistics costs in managing the nickel cadmium battery program
[AD-750907] N73-15977
Maintenance scheduling limitations
[AD-761494] N73-28947
A hierarchy of objectives and related performance indicators for aircraft maintenance organizations
[AD-762270] N73-28951

AIR FORCE SYSTEMS COMMAND, WASHINGTON, D.C.
Effects of deficiency in funding of research and development
N73-20963

AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AFB, OHIO.
The organization of an information computer center in automatic systems controlling enterprises
[AD-761480] N73-28057

AIR TRANSPORT ASSOCIATION OF AMERICA, WASHINGTON, D.C.
Capital requirements for the air transport industry
N73-32860
United States international air transport policy, the promise and the reality
N73-32903

AIR WAR COLL., MAXWELL AFB, ALA.
Selected technical spin offs from the space program
[NASA-TM-X-68943] N73-17994

ALASKA UNIV., PALMER.
Identification of phenological stages and vegetative types for land use classification
[E73-10276] N73-17484

ALLEGHENY AIRLINES, INC., WASHINGTON, D.C.
One airline's view of mergers
N73-32898

ALPHA INST., HUNTSVILLE, ALA.
Patent survey: Search of US government-owned patents, Cleveland, Ohio
N73-25981

AMERICAN AIRLINES, INC., NEW YORK.
Financing the air transportation industry
N73-32861
American Airlines propeller STOL transport economic risk analysis
N73-32866

AMERICAN INST. OF AERONAUTICS AND ASTRONAUTICS, NEW YORK.
AIAA employment workshops. Volume 2: An analytic report on some effects of twenty-two workshops
[PB-209367] N73-10159
AIAA employment workshops, Volume 1
[PB-209366] N73-10168

ARBEITSGEMEINSCHAFT DEUTSCHER VERKEHRSFLUGHAEFEN, STUTTGART (WEST GERMANY).
Airports today: Significance and problems of airports in todays air traffic
N73-19625

ARMY AGENCY FOR AVIATION SAFETY, FORT RUCKER, ALA.
Preparation of a system safety program plan for aviation systems development
[AD-746995] N73-12048

ARMY COMBAT DEVELOPMENTS COMMAND, FORT BLISS, TEX.
Trends in current research
N73-23983

ARMY LOGISTICS MANAGEMENT CENTER, FORT LEE, VA.
DOD aircraft engine requirements study
[AD-745396] N73-10749

ARMY WAR COLL., CARLISLE BARRACKS, PA.
Airspace coordination - who needs it?
[AD-761034] N73-27573
Burdensome procedures involved in awarding research and development contracts
[AD-761443] N73-28949
The US aerospace/defense industry: A current analysis
[AD-763242] N73-31921

ASSOCIATION OF BAY AREA GOVERNMENTS, BERKELEY, CALIF.
Regional airport systems study, final plan
[REPT-73-00316] N73-22208

B

C

D

E

F

G

H

N

O

P

R

S

T

U

V

W

Y