



OCEAN DATA SYSTEMS, INC.

6000 EXECUTIVE BLVD., ROCKVILLE, MARYLAND 20852 • 301/881-3031

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D. C.

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IDENTIFICATION OF SPECIFIC REQUIREMENTS FOR A
NASA AEROSPACE LAW INFORMATION SYSTEM AND
IDENTIFICATION OF THE ACQUISITION REQUIREMENTS
FOR AN AEROSPACE LAW COLLECTION FOR THE NASA LAW LIBRARY

Phase I Final Report

April 15, 1972

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I

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
I.	INTRODUCTION.....	1
II.	DEVELOPMENT OF SURVEY PLAN.....	4
III.	SUMMARY OF MAJOR INTERVIEWS.....	7
	A. Introduction.....	7
	B. System Utilization.....	10
	C. Preliminary System Design.....	17
	D. Input Materials Identified.....	26
	E. Maintenance Procedures.....	28
IV.	SYSTEM TRADE-OFF ANALYSIS.....	29
	A. Introduction.....	29
	B. Concept Index Code Data Base and Thesaurus.....	29
	C. Aerospace Legal Information System Design.....	40
V.	CONCLUSIONS AND RECOMMENDATIONS.....	45

APPENDIX A: NASA/RECON SYSTEM CAPABILITY SUMMARY

APPENDIX B: NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS

APPENDIX C: NASA LEGAL MICRO-THESAURUS

APPENDIX D: LIBRARY ACQUISITION REPORT

- A. Introduction
- B. Collections of Aerospace Law Material
- C. Bibliographies of Aerospace Law Material
- D. Acquisition of Aerospace Law Material

ADDENDUM: Detailed Summaries of Selected Interviews with
Space Law Experts

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
IV-1	NASA LEGAL CONCEPT CODE SHEET.....	31
IV-2	CONCEPT CODE SHEET - MAJOR CONCEPTS.....	34
1	NASA/SCAN NOTIFICATION.....	A-4
2	TYPICAL CITATION FROM IAA.....	B-3
3	TYPICAL TABLE OF CONTENTS FOR BOTH IAA AND STAR.....	B-7
4	SAMPLE ABSTRACTS FROM IAA.....	B-9
5	SAMPLE IAA AND STAR INDEXES.....	B-11
6	NINE SUBJECT CATEGORIES.....	B-16
7	TYPICAL CITATION AND ABSTRACT FROM STAR....	B-18

III



OCEAN DATA SYSTEMS, INC.

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June 8, 1972

Leonard Rawicz, Esq.
Assistant General Counsel for Patent Matters
NASA Headquarters
Mail Code GP
400 Maryland Avenue, S.W.
Washington, D.C. 20546

Dear Mr. Rawicz:

In accordance with Task 2.4 and Article III of NASA Contract #NASW-2266, ODSI hereby submits the final Technical Report and final Library Acquisition Report as required.

Sincerely yours,

Jerome Morenoff
President

JM/nr

CC(3): NASA Scientific & Technical Information Facility

CC(1): NASA Headquarters
New Technology Representative

CC(1): NASA Headquarters
Administrative Contracting Officer

IV

I. INTRODUCTION

In the last decade, the publication of literature relating to space law has increased at a significant rate. The writings are divergent, the definitions contradictory and the views expressed related, in many instances, to the national interest of the author. The international aspects of space efforts, however, remove the space law field from a strictly national problem and make it a world-wide problem of growing importance.

Man's activities in space have intensified the need for readily accessible information pertaining to this field of law. Man can now be injured in space, he can cause damage to others, he can purposely, or inadvertently, damage the spacecraft of another nation, or the territory of a nation. The possibility of such occurrences point to the significance of understanding space law on an international scale.

Many published legal documents are futuristic; they attempt to identify and analyze potential legal problems associated with new technologies or social developments. Legal publications, hence, serve as a major forum for resolving the intellectual and academic issues of the legal profession, just as scientific journals are the major vehicles for forming the consensus for acceptance of scientific findings. Recognizing the established role of the United States in space and the growing number of nations becoming actively engaged in space exploration, the

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need for a concise, readily available guide to space law literature becomes more and more critical.

As efforts of space scientists become more closely meshed with the evolution of public policy, there is a developing need for more effective exchange of information among the professions. Unlike most scientific publications, legal periodicals do not generally require author abstracts, nor are they key worded for automated retrieval. The availability of legal literature is almost entirely restricted to those institutions associated with programs of legal instruction and thus is not generally accessible to a large segment of the scientists working on space affairs. Furthermore, although many efforts have been made to compile bibliographies of the known items of space law, none have been very successful because of the limited resources available to the compiler or because the bibliography terminated with its publication and no effort was made to maintain the currency of the work.

Recognizing the need for an information system to bridge the communication gap between scientist and lawyer, the Office of the General Counsel/NASA took the lead in serving as the focal point for developing, implementing, and maintaining a space law library and information system responsive to the needs of interested user agencies, organizations, and individuals. A contract was entered into with Ocean Data Systems, Inc. for a "two-phase study for the identification

of requirements for a NASA Aerospace Law Information System and acquisition requirements for the NASA Law Library."

This report, summarizing ODSI's efforts in completing Phase I of the study, is submitted in satisfaction of contractual obligations. The remaining sections of the report are organized as follows:

- Section II -- Development of Survey Plan
- Section III -- Summary of Major Interviews
- Section IV -- System Trade-off Analysis
- Section V -- Conclusions & Recommendations
- Appendix A -- NASA/RECON System Capability Summary
- Appendix B -- NASA Scientific and Technical Publications
- Appendix C -- NASA Legal Micro-Thesaurus
- Appendix D -- Library Acquisition Report

II. DEVELOPMENT OF SURVEY PLAN

In accordance with the requirements set forth in Task 1.1 of the contract, ODSI developed "a survey plan for interviewing a selected group of organizations and individuals representative of the spectrum of potential sources, users and producers of information related to aerospace law." The purpose of the interviews was specified as follows:

- Identify potential users of the system.
- Identify potential producers of material for input to the system.
- Identify input source material and sources.
- Identify existing collections, library holdings, and bibliographies.
- Determine acquisition procedures.
- Determine frequency of expected use of the system.
- Determine means for maintaining the system.

The work statement further directed ODSI to include interviews with "elements of the Executive, Legislative and Judicial branches of the Federal Government, including military departments, independent R&D agencies, regulatory agencies, intelligence agencies, enforcement agencies, etc., as well as the governmental organizations directly involved in aerospace matters . . . also . . . professional societies such as the International Institute of Space Law, AIAA, ABA, FBA, and the Marine

Technology Society, state government agencies, the aerospace industrial community, the academic community, and private practitioners."

In accordance with the requirements set forth in Task 1.2 of the contract, a Space Law Advisory Panel was convened by the NASA General Counsel on August 26, 1971 to review ODSI's proposed survey plan. The panel was chaired by Mr. Spencer Beresford and consisted of Messrs. Walter D. Sohler, Paul G. Dembling, and John A. Johnson, and Mrs. Eilene Galloway. Also in attendance at that meeting were Messrs. Leonard Rawicz, Neil Hosenball, and Don Morris, and Mrs. Madeleine Losee and Mrs. Helen Price of NASA; Mr. Robert Cutler from the National Bureau of Standards; Mr. Donald L. Roth and Dr. Jerome Morenoff from ODSI; and two representatives from the FAA's General Counsel Office -- Messrs. Owen Birnbaum and Nathan Edelberg.

The Panel discussed at length the definition of "aerospace" law and its affect on the scope of the project. The consensus of those present was to define the term in the context of significant subject matter categories relating to man's activities in outer space, e.g.,

- The Legal Regime of Satellite Communications
- Liability and Space Activities
- Natural Resources, Pollution, and the Law of Activities in Space

In this context the Panel agreed that ODSI should interview a limited number of space law experts (approximately 25) who would help elaborate on the categorization of space law documents. A study of the integration of air-law related material into the system was deferred for future task assignments.

III. SUMMARY OF MAJOR INTERVIEWS

A. Introduction

In accordance with the requirements set forth in Task 1.3 of the contract, Dr. Jerome Morenoff and Mr. Donald L. Roth, Esq. interviewed the following "experts":

- ① Spencer Beresford, Esq.
General Counsel
National Aeronautics & Space Administration
Washington, D. C.
- ① Paul G. Dembling, Esq.
General Counsel
General Accounting Office
Washington, D. C.
- ① Walter D. Sohler, Esq.
c/o Curtis, Mallet-Prevost, Colt & Mosle, Esqs.
New York, New York
- ① Mrs. Eilene Galloway
Senior Specialist in International Relations
Congressional Research Service
The Library of Congress
Washington, D. C.
- ① Mrs. Madeleine Losee
Program Coordinator
Scientific and Technical Information Office
Office of Industry Affairs & Technology Utilization
National Aeronautics & Space Administration
Washington, D. C.
- ① Herbert Reis, Esq.
Legal Advisor
U. S. Mission to the United Nations
New York, New York
- ① Miss Kwen Chen
Secretary
Legal Sub-committee on Outer Space
United Nations
New York, New York
- ① Dean George J. Alexander
School of Law
The University of Santa Clara
Santa Clara, California

- Professor Carl Q. Christol
University of Southern California
Los Angeles, California
- Professor S. Houston Lay
California Western University
San Diego, California
- Professor Mortimer Schwartz
Law Library
University of California, Davis
Davis, California
- Professor Howard J. Taubenfeld
School of Law
Southern Methodist University
Dallas, Texas
- Professor L. F. Goldie
College of Law
Syracuse University
Syracuse, New York
- Richard Mizrak, Esq.
Communications Satellite Corporation
Washington, D. C.
- Frank Simpson III, Esq.
c/o Sheppard, Mullin, Richter, Balthis & Hampton
Los Angeles, California
- Stephen Doyle, Esq.
Office of Telecommunication Policy
Washington, D. C.
- Dr. Michael Bourelly
Conseiller Juridique
ELDO
Paris, France
- Dr. H. Kaltenecker
Asst. Director for Legal, Contractual & Inter-
national Affairs
ESRO
Paris, France
- Dr. Eugene Pepin
President
International Institute of Space Law
Paris, France
- Dr. Ernst Fasan
Director
International Institute of Space Law
Vienna, Austria

- Dr. Bin Cheng
Faculty of Law
University College
London University
London, England
- Mr. Kenneth Gatland
Spaceflight
New Malden, Surrey, England
- Professor Vrankum
Belgium Representative
U. N. Legal Sub-committee on Outer Space
Brussels, Belgium
- Dr. Manfred Holl
President
Meteorology International, Inc.
Monterey, California
- Mr. William L. Dowdy
Space Division
North American Rockwell
Downey, California

In-depth explanations of prior NASA efforts leading towards this task were presented to the interviewees and the concept of the proposed system specified in detail. The importance of the role of the "experts" and their impact upon the system design was clearly stated. Consequently, they were extremely cooperative and provided significant opinions concerning the proposed structure of a space law information system.

A major concern of the "experts" related to the costs associated with the system, both developmental and operational. To allay their concerns, the RECON system, a NASA developed and operated remote terminal computer based information storage and retrieval system, was explained in some detail and sample outputs were distributed. Also presented for review were copies of SCAN* and a special NASA

*SCAN, standing for Selected Current Aerospace Notices, is discussed in Appendix A to this Report.

Report (i.e., "Management" A Continuing Literature Survey, With Indices, NASA-SP-7500(04)). It was noted that the principal costs associated with the proposed space law information system were those related to the acquisition, abstracting, indexing, and continued maintenance of the system following implementation. The fact that very costly computer programs were not required for the development of the system was a very important consideration to most of the "experts".

B. System Utilization

Each of the interviewees was asked to help identify potential users of the system. The following summarizes the findings in this area:

• FEDERAL GOVERNMENT

a) Executive Branch

- National Aeronautics and Space Administration
- National Space Council
- National Security Council
- Foreign Policy Agencies:
 - U. S. Department of State including:
 - Arms Control and Disarmament Agency
 - U.S. Mission to the United Nations
- Intelligence Agencies:
 - Central Intelligence Agency
 - Defense Intelligence Agency
- Military Agencies:
 - Department of Defense, Office of the Secretary
 - U. S. Air Force

- Aerospace Medical Division/USAF

- Judge Advocate General's Office

- Federal Communications Commission

- Federal Aviation Administration

- Environmental Protection Administration

- National Oceanic & Atmospheric Administration

b) Legislative Branch

- Senate Space Committee

- House Science & Astronautics Committee

c) Judicial Branch

- Federal Courts

• INDUSTRY

- Industrial corporations with an interest in the legal ramifications of space activities

- Practicing attorneys

• ACADEMIC COMMUNITY

- Law schools

- Research Institutes

• PROFESSIONAL SOCIETIES

- International Institute of Space Law (IISL)

- International Astronautical Federation (IAF)

- American Institute of Aeronautics & Astronautics (AIAA)

- International Academy of Astronautics (IAA)

- American Bar Association

- Federal Bar Association

- Inter-American Bar Association
- American Society of International Law
- The David Davies Memorial Institute of International Studies
- Institut de Droit International
- International Law Association
- World Peace Through Law Center
- EUROSPACE

• INTERNATIONAL ORGANIZATIONS

- United Nations Committee on the Peaceful Uses of Outer Space and Its Legal Subcommittee
- International Telecommunication Union (ITU)
- International Civil Aviation Organization (ICAO)
- European Launcher Development Organization (ELDO)
- European Space Research Organization (ESRO)
- European Space Conference (ESC)
- The International Telecommunications Satellite Organization (INTELSAT)
- Committee on Space Research (COSPAR)

Recognizing the breadth of the potential user community, several important uses for the system were identified by the "experts". Listed below, these uses reinforce to a great extent, those previously identified by members of the Space Law Advisory Panel.

• Customary International Law Development

To understand the effect of a space law information system on international law, one must first understand the background and meaning of customary international law.

To cope with the expansion of activities in space resulting from the growth of various national programs, it has become increasingly evident that rules for the conduct of astronautical activity must be promulgated and enforced. The development of international space law is no longer a theoretical concern, but a practical necessity. However, in light of the present dichotomy in world ideologies and the constant, rapid development of technological resources, it is generally agreed that a large order of definitive law would only handicap the natural development of this area of infinite potential. The trend, therefore, has been away from explicit formulation and toward the gradual and often rapid process of an evolving legal custom from which to control activities in outer space. Thus, the most viable method of construction is that of incorporating shared expectations through the development of customary law. Of course, it is understood that there will be some problems that cannot be easily resolved by this system. Still, the traditional and basic method of legal custom is applicable to the problems of the space age and its domain.

At one time, an extensive period was required to incorporate a principle into the body of customary international law. This was primarily due to the difficulty of determining the views of other nations. Geographical separation, poor communications, and the desire for self-

sufficiency and isolation have all been factors in obstructing one nation from learning of another state's consent or non-consent to its conduct. The present situation and facilities, however, create an entirely different view. Present world affairs have a more inclusive effect on the entire community. This is particularly true of space vehicles, such as satellites, which, by passing over so many states in a short period of time, give these states legitimate reason and need to express their consent or nonconsent. Thus, the opinions and declarations of states in international meetings and conferences, of high-ranking officials in their position as representatives of opinion, of legal organizations and of scholars from many nations -- all are important, and, indeed, requisite to the formulation of a customary international law.

With the launching of each new type of space vehicle, legal scholars throughout the world feel it incumbent upon themselves to express their opinions on the legal status of outer space. Thus, one may find literature dealing with proposed space law regarding communications, reconnaissance, medical problems, tort and criminal liabilities, etc. The cumulative effect of these documents on the formulation of customary law is immeasurable. It is necessary, therefore, that the opinions expressed from these multi-disciplined segments of society be disseminated as widely as possible, in an effort to bring world opinion to bear on the formulation of space law.

- Foreign Policy Formulation

Another important use of the proposed space law information system is related to foreign policy assessment and formulation. Specifically, if both Congressional and United Nations documents dealing with space law were made readily available and easily accessible, policy determinations could then be based upon complete and accurate facts, reflecting both national and international concerns.

- Intelligence Information Assessment

Prior experience indicates that foreign doctrines of space law expounded in open literature provide an excellent intelligence indicator of future actions by foreign nations.

- Aerospace Medical Policy Determination

A principal problem of space law will undoubtedly involve injury to man. The biomedical aspects of space law will be one of the first considerations resulting from space exploration. The contamination of space by biological agents may create a problem which must also be considered. These problems have been considered in the past by legal writers from various nations, but, at present, there is no means for determining the views of international space law authorities on these problems.

Within this context, the Aerospace Medical Division, Department of the Air Force, Brooks Air Force Base, Texas, has recognized the importance of a space law information

system, its interface with medical problems, and the fact that the entire body of space law is incorporated in a relatively few documents.

The following other probable uses were also identified:

- Providing aerospace regulatory data to industry, state and local governments, and attorneys.
- Providing space law material to academic researchers.
- Providing space law material to professional societies with the expectation that the utilization of this as a base would provide the necessary stimulus for more meaningful discussions and symposiums.
- Providing space law material relating to the Earth Resource Satellite Program to government and industry. The growing importance of this area and associated legal ramifications was a major concern of most interviewees.

In addition to the uses cited above, Drs. Bourelly and Kaltenecker were extremely enthusiastic about how the system could be of direct value to them in their roles as Chief Legal Counsel for ELDO and ESRO, respectively. This, coupled with the fact that RECON terminals are available to ELDO and ESRO, provides NASA with two potential users of the system who expressed an eager willingness to help make the

system a success by coordinating European inputs and sources of material to the system. Further discussions with these two individuals were promised and are extremely desirable.

C. Preliminary System Design

As previously indicated, one of the primary goals of the interviews was to specify a preliminary design of the space law information system of greatest value to its intended users. The initial step in this process was to identify categories under which space law documents could be classified for ease of retrieval. The process of categorization was iterative with draft suggestions circulated among the interviewees at various stages of the survey. The resultant product is considered inclusive at this point in time, yet modular in scope, with the ability for expansion as new related legal fields of space law emerge and merit separate consideration. Furthermore, the categories have been organized in such a manner that cross-referencing is provided for, allowing a user maximum flexibility in searching the system for relevant information.

The categories listed below have been arranged in a two-tiered hierarchical structure, providing eleven broad terms and selected narrower terms. Cross-referencing to related broader term categories is indicated by a parenthetical asterisk.

CATEGORIES RELATING TO THE LEGAL STATUS
OF MAN'S ACTIVITIES IN OUTER SPACE

I. INTERNATIONAL ACTIVITIES:

(a) U. N. Legal Space Subcommittee Activity:

- (*) Communications Activities
- (*) National Security Activities
- (*) Natural Resource Activities
- (*) Operational Satellite Activities
- (*) Scientific Activities
- (*) Liability for Damages
- (*) Manned/Unmanned Space Exploration
- (*) Sovereignty Considerations
- Miscellaneous

(b) International Cooperation/Agreements:

- (*) Communications Activities
- (*) National Security Activities
- (*) Natural Resource Activities
- (*) Operational Satellite Activities
- (*) Scientific Activities
- (*) Liability for Damages
- (*) Manned/Unmanned Space Exploration
- (*) Sovereignty Considerations
- Miscellaneous

(c) International Laws:

Space Treaty

Relevant International Laws (Air, Sea, Antarctic, etc.)

(d) International Organizations:

I.T.U.

Intelsat

Others

(e) Foreign Laws:

- (*) Foreign Space Law Publications
- (*) Congressional Activities

II. FOREIGN SPACE LAW PUBLICATIONS:

- (*) International Activities
- (*) Communications Activities
- (*) National Security Activities
- (*) Natural Resource Activities
- (*) Operational Satellite Activities
- (*) Scientific Activities
- (*) Liability for Damages
- (*) Manned/Unmanned Space Exploration
- (*) Sovereignty Considerations

III. CONGRESSIONAL ACTIVITIES:

(a) (*) International Activitites:

- . Bills
- . Hearings
- . Reports
- . Congressional Record Debate
- . Documents
- . Legislation

(b) (*) Communications Activities:

- . Bills
- . Hearings
- . Reports
- . Congressional Record Debate
- . Documents
- . Legislation

(c) (*) National Security Activities:

- . Bills
- . Hearings
- . Reports
- . Congressional Record Debate
- . Documents
- . Legislation

(d) (*) Natural Resource Activities:

- . Bills
- . Hearings
- . Reports
- . Congressional Record Debate
- . Documents
- . Legislation

(e) (*) Operational Satellite Activities:

- . Bills
- . Hearings
- . Reports
- . Congressional Record Debate
- . Documents
- . Legislation

(f) (*) Scientific Activities:

- . Bills
- . Hearings
- . Reports
- . Congressional Record Debate
- . Documents
- . Legislation

(g) (*) Liability for Damages:

- . Bills
- . Hearings
- . Reports
- . Congressional Record Debate
- . Documents
- . Legislation

(h) (*) Manned/Unmanned Space Exploration:

- . Bills
- . Hearings
- . Reports
- . Congressional Record Debate
- . Documents
- . Legislation

(i) (*) Sovereignty Considerations:

- . Bills
- . Hearings
- . Reports
- . Congressional Record Debate
- . Documents
- . Legislation

IV. COMMUNICATIONS ACTIVITIES:

(a) Domestic Laws (U.S., Foreign)

(b) Domestic Organizations (U.S., Foreign):

- (*) International Activities
- (*) Foreign Space Law Publications
- (*) Congressional Activities
- (*) Operational Satellite Activities

V. NATIONAL SECURITY ACTIVITIES:

(a) Defense

(b) Intelligence:

- (*) International Activities
- (*) Foreign Space Law Publications
- (*) Congressional Activities
- (*) Operational Satellite Activities

VI. NATURAL RESOURCE ACTIVITIES:

(a) Earth Resource Satellites

(b) Pollution Considerations

(c) Legal Regulations: Domestic/Foreign/International:

- . Accountability
- . Enforcement
- . Criminal Law
- . Liability

- (*) International Activities
- (*) Foreign Space Law Publications
- (*) Congressional Activities
- (*) Operational Satellite Activities

VII. OPERATIONAL SATELLITE ACTIVITIES:

- (a) Defense
- (b) Intelligence
- (c) Communications
- (d) Earth Resources
- (e) Navigation
- (f) Meteorological

- (*) International Activities
- (*) Foreign Space Law Publications
- (*) Congressional Activities
- (*) Communications Activities
- (*) National Security Activities
- (*) Natural Resource Activities

VIII. SCIENTIFIC ACTIVITIES:

- (a) Research & Development
- (b) Radio Astronomy
- (c) Planetary Exploration
- (d) Biomedical Activities

- (*) International Activities
- (*) Foreign Space Law Publications
- (*) Congressional Activities

IX. LIABILITY FOR DAMAGES:

- (a) Domestic Laws
- (*) International Activities
- (*) Foreign Space Law Publications
- (*) Congressional Activities

X. MANNED/UNMANNED SPACE EXPLORATION:

- (a) Legal Status of Astronauts, Space Vehicles,
& Spacecraft
- (b) Assistance, Rescue & Return of Astronauts
and Spacecrafts
- (*) International Activities
- (*) Foreign Space Law Publications
- (*) Congressional Activities
- (*) Liability for Damages

XI. SOVEREIGNTY CONSIDERATIONS:

- (a) Air/Space Boundary
- (b) Celestial Bodies
- (*) International Activities
- (*) Foreign Space Law Publications
- (*) Congressional Activities
- (*) National Security Activities
- (*) Natural Resources Activities
- (*) Operational Satellite Activities
- (*) Manned/Unmanned Space Exploration

Thus, for example, if someone were interested in retrieving information dealing with the legal status of reconnaissance satellites, he might follow the procedures outlined below:

- (1) Review the list of "Categories Relating to the Legal Status of Space Activities."
- (2) Select those broad terms from the list which may contain information relevant to reconnaissance satellites, e.g.:
 - Operational Satellite Activities
 - National Security Activities
 - International Activities
 - Congressional Activities
 - Foreign Space Law Publications
- (3) Query each broad category file to determine information potentially relevant to reconnaissance satellites contained in the narrow terms, e.g.:
 - Operational Satellite Activities:
 - (a) Defense
 - (b) Intelligence

NOTE: Cross-referencing to International Activities, Foreign Space Law Publications, Congressional Activities, and National Security Activities.

- National Security Activities:
 - (a) Defense
 - (b) Intelligence

NOTE: Cross-referencing

- International Activities:

- (a) U.N. Legal Subcommittee on Space Activity

- National Security Activities
 - Operational Satellite Activities

- (b) International Cooperation/Agreements

NOTE: Cross-referencing

- Congressional Activities:

- (a) National Security Activities

- (b) Operational Satellite Activities

NOTE: Cross-referencing

* * *

The next step in specifying a preliminary system design, involved the discussion of potential output reports and formats of greatest possible use to the community. The RECON system was explained to the "experts" as an example of an operational system and to provide a basis from which ideas could be generated for specific outputs which could be expected from the proposed space law information system. A discussion summarizing the NASA/RECON system approach advanced to the interviewees is contained in Appendix A.

At present, NASA/RECON gives its users immediate access to the very large collection of aerospace documents (and a modest collection of space law documents) that have been announced in the semi-monthly journals, International Aerospace Abstracts (IAA) and Scientific and Technical Aerospace

Reports (STAR), as well as in the periodic issues of Classified STAR and Aerospace Medicine and Biology.

Descriptions of these and related NASA publications and how they are published and made available to the user community is found in Appendix B.

After reviewing NASA/RECON and associated publications with the "experts", it was generally agreed that with minor modifications, the existing system would more than adequately satisfy projected user needs. The specific type of system advocated by the interviewees included:

- Abstracts/indexes of all major space law works from 1960-1972. The point of having legally trained personnel performing this effort was strongly enunciated.
- Production of a looseleaf or bound volume containing these abstracts/indexes, for sale to the user community.
- Publication of yearly supplements or insert pages to the document.
- Publication of quarterly SCAN-type reports indicating recent acquisitions.
- Preparation of a bibliography of all space law material with yearly updating procedures established.
- Easy access and availability of the actual documents comprising the library collection.

Assuming the costs for developing a specialized space law information system using NASA/RECON as a base, were modest, the "experts" were confident that the user community would greatly benefit from the resultant publications. This concept is treated more fully in Section IV: System Trade-Off Analysis.

D. Input Materials Identified

The preponderance of information to be entered into the proposed System will consist of published articles dealing with each of the categories identified. This will be supplemented by laws, congressional documents, data on international space-oriented organizations, speeches, U. N. Space Legal Subcommittee documents, etc. Foreign space law documents will also be input in accordance with the approach detailed above.

The majority of those interviewed concurred in the principle that inputs to the system should be gradually selected, acquired and entered. Thus, in the case of "International Activities", one might initially include such related "International Laws" as the 1958 Geneva Convention on the Law of the Seas or the 1944 Chicago Convention on International Civil Aviation, but omit for the time being a bilateral air treaty between the United States and the United Kingdom. It was the general consensus that the most significant part of Section 1 "International Ativities" related to the United Nations Legal Space Subcommittee Activity and that documents associated with this activity should be included in the system

at the earliest possible date. Mr. Herbert Reis, Legal Advisor, U. S. Mission to the United Nations, has a complete file of all such documents and has indicated his willingness to support this project.

Producers of material for entry into the system include all users identified earlier. Stated succinctly above, and repeated here for emphasis, "...the opinions and declarations of states in international meetings and conferences, of high ranking officials in their position as representatives of opinion, of legal organizations and of scholars from many nations -- all are important, and, indeed, requisite to the formulation of a customary international law."

Several mechanisms for entering source material into the proposed System exist. A prime example exists within the NASA/RECON system. Mr. Paul S. Feinstein of NASA*, noted that firm arrangements had been made with other Government Agencies, industry, non-profit organizations, and the academic community to receive products from STID in return for their timely input of material to be included in the system. Also 200-300 foreign governments, organizations, and industrial concerns participated in this exchange program.

Other sources of material and mechanisms for physically entering them into the system are described in Appendix D: Library Acquisition Report, and include a listing of existing private collections and library holdings of

*Mr. Feinstein is with NASA/Office of Technology Utilization/Scientific and Technical Information Division ("STID")/Information Services Branch.

various federal agencies, courts, law schools, and professional associations. Adequate arrangements for securing material for entry in the system are anticipated.

E. Maintenance Procedures

Another concern voiced by the "experts" related to the establishment of adequate maintenance procedures once the system had been implemented. The success of these procedures will depend upon the acquisition arrangements worked out with sources of input material. It was the general consensus that if the system used by NASA for entering scientific and technical documents was employed in the legal field, supplemented by the utilization of abstractors and indexers with a working knowledge of law, this would be more than adequate. The desirability of an outside contractor maintaining the system as is now the case in science and technology, was generally well received.

IV. SYSTEM TRADE-OFF ANALYSIS

A. Introduction

In accordance with the requirements set forth in Task 2.1 of the contract, the input and output requirements of the user/producer communities of aerospace law information were evaluated with respect to the overall capabilities of the RECON system and a trade-off analysis conducted to determine the most cost effective aerospace law information system design compatible with NASA/RECON. This section summarizes the results of the analysis. Specific consideration was given to:

- 1) "the relative values of combining the aerospace legal information data base and thesaurus with the concept index code data base and thesaurus for indexing and retrieving legal memoranda."
- 2) "combining the aerospace legal information data base and thesaurus with the scientific and technical information data base and thesaurus in the NASA/RECON versus the generation of a special data file and thesaurus for the aerospace legal information system."
- 3) "the scope of the inputs to the information system and outputs of the proposed system, including the specific formats for resultant products and reports of value to the user community."

B. Concept Index Code Data Base and Thesaurus

Under Contract No. NASW-2223, ODSI is developing a Concept Index Code for Legal Memoranda. Specifically, ODSI has analyzed the contents of the retrievable items in the NASA Headquarters Office of General Counsel chronological

memoranda files for the years 1960, 1965, and 1970 and identified principal legal concepts contained in these memoranda. The legal concepts formulated are sufficiently broad to encompass the legal items in the OGC subject files and the legal OGC index for the years 1959-1964. ODSI then prepared an initial Concept Index Code Sheet, establishing hierarchical relationships between different legal concepts and logical groupings of concepts sufficient for use in classifying the retrievable legal documents to be incorporated into the OGC legal retrieval system based on the NASA/RECON system. The Concept Index Code Sheet designed by ODSI also provides a symbol cross listing, where feasible, to link the OGC subject files with the retrievable items in the OGC chronological files. The Concept Index Code Sheet is illustrated in Figure IV-1, and the Major Concept Classifications used in conjunction with the Concept Code Sheet are shown in Figure IV-2.

ODSI next developed keypunch code sheets for use in converting Concept Index Code Sheet information into machine readable form for quick entry into the computer, in a system compatible with NASA/RECON input techniques. The same method of indexing used for data preparation could also be used as the retrieval/output method for conducting searches for these same documents. The greater the degree of indexing at the time of data preparation, the higher precision and thoroughness available at the time a search request is entered.

FIGURE IV-1: NASA LEGAL CONCEPT CODE SHEET

ADDRESSEE TRAILER

	<u>COLS.</u>
HEADER CARD	
DOCUMENT ACCESSION NUMBER	1-8
CARD IDENTIFIER=1	9
SUBJECT FILE POINTER	10-20
DOCUMENT TYPE	21-23
ADDRESSEE CODE	24-28
ADDRESS NAME	29-70
ADDRESS TRAILER CARD	
DOCUMENT ACCESSION NUMBER	1-8
CARD IDENTIFIER=2	9
ORIGINATOR CODE	10-14
ORIGINATOR NAME	15-56
CONCEPT TRAILER CARD	
DOCUMENT ACCESSION NUMBER	1-8
CARD IDENTIFIER=3	9
CONCEPT CLASSIFICATION NUMBER	10-13
CONCEPT TERM	14-56

FIGURE IV-2: CONCEPT CODE SHEET - MAJOR CONCEPTS

1.	CLAIMS AND ADJUDICATIONS GENERAL	0100
	BOARD OF CONTRACT APPEALS	0101
	CONTRACT ADJUSTMENT BOARD	0102
	(INTENTIONALLY LEFT BLANK)	0103
	TORT CLAIMS (INCLUDING FTCA)	0104
	ARBITRATION	0105
2.	CONGRESSIONAL MATTERS GENERAL	0200
	NASA LEGISLATIVE PROGRAM	0201
	AUTHORIZATIONS	0211
	APPROPRIATIONS	0221
	NASA LEGISLATIVE COMMENTS	0202
	REPORTS/LETTERS TO CONGRESS	0203
3.	RELATIONS WITH OTHER ORGANIZATIONS	0300
	FEDERAL AGENCIES	0301
	(INTENTIONALLY LEFT BLANK)	0302
	(INTENTIONALLY LEFT BLANK)	0303
	STATE AND LOCAL GOVERNMENT	0304
	PRIVATE ENTERPRISE	0305
4.	FISCAL GENERAL	0400
	AVAILABILITY FOR AND LIMITATION ON APPROP	0401
	OVEROBLIGATION OF FUNDS	0411
	PERIOD OF AVAILABILITY OF APPROP	0421
	NONAPPROPRIATED FUND ACTIVITIES	0402
	REIMBURSEMENT OF APPROP	0403
	INTERAGENCY TRANSFER OF FUNDS	0404
	CONTINUING RESOLUTIONS	0405
5.	INTERNATIONAL GENERAL	0500
	INTERNATIONAL AGREEMENTS	0510
	SPACE LAW	0520
6.	INTELLECTUAL PROPERTY GENERAL	0600
	ANTITRUST	0610
	TRADEMARKS	0620
	COPYRIGHT	0630
	PATENT POLICY CONTRACTORS	0602
	PATENT POLICY EMPLOYEES	0603
	LICENSES	0604
	INFRINGEMENT/ROYALTIES	0605
	DATA	0606
	TRADE SECRETS	0607
	AWARDS	0608
	INVENTIONS AND CONTRIBUTIONS BOARD	0609
7.	PROPERTY GENERAL	0700
	(INTENTIONALLY LEFT BLANK)	0701
	REAL PROPERTY	0705

FIGURE III-2 (CONT'D)

8.	PERSONNEL GENERAL	0800
	PERSONNEL PAY AND ALLOWANCES	0801
	PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT	0802
	PERSONNEL STANDARDS OF CONDUCT	0803
	PERSONNEL CLAIMS BY AND AGAINST THE GOVT	0804
	PERSONNEL OTHER RIGHTS/OBLIGATIONS	0805
9.	PROCUREMENT GENERAL	0900
	STANDARD CONTRACT CLAUSES	0901
	CONTRACTS	0902
	BUY AMERICAN	0912
	COST PRINCIPLES	0922
	FISCAL PROVISIONS	0932
	GOVERNMENT PROPERTY	0942
	INCENTIVES	0952
	LABOR	0962
	OPTIONS	0972
	SMALL BUSINESS	0982
	TERMINATION	0992
	CONTRACT FORMATION	0903
	COMPETITION	0913
	MISTAKES IN BID	0923
	NEGOTIATION AUTHORITY	0933
	PROTESTS	0943
	SELECTION PROCEDURES	0953
	CLAIMS (CONTRACTUAL/EXTRA CONTRACTUAL)	0904
	FOREIGN CONTRACTS	0905
	GRANTS	0906
	REGULATIONS	0907
	SERVICE CONTRACTS	0908
	SUBCONTRACTS	0909
10.	(INTENTIONALLY LEFT BLANK)	
11.	TAXATION GENERAL	1100
	TAXATION FEDERAL	1101
	TAXATION STATE AND LOCAL	1102
12.	NASA GENERAL	1200
	NASA ADMINISTRATOR	1201
	NASA SECURITY	1202

ODSI is developing a "micro-thesaurus" specifically designed for usage by the staff of the OGC, NASA, in conjunction with the Concept Code Sheet. The development, in two phases, is directed at producing a micro-thesaurus that can be used to index the documents and information maintained in the NASA legal files, so that NASA lawyers can describe at desired levels of specificity, search requests for documents and information being sought. The first phase is associated with word development, and the second phase with the implementation and operation of selected software to perform the clerical, non-intellectual functions associated with developing the thesaurus.

The resultant product of a NASA Legal Micro-Thesaurus is designed for use as part of the process of indexing documents and information maintained in the NASA legal files. Appendix C is the current version of the thesaurus to Contract NASW 2223. It is important to note that the concept terms contained therein and the word relationships expressed are principally derived from the body of material from the Headquarters' general chronological files for 18 randomly selected months within the years 1960, 1965 and 1970, representative of information to be retrieved through its utilization.

The Micro-Thesaurus groups together and relates to both single words and multi-worded concepts. The names of the concepts, herein referred to as descriptors, form the main entries in the thesaurus. Within the context of each

document, broader/narrower relationships were established to relate the descriptors. Where appropriate, concepts selected from documents were generalized before entry in the micro-thesaurus and in some instances general concept terms not necessarily contained in the sample documents have been added.

The micro-thesaurus is fully developed in the sense that each concept appearing as a narrow term to a descriptor also appears elsewhere in the micro-thesaurus as a descriptor with the initial descriptor now appearing as a broader term to that descriptor. For example, if "A" appeared as a narrower term to descriptor "B", then "B" would also appear in the micro-thesaurus as a broader term to descriptor "A".

In addition to the listing of broader terms (BT) and narrower terms (NT) associated with each descriptor, the micro-thesaurus contains the Document Identifiers of the source documents within which the word relationships exist and the total number of broader terms and narrower terms associated with each descriptor. In a version of the micro-thesaurus to be supplied to attorneys, the document identifiers and the use counts may not necessarily be present. Their primary purpose is to aid in the development of the thesaurus.

The micro-thesaurus is printed in a double-column format. The first descriptor and last descriptor appearing on a page are printed in the upper left and right-hand corners of the page, respectively. The date of printing and the page number of the micro-thesaurus are printed in the center-top

of each page. The use of an asterisk immediately preceding an alphabetic character denotes that character to be a lower case character. For example, 10 USC 2304(*A)(11) means 10 USC 2304(a)(11).

The effort described above, was very intellectually demanding, requiring the services of legally qualified personnel to extract descriptors for the document set, generalize them as appropriate, and finally establish the broader/narrower word relationships. ODSI also implemented and employed a relatively simple software mechanism to insure that the resultant micro-thesaurus was fully developed in the sense described above, thereby significantly reducing the degree of intellectual activity required to perform that function. In this connection, ODSI provided software to create an initial version of a fully developed micro-thesaurus, to add new terms to the micro-thesaurus on the basis of an expanding document and information corpus, delete terms from the micro-thesaurus, and finally prepare the necessary hard copy version of the thesaurus for use by the legal staff of the OGC.

Having described the Concept Code Sheet derived data base and thesaurus for indexing and retrieving legal memoranda, it is appropriate to discuss the relative value of combining this system with the proposed aerospace legal information data base and thesaurus. The two systems have been designed to be compatible. Hence, the NASA Legal Micro-Thesaurus will be refined during Task I.1/Phase II of this contract to be consistent with the broad/narrow terms des-

cribed in "Categories Relating to the Legal Status of Man's Activities in Outer Space", (Section III of this Report, pages 18-22).

The 11 major headings identified on pages 18-22 are the broad terms, and the sub-categories are the narrow terms. Referring to Figure III-2, Concept Code Sheet - Major Concepts, item 5 would be the appropriate concept to modify, by inserting the 11 concepts cited above in place of the 3 listed therein. The numbering system, i.e., 0500, 0510, 0520 can be easily expanded to include all 11 categories.

The major concern in combining the two systems, however, is not a technical one, but rather one relating to the proposed usage of each system. In the case of the Concept Code system, utilization is anticipated by a limited group, namely staff members of the OGC Headquarters and field offices, and other related NASA personnel designated by the OGC. The documents associated with this system are obviously sensitive and will be treated accordingly.

The material to be included in the aerospace legal information data base and thesaurus is completely public and intended for wide distribution and utilization by a much broader community of interests.

Hence, although the two systems will be compatible, the ability to enter either system will be guided by rigidly enforced regulations and procedures.

C. Aerospace Legal Information System Design

The scope of the inputs to the information system and outputs of the proposed system, were described in Section III and related Appendices of this Report. The purpose of this section is to assess the value of "combining the aerospace legal information data base and thesaurus with the scientific and technical information data base and thesaurus in the NASA/RECON versus the generation of a special data file and thesaurus for the aerospace legal information system."

The scientific and technical information data base and thesaurus in the NASA/RECON has been fully described in Section III of this Report. At present, NASA/RECON provides its users with immediate access to the very large collection of aerospace documents that have been announced in the semi-monthly journals, STAR and IAA. The system is capable, limited only by its storage capacity and the availability of computer time, of handling multiple collections of information, each with its own unique vocabulary, data elements, and descriptions. Thus, NASA/RECON appears adequate to handle the specialized needs of the proposed aerospace legal information system.

Several deficiencies are present, however, in the aerospace legal information system as it exists today within NASA/RECON, and should be noted:

- Selection Process

The total number of space law related items in the system today is under 350. The approximate total number of space law items is over 10,000. The selection process as it exists today is inadequate as only a bare minimum of documents are being received and scanned at AIAA and TISCO. Further, the abstractors and/or indexers not having been legally trained, frequently select items which may not be significant, while at the same time omitting documents of greater importance.

- Citations

The method of citing an article or reference work utilized by the NASA/RECON system is accurate and informative and no major changes are recommended to improve its efficiency to handle increasing demands of the space law community. A more adequate means of covering symposiums and colloquiums, however, would be useful.

- Abstracts

The existing abstracts of space law material are inadequate for a larger, more comprehensive system. The primary problem deals with the fact that the abstractors have no prior legal training or exposure and are apt to miss significant points of space law subject matter. Also, improvements in the

method for abstracting symposiums and colloquiums would be quite useful, as only a limited amount of the information contained therein is referred to, directly or indirectly.

- Indexes

The keywords/indexes currently used to describe a reference work are generally good. However, on numerous occasions, keywords common to the legal profession are omitted because the indexers have no appreciation of their importance. This once again relates to whether technical or legal personnel should be dealing with space law material.

- RECON Thesaurus

The existing thesaurus for scientific and technical material in RECON is adequate for the proposed aerospace legal information system. It is relatively simple to incorporate the thesaurus proposed earlier for the aerospace law system into the existing system. However, it may require slightly more effort to accomplish this, if a high degree of correlation were required between scientific and legal terminology.

Recognizing these exceptions, it is relatively easy to combine the aerospace legal information data base and thesaurus with the scientific and technical information data

base and thesaurus in NASA/RECON. The NASA/RECON thesaurus would have to be modified to more accurately describe the space law material, but this would be necessary no matter which approach were taken. The more important point for discussion deals with the relative value of generating a special data file and thesaurus for the aerospace legal information system similar in scope to the NASA special "Management" Report previously described.

As noted earlier, the majority of those interviewed favored a "specialized" data file and thesaurus to be available to a specialized community. Thus, for example, every law library in the country would be a potential user of a "loose-leaf" publication which initially provided abstract/indexes of all major space law works from 1960-1972 with provisions for yearly supplements or insert pages to the basic document. It is anticipated that the needs of the user community would be satisfied more fully if they had a physical document available to them, rather than having to query RECON for each request. Further, the entire user community does not have and cannot afford easy access to a remote console for direct entry to the NASA/RECON system.

This type of data file could be provided the user community through the development of a specialized thesaurus. Section III of this Report (pages 18-22) presents the basis for one such thesaurus. However, it should be observed that

to be completely compatible with the scientific and technical system, the legally-oriented thesaurus would also have to contain technical keywords to provide for the interface between scientific and legal concepts. This could require additional effort, and recognizing the small community of interests which are trying to be satisfied, may not be warranted. Thus, the only major consideration remaining is the cost of a special publication. It is therefore recommended that prior to making a commitment to this approach, guarantees from potential users might be solicited to absorb the costs associated with this approach, although it is not likely that many would commit themselves without seeing the finished product.

V. CONCLUSIONS AND RECOMMENDATIONS

Phase I of Contract No. NASW-2266, requiring the identification of specific requirements for a NASA aerospace law information system and identification of the acquisition requirements for an aerospace law collection for the NASA law library, has been accomplished with conclusions and recommendations for each specific task outlined in the text and appendices of this Final Report.

The survey of space law "experts" was valuable to the project and their opinions and recommendations were integrated into the proposed system design. It is strongly recommended that a close and continuing liaison be maintained with these "experts" during the periods of modification and refinement to the system design to insure that the final product represents the most efficient and effective system suitable to the needs of the user community. It is further recommended that arrangements for obtaining copies of foreign documents be worked out as soon as possible to guarantee as complete and accurate an operational system as possible.

This Final Report went beyond the scope of requirements by outlining the "Functional Areas of Categorization and Preparation of Draft Thesaurus" as specified in Phase II, Task 1.1 of the Contract. This was a necessary step to take in light of the recommendations of the Space Law Advisory Panel Meeting. Modifications are anticipated to this draft

thesaurus depending upon the degree of compatibility required between it and "the logical concepts and terminology of the existing NASA scientific and technical thesaurus, as well as the Office of General Counsel concept index code for legal memoranda".

The preliminary selection of 650 documents representing a cross section of existing space law material and originally scheduled for Phase II of the contractual effort, has already been accomplished. This selection will be presented in the early stages of Phase II for approval prior to initiation of the abstracting and indexing phase. It is recommended that a study of the integration of air-law related material into the system be undertaken immediately. Upon completion of the abstracting/indexing of the initial 650 documents, an additional 500 documents, which would include air-law related material, should be selected, approved for entry into the system, abstracted/indexed, and incorporated as part of the system.

APPENDIX A

NASA/RECON SYSTEM CAPABILITY SUMMARY

RECON's name is formed from the first syllables of two words that describe its chief distinguishing feature: REmote CONsole. The system provides a computer based information retrieval mechanism by a remote console. The console is remote from the store of information, a computer at the NASA Scientific and Technical Information Facility at College Park, Md., and yet in direct touch with it by leased phone lines. In some instances, console and computer are 3,000 miles apart.

A RECON station or terminal consists of a keyboard, a cathode-ray tube, and a teleprinter. The computer is told what is wanted by the requestor typing and pushing buttons on the keyboard. The computer replies either by displaying its answers on the cathode-ray tube or by the teleprinter for permanent retention of answers if so requested. The three principal elements of a RECON terminal are in a close physical grouping.

Using RECON, the user communicates with a computer that contains complete, up-to-date bibliographic data about the hundreds of thousands of aerospace reports and journal articles that the NASA Office of Technology Utilization has collected, indexed, and stored. These scientific and technical documents range backward in date from those that

have just entered the system to some that predate the start of the NASA collection, begun in 1962.

A NASA scientist or engineer normally uses the RECON information system for one of two principal reasons:

(1) to find out the latest results of work being done by fellow researchers in his field who are employed on the same or a similar project; and (2) to obtain a detailed historical review, especially when embarking on a new assignment, of what has been accomplished to date in a particular field. In either case, the seeker of information needs fast, timely and highly specific results.

Prior to RECON, he sought these results by first trying to explain to a librarian, in the terms of his own discipline (often unfamiliar to the librarian), what he was looking for. The librarian then endeavored to translate his request into appropriate indexing terms used in computer coding at the NASA Scientific and Technical Information Facility. The request was mailed to the Facility, and as soon as possible was processed along with various other requests for information searches. When the computer had completed the search, the result was mailed to the requestor, who often found himself confronted with a very large batch of report citations, not always pertinent to his needs, which arrived well after he had asked for them. The response time was inadequate and the results were not dependably precise.

Recognizing the inadequacy of this mail-order search method, NASA developed several different streamlining procedures, including SDI (Selective Dissemination of Information) and SCAN (Selected Current Aerospace Notices, see Figure 1) in a continuing effort to speed up and refine information dissemination and retrieval. Although these were decided improvements, it remained obvious to NASA officials that the best way to achieve speed, precision, and timeliness in retrieving information stored in the computer was to put the scientist or engineer seeking the information in direct contact with the computer.

NASA/RECON provides that capability. The user at a remote console now conducts his own search by means of a dialog with the computer, which guides him via Boolean Logic and helps him pinpoint the object of the search. The system is capable, limited only by its storage capacity and the availability of computer time, of handling multiple collections of information, each with its own unique vocabulary, data elements, and descriptions.

The reports and journal articles that the NASA scientific and technical information program has collected record the significant findings of Government, industrial, and academic researchers throughout the world on matters of interest to the aerospace community. As such literature is acquired, it is summarized and extensively indexed in two

A SERVICE OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

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ASTRONAUTICAL SOCIETY, ANNUAL MEETING, 16TH, ANAHEIM,
CALIF., JUN. 8-10, 1970, PROCEEDINGS. P. 385-400.
/A71-30256 14-31/ COLL- 7 REFS. PLAC- TARZANA,
CALIF., PUBL- AMERICAN ASTRONAUTICAL SOCIETY, SERI-
/ADVANCES IN THE ASTRONAUTICAL SCIENCES, VOLUME 27/,
DATE- 1970.
CONFERENCES, ECONOMICS, *EUROPEAN SPACE PROGRAMS,
*INTERNATIONAL COOPERATION, *NASA PROGRAMS, *SPACE PROGRAMS,
SPACE SHUTTLES, SPACE STATIONS, SPACE TRANSPORTATION, SPACE
TUGS C34 A71-30262

12 THE MAJOR DEVELOPMENT TRENDS IN AIR TRANSPORT AND
EUROPEAN CO-OPERATION ZIEGLER, H. SOCIETE
NATIONALE INDUSTRIELLE AEROSPATIALE, PARIS, FRANCE
INIT- AERONAUTICAL JOURNAL, VOL. 75, P. 309-319,
DATE- MAY 1971.
*AIRCRAFT DESIGN, *AIRCRAFT PRODUCTION, AIRLINE OPERATIONS,
CARGO AIRCRAFT, CIVIL AVIATION, EUROPE, *INTERNATIONAL
COOPERATION, PASSENGER AIRCRAFT, *SHORT TAKEOFF AIRCRAFT,
URBAN TRANSPORTATION C34 A71-30302

13 NASA WEIGHS REPORTS ON SHUTTLES YAFFEE, M. L.
INIT- AVIATION WEEK AND SPACE TECHNOLOGY, VOL. 94, P.
55-61. DATE- JUN. 7, 1971.
BOOSTER ROCKETS, MISSION PLANNING, *NASA PROGRAMS, PAYLOADS,
*REUSABLE SPACECRAFT, SPACE MISSIONS, *SPACE SHUTTLES,
*SPACECRAFT DESIGN C31 A71-30421

14 DESIGN AND OPERATIONAL CHARACTERISTICS OF AN
INTEGRATED BIOWASTE RESISTOJET SYSTEM BLISS, J. R.
GRECO, R. V. MCDONNELL DOUGLAS AERONAUTICS CO.,
HUNTINGTON BEACH, CALIF. CONF- AMERICAN INST. OF
AERONAUTICS AND ASTRONAUTICS AND SOCIETY OF AUTOMOTIVE
ENGINEERS, PROPULSION JOINT SPECIALIST CONFERENCE,
7TH, SALT LAKE CITY, UTAH, JUN. 14-18, 1971. PLAC-
NEW YORK, PUBL- AMERICAN INST. OF AERONAUTICS AND
ASTRONAUTICS, DATE- 1971, COLL- 20 P. AIAA PAPER
71-686

ATTITUDE CONTROL, CONFERENCES, ENVIRONMENTAL ENGINEERING,
METABOLIC WASTES, *NASA PROGRAMS, ORBIT PERTURBATION,
*ORBITAL SPACE STATIONS, RELIABILITY, *RESISTOJET ENGINES,

FIGURE 1 (Cont'd)

34-04 WORLD SPACE PROGRAMS AND AEROSPACE LAW
IAA AND STAR ISSUES #14, JULY 1971

*SPACECRAFT PROPULSION, STATIONKEEPING, SYSTEMS ENGINEERING,
TRADEOFFS, *WASTE UTILIZATION, WEIGHT ANALYSIS
C28 A71-30748 #

STATUS OF A FIVE-CENTIMETER-DIAMETER ION THRUSTER
TECHNOLOGY PROGRAM BANKS, B. A. LATHAM, W. C.
NAKANISHI, S. NASA, LEWIS RESEARCH CENTER,
CLEVELAND, OHIO CONF- AMERICAN INST. OF
AERONAUTICS AND ASTRONAUTICS AND SOCIETY OF AUTOMOTIVE
ENGINEERS, PROPULSION JOINT SPECIALIST CONFERENCE,
7TH, SALT LAKE CITY, UTAH, JUN. 14-18, 1971. PLAC-
NEW YORK. PUBL- AMERICAN INST. OF AERONAUTICS AND
ASTRONAUTICS, DATE- 1971, COLL- 15 P. 9 REFS.
AIAA PAPER 71-690

CONFERENCES, ION BEAMS, *ION ENGINES, *NASA PROGRAMS,
NEUTRALIZERS, PERFORMANCE TESTS, PRODUCT DEVELOPMENT,
*PROPULSION SYSTEM PERFORMANCE, PROPULSIVE EFFICIENCY,
RESEARCH AND DEVELOPMENT, *ROCKET ENGINE DESIGN, THERMIONIC
CATHODES
C28 A71-30750*#

GEMS - A GLOBAL ENVIRONMENTAL MONITORING SYSTEM
HALLGREN, R. E. TELESETSKY, W. NOAA, ROCKVILLE,
MD. CONF- IN- NTC #71, INST. OF ELECTRICAL AND
ELECTRONICS ENGINEERS, NATIONAL TELEMETERING
CONFERENCE, WASHINGTON, D.C., APR. 12-15, 1971,
RECORD. P. 9-14. /A71-30896 14-07/ PLAC- NEW YORK,
PUBL- INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS,
INC., DATE- 1971.

BIOLOGY, CONFERENCES, *EARTH ATMOSPHERE, *EARTH ENVIRONMENT,
ENVIRONMENTAL CONTROL, ENVIRONMENTAL ENGINEERING,
*INTERNATIONAL COOPERATION, *LAND USE, *MONITORS,
*OCEANOGRAPHY, SYSTEMS ENGINEERING
C07 A71-30897

DELAYED PAYMENTS UNDER CONTRACT STRETCH-OUT REDA,
F. INIT- NATIONAL CONTRACT MANAGEMENT JOURNAL,
VOL. 5, P. 63-70. COLL- 23 REFS. DATE- SPRING 1971.
*ADJUSTING, CLAIMING, *CONTRACT MANAGEMENT, CONTRACT
NEGOTIATION, CONTRACTORS, COST ANALYSIS, DEFENSE INDUSTRY,
INVESTMENT, LAW JURISPRUDENCE, LEGAL LIABILITY
C34 A71-31131

THE BENEFIT OF SPACE RESEARCH FROM THE GERMAN POINT OF
VIEW - A MACRO MODEL FOR ESTIMATING THE MAGNITUDE OF
SPACE RESEARCH BENEFITS FOR THE FEDERAL REPUBLIC OF
GERMANY, PART 1 TECHNISCHE UNIV., BERLIN /WEST
GERMANY/. EHINGER, G. HEIDTMANN, F. KOELLE, H.
H. PLAC- BAD GODESBERG, WEST GER. PUBL-BUNDESMIN.
FUER BILDUNG UND WISS. DATE- JAN. 1971 COLL- 180 P
LANG- IN GERMAN, ENGLISH SUMMARY SPON- SPONSORED BY
BUNDESMIN. FUER BILDUNG UND WISS.
BMRW-FB-W-71-01-PT-1

COST ANALYSIS, *COST EFFECTIVENESS, *EUROPEAN SPACE
PROGRAMS, GERMANY, INDUSTRIES, INTERNATIONAL COOPERATION,
MODELS, PHYSICAL SCIENCES, *TECHNOLOGY TRANSFER
C34 N71-25670 #

GENERAL AVIATION, NAVAL AVIATION AND CONGESTION WITH
AN EXAMPLE FROM SOUTHERN CALIFORNIA TECHNISCHE
UNIV., BERLIN /WEST GERMANY/. EHINGER, G.
HEIDTMANN, F. KOELLE, H. H. PLAC- BAD GODESBERG,
WEST GER. PUBL-BUNDESMIN. FUER BILDUNG UND WISS.
DATE- JAN. 1971 COLL- 263 P REFS LANG- IN GERMAN,
ENGLISH SUMMARY SPON- SPONSORED BY BUNDESMIN. FUER
BILDUNG UND WISS. BMRW-FB-W-71-02-PT-2

COST ANALYSIS, *COST EFFECTIVENESS, *EUROPEAN SPACE
PROGRAMS, GERMANY, INDUSTRIES, INTERNATIONAL COOPERATION,
MODELS, PHYSICAL SCIENCES, PROJECT MANAGEMENT, *TECHNOLOGY
TRANSFER
C34 N71-25671 #

ACTINOMETRIC INSTRUMENTS ABOARD SOVIET METEOROLOGICAL
SATELLITES JOINT PUBLICATIONS RESEARCH SERVICE,
WASHINGTON, D. C. BFSKIN, V. A. DATE- 14 MAY
1971 COLL- 12 P REFS TRAN-TRANSL. INTO ENGLISH FROM
TR. ISENTR. AEROL. OBSERV. /MOSCOW/, NO. 100, 1970
P 125-135 JPRS-53137

*ACTINIMETERS, AEROSPACE ENVIRONMENTS, CIRCUIT DIAGRAMS,
IARIR ATMOSPHERE, LUMINOUS INTENSITY, *METEOROLOGICAL
SATELLITES, PARTICLE FLUX DENSITY, SPECTRAL RESOLUTION,
*SYSTEMS ENGINEERING, *U.S.S.R. SPACE PROGRAM
C14 N71-25838 #

NATIONAL AND INTERNATIONAL ENVIRONMENTAL MONITORING
ACTIVITIES - A DIRECTORY SMITHSONIAN INSTITUTION.

WASHINGTON, D. C. DATE- OCT. 1970 COLL- 309 P
BIOLOGY, *EARTH ENVIRONMENT, EARTH RESOURCES, ENVIRONMENT
POLLUTION, GEOPHYSICS, HYDROLOGY, *INTERNATIONAL
COOPERATION, METEOROLOGY, OCEANOGRAPHY, SEISMOLOGY
C13 N71-25889 #

SIGNIFICANT NASA INVENTIONS. AVAILABLE FOR LICENSING
IN FOREIGN COUNTRIES NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION, WASHINGTON, D. C. DATE- 1971
COLL- 45 P REFS NASA-SP-7038
ABSTRACTS, *INTERNATIONAL COOPERATION, *INVENTIONS, *NASA
PROGRAMS, *PATENTS, REGULATIONS
C34 N71-26041*

UNITED STATES AND SOVIET PROGRESS IN SPACE - SOME NEW
CONTRASTS LIBRARY OF CONGRESS, WASHINGTON, D. C.
SHELDON, C. S., II DATE- 12 JAN. 1971 COLL- 75 P
REPT-71-25-SP

AEROSPACE INDUSTRY, APPLICATIONS TECHNOLOGY SATELLITES,
*MANNED SPACE FLIGHT, MILITARY SPACECRAFT, PROJECT
MANAGEMENT, *RESOURCE ALLOCATION, SPACE EXPLORATION, *SPACE
PROGRAMS, *TECHNOLOGY ASSESSMENT, *U.S.S.R., *UNITED STATES
OF AMERICA
C34 N71-26193 #

A READER IN INTERNATIONAL ENVIRONMENTAL SCIENCE
COMMITTEE ON COMMERCE /U. S. SENATE/. COMMITTEE ON
SCIENCE AND ASTRONAUTICS /U. S. HOUSE/. PLAC-
WASHINGTON PUBL- GPO DATE- MAY 1971 COLL- 164 P
REFS CONF- PRESENTED TO 91ST CONGR., 1ST SESS., 18
MAY 1971 PREP- PREPARED BY LIBRARY OF CONGR.
ENVIRON. POLICY DIV. FOR COMM. ON COM. /U. S. SENATE/
AND COMM. ON SCI. AND ASTRONAUT. /U. S. HOUSE/ SERI-
ITS SERIAL E

BIOCLIMATOLOGY, CONGRESS, *EARTH RESOURCES, *ECGLOGY,
*INTERNATIONAL COOPERATION, PROBLEM SOLVING
C13 N71-26200 #

NASA AUTHORIZATION, 1972, PART 1 COMMITTEE ON
SCIENCE AND ASTRONAUTICS /U. S. HOUSE/. PLAC-
WASHINGTON PUBL- GPO DATE- 1971 COLL- 850 P REFS
CONF- HEARINGS ON H.R. 3981 /SUPERSEDED BY H.R. 7109/
BEFORE COMM. ON SCI. AND ASTRONAUT., 92P CONGR., 1ST
SESS., NO. 2, 2-4, 9-11, AND 16 MAR. 1971
*AEROSPACE SCIENCES, BUDGETING, FINANCIAL MANAGEMENT,
MANAGEMENT PLANNING, *NASA PROGRAMS, PROJECT MANAGEMENT,
*RESEARCH PROJECTS, *SPACE MISSIONS, TECHNOLOGY UTILIZATION
C34 N71-26777 #

NASA AUTHORIZATION FOR FISCAL YEAR 1972, PART 2
COMMITTEE ON AERONAUTICAL AND SPACE SCIENCES /U. S.
SENATE/. PLAC- WASHINGTON PUBL- GPO DATE- 1971
COLL- 429 P REFS CONF- HEARINGS ON S. 720 BEFORE
COMM. ON AERON. AND SPACE SCI., 92D CONGR., 1ST SESS.,
2 AND 5 APR. 1971
*APPROPRIATIONS, *CONGRESS, COST ESTIMATES, DATA
ACQUISITION, DEFENSE PROGRAM, *NASA PROGRAMS, RESEARCH AND
DEVELOPMENT, *SPACE PROGRAMS
C34 N71-26799 #

NASA AUTHORIZATION FOR FISCAL YEAR 1972, PART 1
COMMITTEE ON AERONAUTICAL AND SPACE SCIENCES /U. S.
SENATE/. PLAC- WASHINGTON PUBL- GPO DATE- 1971
COLL- 713 P REFS CONF- HEARINGS ON S. 720 BEFORE
COMM. ON AERON. AND SPACE SCI., 92D CONGR., 1ST SESS.,
30 MAR. - 1 APR. 1971
*APPROPRIATIONS, *CONGRESS, COST ESTIMATES, *NASA PROGRAMS,
RESEARCH PROJECTS, SPACE PROGRAMS, UNIVERSITY PROGRAM
C34 N71-26800 #

abstract journals: STAR (Scientific and Technical Aerospace Reports) and IAA (International Aerospace Abstracts). By merely pushing buttons, a RECON user can obtain the title, date, author, accession number, contract number, and notation of content of any document described in those journals that is likely to be helpful to him. Printed or microfilm copies of most of these documents are available where RECON terminals have been installed, and can generally be consulted immediately; but if a particular item is not at hand, it can be ordered from the central files in Maryland.

APPENDIX B

NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS

Two of the principal NASA publications are the International Aerospace Abstracts (IAA) and the Scientific and Technical Aerospace Reports (STAR).

International Aerospace Abstracts (IAA) is prepared and published semi-monthly (except June and December, which have three issues) by the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc., for the Institute and the National Aeronautics and Space Administration under Contract No. NASW-1949. IAA is an abstracting and indexing service covering the world's published literature in the field of aeronautics and space science and technology. The following types of publications are covered in IAA:

- Periodicals (including government sponsored journals) and books.
- Meeting papers and conference proceedings issued by professional societies and academic organizations.
- Translations of journals and journal articles.

Mr. Glennon, Director of AIAA/Technical Information Service, is involved with every detail of the IAA publication because of his length of service and involvement with AIAA, and their contract with NASA. His primary responsibility is to publish the IAA document for NASA. He indicated that the criteria for selecting material for the System included:

- a. Technical worthiness to professional analyst.
- b. Currency of document (no older than 1.5 years).
- c. Scope of subject matter.
- d. No news items.

IAA is arranged in two major sections:

(1) Abstracts Section: This section contains complete bibliographic citations with informative abstracts, arranged by appropriate subject categories to facilitate scanning. The subject categories are numbered from 01 to 34, and the scope of each category is outlined in the Table of Contents and again at the beginning of each category in the Abstracts Section. Each abstract is prefixed by the IAA accession number.

(2) Index Section: Five indexes are contained in this section: Subject, Personal Author, Contract Number, Meeting Paper and Report Number, and Accession Number. Each index is prefaced by explanatory notes to guide the user to the desired abstract. Two cumulated indexes appear each year. The Semi-Annual Cumulated Index, distributed in June covers the January to June issues. The Annual Cumulated Index, distributed in December, covers all 24 issues published from January to December.

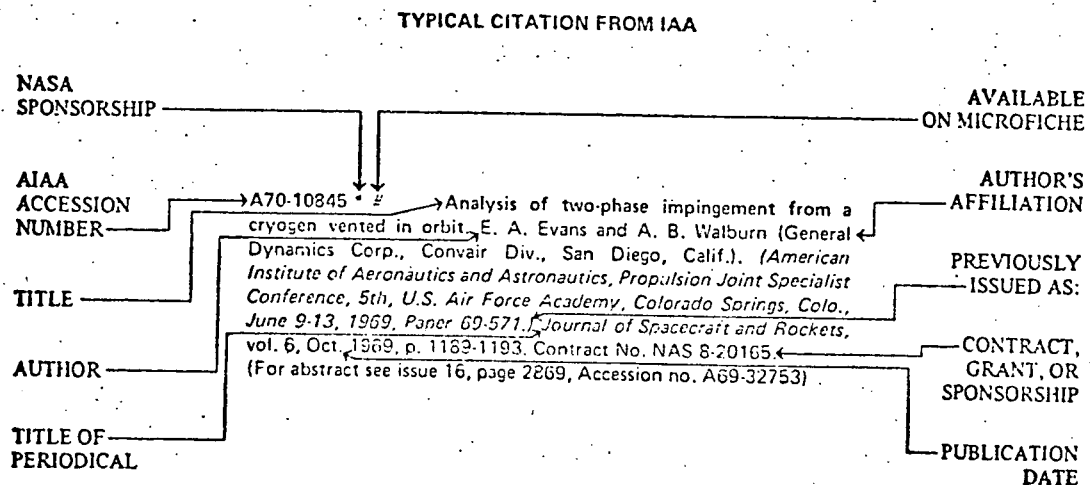
The AIAA personnel doing the actual abstracting, indexing, and preparing the citations are graduate engineers or scientists -- mainly in the physical sciences. No lawyers are currently working in this area.

The purpose of the abstract is to assist the reader in making a judgment as to whether or not he wants to see the document. Hence, it includes as full a description as possible of the contents of the article; it describes the methods used by the author in the article; and it outlines his results or conclusions.

With respect to the indexing, Mr. Glennon noted that it represents principal topics covered in the document. Generally, there are principal terms and secondary terms. These are outlined in conjunction with the NASA Thesaurus. There is sufficient room for expansion of keywords in this system to reflect new terms, etc. The procedure for expansion is systemized and good. Note: the indexer and abstractor are generally not the same person, which might reflect why there may be some inconsistencies in interpretation of the article.

A typical citation from IAA is depicted in Figure 2 below.

FIGURE 2



Scientific and Technical Aerospace Reports (STAR) is a comprehensive abstracting and indexing journal covering current worldwide report literature on the science and technology of space and aeronautics. Publications abstracted in STAR include scientific and technical reports issued by NASA and its contractors, other U. S. Government agencies, and corporations, universities, and research organizations throughout the world. Pertinent theses, NASA-owned patents and patent applications, translations, and other separate documents (including legal documents) are also abstracted. Citations and abstracts in STAR are grouped in 34 subject categories. Six indexes are included in each issue: subject, personal author, corporate source, contract number, report/accession number, and accession/report number. Cumulative index volumes are published semi-annually (quarterly before 1970) and annually.

STAR, which is issued on the 8th and 23rd of each month, is published by NASA, Office of Technology Utilization, Scientific and Technical Information Division (STID). The Scientific and Technical Information Facility (STIF) is operated for NASA by Informatics Tisco, Inc.

Meetings with Mr. Feinstein of the STID Office proved extremely useful for understanding the mechanism in-

volved in managing and publishing the IAA and STAR publications. STID is charged with the responsibility of managing and coordinating the activities of TISCO -- producer of STAR, and AIAA -- producer of IAA. A STID staff man, generally an engineer by training is project manager for this enormous task. The TISCO personnel who prepare the citations, abstracts, and keywords are technically oriented and do not have prior legal training or experience. The Information Systems Branch is responsible for the information retrieval program for literature searching; for quality of abstracting and indexing; and for translation of foreign documents.

By special arrangement between NASA and the AIAA, IAA provides parallel coverage of scientific and trade journals, books, and conference papers in the same subject areas as the reports abstracted in STAR. STAR and IAA are categorized and abstracted in basically identical ways and documents in both are indexed by terms from a common NASA Thesaurus. Both journals appear twice monthly. IAA is issued on the 1st and 15th of each month. Thus the two services provide comprehensive access to the national and international unclassified report and published literature of current significance to aerospace science and technology.

A typical Table of Contents for both IAA and STAR is contained in Figure 3. Sample abstracts from IAA appear in Figure 4. These are identical in format to those appearing

in the STAR system, with the exception of the letter preceding the Accession Number. For IAA material, the accession number is prefaced with an "A". For STAR material, it is prefaced with an "N".

Sample IAA and STAR indexes appear in Figure 5.

table of contents

FIGURE 3

	Page
01 Aerodynamics	3005
Includes aerodynamics of bodies, combinations, internal flow (e.g., ducts and turbomachinery); and wings, rotors, and control surfaces. For applications see: 02 Aircraft; and 31 Space Vehicles. For related information see also: 12 Fluid Mechanics; and 33 Thermodynamics and Combustion.	
02 Aircraft	3013
Includes fixed-wing airplanes, helicopters, gliders, balloons, ornithopters, etc.; and specific types of complete aircraft (e.g., ground-effect machines, STOL, and VTOL); flight tests; operating problems (e.g., sonic boom); safety and safety devices; economics; and stability and control. For basic research see: 01 Aerodynamics. For related information see also: 31 Space Vehicles; and 32 Structural Mechanics.	
03 Auxiliary Systems	3022
Includes fuel cells, energy conversion cells, and solar cells; auxiliary gas turbines; hydraulic, pneumatic, and electrical systems; actuators; and inverters. For related information see also: 09 Electronic Equipment; 22 Nuclear Engineering; and 28 Propulsion Systems.	
04 Biosciences	3024
Includes aerospace medicine, exobiology, and radiation effects on biological systems; and physiological and psychological factors. For related information see also: 05 Biotechnology.	
05 Biotechnology	3035
Includes life-support systems, human engineering, protective clothing and equipment, crew training and evaluation, and piloting. For related information see also: 04 Biosciences.	
06 Chemistry	3041
Includes chemical analysis and identification (e.g., spectroscopy). For applications see: 17 Materials, Metallic; 18 Materials, Nonmetallic; and 27 Propellants.	
07 Communications	3042
Includes communications equipment and techniques; noise; radio and communications black-out; modulation telemetry; tracking radar and optical observation; and wave propagation. For basic research see: 23 Physics, General; and 21 Navigation.	
08 Computers	3048
Includes computer operation and programming; and data processing. For basic research see: 19 Mathematics.	
09 Electronic Equipment	3050
Includes electronic test equipment and maintainability; component parts (e.g., electron tubes, tunnel diodes, and transistors); integrated circuitry; and microminiaturization. For basic research see: 10 Electronics. For related information see also: 07 Communications; and 21 Navigation.	
10 Electronics	3056
Includes circuit theory; and feedback and control theory. For applications see: 09 Electronic Equipment. For related information see: specific Physics categories.	
11 Facilities, Research and Support	3057
Includes airports; lunar and planetary bases, including associated vehicles; ground-support systems; related logistics; simulators; test facilities (e.g., rocket-engine test stands, shock tubes, and wind tunnels); test ranges; and tracking stations.	
12 Fluid Mechanics	3065
Includes boundary-layer flow; compressible flow; gas dynamics; hydrodynamics; and turbulence. For related information see also: 01 Aerodynamics; and 33 Thermodynamics and Combustion.	
13 Geophysics	3075
Includes aeronomy; upper and lower atmosphere studies; oceanography; cartography; and geodesy. For related information see also: 20 Meteorology; 29 Space Radiation; and 30 Space Sciences.	
14 Instrumentation and Photography	3081
Includes design, installation, and testing of instrumentation systems; gyroscopes; measuring instruments and gages; recorders; transducers; aerial photography; and telescopes and cameras.	
15 Machine Elements and Processes	3097
Includes bearings, seals, pumps, and other mechanical equipment; lubrication, friction, and wear; manufacturing processes and quality control; reliability; drafting; and materials fabrication, handling, and inspection.	
16 Masers	3103
Includes applications of masers and lasers. For basic research see: 26 Physics, Solid-State.	
17 Materials, Metallic	3109
Includes cermets; corrosion; physical and mechanical properties of materials; metallurgy; and applications as structural materials. For basic research see: 06 Chemistry. For related information see also: 18 Materials, Nonmetallic; and 32 Structural Mechanics.	

FIGURE 3 (Cont'd)

	Page	Page
18 Materials, Nonmetallic	3127	research see: 06 Chemistry; and 33 Thermodynamics and Combustion. For related information see also: 28 Propulsion Systems.
Includes corrosion; physical and mechanical properties of materials (e.g., plastics); and elastomers, hydraulic fluids, etc. For basic research see: 06 Chemistry. For related information see also: 17 Materials, Metallic; 27 Propellants; and 32 Structural Mechanics.		
19 Mathematics	3128	28 Propulsion Systems 3146
Includes calculation methods and theory; and numerical analysis. For applications see: 03 Computers.		Includes air-breathing, electric, liquid, solid, and magnetohydrodynamic propulsion. For nuclear propulsion see: 22 Nuclear Engineering. For basic research see: 23 Physics, General; and 33 Thermodynamics and Combustion. For applications see: 31 Space Vehicles. For related information see also: 27 Propellants.
20 Meteorology	2132	29 Space Radiation 3149
Includes climatology; weather forecasting; and visibility studies. For related information see also: 13 Geophysics; and 30 Space Sciences.		Includes cosmic radiation; solar flares; solar radiation; and Van Allen radiation belts. For related information see also: 13 Geophysics; and 24 Physics, Atomic, Molecular, and Nuclear.
21 Navigation	3133	30 Space Sciences 3152
Includes guidance; autopilots; star and planet tracking; inertial platforms; and air traffic control. For related information see also: 07 Communications.		Includes astronomy and astrophysics; cosmology; lunar and planetary flight and exploration; and theoretical analysis of orbits and trajectories. For related information see also: 11 Facilities, Research and Support; and 31 Space Vehicles.
22 Nuclear Engineering	3135	31 Space Vehicles 3174
Includes nuclear reactors and nuclear heat sources used for propulsion and auxiliary power. For basic research see: 24 Physics, Atomic, Molecular, and Nuclear. For related information see also: 03 Auxiliary Systems; and 28 Propulsion Systems.		Includes launch vehicles; manned space capsules; clustered and multi-stage rockets; satellites; sounding rockets and probes; and operating problems. For basic research see: 30 Space Sciences. For related information see also: 28 Propulsion Systems; and 32 Structural Mechanics.
23 Physics, General	3135	32 Structural Mechanics 3181
Includes acoustics, cryogenics, mechanics, and optics. For astrophysics see: 30 Space Sciences. For geophysics and related information see also: 13 Geophysics; 20 Meteorology; and 29 Space Radiation.		Includes structural element design and weight analysis; fatigue; thermal stress; impact phenomena; vibration; flutter; inflatable structures; and structural tests. For related information see also: 17 Materials, Metallic; and 18 Materials, Nonmetallic.
24 Physics, Atomic, Molecular, and Nuclear	3137	33 Thermodynamics and Combustion 3193
Includes atomic, molecular, and nuclear physics. For applications see: 22 Nuclear Engineering. For related information see also: 29 Space Radiation.		Includes ablation, cooling, heating, heat transfer, thermal balance, and other thermal effects; and combustion theory. For related information see also: 12 Fluid Mechanics; and 27 Propellants.
25 Physics, Plasma	3138	34 General 3198
Includes magnetohydrodynamics. For applications see: 28 Propulsion Systems.		Includes reports of a broad nature relating to industrial applications and technology, and to basic research; defense aspects; law and related legal matters; and legislative hearings and documents.
26 Physics, Solid-State	3142	
Includes semiconductor theory; and superconductivity. For applications see: 16 Masers. For related information see also: 10 Electronics.		
27 Propellants	3145	
Includes fuels; igniters; and oxidizers. For basic		

Subject Index	I-1
Personal Author Index	I-105
Contract Number Index	I-147
Meeting Paper and Report Number Index	I-151
Accession Number Index	I-153

Practical Uses of Outer Space, and brief review of some other aspects of international cooperation in matters of outer space. The considerable similarity of the information furnished to the United Nations by the Soviet Union and the United States is pointed out. Other countries that have furnished information on launchings to the United Nations are Italy, France, and Australia. The international regulation of space objects is reviewed. Legislative proposals on outer matters connected with activities in outer space are briefly discussed. **M.V.E.**

A70-35790 # **Property in moon samples and things left upon the moon.** C. Wilfred Jenks. In: International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings. (A70-35776 17-34) Edited by M. D. Schwartz. Davis, California, University, 1970, p. 153-152.

Discussion of the legal status of the lunar soil samples brought back and objects left on the moon by the astronauts with respect to ownership rights. It is shown that neither the Declaration of Legal Principles nor the Treaty on Space provide a clear answer to the question of these rights. Some of the legal problems this question raises are reviewed, and the urgency of further thinking toward preparing the groundwork for a Space Resources Agreement and for other pertinent space agreements is pointed out. **M.V.E.**

A70-35791 # **Legal aspects of the lunar landing.** Eugene B. Bick. In: International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings. (A70-35776 17-34) Edited by M. D. Schwartz. Davis, California, University, 1970, p. 160-175. 34 refs.

Discussion of the legal problems arising from Apollo 11 activities connected with lunar landing with respect to the Space Treaty. The following legal problems are discussed: (1) the carrying away of lunar soil and planting of the US flag on the Sea of Tranquility in relation to articles I and II of the Space Treaty, (2) the right of Soviet spacecraft Luna 15 in relation to articles III, IX, and XI of the Space Treaty, (3) the Apollo 11 precautions against contamination in relation to article IX of the Space Treaty, and (4) the dissemination of information on the results of Apollo 11 in relation to article XI of the Space Treaty. In addition, the following legal problems connected with future human activities on the moon and planets are discussed: (1) article II in relation to setting up human bases and colonization of the moon and Mars, (2) article IV in relation to military provisions in relation to possible surveillance devices on the moon, (3) article II and VI provisions in reference to nongovernmental private tourist activities on the moon, and (4) article XII on extrajurisdictional privileges in relation to future lunar exploration. The international exploration of celestial bodies is discussed. **Z.W.**

A70-35794 # **Regime of the property of the natural resources on the moon and other celestial bodies.** Florencia G. Rusconi. In: Instituto de Derecho Aeronáutico y Espacial, Córdoba, Argentina. In: International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings. (A70-35776 17-34) Edited by M. D. Schwartz. Davis, California, University, 1970, p. 185-183.

Discussion of the urgent need for an international Space Resources Agreement, and proposals on its main provisions. It is suggested that title to any natural resources of the moon or other celestial bodies be vested in an international organization and that the exploitation of such resources be made subject to leases or concessions from this international title holder. **M.V.E.**

A70-35795 # **Some considerations on the lunar product.** (Algunas consideraciones sobre el producto lunar). María Eleonor Bick. In: International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings. (A70-35776 17-34) Edited by M. D. Schwartz. Davis, California, University, 1970, p. 189-194. 8 refs. In Spanish.

Discussion of the several legal aspects of the present human space expansion, and particularly those concerning the disposal of lunar matter and lunar product. Following a definition of lunar matter and lunar product, the existing sources of international law on the subject are reviewed and examined. An urgent necessity is pointed out to elaborate legislation regulating the obtainment and disposal of the lunar product. **O.H.**

A70-35796 # **Activities on celestial bodies, including exploitation of natural resources.** Oscar Fernández-Brital (Morón, Universidad, Morón; Universidad del Salvador, Buenos Aires, Argentina). In: International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings. (A70-35776 17-34) Edited by M. D. Schwartz. Davis, California, University, 1970, p. 195-198. 12 refs.

Discussion of the legal status of the natural resources of celestial bodies. The limitations of the Space Treaty of January 27, 1967, are that its provisions cover only the exploration and use and do not include explicitly the exploitation of celestial bodies. It is felt that, until complementary treaties are signed, exploitation should be considered as a form of use subject to the present treaty's pertinent provisions. Proposals on complementary international agreements are set forth. **M.V.E.**

A70-35797 # **The principal sources of space law (Las fuentes principales del derecho espacial).** Fr. W. von Rauchhaupt (Heidelberg, Universität, Heidelberg, West Germany). In: International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings. (A70-35776 17-34) Edited by M. D. Schwartz. Davis, California, University, 1970, p. 201-208. In Spanish.

General discussion of the foundations of space law, a subject which is now of practical importance. The natural scientific bases for investigation and for space law are outlined, and attention is given to the creative forces of space law in theory. The practical application of space law is treated, and future prospects are considered. **F.R.L.**

A70-35798 # **Exploitation of resources in celestial bodies (Explotación de los recursos en los cuerpos celestes).** Enrique Edgardo Elli. In: International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings. (A70-35776 17-34) Edited by M. D. Schwartz. Davis, California, University, 1970, p. 230-238. 10 refs. In Spanish.

Review and discussion of the reasons for the existence and application of regulations established by the U. N. and various nations to control exploration and investigation of celestial bodies. The intent is that space exploration should not become a source of international discord, but rather that it should be a benefit and a step forward for humanity. **F.R.L.**

A70-35799 # **Two emerging problems of space law concerning remote sensing satellites.** George J. Alexander. In: International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings. (A70-35776 17-34) Edited by M. D. Schwartz. Davis, California, University, 1970, p. 258-263. 36 refs.

Discussion of the need for reexamining the law of various states taking into account the full utilization of the greatly accelerated information flow due to the earth resource survey (ERS) satellites without giving economic advantage to speculators, and the control of experiments designed to alter biospheric conditions. The advantages of the ERS satellites are discussed and the economic benefits of an operational ERS system are examined. The technical and legal problems involved in the dissemination of the ERS information are described. It is also indicated that at present there is no federal law in the United States governing weather modification activities. The need for such regulations is stressed. **Z.W.**

A70-35800 # **Some observations on legal problems in connection with satellite communications.** Edward Picman. In: International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings. (A70-35776 17-34) Edited by M. D. Schwartz. Davis, California, University, 1970, p. 264-269.

Discussion of some of the legal work in progress on international satellite communications. It is shown how the world-wide real-time TV coverage of the Apollo 11 moon landing via satellite communication did dramatize the contrast of technical development speed compared to the sluggishness of progress in the social, political, and legal fields, and reminded everyone that the technicians will simply not wait for the social planners and jurists. The time-table for the most advanced forms of communication satellites set up by the Working Group on Direct Broadcast Satellites of the United States Space Committee is reviewed. The political and social problem areas and international legal questions pointed out by the Working Group

FIGURE 4 (Cont'd)

20-34 GENERAL

N70-37042# Saclant ASW Research Center, La Spezia (Italy).
THE ASW ROLE IN THE LOGISTIC SUPPORT OF GROUND FORCES: AN APPLICATION OF LANCHESTER THEORY
 M. Bresson 15 Jun. 1968 85 p refs
 (Saclantcen-TR-117) Avail: CFSTI

On the basis of the observed slowing down of land offensives, a model is developed to explain the logistical constraints that impose an upper limit on the tactical or strategic capabilities of ground forces. The model is then generalized to cover not only the space/time constraints within the land theater itself, but also those constraints that are imposed by the availability of supplies. This leads to the development of a global model showing the interactions between land and naval battles for conditions in which the main source of supply of large land units depends on the safe arrival of transport ships. The role of antisubmarine warfare in the logistic support of ground forces is thereby demonstrated.
 Author (ESRO)

N70-37060# National Bureau of Standards, Washington, D.C.
ENVIRONMENTAL POLLUTION: A SELECTIVE BIBLIOGRAPHY
 May 1970 34 p refs
 Avail: CFSTI

Most reports listed in this bibliography result from federally sponsored research by such departments and agencies as HEW, Interior, AEC, NASA, Defense, Transportation and others. These reports were selected from those appearing in announcement journals during the period 1968 through April 1970.
 Author

N70-37070*# Scientific Translation Service, Santa Barbara, Calif.
DEVELOPMENT OF INSTALLATIONS FOR DIRECT CONVERSION OF HEAT INTO ELECTRICAL ENERGY BY MEANS OF MHD GENERATORS AND OTHER NEW ENERGY DEVICES
 In its The Inst. of High Temp. of the USSR Acad. of Sci. The Most Important Results of Sci. Res. in 1969 Aug. 1970 p 45-83 refs (See N70-37066 20-33)
 Avail: CFSTI CSCL 10A

Research connected with the development of stationary electrical power plants is reported and includes the following: (1) Investigations were conducted on metallic electrodes of steel and copper and also on ceramic electrodes of silicon carbide and zirconium dioxide. (2) Experimental equipment was built for studying the dynamics of processes adjacent to electrodes and permitting electro-optical detection of spots with time resolutions down to 10 to the minus 8th power sec with simultaneous measurement of charged particle concentration in the cathode region with time resolutions as low as 5 x 10 to the minus 8th power sec. (3) Investigation of the high-current discharge on electrodes covered directly with an additive in the MHD generator channel demonstrated that the intensity of the electrode disintegration process by pinched discharge is reduced by a factor of ten. (4) Thermal efficiency studies were made of the combined open cycle MHD power plants with various methods of achieving the high temperatures of the combustion products. (5) Theoretical and experimental studies of problems connected with the development of liquid metal MHD power plants were conducted.
 D.L.G.

N70-37083*# Northwestern Univ., Evanston, Ill. Dept. of Industrial Engineering and Management Sciences.
AGING, CREATIVITY, INTER-SPECIALITY MOBILITY, RETRAINING, AND TECHNICAL OBSOLESCENCE OF SCIENTIFIC AND TECHNICAL PERSONNEL: A SELECTED BIBLIOGRAPHY
 Richard T. Barth Jan. 1970 22 p refs
 (Grant NGR-14-007-062)
 (NASA-CR-112776) Avail: CFSTI CSCL 05I

The entries were selected on the basis of their relevance to the following typical researchable and organizational topics: how to help engineers and scientists change fields, specialties in midcareer; the effect of age on the scientist's engineer's ability to redirect or change his career; technical obsolescence, how it should be measured, and how it is related; organizational aging; the role of continuing education in preventing technical obsolescence; and the concerns of research scientists, engineers who are reassigned into development activities.
 Author

N70-37109# National Science Foundation, Washington, D.C.
Office of Economic and Manpower Studies.
FEDERAL FUNDS FOR R AND D CONTINUE TO REMAIN LEVEL
 14 Aug. 1970 4 p
 (NSF-70-28) Avail: Issuing Activity

The decrease in government support for research and development in the United States is reported. A tabular breakdown is given which shows the amount of basic and applied research, as well as development, and funds provided by the Federal Government, according to the agency receiving the funds. The major support agencies include the Department of Defense, NASA, and the Atomic Energy Commission.
 RE

N70-37141# Grenoble Univ. (France). Faculte de Droit.
LEGAL PROBLEMS RELATING TO SPACE (LEGAL PRINCIPLES AND EFFORTS OF CODIFICATION BY THE NATIONS) [LES PROBLEMES JURIDIQUES DE L'ESPACE (PRINCIPES JURIDIQUES ET EFFORTS DE CODIFICATION DE L'ONU)]
 Akira Matsui (Ph.D. Thesis) 16 Jun. 1970 203 p refs
 FRENCH
 Avail: CFSTI

This report summarizes the work of the U.N. Committee on the Peaceful Uses of Outer Space (COPUOS) and discusses the resolutions adopted by the General Assembly in 1962 and 1963. The treaty governing the exploration and the use of outer space including the moon and other celestial bodies, the agreement on the rescue of astronauts, and the draft conventions on responsibility for damage are also discussed.
 ESFC

N70-37142# Cambridge Language Research Unit (England)
THE USE OF AUTOMATICALLY OBTAINED KEYWORD CLASSIFICATIONS FOR INFORMATION RETRIEVAL Final Report
 K. Sparck Jones and D. M. Jackson Feb. 1969 47 p
 Sponsored by Office for Sci. and Tech. Inform.
 (ML-211; OSTI-5038) Copyright. Avail: CFSTI

This report deals with the automatic construction of keyword classifications and their use in information retrieval. It discusses the possible characteristics of such classifications and potential ways of using them, and describes the various approaches to classification in terms of an overall frame of reference in which several types of classification are distinguished. The results of experiments on a collection of documents and test requests obtained from the ASLIB Cranfield project are presented, and it is concluded that automatic classifications which lead to noticeable improvements in retrieval performance over those obtainable with unclassified text can be set up.
 Author (ESF)

N70-37166# Grumman Aircraft Engineering Corp., Bethel, N.Y. Research Dept.
ADVANCED CONCEPTS IN REFUSE MANAGEMENT
 A. Hershaft Aug. 1970 18 p refs Presented at the Nat. Pollution Control Conf. and Exposition, San Francisco, 3 Apr. 1970 (RM-485J) Avail: CFSTI

SOLID-SOLID INTERFACES

Fluorescence method of determining solid state laser parameters using spontaneous and stimulated emission observations

c16 A70-35101

Solid state laser polarization mechanism, considering isotropic and anisotropic cavities

c16 A70-35103

Crystal and glass lasers activated by Nd ions, examining stimulated emission temperature dependence by high temperature spectroscopy

c16 A70-35105

Picosecond pulses in Q switched neodymium glass and ruby lasers, describing pulse measurement with fluorescence

c16 A70-35623

SOLID-SOLID INTERFACES

Circular inclusion interface separation in matrix under incident compressive waves interpreted for fiber reinforced composites

c32 A70-34963

SOLIDIFICATION

Solidification theory application to Ti alloys, predicting microsegregation in binary alloys

c17 A70-34352

Two dimensional solidification of forced viscous flow over flat plate with constant heat removal

c33 A70-34634

SOLIDS

Stress wave generation in elastic temperature-dependent absorbing solids by impulsive EM radiation

c32 A70-34967

Shock wave response of metals and nonmetals under high strain rates

c32 A70-35223

Nonaxisymmetric thermal stress distribution in infinite elastic solid containing external stress-free crack with prescribed heat flux

c33 A70-35437

Heat conduction from sliding solids, discussing restrictions effect on temperature field near interface

c33 A70-35543

SOLSTICES

Solstitial solar quiet currents along magnetic lines of force in magnetosphere, discussing ionospheric wind asymmetry effects

c13 A70-34949

SOMMERFELD APPROXIMATION

Leaky wave antennas, deriving radiation field distribution in terms of power leakage from interior by Sommerfeld integral and Kirchhoff-Huygens integration

c09 A70-35071

SONIC BOOMS

Sonic boom minimization through airstream alteration by force or heat fields and aircraft body shaping [AIAA PAPER 70-903]

c02 A70-35817

SOUND PROPAGATION

Perturbation method to obtain analytical expressions for attenuation of plane wave sound propagation in lined ducts

c23 A70-34523

SOUND TRANSDUCERS

Precision components engineering inspection and sonic transducer surface vibration modes analysis by hologram interferometry

c14 A70-35021

SOUNDING ROCKETS

Japanese sounding rockets for space research, discussing missions, launchings, flight tests, etc of kappa and MT-135 rockets and M-45 launch vehicle

c31 A70-35205

UK space program, describing scientific satellites, Black Arrow launch vehicle and sounding rockets

c30 A70-35206

Bora-Sond atmospheric probe providing two stage minimum cost high altitude sounding for supersonic transport (SST), discussing hot water propulsion system

c31 A70-35257

SOVEREIGNTY

Juridical status and sovereignty of rocket launching and cosmic stations in international law

c34 A70-35786

SOYUZ SPACECRAFT

Physiological reactions of Soyuz 6, 7 and 8 crew during group flights, noting cardiovascular and respiratory reaction to submaximal stresses after flight

c05 A70-35361

SPACE ENVIRONMENT SIMULATION

Solar alignment, control, intensity scanner and data collection for large Space Environmental Simulator

c11 A70-35155

Test machine for partial gravity environment simulation for aerospace subsystem testing in vacuum chamber

c11 A70-35181

Cryopumping systems of ultrahigh vacuum space environmental chambers

c11 A70-35247

Adenosine triphosphate and vitamins /amitetravil/ as prophylactics against radiation injuries in dogs during simulated space flight

c05 A70-35351

Plasma induced radio frequency interferences from DC-DC converter to receiving antenna simulated for REXS satellite in space chamber

c07 A70-35400

SPACE EXPLORATION

Future manned planetary missions with reusable nuclear shuttles, comparing operating modes in terms of propellant requirement, costs, complexity, etc [AAS PAPER 70-040]

c30 A70-34781

Outer planets exploration program using unique planetary alignment in 1977, discussing mission profiles, spacecraft designs, etc [AAS PAPER 70-028]

c30 A70-34797

Unmanned flyby missions to Mercury in 1973-1990, discussing scientific objectives and payloads [AAS PAPER 70-027]

c30 A70-34798

Slow scan TV systems for planetary exploration, discussing sampled vidicon operation, digital encoding, data storage, signal to noise ratio, future design trends, etc [SMPT PREPRINT 106-3]

c14 A70-35634

Treaty on principles governing activities of states in exploration and use of outer space, appraising various provisions

c30 A70-35792

SPACE LAW

Moon legal status, discussing territorial sovereignty, peaceful uses, UN Resolutions and Space Treaty, rule of occupation, etc

c34 A70-35323

Space law treaties and UN programs

c34 A70-35324

Outer space law - Conference, Mar del Plata, Argentina, October 1969

c34 A70-35776

Legal problems of space telecommunications, discussing world juridical regime, United Nations work and satellite systems broadcasting

c34 A70-35777

Legal questions of satellites telecommunications at Washington Intelsat Conference

c34 A70-35778

UN space committee discussion on rules governing direct TV broadcasting by satellite, taking into account frequency allocation, geostationary orbits, etc

c34 A70-35779

Legal aspects of telecommunications by satellite systems, discussing international organization, Intelsat integration and direct broadcasting

c34 A70-35781

Juridical structure, risks and control of satellite telecommunication ensuring equality of nations

c34 A70-35782

Liability for damages by space objects, taking into account states and international organizations

c34 A70-35783

International organizations participation in convention on liability for damage caused by launching of objects into outer space

c34 A70-35784

Juridical condition of earth orbiting space stations, discussing term definitions in treaty on outer space

c34 A70-35785

Juridical status and sovereignty of rocket launching and cosmic stations in international law

c34 A70-35786

Space object, launching and platform registration

c34 A70-35787

Registration procedure for space exploration objects

c34 A70-35788

Spacecraft launch registration, comparing Soviet and American information furnished to UN

c34 A70-35789

Legal status of ownership rights of lunar soil samples and objects left on moon by astronauts

c34 A70-35790

Legal problems arising from Apollo 11 lunar landing with respect to Space Treaty, discussing lunar soil removal, flag planting, Luna 15 flight, etc

c34 A70-35791

Treaty on principles governing activities of states in exploration and use of outer space, appraising various provisions

c30 A70-35792

Meteorites and celestial products legal status with respect to rights of property

c30 A70-35793

Legal aspects concerning lunar matter and product disposal resulting from human cosmic expansion

c34 A70-35795

Legal status of natural resources of celestial bodies, discussing limitations of Space Treaty of 27 January 1967

c34 A70-35796

Space law foundations, outlining natural scientific bases

c34 A70-35797

Regulations existence and application to exploitation of resources in celestial bodies

c34 A70-35798

Space legal problems involving earth resource survey /ERS/ satellites and weather modification

c34 A70-35799

Legal problems in satellite communications, emphasizing copyright, satellite television legality and protection of transmission and broadcasts

c34 A70-35800

Space law teaching and study facilities

c34 A70-35801

SPACE LOGISTICS

Logistic support reusable earth to orbit space shuttle design, noting weight penalties, payloads and development time

c31 A70-34782

SPACE MISSIONS

Periodic comet nature, origin and anomalous behavior with space mission planning implications, assuming solar plasma source and solar-interstellar interaction

c30 A70-34795

Japanese sounding rockets for space research, discussing missions, launchings, flight tests, etc of kappa and MT-135 rockets and M-45 launch vehicle

c31 A70-35205

Titan 3 launch vehicle for scientific space missions, discussing building blocks, performance and payloads

c31 A70-35260

SPACE PROBES

Digital simulation of linear filter, investigating noise and rounding errors effects on decoding signals from lunar and interplanetary probes

c08 A70-34612

Interplanetary probes trajectory optimization for minimum energy expenditures, neglecting solar and terrestrial perturbations within earth sphere of influence

c30 A70-35366

German monograph on heavy space probes for solar system investigation covering systems analysis, mission success, flight programs, Saturn 5 launch vehicle, etc

c30 A70-35378

SPACE RATIONS

Prototype space foods effects on humans, determining changes in bacterial fecal flora content

c04 A70-35565

SPACE SHUTTLES

Reusable nuclear shuttle /RNS/ for space program providing low cost transportation beyond earth orbit [AIAA PAPER 70-679]

c31 A70-34512

Experiment space module combined with space station and serviced by shuttle for low total cost and maximum flexibility in funding and scheduling

c31 A70-34777

Manned planetary flight systems engineering discussing feasibility, objectives, propulsion, trans planet injection via geospace shuttle station, energy requirements for various synodic modes

c30 A70-34778

Future manned planetary missions with reusable nuclear shuttles, comparing operating modes in terms of propellant requirement, costs, complexity, etc [AAS PAPER 70-040]

c30 A70-34781

Logistic support reusable earth to orbit space shuttle design, noting weight penalties, payloads and development time

c31 A70-34782

Configurational and operational characteristics for space shuttle design, considering economic tradeoffs between expendable and reusable systems [AIAA PAPER 70-045]

c31 A70-34783

SUBJECT INDEX

SUBJECT

Propulsion
discussing
[AAS PAPER 70-040]

Cost reduction
using space operations
[AAS PAPER 70-040]

Space shuttles, discussing
per pound
[AAS PAPER 70-040]

Space shuttles, discussing
booster and
[AAS PAPER 70-040]

Space shuttles, discussing
steering in
[AAS PAPER 70-040]

Space shuttles, discussing
resupply, etc
[AAS PAPER 70-040]

Space shuttles, discussing
transportation
with space
[AAS PAPER 70-040]

Low cost
on shuttle
[AAS PAPER 70-040]

Unmanned
for satellite
spacecraft
[AIAA PAPER 70-045]

SPACE STATIONS
Candidate
station, emphasizing
design and development
[AAS PAPER 70-040]

Manned
space station
[AAS PAPER 70-040]

Subsystems
space base
space station
[AAS PAPER 70-040]

Habitability
design, discussing
[AAS PAPER 70-040]

Low cost
on shuttle
[AAS PAPER 70-040]

Juridical status
and cosmic stations
[AAS PAPER 70-040]

SPACE SUTS
Human
of time with
plethysmograph
[AAS PAPER 70-040]

SPACE TRANSPORT
Low cost
on shuttle
[AAS PAPER 70-040]

SPACE VEHICLES
Digital design
acoustic tests
[AAS PAPER 70-040]

SPACE-TIME
Pulsar motion
in flat space
in Riemannian
[AAS PAPER 70-040]

SPACEBORNE
Mariner 6
approach and
celestial mechanics
[AAS PAPER 70-040]

SPACECRAFT
Registration
[AAS PAPER 70-040]

SPACECRAFT
Flush motion
discussing
pedance, etc
[AAS PAPER 70-040]

SPACECRAFT
Combustion
spacecraft
[AAS PAPER 70-040]

FIGURE 5

- ... spatial filter c07 A70-35077
- ... working by cold püger rolling on the ... tubes c17 A70-34645
- ... energy dissipation in the bearing assem- ... spacecraft c15 A70-34756
- ... of theoretical and flight-measured ... body reentry flow field c01 A70-34495
- ... alternation and low level response c04 A70-35897
- ... damage problems in aircraft structures c32 A70-34924
- ... bimetallic actuator for spacecraft ... control c03 A70-34755
- ... story - Evolution of a universal space ... launch vehicle c31 A70-35261
- ... for neutron-core stars based on realistic ... matter calculations c30 A70-34844
- ... theory and application of ferroelectric radiation c14 A70-34649
- ... Measurements at artificially accelerated protons of ... and 28 GeV/c for calibrating an ionization ... and their application for determining the ... spectrum of the cosmic radiation at the flight ... of balloons c14 A70-34572
- ... Thoracic impedance gradient with respect to ... c05 A70-34576
- ... Optimal takeoff trajectories of a heavily loaded ... c02 A70-35841
- ... One 1-inch-ruby laser producing giant pulses with 50 ... pulse sequence frequency c16 A70-35121
- ... Constant chamber pressure throttling of an expan- ... nozzle [AIAA PAPER 69-435] c28 A70-35635
- ... Fluid dynamics in the upper pulmonary airways c05 A70-34469
- ... Argon plasma viscosity measurements [AIAA PAPER 70-775] c25 A70-34479
- ... Combustion phenomena in space vehicle environ- ... c31 A70-35210
- ... Ultrasound cardiography in single ventricle and the ... hypoplastic left and right heart syndromes c04 A70-35472
- ... Hemodynamic response to dopamine in experimen- ... myocardial infarction c04 A70-35200
- ... Hemodynamic response to dopamine in experimen- ... myocardial infarction c04 A70-35200
- SCHUBERT, H.
Mass spectrometric studies of the decomposition
reactions of perchlorates c27 A70-34638
- SCHUENEMANN, K.
A theory of frequency multipliers with charge
storage diodes c09 A70-34588
- SCHULTZE-WERNINGHAUS, G.
Oxygen uptake capacity during a four-week training
period c05 A70-34594
- SCHWAAR, P. G.
Design optimization of a V/STOL 5000 hp engine c28 A70-34709
- SCHWARTZ, M. D.
International Astronautical Federation, Colloquium
on the Law of Outer Space, 12th, Mar del Plata, Ar-
gentina, October 5-10, 1969, Proceedings c34 A70-35776
- SCOPPE, F.
Magnetostrictive measurements of torque from high
speed rotating shafts c14 A70-35501
- SCOTT, M. H.
The weldability, tensile and fatigue properties of
some titanium alloys c17 A70-34431
- SCOTT, R. D.
An analysis of the space shuttle characteristics
[AIAA PAPER 70-045] c31 A70-34783
- SCULL, W. E.
Evolution in design of the orbiting geophysical ob-
servatories c31 A70-35303
- SCULLEN, R. S.
Inelastic deformation and crosshatching
[AIAA PAPER 70-765] c01 A70-34504
- SCULLY, J. C.
The stress corrosion cracking of alpha-titanium al-
loys at room temperature c17 A70-34369
- SEAGLE, S. R.
Creep-resistant titanium alloys c17 A70-34440
- SEDNEY, R.
The method of characteristics c12 A70-35470
- SEDOV, A. V.
Effect of reduced barometric pressure on the
elimination of gaseous and volatile metabolic products
in man with insulating gear c05 A70-35363
- SEEGER, A.
A treatment of screw dislocations by finite elasticity c32 A70-35453
- SEIDEL, G.
Deformation mode peculiar to composites with a
low volume fraction of fibers c17 A70-35142
- SEIDE, P.
Radial vibrations of spherical shells c32 A70-34978
- SEIKE, S.
Quantum electronic space vehicle c28 A70-35213
- SEKUNDOV, A. N.
Expansion of a plane turbulent jet from a linear
source positioned at the apex of a wedge c01 A70-35349
- SELVARAJAN, R.
Deoxygenation of benzoyl cyanide c06 A70-34750
- Photo-elimination of nitrogen from fused-ring
triazoles c06 A70-34821
- SENATORSKI, A.
A new approach to the theory of fully developed
turbulence c12 A70-35629
- SENGUPTA, P. R.
Solar X-ray control of the E-layer of the ionosphere c29 A70-34943
- SENKO, E. E.
Investigation of turbulent exchange and wash-out
by measurement of natural radioactivity in surface air c20 A70-34611
- SERGIENKO, A. V.
Effect of acute hypoxia on the rates of absorption
and assimilation of glycine radioactive carbon in or-
gans and tissues c04 A70-35360
- SESHAGIRI PRASAD, K. P.
On the detection of a sudden change in system
parameters c10 A70-34856
- SEVERNYI, A. B.
On the contribution of solar activity to the ul-
traviolet spectrum of the sun c30 A70-34824
- The night sky brightness measured from satellites
Kosmos 51 and 213 c30 A70-34901
- SEVERSIKE, L. K.
Optimum parking orbit orientation for a three-
dimensional capture-escape mission
[AIAA PAPER 69-913] c30 A70-35649
- SEWARD, F. D.
A measurement of the optical and X-ray emission
from Scorpius X-1 and the X-ray diffuse background c30 A70-34831
- SHABLIH, O. N.
Carrying capacity of shallow shells of revolution
whose material has different yield points in tension
and compression c32 A70-35717
- SHAFFER, D. G.
Jet-interaction-induced separation of supersonic
turbulent boundary layers - The two-dimensional
problem [AIAA PAPER 70-765] c01 A70-34486
- SHAFFER, I. S.
Ambient temperature stress corrosion cracking in
Ti-3Al-1Mo-1V c17 A70-34371
- SHAFRIN, I. A.
Implementation of a satellite-based method for ther-
mal sounding of the troposphere /numerical experi-
ment/ c20 A70-35338
- SHAMBLEN, C. E.
Air contamination and embrittlement of titanium al-
loys c17 A70-34365
- SHAMMOO, A. E.
Some properties of the ADP-ATP exchange reaction
in turtle bladder microsomes c04 A70-35900
- SHANNON, R. H.
Analysis of injuries incurred during emergency ejection/extraction combat and noncombat c05 A70-35576
- SHAPIRO, G. A.
Experiments in the application of prophylactics
against radiation injuries under simulated prolonged
space flight conditions c05 A70-35351
- SILARP, G. W.
Underside morphology of the F2-ionospheric layer c13 A70-34937
- SHARP, W. F.
Explosive bonding dissimilar metals c15 A70-35551
- SILAW, M.
Space station safety [AAS PAPER 70-056] c02 A70-34792
- SHCHUNOV, B. G.
Computational study of the correlation functions of
a weak turbulent plasma c25 A70-34643
- SHEER, C.
Characteristics of a fluid transpiration arc radiation
source c03 A70-35133
- SHEER, R. E., JR.
Flow and acoustic characteristics of subsonic and
supersonic jets from convergent nozzle c01 A70-34460
- SHEFFLER, K. D.
Creep behavior of T-111 alloy under the influence of
continuously varying stresses c17 A70-34552

INTERNATIONAL
AEROSPACE
ABSTRACTS

CONTRACT NUMBER INDEX

VOLUME 10

NUMBER 17

Listed under each contract number is the IAA accession number preceded by the subject category number, identifying the location of the abstract in *International Aerospace Abstracts*.

To illustrate:

Category Number	Accession Number		
31	A70-10845		
AP 04/611/-67-C-0105 c14 A70-35007	AP 33/615/-69-C-1412 c33 A70-34482	AP 49/638/-1358 c30 A70-34537	AP-EOAR-66-35 c29 A70-34914
AP 04/611/-11541 c33 A70-34513	AP 33/615/-69-C-1664 c02 A70-35837	AP 49/638/-1375 c30 A70-34826	AP-EOAR-69-0058 c12 A70-35629
AP 04/694/-67-C-0035 c01 A70-34487	AP 33/615/-1481 c32 A70-34524	AP 49/638/-1395 c03 A70-35153	AT/30-1/-1238 c16 A70-34476
AP 04/694/-389 c01 A70-34487	AP 33/615/-2976 c25 A70-34547	AP 49/638/-1442 c12 A70-34525	AT/40-1/-2847 c17 A70-34627
AP 04/694/-516 c01 A70-34487	AP 33/615/-3100 c14 A70-35023	AP 49/638/-1485 c32 A70-34966	AT/40-1/-3262 c17 A70-34392
AP 04/694/-667 c14 A70-35519	AP 33/615/-3508 c32 A70-35813	AP 49/638/-1528 c32 A70-34962	AT/45-1/-1375 c17 A70-34412
AP 04/695/-67-C-0158 c16 A70-35082	AP 33/615/-3863 c17 A70-34389 c17 A70-34404	AP 49/638/-1555 c30 A70-34531	CMES 69-224 c30 A70-34893
AP 04/701/-69-C-0066 c30 A70-35868	AP 33/615/-3864 c17 A70-34391	AP 49/638/-1623 c01 A70-34473	DA-AMC-28-043-64-G9 c12 A70-34496
AP 04/701/-69-C-0117 c01 A70-34504 c33 A70-35193	AP 33/615/-3865 c17 A70-34378	AP 49/638/-1642 c29 A70-34833	DA-AMC-28-043-65-G20 c12 A70-34496
AP 04/701/-69-C-0118 c01 A70-34466	AP 33/615/-3866 c17 A70-34420	AP 61/052/-67-C-0007 c17 A70-34394 c17 A70-34396	DA-AO-2J-69-C-0035 c32 A70-35226
AP 04/701/-70-C-0152 c01 A70-34467	AP 33/615/-3967 c17 A70-34376	AP 61/052/-69-C-0039 c31 A70-35257	DA-ARO/D/-31-124-G1008 c32 A70-34544
AP 04/768/-69-C-0041 c30 A70-34532	AP 33/615/-5069 c17 A70-34417	AP 61/052/-179 c25 A70-34934	DA-28-043-AMC-00092/E/ c16 A70-35000
AP 04/804/-1706 c12 A70-34496	AP 33/616/-8378 c04 A70-35562	AP 61/052/-905 c32 A70-34971	DA-28-043-AMC-02412/E/ c02 A70-35941
AP 04/828/-68-C-0103 c29 A70-34833	AP 33/657/-13403 c11 A70-35159	AP 61/052/-909 c13 A70-34942	DA-28-043-AMC-02536/E/ c07 A70-35199
AP 04/801/-69-C-0052 c05 A70-34794	AP 33/657/-14903 c17 A70-34436	AP 94/694/-932 c14 A70-35483	DA-31-124-ARO/D/-139 c30 A70-35386
AP 04/815/-67-C-1559 c18 A70-34624	AP 41/609/-2691 c04 A70-35427	AP-AFOSR-68-1408A c19 A70-34870	DA-31-124-ARO/D/-257 c25 A70-34926 c25 A70-34933 c16 A70-35197
AP 04/815/-67-C-1672 c11 A70-35814	AP 44/620/-68-C-0014 c04 A70-35430	AP-AFOSR-68-1476 c32 A70-35226	DA-31-124-ARO/D/-355 c19 A70-34867
AP 04/815/-68-C-1012 c17 A70-34381	AP 44/620/-68-C-0018 c01 A70-34463 c01 A70-34484	AP-AFOSR-69-1653 c04 A70-35332	DA-36-039-SC-80371 c12 A70-34496
AP 04/815/-68-C-1119 c14 A70-35007	AP 44/620/-68-C-0028 c30 A70-34926	AP-AFOSR-69-1785 c30 A70-34537	DA-49-146-XZ-570 c29 A70-34644
AP 04/815/-68-C-1290 c32 A70-34963	AP 44/620/-69-C-0092 c30 A70-34842	AP-AFOSR-69-1804 c12 A70-34825	DAAB02-67-C-0546 c14 A70-34645
AP 04/815/-69-C-1023 c02 A70-35836	AP 44/620/69-C-0092 c30 A70-35116	AP-AFOSR-693-67 c10 A70-34952	DAAB07-67-C-0199 c14 A70-34648
AP 04/815/-69-C-1121 c02 A70-34722		AP-AFOSR-864-67 c13 A70-34939	DAAH01-69-C-1109 c33 A70-35195
		AP-AFOSR-903-67 c30 A70-34827 c30 A70-34839 c23 A70-35198	DAAH01-68-C-2086 c01 A70-34465
		AP-AFOSR-1015-A-67 c12 A70-34632	DAAJ02-67-C-0072 c02 A70-34702
		AP-AFOSR-1015-67A c33 A70-35038 c25 A70-35040	DAAJ02-68-C-0076 c02 A70-34706
		AP-AFOSR-1029-66 c19 A70-34868	DAAJ02-68-0048 c01 A70-34734
		AP-AFOSR-1226-67 c32 A70-34967	DAAK02-68-C-0089 c13 A70-35616

**INTERNATIONAL
AEROSPACE
ABSTRACTS**

FIGURE 5

ACCESSION NUMBER INDEX

VOLUME 10

The list of IAA accession numbers may be used to locate the subject category in which a specific item can be found. Accession numbers are arranged in ascending order, and each is preceded by a number which identifies the subject category as listed in the Table of Contents of each issue of *International Aerospace Abstracts*. The asterisk (*) indicates NASA-supported work. When a number sign (#) is present, it indicates that the document is available on microfiche.

To illustrate: Category
Number

c31

A70-10845

Accession
Number

NASA
Sponsorship

*

Microfiche
Available

c17 A70-34351	c17 A70-34382	c17 A70-34413	c15 A70-34444	c12 A70-34444
c17 A70-34352*	c17 A70-34383	c17 A70-34414	c15 A70-34445	c01 A70-34444
c17 A70-34353	c17 A70-34384	c17 A70-34415	c15 A70-34446	c31 A70-34444
c17 A70-34354	c17 A70-34385	c17 A70-34416	c15 A70-34447	c31 A70-34444
c17 A70-34355	c17 A70-34386	c17 A70-34417	c28 A70-34448	c01 A70-34444
c17 A70-34356	c17 A70-34387	c17 A70-34418	c28 A70-34449	c01 A70-34444
c15 A70-34357	c17 A70-34388	c17 A70-34419	c15 A70-34450	c01 A70-34444
c15 A70-34358	c17 A70-34389	c17 A70-34420	c15 A70-34451	c01 A70-34444
c15 A70-34359	c17 A70-34390	c17 A70-34421	c34 A70-34452	c01 A70-34444
c15 A70-34360	c17 A70-34391	c17 A70-34422	c34 A70-34453*	c01 A70-34444
c15 A70-34361	c17 A70-34392*	c15 A70-34423	c12 A70-34454*#	c01 A70-34444
c15 A70-34362	c17 A70-34393	c17 A70-34424	c01 A70-34455 #	c25 A70-34444
c15 A70-34363	c17 A70-34394	c17 A70-34425	c01 A70-34456 #	c01 A70-34444
c15 A70-34364	c17 A70-34395*	c17 A70-34426	c12 A70-34457 #	c25 A70-34444
c17 A70-34365	c17 A70-34396	c17 A70-34427	c01 A70-34458 #	c25 A70-34444
c17 A70-34366	c17 A70-34397	c17 A70-34428	c12 A70-34459 #	c01 A70-34444
c17 A70-34367	c17 A70-34398	c17 A70-34429	c01 A70-34460*#	c12 A70-34444
c17 A70-34368*	c17 A70-34399	c17 A70-34430	c01 A70-34461 #	c12 A70-34444
c17 A70-34369	c17 A70-34400	c17 A70-34431	c01 A70-34462 #	c12 A70-34444
c17 A70-34370	c17 A70-34401	c17 A70-34432	c01 A70-34463 #	c12 A70-34444
c17 A70-34371	c17 A70-34402	c17 A70-34433	c01 A70-34464 #	c12 A70-34444
c17 A70-34372	c17 A70-34403	c17 A70-34434	c01 A70-34465 #	c01 A70-34444
c17 A70-34373	c17 A70-34404	c17 A70-34435	c01 A70-34466 #	c01 A70-34444
c17 A70-34374	c17 A70-34405	c17 A70-34436	c01 A70-34467 #	c01 A70-34444
c17 A70-34375*	c17 A70-34406	c17 A70-34437	c05 A70-34468*#	c01 A70-34444
c17 A70-34376	c33 A70-34407	c17 A70-34438	c05 A70-34469 #	c12 A70-34444
c17 A70-34377	c17 A70-34408	c17 A70-34439	c05 A70-34470*#	c12 A70-34444
c17 A70-34378	c17 A70-34409	c17 A70-34440	c05 A70-34471*#	c30 A70-34444
c17 A70-34379	c17 A70-34410	c17 A70-34441	c05 A70-34472 #	c23 A70-34444
c17 A70-34380	c17 A70-34411	c15 A70-34442	c01 A70-34473 #	c33 A70-34444
c17 A70-34381	c17 A70-34412	c15 A70-34443	c01 A70-34474 #	c28 A70-34444
			c01 A70-34475 #	c28 A70-34444
			c16 A70-34476 #	c31 A70-34444
			c25 A70-34477 #	c33 A70-34444
			c25 A70-34478 #	c06 A70-34444
			c25 A70-34479 #	c14 A70-34444



In addition to the publications described above, STID can also produce special reports and documents, such as "Management", which is a compilation of references to selected unclassified reports and periodical articles on the subject of management. This publication assembles groups of citations formerly announced in separate journals, STAR, IAA, and U. S. Government Research and Development Reports (USGRDR), together with other reports included in the NASA system but not previously announced.

Earlier issues of the survey covered references to material from both NASA and non-NASA sources that entered the NASA information system during the period 1962 through 1968. The issue of "Management" which was presented to the interviewees as an example of a special report, covers 1969 material and follows the same basic pattern, but its scope had been enlarged to include references provided by the Defense Documentation Center. Abstracts for these references, and for all items of Defense origin, are grouped together in a section headed "DDC Entries" with cross references from the other sections where they may also be cited.

For greater convenience, the selected items are grouped in nine categories as indicated in Figure 6. The categories bear no relationship to those in STAR, IAA, or USGRDR, but have been specifically chosen for this publication. Three indexes are provided: subject, personal author, and corporate source.

FIGURE 6
SUBJECT CATEGORIES

Abstracts in the survey are grouped under the following categories:

M1 PROGRAM & PROJECT MANAGEMENT

Includes production management; systems management; logistics management; engineering management; management planning; marketing; resource and manpower allocation; program budgeting; decision making.

M2 CONTRACT MANAGEMENT

Includes contract incentives; contract decision making; procurement; subcontracts.

M3 RESEARCH & DEVELOPMENT

Includes research environment; R & D planning; R & D management; inventions and patents; research evaluation.

M4 MANAGEMENT TOOLS & TECHNIQUES

Includes program evaluation and review techniques (PERT); planning, programming and budgeting systems (PPBS); prediction analysis techniques (PAT); program trend line analysis; cost effectiveness; simulation; computers; operations research.

M5 PERSONNEL MANAGEMENT

Includes personnel problems; motivation; environmental problems; personnel development and training; recruitment; psychological studies; communication.

M6 TECHNOLOGICAL RESOURCES

Includes application of space technology and management techniques to social problems; technology utilization; technology assessment; public administration; urban planning and management.

M7 MANAGEMENT POLICY & PHILOSOPHY

Includes management concepts; policy studies; organizational studies and problems; social relationships and problems.

M8 ECONOMICS

Includes impact of federal expenditures and programs; government/industry relations; federal financing; federal budgeting; federal resources and urban needs.

M9 GENERAL

Includes conference proceedings; reviews; patent information; speeches; bibliographies.

Items concerning management in the fields of reliability and quality assurance have for the most part been excluded. Such items appear in "Reliability Abstracts and Technical Review" (RATR), a monthly journal prepared by the NASA Scientific and Technical Information Facility from input provided for NASA by the Research Triangle Institute, Durham, North Carolina.

Many of the abstracts included in "Management" have been reproduced from those appearing in STAR, IAA, and USGRDR. This procedure, adopted in the interests of economy, have introduced some variation in size, style, and intensity of type.

All documents in the STAR section are available to the public as indicated in the citation (see Figure 7) extracted from the "Management" issue of June 1970). NASA documents are identified by an asterisk (*) in the STAR section. NASA documents that have been microfiched¹ (identified by the # sign in the citation) are available on microfiche without charge to an organization that is registered with NASA to receive documents. Non-NASA documents are those cited in the STAR section that do not carry an asterisk in the citation. Those that have been microfiched are available on microfiche without charge only to NASA offices, NASA Centers, NASA contractors, NASA subcontractors, and NASA consultants.

¹ A microfiche is a transparent sheet of film, 105x148mm in size, capable of containing up to 72 pages of information reduced to micro images (not to exceed 20:1 reduction).

TYPICAL CITATION AND ABSTRACT FROM STAR

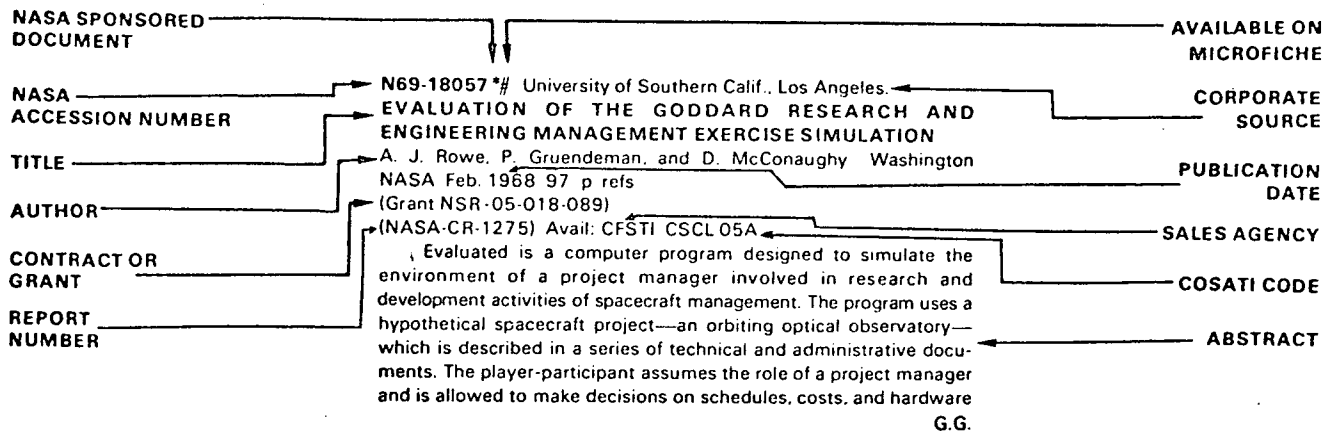


FIGURE 7

To obtain microfiche, if you are registered with NASA and eligible to receive documents as described above, you need only send a completed Document Request (Facility Form 492) to: NASA Scientific & Technical Information Facility, P. O. Box 33, College Park, Maryland.

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European Space Research Organization
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92-Neuilly-sur-Seine, France

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American Institute of Aeronautics and
Astronautics, Inc. (AIAA)
750 Third Avenue
New York, New York 10017

Paper copies are available at \$3.00 per document up to a maximum of 20 pages. The charge for each additional page is 25 cents. Microfiche of documents announced in the IAA section are available at the rate of 50 cents per microfiche on demand. Documents available in this manner are identified by the # sign following the accession number in the citation. Minimum air mail postage to foreign countries is \$1.00. A number of publications, because of their special characteristics, cannot be reproduced.

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Defense Documentation Center
Cameron Station
Alexandria, Virginia 22314

APPENDIX C

NASA LEGAL MICRO-THESAURUS

ABANDONED INVENTIONS

BT INTELLECTUAL PROPERTY GENERAL
60G08058
TOTAL BROADER TERMS (0001)

ACQUISITIONS

BT REAL PROPERTY
60G06022
60G06080
TOTAL BROADER TERMS (0002)

NT APPRAISALS
60G06080
H.R. 10246
60G06022
H.R. 10809
60G06022
SPACE ACT 203(*B)(3)
60G06022
41 USC 14
60G06022
TOTAL NARROWER TERMS (0005)

ACTING ADMINISTRATOR

BT NASA ADMINISTRATOR
70G09009
70G09012
TOTAL BROADER TERMS (0002)

NT AUTHORITY
70G09009
TOTAL NARROWER TERMS (0001)

ACTUAL REDUCTION TO PRACTICE

BT INFRINGEMENT/ROYALTIES
70G01006
TOTAL BROADER TERMS (0001)

ADDITIONAL COSTS

BT OBLIGATION LIMITATION
60G07092
TOTAL BROADER TERMS (0001)

ADEQUATE SPECIFICATIONS

BT NEGOTIATION AUTHORITY
60G08052
TOTAL BROADER TERMS (0001)

ADMINISTRATIVE EXPENSES

BT STUDENT WORK STUDY PROGRAM
70G05001
TOTAL BROADER TERMS (0001)

ADMINISTRATIVE REMEDY EXHAUSTION

BT CLAIMS AND ADJUDICATIONS GENERAL
70G07008
PRELIMINARY INJUNCTION
70G09003
TOTAL BROADER TERMS (0002)

ADMINISTRATOR'S FUND

BT AVAILABILITY FOR AND LIMITATION ON APPROP
70G11007
NASA ADMINISTRATOR
70G11007
TOTAL BROADER TERMS (0002)

NT EXPENDITURE LIMITATIONS
70G11007
TOTAL NARROWER TERMS (0002)

ADVANCE PROGRAM REVIEW

BT ENVIRONMENTAL POLLUTION
70G01021
TOTAL BROADER TERMS (0001)

ADVISORY COMMITTEE COMPENSATION

BT PERSONNEL PAY AND ALLOWANCES
65G02081
TOTAL BROADER TERMS (0001)

NT WAIVER
65G02081
TOTAL NARROWER TERMS (0001)

AEC

BT NASA LEGISLATIVE COMMENTS
70G01011
TOTAL BROADER TERMS (0001)

NT APPROPRIATION ACT 1970
70G01011
TOTAL NARROWER TERMS (0001)

AEROSPACE EXHIBITION SPONSORSHIP

BT SPACE LAW
65G01136
TOTAL BROADER TERMS (0001)

AEROSPACE SAFETY ADVISORY PANEL

BT CONSULTANTS
70G08011
TOTAL BROADER TERMS (0001)

AGE DISCRIMINATION

BT REDUCTION IN FORCE
70G07021
TOTAL BROADER TERMS (0001)

AIAA

BT GRANTS
65G02064
TOTAL BROADER TERMS (0001)

AIRCRAFT DANGER

BT ROCKET TRAFFIC
65G02097
TOTAL BROADER TERMS (0001)

AIRCRAFT LESSORS

BT CONTRACTS
70G09005
TOTAL BROADER TERMS (0001)
NT 49 USC 1404
70G09005
TOTAL NARROWER TERMS (0001)

AIRCRAFT PROC/MAINT/OPS

BT PROCUREMENT GENERAL
60G08047
TOTAL BROADER TERMS (0001)
NT 5 USC 78(*B)
60G08047
TOTAL NARROWER TERMS (0001)

AIRCRAFT USE REGULATION TAX

BT APPLICABILITY TO NASA
70G08003
TOTAL BROADER TERMS (0001)

AIRPORT DEV ACT 1970

BT CONTRACTOR ARTICLES/SERVICES
70G10008
TOTAL BROADER TERMS (0001)

ALCOHOL AND DISTILLED SPIRITS

BT EXEMPTIONS
65G04745
TOTAL BROADER TERMS (0001)
NT PROC. REG. 11.205
65G04745
TOTAL NARROWER TERMS (0001)

ALIENS

BT EMPLOYMENT
65G02034
PERSONNEL GENERAL
60G08069
65G10058
TOTAL BROADER TERMS (0003)
NT IMMIGRATION ACT 212(*E)
65G10058
NATURALIZATION WAITING PERIOD
60G08069
RESIDENCE WAIVER
65G10058
TOTAL NARROWER TERMS (0003)

ALLOWABLE COSTS

BT COST PRINCIPLES
65G01035
TOTAL BROADER TERMS (0001)
NT PROC. REG. 13.205-41(*A)(*I*[*I])
65G01035
TAX LITIGATION
65G01035
TOTAL NARROWER TERMS (0002)

AMOUNT INSURANCE AVAILABLE

BT GROUP LIFE
60G07075
TOTAL BROADER TERMS (0001)

AMP INC.* V US

BT IMPLIED LICENSE IN GOVT
70G01005
TOTAL BROADER TERMS (0001)

ANTITRUST

BT INTELLECTUAL PROPERTY GENERAL
00G00600
TOTAL BROADER TERMS (0001)

NT CONSPIRACY
65G03002
HAZELTINE * V ZENITH
65G03002
PACKAGE LICENSING
65G03002
POOLING
65G03002
TOTAL NARROWER TERMS (0004)

APPEALS

BT CONTRACT ADJUSTMENT BOARD
65G03106
TOTAL BROADER TERMS (0001)

APPLICABILITY TO NASA

BT TAXATION FEDERAL
70G08003
TOTAL BROADER TERMS (0001)

NT AIRCRAFT USE REGULATION TAX
70G08003
TOTAL NARROWER TERMS (0001)

APPRAISALS

BT ACQUISITIONS
60G06080
TOTAL BROADER TERMS (0001)

APPROPRIATION ACT 1961

BT APPROPRIATIONS
60G06017
60G06023
60G09074
TOTAL BROADER TERMS (0003)

NT ENTERTAINMENT EXPENSES
60G06023
FALLOUT SHELTERS
60G09074
PASSENGER VEHICLE
60G06017
TOTAL NARROWER TERMS (0003)

APPROPRIATION ACT 1970

BT AEC
70G01011
TOTAL BROADER TERMS (0001)

APPROPRIATION ACT 1971

BT APPROPRIATIONS
70G01036
70G01736
TOTAL BROADER TERMS (0002)

NT FORMER CONTRACTOR EMPLOYEES
70G01036
FORMER NASA EMPLOYEES
70G01036
RESEARCH
70G01736
TOTAL NARROWER TERMS (0003)

APPROPRIATIONS

NT APPROPRIATION ACT 1961
60G06017
60G06023
60G09074
APPROPRIATION ACT 1971
70G01036
70G01736
TOTAL NARROWER TERMS (0005)

ARBITRATION

BT CLAIMS AND ADJUDICATIONS GENERAL
00G00100
TOTAL BROADER TERMS (0001)

NT WUNDERLICH ACT
70G07002
TOTAL NARROWER TERMS (0001)

ARCHITECT/ENGINEERS

BT SERVICE CONTRACTS
60G08071
TOTAL BROADER TERMS (0001)

NT FEE LIMITATIONS
60G08071
10 USC 2306(*D)
60G08071
TOTAL NARROWER TERMS (0002)

ARMED FORCES ACOUTRA CREDIT

BT RETIREMENT
70G01016
TOTAL BROADER TERMS

(0001)

ARMED FORCES RECRUITING

BT EDUCATIONAL INSTITUTIONS
70G09002
TOTAL BROADER TERMS

(0001)

ASPR REQUIREMENTS

BT RIGHTS IN DATA
60G11016
TOTAL BROADER TERMS

(0001)

ASPR 1.904.3(*A)

BT SMALL BUSINESS
70G07006
TOTAL BROADER TERMS

(0001)

ASPR 7-203.4(*F)

BT RELEASES
60G11038
TOTAL BROADER TERMS

(0001)

ASTRONAUTS

BT PERSONNEL GENERAL
70G01004
TOTAL BROADER TERMS
NT CHARITABLE FUNCTION ATTENDANCE
70G01004
TOTAL NARROWER TERMS

(0001)

(0001)

ATTORNEYS FEES

BT COST PRINCIPLES
70G07014
TOTAL BROADER TERMS
NT PATENT INTERFERENCE PROCEEDINGS
70G07014
TOTAL NARROWER TERMS

(0001)

(0001)

AUSTRALIA

BT MINITRACK STATION AGREEMENT
60G06046

ULTRA VIOLET SURVEY
60G06094
TOTAL BROADER TERMS

(0002)

AUTHORITY

BT ACTING ADMINISTRATOR
70G09009
CONTRACTING OFFICERS
60G11005
RELEASES
65G02120
TOTAL BROADER TERMS
NT DELEGATION
60G11005
TOTAL NARROWER TERMS

(0003)

(0001)

AUTHORIZATION ACT 1961

BT AUTHORIZATIONS
60G06017
TOTAL BROADER TERMS
NT PASSENGER VEHICLE
60G06017
TOTAL NARROWER TERMS

(0001)

(0001)

AUTHORIZATION ACT 1967

BT AUTHORIZATIONS
65G10002
TOTAL BROADER TERMS

(0001)

AUTHORIZATION ACT 1971

BT AUTHORIZATIONS
70G08001
CONSULTANTS
70G08001
EXPERTS
70G08001
TOTAL BROADER TERMS
NT CONSULTANTS
70G08001
EXPERTS
70G08001
TOTAL NARROWER TERMS

(0003)

(0002)

AUTHORIZATION ACT 1972

BT AUTHORIZATIONS
70G10019
TOTAL BROADER TERMS

(0001)

NT EPA ACT 1969,102(2)(*C)
70G10019
EPA COMPLIANCE
70G10019
TOTAL NARROWER TERMS

(0002)

AWARD PRIOR TO RESOLUTION

BT PROTESTS
65G10028
TOTAL BROADER TERMS

(0001)

AUTHORIZATIONS

NT AUTHORIZATION ACT 1961
60G06017
AUTHORIZATION ACT 1967
65G10002
AUTHORIZATION ACT 1971
70G08001
AUTHORIZATION ACT 1972
70G10019
TOTAL NARROWER TERMS

(0004)

AWARDS

BT INTELLECTUAL PROPERTY GENERAL
00G00600
INVENTIONS AND CONTRIBUTIONS BOARD
60G07020
TOTAL BROADER TERMS
NT WEAPONS
60G07020
TOTAL NARROWER TERMS

(0002)

(0001)

AUTHORIZED DEPOSITORY

BT FISCAL GENERAL
65G02046
TOTAL BROADER TERMS

(0001)

AVAILABILITY FOR AND LIMITATION ON APPROP

BT FISCAL GENERAL
00G00400
TOTAL BROADER TERMS

(0001)

NT ADMINISTRATOR'S FUND

70G11007
CAFETERIAS
70G12033
CONSULTANTS
70G08001
EXPERTS
70G08001
OVEROBLIGATION OF FUNDS
00G00400
PASSENGER VEHICLE
60G08097
70G10004
PERIOD OF AVAILABILITY OF APPROP
00G00400
RED FUND USES
70G12003
TOTAL NARROWER TERMS

(0009)

AVIATION CASES

BT TORT CLAIMS (INCLUDING FTCA)
60G09084
TOTAL BROADER TERMS

(0001)

BACK CONTAMINATION

BT FEDERAL AGENCIES
65G04124
TOTAL BROADER TERMS

(0001)

BACK PAY

BT PERSONNEL PAY AND ALLOWANCES
65G10170
WRONGFUL TERMINATION
65G10170
TOTAL BROADER TERMS
NT WRONGFUL TERMINATION
65G10170
TOTAL NARROWER TERMS

(0002)

(0001)

BIDDER KNOWLEDGE

BT MISTAKES IN BID
60G11121
TOTAL BROADER TERMS

(0001)

BLIND PERSON VENDING STANDS

BT NASA GENERAL
70G11002
TOTAL BROADER TERMS
NT 20 USC 197
70G11002
TOTAL NARROWER TERMS

(0001)

(0001)

BOARD OF CONTRACT APPEALS

BT CLAIMS AND ADJUDICATIONS GENERAL
00G00100
TOTAL BROADER TERMS
NT JURISDICTION
70G10021
REPORTS
65G10002
TOTAL NARROWER TERMS

(0001)

(0002)

BOB CIRCULAR A-56

BT NEW EMPLOYEES
65G04116
TOTAL BROADER TERMS

(0001)

BOB CIRCULAR 56A.1.3*A(7)

BT MOVING EXPENSE
70G10007
TOTAL BROADER TERMS

(0001)

BOOK ROYALTIES

BT PERSONNEL OTHER RIGHTS/OBLIGATIONS
65G10113
TOTAL BROADER TERMS

(0001)

BUMPING

BT REDUCTION IN FORCE
70G08004
TOTAL BROADER TERMS

(0001)

BURDEN OF PROOF

BT PATENT INTERFERENCE PROCEEDINGS
70G09010
TOTAL BROADER TERMS

(0001)

BUSINESS ACTIVITY IN SPACE

BT SPACE LAW
70G07013
TOTAL BROADER TERMS

(0001)

BUSINESS TYPE

BT CONTRACTS
65G04006
TOTAL BROADER TERMS
NT PROC. REG. 3.501(*B)(*X*1)
65G04006
TOTAL NARROWER TERMS

(0001)

(0001)

BUY AMERICAN

BT CONTRACTS
00G00900
ESRO-NASA SATELLITE COOP
70G10020
INTERNATIONAL AGREEMENTS
65G01029
TOTAL BROADER TERMS
NT CANADIAN SUPPLIES
65G01029
CERTIFICATIONS
65G04006

(0003)

BUY AMERICAN
(CON'T)

NASA LEGAL MICRO-THESAURUS
11/17/71 PAGE 7

BUY AMERICAN

FOREIGN DEALINGS

65GC4112

WAIVER

70G05003

TOTAL NARROWER TERMS

(0005)

CAFETERIAS

BT AVAILABILITY FOR AND LIMITATION ON APPROP
70G12033
NONAPPROPRIATED FUND ACTIVITIES
60G06756
SOLE SOURCE PROCUREMENTS
60G06676
TOTAL BROADER TERMS (0003)
NT SPACE ACT 203(*D)(3)
60G06756
TOTAL NARROWER TERMS (0001)

CANADA-DEPT OF DEFENCE PROD

BT NASA PROCUREMENT IN CANADA
60G06096
TOTAL BROADER TERMS (0001)

CANADIAN SUPPLIES

BT BUY AMERICAN
65G01029
TOTAL BROADER TERMS (0002)

CAREER DEVELOPMENT PROGRAM PROTECTION

BT REDUCTION IN FORCE
70G07021
TOTAL BROADER TERMS (0001)

CARGO PREFERENCE ACT

BT TRANSPORTATION
65G04049
TOTAL BROADER TERMS (0001)
NT OCEAN TRANSPORTATION POLICY
65G04049
TOTAL NARROWER TERMS (0001)

CASH AWARDS

BT PERSONNEL PAY AND ALLOWANCES
65G10098
TOTAL BROADER TERMS (0001)
NT MILITARY PERSONNEL
65G10098
TOTAL NARROWER TERMS (0001)

CATASTROPHIC ACCIDENTS

BT SPACE LAW
65G03131
UNIFORM LAWS
65G02013
TOTAL BROADER TERMS (0002)
NT CLAIMS
65G03131
LIMITATION OF LIABILITY
65G03131
TOTAL NARROWER TERMS (0002)

CERTIFICATIONS

BT BUY AMERICAN
65G04006
CONTRACT FORMATION
65G04006
COST PRINCIPLES
65G04006
SMALL BUSINESS
65G04006
TOTAL BROADER TERMS (0004)
NT PROC. REG. 6.104-2 AND 3
65G04006
STATUS CHANGE PRIOR TO AWARD
65G04006
10 USC 2306(*F)
65G04006
TOTAL NARROWER TERMS (0003)

CESSION OF JURISDICTION

BT FEDERAL ENCLAVES
65G03016
TOTAL BROADER TERMS (0001)

CHAPEL OF THE ASTRONAUTS

BT LEASES
70G09007
TOTAL BROADER TERMS (0001)

CHARITABLE FUNCTION ATTENDANCE

BT ASTRONAUTS
70G01004
TOTAL BROADER TERMS (0001)

CHECKS PAYABLE TO NON-EMPLOYEES

BT PAYROLL CHECKS
70G08007
TOTAL BROADER TERMS

(0001)

CIVIL AIRCRAFT, DEFINITION

BT SPACE LAW
70G12015
TOTAL BROADER TERMS

(0001)

CIVIL DEFENSE TRAINING

BT OVERTIME PAY
65G04074
TOTAL BROADER TERMS

(0001)

CIVIL MILITARY RELATIONSHIPS

BT SPACE LAW
65G04021
TOTAL BROADER TERMS

(0001)

CIVIL RIGHTS ACT OF 1964

BT NASA GENERAL
65G01049
TOTAL BROADER TERMS
NT TITLE VI REGULATIONS
65G01049
TOTAL NARROWER TERMS

(0001)

(0001)

CIVIL SERVICE COMMISSION POLICY

BT PERSONNEL RECORD RELEASE
70G10012
TOTAL BROADER TERMS

(0001)

CIVIL SERVICE REG 2106(*A)(4)

BT FALSE STATEMENT
60G09035
TOTAL BROADER TERMS

(0001)

CLAIMS

BT CATASTROPHIC ACCIDENTS
65G03131
TOTAL BROADER TERMS

(0001)

CLAIMS (CONTRACTUAL/EXTRA CONTRACTUAL)

BT PROCUREMENT GENERAL
00G00900

TOTAL BROADER TERMS

(0001)

NT EXCUSABLE DELAY

60G07039

INDEMNIFICATION

65G01012

PROCEDURES

65G10041

PROGRESS PAYMENTS

65G10042

TOTAL NARROWER TERMS

(0004)

CLAIMS AND ADJUDICATIONS GENERAL

NT ADMINISTRATIVE REMEDY EXHAUSTION

70G07008

ARBITRATION

00G00100

BOARD OF CONTRACT APPEALS

00G00100

CONTRACT ADJUSTMENT BOARD

00G00100

EXPERTS

65G04248

JURISDICTION

70G07008

NASA EMPLOYEES

70G05010

NASA HUGHES 1964 AGREEMENT

70G05008

PRELIMINARY INJUNCTION

70G09003

RELEASES

65G02120

65G03172

SERVICE OF PROCESS ON NASA

70G07008

TEMPORARY RESTRAINING ORDERS

70G07008

TORT CLAIMS (INCLUDING FTCA)

00G00100

UNIFORM LAWS

65G02013

WITNESSES

65G04248

TOTAL NARROWER TERMS

(0016)

CLASSIFICATION

BT SECURITY PROGRAMS
65G01001
TOTAL BROADER TERMS (0001)

COAST GUARD

BT FEDERAL AGENCIES
65G01099
TOTAL BROADER TERMS (0001)

NT SAFETY
65G01099
TOTAL NARROWER TERMS (0001)

COLLISION INSURANCE

BT INSURANCE
70G10018
TOTAL BROADER TERMS (0001)

NT PASSENGER VEHICLE
70G10018
TOTAL NARROWER TERMS (0001)

COMMISSION GOVT PROCUREMENT

BT DATA
70G10009
TOTAL BROADER TERMS (0001)

NT PATENT AND DATA STUDY
70G10009
TOTAL NARROWER TERMS (0001)

COMMUNICATIONS SATELLITES

BT FEDERAL AGENCIES
60G07041
PRIVATE ENTERPRISE
60G07079
TOTAL BROADER TERMS (0002)

NT FCC
60G07041
PRIVATE USE
60G07079
TOTAL NARROWER TERMS (0002)

COMPENSATION

BT WAIVER AGAINST GOVT
70G05010
TOTAL BROADER TERMS (0001)

COMPETITION

BT CONTRACT FORMATION
00G00900
TOTAL BROADER TERMS (0001)

NT QUALIFIED PRODUCT LIST
70G12010
TOTAL NARROWER TERMS (0001)

COMPETITION WITH PRIVATE ENTERPRISE

BT GRANTS
65G04088
WELFARE/RECREATION ACTIVITIES
70G08012
TOTAL BROADER TERMS (0002)

COMPETITIVE LEVEL

BT REDUCTION IN FORCE
70G08004
TOTAL BROADER TERMS (0001)

COMPETITIVE SERVICE

BT PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT
70G08009
70G08020
TOTAL BROADER TERMS (0002)

NT EXCEPTED POSITIONS
70G08009
70G08020
TOTAL NARROWER TERMS (0002)

COMPUTER DATA BASE RIGHTS

BT DATA
70G12023
TOTAL BROADER TERMS (0001)

COMPUTER INDICES

BT INTELLECTUAL PROPERTY GENERAL
70G01008
TOTAL BROADER TERMS (0001)

NT DISSEMINATION GUIDELINES
70G01008
TOTAL NARROWER TERMS (0001)

COMPUTER PROCUREMENT

BT TAXATION FEDERAL
65G02051
TOTAL BROADER TERMS

(0001)

COMPUTER SOFTWARE PROCUREMENT

BT COPYRIGHT
70G01033
PATENT POLICY CONTRACTORS
70G01033
TOTAL BROADER TERMS

(0002)

COMSAT ACT ACTIVITIES

BT REPORTS/LETTERS TO CONGRESS
70G10002
TOTAL BROADER TERMS

(0001)

COMSAT CORP.

BT PRIVATE ENTERPRISE
60G11117
65G01004
65G02103
REIMBURSEMENT OF APPROP
60G11117
TOTAL BROADER TERMS
DISTRIBUTION OF RECEIPTS
60G11117
LAUNCH VEHICLE PURCHASE
65G02103
47 USC 721(*B)
65G01004
TOTAL NARROWER TERMS

(0004)

NT
TOTAL NARROWER TERMS

(0003)

CONCESSIONS

BT NONAPPROPRIATED FUND ACTIVITIES
70G10017
TOTAL BROADER TERMS
NT PROFIT USE
70G10017
TOTAL NARROWER TERMS

(0001)

(0001)

CONDEMNATION

BT REAL PROPERTY
70G09004
TOTAL BROADER TERMS

(0001)

CONFIDENTIALITY

BT CONTRACT FORMATION
70G10010
COST PRINCIPLES
70G12019
TOTAL BROADER TERMS
NT CONTRACTOR FINANCIAL INFORMATION
70G10010
PROPRIETARY INFORMATION
70G10010
TOTAL NARROWER TERMS

(0002)

(0002)

CONFIRMATORY LICENSE UPON WAIVER GRANT

BT PATENT POLICY CONTRACTORS
70G01005
TOTAL BROADER TERMS

(0001)

CONFLICT OF INTEREST

BT NASA ADMINISTRATOR
65G10143
PROCUREMENT GENERAL
70G01039
70G10016
SPECIAL EMPLOYEES
70G05009
TOTAL BROADER TERMS
NT INVOLUNTARY REGULAR STATUS
70G05009
ORGANIZATIONAL
70G01039
SPACE ACT 202(*C)
65G10143
TOTAL NARROWER TERMS

(0004)

(0003)

CONGRESSIONAL MATTERS GENERAL

NT NASA LEGISLATIVE COMMENTS
00G00200
NASA LEGISLATIVE PROGRAM
00G00200
REPORTS/LETTERS TO CONGRESS
00G00200
TOTAL NARROWER TERMS

(0003)

CONSENT OF GOVT

BT LIABILITY
60G09057
TOTAL BROADER TERMS

(0001)

CONSIDERATION

BT CONTRACT FORMATION
60G06069
TOTAL BROADER TERMS

(0001)

CONSPIRACY

BT ANTITRUST
65G03002
TOTAL BROADER TERMS

(0001)

CONSTRUCTION

BT REAL PROPERTY
60G11107
TOTAL BROADER TERMS
NT MILLER ACT
60G11107
TOTAL NARROWER TERMS

(0001)

(0001)

CONSTRUCTION BIDDING RESTRICTIONS

BT CONTRACT FORMATION
65G04090
TOTAL BROADER TERMS
NT LABOR DISPUTE HISTORY
65G04090
NON-UNION LABOR EXCLUSION
65G04090
PRIME ALL SITE RESPONSIBILITY
65G04090
SMALL BUSINESS
65G04090
UNION SHOPS
65G04090
TOTAL NARROWER TERMS

(0001)

(0005)

CONSTRUCTION FUNDS

BT PERIOD OF AVAILABILITY OF APPROP
65G04117
TOTAL BROADER TERMS
NT FUNDIBILITY
65G04117
SUBSEQUENT AUTHORIZATIONS
65G04117
TOTAL NARROWER TERMS

(0001)

(0002)

CONSULTANTS

BT AUTHORIZATION ACT 1971
70G08001
AVAILABILITY FOR AND LIMITATION ON APPROP
70G08001
PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT
70G08011
TOTAL BROADER TERMS
NT AEROSPACE SAFETY ADVISORY PANEL
70G08011
AUTHORIZATION ACT 1971
70G08001
TOTAL NARROWER TERMS

(0003)

(0002)

CONTINGENT FEES

BT CONTRACTS
65G04006
TOTAL BROADER TERMS
NT 10 USC 2306(*B)
65G04006
TOTAL NARROWER TERMS

(0001)

(0001)

CONTINUING RESOLUTIONS

BT FISCAL GENERAL
00G00400
TOTAL BROADER TERMS

(0001)

CONTRACT ADJUSTMENT BOARD

BT CLAIMS AND ADJUDICATIONS GENERAL
00G00100
TOTAL BROADER TERMS
NT APPEALS
65G03106
PUBLIC LAW 85-804
65G01043
70G01035
REMEDIES
65G04179
TOTAL NARROWER TERMS

(0001)

(0004)

CONTRACT ADMINISTRATION

BT FEDERAL AGENCIES
60G07012
TOTAL BROADER TERMS
NT GOV AGREEMENTS
60G07012
TOTAL NARROWER TERMS

(0001)

(0001)

CONTRACT APPLICABILITY

BT STATE INSURANCE LAWS
65G02169
TOTAL BROADER TERMS

(0002)

CONTRACT FORMATION

BT PROCUREMENT GENERAL
00G00900
TOTAL BROADER TERMS
NT CERTIFICATIONS
65G04006
COMPETITION
00G00900
CONFIDENTIALITY
70G10010
CONSIDERATION
60G06069
CONSTRUCTION BIDDING RESTRICTIONS
65G04090
CONTRACTOR MODIFICATION
60G11020
LEASING AUTHORITY LIMITATIONS
70G11003
LETTER OF INTENT
60G06039
MISTAKES IN BID
00G00900
NEGOTIATION AUTHORITY
00G00900
PAROL EVIDENCE
60G11020
PROCUREMENT UNDER \$10,000
65G03275
PROTESTS
00G00900
SELECTION PROCEDURES
00G00900
UNAUTHORIZED PURCHASES
60G08056
42 USC 1855(*F)
70G08014
TOTAL NARROWER TERMS

(0001)

CONTRACT PENALTY FUNDS DISPOSITION

BT REIMBURSEMENT OF APPROP
65G03076
TOTAL BROADER TERMS
NT WORK HOURS VIOLATIONS
65G03076
TOTAL NARROWER TERMS

(0001)

(0001)

CONTRACTING OFFICERS

BT PROCUREMENT GENERAL
60G11005
TOTAL BROADER TERMS
NT AUTHORITY
60G11005
TOTAL NARROWER TERMS

(0001)

(0001)

CONTRACTOR ARTICLES/SERVICES

BT EXEMPTIONS
70G10005
70G10008
TOTAL BROADER TERMS
NT AIRPORT DEV ACT 1970
70G10008
INT REV CODE 4293
70G10005
TOTAL NARROWER TERMS

(0002)

(0002)

CONTRACTOR AS CONSUMER

BT R&D CONTRACTS
70G07012
TOTAL BROADER TERMS

(0001)

CONTRACTOR FINANCIAL INFORMATION

BT CONFIDENTIALITY
70G10010
TOTAL BROADER TERMS

(0001)

CONTRACTOR MODIFICATION

BT CONTRACT FORMATION
60G11020
TOTAL BROADER TERMS
NT IMPLIED ACCEPTANCE
60G11020
TOTAL NARROWER TERMS

(0001)

(0001)

CONTRACTOR PROTEST

BT PROPERTY RIGHTS IN INVENTIONS
60G09003
TOTAL BROADER TERMS

(0001)

CONTRACTOR WORKING PAPERS

BT FREEDOM OF INFORMATION ACT
70G07024
TOTAL BROADER TERMS

(0001)

CONTRACTORS

BT REFUNDS
65G04104
TOTAL BROADER TERMS

(0001)

CONTRACTS

BT PROCUREMENT GENERAL
00G00900
TOTAL BROADER TERMS

(0001)

NT AIRCRAFT LESSORS
70G02005
BUSINESS TYPE
65G04006
BUY AMERICAN
00G00900

CONTINGENT FEES

65G04006

COST PRINCIPLES

00G00900

EQUAL OPPORTUNITY

65G04006

FISCAL PROVISIONS

00G00900

GOVERNMENT PROPERTY

00G00900

INCENTIVES

00G00900

INDEFINITENESS

60G07109

INDEPENDENT PRICE

65G04006

LABOR PROVISIONS

00G00900

MANUFACTURER

65G04006

OPTIONS

00G00900

REGULAR DEALER

65G04006

SMALL BUSINESS

00G00900

STATE INSURANCE LAWS

65G02169

TERMINATION

00G00900

VAGUENESS

60G07109

TOTAL NARROWER TERMS

(0019)

COPYRIGHT

BT INTELLECTUAL PROPERTY GENERAL
00G00600

TOTAL BROADER TERMS

(0001)

NT COMPUTER SOFTWARE PROCUREMENT
70G01033

TOTAL NARROWER TERMS

(0001)

CORPORATIONS ON MOON

BT SPACE LAW
70G01030
TOTAL BROADER TERMS

(0001)

COST CONTRACTS

BT IMMUNITY
65G01035
PERSONAL PROPERTY
70G07011
TAXATION STATE AND LOCAL
65G03098

TOTAL BROADER TERMS

(0003)

NT SALE FOR RESALE
70G07011

SALES/USE TAX

65G03098

USE TAXES

65G03098

TOTAL NARROWER TERMS

(0003)

COST PLUS PERCENTAGE OF COST

BT PREDETERMINED FIXED O/HEAD RATE
65G02022
TOTAL BROADER TERMS

(0001)

COST PRINCIPLES

BT CONTRACTS
00G00900
TOTAL BROADER TERMS

(0001)

NT ALLOWABLE COSTS
65G01035

ATTORNEYS FEES

70G07014

CERTIFICATIONS

65G04006

CONFIDENTIALITY

70G12019

COST/PRICING DATA

70G11004

DEFLECTIVE PRICING

70G07004

PREDETERMINED FIXED O/HEAD RATE

65G02022

RELOCATION TAX

70G01017

TOTAL NARROWER TERMS

(0008)

COST SHARING

BT PRIVATELY SPONSORED CONFERENCES

60G08110

TOTAL BROADER TERMS

(0001)

COST/PRICING DATA

BT COST PRINCIPLES

70G11004

TOTAL BROADER TERMS

(0001)

NT DUTY TO UPDATE

70G11004

TOTAL NARROWER TERMS

(0001)

COURT DECISIONS

BT 28 USC 1498(*A) AND (*B)

70G01013

TOTAL BROADER TERMS

(0001)

COURT OF CLAIMS

BT JURISDICTION

70G07008

TOTAL BROADER TERMS

(0001)

CRIMINAL ACTIVITY

BT PERSONNEL STANDARDS OF CONDUCT

60G09035

TOTAL BROADER TERMS

(0001)

NT FPM 2.106(*A)(3)

60G09035

TOTAL NARROWER TERMS

(0001)

DAMAGE TO EMPLOYEE PROPERTY

BT PERSONNEL CLAIMS BY AND AGAINST THE GOVT
65G10029
TOTAL BROADER TERMS (0001)
NT NASA FORM 1204
65G10029
NASA FORM 1220
65G10029
NMI 2000.1
65G10029
SPACE ACT 203(+B)(13)
65G10029
TOTAL NARROWER TERMS (0004)

DATA

BT EXPORT CONTROL ACT
65G10032
INTELLECTUAL PROPERTY GENERAL
00G00600
TOTAL BROADER TERMS (0002)
NT COMMISSION GOVT PROCUREMENT
70G10009
COMPUTER DATA BASE RIGHTS
70G12023
EMPLOYEE SPEECHES
65G10032
EXPORT CONTROL ACT
65G10032
FREEDOM OF INFORMATION ACT
70G01032
RESTRICTED DATA
60G07053
60G07074
RIGHTS IN DATA
60G11016
UNSOLICITED PROPOSALS
60G07053
TOTAL NARROWER TERMS (0009)

DATA FURNISHED BY PRIME

BT SUBCONTRACTS
70G01015
TOTAL BROADER TERMS (0001)

DAVIS HACON ACT

BT LABOR PROVISIONS
65G02023
TOTAL BROADER TERMS (0001)

NT PREVAILING WAGES
65G02023
TOTAL NARROWER TERMS (0001)

DC REGULATIONS

BT GROUP LIFE
60G07075
TOTAL BROADER TERMS (0001)

DEBT TO U.S.

BT PERSONNEL CLAIMS BY AND AGAINST THE GOVT
60G07068
TOTAL BROADER TERMS (0001)
NT SALARY
60G07068
TERMINATION BENEFITS
60G07068
TOTAL NARROWER TERMS (0002)

DEFECTIVE PRICING

BT COST PRINCIPLES
70G07004
TOTAL BROADER TERMS (0001)

DEFINITION

BT PASSENGER VEHICLE
60G06017
TOTAL BROADER TERMS (0001)

DELAY

BT INSPECTION
60G11039
TOTAL BROADER TERMS (0001)
NT LACHES
60G11039
TOTAL NARROWER TERMS (0001)

DELEGATION

BT AUTHORITY
60G11005
TOTAL BROADER TERMS (0001)

DEPUTY

BT NASA ADMINISTRATOR
70G09012
TOTAL BROADER TERMS (0001)

DEVIATIONS

DEVIATIONS

BT STANDARD CONTRACT CLAUSES
65G01082
TOTAL BROADER TERMS (0001)
NT PERT SYSTEM
65G01082
WALSH IN ALEY
65G01082
TOTAL NARROWER TERMS (0002)

DISCLAIMER CLAUSES

BT PATENT POLICY CONTRACTORS
70G12011
TOTAL BROADER TERMS (0001)

DISCLOSURE

BT RESTRICTED DATA
60G07053
60G07074
TOTAL BROADER TERMS (0002)

DISSEMINATION GUIDELINES

BT COMPUTER INDICES
70G01009
TOTAL BROADER TERMS (0001)

DISTRIBUTION OF RECEIPTS

BT COMSAT CORP.
60G11117
NASA TORT CLAIMS
60G08007
TOTAL BROADER TERMS (0002)
NT SPACE ACT 203(*B)(5)&(6)
60G11117
TOTAL NARROWER TERMS (0001)

DOD AGREEMENTS

BT CONTRACT ADMINISTRATION
60G07012
TOTAL BROADER TERMS (0001)

DUAL COVERAGE

BT HEALTH BENEFIT PROGRAM
70G07023
TOTAL BROADER TERMS (0001)

DUTY FREE ENTRY

BT FOREIGN DEALINGS
65G04112
INTERNATIONAL AGREEMENTS
60G11107
TOTAL BROADER TERMS (0002)
NT SPACE ACT 203(*B)(3)
60G11107
41 USC 10(*A)-(*D)
65G04112
TOTAL NARROWER TERMS (0002)

DUTY TO UPDATE

BT COST/PRICING DATA
70G11004
TOTAL BROADER TERMS (0001)

EASEMENTS

BT REAL PROPERTY
65G01028
TOTAL BROADER TERMS (0001)
NT NMI 3-8-58 PARA 3(*C)(1)(D)
65G01028
TOTAL NARROWER TERMS (0001)

EDUCATIONAL INSTITUTIONS

BT GRANTS
70G09002
TOTAL BROADER TERMS (0001)
NT ARMED FORCES RECRUITING
70G09002
TOTAL NARROWER TERMS (0001)

EMPLOYEE COVERAGE

BT INSURANCE
60G08044
TOTAL BROADER TERMS (0001)
NT NASA AIRLIFT SERVICE
60G08044
TOTAL NARROWER TERMS (0001)

EMPLOYEE FUNERALS

BT TRAVEL EXPENSES
65G10128
TOTAL BROADER TERMS (0001)

EMPLOYEE MORTGAGES

BT PERSONNEL GENERAL
60G08103
TOTAL BROADER TERMS (0001)
NT FHA AGREEMENT
60G08103
12 USC 78*H-1
60G08103
TOTAL NARROWER TERMS (0002)

EMPLOYEE ORGANIZATION ACTIVITIES

BT LEAVE
65G02173
TOTAL BROADER TERMS (0001)

EMPLOYEE OVERPAYMENT

BT PERSONNEL CLAIMS BY AND AGAINST THE GOVT
70G05004
TOTAL BROADER TERMS (0001)
NT WAIVER
70G05004
TOTAL NARROWER TERMS (0001)

EMPLOYEE PRIVATE DEBTS

BT PERSONNEL GENERAL
60G08001
TOTAL BROADER TERMS (0001)
NT NASA COOPERATION WITH CREDITOR
60G08001
TOTAL NARROWER TERMS (0001)

EMPLOYEE SPEECHES

BT DATA
65G10032
EXPORT CONTROL ACT
65G10032
TOTAL BROADER TERMS (0002)

EMPLOYEE USER

BT LIABILITY
60G09057
TOTAL BROADER TERMS (0001)

EMPLOYEE WANT ADS

BT NASA NEWSLETTERS
65G03101
TOTAL BROADER TERMS (0001)

EMPLOYEE WELFARE ACTIVITIES

BT NONAPPROPRIATED FUND ACTIVITIES
60G06756
TOTAL BROADER TERMS (0001)
NT RECEIPTS
60G06756
TOTAL NARROWER TERMS (0001)

EMPLOYMENT

BT PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT
65G02034
TOTAL BROADER TERMS (0001)

NT	ALIENS 65G02034 TOTAL NARROWER TERMS	(0001)	NT	NASA IMPLEMENTATION 60G11065 PROC. REG. 12-802-4 65G04006 TOTAL NARROWER TERMS	(0002)
ENFORCEMENT					
BT	NASA HUGHES 1964 AGREEMENT 70G05002 70G05008 TOTAL BROADER TERMS	(0002)	ESRO		
NT	WAIVER OF APPEAL 70G05008 TOTAL NARROWER TERMS	(0001)	BT	TAXATION STATE AND LOCAL 65G03284 TOTAL BROADER TERMS	(0001)
ENTERTAINMENT EXPENSES			ESRO DATA ACQUISITION		
BT	APPROPRIATION ACT 1961 60G06023 TOTAL BROADER TERMS	(0001)	BT	INTERNATIONAL AGREEMENTS 65G03034 TOTAL BROADER TERMS	(0001)
NT	FOREIGN TPACKING STATIONS 60G06023 TOTAL NARROWER TERMS	(0001)	NT	OUTLEASES 65G03034 TOTAL NARROWER TERMS	(0001)
ENVIRONMENTAL POLLUTION			ESRO TAX STATUS ALASKA		
BT	NASA GLNERAL 70G01021 TOTAL BROADER TERMS	(0001)	BT	INTERNATIONAL AGREEMENTS 65G03284 TOTAL BROADER TERMS	(0001)
NT	ADVANCE PROGRAM REVIEW 70G01021 WHITE HOUSE QUESTIONNAIRE 70G01021 TOTAL NARROWER TERMS	(0002)	ESRO-NASA SATELLITE COOP		
EPA ACT 1969, 102(2)(*C)			BT	INTERNATIONAL AGREEMENTS 70G10020 TOTAL BROADER TERMS	(0001)
BT	AUTHORIZATION ACT 1972 70G10019 TOTAL BROADER TERMS	(0001)	NT	BUY AMERICAN 70G10020 TOTAL NARROWER TERMS	(0001)
EPA COMPLIANCE			EVALUATION		
BT	AUTHORIZATION ACT 1972 70G10019 TOTAL BROADER TERMS	(0001)	BT	UNSOLICITED PROPOSALS 60G07053 TOTAL BROADER TERMS	(0001)
EQUAL OPPORTUNITY			EXAMINATION OF RECORDS		
BT	CONTRACTS 65G04006 PERSONNEL GENERAL 60G11065 TOTAL BROADER TERMS	(0002)	BT	TERMINATION 65G02014 TOTAL BROADER TERMS	(0001)
			EXCEEDING 6 MOS.		
			BT	TEMPORARY TRANSFERS 60G08018 TOTAL BROADER TERMS	(0001)

EXCEPTED POSITIONS

BT COMPETITIVE SERVICE
70G08009
70G08020
TOTAL BROADER TERMS

(0002)

EXCESS DECLARATION

BT REAL PROPERTY
70G07018
TOTAL BROADER TERMS

(0001)

EXCHANGE VISITOR PROGRAM

BT PERSONNEL GENERAL
70G07017
TOTAL BROADER TERMS
NT IMMIGRATION ACT 212(*E)
70G07017
RESIDENCE WAIVER
70G07017
TOTAL NARROWER TERMS

(0001)

(0002)

EXCHANGES

BT NONAPPROPRIATED FUND ACTIVITIES
70G07009
TOTAL BROADER TERMS
NT LITIGATION
70G07009
TOTAL NARROWER TERMS

(0001)

(0001)

EXCLUSIVE

BT REMEDIES
60G09084
TOTAL BROADER TERMS
NT FEDERAL EMPLOYEES COMP ACT
60G09084
TOTAL NARROWER TERMS

(0001)

(0001)

EXCUSABLE DELAY

BT CLAIMS (CONTRACTUAL/EXTRA CONTRACTUAL)
60G07039
TOTAL BROADER TERMS
NT STANDARD FORM 32 PROV 11(C)
60G07039
WAIVER
60G07039
TOTAL NARROWER TERMS

(0001)

(0002)

EXECUTIVE LUNCHROOM

BT NONAPPROPRIATED FUND ACTIVITIES
60G08028
PERSONNEL PAY AND ALLOWANCES
60G08028
TOTAL BROADER TERMS

(0002)

EXECUTIVE PRIVILEGE

BT PERSONNEL RECORD RELEASE
70G10012
TOTAL BROADER TERMS

(0001)

EXEMPTIONS

BT INTERNATIONAL AGREEMENTS
60G09081
OFFICIALS NOT TO BENEFIT
60G09081
TAXATION FEDERAL
65G04745
70G10005
70G10008
TAXATION STATE AND LOCAL
70G10011
TOTAL BROADER TERMS
NT ALCOHOL AND DISTILLED SPIRITS
65G04745
CONTRACTOR ARTICLES/SERVICES
70G10005
70G10008
LEASES
70G10011
TOTAL NARROWER TERMS

(0006)

(0004)

EXPENDITURE LIMITATIONS

BT ADMINISTRATOR'S FUND
70G11007
TOTAL BROADER TERMS

(0002)

EXPERIMENTAL SALES

BT 35 USC 102(*B)
70G01006
TOTAL BROADER TERMS

(0001)

EXPERTS

BT AUTHORIZATION ACT 1971
70G08001

AVAILABILITY FOR AND LIMITATION ON APPROP

70G08001

CLAIMS AND ADJUDICATIONS GENERAL

65G04248

PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT

70G08015

PERSONNEL PAY AND ALLOWANCES

70G11010

TOTAL BROADER TERMS

(0005)

NT

AUTHORIZATION ACT 1971

70G08001

PART TIME EMPLOYEES

70G08015

PAY DETERMINATION AUTHORITY

70G11010

TRAVEL EXPENSES

65G04248

TOTAL NARROWER TERMS

(0004)

EXPORT CONTROL ACT

BT

DATA

65G10032

INTERNATIONAL GENERAL

65G03211

65G10032

TOTAL BROADER TERMS

(0003)

NT

DATA

65G10032

EMPLOYEE SPEECHES

65G10032

LICENSES

65G03211

REGULATIONS

65G03211

TOTAL NARROWER TERMS

(0004)

EXPOSITIONS

BT

INTERNATIONAL GENERAL

65G03079

TOTAL BROADER TERMS

(0001)

EXTENDED PERIODS

BT

PASSENGER VEHICLE

60G06017

TOTAL BROADER TERMS

(0001)

FISCAL PROVISIONS

BT CONTRACTS
60G00900
TOTAL BROADER TERMS (0001)

NT INCREMENTAL FUNDING
60G06121
OBLIGATION LIMITATION
60G07092
TOTAL NARROWER TERMS (0002)

FISCAL YEAR 1971 HEARINGS

BT NASA LEGISLATIVE PROGRAM
70G01015
TOTAL BROADER TERMS (0001)

FIXED PRICE REG CONTRACTS

BT PROCUREMENT GENERAL
60G06400
TOTAL BROADER TERMS (0001)

NT PROC. REG. 7.3
60G06400
TOTAL NARROWER TERMS (0001)

FOREIGN DEALINGS

BT BUY AMERICAN
65G04112
INSURANCE
65G10015
PROCUREMENT GENERAL
00G00900
TOTAL BROADER TERMS (0003)

NT DUTY FREE ENTRY
65G04112
PROC. REG. 6.601
65G04112
TARIFFS
65G04112
TOTAL NARROWER TERMS (0003)

FOREIGN TRACKING STATIONS

BT ENTERTAINMENT EXPENSES
60G06023
TOTAL BROADER TERMS (0001)

FORMER CONTRACTOR EMPLOYEES

BT APPROPRIATION ACT 1971
70G01036
TOTAL BROADER TERMS (0001)

FORMER EMPLOYEES

BT PERSONNEL STANDARDS OF CONDUCT
70G01023
TOTAL BROADER TERMS (0001)

NT 18 USC 203(*A)
70G01023
18 USC 207(*A)
70G01023
18 USC 207(*B)
70G01023
42 USC 2462
70G01023
TOTAL NARROWER TERMS (0004)

FORMER MILITARY PERSONNEL

BT RETIREMENT
65G04028
SOCIAL SECURITY TAX
60G08018
TOTAL BROADER TERMS (0002)

FORMER NASA EMPLOYEES

BT APPROPRIATION ACT 1971
70G01036
TOTAL BROADER TERMS (0001)

FPM CHAP 294, SUB 7

BT PUBLIC DISCLOSURE
70G07015
TOTAL BROADER TERMS (0001)

FPM CHAP 351, SUB 9

BT REDUCTION IN FORCE
70G07008
TOTAL BROADER TERMS (0001)

FPM 2.106(*A)(3)

BT CRIMINAL ACTIVITY
60G09035
TOTAL BROADER TERMS (0001)

FPM 39.308

BT LOYALTY
60G07011
TOTAL BROADER TERMS (0001)

FRAUD

BT PROGRESS PAYMENTS
65G10042
TOTAL BROADER TERMS (0001)

FRCP 6(*A)

BT LIMITATION OF ACTIONS
70G11008
TOTAL BROADER TERMS (0001)

FREEDOM OF INFORMATION ACT

BT DATA
70G01032
NASA SECURITY
70G07024
PERSONNEL RECORD RELEASE
70G10012
REDUCTION IN FORCE
70G08017
TOTAL BROADER TERMS (0004)

NT CONTRACTOR WORKING PAPERS
70G07024
RECORD RELEASE
70G01032
TOTAL NARROWER TERMS (0002)

FREQUENCY ALLOCATION

BT FCC
60G07041
TOTAL BROADER TERMS (0001)

FUNGIBILITY

BT CONSTRUCTION FUNDS
65G04117
TOTAL BROADER TERMS (0001)

FUTURE DELIVERY

BT PERIOD OF AVAILABILITY OF APPROP
65G01104
TOTAL BROADER TERMS (0001)

GIFT OR SALE TO FOREIGN GOVT

BT INTERNATIONAL GENERAL
60G06054
TOTAL BROADER TERMS
NT SPACE ACT 203(*B)(3)
60G06054
TOTAL NARROWER TERMS

(0001)

GOVERNMENT AS INDEMNITEE

BT INDEMNIFICATION
60G11085
TOTAL BROADER TERMS

(0001)

GOVERNMENT EMPLOYEES TRAINING ACT 14

BT LOYALTY
60G07011
TOTAL BROADER TERMS

(0001)

GOVERNMENT FURNISHED EQUIP TITLE

BT GOVERNMENT PROPERTY
70G11006
GRANTS
70G11006
TOTAL BROADER TERMS

(0002)

GOVERNMENT LIABILITY

BT INFRINGEMENT/ROYALTIES
60G06009
TOTAL BROADER TERMS

(0001)

GOVERNMENT NEGLIGENCE

BT INDEMNIFICATION
70G05005
TOTAL BROADER TERMS

(0001)

GOVERNMENT PRINTING REG 14

BT NASA NEWSLETTERS
65G03101
TOTAL BROADER TERMS

(0001)

GOVERNMENT PROPERTY

BT CONTRACTS
60G06000
TOTAL BROADER TERMS

(0001)

NT GOVERNMENT FURNISHED EQUIP TITLE
70G11006
TOTAL NARROWER TERMS

(0001)

GRANTS

NT AIAA
65G02064
COMPETITION WITH PRIVATE ENTERPRISE
65G04088
EDUCATIONAL INSTITUTIONS
70G09002
GOVERNMENT FURNISHED EQUIP TITLE
70G11006
INSTITUTE OF AEROSPACE SCIENCES
65G02064
STUDENT WORK STUDY PROGRAM
70G05001
TOTAL NARROWER TERMS

(0006)

GROUP LIFE

BT INSURANCE
60G07075
65G03163
TOTAL BROADER TERMS
NT AMOUNT INSURANCE AVAILABLE
60G07075
DC REGULATIONS
60G07075
GROUP SIZE
60G07075
SOLICITATION
65G03163
TOTAL NARROWER TERMS

(0002)

(0004)

GROUP SIZE

BT GROUP LIFE
60G07075
TOTAL BROADER TERMS

(0001)

GSA LEASING AUTHORITY

BT REAL PROPERTY
60G11035
TOTAL BROADER TERMS

(0001)

GSA MOTOR POOL USER LIABILITY

BT PASSENGER VEHICLE
70G10004
TOTAL BROADER TERMS

(0001)

H.R. 10246

BT	ACQUISITIONS	
	60G06022	
	TOTAL BROADER TERMS	(0001)

H.R. 10809

BT	ACQUISITIONS	
	60G06022	
	TOTAL BROADER TERMS	(0001)

HAZELTINE V ZENITH

BT	ANTITRUST	
	65G03002	
	TOTAL BROADER TERMS	(0001)

HEALTH BENEFIT PROGRAM

BT	PERSONNEL PAY AND ALLOWANCES	
	70G07023	
	TOTAL BROADER TERMS	(0001)
NT	DUAL COVERAGE	
	70G07023	
	TOTAL NARROWER TERMS	(0001)

HEALTH HAZARDS

BT	LABOR AGREEMENTS	
	70G01031	
	TOTAL BROADER TERMS	(0001)

HOME TO OFFICE USE

BT	PASSENGER VEHICLE	
	70G08005	
	TOTAL BROADER TERMS	(0001)

HOUSEHOLD GOODS

BT	PERSONNEL PAY AND ALLOWANCES	
	60G08130	
	65G04116	
	TOTAL BROADER TERMS	(0002)
NT	NEW EMPLOYEES	
	65G04116	
	TRANSPORTATION	
	60G08130	
	TOTAL NARROWER TERMS	(0002)

IMMIGRATION ACT 212(*E)

BT ALIENS
65G10058
EXCHANGE VISITOR PROGRAM
70G07017
TOTAL BROADER TERMS (0002)

IMMUNITY

BT TAXATION STATE AND LOCAL
65G01035
TORT CLAIMS (INCLUDING FTCA)
60G09057
TOTAL BROADER TERMS (0002)
NT COST CONTRACTS
65G01035
WAIVER
60G09057
TOTAL NARROWER TERMS (0002)

IMPLIED ACCEPTANCE

BT CONTRACTOR MODIFICATION
60G11020
RESTRICTED DATA
60G07053
TOTAL BROADER TERMS (0002)

IMPLIED LICENSE IN GOVT

BT PATENT POLICY CONTRACTORS
70G01005
TOTAL BROADER TERMS (0001)
NT AMP INC.* V US
70G01005
TOTAL NARROWER TERMS (0001)

INCENTIVES

BT CONTRACTS
00G00900
TOTAL BROADER TERMS (0001)

INCREMENTAL FUNDING

BT FISCAL PROVISIONS
60G06121
OBLIGATION LIMITATION
60G07092
TOTAL BROADER TERMS (0002)

INDEFINITENESS

BT CONTRACTS
60G07109
TOTAL BROADER TERMS (0001)

INDEMNIFICATION

BT CLAIMS (CONTRACTUAL/EXTRA CONTRACTUAL)
65G01012
TORT CLAIMS (INCLUDING FTCA)
60G11085
70G05005
TOTAL BROADER TERMS (0003)
NT GOVERNMENT AS INDEMNITEE
60G11085
GOVERNMENT NEGLIGENCE
70G05005
TOTAL NARROWER TERMS (0002)

INDEPENDENT PRICE

BT CONTRACTS
65G04006
TOTAL BROADER TERMS (0001)
NT PROC. REG. 1.115
65G04006
TOTAL NARROWER TERMS (0001)

INDUSTRIAL R&D SUPPORT

BT PROCUREMENT COMMISSION
70G01014
TOTAL BROADER TERMS (0001)

INFORMATION RELEASE

BT PROCUREMENT GENERAL
60G06039
TOTAL BROADER TERMS (0001)

INFRINGEMENT/ROYALTIES

BT INTELLECTUAL PROPERTY GENERAL
00G00600
TOTAL BROADER TERMS (0001)
NT ACTUAL REDUCTION TO PRACTICE
70G01006
GOVERNMENT LIABILITY
60G06009
OFFER FOR SALE BEFORE CRITICAL DATE
70G01006

PROTECTION U.S. INTEREST
60G06009
REPORTING NASA ROYALTIES
60G11044
SPACE ACT 203(*D)(3)
60G11044
SPACE ACT 305(*A)
70G01006
35 USC 102(*B)
70G01006
TOTAL BROADER TERMS

(0008)

INJUNCTION

BT LANHAM ACT 32(1)
70G09011
NASA EXCLUSIVE LICENSEE* V INFRINGER
70G08010
TOTAL BROADER TERMS

(0002)

INSPECTION

BT STANDARD CONTRACT CLAUSES
60G11039
TOTAL BROADER TERMS
DELAY
60G11039
TOTAL NARROWER TERMS

(0001)

(0001)

INSTITUTE OF AEROSPACE SCIENCES

BT GRANTS
65G02064
TOTAL BROADER TERMS

(0001)

INSURANCE

BT FISCAL GENERAL
70G05007
70G10018
LIABILITY
60G09057
NASA GENERAL
70G08016
70G10013
PASSENGER VEHICLE
65G10015
PERSONNEL GENERAL
60G08044
60G09121
PERSONNEL PAY AND ALLOWANCES
60G07075

NT

PROCUREMENT GENERAL
70G12020
STATE AND LOCAL GOVERNMENT
65G03163
TOTAL BROADER TERMS
COLLISION INSURANCE
70G10018
EMPLOYEE COVERAGE
60G08044
FOREIGN DEALINGS
65G10015
GROUP LIFE
60G07075
65G03163
PASSENGER VEHICLE
60G09121
70G05007
70G10018
PASSENGERS ON NASA AIRCRAFT
70G08016
70G10013
US AS SELF INSURER
70G12020
TOTAL NARROWER TERMS

(0011)

(0011)

INT REV CODE 4293

BT CONTRACTOR ARTICLES/SERVICES
70G10005
TOTAL BROADER TERMS

(0001)

INTELLECTUAL PROPERTY GENERAL

NT ABANDONED INVENTIONS
60G08058
ANTITRUST
00G00600
AWARDS
00G00600
COMPUTER INDICES
70G01008
COPYRIGHT
00G00600
DATA
00G00600
INFRINGEMENT/ROYALTIES
00G00600
INVENTIONS AND CONTRIBUTIONS BOARD
00G00600
LICENSES
00G00600
PATENT POLICY CONTRACTORS
00G00600

PATENT POLICY EMPLOYEES
00G00600
SECURITY REVIEW
60G08067
SPECIFICATIONS AND STANDARDS
60G09119
TRADE SECRETS
60G00600
TRADEMARKS
00G00600
28 USC 1498(*A) AND (*B)
70G01013
TOTAL BROADER TERMS

(0016)

INTERAGENCY AGREEMENTS CHECKLIST

BT FEDERAL AGENCIES
65G03199
TOTAL BROADER TERMS

(0001)

INTERAGENCY TRANSFER OF FUNDS

BT FISCAL GENERAL
60G00400
TOTAL BROADER TERMS
NT PROPERTY TRANSFERS
60G06118
SERVICES
60G06118
TOTAL BROADER TERMS

(0001)

(0002)

INTEREST RATE RAISE

BT RENEGOTIATION ACT
70G01025
TOTAL BROADER TERMS

(0001)

INTERNATIONAL AGREEMENTS

BT INTERNATIONAL GENERAL
00G00500
OFFICIALS NOT TO BENEFIT
60G09081
TOTAL BROADER TERMS
NT BUY AMERICAN
65G01029
PUTY FREE ENTRY
60G11107
ESRO DATA ACQUISITION
65G07034
ESRO TAX STATUS ALASKA
65G03284

(0002)

ESRO-NASA SATELLITE COOP
70G10020
EXEMPTIONS
60G09081
MINITRACK STATION AGREEMENT
60G06044
60G06046
NASA PROCUREMENT IN CANADA
60G06096
OFFICIALS NOT TO BENEFIT
60G09081
SPACE TRAVEL
70G08008
ULTRA VIOLET SURVEY
60G06094
TOTAL BROADER TERMS

(0012)

INTERNATIONAL GENERAL

NT EXPORT CONTROL ACT
65G03211
65G10032
EXPOSITIONS
65G03079
GIFT OR SALE TO FOREIGN GOVT
60G06054
INTERNATIONAL AGREEMENTS
00G00500
LOANS TO FOREIGN GOVTS
60G06054
SPACE LAW
00G00500
TOTAL BROADER TERMS

(0007)

INVENTION SECURITY ACT 1951

BT NASA SECURITY
60G06071
TOTAL BROADER TERMS
NT 35 USC 181-88
60G06071
TOTAL BROADER TERMS

(0001)

(0001)

INVENTIONS AND CONTRIBUTIONS BOARD

BT INTELLECTUAL PROPERTY GENERAL
00G00600
TOTAL BROADER TERMS
NT AWARDS
60G07020
TOTAL BROADER TERMS

(0001)

(0001)

INVOLUNTARY REGULAR STATUS

NASA LEGAL MICRO-THESAURUS
11/17/71 PAGE 30

IRREPARABLE INJURY

INVOLUNTARY REGULAR STATUS

BT CONFLICT OF INTEREST
70G05009
TOTAL BROADER TERMS

(0001)

IRREPARABLE INJURY

BT PRELIMINARY INJUNCTION
70G09003
TOTAL BROADER TERMS

(0001)

JURISDICTION

BT	BOARD OF CONTRACT APPEALS	
	70G10021	
	CLAIMS AND ADJUDICATIONS GENERAL	
	70G07004	
	TOTAL BROADER TERMS	(0002)
NT	COURT OF CLAIMS	
	70G07008	
	US DISTRICT COURT	
	70G07008	
	TOTAL BROADER TERMS	(0002)

JUSTICE DEPARTMENT COOPERATION

BT	FEDERAL AGENCIES	
	70G01037	
	TOTAL BROADER TERMS	(0001)

LABOR AGREEMENTS

BT PERSONNEL OTHER RIGHTS/OBLIGATIONS
70G01031
TOTAL BROADER TERMS (0001)
NT HEALTH HAZARDS
70G01031
TOTAL NARROWER TERMS (0001)

LABOR DISPUTE HISTORY

BT CONSTRUCTION BIDDING RESTRICTIONS
65G04090
TOTAL BROADER TERMS (0001)

LABOR PROVISIONS

BT CONTRACTS
00G00900
TOTAL BROADER TERMS (0001)
NT DAVIS BACON ACT
65G02023
TOTAL NARROWER TERMS (0001)

LACHES

BT DELAY
60G11039
TOTAL BROADER TERMS (0001)

LACK OF TIME

BT NEGOTIATION AUTHORITY
60G08052
TOTAL BROADER TERMS (0001)

LANHAM ACT 32(1)

BT TRADEMARKS
70G09011
TOTAL BROADER TERMS (0001)
NT INJUNCTION
70G09011
REGISTERED MARK NASA USE
70G09011
TOTAL NARROWER TERMS (0002)

LAUNCH VEHICLE PURCHASE

BT COMSAT CORP.
65G02103
TOTAL BROADER TERMS (0001)

LEASE/RENT BEYOND FISCAL YEAR

BT PERIOD OF AVAILABILITY OF APPROP
70G11003
TOTAL BROADER TERMS (0001)

LEASES

BT EXEMPTIONS
70G10011
REAL PROPERTY
70G09007
TOTAL BROADER TERMS (0002)
NT CHAPEL OF THE ASTRONAUTS
70G09007
TOTAL NARROWER TERMS (0001)

LEASING AUTHORITY LIMITATIONS

BT CONTRACT FORMATION
70G11003
TOTAL BROADER TERMS (0001)

LEAVE

BT OVERSEAS EMPLOYEES
60G09083
PERSONNEL PAY AND ALLOWANCES
65G02173
70G09001
70G09008
TOTAL BROADER TERMS (0004)
NT EMPLOYEE ORGANIZATION ACTIVITIES
65G02173
NATIONAL SERVICE ORGANIZATION DUTIES
70G09008
TOTAL NARROWER TERMS (0002)

LEGAL ASSISTANCE

BT REDUCTION IN FORCE
70G07020
TOTAL BROADER TERMS (0001)

LEGAL RESEARCH SERVICES

BT SERVICE CONTRACTS
70G12058
TOTAL BROADER TERMS (0001)

LEGISLATIVE HISTORY

BT NASA FORMATION
65G04021
SPACE ACT 203(*B)(2)
70G12014
STANDARD FORM 23A
60G06071
28 USC 1498(*A) AND (*B)
70G01013
TOTAL BROADER TERMS (0004)

LETTER OF INTENT

BT CONTRACT FORMATION
60G06039
TOTAL BROADER TERMS (0001)
NT PROC. REG. 3.4
60G06039
TOTAL NARROWER TERMS (0001)

LIABILITY

BT PASSENGER VEHICLE
60G09057
SATELLITE CAUSED DAMAGE
65G04111
TOTAL BROADER TERMS (0002)
NT CONSENT OF GOVT
60G09057
EMPLOYEE USER
60G09057
INSURANCE
60G09057
SCOPE OF EMPLOYMENT
60G09057
42 USC 2473(*B)(13)
65G04111
TOTAL NARROWER TERMS (0005)

LICENSES

BT EXPORT CONTROL ACT
65G03211
INTELLECTUAL PROPERTY GENERAL
00G00600
TOTAL BROADER TERMS (0002)
NT NASA EXCLUSIVE LICENSEE* V INFRINGER
70G08010
NON-USE
70G12001

PREPROCUREMENT POLICY

70G01737
PRIOR TO AWARDS
70G05011
REISSUE
70G12001
REVOCATION
70G12001
US GOVT RIGHT TO UTILIZE PATENTS
70G01027
TOTAL NARROWER TERMS (0007)

LIMITATION OF ACTIONS

BT TORT CLAIMS (INCLUDING FTCA)
70G11008
TOTAL BROADER TERMS (0001)
NT FRCP 6(*A)
70G11008
TOTAL NARROWER TERMS (0001)

LIMITATION OF LIABILITY

BT CATASTROPHIC ACCIDENTS
65G03131
STANDARD CONTRACT CLAUSES
70G07005
TOTAL BROADER TERMS (0002)
NT LIMITATION OF PRICE
65G03131
TOTAL NARROWER TERMS (0001)

LIMITATION OF PRICE

BT LIMITATION OF LIABILITY
65G03131
PASSENGER VEHICLE
60G06017
60G06097
TOTAL BROADER TERMS (0003)
NT 5 USC 78(*C)(*1)
60G06097
TOTAL NARROWER TERMS (0001)

LITIGATION

BT EXCHANGES
70G07009
TOTAL BROADER TERMS (0001)

LOAN OF PROPERTY

LOAN OF PROPERTY

BT LOANS TO FOREIGN GOVTS
60G06054
TOTAL BROADER TERMS (0001)

LOAN PERIOD

BT LOANS TO FOREIGN GOVTS
60G06054
TOTAL BROADER TERMS (0001)

LOAN REVOCABILITY

BT LOANS TO FOREIGN GOVTS
60G06054
TOTAL BROADER TERMS (0001)

LOANS TO FOREIGN GOVTS

BT INTERNATIONAL GENERAL
60G06054
TOTAL BROADER TERMS (0001)

NT LOAN OF PROPERTY
60G06054
LOAN PERIOD
60G06054
LOAN REVOCABILITY
60G06054
SPACE ACT 203(*B)(3)
60G06054
SPACE ACT 203(*B)(5)&(6)
60G06054
SPACE ACT 203(*C)(7)
60G06054
SPACE ACT 205
60G06054
TOTAL NARROWER TERMS (0007)

LOYALTY

BT PERSONNEL GENERAL
60G07011
TOTAL BROADER TERMS (0001)

NT FPM 39.308
60G07011
GOVERNMENT EMPLOYEES TRAINING ACT 14
60G07011
TOTAL NARROWER TERMS (0002)

MANUFACTURER

BT CONTRACTS
65G04006
TOTAL BROADER TERMS (0001)

MARINE RESOURCES ACT OF 1966

BT NASA LEGISLATIVE COMMENTS
70G01019
TOTAL BROADER TERMS (0001)

MARITAL STATUS

BT PERSONNEL STANDARDS OF CONDUCT
60G09035
TOTAL BROADER TERMS (0001)
NT FALSE STATEMENT
60G09035
TOTAL NARROWER TERMS (0001)

MAXIMUM AMOUNT

BT SETTLEMENT
60G07097
TOTAL BROADER TERMS (0001)
NT SPACE ACT 203(*B)(13)(A)
60G07097
28 USC 2672
60G07097
TOTAL NARROWER TERMS (0002)

MEDICAL SERVICES

BT PERSONNEL PAY AND ALLOWANCES
65G02168
TOTAL BROADER TERMS (0001)
NT PUBLIC HEALTH SERVICE CONSULTATION
65G02168
TOTAL NARROWER TERMS (0001)

MILITARY LEAVE

BT PERSONNEL PAY AND ALLOWANCES
60G09131
TOTAL BROADER TERMS (0001)

MILITARY PERSONNEL

BT CASH AWARDS
65G10098
TOTAL BROADER TERMS (0001)

MILLER ACT

BT CONSTRUCTION
60G11107
TOTAL BROADER TERMS (0001)
NT WAIVER
60G11107
TOTAL NARROWER TERMS (0001)

MINITRACK STATION AGREEMENT

BT INTERNATIONAL AGREEMENTS
60G06044
60G06046
TOTAL BROADER TERMS (0002)
NT AUSTRALIA
60G06046
SOUTH AFRICA
60G06044
60G06046
UK
60G06046
TOTAL NARROWER TERMS (0004)

MISTAKE OF FACT

BT PUBLIC LAW 85-804
65G01043
TOTAL BROADER TERMS (0001)

MISTAKES IN BID

BT CONTRACT FORMATION
00G00900
TOTAL BROADER TERMS (0001)
NT BIDDER KNOWLEDGE
60G11121
TOTAL NARROWER TERMS (0001)

MMI 6-5-A

BT NASA INSIGNIA USE
65G04069
TOTAL BROADER TERMS (0001)

MOVING EXPENSE

BT REDUCTION IN FORCE
70G10007
TOTAL BROADER TERMS (0001)
NT BOB CIRCULAR 56A,1.3*A(7)
70G10007

MOVING EXPENSE
(CON'T)

5 USC 5724(*A)
70G10007
TOTAL NARROWER TERMS

NASA LEGAL MICRO-THESAURUS
11/17/71 PAGE 36

(0002)

MOVING EXPENSE

NASA ACRONYM AS TRADEMARK

BT PATENT POLICY CONTRACTORS
70G12023
TRADEMARKS
70G12023
TOTAL BROADER TERMS

(0002)

NASA ADMINISTRATOR

BT NASA GENERAL
00G01200
TOTAL BROADER TERMS
NT ACTING ADMINISTRATOR
70G09009
70G09012
ADMINISTRATOR'S FUND
70G11007
CONFLICT OF INTEREST
65G10143
DEPUTY
70G09012
PASSENGER VEHICLE
70G08005
TERM OF OFFICE
60G08060
TOTAL NARROWER TERMS

(0001)

(0007)

NASA AIRLIFT SERVICE

BT EMPLOYEE COVERAGE
60G09044
TOTAL BROADER TERMS

(0001)

NASA CIRCULAR 25, CHAP 26

BT TEMPORARY TRANSFERS
60G08018
TOTAL BROADER TERMS

(0001)

NASA COOPERATION WITH CREDITOR

BT EMPLOYEE PRIVATE DEBTS
60G08001
TOTAL BROADER TERMS

(0001)

NASA EMPLOYEES

BT CLAIMS AND ADJUDICATIONS GENERAL
70G05010
TOTAL BROADER TERMS

(0001)

NT WAIVER AGAINST GOVT
70G05010
TOTAL NARROWER TERMS

(0001)

NASA EXCLUSIVE LICENSEE* V INFRINGER

BT LICENSES
70G08010
TOTAL BROADER TERMS
NT INJUNCTION
70G08010
TOTAL NARROWER TERMS

(0001)

(0001)

NASA FORM 1204

BT DAMAGE TO EMPLOYEE PROPERTY
65G10029
TOTAL BROADER TERMS

(0001)

NASA FORM 1220

BT DAMAGE TO EMPLOYEE PROPERTY
65G10029
TOTAL BROADER TERMS

(0001)

NASA FORM 247

BT PROC. REG. 7.3
60G06400
TOTAL BROADER TERMS

(0001)

NASA FORMATION

BT NASA LEGISLATIVE PROGRAM
65G04021
TOTAL BROADER TERMS
NT LEGISLATIVE HISTORY
65G04021
TOTAL NARROWER TERMS

(0001)

(0001)

NASA GENERAL

BT NASA GENERAL
00G01200
TOTAL BROADER TERMS
NT BLIND PERSON VENDING STANDS
70G11002
CIVIL RIGHTS ACT OF 1964
65G01049
ENVIRONMENTAL POLLUTION
70G01021
INSURANCE
70G08016

(0001)

70G10013
NASA ADMINISTRATOR
00G01200
NASA GENERAL
00G01200
NASA INSIGNIA USE
65G04069
NASA NEWSLETTERS
65G03101
NASA REPORT
70G07016
NASA SECURITY
00G01200
OATHS
60G08066
OFFICIAL PHOTOGRAPHS
70G07019
TOTAL NARROWER TERMS

(0013)

NASA HUGHES 1964 AGREEMENT

BT CLAIMS AND ADJUDICATIONS GENERAL
70G05008
PATENT POLICY CONTRACTORS
70G05002
TOTAL BROADER TERMS
NT ENFORCEMENT
70G05002
70G05008
TOTAL NARROWER TERMS

(0002)

(0002)

NASA IMPLEMENTATION

BT EQUAL OPPORTUNITY
60G11065
PRESIDENT'S POLICY STATEMENT
65G01077
TOTAL BROADER TERMS

(0002)

NASA INSIGNIA USE

BT NASA GENERAL
65G04069
TOTAL BROADER TERMS
NT MMT 6-5-A
65G04069
18 USC 701
65G04069
TOTAL NARROWER TERMS

(0001)

(0002)

NASA LANDING FIELD

BT REAL PROPERTY
70G11005
TOTAL BROADER TERMS
NT NON-GOVERNMENT
70G11005
TOTAL NARROWER TERMS

(0001)

(0001)

NASA LEGISLATIVE COMMENTS

BT CONGRESSIONAL MATTERS GENERAL
00G00200
TOTAL BROADER TERMS
NT AEC
70G01011
MARINE RESOURCES ACT OF 1966
70G01019
PROCUREMENT COMMISSION
70G01014
RENEGOTIATION ACT
70G01025
STANDARD FORM 23A
60G07073
TOTAL NARROWER TERMS

(0001)

(0005)

NASA LEGISLATIVE PROGRAM

BT CONGRESSIONAL MATTERS GENERAL
00G00200
TOTAL BROADER TERMS
NT FISCAL YEAR 1971 HEARINGS
70G01015
NASA FORMATION
65G04021
TOTAL NARROWER TERMS

(0001)

(0002)

NASA NEWSLETTERS

BT NASA GENERAL
65G03101
TOTAL BROADER TERMS
NT EMPLOYEE WANT ADS
65G03101
GOVERNMENT PRINTING REG 14
65G03101
TOTAL NARROWER TERMS

(0001)

(0002)

NASA POLICY

BT RIGHTS IN DATA
60G11016
TOTAL BROADER TERMS

(0001)

NASA PROCUREMENT IN CANADA

BT INTERNATIONAL AGREEMENTS
60G06096
TOTAL BROADER TERMS (0001)
NT CANADA-DEPT OF DEFENCE PROD
60G06096
TOTAL NARROWER TERMS (0001)

NASA REPORT

BT NASA GENERAL
70G07016
TOTAL BROADER TERMS (0001)
NT PRIVATE PUBLICATION
70G07016
TOTAL NARROWER TERMS (0001)

NASA SECURITY

BT NASA GENERAL
00G01200
TOTAL BROADER TERMS (0001)
NT FREEDOM OF INFORMATION ACT
70G07024
INVENTION SECRECY ACT, 1951
60G06071
PREAPPOINTMENT INVESTIGATIONS
65G01001
SEARCH OF PERSONS/EFFECTS
70G10001
SECURITY PROGRAMS
65G01001
UPDATING INVESTIGATIONS
65G01001
UPDATING PROCEDURES
65G01001
TOTAL NARROWER TERMS (0007)

NASA TORT CLAIMS

BT REIMBURSEMENT OF APPROP.
60G08007
TOTAL BROADER TERMS (0001)
NT DISTRIBUTION OF RECEIPTS
60G08007
42 USC 2473(*B)(12)
60G08007
TOTAL NARROWER TERMS (0002)

NATIONAL SERVICE ORGANIZATION DUTIES

BT LEAVE
70G09008
TOTAL BROADER TERMS (0001)

NATURALIZATION WAITING PERIOD

BT ALIENS
60G08069
TOTAL BROADER TERMS (0001)
NT 8 USC 1447(*C)
60G08069
TOTAL NARROWER TERMS (0001)

NEGOTIATION AUTHORITY

BT CONTRACT FORMATION
00G00900
TOTAL BROADER TERMS (0001)
NT ADEQUATE SPECIFICATIONS
60G08052
LACK OF TIME
60G08052
R&D PROCUREMENTS
60G06074
SOLE SOURCE PROCUREMENTS
60G06074
60G06074
10 USC 2304(*A)(11)
60G08052
10 USC 2310
65G01033
TOTAL NARROWER TERMS (0007)

NEW EMPLOYEES

BT HOUSEHOLD GOODS
65G04116
TRAVEL EXPENSES
60G07078
60G11026
TOTAL BROADER TERMS (0003)
NT BOB CIRCULAR A-56
65G04116
TIME EXTENSION
65G04116
TOTAL NARROWER TERMS (0002)

NMI 2080.1

BT DAMAGE TO EMPLOYEE PROPERTY
65G10029
TOTAL BROADER TERMS

(0001)

NMI 3-8-58 PARA 3(*C)(1)(D)

BT EASEMENTS
65G01028
TOTAL BROADER TERMS

(0001)

NON-GOVERNMENT

BT NASA LANDING FIELD
70G11005
TOTAL BROADER TERMS

(0001)

NON-INTERFERENCE

BT STIPULATIONS
65G10039
TOTAL BROADER TERMS

(0001)

NON-UNION LABOR EXCLUSION

BT CONSTRUCTION BIDDING RESTRICTIONS
65G04020
TOTAL BROADER TERMS

(0001)

NON-USE

BT LICENSES
70G12001
TOTAL BROADER TERMS

(0001)

NONAPPROPRIATED FUND ACTIVITIES

BT FISCAL GENERAL
60G00400
TOTAL BROADER TERMS

(0001)

NT CAFETERIAS
60G06756
CONCESSIONS
70G10017
EMPLOYEE WELFARE ACTIVITIES
60G06756
EXCHANGES
70G07009
EXECUTIVE LUNCHROOM
60G08028

PROPERTY OWNERSHIP
70G07009
WELFARE/RECREATION ACTIVITIES
70G08012
TOTAL NARROWER TERMS

(0007)

NONPERSONAL SERVICES

BT SERVICE CONTRACTS
65G03015
TOTAL BROADER TERMS

(0001)

OATHS

BT NASA GENERAL
60G08066
TOTAL BROADER TERMS (0001)

OBLIGATION LIMITATION

BT FISCAL PROVISIONS
60G07092
TOTAL BROADER TERMS (0001)
NT ADDITIONAL COSTS
60G07092
INCREMENTAL FUNDING
60G07092
TOTAL NARROWER TERMS (0002)

OCEAN TRANSPORTATION POLICY

BT CARGO PREFERENCE ACT
65G04049
TOTAL BROADER TERMS (0001)

OFFER FOR SALE BEFORE CRITICAL DATE

BT INFRINGEMENT/ROYALTIES
70G01006
TOTAL BROADER TERMS (0001)

OFFICIAL PHOTOGRAPHS

BT NASA GENERAL
70G07019
TOTAL BROADER TERMS (0001)
NT SALE TO PUBLIC
70G07019
TOTAL NARROWER TERMS (0001)

OFFICIALS NOT TO BENEFIT

BT INTERNATIONAL AGREEMENTS
60G09081
STANDARD CONTRACT CLAUSES
60G09081
TOTAL BROADER TERMS (0002)
NT EXEMPTIONS
60G09081
INTERNATIONAL AGREEMENTS
60G09081
TOTAL NARROWER TERMS (0002)

OHIO

BT SALES/USE TAX
60G11030
TOTAL BROADER TERMS (0001)

OIL/GAS LEASES

BT REAL PROPERTY
65G10039
TOTAL BROADER TERMS (0001)
NT PRIMARY LAND USE
65G10039
STIPULATIONS
65G10039
TOTAL NARROWER TERMS (0002)

OPTIONS

BT CONTRACTS
00G00900
TOTAL BROADER TERMS (0001)

ORGANIZATIONAL

BT CONFLICT OF INTEREST
70G01039
TOTAL BROADER TERMS (0001)

OUTLEASES

BT ESRO DATA ACQUISITION
65G03034
TOTAL BROADER TERMS (0001)

OVEROBLIGATION OF FUNDS

BT AVAILABILITY FOR AND LIMITATION ON APPROP
00G00400
FISCAL GENERAL
00G00400
TOTAL BROADER TERMS (0002)

OVERPAYMENT

BT TRAVEL ADVANCES
60G09120
TOTAL BROADER TERMS (0001)
NT SET-OFF
60G09120
TOTAL NARROWER TERMS (0001)

OVERSEAS EMPLOYEES

BT	PERSONNEL PAY AND ALLOWANCES	
	60609083	
	TOTAL BROADER TERMS	(0001)
NT	LEAVE	
	60609083	
	TRAVEL EXPENSES	
	60609083	
	TOTAL NARROWER TERMS	(0002)

OVERTIME PAY

BT	PERSONNEL PAY AND ALLOWANCES	
	65604074	
	TOTAL BROADER TERMS	(0001)
NT	CIVIL DEFENSE TRAINING	
	65604074	
	TOTAL NARROWER TERMS	(0001)

W PACKAGE LICENSING

BT ANTITRUST
65G03002
TOTAL BROADER TERMS

(0001)

PAROL EVIDENCE

BT CONTRACT FORMATION
60G11020
TOTAL BROADER TERMS

(0001)

PART TIME EMPLOYEES

BT EXPERTS
70G08015
TOTAL BROADER TERMS

(0001)

PASSENGER VEHICLE

BT APPROPRIATION ACT 1961
60G06017
AUTHORIZATION ACT 1961
60G06017
AVAILABILITY FOR AND LIMITATION ON APPROP
60G06097
70G10004
COLLISION INSURANCE
70G10018
FEDERAL AGENCIES
70G10004
FISCAL GENERAL
65G10015
INSURANCE
60G09121
70G05007
70G10018
NASA ADMINISTRATOR
70G08005
PERIOD OF AVAILABILITY OF APPROP
60G06017
TORT CLAIMS (INCLUDING FTCA)
60G09057
TOTAL BROADER TERMS
DEFINITION
60G06017
EXTENDED PERIODS
60G06017
GSA MOTOR POOL USER LIABILITY
70G10004
HOME TO OFFICE USE
70G08005

(0013)

NT

INSURANCE
65G10015
LIABILITY
60G09057
LIMITATION OF PRICE
60G06017
60G06097
SCOPE OF EMPLOYMENT
60G09121
SERVICING COSTS
60G06097
TRAVEL EXPENSES
60G06097
TOTAL NARROWER TERMS

(0011)

PASSENGERS ON NASA AIRCRAFT

BT INSURANCE
70G08016
70G10013
TOTAL BROADER TERMS

(0002)

PATENT AND DATA STUDY

BT COMMISSION GOVT PROCUREMENT
70G10009
TOTAL BROADER TERMS

(0001)

PATENT APPLICATIONS

BT PATENT POLICY EMPLOYEES
70G10015
TOTAL BROADER TERMS

(0001)

PATENT DISPUTES

BT PATENT POLICY CONTRACTORS
60G11017
TOTAL BROADER TERMS

(0001)

PATENT INTERFERENCE PROCEEDINGS

BT ATTORNEYS FEES
70G07014
PATENT POLICY CONTRACTORS
70G01012
70G09010
TOTAL BROADER TERMS
BURDEN OF PROOF
70G09010
SETTLEMENT
70G01012
TOTAL NARROWER TERMS

(0003)

NT

(0002)

PATENT NOTICE

BT SPECIFICATIONS AND STANDARDS
60G09119
TOTAL BROADER TERMS (0001)

PATENT POLICY CONTRACTORS

BT INTELLECTUAL PROPERTY GENERAL
00G00600
TOTAL BROADER TERMS (0001)

NT COMPUTER SOFTWARE PROCUREMENT
70G01033
CONFIRMATORY LICENSE UPON WAIVER GRANT
70G01005
DISCLAIMER CLAUSES
70G12011
IMPLIED LICENSE IN GOVT
70G01005
NASA ACRONYM AS TRADEMARK
70G12023
NASA HUGHES 1964 AGREEMENT
70G05002
PATENT DISPUTES
60G11017
PATENT INTERFERENCE PROCEEDINGS
70G01012
70G09010
PRESIDENT'S POLICY STATEMENT
60G01077
PROPERTY RIGHTS IN INVENTIONS
60G06071
REDUCTION TO PRACTICE
60G06071
1963 PROPOSED REVISIONS
70G07001
305(*D) PROCEEDINGS
70G05006
TOTAL NARROWER TERMS (0014)

PATENT POLICY EMPLOYEES

BT INTELLECTUAL PROPERTY GENERAL
00G00600
TOTAL BROADER TERMS (0001)

NT PATENT APPLICATIONS
70G10015
WAGE BOARD EMPLOYEE
70G11001
1963 PROPOSED REVISIONS
70G07001
TOTAL NARROWER TERMS (0003)

PAY DETERMINATION AUTHORITY

BT EXPERTS
70G11010
TOTAL BROADER TERMS (0001)

PAYROLL CHECKS

BT PERSONNEL PAY AND ALLOWANCES
70G08007
TOTAL BROADER TERMS (0001)

NT CHECKS PAYABLE TO NON-EMPLOYEES
70G08007
STANDARD FORM 1189
70G08007
TOTAL NARROWER TERMS (0002)

PERIOD OF AVAILABILITY OF APPROP

BT AVAILABILITY FOR AND LIMITATION ON APPROP
00G00400
TOTAL BROADER TERMS (0001)

NT CONSTRUCTION FUNDS
65G04117
FUTURE DELIVERY
65G01104
LEASE/RENT BEYOND FISCAL YEAR
70G11003
PASSENGER VEHICLE
60G06017
PERIODICAL SUBSCRIPTIONS
70G01034
TOTAL NARROWER TERMS (0005)

PERIODICAL SUBSCRIPTIONS

BT PERIOD OF AVAILABILITY OF APPROP
70G01034
TOTAL BROADER TERMS (0001)

NT 31 USC 530(*A)
70G01034
TOTAL NARROWER TERMS (0001)

PERSONAL PROPERTY

BT TAXATION STATE AND LOCAL
70G07011
70G07012
TOTAL BROADER TERMS (0002)

NT COST CONTRACTS
70G07011

R&D CONTRACTS
70G07012
TOTAL NARROWER TERMS

PERSONNEL CLAIMS BY AND AGAINST THE GOVT

BT PERSONNEL GENERAL
00G00800
TOTAL BROADER TERMS
NT DAMAGE TO EMPLOYEE PROPERTY
65G10029
DEBT TO U.S.
60G07068
EMPLOYEE OVERPAYMENT
70G05004
PRISONER HUMAN SUBJECT INJURY CLAIMS
70G12027
TOTAL NARROWER TERMS

PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT

BT PERSONNEL GENERAL
00G00800
TOTAL BROADER TERMS
NT COMPETITIVE SERVICE
70G08007
70G08020
CONSULTANTS
70G08011
EMPLOYMENT
65G02034
EXPERTS
70G08015
PRISONER HUMAN SUBJECT EMPLOYEE STATUS
70G12027
REDUCTION IN FORCE
70G07003
70G07008
70G07020
70G07021
70G08004
70G08017
70G08018
70G10014
RETIREMENT
65G04028
70G01016
70G11009
TRIAL RETIREMENT
70G08006
WRONGFUL TERMINATION
65G10170
TOTAL NARROWER TERMS

(0002)

(0001)

(0004)

(0001)

(0019)

PERSONNEL GENERAL

BT SECURITY PROGRAMS
65G01001
TOTAL BROADER TERMS
NT ALIENS
60G08069
65G10058
ASTRONAUTS
70G01004
EMPLOYEE MORTGAGES
60G08103
EMPLOYEE PRIVATE DEBTS
60G08001
EQUAL OPPORTUNITY
60G11065
EXCHANGE VISITOR PROGRAM
70G07017
INSURANCE
60G08044
60G09121
LOYALTY
60G07011
PERSONNEL CLAIMS BY AND AGAINST THE GOVT
00G00800
PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT
00G00800
PERSONNEL OTHER RIGHTS/OBLIGATIONS
00G00800
PERSONNEL PAY AND ALLOWANCES
00G00800
PERSONNEL STANDARDS OF CONDUCT
00G00800
TEMPORARY TRANSFERS
60G08018
TOTAL NARROWER TERMS

(0001)

(0016)

PERSONNEL OTHER RIGHTS/OBLIGATIONS

BT PERSONNEL GENERAL
00G00800
TOTAL BROADER TERMS
NT BOOK ROYALTIES
65G10113
FEDERAL ENCLAVES
65G03016
LABOR AGREEMENTS
70G01031
PERSONNEL RECORD RELEASE
70G10012
TOTAL NARROWER TERMS

(0001)

(0004)

PERSONNEL PAY AND ALLOWANCES

NASA LEGAL MICRO-THESAURUS
11/17/71 PAGE 46

PHYSICAL SECURITY

PERSONNEL PAY AND ALLOWANCES

BT PERSONNEL GENERAL
00G00800
TOTAL BROADER TERMS (0001)
NT ADVISORY COMMITTEE COMPENSATION
65G02081
BACK PAY
65G10170
CASH AWARDS
65G10098
EXECUTIVE LUNCHROOM
60G08028
EXPERTS
70G11010
HEALTH BENEFIT PROGRAM
70G07023
HOUSEHOLD GOODS
60G08130
65G04116
INSURANCE
60G07075
LEAVE
65G02173
70G09001
70G09008
MEDICAL SERVICES
65G02168
MILITARY LEAVE
60G09131
OVERSEAS EMPLOYEES
60G09033
OVERTIME PAY
65G04074
PAYROLL CHECKS
70G08007
PRISONER HUMAN SUBJECT BENEFIT STATUS
70G12027
PUBLIC DISCLOSURE
70G07015
REDUCTION IN FORCE
70G10007
SETTLEMENT COSTS
70G12002
SOCIAL SECURITY TAX
60G08018
SPACE ACT 203(*B)(2)
70G12014
TAXATION PERSONNEL
70G08013
TRAVEL ADVANCES
65G09120

TRAVEL EXPENSES

60G07078
60G11026
65G10128
TWO GRADE DIFFERENTIAL
60G11107
WAGE BOARD SCHEDULES
70G09006
TOTAL NARROWER TERMS (0030)

PERSONNEL RECORD RELEASE

BT PERSONNEL OTHER RIGHTS/OBLIGATIONS
70G10012
TOTAL BROADER TERMS (0001)
NT CIVIL SERVICE COMMISSION POLICY
70G10012
EXECUTIVE PRIVILEGE
70G10012
FREEDOM OF INFORMATION ACT
70G10012
SENATE SPACE COMMITTEE
70G10012
TOTAL NARROWER TERMS (0004)

PERSONNEL STANDARDS OF CONDUCT

BT PERSONNEL GENERAL
00G00800
TOTAL BROADER TERMS (0001)
NT CRIMINAL ACTIVITY
60G09035
FORMER EMPLOYEES
70G01023
MARITAL STATUS
60G09035
QUESTIONABLE COHABITATION
60G09035
SPECIAL EMPLOYEES
70G05009
TOTAL NARROWER TERMS (0005)

PERT SYSTEM

BT DEVIATIONS
65G01082
TOTAL BROADER TERMS (0001)

PHYSICAL SECURITY

BT SECURITY PROGRAMS
65G01001
TOTAL BROADER TERMS (0001)

POOLING

BT ANTITRUST
65G03002
TOTAL BROADER TERMS

(0001)

PREAPPOINTMENT INVESTIGATIONS

BT NASA SECURITY
65G01001
TOTAL BROADER TERMS

(0001)

PREDETERMINED FIXED O/HEAD RATE

BT COST PRINCIPLES
65G02022
TOTAL BROADER TERMS
NT COST PLUS PERCENTAGE OF COST
65G02022
TOTAL NARROWER TERMS

(0001)

(0001)

PREFERENCE

BT REDUCTION IN FORCE
70G10014
TOTAL BROADER TERMS
NT RETIRED MILITARY
70G10014
VETERANS
70G10014
TOTAL NARROWER TERMS

(0001)

(0002)

PREFERRED CREDITOR, GOVT AS

BT FISCAL GENERAL
65G04006
TOTAL BROADER TERMS
NT 31 USC 191
65G04006
TOTAL NARROWER TERMS

(0001)

(0001)

PRELIMINARY INJUNCTION

BT CLAIMS AND ADJUDICATIONS GENERAL
70G09003
SERVICE CONTRACTS
70G09003
TOTAL BROADER TERMS
NT ADMINISTRATIVE REMEDY EXHAUSTION
70G09003
IRREPARABLE INJURY
70G09003

(0002)

SERVICE CONTRACTS

70G09003
TOTAL NARROWER TERMS

(0003)

PREPROCUREMENT POLICY

BT LICENSES
70G01737
TOTAL BROADER TERMS

(0001)

PRESCRIPTIVE PERIOD EXTENSION

BT TAXATION STATE AND LOCAL
65G01021
TOTAL BROADER TERMS

(0001)

PRESIDENT'S POLICY STATEMENT

BT PATENT POLICY CONTRACTORS
65G01077
TOTAL BROADER TERMS
NT NASA IMPLEMENTATION
65G01077
TOTAL NARROWER TERMS

(0001)

(0001)

PREVAILING WAGES

BT DAVIS BACON ACT
65G02023
TOTAL BROADER TERMS

(0001)

PRIMARY LAND USE

BT OIL/GAS LEASES
65G10039
TOTAL BROADER TERMS

(0001)

PRIME ALL SITE RESPONSIBILITY

BT CONSTRUCTION BIDDING RESTRICTIONS
65G04090
TOTAL BROADER TERMS

(0001)

PRIOR TO AWARDS

BT LICENSES
70G05011
TOTAL BROADER TERMS

(0001)

PRISONER HUMAN SUBJECT BENEFIT STATUS

BT PERSONNEL PAY AND ALLOWANCES
70G12027
TOTAL BROADER TERMS

(0001)

PRISONER HUMAN SUBJECT EMPLOYEE STATUS

PROC. REG. 1.115

BT PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT
70G12027
TOTAL BROADER TERMS (0001)

BT INDEPENDENT PRICE
65G04006
TOTAL BROADER TERMS (0001)

PRISONER HUMAN SUBJECT INJURY CLAIMS

PROC. REG. 11.205

BT PERSONNEL CLAIMS BY AND AGAINST THE GOVT
70G12027
TOTAL BROADER TERMS (0001)

BT ALCOHOL AND DISTILLED SPIRITS
65G04745
TOTAL BROADER TERMS (0001)

PRIVATE ENTERPRISE

PROC. REG. 11.401-2(*D)

BT RELATIONSHIPS WITH OTHER ORGANIZATIONS
00G00300
TOTAL BROADER TERMS (0001)
NT COMMUNICATIONS SATELLITES
60G07079
COMSAT CORP.
60G11117
65G01004
65G02103
PRIVATELY SPONSORED CONFERENCES
60G08110
TOTAL NARROWER TERMS (0005)

BT REGULATIONS
70G07005
TAXATION GENERAL
70G07005
TOTAL BROADER TERMS (0002)

PROC. REG. 12.802-4

BT EQUAL OPPORTUNITY
65G04006
TOTAL BROADER TERMS (0001)

PROC. REG. 13.205-41(*A)(*I*I*I)

BT ALLOWABLE COSTS
65G01035
TOTAL BROADER TERMS (0001)

PRIVATE PUBLICATION

PROC. REG. 3.4

BT NASA REPORT
70G07016
TOTAL BROADER TERMS (0001)

BT LETTER OF INTENT
60G06039
TOTAL BROADER TERMS (0001)

PRIVATE USE

PROC. REG. 3.501(*B)(*X*I)

BT COMMUNICATIONS SATELLITES
60G07079
TOTAL BROADER TERMS (0001)

BT BUSINESS TYPE
65G04006
TOTAL BROADER TERMS (0001)

PRIVATELY SPONSORED CONFERENCES

PROC. REG. 6.104-2 AND 3

BT PRIVATE ENTERPRISE
60G08110
TOTAL BROADER TERMS (0001)
NT COST SHARING
60G08110
18 USC 1914
60G08110
5 USC 2301,2318
60G08110
TOTAL NARROWER TERMS (0003)

BT CERTIFICATIONS
65G04006
TOTAL BROADER TERMS (0001)

PROC. REG. 6.601

BT FOREIGN DEALINGS
65G04112
TOTAL BROADER TERMS (0001)

PROC. REG. 7.3

BT FIXED PRICE R&D CONTRACTS
60G06400
TOTAL BROADER TERMS (0001)
NT NASA FORM 247
60G06400
TOTAL NARROWER TERMS (0001)

PROCEDURES

BT CLAIMS (CONTRACTUAL/EXTRA CONTRACTUAL)
65G10041
TOTAL BROADER TERMS (0001)

PROCUREMENT COMMISSION

BT NASA LEGISLATIVE COMMENTS
70G01014
TOTAL BROADER TERMS (0001)
NT INDUSTRIAL R&D SUPPORT
70G01014
PROPOSAL COSTS
70G01014
TOTAL NARROWER TERMS (0002)

PROCUREMENT GENERAL

NT AIRCRAFT PROC/MAINT/OPS
60G08047
CLAIMS (CONTRACTUAL/EXTRA CONTRACTUAL)
00G00900
CONFLICT OF INTEREST
70G01039
70G10016
CONTRACT FORMATION
00G00900
CONTRACTING OFFICERS
60G11005
CONTRACTS
00G00900
FIXED PRICE R&D CONTRACTS
60G06400
FOREIGN DEALINGS
00G00900

INFORMATION RELEASE

60G06039
INSURANCE
70G12020
REGULATIONS
00G00900
SERVICE CONTRACTS
00G00900
STANDARD CONTRACT CLAUSES
00G00900
SUBCONTRACTS
00G00900
TRANSPORTATION
65G04049
TOTAL NARROWER TERMS (0016)

PROCUREMENT UNDER \$10,000

BT CONTRACT FORMATION
65G03275
TOTAL BROADER TERMS (0001)

PROFIT USE

BT CONCESSIONS
70G10017
TOTAL BROADER TERMS (0001)

PROGRESS PAYMENTS

BT CLAIMS (CONTRACTUAL/EXTRA CONTRACTUAL)
65G10042
TOTAL BROADER TERMS (0001)
NT FRAUD
65G10042
TOTAL NARROWER TERMS (0001)

PROPERTY GENERAL

NT REAL PROPERTY
00G00700
TOTAL NARROWER TERMS (0001)

PROPERTY OWNERSHIP

BT NONAPPROPRIATED FUND ACTIVITIES
70G07009
TOTAL BROADER TERMS (0001)

PROPERTY RIGHTS IN INVENTIONS

BT PATENT POLICY CONTRACTORS
60G06071

(0001)

(0001)

(0001)

(0003)

(0002)

(0001)

(0001)

NT AWARD PRIOR TO RESOLUTION
65G10028
TEMPORARY RESTRAINING ORDERS
70G97003
TIMELINESS
65G10028
70G0P019
URGENCY
70G0B019
TOTAL NARROWER TERMS

(0001)

QUALIFIED PRODUCT LIST

BT	COMPETITION	
	70G12010	
	TOTAL BROADER TERMS	(0001)

QUANTUM MERUIT

BT	UNAUTHORIZED PURCHASES	
	60G08056	
	TOTAL BROADER TERMS	(0001)

QUESTIONABLE COHABITATION

BT	PERSONNEL STANDARDS OF CONDUCT	
	60G09015	
	TOTAL BROADER TERMS	(0001)

R&D CONTRACTS

BT PERSONAL PROPERTY
70G07012
TOTAL BROADER TERMS (0001)
CONTRACTOR AS CONSUMER
70G07012
UMBRELLA USE
70G07012
TOTAL NARROWER TERMS (0002)

R&D FUND USES

BT AVAILABILITY FOR AND LIMITATION ON APPROP
70G12003
TOTAL BROADER TERMS (0001)

R&D PROCUREMENTS

BT NEGOTIATION AUTHORITY
60G06074
TOTAL BROADER TERMS (0001)
NT SOLE SOURCE PROCUREMENTS
60G06074
TOTAL NARROWER TERMS (0001)

RATIFICATION

BT UNAUTHORIZED PURCHASES
60G08056
TOTAL BROADER TERMS (0001)

REAL PROPERTY

BT PROPERTY GENERAL
60G06700
TOTAL BROADER TERMS (0001)
NT ACQUISITIONS
60G06022
60G06080
CONDEMNATION
70G09004
CONSTRUCTION
60G11007
EASEMENTS
60G01028
EXCESS DECLARATION
70G07018
GSA LEASING AUTHORITY
60G11035
LEASES
70G09007

NASA LANDING FIELD

70G11005
OIL/GAS LEASES
65G10039
SEWER INSTALLATION/MAINTENANCE
60G07045
TRANSFER TO GSA
70G07018
TOTAL NARROWER TERMS (0012)

RECEIPTS

BT EMPLOYEE WELFARE ACTIVITIES
60G06756
TOTAL BROADER TERMS (0001)
NT 36 COMP GEN 461
60G06756
TOTAL NARROWER TERMS (0001)

RECORD RELEASE

BT FREEDOM OF INFORMATION ACT
70G01032
TOTAL BROADER TERMS (0001)

RECORDING

BT 305(*D) PROCEEDINGS
70G05006
TOTAL BROADER TERMS (0001)

REDUCTION IN FORCE

BT PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT
70G07003
70G07008
70G07020
70G07021
70G08004
70G08017
70G08018
70G10014
PERSONNEL PAY AND ALLOWANCES
70G10007
SERVICE CONTRACTS
70G07003
TOTAL BROADER TERMS (0010)
NT AGE DISCRIMINATION
70G07021
BUMPING
70G08004
CAREER DEVELOPMENT PROGRAM PROTECTION
70G07021

COMPETITIVE LEVEL

70G08004
FPM CHAP 351, SUB 9
70G07008
FREEDOM OF INFORMATION ACT
70G08017
LEGAL ASSISTANCE
70G07020
MOVING EXPENSE
70G10007
PREFERENCE
70G10014
SERVICE CONTRACTS
70G07003
70G08004
TEMPORARY RESTRAINING ORDERS
70G08018
TRAINING POSITION PROTECTION
70G07021
TOTAL NARROWER TERMS

(0013)

REDUCTION TO PRACTICE

BT PATENT POLICY CONTRACTORS
60G06071
TOTAL BROADER TERMS

(0001)

REFUNDS

BT REIMBURSEMENT OF APPROP
65G04104
TOTAL BROADER TERMS
NT CONTRACTORS
65G04104
TOTAL NARROWER TERMS

(0001)

(0001)

REGISTERED MARK NASA USE

BT LANHAM ACT 32(1)
70G08011
TOTAL BROADER TERMS

(0001)

REGULAR DEALER

BT CONTRACTS
65G04006
TOTAL BROADER TERMS

(0001)

REGULATIONS

BT EXPORT CONTROL ACT
65G03211

PROCUREMENT GENERAL

00G00900
TOTAL BROADER TERMS
PROC. REG. 11.401-2(*D)
70G07005
TOTAL NARROWER TERMS

(0002)

(0001)

REIMBURSEMENT OF APPROP

BT FISCAL GENERAL
00G00400
TOTAL BROADER TERMS
NT COMSAT CORP.
60G11117
CONTRACT PENALTY FUNDS DISPOSITION
65G03076
NASA TORT CLAIMS
60G08007
REFUNDS
65G04104
STATE INSURANCE LAWS
65G02169
TOTAL NARROWER TERMS

(0001)

(0005)

REISSUE

BT LICENSES
70G12001
TOTAL BROADER TERMS

(0001)

RELATIONSHIPS WITH OTHER ORGANIZATIONS

NT FEDERAL AGENCIES
00G00300
PRIVATE ENTERPRISE
00G00300
STATE AND LOCAL GOVERNMENT
00G00300
TOTAL NARROWER TERMS

(0003)

RELEASES

BT CLAIMS AND ADJUDICATIONS GENERAL
65G02120
65G03172
STANDARD CONTRACT CLAUSES
60G11038
TOTAL BROADER TERMS
NT ASPR 7-203.4(*F)
60G11038
AUTHORITY
65G02120
TOTAL NARROWER TERMS

(0003)

(0002)

RELOCATION TAX

BT COST PRINCIPLES
70G01017
TOTAL BROADER TERMS (0001)

REMEDIES

BT CONTRACT ADJUSTMENT BOARD
65G04179
TOPT CLAIMS (INCLUDING FTCA)
60G09084
US GOVT RIGHT TO UTILIZE PATENTS
70G01027
TOTAL BROADER TERMS (0003)
EXCLUSIVE
60G09084
PUBLIC LAW 85-804
65G04179
TOTAL NARROWER TERMS (0002)

REMOVAL OF PAPERS

BT RETIREMENT
70G11009
TOTAL BROADER TERMS (0001)

RENEGOTIATION ACT

BT NASA LEGISLATIVE COMMENTS
70G01025
TOTAL BROADER TERMS (0001)
NT INTEREST RATE RAISE
70G01025
TOTAL NARROWER TERMS (0001)

REPORTING NASA ROYALTIES

BT INFRINGEMENT/ROYALTIES
60G11044
TOTAL BROADER TERMS (0001)

REPORTS

BT BOARD OF CONTRACT APPEALS
65G10002
TOTAL BROADER TERMS (0001)

REPORTS/LETTERS TO CONGRESS

BT CONGRESSIONAL MATTERS GENERAL
60G00200
TOTAL BROADER TERMS (0001)

NT COMSAT ACT ACTIVITIES
70G10002
SEMI-ANNUAL REPORT
60G09006
TOTAL NARROWER TERMS (0002)

RESEARCH

BT APPROPRIATION ACT 1971
70G01736
TOTAL BROADER TERMS (0001)

RESIDENCE WAIVER

BT ALIENS
65G10058
EXCHANGE VISITOR PROGRAM
70G07017
TOTAL BROADER TERMS (0002)

RESTRICTED DATA

BT DATA
60G07053
60G07074
UNSOLICITED PROPOSALS
60G07053
TOTAL BROADER TERMS (0003)
NT DISCLOSURE
60G07053
60G07074
IMPLIED ACCEPTANCE
60G07053
TOTAL NARROWER TERMS (0003)

RETIRED MILITARY

BT PREFERENCE
70G10014
TOTAL BROADER TERMS (0001)

RETIREMENT

BT PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT
65G04028
70G01016
70G11009
TOTAL BROADER TERMS (0003)
NT ARMED FORCES ACOUTRA CREDIT
70G01016
FORMER MILITARY PERSONNEL
65G04028

RETIREMENT
(CONT)

NASA LEGAL MICRO-THESAURUS
11/17/71 PAGE 55

ROCKET TRAFFIC

REMOVAL OF PAPERS
70G11009
TOTAL NARROWER TERMS

(0003)

RETIREMENT ANNUITY

BT TAXATION PERSONNEL
70G08013
TOTAL BROADER TERMS

(0001)

RETIREMENT CREDIT

BT TAXATION PERSONNEL
70G08013
TOTAL BROADER TERMS

(0001)

RETROACTIVE EFFECT

BT WAGE BOARD SCHEDULES
70G09006
TOTAL BROADER TERMS

(0001)

REVOCATION

BT LICENSES
70G12001
TOTAL BROADER TERMS

(0001)

RIGHTS IN DATA

BT DATA
60G11016
TOTAL BROADER TERMS
NT ASPR REQUIREMENTS
60G11016
NASA POLICY
60G11016
TOTAL NARROWER TERMS

(0001)

(0002)

ROCKET TRAFFIC

BT SPACE LAW
65G02097
TOTAL BROADER TERMS
NT AIRCRAFT DANGER
65G02097
TOTAL NARROWER TERMS

(0001)

(0001)

SAFETY

BT COAST GUARD
65G01099
TOTAL BROADER TERMS (0001)
NT VESSELS/HARBORS/PORTS
65G01099
TOTAL NARROWER TERMS (0001)

SALARY

BT DEBT TO U.S.
60G07068
TOTAL BROADER TERMS (0001)
NT SET-OFF
60G07068
TOTAL NARROWER TERMS (0001)

SALE FOR RESALE

BT COST CONTRACTS
70G07011
TOTAL BROADER TERMS (0001)

SALE TO PUBLIC

BT OFFICIAL PHOTOGRAPHS
70G07019
TOTAL BROADER TERMS (0001)

SALES/USE TAX

BT COST CONTRACTS
65G03098
TAXATION STATE AND LOCAL
60G11030
TOTAL BROADER TERMS (0002)
NT CHIEF
60G11030
TOTAL NARROWER TERMS (0001)

SATELLITE CAUSED DAMAGE

BT SPACE LAW
65G04111
TOTAL BROADER TERMS (0001)
NT LIABILITY
65G04111
TOTAL NARROWER TERMS (0001)

SCANWELL LABS* V THOMAS

BT TEMPORARY RESTRAINING ORDERS
70G07003
TOTAL BROADER TERMS (0001)

SCHOONMAKER* V RESOR

BT TEMPORARY RESTRAINING ORDERS
70G07003
TOTAL BROADER TERMS (0001)

SCOPE OF EMPLOYMENT

BT LIABILITY
60G09057
PASSENGER VEHICLE
60G09121
TOTAL BROADER TERMS (0002)

SEARCH OF PERSONS/EFFECTS

BT NASA SECURITY
70G10001
TOTAL BROADER TERMS (0001)
NT SPACE ACT 304(*A)
70G10001
TOTAL NARROWER TERMS (0001)

SECRECY REVIEW

BT INTELLECTUAL PROPERTY GENERAL
60G08067
TOTAL BROADER TERMS (0001)

SECURITY PROGRAMS

BT NASA SECURITY
65G01001
TOTAL BROADER TERMS (0001)
NT CLASSIFICATION
65G01001
PERSONNEL GENERAL
65G01001
PHYSICAL SECURITY
65G01001
TOTAL NARROWER TERMS (0003)

SELECTION PROCEDURES

BT CONTRACT FORMATION
00G00900
TOTAL BROADER TERMS (0001)

SEMI-ANNUAL REPORT

BT REPORTS/LETTERS TO CONGRESS
60G09006
TOTAL BROADER TERMS (0001)
NT SPACE ACT 206(*A)
60G09006
TOTAL NARROWER TERMS (0001)

SENATE SPACE COMMITTEE

BT PERSONNEL RECORD RELEASE
70G10012
TOTAL BROADER TERMS (0001)

SERVICE CONTRACTS

BT PRELIMINARY INJUNCTION
70G09003
PROCUREMENT GENERAL
60G00900
REDUCTION IN FORCE
70G07003
70G08004
TOTAL BROADER TERMS (0004)
NT ARCHITECT/ENGINEERS
60G0071
LEGAL RESEARCH SERVICES
70G12058
NONPERSONAL SERVICES
65G03015
PRELIMINARY INJUNCTION
70G09003
REDUCTION IN FORCE
70G07003
TOTAL NARROWER TERMS (0005)

SERVICE OF PROCESS ON NASA

BT CLAIMS AND ADJUDICATIONS GENERAL
70G07008
TOTAL BROADER TERMS (0001)

SERVICES

BT INTERAGENCY TRANSFER OF FUNDS
60G06118
TOTAL BROADER TERMS (0001)
NT SPACE ACT 203(*B)(5)&(6)
60G07118
TOTAL NARROWER TERMS (0001)

SERVICING COSTS

BT PASSENGER VEHICLE
60G06097
TOTAL BROADER TERMS (0001)

SET-OFF

BT OVERPAYMENT
60G09120
SALARY
60G07068
TERMINATION BENEFITS
60G07068
TOTAL BROADER TERMS (0003)

SETTLEMENT

BT PATENT INTERFERENCE PROCEEDINGS
70G01012
TORT CLAIMS (INCLUDING FTCA)
60G07097
UNAUTHORIZED DISCLOSURE CLAIM
70G01712
305(*D) PROCEEDINGS
70G05006
TOTAL BROADER TERMS (0004)
NT MAXIMUM AMOUNT
60G07097
TOTAL NARROWER TERMS (0001)

SETTLEMENT COSTS

BT PERSONNEL PAY AND ALLOWANCES
70G12002
TOTAL BROADER TERMS (0001)

SEVERANCE PAY

BT TAXATION PERSONNEL
70G08013
TOTAL BROADER TERMS (0001)

SEWER INSTALLATION/MAINTENANCE

BT REAL PROPERTY
60G07045
TOTAL BROADER TERMS (0001)

SMALL BUSINESS

BT CONSTRUCTION BIDDING RESTRICTIONS
65G04090
CONTRACTS
66G00900
TOTAL BROADER TERMS (0002)
NT ASPP 1.904.3(*A)
70G07006
CERTIFICATIONS
65G04036
TOTAL NARROWER TERMS (0002)

SOCIAL SECURITY TAX

BT PERSONNEL PAY AND ALLOWANCES
60G08019
TOTAL BROADER TERMS (0001)
NT FORMER MILITARY PERSONNEL
60G08018
TOTAL NARROWER TERMS (0001)

SOLE SOURCE PROCUREMENTS

BT NEGOTIATION AUTHORITY
60G06074
60G06076
RED PROCUREMENTS
60G06074
TOTAL BROADER TERMS (0003)
NT CAFETERIAS
60G06076
10 USC 2304(*A)(10)
60G06074
10 USC 2304(*A)(11)
60G06074
TOTAL NARROWER TERMS (0003)

SOLICITATION

BT GROUP LIFE
65G03163
TOTAL BROADER TERMS (0001)

SONIC BOOM

BT SPACE LAW
65G02175
TORT CLAIMS (INCLUDING FTCA)
60G09084
TOTAL BROADER TERMS (0002)

SOUTH AFRICA

BT MINITRACK STATION AGREEMENT
60G06044
60G06046
TOTAL BROADER TERMS (0002)

SPACE ACT 202(*C)

BT CONFLICT OF INTEREST
65G10143
TOTAL BROADER TERMS (0001)

SPACE ACT 203(*B)(13)

BT DAMAGE TO EMPLOYEE PROPERTY
65G10029
TOTAL BROADER TERMS (0001)

SPACE ACT 203(*B)(13)(A)

BT MAXIMUM AMOUNT
60G07097
TOTAL BROADER TERMS (0001)

SPACE ACT 203(*B)(2)

BT PERSONNEL PAY AND ALLOWANCES
70G12014
TOTAL BROADER TERMS (0001)
NT LEGISLATIVE HISTORY
70G12014
TOTAL NARROWER TERMS (0001)

SPACE ACT 203(*B)(2)(B)

BT TWO GRADE DIFFERENTIAL
60G11107
TOTAL BROADER TERMS (0001)

SPACE ACT 203(*B)(3)

BT ACQUISITIONS
60G06022
CAFETERIAS
60G06756
DUTY FREE ENTRY
60G11107
GIFT OR SALE TO FOREIGN GOVT
60G06054
INFRINGEMENT/ROYALTIES
60G11044

LOANS TO FOREIGN GOVTS
60G06054
TOTAL BROADER TERMS

(0006)

SPACE ACT 203(*B)(5)&(6)

BT DISTRIBUTION OF RECEIPTS
60G11117
LOANS TO FOREIGN GOVTS
60G06054
SERVICES
60G06118
TOTAL BROADER TERMS

(0003)

SPACE ACT 203(*C)(7)

BT LOANS TO FOREIGN GOVTS
60G06054
TOTAL BROADER TERMS

(0001)

SPACE ACT 205

BT LOANS TO FOREIGN GOVTS
60G06054
TOTAL BROADER TERMS

(0001)

SPACE ACT 206(*A)

BT SEMI-ANNUAL REPORT
60G09006
TOTAL BROADER TERMS

(0001)

SPACE ACT 304(*A)

BT SEARCH OF PERSONS/EFFECTS
70G16001
TOTAL BROADER TERMS

(0001)

SPACE ACT 305(*A)

BT INFRINGEMENT/ROYALTIES
70G01006
TOTAL BROADER TERMS

(0001)

SPACE ACT 306

BT WEAPONS
60G07020
TOTAL BROADER TERMS

(0001)

SPACE LAW

BT INTERNATIONAL GENERAL
00G00500
TOTAL BROADER TERMS (0001)
NT AEROSPACE EXHIBITION SPONSORSHIP
65G01136
BUSINESS ACTIVITY IN SPACE
70G07013
CATASTROPHIC ACCIDENTS
65G03131
CIVIL AIRCRAFT, DEFINITION
70G12015
CIVIL MILITARY RELATIONSHIPS
65G04021
CORPORATIONS ON MOON
70G01030
ROCKET TRAFFIC
65G02097
SATELLITE CAUSED DAMAGE
65G04111
SONIC BOOM
65G02175
SPACE LAW BIBLIOGRAPHY
70G10003
STATE LEGISLATION/SPACE PROGRAM
65G02167
TOTAL NARROWER TERMS (0011)

SPACE LAW BIBLIOGRAPHY

BT SPACE LAW
70G10003
TOTAL BROADER TERMS (0001)

SPACE TRAVEL

BT INTERNATIONAL AGREEMENTS
70G08008
TOTAL BROADER TERMS (0001)

SPECIAL EMPLOYEES

BT PERSONNEL STANDARDS OF CONDUCT
70G05009
TOTAL BROADER TERMS (0001)
NT CONFLICT OF INTEREST
70G05009
18 USC 201-209
70G05009
TOTAL NARROWER TERMS (0002)

SPECIFICATIONS AND STANDARDS

BT INTELLECTUAL PROPERTY GENERAL
60G09119
TOTAL BROADER TERMS (0001)
NT PATENT NOTICE
60G09119
TOTAL NARROWER TERMS (0001)

STANDARD CONTRACT CLAUSES

BT PROCUREMENT GENERAL
00G00900
TOTAL BROADER TERMS (0001)
NT DEVIATIONS
65G01082
INSPECTION
60G11039
LIMITATION OF LIABILITY
70G07005
OFFICIALS NOT TO BENEFIT
60G09081
PROPERTY RIGHTS IN INVENTIONS
60G09003
RELEASES
60G11038
STANDARD FORM 23A
60G06071
TAXATION GENERAL
70G07005
TECHNICAL DIRECTOR
60G06070
TRANSPORTATION
65G04049
TOTAL NARROWER TERMS (0010)

STANDARD FORM 1189

BT PAYROLL CHECKS
70G08007
TOTAL BROADER TERMS (0001)

STANDARD FORM 23A

BT NASA LEGISLATIVE COMMENTS
60G07073
STANDARD CONTRACT CLAUSES
60G06071
TOTAL BROADER TERMS (0002)
NT LEGISLATIVE HISTORY
60G06071
TOTAL NARROWER TERMS (0001)

STANDARD FORM 32 PROV 11(C)

BT EXCUSABLE DELAY
60G07039
TOTAL BROADER TERMS (0001)

STATE AND LOCAL GOVERNMENT

BT RELATIONSHIPS WITH OTHER ORGANIZATIONS
00G00300
TOTAL BROADER TERMS (0001)
NT FEDERAL ENCLAVES
65G03016
INSURANCE
65G03163
STATE LEGISLATION/SPACE PROGRAM
65G02167
TOTAL NARROWER TERMS (0003)

STATE INSURANCE LAWS

BT CONTRACTS
65G02169
REIMBURSEMENT OF APPROP
65G02169
TOTAL BROADER TERMS (0002)
NT CONTRACT APPLICABILITY
65G02169
TOTAL NARROWER TERMS (0002)

STATE LEGISLATION/SPACE PROGRAM

BT SPACE LAW
65G02167
STATE AND LOCAL GOVERNMENT
65G02167
TOTAL BROADER TERMS (0002)

STATUS CHANGE PRIOR TO AWARD

BT CERTIFICATIONS
65G04006
TOTAL BROADER TERMS (0001)

STIPULATIONS

BT OIL/GAS LEASES
65G10039
TOTAL BROADER TERMS (0001)
NT NON-INTERFERENCE
65G10039
TOTAL NARROWER TERMS (0001)

STUDENT TRAINEES

BT TRAVEL EXPENSES
60607078
TOTAL BROADER TERMS (0001)

STUDENT WORK STUDY PROGRAM

BT GRANTS
70605001
TOTAL BROADER TERMS (0001)

NT ADMINISTRATIVE EXPENSES
70605001
42 USC 2751 ET. SEQ.
70605001
TOTAL NARROWER TERMS (0002)

SUBCONTRACTOR DIRECT REQUEST

BT PUBLIC LAW 85-804
65604179
TOTAL BROADER TERMS (0001)

SUBCONTRACTS

BT PROCUREMENT GENERAL
00600900
TOTAL BROADER TERMS (0001)

NT DATA FURNISHED BY PRIME
70601015
TOTAL NARROWER TERMS (0001)

SUBSEQUENT AUTHORIZATIONS

BT CONSTRUCTION FUNDS
65604117
TOTAL BROADER TERMS (0001)

TARIFFS

BT FOREIGN DEALINGS
65G04112
TOTAL BROADER TERMS

(0001)

TAX LITIGATION

NT ALLOWABLE COSTS
65G01035
TOTAL BROADER TERMS

(0001)

TAXATION FEDERAL

BT TAXATION GENERAL
00G01100
TOTAL BROADER TERMS
NT APPLICABILITY TO NASA
70G02003
COMPUTER PROCUREMENT
65G02051
EXEMPTIONS
65G04745
70G10005
70G10008
TOTAL NARROWER TERMS

(0001)

(0005)

TAXATION GENERAL

BT STANDARD CONTRACT CLAUSES
70G07005
TOTAL BROADER TERMS
NT PROC. REG. 11.401-2(*D)
70G07005
TAXATION FEDERAL
00G01100
TAXATION STATE AND LOCAL
00G01100
TOTAL NARROWER TERMS

(0001)

(0003)

TAXATION PERSONNEL

BT PERSONNEL PAY AND ALLOWANCES
70G08013
TOTAL BROADER TERMS
NT RETIREMENT ANNUITY
70G08013
RETIREMENT CREDIT
70G08013
SEVERANCE PAY
70G08013
TOTAL NARROWER TERMS

(0001)

(0003)

TAXATION STATE AND LOCAL

BT TAXATION GENERAL
00G01100
TOTAL BROADER TERMS
NT COST CONTRACTS
65G03098
ESRD
65G03284
EXEMPTIONS
70G10011
IMMUNITY
65G01035
PERSONAL PROPERTY
70G07011
70G07012
PRESCRIPTIVE PERIOD EXTENSION
65G01021
SALES/USE TAX
60G11030
WAIVER
65G01021
TOTAL NARROWER TERMS

(0001)

(0009)

TECHNICAL DIRECTOR

BT STANDARD CONTRACT CLAUSES
60G06070
TOTAL BROADER TERMS

(0001)

TEMPORARY EMPLOYMENT

BT TRIAL RETIREMENT
70G08006
TOTAL BROADER TERMS

(0001)

TEMPORARY RESTRAINING ORDERS

BT CLAIMS AND ADJUDICATIONS GENERAL
70G07008
PROTESTS
70G07003
REDUCTION IN FORCE
70G08018
TOTAL BROADER TERMS
NT SCANWELL LABS* V THOMAS
70G07003
SCHOONMAKER* V RESOR
70G07003
TRANSCRIPT OF PROCEEDINGS
70G07008
TOTAL NARROWER TERMS

(0003)

(0003)

TEMPORARY TRANSFERS

BT PERSONNEL GENERAL
60G08018
TOTAL BROADER TERMS (0001)
NT EXCEEDING 6 MOS.
60G08018
NASA CIRCULAR 25, CHAP 26
60G08018
TOTAL NARROWER TERMS (0002)

TERM OF OFFICE

BT NASA ADMINISTRATOR
60G08060
TOTAL BROADER TERMS (0001)

TERMINATION

BT CONTRACTS
00G00900
TOTAL BROADER TERMS (0001)
NT EXAMINATION OF RECORDS
65G02014
TOTAL NARROWER TERMS (0001)

TERMINATION BENEFITS

BT DEBT TO U.S.
60G07068
TOTAL BROADER TERMS (0001)
NT SET-OFF
60G07068
TOTAL NARROWER TERMS (0001)

TIME EXTENSION

BT NEW EMPLOYEES
65G04116
TOTAL BROADER TERMS (0001)

TIMELINESS

BT PROTESTS
65G10028
70G08019
TOTAL BROADER TERMS (0002)

TITLE VI REGULATIONS

BT CIVIL RIGHTS ACT OF 1964
65G01049
TOTAL BROADER TERMS (0001)

TORT CLAIMS (INCLUDING FTCA)

BT CLAIMS AND ADJUDICATIONS GENERAL
00G00100
TOTAL BROADER TERMS (0001)
NT AVIATION CASES
60G09084
IMMUNITY
60G09057
INDEMNIFICATION
60G11085
70G05005
LIMITATION OF ACTIONS
70G11008
PASSENGER VEHICLE
60G09057
REMEDIES
60G09084
SETTLEMENT
60G07097
SONIC BOOM
60G09084
WRONGFUL DEATH
70G01037
TOTAL NARROWER TERMS (0010)

TRADE SECRETS

BT INTELLECTUAL PROPERTY GENERAL
00G00600
TOTAL BROADER TERMS (0001)
NT UNAUTHORIZED DISCLOSURE CLAIM
70G01712
TOTAL NARROWER TERMS (0001)

TRADEMARKS

BT INTELLECTUAL PROPERTY GENERAL
00G00600
TOTAL BROADER TERMS (0001)
NT LANHAM ACT 32(1)
70G09011
NASA ACRONYM AS TRADEMARK
70G12023
TOTAL NARROWER TERMS (0002)

TRAINING POSITION PROTECTION

BT REDUCTION IN FORCE
70G07021
TOTAL BROADER TERMS (0001)

TRANSCRIPT OF PROCEEDINGS

BT TEMPORARY RESTRAINING ORDERS
70G07008
TOTAL BROADER TERMS

(0001)

TRANSFER TO GSA

BT REAL PROPERTY
70G07018
TOTAL BROADER TERMS

(0001)

TRANSPORTATION

BT HOUSEHOLD GOODS
60G08130
PROCUREMENT GENERAL
65G04049
STANDARD CONTRACT CLAUSES
65G04049
TOTAL BROADER TERMS
CARGO PREFERENCE ACT
65G04049
TOTAL NARROWER TERMS

(0003)

NT
TOTAL NARROWER TERMS

(0001)

TRAVEL ADVANCES

BT PERSONNEL PAY AND ALLOWANCES
60G09120
TOTAL BROADER TERMS
OVERPAYMENT
60G09120
TOTAL NARROWER TERMS

(0001)

(0001)

TRAVEL EXPENSES

BT EXPERTS
65G04248
OVERSEAS EMPLOYEES
60G09083
PASSENGER VEHICLE
60G06097
PERSONNEL PAY AND ALLOWANCES
60G07078
60G11026
65G10128
WITNESSES
65G04248
TOTAL BROADER TERMS
EMPLOYEE FUNERALS
65G10128

(0007)

NEW EMPLOYEES

60G07078
60G11026
STUDENT TRAINEES
60G07078
TOTAL NARROWER TERMS

(0004)

TRIAL RETIREMENT

BT PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT
70G08006
TOTAL BROADER TERMS
NT TEMPORARY EMPLOYMENT
70G08006
TOTAL NARROWER TERMS

(0001)

(0001)

TWO GRADE DIFFERENTIAL

BT PERSONNEL PAY AND ALLOWANCES
60G11107
TOTAL BROADER TERMS
NT SPACE ACT 203(*B)(2)(B)
60G11107
TOTAL NARROWER TERMS

(0001)

(0001)

UK

BT MINITRACK STATION AGREEMENT
60G06046
TOTAL BROADER TERMS (0001)

ULTRA VIOLET SURVEY

BT INTERNATIONAL AGREEMENTS
60G06094
TOTAL BROADER TERMS (0001)
NT AUSTRALIA
60G06094
TOTAL NARROWER TERMS (0001)

UMBRELLA USE

BT R&D CONTRACTS
70G07012
TOTAL BROADER TERMS (0001)

UNAUTHORIZED DISCLOSURE CLAIM

BT TRADE SECRETS
70G01712
TOTAL BROADER TERMS (0001)
NT SETTLEMENT
70G01712
TOTAL NARROWER TERMS (0001)

UNAUTHORIZED PURCHASES

BT CONTRACT FORMATION
60G08056
TOTAL BROADER TERMS (0001)
NT QUANTUM MERUIT
60G08056
PATIFICATION
60G08056
TOTAL NARROWER TERMS (0002)

UNIFORM LAWS

BT CLAIMS AND ADJUDICATIONS GENERAL
65G02013
TOTAL BROADER TERMS (0001)
NT CATASTROPHIC ACCIDENTS
65G02013
TOTAL NARROWER TERMS (0001)

UNION SHOPS

BT CONSTRUCTION BIDDING RESTRICTIONS
65G04090
TOTAL BROADER TERMS (0001)

UNSOLICITED PROPOSALS

BT DATA
60G07053
TOTAL BROADER TERMS (0001)
NT EVALUATION
60G07053
RESTRICTED DATA
60G07053
TOTAL NARROWER TERMS (0002)

UPDATING INVESTIGATIONS

BT NASA SECURITY
65G01001
TOTAL BROADER TERMS (0001)

UPDATING PROCEDURES

BT NASA SECURITY
65G01001
TOTAL BROADER TERMS (0001)

URGENCY

BT PROTESTS
70G08019
TOTAL BROADER TERMS (0001)

US AS SELF INSURER

BT INSURANCE
70G12020
TOTAL BROADER TERMS (0001)

US DISTRICT COURT

BT JURISDICTION
70G07008
TOTAL BROADER TERMS (0001)

US GOVT RIGHT TO UTILIZE PATENTS

BT LICENSES
70G01027
TOTAL BROADER TERMS (0001)

US GOVT RIGHT TO UTILIZE PATENTS
(CON'T)

NASA LEGAL MICRO-THESAURUS
11/17/71 PAGE 66

USE TAXES

NT REMEDIES
70G01027
TOTAL NARROWER TERMS

(0001)

USE TAXES

BT COST CONTRACTS
65G03098
TOTAL BROADER TERMS

(0001)

VAGUENESS

BT	CONTRACTS	
	60G07109	
	TOTAL BROADER TERMS	(0001)

VESSELS/HARBORS/PORTS

BT	SAFETY	
	65G01049	
	TOTAL BROADER TERMS	(0001)

VETERANS

BT	PREFERENCE	
	70G10014	
	TOTAL BROADER TERMS	(0001)

VOTING RIGHTS

BT	FEDERAL ENCLAVES	
	65G03016	
	TOTAL BROADER TERMS	(0001)

WAGE BOARD EMPLOYEE

BT PATENT POLICY EMPLOYEES
70G01001
TOTAL BROADER TERMS (0001)

WAGE BOARD SCHEDULES

BT PERSONNEL PAY AND ALLOWANCES
70G09006
TOTAL BROADER TERMS (0001)
NT RETROACTIVE EFFECT
70G09006
5 USC 5341(*C)
70G09006
TOTAL NARROWER TERMS (0002)

WAIVER

BT ADVISORY COMMITTEE COMPENSATION
65G02081
BUY AMERICAN
70G05003
EMPLOYEE OVERPAYMENT
70G05004
EXCUSABLE DELAY
60G07039
IMMUNITY
60G09057
MILLER ACT
60G11107
TAXATION STATE AND LOCAL
65G01021
TOTAL BROADER TERMS (0007)
NT 41 USC 10(*A)
70G05003
TOTAL NARROWER TERMS (0001)

WAIVER AGAINST GOVT

BT NASA EMPLOYEES
70G05010
TOTAL BROADER TERMS (0001)
NT COMPENSATION
70G05010
18 USC 203
70G05010
18 USC 205
70G05010
TOTAL NARROWER TERMS (0003)

WAIVER OF APPEAL

BT ENFORCEMENT
70G05008
TOTAL BROADER TERMS (0001)

WALSH HEALEY

BT DEVIATIONS
65G01082
TOTAL BROADER TERMS (0001)

WEAPONS

BT AWARDS
60G07020
TOTAL BROADER TERMS (0001)
NT SPACE ACT 306
60G07020
TOTAL NARROWER TERMS (0001)

WELFARE/RECREATION ACTIVITIES

BT NONAPPROPRIATED FUND ACTIVITIES
70G08012
TOTAL BROADER TERMS (0001)
NT COMPETITION WITH PRIVATE ENTERPRISE
70G08012
TOTAL NARROWER TERMS (0001)

WHITE HOUSE QUESTIONNAIRE

BT ENVIRONMENTAL POLLUTION
70G01021
TOTAL BROADER TERMS (0001)

WITNESSES

BT CLAIMS AND ADJUDICATIONS GENERAL
65G04248
TOTAL BROADER TERMS (0001)
NT TRAVEL EXPENSES
65G04248
TOTAL NARROWER TERMS (0001)

WORK HOURS VIOLATIONS

BT CONTRACT PENALTY FUNDS DISPOSITION
65G03076
TOTAL BROADER TERMS (0001)

WRONGFUL DEATH

WRONGFUL DEATH

BT	TORT CLAIMS (INCLUDING FTCA)	
	70G01037	
	TOTAL BROADER TERMS	(0001)

WRONGFUL TERMINATION

BT	BACK PAY	
	65G10170	
	PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT	
	65G10170	
	TOTAL BROADER TERMS	(0002)
NT	BACK PAY	
	65G10170	
	TOTAL NARROWER TERMS	(0001)

WUNDERLICH ACT

BT	ARBITRATION	
	70G07002	
	TOTAL BROADER TERMS	(0001)
NT	41 USC 321	
	70G07002	
	TOTAL NARROWER TERMS	(0001)

10 USC 2304(*A)(10)

BT SOLE SOURCE PROCUREMENTS
60G06074
TOTAL BROADER TERMS

(0001)

10 USC 2304(*A)(11)

BT NEGOTIATION AUTHORITY
60G08052
SOLE SOURCE PROCUREMENTS
60G06074
TOTAL BROADER TERMS

(0002)

10 USC 2306(*B)

BT CONTINGENT FEES
65G04006
TOTAL BROADER TERMS

(0001)

10 USC 2306(*D)

BT ARCHITECT/ENGINEERS
60G08071
TOTAL BROADER TERMS

(0001)

10 USC 2306(*F)

BT CERTIFICATIONS
65G04006
TOTAL BROADER TERMS

(0001)

10 USC 2310

BT NEGOTIATION AUTHORITY
65G01033
TOTAL BROADER TERMS

(0001)

12 USC 78*H-1

BT EMPLOYEE MORTGAGES
60G08103
TOTAL BROADER TERMS

(0001)

18 USC 1914

BT PRIVATELY SPONSORED CONFERENCES
60G08110
TOTAL BROADER TERMS

(0001)

18 USC 201-209

BT SPECIAL EMPLOYEES
70G05009
TOTAL BROADER TERMS

(0001)

18 USC 203

BT WAIVER AGAINST GOVT
70G05010
TOTAL BROADER TERMS

(0001)

18 USC 203(*A)

BT FORMER EMPLOYEES
70G01023
TOTAL BROADER TERMS

(0001)

18 USC 205

BT WAIVER AGAINST GOVT
70G05010
TOTAL BROADER TERMS

(0001)

18 USC 207(*A)

BT FORMER EMPLOYEES
70G01023
TOTAL BROADER TERMS

(0001)

18 USC 207(*B)

BT FORMER EMPLOYEES
70G01023
TOTAL BROADER TERMS

(0001)

18 USC 701

BT NASA INSIGNIA USE
65G04069
TOTAL BROADER TERMS

(0001)

1963 PROPOSED REVISIONS

BT PATENT POLICY CONTRACTORS
70G07001
PATENT POLICY EMPLOYEES
70G07001
TOTAL BROADER TERMS

(0002)

20 USC 107

BT	BLIND PERSON VENDING STANDS	
	70G11002	
	TOTAL BROADER TERMS	(0001)

28 USC 1498(*A) AND (*B)

BT	INTELLECTUAL PROPERTY GENERAL	
	70G01013	
	TOTAL BROADER TERMS	(0001)
NT	COURT DECISIONS	
	70G01013	
	LEGISLATIVE HISTORY	
	70G01013	
	TOTAL NARROWER TERMS	(0002)

28 USC 2672

BT	MAXIMUM AMOUNT	
	60G07097	
	TOTAL BROADER TERMS	(0001)

305(*D) PROCEEDINGS

BT	PATENT POLICY CONTRACTORS	
	70G05006	
	TOTAL BROADER TERMS	(0001)
NT	RECORDING	
	70G05006	
	SETTLEMENT	
	70G05006	
	TOTAL NARROWER TERMS	(0002)

31 USC 191

BT	PREFERRED CREDITOR, GOVT AS	
	65G04006	
	TOTAL BROADER TERMS	(0001)

31 USC 530(*A)

BT	PERIODICAL SUBSCRIPTIONS	
	70G01034	
	TOTAL BROADER TERMS	(0001)

35 USC 102(*B)

BT	INFRINGEMENT/ROYALTIES	
	70G01006	
	TOTAL BROADER TERMS	(0001)
NT	EXPERIMENTAL SALES	
	70G01006	
	TOTAL NARROWER TERMS	(0001)

35 USC 181-RR

BT	INVENTION SECRECY ACT 1951	
	60G06071	
	TOTAL BROADER TERMS	(0001)

36 COMP GEN 461

BT	RECEIPTS	
	60G06756	
	TOTAL BROADER TERMS	(0001)

41 USC 10(*A)

BT WAIVER
70G05003
TOTAL BROADER TERMS

(0001)

41 USC 10(*A)-(*D)

BT DUTY FREE ENTRY
65G04112
TOTAL BROADER TERMS

(0001)

41 USC 14

BT ACQUISITIONS
60G06022
TOTAL BROADER TERMS

(0001)

41 USC 321

BT WUNDERLICH ACT
70G07002
TOTAL BROADER TERMS

(0001)

42 USC 1855(*F)

BT CONTRACT FORMATION
70G08014
TOTAL BROADER TERMS

(0001)

42 USC 2462

BT FORMER EMPLOYEES
70G01023
TOTAL BROADER TERMS

(0001)

42 USC 2473(*B)(12)

BT NASA TORT CLAIMS
60G08007
TOTAL BROADER TERMS

(0001)

42 USC 2473(*B)(13)

BT LIABILITY
65G04111
TOTAL BROADER TERMS

(0001)

42 USC 2751 ET. SEQ.

BT STUDENT WORK STUDY PROGRAM
70G05001
TOTAL BROADER TERMS

(0001)

47 USC 721(*D)

BT COMSAT CORP.
65G01004
TOTAL BROADER TERMS

(0001)

49 USC 1404

BT AIRCRAFT LESSORS
70G09005
TOTAL BROADER TERMS

(0001)

5 USC 150

BT PUBLIC HEALTH SERVICE CONSULTATION
65G02168
TOTAL BROADER TERMS (0001)

5 USC 2301,2318

BT PRIVATELY SPONSORED CONFERENCES
60G08110
TOTAL BROADER TERMS (0001)

5 USC 5341(*C)

BT WAGE BOARD SCHEDULES
70G09006
TOTAL BROADER TERMS (0001)

5 USC 5724(*A)

BT MOVING EXPENSE
70G10007
TOTAL BROADER TERMS (0001)

5 USC 78(*B)

BT AIRCRAFT PROC/MAINT/OPS
60G08047
TOTAL BROADER TERMS (0001)

5 USC 78(*C)(*I)

BT LIMITATION OF PRICE
60G06097
TOTAL BROADER TERMS (0001)

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NASA LEGAL MICRO-THESAURUS
11/17/71 PAGE 75

8 USC 1447(*C)

8 USC 1447(*C)

BT NATURALIZATION WAITING PERIOD
60608069
TOTAL BROADER TERMS

(0001)

APPENDIX D
LIBRARY ACQUISITION REPORT

A. Introduction

In accordance with the requirements set forth in Task 2.2 of the contract, major sources of aerospace law material were identified including holdings by federal agencies, law libraries and private collections. Existing bibliographies were identified and collected, and used as a source of information of the majority of aerospace law material in existence.

The purpose of this section of the Report is to summarize ODSI's efforts in this area including the identification of the bibliographies, a listing of the sources of aerospace law material, and a listing of legal documents for acquisition by the NASA Law Library. Further, availability and accessibility of this material is presented along with the cost associated with the acquisition process, including a recommendation as to whether or not specific documents should be included as an original source or a microfilm copy.

B. Collections of Aerospace Law Material

As a consequence of the interviews conducted to ascertain user needs, it was possible to categorize existing collections of space law material into one of two types of collections: the first are law libraries which contain a great deal of space law material but are not necessarily organized as separate space law collections, and the second are

private collections of "space lawyers" and space law organizations which contain nothing but space law material. The information gathered from the survey, coupled with ODSI's own knowledge of existing collections, resulted in the following list of organizations and individuals having significant space law "collections" in their possession:

- ⊙ Library of Congress
- ⊙ Congressional Research Service/Mrs. Eilene Galloway
- ⊙ NASA Library
- ⊙ U. S. Supreme Court Library
- ⊙ Federal Bar Association Library
- ⊙ COMSAT Library
- ⊙ Federal Communications Commission Library
- ⊙ Federal Aviation Administration Library
- ⊙ American Bar Foundation
- ⊙ American Society of International Law
- ⊙ Institute de Droit International
- ⊙ The David Davies Memorial Institute of International Studies
- ⊙ University of Oklahoma Law Library
- ⊙ University of California - Davis Law Library
- ⊙ University of Santa Clara Law Library
- ⊙ McGill University Institute of Air and Space Law
- ⊙ Southern Methodist University Institute of Aerospace Law
- ⊙ Dr. Jerome Morenoff's collection
- ⊙ Professor S. Houston Lay's collection

- ⊙ Professor Howard Taubenfeld's collection
- ⊙ Professor Mortimer Schwartz's collection
- ⊙ Dean George Alexander's collection
- ⊙ Judge Harold Berger's collection
- ⊙ Mr. Andrew Haley Jr.'s collection
- ⊙ Mr. Herbert Reis's collection (U.N. documents)
- ⊙ Mrs. Lee Love's collection (U.N. documents)
- ⊙ Dr. Eugene Pepin's collection
- ⊙ Dr. M. Kaltenecher's collection
- ⊙ Dr. M Boureley's collection

The majority of these collections listed above are sparse, incomplete, poorly organized and difficult to categorize. A case in point is the collection of documents at McGill University's Institute of Air and Space Law. One space law "expert" reported that McGill's Library was in such a state that it was impossible to complete his research there. Another example is the collection of the American Bar Foundation. NASA sponsored the ABF to prepare a study on "The Law Relating to Activities of Man in Space", edited by Professors Lay and Taubenfeld. It was learned that the great majority of documents and sources collected were lost or misplaced upon termination of the study and other than some material which Professors Lay and Taubenfeld retained, the collected documents are not now available.

Despite these problems, it is estimated that the significant body of documents which will constitute the NASA Law Library Collection are available in the Washington, D.C. Metropolitan area, primarily through resources of the Library of Congress, the Congressional Research Service, the Federal Bar Association Library, private collections of Dr. Jerome Morenoff, Andrew Haley Jr., Mrs. Eilene Galloway, and Judge Harold Berger, and the U.N. Document collection of Mr. Herbert Reis and Mrs. Lee Love. Materials relating to communications activities can be found at the COMSAT and FCC Libraries and Foreign Documents not readily available in the U.S., can be obtained through arrangement with ELDO/ESRO and the Institut de Droit International in France.

Most of the material to be contained in the system is listed in the following sources:

- Periodical Indexes, Guides, and Other Reference Works

The more important legal and political indexes and reference guides are:

- Index to Foreign Legal Periodicals
- Index to Legal Periodicals
- Index to Periodicals Related to Law
- Index to Publications (RAND Corporation)
- Index to United Nations Documents
- Monthly Catalog of United States Government Publications
- American Journal of International Law
(Quarterly bibliographies)
- Journal of Air Law and Commerce (Quarterly bibliographies)

Useful non-legal indexes and reference guides are:

Air University Periodical Index
Bulletin of the Public Affairs Information
Service
International Index to Periodicals
International Political Science Abstracts
Index to the Times (London)
New York Times Index
Reader's Guide to Periodical Literature
The Current Digest of the Soviet Press
East European Accessions List
Monthly List of Russian Accessions (a
monthly record of monographic and periodi-
cal publications received by the Library
of Congress from these Communist nations.)

- Non-Legal Periodicals for Lawyers Interested in
Policy Background and Global Implications of
National Space Research Programs

The following periodicals are among the best
published in the English language:

Air Force/Space Digest (monthly)
Air Force Association
1750 Pennsylvania Avenue, N.W.
Washington, D. C. 20006

Air University Periodical Index (Quarterly)
Air University, Maxwell AFB, Alabama

Astronautics and Aeronautics (Monthly)
Journal of Spacecraft and Rockets (Monthly)
AIAA Bulletin (Monthly)
AIAA Journal (Monthly)
American Institute of Aeronautics and
Astronautics
1290 Sixth Avenue
New York, New York 10019

Aviation Week and Space Technology (Weekly)
Space Technology International (Quarterly)
McGraw-Hill Publishing Company
330 West 42nd Street
New York, New York 10036

Journal of the British Interplanetary
Society (Bi-monthly)
Spaceflight (Monthly)
British Interplanetary Society
12 Bessborough Gardens
London, S.W.1, England

Broadcasting (Business Weekly of Television
and Radio)
1735 DeSales Street, N. W.
Washington, D. C. 20006

Missile/Space Daily (Daily)
Technology Week, including Missiles and
Rockets (Weekly)
American Aviation Publications, Inc.
1001 Vermont Avenue, N.W.
Washington, D. C. 20006

Space Business Daily
Space Business Weekly
1426 G Street, N. W.
Washington, D. C. 20005

Space/Aeronautics (Monthly)
Conover-Mast Publications, Inc.
205 East 42nd Street
New York, New York 10017

Space World (Monthly)
Palmer Publications, Inc.
P. O. Box 388
Amherst, Wisconsin 54406

Telecommunications Journal (Monthly)
International Telecommunications Union (ITU)
Place des Nations
1211 Geneva 20, Switzerland

Telecommunications Reports (Weekly)
1208-1216 National Press Building
Washington, D. C. 20004

C. Bibliographies of Aerospace Law Material

In the past, many efforts have been made to compile bibliographies of known space law documents but none have been very successful because of the limited resources available to the compiler or because the bibliography terminated with its publication and no effort was made to update the work.

Perhaps the most comprehensive bibliography compiled to date was included as an appendix to the NASA sponsored American Bar Foundation Study "The Law Relating to Activities of Man in Space." The contents of the bibliography are referenced below in Appendix D(1).

Appendix D(1)

"Colloquia, Symposia, and Collections of Articles on Space Law," compiled by K.A. Finch and H.P. Kehrberger in "A Guide to the Study of the Legal and Political Aspects of Space Exploration including a Selective Topical Bibliography" extracted from "The Law Relating to Activities of Man in Space" by S. Houston Lay and Howard J. Taubenfeld, American Bar Foundation Study, the University of Chicago Press, 1970.

Other bibliographies listed in the American Bar Foundation Study include:

General Bibliographies on Space Law

"A Guide to the Study of Space Law: Including a Selective Bibliography on the Legal and Political Aspects of Space," compiled by J.C. Hogan, 5 Saint Louis University Law Journal 79-133 (Spring 1958).

RAND Report P-1290 (Santa Monica, California, RAND Corporation, 1958), 59 p. Reprinted in full at pp. 291-345, "Space Law: A Symposium," Senate Special Committee on Space and Astronautics, 85th Congress, 2d Session, December 31, 1958, Committee Print (Washington: Government Printing Office, 1959); and in part at pp. 330-44, Legal Problems of Space Exploration: A Symposium, Senate Committee on Aeronautical and Space Sciences, 87th Congress, 1st Session, March 22, 1961, Senate Document No. 26 (Washington: Government Printing Office, 1961), 1967 GPO Catalog No. 87-1: Senate Document 26. (The latter work is hereinafter referred to as 1961

Senate Symposium.)

"Bibliography of Space Law," compiled by K.A. Finch, R.C. Hagan et al., at pp. 37-60 in Survey of Space Law, Staff Report of House Select Committee on Astronautics and Space Exploration, 86th Congress, 1st Session, House Document No. 89 (Washington: Government Printing Office, 1959), 1967 GPO Catalog No. 86-1: House Document No. 89. The above-cited sources are acknowledged by L. Lipson and N. deB. Katzenbach in their bibliography at pp. 155-78 in The Law of Outer Space (Chicago: American Bar Foundation, 1961), reprinted at pp. 954-82 in 1961 Senate Symposium.

"Guides to the Study of Communist Views on the Legal Problems of Space Exploration and a Bibliography", compiled by R.D. Crane, at pp. 1011-36 in 1961 Senate Symposium.

"Selected References on the Legal Problems of Space Exploration," compiled by K.A. Finch, at pp. 1329-92 in 1961 Senate Symposium. Revised and reprinted as "Space Law Bibliography," Air Force Pamphlet 110-14, July 20, 1961 (Washington, Department of the Air Force, 1961), 79p.

World Bibliography of Space Law, compiled by M. Smirnoff (Belgrade, Institut za medunarodnu politiku i privredu, 1962), 162 p. (This covers the principal works published from 1910 to the end of 1959, with titles translated into English and Serbo-Croatian).

Worldwide Bibliography for Year 1964 of Space Law and Related Matters, compiled by the International Institute of Space Law of the International Astronautical Federation, edited by E. Pepin, IISL Bibl. No. 1 (Paris, IAF Secretariat, 1965), 33 p.; No. 2, 1966, 64 p.; No. 3, 1967, 43 p.; No. 4, 1968, 48p.

Legal and Political Implications of Space Research, compiled by H.P. Kehrberger (Hamburg, Verlag Weltarchiv GmbH., 1965), 421 p. (A bibliography of materials published through 1965 on space law and associated political, military, economical and socio-technological aspects of astronautics, contains 6421 citations, and covers literature from 55 nations in 30 languages, with titles translated into English.)

International Space Bibliography, Outer Space Affairs Group of the Secretariat of the United Nations: U.N. Doc. No. A/AC.105/33, December 1966, 166p. Thirty-five

member states have provided a comprehensive list of books published in their individual countries dealing in general with space exploration, international cooperation in space activities, the impact and economic, social, political, and legal implications of space activities. English titles in translation are provided."

As previously indicated, each of the bibliographies listed above are one-time compilations, with the exception of the bibliography prepared by the International Institute of Space Law (of the International Astronautical Federation). A genuine attempt has been made by this organization to publish annually a "Worldwide" bibliography of space law related documents. The Foreword to the first "Worldwide Bibliography" for the year 1964 concisely states their goals as follows:

"The Board of Directors of the International Institute of Space Law decided, on March 6, 1965, to prepare yearly, as a periodical publication of the Institute, a WORLDWIDE BIBLIOGRAPHY of books and articles on space law and related matters published during the preceding year; it also decided that the first issue of the series should concern the year 1964 and should be published as soon as possible in 1965.....

The present Bibliography contains 369 references to books and to articles of 133 periodicals, published in 27 different countries, and also to papers presented to international or national meetings or conferences. Titles appear in their original languages, but titles in other languages than French or English are also translated into one of these two languages.

In order to facilitate researchers, the references have been grouped... by subject matters... complemented by three Annexes: 1. Documents of United Nations; 2. International (Multilateral and Bilateral) agreements; 3. Reviews of previously published books..."

The completeness of these bibliographies is currently under review and if it proves accurate and useful, it could serve as a valuable input to NASA's proposed Library Information System. The Worldwide Bibliographies for the years 1964-1969 are referenced below in Appendix D(2).

Appendix D(2)

"Worldwide Bibliography for the Year 1964 of Space Law and Related Matters" compiled by the International Institute of Space Law of the International Astronautical Federation.

Same citation for Years 1965-1969.

Other bibliographies cited in the American Bar Foundation Study have been collected and are referenced below in Appendices D(3)-D(5).

Appendix D(3)

"Selected References on the Legal Problems of Space Exploration," compiled by K.A. Finch, at pp. 1329-92 in 1961 Senate Symposium.

Appendix D(4)

"Guides to the Study of Communist Views on the Legal Problems of Space Exploration and a Bibliography," compiled by R.D. Crane, at pp. 1011-36 in 1961 Senate Symposium.

Appendix D(5)

"Bibliography of Space Law," compiled by K.A. Finch, R.C. Hagon et al., at pp. 37-60 in Survey of Space Law, Staff Report of House Select Committee on Astronautics and Space Exploration, 86th Congress, 1st Session, House Document No. 89 (Washington: Government Printing Office, 1959), 1967 GPO Catalog No. 86-1, House Document No. 89. The above-cited sources are acknowledged by L. Lipson and N. deB. Katzenbach in their bibliography at pp. 155-78 in The Law of Outer Space (Chicago: American Bar Foundation, 1961), reprinted at pp. 954-82 in 1961 Senate Symposium.

Other bibliographies not previously referenced are included below in Appendices D(6)-D(13) for completeness:

Appendix D(6)

"Selected Bibliography," compiled by G.W. Jenks, at pp. 463-469 in Space Law, 1969, Frederick A. Praeger publishers.

Appendix D(7)

"Bibliography", compiled by M. Seara Vazquez, at pp. 255-283 in Cosmic International Law, 1965, Wayne State University Press.

Appendix D(8)

"Bibliographies and Books", compiled by Rene H. Mankiewicz, Editor-in-Chief, Yearbook of Air and Space Law, 1965, at pp. 695-705, McGill University Press, 1967.

Appendix D(9)

"Bibliography of Aerospace Law Writings 1931-1967", compiled by John Cobb Cooper, Explorations in Aerospace Law, at pp. 459-465, McGill University Press, 1968.

Appendix D(10)

"Bibliographies of Space Law Literature", compiled by Andrew G. Haley at pp. 528-539, Appleton-Century-Crofts, 1963.

Appendix D(11)

"Soviet Attitude Toward Law of Outer Space", by Dowas Krivickas and Armins Ruisis, at pp. 453-505, in Soviet Space Programs, 1966-70, Staff Report prepared for the use of the Committee on Aeronautical and Space Sciences, U.S. Senate by the Science Policy Research Division and Foreign Affairs Division of the Congressional Research Service of the Law Library, Library of Congress, December 9, 1971.

Appendix D(12)

"Bibliography", compiled by Nicolas Mateesco Matte, at pp. 467-478, in Aerospace Law, Sweet and Maxwell Limited, 1969.

Appendix D(13)

"Selected Bibliography", compiled by Maxwell Cohen, at pp. 189-211, in Law and Politics in Space, McGill University Press, 1964.

Appendix D(14)

"Selected References on the Treaties on Outer Space", compiled by the Congressional Research Service, Library of Congress, January, 1971.

D. Acquisition of Aerospace Law Material

As previously noted, the space law "experts" were of the opinion that material should be gradually acquired on a time phased basis by the NASA Law Library to insure a uniform high quality. Most felt that the materials referenced above in Appendix D(1), "Colloquia, Symposia, and Collections of Articles on Space Law" as contained in the American Bar Foundation Study "The Law Relating to Activities of Man in Space" should form the basis for a solid initial collection of a NASA Space Law Library. These documents, coupled with recent writings in this field of law, represent ODSI's preliminary listing of legal documents for acquisition by NASA. A listing of U.N. Documents to be included in the system is being compiled with the help of Mr. Herbert Reis and will be made available upon completion. Relevant international laws, agreements, etc. suitable for inclusion into the system, will be provided in a later phase of the contractual effort.

The availability of these documents in the Washington, D.C./New York City areas facilitate their incorporation as part of the overall system. Certainly all of the materials constituting the Space Law Library should be microfilmed in accordance with standard NASA/RECON procedures. Costs associated with microfilming average approximately \$0.008/frame for commercial rates.

It is further recommended that NASA obtain as original sources, all books, proceedings of symposiums and colloquims, and U.S. Government Publications. Congressional documents, hearings, and reports are published by the U.S. Government Printing Office (GPO), Washington, D.C., as are the publications of other government agencies, unless otherwise specified. The "Monthly Catalog of United States Government Publications" annually list Depository libraries in the September issue. The catalog contains complete information on how to order publications, price and catalog number, whether the document is for sale from the Superintendent of Documents or being distributed by the Issuing Office, i.e., the Congressional Committee, or the House or Senate Document Room, or government agencies, and finally indicates whether the document has been sent to so-called Depository Libraries. Over 500 university, college, and public libraries are currently designated by Congress as repositories for government publications.

Addendum to
Phase I Final Report

DETAILED SUMMARIES OF SELECTED
INTERVIEWS WITH SPACE LAW EXPERTS

Professor Mortimer Schwartz
Law Library
University of California, Davis

Professor Schwartz is an internationally recognized expert in space law. He has achieved recognition by editing the annual symposiums of the International Institute of Space Law. Prior to his current position, Professor Schwartz was in charge of the Law Library at the University of Oklahoma where he collected for the Library a modest space law collection of approximately 500 documents. He did not think he could provide me with a listing of these documents because they were not catalogued systematically. He further noted that the collection at Oklahoma has remained dormant since his departure.

He was enthusiastic about the proposed space law information system which I described to him. He said that several years ago he attempted a similar project for the Aerospace Medical Division/USAF at San Antonio but it never got off the ground due to lack of funding. At Davis, he is compiling another modest space law collection, bibliographic data of which will be available and in a form compatible with the Library of Congress' MARK System.

With respect to the International Institute of Space Law Symposiums, he noted that 500 copies are printed and sold annually. The largest subscribers were aerospace industrial

corporations and U.S. government agencies. He was confident that the same user community would desire copies of whatever permanent output the proposed space law information system could produce. He was in favor of a master book containing abstracts of all space law documents and provisions for a loose leaf updating service either once or twice a year.

We discussed at length the categorization of material for the proposed system and his comments were incorporated in the preliminary design. He noted that the main collections of space law material was probably at the Library of Congress and the American Bar Foundation. Bibliographies would be available from the International Institute of Space Law and the American Bar Foundation study. He felt close cooperation with European organizations dealing with space law material would be important if the system were to be complete. However, he further noted that most European material to date has not been useful.

Professor Schwartz was anxious to maintain an active interest in the project and volunteered to be of any assistance required.

Professor S. Houston Lay
California Western University
San Diego, California

Professor Lay is a internationally recognized expert in space law. His most recent accomplishment in this area was his co-authorship with Professor Taubenfeld of "The Law Relating to Activities of Man in Space", an American Bar Foundation Study published in accordance with NASA contract NSR-041-001. He was enthusiastic about the proposed space law information system and noted that several years ago he urged Paul Dembling, then General Counsel of NASA, to initiate work on a similar project.

Professor Lay believed that the important foreign inputs to the system would come from the French, Germans, Russians and Japanese but that material from Spanish authors was generally uninformative. He did emphasize the importance of foreign material to the system, noting the fact that it reflects trends and possible indicators of impending actions on the part of their respective nations. He saw foreign documents as an intelligence indicator in this respect.

Professor Lay has approximately 1,000 space law documents of his own, but they are not catalogued or co-located. He felt that the Library of Congress would be the best source for all related material. He regretfully noted that most of the material collected for the American Bar Foundation study

had been misplaced or lost in shipping. Other modest collections could be found at McGill University, Yale Law School (Professor McDougal), Professor Taubenfeld and Professor Goldie.

Bibliographies are available, he noted, through the International Institute of Space Law and the American Bar Foundation Study. Others include those prepared by Kehr Berger at the Max Planck Institute in Germany and Ken Finch in D.C.

We reviewed the list categorizing space law material and I noted his comments. He was particularly interested in the Natural Resource Activities Classification and emphasized the future importance of this topic and the need to collect and document all material on this area as soon as possible.

Professor Lay noted that the academic community would be particularly interested in the proposed system, followed by communications - oriented companies, followed by aero-space companies receiving government contracts and concerned with liability matters. Also oil companies and natural resource oriented companies on an international basis would be potential system users.

Another major area of concern to Professor Lay related to copyright problems associated with direct broadcast from satellites - - copyright in the sense of problems associated with the broadcasting of music/programs to home radio and T.V.

With respect to system output, Professor Lay preferred having a master copy of space law abstracts with updating capabilities via loose-leaf page inserts. Updates on a yearly basis would be more than adequate.

Professor Carl G. Christol
University of Southern California
Los Angeles, California

Professor Christol is a political scientist with a major interest in space law. He has written extensively in this area and currently has extended his interests to ocean-related legal problems. He recently compiled a legal bibliography on the subjects of marine environment and oil pollution problems. He noted the concern of States in these areas and their inter-relationships and similarities to aerospace activities. He was enthusiastic about the proposed system noting that the proliferation of space law material was upon us now and that remedial action was necessary. An abstracting/indexing systems approach was most desirable to him.

He noted that the pollution bibliography which he was compiling includes State laws, national laws, foreign laws, international laws, and judicial opinions. He felt this type of material should be included in the proposed space law system at a future date. He observed that the system would be used on a research and policy-making level and would gladly use it if the costs were reasonable.

Professor Christol was concerned with the institutions involved in space law. He said that such institutions should be identified, their interests outlined, and the coordination of their activities summarized. A meaningful input to the system dealing with the interrelationships at both the interna-

tional and national levels was recommended, although no specific suggestions made in this respect. Professor Christol was also concerned with the peaceful vs. military uses of space, as well as the definition of terminology, especially in communist countries.

Professor Christol noted that the immediate users of the proposed system would come primarily from the Government, academic institutions, and international professional societies. He was confident that although the aero-space industrial community may not have a current interest, when they are aware of the material available, they will become a prime user.

He did not have a collection of space law material, but referred me to Professors Taubenfeld and Lay for both source and bibliographic references. The categorization of material for the system was discussed at length, and his important comments duly incorporated in the draft.

Dean George J. Alexander
School of Law
University of Santa Clara
Santa Clara, California

Dean Alexander has kept abreast and published a good deal of material in the field of space law. He is not an international lawyer however, and his prime interest lies in the problems of space law as they overlay our domestic law. He has recently written a book called "Cases and Materials on Aero-Space Law" utilizing a NASA grant. The materials contained in the book are of potential value to the proposed system. These are best summarized by the following extracts from his table of contents:

Chapter I. Creation of the N.A.S.A.

- A. Legislative History of the Space Act
- B. Proposed Amendment to the Space Act in 1960
- C. NASA's Operational Authority
- D. Special Personnel Problems
- E. Patent Rights and Space Inventions

Chapter II. Injury to Person and Property

- A. Medial Experimentation
- B. Sonic Boom
- C. Indirect "Taking" and Other Damage
- D. Disaster Liability

Chapter III. Operational Problems

- A. Domestic Communications Satellites
- B. Earth Resource Satellites

- C. Weather Modification
- D. Privacy

Chapter IV. Outer Space and International Law

- A. Identification and Registration of Space Vehicles
- B. Re-entry and Landing of Space Vehicles: Assistance to Astronauts and Return of Vehicles
- C. Liability for Injury or Damages Caused by Space Vehicles
- D. Allocation of Radio Frequencies
- E. Direct Broadcasting by Satellites
- F. Non-appropriation of Celestial Bodies and the Freedom of Outer Space
- G. International Cooperation in Space Activities
- H. Background Documents

The categorization proposed for the space law system was reviewed and comments duly noted. Dean Alexander was enthusiastic about the system and believed its greatest usage would involve the area of Natural Resource Activities. He believes that the ERTS program will have tremendous implications on both domestic and international law. The loose-leaf update abstract/index concept was appealing to him.

With respect to existing collections and bibliographies, he noted that in addition to his own book, the American Bar Foundation Study would be quite useful. He also noted that Andrew Haley's son might be a source of materials.

Professor Howard J. Taubenfeld
School of Law
Southern Methodist University
Dallas, Texas

Professor Taubenfeld is an internationally recognized expert in space law. He is the senior editor of the Journal of Air Law and Commerce and in 1967 founded the Institute of Aerospace Law at S.M.U. He has authored numerous books and articles on the subject and his latest contribution is the co-authorship with Professor Lay of "The Law Relating to Activities of Man in Space", American Bar Foundation Study, sponsored by NASA.

Professor Taubenfeld sees the proposed system as an extremely important tool to himself, personally, and to the Institute of Aerospace Law as a research tool. He raised the idea of providing him with a terminal to the nearest NASA facility at Houston to be able to use the proposed system once it is incorporated in RECON. He also volunteered himself and his students for a demonstration of the effectiveness of utilization of the system. The idea of publishing a book of abstracts with annual or semi-annual supplements interested him a great deal.

We discussed the categorization of materials at length and he was satisfied with its completeness. He noted that he had quite a few documents in his own collection, that the University also had a modest collection, but that the Library of Congress would probably be the best source. He noted that

the American Bar Foundation Study cited existing bibliographies and was quite complete in that area. He stated that McGill University probably has a tremendous collection, but his recent visit there alerted him to the fact that their library was totally disorganized.

Professor Taubenfeld was interested in aiding the project to insure its success and desired to stay on close touch with its progress.

Professor L.F. Goldie
College of Law
Syracuse University
Syracuse, New York

Professor Goldie has been active in the space law field from its inception and has published several articles. He is primarily interested in the Natural Resource areas and how it impacts on domestic law especially with respect to enforcement, accountability, criminal law, and liability. He is also interested in the legal problems associated with freedom of scientific research. In this area the ERTS program, espionage satellites, and military satellites were of prime concern.

He personally has 200-300 documents in his own collection and intends to build up a collection at Syracuse. He feels the proposed system is timely and will provide both government and the academic communities with an extremely valuable research tool. The idea of publishing one document containing all abstracts with provisions for updating semi-annually were appealing to him.

Professor Goldie was satisfied with the categorization of materials and stressed the modularity of it as a prime asset. He volunteered to be of any assistance which might benefit the project. He cited Eilene Galloway as a prime reference for all source documents and bibliographies.

Michel Bourelly
Docteur en Droit
Conseiller Juridique
Charge' Des Relations Exterieures
CECLES/ELDO
Paris, France

Dr. H. Kaltenecker
Assistant Director for Legal, Contractual,
and International Affairs
ESRO
Paris, France

Drs. Bourelly and Kaltenecker represent major European views on the field of space law. They were both extremely enthusiastic about the proposed system and were quick to note that both ELDO and ESRO use RECON now and that procedures for exchange of information have already been established. Their eagerness to support the proposed system stems from their belief that they are currently hampered in performing their jobs because they do not have access to full legal data.

The categories of space law material were reviewed at length and both made important inputs and changes. They would like the opportunity of seeing the categories once more before finalization. They expressed an eager desire and willingness to coordinate all European inputs to the system if that would make it easier. Several foreign collections and bibliographies were noted including that of H. Peter Kehrberger ("Legal and Political Implications of Space Research"), Professor Maurice Flory of the Louvre Facility, the University of Nice law library, and Professor Jean Touscoz.

Both urged me to keep in close touch with them to insure the success of the project.

Herbert Reis, Esq.
Legal Advisor
U.S. Mission to the United Nations
New York, New York.

Miss Kwen Chen
Senior Legal Officer
General Legal Division
Office of Legal Affairs
United Nations
New York, New York

Both Mr. Reis and Miss Chen were interviewed by me with Mr. Beresford present. The general nature of the system was outlined to them and potential outputs identified. Both expressed enthusiasm for the system especially if U.N. Documents could be incorporated. Mr. Reis noted that he has a total collection of all U.N. Documents relating to the legal problems of outer space and would make this collection available as needed. The preliminary categorization of material was reviewed with them and it was agreed that subsequent discussions should be held to coordinate their interests in the system.

Dr. Eugene Pepin
President
International Institute of Space Law
Paris, France

Dr. Ernst Fasan
Director
International Institute of Space Law
Vienna, Austria

Drs. Pepin and Fasan represent two of Europe's most interested professionals in the field of space law. Both have written extensively on the subject and have contributed in many ways to the success of the International Institute of Space Law. They were both cautiously interested in the system. Their enthusiasm was tempered by a fear that work was being initiated in an area that the Institute had already been active in. I assured them that the Bibliographies which the Institute has compiled to date represents a major input to the system and that plans for cooperating in this area would have to be worked out.

They are interested in hearing progress reports on the system and will support it if possible. They liked the idea of an abstract book with semi-annual updates. The categories were also acceptable. A liaison with the Institut was stressed to insure that the system developed would be a most efficient one.

Spencer Beresford, Esq.
General Counsel
National Aeronautics and Space Administration
Washington, D.C.

Paul G. Dembling, Esq.
General Counsel
General Accounting Office
Washington, D.C.

Mrs. Eilene Galloway
Senior Specialist in International Relations
Congressional Research Service
The Library of Congress
Washington, D.C.

As each of the above individuals serves on the Space Law Advisory Panel, orientation into the goals and objectives of the project were unnecessary. Most of the time was spent with these individuals reviewing, modifying, and revising the categorization of space law materials. Queries were generated and the categorization proved highly effective in directing a researcher to the proper categories. The modular feature was stressed by these experts as necessary for future system expansion. Existing collections and bibliographies were also discussed at length.