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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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June 8, 1972

Leonard Rawicz, Esq.
Assistant General Counsel for Patent Matters
NASA Headquarters
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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 Morehoff
President

CC(3): NASA Scientific & Technical Information Facility

CC(1): NASA Headquarters
New Technology Representative

CC(1): NASA Headquarters
Administrative Contracting Officer
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
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. Sohier, 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

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In this context the Panel agreed that ODSI should inter-
view 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 assign-
ments.
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":

- Spencer Beresford, Esq.
  General Counsel
  National Aeronautics & Space Administration
  Washington, D. C.

- Paul G. Dembling, Esq.
  General Counsel
  General Accounting Office
  Washington, D. C.

- Walter D. Sohier, Esq.
  c/o Curtis, Mallet-Prevost, Colt & Mosle, Esqs.
  New York, New York

- Mrs. Eilene Galloway
  Senior Specialist in International Relations
  Congressional Research Service
  The Library of Congress
  Washington, D. C.

- Mrs. Madeleine Losee
  Program Coordinator
  Scientific and Technical Information Office
  Office of Industry Affairs & Technology Utilization
  National Aeronautics & Space Administration
  Washington, D. C.

- Herbert Reis, Esq.
  Legal Advisor
  U. S. Mission to the United Nations
  New York, New York

- Miss Kwen Chen
  Secretary
  Legal Sub-committee on Outer Space
  United Nations
  New York, New York

- Dean George J. Alexander
  School of Law
  The University of Santa Clara
  Santa Clara, 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
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 declara-
tions 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 them-
selves 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 immeasur-
able. 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 symposia.
-- 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. Bourely 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.
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 Activities:
   . 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
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 Activities" 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

Document Accession Number

Card Identifier

Subject File Pointer

Document Type

Addressee Code

Addressee Name

Card Identifier Originator Code

Document Accession Number

Originator Name

ADDRESSEE TRAILER

-31-
<table>
<thead>
<tr>
<th>Document Accession Number</th>
<th>Card Identifier</th>
<th>Concept Classification Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONCEPT TERM*</th>
<th>CONCEPT TERM*</th>
<th>CONCEPT TERM*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Concept terms are punched as follows: Columns 1-13 from top of form are duplicated in each concept term card. Concept term itself is punched in Columns 14-56.
<table>
<thead>
<tr>
<th>CARD TYPE</th>
<th>COLS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEADER CARD</td>
<td></td>
</tr>
<tr>
<td>DOCUMENT ACCESSION NUMBER</td>
<td>1-8</td>
</tr>
<tr>
<td>CARD IDENTIFIER=1</td>
<td>9</td>
</tr>
<tr>
<td>SUBJECT FILE POINTER</td>
<td>10-20</td>
</tr>
<tr>
<td>DOCUMENT TYPE</td>
<td>21-23</td>
</tr>
<tr>
<td>ADDRESSEE CODE</td>
<td>24-28</td>
</tr>
<tr>
<td>ADDRESS NAME</td>
<td>29-70</td>
</tr>
<tr>
<td>ADDRESS TRAILER CARD</td>
<td></td>
</tr>
<tr>
<td>DOCUMENT ACCESSION NUMBER</td>
<td>1-8</td>
</tr>
<tr>
<td>CARD IDENTIFIER=2</td>
<td>9</td>
</tr>
<tr>
<td>ORIGINATOR CODE</td>
<td>10-14</td>
</tr>
<tr>
<td>ORIGINATOR NAME</td>
<td>15-56</td>
</tr>
<tr>
<td>CONCEPT TRAILER CARD</td>
<td></td>
</tr>
<tr>
<td>DOCUMENT ACCESSION NUMBER</td>
<td>1-8</td>
</tr>
<tr>
<td>CARD IDENTIFIER=3</td>
<td>9</td>
</tr>
<tr>
<td>CONCEPT CLASSIFICATION NUMBER</td>
<td>10-13</td>
</tr>
<tr>
<td>CONCEPT TERM</td>
<td>14-56</td>
</tr>
</tbody>
</table>
FIGURE IV-2: CONCEPT CODE SHEET - MAJOR CONCEPTS

1. CLAIMS AND ADJUDICATIONS GENERAL
   - BOARD OF CONTRACT APPEALS
   - CONTRACT ADJUSTMENT BOARD
     (INTENTIONALLY LEFT BLANK)
   - TORT CLAIMS (INCLUDING FTCA)
   - ARBITRATION

2. CONGRESSIONAL MATTERS GENERAL
   - NASA LEGISLATIVE PROGRAM
     - AUTHORIZATIONS
     - APPROPRIATIONS
   - NASA LEGISLATIVE COMMENTS
   - REPORTS/LETTERS TO CONGRESS

3. RELATIONS WITH OTHER ORGANIZATIONS
   - FEDERAL AGENCIES
     (INTENTIONALLY LEFT BLANK)
     (INTENTIONALLY LEFT BLANK)
   - STATE AND LOCAL GOVERNMENT
   - PRIVATE ENTERPRISE

4. FISCAL GENERAL
   - AVAILABILITY FOR AND LIMITATION ON APPROP
     - OVEROBLIGATION OF FUNDS
     - PERIOD OF AVAILABILITY OF APPROP
   - NONAPPROPRIATED FUND ACTIVITIES
   - REIMBURSEMENT OF APPROP
   - INTERAGENCY TRANSFER OF FUNDS
   - CONTINUING RESOLUTIONS

5. INTERNATIONAL GENERAL
   - INTERNATIONAL AGREEMENTS
   - SPACE LAW

6. INTELLECTUAL PROPERTY GENERAL
   - ANTITRUST
   - TRADEMARKS
   - COPYRIGHT
   - PATENT POLICY CONTRACTORS
   - PATENT POLICY EMPLOYEES
   - LICENSES
   - INFRINGEMENT/ROYALTIES
   - DATA
   - TRADE SECRETS
   - AWARDS
   - INVENTIONS AND CONTRIBUTIONS BOARD

7. PROPERTY GENERAL
   (INTENTIONALLY LEFT BLANK)
   - REAL PROPERTY
FIGURE III-2 (CONT'D)

8. PERSONNEL GENERAL
   PERSONNEL PAY AND ALLOWANCES 0800
   PERSONNEL EMPLOYMENT/DISCHARGE/RETIREMENT 0801
   PERSONNEL STANDARDS OF CONDUCT 0802
   PERSONNEL CLAIMS BY AND AGAINST THE GOVT 0803
   PERSONNEL OTHER RIGHTS/OBLIGATIONS 0804

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

-37-
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
FIGURE 1
A SERVICE OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

ORDER THE DOCUMENTS YOU WANT BY CHECKING THE APPROPRIATE BOXES. THEN WRITE YOUR NAME AND INTERNAL Mail CODE IN THE SPACES BELOW, AND FORWARD THE ENTIRE SHEET TO YOUR LIBRARY.

NAME: MAIL CODE:


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  REPS

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.

SHERMAN, G. S.  11 DATE- 12 JAN. 1971  COLL.- 75 P  REPT.-71-25-SP

AEROSPACE INDUSTRY, APPLICATIONS TECHNOLOGY SATELLITES, MANAGED SPACE MISSION, MILITARY SPACECRAFT, PROJECT MANAGEMENT, RESOURCE ALLOCATION, SPACE EXPLORATION, SPACE PROGRAMS, TECHNOLOGY ASSESSMENT, U.S.S.R., UNITED STATES OF AMERICA

C34 N71-26493

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  REPS  CONF-PRESENTED TO 91ST CONGR., 1ST SESS., 18 MAY 1971 PREP.- PREPARED BY LIBRARY OF CONGNK, ENVIRON. POLICY DIV. FOR COMM. ON COM. /U.S. SENATE/ AND COMM ON SCI. AND ASTRONAUT. /U.S. HOUSE/ SERIES SERIAL E

BIOCLIMATOLOGY, CONGRESS, EARTH RESOURCES, GEOLOGY, INTERNATIONAL COOPERATION, PROBLEM SOLVING

C13 N71-26200


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.-295 P  REPS CONF.- HEARINGS ON S. 270 BEFORE COMM. ON AERON. AND SPACE SCI., 92ND 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  REPS CONF.- HEARINGS ON S. 720 BEFORE COMM. ON AERON. AND SPACE SCI., 92ND CONGR., 1ST SESS., 30 MAR. - APR. 1971

APPROPRIATIONS, CONGRESS, COST ESTIMATES, NASA PROGRAMS, RESEARCH PROJECTS, SPACE MISSIONS, UNIVERSITY PROGRAM

C34 N71-26806

FIGURE 1 (Cont'd)

PAGE 2

A-5  LAST PAGE
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**

**TYPICAL CITATION FROM IAA**

NASA SPONSORSHIP

AIAA ACCESSION NUMBER

AIA70-10845


AIAA AFFILIATION

PREVIOUSLY ISSUED AS:

CONTRACT, GRANT, OR SPONSORSHIP

PUBLICATION DATE

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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.
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<tr>
<td>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.</td>
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</tr>
<tr>
<td>02 Aircraft</td>
<td>3013</td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>03 Auxiliary Systems</td>
<td>3022</td>
</tr>
<tr>
<td>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.</td>
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</tr>
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<td>04 Biosciences</td>
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<tr>
<td>Includes aerospace medicine, exobiology, and radiation effects on biological systems; and physiological and psychological factors. For related information see also: 05 Biotechnology.</td>
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<tr>
<td>05 Biotechnology</td>
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<tr>
<td>Includes life-support systems, human engineering, protective clothing and equipment, crew training and evaluation, and piloting. For related information see also: 04 Biosciences.</td>
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<tr>
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<tr>
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<tr>
<td>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.</td>
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**FIGURE 3**

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<tr>
<td>08 Computers</td>
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<td>Includes computer operation and programming; and data processing. For basic research see: 19 Mathematics.</td>
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<tr>
<td>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.</td>
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<tr>
<td>10 Electronics</td>
</tr>
<tr>
<td>Includes circuit theory; and feedback and control theory. For applications see: 09 Electronic Equipment. For related information see: specific Physics categories.</td>
</tr>
<tr>
<td>11 Facilities, Research and Support</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>12 Fluid Mechanics</td>
</tr>
<tr>
<td>Includes boundary-layer flow; compressible flow; gas dynamics; hydrodynamics; and turbulence. For related information see also: 01 Aerodynamics; and 33 Thermodynamics and Combustion.</td>
</tr>
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</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>14 Instrumentation and Photography</td>
</tr>
<tr>
<td>Includes design, installation, and testing of instrumentation systems; gyroscopes; measuring instruments and gages; recorders; transducers; aerial photography; and telescopes and cameras.</td>
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<tr>
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</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>16 Masers</td>
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<tr>
<td>Includes applications of masers and lasers. For basic research see: 26 Physics, Solid-State.</td>
</tr>
<tr>
<td>17 Materials, Metallic</td>
</tr>
<tr>
<td>Includes composites; 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.</td>
</tr>
</tbody>
</table>
18 Materials, Nonmetallic 3127
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
Includes calculation methods and theory; and numerical analysis. For applications see: 03 Computers.

20 Meteorology 2132
Includes climatology; weather forecasting; and visibility studies. For related information see also: 13 Geophysics; and 30 Space Sciences.

21 Navigation 3133
Includes guidance; autopilots; star and planet tracking; inertial platforms; and air traffic control. For related information see also: 07 Communications.

22 Nuclear Engineering 3135
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.

23 Physics, General 3135
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.

24 Physics, Atomic, Molecular, and Nuclear 3137
Includes atomic, molecular, and nuclear physics. For applications see: 22 Nuclear Engineering. For related information see also: 29 Space Radiation.

25 Physics, Plasma 3138
Includes magnetohydrodynamics. For applications see: 28 Propulsion Systems.

26 Physics, Solid-State 3142
Includes semiconductor theory; and superconductivity. For applications see: 16 Lasers. For related information see also: 10 Electronics.

27 Propellants 3145
Includes fuels; igniters; and oxidizers. For basic research see: 06 Chemistry; and 33 Thermodynamics and Combustion. For related information see also: 28 Propulsion Systems.

28 Propulsion Systems 3146
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.

29 Space Radiation 3149
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.

30 Space Sciences 3152
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.

31 Space Vehicles 3174
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: 23 Propulsion Systems; and 32 Structural Mechanics.

32 Structural Mechanics 3181
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.

33 Thermodynamics and Combustion 3193
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.

34 General 3198
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.
FIGURE 4

Category 34 3203


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 provisions. Proposals on complementary international agreements are set forth.

M.V.E.


General discussion of the foundations of space law, a subject which is now of practical importance. The nature and uses of cases 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 (Exploitation de los recursos en los cuerpos celestes). Eduardo Ellí (Ed. 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.


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.


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 Committees is reviewed. The political and social problem areas and international legal questions pointed out by the Working Group...
The entries were selected on the basis of their relevancy to the following typical researchable and organizational topics: how to help engineers and scientists change their 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 to organizational aging; the role of continuing education in preventing technical obsolescence; and the concerns of research scientists, engineers who are reassigned into development activities.

N70-37109\# National Science Foundation, Washington, D.C., Office of Economic and Manpower Studies.

FEDERAL FUNDS FOR R AND D CONTINUE TO REMAIN AT LEVEL
14 Aug. 1970 4 p
(INSF-70-28) Avail: Issuing Activity

The decrease in government support for research and development in the United States is reported. A tax 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.

N70-37141\# Grenoble Univ (France). Faculte de Droit.

LEGAL PROBLEMS RELATING TO SPACE (LEG: PRINCIPLES AND EFFORTS OF CODIFICATION BY TRANSMISSION) [LES PROBLEMES JURIDIQUES DE L'ESPACE] (PRINCIPES ET EFFORTS DE CODIFICATION DE L'ESPACE)
FRENCH
Avail: CFSTI
This report summarizes the work of the U.N. Committee on the Peaceful Uses of Outer Space (COPUOS) and discusses resolutions adopted by the General Assembly in 1962 and 1969. The treaty governing the exploration and use of outer space, including the moon and other celestial bodies, the agreement on rescue of astronauts, and the draft conventions on responsibilities for damage are also discussed.

N70-37142\# Cambridge Language Research Unit (England).

THE USE OF AUTOMATICALLY OBTAINED KEYWORDS CLASSIFICATIONS FOR INFORMATION RETRIEVAL Final Report
K. Sparck Jones and D. M. Jackson Feb. 1969 47 p refs
Sponsored by Office for Sci. and Tech. Inform.
(ML-211; GCT-5038) Copyright. Avail: CFSTI

This report deals with the automatic construction of key-word classifications and their use in information retrieval. It discusses 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 criteria of classification are distinguished. The results of experiments with a collection of documents and test requests obtained from ASLIB Cranfield project are presented, and it is concluded that automatic classifications which lead to noticeable improvement in retrieval performance over those obtainable with unclassified texts can be set up.


ADVANCED CONCEPTS IN REFUSE MANAGEMENT
(RM-485J) Avail: CFSTI

The authors have identified four areas of significant potential, these being: (1) the possibility of conversion of garbage into useful products; (2) the development of novel waste disposal facilities; (3) the development of new methods for the recovery of valuable materials from waste; and (4) the development of new methods for the reduction of waste generation.
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SHEFFLER, K. D.  
Creep behavior of Ti-11 alloy under the influence  
of continuous varying stresses.  
e17 A70-34552
## CONTRACT NUMBER INDEX

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.

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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:

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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.

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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 microfiched\(^1\) (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.

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\(^1\) 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).
EVALUATION OF THE GODDARD RESEARCH AND ENGINEERING MANAGEMENT EXERCISE SIMULATION

A. J. Rowe, P. Gruendeman, and D. McConaughy Washington

NASA Feb. 1968 97 p refs
(Grant NSR-05-018-089)

NASA-CR-1275) Avail: CFSTI CSCL 05A

Evaluated is a computer program designed to simulate the environment of a project manager involved in research and development activities of spacecraft management. The program uses a hypothetical spacecraft project—an orbiting optical observatory—which is described in a series of technical and administrative documents. The player-participant assumes the role of a project manager and is allowed to make decisions on schedules, costs, and hardware.

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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New York, New York 10017
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APPENDIX C

NASA LEGAL MICRO-THESAURUS
ABANDONED INVENTIONS

BT INTELLECTUAL PROPERTY GENERAL 69G00058 TOTAL BROADER TERMS

ACQUISITIONS

BT REAL PROPERTY 69G00062 69G00064 TOTAL BROADER TERMS

NT APRAISALS 69G00000 H.R. 10246 69G00002 H.R. 10289 69G00022 SPACE ACT 2031(B) (3) 69G00022 41 USC 14 69G00022 TOTAL NARROWER TERMS

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ADMINISTRATIVE REMEDY EXHAUSTION

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NT QUANTUM MERUIT 60G0466 PATENTIFICATION 60G0466 TOTAL NARROWER TERMS

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

UNION SHOPS
BT CONSTRUCTION BIDDING RESTRICTIONS 65G04090 TOTAL BROADER TERMS
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NT EVALUATION 60G07053 TOTAL BROADER TERMS
(0001)
NT RESTRICTED DATA 60G07053 TOTAL NARROWER TERMS
(0002)

UPDATING INVESTIGATIONS
BT NASA SECURITY 65G01001 TOTAL BROADER TERMS
(0001)

UPDATING PROCEDURES
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(0001)

URGENCY
BT PROTESTS 70G09019 TOTAL BROADER TERMS
(0001)

US AS SELF INSURER
BT INSURANCE 70G12020 TOTAL BROADER TERMS
(0002)

US DISTRICT COURT
BT JURISDICTION 70G01001 TOTAL BROADER TERMS
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BT LICENSES 70G01027 TOTAL BROADER TERMS
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BT COST CONTRACTS 65G03094 TOTAL BROADER TERMS
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VETERANS

BT PREFERENCE
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BT FEDERAL ENCLAVES
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**WAGE BOARD EMPLOYEE**

**BT** PATENT POLICY EMPLOYEES
70G10001
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**WAGE BOARD SCHEDULES**

**NT** PERSONNEL PAY AND ALLOWANCES
70G90006
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**NT** RETROACTIVE EFFECT
70G90006
5 USC 5341(C)
70G90006
TOTAL NARROWER TERMS

**WAIVER**

**BT** ADVISORY COMMITTEE COMPENSATION
65G6001
BUY AMERICAN
70G90003
EMPLOYEE OVERPAYMENT
70G90004
EXCUSABLE DELAY
65G70039
IMMUNITY
65G90057
MILLER ACT
65G11107
TAXATION STATE AND LOCAL
65G0121
TOTAL BROADER TERMS
**NT** 41 USC 10(A)
70G60003
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**WAIVER AGAINST GOVT**

**BT** NASA EMPLOYEES
70G00010
TOTAL BROADER TERMS
**NT** COMPENSATION
70G00010
18 USC 203
70G00010
18 USC 205
70G00010
TOTAL NARROWER TERMS

**WAIVER OF APPEAL**

**BT** ENFORCEMENT
70G00008
TOTAL BROADER TERMS

**WALSH HEALEY**

**BT** DEViations
65G01002
TOTAL BROADER TERMS

**WEAPONS**

**BT** AWARDS
65G07020
TOTAL BROADER TERMS
**NT** SPACE ACT 306
65G07020
TOTAL NARROWER TERMS

**WELFARE/RECREATION ACTIVITIES**

**BT** NONAPPROPRIATED FUND ACTIVITIES
70G00012
TOTAL BROADER TERMS
**NT** COMPETITION WITH PRIVATE ENTERPRISE
70G00012
TOTAL NARROWER TERMS

**WHITE HOUSE QUESTIONNAIRE**

**BT** ENVIRONMENTAL POLLUTION
70G01021
TOTAL BROADER TERMS

**WITNESSES**

**BT** CLAIMS AND ADJUDICATIONS GENERAL
65G04248
TOTAL BROADER TERMS
**NT** TRAVEL EXPENSES
65G04248
TOTAL NARROWER TERMS

**WORK HOURS VIOLATIONS**

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BT SOLE SOURCE PROCUREMENTS 64060074
TOTAL BROADER TERMS

10 USC 2304(*A)(11)
BT NEGOTIATION AUTHORITY 64060052
SOLE SOURCE PROCUREMENTS 64060074
TOTAL BROADER TERMS

10 USC 2306(*B)
BT CONTINGENT FEES 65094006
TOTAL BROADER TERMS

10 USC 2306(*D)
BT ARCHITECT/ENGINEERS 60604071
TOTAL BROADER TERMS

10 USC 2306(*F)
BT CERTIFICATIONS 65094004
TOTAL BROADER TERMS

10 USC 2310
BT NEGOTIATION AUTHORITY 65091033
TOTAL BROADER TERMS

12 USC 78 hostility
BT EMPLOYEE MORTGAGES 64060103
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18 USC 1914
BT PRIVATELY SPONSORED CONFERENCES 64060110
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18 USC 201-209
BT SPECIAL EMPLOYEES 70605009
TOTAL BROADER TERMS

18 USC 203
BT WAIVER AGAINST GOVT 70605010
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18 USC 203(*A)
BT FORMER EMPLOYEES 70601023
TOTAL BROADER TERMS

18 USC 205
BT WAIVER AGAINST GOVT 70605010
TOTAL BROADER TERMS

18 USC 207(*A)
BT FORMER EMPLOYEES 70601023
TOTAL BROADER TERMS

18 USC 207(*B)
BT FORMER EMPLOYEES 70601023
TOTAL BROADER TERMS

18 USC 701
BT NASA INSIGNIA USE 65094069
TOTAL BROADER TERMS

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BT PATENT POLICY CONTRACTORS 70607001
PATENT POLICY EMPLOYEES 70607001
TOTAL BROADER TERMS
28 USC 107

**BT**

**BLIND PERSON VENDING STANDS**

70011002

TOTAL BROADER TERMS

(0001)

28 USC 14981(A) AND (B)

**BT**

**INTELLECTUAL PROPERTY GENERAL**

70001013

TOTAL BROADER TERMS

(0001)

**NT**

**COURT DECISIONS**

70001013

**LEGISLATIVE HISTORY**

70001013

TOTAL NARROWER TERMS

(0002)

28 USC 2672

**BT**

**MAXIMUM AMOUNT**

60057097

TOTAL BROADER TERMS

(0001)
41 USC 10(*A)

BT WAIVER
70G05003
TOTAL BROADER TERMS

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

BT DUTY FREE ENTRY
65G06112
TOTAL BROADER TERMS

41 USC 14

BT ACQUISITIONS
64G06022
TOTAL BROADER TERMS

41 USC 371

BT WUNDERLICH ACT
70G07002
TOTAL BROADER TERMS

42 USC 1855(*F)

BT CONTRACT FORMATION
70G08014
TOTAL BROADER TERMS

42 USC 2462

BT FORMER EMPLOYEES
70G01023
TOTAL BROADER TERMS

42 USC 2473(*H)(112)

BT NASA LIGHT CLAIMS
64G09107
TOTAL BROADER TERMS

42 USC 2473(*H)(113)

BT LIABILITY
65G04111
TOTAL BROADER TERMS

42 USC 7751 IT. SEC.

BT STUDENT WORK STUDY PROGRAM
70G09001
TOTAL BROADER TERMS
5 USC 150
BT PUBLIC HEALTH SERVICE CONSULTATION 65002168 TOTAL BROADER TERMS (0001)

5 USC 2301, 7418
BT PRIVATELY SPONSORED CONFERENCES 65004110 TOTAL BROADER TERMS (0001)

5 USC 5341(*C)
BT WAGL BOARD SCHEDULES 70609006 TOTAL BROADER TERMS (0001)

5 USC 5724(*A)
BT MOVING EXPENSE 70610007 TOTAL BROADER TERMS (0001)

5 USC 78(*B)
BT AIRCRAFT PROC/MAINT/OPS 60608047 TOTAL BROADER TERMS (0001)

5 USC 78(*C)(*I)
BT LIMITATION OF PRICE 60606097 TOTAL BROADER TERMS (0001)
8 USC 1447(c)

BT NATURALIZATION WAITING PERIOD

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 periodical 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
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)


Other bibliographies listed in the American Bar Foundation Study include:

General Bibliographies on Space Law


"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.


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).


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.)

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 on 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)


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)


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)


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

Appendix D(6)


Appendix D(7)

Appendix D(8)

Appendix D(9)

Appendix D(10)

Appendix D(11)

Appendix D(12)
Appendix D(13)


Appendix D(14)


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 Symposiaums, 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 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. Medical 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.
Drs. Bourely 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.
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.
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.
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.