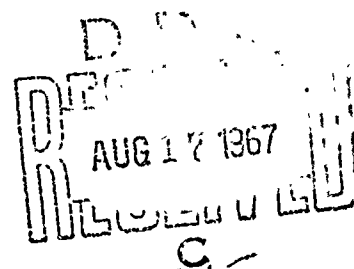


OAR 67-0009

# THE OFFICE OF AEROSPACE RESEARCH SCIENTIFIC & TECHNICAL INFORMATION PROGRAM

AD656694



UNITED STATES AIR FORCE  
Office of Aerospace Research  
Arlington, Virginia  
RECEIVED



AUG 24 1967

CFS71

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

**THE OFFICE OF AEROSPACE RESEARCH  
SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM**

**Based on a Briefing for the Raymond Committee  
15 March 1967**

**Colonel Currie S. Downie  
Lt Col Thomas T. Luginbyhl  
Mr. Alexander G. Hoshovsky  
Lt Col Carlton M. Smith**

**Office of Aerospace Research  
United States Air Force  
Arlington, Virginia**

**DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED**

**BLANK PAGE**

THE OFFICE OF AEROSPACE RESEARCH  
SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM

Table of Contents

	<u>Page</u>
Preface. . . . .	iii
Figures & Tables . . . . .	iv
Appendix . . . . .	v
 I. Abstract . . . . .	 1
II. OAR Organization & Mission. . . . .	2
III. The OAR Scientific & Technical Information Office. . . . .	8
IV. The Publications Division . . . . .	12
V. The Information Studies Division . . . . .	14
1. Problem Definition, Fact Finding & Analytical Studies. . . . .	14
2. Explorations, Feasibility Tests & Breadboard Models . . . . .	15
3. Coupling and Communication . . . . .	21
4. Planning . . . . .	21
5. Summary. . . . .	23
VI. The Programs Division . . . . .	24
1. Selective Dissemination of Information . . . . .	24
2. Some Relevant Statistics . . . . .	26
3. DDC Five-Year Plan . . . . .	28
4. Wright-Patterson AFB Information Needs . . . . .	28
5. Air Force Participation in NASA SCAN . . . . .	29
6. Clearinghouse Topical Announcement Service . . . . .	29
7. Chemical Abstracts Issue Tape Experiment . . . . .	33
8. DD Forms 1498a . . . . .	33
9. OAR Technical Libraries. . . . .	34
VII. The Executive Division . . . . .	35
VIII. Recommendations . . . . .	38

## PREFACE

This brochure is based on a briefing presented for the Raymond Committee on 15 March 1967 by the Office of Scientific and Technical Information, Hq Office of Aerospace Research (OAR). The committee, appointed by the DoD Director of Defense Research and Engineering, has been conducting a management appraisal of the DoD Technical Information Program.\*

Since the briefing emphasized those aspects of OAR's scientific and technical information activities that were judged to hold the most interest for the committee, the material herein should be viewed in that context. Thus, this report is not intended to be a complete or exhaustive description of the functions and achievements of the Office of Scientific and Technical Information. Nevertheless, this brochure should serve as a useful guide to the basic structure of that office and to many of its plans and programs. Beyond that, the brochure offers a number of suggestions for strengthening the DoD Technical Information Program.

\*See Appendix (page A1) for DDR&E letter of Nov 1966 which established the committee and outlined its responsibilities for conducting a management review of the technical information program. The Areas of Interest of the Raymond Committee, as identified by the Committee on 27 January 1967 after the first few meetings, are mainly concerned with Management, Effectiveness, Resources, Communication and Dissemination, and Coordination as summarized in the Appendix on page A4.

## APPENDIX

	<u>Page(s)</u>
1. DDR&E letter dated 1 November 1966, Subject: Management Review of Technical Information Program. . . . .	A1
2. Management Review of DoD Technical Information Program - Areas of Interest. . . . .	A4
3. Case Histories or Benefits of an Effective Technical Information Program. . . . .	A6-A8
4. Estimated OAR Resources Devoted to the S&T Information Program, FY 67 . . . . .	A9
5. Research Coupling Activities . . . . .	A10
6. The OAR Management and Scientific Information Program. . .	A12
7. General Ostrander's letter of 19 March 1963, Subject: Scientific and Technical Information Program . . . . .	A13
8. Distribution of <u>OAR Research Review</u> . . . . .	A14
9. <u>STINFO Newsletter</u> (March 1967) . . . . .	A15-A16
10. OAR Research Objectives in Information Sciences. . . . .	A17-A20
11. OAR (RRYB) letter dated 22 Dec 1966, Subject: Development Plan for Defense Documentation Center (DDC). . . . .	A21
12. OAR (RRYB) letter dated 9 Jan 1967, Subject: Requirements for SDI Service. . . . .	A24
13. Wright-Patterson AFB Information Needs . . . . .	A26
14. OAR (RRYB) letter dated 3 Feb 1967, Subject: Clearinghouse Topical Announcement Service . . . . .	A28
15. Example of Clearinghouse Fast Announcement . . . . .	A30
16. Example of Project/Task DD Form 1498 . . . . .	A31

## FIGURES AND TABLES

<u>Figure</u>		<u>Page</u>
1.	USAF Organization Chart . . . . .	3
2.	OAR Unit Locations... . . . .	4
3.	Federal Obligations for R&D in the Information Sciences, FY 1967 . . . . .	6
4.	Hq OAR Organization Chart . . . . .	9
5.	OAR Office of Scientific & Technical Information. . . .	11
6.	Memo Pad Questionnaire. . . . .	16
7.	Technological Barrier Resume. . . . .	17
8.	Research Resume . . . . .	18
9.	Numerical Filing. . . . .	20
10.	Indexing Words. . . . .	20
11.	Word-Cards. . . . .	20
12.	NASA/SDI Notification . . . . .	25
13.	NASA/SCAN (IAA) . . . . .	30
14.	NASA/SCAN (STAR). . . . .	31
15.	Clearinghouse Preliminary Form for Topical Announcement. . . . .	32
16.	Implementation of DoD Directives. . . . .	36
17.	Planning Conference . . . . .	40
18.	Idealized Technical Information Office. . . . .	41

<u>Table</u>		
1	Dollar Amount of Federal Obligations for R&D in the Information Sciences. . . . .	7
2	Distribution of OAR Information Sciences Program. . . .	22
3	Number of Reports Prepared by OAR Subordinate Organizations, CY 1966. . . . .	27
4	Air Force User Statistics, NASA SDI System, Jul- Dec 1966. . . . .	27
5	OAR Usage Figures for DDC Services, CY 1966 . . . . .	28
6	Statistics on OAR Libraries . . . . .	34

THE OFFICE OF AEROSPACE RESEARCH  
SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM

I. ABSTRACT

This document outlines the mission and organization of the Office of Aerospace Research (OAR), then describes how its principal product, scientific and technical information, is disseminated annually through its various publications. The magnitude of OAR's research in Information Sciences (approximately 15% of total Federal expenditures in this area) is compared to that of other governmental agencies. Savings of over \$3.5 million, resulting from an effective technical information program, are documented by examples.

The role of the Office of Scientific and Technical Information within OAR as performed by the 16 personnel assigned is described in terms of its four divisions. The Information Studies Division examines current problems, studies new approaches to improve the present information systems, attempts to improve coupling procedures and is responsible for various planning activities. The Programs Division carries out the actual experimentation with new approaches, co-ordination of technical information effort and general policy formulation. The Executive Division administers the over-all S&T information program and integrates it with the security functions of the command. The Publications Division, responsible for the announcement of OAR research results, publishes over a dozen different publications: the Research Review, List of OAR Research Efforts (LORE), USAF STINFO Newsletter, Research Objectives, OAR Progress, Research Resumes, Index of Research Results, and Report of Research Proposals.

It is suggested that the most pressing problem facing the DoD Technical Information Program is the absence of integrated, DoD-wide, planning efforts with the active participation of the three services. Planning conferences are needed to improve the organizational structure and co-ordinate the future activities of the program. The classical functions of management -- planning, organizing, etc. -- should be reviewed to determine whether they are being adequately emphasized and implemented throughout DoD in the Scientific and Technical Information Program.



## II. OAR ORGANIZATION AND MISSION

The Office of Aerospace Research is a separate agency of the Air Force, responsible for the management of the total Air Force basic research program and also responsible for a small portion of the exploratory development program. The OAR Commander, Major General Ernest A. Pinson, reports directly to the USAF Chief of Staff, as indicated in the USAF Organization Chart in Figure 1. OAR's day-to-day contacts, however, are primarily with the Deputy Chief of Staff for Research and Development. The "new ideas" portion of the Air Force -- OAR, originator of ideas; the Air Force Systems Command, developer of ideas; and the Air Force Logistics Command, buyer of the finished product -- is on the right of the chart. Air Force support and training organizations are shown in the center, and the combat commands are on the left.

OAR, with its Headquarters in Arlington, Virginia, and with a total complement of almost 2,000 people, manages some 100 million dollars' worth of the DoD research effort. Some of this research is performed in-house; much of it is performed by the academic community under contract and grant. OAR conducts and sponsors research in the physical, engineering, environmental and life sciences. Almost half of the OAR Defense Research Sciences funding is spent by the Air Force Office of Scientific Research (AFOSR), which supports the work of some 2,000 scientists in universities, nonprofit organizations, and industry. OAR laboratories include the Air Force Cambridge Research Laboratories (AFCRL) at L. G. Hanscom Field, Bedford, Massachusetts, the Aerospace Research Laboratories (ARL) at Wright-Patterson Air Force Base, Dayton, Ohio, the Office of Research Analyses (ORA) at Holloman Air Force Base, Alamogordo, New Mexico, and the Frank J. Seiler Research Laboratory (FJSRL) at the United States Air Force Academy, Colorado Springs, Colorado. OAR's three liaison offices in the United States are at Patrick Air Force Base, Florida, Vandenberg Air Force Base, California, and Los Angeles, California. OAR maintains foreign offices at Brussels, Belgium, and Rio de Janeiro, Brazil. The locations of the OAR headquarters, laboratories, and offices are shown on the map in Figure 2.

The mission of OAR is threefold: (1) To conduct and support research which is relevant to Air Force interests and in those areas where new knowledge is essential to the continued superiority of the Air Force operational capability; (2) to conduct and support specifically assigned exploratory development efforts; and (3) to insure the effective dissemination of research results to those responsible for the development of improved aerospace technology, weapons, equipment, and operations.

Thus, OAR must communicate the results of its research to those scientists and engineers in AFSC, and throughout the Air Force and DoD, whose task it is to advance technology through the application of new scientific discoveries. The entire OAR research effort results essentially in a single product: scientific and technical information. This information is documented in about 4,000 reports a year, more than 3,000 of these reports appearing in some 500 scientific or professional journals. OAR supports about 50 to 60 conferences and symposia each year to allow for rapid and more effective exchange of information.

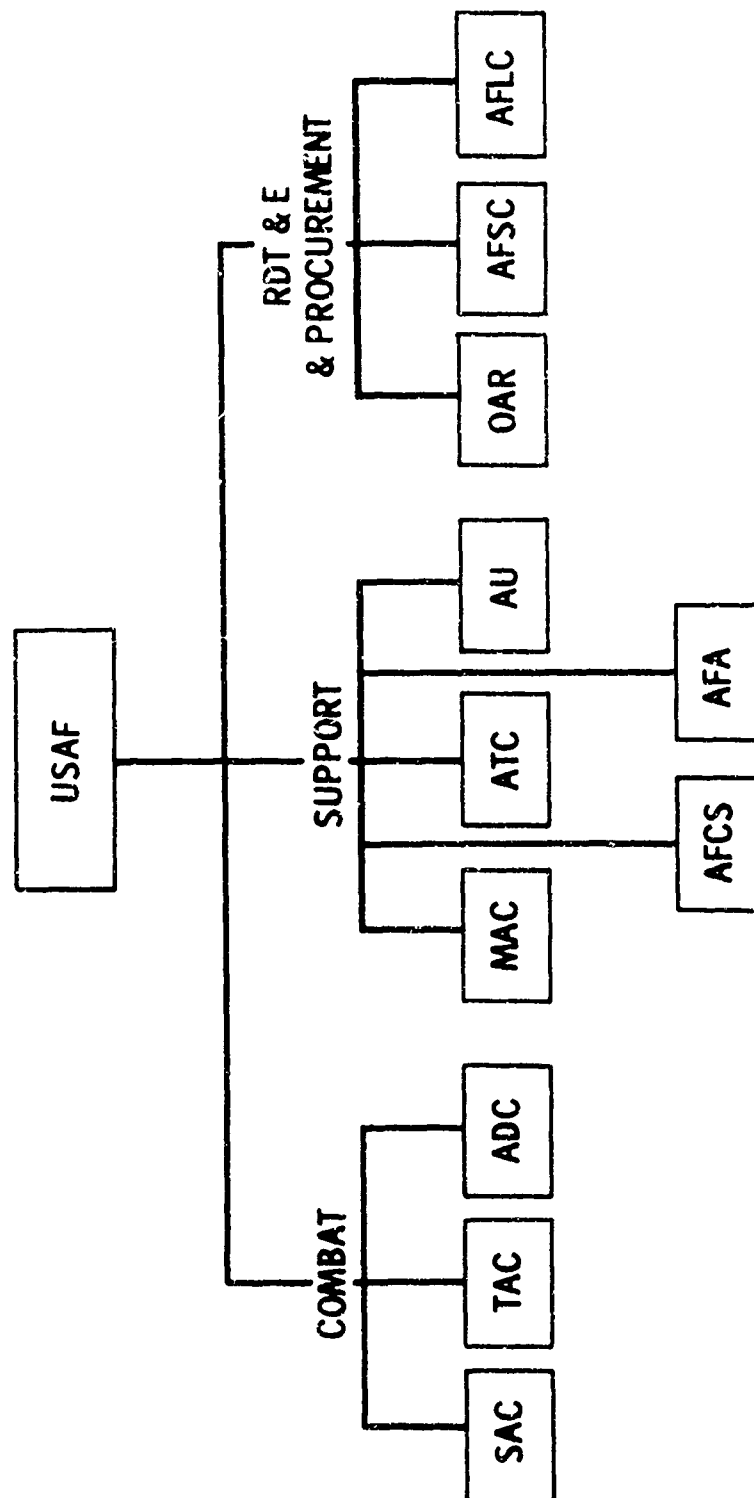


Figure 1. USAF Organization Chart

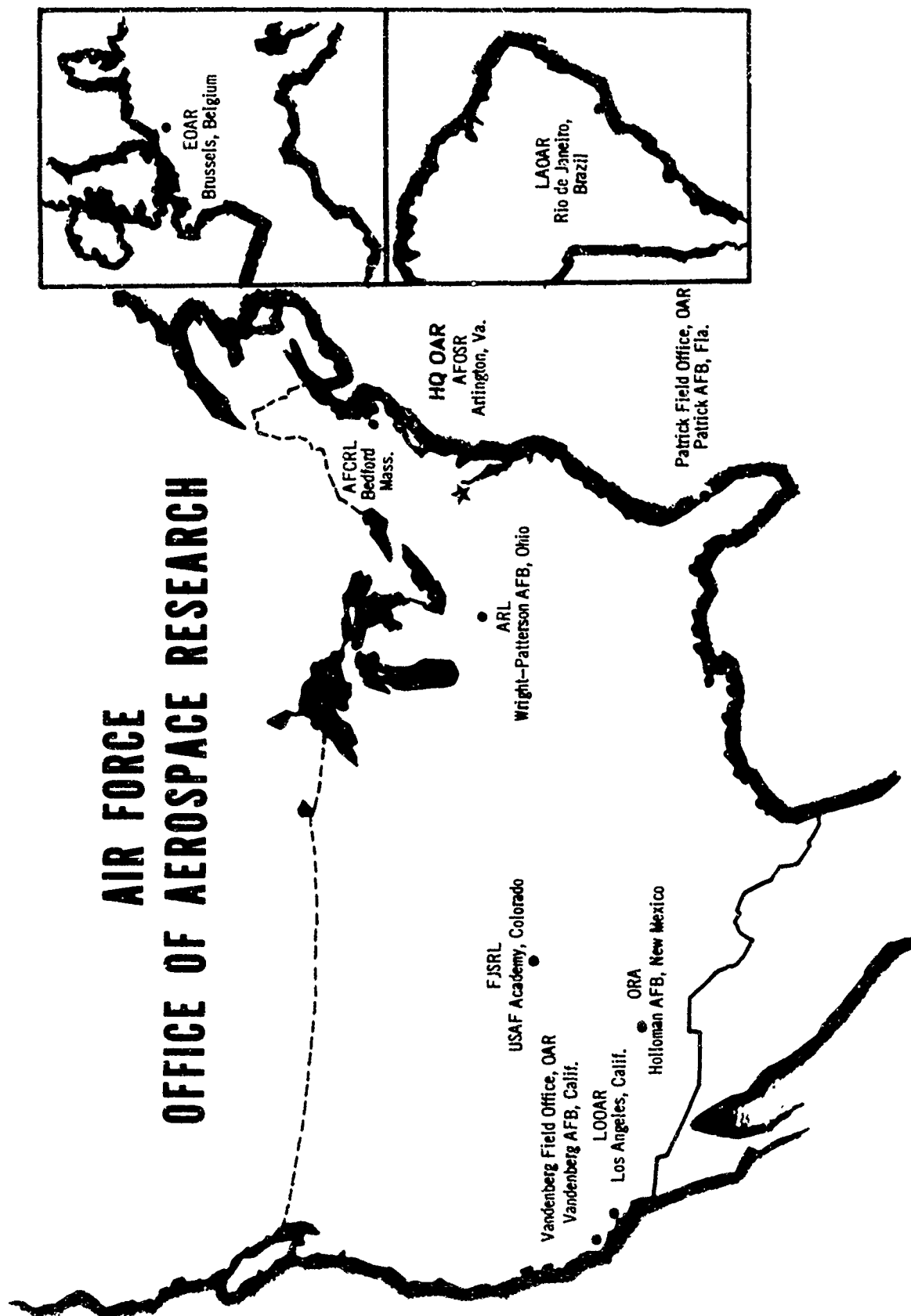


Figure 2. OAR Unit Locations

OAR's annual expenditure in the field of information sciences research is about \$4 million. The total annual DoD expenditure in this field is just over \$14 million. Annual Government-wide funding in the same area is almost \$28 million. Thus, OAR supports more than 25% of the DoD research on information sciences and about 14% of the total Federal research on information sciences, as indicated graphically in Figure 3.

Our sister command, AFSC, spends an additional \$5 million on information sciences research. Thus, the total Air Force funding for this item represents 60% of the entire DoD budget for research on information sciences, and almost one-third of the total Federal expenditure in this area. In fact, the Air Force is spending almost as much on information sciences research as AEC, NASA, NSF and HEW combined. The dollar figures upon which Figure 3 is based are shown in Table 1.

The whole OAR research program is documented in the Air Force Research Resumes and LORE (List of OAR Research Efforts). The information sciences program is represented by over 100 individual research efforts. OAR's in-house research under this program is performed primarily in the Air Force Cambridge Research Laboratories and represents somewhat less than half of the total OAR effort in the information sciences. The balance of the research in this field is performed by contractors and grantees, and is administered by AFOSR.

It has been mentioned that the Raymond Committee has tried without success to obtain examples of useful contributions resulting from the technical information program. This office recently asked the OAR laboratories if they could forward case histories, or brief write-ups, of examples where an effective technical information program saved money and/or time, or gave an increased capability in a weapon system. This did not constitute a comprehensive or exhaustive survey, but only a request for examples of benefits derived from the over-all technical information program. The purpose was to identify contributions to the R&D process and to obtain examples of improved information transfer processes. Several replies to this request have been received. (See Appendix, pages A6-A8, for examples.) Some are good solid examples, others are fairly subjective. The total benefits in the package are estimated to be in excess of \$3.5 million. It should be emphasized here that these benefits or savings cannot be traced to the STINFO program per se, but have accrued as a result of the effective use of technical information. In contrast to this \$3.5 million benefit, the cost of the entire Scientific and Technical Information Program throughout OAR for FY 1967 is about \$1.1 million (See Appendix, page A9).

# FEDERAL OBLIGATIONS FOR R&D IN THE INFORMATION SCIENCES FY 1967

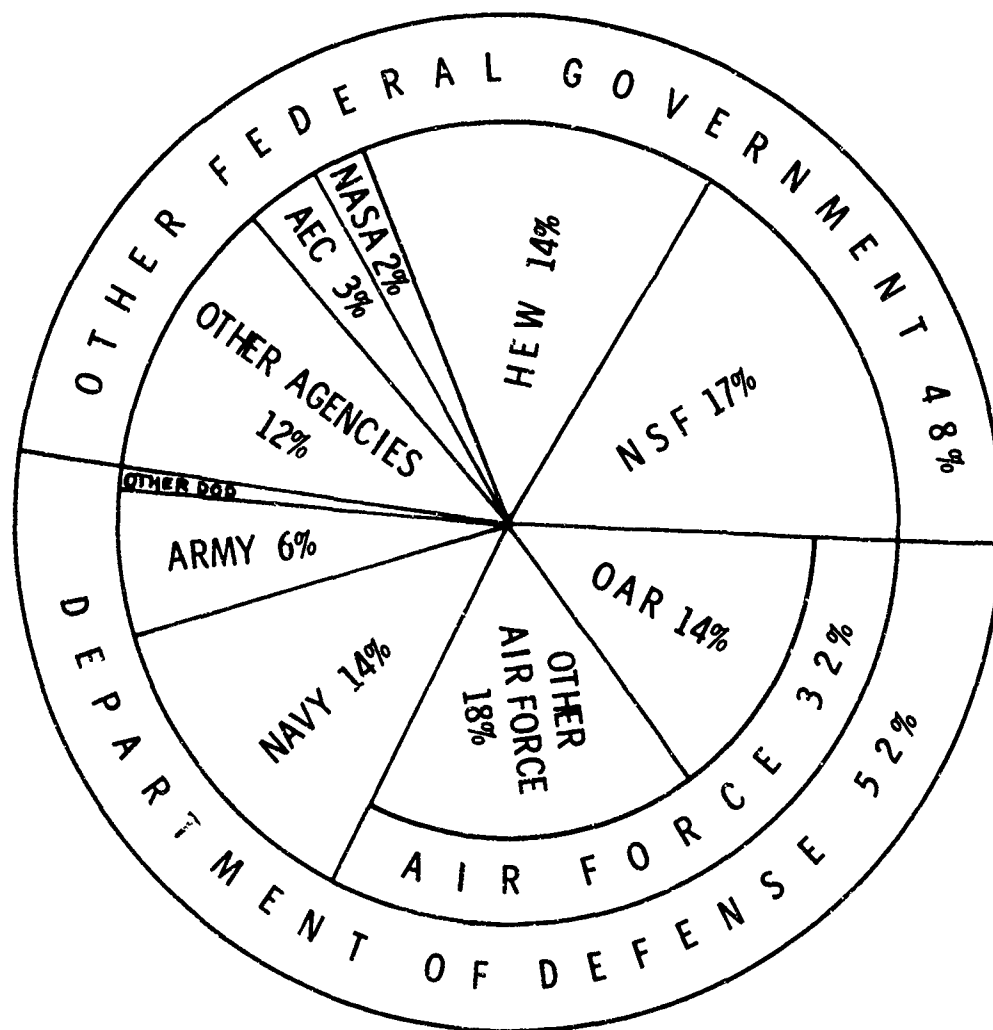


Figure 3.

**TABLE 1. Dollar Amount of Federal Obligations  
for R&D in the Information Sciences\***

FY 1967 (Estimated)			
Agency	R&D in Info Sciences (Funding in Thousands of Dollars)	Percentage of DoD Total	Percentage of Federal Fund Total
Army	1782	12.3	6.4
Navy	3728	25.8	13.5
Air Force (OAR)	8863 (3994)	61.3 (27.6)	32.1 (14.4)
Defense Agencies	<u>70</u>	<u>.6</u>	<u>.3</u>
DoD Total	14443	100	52.3
NSF	4700		17.0
HEW	3919		14.2
AEC	702		2.6
NASA	490		1.7
Other Agencies	3353		12.2
Federal Total	27607		100.0

\*Amounts from Federal Funds for Research, Development and Other Scientific Activities, National Science Foundation, July 1966, Appendix D, Table D-6, except OAR figures which have been updated as of March 1967.

### III. THE HQ OAR SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

The Office of Scientific and Technical Information, commonly known as the STINFO Office, is the staff office of the OAR Commander which is responsible for the over-all policy formulation and general supervision of the OAR Scientific and Technical Information Program. Each field organization has a STINFO Office assigned to insure that the command policy on information transfer is implemented.

The management of technical information activities parallels the general OAR management concept -- centralized policy-making by Hq OAR, and decentralized execution by the OAR laboratories. The control of technical information resources is vested in our field commanders, except for the rather limited and insufficient library funds which come to us from the AFLC and are parcelled out to the field laboratories by the Hq OAR STINFO Office. This deficiency in library funds is made up by the transfer of OAR funds by the laboratory directors.

Within Hq OAR, the Scientific and Technical Information Office works with other functional staffs to see that the entire technical information program is integrated and efficient. The Office works very closely with the Deputy for Plans and Programs on developing and organizing various activities for "coupling" -- the transfer of research results to users, as well as the feedback from users to our research program. As an indication of the importance OAR attaches to coupling, General Pinson has authorized each laboratory scientist to spend up to 20% of his time on coupling activities. The responsibility for effective coupling is explicitly included in the job description of each and every military and civilian scientist in OAR. Thus the Scientific and Technical Information Office attempts to create an environment in which better information transfer takes place. (See Appendix, page A10.)

The Director of the Hq OAR Scientific and Technical Information Office reports directly to General Pinson, the Commander of OAR, as shown in the organizational chart in Figure 4. Those staff offices on the right portion of the chart are most closely associated with information: the Office of Information (the public relations activity), DCS/Plans and Programs, the MASIS (Management and Scientific Information System)(see Appendix, page A12) under the DCS/Financial Programs, and the STINFO Office.

The Office of Scientific and Technical Information was established in December 1962. Its purpose as stated by the then Commander, General Ostrander, was to "give continued attention to the information problems within OAR . . . to formulate, recommend and implement the policies and procedures aimed at improving the transfer of scientific information between this Command and other Air Force R&D components, as well as the remainder of the scientific community." The Office was also charged with "the surveillance over and co-ordination of all OAR scientific and technical information exchange activities." A copy of the original charter of the Office is included on page A13 of the Appendix.

# HEADQUARTERS OFFICE OF AEROSPACE RESEARCH

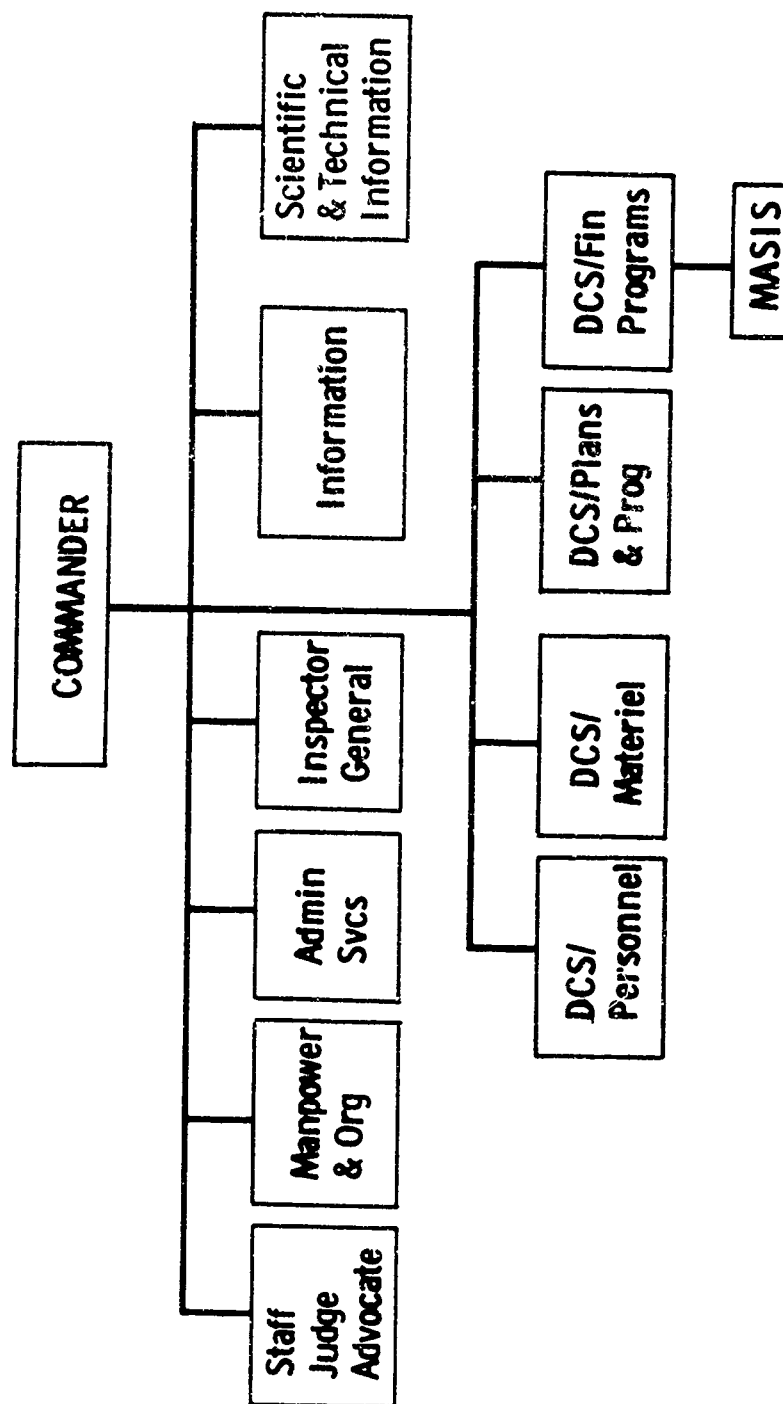


Figure 4.



The Office of Scientific and Technical Information tries to carry out this assignment through four divisions, shown in Figure 5. Examination of the problems of information transfer, studies of new approaches and short-term applied research efforts for improvement of our present information systems, and planning and improvement of coupling activities are all the job of the Information Studies Division. Considerable long-hair, far-out research is being conducted by OAR, but almost no one is looking at today's system with a view toward applied research with a relatively short-term payoff in usable improvements. This is the job of the Information Studies Division -- to try to devise improvements in today's information system.

The actual experimentation with new approaches and co-ordination of technical information efforts, as well as general policy formulation, is carried out by the Programs Division. The Executive Division administers the program and integrates it with the security functions of the command. The Publications Division takes care of central OAR announcement tools to ease the problems of identification of information sources and documents.

Altogether, 16 people are employed full time in Hq OAR to insure that the information systems and procedures are effective and that our scientists not only have access to needed information but also communicate with other Air Force people who make technical and military progress possible. In other words, this office has responsibilities in facilitating procedures for obtaining all incoming information needed by our scientists, and insuring that all OAR-generated scientific and technical information actually gets to the potential users. These 16 people represent close to 8% of the total complement of about 200 people in Hq OAR. This indicates the degree of emphasis placed on scientific and technical information services by General Pinson.

# OFFICE OF SCIENTIFIC AND TECHNICAL INFORMATION

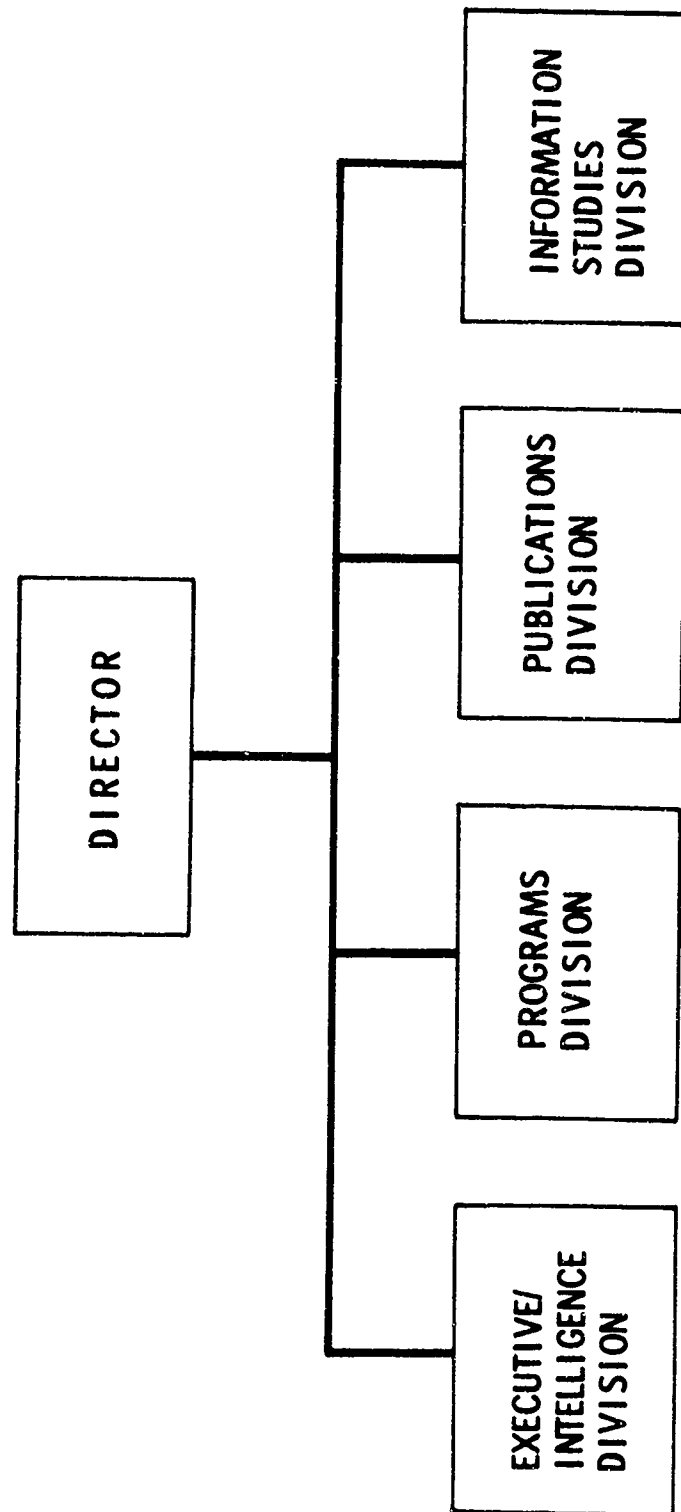


Figure 5.

#### IV. THE PUBLICATIONS DIVISION

The Publications Division produces well over a dozen different publications for Hq OAR. Just a few of them are mentioned here. A complete list will be found in the brochure, OAR Publications. The OAR Research Review is published monthly in 5,600 copies, 2,600 of which are distributed throughout DoD; about 3,000 copies go to industry, universities and other Government agencies (see Appendix, page A14). The purpose of the Review with its wide distribution is to contribute to the exchange of information concerning research activities conducted and sponsored by the Air Force. The Research Review and the LORE (List of OAR Research Efforts) are some of OAR's best means of coupling with the STLO's -- the AFSC Scientific and Technical Liaison Officers.

The USAF STINFO Newsletter is another OAR monthly publication. (See pages A15 and A16 of the Appendix for the March 1967 issue.) Its prime purpose is to get the latest information on STINFO activities to the people in the field with a minimum of delay.

Another of the publications prepared by this office is the Air Force Research Objectives in which are listed Air Force objectives in 4 major areas -- the physical, engineering, environmental, and life sciences. This brochure is distributed to prospective proposal writers -- scientists who wish to submit research proposals to OAR for possible support. (See Appendix, pages A17-A20, for Air Force Research Objectives in the Information Sciences.)

The Hq OAR Consolidated Distribution List, another publication of the Division, has proven to be an outstanding management tool in the distribution control of Hq OAR documents. Response from STINFO officers has indicated that the list is extremely valuable as a check against the secondary distribution of documents made by them. It has practically eliminated duplication and has kept waste to a minimum. In general, this publication contributes to the coupling of OAR researchers and users of OAR research results, encourages user participation in updating the mechanized OAR distribution list, and increases users' awareness of the OAR publications available to them.

An example of OAR's positive approach to the exchange of scientific and technical information and its coupling efforts is the OAR Research Applications Conference held on 14 March 1967 at the State Department in Washington. Copies of the Proceedings are available.

One other activity of the Publications Division is its publication of the OAR Monthly Report of Research Proposals. Most agencies of the U.S. Government which support basic research -- the Atomic Energy Commission, the National Science Foundation, the National Aeronautics and Space Administration, the Army, the Navy, and the Air Force, for example -- publish and exchange reports on research proposals monthly. NIH does not. Instead, NIH registers all its proposals with the Science Information Exchange (SIE). There is no standardized format for these proposal reports. Some are complete inventories, and some merely a report of action taken during the last month. Each agency has its own subject classification procedure. All in all it is a somewhat disorganized operation, completely nonstandardized. Thus it is

extremely difficult for the scientific administrator to determine whether another agency has received a proposal that he has just received, or whether another agency is planning to fund it, or has already funded it. To try and get order out of chaos, OAR has taken the initiative in establishing an informal Interagency Group to devise a unified system for handling this problem. Two meetings have been held so far, the last one at SIE to learn about its services and how it handles NIH proposals. Most of the agencies have been extremely cooperative.

## V. THE INFORMATION STUDIES DIVISION

Briefly, the Information Studies Division insures that OAR information programs are based on a reasonably adequate set of facts and assumptions about scientific and technical communication processes and about the R&D environment in general.

To achieve this, the Division devotes its time to the following activities:

Studies, consisting of defining, describing, and analyzing problems found in the flow and exchange of technical communications in this command, as well as between OAR and other Air Force, DoD, and Federal R&D establishments.

Exploration, in which the Division examines the more promising ideas and proposals toward improved communications, and tests them for their applicability in a research environment.

Coupling, which consists of learning about and trying to understand the results of research in information sciences; becoming familiar with the innovations in information technology; and making the relevant knowledge available to the rest of the OAR staff for possible exploitation.

Planning, where the Division participates in the formulation of command policies to improve efforts for coupling Air Force research and Air Force technology.

The Division is manned by two people. At present it has 14 active tasks. Some of them are long-term projects requiring a period of 2 to 3 years to complete. Others are of one to two months' duration. Five of these tasks will be discussed here to illustrate the character and scope of the work.

### 1. Problem Definition, Fact-Finding and Analytical Studies

First, in the area of problem definition, fact-finding and general studies, two tasks will be mentioned. One is underway, the other is about to begin.

#### Survey of SDI Options

This is a survey of the information systems which employ the selective-dissemination-of-information technique, generally known as SDI. This technique is used to identify relevant documents and to notify the individual subscribers about these documents as they are processed into a documentation system. The reason for the study was the need to explore the different output and input options which could offer OAR an economical and at the same time effective document announcement system.

Forty-six SDI systems have been identified, most of them in Government and the aerospace industry. They range over a wide spectrum of input/output options: from the Fast Announcement Service of the Clearinghouse, which offers subscribers a chance to receive any or all notices in some 57 areas of technology, to the sophisticated, computer-operated, keyword-matching SDI systems of AEC and NASA.

The operators of these systems will now be asked to identify their data base, their methods of input and processing, their methods for notifying the users and providing copies of announced reports, and their operating costs.

#### Information Needs of Research Managers

The second project is an effort to learn more about research managers and their information needs. This knowledge is needed because, so far, practically all data systems designed to help research managers leave much to be desired. The OAR Management and Scientific Information System (MASIS) is no exception.

User studies are generally very difficult to perform. They tend to be unreliable since most of them depend on users' opinions or memory about past information requirements. The Information Studies Division is trying to eliminate these deficiencies by a locally invented memo-pad questionnaire shown in Figure 6. It should permit the identification of problems as they are tackled by the research managers in the course of their daily activities. A pre-test of this questionnaire in this Headquarters has shown that the recording method is workable. As planned, the survey will begin in May and will continue for about 3 weeks. Some 100 Hq USAF and OAR managers will be asked to participate in this effort. The results of the study should provide a better perception of the management information system requirements and thus enhance the use of the present system's capabilities.

#### 2. Explorations, Feasibility Tests and Breadboard Models

Two tasks have been selected as representative of that type of activity which deals with explorations, feasibility tests and breadboard models.

##### Technical Barriers Documentation Systems

The first example in the area of explorations concerns the work known as the Technical Barriers Documentation Study. It is a joint venture of the Director of Plans, DCS/Plans and Programs, Hq OAR; the Assistant Executive Director, Research Communication, AFOSR; and the Information Studies Division. It has been moving somewhat slowly because, while simple in concept, the establishment of effective prototype systems is a complicated, difficult and time-consuming task.

The heart of the proposal is the construction of easily accessible files in which we would store the indexed "problem resumes" (Figure 7) in about the same way as we now store DD Form 1498 Research Resumes for on-going research (Figure 8). The completed problem resumes would be stored and manipulated in a mechanized data system, such as available at DDC, and retrieved by the appropriate technical descriptors as needed by the research managers or laboratory scientists.

The project was begun in early 1965 with an interoffice memorandum, issued later as an OAR report, Data System for Matching Planned Research with Military Needs, OAR 607-5, 15 July 1965. The major difficulty, as then seen, was the identification of operational problems and their recording in the language of science, i.e., as statements of needed research. This problem still exists. Answers are now being sought to such questions as: When is a problem a valid

# MEMO - QUESTIONNAIRE

Date \_\_\_\_\_

## THE PROBLEM/QUERY

(Use an abstract of about 20 words or less. Be sure to state the problem, what is required and who requests action or information)

### PROBLEM COMES FROM -Mark One-

- ☐ My own organization
- ☐ Higher Headquarters
- ☐ Lower Organization
- ☐ Other government agency
- ☐ Industry
- ☐ University
- ☐ Professional society

### IN THE FORM OF -Mark One-

- ☐ Personal Contact
- ☐ Telephone Call
- ☐ Letter
- ☐ TWX - Electronic Display

### THE ANSWER/SOLUTION IS WANTED IN -Mark One-

- ☐ Less than 1 hour
- ☐ 1-4 hours
- ☐ 1 day
- ☐ 1 week
- ☐ 2 weeks
- ☐ 1 month
- ☐ 1/2 year
- ☐ \_\_\_\_\_

### MY ESTIMATE OF REQUIRED VS AVAILABLE INFORMATION IS (Mark as many as appropriate)

Required			Available		
Primary	Secondary	Tertiary	Sufficient	Meager	None
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### IN DEALING W/PROBLEM I WILL RELY PRIMARILY ON -Mark as many as needed-

- ☐ ☐ ☐ Own memory/experience
- ☐ ☐ ☐ Own memory/education
- ☐ ☐ ☐ Private files/notes
- ☐ ☐ ☐ Official correspondence
- ☐ ☐ ☐ Technical papers/reports
- ☐ ☐ ☐ Planning documents
- ☐ ☐ ☐ Computer data service
- ☐ ☐ ☐ Technical library
- ☐ ☐ ☐ Consultation/advice of others

### ESTIMATED TOTAL EFFORT TO COMPLY WITH REQUEST IS -Mark One-

- ☐ Less than 1 man/hour
- ☐ 1-4 man/hours
- ☐ 4-8 man/hours
- ☐ about 1 man/week
- ☐ about 1 man/month
- ☐ about 1 man/year
- ☐ \_\_\_\_\_

Figure 6.  
16

UNCLASSIFIED  
Security Classification

TECHNOLOGICAL BARRIER RESUME		
TITLE: SELF-CALIBRATION OF TRACKING SYSTEM	DATE RECORDED: 15 Sep 1965	ACCESSION NO. 00013
<b>ABSTRACT:</b> (State the problem and the areas of research which are thought as holding a promise of solution)		
<p>Specifications for <u>Mistram</u> ballistic missile <u>tracking</u> system require <u>accuracies</u>: range to 0.4 ft., range rate to 0.02 ft/sec., <u>range</u> difference to 3 parts per mission, and range difference rate to 2 parts per 100 million per second. These are absolute accuracies. This requires system capable of <u>self-calibration</u>.</p> <p>Research is needed toward developing <u>analytical error models</u> which adequately present <u>sources of error</u> in the tracking system. Also intensive effort is required to study tracking errors due to <u>electro-magnetic transmission through the atmosphere</u>, such as <u>phase delays due to tropospheric phenomena</u>, <u>velocities of light uncertainties</u>, etc.</p>		
<b>SCIENTIFIC KEYWORDS:</b>		
<u>Statistics, velocity measurements, atmospheric densities, electro-magnetic propagation, geodetic errors</u>		
<b>RELEVANCE FACTORS:</b>		
SUBJECT CATEGORIES: <u>12, 14, 17, 22</u> (Use COSATI Subject List)		Will it involve costly experiments? <input type="checkbox"/> Yes <input type="checkbox"/> No
DEFENSE RESEARCH CATEGORIES: <u>MATH</u>	<input type="checkbox"/> Below \$ 100,000	
RELEVANT SYSTEMS: <u>MOL</u>	<input type="checkbox"/> Above \$ 100,000 but less than \$1 million	
	<input type="checkbox"/> More than \$1,000,000	
Solution Needed in:		
	<input type="checkbox"/> Less than 5 years	
	<input type="checkbox"/> 5-10 years	
	<input type="checkbox"/> 10 or more years	
<b>PERTINENT REFERENCES:</b> (Use standard bibliographic citations--Also include names of people and their organizations who must be contacted for more detail)		
Tracking Data Analysis Panel, 5th AFMTC/RANGE USER CONF. 1964, p.19 AD 600091.		

DD Form \_\_\_\_\_

UNCLASSIFIED  
Security Classification

Figure 7. Technological Barrier Resume



RESEARCH AND TECHNOLOGY RESUME				1.	2. GOVT ACCESSION	3. AGENCY ACCESSION	REPORT CONTROL SYMBOL
4. DATE OF RESUME	5. KIND OF RESUME	6. SECURITY	7. REGRADING	8. RELEASE LIMITATION	9. LEVEL OF RESUME		
10a. CURRENT NUMBER/CODE				10b. PRIOR NUMBER/CODE			
11. TITLE:							
12. SCIENTIFIC OR TECH. AREA				13. START DATE	14. CRIT. COMPL. DATE	15. FUNDING AGENCY	
16. PROCURE. METHOD	17. CONTRACT/GRANT	a. DATE:	18. RESOURCES EST.	a. PROFESSIONAL MAN-YEARS	b. FUNDS (in thousands)		
	a. NUMBER:		PRIOR FY				
	c. TYPE:	d. AMOUNT:	CURRENT FY				
19. GOV'T LAB/INSTALLATION/ACTIVITY			20. PERFORMING ORGANIZATION				
NAME:			NAME:				
ADDRESS:			ADDRESS:				
RESP. INDIV.:			INVESTIGATORS				
TEL:			PRINCIPAL:				
			ASSOCIATE:				
			TEL:				
			TYPE:				
21. TECHNOLOGY UTILIZATION				22. COORDINATION			
23. KEYWORDS							
24.							
25.							
26.							
27. COMMUNICATIONS SECURITY		28.		29. OSD CODE		30. BUDGET CODE	
a. CONSEC OR b. CONSEC RELATED <input type="checkbox"/> c. NOT RELATED							
31. MISSION OBJECTIVE				32. PARTICIPATION			
33. REQUESTING AGENCY		34. SPECIAL EQUIPMENT					
35. EST FUNDS (in thousands)		36.					
CFY+1							

DD FORM 1498

1 AUG 84

(Items 1 to 26 identical to NASA Form 1122)

Figure 8.

research problem? What is the most practical way of collecting technical problems? What minimum data elements are needed for an adequate description of technical problems? What measures of utility can be devised to test the usefulness of the proposed system?

Despite slow progress, work on this project continues because it seems to offer a new and useful tool for the management of research programs in a mission-oriented organization. One of its more obvious uses would be to support the work of research managers or planners of research programs with factual information about current technical problems. Another promising use is seen in linking together the potential users and producers of scientific knowledge, thus facilitating productive interpersonal communications. In short, a well-functioning data system would enable OAR to better prove the relevance of its work to the needs of Air Force technology as well as generally facilitate OAR's coupling efforts.

#### Office and Private Retrieval Files Study

While there is clearly a need for work on major systems, there is also a real need to give some attention to the needs of technical people who depend mainly upon their memory and their private files. Unfortunately, very few people want to work in this area despite the considerable evidence from user studies that memory and private files are by far the most widely used sources of information. The exploratory project discussed below concerns the work of putting modern retrieval methods to work in an office situation.

The core of this experiment is the application of a well-known technique known as co-ordinate indexing and retrieval. In simple English, this means that documents are numbered and filed in the same order as they come into the office, as illustrated in Figure 9, rather than by the conventional subject categories. Each document is indexed by a set of words, examples of which are shown in Figure 10, to describe its contents and origin. For each of these words there is a separate card (Figure 11) on which the document number is entered. The documents are retrieved by selecting the combination of word-cards that best represent the question. The document number (circled in Figure 11) that appears on all of the selected cards is the number of the wanted paper.

So far, the experiment is an unequivocal success. Two participating GS-5 secretaries not only maintain these files but have actually developed two distinct systems. They did all this with only a minimum of professional assistance and advice. Here are the "before" and "after" results of this project. The asterisks show the results of an actual test, the other figures are subjective estimates provided by the secretaries.

	<u>Before</u>	<u>After</u>
Purging of files	An annual affair	As you go routine
Filing time per document	1-2 minutes	*7 minutes
Retrieval time per document	*15 minutes	*2 minutes
Failure to retrieve	*2 in 8 documents	None to date
Secretarial cross-training	Unknown	About 2 hours

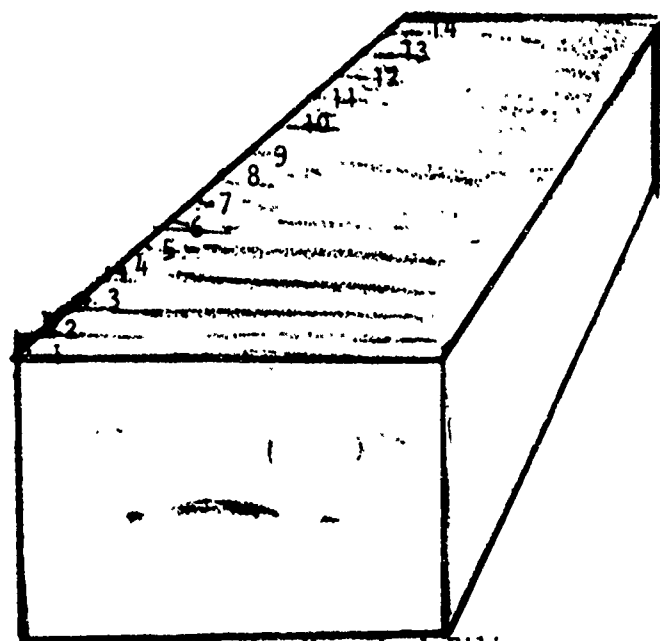


Figure 9. Numerical Filing

INDEXING WORDS	
INDEXING	
INFORMATION	
INTERSERVICE	
LIBRARY	
MANAGEMENT	
MASIS	
OBJECTIVES	
ORGANIZATION	
PLAN	
R&D	
RELEVANCE	
RESEARCH	
STINFO	
TECHNICAL	

Figure 10.  
Indexing Words

USAF										35	27
30	11	24									
50											
PERSONNEL											
30	21	22	23			25		27			
50						42					
TECHNICAL											
	11	12	23	4	25		32				
					35						
					45						

Figure 11. Word Cards

What's more, both the morale and efficiency of the secretaries have improved considerably. They really believe in this new method. "I'd rather fight than switch" is their typical reaction when they consider the possibility of converting back to the subject-heading system. (The Air Force Manual which now governs the construction of Air Force office files requires the subject-heading system.)

The project is now being expanded to include a secretary with somewhat different filing problems. If it is equally successful here, the project will be transferred to the Programs Division for field testing.

### 3. Coupling and Communication

The Division's work in the third category, coupling and communication, is oriented toward promoting a wider knowledge of tools and techniques for application in information systems, and toward greater co-operation among technical information people.

Learning about the relevant research is an important part of this activity and is a major task in itself. The Form 1498 research resumes system of DDC is a real help here. Particularly helpful were the DDC printouts which were recently obtained to better acquaint the Division with the current DoD research in this area. As a matter of interest, OAR alone has over 100 distinct research efforts in various scientific disciplines supporting the information sciences. The distribution of this effort is shown in Table 2.

The Division's coupling effort takes many forms, from participation in a local staff meeting in order to resolve an issue, to lecturing at the DoD STINFO Course at Wright-Patterson AFB, or to organizing DoD-wide interservice meetings of information specialists. The later work has been prompted by an evident lack of horizontal communications among STINFO specialists with the result that very few people in DoD have a clear idea of the scope and complexity of the DoD STINFO program. The Information Studies Division has joined forces with interested offices of the Department of the Army and the Office of Naval Research to correct this situation. The second DoD-wide STINFO meeting on 26 April 1967 will bring together STINFO officers and technical librarians from the various services for a face-to-face discussion of DoD technical information problems.

One more item that should perhaps be mentioned is the Division's involvement in the preparation of the annual progress reports of the Committee of Scientific and Technical Information of the Federal Council for Science and Technology. This assignment is a convenient way of keeping up with events and innovations in other U.S. departments and agencies.

### 4. Planning

In a sense the payoff of all of the above activities is summed up in the Division's fourth category of work, planning. Generally this planning is of three types: (1) participation in the OAR 5-year planning exercises, where

Table 2

Distribution of OAR Information Sciences Program (Source: DDC Printout)			
	Office Symbol	Number of Work Units	Percent
<u>Office of Aerospace Research</u>	OAR	124	100
AF Office of Scientific Research	AFOSR	71	57.5
AF Cambridge Research Laboratories	AFCRL	50	41
Office of Research Analyses	ORA	2	1.5
<u>AF Office of Scientific Research</u>	AFOSR	71	100
Mechanics Division	SREM	1	1.2
Information Sciences Directorate	SRI	49	69
Behavioral Sciences Division	SRLB	8	11.6
Mathematical Sciences Directorate	SRM	5	7.1
Chemical Sciences Directorate	SRC	1	1.2
Biological Sciences Division	SRLA	7	9.9
<u>AF Cambridge Research Laboratories</u>	AFCRL	50	100
Data Sciences Laboratory	CRB	47	94
Optical Physics Laboratory	CRO	1	2
Upper Atmosphere Physics Laboratory	CRU	2	4

the Division tries to inject the need for planning future communications systems; (2) work on the annual reviews of the OAR STINFO program; and (3) participation in the Hq USAF STINFO planning group where the Division tries to represent the views of OAR.

The Division's participation in the Command 5-year planning is a means of insuring that the OAR STINFO program is and remains in balance with other equally important command programs such as corporate planning, organizational structure, facility and equipment support, and administrative practices and technical objectives of the program. Moreover it provides us with an opportunity to insure that our research in the information sciences takes into account the needs of the technical information program.

The Division's efforts in reviewing and critiquing the OAR STINFO program are concerned with three fundamental questions: Where have we been? What problems are still to be resolved? How and with what resources do we plan to tackle these problems? We believe that such an annual soul-searching affair is a good way of insuring that we remain a viable and useful part of the OAR management structure.

The Division is particularly pleased to participate in the Hq USAF STINFO planning exercises. This type of work not only provides an opportunity to influence the progress and development of the total Air Force program, but, more importantly, it allows the Division to sense management's consensus on major issues pertaining to this program. Work on a new draft to update the old Air Force STINFO plan has just been completed. This draft is the product of a steering group from Hq USAF, Hq AFSC and Hq OAR, aimed at a comprehensive overview of the objectives, organization and programs required to support the Air Force scientific and technical information activities. As a management plan, it is designed to serve as a framework within which future actions and improvements can be considered and implemented.

One of its major innovations is that it departs from the traditional "STINFO focal point" concept and emphasizes the need for giving the STINFO officer the resources and tools for program implementation, i.e., making him the supervisor of the organization's technical information processing facilities. The adoption of this concept is essential to future STINFO activities.

##### 5. Summary of the Information Studies Division Activities

Summing up, the Information Studies Division performs tasks in four distinct but interrelated categories. These are studies, explorations, coupling, and planning.

Within the limits of its capabilities, the Division tries to contribute to each of these categories, because all of them are essential in an enlightened scientific and technical information program.

## VI. THE PROGRAMS DIVISION

The Programs Division is primarily responsible for:

1. Reviewing and improving present systems and methods.
2. Initiating and testing new systems and methods.
3. Formulating general technical information policy.
4. Managing the OAR technical libraries fiscal programs and providing policy and guidance for their operations.

Two officers, one airman and one secretary are assigned to the Division. There follows a discussion of some of the Division's activities.

### 1. Selective Dissemination of Information

There are many kinds of SDI, ranging from special listings of accessions prepared by the librarian to highly automated systems. Usually when we use the term we mean a system in which a computer is used to match a description of a document with a description of a user's specific interests.

OAR interest in SDI stems from the responsibility to provide scientists and engineers with the results of our world-wide aerospace research. About two years ago NASA began an SDI service using the NASA STAR and the (AIAA) International Aerospace Abstracts as a data base. These announcement bulletins are published twice a month. The SDI program issues announcements with the same frequency. The purpose of this program is to provide NASA people with a current awareness and literature-search tool. But because OAR negotiated with NASA to have Air Force people included in the system, the Air Force has had 200 participants among a total of 900 users.

The original SDI announcements were in card form and included document abstracts. After about 1 year of operation NASA decided that the system was too costly, changed the output to a machine-printed page, and eliminated the abstract. For a sample NASA SDI announcement in the current format see Figure 12.

Feeling that sufficient time had elapsed to allow an evaluation of the present mode of operation, the Programs Division sent survey questionnaires to Air Force participants in late December 1966, with a follow-up in February 1967. The purpose of the survey was threefold: (1) to obtain some indication of the value of the SDI program and for the degree of user satisfaction; (2) to determine whether a reshaping of the user base toward those needing the service most was necessary; and (3) to identify shortcomings and areas for improvement in the program.

Eighty-six percent of the users responded to the questionnaire. A preliminary look at the results of the current survey shows: (1) 96% of the respondents stated that the service is either useful or highly useful; (2) the users also declared that they would allocate about 10% of their total budget for

# N A S A / S D I   N O T I F I C A T I O N

Please check the appropriate box. USER keep the top copy,  
and send the second and third copies to your library.

NO INTEREST  
OF INTEREST,  
NOT REQUESTED  
DOCUMENT  
REQUESTED

STAR ISSUE #09, 08 MAY 1967  
C S DOWNIE WAS0032  
OAR /RRY/

N67-20146 #GENERAL DYNAMICS/POMONA, CALIF.  
CAT. 22 ENGINEERING DEPT.

NUCLEAR CLOUD SAMPLING SYSTEM  
SWETNAM, R. L. 1966 25 P PREPARED FOR  
LAWRENCE RADIATION LAB., LIVERMORE, CALIF.  
W-7405-ENG-48

UCRL-13215 CFSTI- HC \$3.00/MF \$0.65

AERODYNAMIC, \*AERODYNAMIC VEHICLE, AEROSPACE, \*CLOUD,  
COMPUTER, CONICAL, DEBRIS, DESIGN, DIFFUSER, EXPLOSION, GAS,  
HIGH ALTITUDE, NUCLEAR, \*NUCLEAR EXPLOSION, PROGRAM,  
SAMPLING, \*SAND PROJECT, SHOCK, TEST, TUNNEL, VEHICLE, WIND

N67-20299 #MAX-PLANCK-INSTITUT FUR PHYSIK UND  
CAT. 13 ASTROPHYSIK, MUNICH /WEST GERMANY/.

ARTIFICIAL STRONTIUM AND BARIUM CLOUDS IN THE  
UPPER ATMOSPHERE

FOEPPL, H. HAERENDEL, G. HASER, L. LOIDL, J.

LUETJENS, P. AUG. 1966 35 P REFS

MPI-PAE/EXTRATERR.-34/66 CFSTI- HC \$3.00/MF  
\$0.65

ARTIFICIAL, \*ARTIFICIAL CLOUD, ATMOSPHERE, \*BARIUM,  
CHEMISTRY, CLOUD, COPPER, DIFFUSION, EVAPORATION, IONIZATION,  
METAL, MOLECULAR, REACTION, \*STRONTIUM, UPPER, \*UPPER  
ATMOSPHERE, VAPOR, VELOCITY, YIELD

N67-20349 #TEXAS A&M UNIV., COLLEGE STATION.

CAT. 20 DEPT. OF METEOROLOGY.

RESEARCH ON TROPICAL RAINFALL PATTERNS  
AND ASSOCIATED MESOSCALE SYSTEMS

FINAL REPORT, MAY 1962 - OCT. 1966

COBB, L. G. CORNETT, J. S. GRIFFITHS, J. F.

HENRY, W. K. OCT. 1966 162 P

DA-36-039-AMC-89202

ECOM-89202-F REPT.-11 AD-642861 CFSTI- HC  
\$3.00/MF \$0.65

CENTRAL, DISTRIBUTION, MAP, MESOSCALE, METEOROLOGY, PATTERN,  
\*RAIN, SEASON, \*SOUTH AMERICA, SPECTRUM, SYSTEM,  
THUNDERSTORM, TROPICAL, \*TROPICAL METEOROLOGY

Figure 12. NASA/SDI Notification



information services; (3) the users spend an average of 10% of work time in literature searching (even with the SDI service), and (4) 95% of the respondents saved at least 10% of their literature search time because of SDI. By converting time saved into a dollar figure -- a reasonable reliable estimate can be obtained -- SDI is calculated to be currently worth about \$150 per user/year. The present cost is \$80 per user/year. One can say that it is on a paying basis. But the real pay-off is in the cost of knowing vs. the cost of not knowing, and we don't know how to measure this.

The survey has revealed that:

1. A user education program is needed.
2. Some users are still not aware of procedures to update their interest profile. To be truly responsive the profile must be current.
3. There is some difficulty in getting documents because of:
  - a. Lack of quick access to library facilities in some cases.
  - b. Lack of knowledge concerning how and where to order in other cases.

On the basis of the Division's experience in SDI and the experience of others as learned from an in-house study of the Information Studies Division, it is concluded that SDI in some form is not only feasible economically and technically but is a valid requirement for the Air Force scientific and technical community. Lower-cost methods are being sought.

## 2. Some Relevant Statistics

OAR has been concerned with insuring that the OAR product be announced. In addition to journal publication, the primary methods of announcement are through DDC and the NASA systems.

At present the DDC data base contains about 800,000 documents and is increasing at the rate of about 51,000 per year. The NASA data base contains about 500,000 documents and is increasing at the rate of 65,000 per year.

Through its monitoring of the DD Form 1473 (Document Control Data-R&D), and its monitoring of the DDC and NASA announcement bulletins, the Programs Division has effected an increase in the number of OAR reports announced. At the end of 1966 virtually 100% of our output appeared in the DDC Technical Abstract Bulletin (TAB). At the end of 1966 more than 70% of the OAR output was also announced in the NASA System.

Table 3 shows the number of reports prepared by OAR subordinate organizations during CY 1966.

Table 3

Number of Reports Prepared by OAR Subordinate Organizations, CY66				
	Technical Reports	Journal Articles	Other	Total
AFCRL	619	227	5	851
AFOSR	732	1905	121	2758
ARL	161	84	3	248
ORA	6	0	0	6
FJSRL	3	5	2	10
Total	1521	2221	131	3873

Referring to the user statistics in Table 4, we see that in the last 6 months of 1966 6,897 reports were ordered by Air Force users as a result of SDI announcement.

Table 4

Air Force User Statistics, NASA SDI System July thru December 1966				
No. of Notices	No. of Relevant Notices	Relevancy Ratio	Reports Requested	No. of Notices not Responded to
59,060	33,972	59%	6,897	1,240 2% of Total

## Comments:

1. 185 average number of users during period.
2. Average of 26 notices per user per announcement cycle.
3. Average of 16 relevant notices per user per announcement cycle.
4. Average of 3 documents requested per user per announcement cycle.
5. Statistics available only for 6-month period.

Table 5 shows OAR use of DDC. OAR ordered 15,580 documents from DDC during CY 1966. It ordered 113 bibliographies in a 6-month period.

Note the small number of Research Management Reports (DD Form 1498) requested to date. Obviously additional education is necessary concerning the value and availability of this tool.

Table 5

OAR Usage Figures for DDC Services Calendar Year 1966			
Unit	No. of Reports Requested 1966	No. of Bibs Requested July- December 1966	No. of Research Management Reports (1498) Requested
Hq OAR	317	13	6
AFCRL	10,867	17	
ARL	1,797	3	
AFOSR	915	7	3
EOAR	260	52	
LAOAR	848	0	
LOOAR	0	0	
ORA	576	21	1
VFOAR	0	0	
Totals	15,580	*113	**10

\*Statistics available only for 6-month period.

\*\*Total as of 1 March 1967 - (approximately a 6-month period).

### 3. DDC Five-Year Plan

The Programs Division has submitted a list of items for DDC's consideration in connection with its Five-Year Plan (see Appendix, page A21). Among these is a suggestion to initiate an SDI program on a test basis, using microfiche. A separate specific proposal was sent to DDC on this (see Appendix, page A24).

DDC has taken no action on any of these suggestions to date. DDC is now placing first priority on the 1498 program. When that program is running well, some action may be taken along the lines of these suggestions.

### 4. Wright-Patterson AFB Information Needs

Some preliminary steps have been taken toward formulating an approach toward the solution of some of the information needs at Wright-Patterson AFB. Since about one third of the Air Force S&E personnel involved in R&D activities are located there, and since some 15 technical libraries and information facilities (few, if any, are cross-referenced) are located there, it appears that the time to seriously consider methods

of co-ordinating and integrating the existing Wright-Patterson information activities is long overdue. Of particular concern is the need for a method for rapid acquisition of hard-to-get references. (See Appendix, page A26.)

#### 5. Air Force Participation in NASA SCAN

The Programs Division has approached NASA in regard to AF participation in the Selected Current Aerospace Notices (SCAN) system, presently operated by NASA on an experimental basis. Examples of SCAN announcements appear in Figures 13 and 14.

The SCAN system is a current awareness program operating on the same data base as the NASA SDI system. It is similar to SDI in that selective information is the product; however, considerably different production techniques are used. SCAN, briefly, is a system where all documents in the data base are indexed to corresponding topical subject categories. There are about 55 topics to which a user can subscribe. Twice each month, the data base is searched for documents indexed to the user's designated topics of interest and announcements of relevant documents are sent to the user.

NASA has agreed to the initial participation of two Air Force groups (35 to 40 per group) which are presently being selected. The effectiveness of SCAN as compared to known SDI performance data will be analyzed for possible trade-offs in economy and efficiency.

#### 6. Clearinghouse Topical Announcement Service

A proposal has been made to the Federal Clearinghouse for Scientific and Technical Information for the establishment of a Topical Announcement Service based on the data announced in the Clearinghouse bulletin, U.S. Government Research and Development Reports (USGRDR) (see Appendix, page A28). The fundamental idea is to provide scientific and engineering people with selected material from USGRDR as opposed to the present situation where the voluminous publication must be searched for items of interest. One would thus avoid the psychological hurdle posed by the sheer size of the publication and would also eliminate the need for using an index, since recipients would be forwarded only those items dealing with subjects of interest.

This suggested approach was sent to the Clearinghouse on 3 February 1967. The approach differs from the Fast Announcement Service of the Clearinghouse in that all Clearinghouse announcements within a topical area would be included. The Fast Announcement Service only includes those items considered to be of highest significance. (See example, Appendix, page A30.) The proposal was favorably received and contacts have been made with Clearinghouse people to consider methods to implement the service. Figure 15 shows a preliminary sample -- it is somewhat similar to the NASA SCAN, except that it includes abstracts. As planned, the announcement service will include about 66 topical areas and will have approximately 1,000 participants.

# NASA/SCAN Notification

10-0005 MICROELECTRONICS  
TAA ISSUE #24, 15 DECEMBER 1966

- INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, ANNUAL NEW YORK CONFERENCE ON ELECTRONIC RELIABILITY, 7TH, NEW YORK, N.Y., MAY 20, 1966, CONFERENCE RECORD. CONFERENCE SPONSORED BY THE PROFESSIONAL TECHNICAL GROUPS ON RELIABILITY, PARTS, MATERIALS AND PACKAGING, AND THE BASIC SCIENCE GROUP OF THE INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS. NEW YORK, INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS, 1966, 331 P. AMBIENT, ANALYSIS, APOLLO SPACECRAFT, ARRAY, CELL, CONFERENCE, CONTROL, DATA, DATA ANALYSIS, DESIGN, EFFECTIVENESS, ELECTRONICS, FAILURE, GAS, INTEGRATION, LOGIC, LOW TEMPERATURE, MAINTAINABILITY, MICROELECTRONICS, PHASE, RELIABILITY, SOLAR, SURVEILLANCE, SYSTEM, SYSTEMS DESIGN, TRANSISTOR C09 A66-42087
- RELIABILITY PREDICTION IN DESIGN OF MICROELECTRONIC AEROSPACE SYSTEMS. CHERNEY, R. W. NORTH AMERICAN AVIATION, INC., AUTONETICS DIV., DATA SYSTEMS DIV., ANAHEIM, CALIF. IN- INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS, ANNUAL NEW YORK CONFERENCE ON ELECTRONIC RELIABILITY, 7TH, NEW YORK, N.Y., MAY 20, 1966, CONFERENCE RECORD. #A66-42087 24-09# CONFERENCE SPONSORED BY THE PROFESSIONAL TECHNICAL GROUPS ON RELIABILITY, PARTS, MATERIALS AND PACKAGING, AND THE BASIC SCIENCE GROUP OF THE INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS. NEW YORK, INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS, 1966, P. 23-2 TO 23-26. CIRCUIT, COMPONENT, COMPONENT RELIABILITY, COMPUTER, CONFERENCE, CONTROL, ELECTRONIC PACKAGING, FAILURE, FIELD EFFECT TRANSISTOR /FET/, INTEGRATED CIRCUIT, INTEGRATION, METAL OXIDE SEMICONDUCTOR /MOS/, MICROMINIATURIZATION, PACKAGING, PREDICTION, QUALITY, QUALITY CONTROL, RATE, RELIABILITY, SYSTEM, SYSTEM FAILURE, WEAPON C09 A66-42090
- OPTIMUM USE OF MICROELECTRONIC RELIABILITY DATA IN SYSTEM DEVELOPMENT. LENNON, J. R. ARINC RESEARCH CORP., ANNAPOLIS, MD. IN- INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS, ANNUAL NEW YORK CONFERENCE ON ELECTRONIC RELIABILITY, 7TH, NEW YORK, N.Y., MAY 20, 1966, CONFERENCE RECORD. #A66-42087 24-09# CONFERENCE SPONSORED BY THE PROFESSIONAL TECHNICAL GROUPS ON RELIABILITY, PARTS, MATERIALS AND PACKAGING, AND THE BASIC SCIENCE GROUP OF THE INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS. NEW YORK, INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS, 1966, P. 25-2 TO 25-11. CIRCUIT, CIRCUIT RELIABILITY, CONFERENCE, DESIGN, ENGINEERING, FAILURE, INTEGRATED CIRCUIT, INTEGRATION, MICROELECTRONICS, PROTOTYPE, RELIABILITY, SYSTEM, SYSTEMS ENGINEERING, TEST C09 A66-42099
- DETERMINING CHARACTERISTICS OF INTEGRATED LOGIC DEVICES. PARKER, C. D. RESEARCH TRIANGLE INST., SOLID STATE LAB., DURHAM, N.C. IN- INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS, ANNUAL NEW YORK CONFERENCE ON ELECTRONIC RELIABILITY, 7TH, NEW YORK, N.Y., MAY 20, 1966, CONFERENCE RECORD. #A66-42087 24-09# CONFERENCE SPONSORED BY THE PROFESSIONAL TECHNICAL GROUPS ON RELIABILITY, PARTS, MATERIALS AND PACKAGING, AND THE BASIC SCIENCE GROUP OF THE INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS. NEW YORK, INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS, 1966, P. 28-2 TO 28-10. 7 REFS. CIRCUIT, COEFFICIENT, COMPUTER, CONFERENCE, DIGITAL, INTEGRATED CIRCUIT, INTEGRATION, LEAST, LOGIC, LOGIC CIRCUIT, MATHEMATICAL MODEL, MATHEMATICS, MODEL, SQUARE C08 A66-42100
- A NOTE ON BOLOMETER MOUNT EFFICIENCY MEASUREMENT TECHNIQUE BY IMPEDANCE METHOD IN JAPAN. TAMARU, T. ELECTROTECHNICAL LAB., TOKYO, JAPAN IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, VOL. MT-14, SEP. 1966, P. 437. 6 REFS. BOLOMETER, CALORIMETRY, EFFICIENCY, IMPEDANCE, IMPEDANCE MEASUREMENT, JAPAN, MEASUREMENT, MICROELECTRONICS, MOUNT C14 A66-42104
- PHASE-LOCK FREQUENCY STABILIZATION OF ROCKET TELEMETRY TRANSMITTERS BY MEANS OF SILICON INTEGRATED CIRCUITS. LINDSAY, A. E. PULFER, J. K. NATIONAL RESEARCH COUNCIL, RADIO AND ELECTRICAL ENGINEERING DIV.

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 |
|---|-----------|
| OTTAWA, CANADA /CANADIAN AERONAUTICS AND SPACE INST., AVIONICS SYMPOSIUM, TORONTO, CANADA, MAR. 10, 1966, PAPER./ CANADIAN AERONAUTICS AND SPACE JOURNAL, VOL. 12, SEP. 1966, P. 249-271. AMPLIFIER, ANTENNA, CIRCUIT, CRYSTAL, FREQUENCY, INTEGRATED CIRCUIT, INTEGRATION, LOCK, MODULATION, NETWORK, OSCILLATOR, PHASE, PHASE LOCK, RATE, RELIABILITY, SILICON, STABILIZER, SWEEP, TELEMETRY, TRANSISTOR, TRANSMITTER, VOLTAGE C09 A66-42262  |           |
| BIREFRINGENT TAPE - A NEW, EASIER TECHNIQUE FOR SEPARATING THIN FILM AND PRINTED CIRCUIT MASTER DRAWINGS WITH PERFECT REGISTRATION. ASKOWITH, B. J. MIDDLETON, W. J., JR. MARTIN MARIETTA CORP., MARTIN CO., ORLANDO, FLA. INTERNATIONAL LATEX CORP., ENGINEERING SECTION, DOVER, DEL. IEEE TRANSACTIONS ON PARTS, MATERIALS AND PACKAGING, VOL. PHP-2, MAR.-JUN. 1966, P. 25-28. ADHESIVE, BIREFRINGENCE, CIRCUIT, FILM, GRAPH, GRAPHIC ARTS, LAMP, MICROELECTRONICS, PLASTIC, POLARIZATION, PRINT, PRINTED CIRCUIT, REGISTRATION, ROTATION, SEPARATION, TAPE, THIN, THIN FILM C09 A66-42312   |           |
| CONTOUR DEPOSITION - A NEW EPITAXIAL DEPOSITION TECHNIQUE FOR SEMICONDUCTOR DEVICES AND INTEGRATED CIRCUITS. KLEIN, T. MULLARD, LTD., MULLARD RESEARCH LABS., SALFORDS, SURREY, ENGLAND INST. OF ELECTRICAL ENGINEERS, COLLOQUIUM ON INTEGRATED CIRCUITS, LONDON, ENGLAND, NOV. 29, 1965, PAPER./ SOLID-STATE ELECTRONICS, VOL. 9, OCT. 1966, P. 959-966. 10 REFS. CIRCUIT, CONFERENCE, CONTOUR, DEPOSITION, DEVICE, EPITAXIAL DEPOSITION, EPITAXY, FACTOR, GEOMETRIC FACTOR, GEOMETRY, INTEGRAL, INTEGRATED CIRCUIT, SEMICONDUCTOR, SEMICONDUCTOR DEVICE, SURFACE, SURFACE TREATMENT, TREATMENT C09 A66-42386  |           |
| SYSTEM DESIGN AND PACKAGING USING INTEGRATED CIRCUITS. WALKER, R. M. PHILCO CORP., HOL DIV., PALO ALTO, CALIF. EEE - THE MAGAZINE OF CIRCUIT DESIGN ENGINEERING, VOL. 14, SEP. 1966, P. 78-83. CIRCUIT, DESIGN, DIODE, ELECTRONIC, ELECTRONIC PACKAGING, EXPANSION, IMMUNITY, INTEGRATED CIRCUIT, INTEGRATION, MODULE, NOISE, OUTPUT, PACKAGING, PARAMETER, RELAY, RESISTOR, SPEED, SYSTEM, SYSTEMS DESIGN, TERMINATOR, VOLTAGE C09 A66-42499   |           |
| AMPLIFIERS USING BIPOLAR AND UNIPOLAR TRANSISTORS WITH LIMITED DRAIN - SOURCE VOLTAGE. GOSLING, W. WALES, U. COLL. OF SWANSEA, SCHOOL OF ENGINEERING, SWANSEA, WALES INSTITUTION OF ELECTRICAL ENGINEERS, PROCEEDINGS, VOL. 113, OCT. 1966, P. 1380-1386. 8 REFS. AMPLIFIER, ANALYSIS, BIPOLAR, CIRCUIT, CLASS, DEVICE, DRAINING, EFFECT, FIELD, FIELD EFFECT TRANSISTOR /FET/, INTEGRATED CIRCUIT, INTEGRATION, LIMITATION, PROPERTY, SOURCE, TRANSISTOR, TRANSISTOR AMPLIFIER, UNIPOLAR, UNIPOLAR TRANSISTOR, VOLTAGE C09 A66-43031   |           |
| THERMAL PROBLEMS IN A SPACE ENVIRONMENT - A STUDY OF THE FLAT-PACK CASE. RAINE, M. L. INTERNATIONAL BUSINESS MACHINES CORP., FEDERAL SYSTEMS DIV., ELECTRONICS SYSTEMS CENTER, OREGON, N.Y. /NATIONAL ELECTRONIC PACKAGING AND PRODUCTION CONVENTION, NEW YORK, N.Y., JUN. 21-23, 1966, PAPER./ ELECTRONIC PACKAGING AND PRODUCTION, VOL. 6, SEP. 1966, P. 97-101. ANALYSIS, CALIBRATION, CASE, CIRCUIT, CONDUCTION, CONFERENCE, COOLING, CURVE, ELECTRONIC PACKAGING, EMISSIVITY, FLAT, HEAT RESISTANCE, INFRARED, INTEGRATED CIRCUIT, INTEGRATION, MEASUREMENT, PACK, PACKAGING, RADIATION, RADIATION COOLING, RESISTANCE, STRESS, TEST, THERMAL, THERMAL PROTECTION, VACUUM, VIBRATION C09 A66-43059 |           |
| OPTIMIZING TRANSISTOR PARAMETERS IN INTEGRATED CIRCUITS. HJELLE, O. HOCHMAN, H. T. NATIONAL CASH REGISTER CO., DAYTON, OHIO SEMICONDUCTOR PRODUCTS AND SOLID STATE TECHNOLOGY, VOL. 9, SEP. 1966, P. 42-47. 5 REFS. BREAKDOWN, CAPACITANCE, CIRCUIT, DESIGN, EPITAXY, FABRICATION, FREQUENCY, FREQUENCY RESPONSE, GEOMETRY, GOLD, IMPURITY, INTEGRATED CIRCUIT, INTEGRATION, JUNCTION,  |           |

# NASA/SCAN Notification

13-0003 GEOMAGNETISM  
STAR ISSUE #23, 06 DECEMBER 1966

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

- " ALTERNATING FIELD DEMAGNETIZATION STUDY ON LOWER  
SINIAN SANDSTONES IN XIUMING HSIUNG DISTRICT, ANHUI  
/ONTARIO/. CHUN, L. MAG. F. MAY 1966 13 P  
REFS TRANSL. INTO ENGLISH FROM TI CHIU WU LI HSUEH  
PAO /PEKING/, V. 14, NO. 3, SEP. 1965 P 173-180  
1-7-C TT-66-62025 AD-634970  
ALTERNATING, DEMAGNETIZATION, FIELD, \*GEOMAGNETISM,  
\*MAGNETIC PROPERTY, PALEOMAGNETISM, PETROLOGY, \*SANDSTONE,  
STRATIGRAPHY C13 N66-38177 0
- " TREATING TELLURIC-CURRENT GRAPHS BY THE METHOD OF TRUE  
ELLIPSES AIR FORCE SYSTEMS COMMAND, WRIGHT-  
PATTERSON AFB, OHIO. TRACHEV, G. M. 26 MAY  
1966 15 P REFS TRANSL. INTO ENGLISH FROM GEOL. I  
GEOL. 12, AKAD. NAUK SSSR, SIBIRSK. OTD. /NOVOSIBIRSK/,  
NO. 11, 1963 P 114-121 FTD-TT-65-1902  
TT-66-62036 AD-637062  
CALCULATION, DETERMINATION, ELLIPSE, FIELD, \*FLOW GRAPH,  
\*GEOPHYSICS, POINT, POLARIZATION, PROSPECTING, \*STATISTICAL  
ANALYSIS, \*TELLURIC CURRENT, TRUE C13 N66-38306 1
- " GEOMAGNETIC DISTURBANCES NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION, GODDARD SPACE FLIGHT CENTER,  
GREENBELT, MD. SUGIURA, M. 1965 26 P REFS  
SUBMITTED FOR PUBLICATION NASA-TN-X-57005  
ACTIVITY, AREA, BAY, CAP, CHARACTERISTIC, COMPRESSION,  
CONJUGATE, CONVECTION, CURRENT, ELECTROJET, EMISSION, FLARE,  
\*GEOMAGNETIC STORM, HOT PLASMA, INDEX, LINE, LOW LATITUDE,  
\*MAGNETIC FIELD DISTURBANCE, MAGNETOSPHERE, NEGATIVE,  
PHYSICAL, \*POLAR AURORA, POSITIVE, SCLAR, SUN, SYSTEM, WIND  
C13 N66-38364 00
- " SOLAR FLARE HAZARD TO EARTH-ORBITING VEHICLES FINAL  
REPORT REPUBLIC AVIATION CORP., FARMINGDALE, N. Y.  
11 APR. 1966 50 P REFS NASA-CR-66202 FMR-1395-3  
PCC-TR-66-5  
DIPOLE, DOSE, EARTH, EARTH SATELLITE, EFFECT, FIELD,  
\*GEOMAGNETIC STORM, MAGNETIC, MODEL, ORBITAL, \*RADIATION  
HAZARD, SHADOW, \*SOLAR FLARE, SPACECRAFT, STORMER THEORY  
C29 N66-38758 00

# CLEARINGHOUSE ANNOUNCEMENTS in SCIENCE & TECHNOLOGY

REPRINTED FROM U.S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS.

67, NO 10

## Cartography & Geodesy

### 8B. CARTOGRAPHY

#### DEPARTMENT OF DEFENSE SELENODETTIC CONTROL SYSTEM, 1966.

Technical rept.  
Defense Intelligence Agency Washington D C  
Jan 67, 184p Rept no. TR-1  
Prepared in cooperation with Army Map Service, Washington, D. C., and Aeronautical Chart and Information Center, St. Louis, Mo.

Descriptors: (\*Moon, \*Mapping). Geodesics, Control systems, Terrain, Navigation charts, Site selection, Department of Defense.

Using the methods described in AD-262 889 and AD-460 485, the Army Map Service in cooperation with the Aeronautical Chart and Information Center completed the Department of Defense (DOD) Selenodetic Control System 1966. A listing of the 734 points which constitute the DOD-66 is included. The average point was measured on nine photographic plates. The rms horizontal and vertical uncertainties (precision) of the solutions are plus or minus 972 and plus or minus 751 meters, respectively. The crater coordinates were compared point-by-point with other selenodetic systems. In each comparison, the rms differences, both horizontal and vertical, were less than the expected rms differences computed from the corresponding variances. Maximum rms differences approached plus or minus 1500 meters.  
AD-648 067

#### VISUAL FACTORS AFFECTING THE PRECISION OF COORDINATE MEASUREMENT IN AEROTRIANGULATION.

Research note.  
Army Engineer Geodesy Intelligence And Mapping Research And Development Agency Fort Belvoir Va  
Desmond C. O'Connor, 13 Jan 67, 168p Rept no. RN-21

Descriptors: (\*Triangulation, \*Photogrammetry), (\*Visual acuity, Triangulation), Measurement, Accuracy, Aerial photography.

A study was made of the precision of centering black circular measuring marks in sharp circular targets simulating artificial pass-points with homogeneous backgrounds of different densities. An extensive review of the relevant functions of the visual system is given, and the task is related to the general area of visual acuity. The results demonstrate that the precision of pointing may be significantly affected by the size relationship between the measuring mark and pass-point, the background density, and the adaptation level, provided that the instruments used are sufficiently sensitive.

The results support the proposition that subjective neural effects at edges contain significant visual information, and this would appear to be important where visual settings are being made by bringing geometrical configurations into close relationship with one another. The maximum information for the centering was contained in ribbons approximately 1 minute of arc wide around the light areas of target and measuring mark. The most precise pointings were made by selecting a measuring mark to give a minimum annulus width within these ribbons, irrespective of the target size, up to 2 degrees retinal subtense. The relationship between the standard deviation of pointing and annulus width appears to be linear for annulus widths up to approximately 1 minute of arc visual subtense. A discontinuity occurs in this vicinity, and the relationship appears to take on an exponential form. (Author)  
AD-648 303

#### A COMPACT STATISTICAL METHOD OF TOPOGRAPHIC REPRESENTATION.

Rand Corp Santa Monica Calif  
B. W. Boehm, and J. E. Rieber, Feb 67, 64p Rept no. RM-5081-PR  
Contract F44620-67-C-0045

Descriptors: (\*Statistical analysis, \*Terrain), (\*Maps, \*Information retrieval), Computer programs, Numerical methods and procedures.

An information regeneration method embodied in a FORTRAN program for storing topographic maps in a digital computer in compact form. A statistical model of the terrain is used. The major outlines of the topography are entered directly. When the altitude of any point is desired, the interstices are "fleshed out" by regeneration from the probability distribution of altitude variations, thus trading computer storage for execution time. Any desired degree of realism can be achieved at increased space/time cost. If realistic representation of a particular area is needed for detailed analyses of the influence of terrain, the direct representation methods described in RM-4636-PR are recommended. The statistical method is preferable for broad-brush analyses, in particular for terrain variation in a Monte Carlo analysis. (Author)  
AD-648 487

#### THE IMPORTANCE OF SOUND CARTOGRAPHIC RESEARCH.

Aeronautical Chart And Information Center St Louis Mo  
Martin G. Zschiegner, Mar 63, 10p Rept no. ACIC-Technical Paper-5

Descriptors: (\*Mapping, Scientific research), Navigation charts, Preparation, Control systems.

#### Predictions.

The present and future importance of cartographic research is discussed. The various parameters of this function are defined and the various tasks involved in its accomplishment are described.  
AD-648 704

### 8E. GEODESY

#### THRESHOLD DETECTION OF GEODETIC SATELLITE IMAGES.

Fg And G Inc Bedford Mass  
For primary bibliographic entry see Field 17H.  
AD-648 165

#### RESONANCE EFFECTS DUE TO THE LONGITUDE DEPENDENCE OF THE GRAVITATIONAL FIELD OF A ROTATING PRIMARY.

Royal Aircraft Establishment Farnborough (England)  
For primary bibliographic entry see Field 3C.  
AD-648 540

#### AN ORBITAL ANALYSIS TECHNIQUE FOR SHARPLY VARYING GEOPHYSICAL PHENOMENA.

National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md  
For primary bibliographic entry see Field 22C.  
For abstract, see STAR 05 08.  
N67-18746

THIS ANNOUNCEMENT HAS BEEN PREPARED BY THE CLEARINGHOUSE AS A PART OF A JOINT OAR-CLEARINGHOUSE EXPERIMENTAL PROGRAM IN SCIENTIFIC & TECHNICAL INFORMATION DISSEMINATION. THE DOCUMENTS LISTED CAN BE ORDERED DIRECTLY FROM THE CLEARINGHOUSE ON SPECIAL ORDER FORMS AVAILABLE TO PARTICIPANTS IN THIS EXPERIMENT. COMPLETED FORMS SHOULD BE MAILED TO: CLEARINGHOUSE, SPRINGFIELD, VA. 22151.

#### 7. Chemical Abstracts Issue Tape Experiment

This experiment is to determine the utility of Chemical Abstracts Service indexes, titles, and original journal references on magnetic tape for current awareness searching. It will serve to indicate whether or not a locally operated system is more desirable and/or more effective than a central operation.

The experiment is to run for one year. As planned, Chemical Abstracts Service will send one tape every two weeks to ARL for local use. ARL will duplicate the tape and send a copy to Frank J. Seiler Research Laboratory for their use. Through FJSRL, the Air Force Academy would also have access to the information.

#### 8. DD Forms 1498m

The 1498m program is a system for reporting, storage and retrieval of information on DoD scientific and technical programs. Its purposes are:

- a. To provide ready access to basic technical and management data.
- b. To provide a common base for co-ordination and correlation.
- c. To provide statistical summaries.
- d. To provide information for exchange with other Government agencies.

The completed DD Form 1498 at the project or task level contains a report of on-going research and planning information. The form at the work-unit level represents a report of on-going work, without indication of future plans.

Project/task 1498's are prepared by all laboratories responsible for OAR projects. The project/task forms are screened by Hq OAR and distributed to all concerned. (For example see Appendix, page A31.)

Work-unit level information is assembled by the MASIS office. The information is fed into the MASIS data bank and is supplied to DDC on tape. Both the DDC program and MASIS are still in the developmental stage. Some problems are yet to be resolved, such as (1) compatible formats, (2) completeness of information, and (3) timeliness of submissions. MASIS is scheduled to send an updated tape to DDC in the near future and will update every 15 days thereafter.

Properly used, the 1498m promises to be an excellent and a most valuable coupling device.



### 9. OAR Technical Libraries

The technical libraries of OAR are an integral part of the OAR Scientific and Technical Information Program. They must be responsive to the needs of the scientists within the command.

The operation of libraries has been encouraged to be along the lines of "service centers" rather than storage and retrieval facilities. This concept emphasizes the need for concentrating efforts to acquire relevant and significant information in a reasonable time span and provide it expeditiously to appropriate library users. Library personnel training programs, selective dissemination of information (either manual or automatic), new techniques to furnish "hard copy," and micro-reduction efforts to conserve storage space have been encouraged.

Funds for the technical libraries are programmed from the BP438 USAF library program fund. This funding program has been insufficient for essential needs, and fund levels have been increased by supplementing with OAR funds.

Five technical libraries are operated by OAR. The following statistics provide some details on funding, manning, and size of collections:

Table 6

Statistics on OAR Libraries						
Unit	No. of Library Personnel	Funds Spent in CY 66		Collections		
		OAR	BP 438	Books	Periodical Subscriptions	Tech Reports
AFOSR	3	\$ 900	\$ 21,500	11,800	346	30,000
AFCRL	30	267,100	54,500	190,000	3,700	161,000
ARL	3	3,350	26,500	15,400	435	900
EOAR	2	0	1,500	1,000	5	6,300
ORA	5	1,600	26,000	18,000	356	30,000
Total	43	\$272,950	\$130,000	236,200	4,896	228,200

## VII. THE EXECUTIVE DIVISION

The Executive Officer of the Scientific and Technical Information Office has a number of recurring or special projects in progress. He is currently conducting a check on Forms 1473 to insure compliance with the provisions set forth in OAR supplement to AFR 80-29 ("The Scientific and Technical Information Program," 18 May 1964). He is striving to correct the minor errors and inconsistencies so that the information contained on the forms can be easily and quickly incorporated into the MASIS, DDC and Clearinghouse systems.

In some instances, reports or their abstracts have appeared in journals and indexes but no related 1473's were on file at OAR Headquarters. In other cases, the distribution statements, required by AFR 310-2 to be imprinted on all technical reports, were questionable or missing. Abstracts in section 13 of Form 1473 were sometimes confusing and contained superfluous information.

All such errors were detected and brought to the attention of the originating laboratory. Immediate action was taken to correct the situations.

Although checking is performed on 100% of the completed forms today, it is believed that only spot checks will be necessary in the future in view of the gradual and steady improvement. It is planned to continue the review, to advise the field units, and even to revise the OAR supplement, if necessary, in the quest for accuracy.

The most recently completed project was a study to determine the extent to which basic DoD directives pertaining to the Technical Information Program have been implemented. The methodology and findings are illustrated in Figure 16.

### Method:

1. List the DoD directives identified in Dr. John S. Foster, Jr.'s memorandum of 1 November 1966 (announcing the establishment of the Raymond Committee). They were the directives which followed and related to the basic DoD Directive 5100.36 ("DoD Technical Information," 31 December 1962).
2. Add AFR's which relate to, amplify or formally implement the DoD directives.
3. Add OAR regulations, supplements, office instructions and other directives which likewise refer to the AFR's.
4. Add laboratory publications which similarly apply.
5. Add other publications related to the Technical Information Program in the appropriate organizational column.

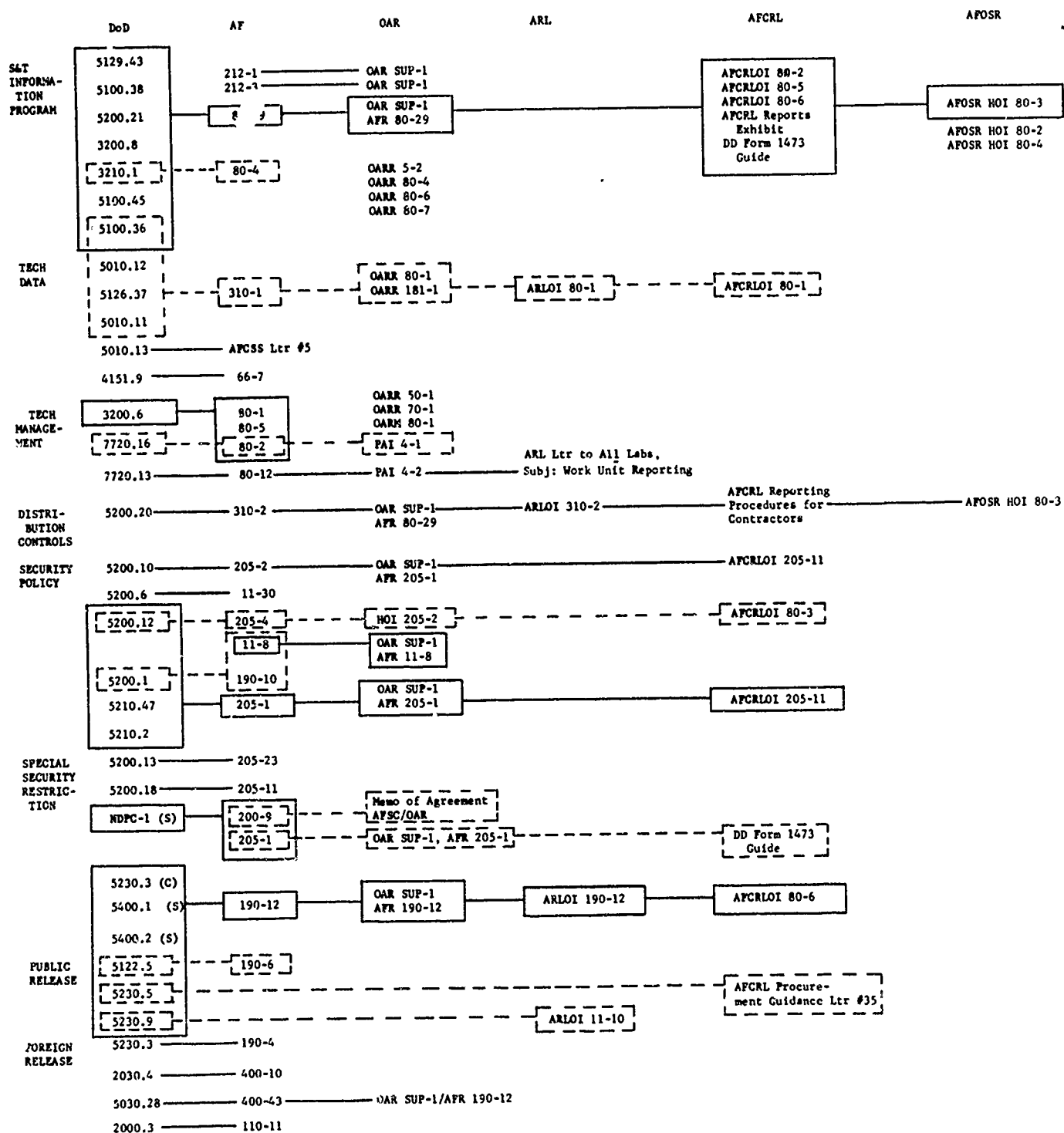


Figure 16. Implementation of DoD Directives  
16

Findings:

1. All DoD directives have been clarified or expanded in one way or another by subordinate unit directives. It should be noted here that all AFR's do not require amplification by directive. That is to say, OAR units can, in some cases, operate directly from USAF guidance and no OAR or laboratory level directive is necessary.
2. The relationships among the publications portray a complex system of overlaps. This is noted as a fact, not as a strength or weakness. A more detailed study may or may not determine that changes should be made.

The chart in Figure No. 16 represents implementation of the program by directive -- the written word. However, it takes more than a directive to make a program go. It takes leg work and positive action by all parties concerned. An example of such action is another one of the Executive Officer's planned projects.

During the coming months, personnel from this office will spend at least one day with each of the major OAR field units to brief the commanders and staffs on the current projects, problems and plans of concern to the Technical Information Program. The purpose will be to orient and update, to discuss and clarify the issues, to truly implement the Technical Information Program. The proposed agenda at this time is as follows:

1. A discussion of the rationale behind the revision of OARR 80-4, a very important directive dealing with invitations to foreign nationals to this country, and the OAR Supplement to AFR 80-29.
2. A review of the errors in completing Forms 1473. This may end the need for even the spot checks referred to earlier.
3. A discussion of some of the programs for which this office has requested funds during FY 68.
4. A general review of the Moss Bill (PL 89-487), commonly known as the Freedom of Information Act, and how it may affect OAR operations.
5. A discussion of what DDC can do for OAR people. This will include acquainting laboratory scientists with the ways in which work unit 1498m's can assist them with new research programs just being established and acquainting new personnel with ongoing DoD research programs in their areas of interest.

## VIII. RECOMMENDATIONS

During the recent visit of the Raymond Committee to AFCRL, a member of the Committee asked the question: "Consider for a moment what you would look at and what you would recommend if you were one of this group and had to review the DoD programs for (1) tech information, (2) tech data, and (3) tech intelligence. What would you suggest as being the most pressing problems, and what recommendations would you make for solving them?"

The first thought in attempting to answer such a question would be to review the classical functions of management to determine whether they have been and are being adequately fulfilled. The primary functions of management are:

1. Planning
2. Organizing
3. Directing
4. Co-ordinating
5. Controlling and evaluating

Some guidance is needed from above -- specifically, some planning guidance and direction from DoD. Where is the program going, why, how and when? What is its objective? The current Air Force STINFO Plan, dated February 1964, is 3 years old and is currently undergoing a much-needed revision, but this may well be a futile exercise without corresponding planning at the DoD level and guidance to the individual services. A framework is necessary that will allow for an integrated plan within the over-all context of the DoD plan, co-ordinated in advance with the future activities of the Army and Navy in this area. Corporate planning as a function of top-level management in industry generally occurs at the vice president's level. Divisional planning is fruitless unless integrated with the corporate plan.

A planning exercise, if properly carried out, is a wonderful communications tool. However, it must be conducted face-to-face, informally, and it must be in the nature of a think session -- picking the best and most experienced brains available. In this way ideas move from the bottom upward in the hierarchical structure. This is something that has been lacking in the DoD Technical Information Program heretofore. A finished plan is also a unifier, giving everyone one purpose and one direction. A DoD plan could include provision for research and development of DoD-wide information systems for the benefit of DoD over-all, instead of the bits-and-pieces approach of each individual service that has been taken in the past. Portions of the development of the DoD-wide information systems would be assigned to each of the services. But the over-all integration and co-ordination would be most effectively carried out at DoD level.

The DoD Planning Conference (Figure 17) should include representation from all interested agencies of DoD and the various services. More than just the STINFO representatives of each of the three services in the Pentagon should be included. For the Air Force, both OAR and AFSC should participate, as well as the representative from the Air Staff.

Planning committees would draw up plans for the future for each of the major facets and activities of the Scientific and Technical Information Program. The Organization Planning Committee could profitably examine the organization of Scientific and Technical Information Offices at all levels within the DoD "corporate structure," and recommend changes and improvements. At the DoD level, at Air Force, and in our own laboratories the STINFO officers are merely focal points, their information resources managed by someone else. They have STINFO responsibility but little authority and almost no resources with which to accomplish the job. Figure 18 depicts an idealized Technical Information Office. The Technical Information Manager should report directly to the boss. This idealized organization is most applicable to an AFSC laboratory and is modelled after the STINFO Office in the Rome Air Development Center. OAR, of course, does not deal with tech data and components standardization, but by removing the two boxes on the left we arrive at the present organization of the ARL Technical Information Office.

The Scientific and Technical Information Systems Planning Committee would prepare a plan for the development of a better scientific and technical information system or systems for DoD, with each of the services playing its own preassigned role in the system development. Thus the development of an information system would be accomplished in the same manner as the development of a weapons system -- by means of an integrated time-phased systematic effort to bring the latest technology to bear on the development and production of an advanced system.

The Information Sciences Research and Development Planning Group would examine the present state of the art of information technology and determine where present technology is deficient and where the greatest potential pay-off areas are located -- determine technical objectives, as it were. The planned research, of course, would be coupled directly to the most urgent needs of the systems designers and developers, and would directly support their efforts.

In addition to the above planning groups and others as needed, a Resources Planning Group would be required to tie together the work of all the other planning groups and integrate their resource requirements into an over-all resources section of the DoD Scientific and Technical Information Plan. Resources, of course, including funding, manpower, facilities, and equipment.

One fundamental problem in need of careful examination is the fact that there is no central DoD document service facility. The Defense Documentation Center could become such a facility but in the past has been prevented by

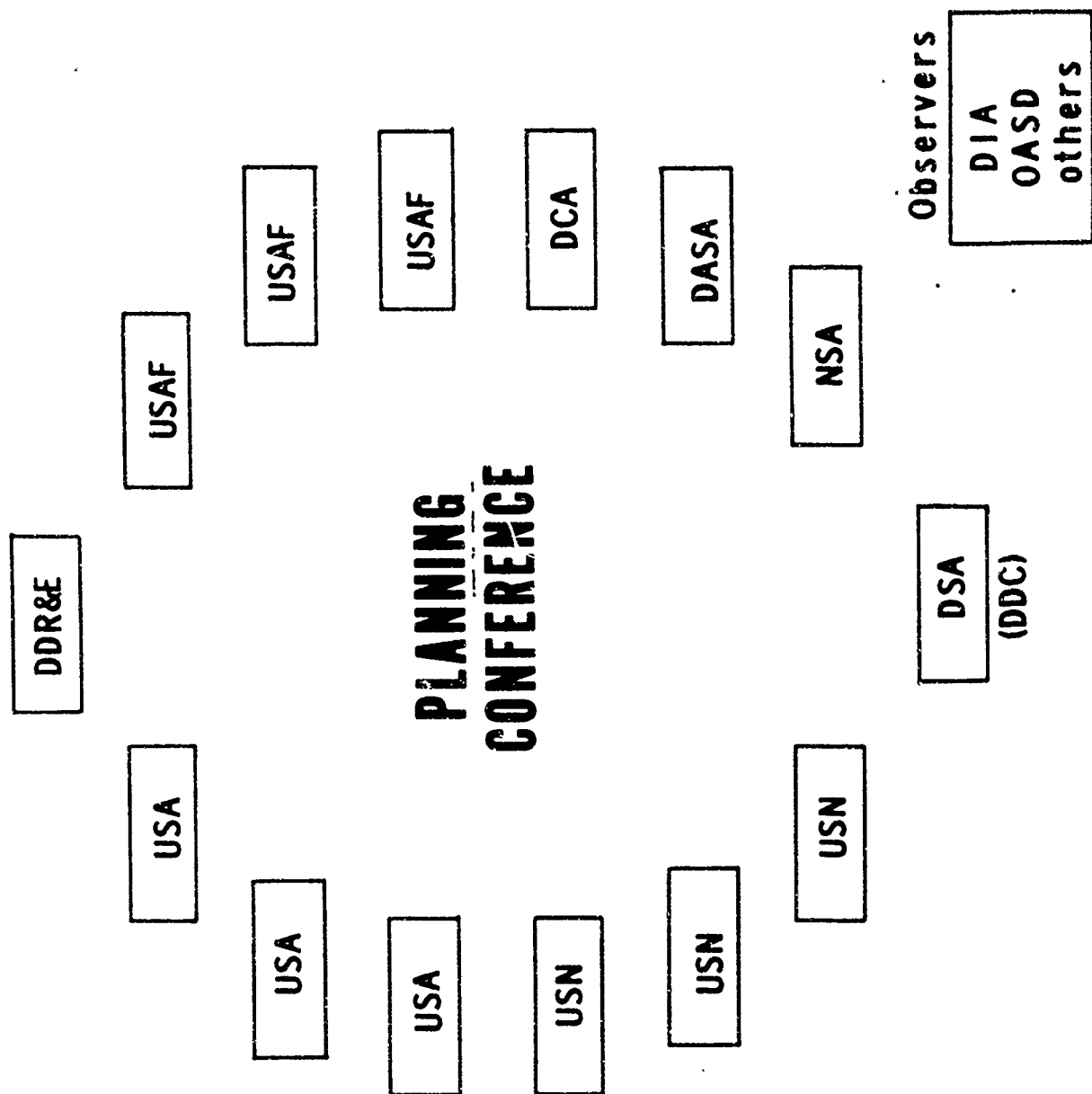


Figure 17.

# IDEALIZED TECHNICAL INFORMATION OFFICE

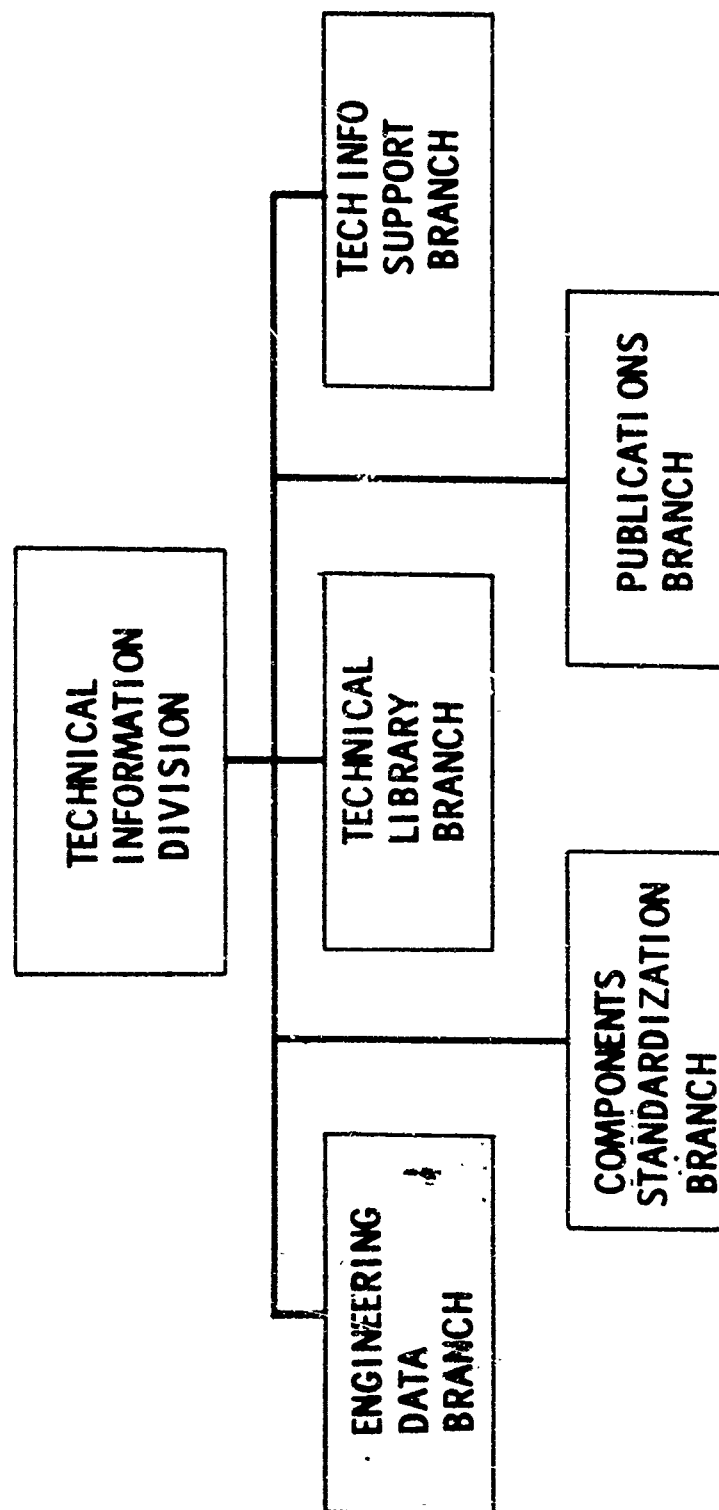


Figure 18.



its very charter which allowed it to function only as the DoD publishers' clearinghouse. While the need for the Clearinghouse is undisputed, it should be noted that DoD scientists and engineers have information needs which are not confined to DoD-generated documents alone. In fact, only a relatively small portion of the worldwide total of scientific and technical information is contained within DDC or the Clearinghouse.

One major activity worthy of consideration is the Central Access Point (CAP) for difficult-to-acquire documents. Thus, instead of a hundred or a thousand different sources for individual hard-to-get articles and reports, a scientist would requisition his needs from one central point, the CAP, which would act similarly to the present DDC, but not as a source for DoD-produced documents. The CAP, instead, would be the source for difficult-to-acquire documents not of DoD origin.

Another concept worth exploring is a complete DoD reliance on the Federal Clearinghouse for unclassified documentation service and the conversion of DDC for similar service for all classified documents. Such a move would have considerable impact on the progress and development of a Government-wide information network.

Without proceeding further in detail on the discussion of the primary function of management, it is fairly obvious that there is one major factor that would do the DoD STINFO program the most good. This is to obtain a knowledgeable manager as head of it -- a person who will intelligently carry out the basic functions of management, be a team worker, and be able to survive in the political environment of the Pentagon.

Acknowledgement. The authors wish to express their thanks to the OAR Publications Division (principally Mr. B. Roberts) for editing the several individual briefings and preparing an integrated manuscript in a uniform style and format suitable for publication.

C O P Y

DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING  
WASHINGTON, D. C. 20301

November 1, 1966

MEMORANDUM FOR      Assistant Secretary of the Army (R&D)  
                         Assistant Secretary of the Navy (R&D)  
                         Assistant Secretary of the Air Force (R&D)  
                         Director, Defense Atomic Support Agency  
                         Director, Defense Communications Agency  
                         Director, Defense Supply Agency  
                         Director, National Security Agency

SUBJECT: Management Review of Technical Information Program

In October 1962, the Deputy Secretary of Defense issued a memorandum directing that the components of the Department of Defense undertake a thorough examination of their technical information activities. In subsequent actions, DoD Directive 5100.36, "DoD Technical Information" was issued (Enclosure 1). This Directive was followed by Instructions and other related Directives listed in Enclosure 2 and is being coordinated with interfacing Instructions and Directives also listed in Enclosure 2.

Four years have elapsed since the initial impetus was given to the program. Substantial progress has been made. We are now deeply involved in finding ways to expedite technical communication of DoD's needs and its R&D results. I think that it is time to look at what has been accomplished, to evaluate the results against today's research and development needs, to see if the effort is well-balanced, and to realign priorities if the existing program needs revision.

To get an independent management appraisal of the program, I plan to set up an in-house team headed by one man selected from outside DoD and to supplement this team with a small advisory board of outside people. Members of the team will be assigned for a maximum of six months, full-time, starting November 15, 1966.

The team leader will be Dr. Richard C. Raymond of the General Electric Company. Some of the issues that the team will be asked to resolve are listed in Enclosure 3.

An equitable balance of the team would require that each of the addressees supply one individual. The Assistant Secretary of Defense (I&L) and the Director of DIA are also encouraged to supply observers to work with the team. To achieve the results desired, I would like to have senior men with broad technical experience and responsibility assigned to this work; by this I mean civilians, GS-15 or above, and their military equivalents.

Dr. Donald M. MacArthur, Deputy Director for Research and Technology, will be responsible for this management review. Please give him the nomination of your participant on the team within 10 days in order that the work can be started promptly.

/s/

John S. Foster, Jr.

Enclosures

Management Review of DoD Technical Information Program

Partial List of Key Issues

1. What is the technical information program trying to accomplish? Are the efforts properly directed toward improved effectiveness of the RDT&E programs in DoD?
2. What more or less should DoD do about dissemination of scientific information and technical data? Are there obvious alternatives now available?
3. What are the boundaries of the technical information program? Are the various activities fully geared to the transfer of information from the person who creates it to the user?
4. What balance is being achieved for providing just enough information, as opposed to too little or too much? Are there obvious opportunities for putting some of the activities on a pay-as-you-go basis through adoption of user charges?
5. How well is the program being managed at each echelon?
6. Is DoD playing its proper role in federal, national, and international efforts to improve technical communication?

27 January 1967

Management Review of DoD Technical Information Program

Areas of Interest

MANAGEMENT

1. Is it in the best interests of DoD to have its technical information program divided into segments such as STINFO, technical data, technical intelligence, etc? Why do you reach this conclusion?
2. Are there adequate policies and regulatory documents available to you and are these effectively supported at all DoD management levels? Is the attitude of the individual technical information user toward these policies and regulations the same as that of the manager?
3. What is the content of your technical information program and what are the management review criteria you apply to it?
4. What restrictions impede the development of a better technical information program; e.g., security, fund availability, facilities, personnel, regulations, organizational structures, training needs?

EFFECTIVENESS

1. Has the technical information program been effective in assisting in the execution of your job and fulfilling the needs of the DoD? Do you have specific illustrations?
2. Do users make adequate use of the system and are they satisfied with the results in terms of quality, quantity and speed or response?
3. How well does the program adjust to the changing needs and nature of your mission? Is there an effective channel through which users get consideration of suggested improvements?

RESOURCES

1. Are the resources allocated to the technical information program adequate to accomplish its purpose? Funds, personnel, facilities, equipment?
2. Do you see opportunities for significant reductions in DoD costs through better use of technical information or through changes in the technical information program itself?
3. What are the resources utilized in your technical information program; do any of these appear to constrain the program performance unduly?

COMMUNICATION AND DISSEMINATION

1. Does the information program provide adequate communication of requirements as well as accomplishments? Are there sufficient provisions for intense, detailed interchange of ideas as well as finished conclusions?
2. Do the current patterns of circulating reports and technical data strike an appropriate balance between the receipt of too much and too little technical information?
3. Do restrictions imposed because of security and related considerations adequately balance the conflicting needs of avoiding exposure to inimical interests and providing data for friendly exploitation?

COORDINATION

1. In what manner and to what degree are the various DoD information programs and closely related activities coordinated? Is it adequate?
2. What are the interfaces between the DoD technical information program with those of other Federal agencies and non-Federal organizations? Do they provide adequate information flows?

These questions were prepared by the members of the team conducting the Management Review of the DoD Technical Information Program.

SCIENTIFIC AND TECHNICAL INFORMATION  
Case from Experience

PROGRAM ELEMENT: 62405454

PROJECT/TASK NO: Project 4610

DATE: December 1965 to current

ACTION BEING PERFORMED WHERE THE INFORMATION WAS USED

Defense Communications Agency is supporting an R&D study at Radio Corporation of America on the problem of digital combining of vocoder signals. DCA was visited in December 1965 in order to exchange information on our speech compression R&D program in relation to their operational needs. As a result of discussions and information exchange, it was possible to make available to DCA the shared use of the AFCRL voice-excited vocoder equipments in order that their contractor could perform his study without having to design and build voice-excited vocoders. Administrative details were worked out in the late summer and fall of 1966 and RCA, DCA's contractor, will perform their tests using the AFCRL equipments during January 1967.

RESULTS OF USING THE INFORMATION

The information exchange led to an arrangement being worked out under which AFCRL was able to provide direct support to Defense Communications Agency on an R&D problem, permitting the work to be done more quickly and avoiding the expense of developing special equipments.

ESTIMATE OF COST SAVINGS -- OR COSTS AVOIDED

It is estimated that the costs of design and fabrication of voice-excited vocoders that would have been required for the study without the support from AFCRL would amount to \$300,000 and would have required at least a 12-month period.

PREPARED BY: Caldwell P. Smith  
AFCRL (CRBS)  
L G Hanscom Field  
Bedford, Mass. 01730

SCIENTIFIC AND TECHNICAL INFORMATION  
Case from Experience

PROGRAM ELEMENT: 61445014

PROJECT: 9749

DATE: 1965-1966

ACTION BEING PERFORMED WHERE THE INFORMATION WAS USED

Digital computers are extensively used to make quantum mechanical calculations of the behavior of atoms, ions, and molecules. The devising and checking of the many computer programs is an expensive proposition. Professor Shull, Indiana University, has organized a Program Exchange to disseminate and check computer programs.

RESULTS OF USING THE INFORMATION

175 American universities and not-for-profit organizations, 12 Federal (non-Air Force) labs, 2 Air Force labs, 6 companies in the aerospace industry, over 25 industrial laboratories, and over 100 foreign universities, laboratories, and companies are active participants in the exchange program. These participants are thus able to use the existing computer programs already developed without having to go to the expense of developing their own.

ESTIMATE OF COST SAVINGS -- OR COSTS AVOIDED

In 1964, the participants in the exchange spent over \$300,000 of Federal money on computer time to perform quantum mechanical calculations. A considerable portion of this money was spent on duplicatory program generation. Because of the ability of participants to obtain verified programs from the exchange, and thus not required to prepare their own, an annual savings of \$100,000 is estimated.

PREPARED BY: T. P. Baker, Jr.  
AFOSR (SRGC)  
Arlington, Virginia 22209



C O P Y

DEPARTMENT OF THE AIR FORCE  
The Frank J. Seiler Research Laboratory (OAR)  
USAF Academy, Colorado 80840

Reply to  
Attn of: FJSRL

14 November 1966

Subject: Scientific and Technical Information

To: RRY

The following case is forwarded as the only specifically documentable case of assistance by the STINFO program in the research of the laboratory:

a. The applicable project is 7904.

b. Date of action is Jan-Jun 1966.

c. The NASA/SDI system provided one of our researchers, Major Bernard S. Morgan, Jr., with information on a paper closely related to his current research. Upon receipt of this paper, he modified its results to provide a general solution. This was directly related to his research and thus permitted him to concentrate his time on other aspects of his research. The generalized solution he developed from the specifics of the paper received were subsequently published as a journal article.

/s/  
JOHN P. BROOKS, Lt Colonel, USAF  
Executive Officer

Estimated OAR Resources Devoted to the  
Scientific and Technical Information Program, FY67  
(Thousands of Dollars)

Publications, distribution, and support of publications*	80
Salaries of people in publications work (8) **	80
Library salaries (35 people)**	350
Bibliographic and Reference (all sources)	300
Translations	100
Salaries of Hq OAR S&T Information people and unit STINFO Officers (total 15 people - full time)	150
Hq OAR Developmental Tests and Studies	<u>85</u>
TOTAL	1,145

\*Publications costs of technical reports, journal articles, etc. are not included.

\*\*An average annual salary of \$10,000 per person was used.

In addition, this tabulation does not include R&D funding for Information Sciences, costs of symposia and technical meetings and excludes the costs of coupling activities.

## RESEARCH COUPLING ACTIVITIES

It is the command policy to make a concerted effort to couple OAR research results to users. This effort has been emphasized and continually nurtured at all levels of management and by the individuals performing OAR research.

Travel, assignments, and promotion policies established by this command and its elements insure that coupling receives consideration coequal to the conduct of research itself.

The term coupling is considered to include:

The orderly transfer of research results and the dissemination of interim research findings to the user.

Advice to Air Force planners and other elements of the Air Force headquarters establishment.

Familiarization with technical problems within the operational elements of the Air Force.

Feedback from the above activities, which on a long term basis permits the research activity to develop programs of the greatest future impact to the Air Force.

The following are some examples of OAR coupling activities:

(1) A Coupling Working Group<sup>1</sup> whose membership includes the OAR field unit commanders. The group reviews coupling actions, recommends specific goals, and provides specific ideas on OAR's coupling operations.

(2) A "Road Show" briefing team<sup>2</sup> which conveys to other Air Force organizations information about the objectives, conduct and results of OAR's research program.

(3) The insertion of a statement<sup>3</sup> outlining coupling responsibilities into the official job descriptions of OAR professional personnel.

(4) The conduct of the annual "Research Applications Conference" which highlights significant OAR findings that have made contributions to AF and DoD technical problems or possess a high potential for future development.<sup>4</sup>

(5) The publication of various coupling reports by OAR field units which record accomplished coupling actions.<sup>5</sup> Reports which identify scientific area points of contact for quick and precise communications are provided also by OAR and its field units.<sup>6</sup>

(6) Periodic issuances from the OAR Commander of letters and statements which maintain a current awareness on the part of the OAR scientist of his responsibility for coupling.<sup>7</sup>

(7) An Assistant for Limited War, DCS/Plans and Programs, whose office has headquarters staff responsibility for OAR research and exploratory development programs in direct support of limited war requirements. In addition, personnel from OAR headquarters and the OAR laboratories perform temporary duty (up to 60 days) with AFSC/ASD, Deputy for Limited War, to provide research support for AFSC's limited war R&D efforts.

References;

1. Report of the OAR Coupling Working Group, 15 Oct 65, Hq Office of Aerospace Research.
2. "OAR Show Hits Road", Bolling Beam, 17 Dec 65, p 2.
3. "Coupling Responsibility" 29 Mar 65 letter to all OAR from DCS/Personnel.
4. Proceedings of the OAR Research Applications Conference, OAR 607-2, Mar 67.
5. AFCRL STINFO Activities, Mar 67. A Summary of ARL Coupling Activities, MR 66-0001, 1966. A Summary of AFOSR Coupling Activities, 1966.
6. OAR Technical Directory, OAR 607-4, Feb 67. OAR Directory of Key Staff Offices and Labs, 1967.
7. "Responsibility for Relating Research to the Needs of the Air Force," 14 May 66 letter to all OAR from B/G E. A. Pinson, Commander.  
Concluding remarks in "Basic Research in OAR," 27 Sep 66 speech, given by B/G E. A. Pinson to 13th Annual AF S&E Symposium, 27 Sep 66.

## THE OAR MANAGEMENT AND SCIENTIFIC INFORMATION SYSTEM

The Management and Scientific Information System (MASIS) is a central information file of OAR current and completed research. It is designed to assist all elements of OAR in the management of the research program and in the dissemination of information regarding research achievements and results. Flexible retrieval techniques are designed into the MASIS, so that information useful to the headquarters staff and the laboratory directors is available on an inquiry basis with rapid response.

The MASIS significantly increases the availability of essential OAR data, because it includes detailed information on both contract and in-house research efforts. Research investigators and administrators draw on the data bank for presentations of selected work units to determine past accomplishments, current activity and future needs. Program directors combine historical and current levels of dollar efforts to develop plans for future findings. Balancing and selection of emphasis are primary purposes of the system.

As many as possible of the reporting requirements to higher headquarters are programmed into the MASIS. A major function performed by the system is the compilation of Research and Technology Resumes (DD Form 1498 reports) for interagency exchange. Taken from existing internal agency reports or working documents, production of Resumes requires no time-consuming gathering of fiscal or technical data by a project monitor.

Employing IBM 1410 and IBM 1401 computers, the system operates using autocoder for the programming language. Several programs provide for establishment and maintenance of data files. The files are maintained in both tape and printed form up to date at all times. When any portion of a work unit within a file is corrected, the whole work unit is reprinted and replaced. A cycle of five master tapes for each file provides assurance that records will not be lost through mechanical or program errors.

Several file modules provide storage for proposals received from contractors; fiscal data on current research; narrative descriptions of work units in both scientific and non-technical language; progress of research in terms of actual reports submitted by principal investigators; and selected terms assigned to work units for performing subject searches through word queries. The modules may be matched to one another through a common accession number. Thus, reports may be compiled drawing on data from the several modules.

The system, then, has the flexibility to meet the reporting and control needs of line and staff; of supervisory levels; and of middle and executive management. Special attention is directed toward providing control documents tailored directly to the requestor's needs which are long enough to include all essential data but short enough to be useful.

C O P Y

HEADQUARTERS  
OFFICE OF AEROSPACE RESEARCH  
United States Air Force  
Washington 25, D. C.

RRG

19 March 1963

SUBJECT: Scientific and Technical Information Program

TO:	AFOSR	CRR	LAOAR	ORA
	AFCRL	CARL	LOOAR	
	ARL	EOAR	PFOAR	

(Commander)

1. I am forwarding you a copy of the President's Science Advisory Committee's (PSAC) report on the responsibilities of the technical community and the government in the transfer of scientific information. I heartily endorse the findings and recommendations of this report for application within OAR. It should be read by all members of this command and our scientists in particular.
2. As you know, early in December 1962 I established the Office of Scientific and Technical Information under the direction of Colonel Dalton Smith to give continued attention to the information problems within OAR. I expect this office to formulate, recommend and implement the policies and procedures aimed at improving the transfer of scientific information between this command and other Air Force R&D components, as well as the remainder of the scientific community. Further, I hold this office responsible for exercising surveillance over and coordination of all OAR scientific and technical information exchange activities.
3. To assist you in dissemination of the PSAC report I have instructed the Office of Scientific and Technical Information to provide you with additional copies as required.

Signed  
DON R. OSTRANDER  
Major General, USAF  
Commander

Atch  
A Report of the President's  
Science Advisory Committee,  
10 Jan 63

Copies to:  
Deputy Chiefs of Staff and  
Special Staff Offices, Hq OAR

Distribution of OAR Research Review

	<u>No. of Copies</u>	
<u>Department of Defense</u>		2048
Army	<u>176</u>	
Army Materiel Command	100	
Other	76	
Navy	<u>99</u>	
ONR	26	
Other	73	
Air Force	<u>1689</u>	
Hq USAF	96	
AFSC		
STLOs	379	
RTD Labs	233	
AFSC Divisions	130	
Other	142	
OAR		
AFCRL	284	
ARL	55	
AFOSR	34	
Hq & Other	80	
AF Reserve	122	
Other	134	
Misc DoD	84	
<u>Other US Government Agencies</u>		238
AEC	15	
CIA	7	
Commerce Dept	31	
Congress	12	
HEW	12	
NASA	110	
NSF	5	
State Dept	21	
Others	25	
<u>Industry</u>		1131
<u>Universities</u>		1647
U.S.	788	
Foreign	859	
<u>Foreign Government Agencies</u>		47
<u>Miscellaneous</u>		<u>67</u>
Total Distribution		5178

# USAF **STINFO newsletter**

published by HQ OAR (RRY)



VOLUME III No. 3

HQ USAF ★ AFSC ★ CAR

March 1967

## OAR AND CLEARINGHOUSE CONSIDERING A SELECTIVE TOPICAL ANNOUNCEMENT OF GOVERNMENT R&D REPORTS

Colonel Currie S. Downie, Director of Scientific and Technical Information, Hq OAR, has proposed to the CLEARINGHOUSE that it undertake an experiment to selectively announce all unclassified U.S. Government R&D reports. This service would be somewhat similar to the present Fast Announcement Service (FAS) operated by the CLEARINGHOUSE. The difference would be that, unlike FAS which highlights prescreened items, the new service will announce by topic all items now included in the CLEARINGHOUSE bulletin, U.S. Government Research & Development Reports. A list of Air Force subscribers for this prototype service will be furnished by Hq OAR.

## NEW R&D LIAISON OFFICER AT DDC

Major William R. Sommer, formerly from Eglin AFB, Fla., has replaced Lt Col Voya N. Skakich as Air Force R&D Liaison Officer at the Defense Documentation Center (DDC), Cameron Station. Col Skakich was retired recently.

## NEW AIR FORCE "CHIEF LIBRARIAN" NAMED

Mr. John L. Cook, Director of Libraries, Wright-Patterson AFB, Ohio, has been named the new Director of Air Force Library Service, Randolph AFB, San Antonio, Texas, effective 1 March 1967. He has replaced Mr. Harry F. Cook (no relation), who was retired on 30 December 1966.

## SECOND INTERSERVICE STINFO MEETING SLATED FOR END OF APRIL 1967

The second meeting of technical-information officers, librarians, and documentalists of the Department of Defense is to be held at the Washington Navy Yard, Washington, D. C., on 26 April 1967. The objective of the one-day meeting will be to examine the role of technical libraries in the DoD STINFO Program. The meeting will be organized by the Department of the Navy and hosted by Mr. Charles DeVore, Navy member of the three-man Steering Group. Mr. John L. Cook, newly appointed Director of Air Force Library Service, will be the Air Force speaker.

Attendance at the Conference is by invitation only. Each service representative on the three-man Steering Group is responsible for inviting people from his own particular service. Thus, Mr. Peppino Vlannes, Army member of the Steering Group, will invite Army attendees. Mr. Alex Hoshovsky, Hq OAR, will send invitations to Air Force participants. However, invitations to DoD people in the various DoD agencies (DSA, DIA, etc.) will be extended by the host, Mr. DeVore.

All Air Force inquiries regarding this meeting should be directed to Mr. Hoshovsky, Telephone Area Code 202, OX 4-4836 or, if calling from a Government phone in Washington, D.C., Code 11, Ext. 44836.

## FEDERAL FUNDS FOR RESEARCH AND DEVELOPMENT

Federal funds for research, development, and other scientific activities for fiscal years 1965, 1966, and 1967 are covered in Volume 15 of the Surveys of Science Resources Series of the National Science Foundation. Order NSF 66-25 from the Government Printing Office. The price is \$1.25.



#### AIR FORCE PUBLISHED COSATI REPORT

Progress of the United States Government in Scientific and Technical Communication 1965 is COSATI's third report on progress achieved by the Federal Government in improving the information resources and processes required to support a vigorous and expanding national science and technology. It seeks to present a comprehensive view, not only of how COSATI conducted its activities and the problems it considered and tackled, but also of the results of joint and separate actions of the Federal agencies. The Report attempts to delineate the present state of affairs, with the hope that it may serve as a springboard for future productive actions. This Report, prepared by a team headed by Mr. Alexander G. Hoshovsky, Office of Scientific and Technical Information, Hq OAR, was signed by Mr. William T. Knox, Chairman of COSATI, and published by the U.S. Air Force. It is available under No. PB 173 510 from the CLEARINGHOUSE, 5285 Port Royal Road, Springfield, Va. 22151.

#### DOD REVIEW TEAM VISITS AFSC AND OAR UNITS

The DoD team conducting a review of the management of the DoD Technical Information Program (See our February 1967 issue) is continuing its work. During the week of 20 February 1967 this group, headed by Dr. Richard Raymond of General Electric, visited the following AFSC and OAR organizations at Wright-Patterson AFB: the C-SA SPO (Systems Program Office); the Avionics Laboratory Reconnaissance Central; the Foreign Technology Division; the Air Force Materials Laboratory; and the Aerospace Research Laboratories. After leaving Wright-Patterson AFB, the team visited the Battelle Memorial Institute at Columbus, Ohio, where it looked into the work of the Remote Area Conflict Information Center (RACIC), the Defense Metals Information Center (DMIC), and other information centers at Battelle including the Center dealing with technical information itself. The final visit of the week was to OAR's Air Force Cambridge Research Laboratories at L. G. Hanscom Field, Bedford, Mass.

The DoD team is reviewing technical data, scientific and technical information, and technical intelligence with a view toward possible recommendations for improving DoD programs dealing with these areas.

#### AFCLR ENVIRONMENTAL CONSULTATION SERVICE ESTABLISHED

OAR's Air Force Cambridge Research Laboratories (AFCLR) at L. G. Hanscom Field, Bedford, Mass. recently established an Environmental Consultation Service (ECS). The purpose of ECS is to increase the scope and effectiveness of AFCLR's efforts to apply research results to Air Force and other military planning, design, development, and operational activities. Mr. M. B. Gilbert, Chief, Evaluations Division, Deputy for Technical Plans and Operations, AFCLR, has been appointed Director of this Environmental Consultation Service. AFCLR scientists and engineers will assist him with this responsibility.

ECS will provide to qualified organizations and individuals, upon request, scientific and technical advice and guidance in analyzing, defining, and solving problems involving the natural environment. It will also provide special studies, evaluations, data summaries and technical reports, either on its own initiative, or upon request.

Mr. Gilbert will not only organize and direct AFCLR's ECS, but will also conduct liaison with the actual and potential users of the scientific services available. In addition, he will co-ordinate with other organizations which offer environmental consultation, and which have environmental data-analysis functions.

#### INTERAGENCY WORKING GROUP FORMED TO CONSIDER CO-OPERATIVE EFFORTS ON UNSOLICITED RESEARCH PROPOSALS

As a follow-up of the First Government Interagency Conference on unsolicited research proposals, held at Hq OAR on 20 January 1967 (See our February 1967 issue), the following Government agencies have nominated members of the Interagency Working Group, as follows: for NSF: Mr. J. Richard Mayer and Mrs. Dorothy Jones; for Army: Mr. Henry L. Mourning (Hq AMC, Gravelly Point) and Mr. James G. Pierce (Frankford Arsenal); for NASA: Mr. Web Lenox and Mr. Kirby McCollum; and for Air Force: Mr. Jacob Seiden and Mr. B. F. Roberts (both of Hq OAR). NIH will be represented by an observer, Mr. Frank Morrone.

It is anticipated that the first meeting of the Interagency Working Group will be held some time this month.

## OAR RESEARCH OBJECTIVES IN INFORMATION SCIENCES

### Information Sciences

OAR's ultimate objective in the information sciences is to improve the technology in all aspects of information handling, especially as they relate to the problems of command and control, scientific-and-technical information, intelligence, communications, and logistics. This goal will be achieved by fundamental research into the methodology and techniques required for the acquisition, transformation, evaluation, filtering, and interpretation of information data.

**LANGUAGE AND LINGUISTICS.**--The link between language and thought represents the single most important area in which information-processing technology can be advanced. Linguistics occupies a uniquely pivotal position in relation to various aspects of intelligence and automata. Natural language breaches the interface between conscious reasoning and the underlying mechanisms, and serves as the medium for the conscious organization, transmission, storage, and retrieval of information. Therefore, to better understand the nature and basis of intelligence, so as to exploit this understanding in the use and development of automata, we must know much more about language. Similarly, to understand more fully the techniques of symbolizing and systematizing meanings or concepts, so as to exploit this understanding in the areas of analysis, storage, cross-linkage, and information search and retrieval, we must again know much more about language.

**BIOLOGICAL SYSTEMS ANALYSIS.**--Well-conceived and theoretically oriented research is needed in this area to discover those plausible fundamental mechanisms responsible for the development of intelligence in information-processing organisms and automata. OAR seeks to understand the nature and characteristics of the ultimate mechanistic basis of intelligence by conducting these investigations at approximately the "neural" level.

**INFORMATION RECOGNITION.**--Research in this area is needed to acquire knowledge of such subjects as: the interrelationship between the analytic and Gestalt aspects of visual-pattern recognition; how and what subsets of point stimuli are perceived as unitary entities; the figure-figure, and figure-background separation mechanisms; and the meaning of the direction and limitation of attention.

In the field of speech perception, similar, but perhaps more complex, problems are also being encountered. It is therefore becoming increasingly obvious that speech-recognition research cannot continue as based on the acoustic properties of the speech signal alone, and that future investigations must be directed toward the interplay of linguistics and semantics. However, solutions of these problems will lead to the far more difficult problem of semantic-pattern recognition, operational methods of arriving at the intellectual concepts underlying natural language statements.

**SELF-ORGANIZATION.**--Self-organization is one basic phenomenon which appears to be exhibited in the greatest variety of systems, and which can be described and understood in terms independent of the particular system in which it is observed. One of our needs, therefore, is for research in which self-organization is studied as the central phenomenon of any system or systems, and then to attempt to describe it in the most basic and general of terms. Some attention must be directed to self-organization as manifested in the most central phenomena underlying intelligence, and to the possibility of generalizing the principles of self-organization.

**NONNUMERICAL INFORMATION PROCESSING.**--The field of nonnumerical information processing has no distinct boundaries. In general, it covers widely disparate activities not encompassed by numerical analysis, and includes such subjects as: the translation of artificial and natural languages, command/control, information retrieval, game playing, pattern recognition, and adaptive machines. Common to all these areas, in addition to any

passing analogy to human intellectual processes, is the extreme difficulty in reducing fragmentary demonstrations and limited experiments down to a body of scientific knowledge, or to even a structured branch of technology. However, as isolated problems in many specific areas are studied and understood, new devices and techniques are being developed to enhance the range and effectiveness of man-computer interactions.

#### **Information Processing**

**LINGUISTICS AND ARTIFICIAL INTELLIGENCE.**--Research in linguistics will include the formulation and evaluation of specific models (grammars) of natural language. Sophisticated formal grammars will be developed that enumerate the sentences of a language and assign structural descriptions to those sentences. Concomitant research will also be conducted by OAR in devising recognition programs to find the structural descriptions assigned by a grammar to a given sentence, and in making use of those structural descriptions in such areas as machine translations, information retrieval, and natural-language programming to permit more efficient use of data-processing systems by operational personnel charged with decision-making, guidance and control, etc. This latter point is of particular importance for the development of effective co-operative relationships between man and machine.

**BIOPHYSICAL INFORMATION SYSTEMS.**--OAR will conduct theoretically oriented research in the biophysical information-systems area to discover those plausible fundamental mechanisms responsible for the development of intelligence in information-processing organisms and automata. These investigations will be conducted at approximately the neural levels, to seek the nature and characteristics of the ultimate mechanics of intelligent behavior. Knowledge of biophysical information systems, such as the sensory apparatus of mammals, has progressed from behavioral descriptions to a certain understanding of the physical processes involved. To increase the scope of this knowledge for ultimate application to advanced data-processing systems, efforts

will include research on visual and auditory systems, and attempts will be made to reach conclusions concerning the mechanisms for higher-level concept formation. For this purpose, the spontaneous behavior of individual neurons and groups of neurons, and their responses to stimulation, will be studied by means of modern microelectrode and computer techniques. Wave forms that can be measured with the electroencephalograph, such as the alpha rhythm, will be studied in terms of nonlinear mathematical models, the results of which could lead to a new understanding of the communication and cognitive processes occurring in the human brain.

**METHODOLOGY OF DYNAMIC DATA PROCESSING.**--OAR will conduct research in the area of processing dynamic data, i.e., data resulting from complex sensor systems interacting strongly with the environment. Practically all real-life complex data-gathering systems supply an abundance of complex raw data that have to be filtered, compacted, and transformed to yield a clear and complete description of the process in question. Research on the statistical theory of measurement will be carried out to evolve methods of generating attribute filters which will be dynamically derived from the statistics of the data stream itself.

**LOGIC NETWORK THEORY.**--A deeper understanding of the mathematics of nets, Boolean algebra, and of logical network behavior, especially in probabilistic networks, is required for advanced data-processing systems used in military operations. Planned research will concentrate on more complex network structures, and on structures with greater dimensionality, more elaborate connectivity schemes, and more complex probabilistic properties of networks.

OAR will do further research in the construction of complex nets capable of accomplishing their desired function even in the presence of local or distributed changes in the function of the constituent elements of the net. New work will be done on large nets

of microminiaturized polyfunctional elements, all identical in basic structure, with functions that are externally controllable. OAR will continue the development of an optimum design of active networks in terms of a minimum number of elements, minimum element spread, and minimum sensitivity to changes in the active element characteristics.

#### **Communication Theory**

Obviously, secure communications must be maintained by the Air Force, not only between points on earth, but also from earth to space, and from points within space. These communications must be accomplished with a maximum use of the energy spectrum and with a minimum of error. To achieve this goal, OAR is studying such techniques as band compression, coding and decoding, operation at extreme ranges, finer resolution, absolute directivity, and the control of electromagnetic energy through various media.

**CODING THEORY.**--OAR will study the theory of codes in great detail to develop new concepts of information, to determine essential elements of communications, to produce new classes of codes for special applications, and to increase the information-handling capacity of communications systems. Communications feed-back processes will be studied to achieve low error rates in information systems, and investigations will be made in signal-design techniques to determine the best methods of minimizing detection errors.

**SPEECH RESEARCH.**--The goal OAR seeks in this research is to provide the knowledge needed to design reliable, narrow-band, highly intelligible, good-quality voice-communication equipment for all forms of ground-to-ground, ground-to-space, and space-to-space transmissions. Thorough investigations will be made of fundamental attributes of the human-speech communication process. Particular study areas include: the role of voicing in speech, emotional content of the speech signal, the significance

of intonation and breath groups, and the relation of language structure to the production and perception of speech. Continued study will be made of methodology for evaluating the performance of speech-compression devices in terms of obtaining valid and reliable measures not only of intelligibility, but also of quality and naturalness, and of acceptability for particular communications applications.

**VISUAL INFORMATION PROCESSES.**--Basic mechanisms for visual recognition and discrimination, theoretical investigation of biologically oriented pattern-recognition models, and basic abilities and limitations of the human to extract information from a visual presentation will be investigated.

These efforts will provide a better understanding of the way the brain works, aid in designing and establishing performance goals for more powerful computing machines, and contribute to the establishment of quality criteria for visual presentations which involve a human observer. Information from these studies will also aid in understanding how man sees, with a view to a more efficient man-machine interface, as well as aid in the design of machines that can replace the human operator in some visual tasks.

#### **Biophysics**

Biophysics includes the effects of physical forces in living things, and the chemical and physical responses which allow them to adapt to such forces. Of greatest interest is communications biophysics, which is concerned with the informational systems that permit animals to adjust their behavior to the outside world. In this area, explanations are needed of the following: the origin, nature, and function of nerve impulses; the nature and function of nerve synapses and specialized neurons; the information process in the visual, auditory, and olfactory systems; and the function of special sensory systems, such as those in electric fishes. Also needed is an explanation of biological membrane properties, the understanding of which may provide the basis for advances in engineering and biological technology. Future areas

of interest will therefore include studies on ion transport, membrane structure, and the role of membranes in the initiation of neural signals.

The increased attention from engineers and physicists on the organization of interactions in the nervous system affords an opportunity for more collaboration between these groups and biologists. OAR will continue to encourage this trend where it promises to increase the understanding of biological principles. The results of such studies are fundamental to the development of research in other related fields. One such field is bionics, which is currently under development in the applied-research program of AFSC.

#### **Psychology of Individual Performance**

**MAN-MACHINE INTERACTION.**--In complex semiautomated systems, whether they be aerospace or command-control systems, man's essential function is that of decision making. Accordingly, research on man-machine interactions will seek answers to such problems as: (1) What is the optimal amount and kind of information necessary for appropriate human action in a systems context? (2) How should information be best organized to meet the constraints imposed by human perceptual and intellectual behavior? (3) What is the optimal means of communication between man and machine? (4) What are the consistent biases in human behavior which may be corrected by other system components? (5) How is the confidence level of decision making affected by pre-decision information searching? Similar questions involving small groups or units may be studied, as appropriate, where the group or unit can be thought of as an operating system.

#### **Learning and Perception Psychology**

Experimental and theoretical psychologists are encouraged to carry out research relating to the development of general learning principles, and how these principles relate to the acquisition and retention of various

classes of behavior. The skills involved range from motor skills, to such intellectual skills as problem solving. These studies will investigate methods for training people in complex tasks, with an attempt to discover those aspects most likely to be affected in the retention and retraining of these skills. In addition, an attempt will be made to identify techniques which will allow mastery of complex subject matter in a short time, with no qualitative decrements in performance. This will involve studies in programmed learning to improve the sequencing of programmed material, and in the psychology of learning to provide new concepts and techniques. Other studies will be concerned with the particular problems encountered in the learning of skilled perceptual-motor behavior, such as the human tasks involved in guidance and tracking systems. An example of this would be investigations into those components of behavior that are susceptible to environmental factors, such as noise, fatigue, and other forms of stress. Other important areas of human perception also require investigation. These include: human adaptation to the sensory environment or aspects of it, and how these effects may be controlled to produce good performance; short-term memory, which involves research into tolerable information loads for human operators, and how different methods of coding such inputs may extend the tolerable limits; studies of signal detection and vigilance, in which investigations will seek to discover how such factors as monotony, lack of sleep, etc., affect the perception of weak signals; and studies concerning the perception of space, time, and the velocity of objects.

OAR studies will also be conducted in verbal and symbolic learning, and of the motivational factors involved. Particular emphasis will be placed on those efforts which promise new ways for improving the educational and training programs for the Air Force, as well as for other agencies. Special emphasis will be placed on unique and original approaches for Counterinsurgency (COIN) warfare and limited-war prosecution through persuasion and attitude modification.

C O P Y  
DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS OFFICE OF AEROSPACE RESEARCH  
ARLINGTON, VIRGINIA 22209



REPLY TO  
ATTN OF:

RRYB

22 Dec 1966

SUBJECT: Development Plan for Defense Documentation Center (DDC)

TO: Administrator  
Defense Documentation Center

1. Reference Hq USAF (AFRSTF) letter, subject as above, dated 1 December 1966, copy attached. The following OAR requirements are submitted primarily in response to this letter.

2. We believe that DDC should be in the forefront in providing advances in the methods of information retrieval, as well as operating the existing services. Therefore, OAR requirements are expressed in two classifications: development requirements and service requirements.

A. Developmental Requirements

1. Remote Access Query of Time Sharing Computer on a Real Time Basis.

Purpose: To provide the scientist and engineer with the capability to obtain required information at the time when it is needed. The volume of information requests is increasing and is expected to continue to increase. Both increases in personnel requirements and increases in time to service information requests are likely to result. The provision of the capability for the user to query the DDC data bank from his home base will solve this problem. Remote access querying of a time-sharing computer system that provides real time retrieval should be instituted first on a small experimental basis. The lessons learned from the experiment could provide the refinement of design parameters for an expanded program.

2. Electrical Transmission of Information Requests and Document Surrogates.

Purpose: To reduce delay now caused by processing in mail rooms and the Post Office Department. Currently the largest time lag in user acquisition of requested information is in the transmission of paper between the user and DDC. Consideration should be given to the use of an expanded autodin network for the electrical transmission of surrogates.

3. Single Access Point for all Documents, Data and Referrals.

Purpose: To simplify ordering and acquisition procedures for all information on a single subject and to reduce redundancies

between products of separate systems. At present DoD organizations, personnel and their contractors must obtain the information they need from a multitude of sources. In many cases the user is unaware of many of the available information services. Information services within and outside of the Federal Government are a heterogeneous collection of incompatibilities with regard to the nature of collections, methods of handling information and types of products. To eliminate confusion, duplication and inefficiency, a single point of access is required which will provide a follow-up service as opposed to a purely referral service.

#### B. Service Requirements

##### 1. Selective Dissemination of Microfiche

Purpose: OAR is currently sponsoring 200 Air Force users in the NASA operated SDI system. There are at present some 50 organizations of various kinds using or experimenting with SDI systems. The need for similar service for DoD information is unquestioned. A specific proposal on this subject is forwarded under separate cover.

##### 2. Aggressive DDC Educational Program

Purpose: To acquaint the user with DDC services. Many Air Force technical people are completely unaware of the potentialities of the DDC services. An aggressive and comprehensive educational program, which stresses basic retrieval theory, operational techniques and pragmatic hints for better service, would improve overall effectiveness by awakening the user and the potential user to hitherto relatively untapped information sources.

##### 3. Printed Bibliographies

Purpose: To provide special bibliographies for symposia. OAR sponsors approximately fifty scientific and technical symposia annually. A DDC printed bibliography on the symposium theme would provide a valuable tool to consolidate DoD developments in the field. OAR would also like to have periodic printed bibliographies on selected subjects of prime concern to its components.

##### 4. Request for Proposal (RFP) Bibliographies

Purpose: Since OAR issues approximately 2500 contracts annually, it is desirable to have a bibliography on the specific subject prior to the issuance of an RFP.

##### 5. Coupling Bibliographies

Purpose: To aid in person-to-person contact. It is believed that a large portion of the total transfer of scientific and technical

information is transmitted by the direct coupling of knowledgeable people. Senior scientists have established methods and contacts over the years. It is highly desirable to assist youthful scientists in acquiring contacts in his field. Bibliographies of active workers, in specific areas of research, would be of assistance.

FOR THE COMMANDER

/s/

CURRIE S. DOWNIE, Col, USAF

1 Atch

Director

Office of Scientific & Technical  
Information



C O P Y  
DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS OFFICE OF AEROSPACE RESEARCH  
ARLINGTON, VIRGINIA 22209



REPLY TO  
ATTN OF: RRYB

9 Jan 1967

SUBJECT: Requirements for SDI Service

TO: Administrator  
Defense Documentation Center

1. Reference is made to discussion of the requirements for Selective Dissemination of Information (SDI) service to Air Force R&D laboratories during the Liaison Representative Meeting No. 59 on 7 November 1966 and OAR letter, Subject: Development Plan for Defense Documentation Center (DDC), dated 22 December 1966.
2. One of the primary missions of OAR is to insure the effective coupling or transfer of research information from the research scientist to the Air Force engineer having the responsibility for developing new or improved weapons systems. The Office of Aerospace Research has the responsibility to insure that OAR customers are provided with OAR technical publications. In addition, OAR is concerned with the problem of insuring that OAR scientists are provided with information produced by other DoD elements and federal research agencies in appropriate scientific and technical fields. Thus, OAR has a firm requirement to insure that its customers and in-house scientists are provided SDI service.
3. OAR is specifically interested in seeking better service for approximately 200 Air Force organizational groups for which preliminary interest profile data have been compiled. These groups comprise the bulk of the Air Force R&D community. A DDC operated SDI system would improve the dissemination of scientific and technical information to these prime users.
4. It is proposed that DDC establish the SDI service on a developmental basis. As the initial increment, it is proposed that DDC initiate service for 50 organizational groups. A proposed list of organizations is forwarded as attachment 1.
5. OAR prefers that the service consist of selective dissemination of microfiche. In this event all participating organizations must be provided with microfiche readers. It is understood that, since DDC is currently participating in a current awareness program, the decision to provide microfiche SDI service would not involve an entirely new concept, merely a specialized modification of an existing service.

6. It is emphasized that the success or failure of all SDI programs depends on the validity of customer retrieval profiles. Therefore, the profiles should be carefully developed by experienced personnel.

7. OAR desires to participate in a DDC/SDI program as soon as possible. OAR participation at a minimum would consist of making initial contacts with using organizations, and conducting a user survey and evaluation of the SDI service after a reasonable trial period.

8. It is suggested that a meeting of interested DDC and OAR personnel be arranged in the near future to work out the details of the program. Lt Col Thomas T. Luginbyhl (OX 4-4837) is the OAR Project Officer.

FOR THE COMMANDER

/s/  
CURRIE S. DOWNIE, Col, USAF  
Director  
Office of Scientific and Technical  
Information

1 Atch

## WRIGHT-PATTERSON AFB INFORMATION NEEDS

It has long been recognized that a variety of serious information problems and information needs exist at Wright-Patterson AFB. There have been several direct studies and numerous related studies regarding the Wright-Patterson situation. In spite of repeated detailed exposition of the major problems along with recommended steps toward solution, the majority of the problems in the information environment which existed four years ago still exist. Real efforts at solution have been individual with no higher level of emphasis than the laboratory level.

The following problems are among those identified as most persistent and serious:

1. A large scientific and technical data base exists at Wright-Patterson only in theory. In fact, each unit operates differently. There is no continuity at the interface between on-base units and between base units and outside users. This complex information environment has continued to exist because of the complexity and diversity of organizations and missions. Each laboratory has its own system which provides a partial local solution. There are some 40 unique independent centers or collections of scientific and technical information (ranging from small document collections to full scale information analysis centers), each going its own way, using its own rules and employing its own methodologies and therefore providing little or no help to other units or laboratories.

2. In general, the information services available are inadequate. Library facilities and technical reference facilities are seldom cross-referenced. In order to insure adequate local coverage a user must query each one. Information exchange is limited, accessions lists are often inadequate and out of date. In some cases special collections are not indexed. Indexing and control systems are not compatible, therefore communication is difficult, cooperative sharing of resources is impeded, searching is difficult, and retrieval is haphazard.

3. There is little systematic dissemination of scientific and technical information. Because of increased volume and diversity both in people and S&T literature, personal contact is becoming a less reliable method of dissemination. The problem of current awareness is becoming more acute. It is felt that user needs are largely unidentified - sometimes not even recognized by the user himself!

4. Outside sources seldom know how to get the information they need from the Wright-Patterson complex.

It is felt that, in view of the results of past studies, another large scale study would most likely suffer the same fate and would therefore contribute little. Past attempts probably failed because of scope. They recommended total solutions which required the initial investment of too many resources.

Many recent studies such as DoD User Needs Study, North American Aviation, Inc., 30 Nov 66 (AD 647 112) and Studies in the Man-System Interface in Libraries, Victor Rosenberg, Lehigh University, July 1966 (AD 637 713), reveal the value of the local source of information. Some 80% of the time people first search for information within their local work environment and that preference in information gathering methods is toward the method easiest to use. Therefore information policies should seek to strengthen the local sources, to make ease of access of prime importance and to devote greater publicity toward revealing local availability of resources.

Therefore we should not attempt to reduce duplication among centers and laboratories regarding small holdings of information, nor should they be consolidated into one large unit. Small holdings should be augmented in their capabilities.

Although a quick total solution would be desirable, we feel that such a solution can be achieved only through a series of intermediate steps. OAR is interested in attempting to establish a step toward the solution. It is proposed that:

1. An Air Force team be established to perform a thorough management review of the technical information program, systems and resources at W-PAFB.
2. The team report directly to Hq USAF since there are four commanders involved (AFSC, AFLC, AU and OAR) at W-PAFB.

#### References:

1. The RTD Information Environment: A Report of Survey, Systems Development Corporation, 3 Mar 64, TM-(L)-1785 (containing references to 4 previous studies).
2. Unpublished report, Study and Analysis of Requirements for a Research & Technology Center at Area "B" Wright-Patterson Air Force Base, Philco, Deputy for Civil Engineering, Aeronautical Systems Division, June 1965.
3. Computer Implementation of Recon Central, Air Force Avionics Laboratory, 25 October 1965 (RC-015572).
4. Study of Mechanization in DoD Libraries and Information Centers, Bocz-Allen Applied Research, Inc., Sept 1966 (AD 640 100).
5. DoD User Needs Study, North American Aviation, Inc., 30 Nov 66 (AD 647 112).
6. Annual Report of the Aerospace Materials Information Center, Richard F. Klinger, Air Force Materials Laboratory, February 1967 (AFML-TR-67-32).

C O P Y  
DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS OFFICE OF AEROSPACE RESEARCH  
ARLINGTON, VIRGINIA 22209



REPLY TO  
ATTN OF: RRYB

3 Feb 1967

SUBJECT: Clearinghouse Topical Announcement Service

TO: Director  
Clearinghouse for Federal S&T Information

1. The Office of Aerospace Research conducts comprehensive and continuous efforts to enhance the conditions by which S&T information is effectively transferred. We are presently experimenting with various selective announcement programs and have become convinced that a practical service to selectively announce information arranged by topical disciplinary groupings is needed. We are of the opinion that the Clearinghouse is the logical facility to provide such a service because of its presently established status as a primary liaison between the Government and civilian S&T communities. Therefore, it is proposed that the Clearinghouse establish and operate a topical announcement service for the S&T information it acquires.

2. The primary differences between the proposed Topical Announcement Service (TAS) and the present CFSTI Fast Announcement are:

a. TAS would include all items in the USGRDR (no prescreening accomplished) thus offering more complete and comprehensive coverage;

b. TAS would be conducted semimonthly to coincide with the publication of the USGRDR; and

c. TAS could be prepared from present final magnetic tape used to produce the USGRDR, with program modifications.

3. It is recommended that the proposed service be initiated on a test basis for approximately 2000 Air Force people as soon as possible. We can assist in the selection of participants and provide a portion of funds that may be necessary to offset initial expenditures. The resulting wider advertisement of CFSTI products could result in increased sales which may well cover the costs of the test basis operation.

4. Attached for your information are two documents which describe a NASA service very similar to that proposed in this letter. After

your review, please contact us for a discussion of further arrangements and details. Our telephone number is OX 4-4836.

/s/  
CURRIE S. DOWNIE, Colonel, USAF  
Director  
Office of Scientific & Technical  
Information

2 Atch  
1. Introducing NASA/SCAN  
2. Initial Listing of Topics



# FAST ANNOUNCEMENT

U. S. DEPARTMENT OF COMMERCE NATIONAL BUREAU OF STANDARDS INSTITUTE FOR APPLIED TECHNOLOGY

PUBLICATIONS & CUSTOMER RELATIONS BRANCH  
Telephone: 321-8500 Ext. 22 (Area Code 703)

FA 66-225  
COMMUNICATIONS

FOR RELEASE MONDAY  
JUNE 13, 1966

COMMUNICATIONS — NEW TECHNICAL INFORMATION  
AVAILABLE FROM CLEARINGHOUSE

☐ Periodically Loaded Transmission Lines. . . A report prepared by Syracuse University offers equations for the transmission parameters of a periodically loaded line with no restrictions on magnitude, type, or number of discontinuities and on attenuation on the line. Of interest are the input reflection coefficient and the generator to load transmission coefficient of the line when terminated by its characteristic impedance. The equations for these coefficients are readily derived from the transmission parameters. Several plots of the input reflection coefficient and transmission coefficient are presented and compared with experimental results, and the report indicates agreement is very good. Among other important results, the report shows that maximum transfer of power to the load through a periodically loaded line does not always occur for minimum input VSWR. In fact, for the case of purely resistive shunt discontinuities, it corresponds to the maximum input VSWR, and for the case of mixed discontinuities, the minimum input VSWR does not correspond either to minimum or maximum power transfer. In such cases the transmission coefficient presents a peculiar behavior near its maximum, having a sharp minimum near one side of the maximum which should be avoided. . . J. Perini, Syracuse University Research Institute, Syracuse, N. Y., for the Air Force (RADC-TR-65-474), Mar. 1966, 80 pages. . . . Order Stock No. AD-631 450 PERIODICALLY LOADED TRANSMISSION LINES from Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151, price \$3.00 (microfiche 75 cents).

☐ A Communications Switching System. . . that uses a totally modular approach to functions that previously have been performed by a combination of modular and common equipment is described in a report prepared by the Rome Air Development Center which discusses and describes the Time Division Electronic Switch (TIDES) System. The resulting configuration is highlighted by the use of a recirculating memory both for call-processing and for connection-maintaining functions. This is advantageous from the system reliability point-of-view, because a malfunction in the call-processing equipment at worst will affect far fewer lines than in a system using common control. The Rome report details the operation of the module and a suggested circuit switching system containing several such modules. Included are discussions of some important system features and their impact on the basic approach, such as:

RESEARCH AND TECHNOLOGY RESUME				1.	2. GOVT ACCESSION	3. AGENCY ACCESSION	REPORT CONTROL SYMBOL
4. DATE OF RESUME 15 08 66	5. KIND OF RESUME F PLAN (CHANGE) 01 09 65	6. SECURITY U REF	7. REGRADING 1	8. RELEASE LIMITATION NL	DD-DR&E (AR) 636		
10. CURRENT NUMBER/CODE 6.14.45.01.4 9769				10. PRIOR NUMBER/CODE NO CHANGE			
11. TITLE: RESEARCH IN INFORMATION SCIENCES							
12. SCIENTIFIC OR TECH. AREA 005100 DOCUMENTATION AND INFORMATION TECHNOLOGY				13. START DATE N/A	14. CRIT. COMPL. DATE N/A	15. FUNDING AGENCY N/A	
16. PROCEDURE METHOD N/A	17. CONTRACT/GRANT a. NUMBER: N/A b. TYPE:		c. DATE:	18. RESOURCES EST. PRIOR FY 66 CURRENT FY 67	19. PROFESSIONAL MAN-YEARS 3 3	20. FUNDS (in thousands) 15.2 1293	
16. GOVT LAB/INSTALLATION/ACTIVITY NAME: AFOSR ADDRESS: Arlington, Virginia 22209				20. PERFORMING ORGANIZATION NAME: ADDRESS: INVESTIGATORS PRINCIPAL: ASSOCIATE: TELE: TYPE:			
21. TECHNOLOGY UTILIZATION Command & Control, Information Systems				22. COORDINATION ONR, ARO, NSF, NSA, NASA, AEC, ARPA, NIH, FA			
23. KEYWORDS a) 681304 MATHEMATICS							
24(U) OBJECTIVE: The objective of this project is to identify and support the fundamental areas of scientific knowledge and understanding needed to improve the technology of information handling to enable the Air Force to operate maximally effective and efficient <u>automatic information systems</u> .							
25(U) FY 68 PLANS: Emphasis is being concentrated on research on principles and methodologies for characterizing <u>adaptive systems</u> ; on analyses of natural and <u>mechanical language structures</u> ; and on new procedures for the identification, <u>classification</u> , <u>representation</u> , <u>storage</u> , manipulation, and presentation of information in environments permitting <u>automatic information systems</u> . Tasks on information <u>coding</u> and <u>communication</u> in biological systems and on concepts for physical structures for new <u>non-numeric processors</u> will be continued. Emphasis is also being placed on the exploration of modern developments in <u>mathematical logic</u> as prescriptions for the explicit representation of procedures generally considered " <u>intelligent</u> " activities							
26(U) FUTURE PLANS: Research will be encouraged on the extension of formal axiomatic frameworks for the <u>information sciences</u> . Efforts will aim towards advancement of conceptualizations, <u>generalizations</u> and formalizations of <u>pattern recognition</u> gained both from increased knowledge of visual, auditory and other <u>sensory information processing systems</u> and from logical and <u>language structures</u> . Increased sponsorship is planned for design and <u>simulation studies</u> concerned with theories of machines, models of dynamic information processing systems, search and retrieval strategies, and the information processing aspects of <u>man-machine systems</u>							
27. COMMUNICATIONS SECURITY a. COMSEC ON b. COMSEC RELATED (X) c. NOT RELATED 31. MISSION/DELIVERABLE N/A				28.		29. OLD CODE BR	
32. REQUESTING AGENCY				33. SPECIAL EQUIPMENT		30. BUDGET CODE 1	
34. EST. (in thousands) 1631				35.		36.	

UNITED STATES AIR FORCE  
 HQ. OFFICE OF AEROSPACE RESEARCH  
 OFFICIAL Initial Date  
 30 Aug 66



UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D		
(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)		
1. ORIGINATING ACTIVITY (Corporate author) Hq Office of Aerospace Research 1400 Wilson Boulevard Arlington, Virginia 22209		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED
		2b. GROUP N/A
3. REPORT TITLE The Office of Aerospace Research Scientific and Technical Information Program		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Management Nonrecurring		
5. AUTHOR(S) (First name, middle initial, last name) Currie S. Downie Carlton M. Smith Thomas T. Luginbyhl Alexander G. Hoshovsky		
6. REPORT DATE 15 March 1967	7a. TOTAL NO. OF PAGES 73	7b. NO. OF REFS N/A
8a. CONTRACT OR GRANT NO. N/A	9a. ORIGINATOR'S REPORT NUMBER(S) N/A	
b. PROJECT NO. N/A		
c. N/A	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
d. N/A	OAR 67-0009	
10. DISTRIBUTION STATEMENT 1. Distribution of this document is unlimited.		
11. SUPPLEMENTARY NOTES N/A		12. SPONSORING MILITARY ACTIVITY Hq OAR (RRY) 1400 Wilson Blvd Arlington, Va. 22209
13. ABSTRACT This document outlines the mission and organization of the Office of Aerospace Research (OAR), then describes how its principal product, scientific and technical information, is disseminated through its various publications. The magnitude of OAR's research in Information Sciences (approximately 15% of total Federal expenditures in this area) is compared to that of other governmental agencies. Savings of over \$3.5 million, resulting from an effective technical information program, are documented by examples.  The role of the Office of Scientific and Technical Information within OAR as performed by the 16 personnel assigned is described in terms of its four divisions: Publications, Information Studies, Programs, and Executive.  It is suggested that the most pressing problem facing the DoD Technical Information Program is the absence of integrated, DoD-wide planning efforts with the active participation of the three services and various DoD agencies. Planning conferences are needed to improve the organization structure and co-ordinate the future activities of the program. The classical functions of management -- planning, organizing, etc. -- should be reviewed to determine whether they are being adequately emphasized and implemented throughout DoD in the Scientific and Technical Information Program.		

DD FORM 1473  
1 NOV 65

UNCLASSIFIED

Security Classification