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ABSTRACT

The Aerospace Materials Information Center (AMIC) Selective Dissemination of Information (SDI) program was evaluated by an interview technique after one year of operation. The data base for the SDI consists of the periodic document index records input to the AMIC system. The users are 63 engineers, scientists, and technical administrators at the Air Force Materials Laboratory (AFML) and 16 scientific and technical personnel at the University of Dayton. An informal interview technique elicited responses regarding the user assessment of the program and also indicated problem areas in the returns received by the users from the SDI profiles. Most respondents indicated that too many abstracts were being received and too low a relevance was occurring. Refinement of the profiles based on more precise statements obtained from the interviews and on rejected abstracts increased the overall relevance from 37.6% to 51.8%. The primary factor in the improvement was the judicious but copious use of NOT terms to eliminate unwanted abstracts. Results showed the validity of the NOT strategy and indicated the effectiveness of direct contact between the information specialist and the SDI user in getting uninhibited feedback and obtaining meaningful expressions of user technical interests. (Author/NH)

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AFML-TR-71-11

EVALUATION OF THE SELECTIVE DISSEMINATION OF INFORMATION (SDI) PROGRAM FOR THE AEROSPACE MATERIALS INFORMATION CENTER

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TECHNICAL REPORT AFML-TR-71-11

MARCH 1971

AIR FORCE MATERIALS LABORATORY
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

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FOREWORD

This report was prepared by the University of Dayton Research Institute, Dayton, Ohio, under Air Force Contract F33615-69-C-1128. The work described herein was accomplished under Project 7381 "Materials Application," and Task 738103 "Materials Information Development, Collection and Processing." The effort was administered under the direction of the Materials Information Branch, Materials Support Division, Air Force Materials Laboratory with Mr. Harold B. Thompson (AFML/LAM), as Project Monitor.

This is a final summary report and covers the work accomplished from 1 December 1969 through 30 November 1970.

The authors acknowledge the cooperative efforts of a number of personnel of the Air Force Materials Laboratory who were interviewed regarding their SDI profiles. Many valuable suggestions were received which have led to improvements in the SDI operations. Mr. John E. Bernados (AFML/LAM) provided willing assistance in coordinating the University's efforts with personnel of the Air Force Materials Laboratory.

The contractor's report number is UDRI-TR-71-04.

This report was submitted by the authors in January 1971.

This technical report has been reviewed and is approved.

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ABSTRACT

The Aerospace Materials Information Center (AMIC) Selective Dissemination of Information (SDI) program was evaluated by an interview technique after one year of operation. The data base for the SDI consists of the periodic document index records input to the AMIC system. The users served by the SDI program are 63 engineers, scientists, and technical administrators at the Air Force Materials Laboratory (AFML) and 16 scientific and technical personnel at the University of Dayton. The scope of interest of the SDI users encompasses all materials of current or potential use in aerospace systems and includes such aspects as theoretical studies, manufacturing processes, and in-service performance and failure analysis. An informal interview technique elicited responses regarding the user assessment of the program and also indicated problem areas in the returns received by the users from the SDI profiles. Most respondents indicated that too many abstracts were being received and too low a relevance was occurring. However, the SDI profiles were originally constructed so as not to exclude relevant materials. Refinement of the profiles was anticipated from the inception of the program. Based on more precise statements obtained in the interviews and on rejected abstracts returned to the University, profile modifications were effected. An SDI experiment to test the effect of profile modifications on relevance indicated that overall relevance was increased from 37.6% to 51.8%. The primary factor in the improvement was the judicious but copious use of NOT terms to eliminate unwanted abstracts while retrieving desired abstracts. Results showed the validity of the NOT strategy and indicated the effectiveness of direct contact between the information specialist and the SDI user in getting uninhibited feedback and obtaining meaningful expressions of user technical interests.

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INTRODUCTION

The Information Systems Section of the University of Dayton Research Institute (UDRI) has established and presently maintains and operates a document retrieval system in support of the Aerospace Materials Information Center (AMIC). The document retrieval system operated by the University of Dayton contains approximately 51,000 documents concerning materials research and development with new acquisitions being made continually. The establishment, modification, and operation of the document retrieval system are described in the following reports: RTD-TDR-63-4263 (AD 428 423)[1], AFML-TR-65-20 (AD 613 301)[2], AFML-TR-66-36 (AD 633 614)[3], AFML-TR-66-391 (AD 651 039)[4], AFML-TR-67-379 (AD 666 462)[5], AFML-TR-68-367 (AD 686 804)[6], and AFML-TR-70-27 (AD 670 597)[7]. The present report describes the work performed from December 1969 to December 1970.

The AMIC document retrieval system has been in operation with retrospective search capabilities since 1963. The purpose of the system is to provide scientific and technical information to qualified requestors in a timely and efficient manner. The information is supplied in the form of abstracts of documents pertinent to the search request; these abstract forms also contain complete bibliographic information including AMIC access number, DDC AD number or NASA N number, generating agency, report number, title, author, contract number (if applicable), and date of issue of the document. The documents themselves, are available from the AFML Library on loan to the local requestor, or may be referred to in the library. Abstracts of the documents are provided to all requestors.

The AMIC document retrieval system is primarily concerned with the materials aspect of technical documents. Because of the concentration on materials, retrieval capabilities from a materials standpoint are very comprehensive. Retrieval can be very specific, as, for example, all information on the alloy Aluminum 2024-T6, or retrieval could be as general as high temperature fatigue of all metals and alloys. Similarly, one could request information on boron reinforced Epon epoxy composites, or one could ask for aircraft structural applications of any composite material.

Searches encompassing the entire range of materials information are regularly run by the UDRI in response to requests both from the AFML and from DOD contractors. To ensure that the requestor receives abstracts which are relevant to the request, all abstracts and index cards retrieved are screened for content by a UDRI information specialist to assess their relative pertinence to the originally-stated request.

Recently, in an effort to expand its scope of services offered, AMIC began offering SDI services. SDI refers to Selective Dissemination of Information, which is the practice of providing timely, pertinent references to documents in particular areas of interest to a number of users, each user receiving only material of interest to him. The concept of SDI is also referred to as "current awareness." Because of the staggering numbers of technical publications already produced, and the ever-increasing amount of literature appearing daily, it is difficult for an individual scientist or engineer to keep currently informed in his own field. To stay abreast would necessitate full-time literature searching and would leave no time for research effort. However, without this necessary screening to eliminate duplication, or without the advantage of the knowledge of the previous work of other scientists, needless expenditures and slower progress would result. It is the role, then, of the information specialist to eliminate the necessity for time-consuming searching on the part of the scientist, and to make the process of being exposed to information of interest as efficient as possible.

Many organizations have approached the solution to this problem in different ways.[8] E. M. Housman of the U.S. Army Electronics Command (ECOM) claims that their SDI system "provides a method of improving the efficiency of the line of communication between secondary recorded media and individual scientists and engineers."[9] Interest profiles for all subscribers are entered on a master magnetic tape for SDI processing. A Defense Documentation Center (DDC) tape is forwarded semimonthly to ECOM by special arrangement. This tape contains the same information as is published in the Technical Abstracts Bulletin (TAB). A computerized matching occurs which results in selected abstracts and analysis reports. Operating costs are given as $1229 per run of 500 subscribers, or $2.45 per subscriber. Translated to annual figures, the system costs $29,496 per year, or about $58 per subscriber. A Burroughs 5500 computer is used. The low cost of operation is attributed to the use of the DDC document data base, since as part of its normal operations, DDC performs the costly functions of document acquisition, storage, abstracting, indexing, keypunching citations, and providing hard copies. As an example of the potential for cost saving implicit in SDI, a subscriber recently reported a saving of $42,000 and 750 man-hours as a result of one item of information provided. ECOM has a profile revision system with a periodic feedback report to each subscriber.[10]

A. G. Hoshovsky, et al., of the Office of Aerospace Research, in discussing broad vs. more specific coverage of information for SDI, says "this is largely a question of trade-off; how much of his own time is the individual user willing to invest in final screening of the documents to broaden his coverage?"[11] Citing the screening of 1000 documents, three different users noted the relevance three ways. Hoshovsky states that there is a positive correlation between the degree of satisfaction and the literature coverage provided by the SDI service. Contrary to the usual belief, no correlation has been determined between the degree of satisfaction (expressed in terms of time saved and expansion of coverage) and the accuracy of the matching. In one study, users with the matching precision percentage as low as 25% wanted to continue the service because it expanded their literature searching ability and saved them time. Conversely, users who were not completely satisfied with the system were receiving notices with the matching precision of 47% and higher. Costs (1967) were given as $100 per year for a single profile. For 500 profiles this was reduced to $92.50 per profile. NASA reported costs (1966) as $80 per user. Hoshovsky says that SDI service saves 1% of the technical man's time (approximately $150 per year). He adds that the time saving is not the only desirable feature of the SDI service, but it also provides the technical worker the peripheral vision, i.e., the ability ... to learn about information which could be essential to his work, but which is published in the literature he normally would not consider as likely to contain anything of interest.

In 1966, W. A. Bivona of Information Dynamics Corporation made a survey of SDI Systems in the following organizations for the U.S. Army Natick Laboratories.[12]

American Cyanamid Co., Organic Chemicals Division, Bound Brook, New Jersey

Chemical Abstracts Service, Columbus, Ohio

Chemicals and Phosphates Limited, Haufa, Israel

Douglas Aircraft Co., Inc. Missiles and Space Systems Engineering, Santa Monica Division, Santa Monica, California.

Dow Chemical Co., Midland, Michigan

Eli Lilly & Co., Indianapolis, Indiana

IBM Advanced Systems Development Division, Yorktown Heights, New York

IBM Data Systems Division, Poughkeepsie, New York

IBM Federal Systems Division, Space Guidance Center, Owego, New York

IBM Midwestern Region Sales Office, Chicago, Illinois

IBM Technical Information Retrieval Center, T. J. Watson Research Center, Yorktown Heights, New York

Institute for Scientific Information, Automatic Subject Citation Alert (ASCA), Philadelphia, Pennsylvania

Iowa State University, Ames Laboratory, Ames, Iowa

Mitre Corp., Bedford, Massachusetts

National Aeronautics and Space Administration, College Park, Maryland

Olin Mathieson Chemical Corp., E. R. Squibb & Sons Division, New Brunswick, New Jersey

Sandia Corporation, Livermore Laboratory, Technical Information Division, Livermore, California

U.S. Air Force Systems Command, Deputy for Foreign Technology, Wright Patterson Air Force Base, Dayton, Ohio

U. S. Army Biological Laboratories, Fort Detrick, Maryland

U. S. Army Electronics Command, Information Office, Technical Information Division, Fort Monmouth, New Jersey

U. S. Department of the Interior, Bureau of Reclamation, Denver, Colorado

University of Pittsburgh, The Knowledge Availability Systems Center, Pittsburgh, Pennsylvania

The designs of these systems provided criteria for developing an SDI system for the Army Technical Libraries. The user profile/document match strategy incorporates both Boolean and weighted selection criteria. High relevance (79% for IBM, and 58% for Automatic Subject Citation Alert (ASCA)) is claimed by many reporting.

Gifford Young described in detail the NASA SDI program in 1966, including a graphic presentation of their SDI system.[13] He reported that 52 to 62% of retrieval items were of interest to the users.

On 1 July 1969 the University of Dayton established an SDI program to serve AFML and UDRI personnel. The SDI program is based on the periodic input of document index data to the AMIC system. After about one year of operation, it was deemed appropriate to perform an evaluation of the SDI program regarding its usefulness and acceptability by the SDI users. Also it was desired to determine if there were problems in the types of materials being disseminated as a result of profile logic. Such problems would be subject to resolution by appropriate profile modifications.

SECTION II

DESCRIPTION OF THE AMIC SDI SYSTEM

1. INPUT

The input to the AMIC SDI is the same as the input to the overall AMIC document storage and retrieval system. The documents are generally materials-related technical reports generated in-house or by contractors. The reports consist of Air Force in-house reports, Air Force sponsored reports, pertinent reports of other military services and agencies and other Government and civilian organizations such as NASA and AEC. Some foreign documents translated by the Foreign Technology Division (FTD) and a few journal article reprints are in the system. Bibliographies, handbooks, state-of-the-art reports, symposia, independent research and development, and Commerce Business Daily items are included in the system and are designated by special access numbers prefixed respectively by: B, H, SA, S, I, and C. The mission of the AMIC is to acquire, index, store, and retrieve technical documents dealing with some aspect of materials, or components derived from materials, which are of present or potential aerospace interests.

Personnel performing the manual indexing are full-time and part-time professionals with a Master of Science degree in specific subject areas, and part-time students, both graduate and undergraduate trained by the UD - developed student indexer training program.[4] Links are used in the AMIC system to associate index terms with major topics within the same report. A controlled indexing vocabulary is used, with acceptable terms, reference terms and relationships of terms displayed in the AMIC thesaurus.

2. COMPUTER UPDATE PROGRAMS

The AM ~ update programs are designed to accept the index data in machine-readable form, to perform automatically the hierarchical posting, and to merge the update records with the previously existing search tape. The programs are designed to simplify as much as possible the clerical operations in preparing input data and in maintaining the necessary files. Input data are prepared by keypunching each index term in alphanumeric characters as listed by the indexer with the corresponding document access number and link for each term. These keypunch cards are accumulated until about 30,000 keypunch cards (representing approximately 1200 documents) are on hand. The machine-readable data are then delivered to the computer center at WPAFB for the updating process.

There are three program steps required to complete the updating. The first step is the Master Word List (MWL) match and conversion to the corresponding digital identifier (UDM-A). Each term in the AMIC system is provided with a seven-digit number which then serves as the storage and retrieval element for all subsequent processing. If the candidate term exactly matches the appropriate MWL item, the term is converted to the proper term number, and the associated access number/link is retained for use in the second step. If the term is misspelled or incorrectly spaced, the term and its access number/link is printed out on an error sheet which must then be corrected manually and resubmitted.

The second step is the automatic hierarchical posting of terms which are members of class groups. This posting is accomplished by the Generic Tape (GT) file (UDM-B). Each term number from UDM-A is compared with the GT. If a match occurs, the program adds to the original index data the term numbers representing higher generic levels of the term under consideration. The output from this step is a tape of only the update data with the appropriate hierarchical postings. It has exactly the same format as the retrospective search tape.

The third step (UDM-C) consists of merging the update data from UDM-B with the existing retrospective search tape. The end result of the merge step is a new search tape containing both the previously existing and the update data, completely sorted sequentially by access number and by term number under each access number. Because of editing capabilities provided by the search tape update program, it is possible to add term data to previously existing access number term records. There is a duplicate elimination feature which prevents the posting of the identical term number more than once to the same access number/link.

To demonstrate the functioning of the update programs, let us consider an example of a 1969 report on the fatigue of Aluminum 2024 in aircraft. The access number/link is 0055255A and the index terms assigned by the indexer are 1969, FATIUGE, ALUMINUM 2024, and AIRCRAFT. The index terms and access numbers are first keypunched into a standard format. There are four keypunch cards prepared, one for each term. Each has the same access number. These cards are read onto magnetic tape along with other access number-term cards. This tape is compared with the MWL which contains all the allowable index terms and their corresponding term numbers. The first step of the update program (UDM-A) converts all the alphanumeric terms to corresponding term numbers. In our example, 1969 is converted to 7000690, ALUMINUM 2024 is converted to 0161500 and AIRCRAFT is converted to 0071500. The term FATIUGE (intentionally misspelled for illustration) is not recognized as a valid term, so it is saved and printed out on the error sheet which must then be corrected and resubmitted.

The tape from this step now contains the access number and associated term numbers as derived from UDM-A. This tape is next compared with the GT which includes all the hierarchical postings. The next step (UDM-B) guarantees that all terms which belong to higher generic classes also have the term numbers corresponding to these generic class terms entered. In our example ALUMINUM 2024 also belongs to the high generic classes ALUMINUM-CU-MG-MN, ALUMINUM ALLOYS, LIGHT METAL ALLOYS, and ALLOYS. These corresponding term numbers are entered into the tape for access number 0055255A.

The final step is the sort and merge operation (UDM-C). In this step, all the new update data is located with respect to previously existing data on the search file tape and inserted appropriately. A flow diagram of the AMIC sequency of steps is shown in Figure 1.

3. AMIC SDI OPERATIONS

The key to the AMIC SDI operation is the update tape generated as a result of UDM-B. Since it is in the precise format of the retrospective search tape, the search program can be applied to it in the same manner as for retrospective searches. Each profile is prepared using logical AND, OR, NOT operators on the terms selected. The profile represents the expression of the SDI user's interest in the form of logically connected AMIC terms. Twenty-five SDI search profiles are run simultaneously, and the results are printed out in the form of those access numbers which qualified according to the SDI strategy applied. Abstracts corresponding to the access numbers are copied, and these abstracts are forwarded to the SDI users. The process is repeated for each update.

At the initiation of the SDI program, a number of technical personnel both at the AFML and at the UDRI were contacted regarding their interest in participating in the AMIC SDI program. At the AFML, Branch Chiefs constituted the first point of contact. A letter describing AMIC SDI was distributed and was followed up by personal contacts. This letter is provided in Appendix I. In several cases, the Branch Chief preferred to prepare one statement of interest to serve the entire branch. Other Branch Chiefs preferred to make the SDI service available either on an individual basis to members of their branch or to group leaders for the various interests within the branch. At UDRI, a letter describing AMIC SDI was presented either in conjuction with an interview or by mail where personal interviews were not made. This letter is also shown in Appendix I. It was found that letter contact only was largely unsuccessful. Personal interviews were far more productive in acquiring technical areas of interest from the user. A more detailed description of the user groups is provided in Section III.

Statements of interest were received from the users in various forms. The best statements were obtained during the personal interview between the information specialist and the SDI user. The interview permitted interaction to take place, and the interviewer was able to help the user delineate various aspects of the subject area of interest. For example, the interviewer could determine if the user were interested in theoretical or basic research, development and application work, testing, manufacturing and production processes, or in-service experience with actual equipment

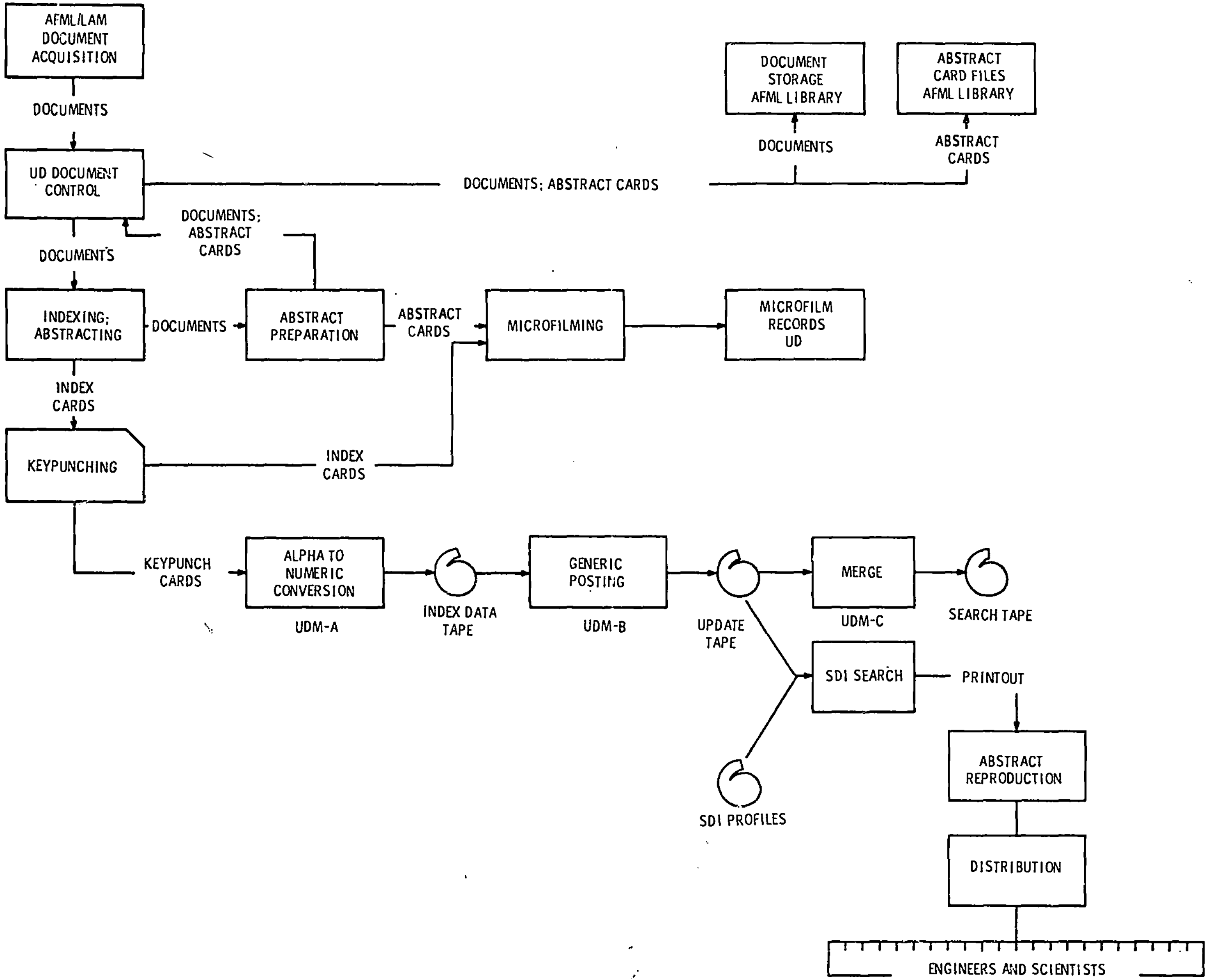

Figure 1. Flow Chart of AMIC SDI Operations

and systems. In a number of cases the SDI user indicated that he would send statements of interest after giving the matter more thought. Some statements were received in narrative or textual form and other persons submitted lists of keywords, some of which were quite extensive.

In formulating SDI search profiles, an effort was made to make them fairly general with the philosophy that it would be better to provide all the abstracts of interest at the risk of also including nonrelevant abstracts than to be too restrictive thus possibly excluding relevant abstracts. Where somewhat diverse lists of key words or statements were obtained, more than one profile was prepared so that the abstracts could be categorized by the user depending on the subject matter emphasis placed on the particular profile. This procedure permitted the occurrence of duplicate abstracts for an individual receiving abstracts from more than one profile. Group profiles particularly tended to be of a general nature.

The following is typical statement of interest.

SDI REQUEST

Information on thin metal films including preparation methods by electroless deposition, electron beam deposition, electrodeposition, sputtering. Skin effect is not of interest.

The SDI search profile strategy corresponding to the request is shown below.

ORDER	CONNECTOR			TERM	TERM NUMBER
	AND	OR	NOT		
1	✓			1968	7000680
2		✓		1969	7000690
3		✓		1970	7000700
4			✓	SKIN EFFECT	3681500
5	✓			METALS	2400500
6		✓		ALLOYS	0114200
7	✓			FILMS	1468000
8		✓		FOILS	1531500
9		✓		MEMBRANES	2383000
10		✓		DIAPHRAGMS	1225200
11		✓		PRINTED CIRCUITS	3321000
12	✓			ELECTROLESS DEPOSITION	1344500
13		✓		DEPOSITION	1205000
14		✓		SPUTTERING	3761500
15		✓		ELECTROLYTIC CELLS	1346000

The first AND/OR group requires that the date of issue of the report be within the time period of 1968-1970. The second AND/OR group requires that either the term METALS or ALLOYS (or both) appear as an index term. Note that because of the automatic hierarchical posting described in Section II. 2, an original index term of TITANIUM also causes the index term METALS to appear with the access number, and therefore a report on thin titanium films would qualify at this point in the search strategy. The third AND/OR group requires FILMS or a similar term, and the fourth group necessitates the occurrence of DEPOSITION or a similar term. A printout of the qualifying documents and an abstract of one of the documents listed in the printout are shown in Figure 2.

During the past year of operation, the number of SDI users has grown to about 80. Because some of the profiles actually serve a group, more than 80 individuals receive the benefits of SDI. In this period of time, 10 updates have been processed. For a typical update, about 5500 abstracts are distributed. The range of distribution of abstracts for the 10th update is shown in Table I. As can be seen from the table, about 8% of all profiles are retrieving over 100 abstracts for an update, and 73% receive fewer than 30 abstracts per profile.

Figure 2. Computer Printout and a Typical Abstract from an SDI Search Request

INFORMATION RETRIEVAL -- DOCUMENT SEARCH NO 99189 DATE 23 NOV 70

SEARCH TITLE - THERMOPHYSICAL PROPERTIES REQUESTED BY - G DENMAN MAAS SDI CUTOFF 18 MAX NO. ALL

11TH UPDATE 11-18-70

ORDER	CONN	WORD NO.	
1	AND	7000680	1968
2	OR	7000690	1969
3	OR	7000700	1970
4	AND	240[illegible]	METALS
5	OR	114200	ALLOYS
6	OR	839000	CERAMICS
7	OR	3679050	SINGLE OXIDES
8	OR	624500	BORIDES
9	OR	791500	CARBIDES
10	OR	2852000	NITRIDES
11	OR	1677500	GRAPHITES
12	AND	1014500	COEF. OF THERMAL EXPANSION
13	OR	3742000	SPECIFIC HEAT
14	OR	2381500	MELTING POINT
15	OR	4063500	THERMAL CONDUCTIVITY
16	OR	4065000	THERMAL DIFFUSIVITY
17	OR	4069500	THERMAL STABILITY
18	OR	1778500	HEAT RESISTANCE

0S3372A	008280A	008422A	004423A	00H519A	00H584A	00H587A	00S256A	046268A	048180A
048182A	048213A	048398A	049642A	052907A	054514A	054706A	055027A	055515A	056286A
056582A	057243A	057329A	057448A	058772A	058791A	059898A	060062A	060480A	060642A
060747A	060928A	061392A	061438A	061619A	061669A	061703A	061704A	061852A	061951A
061958A	062[illegible]38A	062071A	062[illegible]824	062144A	062175A	062177A	062499A	062555A	062703A
065743A	065982A	066805A	066897A	066916A	067257A	067267A	067323A	067443A	067449A
067451A	067463A	067515A	067527A	067528A	067560A	067595A	067737A	067739A	067759A
067769A	067783A								

THE 72 DOCUMENTS LISTED ABOVE CONTAIN THE FIRST 18 WORDS.

ACCESS NO: 67,783

TITLE: ARPA-NBS PROGRAM OF RESEARCH ON HIGH TEMPERATURE MATERIALS

Author(s): A. D. Franklin
Report No: Technical Note 494
Date: Sept. 1969
Contract No:
Contractor: National Bureau of Standards
Sponsoring Agency: Department of Defense
Project Monitor:

ABSTRACT: Brief reviews are given of work performed, on a number of projects concerning High Temperature Materials. Topics include the optical constants of titanium, diffusion of oxygen in oxides, growth of Al_2O_3 bicrystals by chemical vapor deposition, high temperature creep in copper, fracture in glass, the electronic structure of transition metal borides and related compounds, the enthalpy of pyrolytic graphite at high temperatures, the mechanism of volatilization of polymers, and the interaction between mechanical relaxation and annealing in polymers.

TABLE I

DISTRIBUTION OF ABSTRACTS PER PROFILE

Tenth Update	August 20, 1970
No. Profiles Run	185*
No. Individuals	67*

No. of abstracts/profile	No. of profiles	Percent of profiles
0	12	6.5
1-10	67	36.3
11-20	36	19.5
21-30	20	10.8
31-40	17	9.2
41-50	4	2.2
51-60	8	4.2
61-70	2	1.0
71-80	3	1.5
81-90	0	0.0
91-100	1	0.5
101-200	11	5.9
201-300	3	1.5
301-400	1	0.5
Greater than 400	0	0.0
	185	99.4

*Approximately 55 profiles representing 13 individuals were prepared since the 10th update. These are being run at the next update.

SECTION III

USER GROUPS

The users of AMIC SDI services are scientific and technical personnel at AFML and UDRI engaged in materials-related research and development. The AFML is responsible for the exploratory and advanced developmental program for materials, particularly as applied to aerospace systems and related equipment. To carry out its mission effectively, the AFML is organized into six major Divisions which are further subdivided into Branches. A brochure published by the AFML[14] provides summaries of the work objectives of the various divisions which, in turn, characterize the technical information needs of the individuals and groups within the AFML. To illustrate the vast scope of the AFML information requirements, the Division missions are summarized below, and the complete organizational breakdown is shown in Figures 3 through 9.

1. METALS AND CERAMICS DIVISION

The Metals and Ceramics Division is responsible for providing the Air Force with needed technology in the metals, ceramics and related areas of materials sciences. Within the Division, eight technology areas have been defined: metals and alloys, metal processing and joining, metal and ceramic matrix composites, static and dynamic mechanical properties, nondestructive testing (NDT), and graphite. Three application areas for these technologies have also been defined. These are aerospace primary structures, high temperature materials and thermal protection systems.

2. NONMETALLIC MATERIALS DIVISION

The Nonmetallic Materials Division is concerned with research and development on elastomers, transparent plastics and glasses, fibers, adhesives, coatings, fluids and lubricants, structural plastic composites, and ablative plastics. The goal is to develop materials having superior properties compared with currently available materials to permit improved performance of aerospace vehicles. Mechanisms of material behavior and interactions of materials with adverse environments such as high temperature, humidity, and various types of electromagnetic radiation are investigated to meet the objective of developing superior nonmetallic materials.

3. MATERIALS PHYSICS DIVISION

The Materials Physics Division has the following interests: the chemical and physical composition of materials; the thermophysical and thermodynamic properties of materials; armor materials and ballistic response; radar and optical camouflage materials; the development of electrical and electronic materials. These interests also require ancillary work in such diversified fields as physical organic chemistry and impact physics.

4. MATERIALS SUPPORT DIVISION

The Materials Support Division provides the essential link between materials which emerge from the research laboratories and their ultimate utilization in an aerospace system. Candidate materials resulting from research and development programs of the Air Force Materials Laboratory, as well as those from industrial laboratories, are continuously examined for potential use. Those which pass initial screening criteria are evaluated under simulated environments closely approximating their projected use. The final product is a complete characterization of the new material outlining its engineering properties, performance parameters, and specifications. Transfer of information on materials is accomplished by the Air Force Materials Laboratory Information Centers. They serve the aerospace designer to enable him to select from the many possibilities a particular material for a certain application. Operational weapon systems are supported by materials engineering services including failure analysis, corrosion control and maintenance recommendations.

5. MANUFACTURING TECHNOLOGY DIVISION

The Manufacturing Technology Division is concerned with the development of manufacturing processes, techniques and equipment. The overall objectives are to assure that end items of Air Force materiel are manufactured by the most economical and efficient methods and that widely applicable manufacturing methods are economically developed and made available to all manufacturers and designers well before they are required for the actual manufacture of Air Force materiel. The specific objectives are to develop manufacturing processes, techniques and equipment in advance of production to ensure economic availability of materials, components and system; reduce unit production man-hour and material costs; and to improve fabrication efficiency, techniques, processes, equipment and materials utilization.

6. ADVANCED COMPOSITES DIVISION

The Advanced Composites Division is responsible for developing advanced composite materials technology and conclusively demonstrating the high payoff potential in selected aerospace systems structural applications. The Advanced Composites Division is concerned with the economical and reproducible processes for making high quality, high modulus reinforcements and the development of improved organic and metallic matrix composites. These developments include improvements in mechanical properties and the improvements in elevated temperature capabilities needed for selected applications in aeropropulsion systems and future high performance aerospace vehicles.

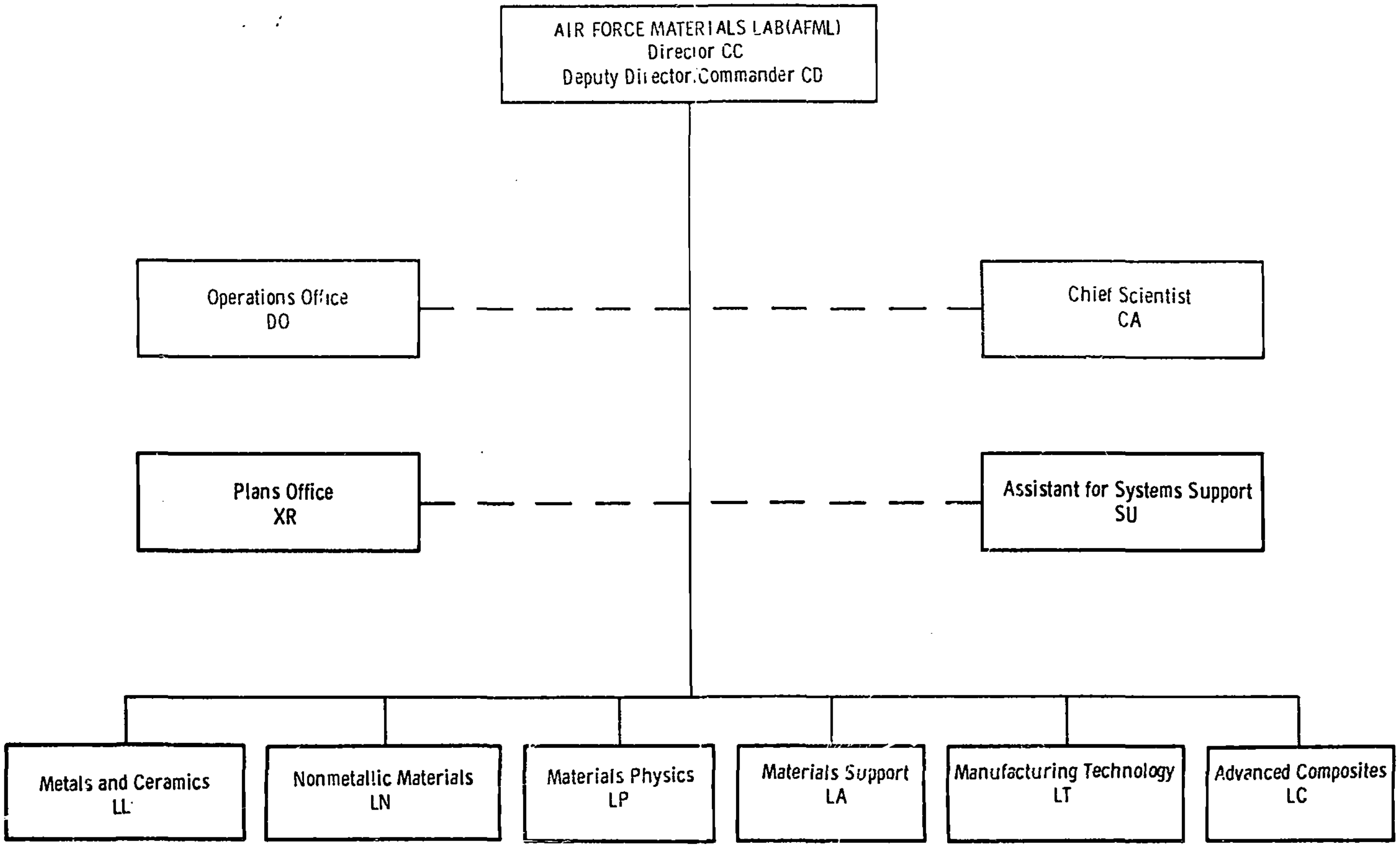

Figure 3. Organization of the AFML by Divisions

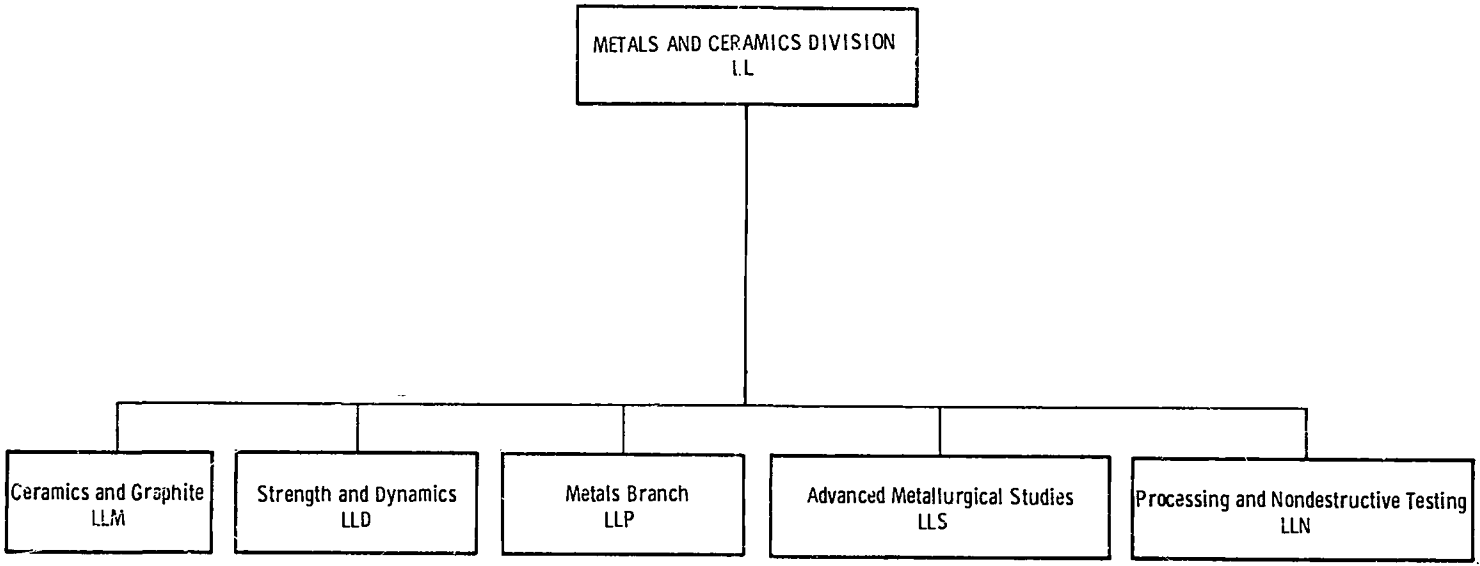

Figure 4. Organization of the Metals and Ceramics Division by Branches

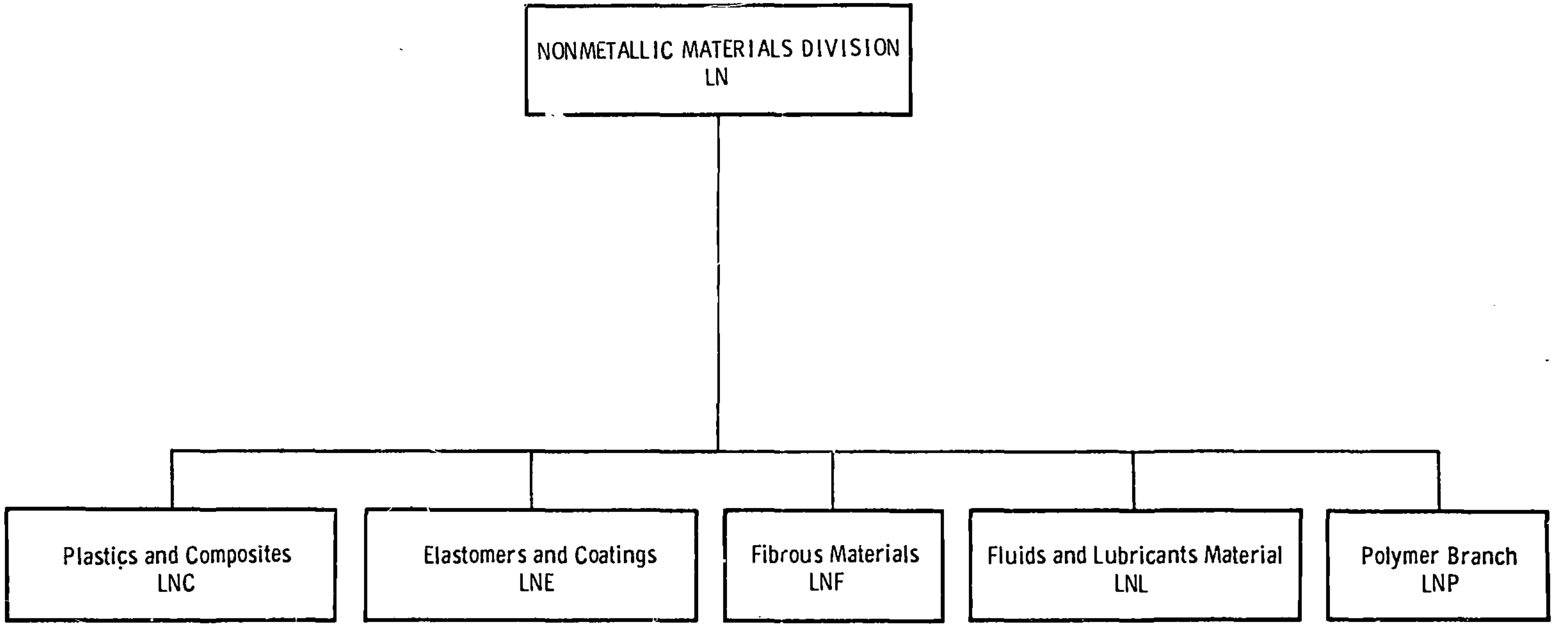

Figure 5. Organization of the Nonmetallic Materials Division by Branches

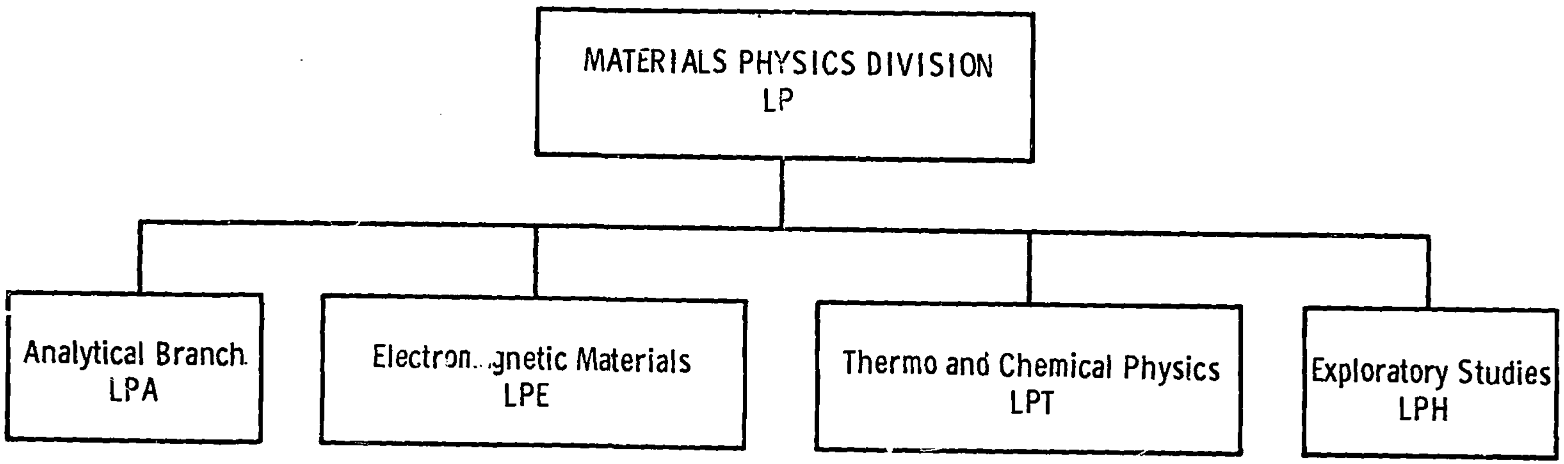

Figure 6. Organization of the Materials Physics Division by Branches

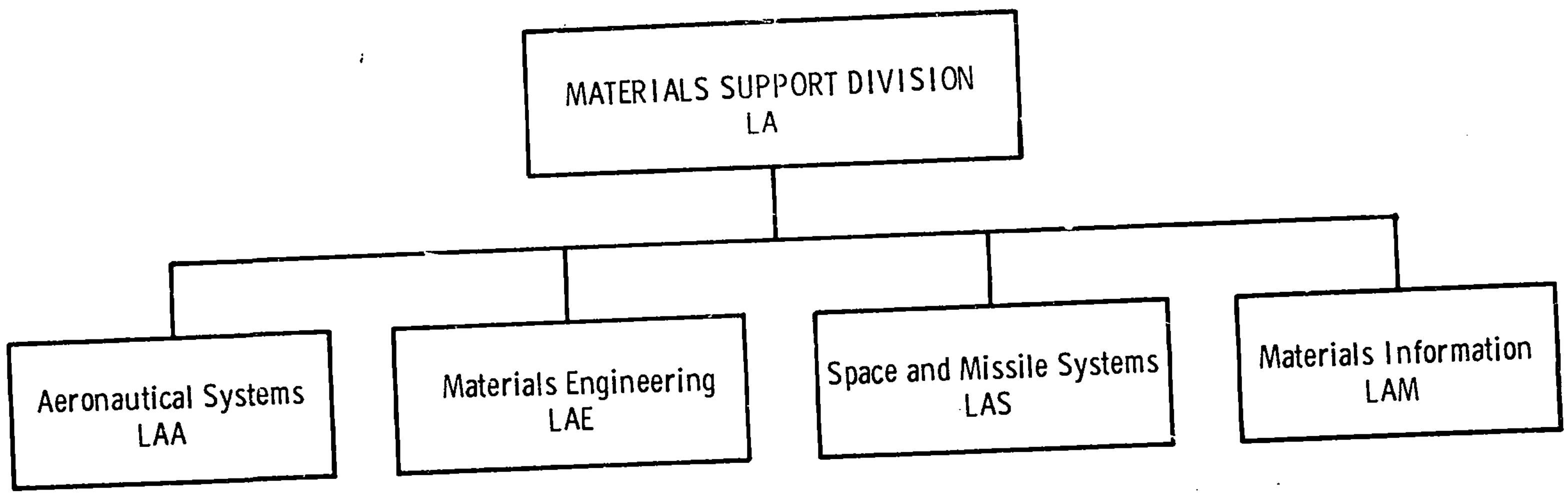

Figure 7. Organization of the Materials Support Division by Branches

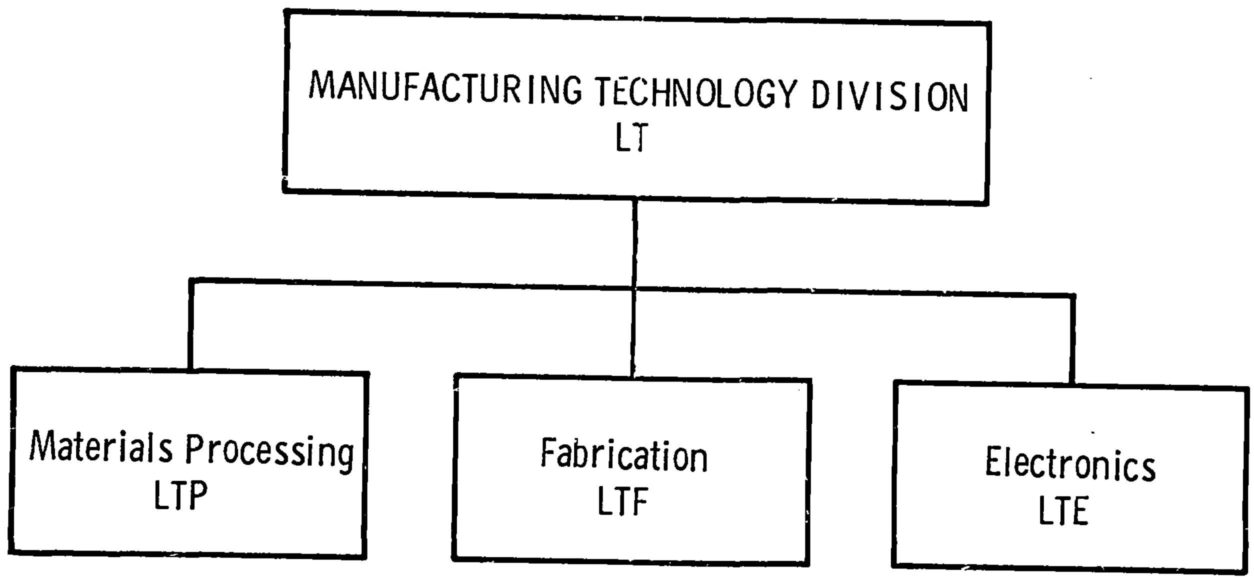

Figure 8. Organization of the Manufacturing Technology Division by Branches

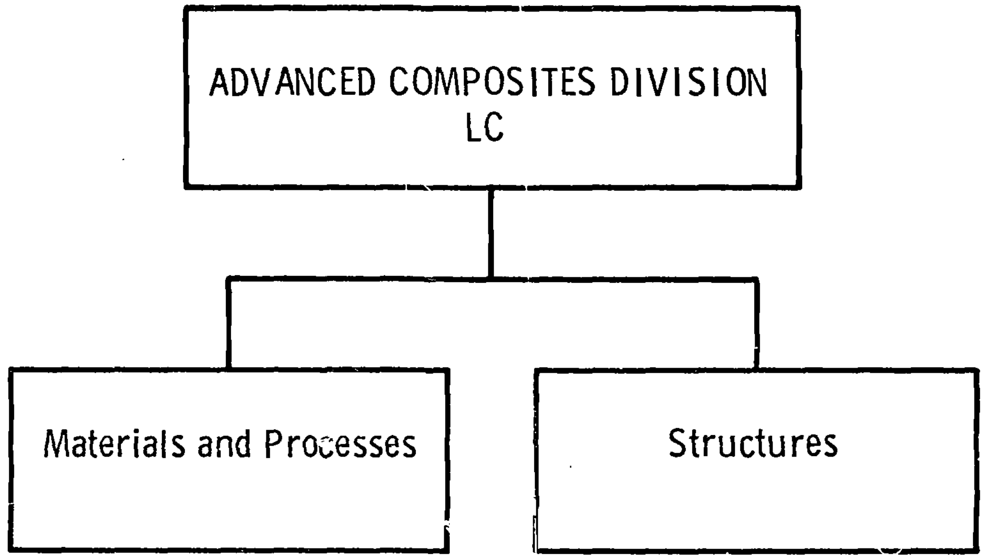

Figure 9. Organization of the Advanced Composites Division by Branches

7. SUMMARY OF USER INTERESTS

As the preceding Divisional objective descriptions indicate, not only is the scope of subject matter very broad, but the level of interest also varies considerably. Some users are concerned with basic physical-chemical research and theory; they need to predict the in-space behavior of materials whose physical and chemical properties are known only in a terrestrial environment. Others must conceive the physical components from mathematical models, taking into consideration the aerothermodynamic environment and limits of materials from available data on mechanical, physical and chemical behavior. The design and engineering must proceed from the planning stage, followed by actual fabrication and manufacturing. In-service operating conditions, failure analysis of in-service failed components and maintaining the aerospace systems represent another aspect of materials research and development. Testing to discover the capabilities under varying conditions of new materials and designs requires new methods of analysis, instrumentation and equipment. To serve these interests, it is important that relevant information be made available to each individual, in a form and pattern which will best suit the individual's needs, interests and work environment.

The listing of some SDI profile titles in conjunction with the level of interest exemplifies further the nature of the user groups being served. This listing is shown in Table II.

TABLE II

LFVEL OF INTEREST AND TOPICS OF SDI PROFILES

LEVEL OF INTEREST	SDI PROFILE TOPIC
Theoretical studies	High Temperature Oxidation and Kinetics
	Physical Behavior of Polymer Solutions
	Molecular Vibrations/Molecular Structure Correlation
Applied research on new materials	Radar Absorbing Materials
	Rain Erosion Resistant Materials
	High Temperature Dielectrics
Design and Engineering	Load and Stress on Parachutes
	Properties of Polymer Composites for Structural Applications
	Expandable Structures
Fabrication and Manufacturing	Fabrication of Metal Composites
	Joining, Welding or Brazing
	Paint Formulation
Testing and Instrumentation	Nondestructive Testing
	Biaxial Testing
	Instrumentation for Infrared Spectra
Operations and Maintenance	Cleaning of Aircraft
	In-service Stress Corrosion
Research applied to Aerospace Systems	Aircraft Armor Materials
	High Temperature Lubricans and Hydraulic Fluids
	Transparent Materials for Aircraft Windshields

8. USER POPULATION

The SDI user population is composed of scientific and technical personnel from all branches of the AFML and from the Materials Science and Engineering Section of the UDRI. There are 79 requestors currently participating in the program; 204 profiles are active, some requestors having more than one profile. In the AFML, some Branch Chiefs, Group Leaders and Technical Managers serve as central points for further distribution, whereas in other branches each individual has his own profile. In the UDRI, SDI services are provided on an individual basis. The SDI profiles are distributed as follows:

UDRI	
Individuals	16
AFML	
Branch chiefs	11
Group leaders	7
Technical managers	4
Individuals	41
	63

SECTION IV

EVALUATION OF THE AMIC SDI PROGRAM

1. EVALUATION TECHNIQUE

After the SDI program had become fairly well established and several SDI runs had been made with the distribution of abstracts, an evaluation form was submitted to SDI participants. This form is shown in Appendix II. Twenty-six forms were returned and these provided some feedback as to the performance of the AMIC SDI program in meeting the current awareness needs of the participants. No trend was easily recognizable, and, indeed, a number of questions were raised by certain answers to the questionnaire. At a meeting between information specialists at UDRI and AFML, various alternatives for performing a more in-depth evaluation were considered. It was decided that, instead of sending a formal questionnaire, personal interviews would be conducted, using a question sheet as a guide. The purpose of the interviews would be twofold: (1) to obtain opinions on the SDI program in general and on the SDI users' experiences with it; (2) to achieve more accurate or precise expressions of the SDI users' real interests with the objective of making modifications in profile strategies and operational techniques to provide better service.

SDI users who had returned the evaluation questionnaire were selected as the primary source of interviewees. It was deemed essential also to interview at least one SDI user from each branch of the six divisions of the AFML. A suitable question sheet was developed and an interviewing style was adopted. This question sheet is shown in Appendix III.

Interviews were unstructured, informal interchanges without note-taking or a tape recorder. Notations were made on the previously designed question sheet immediately following the interview, but not in the presence of the user interviewed. In initial interviews, note-taking seemed to inhibit the free interchange of information. Some interviewees stopped talking when they observed that their words were being recorded. Therefore this practice was terminated. There was the risk that something would be forgotten, but it was offset by the advantage of open communication. The SDI user could express his actual opinion without fear of having it recorded. This procedure permitted the interviewer to obtain firsthand an acquaintance with the SDI user personnel. Better understanding of his particular information needs resulted. It was found that presenting the computer printout sheet which shows the strategy and the access numbers retrieved to the interviewees was very helpful in eliciting a better statement of the SDI users' requests. It was especially useful in revealing terms which were not of interest.

Wherever possible, requests for special service were filled immediately. As an example, one user retains the abstract cards received on his SDI for his personal file. He prefers abstracts reproduced on card stock instead of paper, and this request will be met in future SDI runs. Some users requested inclusion of open literature for current awareness. Accordingly, open literature abstracting sources in the AFML Library and periodicals containing abstracts from the open literature were added to the AFML Periodical Digest, which is an in-house monthly dissemination publication listing the tables of contents of periodicals and abstract journals.

2. RESULTS OF THE EVALUATION

The interviews revealed a number of interesting insights regarding the SDI program. The technique of an informal unrecorded interchange proved to be an excellent evaluation method, because much information was obtained in this way which could not have been elicited by a questionnaire. In analyzing the form of the original SDI request statement in conjuction with the interview results, certain trends were noted. Statements received in text form about areas of interest led to far better SDI profile strategies than occurred when only lists of key words were supplied. Some users had tried to convey their interests by using previously established key word listings from Chemical Abstracts, DDC, or FTD instead of using their own terms to describe their needs exactly. Although well-intended, these key word listings often left the information specialist who formulated the SDI search strategy with some ambiguous choices. Others had tried to provide profiles for a whole group and ended up with such a broad coverage that no one was helped very much.

Certain procedural problems, especially in the case of group profiles, were noted. In some cases the abstracts were not reviewed by the person serving as the central receiving point. The significance of abstracts to the individual in the group was not ascertained and the abstracts were never distributed. Other group leaders were so selective in sending only what they considered were appropriate items to individual members that the peripheral benefits were lost. In at least one case, a predecessor had set up a profile which did not fit the interests of the present user. With new contracts, interests changed and the profiles became obsolete.

On the other hand, some participants suggested additional users and helped them work out their SDI request statements. Other participants, who knew of new contracts soon to be started, asked for modifications of existing profiles or additions of new ones. There were users who wanted two or more profiles consolidated, and some deleted altogether, as a reflection of changes of interest.

One particularly interesting fact became apparent during the interviews. Some users who had responded to the questionnaire sent to them previously were hesitant to criticize the service for fear it might be stopped altogether.

Questions directed to the value of the SDI service elicited an entire spectrum of opinion from being of little value to very worthwhile. There was not too much opinion in between. The users either liked it very much or not much at all. Some users found the returns unsatisfactory and stopped looking at the abstracts. Interestingly, these individuals did not make an effort to rectify the situation by providing feedback to the information specialists, but rather, they assumed that it would be of no use to do so. In the interview, they expressed that if efforts were made to improve the results, they would at least examine the returns once again. A number of participants received no retrievals or a very small number of returns. Others received considerable quantities of nonrelevant material.

Based on 40 interviews, here are some of the findings.

a. Degree of Relevance

Percentage of interviewees who received at least some new information with close relevance to interest profile	57%
Percent receiving information of some interest to user	27%
Percent who considered nearly all material received irrelevant	16%

b. User Acceptability of Relevance

Satisfactory	60%
Not Satisfactory	33%
No Answer	7%

c. Number of Abstracts Received

Too many abstracts	60%
Satisfactory	36%
No response	4%

d. Desire for Profile Modification

Desired modification	90%
Current profile satisfactory	10%

e. Use of SDI Services

Save time in literature searching	50%
Primarily for reference	10%
Affected technical decisions	13%
Not specified	27%

A note of explanation would seem in order, here, lest these findings appear misleading or contradictory to later results. Variation of the individual's attitude toward returns occurred, because some would rather get too much and not miss anything, while others, even though receiving fewer abstracts, felt that too many abstracts were being provided. (See Section I and Reference 11.) One use showed concern for the cost of reproduction and objected to the irrelevant ones he had to throw away. Most users were very happy to comply when asked to return to AMIC the abstracts not of interest, rather than to dispose of them.

Many and varied other sources of current awareness (SDI) are available to users. Asked which was the more valuable, 27% of those questioned said AMIC; 30% replied that other SDI services were better. Of the other 43%, some couldn't answer the question because either they were uncertain about whether the source of the SDI was AMIC or some other, or they had no clear recollection of the returns. These replies are also influenced by the area of interest. Basic scientists prefer the open literature and sometimes question the accuracy of reports applied technical research. Technical and engineering researchers tend to rely heavily on the publications from their specialized fields of application, such as ceramics, electronics, plastics, and metal fabrication. Two or three SDI participants expressed high resistance to the concept of computerized searching. One universal request was for more recent material. Many users are already aware of the work when the SDI notice reaches them. Several respondents suggested that a periodic check on interests to keep profiles current would be helpful.

3. PROFILE MODIFICATION

As indicated in Section IV. 2, the interviews with SDI participants revealed that nearly all SDI users desired some modifications of their profiles. Most of those interviewed indicated that too many abstracts were being received, and the relevance was generally low. Some persons said that getting duplicate abstracts for different profiles was bothersome and that the consolidation of profiles would be preferred. Others were satisfied with more than one profile, since each profile was passed on to a different individual after the group leader or branch chief had reviewed all of them. The experience of having received abstracts over a period of time was of great help in pinpointing reasons for the retrieval of nonrelevant abstracts. With information obtained from the interviews, and from examination of abstracts returned by SDI requestors as nonrelevant (see Section IV. 4), profile modifications were effected. Profile consolidations were made as requested. New profiles were formulated for individuals suggested during the interviews as additional SDI participants. Profiles were cancelled and added for established users to reflect changes in their scope of interest. In the majority of cases, however, the profile modifications were made to reflect more accurately the information needs which had not changed. The analysis by the information specialists of the comments made during the interviews, plus the analysis of the abstracts rejected by the users, led to a much clearer delineation of the users' real needs. This improvement in the statement of interest was most dramatic in those situations in which only a list of key words had been supplied originally to the information specialist.

The most significant trend in the revised SDI profiles was the copious use of NOT terms to eliminate nonrelevant abstracts. In applying NOT strategy, there is an inherent risk of negating relevant abstracts which would otherwise qualify, so the use of NOT terms must be very judicious. The great reduction of nonrelevant retrievals, however, is sufficient in the minds of most users to offset the risk of occasionally failing to retrieve a relevant abstract.

A specific example will serve to demonstrate the effect of NOT strategy to eliminate unwanted retrievals. One requestor desired information on various aspects of vibration. The original strategy is shown in Figure 10. The requestor was interested in mechanical vibration as might be experienced in aircraft or other aerospace vehicles. In particular, he was interested in vibration damping. With the SDI profile strategy shown in Figure 10, the requestor not only got mechanical vibration which he desired, but he also received abstracts on molecular vibration, electronic vibration, electromagnetic vibration, and spectra-related vibration, all of which were not of interest. The revised profile shown in Figure 11, made use of NOT strategy on those terms which are associated with types of vibration to eliminate such retrievals, while at the same time permitting

Figure 10. Original SDI Profile for Mechanical Vibration

IR WORKSHEET FOR SEARCH # 99104

PAGE 1 OF 1

ORDER	CONNECTOR			WORD	WORD NUMBER
	AND	OR	NOT		
1	✓			1968	7000680
2		✓		1969	7000690
3		✓		1970	7000700
4	✓			Vibration	4511500
5		✓		Acoustical Energy	0030000
6		✓		Acoustical Power	0031000
7		✓		Noise	2881000

Figure 11. Revised SDI Profile for Mechanical Vibration

IR WORKSHEET FOR SEARCH # 99269

PAGE 1 OF 1

ORDER	CONNECTOR			WORD	WORD NUMBER
	AND	OR	NOT		
1	✓			1968	7000680
2		✓		1969	7000690
3		✓		1970	7000700
4			✓	Electrons	1355500
5			✓	Energy Levels	1371500
6			✓	Electronic Transitions	1355200
7			✓	Molecular Structure	2579000
8			✓	Synthesis	3942400
9			✓	Chemical Reactions	0877450
10			✓	Band Structure	0445000
11			✓	Spectroscopy	3746000
12			✓	Spectrometry	3745000
13			✓	Band Levels	0444800
14			✓	Charge Carriers	0871000
15			✓	Semiconductors	3559500
16			✓	Reaction Rate Constant	3413500
17			✓	Excited State	1425000
18			✓	Atomic Structure	0425000
19			✓	Bond Energy	0599000
20			✓	Bending Frequency	0480200
21			✓	Stretching Frequency	3885000
22			✓	Rotational Constants	3485500
23			✓	Molecular Orbitals	2578500
24			✓	Polymer Structure	3248500
25			✓	Absorption Spectra	0006100
26			✓	NMR Spectra	2879000
27			✓	ESR Spectra	1399000
28			✓	Emission Spectra	1363500
29			✓	X-Ray Diffraction	4604500
30			✓	Molecular Resonance	2578700
31	✓			Vibration	4511500
32		✓		Acoustical Energy	0030000
33		✓		Vibrational Energy	4512000
34		✓		Vibrational Frequency	4512100
35		✓		Acoustical Energy	0030000
36		✓		Acoustical Power	0031000
37		✓		Noise	2881000
38		✓		Mechanical Shock	2377500
39	✓			Damping	1175500
40		✓		Attenuation	0426000
41		✓		Absorption	0004500
42		✓		Shock Absorbers	3581500
43		✓		Acoustical Insulation	0030550
44		✓		Aircraft	0071500
45		✓		Aerospace Vehicle Components	0065500
46		✓		Space Vehicles	3738500
47		✓		Structural Components	3894700
48		✓		Re-Entry Vehicles	3413000

the relevant abstracts to be retrieved. For the 11th update, the original strategy caused 91 retrievals with a relevance of 49.5%. With the same update using the modified strategy, 28 retrievals were obtained with a relevance of 67.9%.

4. SDI EXPERIMENT

An experiment was conceived to test the effect of the profile modifications on the quantity and relevance of SDI retrievals, the relevance being determined by the users themselves. The original profiles were run against the 11th update, and the SDI users were asked to return to us all nonrelevant abstracts. The difference between the total number sent to the user and those returned to the University of Dayton represented the relevant documents. The 11th update was then run against the modified profiles. In several cases, the modified profiles retrieved abstracts not retrieved by the original profiles. The additional abstracts were sent to the user, and, as before, he was asked to return nonrelevant abstracts. With no more effort on the part of the users than returning nonrelevant abstracts, it was then possible to perform a complete analysis of the effect of profile modifications. The composite results are shown in Table III. The results for the individual profiles are given in Appendix IV.

5. ANALYSIS OF RESULTS AND CONCLUSIONS

The results of the SDI experiment demonstrated that the relevance of groups of abstracts could be significantly increased by the use of Boolean NOT terms in the SDI profile to eliminate nonrelevant abstracts. The increase in relevance is brought about because the NOT strategy on certain terms causes documents containing such terms to be rejected when they otherwise would qualify according to the search strategy. From the distribution shown in Table III, one can see that the distribution of the number of abstracts per profile varies significantly between the original and revised profiles. With the original profiles, the number of abstracts was fairly evenly distributed, with about as many profiles causing high quantities of retrievals as those causing low number of retrievals. With the modified profiles, few profiles caused large numbers of retrievals while many profiles resulted in 0-60 retrievals. This change in distribution can be largely attributed to the NOT strategy which is responsible for eliminating many nonrelevant abstracts. Some of the SDI users interviewed had indicated that the large number of returns in conjunction with the low relevance had made the SDI too burdensome to be useful. The higher relevance and lower number of abstracts brought about by the Boolean NOT strategy should improve the acceptability of the SDI program.

TABLE III

THE EFFECT OF SDI PROFILE MODIFICATIONS ON

THE QUANTITY, RELEVANCE, AND DISTRIBUTION OF RETRIEVALS

	Original Profiles No.	Original Profiles %	Modified Profiles No.	Modified Profiles %
Total profiles	[illegible]3		39	
Total retrievals*	4087		2020	
New retrievals recovered by modified profiles			432	
Relevant abstracts recovered by original profiles, but missed by modified profiles			653	
Relevant abstracts	1533	(37.6%)	1046	(51.8%)
Distribution*				
0	0		1	
1- 10	3		6	
11- 20	6		10	
21- 30	1		4	
31- 40	3		2	
41- 50	5		2	
51- 60	2		5	
61- 70	3		2	
71- 80	2		0	
81- 90	1		1	
91-100	3		1	
101-200	3		3	
201-300	3		2	
301-400	1		0	
401-500	3		0	
> 500	0		0	

*Duplicates eliminated

A significant number of abstracts which were retrieved on the original profile and not rejected were not retrieved with the revised profile. Although this situation is of concern, there are certain factors which influenced this result. First, the revised profiles were modified on the basis of two factors: (1) the clearer expression of interest obtained from the personal interviews; (2) the rejected abstracts. Since both of these factors were applied, it could be expected that the set of documents retrieved with the revised profile strategy would be different from the original set. Thus, there was the risk of missing nonrejected abstracts from the original strategy. If optimization of the Boolean NOT strategy had been the sole objective, only the rejected abstracts would have been used in revising strategies and the set of documents retrieved with the modified profile would have matched more nearly the set obtained with the original profile. However, the intent of the profile modifications was to make them as useful to the SDI user as possible, both rejected abstracts and comments received in the interview influenced the SDI profile revisions.

Although it was desired that the user himself would evaluate the abstracts provided to him and send us those definitely not of interest, not all of the participants in the SDI experiment returned to us their rejected abstracts. To complete the experiment, an independent information analyst screened the retrieved abstracts based on the statement of the SDI interest profile for those who did not return their rejects.

The information analyst probably tended to reject fewer abstracts than the actual user would have rejected, simply because the information analyst had to give the benefit of the doubt on questionable abstracts. Furthermore, those who did return their rejects tended to be those favorable to the SDI program, and consequently they probably rejected fewer than would have been the case for those who did not return their abstracts.

Finally, the modified SDI profiles which are rejecting legitimate relevant abstracts can be reviewed and re-revised to remove NOT terms causing unwarranted rejections. One must keep in mind, too, that by their nature, SDI profiles are more general than retrospective search requests which means that the relevance is likely not to be as high for SDI (See Appendix I). Also, the document base of the SDI changes for each update so that a wide variation of relevance can occur between SDI runs for the exact same SDI search strategy.

The use of the Boolean NOT strategy with certain terms to cause the rejection of nonrelevant abstracts is a powerful tool for improving the relevance of abstracts retrieved by SDI profiles. However, caution is required so that the NOT strategy is not carried too far, thus causing the rejection of valid abstracts. The optimum means of using Boolean NOT logic in SDI profile strategies is to review nonrelevant abstracts returned by the SDI users themselves before the NOT strategy is applied. Rejected abstracts from the original profile over several runs should permit the identification of those factors causing nonrelevant retrievals. The correction can then be made with greater confidence by using NOT logic on the appropriate terms. This technique is anticipated as the one to be used for future SDI efforts of the AMIC.

Perhaps the most important conclusion of the entire SDI experiment is the need to know the user and to recognize individual differences. The personal interview technique with the SDI users proved extremely helpful and also established rapport between the information specialist and the users. People who had not responded to questionnaires were quite willing to talk about their work and information needs in person. It is important to recognize the desires and attitudes of the user. Some people would rather get a considerable amount of material even with relatively low relevance to ensure that nothing is missed. Others would rather be somewhat restrictive and be exposed to information only in their specific area of interest. In some cases the SDI users commented that some abstracts related to work with which they were already familiar, but the appearance of the abstracts on SDI reinforced their confidence that they were truly aware of the work about which they should be knowledgeable. The careful use of the Boolean NOT logic provides a great flexibility in SDI profile strategy formulation so that all types of individuals' needs can be accommodated effectively.

SECTION V

DOCUMENT RETRIEVAL SYSTEM OPERATION

I. INPUT

During the period covered by this report, 1 December 1969 through 30 November 1970, 7782 documents were indexed and processed into the system. Of this number, 138 were handbooks, 165 were state-of-the-art reports, 185 were bibliographies, and 105 were symposia proceedings. The documents were indexed with an average of 19.4 terms per document (exclusive of generic postings) with an average indexing time of 31.3 minutes per document. Distribution by subject category is shown in Table IV. The subject categories are defined in Appendix IV. There are now approximately 52,000 documents in the AMIC document retrieval system.

2. SEARCHING

A total of 302 technical requests were processed by the Information Systems Section during the report period. This represents a decrease of 13% over the previous reporting period. An average of 22 abstracts was printed per search for forwarding to the search requestors.

Figure 12 presents the number of search requests processed by the AMIC document retrieval system since 1963 on a contract year basis. The number of requests is shown by total requests from the AFML and requests from organizations outside the AFML. During the past year, the number of requests both from organizations outside the AFML and from the AFML decreased significantly. AMIC searches are run for the AFML prior to the establishment of new research projects to provide background information and direction to the responsible AFML personnel. Because of the small number of new projects considered, the number of such searches was down significantly, as compared to recent years. The same situation probably accounts to a large extent for a reduction in the number of request from outside organization. The number of AFML searches other than for new projects was up slightly over the previous year.

Comments obtained from interviews with SDI participants suggested that the SDI operation had virtually no effect on the number of retrospective search requests. There is some evidence that the SDI program may tend to increase the retrospective searches slightly.

TABLE IV

DOCUMENT INPUT AND SEARCHES PROCESSED BY SUBJECT CATEGORY

AMIC CATEGORY		DOCUMENTS		SEARCHES	
		No.	%	No.	%
01	Aeronautics	120	1.3	12	3.8
02	Atmospheric Sciences	80	0.9	0	0.0
03	Chemistry	784	8.8	19	6.0
04	Electronics	165	1.9	12	3.8
05	Adhesives	42	0.5	10	3.2
06	Seals	32	0.4	1	0.4
07	Ceramics	184	2.1	18	5.7
08	Coatings	132	1.5	11	3.5
09	Composites	214	2.4	44	14.0
10	Fibrous material	93	1.0	4	1.3
11	Metallurgy	1508	17.0	67	21.3
12	Lubricants	211	2.4	9	2.9
13	Polymers	217	2.4	26	8.3
14	Elastomers	33	0.4	4	1.3
15	Cleaning compounds	4	0.0	1	0.4
16	Wood, paper	9	0.1	1	0.4
17	Fuels, propellants	135	1.5	2	0.8
18	Engineering	447	5.0	28	8.9
19	Equipment, methods	500	5.6	11	3.5
20	Nuclear science	403	4.5	3	1.0
21	Physics	3365	38.0	26	8.3
22	Space technology	192	2.2	6	1.9

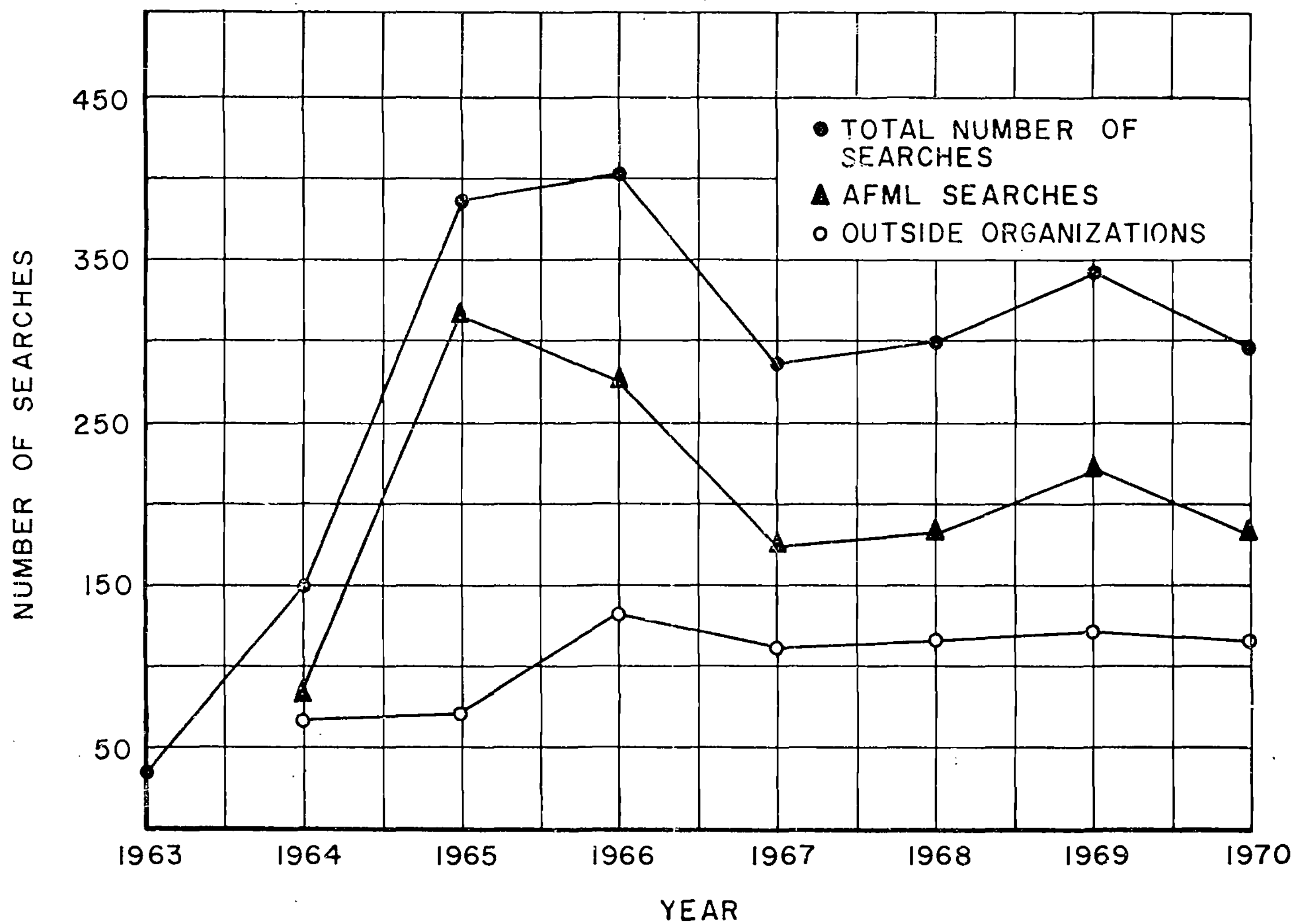

Figure 12. Search Requests Processed 963 - 1969

3. THESAURUS

A revision of the AMIC thesaurus was completed. Recently more and more search requests have been received for which information by country of origin or sponsor has been desired as a retrieval parameter in conjunction with the technical aspects of the request. In response to this need, the country of origin is now being used as an index term. AFML IN-HOUSE and AFML SPONSORED have been active terms for several years. To augment retrieval capability by organization, the sponsoring agency or military service is indexed to designate a number of U. S. Government installations. Previous document records are being updated with these data. With these terms in use, it is now possible to retrieve, as an example, all work of Russian origin on the development of high performance aircraft engines. Similarly, one can request all work on semiconductor development performed by or sponsored by the Army Electronics Command.

In the next issue of the thesaurus, the special use terms such as foreign country of origin, sponsoring agency, year of document issue, and descriptive type terms such as GLOSSARY, CBD (Commerce Business Daily), OPERATOR'S MANUAL, and HANDBOOK will be displayed as part of the introductory material instead of being scattered among the technical terms in the thesaurus as is the situation currently.

4. PARTICIPATION IN THE AFML SYMPOSIUM

The AFML-sponsored information centers were invited to present displays at the AFML Symposium in Miami Beach, Florida, 18-22 May 1970. The activities of the centers in serving the information needs of the Air Force and contractors consituted the subjects to be presented by the displays. The University designed a dynamic audio-visual display of the AMIC which presented a synopsis of both the retrospective search procedures and the SDI program.

5. PERSONNEL TIME DISTRIBUTION

Time spent by personnel on the contract is assigned to categories designated by task numbers to indicate the type of activity in which the persons are engaged. From these data a cost distribution by type of activity can be made. The task numbers are defined in Table V. The distribution by task number is shown in Table VI.

TABLE V

DEFINITION OF TASK NUMBERS

01	General	Includes:
		Supervision Meeting and trips Holidays and sick leave Writing of reports Training of students Time spent with visitors
02	Input	Includes:
		Assignment of accession numbers Document accounting records Preparation of index and abstract cards Indexing Keypunching
03	Output	Includes:
		Preparation of search strategy Search Screening of searches Search accounting records Library loan functions Keypunching
04	Updating	Includes:
		Review of vocabulary and thesaurus Changes or additions to previous records Keypunching Acquisition of missing documents

TABLE V

DEFINITION OF TASK NUMBERS

05	(UD) Research	Includes: Evaluation studies; Studies of new techniques; Investigation of new systems
05	(AFML) Library	Includes: Preparation of Materials Information Bulletin
06	Special Projects	Includes: Special work performed at the request of AFML
07	Microfilming	Includes: Time spent on the microfilming of index/abstract records
08	SDI	Includes: Preparation of SDI profiles; SDI records; Keypunching; Photocopying of abstracts; Distribution of abstracts
16	Management Information System	Includes: Coordination with AFML; Preparation of data in machine-readable form

TABLE VI

DISTRIBUTION OF PERSONNEL TIME BY TASK NUMBER

Professional and Clerical at UD

Task Number	Percent of time
01	18.2
02	43.5
03	7.2
04	3.0
05	4.6
06	16.0
07	0.1
08	5.2
16	2.2

Clerical at the AFML Library

Task Number	Percent of time
01	11.0
02	56.0
03	4.3
04	7.0
05	10.7
06	11.0

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APPENDIX I

INTRODUCTION TO THE AMIC SDI PROGRAM

1. Letter Sent to AFML Personnel
2. Explanatory Material Provided to UDRI Personnel

DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIALS LABORATORY (AFSC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

REPLY TO ATTN OF: AFML/LAM Mr. Bernados/52160/B17/Rm 225.

SUBJECT: Aerospace Materials Information Center Selective Dissemination of Information Service For the AFML Engineer and Scientist

TO: THE POTENTIAL AMIC/SDI USER

1. Please indicate, in your own words, your major technical interest in whatever form you like - e.g. narrative, several-word term descriptors, keywords, etc. Your in-put will be reviewed by University of Dayton personnel who are highly trained and skilled in the use of the AMIC Thesaurus (bible of terminology for the AMIC literature collection). They will then establish your "interest profile" based on the AMIC Thesaurus. To insure a maximum return of pertinent technical report abstracts, this procedure is a must. Profiles can be made on an individual or a group basis as is desired.

2. Profiles can and will be modified as required when:

a. the original profile is not satisfactory;

b. experience indicates a change in the profile although it is "satisfactory";

c. the person or group profile is modified by new technical interests at any time.

3. Control over the AMIC/SDI system will be exercised by LAM. Evaluation will be requested periodically on a voluntary basis using Form AFML 3a. Your cooperation is solicited. Reports will be available from the Building 17 Library as desired.

4. A five year retrospective study will be done for each profile is such is desired by the user. Since older documents are sometimes added to the AMIC collection, please also indicate for which years you would like to have your profile checked against during normal SDI system operation.

5. In writing your profile it would be helpful to know what you do not want that may be related to your profile.

John E. Bernados

JOHN E. BERNADOS
Materials Information Branch
Materials Support Division

JEB:jld

EXPLANATORY MATERIAL PROVIDED TO UDRI PERSONNEL

What is SDI?

The Selective Dissemination of Information is a means of providing relevant abstracts to a number of personnel from a source which covers the entire spectrum of materials information. Each individual receives only those abstracts from the source which are pertinent to his interest.

Why SDI?

Because of the staggering amount of technical publications being published and the rate of increase of publications, it is increasingly difficult to keep up with the information one needs. The objective of SDI is to provide timely, pertinent references to documents in a person's area of interest by applying computer techniques to make the process of being exposed to information of interest as efficient as possible. The AMIC-SDI system provides this service based on technical reports processed into the AMIC system. Government sponsored in-house materials research and contracted materials research are covered by the AMIC. Journal literature is not included.

How does SDI work?

The key to SDI is the SDI interest profile. The SDI profile is derived from a textual statement of the person's or group's interest which is converted by the information specialist to a computer-readable form. Update material for the AMIC system is compared with the SDI profiles and the access numbers corresponding to the profile are printed, abstracts are Xeroxed, and the abstracts are forwarded to the appropriate persons. Abstracts are provided with each updating, which may vary from two weeks to six weeks depending on the rate of indexing. Search profiles are usually general in nature to insure that all relevant documents are retrieved. The generality of the profile also includes the risk of retrieving nonpertinent documents as well as all pertinent documents, but if the total number of abstracts to be looked at is small, this is a manageable situation. Profiles can be modified as required to increase, decrease or change the coverage.

How does one join the SDI service?

All that is required to begin receiving SDI abstracts is to prepare a hand-written textual statement of your interest and submit it to the Information Systems Section. Blank sheets and a preaddressed envelope are provided for this purpose. In formulating the profile, attention should be given to the following items as applicable:

1) Years of coverage (e g. only reports since 1 JAN.68)
2) Materials of interest (e. g. aluminum alloys, solid propellants)
3) Properties, phenomena of interest (e. g. fatigue failure of metal composites)
4) Testing methods (e. g. nondestructive testing for structural defects)
5) Applications (e. g. plastic composites for aircraft structural members)
6) Environmental factors (e. g. high vacuum, high radiation as would be encountered in space)
7) Processing (e. g. forging, vacuum bag molding, welding)

How much does this cost?

The service will be provided at no cost to the subscriber or his contract.

How does one get the actual documents for abstracts of considerable interest?

Documents are available from the AFML library on a loan basis. Requests by access number should be made to the Information Systems Section. In most cases documents in microfiche form can be ordered free for your permanent retention.

What about retrospective searches?

Retrospective searches are searches of the entire file of documents in the AMIC system. Retrospective searches are also available to UDRI and AFML personnel on a no-cost basis. These searches are usually one-time searches on a specific topic of interest. They are initiated by the technical person by submitting a text statement of the problem to the Information Systems Section.

Background Information

The University of Dayton Research Institute Information Systems Section, under various contracts to the Air Force Materials Laboratory, has established and maintains a document retrieval system as a part of the Aerospace Materials Information Center. The AMIC is one of seven specialized information and data centers which constitute the Air Force Materials Information Centers (AFMIC). The mission of the AMIC is to acquire, index, store, and retrieve technical documents dealing with some aspect of materials or components derived from materials which are of present or potential aerospace interest. The reports are generally technical reports generated in-house or by contractors. The reports are primarily Air Force sponsored, but pertinent reports of other military services and agencies and other Government and civilian organizations such as NASA, AEC, etc., are included. Some foreign documents translated by the Foreign Technology Division (FTD) and a few journal article reprints are in the system. Bibliographies, handbooks, state-of-the-art reports, symposia, independent research and development, and Commerce Business Daily items are included in the system and are designated by special access numbers prefixed respectively by: B, H, SA, S, I, and C.

APPENDIX II

EVALUATION FORM RETURNED BY SDI PARTICIPANTS

AMIC SEARCH EVALUATION

AMIC Source Evaluation No. ____________________

Information Source ____________________

Date Sent ____________ Date Returned ____________

Number of Information Items Sent ____________________

A. EFFECTIVENESS OF SYSTEM

1. Relation of material received to question asked.

	Estimated Percent
Close Relation............	______ %
Moderate Relation..........	______ %
Remote Relation...........	______ %
No Relation	______ %

2. Material was pertinent and new to me........................ ______ %

B. EFFECT OF MATERIALS RECEIVED

1. Effect on work done.

   Changed course of work .... ☐
   Confirmed requirement for proposed work .... ☐
   Indicated some anticipated work was unnecessary.... ☐
   Only effect was time required to check material..... ☐
   Other *(please specify)* .... ☐

   ____

2. Please give estimates of the value of the information received. *(Indicate if negative.)*

   $ ____________ or ____________ Manhours.

C. GENERAL INFORMATION

1. Please identify agency that benefited from this service.

   ☐ Air Force ☐ Army ☐ Navy ☐ ARPA
   ☐ AEC ☐ NASA ☐ FAA
   ☐ Others *(Specify)* ____________________

2. Response time. ☐ O.K. ☐ Slow ☐ Very slow

PLEASE FOLD, STAPLE, AND RETURN *(See other side)*

APPENDIX III

QUESTION SHEET GUIDE FOR SDI EVALUATION INTERVIEWS

SDI interviews at UDRI asked the following questions, informally:

1. Did the information supplied have

   Close relevance?
   Some interest?
   Irrelevant?

2. Was the % relevance satisfactory?

3. How was the quality of the reproduction?

4. Do you have any other sources of current awareness? Any other SDI Program? Which provide the more relevant response?

5. Are you receiving too many abstracts?

6. Can you suggest any terms which are causing you to receive documents not of interest to you? They can be entered in the profile as not or negative factors and you won't be bothered with them. This would reduce the number of abstracts you have to look through and make them more selective.

7. Do you want your profile modified?

Would you care to comment on how this service has been helpful to you?

8. Did it save time in literature searching?

9. Was it primarily for reference material?

10. Has it affected technical decisions in the work area?

11. Do your profiles serve a group? Do you further distribute the results, being the central recipient of the material?

12. Do you receive the Materials Information Bulletin? How would you compare its services and usefulness to our SDI service?

APPENDIX IV

RESULTS OF THE SDI EXPERIMENT BY INDIVIDUAL PROFILES

ORIGINAL PROFILES			REVISED PROFILES					
Profile Number	Total Retrievals	Relevant Retrievals	New Profile Number	Total Retrievals	New Retrievals	New Relevant Retrievals	Overall Relevant Retrievals	Original Relevant Retrievals Missed
1*	11	3(27.3%)	1 R	7	3	3(100.0%)	6(85.7%)	0(0.0%)
2	44	8(18.2%)	2 R	11	0	0	6(54.5%)	2(25.0%)
3*	140	22(15.7%)	3 R	39	16	6(37.5%)	11(28.2%)	17(77.3%)
4*	202	21(20.4%)	4 R	55	17	5(29.4%)	24(43.7%)	4(19.0%)
5	28	12(42.8%)	5 R	16	1	0(0.0%)	10(62.5%)	2(16.7%)
6	9	26(66.6%)	6 R	9	0	0(0.0%)	8(88.9%)	18(69.3%)
7 a								
7 b *	48	19(39.6%)	7 R	36	0	0(0.0%)	14(38.9%)	5(26.3%)
7 c								
8 a								
8 b								
8 c								
8 d								
8 e								
8 f *	83	37(44.6%)	8 R	15	5	2(40.0%)	8(53.3%)	31(83.8%)
8 g								
8 h								
8 i								
8 j								
9*	11	8(72.7%)	9 R	13	7	0(0.0%)	5(38.4%)	3(37.5%)
10	140	26(18.5%)	10 R	111	76	24(31.6%)	38(34.2%)	12(46.2%)
11*	47	7(14.9%)	11 R	27	7	4(57.2%)	6(22.2%)	5(71.5%)
12*	15	3(20.0%)	12 R	17	3	1(33.3%)	4(23.5%)	0(0.0%)
13*	328	69(21.0%)	13 R	51	7	3(42.8%)	20(39.2%)	52(75.4%)
14	19	2(10.5%)	14 R	84	69	17(24.7%)	19(22.6%)	0(0.0%)
15	1	0(0.0%)	15 R	0	0	0(0.0%)	0(0.0%)	0(0.0%)
16	91	45(49.5%)	16 R	28	1	1(100.0%)	19(67.9%)	27(60.0%)
17	473	407(86.1%)	17 R	291	39	21(53.4%)	275(94.5%)	153(37.0%)

APPENDIX IV

RESULTS OF THE SDI EXPERIMENT BY INDIVIDUAL PROFILES

ORIGINAL PROFILES			REVISED PROFILES					
Profile Number	Total Retrievals	Relevant Retrievals	New Profile Number	Total Retrievals	New Retrievals	New Relevant Retrievals	Overall Relevant Retrievals	Original Relevant Retrievals Missed
18	253	179(70.8%)	18 R	147	1	0(0.0%)	135(91.8%)	44(24.5%)
19*	407	65(15.9%)	19 R	175	27	16(59.3%)	66(37.7%)	15(23.1%)
20 a, 20 b, 20 c, 20 d *	419	164(39.1%)	20 R	226	7	3(42.8%)	119(52.7%)	48(29.2%)
21 *	41	13(31.7%)	21 R	19	0	0(0.0%)	10(52.7%)	3(23.1%)
22 a, 22 b *	71	33(46.5%)	22 R	51	3	2(66.7%)	29(56.9%)	6(17.8%)
23	96	64(66.7%)	23 R	17	3	0(0.0%)	13(76.5%)	51(79.6%)
24	50	29(58.0%)	24 R	9	0	0(0.0%)	7(77.8%)	22(75.8%)
25	14	4(28.6%)	25 R	7	0	0(0.0%)	2(28.6%)	2(50.0%)
26*	8	7(87.5%)	26 R	18	12	4(33.3%)	9(50.0%)	2(28.6%)
27*	53	21(39.6%)	27 R	59	6	3(50.0%)	24(40.7%)	0(0.0%)
28*	5	4(80.0%)	28 R	5	3	2(66.7%)	4(80.0%)	2(50.0%)
29*	51	21(41.2%)	29 R	65	14	8(57.1%)	29(44.6%)	0(0.0%)
30*	197	61(30.9%)	30 R	99	32	17(53.1%)	29(29.3%)	49(80.4%)
31*	61	17(27.9%)	31 R	3	0	0(0.0%)	3(100.0%)	14(82.4%)
32*	252	35(13.9%)	32 R	43	3	3(100.0%)	12(27.9%)	26(74.3%)
33*	36	11(30.6%)	33 R	20	3	2(66.7%)	7(55.0%)	6(54.5%)
34	11	1(9.1%)	34 R	17	8	2(25.0%)	3(17.6%)	0(0.0%)
35 a, 35 b	68	3(4.4%)	35 R	29	6	2(33.3%)	5(17.2%)	0(0.0%)
36 a, 36 b, 36 c, 36 d	33	18(54.6%)	36 R	26	11	5(45.5%)	16(61.5%)	7(38.9%)

APPENDIX IV

RESULTS OF THE SDI EXPERIMENT BY INDIVIDUAL PROFILES

ORIGINAL PROFILES			REVISED PROFILES					
Profile Number	Total Retrievals	Relevant Retrievals	New Profile Number	Total Retrievals	New Retrievals	New Relevant Retrievals	Overall Relevant Retrievals	Original Relevant Retrievals Missed
37 a, 37 b, 37 c, 37 d, 37 e *	94	29(30.9%)	37 R	68	0	0(0.0%)	24 35.3%)	5(17.2%)
38	78	14(18.0%)	38 R	65	17	0(0.0%)	12(18.5%)	2(14.3%)
39	69	25(36.3%)	39 R	42	25	8(32.0%)	15(35.7%)	18(72.0%)

*Evaluated by independent information analyst

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APPENDIX V

DEFINITION OF SUBJECT CATEGORIES

AMIC	COSATI	CATEGORY
01	01	Aeronautics
		Aerodynamics
		Aeronautics
		Aircraft
		Aircraft flight control and instrumentation
		Jet engines
02	03+04	Astronomy, Astrophysics, Atmospheric Sciences
		Astronomy
		Astrophysics
		Atmospheric physics
		Meteorology
03	06+07	Chemistry, Biology, Medical Sciences
		Biochemistry
		Bioengineering
		Biology
		Chemical analysis
		Chemical engineering
		Inorganic chemistry
		Life support systems
		Organic chemistry
		Physical chemistry
		Radiochemistry
		Toxicology

AMIC	COSATI	CATEGORY
04	09	Electronics and Electrical Engineering
		Components
		Electronic and electrical engineering
		Telemetry
05	11A	Adhesives
		Ceramic cements
		Organic resin adhesives
		Potting compounds
06	11A	Seals, Sealants
		Ceramic-metal bonds
		Mechanical seals
		O-rings
07	11B	Ceramics, Refractories, Glasses, Minerals
		Borides
		Carbides
		Carbon, graphites
		Mixed oxides
		Nitrides
		Single oxides
08	11C	Coating, Paints, Oxide Films
09	11D	Composites Materials, Laminates, Sandwich Structures, Honeycomb
10	11E	Fibers, Textiles, Cloth
11	11F	Metallurgy, Metallography
		Alloys
		Metals
12	11H	Oils, Lubricants, Heat Transfer Fluids, Greases, Hydraulic Fluids
13	11I	Polymers, Plastics
14	11J	Elastomers
15	11K	Cleaning Compounds, Surface Active Agents

AMIC	COSATI	CATEGORY
16	11L	Wood and Paper Products
17	21	Fuels, Propellants, Propulsion Systems, Explosives
18	13	Mechanical, Industrial, Civil and Marine Engineering
		Civil engineering
		Construction equipment, materials, supplies
		Containers and packaging
		Couplings, fittings, fasteners, joints
		Industrial processes
		Machining, tools, machine elements such as bearings, gas lubrication systems
		Marine engineering
		Pumps, filters, pipes, fittings, tubing, and valves
		Safety engineering
		Structural engineering
19	14	Methods and Equipment
		Apparatus
		Detectors
		Laboratories, test facilities, and test equipment
		Recording devices
20	18	Nuclear Science and Technology
		Fuel elements; fuel, nuclear
		Nuclear explosions
		Nuclear power plants
		Nuclear reactors
		Radiation shielding
		Radioactive wastes

AMIC	COSATI	CATEGORY
21	20	Physics
		Acoustics
		Crystallography
		Electricity and magnetism
		Fluid mechanics
		Masers and lasers
		Optics
		Particle accelerators
		Particle physics
		Plasma physics
		Quantum theory
		Solid mechanics
		Solid-state physics
		Spectrometry, spectroscopy
		Thermodynamics
		Wave propagation
22	10, 16, 22	Space Technology and missiles
		Astronautics
		Energy conversion, solar cells
		Launch vehicles
		Missile technology
		Re-entry vehicles
		Rockets
		Satellites, artificial
		Spacecraft
		Trajectories and re-entry

APPENDIX VI

SEARCH REQUESTS PROCESSED
1 DECEMBER 1969 - 30 NOVEMBER 1970

SEARCH NO.	SEARCH TITLE
1919	Jet Aircraft Fuel Filters
1920	Filiform Corrosion
1921	Structural Composites - Boron, Carbon Reinforced
1922	Fatigue of Steels - Size Effect
1923	High Speed Bearings
1924	Servo Drives
1925	Stainless Steel Information
1926	Automatic Control Machine Tools
1927	Automated Vehicles
1928	Fire Resistant Coatings for Magnesium
1929	Hugoniot Pressure of Aluminum 5456
1930	Ablative Heat Shield Thermooptical Properties
1931	Rain Erosion of Nylon
1932	Structural Adhesives
1933	Buna N and Hydrin Elastomers
1934	Thermal Properties of Nylon to Zero Degrees Kelvin
1935	Temperature Effect on Non-Destructive Testing
1936	Heat Transfer in Composites
1937	Effect of Temperature on Aircraft Tires
1938	Decompositions of Polymers
1939	AFML Contractor Reports on Composite Materials
1940	Shaft Seals for Auto Air Conditioners
1941	Purification of Sea Water
1942	Cryogenic Temperature Effect On Acceleration Materials

SEARCH NO.	SEARCH TITLE
1943	Cracking in Plastic Composites
1944	Phenothiazine Compounds as Antioxidants
1945	Fatigue Properties in Maraging Steels
1946	Stainless Steels - 300 Series
1947	Stainless Steels - 310 Series
1948	Stainless Steel 321
1949	Stainless Steels 347, 348
1950	Stainless Steel 77-5
1951	Stainless Steel 19-9 DL & DY
1952	Stainless Steel 201
1953	Particle Reflection Polarized Light
1954	Tantalum Carbide
1955	Pyrotechnics
1956	Epoxy Polymer Encapsulation
1957	Steels for Cutting Tools
1958	Crashworthy Landing Gear for Helicopters
1959	Thermal Insulation of FiberGlas
1960	Oxygen Heat Transfer Coefficient
1961	Thermal Properties of Cryogenic Frost
1962	Tungsten-CU; Specific Heat and Thermal Conductivity
1963	Carbon Fiber Unidirectionally Reinforced Polymer Composites
1964	Carbon Fibers - Processing and Fabrication
1965	Heat Transfer of Vacuum Insulated Pipes
1966	Properties of Intermetallic Compounds
1967	Safety Headgear for Aircraft Occupants
1968	Nondestructive Testing Polymer Composites
1969	Torsional Fatigue Strength - 52100 Steel

SEARCH NO.	SEARCH TITLE
1970	Production of Dinol
1971	Oxidation Behavior of Metals
1972	Infrared Spectra, Spectrometry
1973	Molecular Structure, Crystal Structure, Vibrations
1974	Instrumentation for Infrared Spectra
1975	Ceramics for Aircraft Brakes
1976	Sparking of Aircraft Metals
1977	Electrical Conductivity of DDT Spary
1978	Potting Compounds for F-4 Aircraft
1979	Bend Radii of Phosphor Bronze
1980	Infrared Spectra of Asbestos Composites
1981	Plasma Spraying of Electrical Coatings of Plastics
1982	Adhesives, Coefficient of Thermal Expansion
1983	Adhesive Bonding of Metals
1984	Low Temperature Phenomena of Metals
1985	Thermal Conductivity of Powder Metals
1986	Ceramic Composites for Armor
1987	Transpiration Cooling
1988	Metal - Polymer Adhesive Bonds
1989	Nickel Alloy Properties
1990	Properties of Glass Reinforced Polyimide Thermoset Compounds
1991	Chlorothene Cleaning of Metals
1992	Fire Proofing Paper, Textiles
1993	Antenna Window Composites
1994	Material Response to Nuclear Radiation
1995	Boron Nitride Fibers and Cloth
1996	Boron Nitride Composites

SEARCH NO.	SEARCH TITLE
1997	Fluorinated Polymers
1998	Ball Bearings
1999	Seleniumand Tellurium in Alloys
2000	Light Triggered By Laser
2001	Laser Spectra In Solutions
2002	Converters For Liquid Oxygen To Gas Conversion
2003	Shot for Peening
2004	Shot Peen Forming of Titanium
2005	Bending Titanium
2006	Infared Suppression by Transpiration Cooling
2007	Explosive Forming of End Closures
2008	Manufacturing Filament Wound Composites
2009	Schottky Junctions
2010	Manufacturing Foam Composite Radomes
2011	Laser Modulation
2012	Electrooptical Sensors
2013	Radiation Protection of Integrated Circuits
2014	Magnetic Film Storage Arrays
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13. ABSTRACT The Aerospace Materials Information Center (AMIC) SDI program was evaluated by an interview technique. The SDI data base consists of the periodic document index records input to the AMIC system. The users served by the SDI program are 63 engineers, scientiest and technical administrators at the AFML and 16 scientific and technical personnel at the University of Dayton. The scope of interest encompasses all materials of current or potential use in aerospace systems and includes theoretical studies, manufacturing processes, and in-service performance and failure analysis. An informal interview technique elicited responses regarding the user assessment of the program and indicated problem areas in the SDI returns received by the users. Most respondents indicated that too many abstracts were being received and relevance was too low. However, the SDI profiles were originally constructed so as not to exclude relevant materials. Refinement of the profiles were anticipated from the inception of the program. Based on more precise statements obtained in the interviews and on rejected abstracts, profile modifications were effected. An SDI experiment to test the effect of profile modifications on relevance indicated that overall relevance was increased from 37.6% to 51.8%. The primary factor in the improvement was the judicious but copious use of NOT terms to eliminate unwanted abstracts while retrieving desired abstracts. Results showed the validity of the NOT strategy and indicated the effectiveness of direct contact between the information specialist and the SDI user.

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14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Aerospace Materials Information Center						
Selective Dissemination of Information						
SDI						
Current Awareness						
Profiles						
Search Strategy						
Boolean logic						
Information Retrieval						
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Information services						
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