U.S. ARMY SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM, FY 1966-1972

Dale L Vincent

Office of the Chief of Research and Development
Washington, D.C.

December 1966

U. S. ARMY
Scientific & Technical Information Program

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U.S. Army Research Office
Office, Chief of Research and Development
Washington, D.C. 20310

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Information Division

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This report updates the Department of the Army Scientific and Technical Information Program Report approved 8 February 1963.

Utilizing the attached DA Form 1598, submit comments or suggestions concerning this Program to:

The Chief of Research and Development
ATTN: CRDSTI
Hqs, Department of the Army
Washington, D.C. 20310

THE U. S. ARMY SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM

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I. INTRODUCTION

To be of optimum value, any information system or program must be responsive to the needs of Army scientific, technical and management personnel and support the accomplishment of the Army mission. From this premise stems the basic objective of the U.S. Army Scientific and Technical Information Program, viz., to improve the cost effectiveness of transfer of scientific and technical information from source to user in support of scientific, technical, and related activities.

The On-Site Survey of Scientific and Technical Information Functions and Activities revealed that current annual costs for transferring scientific and technical information from source to user throughout the Army is approximately fifty-five million dollars. These expenditures relate to the operation of 180 technical organizations at 50 world-wide locations, which perform 60 types of data handling functions involving 540 substantial holdings of technical data (figure 1). For example, the Survey revealed that an estimated $15,600,000 per year is spent by the Army for handling chemical information and data services in support of RDT&E in the above areas. In addition, the portion of the salaries of scientists and engineers for time spent in personal search of chemical literature and other currently available chemical information media, as extracted from preliminary reports on the Chemical Information and Data Systems survey conducted in May-November 1964, amounts to approximately $7,000,000 per year. This results in a total Army expenditure of approximately $22,600,000 for chemical information services. This same kind of analysis can be made for any other discipline, field, or subfield.

By way of contrast to this total expenditure, the amount being spent by the Army Scientific and Technical Information Program to develop improved techniques in information handling is approximately 2 million dollars or 4% of the total cost of scientific and technical data handling (figure 2).

The direct benefits to the Army that will be obtained from improvements in data handling provided by information systems research and development conducted within the Army Scientific and Technical Information Program are the following:

Reduction of information search time
Reduction of the information search area
Improvement of reliability of information
Improvement of efficiency of collection, storage, retrieval and dissemination of information
Reduction of language difficulties impeding information transfer

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Reduction of excessive or deficient responses to information queries
Delivery of information in proper form
Improvement of relevancy of information
Improvement of communication of information

The indirect benefits are the following:

Shortening of RDT&E time cycle
Elimination of undesirable duplications of RDT&E effort
Reduction of false starts in RDT&E programs
Reduction of RDT&E costs
Improvement of RDT&E technical management
Improved information support to logistics and other programs

The S&TI Program contains six projects structured to perform the following:

(1) Develop and apply new concepts in information management.

(2) Upgrade existing and planned technical information facilities such as technical libraries.

(3) Conduct RDT&E in information systems that support specific scientific disciplines or mission oriented R&D projects.

Certain of the S&TI projects emphasize one or another of these three approaches. This requires that there be a high degree of coordination among the projects.

II. PURPOSE

The purpose of the Army Program is to insure continuous and effective exchange of scientific and technical information. In so doing it is the Program's additional purpose to preclude unnecessary expenditure of resources, reduce lead time, and make more effective use of known technology. It will provide guidance and direction for control and improvement of the acquisition, evaluation, storage, retrieval and dissemination of scientific and technical information.

III. SCOPE

This Program covers all scientific and technical information and data activities of the Army exclusive of technical logistics data and is applicable to all Army elements, their contractors, subcontractors and grantees.

IV. OBJECTIVES

The objectives of the Program are to:

1. Develop policy and guidance based on a current inventory of scientific and technical information functions and activities.

2. Provide programming, budgeting, funding, accounting, reporting, and support functions for information activities.

3. Develop concepts for scientific and technical information requirements, conduct research, development, test and evaluation of these requirements, and initiate programs for proper acquisition, evaluation, storage, retrieval, and dissemination of that information deemed necessary.

4. Utilize modern techniques as justified by effectiveness for handling scientific and technical information.

5. Secure economies by eliminating unnecessary duplication of work in RDT&E and related areas, and by providing timely, relevant and comprehensive scientific and technical information.

6. Provide a direct channel for exchange of scientific and technical information.

V. GUIDELINES

The Army Scientific and Technical Information Program shall conform to the following general guidelines:

1. Scientific and technical information services and activities, system design, file building, and technical systems experimentation will be directed toward support of Army in-house work, with specific emphasis on priority Army projects.

2. Maximum use will be made of existing technical information facilities and resources.

3. New requirements for technical information and data systems will be examined relative to general and specific Army requirements.

4. The experimental network of the Information and Data Exchange Experimental Activities project will be used to conduct pilot tests and demonstrations in support of projects in the Scientific and Technical Information Program. In addition, pilot tests and demonstrations will be conducted supporting other projects independent of IDEEA.

VI. PROGRAM BASES

The Army Scientific and Technical Information Program was started by an April 1962 action of the Chief of Research and Development, which established the Army Ad Hoc Group on Scientific and Technical Information.

Twenty-three problem areas were identified, defined, and categorized into eight sub-groups.

1. Identification of information resources
2. Vocabulary, indexing and dissemination
3. Bibliographies and literature search
4. Management requirements for scientific information
5. Information flow
6. Information generation
7. Conferences, meetings and symposia
8. Training

The report of the Ad Hoc Group contained 23 staff studies, which resulted in 105 recommendations, and was used as the basis for the preparation of the Five-Year Army Scientific and Technical Information Program. The original program was staffed, approved by the Army, and forwarded by the Secretary of the Army to the Deputy Secretary of Defense in January 1963. The Army Program was approved by Memorandum of the Office of the Secretary of Defense on 8 February 1963, as the Army portion of the Defense Program. Meanwhile, the Defense Scientific and Technical Information Program was launched by a memorandum of 3 October 1962 from the Deputy Secretary of Defense, followed by DoD Directive 5100.36 dated December 31, 1962, and DoD Instruction 5129.43 dated January 22, 1963.

The basic general regulation for the Army Scientific and Technical Information Program is Army Regulation 70-45 dated 18 August 1965. Specific aspects of the Program are covered by the following AR's:

1. 70-9 dated 24 May 1966, Research and Technology Resume' Work Unit Level.

2. 70-11 dated 8 October 1965, Defense Documentation Center for Scientific and Technical Information.

3. 70-14 dated 13 February 1963, Payments of Costs of Reprints of Articles in Professional Journals.

4. 70-21 dated 21 February 1966, Certification for Access to Scientific and Technical Information.

5. 70-22 dated 14 January 1965, Centers for Analysis of Scientific and Technical Information.

6. 70-31 dated 9 September 1966, Standards for Technical Reporting.

DoD Directives and Instructions covering the DoD Program are:

1. DoD Directive 5100.36 dated December 31, 1962, Department of Defense Technical Information.

2. DoD Instruction 3200.8 dated March 7, 1966, Standards for Documentation of Technical Reports under the DoD Scientific and Technical Information Program.

3. DoD Instruction 5100.38 dated March 19, 1963, Defense Documentation Center for Scientific and Technical Information (DDC).

4. DoD Instruction 5100.45 dated July 28, 1964, Centers for Analysis of Scientific and Technical Information.

VII. CONCEPT

Two basic requirements must be met before scientists, engineers, or managers attack a new problem. They must first examine related work that is completed, in progress, or planned, and secondly must identify the workers in their area of interest. Once work is underway the requirement shifts to facts or data necessary to support the work. It is the concept of this Program that an appropriately structured scientific and technical information system must fulfill these requirements and then provide the means for final recording and dissemination of results.

The classical approach to past information retrieval has been that of document retrieval. But deficiencies have been found to exist here, because once the document is retrieved, additional time is required to extract and evaluate the data. To overcome this deficiency, it is necessary to develop data or fact retrieval systems, that capture the essential elements of information directly from the work and make it immediately available. However, this in no way invalidates the need for maintaining and improving documentation systems that are responsive to mission needs. The Army S&TI program is structured to take both types of systems into account.

One primary approach to the concept focuses attention on the scientific and technical disciplines, or mission-related fields. Subdivision is made for example in terms of chemistry, physics, engineering, environmental sciences, and life sciences, or in missiles and communications. The Chemical Information and Data System (CIDS) and the Engineering Data and Information System (EDIS) are examples of projects oriented in this way.

This is supplemented by a second approach which insures that all languages, forms, formats, information items and information media are effectively structured and managed. For example, all technical reports,

data files, libraries, information centers and technical meetings, conferences and symposia must be coordinated. The Army Technical Library Improvement Studies (ATLIS) and Technical Conferences, Meetings and Symposia are two projects which are devised for this purpose.

The third approach is directly related to the two preceding ones. It involves an examination of the form of the data holdings, their location and degree of quantitative and qualitative development. The objective of such an analysis is to insure that all operations on technical data be performed effectively at minimal cost. The Technical Information Functions and Activities Project is designed to provide this information.

For a complete analysis, all three approaches must be considered because one cannot be taken without involving the other two. The loose collection of interrelated parts can then be organized into an integrated technical information system. Figure 3 illustrates the interrelationship of this three-dimensional approach and Figure 4 shows its application to the Scientific and Technical Information Program. For example, the following statement might typify intermediate objectives in terms of the (1) operations or procedures, (2) scientific discipline or mission orientation, and (3) forms, format, language or information representation, as shown in Figure 3.

> "Retrieve (operation) engineering (discipline) drawings (form with parameters a, b, c ... n."

A more complex statement might be:

"Find (operation) the chemical (discipline) structures (form) which are analogs of C_4N - C_5N - C_6 system, either as such or as derivatives and which specifically are pyrrologuinolines."

Within the scientific and technical information concept a request for technical information at an Army installation would be processed via a technical information network (e.g., IDEEA) and the contents of discipline oriented files (e.g., CIDS) would be queried by using specific languages (e.g., standardized codes, media, and format). This is illustrated in Figure 5. The point of query would be the local Army Technical Information Center or its counterpart. Thus, by structuring a network of technical information activities, any Army technical information center (though autonomous in support of the mission of its parent organization) would be augmented because it could draw upon others for support.

VIII. CURRENT PROJECTS

The RDT&E efforts of the Army Scientific and Technical Information Program have been divided into several projects. These are designed to investigate and select methods of improving current data handling

operations. Use is being made of new approaches and advanced techniques in handling scientific and technical data and information. These new approaches include the provision of an experimental network in which research can be conducted on the processing and dissemination of live scientific data. The exploratory and experimental data projects are: 1) the Technical Information Functions and Activities Project, which includes the Technical Effort Locator/Technical Interest Profile System (TEL/TIPS), and the Scientific and Technical Information Data System; 2) the Engineering Data and Information System (EDIS); 3) the Chemical Information and Data System (CIDS); 4) the Army Technical Library Improvement Studies (ATLIS); and 5) the Information and Data Exchange Experimental Activities (IDEEA). A concise description of each project follows:

1. Technical Information Functions and Activities Project.

The Technical Information Functions and Activities Project (TIFA) is in the exploratory development phase. It includes a number of tasks for establishing technical information and data banks and retrieval systems for the management of the Army Scientific and Technical Information Program and for providing supporting data for RDT&E programs. These tasks cover the following areas:

a. The Scientific and Technical Information Data Bank will provide the Army with information on personnel, facilities and funding related to the conduct of scientific and technical information activities. It serves as the basis for staff supervision and program management for the on-going scientific and technical information activities of the Army. In addition, the data bank serves as the source of input to Section V of the Annual Report of Federal Funds for Science (an annual report prepared by the National Science Foundation in conjunction with the Bureau of the Budget), and special reports, e.g., those required by the Committee on Scientific Information of the Federal Council for Science and Technology, Executive Office of the President, and the Director of Defense Research and Engineering.

b. The Technical Effort Locator and Technical Interest Profile System provides data on the scientific and technical needs and interests of the technical personnel of the Army along with data covering their education, experience and assignments. The data is used in conjunction with the Scientific and Technical Information Data Bank to provide information on scientific and technical manpower distribution, and is needed to provide information service support. It augments the DCSPER personnel manpower resources data bank. In addition, at the local level, it serves as the basis for the "Patron File" of the Army Technical Libraries and it is one of the main devices that can be used for the effective dissemination of scientific and technical information.

c. The Research and Technology Resume (DD Form 1498) is a reporting system for technical and management data down to the work unit level for technical and scientific work being conducted within the research and exploratory development categories in the Army. The system was established in response to an OSD requirement and is operated and maintained under the authority of AR 70-9.

d. Technical Information Analysis Centers have been established or continued as required for specific subject disciplines of particular interest to the Army. This task area is concerned with the evaluation and analysis of scientific and technical information in the scientific discipline and technical mission areas. In addition to preparing such products as special studies and state-of-the-art summaries, the centers are capable of responding to queries concerning specific information. This task area is concerned with the identification or establishment, as well as the functional aspects of these centers. The Army has been assigned responsibility for five DoD Technical Information Centers. Assignees for the centers per letter, TAG, AGAM-P (M) (31 Aug 64). CRD/P Subject: Five Year Plan for Centers of Analysis of Scientific and Technical Information (RCS DD-DR&E(AR)624) are as follows:

ASSIGNEE	NAME OF CENTER	LOCATION OF CENTER
The Chief of Research and Development	Counterinsurgency Information Analysis Center	American University Center for Research & Social Systems 5010 Wisconsin Ave., N.W. Washington, D.C.
The Surgeon General	Military Entomology Information Service	Walter Reed Army Medical Center Forest Glen Section Washington, D.C.
Commanding General US Army Material Cmd.	Human Engineering Information & Analysis Center	Tufts University Dolles House Medford, Mass.
	Nondestructive Testing Information Service	Watertown Arsenal Watertown, Mass.
	Plastics Technical Evaluation Center	Picatinny Arsenal Dover, New Jersey

e. Training and Career Management.

The rapid growth of information handling activities has exceeded the availability of personnel properly trained in both the subject matter of the scientific and technical fields and the theory

and techniques of information science. In order to provide support to the training and career management program of DCSPER, particularly for personnel required for Army programs, the Training and Career Management Task has as its objective the investigation of the current status of training of the various types of specialists needed and the identification and establishment of guidelines for job catagorization, incentives, recognition, prestige, managerial responsibilities and performance standards. In addition, the task area will investigate the requirements for user education and training in order that more effective use can be made of existing support activities.

f. Miscellaneous Activities.

An index of Army research and development key words and phrases from DD Form 1498's is being developed. An edited version of this index now exists, but further word associations to establish improved hierarchical relationships are necessary. The effort is being coordinated with the Committee on Scientific and Technical Information (COSATI) Subject Category List and the DDC Thesaurus of Technical Descriptors. Data items from selected data elements will be retrievable in all areas of on-going Army R&D work.

An effort is underway to relate and integrate the DD 1498 system with the Document Control (DD 1473) system, the Scientific and Technical Information Data Bank and TEL/TIPS. Effort also is devoted to the preparation of technical information for the conduct of Army sponsored symposia and conferences.

2. Engineering Data and Information System.

The Engineering Data and Information System (EDIS) is an exploratory development project leading to the design of an engineering information system that will improve the flow of engineering information to and from scientists and engineers engaged in Army RDT&E activities. Specific purposes of the project are to:

a. Reduce RDT&E lead time and eliminate unnecessary duplication.

b. Support the engineering information needs of engineers, scientists and managers. These goals would be met by a coordinated network of decentralized engineering information activities. The development of the project plan has resulted in the establishment of four task areas to:

(1) Determine the data to be handled, on the basis of need and availability.

(2) Develop programs and procedures to be adopted.

(3) Design the system.

(4) Develop appropriate training materials.

These tasks are all within Phase I of the EDIS project, and are to result in the design of the system. If the design is approved for adoption, it will be followed by an implementation phase of the project. It should be emphasized that all engineering data and information requirements throughout the Army will be considered in the ultimate EDIS design. The primary concern in the design of EDIS is to insure that engineering data available both within and outside the Army be made rapidly available to Army scientists, engineers, technicians, and managers in the required quantity, place, and form.

3. Chemical Information and Data System.

The Chemical Information and Data System (CIDS) is an exploratory development project established for the following three primary purposes:

a. To determine the feasibility of handling chemical and related information by automated techniques.

b. To evaluate resource requirements and procedures for the establishment of an operational system.

c. To determine the specific Army needs and the basis for projection of an operational system.

The CIDS project is to be pursued as a user-oriented cooperative system of specialized chemical information and data sources. The system will be linked by communications designed to provide maximum exchange of information from data resources. It will include a common pool of digitally-stored chemical structures and formulas organized for efficient retrieval and comparison. Accompanying each common entry is a concise description that can be rapidly transmitted to the user. In addition to this central file, there will be files of associated records that can be obtained from other technical information centers.

Initially, CIDS will be used to support work related to the life science and physical science areas. Work under the project is directed generally toward investigation of the systems design of modern data handling techniques for the effective acquisition, handling, retrieval and exchange of chemical information in support of the Army's RDT&E mission. This will be followed by necessary pilot tests to illustrate the systems application in selected operational areas. An intensive effort will be included on a system in support of on-going scientific and technical "bench level" efforts of the Army RDT&E program.

4. Army Technical Library Improvement Studies.

The Army Technical Library Improvement Studies (ATLIS) is an exploratory development project which has as its objective the improvement of service from technical libraries. There are four principal areas of effort.

a. Management & Technical Direction

b. Library Operations

c. Library Services

d. Advanced Technology

The first of these will include an analysis of library organization and procedures, and of the resource requirements to provide the necessary information. Under the category of Library Operations, feasibility studies are being made in the conduct of central cataloging operations and in initial distribution procedures. It is within this area that studies are being made for the automation of library operations. The training requirements which exist in the Library Services area apply to both scientific and technical personnel who are library users and to the technical librarians and information specialists who staff and operate the library. Training needs in both these areas will be investigated. In the Advanced Technology area, research is being conducted on procedures for operation of internal selective dissemination of information systems. Present methods for acquiring, formatting, and processing abstracts of technical reports are being reviewed.

5. Symposia and Conferences.

This project provides the means for bringing together and coordinating various activities in the scientific and technical disciplines. It is concerned specifically with the Army Science Conference held biannually at West Point, New York, the Junior Science and Humanities Symposia and with the support of symposia in general. The Army Science Conference provides an opportunity to scientists of the Department of the Army to present papers before their colleagues in the Department of Defense, other Governmental agencies and key scientists or managers from industry. The Junior Science and Humanities Symposia promote study of the sciences and mathematics at high school level to encourage promising young people to follow a career in science. Regional symposia are held throughout the country at universities and/or military installations, in conjunction with industry, for high school students and their teachers. These symposia culminate in an annual National Symposium for selected winners.

The Support of Symposia task area provides support for scientific and technical symposia, which are determined to be of benefit to the Army, and are promoted by professional groups, scientific societies or educational institutions. Sponsorship or cosponsorship of symposia by the Army is carefully considered to insure that tangible benefits will accrue.

6. Information and Data Exchange Experimental Activities.

The Information and Data Exchange Experimental Activities (IDEEA) is an exploratory development project established to provide an environment for conducting test experiments in the transmission, exchange, and dissemination of technical data. A series of studies will be made concerning advanced concepts, techniques and facilities for handling technical data of the type developed in the Chemical and Engineering Data and Information Systems.

Specific effort will be directed toward:

a. Development of advanced techniques for data acquisition, data management, and storage and retrieval techniques.

b. Solving interdisciplinary linguistic problems in query-type data systems.

c. Solving problems created by differing notations, codes, ciphers, and storage modes and media.

d. Solving problems related to operating and maintaining a scientific information network.

When sufficient data have been generated from these experiments, additional studies will be made in the analysis of the resulting statistical data. Descriptions of systems characteristics that would meet operating requirements and an overall system design will be prepared.

IX. INTERRELATIONSHIP OF THE PROJECTS OF THE S&TI PROGRAM

The primary purpose of the entire Scientific and Technical Information Program is to improve the cost-effectiveness of transfer of technical information from sources to users. Each project within the program is designed to either improve current ways and means of technical data interchange or to devise new and improved systems and procedures to provide the basis for better control and management. Because each project attacks a different part of the overall problem of improving technical data interchange, the projects must be carefully coordinated. (See Figures 3 and 4).

Dividing the problem of improving data interchange by technical subjects or disciplines has led to the establishment of a set of discipline-oriented efforts, such as CIDS, EDIS, and the Technical Information Analysis Center System (TIAC's). By encompassing the entire spectrum of technical subjects, coverage is extended to all forms of data as well as to all methods of data handling.

A second way of arriving at more effective data interchange is to examine, analyze, and improve all operations being performed, such as indexing, cataloging, storing, translating, and abstracting, regardless of the disciplines and form of the data. The ATLIS and IDEEA are examples of projects oriented toward improvement of the ways and means of processing or operating on data.

A third way of improving data interchange is by examination of problems related to the data forms, data carriers, or data media, i.e., the technical reports, engineering drawings, microfilms, magnetic tapes, optical readers, combinational logic circuitry, and those yet to be developed. Each project considers problems of data format, media, or carrier as exemplified by a chemical symbol generator or chemical typewriter in CIDS or by microfilm chips, video tapes, or microfiche in EDIS or ATLIS.

This three-way attack on information systems provides complete coverage, by giving consideration to all aspects of the problem. However, great care and coordination of work units is required. Each step forward affects all projects regardless of the type of problem approach. For example, a new microimage process might have an effect on the storage and retrieval of engineering data. Thus, the data form, the data process, and the data discipline are involved, and the projects have become mutually interdependent.

Another example of the mutual interdependence of the projects can easily be seen in the relationships between the TIFA, the DD Form 1498 Research and Technology Resume Reporting System, and the DD Form 1473 reports. They describe the RDT&E work-in-progress, the results of RDT&E, the scientific and technical information exchange functions and activities in support of the work, and the information needs of the technical personnel doing the work. The data base provided by these three systems enables sound management of the Army Scientific and Technical Information Program and provides support for the technical management of the RDT&E Program.

X. ACCOMPLISHMENTS

A. Technical Information Functions and Activities Project	FY 65	FY 66
1. A 30,000 DATA ITEM DATA BANK.	X	
2. FORMATS FOR PERIODIC REPORTS DEVELOPED.	X	
3. FILE MAINTENANCE, PERIODIC REPORT, AND RETRIEVAL PROGRAMS DEVELOPED.	X	
4. DATA BANK OPERATING PROCEDURES DEVELOPED AND DOCUMENTED.	X	
5. INFORMATION PROFILES OF ARMY TECHNICAL PERSONNEL AVAILABLE	X	
6. INDEX OF TECHNICAL DESCRIPTORS PRODUCED.	X	
7. FEASIBILITY STUDY OF A SELECTIVE DISSEMINATION OF INFORMATION PROGRAM COMPLETED.	X	
8. DATA BANK UPDATING PROCEDURES DEVELOPED.	X	
9. DATA BANK UPDATING FORMS, INSTRUCTIONS AND SUPPLEMENTARY LISTS COMPLETED.	X	
10. TEL/TIPS DATA BANK COORDINATED BY DCS/PER.	X	
11. S&TI FUNCTIONS AND ACTIVITIES LIST DEVELOPED.	X	
12. DATA HOLDINGS AND SOURCES FILE PREPARED.	X	
13. NEW FUNDING AND EQUIPMENT QUESTIONNAIRE DEVELOPED.	X	

	FY 65	FY 66
B. Engineering Data and Information System (EDIS)		
1. REPORT EDIS-1, "ENGINEERING DATA & INFORMATION SYSTEM CONCEPT AND ACTION PLAN REPORT" ISSUED JULY 1964.	X	X
2. REPORT EDIS-2 "RECOMMENDED APPROACHES TO DESIGN OF THE U.S. ARMY ENGINEERING DATA AND INFORMATION SYSTEM" ISSUED DECEMBER 1964.	X	
3. A REPORT DATED 16 MAR 65, "A GENERALIZED CONCEPTUAL MODEL FOR AN ENGINEERING DATA & INFORMATION SYSTEM.	X	
4. TWO PROGRESS REPORTS ON TASK I, DATED JUNE 1965 & SEPTEMBER 1965 PUBLISHED BY HOWARD RESEARCH CORPORATION.	X	X
5. TWO REPORTS DATED 3 JANUARY 1966 GIVE FINDINGS TO DATE OF WHAT MAY BE REGARDED AS COMPLETION OF PHASE I: DETERMINATION OF ENGINEERING DATA REQUIREMENTS.		X
6. NEW DEVELOPMENT PLAN WRITTEN CONSISTENT WITH FINDINGS FROM TASK AREA I THROUGH DECEMBER 1965.		X
7. A TECHNICAL REPORT WAS PREPARED BY THE UNIVERSITY OF ALABAMA RESEARCH INSTITUTE, "SOME MATHEMATICAL PROBLEMS ARISING IN INFORMATION RETRIEVAL FROM INVERTED FILES."	X	
8. WORK WAS COMPLETED ON A DISPLAY FORMAT FOR TEST DATA. THE RESULTS OF THE WORK ARE BEING APPLIED TO THE INTERAGENCY DATA EXCHANGE PROGRAM (IDEP).	X	
C. Chemical Information and Data System (CIDS)		
1. STRUCTURED SEARCH PROGRAM WRITTEN. THE OBJECTIVE OF THIS PROGRAM TO SEARCH AND OUTPUT CHEMICAL STRUCTURAL INFORMATION GENERATED BY CHEMICAL TYPEWRITER.	X	
2. DELIVERY OF SECOND ARMY CHEMICAL TYPEWRITER-MODEL 2 (ACT-2) TO FRANKFORD ARSENAL.	X	

	FY 65	FY 66
3. ACT-2 FILE BUILDING CONDUCTED AT RATE OF 10,000 STRUCTURES/ MONTH (50K COMPLETED).	X	
4. APPROXIMATELY 100K STRUCTURES INPUT TO FILE.		X
5. PROTOTYPE ACCEPTANCE OF ACT-2		X
6. UNIVERSITY OF PA. FUNCTIONAL ANALYSIS COMPLETED 2ND QTR.	X	
7. UNIVERSITY OF PA. "ACTION PLAN FOR CIDS" COMPLETED 4TH QTR.	X	
8. INFORMATION FOR INDUSTRY FILES OF 150K PATENTS PURCHASED WITH RELATED SEARCH PROGRAMS.	X	
9. CIDS STATUS REPORT #1 PUBLISHED BY EDGEWOOD ARSENAL	X	
10. DEMONSTRATION OF INITIAL PROTOTYPE CIDS BY UNIVERSITY OF PA.	X	
11. CHEMICAL BIOLOGICAL COORDINATION CENTER (CBCC) DATA FILE AUTOMATION COMPLETED.	X	
D. Army Technical Library Improvement Studies (ATLIS)		
1. TECHNICAL LIBRARY PROBLEM IDENTIFICATION & DESCRIPTION TECHNICAL REPORT COMPLETED.		X
2. TECHNICAL LIBRARY REGULATORY PUBLICATIONS GUIDE COMPLETED.		X
3. TECHNICAL LIBRARY SERVICES USER'S GUIDE COMPLETED.		X
4. QUESTIONNAIRE DESIGNED & TESTED FOR ESTABLISHING DATA BASE FOR INCREASING EFFECTIVENESS OF INITIAL DISTRIBUTION OF TECHNICAL PUBLICATIONS.		X
5. PLAN FOR AUTOMATION OF TECHNICAL LIBRARIES COMPLETED.		X
6. THE AUTOMATED LITERATURE PROCESSING HANDLING AND ANALYSIS (ALPHA) IS 80% COMPLETE AND IS BEING USED AT REDSTONE SCIENTIFIC INFORMATION CENTER IN SUPPORT OF APPROXIMATELY 4,000 SCIENTIFIC AND TECHNICAL PERSONNEL.		X

		FY 65	FY 66
E.	Symposia and Conferences		
	1. NATIONAL JUNIOR SCIENCES & HUMANITIES SYMPOSIUM, WEST POINT, N.Y.	X	
	2. NATIONAL JUNIOR SCIENCES & HUMANITIES SYMPOSIUM, FT. MONMOUTH - PRINCETON, NEW JERSEY		X
	3. ARMY SCIENCE CONFERENCE (BIANNUAL), West Point, N.Y.		X
F.	Information and Data Exchange Experimental Activities (IDEEA)		
	1. FRANKFORD ARSENAL PREPARED REPORTS COVERING CONCEPT, ACTION PLAN, PROJECT STATUS AND EQUIPMENT SURVEY.	X	
	2. PHILCO CORP. PREPARED BIBLIOGRAPHY FOR INFORMATION STORAGE AND RETRIEVAL AND FOR USE OF NATURAL LANGUAGE FOR INFORMATION NETWORKS.	X	
	3. INTERFACE EQUIPMENT BETWEEN ARMY CHEMICAL TYPEWRITER (ACT), M-18 FIELD ARTILLERY DIGITAL AUTOMATIC COMPUTER (FADAC), AND IBM 7090 COMPUTER DESIGNED.		X
	4. DESIGN AND DEVELOPMENT COMPLETED FOR INITIAL OPERATION OF THREE M-18's IN A MULTIPROCESSING LOOP INCLUDING BUFFER (SYSTEMIZER), DURAMATIC ACT, AND SOFTWARE		X
	5. SYSTEMIZER DESIGNED, BUILT AND CHECKED STATICALLY AND DYNAMICALLY.		X
	6. COMMERCIAL VERSION OF CHEMICAL TYPEWRITER DEVELOPED.	X	
	7. INTEGRATED DATA BASE CONCEPT DEVELOPED.		X

TECHNICAL INFORMATION FUNCTIONS AND ACTIVITIES

1. 180 TECHNICAL ORGANIZATIONS AT 50 WORLDWIDE LOCATIONS.

2. 60 TYPES OF DATA HANDLING FUNCTIONS DIVIDED INTO 6 CATEGORIES:

   a. MANAGEMENT AND R&D.

   b. SYMPOSIA AND TECHNICAL MEETINGS.

   c. GENERATION AND EVALUATION OF TECHNICAL INFORMATION.

   d. DATA EXCHANGE (ACQUISITION AND DISSEMINATION).

   e. STORAGE AND RETRIEVAL OF TECHNICAL INFORMATION.

   f. SUPPORT FOR TECHNICAL INFORMATION ACTIVITIES.

3. 540 SUBSTANTIAL HOLDINGS OF TECHNICAL DATA. DETERMINED SUBSTANTIAL BY: a) SIZE OF HOLDING TO EXCEED 16,000,000 CHARACTERS, b) MAINTAINING ORGANIZATION HAS R&D MISSION REQUIREMENT IN AREA, c) HOLDINGS ARE MADE AVAILABLE OUTSIDE THE PREPARING ORGANIZATION, d) MATERIAL IS MAINTAINED CURRENT BY A RESPONSIBLE TECHNICAL SPECIALIST.

4. CURRENT ANNUAL COST OF $55,000,000 NOT INCLUDING COST OF TECHNICAL PERSONNEL SEARCH-TIME.

5. CURRENT ANNUAL COST OF $2,000,000 TO PROVIDE INCREASED EFFECTIVENESS OF DATA TRANSFER FROM SOURCE TO USER.

FIGURE 1

RELATIONSHIP OF THE SCIENTIFIC & TECHNICAL INFORMATION PROJECTS TO ALL DEPARTMENT OF ARMY S&TI FUNCTIONS & ACTIVITIES

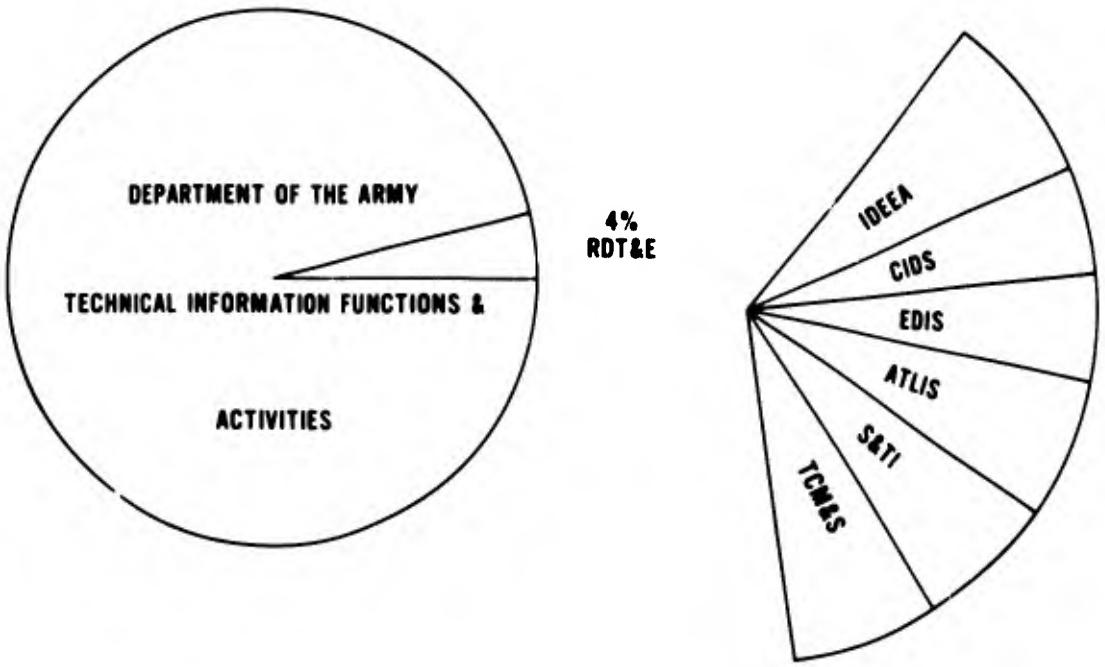


Figure 2

INTERRELATIONSHIP OF OPERATIONS, DISCIPLINES AND MEDIA FOR SCIENTIFIC AND TECHNICAL INFORMATION MANAGEMENT

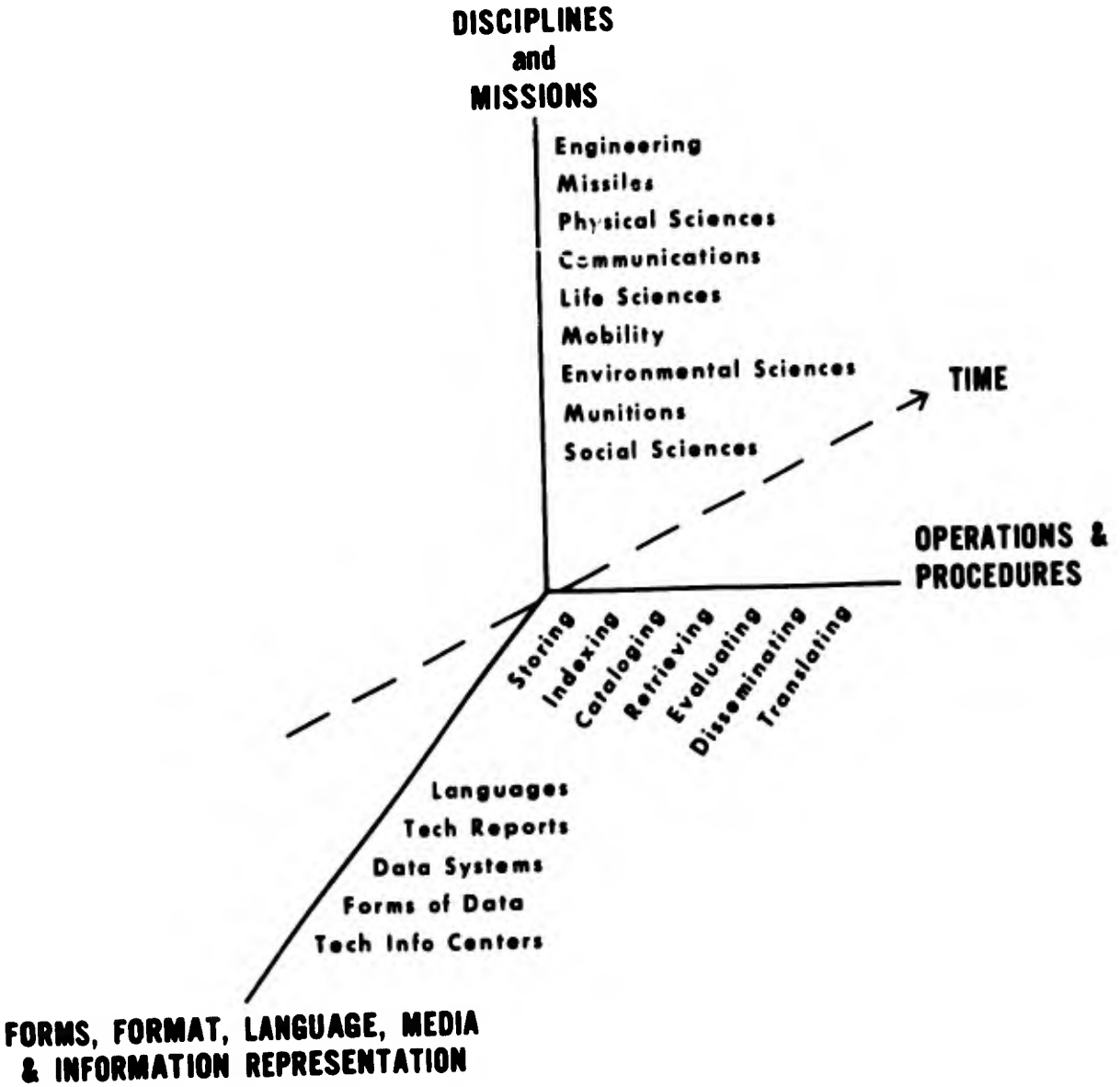


Figure 3

INTERRELATIONSHIP OF SPECIFIC PARTS OF THE ARMY SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM

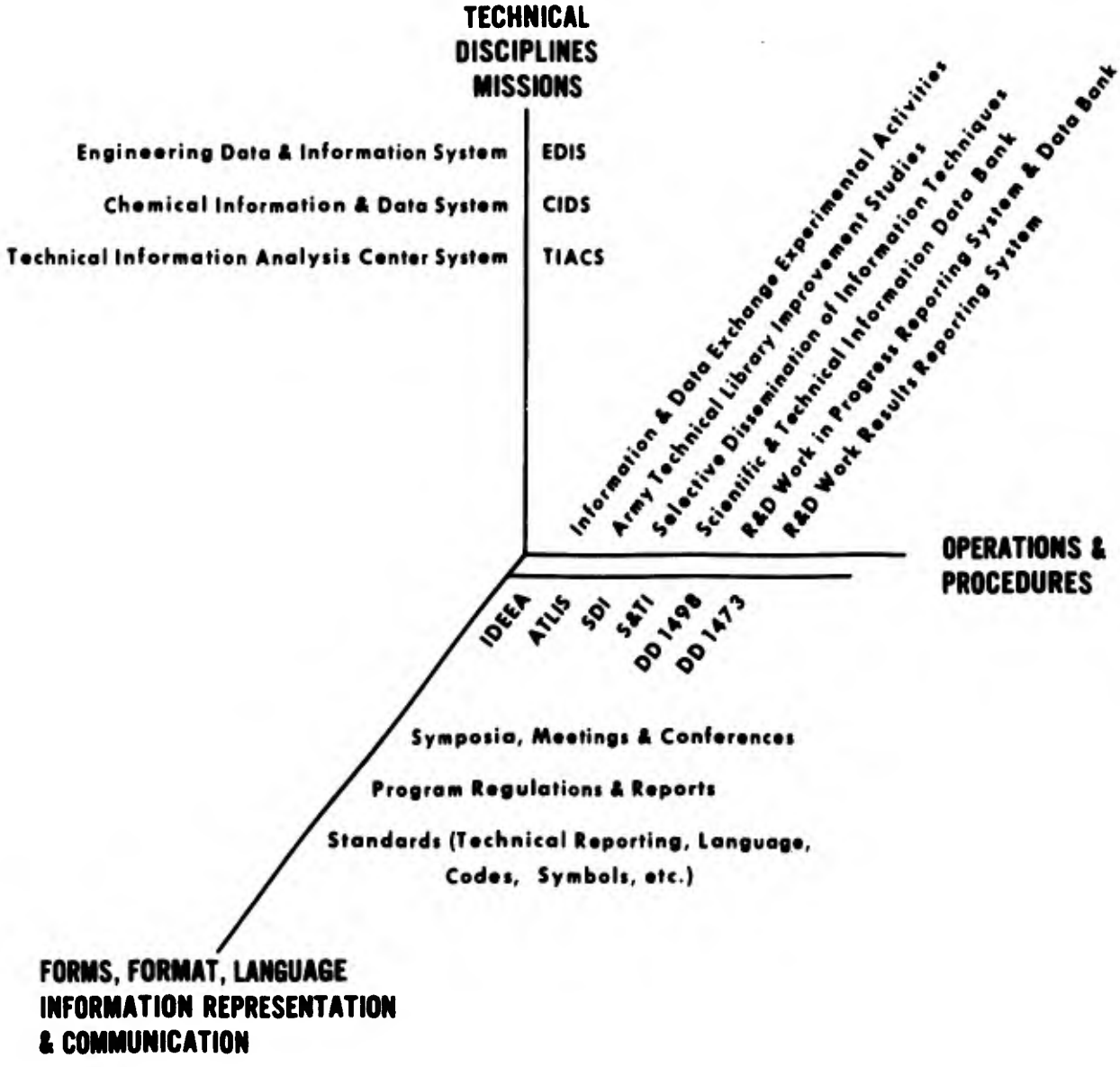
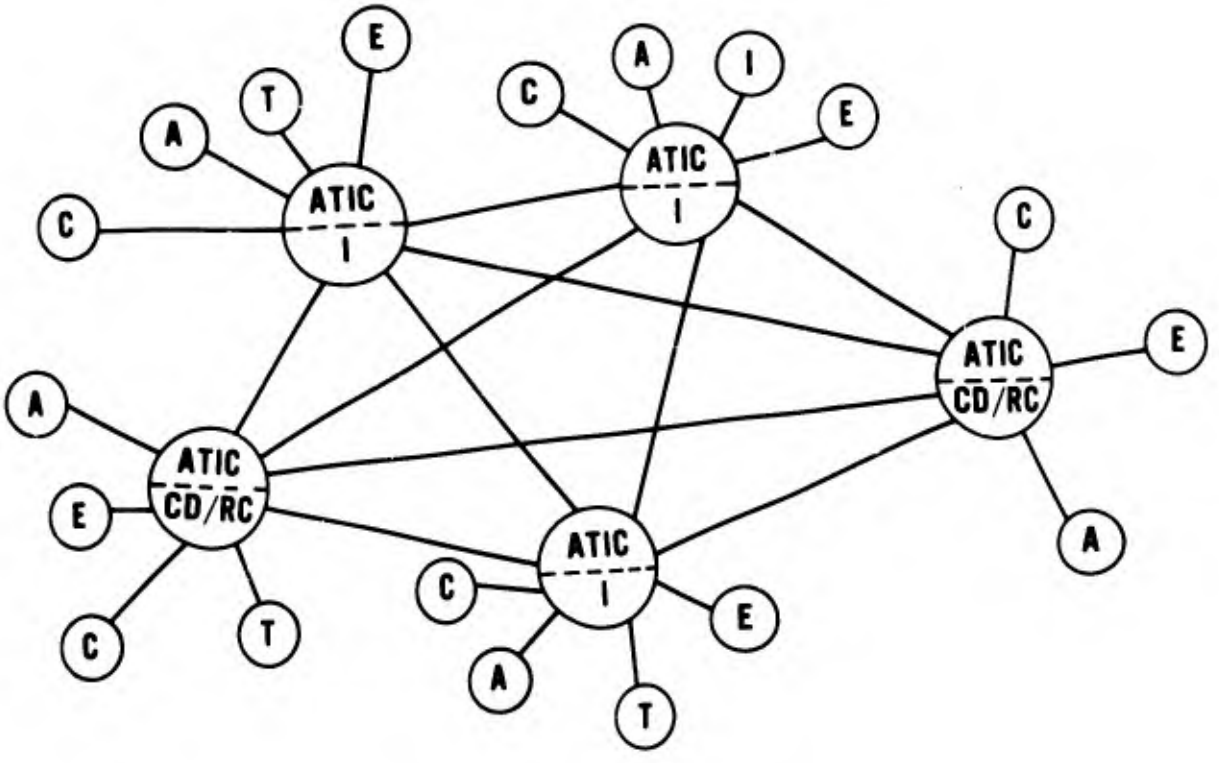


Figure 4

ARMY INTEGRATED TECHNICAL INFORMATION SYSTEM



ATIC - ARMY TECHNICAL INFORMATION CENTER
CD - CENTRAL DIRECTORY
RC - ROUTING CENTER (INFORMATION)
C - CHEMICAL INFORMATION & DATA SYSTEM (CIDS)
E - ENGINEERING DATA & INFORMATION SYSTEM (EDIS)
I - INFORMATION & DATA EXCHANGE EXPERIMENTAL ACTIVITIES (IDEEA)
T - TECHNICAL INFORMATION ANALYSIS CENTER (TIAC)
A - ARMY TECHNICAL LIBRARY IMPROVEMENT STUDIES (ATLIS)

Figure 5

APPENDIX A

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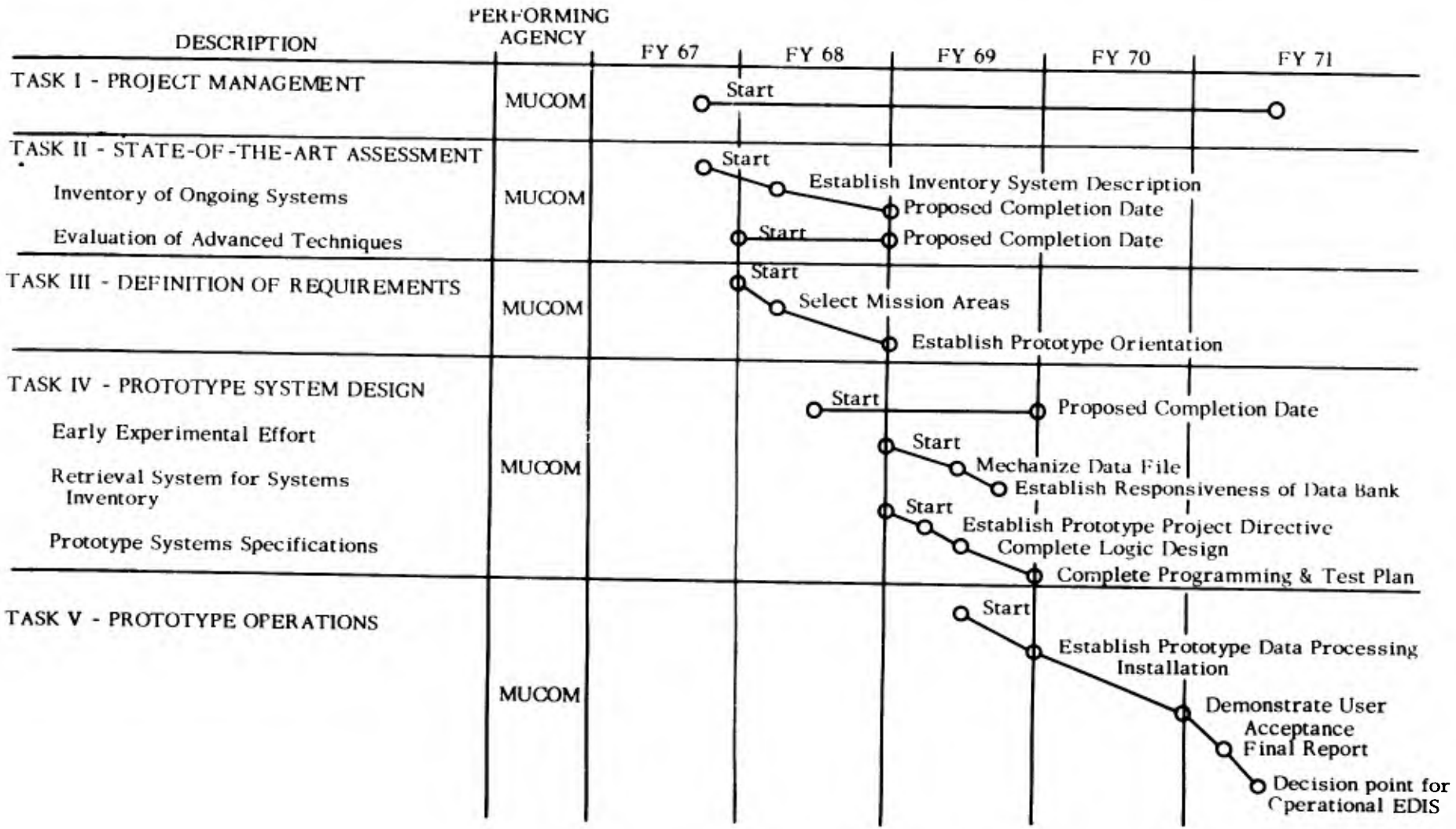
APPENDIX B

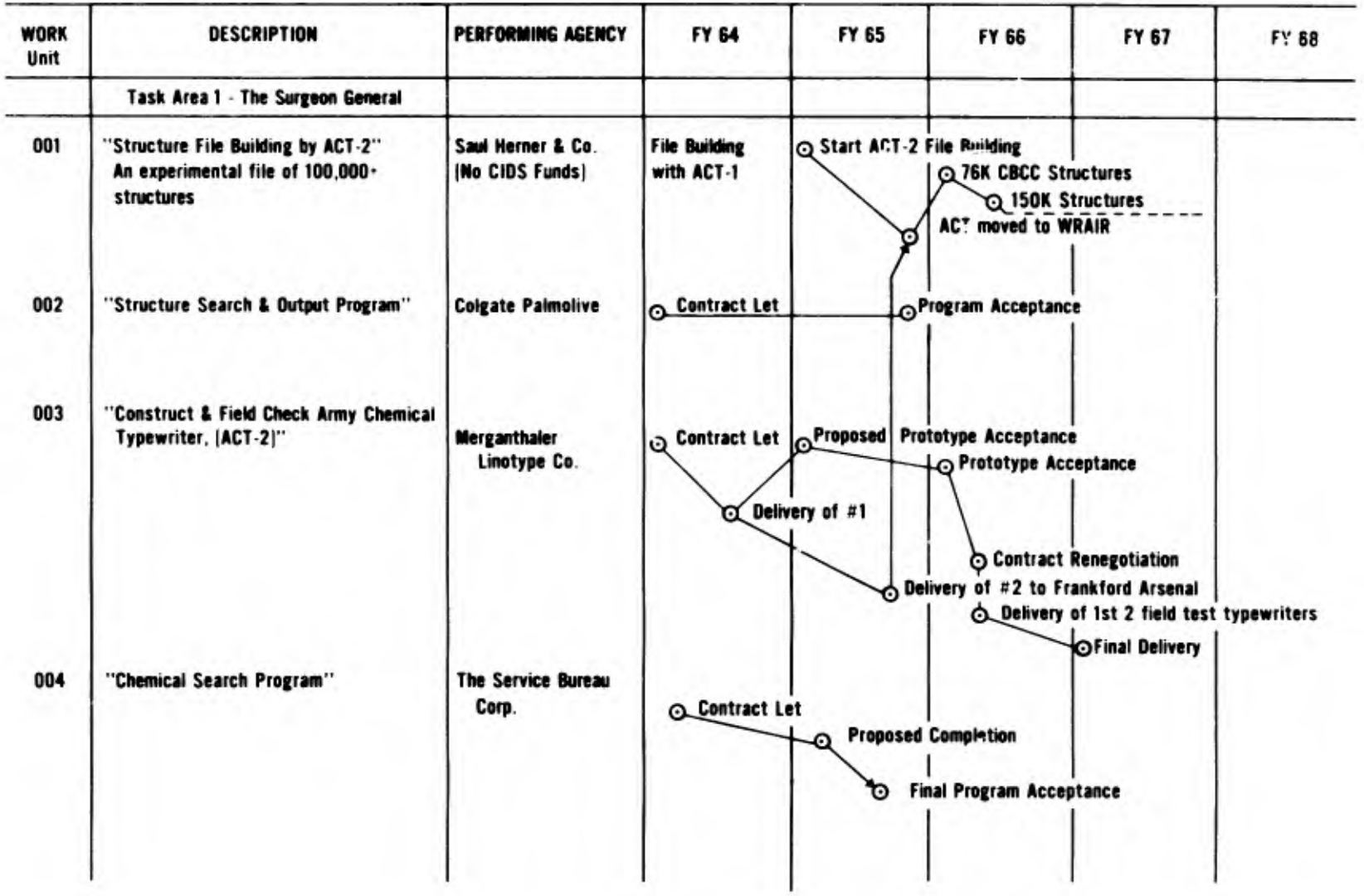
MILESTONES CHARTS

Item 1 of Appendix B not included.

ENGINEERING DATA AND INFORMATION SYSTEM (EDIS)



CHEMICAL INFORMATION AND DATA SYSTEM
CIDS



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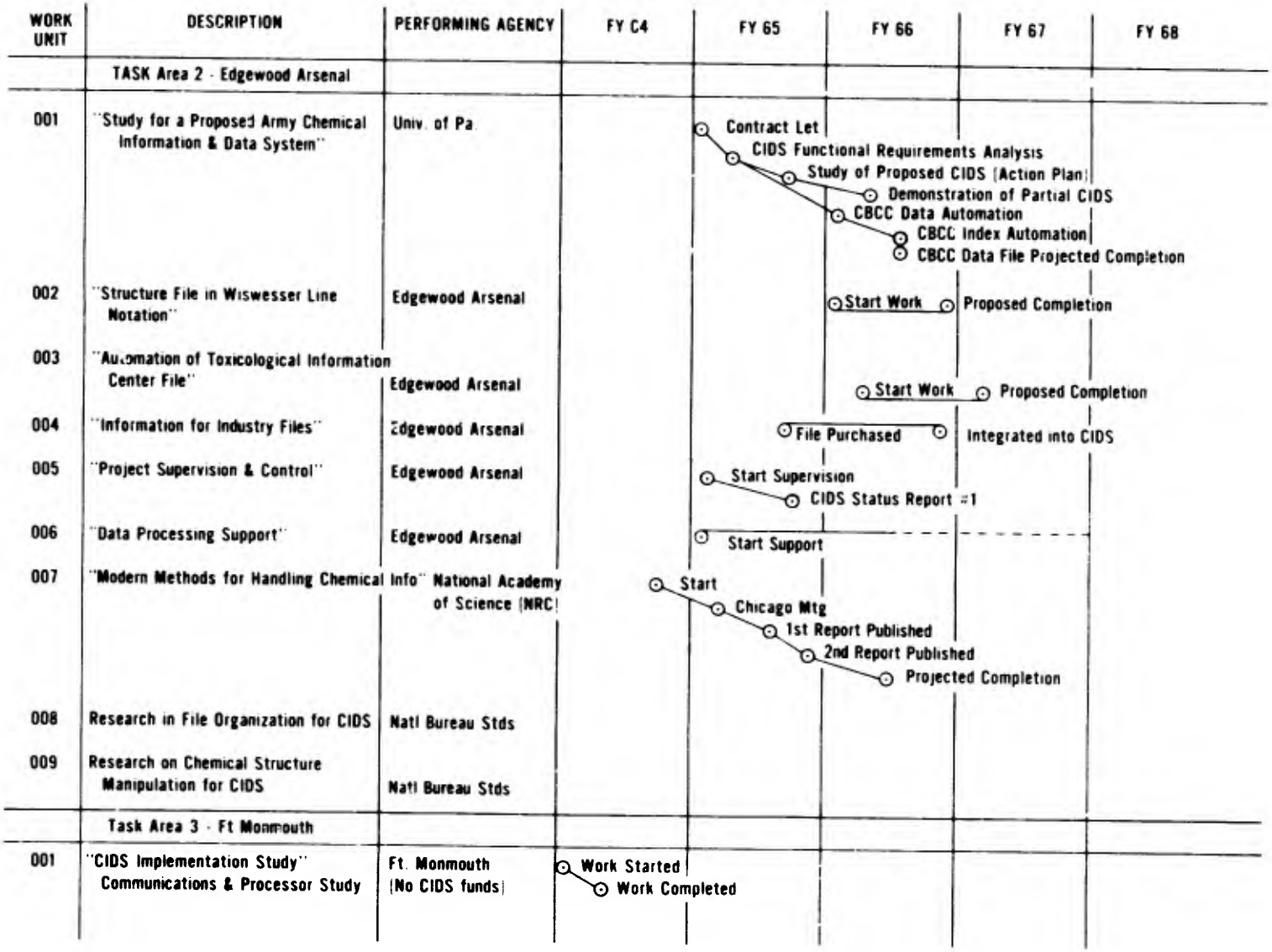
CIDS



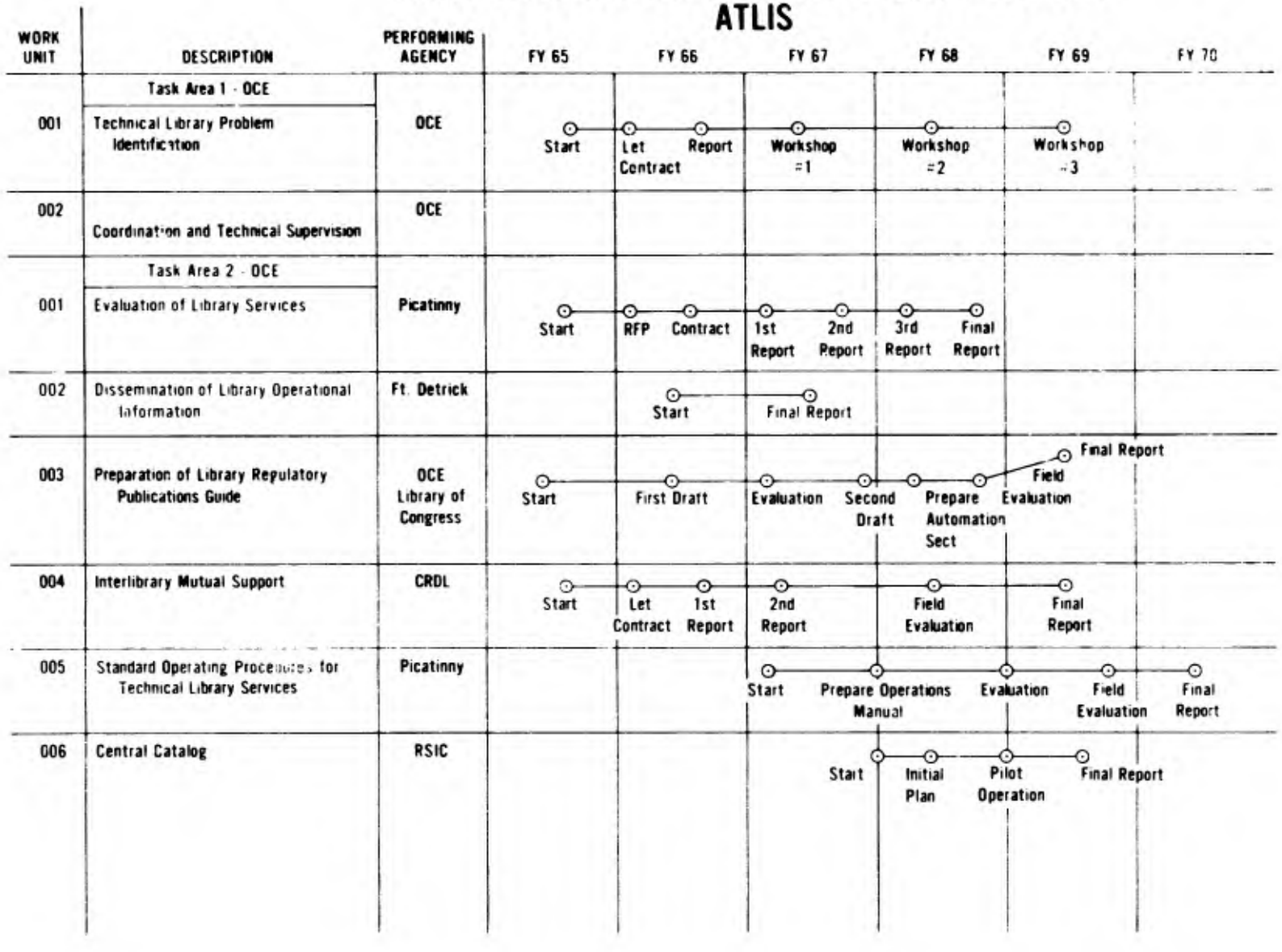
CHEMICAL INFORMATION AND DATA SYSTEM
CIDS

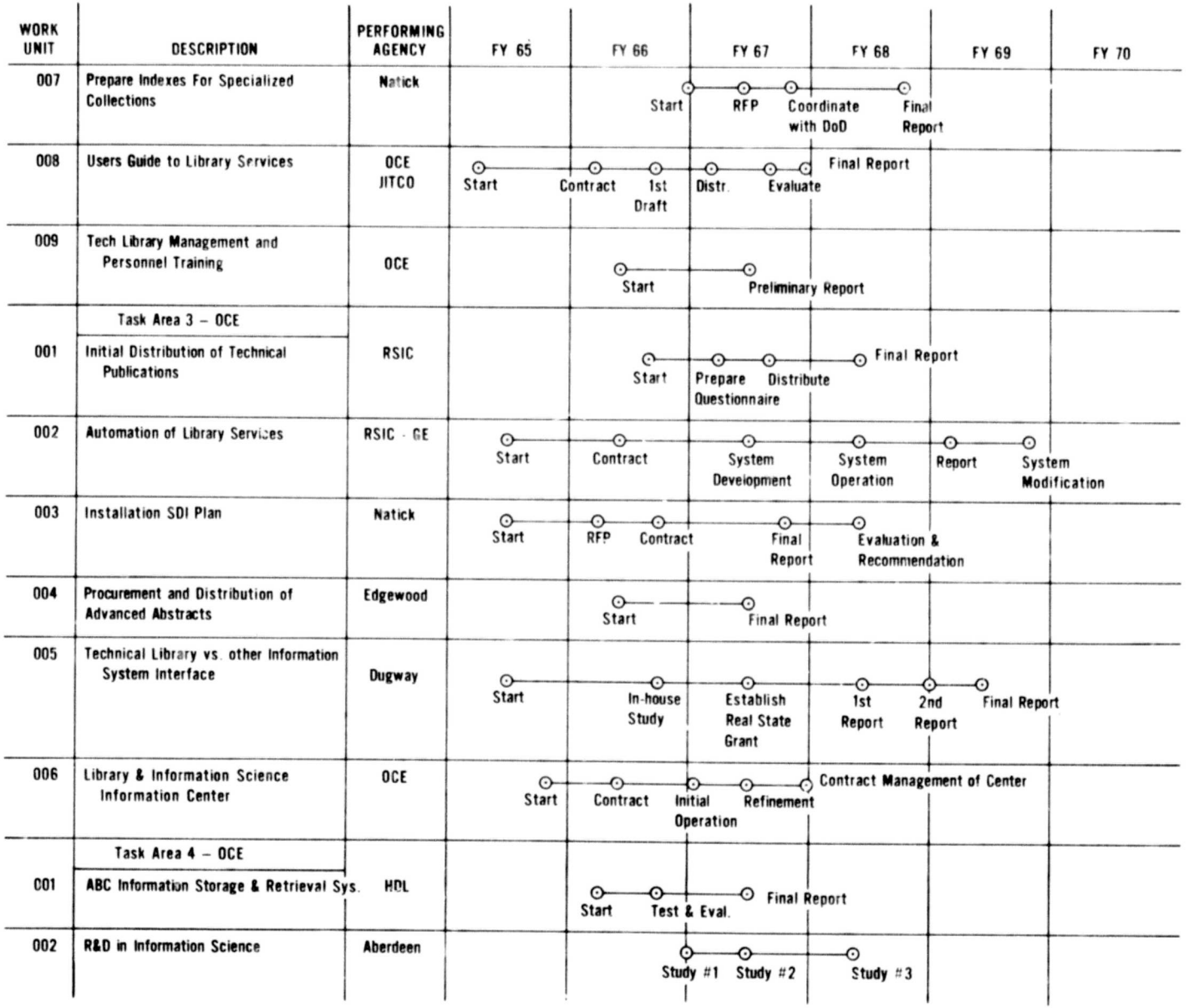
WORK UNIT	DESCRIPTION	PERFORMING AGENCY	FY 64	FY 65	FY 66	FY 67	FY 68
	Task Area 4 - Redstone Arsenal	FY 63					
001	"Review of Selected Methods of Machine Manipulation of Chemical Structures"	General Electric		Work Completed	Final Report CIDS #2		
002	"Collection of Algorithms for Searching Chemical Compound Structure Analogs"	General Electric			Final Report CIDS #3		
003	High Speed Display of Chemical Nomenclature, Molecular Formula & Structural Diagram	General Electric			Final Report CIDS #4		
	Task Area 5 - Frankford Arsenal						
001	"CIDS Technical Information Center Study"	Frankford Arsenal (Eisman)		Work Started		Proposed Completion Date	
002	"CIDS Linear Notations For Chemical Compounds" (Polish-string)	Frankford Arsenal (Eisman)	Work Started	Work Completed Report Published			
003	"User Needs Study"	Frankford Arsenal (Charlotte Smith)		Work Started	Report Published		

CHEMICAL INFORMATION AND DATA SYSTEM
CIDS

WORK UNIT	DESCRIPTION	PERFORMING AGENCY	FY 66	FY 67	FY 68	FY 69	FY 70
	Task Area 6 - Edgewood Arsenal						
001	Experimental CIDS System		⊙	⊙	Decision Point For Operational CIDS		
002	Development or Modification of Experimental Executive Program		⊙				
003	Processing & Integration of Systems Using Structure-Translation Techniques		⊙				
004	Improvement of File Structure & Interrogation Techniques		⊙				
005	Evaluation of Interagency Chemical Information Program (ICIP)		⊙	⊙			
006	Man/Machine Communications		⊙				
007	File Index Evaluation		⊙	⊙			
008	Structure Display & Output				⊙		

ARMY TECHNICAL LIBRARY IMPROVEMENT STUDIES
ATLIS

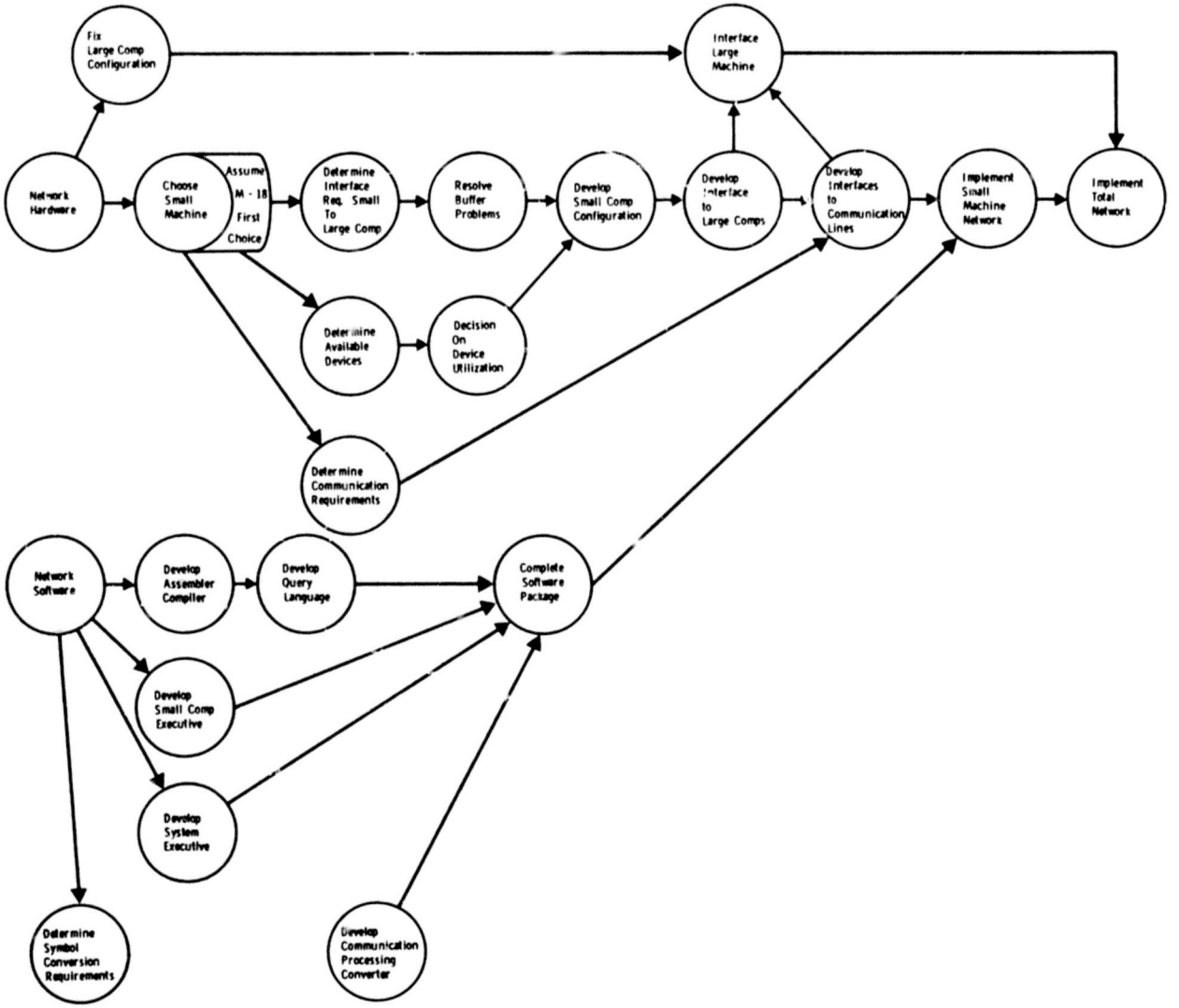



WORK UNIT
DESCRIPTION
PERFORMING AGENCY
FY 65
FY 66
FY 67
FY 68
FY 69
FY 70
007
Prepare Indexes For Specialized Collections
Natick
Start
RFP
Coordinate with DoD
Final Report
008
Users Guide to Library Services
OCE JITCO
Start
Contract
1st Draft
Distr.
Evaluate
Final Report
009
Tech Library Management and Personnel Training
OCE
Start
Preliminary Report
Task Area 3 – OCE
001
Initial Distribution of Technical Publications
RSIC
Start
Prepare Questionnaire
Distribute
Final Report
002
Automation of Library Services
RSIC - GE
Start
Contract
System Development
System Operation
Report
System Modification
003
Installation SDI Plan
Natick
Start
RFP
Contract
Final Report
Evaluation & Recommendation
004
Procurement and Distribution of Advanced Abstracts
Edgewood
Start
Final Report
005
Technical Library vs. other Information System Interface
Dugway
Start
In-house Study
Establish Real State Grant
1st Report
2nd Report
Final Report
006
Library & Information Science Information Center
OCE
Start
Contract
Initial Operation
Refinement
Contract Management of Center
Task Area 4 – OCE
001
ABC Information Storage & Retrieval Sys.
HDL
Start
Test & Eval.
Final Report
002
R&D in Information Science
Aberdeen
Study #1
Study #2
Study #3

SYMPOSIA AND CONFERENCES

Item 5 of Appendix B not included.

INFORMATION DATA EXCHANGE EXPERIMENTAL ACTIVITIES (IDEEA)



INFORMATION DATA EXCHANGE EXPERIMENTAL ACTIVITIES (IDEEA)

	FY 66				FY 67				FY 68				FY 69				FY 70			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Network Implementation																				
Equipment Acquisition	X	X	X	X	X	X	X													
Software Development	X	X	X	X	X	X	X	X	X	X	X	X								
3-Point Operation						X	X	X	X											
5-Point Operation									X	X	X	X – –	/							
2. User Experiments																				
Measurements			X—Local	– –	– –	– –	X	X—Network	– –	– –	– –	– –	/							
Analysis				X	X	X	X	X	X	X	X	X – –	/							
Define User Requirements											X									
System Specs													X							
3. Supporting Studies																				
Man–Machine Interface	X	X	X	X																
Linguistics			X	X	X	X	X	X	X	X	X	X – –	/							
Advanced Software					X	X	X	X	X	X	X	X – –	/							
Communications	X	X	X	X	X	X	X	X												
4. Reviews and Reports																				
Advisory Group Review		X		X		X		X		X		X (include coord with CIDS)								
Status Reports	X	X	X	X	X	X	X	X	X	X	X	X								
Hardware Final Report											X									
Software Final Report											X									
Project Final Report														X						

APPENDIX C

FUNDING

FUNDING

The Scientific and Technical Information Program portion of the RDT&E budget, approved within the OSD Five Year Force Structure and Financial Program, is shown in the Funding Tables. The Tables are arranged as follows:

Table 1 - Scientific and Technical Information Program - FY 67 - FY 72

Table 2 - Scientific and Technical Information Program Funding by Project

Table 3 - Technical Information Functions and Activities Project - Task Area Funding

Table 4 - Engineering Data and Information System (EDIS) Project - Task Area Funding

Table 5 - Chemical Information and Data System (CIDS) - Task Area Funding

Table 6 - Army Technical Library Improvement Studies (ATLIS) - Task Area Funding

Table 7 - Symposia and Conferences - Task Area Funding

Table 8 - Information and Data Exchange Experimental Activities (IDEEA) Project - Task Area Funding

SCIENTIFIC AND TECHNICAL INFORMATION

APPROVED FUNDING

Pages 45 through 52 containing detailed funding information have been extracted. These pages are available upon request from The Chief of Research and Development, ATTN: CRDSTI, Headquarters, Department of the Army, Washington, D.C. 20310.

RECORD OF COMMENTS ON PUBLICATIONS

(AR 310-3)

DATE

SUBJECT

REVISION NOTES FROM

ITEM NR	PAGE	PARAGRAPH	LINE*	COMMENT *(Exact wording of recommended change must be given)*

* *Reference to line number within the paragraph or subparagraph.*

DA FORM 1 DEC 68 1598

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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)*
Scientific & Technical Information Division
Office of the Chief of Research & Development
Headquarters, Department of the Army

2a. REPORT SECURITY CLASSIFICATION
Unclassified

2b. GROUP

3. REPORT TITLE
U. S. Army Scientific & Technical Information Program

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*
Annual

5. AUTHOR(S) *(First name, middle initial, last name)*
Dale L. Vincent, Col, GS

6. REPORT DATE
December 1966

7a. TOTAL NO. OF PAGES
52

7b. NO. OF REFS
10

8a. CONTRACT OR GRANT NO.
N/A

b. PROJECT NO.

c. 2P020401A720

d.

9a. ORIGINATOR'S REPORT NUMBER(S)
N/A

9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*
N/A

10. DISTRIBUTION STATEMENT
Distribution of this document is unlimited

11. SUPPLEMENTARY NOTES
None

12. SPONSORING MILITARY ACTIVITY
Scientific & Technical Information Division
Office of the Chief of Research & Development
Headquarters, Department of the Army

13. ABSTRACT

The purpose of the Army Program is to insure continuous and effective exchange of scientific and technical information. In so doing it is the Program's additional purpose to preclude unnecessary expenditure of resources, reduce lead time, and make more effective use of known technology. It will provide guidance and direction for control and improvement of the acquisition, evaluation, storage, retrieval and dissemination of scientific and technical information.

This Program covers all scientific and technical information and data activities of the Army exclusive of technical logistics data and is applicable to all Army elements, their contractors, subcontractors and grantees.

DD FORM 1 NOV 65 1473

UNCLASSIFIED
Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Technical Information Technical Data Information Systems Five-Year Program Technical Information Program Information Retrieval						