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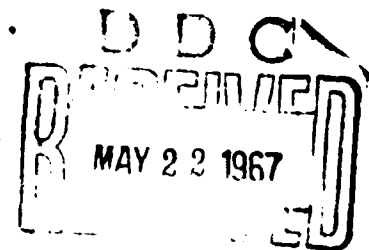
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ANALYSIS OF SCIENTIFIC &
TECHNICAL INFORMATION
REQUIREMENTS OF FAA
CONTRACT NO. FA64WA-5213



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NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION
12214 Lakewood Blvd., Downey, California



FOREWORD

This report covers the work performed by the Space and Information Systems Division (S&ID), North American Aviation (NAA), under Federal Aviation Agency (FAA) Contract No. FA64WA-5213, "Analysis of the Scientific and Technical Information Requirements of the Federal Aviation Agency." This work was performed under the direct cognizance of the contractor's technical representative within the FAA Library Services Division, and the contractual effort covered a 12-month period from August 1964 through July 1965. This report covers all work performed on the contract plus conclusions and recommendations considered important to the FAA.



TECHNICAL REPORT INDEX/ABSTRACT

ACCESSION NUMBER 09951-65		DOCUMENT SECURITY CLASSIFICATION Unclassified	
TITLE OF DOCUMENT ANALYSIS OF SCIENTIFIC & TECHNICAL INFORMATION REQUIREMENTS OF FAA CONTRACT NO. FA64WA-5213		LIBRARY USE ONLY	
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CODE	ORIGINATING AGENCY AND OTHER SOURCES NAA/S&ID	DOCUMENT NUMBER SID 65-1397	
PUBLICATION DATE 25 October 1965		CONTRACT NUMBER FA64WA-5213	
DESCRIPTIVE TERMS Scientific and technical information requirements. User need study. Information requirements of FAA.			
ABSTRACT This report covers the work performed by S&ID under Federal Aviation Agency (FAA) Contract No. FA64WA-5213. A three-phase survey was conducted to determine the scientific and technical information requirements of the FAA. Phase I was an inventory of the present resources and services offered by the FAA libraries. Phase II was a detailed questionnaire survey of 3818 FAA personnel to determine their present information acquisition methods and needs. An unprecedented 92-percent response was obtained. A series of eleven charts present the questionnaire survey results. Phase III was an in-depth interview with 76 top management personnel. As a result of the detailed analysis of the results of those surveys a series of recommendations are made. They are grouped as recommendations for immediate implementation, phased implementation over a five-year period, or study recommendations. Major recommendations involved means to further acquaint FAA employees with present library services and means to keep the FAA current with technical information handling advances.			



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SPACE and INFORMATION SYSTEMS DIVISION

1. INTRODUCTION

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1. INTRODUCTION

This report covers the work performed by the Space and Information Systems Division (S&ID), North American Aviation (NAA), under Federal Aviation Agency (FAA) Contract No. FA64WA-5213, "Analysis of the Scientific and Technical Information Requirements of the Federal Aviation Agency." This work was performed under the direct cognizance of the contractor's technical representative within the FAA Library Services Division, and the contractual effort covered a 12-month period from August 1964 through July 1965. This report covers all work performed on the contract plus conclusions and recommendations considered important to the FAA.

Under conditions of this contract, S&ID has developed recommendations to aid FAA in the formulation of programs and policies that would meet the scientific and technical information needs of Agency personnel. To be complete, an evaluation of these recommendations should be prefaced by a brief historical summation of the Agency library system. On 15 March 1960, a study addressed to the task of reviewing the existing library capabilities and services requirements was completed. This study was conducted by the Management Analysis Division (FAA) for the Assistant Administrator for Management Services. A copy of the summary of findings and conclusions is included for reference in Appendix A.

On the basis of the study completed in March 1960, the following conclusions were reached:

1. The FAA had a need for a library system to provide a broad range of reference support to staff and operating officials and a need for research support in certain specialized fields.
2. There was a need for better facilities and services to replace these that were grossly inadequate.
3. There was a need for a highly qualified librarian to develop a library program.

Accordingly, a highly qualified chief librarian was employed and directed to develop a comprehensive library program. During his tenure with the Agency, significant improvement was made in the function of the Headquarters library, and development of field libraries was expedited.



Between March 1960 and July 1964, significant progress was made in correcting the deficiencies noted in the study. To provide the Agency with required reference and research support, positive action was taken. Obsolete data were eliminated, new materials were acquired, a limited bibliographic service was initiated, and library system responsibilities were established. Additionally, well-qualified, professional library personnel were employed to provide improved service through specialized branches of the library, such as those for information retrieval, law, and aviation medicine.

Two contracts were awarded for the development of the Agency information retrieval system. The first contract, awarded in 1963, was for the development of the "Thesaurus of Descriptors." This Thesaurus has aided in improved reference service within the Agency and may be considered as a first step in development of a coordinated Agency library system that will eventually integrate its capabilities with other Governmental agencies such as the NASA, the DOD, and the Armed Forces.

The second contract, awarded in 1964, provided for indexing of documents on file in the Headquarters library. Indexing was accomplished by use of the descriptors supplied in the Thesaurus. The indexing project was a great step forward in modernizing the Agency's capabilities to meet the demands of an increasingly technical mission. For the first time, information storage and retrieval became a practical realization in the Agency. Through the use of the Termatrix system installed at Headquarters, Aeronautical Center, NAFEC, and at each regional office, technical literature searches based on subject-matter descriptors (using the Thesaurus) are being conducted. This system is relatively inexpensive and provides a logical base from which to expand to the use of more advanced electronic data processing equipment as the need arises. Because the Termatrix system was in operation at only the Headquarters library during the course of this contract, it could not be properly evaluated. Thus, no detailed analysis on the system is provided in this report. However, it is recommended that periodic examination be made of the Termatrix system in order to properly assess its performance. The relocation of the Agency into the new facilities on Independence Avenue in Washington, D.C., provided, for the first time, modern and adequate facilities for the headquarters library.

In 1964, to aid the Agency in the formulation of programs and policies to best meet the information needs of its technical and management personnel, a contract titled, "Analysis of the Scientific and Technical Information Requirements of the Federal Aviation Agency" was awarded. The report that follows covers the work accomplished and the results determined under this contract.



This final report is designed to be a summary, with the exception of the analysis and recommendations. Detailed discussion of phases such as Library Inventory, Questionnaire Survey, and In-Depth Interviews has been included in a supplement. This supplement, in addition to the above-mentioned detailed discussions, includes Appendixes of raw and reduced data development on the contract.

Section 1.1 of this report provides a brief discussion of the scope of the technical effort identifying major survey phases and numbers of personnel surveyed or personally interviewed; Section 1.2 discusses the summary of results obtained from the data analysis; and Section 1.3 identifies summary recommendations in brief form taken from the recommendations. The recommendations are based upon the results obtained from data analyses and have been structured in a 5-year program. Section 2.0 provides a breakdown of subtasks within each phase of the overall technical effort. Each phase and its characteristic tasks has been summarized in order to provide a better understanding of the subsequent Section 3.0, Presentation of Results.

1.1 SCOPE OF SURVEY

The scope of this study encompassed an analysis of the scientific and technical information requirements of the FAA. The survey portion of the analysis required a three-phase effort. Phase I was an inventory of the library services now offered by the Headquarters library and other library or library-related functions throughout the entire Agency. Phase II addressed itself to the surveying, by questionnaire, of 3818 management and non-management personnel with the Agency. An unprecedented 92% response was obtained on this survey in contrast with much lower returns on contemporary surveys. Phase III was concerned with in-depth interviews with 76 selected top-management personnel at Headquarters, Aeronautical Center, NAFEC, and the five continental United States regional offices.

The contract embodied an analysis of the data collected using computer-aided statistical analysis procedures and a set of recommendations which, if implemented, would more effectively match the Agency's technical information handling system to the requirements of its personnel.

1.2 SUMMARY OF RESULTS

Within the Agency, there is presently a high degree of diversity in the operation of library facilities. Four regions exist in the Agency that do not

*This section is a summary and, as such, does not provide supporting data for the conclusions discussed. For a more detailed discussion (including supporting data) the reader is referred to Section 1.0.



yet have a functioning library. From the questionnaire survey, indications are that when a library is established in an FAA region or at a special facility, it will be used by significantly large percentages of the personnel. The highest percentages of use of the library are at the three special facilities (Headquarters, NAFEC, and Aeronautical Center) where libraries have existed for a period of time. The moderate user's group is in the Pacific and Southern regions which have relatively new libraries. The low user's group is composed of the remaining FAA regions where library system facilities had not, at the time of survey, been established.

Those services used most regularly, where libraries exist in a region or special facility, are the reference and research services and services providing FAA technical reports and manuals. Where no FAA library system facility exists within a region, FAA personnel indicate a greater need for library services and a greater degree of difficulty in acquiring technical information than do the regions and facilities that have libraries. Where no library exists, the location of the library is indicated as the major problem in rapidly acquiring desired information.

One important point about the users is that they are diversified with respect to use of services. That is, if a person uses the library system at all, he will tend to utilize all services provided to him rather than a few selected ones. His use of outside sources (i. e., outside the FAA library) will tend to be unaffected by the FAA library system. This is due to the fact that individuals utilize outside sources, such as Government Printing Office (GPO), for acquisition of technical information for their own private collections. In the case of personnel surveyed, 74% of the sources of scientific and technical information utilized are outside the FAA library system, but are within the FAA. Of the sources used outside the FAA library system, 64 percent of the personnel use fellow employees, and the use of this source averages three times per month. The special facilities tend to use the Defense Documentation Center (DDC) as a scientific and technical information source, whereas the regions do not. With respect to the Agency as a whole, the most important non-FAA information source is the Government Printing Office (GPO).

While the survey shows that there are specific requirements for scientific and technical information throughout the Agency, the most important single indicated need is for information on the library services. There is an immediate need for information informing the user about the library system in the form of a brochure and handbook. The brochure should describe the technical and scientific information available through the library and should be available to all FAA personnel. In addition, the handbook should describe the library facilities and services available throughout



the Agency, and should be developed through the Agency directive system. Of almost equal importance is the need for information on the technical data that is available and acquired within the library system.

With respect to personnel within the regions, it may be concluded that there is no significant difference in information requirements from region to region. Regional personnel, as well as special facilities personnel, feel that an "awareness service" is needed and valuable. Their preference of storage location for scientific and technical information is indicated as "a regional library" rather than as a private collection.

Comparing managers with non-managers over the entire Agency, the managers have a higher interest in indexing, current awareness, information retrieval, and abstracting services. But, the managers are clearly unenthusiastic about microfilm and microfiche as a medium for storage of scientific and technical information. The general reason given was that this system was felt to be inconvenient.

1.3 SUMMARY RECOMMENDATIONS

A series of recommendations have been developed based on the analysis of the data gathered. These recommendations are based on the stated needs of the Agency personnel and on the requirements to improve Agency technical effectiveness over the next five years in order to function in the predicted technological environment of the 1970's.

The recommendations for immediate implementation have been designed to provide immediate benefits to the Agency through more effective utilization of existing facilities and services. These recommendations can be implemented in the shortest possible time and can be maintained with no increase in personnel. However, they should not be considered to meet the total needs of the Agency in this area. Much more comprehensive action is necessary to provide the Agency with the capabilities to meet the technological challenge over the next five years. The total recommendations of this study have been designed to meet this need. Five recommendations are presented as follows for immediate implementation.

1. Provide so-called "basic reference materials" for all FAA offices not colocated with libraries on an as-requested basis.
2. Develop and distribute an employee library handbook advertising library services, information resources, facilities, and how to use them.
3. Generate a monthly, Agency-wide new library acquisitions list that would cover all newly acquired items in the entire Agency library system.



4. Develop an FAA technical program summary handbook and distribute it to managers and researchers. (See Section 4.1)
5. Establish a list of personnel within the Agency that are considered experts in specific technical fields. This list to be maintained at each library facility for use in specialized reference.

Recommendations for phased implementation provide a framework for pursuing a 5-year improvement program. It is recommended that an Agency Technical Information System be developed and organized on an Agency-wide basis.

The emphasis of the Technical Information System would be directed toward information services supplied directly to the user as opposed to library facilities functioning as a "storehouse" of technical information. (See Section 4.2). Some of the changes under this organizational philosophy would be to provide rapid reproduction of periodical and journal articles, extend the library loan period, assign distribution of FAA technical and medical reports to the Technical Information Centers at NAFEC and Aeronautical Center respectively, provide a telephone courier service within special facilities and regional offices, and provide "current awareness" service to selected professional personnel. The term "current awareness" refers to a system wherein a profile (by use of key words, etc.) of each user's subject matter interest areas is kept. When new information is acquired by the library, its subject matter profile is compared with each user's profile to determine those individuals who would be interested in being informed about the new technical information.

Effort should be made to reduce as much as is feasible the number of indexing and shelving systems throughout the Agency and also continue the present indexing of technical reports at the Headquarters library. The fewer the indexing systems in use the better the communication between the users and the libraries. Also, the Agency would be better prepared to utilize automated storage and retrieval systems at such time as a cost effectiveness study would determine it was feasible.

Recommendations for study provides for a series of long-range studies to assure continued development of the Agency technical information system. These studies recommendations are based upon present requirements for technical information services, an extrapolation of those needs over the next five years and a forecast of the evolution of information handling technology over the next several years.

The specific recommendations are: A study of centralized and automated information distribution, the development of a cost effectiveness



model to help maximize the effective utilization of information resources, and the use of one FAA Region as a test area for certain specified information service developments.

The ultimate goal for the design of any system that is to be developed for the FAA should be to provide for the improved effectiveness of the Agency in the rapidly expanding technological environment and, most important, be designed toward future compatability with other Governmental agencies such as NASA and Defense Documentation Center (DDC).

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2. SURVEY TASKS



2. SURVEY TASKS

At the outset of the contractual effort, a detailed plan of operation was developed. The overall plan was expressed in terms of five major phases, and subsequent work undertaken to fulfill contract commitments was within the context of these phases. As the plan was developed, S&ID personnel drafted a general announcement to FAA personnel stating the objectives, background, and major tasks being undertaken and soliciting the cooperation necessary to ensure the success of the survey. This announcement was approved and issued as an FAA notice signed by the Associate Administrator for Administration and distributed to all offices and facilities of the Agency.

2.1 PHASE I - DETERMINATION OF LIBRARY SERVICES WITHIN FAA

As the detailed plan was being developed, selected library personnel at FAA Headquarters, NAFEC, Aeronautical Center, and the Southern Region were interviewed to obtain background information for subsequent use in developing the library inventory questionnaire. A letter questionnaire, developed to elicit information concerning present and projected library services, was sent to Regional Offices, NAFEC, Aeronautical Center, and FAA Headquarters. An inventory of library services, materials, and facilities was developed from the data received. Approximately three months prior to the conclusion of the contract, a follow-up letter was sent to each of the above offices to obtain information on any changes that had taken place since the inventory was taken.

2.2 PHASE II - DEVELOPMENT OF A DETAILED QUESTIONNAIRE AND SURVEY OF TEN PERCENT OF FAA PERSONNEL

This phase included eight functional steps carried out over approximately 70 percent of the life of the contract. The initial step was to develop a set of topics to be covered by the survey questionnaire which pertained to FAA practices, policies, and resources for acquiring and disseminating information. These topics were discussed with and approved by the contracting officer's technical representative. The questionnaire topics (discussed in Section 6 of the Supplement) were used as a framework for developing specific questions. The questionnaire itself was composed of two basic sections. One concerned respondent classification by location, assignment, grade, occupation and education; the other, with scientific and technical information requirements pertaining to library services used, scientific and technical information sources, and kinds of information which interest the respondent.



S&ID developed a questionnaire for non-management personnel (see Appendix A) which would elicit information with respect to each approved topic. Questions pertaining to respondent classification are self-explanatory. Other questions pertaining to scientific and technical information requirements dealt with familiarity with and use of the FAA library system; frequency of use and importance of various sources of scientific and technical information; interest in various information media; and use and preference of library services.

An additional set of detailed questions was developed to elicit data concerning unique information requirements of management personnel, and then combined with the non-management questionnaire to form a management personnel survey questionnaire. The survey questionnaires were reviewed and discussed for an extensive period prior to approval by the FAA to ensure that the contents and formats would result in high response and efficient data reduction.

Two groups of individuals were selected for interview by NAA. The first group, consisting of one percent of the FAA personnel, served as a test sample for validating the survey questionnaire. The second group consisted of 10 percent of the FAA personnel and constituted the survey sample. Individuals were selected for both samples on the basis of Agency-wide proportions of personnel in FAA job categories. These personnel were selected from listings of personnel in each job category provided by FAA Headquarters.

Three hundred and eighty initial survey questionnaires were mailed to individuals selected for the test survey. The information elicited a 98-percent response and was analyzed by S&ID. Experts in the field of library science, information retrieval, and opinion surveys conducted the analysis. The information was analyzed to ascertain the clarity and validity of the questions, the effectiveness of the arrangement of questions, and the format of the questionnaire for ease of response, efficient data reduction, and its ability to elicit required information. The findings of this analysis resulted in deletion of some questions, restatement of others, further amplification and categorization of alternate selections to multiple choice questions, and a change in the sequence of question within the questionnaire.

Upon receiving FAA approval of the finalized questionnaires, S&ID printed and distributed 572 copies of the management personnel questionnaire and 2866 copies of the non-management personnel questionnaire to FAA personnel comprising the 10-percent sample. The reader is referred to Section 6.0 of the Supplement for a detailed discussion of the method of selecting personnel for the sample. Section 3.1 provides a profile of personnel surveyed by region, occupational category, G.S. rating, and



educational level. Shipments of the questionnaire to each facility were accompanied by copies of FAA Notice MS 1750.4 and an attached list of the individuals to be surveyed. A total of 92 percent of the questionnaires distributed were completed and returned to North American Aviation's Space and Information Systems Division in Downey, California.

2.3 PHASE III - IN-DEPTH INTERVIEWS OF SELECTED PROFESSIONAL FAA PERSONNEL

Phase III was concerned with the in-depth interview (Section 6.0, Supplement) of selected members of the FAA professional staff. A prerequisite to the conducting of interviews was the detailed development of an interview guide based on a set of pertinent subject matter topics. The approved topics included the analysis of information requirements and information services, and suggestions for improvements in information services. Questions pertaining to the topics were developed independently of the questionnaire survey set. In most cases, the questions were designed to be of a leading type so as to provide maximum latitude to the respondent for giving his opinion.

Simultaneous with the development of the topics, two lists of professional personnel were developed for interviewing. One list consisted of 17 top-management personnel at the Administrator-Regional Director level; the other list included 63 top-level professional staff personnel. For each individual named on the lists, an alternate was also selected by name. The lists were reviewed and approved by Mr. Eugene Kennedy, FAA, the contributing officer's technical representative.

S&ID developed two interview guides: one for interviewing Administrator/Director personnel; the other for interviewing professional staff personnel (Appendix A). The Administrator/Director Interview Guide was comprised of two parts consisting of questions designed to elicit data on the respondent's background, and his opinions about an integrated information system, kinds of information, reports required by his staff, and future information requirements. The In-Depth Interview Guide for professional staff personnel consisted of four parts: Part I contained the questions included in the Administrator/Director Interview Guide for respondent classification. Parts II, III, and IV consisted of questions covering the approved interview topics. Questions concerning analysis of information requirements elicited information about the types of tasks undertaken by FAA professional personnel, kinds of information required to accomplish these tasks, and the sources from which this information is sought. Questions in the Analysis of Information Services part of the guide were directed toward determining what services are available, how they are provided, frequency of use, and reasons for not



using a given type of service. The part pertaining to suggestions for improvements in information services was intended to disclose the value of various types of services, kinds of information desired, preferences in media and format, and opinion on how technical information services could be improved.

Interviews of personnel in the Western Region offices served as a pilot sample. The success of these interviews resulted in no significant changes to the interview guides.

No particular problem was encountered in conducting the remainder of the interviews. There were a total of 76 out of a possible 80 interviews conducted for an overall response of 95 percent.

Information elicited by the interviews was interpreted and categorized by nature of task, type of information, and kind of information service. The data were further analyzed in terms of the proportions of personnel from each functional area of the Agency included in the interview sample.

2.4 PHASE IV - FINAL ANALYSIS AND PREPARATION OF RECOMMENDATIONS

The final analysis was conducted to determine exactly the scientific and technical information requirements of personnel within the FAA. In addition, analysis of use of present library services, technical information services improvements, and information acquisition patterns was considered. The analysis was intended to reveal for each of these aspects, the current status, reasons for the status, and what is desired to meet present and future requirements of the users. All data collected through the survey were used in this analysis.

The operating personnel questionnaire survey provided the largest body of data. Automatic data processing was used to derive correlations between variables and provide reduced data for generation of tables and histograms which reflected patterns of responses to key questions. The compiled narrative replies were analyzed further in terms of such sample characteristics as location, area of functional responsibility, and education.

The analyzed operating personnel, professional staff, management personnel, and library services data were analyzed collectively to determine present and projected library services, availability of facilities with respect to user requirements, information-use patterns of FAA personnel, and general problem areas in the acquisition of information by Agency personnel.

Recommendations for an improved library service were developed from evaluation of the analyzed data. The basis upon which these



recommendations evolved were: benefit to present users, compatibility with projected future information requirements, and professional development of Agency personnel.

2.5 PHASE V - PRESENTATION OF RESULTS AND RECOMMENDATIONS IN FINAL REPORT

The survey results and recommendations are presented in a one-volume Summary and a Supplement. The Summary volume includes a broad overview of the survey of FAA technical information requirements, detailed interpretation of the data collected through the survey, and recommendations for an improved technical information system in the Agency. The Supplement consists of a detailed presentation of the reduced data that were collected through questionnaire surveys of library services, operating personnel, and in-depth interviews of professional staff and top-management personnel. This analysis is further supported by an Appendix composed of statistical tables and graphs pertinent to questions and topics comprising the questionnaires and interview guides.

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3. PRESENTATION OF RESULTS



3. PRESENTATION OF RESULTS

This Section is divided into five major parts. Section 3.1 presents the profile of the distribution of respondent attributes such as occupational category and G.S. rating. Section 3.2 provides the distribution of responses to the questions about technical information use—it is the Agency profile of the composite respondent. Section 3.3 correlates those two profiles and shows the significant differences in technical information use as determined by the respondent attributes. Section 3.4 consists of a brief discussion of the statistical analyses used, and Section 3.5 presents the results of the library inventory.

3.1 PROFILE OF SURVEYED PERSONNEL

The total response to the FAA User-Needs Survey questionnaire consists of 3544 returned survey booklets. Of these, 373 represent data from the preliminary sample survey.

The distribution of the composite total of 3544 responses is shown across the various user attributes about which data were obtained. Percentages given are the percent of the total response assigned to a given attribute by region and special facility:

1. Response by region:

- Eastern Region, 16 percent
- Southern Region, 10 percent
- Southwestern Region, 9 percent
- Central Region, 13 percent
- Western Region, 14 percent
- Alaskan Region, 3 percent
- Pacific Region, 3 percent
- Aeronautical Center, 16 percent
- NAFEC, 4 percent
- Office of Assistant Administrator:
 - Europe, Africa and Middle East, 1 percent
- FAA Headquarters, 18 percent

2. Response by occupational categories:

- Administrative, 19 percent
- Civil Engineering, 3 percent



Electronic Engineering, 9 percent
Aerospace Engineering, 3 percent
Airways Engineering, 3 percent
Aircraft Operation, 3 percent
Flight Standards Inspector, 11 percent
Electronic Technician, 21 percent
Air Traffic Control, 22 percent
Other, 7 percent

3. Sixteen percent were FAA management levels 1, 2, or 3.
4. One-third held pilot licenses
5. G.S. ratings were distributed as follows:

GS7, 3 percent
GS8, 3 percent
GS9, 12 percent
GS10, 3 percent
GS11, 19 percent
GS12, 15 percent
GS13, 14 percent
GS14, 15 percent
GS15, 12 percent
GS16, 2 percent
GS17, 1 percent

Eight respondents were GS18, or above.

6. Response by education level attained:

High school diploma, 58 percent
B.S., 14 percent
B.A., 3 percent
M.S., 2 percent
M.A., 1 percent
Ph.D., 1 percent
L.L.B., 2 percent
Ed. D., 0 percent
M.D., 1 percent
Other, or no answer, 18 percent

3.2 AGENCY PROFILE OF RESPONSES

The Agency-wide distribution of responses to the questionnaire provides an indication of the average opinion of personnel surveyed and provides a departure point from which to discover significant differences from the average.



A summary of the key responses is given below:

- | | |
|---|--------------|
| 1. Familiar with FAA library system | 51% |
| 2. Use the library system | 39% |
| 3. Do not require use of the library system | 13% |
| 4. Use section on division collections | 49% |
| 5. Have a personal library at work | 78% |
| 6. Size of personal library (average) | 34 documents |
| 7. Have difficulty using FAA library facilities
(mostly because of inconvenient location
(15 percent) or lack of information about
how to use the facility (19 percent). | 41% |
| 8. Lack of library created a problem in
performance | 25% |

The subject areas of most interest are Electronics, Air Traffic Control, Aviation Safety, Communications Systems, and Radar. (See Reference Chart 10). Note that all charts show the geographical distribution and the occupational distribution. Geographical distribution codes are:

E - Eastern Region
S - Southern Region
SW - Southwestern Region
C - Central Region
W - Western Region
A - Alaskan Region
P - Pacific Region
AC - Aeronautical Center
Hdq - FAA Headquarters

The average respondent has a primary and immediate need for information about the library system, how to use it, and what it contains. The most frequently stated "need for library services" are for an employee's handbook describing library services and facilities, with 56 percent of those surveyed ranking it most important; or, for a brochure describing information available through the library. (See Reference Chart 8.)



Most respondents did not indicate outstanding needs for additional library services or materials. The most often stated unfilled needs for library materials consisted of the following:

1. Scientific and technical periodicals, 4%
2. SRDS technical reports, 3%
3. Technical reports, 3%
4. Textbooks and other books, 3%
5. Speeches by FAA management, 3%
6. Library Organization Bulletin, 3%
7. Commercial atlases, 3%
8. Nontechnical periodicals, 3%
9. Proceedings of technical meetings, 2%
10. Legislative and congressional materials, 2%

(See Reference Chart 4.)

The most often stated unfulfilled needs for library services consisted of the following:

1. Reference and research services, 8%
2. Termatrix system, 6%
3. Motion Picture Films, 5%
4. Bibliographic services, 4%
5. Interlibrary loan services, 4%
6. Microfilms and readers, 4%

(See Reference Chart 8.)



The most important sources of information to the average respondent were:

	Average Times Referenced per Month
1. Personal collection	5.0
2. Fellow employee	3.1
3. Manufacturer's data	3.0
4. FAA nonlibrary source	2.3
5. Government Printing Office	1.2
6. FAA Regional or Special Facility Library	1.0
7. Air Force	0.6
8. FAA Washington Headquarters Library	0.6

To simplify statistical analysis, the question concerning the use and requirement for specific documents was broken down into four categories of documents as follows:

1. The "Universal references" assumed to be of universal interest and likely to be found in every FAA facility include dictionaries and handbooks, textbooks, procedures and policies manuals, FAA Training Manuals, and FAA Directives.
2. "Special references" of interest primarily to specialists. They are commercial atlases, medical and legal publications, legislative materials, and vendor catalogs.
3. "Indexes" used to research information, including all abstracts, bibliographies, and report listings.
4. "Periodicals" or items of transient value. These include all periodicals, reports, and speeches.



The suggested best locations for each of the categories were distributed as follows:

	Private Collection	Region or Facility Library	Headquarters	All Libraries
Universal References	40%	30%	7%	23%
Special References	19%	39%	16%	26%
Indexes	6%	41%	32%	21%
Periodicals and Reports	15%	40%	22%	23%
(Reference Chart 6)				

3.3 CORRELATION OF PROFILES

The determination of differences in the response profile due to variations in the personnel profiles was one of the key objectives of the survey. It was used to determine who uses what library services, who needs what library services, and what the future development of the library system should be.

Two basic approaches were used. If the personnel attribute could be quantified (assigned a meaningful number such as G.S. level), it was then correlated both in its relation to the response profile attributes and the other personnel profile attributes by computing a statistical correlation matrix. If the personnel attribute could not be meaningfully quantified (such as region of assignment), it was treated as one of a strata and analyzed in its relationship to other strata. These methods are discussed in more detail in Section 3.5, with only results of the analyses being presented here.

Some of the more significant correlations derived from the survey, are shown in Figure 3-1. Each symbol represents the correlation between two variables. For example, the symbol + in the upper left corner represents the correlation between row 1, (Do you use library?) and row 2, "Amount of use." The sign, + or -, signifies positive or negative correlation. Circled intersections indicate a correlation of greater than 0.224 which is the level at which more than 5 percent of the variation in one variable can be determined by the variation in the other variable. Uncircled intersections indicate correlations between 0.035 and 0.224. A correlation of 0.035 gives evidence of some linear relationship between the variables with a significance level of 0.95.



1	2	3	4	5	6	7	8	9	10	
⊕	+	+	-			+	+	+	+	1 Do you use the FAA library system?
⊕	⊕	-	-	⊕	⊕	⊕	⊕			2 Amount of use of system
	⊕	⊖	-	+	+	⊕	+			3 Items in personal library
		⊖	-	⊕	+	⊕	+			4 Familiarity with library
				⊕	-	-				5 Difficulty in using
					+	+	-	+		6 Performance affected by lack of library
						+	+	⊕		7 Manager
							+	+		8 Engineer
								+		9 G.S. Rating
										10 Formal education

Figure 3-1. Subset of Correlation Matrix

3.3.1 Library Usage

Several survey questions were related to technical data use, both within and outside of the FAA library system. A significantly high inter-correlation was found among the responses to these questions. (See Reference Chart 11.) Frequent users of one type of material or source of information tend to be frequent users of all types of material and sources of information.

Most significant determinants of library use were:

1. The availability of a regional or special facility library. Use of these libraries is shown on Figure 3-2. It indicates that readily available facilities, such as those at the special facilities and the Southern, Alaskan, and Pacific Regions, are used by nearly 50 percent of the personnel assigned to these regions. When facilities are not readily available, as in the other regions, the survey showed that only about 23 percent of the personnel used any FAA library. Total use of non-FAA library services was largely independent of the region of assignment. There also appears to be a possible correlation between the maturity of the library facility and the amount of its use.

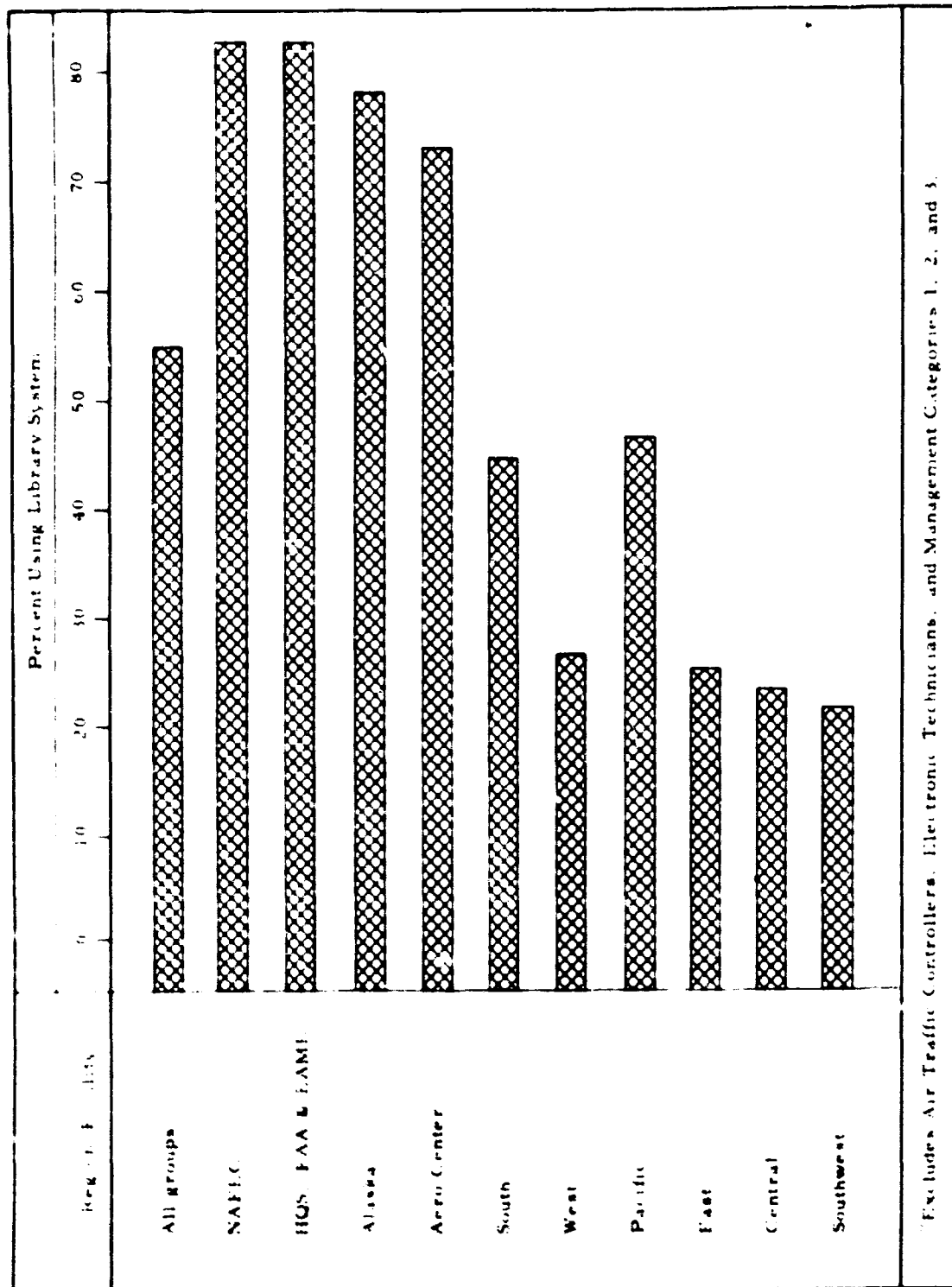


Figure 3-2. FAA Library System Use - Region/Facility



2. Air Traffic Controllers and Electronic Technicians use the library significantly less than persons in other occupational categories (as indicated by a correlation of -0.1 with library use). Engineers and managers use technical reports slightly, but not significantly more than the average. (Figure 3-3.)
3. Education, G. S. level, and familiarity with the library are factors that are positively correlated with library use.
4. Special facilities (Headquarters, NAFEC and Aeronautical Center) use library services significantly more than regions (correlation of 0.1). This apparent effect is compounded with library availability (see item 1. above), and the reason for the differences cannot be completely isolated; that is, the reason cannot be completely determined how much of the use is because of library availability and how much because of differences in mission and personnel between the regions and the special facilities.
5. Individual use of library services is primarily a matter of individual rather than class differences. While there are significant differences in the use distributions for the factors discussed above, they account for less than 70 percent of the variation in library use by individuals. It is possible to predict aggregate usage with considerably validity. Individual usage cannot be reliably predicted, at least not from the factors evaluated in this survey. (See Reference Chart 11 and the discussion of regression analysis in Section 3.5.)

The use of all FAA library services, as averaged over all respondents in response to Survey Question 15, is 7 times a month plus $4\frac{1}{2}$ uses of instruction books and manuals (Chart 8).

Other average monthly uses reported were:

- 16.8 - Personal sources (FAA nonlibrary sources, public libraries, Government Printing Office, personal library, fellow employees)
- 1.6 - FAA regional, special facility, or headquarters libraries.
- 6.6 - Use of outside sources
- 35.9 - Use of "universal references"
- 8.7 - Use of "special references"
- 13.5 - Use of "periodicals"
- 2.8 - Use of "indexes"

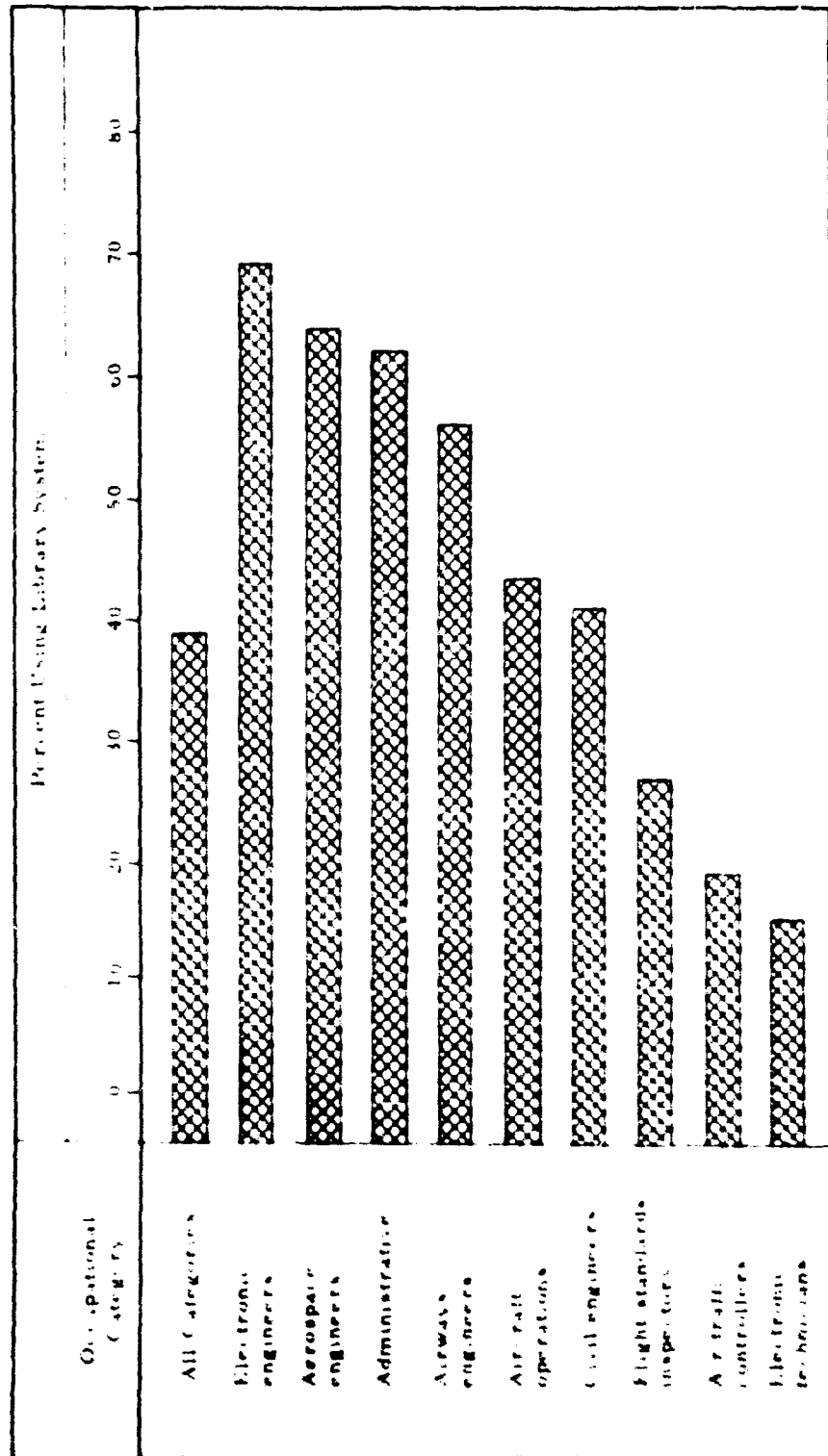


Figure 3-3. FAA Library System Use - Occupational Category



The heaviest uses of FAA library services are:

- | | |
|--------------------------------------|-----|
| 1. FAA instruction books and manuals | 46% |
| 2. FAA technical reports | 36% |
| 3. FAA specifications | 29% |
| 4. Reference and research services | 27% |
| 5. Military specifications and TO's | 24% |

(Chart 8.)

The heaviest uses of specific document types are:

- | | |
|---|-----|
| 1. Dictionaries and handbooks | 90% |
| 2. FAA directives | 89% |
| 3. Procedures and policies manuals | 79% |
| 4. FAA training manuals | 75% |
| 5. Textbooks | 71% |
| 6. Scientific and technical periodicals | 58% |
| 7. Personnel classification standards | 55% |
| 8. Technical reports | 53% |

(Chart 3.)

3.3.2 Problems in Library Use.

Forty-one percent of the respondents reported difficulty in using FAA library facilities, and 25 percent stated they felt that the lack of an adequate facility at their office created a performance problem.

Special facilities personnel and managers reported less difficulty than the average respondent. Air Traffic Controllers and Electronic Technicians reported more. Greatest difficulties were lack of information about how to use the library (reported as a difficulty by nearly one-third of the Air Traffic Controllers and Electronic Technicians) and inconvenient location of library facilities (reported by 26 percent of Flight Standards Inspectors).



22 percent of Air Traffic Controllers and Electronic Technicians, and 26 percent of the personnel in regions with no regional library facilities. Misunderstanding of requests to the library or loss of requests were almost never a problem.

Relative importance of the library to various occupational categories may be deduced from the percentage of respondents stating that they do not use the library because they do not need it. The occupations and percentages are:

Electronic Engineers	6	Managers	12
Aerospace Engineers	7	Administrative	15
Airways Engineers	7	Flight Standards Inspectors	16
Civil Engineers	9	Air Traffic Controllers	16
Electronic Technicians	10	Aircraft Operations	17

The average respondent reported in Question 15 that some needed library service was unavailable to him an average of eight times per year. Nonavailability of documents was reported (in times per month) as:

Universal references	0.25
Special references	1.45
Periodicals	2.33
Indexes	3.28

The greatest specific unfilled document needs were for scientific and technical periodicals and technical reports for the average user, and indexes and abstracts by managers.

A strong relationship exists between difficulty of use and lack of use, as reported by the regions and special facilities and as indicated below:

		Lack of Use (Percent)	Difficulty Using (Percent)
Frequent Users:	NAFEC	15	14
	HQ	17	10
	Alaska	20	23
	Aero. Center	24	25



		Lack of Use (Percent)	Difficulty Using (Percent)
Moderate users:	Pacific	54	30
	South	55	34
Light users:	West	74	52
	East	74	48
	Central	76	50
	S. West	76	57

The light users (those without libraries) all reported "inconvenience of library location" as their most common reason for not using the library system or for their difficulty in using it. The second most common reason was lack of familiarity with the system, again reported by all light users as a reason for both nonuse and difficulty of use.

Figures 3-4 and 3-5 show the stated unfilled needs for several types of data and service.

Problems associated with library use are related both to library services and to information presentation services. Presently, there are many FAA libraries outside of the formal system. They are the multitudinous personal collections, small section, branch, or division collections, and the information retrieval systems provided by personal contact with fellow employees. Local, non-FAA libraries and the Government Printing Office are sometimes used as sources of scientific and technical information when more convenient data sources are not available.

Services that could be provided by the FAA library system to satisfy the needs of the greatest part of the FAA technical, scientific, and management population fall into two groups. The first, and most requested, services are in the group that can be categorized as "informing the user about the library system." The second most desired service deals with providing specific information to the individual about library materials he should know about, either on request or as part of a current awareness service. The term "current awareness" means a system that has on file a technical information interest profile on each user and utilizes this profile to identify new information that may be of interest to him. A bibliographic entry, including a short abstract, is then routed to the individual for his reference.



Type of Data	With Library (Percent)	Without Library (Percent)
FAA technical reports	2.3	10.8
FAA instruction books and manuals	3.1	17.0
Medical data	1.1	2.2
Legal data	1.9	5.9
FAA specifications	2.4	8.4
Mil specs, TO's and standards	3.8	9.9

Figure 3-4. Data Not Available But Needed
(Region/Facility Responses)

Type of Service	With Library (Percent)	Without Library (Percent)
Bibliographies	2.2	6.4
Reference and research	3.3	13.6
Interlibrary loan	1.6	5.7
Motion pictures	2.6	6.3
Microfilm	1.9	6.5
Termatrix	3.2	10.0

Figure 3-5. Services Not Available But Needed
(Region/Facility Responses)



Managers tend to be more interested in the service dealing with information about library materials than is the average user. (Figure 3-6.) The top five services needed are the same but the order is different:

	Management Preference	Average Preference
Quick access to data to avoid duplication of effort	1	5
Employees handbook of library services	2	1
Current awareness service	3	4
Brochure describing information available from library	4	2
More rapid processing of requests	5	3

Figure 3-6. Breakdown of Services

When awareness service is specifically pursued in Interview Question 47, there is a strong feeling that "current awareness" service would be of value. In fact, 71 percent of top management rated "awareness service" of potential value, while only 44 percent of top management felt that way about acquisition lists.

The potential use of microfilm or microfiche was investigated in the interviews; it was found that management was relatively unenthusiastic about their use. They preferred hard copy because it is more convenient. However, of those who did not indicate an interest in microfilm or microfiche, 60 percent had never used it.

3.3.3 Subject Areas

Interest in specific subject areas is, not surprisingly, highly correlated with occupational category. It is interesting to note that managers tended to have broader interests and to be significantly more interested in general topics such as transportation than the average respondent, who was interested primarily in more specific types, such as radar. Chart 10 provides a complete description of the distribution of interests over each region, special facility, and occupational category. Note that in this



question respondents were asked to note the three subject areas of most importance to them. Thus, each column adds up to approximately 300 percent, because some respondents checked more or less than three subject areas.

Figure 3-7 illustrates a summary of the ordering of the subject areas of most interest.

3.3.4 Sources of Technical Information

Chart 7 shows the distribution of sources of information in terms of the percent of respondents using each source. Figure 3-8 presents the use of libraries in terms of the distributions of amount of use.

The primary source of technical data is "FAA nonlibrary" (74 percent). There is a statistically significant difference between those locations with and without libraries in their use of library services. On the average, the special facilities use the library as a source of data 12 percent of the time (for 12 percent of all information requirements) with approximately 2.4 inquiries per month per respondent. Those regions with libraries use the library 7 percent of the time with approximately 1.4 inquiries per month per respondent. Regions without libraries use the library 3 percent of the time with 0.6 inquiries per month. In summary, the presence of a regional library doubles the use that is made of the FAA library as a source of information.

In all regions and special facilities, the use of Government sources and public and university libraries is relatively constant. Less use of FAA library facilities is compensated for by more use of FAA nonlibrary sources.

Question 19 analyzed the non-library sources. The predominant non-library source is at the regional, district, or facility offices. Three division offices are the principal sources. They are Air Traffic Service, Systems Maintenance Service, and Flight Standards Service. The Flight Standards Service is significantly more important to the special facilities personnel, and the other two are significantly more important to the regional personnel.

In conclusion, the data acquired from this question suggest a particular library system. The 3-percent usage of FAA library facilities, noticeable regardless of whether a regional library is present or not, suggests some data that might be stored in one centralized location. The added 3- or 4-percent usage (from 4 percent without to 7 percent with a library), notable in the three regions with a library, indicates that a librarian performs a notable service for a regional facility. Based on the responses to Survey Question 16 and assuming that the estimates of library usage were not overstated, the potential library usage in those regions presently without



Subject Area	Region/Facility								HQS FAA & AEME
	East	South	SW	Central	West	Alaska	Pacific	Aero Center	NAFEC
Air traffic control	2				6		3T		3
Aircraft and flight equipment	3	3	3T	4	3	3		4T	4
Aircraft maintenance		6	6	6					
Airports	4	5		5					
Aviation medicine								6	
Aviation safety	1	1	1	1	1	2	2	2	5
Communication systems					5	4	3T		6
Computers and data processing systems								4T	2
Electronics	6	4	2	2	4	5T	6	1	1
Human engineering			5				3T		
Management engineering	5	2	3T	3	2	1	1		4
Economics						5T			
Statistics								3	
NOTE: Numbers indicate order of preference from lowest to highest									
T tie									

Figure 3-7. Subject Area Preferences - Region Facility



	Regions With Libraries	Regions Without Libraries	Special Facilities	ATC's	Managers
FAA - Non-library	14.4	15.5	14.1	9.9	14.3
FAA-Library	1.4	.6	2.4	1.1	2.1
Public and university libraries	.7	1.0	.6	.7	.7
Government sources	3.0	3.1	3.0	3.4	3.3
Total	19.5	20.2	20.1	15.1	20.4

Figure 3-8. Usage of Information Sources
Average Monthly Use per Respondent



libraries would indicate an average of 50 calls for information per day in each region. Similarly, based on the estimated 3-percent usage response of the survey (which represents approximately 10 percent of the FAA personnel) an Eastern Region librarian would have approximately 930 calls for information per month or 42 per day (22-day month). To evaluate the need for a librarian, it is necessary that this volume of activity be weighed along with a librarian's other activities, which include acquiring new data, cataloging, abstracting, filing, routing control, and aiding persons unfamiliar with the library and its services.

Other sources include Government agency sources and public and university library sources, excluding the FAA.

The general categories of other sources are consulted the same percentage of times (15 percent for government sources and 4 percent for public and university library) regardless of the presence of an FAA library within the region or special facility. Furthermore, management and non-management alike maintain the same source-use ratios. The only noticeable deviation from this pattern is that Electronic Technicians use the general category of Government sources significantly less than average, and Air Traffic Controllers use Government sources considerably more than the average.

However, with the Government sources there are some significant variations in information source patterns. The special facilities make noticeable use of DDC, while the regions make little use of it. Everyone uses the Government Printing Office as his main outside source, but the regions use it twice as often, in terms of percentage, as the special facilities do. The Alaskan and Pacific Regions use the Government Printing Office less often than the special facilities.

There are some other unique patterns, probably related to source availability of data. For example, the Pacific Region has a significantly higher use of the Air Force and Navy as a source. Another unique pattern is that the Eastern, Central, and Western Regions use the Air Force much less than the average, and Headquarters uses the Navy and Army more often than the average. The Electronic Technicians use the Government Printing Office as seldom as the special facilities do and they make an extraordinarily high use of the Air Force as a source of information.

Use of outside sources is relatively unaffected by the presence or absence of a local library. As an example, the regions with libraries use public and university libraries 4 percent of the time and other government sources 15 percent of the time for a total of 19 percent outside source usage. The regions without libraries use outside libraries 5 percent of the time and other government sources 15 percent of the time for a total of 20 percent outside source usage.



3.4 STATISTICAL ANALYSIS

The returned survey booklets were processed through a series of data reduction steps designed to reduce the responses to comprehensible summarized forms. Automatic data processing methods were employed on all non-narrative response summarizations. A computer program was developed to take the responses, as keypunched directly from the survey booklets, and aggregate these responses over any subset of the total response. Other programs computed intercorrelations between all quantifiable variables and, together with a regression analysis, were used to analyze the internal structure of the replies.

Twenty-one basic subsets of user responses were summarized for comparison. These included each Region, Aeronautical Center, NAFEC, Headquarters, each occupational category, all managers, and a composite total response, which included the sample survey results. These breakouts are presented in detail in a series of charts in Section 3.3. The computer program requires approximately 15 minutes of IBM 7094 computer time to summarize the total response into a group of mutually exclusive, presorted subsets. Overlapping subsets require separate computer runs.

A correlation matrix was developed to show some of the structure of replies not evident from summarized data. We will now consider a simplified example to see how this approach works. Two questions, A and B, are answered by "yes" or "no" replies. A summary may show that 50 percent of the replies to question A are "yes" and 30 percent are "yes" to question B. However, the internal distribution of the replies is unknown. It may be, for example, any of the following:

Case	A	B	Yes	No	Total
A, yes, B, yes	0	0	20	30	23
A, yes, B, no	0	0	20	20	27
A, no, B, yes	0	0	20	20	28
A, no, B, no	50	0	20	30	22

These patterns may be summarized by the correlation between the A and B answers. The correlations are, respectively, 1.0, -1.0, 0, 0.2, and -0.1. The statistical significance of these correlations is dependent upon the number of sample points. With this survey sample, a correlation of greater than 0.035 in absolute value has a statistical significance level of over 0.95.



PERSONNEL SURVEYED BY QUESTIONNAIRE,
EDUCATION AND G. S. LEVEL DISTRIBUTION (PERCENT)

[illegible]

CHAMBER

GENERAL USAGE PROFILES

100



INFORMATION INTEREST REGISTER
(USERS)

CARET (%)	FAA										Admin	Civil Eng	Elect Eng	Aeron Eng	Aero Eng	All Eng	All Support
	1	5	10	C	A	A	P	AL	NAFEC	MAA							
Continuation and Handouts	95	90	92	30	91	91	91	88	90	83	88	88	90	92	92	91	92
Continental Airline	44	43	53	19	54	48	44	2	29	38	38	48	41	48	42	48	25
Continental Airlines	7	7	16	9	14	6	4	73	5	2	1	1	5	5	1	15	11
Continental Airlines	20	20	25	24	33	28	3	8	26	20	32	27	13	6	13	32	30
Continental Airlines	74	74	75	76	77	77	77	77	83	77	82	81	82	82	82	82	82
Continental Airlines	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Continental Airlines	50	47	45	41	49	58	6	39	5	44	52	56	42	37	48	45	37
Continental Airlines	37	38	45	40	41	44	44	35	50	40	34	41	40	53	55	33	30
Continental Airlines	24	22	27	28	33	48	38	3	2	31	43	38	15	28	22	27	21
Continental Airlines	48	47	48	43	42	47	45	19	78	82	31	38	87	88	78	67	32
Continental Airlines	21	24	37	35	40	37	50	35	48	37	37	73	76	51	63	38	13
Continental Airlines	11	14	6	6	20	6	13	20	10	2	9	14	7	13	3	15	3
Continental Airlines	31	40	44	38	42	47	35	37	64	48	37	59	73	58	66	34	22
Continental Airlines	97	87	87	88	9	85	13	64	48	80	88	73	60	81	81	89	79
Continental Airlines	78	74	58	76	71	68	51	51	78	58	58	54	60	51	49	68	57
Continental Airlines	61	69	61	61	68	62	66	71	58	68	68	67	64	60	69	73	67
Continental Airlines	58	58	55	64	57	57	53	53	52	54	57	51	51	48	52	60	59
Continental Airlines	2	20	2	2	2	2	2	15	25	21	21	25	24	20	20	2	13
Continental Airlines	11	14	8	11	9	40	2	22	47	43	29	26	39	41	43	2	14
Continental Airlines	7	7	7	7	7	7	7	7	7	7	9	9	9	9	9	7	6
Continental Airlines	3	5	3	6	9	16	6	8	7	8	3	4	5	2	2	2	2
Continental Airlines	3	3	3	3	3	3	3	3	3	3	4	6	8	13	4	4	3
Continental Airlines	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Continental Airlines	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Continental Airlines	25	25	25	25	25	25	25	25	25	25	19	29	32	27	32	20	15
Continental Airlines	16	8	23	18	21	15	2	20	35	26	17	23	31	27	28	18	13
Continental Airlines	49	45	45	42	45	44	2	21	40	50	46	46	46	47	46	46	43



INFORMATION INTEREST REGISTER
(UNCLASSIFIED)

NO.	DATE	NAME	ADDRESS	PHONE	TELETYPE	TELEFAX	TELEVISION	RADIO	MAILING	OTHER
1	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
2	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
3	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
4	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
5	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
6	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
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21	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
22	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
23	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
24	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
25	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
26	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
27	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
28	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
29	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
30	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
31	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
32	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
33	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
34	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
35	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
36	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
37	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
38	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
39	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
40	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
41	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
42	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
43	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
44	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
45	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
46	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
47	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
48	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
49	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						
50	10/25/68	JOHN J. HARRIS	1000 17th St. N.W.	202-462-1000						



INFORMATION INTEREST REGISTER
(PREFERRED LOCATION)

[illegible]

A = All
W = Washington
RC = Region Centre
P = Private

CHART 6



TECHNICAL INFORMATION SOURCES (QUESTIONS 16 & 17)

PERCENT USING	REGIONS										SPECIAL FACILITIES					OCCUPATIONAL CATEGORIES										TOT
	E	S	SW	C	W	A	P	AC	N	Hq	Ad	CE	EE	AE	AO	FST	ET	ATC	MGR							
NASA	8	7	11	3	9	3	10	9	25	12	8	6	6	51	8	10	5	1	3	13	8					
FAA non-library source (if used, answer questions 18 through 21)	44	41	44	41	38	45	33	33	29	35	32	45	43	26	47	42	35	36	31	36	34					
Office of Technical Services (OTS)	9	8	5	4	8	5	5	7	7	7	5	6	8	13	9	8	5	5	4	6	4					
FAA Regional or Center Library	21	41	15	16	13	50	52	51	47	2	22	17	35	19	73	18	12	12	21	28	20					
FAA Washington HQ Library	9	3	7	8	5	5	4	11	16	69	31	22	30	42	25	16	8	2	5	36	16					
Defense Documentation Center (formerly ASTIA, now DDC)	1	3	3	8	4	0	3	15	35	11	3	2	15	23	7	3	1	1	2	8	5					
Army	10	10	12	7	8	11	11	7	13	12	9	16	8	9	8	14	6	2	10	14	10					
Air Force	22	21	20	15	21	32	27	30	28	25	22	24	28	28	16	34	18	16	23	28	22					
Navy	14	12	12	4	11	10	19	13	19	20	13	13	16	20	8	27	9	6	12	17	13					
National Bureau of Standards	9	8	6	4	10	9	13	15	20	9	10	8	11	14	10	6	10	3	7	11	9					
Department of State library facilities	0	3	4	1	1	0	7	2	0	1	3	0	0	0	0	1	1	1	0	2	1					
Library of Congress	0	2	2	0	0	2	3	9	2	7	4	4	1	3	0	2	1	1	0	3	3					
University library facilities	8	8	16	13	11	2	7	21	5	6	8	18	9	7	9	4	4	5	3	8	8					
Public library facilities	36	23	30	33	37	35	36	25	18	17	28	44	30	17	39	26	23	32	27	29	28					
Government Printing Office	46	35	34	33	44	30	33	37	40	23	30	32	29	24	34	42	49	21	38	29	32					
Fellow employee	45	66	68	68	73	68	71	72	74	68	64	83	79	81	80	68	68	75	57	69	64					
Manufacturer (catalogs, manuals, house organs, etc.)	69	67	76	54	80	79	61	73	84	59	57	91	85	83	81	66	76	85	33	63	59					
Your personal collection of publications	87	85	81	82	88	84	80	81	87	78	77	77	91	86	89	78	86	83	66	84	75					
Average number of personal items	13.2	8.6	11.7	10.9	12.0	6.6	12.3	16.0	17.8	9.3	10.3	13.6	13.7	8.5	15.1	10.1	12.1	11.1	5.3	11.6	8.8					
Technical Books (Non-FAA)	9.4	6.0	9.8	6.6	9.4	8.3	7.8	11.7	14.5	10.6	7.8	9.1	10.0	14.5	10.8	8.0	4.5	6.0	9.0	8.8	8.8					
Technical Reports (Non-FAA)	6.8	4.2	17.5	6.5	8.2	5.9	7.2	10.7	10.4	6.8	6.5	5.8	8.7	5.3	7.8	4.3	7.2	4.8	3.5	4.8	4.8					
Journals (Non-FAA)	22.4	20.7	20.2	16.9	16.0	16.9	15.6	12.4	14.9	14.8	12.5	18.4	15.3	18.1	13.0	16.9	23.3	12.5	10.3	19.8	15.8					
FAA Publications																										

CHART 7

%	E		S		SW		C		W		A		P		AC		NAF	
	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need
15. USERS OF:																		
Bibliography services	3	4	7	6	9	9	6	7	2	7	15	3	1	16	42	1		
Reference and research services	12	8	35	6	7	21	11	13	14	16	42	35	6	46	2	76		
Intra-library loan services	5	3	12	5	8	11	9	5	7	6	25	3	4	3	0	4		
FAA technical reports	36	3	45	8	40	18	31	13	40	40	2	4	4	46	76			
FAA instruction books and manuals	52	5	50	8	43	15	38	9	51	12	45	5	47	50	2	63		
Motion picture films	22	4	25	2	19	12	19	8	18	8	20	8	5	6	24	1	6	
Microfilm and readers	0	4	6	5	4	10	5	8	5	6	2	2	4	14	0	10		
Termatrix system for a subject approach to FAA publications, R&D reports, and other scientific and technical publications	8	7	17	7	12	4	6	15	9	12	3	1	13	6	13	3	34	
Medical data	7	2	6	3	12	5	3	1	6	2	4	1	9	0	10	0	8	
Legal data	13	5	24	5	9	9	7	5	19	6	13	5	7	5	1	6		
FAA specifications	34	6	36	6	40	11	31	7	49	9	30	5	36	4	36	1	53	
Military specifications, TO's and standards	22	5	22	9	24	3	23	9	31	14	19	7	33	6	34	3	49	
ITEMS INCLUDED IN LIST OF THREE MOST IMPORTANT SERVICES DESIRED																		
33. Service for giving abstracts of articles, books, etc., by telephone	11		8		15		9		9		12		6		9		14	
Employee's handbook which describes library services and facilities more completely	56		54		46		51		53		46				38		31	
Brochure which describes the technical and scientific information available through the library	52		51		54		55		60		51		51		44			
Expand the scope of coverage to include more technical disciplines	6		13		9		6		10		6		4		14			
Greater detailed coverage within technical areas	13		18		14		14		15		22		17		27			
More rapid processing of requests and transmitting the information to the user	10		8		12		17		5		5		7		11			
A listing of book and periodical titles	39		32		28		36		35		31		27		29			
Quick access to information to determine whether work you are planning has been developed or worked upon previously	29		36		40		28		29		34		37		35			
Translations of foreign publications	1		4		4		2		2		2		0		7			
Periodic issuance of lists of experts in technical fields whom you may contact to obtain information	14		12		7		7		16		20		6		16			
A current awareness service which would provide automatic notification of literature of interest to you	38		27		27		36		25		44		42		35			
List any other future service which you consider to be important which is not listed above and note it with them in the box at the right	3		7		8		7		10		17		4		8			
TOTAL RESPONSE	210		126		112		174		198		60		70		184			

As an example of how to read the table: 11% of the respondents in the Eastern Region listed item 1, "Service for giving abstracts of articles, books, etc., by telephone" as one of the 3 most important.



SURVEY QUESTIONS

(15 & 33)

P	AC		NAFEC		HDO		Admin		Civ Eng		El Eng		AEROS Eng		Air Eng		Air Ops		Flt Stand		Flt Insp		Flt		Air Traffic Cont		All MGRS		Composite Total		
	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	Use	Need	
11	1	10		42	0	25	2	18	3	10	8	14	3	26	7	19	0	5	2	4	0	2	6	3	5	20		10	4		
35	0	40	2	78	3	63	2	43	6	35	10	3	7	26	9	25	3	29	6	1	1	14	3	1	4	5	45	5	5	8	
14	2	3	0	41	0	29	1	20	1	1	4	18	4	3	7	19		9	4	1	5	3	1	4		24	2	2	4		
41	4	40		76	0	51		34	3	50	5	68	8	51	6	50	6	49	5	4	8	30	16	26		4	3	36	7		
49	7	50	2	63	2	44		40	4	50	12	60	6	36	5	45		6	5	51		53	9	63	7	41	3	46	6		
15	6	24		6	3	9	2	19	4	12	5	12	2	9	3	15	4	29	6	17	8		10	49	8	19	3	20	5		
4		14	0	16	2	2	2	4	2		8	5	4	8	3	0	3	5	2		4		5	9	6	5	3	5	4		
13	6	13	3	34	2	13	1	10	4	18	12	15	7	18	5	9	7	21	10	6	9		9	6		13	6		6		
9	10	16	0	8	2	9		10	4		4	0	1	6		4	0	7	4	9	2	3	3	5	7	6		6	2		
22	1			6	2	20		20	3	10	5	5	1	7		6		16	4	16		5	6	4	6	9	20	7	0	4	
38	4	36		53	3	33		25	3	56	13	50	7	38	2	40	8	48	5	4		36	18	6	29	3	29	0			
33	6	34	3	49	6	36	1	23	3	35	16	49	7	44	5	26	6	39	6	29	10	28	7	13	5	26	3	24	5		
16		9		14		19		17		12		10		19		7		6		10		4		5		17		10			
51		38		31		35		43		45		40		38		43		58		6		64		77		42		56			
51		44		34		35		36		62		52		52		50		63		49		72		60		40		55			
4		14		14		10		8		15		3		9						3		9		3							
10		27		28		19		13		21		30		26		16		9		14		22		4		15					
7		11		14		9		12		9		13				18		2		9		10		13		15					
21		29		20		73		29		35		27		29		27		27		36		35		41		26		33			
37		35		46		36		36		32		35		41		45		32		21		15		21		44		26			
0		7		0		4		3		4		0		0		1		1		1		1		1		3		3			
6		16		24		15		17		14		17		8		13		12		16		11		8		15		13			
42		35		32		37		39		29		32		40		33		34		27		26		35		42		33			
4		8		15		6		6		6		7		5		10		6				4		4		8		6			
70		184		66		368		587		77		240		86		21		82		312		666		637		501		3544			

Region listed
one of the 3

CHART 2



Chart 9. Ranking of Items Judged Important by Managers for
Inclusion in the FAA Information Retrieval System (FAIRS)
(Question 40)

	1	2	3	4	5	6	X
FAA technical reports and studies	18	23	14	9	8	5	2
Program data (management information of FAA programs such as cost, funding, schedule data, milestone achievements, etc.)	30	11	9	9	5	8	1
Non-FAA technical reports and publications, i.e., from NASA, DDC, etc.	3	4	5	6	8	7	9
FAA articles, speeches, and pamphlets	5	11	12	10	10	12	5
Non-FAA articles, speeches, and pamphlets	1	3	4	6	5	5	17
FAA technical orders, manuals, and specifications	20	14	12	11	8	5	3
Non-FAA technical orders, manuals, and specifications	2	4	8	6	6	6	9
FAA controlled engineering drawings	1	2	3	4	3	4	2
Audio-visual files (tapes, movies, recordings, and pictures)	3	7	6	10	8	9	
Books (monographic material)	3	4	7	7	8	7	6
Periodical articles	2	5	7	6	13	14	8
Technical information on-going or completed research by the FAA and other agencies	8	10	11	10	11	10	4

*"X" denotes ranking of least important items.

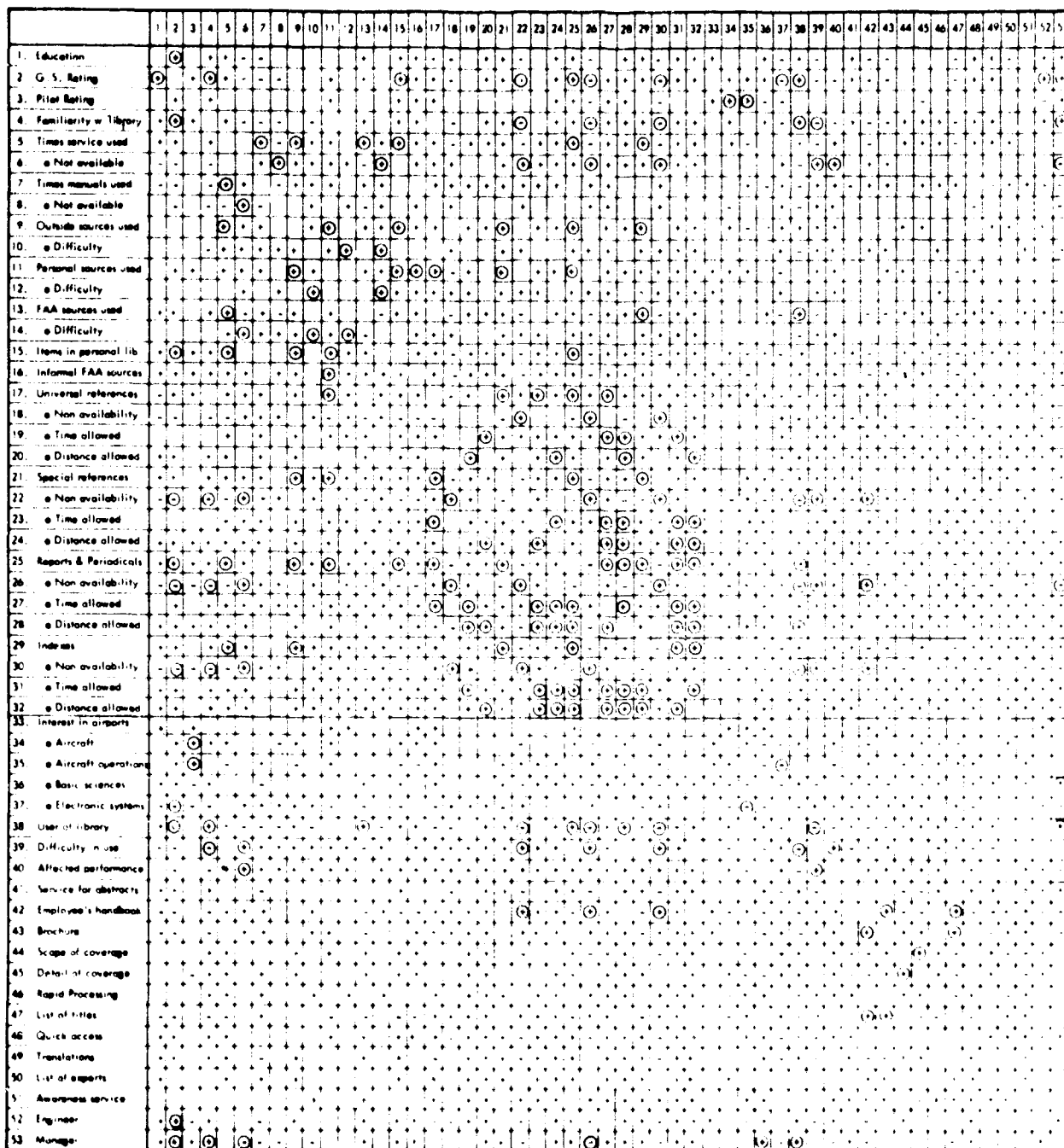


TECHNICAL INFORMATION SUBJECT AREA PROFILES
THREE SUBJECT AREAS MOST IMPORTANT AND GREATEST NEED
(QUESTION 24)

	E	S	SW	C	W	A	P	AC	NAEEC	Hdq	Adm	Civ Eng	ET Eng	Aeros Eng	Air Eng	Air Ops	ET Stand Imp	ETs	Air Tral Cent	All Mgn	Composite Total
Aeronautical Engineering	9	8	5	7	12	3	4	3	14	10	4	1	3	83	4	7	9	1	1	7	5
Air Traffic Control	27	15	15	18	15	17	24	5	9	21	21	6	22	2	17	22	10	3	94	29	31
Aircraft & Flight Equipment	24	22	21	25	24	25	13	22	24	21	13	5	3	44	3	20	55	2	10	16	16
Aircraft engines	10	13	10	13	11	9	14	9	9	7	5	1	0	27	0	22	28	0	0	6	6
Aircraft maintenance	16	17	18	16	14	17	11	15	6	7	6	0	0	12	0	35	40	1	0	9	8
Airport lighting	8	7	5	9	8	15	4	4	6	5	6	36	1	0	24	6	3	1	4	5	5
Airports	20	17	13	21	14	17	11	1	3	13	16	48	1	1	20	17	9	1	16	15	11
Law	10	13	6	6	12	13	10	4	2	10	16	5	0	0	1	4	7	1	1	12	5
Aviation medicine	1	3	7	1	3	2	6	19	4	6	4	0	0	0	0	2	1	0	1	4	4
Aviation safety	41	37	37	40	30	35	26	20	37	28	16	3	3	38	3	52	76	2	29	30	27
Communication systems	14	14	16	15	16	23	14	13	17	13	15	8	39	0	23	18	5	50	23	18	24
Computers & Data processing	7	10	14	12	9	5	4	22	15	13	1	1	35	3	20	6	1	21	9	16	14
Electronics	18	20	22	27	26	25	17	29	41	19	14	1	87	2	32	9	12	94	1	19	33
Fuels	3	4	3	1	4	2	0	4	0	2	1	3	1	6	11	7	4	0	0	2	2
Human engineering	10	16	19	15	12	11	24	17	14	9	21	8	12	7	21	4	4	1	4	19	9
Instrument landing systems	16	14	11	18	12	13	11	12	11	9	7	22	16	3	13	26	20	1	6	10	12
Management engineering	2	14	21	27	27	37	34	10	12	20	38	25	25	14	62	2	10	1	6	35	16
Mathematics	4	3	5	7	6	3	1	16	15	5	3	9	10	5	6	6	3	18	0	1	7
Metamology	10	2	2	6	2	1	0	1	6	3	3	4	2	1	0	13	4	0	3	2	0
Navigation	9	5	5	10	9	10	1	9	14	13	8	6	18	3	6	23	10	12	20	8	13
Radar	9	15	9	9	11	7	13	13	12	7	6	8	30	0	10	11	5	39	41	9	22
Radio	6	8	8	7	7	15	4	7	6	5	5	1	20	0	1	1	5	30	13	4	13
Supersonic aircraft	3	4	4	5	6	0	1	1	3	6	3	1	0	15	1	10	6	0	3	1	7
Transportation	7	7	4	5	5	11	4	1	5	9	11	21	1	3	3	10	3	0	1	10	4
Economics	5	8	4	10	7	26	13	3	2	9	16	14	2	2	7	4	4	1	3	11	5
Statistics	12	13	12	9	12	17	11	11	14	17	22	15	6	5	17	15	8	2	1	20	9
TOTAL RESPONSES	210	178	132	175	198	60	70	184	66	348	587	77	240	83	71	82	312	646	637	501	3544

CHART 10

1



1

1

1

The dependence of one variable upon the other is an important analysis tool. In Cases 1 and 2 above, A and B evidence complete dependence; that is, one is an infallible predictor of the other. Case 3 indicates complete independence, and 4 and 5 indicate partial dependence.

A regression analysis illustrated the high degree of intercorrelation evident in the response structure. The independent variables selected for this regression were (a) educational level, (b) G.S. rating, (c) stated familiarity with the library, (d) the number of items in the respondent's personal library, (e) whether or not he was an engineer, (f) whether or not he was an Air Traffic Controller or Electronic Technician, (g) whether or not he was a manager, and (h) whether or not he was assigned to Aeronautical Center, NAFEC, or Headquarters. These variables were evaluated, using a linear regression model, for their ability to predict the monthly usage by the respondent of the FAA library service.* The average use was seven times per month. The final prediction equation developed by the computer provided the following information:

$$\text{Monthly usage} = 3.2 + 0.08 (\text{number of items in personal library}) + 2.1 (\text{if familiar with the library}) + 1.5 (\text{if assigned to a special facility}) - 1.6 (\text{if a manager}) - 1.0 (\text{if an engineer})$$

The other variables did not contribute to the predictability. The standard deviation of the prediction decreased only from 11.4, using an average answer, to 10.77, using the prediction equation. Ninety-three percent of the variations remained unexplained by the variables just described. These results, coupled with a consideration of the high correlation evident among the use rates of various data sources, indicate that library usage is primarily a matter of individual differences rather than group differences.

To understand the implication of this equation, it is necessary to consider briefly the status of the variables entering the program.

	Average	Correlation With Use (y)
a. Education	1.12	0.059
b. G.S.	2.23	0.058
c. Familiarity	0.51	0.136
d. Personal library	34.34	0.225
e. Engineer	0.16	0.015
f. ATC or ET	0.43	-0.102
g. Manager	0.16	0.007
h. Special facility	0.32	0.113
y. Use	7.026	

Usage was determined by the sum of the users of all FAA services, as indicated in Survey Question 15, but deleting responses for FAA instruction books and manuals.



The correlation matrix was:

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(a)	1.0	0.235	0.130	0.092	0.136	-0.271	0.126	0.205
(b)		1.0	0.344	0.252	0.231	-0.498	0.424	0.285
(c)			1.0	0.179	0.136	-0.338	0.268	0.341
(d)				1.0	0.148	-0.259	0.111	0.157
(e)					1.0	-0.386	0.064	0.140
(f)						1.0	-0.255	-0.422
(g)							1.0	0.202
(h)								1.0

Note that the intercorrelations between independent variables are as strong or stronger than the correlations with the dependent variables. When the variable with the highest correlation with use (d) at 0.225, is selected, we find that it (items in personal collection) is highly correlated with managers, who tend to have large personal collections, and Air Traffic Controllers, who tend to have small collections. In fact, the correlation between independent variables is so high that this first variable explains three-quarters of the total variation explained by all variables. It has even managed to reverse the expected sign of the correlation coefficient for the manager and the engineer variables. The effect is a warning. The assignability of the cause of a variation is suspect. In this example, more books in a personal collection indicate a propensity for greater use of technical information, which is also manifested by greater library usage. It does not cause greater usage as the equation indicates. However, it is one of the strongest predictors of the use of the library system by an individual that we have found, other, of course, than a history of his past usage.

The statistical analysis, in summary, has included determination of cumulative responses to survey questions by several classes of respondents, a correlation analysis of all key variables, and a sample linear regression analysis.

3.5 LIBRARY INVENTORY

The first step in determining the scientific and technical information requirements of the Agency was to compile an inventory of library services existing at the present time. To accomplish this task, a questionnaire was prepared by means of which data were elicited from fifteen Agency libraries. The libraries and their locations are:



REGIONAL LIBRARIES	LOCATION
1. Eastern	Jamaica, N. Y.
2. Southern	Atlanta, Ga.
3. Southwestern	Fort Worth, Texas
4. Central	Kansas City, Kansas
5. Western	Los Angeles, Calif.
6. Alaskan	Anchorage, Alaska
7. Pacific	Honolulu, Hawaii

SPECIAL FACILITIES LIBRARIES

1. Europe, Africa, and Middle East (EAME)	London, England
2. National Aviation Facilities Experiment Center (NAFEC)	Atlantic City, N. J.
3. Aeronautical Center (AC)	Oklahoma City, Okla.
4. Washington Headquarters Technical Processing Branch Information Retrieval Branch Medical Library Branch Law Library Branch	Washington, D. C. HQ 610 HQ 630 HQ 640 HQ 650
5. Civil Aeromedical Research Institute	Oklahoma City, Okla.
6. FAA Film Library	Oklahoma City, Okla.

Data were elicited by the questionnaire about:

Document holdings
Indexing methods
Library services
Facilities
Personnel



Document holdings, indexing methods, and library services data are current as of October 1964. Facilities and personnel data were updated in July 1965. (See Table 1)

The data are divided into two kinds: enumerable and verbal. Enumerable data include (1) countable items such as book titles, numbers of requests for books in a specified time interval, number of libraries furnishing inter-library loan services, number of different indexing techniques, and (2) "yes" or "no" responses to questions. Verbal data include responses in written form, which are listed or tabulated rather than represented by numbers, sums or coverages of these numbers, or codes and abbreviations.

Storage

In nonautomated facilities storage will be limited to consideration of conventional file and shelving facilities. Inputs are stored manually and special study, other than gross calculation of physical requirements, is not required.

Acquisition

Data on acquisition of documents are more varied and complex. Recording forms, labeling items, indexing and classification—all these have widely divergent methods and approaches. The objective of studying the methods of acquiring documents, reports, papers, maps, etc., is to determine the optimum procedure in terms of the library facility's limits.

Dissemination

Dissemination of information is usually accomplished through user-requests and through circulation of lists, bibliographies, and abstracts. To improve dissemination methods, the gathering of information on user needs and habits is required; this is done as a part of the User-Needs survey. The inventory data are relevant to the question of dissemination only to the extent that they provide base figures for the kind and amount of information distributed and to the number and kinds of requests made by both library users and the library itself.

Library Services

An inventory of library services is required for comparison with the data accumulated in the User-Needs survey. The library services data serve as a base from which the future service requirements of the library may be projected.



Volume of Processed Items

Numerical data on the volume of items stored and disseminated by the library are required in order to establish a basis for projected scientific and technical information requirements. For example, the number of new book titles acquired during a specified time provides a basis for comparison of present volume and the future volume projected in terms of the results of the survey.

In this study, volume data were accumulated in the following categories and were calculated for each region on the basis of the indicated time intervals:

Library Services

1. Number of bibliographies compiled to date
2. Average number of bibliographies compiled per month
3. Number of interlibrary loan (ILL) connections established by each library
4. Number of requests per month in the following categories:
 - a. Interlibrary loan (ILL) requests
 - b. Requests for:
 - Technical reports
 - FAA reports
 - Books
 - Periodicals
 - Speeches
 - Technical papers
 - DOD nomenclature cards
 - c. Other: Responses to this category were limited to an indication of five requests per month for unspecified items by the Medical Library Branch (HQ-640) and five hundred requests per month from the FAA Film Library.

New Acquisitions

New acquisitions per month were indicated on the questionnaire under the following categories by title unless otherwise indicated



1. Technical reports (by both issue and title)
2. FAA publications
3. Books
4. Periodicals
5. Speeches
6. Technical papers (included under periodicals by one library, the NAFEC)
7. DOD nomenclature cards (indicated only by the Information Retrieval Branch, HQ 630.

The figures indicated in response to the questionnaire for these categories are given in Table 1.

3.5.1 Questionnaire Responses

Responses to the questionnaire varied for a number of reasons: In some instances, it was indicated that no figures were available; in other instances, no response was recorded because the category did not apply to the library being surveyed, e. g., number of speeches filed. Some categories, e. g., major subject areas of cataloged documents, would have required analysis extending over too long a time period; and some responses were necessarily estimates, while others were given as averages over a specific period of time.

Additionally, there were instances where there was incomplete distribution of data across categories for a given library; and others where the converse situation, incomplete distribution of data across the libraries for a given category, occurred. For these reasons representations in the form of lists, tables, and charts of the data collected are necessarily selective. For example, illustrations of the percentages of requests for particular items of each library are limited to instances where data were given for four or more libraries.

3.5.2 Enumerable Data

Enumerable data were elicited from the fifteen regional libraries in the following categories. (Sums and averages of all enumerable data are given in Table 1.)

[illegible]

ERABLE DATA

OCTOBER 1964

SERVICES		REQUESTS PER MONTH										NEW ACQUISITIONS PER MONTH							TRANS- LATION	CLASSI- FICATION	HARDCOPY FROM MICRO- FILM	USER'S HAND- BOOK	NEWS- LETTER			
COMPILED TO DATE	AV. NO. COMPILED MONTHLY	NO. OF ILL. LINKS	NO. OF ILL. REG. 117 MONTH	NO. OF TECH REPTS. MONTH	NO. FAA TECH REPTS. MONTH	NO. BC Q'S MONTH	NO. PERIODICALS MONTH	NO. SPEECHES MONTH	NO. TECHNICAL PAPERS MO	NO. NOMENCLATURE CARDS MO	OTHER	TECH. REPORTS	FAA PUBLICATIONS	BOOKS	PERIODICALS	SPEECHES	TECH. PAPERS	NOMENCLATURE CARDS	OTHER							
			50			30-40		25							20-30						22	NO		NO	YES	NO
	3	5-15	45	28	115	65						38.7	9.2	25	91.5							NO		NO	NO	NO
	1	4																				NO			NO	NO
	1		9			5						3.3	7		.5							NO	NO	NO	YES	NO
	1	5	6	6	2	4	2					55	30	110	114							NO	NO	YES	NO	YES
																						NO	NO		NO	NO
50	2	ALAC	10	190		294						171.8	35	14	118.9		2					NO			YES	NO
	6	1	100	10	10	5						60	5	50	1.5		1.7					NO				
	8	75 IN 100 OUT				1200							17.6	275	5							NO		NO	NO	YES
	15			1500	700			10	10	75		437	30					300				NO		YES		YES
35	5	7	65	25	35	120	200				5		15	29.2					4.2			YES		YES		
11	1		30 IN 30 OUT			300							5	125	75				400**			YES				
	110	35 IN 50 OUT				98	224					6.3	7.4	15.1 7.8			*					NO		YES	NO	NO
	5	75		500							500								** 67			NO		NO		YES
10*	20	101	3.2 IN	1925	1275	98	96	10.3	10	75	505	772	112.5	636	332		1.7	300	71.2			2		4	3	4
1	1	11	20.9	178.3	85	65.4	33	.69	.67	5	33.7	51.4	7.4	42.4	22.1		11	20	4.75			.13		.3	.2	.3

CONGRESS
MON OF LC
CONGRESS SUBJECT HEADING LIST
SPECIFICATION
1 (NOT INCLUDED IN TOTAL)
SESSION NUMBERS

OPS
PF
STAR
SUB
F
TI

OPEN FILE SHELVING
PRINCETON FILE
STAR BULLETIN
SUBJECT INDEX
TITLE
TERMINAL

25 DIFFERENT INDEXING TECHNIQUES
3 DIFFERENT SHELVING METHODS
1 LOAN CODE

NOTE WHEN TWO FIGURES ARE CITED (30-40, ETC.) FOR ONE CELL, THESE ARE AVERAGED AND THE AVERAGES CALCULATED IN THE TOTALS

* NEW TITLES UNLESS OTHERWISE INDICATED
** NEW ISSUES (NOT CALCULATED IN TOTAL - INCLUDES PIECES, ITEMS)
*** BOUND VOLUMES (NOT CALCULATED IN TOTAL)
* INCLUDED WITH TECHNICAL REPORTS
* FILM
* ESTIMATE INDICATED (NOT CALCULATED IN TOTAL)
* INCLUDED WITH PERIODICALS
* ACROSS INDICATED CATEGORIES (NOT CALCULATED IN SUMS OF COLUMNS)



Periodicals
Books
Technical reports
Speeches
FAA publications
Technical publications
Library services
New acquisitions
Translation services
Classified documentation
Hardcopy (produced from microfilm)
User's handbooks
DOD nomenclature cards
Indexing methods
FAA newsletters

The data have a wide range of distribution across the fifteen libraries surveyed. Figures obtained for the number of periodical holdings range from about four for EAME to 1097 for the Technical Processing Branch (HQ-610). The number of book titles ranges from one reported by the Western Region to 15,000 reported by the Technical Processing Branch of the Headquarters library. Such wide ranges reflect the significant differences in both size and function of the various Agency library facilities.

Counts of enumerable items elicited by the questionnaire were extracted from the returned copies, and sums and averages were computed from the raw data. Twenty-three different indexing techniques, three different shelving methods, and one load code were reported. Indexing and shelving techniques are given in the table of enumerable data, Table 1.

3.5.3 Verbal Data

Verbal responses were elicited under the five questionnaire headings listed in Section 3.5. The purpose of this section is to consider salient verbal data which require some discussion under the headings Document Holdings and Indexing Techniques and to list those kinds of data elicited for Library Services. More detailed treatment of the data is presented in Table 1, and in Appendix B of the Supplement. Verbal data on types and functions of Library Personnel and on Library Facilities are given in Appendix B-V.

Document Holdings

Verbal data for document holdings were elicited in the following areas:

1. Major subject areas
2. Issuing agencies of technical reports



Major Subject Areas. Overlapping in subject areas is shown in the inventory questionnaire responses, both across document types and across regional libraries. Ninety-three different subject-area names are listed by respondents to the fifteen inventory questionnaires. The term, "subject-area name" is used because indications of subject areas such as Airports, Airport Runways, and Taxiways may be overlapping in their reference to specific documents. The subject-area names elicited are, in the great majority of instances, technical although there were scattered instances of subject-areas including administrative, management, and organizational materials.

Not all of the libraries surveyed arrange document holdings by subject area. For example, CARI classifies books by subject area but does not follow a subject-area scheme for technical reports. The Library of Congress method and journal indexes are used for CARI periodicals. Only three regional libraries listed major subject areas in all four categories calling for this response in the questionnaire, i.e., books, technical reports, FAA publications, and technical papers.

Thus, the Agency libraries surveyed are generally eclectic with regard to identification and classification of holdings in terms of subject areas. The validity of the subject-area names as representations of the material is a matter that can be determined only by a separate investigation but such an investigation should not be considered necessary, however, particularly in view of recent installation of an optical coordinate indexing system, i.e., Termatex, throughout the Agency. The principal question is that of standardization of subject-area names rather than validation of existing subject-area classification schemes. A listing of the major subject areas indicated by each of the thirteen libraries responding to this question is given in Appendix B-II.

Issuing Agencies of Technical Reports. Responses were elicited from nine regional libraries listing governmental and military agencies and private institutions issuing technical reports contained in library holdings. The largest number of issuing agencies (27) was reported by NAFEC. The overwhelming majority of issuing agencies are governmental and, of these, the greatest number may be classified as military. The majority of governmental issuing agencies are located in the United States, with a few British agencies providing reports to libraries both in the United States and abroad. Private industrial organizations such as the System Development Corporation, the Stanford Research Institute, and one private educational institution, the Massachusetts Institute of Technology, are listed. Private industrial organizations constitute a small minority of issuing agencies, and no state or locally supported organizations were listed. State-supported educational institutions are the originating sources of some documents processed by Agency libraries, however, as may be seen by inspection of the list of



libraries supplying interlibrary loan services to FAA, the lists of periodicals recorded for each Agency library responding to the questionnaire, and in the document, Periodicals Received in Library Services Division, Federal Aviation Agency, W-4 (lea); RCN-3, Washington, D. C., Office of Headquarters Operations, Library Services Division, 1964.

Indexing Methods

Enumerable data elicited for indexing methods were discussed in Section 3.5.2. Verbal data were elicited from seven libraries and are tabulated in Table 1. Entries in the table are in accordance with the code given in Section 3.5.2. The term "Indexing Methods" was used in the questionnaire to cover methods of indexing applied to periodicals, books, technical reports, speeches, FAA publications, technical papers, and shelving methods. However, these methods are all separated and identified in the Table of Enumerable Data.

A substantial number of these data are self-explanatory. However, certain details of current indexing procedures are not amenable to tabulation and bear implications for the future organizational and technical development of Headquarters and Regional libraries. For these reasons, they merit some discussion.

Indexing of DOD nomenclature cards has followed the procedures of Armed Services Technical Information Agency (ASTIA) indexing. It is reported by the Central Region, in response to the question on indexing methods, that the existing accumulation of ASTIA indices for DOD nomenclature cards constitute the sole Central index of items. This index has been turned over to the Electronic Engineering Branch, I & M Division, since there was no facility available to handle the work load involved. It is reported by the Western Region that "periodicals are being maintained in a bookcase close to the desk of the secretary to the ASD chief..." and that "FAA publications are maintained on a shelf in the Distribution Section." Technical reports held by this office are filed or shelved alphabetically by author in the Distribution Section. Periodicals held by the Alaskan Region are indexed by the Acme Visible File (AVF) technique, while books held by this office are indexed by the Library of Congress classification and cataloging rules. In the Alaska Regional Office, technical reports are: (1) arranged and shelved separately by category of the issuing agency; (2) within that category, are arranged alphabetically by title; and (3) are listed in a card catalog in this way also. It was stated that this is "temporary indexing until there is time for more sophisticated treatment."

As with indexing and cataloging, shelving arrangements show extreme variation. It is reported by NAFEC that shelving arrangements for books are by the Library of Congress classification scheme except for unclassified



books, which are arranged in a separate group according to author. Shelving arrangements for technical reports are by issuing agency, subdivided by individual or series title, and, within that, by the numbering sequence assigned by the issuing agency. If a number sequence is lacking, the arrangement is made chronologically, by publication date. No processing techniques are used for speeches and technical papers. Shelving arrangements reported by various Agency library facilities are tabulated in Table 1.

Indexing by specially published abstracts and content lists was reported by CARI, which listed Biological Abstracts, Index Medicus, Psychological Abstracts, Quarterly Cumulative Index Medicus, Current List of Medical Literature, and Current Contents.

To summarize, indexing methods across the Agency libraries surveyed vary greatly both as to scope and to type. Variation is also found in the indexing of document types. The data, per se, suggest a high degree of autonomy in the operation of individual regional library facilities. If a closely coordinated and tightly knit centralized program of operation for Agency libraries is deemed necessary in the future, the transition from the present diversified methods of indexing to a standardized indexing system will require considerable effort in terms of system revision, physical change, and the training and reorientation of personnel.

Library Services

Verbal data elicited in the category of Library Services consist of nine items:

1. Uses of the ALA Loan Code by one library (NAFEC) as an inter-library loan medium
2. Lists of titles of major bibliographies compiled. (Lists for each responding library are given in Appendix B-II.)
3. Lists of libraries with which interlibrary loan services have been established. (See Appendix B-II.)
4. Kinds of interlibrary loan requests. (See Table 1.)
5. Technical materials distributed by the libraries. (See Table 2, Section 5. 2 of Supplement.)
6. Materials, and offices to which materials are distributed on an automatic basis. (See Table 3, Section 5. 2 of Supplement.)



7. Lists of periodicals which are circulated from the libraries on a regular basis; offices to which these materials are routed (indicated either by verbal responses or by copies of routing slips). (See list in Appendix B-III.)
8. Retrieval methods, including reference searches, special techniques and equipment, etc. (See Table 4, Section 5.2 of Supplement.)
9. User services, such as employee library indoctrination programs, which are included in Table 5, Section 5.2 of the Supplement, under the heading, Special Service.

NORTH AMERICAN AVIATION, INC.



SPACE and INFORMATION SYSTEMS DIVISION

4. RECOMMENDATIONS



4. RECOMMENDATIONS

To properly orient the reader with respect to the recommendations of this study, a few basic considerations will be discussed. To begin with, the FAA has taken great strides over the past five years in an effort to meet the challenge of increasing need for and use of scientific and technical information on the part of its technical and management personnel. At the same time, both Government and industry are expending greater effort and money in the development of systems to process and make available the vast amounts of data being generated. An example of Government's participation in the management of scientific and technical information is the establishment of the Committee on Scientific and Technical Information (COSATI) under the direct cognizance of the President.

As stated previously in this report, the scope of the study embodied the analysis of the scientific and technical information requirements of the FAA, culminating in a set of recommendations which, if instituted, would satisfy those requirements indicated by Agency personnel. The approach used to determine user information requirements was the survey via questionnaire of 3818 Agency personnel. The 92-percent response to this questionnaire was far above the normal response for a survey of this type. This outstanding response in addition to the care that was shown in completing the questionnaires is an indication of the intense interest taken by the Agency personnel in this subject. The selection of respondents was made on a random basis to ensure representation of the opinions of all groups of personnel. The random selection should balance the effects of overstatements of information requirements against the understatements of those requirements. No one is in a better position to determine the scientific and technical information requirements of a technical person than that person himself—he is the expert!

Any attempt to override this expert's opinion, to read in conclusions, or to make assumptions, would only serve to bias and to render ineffective and inaccurate the final results. It is with this in mind that the reader should consider the following recommendations.

The study was conducted over a period of one year. Due to the dynamic nature of the FAA, reorganization of some offices, realignment of some functions, and some changes in key personnel occurred while the study was in progress. As an example, it was recently announced that the Research Division which was located at NAFEC has been transferred to Washington, D. C. This one change alone will have an effect on the level of required services both at Headquarters and NAFEC.



No adjustments in this study's results, due to changes of the above nature, have been made. All results are based on the Agency as it existed when the data was gathered in the spring of 1965.

A series of recommendations have been developed based on the analysis of the data gathered. They are based on the stated needs of the Agency personnel and the requirements to improve Agency technical effectiveness over the next five years in order to function in the predicted technological environment of the 1970's.

These recommendations have been divided in the following sections into "recommendations for immediate implementation" (section 4.1), "recommendations for phased implementation" (section 4.2), "recommendations for study" (section 4.3), and "reorganization" recommendations (section 4.4). In general, each of the recommendations are independent and may be implemented as a separate entity leading to an improvement in the present information handling system. It is strongly suggested that the recommendations of section 4.1 be implemented immediately. They are characterized by low cost and immediacy of need. Those services, suggested for phased implementation, are designed to provide for continuing modernization of the system and to meet additional needs of the Agency determined by the survey. Recommendations for study are designed to apply a rapidly growing information handling technology to the specific technical information requirements of the FAA.

Note that no attempt is made in the recommendations to define every detail of the recommended operational systems. Rather, the approach is to identify each new service, organizational arrangement, and information resource that is to be implemented.

4.1 RECOMMENDATIONS FOR IMMEDIATE IMPLEMENTATION

These recommendations provide for changes in the services offered to FAA personnel and establish a set of basic reference materials to be supplied to field facilities.

1. Place a set of basic reference materials at all library facilities, regional offices and major field facilities on an as-requested basis. The items considered pertinent as basic reference materials are:

- Dictionaries and handbooks
- Policies and procedures manuals
- Basic textbooks pertinent to facility function



FAA training manuals
FAA directives
Atlases
Vendor catalogs pertinent to local procurement
Personnel classification standards
Basic technical periodicals
Selected nontechnical periodicals

This recommendation is based on Charts 3, 4, 5, and 6. On Chart 4, the greatest unfilled needs occur in the items listed above. On Chart 5, the most common "time allowable for retrieval" is indicated as being either private collection or regional or center collection. Based on these results, it is recommended that the basic reference materials be located where they can be used within an hour; they would have to be located at all library facilities, regional offices, and field facilities.

2. Prepare and distribute a library handbook advertising present resources, services, and facilities of the Agency library system. Publish a facility supplement to describe locally available library services. The handbook should include sections covering each library presently operational in the Agency. Updating of the handbook should be on a semi-annual basis.

Substantiation of this recommendation is made on the basis of results shown in Charts 2 and 8. In Chart 8 (Question 33) the most important item indicated by Agency personnel as a desired service is "employee's handbook which describes library services and facilities more completely." Verification of importance is made by observation of Chart 2 (Question 31) where it is indicated that the greatest problem is "lack of information on how to use the library."

3. Develop a consolidated monthly Agency Library System new-acquisitions list. This list to be prepared and distributed by Headquarters library.

Question 33 (Chart 8) indicates that "a listing of book and periodical titles" shares the third most important indicated service with "a current awareness service which would provide automatic notification of literature of interest to you." Short of providing a complete awareness service, it is recommended that a list of new library acquisitions be provided to Agency personnel and that it be prepared and circulated on a monthly basis to meet time requirements as indicated in Chart 5.



4. Provide a technical program summary handbook on FAA programs to managers and researchers. The handbook is to be a loose-leaf notebook indexed by project subject area and updated on a monthly basis.

Question 40 (Chart 9) shows the ranking of items considered important to managerial personnel for ultimate inclusion in an FAA information retrieval system. The item ranked as most important by a large margin (50 percent above) is program data (management information of FAA programs such as cost, funding, schedule data, milestone achievements, etc.). The recommendation is based on this result.

5. Establish a list of personnel within the Agency who are considered experts in specific technical fields. This list would be compiled by the library system and maintained at each recognized library facility for use in specialized reference.

Chart 7 indicates that approximately 64 percent of the personnel surveyed use fellow employees as a source of technical information. Responses from question 16 of the Survey indicate that this source is used on an average of 3.1 times per month. This is three times the indicated use of the FAA library service. Development of a list of expert reference personnel within the Agency would provide an immediate benefit to both the library system and Agency personnel.

All of these recommendations should be implemented within the next six months. The basic steps involved in each are:

- a. Inventory the present Agency resources available to meet the need
- b. Determine the distribution requirements.
- c. Develop the format of the material to be distributed.
- d. Procure or develop the materials not available in inventory. This includes writing and printing as necessary.
- e. Distribute the material.



4.2 RECOMMENDATIONS FOR PHASED IMPLEMENTATION

It is recommended that a more comprehensive agency technical information system be developed, based upon the existing organization. As the name implies, the system would be organized on an Agency-wide basis. Major modifications are proposed in policies and procedures used in the distribution and acquisition of technical information.

The sections that follow provide a framework from which subsequent decisions may be made relative to pursuing a five-year improvement program.

It is to be emphasized that underlying all recommendations discussed in this report is the basic recommendation that future activity, whether it be with reference to a library or technical information center, be strongly oriented toward services as opposed to facilities.

Use of technical information by technical personnel depends upon convenience of acquisition. And convenience of acquisition depends directly upon the services provided to aid acquisition of desired information.

It was apparent in this study, that where a technical information need existed, services to the individual were lacking. Comparison of the "need" columns in Question 15, Chart 8, shows greater needs in those regions not having a library than in those regions having libraries and supplying services. Thus, it is the intent of this section to delineate services that are either in addition to those presently offered by the Agency or are modifications of them.

The following is a list of recommended services to be instituted in the establishment of an Agency Technical Information System. These recommendations are in addition to those discussed earlier and those presently in use in the Agency.

1. Investigate the various indexing and shelving methods used throughout the Agency with a view toward standardization. The minimum number of methods that are considered practical will aid in communication between Technical Information Centers and provide for more rapid and economical conversion to automation at a later date. A listing of the variety of indexing and shelving methods in use throughout the agency library system is indicated in Table 1. (Section 3.)



2. Provide technical book and report loan service with a loan period of at least one month. Provide some materials, such as key SRDS reports, on indefinite loan. Results of Question 54 of the In-depth Interviews (Appendix A) indicate that a major source of problems connected with use of a central library occurs because of the relatively short loan time available on books and technical reports. Personnel in regional offices and field facilities that do not have libraries use the major portion of the two-week loan period in merely transmitting technical information by the mail system.
3. Set up an intra-agency technical book and report loan service via wire service for requests and public main system for replies. This recommendation is based on the justification for the previous recommendation and the results of Question 23, Chart 5. In eight out of ten cases (regions and major facilities), SRDS reports are needed within one week or less. In all cases scientific and technical periodicals are required in one week or less, and in the case of general technical reports, all regions and major facilities indicated they needed the information in one week or less.
4. The Technical Information Center at NAFEC should be responsible for all distribution of SRDS reports. The Aeronautical Center should be responsible for all FAA Aviation Medical Reports and Academy Textbooks. This recommendation is based on the fact that the majority of all SRDS reports are generated at NAFEC and the greatest use is indicated at NAFEC (Chart 3). In addition, the majority of all Aviation Medical Reports are generated at CARI (Aeronautical Center) and the greatest use is indicated at the Aeronautical Center (Chart 3).
5. Provide an Agency Technical Information System newsletter. The newsletter should be for general distribution and should be published every two weeks. It should cover items of interest about the System, such as new services offered, selected new acquisitions, facilities improvement, and Technical Information Center personnel highlights. In the In-depth Interviews, Question 50 dealt with a library newsletter. In this instance, 44 percent of those interviewed indicated it would be of value. In addition, Question 33, Chart 8, indicates 55 percent of the Agency personnel surveyed desired a brochure that "describes the technical and scientific information available through the library." Thus, this recommendation embodies the basic requirements of the indicated requests through the medium of a library newsletter.



6. Develop a current-awareness service by categories of personnel (job and subject specialties). Develop a comprehensive trial service in FAA SRDS report abstracts. Substantiation is made on the basis of Question 54, In-depth Interviews (Appendix D, and Question 33, Chart 8). In the case of FAA top management, current awareness was considered the most important additional service by 25 percent of those interviewed. The next most important additional service was selective dissemination of information, indicated by 10 percent of the respondents. With respect to the overall Agency, current awareness ranked third.
7. Make provision for rapid reproduction of periodical and journal articles. The necessity for this service is apparent from the results of Questions 30, 31, 35, and 36 of the In-depth Interviews (Appendix D). Hardcopy was indicated by 83 percent of the respondents as being the most preferable medium on which to record technical information. A total of 76 percent of the respondents indicated that convenience of use was the reason for preferring hardcopy. Forty-nine percent indicated a need to retain a hardcopy of information requested as shown in Question 35, and 53 percent stated it was "not needed because of a geographic problem existing with the library." Thus, the reproduction service will meet a direct need for providing permanent retention copies of technical information.
8. Within Headquarters, NAFEC, Aeronautical Center, and the regional offices provide telephone and courier service with respect to technical information requests. Do not rely on internal mail system. As shown on Chart 5, almost all standard references material and operational data are required within one hour after a need arises. Implementation of this recommendation will provide the needed rapid access to specific kinds of data on an as-needed basis.

4.3 RECOMMENDATIONS FOR STUDY

It is recommended that a series of long range studies be undertaken to assure continued development of the Agency technical information system. These studies recommendations are based upon stated present requirements for technical information services, a logical extrapolation of those needs into the 1970's, and a conservative forecast of the evolution of information handling technology over the next several years. The specific studies suggested are:

1. Test the applicability of user profiles to determine specific information needs. These profiles would be based initially



on the attributes of G. S. level, occupational category, occupational specialty, and facility function. Attempt a correlation—using keywords or other indexing data from abstracts—between documents and user profiles. Implement a computerized working model to maximize correlations by actually providing these documents to users and obtaining feedback about their applicability to the user's needs. Computers available within the Agency should be used. The subject matter and documents included and the users served should be a small workable subset modeling several pertinent attributes of the total FAA library system services.

Survey results indicate that interest areas can be correlated with classes of users (Chart 10), but that actual document use is largely determined by individual differences or by class differences not defined in the survey (section 3.4). The responses to the three subject areas of most interest for each occupational category averaged slightly more than 50 percent of those to all subject areas. By contrast, the regression analysis was able to explain, by all recorded variables used to determine user classification, slightly less than 7 percent of total usage of library services.

This study will be aided by the knowledge obtained from use of the Termatrix system and should be able to improve the system's application as well as to establish key parameters for FAA computerized awareness service and technical information retrieval service in the future. One possible early use of this study would be the automatic determination of distribution lists and requirements for agency-produced documents.

2. Develop a cost-timing model for each library function and data class to determine where and how to best perform the function. For example: Should a given document class be best stored at a central facility only, at each regional library, or at every FAA office? How is it best requested—telephone, teletype, mail, dataphone—and how is it best transmitted? How many copies of each document should be procured? The answers to these questions are a function of cost of document, cost of communication, cost of reproduction, allowable response time, probability of use, probable duration of use, and the intensity of the need for the document.
3. Select one FAA region as a test vehicle for expanded regional services and another as a control group of users. In the test region, some, or all, of the following would be accomplished:
 - a. Develop a permanent loan with recall service. Documents requested would be procured permanently by the regional



facility and, in turn, permanently loaned to the requester. Documents would be returned to the library facility when the requester was finished with them or when the library determined that a more urgent need existed elsewhere.

- b. Data-acquisition cards would record from each test region library transaction the user's profile, the response time, the user's evaluation of the need for the document, and the satisfaction of that need by the document.
- c. Assist in the determination of user profiles, as recommended previously, by providing feedback on the data-acquisition cards. Both the control region and the test region should record all transactions with central libraries.
- d. Investigate the establishment of satellite libraries in the larger regional facilities which are not co-located with the regional headquarters. Some information pertinent to this problem can be obtained from the survey responses.
- e. Develop a cost model to determine where and how many copies of what periodicals should be placed. The same general model developed for Item 2 above should be applicable to this problem.

It is tentatively recommended that the Eastern Region be the test region and the Western Region be the control region. These two appear to be the two most similar regions in user profiles as determined by the survey and there may well be some advantages to Eastern Region's proximity to Headquarters and NAFEC.

- 4. As conclusions are reached by these studies, take the actions implied by the conclusion.

4.4 ORGANIZATION

It is recommended the Agency technical information system be reorganized and that Technical Information Center facilities be established at Headquarters, NAFEC, Aeronautical Center, and at all regional offices. It is further recommended that subunits of the Technical Information Centers be established at each of the major field facilities and area offices. These centers should be developed using as a base the present existing library organization facilities and personnel.



Facilities at each of these offices would provide immediate service to all major facility personnel and establish regional services for technical information. This recommendation is backed by the response to Question 32 (Chart 2), which indicates that over 30 percent of the regional personnel feel that "a problem in performance of (their) duties was created by lack of a library facility at (their) office."

Figure 4-1 shows a recommended organization for the Agency Technical Information System. The major change is that development and direction of the technical information centers would be performed by a staff charged with national program responsibility. This staff should be placed at an organizational level that will assure wide latitude for independent judgement in exercising the responsibility for program development and direction. The Technical Information Center (TIC) is to report to the newly established Office of Technical Information. It is the responsibility of that office to develop policy, budget, and operational specifications of the agency technical information system.

All policies, budgets, and operational specifications for the entire Agency Technical Information System are administered by that office through the appropriate FAA hierarchy. Policy development and direction throughout the Agency should be centralized. This recommendation is made in light of the requirement for a uniform agency-wide technical information system.

The Office of Technical Information also will have as its responsibility the establishment and continuation of close working relationships with technical information systems in operation within other Government and non-Government agencies for maximum flexibility of the FAA system.

Policy, budget, and operational specifications are directed to the Directors of Regions, and managers of NAFEC and Aeronautical Center by the Administrator through Agency directives. Note that no change is recommended within the regions or major facilities.

Billets and budget required for operation of the Agency system will be provided directly by Headquarters through the Office of Technical Information

Personnel directing the various centers will be selected for operating the units located within regions, NAFEC, and Aeronautical Center using specifications from the Office of Technical Information. They will report directly to the Chiefs, Administrative Services Division, within their respective regions or major facilities.

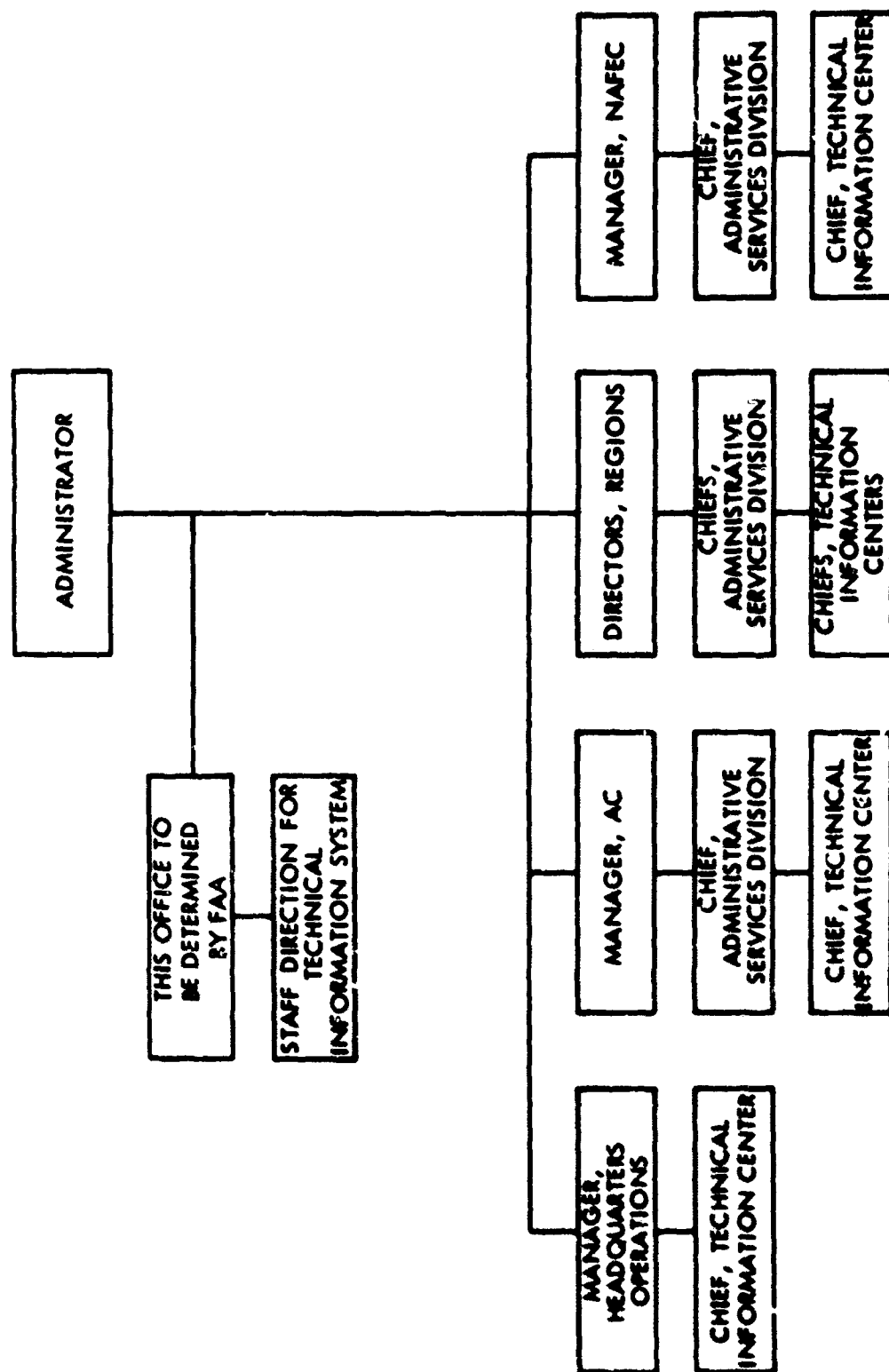


Figure 4-1. Organization—Agency Technical Information System



Different types of technical information should be stocked and distributed by different Technical Information Centers. The following identifies gross characteristics of technical information that, in the opinion of S&ID, should be made available by specific centers.

1. Headquarters Technical Information Center

This should be a general repository for technical information in the aviation field. Those sections presently covered (engineering, medical, law) and the extent of coverage should not be altered. Reference copies of SRDS reports should be kept, and a comprehensive collection of periodicals and journals pertinent to the aviation field should be maintained. Chart 3 indicates that Headquarters consistently uses all types of technical information with no real standouts. Thus, a broad coverage for this information center is recommended.

2. NAFEC Technical Information Center

This center should be research-oriented in the field of aviation and, in particular, aviation safety and electronics. Reference copies of SRDS reports, supplies to fill all Agency requests for SRDS reports, and a comprehensive collection of periodicals and journals in the field of aviation should be maintained. Low coverage of medical and legal fields is recommended. As shown in Chart 3, NAFEC has the highest percentage of users of SRDS reports (64 percent) and the lowest percentage of users of medical publications (5 percent) and legal publications (8 percent). This recommendation would centralize the development, distribution and use of SRDS reports at one location, NAFEC.

3. Aeronautical Center Technical Information Center

This should provide broad coverage of the electronics field with special emphasis on electronics pertaining to air navigation aids. Only reference copies of SRDS reports should be stocked. A complete inventory of medical reports published through the Office of Aviation Medicine should be retained for reference and for fulfilling requests for copies on an Agency-wide basis. Periodical and journal coverage is to be comprehensive. Aeronautical Center, as shown in Chart 3, has the highest use of medical publications (23 percent) and the lowest use of SRDS reports (27 percent). The relatively low use of medical publications is due to the fact that the number of medical personnel is small. However, the medical personnel represent over half of all those in the Agency.



4. Regional Technical Information Centers

The Technical Information Center recommended for the regions should be of a general nature covering the aviation field. An extensive collection is unnecessary. There should be a budget to purchase books and technical reports on an as-requested basis. Complete coverage of aviation periodicals and journals should be maintained. As shown in Chart 3, the regional personnel have the greatest requirement for various operational data (e. g., an average of 95 percent of the personnel in the regions use FAA directives, 86 percent use Procedures and Policies Manuals, and 73 percent use FAA Training Manuals). However, there is also a need for textbooks, scientific and technical periodicals, technical reports, and vendor catalogs based on the indicated use of 72 percent, 63 percent, 64 percent, and 50 percent, respectively.

5. Field Facilities

The field facilities will not have a recognized Technical Information Center. Rather, they should be given the set of basic reference materials described in Section 4.1, Recommendations for Immediate Implementation.

4.5 SCHEDULE

It is most convenient to present the steps which should be taken in several successive periods.

0 - 3 Months:

- 1. Develop and distribute new-acquisition list (Section 4.1)**
- 2. Develop and distribute handbook of library use. (Section 4.1)**
- 3. Design and collect data for project progress summary book. (Section 4.1)**
- 4. Determine list of specific documents to meet immediate needs. (Section 4.1)**
- 5. Develop list of expert personnel for technical reference (Section 4.1).**



6. Submit survey responses to detailed analysis to determine geographical locations of specific needs. (Section 4. 3)
7. Develop detailed plan of action for the study of centralized information handling and/or system planning. (Section 4. 3)
8. Select regions for the study of regional information handling procedures; fund and staff the study team. (Section 4. 3)
9. Develop in detail the Technical Information Center concept. Notify all Regional Directors of the program being undertaken and detail the organizational changes to be made. (Section 4. 4)

3 - 6 Months:

1. Distribute first copy of project progress summary; implement procedures for continuing update. (Section 4. 1)
2. Procure documents necessary to meet immediate needs; distribute these documents. (Section 4. 1)
3. Develop a feedback system to allow for analysis of the methods to relate documents to users; at this stage, the plan would involve the association of classes of users with key words from document abstracts; write necessary computer program specifications. (Section 4. 3)
4. Develop concepts of a cost-timing model to determine where services and documents should be located from a cost-effectiveness point of view. (Section 4. 3)
5. Implement regional studies. (Section 4. 2)
6. Begin and continue over a two-year period, implementation of:
 - a. indexing technique standardization (section 4. 2)
 - b. extended loan period for technical materials (section 4. 2)
 - c. modified interagency loan service (section 4. 2)
 - d. modified distribution system (section 4. 2)
7. Begin publishing the agency Technical Information System Newsletter. (Section 4. 2)

**6 - 12 Months:**

1. Make 2-percent resurvey to determine effects of recommendations already implemented; use present survey books and analysis procedures for a minimum cost survey.
2. Write computer program for study of key-word or abstract indexing. (Section 4.3)
3. Develop the cost-timing model. (Section 4.3)
4. Continue with the regional studies. (Section 4.3)

1 - 2 Years:

1. Study relationships between classes of users and indexing methods; refine programs and procedures used. (Section 4.3)
2. Consider automatic abstracting; coordinate technical information handling development with outside sources and users of FAA data. (Section 4.3)
3. Exercise the cost-timing model; update with specification of latest communications, reproduction and data-handling equipment (Section 4.3)
4. Continue with regional studies. (Section 4.3)

2-Year Decision Point

1. Present the results of the studies and make a decision concerning the specific location and extent of the facilities to be developed over the next three years.

2 - 5 Years:

1. Implement computerized document distribution and awareness system by class of user. (Section 4.2)
2. Develop awareness service by individual. (Section 4.3)
3. Procure necessary equipment and implement system for high-speed document reproduction. (Section 4.2)
4. Establish courier service. (Section 4.2)



5. Continue studies as indicated by the decisions made at the 2-year decision point. (Section 4. 3)
6. Implement the detailed plan of action decided upon at the 2-year decision point. (Section 4. 3)

4.6 MANPOWER RESOURCES

With the present workload and authorized staffing, no additional personnel would be required to maintain the services outlined in Section 4. 1. The implementation of these recommendations, however, may increase the use of the present Agency library system. The manpower requirements should be continually evaluated to ensure adequate service. The addition of qualified library personnel, as needed, will not only improve the effectiveness of the system, but will reduce cost to the entire Agency. Implementation of the recommendations of Sections 4. 2 and 4. 3 requires a detailed study of the functions involved and the resources required. It is estimated that a two-man effort would be needed for the planning function. These two persons should have the ability to formulate policy and programs necessary for implementation of the recommended plans. It is estimated that this two-man effort, devoted exclusively to immediate implementation recommendations would be required for three months. They would gather the data and prepare the library handbook covering the information services available. They would establish the format and data input requirements as well as distribution listings for the monthly new accessions list, and they would determine the type of data to be included in the technical data handbook and the data sources involved. They would also identify through contact with regions, special facilities, and area offices the reference personnel and the required data that would be included in the reference package and establish the system for acquiring, authorizing, and transmitting these data.

The formulation of a plan for phased implementation (Section 4. 2) would require a concentrated effort with considerable traveling to regions, special facilities, and a representative sample of newly established area offices. These two people would establish the detailed plans for the establishment of the technical information centers. This effort would require an additional three to nine months, depending upon the scope of the implementation.

The formulation of the recommended studies (Section 4. 2) requires three to nine months with a man loading of two to four; again, depending upon the scope of the studies.



4.7 SUMMARY

Significant changes in concepts of information handling will evolve over the next several years. These changes are likely to result in more centralized data handling as information storage, retrieval, and communication methods become more sophisticated and relatively less costly. It is anticipated that by the 1970's the optimum concept for FAA may be a centralized technical information system providing an awareness service, reference and research services, interlibrary loan service, and complete files on each FAA library user and FAA library system document. Actual distribution of documents probably will be from Aeronautical Center, NAFEC, Headquarters, and regional information storage facilities.

In addition, more technical information service interaction is expected with other Government agencies such as NASA and DDC. This interaction will be mainly through the central facility.

Over a longer time span—10 to 50 years—the nature of libraries is expected to change to an emphasis on information rather than on documents. Libraries will be expected to provide briefs of specific subjects rather than a stack of documents about the subject. This service will involve considerable expenditures for automatic data-handling systems. These expenditures will probably limit such installations either to one central facility or to facilities where the technical information handling function shares equipment with other data-handling functions.

The present FAA library services appear to be satisfying most of the stated user needs. However, it must be emphasized that technology, including the field of aviation, is becoming increasingly complex. New fields of specialization are occurring almost daily. An individual, to keep abreast of developments, must be continually digesting new scientific and technical information.

Now, the question might be asked—Where does the Federal Aviation Agency fit into the picture? The reply is an emphatic one: If the FAA wishes to maintain its pre-eminence in the field of aviation, it must take an aggressive position with respect to seeing that its personnel keep up to date on technical developments. An unconditional prerequisite to this is an active technical information program internal to the Agency.

If such a program were instituted, what would be the number of potential users? Considering, for the moment, the sample taken for the questionnaire survey, one finds that the potential is great. In the first place, those selected for survey were considered to be users or potential users of the library. All others were excluded on the basis of G. S. rating and job function.



On this basis, 85 percent of all Agency personnel were deemed potential library users. Of these, in excess of sixty percent do not use the library system. These individuals need to use a library to keep abreast of technical developments.

Non-use of the library may be attributed partly to use of scattered collections of technical information in various offices throughout the Agency. However, indications are that development of these collections and subsequent use is due primarily to the lack of a comprehensive Agency-organized technical information program. This is verified by the fact that the main reasons for non-use of the library are "not familiar with the library" and "the library is not close enough." Further, the data showed unmistakably that when a library was established personnel in the Agency made use of it.

Based on the above analysis, one is led to the conclusion that the FAA must determine a consistent policy relative to an information program for ensuring the technical awareness of its personnel. Implementation of any of the recommendations given in this report will be of transient benefit without consistency and continuing support from Agency management.

NORTH AMERICAN AVIATION, INC.



SPACE and INFORMATION SYSTEMS DIVISION

APPENDIX A



APPENDIX A

I

LIBRARY SERVICES FOR FAA

FEDERAL AVIATION AGENCY
Washington 25, D. C.

March 15, 1960

MEMORANDUM

TO : Assistant Administrator for Management Services

FROM : Chief, Management Analysis Division

SUBJECT: Library Services for FAA

In response to your request, we have reviewed FAA's requirement for library services and FAA's existing library capability.

Our findings and conclusions are discussed in the attached report. In summary,

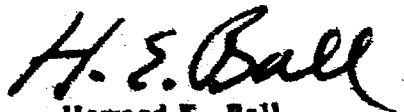
- * FAA needs a library system to provide (1) a broad range of reference support to staff and operating officials, and (2) research support in certain specialized fields.
- * Library facilities and services currently provided to the professional staff of FAA are grossly inadequate.
- * The next step toward improving the situation should be the employment of a highly-qualified librarian, and charging him with the technical job of developing a detailed library program for FAA.
- * The basic framework within which such a program should be developed should provide for:

A centralized library system for all library-type efforts conducted at FAA Headquarters;

Physical decentralization of library efforts to branch libraries held to a minimum consistent with reasonable accessibility to users;

A minimum role for the library in the procurement of non-library books, and complete detachment from accountability for such books;

Resources adequate to permit the accomplishment of finally agreed-upon objectives.


Howard E. Ball



II

LIBRARY INVENTORY QUESTIONNAIRE

UNITED STATES GOVERNMENT

FEDERAL AVIATION AGENCY

Memorandum

DATE:

SUBJECT: Analysis of the Scientific and Technical Information Requirements of the Federal Aviation Agency (Reference AD 1750.)

FROM : Chief, Administrative Standards Division

TO :

The Federal Aviation Agency has contracted with North American Aviation, Inc., to analyze the scientific and technical information requirements of the entire Agency and recommend the programs and policies that will best meet these needs (FA64WA-5213). In investigating the information requirements, it is planned to establish our requirements by three functional steps: first, compiling an inventory of the library services that exist within the Agency at the present time; second, detailed questionnaire surveying of approximately 10 percent of the Federal Aviation Agency personnel; and third, in depth interviews with selected members of the F.A.A. professional staff.

To aid in accomplishing step one, we are asking that you provide the information requested on the enclosed questionnaire. Please provide detailed descriptions where applicable and disregard questions not applying to your facility. Approximate figures should be given on questions where obtaining accurate figures would involve a considerable workload. It is further requested that you return the information required to headquarters library (attention: Eugene Kennedy, Chief, Information Retrieval Branch) no later than September 25, 1964.

T. L. Scott, MS-100

USER STUDY CONTRACT (FA64WA-5213)

Document Holdings

1. Periodicals

- a. List all titles
- b. No. of copies received per title
- c. No. of foreign publications

2. Books

- a. No. of titles (approximate)
- b. List major subject areas under which the book titles fall

3. Technical Reports

- a. No. of titles (approximate)
- b. Major subject areas
- c. Multiple copies (number kept for each title)
- d. Extra stock for retention copies
- e. Issuing agencies (list major originating sources)
- f. No. of classified documents

4. Speeches

- a. No. of speeches cataloged
- b. No. of speeches authored by F.A.A. personnel

5. F.A.A. Publications

- a. No. of titles
- b. Major subject areas

6. Technical Papers (Conferences, Proceedings, etc.)

- a. No. of titles

User Study Contract (FA64WA-5213) (Cont)

- b. Major subject areas
- c. No. authored by F.A.A. personnel
- 7. DOD Nomenclature Cards
 - a. No of cards stocked
- 8. Indexing Methods (Including cataloging and classification)
 - a. Periodicals
 - b. Books
 - c. Technical Reports
 - d. Speeches
 - e. F.A.A. Publications
 - f. Technical Papers

Also, indicate the shelving method used. (i.e., equipment used, shelving arrangement, etc.)

Library Services

- 9. Bibliographies
 - a. How many has your library compiled?
 - b. How many are compiled (average) per month?
 - c. List titles of major bibliographies compiled.
- 10. Interlibrary Loan Services
 - a. What libraries have you established this service with?
 - b. Indicate types and amount of requests per month.
- 11. Items Requested Per Month (Include requests both for circulation and retention copies. Give total number of titles requested) (e.g., 4 copies of SRDI reports count as 1 request if requested by same person.)
 - a. Technical Reports
 - b. F.A.A. publications
 - c. Books

User Study Contract (FA64WA-5213) (Cont)

- d. Periodicals
 - e. Speeches
 - f. Technical papers
 - g. Nomenclature cards
 - h. Other
12. Number of New Acquisitions Per Month (Give average for a specific period - 3 mos., 6 mos., etc., state time period used in reaching average.)
- a. Technical reports
 - b. F.A.A. publications
 - c. Books
 - d. Periodicals
 - e. Speeches
 - f. Technical papers
 - g. Nomenclature cards
 - h. Other
13. Distribution of Technical Information
- a. Does the library distribute all technical materials requested?
If not, identify those which the library distributes.
 - b. Identify the materials and offices to which materials are distributed on an automatic basis.
14. Identify the periodicals or journals that are circulated from the library on a regular basis. Also, identify the offices to which these materials are routed. (Copies of routing slips, if available, will be sufficient.)
15. Information Retrieval
- a. Identify the types of reference searches provided users.
 - b. Has your facility instituted any particular types of techniques or equipment in and in reference searches? If yes, please describe.

Her Study Contract (FA64WA-5213) (Cont)

16. Does your library circulate any materials (other than periodicals) to Agency personnel? If yes, please describe.
17. Does your library provide translation services? If yes, please describe.
18. Is hardcopy available from microfiche or microfilm through your library? If yes, please describe.
19. What employee-library indoctrination programs do you have?
20. Does the library provide a user's handbook?
21. Are library newsletters compiled and circulated regularly?
22. Please discuss any services which your library provides that were not covered in this section of the questionnaire.

Facilities

23. Please provide the following information with respect to the library facilities:
 - a. Floor space (square feet)
 - b. Number of reference study/reading tables and chairs
 - c. Types of document storage

Library Personnel

24. Identify the library organization by job function.
25. Identify the number and classification of library personnel. Distinguish between actual personnel on board and those authorized.

NORTH AMERICAN AVIATION INC



SPACE AND INFORMATION SYSTEMS DIVISION

III

SURVEY QUESTIONNAIRE

SURVEY

Scientific and Technical Information Requirements of the FEDERAL AVIATION AGENCY

PREPARED UNDER CONTRACT FA64WA-5213 BY

**SPACE & INFORMATION SYSTEMS DIVISION
North American Aviation Inc.
Downey, California**

**ANALYSIS OF SCIENTIFIC AND TECHNICAL INFORMATION
REQUIREMENTS OF THE FEDERAL AVIATION AGENCY
MANAGEMENT SURVEY-INSTRUCTIONS**

The Federal Aviation Agency has contracted with North American Aviation, Inc., to analyze the scientific and technical information requirements of the entire Agency and recommend programs and policies that will best meet these needs. The responses to this questionnaire will serve as data upon which the analysis and subsequent recommendations are based. It is therefore of great importance that a complete and accurate sample of the scientific and technical information needs of Agency personnel be taken. Scientific and technical information is broadly interpreted for the purpose of this questionnaire to include the information associated with all professional fields, such as management, planning, legal, medical and other professions, in addition to the purely scientific fields.

To help accomplish the above goals, you have been selected on the basis of your occupational category and grade as a respondent to the questionnaire.

The questionnaire is divided into three parts. Part I is for the purpose of obtaining the vital statistics needed for correlation of personnel background characteristics with technical information requirements. Part I is to be filled out completely by all respondents.

Part II is designed to reflect the technical information requirements of the main sample of Agency employees and will be filled out by all respondents.

Part III will provide the data base for analysis of Agency technical information requirements from a managerial standpoint. Part III is to be filled out by preselected managerial personnel in addition to Parts I and II. This part is only included in the questionnaires for selected management personnel.

The procedure for filling out the questionnaire is in most instances self-explanatory. Appropriate instructions are inserted when required. You will find that four types of responses are called for. The first type simply requires insertion of a check mark ☒ or ☒ in the appropriate box. The second type requires insertion of numbers in the appropriate boxes, for example, 2, 4, etc. The third type requires circling of items, for example,

NASA. The fourth type calls for answers to be printed out in blank spaces. Please print all answers of the fourth type.

Because the responses of several thousand Agency personnel must be read and tabulated, it is requested that all responses be indicated as clearly as possible so as to minimize the time needed to process the returned questionnaire. It is requested that the completed questionnaire be returned within two weeks to the Chief, Administrative Services, of the office with which you are affiliated or other office as may be designated.

Control No.

PART I

Date

RESPONDENT DATA

1. Name of FAA region and facility type to which you are assigned.

- | | |
|---|--|
| ☐ Eastern Region | ☐ Pacific Region |
| ☐ Southern Region | ☐ Aeronautical Center |
| ☐ Southwest Region | ☐ NAFEC |
| ☐ Central Region | ☐ Office of Assistant Administrator,
Europe, Africa, and Middle East |
| ☐ Western Region | |
| ☐ Alaskan Region | ☐ FAA Headquarters |

FACILITY ASSIGNMENT

- | | |
|--|---|
| ☐ Area Coordinator | ☐ General Aviation District Office |
| ☐ Station Managers - Alaska | ☐ Air Carrier District Office |
| ☐ Airport District Office | ☐ Engineering & Manufacturing
District Office |
| ☐ Air Traffic Control Center | ☐ Flight Inspection District Office |
| ☐ Airport Traffic Control
Tower | ☐ Internat'l Field & Internat'l
District Office |
| ☐ Combined Station/Tower | ☐ Aircraft/Avionics Maintenance Base |
| ☐ Air Traffic Supervisor | ☐ Civil Aviation Assistance Group |
| ☐ Flight Service Station | ☐ International Liaison Officer |
| ☐ International Flight Service
Station | ☐ System Maintenance District Office |
| ☐ Air Traffic Liaison Officer | ☐ System Maintenance Sector |
| ☐ Other (specify) _____ | |

2. City _____ 3. State _____ 4. Country _____

5. Highest Degree (circle one or specify)

High School Diploma B.S. B.A. M.S. M.A. Ph.D. LL.B.

LL.D. Ed.D. M.D. Other (specify) _____

6. Year Obtained _____, and 7. Field _____

8. Grade: GS _____ 9. Series _____

10. Position (exact title) _____

11. Responsibilities _____

12. Occupational Category

- | | |
|---|---|
| ☐ Administrative | ☐ Aircraft Operations |
| ☐ Civil Engineering | ☐ Flight Standards Inspectors |
| ☐ Electronic Engineering | ☐ Electronic Technician |
| ☐ Aerospace Engineering | ☐ Air Traffic Control |
| ☐ Airways Engineering | ☐ Other (specify) _____
_____ |

13. Pilot License Held

- ☐ Private
☐ Commercial
☐ Instructor
☐ None

PART II

SCIENTIFIC AND TECHNICAL INFORMATION REQUIREMENTS

14. Are you familiar with the FAA library system? ☐ Yes
☐ No
15. Indicate in the appropriate boxes what you feel is the average number of times per month you use the following FAA library data or services. If not available and needed, so indicate.

	Average number of times per month available service is used.					Not Available But Needed
	0	1	5	10	over 10	
Bibliography services	☐	☐	☐	☐	☐	☐
Reference and research services	☐	☐	☐	☐	☐	☐
Inter-library loan services	☐	☐	☐	☐	☐	☐
FAA technical reports	☐	☐	☐	☐	☐	☐
FAA instruction books and manuals	☐	☐	☐	☐	☐	☐
Motion picture films	☐	☐	☐	☐	☐	☐
Microfilms and readers	☐	☐	☐	☐	☐	☐
Termatrix system for a subject approach to FAA publications, R&D reports, and other scientific and technical publications	☐	☐	☐	☐	☐	☐
Medical data	☐	☐	☐	☐	☐	☐
Legal data	☐	☐	☐	☐	☐	☐
FAA specifications	☐	☐	☐	☐	☐	☐
Military specifications, TO's and standards	☐	☐	☐	☐	☐	☐

16. Indicate what you feel is the average number of times per month which you obtain information from the agencies or sources listed below. ALSO indicate if difficulty is encountered.

Circle the name of the agency or source you consider the most important in fulfilling the requirements of your job.

	Average Times Used per Month					Have Difficulty Using
	0	1	2	5	10 or more	
NASA	☐	☐	☐	☐	☐	☐
FAA non-library source (if used, answer questions 18 through 21)	☐	☐	☐	☐	☐	☐
Office of Technical Services (OTS)	☐	☐	☐	☐	☐	☐
FAA Regional or Center Library	☐	☐	☐	☐	☐	☐
FAA Washington HQ Library	☐	☐	☐	☐	☐	☐
Defense Documentation Center (formerly ASTIA, now DDC)	☐	☐	☐	☐	☐	☐
Army	☐	☐	☐	☐	☐	☐
Air Force	☐	☐	☐	☐	☐	☐
Navy	☐	☐	☐	☐	☐	☐
National Bureau of Standards	☐	☐	☐	☐	☐	☐
Department of State library facilities	☐	☐	☐	☐	☐	☐
Library of Congress	☐	☐	☐	☐	☐	☐
University library facilities	☐	☐	☐	☐	☐	☐
Public library facilities	☐	☐	☐	☐	☐	☐
Government Printing Office	☐	☐	☐	☐	☐	☐
Your personal collection of publications	☐	☐	☐	☐	☐	☐
Fellow employee	☐	☐	☐	☐	☐	☐
Manufacturer (catalogs, manuals, house organs, etc.)	☐	☐	☐	☐	☐	☐

17. Indicate the approximate numbers of the following items which you have in your personal collection at work.

Number of Items	0	1-10	11-25	26-50	Over 50
Technical Books (Non-FAA)	☐	☐	☐	☐	☐
Technical Reports (Non-FAA)	☐	☐	☐	☐	☐
Journals (Non-FAA)	☐	☐	☐	☐	☐
FAA Publications	☐	☐	☐	☐	☐

18. Do you use other scientific and technical information sources outside of the FAA library system, but within the agency, such as small section or division collections? ☐ Yes ☐ No

If the answer to Question 18 is Yes, write down the location(s) and type of information obtained, e.g., verbal information, documents or publications.

19. _____

20. _____

21. _____

22. Indicate the major source which you have used to obtain information on library use (check one).

- | | |
|--|---|
| ☐ Agency directives | ☐ Other fellow employees |
| ☐ Office and service directives | ☐ Intercom |
| ☐ Indoctrination by librarians | ☐ None of these |
| ☐ Through secretaries | |

INFORMATION INTEREST REGISTER (See following page)

23. The following table lists types of scientific and technical information. Please indicate as requested at the top of each set of columns.

INFORMATION INTEREST

If information is available to you, check uses per month. Otherwise, check "not available" column and indicate times needed per month.

	0	1	2-10	Over 10	Not Available
Dictionaries and Handbooks	☐	☐	☐	☐	☐
Commercial Atlases	☐	☐	☐	☐	☐
Medical Publications	☐	☐	☐	☐	☐
Legal Publications	☐	☐	☐	☐	☐
Other Books (including textbooks)	☐	☐	☐	☐	☐
Scientific and Technical Periodicals	☐	☐	☐	☐	☐
Non-technical Periodicals, e.g., Newsweek, Business Week, Fortune, etc.	☐	☐	☐	☐	☐
Proceedings of Technical Meetings	☐	☐	☐	☐	☐
Legislative and Congressional Materials	☐	☐	☐	☐	☐
Technical Reports	☐	☐	☐	☐	☐
Vendor Catalogs	☐	☐	☐	☐	☐
New York Times and Index	☐	☐	☐	☐	☐
NASA Reports	☐	☐	☐	☐	☐
Recently Released Systems Research & Development Services (SRDS Technical Reports)	☐	☐	☐	☐	☐
Procedures & Policies Manuals	☐	☐	☐	☐	☐
FAA Training Manuals	☐	☐	☐	☐	☐
FAA Directives	☐	☐	☐	☐	☐
Personnel Classification Standards	☐	☐	☐	☐	☐
Periodical Indexes	☐	☐	☐	☐	☐
Technical Abstract Bulletin (TAB)	☐	☐	☐	☐	☐
Library Acquisition Bulletin	☐	☐	☐	☐	☐
Scientific and Technical Abstract Reports (STAR)	☐	☐	☐	☐	☐
Reporting Services, e.g., Commerce Clearing House (CCH) or Prentice-Hall	☐	☐	☐	☐	☐
International Aerospace Abstracts	☐	☐	☐	☐	☐
Special Bibliographies	☐	☐	☐	☐	☐
Other Special Report Listings	☐	☐	☐	☐	☐
DOD Nomenclature cards	☐	☐	☐	☐	☐
FAA Notice #1710 Avail. STDS Tech. Rpts.	☐	☐	☐	☐	☐
Selected Technical Reports (Information Retrieval Bulletin)	☐	☐	☐	☐	☐
Speeches by FAA top management	☐	☐	☐	☐	☐

ATION INTEREST REGISTER

is available to you, month. Otherwise, "available" column and needed per month

Over 10 Not Available

Check the maximum time you can allow to obtain data used or needed.

Please check where your consider the information you need could best be located.

Over 10	Not Available	1 hour	1 day	1 week	1 month	All FAA Libraries	Washington HQ Library	Your Region or Center Library	Your Own Private Collection
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24. Check the three subject areas which are most important to you and about which you have the greatest need for information.

- | | |
|--|---|
| ☐ Aeronautical Engineering | ☐ Human engineering |
| ☐ Air Traffic Control | ☐ Instrument landing systems |
| ☐ Aircraft & Flight Equipment | ☐ Management engineering |
| ☐ Aircraft engines | ☐ Mathematics |
| ☐ Aircraft maintenance | ☐ Meteorology |
| ☐ Airport lighting | ☐ Navigation |
| ☐ Airports | ☐ Radar |
| ☐ Law | ☐ Radio |
| ☐ Aviation medicine | ☐ Supersonic aircraft |
| ☐ Aviation safety | ☐ Transportation |
| ☐ Communication systems | ☐ Economics |
| ☐ Computers & Data processing systems | ☐ Statistics |
| ☐ Electronics | |
| ☐ Fuels | |

25. Does anyone (other than yourself) within your group or department routinely collect information for you? ☐ Yes
☐ No

26. If the answer to Question 25 is Yes, what position does this person hold?

- ☐ Secretary/Admin
☐ Supervisory
☐ Technical Associates

27. Do you supply, or act as, a point of contact for scientific or technical information? ☐ Yes
☐ No

28. Do you use the FAA library system? ☐ Yes
☐ No
29. If the answer to Question 28 is No, is the main reason that: Check One
- You do not need the library at present ☐
- You are not familiar with the library ☐
- Library does not have what I need ☐
- The library is not close enough ☐
- Other (specify) _____ ☐
30. Do you have difficulty using the FAA library facilities? ☐ Yes
☐ No
31. If the answer to Question 30 is Yes, what is the main reason for the trouble? Check One
- Location is inconvenient ☐
- Response time is too long ☐
- Requests are misunderstood ☐
- Requests are lost ☐
- Library does not have needed materials ☐
- Lack of information on how to use the library ☐
- Other (specify) _____ ☐
32. Have you ever felt that a problem in performance of your duties was created by lack of a library facility at your office? ☐ Yes
☐ No

33. Which of the following library services do you think should be emphasized or developed in the future? Rank at least six choices in order of descending importance using 1 for the most important.

	Rank Numerically
Service for giving abstracts of articles, books, etc., by telephone	☐
Employee's handbook which describes library services and facilities more completely	☐
Brochure which describes the technical and scientific information available through the library	☐
Expand the scope of coverage to include more technical disciplines	☐
Greater detailed coverage within technical areas	☐
More rapid processing of requests and transmitting the information to the user	☐
A listing of book and periodical titles	☐
Quick access to information to determine whether work you are planning has been developed or worked upon previously	☐
Translations of foreign publications	☐
Periodic issuance of lists of experts in technical fields whom you may contact to obtain information	☐
A current awareness service which would provide automatic notification of literature of interest to you	☐
List any other future service which you consider to be important which is not listed above and rank it with others in the box at the right	
	☐

PART III

EXECUTIVE MANAGEMENT QUESTIONNAIRE

34. What do you consider to be the most important information service presently offered to you?

35. As a manager, what do you consider in your organization to be the most important technical information acquisition problem?

36. What new technical information service do you feel would help you most as a manager?

37. What new technical information service do you feel would most help the people working for you?

38. Do you believe that there should be a central reference collection established at the Agency Library in Washington, D. C. , in which one copy of every FAA publication is on file and accessible to all FAA officer?

☐ Yes

☐ No

39. Would you prefer that abstracting be done by a central staff or by document authors as is presently done?

Central

☐

Author

☐

40. The following 12 items are being contemplated as part of the FAA Information Retrieval System (FAIRS). Please rank what you consider the six most important types of information to be incorporated in this system. Rank from 1 through 6, using one (1) for the most important.

Place an "X" in the block for the item you consider as the least important of the remaining 6 unmarked blocks.

	Rank Numerically
FAA technical reports and studies	☐
Program data (management information of FAA programs such as cost, funding, schedule data, milestone achievements, etc.)	☐
Non-FAA technical reports and publications, i.e., from NASA, DDC, etc.	☐
FAA articles, speeches, and pamphlets	☐
Non-FAA articles, speeches, and pamphlets	☐
FAA technical orders, manuals, and specifications	☐
Non-FAA technical orders, manuals, and specifications	☐
FAA controlled engineering drawings	☐
Audiovisual files (tapes, movies, recordings, and pictures)	☐
Books (monographic material)	☐
Periodical articles	☐
Technical information on on-going or completed research by the FAA and other agencies	☐

41. Use the space below if you wish to add any additional comments or opinions about the information requirements of your organization.



IV

IN-DEPTH INTERVIEW GUIDE

IN-DEPTH INTERVIEW GUIDE

**Scientific and Technical
Information Requirements of the
Federal Aviation Agency**

Contract FA64WA-5213



Name of Interviewer _____

Date _____

RESPONDENT DATAPART I

1. Name of FAA region or major facility to which respondent is assigned:

2. City in which respondent's facility is located:

3. State in which respondent's facility is located:

4. Level of education (indicate by circling highest degree):

High School Diploma BS BA MA MS PhD LLB LL.D. Ed.D.

M.D. Other _____

5. Year Obtained: _____

6. Field in which degree was taken: _____

7. FAA Job Title: _____

8. Occupational category (e.g., Administrative, Aerospace Engineering, Flight Standards Inspectors):

9. GS Rating: _____ 10. Series: _____

11. Supervisory Code No. _____

12. Brief Description of Job Duties:

13. Length of time in present job: _____

PART IIANALYSIS OF INFORMATION REQUIREMENTS

To begin with, I would like to consider your information requirements by discussing a particular task you have recently completed.

14. What is the most recent task you have undertaken where technical information was required for its completion?

Briefly describe. _____

15. What, specifically, was the type of technical information you required?
- _____
- _____

16. Was the information readily available in your own personal file?
- _____

17. If the information was not in your personal file, to whom or where did you go for help?
- _____

18. Do you regularly go to this person or office for technical information or data?
- _____

19. Did the person or office to whom you referred have what you were looking for?
- _____

20. Have you had need of this type or similar information before?
- _____



21. For what types of technical information have you had the most need?

22. Was the reason you referred to a particular person or office for fulfillment of your information requirement because:

- a. information required is usually available there
- b. more convenient
- c. there was no one else to go to
- d. combination of "a" with "b" or "c" above
- e. other: _____

23. Did you make use of any other sources of technical information in completing the task?

24. What sources of technical information (i.e., holdings, private or other) do you make use of in completing tasks you undertake?

PART IIIANALYSIS OF INFORMATION SERVICES

Now, let us turn our attention to the information services which would be of value to you in your job.

25. What technical information services do you presently make use of?

26. Are all of these services supplied within the FAA?

27. What outside (i.e., outside FAA) sources supply you with technical information services?

28. What service, which you personally make use of, do you consider the most important in helping you do your job?

29. When requiring some specific technical information for completion of a task, what is the most critical requirement?

- a. time required to obtain desired information
- b. adequacy of acquired information to cover specific technical area
- c. convenience of source
- d. other: _____



30. When requiring technical information, what is your preference in terms of the medium on which it is recorded?

- a. hardcopy
- b. microfilm or microfiche
- c. 35 mm slides

- d. motion picture film
- e. other: _____

31. In reference to your answer to the question above, why do you prefer the particular medium you selected?

32. If the answer to question 30 is other than "b", have you ever had occasion to use microfiche or microfilm?

What is your opinion of its use as a medium for technical information to be used by people such as yourself?

33. If the answer to question 30 is "a", what is the approximate number of pages of technical material you require per month? _____

34. Are you familiar with the Termatrix System? _____

If you are familiar with the Termatrix System, what do you feel are its strong points and weak points with respect to meeting your needs?

35. Is it important to you to retain a hardcopy of information requested for your own file?



36. If you require a hardcopy of all technical information requested, is it because a geographic problem exists between your office and the library? Please explain.

37. Does the location of the nearest FAA library interfere with the use of its services?

If the answer is yes, please explain: _____

38. If it is necessary for you to use the services of the FAA Headquarters Library, what are your time requirements in receiving a reply?

39. What do you consider to be the advantages and disadvantages of author abstracts?

Of abstracts generated by the library? _____

40. Does your job require the use of engineering specifications?



41. If the answer to question 40 is yes, would it be advantageous to you if they were maintained at one central facility? If not, please explain.

42. What do you consider to be the preferable storage medium for engineering specifications?

- a. cards
- b. microfilm
- c. microfiche
- d. other: _____

43. Have you had opportunity to review or use the FAA Thesaurus?

If the answer is yes, would you please comment on its effectiveness as a working tool.

44. The FAA Thesaurus of Descriptors is provided for your benefit in obtaining documentation which meets subject matter requirements relative to a request. If you have used this thesaurus, what are your comments relative to:

- a. Completeness: _____
- _____
- _____

- b. Effectiveness of descriptors included: _____
- _____
- _____

- c. Simplicity of use: _____
- _____
- _____



PART IV SUGGESTIONS FOR INFORMATION SERVICES IMPROVEMENT

I would now like use to consider some possible areas where improvement could be made in terms of information services within the FAA. I am primarily interested in your opinion of how improvement could be realized.

45. What types of periodic reports, that the library could supply to you, would be beneficial and desirable in doing your job?

46. Is bibliographic service (identify) helpful to you? If the answer is yes, what is your preference with respect to the following:

a. Subject matter: _____

b. Format: _____

c. Frequency of distribution: _____

47. Does a "current awareness" service have any value to you? If the answer is yes, what suggestion might you have that would aid in setting one up?

48. As a part of an awareness service, would routing of copies of tables of contents of books, technical reports, trade publications, etc., be satisfactory and adequate? Please explain.



49. With respect to question 48, would this kind of service suffice to meet your current information needs? Please explain.

50. Would a periodic library newsletter (covering new acquisitions, new services, etc.) be valuable to you? Please explain.

51. Has the library publication titled, "Selected Technical Reports," helped you in identifying information of value to you? If so, how do you rate its value?

Could it be improved? Please explain: _____

52. Do you make use of FAA film services from the Aeronautical Center? If so, what is your opinion of them?

Is present indexing adequate? _____

Is response time satisfactory? _____



53. Do you make use of the "Current Legal Literature Bulletin?" If so, is it adequate in meeting your needs? Please explain.

54. What technical information service that is not already available to you, do you feel would help the most in doing your job if it were instituted?

55. What specific types of technical information would you like to have made available to you for periodic reference?

56. What is your opinion of the layout of the FAA technical bulletin. Could it be improved? Please explain.

57. Do you have any particular comment with respect to improvement of technical information services or facilities presently provided to you?

This concludes the interview. I wish to thank you for your cooperation in supplying this information for the survey.