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TECHNICAL MEMORANDUM

ROLE OF THE TECHNICAL LIBRARY IN SUPPORT  
OF AN INFORMATION CENTER

November 1964

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ROLE OF THE TECHNICAL LIBRARY IN SUPPORT  
OF AN INFORMATION CENTER

TM-804

M. Bloomfield

November 1964

SERVICES DIVISION

Hughes Aircraft Company • Culver City, California

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## ABSTRACT

The information center is defined as that organization which acquires, stores, indexes, analyzes and synthesizes data and information. The library acquires, indexes, stores and disseminates documents and information. The information center's major product appears in reports which have evaluated, analyzed, integrated and synthesised the data of a special scientific topic and presented it in graphic or tabular form.

The library supports the activities of the information center by providing for its acquisitions. The library can also provide assistance to the information center through its familiarity with information retrieval principles. The information center can rely on the library to provide it with indexing and abstracting tools which provide a means of access to related information. The library also supports the information center with its current awareness announcement bulletins.

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## INTRODUCTION

The information center is a fairly new phenomenon in the area of literature analysis. For many years the library was the sole possessor of the information storage and retrieval facility. With the technological advances in nuclear energy and the space sciences and the avalanche of technical literature, a serious challenge arose trying to cope with the rapidly accumulating store of information.

The information center arose from a need to help utilize effectively the proliferating literature. The technical libraries were and are interested mainly in the collecting and disseminating the written records of the scientific events and scientific thinking. The information center is dedicated to not only the library techniques of collecting, integrating and disseminating written records, but it has a far more sophisticated function as well. This function which separates the information center from the library, is one of interpretation, analysis, synthesis and publication of data and information.

Recently the information center has itself begun to be reported in the literature. Several articles and reports have been published which try to define the information center. (See the bibliography appended). The scientific information center has been defined in the literature by Simpson in the following statement.

A scientific information center exists for the primary purpose of preparing authoritative, timely and specialized reports of the evaluative, analytical, monographic or state-of-the-art type. It is an organization staffed in part with scientists and engineers and, to provide a basis for its primary function, it conducts a selective data and information acquisition and processing program.<sup>1</sup>

Simpson does not consider those organizations which produce selected abstracts, prepare literature searches or prepare bibliographies and accession lists as information centers. Nor does he feel that organizations which acquire, store, retrieve and disseminate copies from their collection of data and information such as libraries to be information centers.

Rees has also defined the information center. He defined it by its function of offering "selected, specific, and synthesized information derived from a carefully preselected store of documents."<sup>2</sup> Weinberg in his article reporting on the work of the President's Science Advisory Committee has his definition of the information center. It is:

The specialized information center is a technical institute not a technical library. It differs from a library in that those who operate it are expected to know, in the usual sense that a scientist knows, the contents of the materials contained in the center. It uses the tools of the librarian and it cannot function without support of librarians, but its point of view is that of the scientist.

The best of the specialized information centers have contributed centrally and directly to the advancement of the sciences they serve.<sup>3</sup>

Thus from the definition given us by Simpson, Rees and Weinberg it becomes clear that the library and the information center are two distinct and separate entities. The librarian will from time to time perform some of the functions of the specialist working in the information center, and the specialists in the information center will perform library functions. However in the main the information specialist of the center is interested in evaluating, interpreting and analyzing data. The librarian is mainly interested in the collection and retrieval of information from his own collection. Figure 1 shows in graphic form the characteristics of both the information center and the technical library.

The objective of this paper is to present the relationship and the role of a particular library in the support of a specific information center. The specific information center is the Electronic Properties Information Center (EPIC or the Center) and the Library Service Section both located at Hughes Aircraft Company, Culver City, Calif. The Hughes Library Services consist of two units, the Culver City Library which houses the material published in the open literature such as books and periodicals and the Company Technical Document Center which services the report literature published under government contract including those items which have a security classification. For purposes of familiar terminology, the Hughes Library Services Section will be called the Hughes Technical Library.

It might be well to mention a few other information centers along with EPIC. These would include the Thermophysical Properties Research Center at Purdue, Defense Metals Information Center at Battelle Memorial Institute and the Radiation Effects Information Center also at Battelle.

Characteristic	Information Center	Technical Library
Users	Widespread clientele	Restricted to company personnel
Products	State-of-the-art reviews; data sheets; bibliographies; data and information in response to inquiries.	Answering technical questions; bibliographies; loan of books, periodicals and documents bibliographies and references.
Evaluation of input	Mission or discipline determined	Related to company's interests
Evaluation of output	Critical evaluation of data	Oriented to user's request.
Information needs of users	For special data and information within limits of the mission	Specific and general information in wide areas of interest
Storage and retrieval methods	Use of standard library techniques plus some automated techniques	Standard library techniques plus some automated techniques
Operating personnel	Scientists; engineers; librarians	Librarians, mainly
Indexing techniques	Quite specific	Specific, but more general than information centers.

Figure 1. Characteristics of Information Centers and the Technical Library



The main product of the center is published as data presented in either graphic or in tabular forms. The Thermophysical Properties Research Center at Purdue publishes its synthesized data for all materials in the three volume publication entitled "Data Book." The Electronic Properties Information Center publishes its synthesized data in report form for single materials as its DS-131 entitled Germanium-Data Sheets. The Defense Metals Information Center publishes its data in report form such as DMIC-152 entitled Structural Considerations in Developing Refractory Metal Alloys. The Radiation Effects Information Center publishes its synthesized data in reports such as REIC-27 entitled The Effect of Nuclear Radiation on Ceramic Reactor Fuel Material. Also indexed to the literature have been published by information centers. For instance, the EPIC publication entitled Electronic Properties of Materials; A Guide to the Literature.

The information center must find its data in published articles, books or reports. At present very little laboratory work is being done in the centers to provide new data. Because of the centers reliance on published materials, it must depend heavily on the library resources.

An intimate relationship exists between the information center and the library which supports its activities. It is of value to discuss the interaction of a library, with the information center. The relationship of these two organizations at Hughes began with the initial proposal for the EPIC contract. Librarians in the Hughes Technical Library supported and helped prepare the proposal which won the EPIC contract for Hughes Aircraft Company.

The Hughes Technical Library provided the nucleus of key personnel for the institution of EPIC. But not only did it provide these key people, it also provides in a large measure the storehouse of data needed for the successful preparation of EPIC's product, data sheets.

#### Services Rendered by the Technical Library to EPIC

One of the initial problems an information center has, is to find useful data to provide the input into its store. This involves searching established indexes in order to accumulate a sufficient storehouse of knowing concerning the area of interest for the Center. Electronic properties

of materials is the area of interest for EPIC. The Hughes Technical Library provided some of the searching initially until the Center had sufficiently organized its procedures to provide its own searching capability. This initial searching by the Technical Library helped establish a small working file for the Center. This activity of the Technical Library came to an end quite soon after the inception of the Center.

One of the major functions of the Technical Library in support of the Center has been in the provision of reprints and reports. The Center once it has made a preliminary screening of the searched items, gives the Technical Library, the citations it wants. If the citation is for a report, the established channels are used to obtain the report. That is, Defense Document Center, National Aeronautics and Space Administration Scientific and Technical Information Division and Atomic Energy Commission Division of Technical Information Extension are sent requests for technical reports written on various government contracts which bear on the Center's interest.

The open literature is handled somewhat differently. The citations from the open literature are given to the Technical Library. These citations for the most part can be located in the library's collection of technical journals or books. The library subscribes to over 800 serial titles, with the major emphasis on electronics or the disciplines of physics, chemistry or mathematics. The journals are kept by the library with fairly long runs of back issues. For instance, Physical Review is held from 1913 to date. Journal of Applied Physics is held by the Technical Library from the first volume to date. With these extensive holdings, it is possible for the Technical Library to supply the major portion of the citations from the open literature directly from its own collection.

The procedure followed by the Center and the Technical Library in the provision of materials is one where the Center specialists screen the initial citations. Then these are given to the library to pull from the shelves. Once some fifty to a hundred articles have been pulled from the library's shelves, a center specialist again reviews the article for relevance to the needs of the Center. The first review is made from the

title of the citation alone; the second review is made with the entire article in hand. Those items which pass this second review, are then charged to the Center and sent to the library's reproduction area where the item is reproduced by a Xerox 914 Copier.

For those items which cannot be located on the shelves of the Technical Library, then other means are used to procure the item. In these cases, the standard interlibrary loan method is used. The Hughes Technical Library has borrowed material for the Center from the Library of Congress in Washington as well as from many other libraries at Princeton University, University of Illinois, Harvard University and others. Interlibrary loan performed by the Technical Library allows the Center the library resources available throughout the entire United States. With this resource available to the Center, it is doubtful that any item that is found by its searching procedures could not be obtained with the literature resources available through interlibrary loan. Again it is well to note that the majority of the Center's requests are furnished either by the Technical Library's back file of journals for open literature citations or through governmental agencies for the report literature. Our interlibrary loan procedures supply only a small portion of the total literature incorporated into the Center's holdings. Thus the Technical Library provides a major service to the Center by providing it with raw materials of primary data.

With the extensive electronics coverage of the Hughes Technical Library, the Center has a reference source for related questions which are not covered by the material available within the Center itself. The library has an extensive back file of the leading abstracting and indexing journals. Over 100 current subscriptions are devoted by the library for these abstracting and indexing journals. These include such items as Chemical Abstracts, Engineering Index, Science Abstracts (both Physics and Electrical Engineering Sections), Applied Science and Technology Index, Solid State Abstracts, DDC Technical Abstract Bulletin, NASA Scientific and Technical Aerospace Reports, Nuclear Science Abstracts, Ceramic Abstracts, Digest of Literature on Dielectrics, and many others.

The information which EPIC uses for its input is normally in the form of reprints of articles from the open literature. Other inputs to the system are found in report literature, vendor literature and once in a while, in chapters from books. These basic literature sources must be copied for efficient handling in the Center. The most economical and practical way to achieve this for articles in the open literature is to use reprints. The Technical Library directs of the work flow of a Xerox 914 Copier. This machine is located within the library where it is easily accessible to the library and to the Center. The major use of the copier is by the library in supplying the reprint needs of the technical people associated with the many varied programs at Hughes Aircraft Company. The copier is also available to the Center for many of its clerical routines as well.

#### Other Factors Affecting the Relationship Between the Center and the Technical Library

One of the least recognized factors that has affected the relationship of the Center and the Technical Library is their physical proximity. The Center and Technical Library are adjacent to each other at the Hughes Aircraft Culver City plant and a member of the Center need only step through a doorway to be in the library. This closeness, which is true not only of distance but of service as well, allows the Center to rely heavily on the resources of the library's collection and personnel. This nearness results in the ability to facilitate many functions. If a citation has to be checked for accuracy, the indexes are a few seconds walk away. If a journal article must be inspected and it is not in the Center's collection, it can usually be found on the library's shelves next door. If background information must be obtained from either a book or encyclopedia it usually will be available immediately. Were this not the case, many of the problems that have been solved by use of the Technical Library's materials, would probably have been delayed substantially. The inertia of having to travel any distance reduces the desire to obtain library service. The proximity of the Technical Library to the Center provides the synergetic bonus to the successful operation of the Center.

Another factor that affects the operation of the Center is the depth of the collection in the supporting library. The Hughes Technical Library

has an excellent collection of books and periodicals in the area of electronics and materials. The objectives of EPIC and those of the Hughes Technical Library are quite similar. The programs that are being conducted at Hughes parallel in most part the aim of the Electronic Properties Information Center and therefore provide it with excellent support. Hughes Aircraft Company has adequately supported its Technical Library with funds to build a fairly complete collection of electronics publications.

The library receives 800 serial titles with strong subject emphasis on electronics and physics. Thus the strength of the journal collection is in wide current coverage as well as in its holdings of long sets of many titles, some from their initial issue. The Hughes Technical Library has provided the Center with an excellent collection for a broad literature base. It is our opinion that it is essential for the successful operation of any information center to have such a library at its disposal.

The effectiveness of the library staff is another factor associated with the successful operation of the Center. It is essential that a constructive relationship exist between the members of the Center and those of the library. The operation of an information center is dependent on the cooperation of the associated library staff members; this is also the case between the Center and the Hughes Technical Library. It is also essential that the library staff be competent in both understanding the needs of the Center and providing for the needs of the Center in both reports and reprints. Also the library provides additional backup in its ability to ferret out information. The Center personnel rely from time to time on the ability of library staff members to assist them in a search for answers to specific problems and for guidance to specific references in the literature.

It should also be pointed out that the library has provided the Center with some of its staff. Because many of the routine procedures of the Center parallel those of the library, it is possible for an interchange of personnel from one to the other. The library was in existence prior to the initiation of the Center, and many of the original staff of the Center

re former Technical Library staff members. This use of the library personnel for staffing the Center has had the additional benefit of smoothing relations between the Center and the Technical Library.

Another factor which increases the effectiveness of the Center is the distribution of the Library Information Bulletin (LIB) to the Center technical personnel. LIB is published every two weeks and contains the latest acquisitions of the Hughes Technical Library. LIB is designed to support the entire research and development effort at Hughes Aircraft Company. This publication is divided into several sections. One of these sections contains books and other reference works. The circulating books listed are then placed on a special rack in the library's reading room where they may be inspected by all Hughes personnel. The technical staff of the Center make it a practice to study the books placed on the new book shelf. Other sections of LIB include a classified list of reports. For reports, LIB must be read by the Center's technical staff in order for them to be aware of the reports received by the Hughes Technical Library. Because the LIB publication has listed all its reports in a classified arrangement, this aids the Center personnel in selecting those reports which it desires to add to its collection. The last section of LIB is a collection of reproduced tables of contents from thirty selected journals. This last section of LIB entitled "Contents of Selected Periodicals" includes many of the journals that are of interest to the Center. For instance Journal of Applied Physics, Institute of Electrical and Electronic Engineers' Spectrum and Proceedings, British Journal of Applied Physics and Reviews of Modern Physics are included in this last section of LIB.

The distribution of LIB is accompanied by the distribution of two other publications by the library to the Center. The Technical Library also distributes Defense Documentation Center's Technical Abstract Bulletin and NASA's STAR to the Center. These three publications distributed by the library to the Center provide the Center with its current awareness of the report literature supported by government funds in its areas of interest. Also once a technical reviewer of the Center finds an item of interest in any of these three publications, he requests it through the library. The library will then take any measures necessary

to obtain the item for the Center.

In the area of data processing the Hughes Technical Library provided the Center with an initial program from which to build its more sophisticated program. The Technical Library had developed a data processing system for the automatic up-dating and printing of its coordinate index terms on 5 x 8 form cards. Originally the identical program was used by the Center that had been generated for the library; however, with time and additional experience, the card form of the index has been dropped and the print-out of the index now appears as a standard print-out on fourteen inch wide paper in a continuous fashion. Thus the index can now be bound in book form. However, the library provided the initial experience with data processing programs and from this experience the Center has been able to augment its program.

#### The Technical Library and EPIC

In one of the final reports of EPIC<sup>4</sup> on the initial contract, a flow chart was presented to show the various steps needed to process the incoming materials through the preliminary stages of documentation. From Figure 1, the second column from the right defines the activities of the library in direct support of EPIC. These services given in direct support are to "locate requested material" nominally from the library's own collection and then to "obtain from external source, if necessary" all the materials that are not available within the library's own collection. Also the library has been given the duty to "request copies" of the items desired and to have reprinted two copies all the items requested by EPIC. When the library has received the two reproduced copies it will "return original material to file or to source from which it was borrowed" and to "forward both copies of literature" to EPIC.

From the flow chart in Figure 1, it is evident that the library is a direct link in the performance of the Center's activity.

#### The Effect of EPIC in Enriching the Library

The proximity of the Center to the library allows the library to rely on the capabilities of the Center. The subject specialists of the Center are consulted from time to time to assist the librarians with many of their problems. These problems can be related to both technical areas

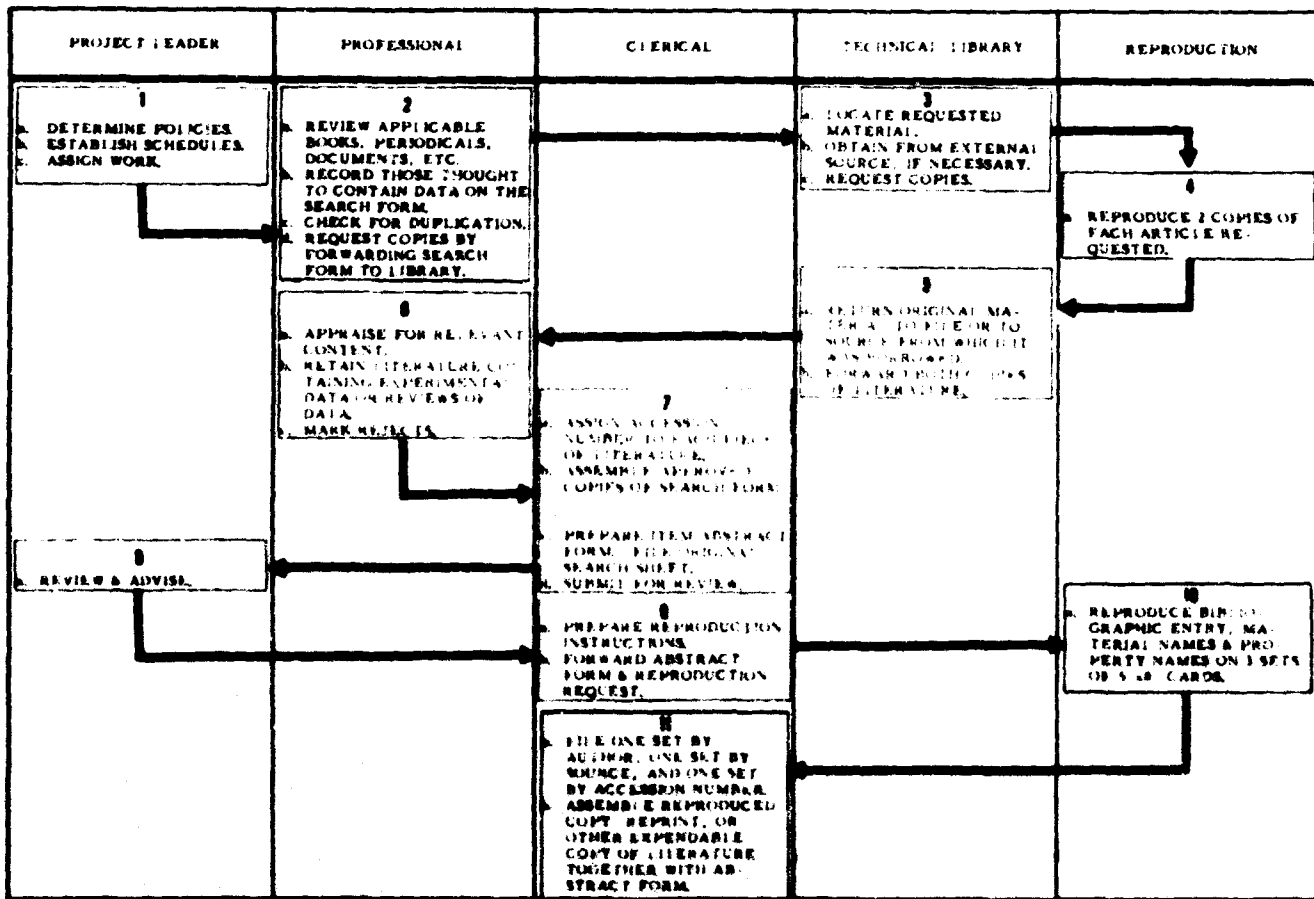


Figure 2. EPIC Operations Flow Chart



or to library administrative areas. The richness of the experience and education acquired by the members of the Center can be tapped by the library staff. The library staff with the aid of this capability thus adds to its own stature in its ability to provide service not only to the Center but to the rest of its clientele.

Because the Center's activity is one of engagement in the use and interpretation of data, the library has the opportunity to learn of the needs for technical data in the reported literature. This opportunity again extends the ability of the library staff to provide a deeper and better service.

One of the lasting benefits in the relationship between the Center and the library concerns the additional experience gained by the library. That the library must solve many problems with the Center means that the library grows in experience and therefore becomes a better and more knowledgeable library.

#### Summary

In summary, it is evident that the information center must rely on the resources of a technical library. The library's collection of books and periodicals provides the information center with its primary resource. Also the information center relies on the library to select from the entire published store of information in the world through the library's collection and the library's interlibrary loan function. Both the library and center benefit from their interaction.

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