https://ntrs.nasa.gov/search.jsp?R=19950021280 2020-06-16T07:53:41+00:00Z

NASA-TM-110619

NASA
IN-82-TM
50147
P. 66

DEVELOPMENT AND IMPLEMENTATION OF AN ELECTRONIC LIBRARY TOUR FOR THE NASA LANGLEY TECHNICAL LIBRARY

by
Nancy A. Rinker

A Master's paper submitted to the faculty
of the School of Information and Library Science
of the University of North Carolina at Chapel Hill
in partial fulfillment of the requirements
for the degree of Master of Science in
Library Science.

Chapel Hill, North Carolina

July, 1994

Approved by:
Evelyn H Daniel
Advisor

(NASA-TM-110619) DEVELOPMENT AND
IMPLEMENTATION OF AN ELECTRONIC
LIBRARY TOUR FOR THE NASA LANGLEY
TECHNICAL LIBRARY M.S. Thesis,
North Carloina Univ., Jul. 1994
(NASA. Langley Research Center)
66 p

N95-27701

Unclas

G3/82 0050147

405337 (67p)

Nancy A. Rinker. Development and Implementation of an Electronic Library Tour for the NASA Langley Technical Library. A Master's paper for the M.S. in L.S. degree. July, 1994. 63 pages. Advisor: Evelyn Daniel.

This paper examines the development and implementation of a hypertext library tour for the Technical Library at NASA Langley Research Center in Hampton, Virginia. The NASA Langley Technical Library is a special library supporting research in the areas of aeronautics, engineering, computer science, and the space sciences.

The electronic library tour was developed in response to a need for additional bibliographic instruction at the Library. An overview of the NASA Langley Technical Library is presented as background for the discussion of system development. The decisions behind the use of a hypertext interface versus a menu-driven system are presented. The electronic library tour interface is described and illustrated, focusing on major design decisions. Some evaluation criteria for future system testing are also outlined.

Headings:

Hypertext systems

Computer-assisted instruction

Bibliographic instruction

TABLE OF CONTENTS

Acknowledgements 1

I. Introduction 2

II. Description of Problem 5

  A. Background -- NASA Langley Technical Library 5

  B. Problem statement 8

  C. Proposed solution 12

III. Literature Review 15

IV. Description of Interface 21

  A. Choice of direct manipulation system/hypertext application 21

  B. Original interface design 23

  C. Scenarios: examples of possible system use 27

  D. Evolution of interface 31

V. Evaluation of Interface 34

VI. Future of system 41

VII. Conclusion 43

Appendix A 44

Appendix B 59

Bibliographic References 61

Acknowledgements

The author wishes to thank everyone at the NASA Langley Technical Library for their assistance and encouragement throughout the duration of this project, especially George Roncaglia, Susan Adkins, JoAnne Rocker, Sue Miller, and David Adams.

Special thanks also to Dr. Evelyn Daniel and Dr. Barbara Wildemuth at SILS, both of whom helped me to get this project off the ground.

Finally, I wish to thank Robert and Jeane Rinker, Craig Rinker, Margaret Adams, Neosha Hough, and Joe Kaplan for their unending moral support.

Development and Implementation of an Electronic Library Tour for the NASA Langley Technical Library

I. Introduction

> *Electronic resources are proliferating, and users need assistance in locating and accessing the information needed for problem solving, decision making, and even entertainment. The role librarians play depends on the willingness of the individual librarian to become involved, participate, learn, and contribute. (Jacob, p.210)*

As the above quote by M.E.L. Jacob illustrates, the role of librarians today is drastically influenced by the changing nature of information and library services. The museum-like libraries of yesterday are a thing of the past: today's libraries are bustling with life, activity, and the sounds of new technologies. Libraries are replacing their paper card catalogs with state-of-the-art online systems, which provide faster and more comprehensive search capabilities. Even the resources themselves are changing. New formats for information, such as CD-ROMs, are becoming popular for all types of publications, from bibliographic tools to encyclopedias to electronic journals, even replacing print materials completely in some cases. Today it is almost impossible to walk into a library and find the information you need without coming into contact with at least one computer system. Librarians are not only struggling to keep up with the technological advancements of the day, but they are becoming information intermediaries: they must teach library users how to use all of the new systems and electronic resources.

These increases in library technology have proven to be quite a switch for users, some of whom are just learning to use computers. Many of the users entering the library are resistant to the changes brought about by technology, or are too impatient to learn a new procedure. A typical reference question is no longer "Can you tell me where to find this book?" -- a more commonly heard query today is "Could you show me how to use the online catalog, and then tell me where the books are?"

Not surprisingly, bibliographic instruction itself has taken on a new look and feel in these electronically advanced libraries. Many libraries are experimenting with the development of expert systems and other computer aided instruction interfaces for teaching patrons how to use the library and its resources. One popular type of interface in library instruction programs is hypertext, which utilizes "stacks" or linked pages of information. Hypertext stacks can incorporate color graphics along with text to provide a more interesting interface and entice users into trying out the system. Another advantage of hypertext is that it is generally easy to use, even for those unfamiliar with computers. As such, it lends itself well to application in libraries, which often serve a broad range of clientele.

This paper will discuss the design, development, and implementation of a hypertext library tour in a special library setting. The library featured in the electronic library tour is the National Aeronautics and Space Administration's Technical Library at Langley Research Center in Hampton, Virginia.

II. Description of Problem

A. Background -- NASA Langley Technical Library

In 1917, the National Advisory Committee for Aeronautics (NACA) was established to provide basic research for the United States government in the new science of aeronautics. NACA served in an advisory capacity only until 1958, when the National Aeronautics and Space Act, introduced and approved by Congress, detailed the need for greater research in the areas of flight and space flight. The 1958 Act created the National Aeronautics and Space Administration (NASA) as "a civilian agency exercising control over aeronautical and space activities sponsored by the United States" (National Aeronautics and Space Act, 1958). With its new name, NASA was also charged with establishing an experimental program in the area of space flight, as well as continuing its emphasis on aeronautics.

The Langley Memorial Research Laboratory (now Langley Research Center) in Hampton, Virginia, was the first laboratory created under NACA to conduct flight research. Throughout the history of NACA and its evolution into NASA, Langley has remained the agency's foremost research center in the area of aeronautics. The Langley Research Center is one of the largest aerospace research facilities in the world, with a workforce of over 5,400 civil service and contract personnel. Some of the main research and technology efforts at Langley occur in the following areas: aircraft stability and control, guidance and navigation, fluid and flight mechanics, fatigue and fracture, airfoil research, noise reduction, structural design and analysis, and aeroelasticity. The Center also does limited, but important, work in the areas of space flight, space guidance and control, applied mathematics and computer sciences, and remote sensing technology.

The research efforts of Langley's community of scientists and engineers are served, in part, by the Center's Technical Library. The Langley Technical Library's main purpose is to support the activities that take place across the Center through the collection, organization, and dissemination of information vital to Langley's research. The Library employs more than 40 full time personnel, of whom approximately a third are professional librarians, technical information specialists, or computer scientists. Collections and services are concentrated in the fields of aeronautics, astronautics, computer science, engineering, structures, and other areas, reflecting the interests of Langley researchers and support personnel.

The Library has a strong commitment to providing the latest materials and resources to assist the researcher in information acquisition, retrieval, and utilization. The collection of the NASA Langley Technical Library consists of approximately 60,000 books, 1,500 current journal subscriptions, and over 1.5 million documents and technical reports. In addition to print resources, the Library has a number of electronic information systems available for use by patrons. It is providing as much information as possible in electronic format, with the ultimate goal of transmitting Library materials and information directly to researchers at their desktops. Currently, the Library has over 50 commercially-produced CD-ROM databases, including two that are full-text and 11 that are networked throughout the Library building. Plans are to expand the networked CDs to the Langley Research Center's local area network, LaRCnet, by the end of August 1994. The Library also has produced its own CD-ROM product, which contains the full text, charts, and diagrams from 36 National Advisory Council for Aeronautics documents (NACA was NASA's predecessor; it was established at Langley in 1917). In addition to the CDs, the Library also has a number of other electronic systems available for use by patrons, including Current Contents on Diskette (a current awareness service), an Internet browser, and NASA RECON, which is the NASA agency's database of aerospace and aeronautics literature. The Technical Library's resources come together in STILAS, its online catalog. STILAS, which stands for Scientific and Technical Information Library Automated System, provides a searchable interface for many of the Library's print and electronic information sources. In addition to the STILAS workstations at the Library, STILAS is also accessible to Center employees through the LaRCnet network. A new release of STILAS allows users to request library materials from remote login sites.

In terms of programs, instruction, and outreach, the Library has become an active and vocal entity on the Center within the last few years. The arrival of a new library director in 1990 was the catalyst for many changes; the director, George

Roncaglia, is a firm believer in both user education and marketing library services. Because of his philosophy, different from the beliefs of the previous library head, there has been a real push to provide more information to users about products and services. In support of this, the Library is undergoing an internal reorganization process, to restructure staff and services and gear them more toward user education and less toward information delivery only. The user education activities of the Library so far appear to be successful, both for staff and for patrons. Some of these activities currently underway at the Library include: in-house production of print and online user guides for all of the Library's CD-ROM products, planning of Library outreach programs for Center researchers, continuation of summer tours for visiting summer students and researchers, and continued development of a Library Home Page for the Center's World Wide Web browser on Mosaic.

B. Problem statement

As the previous overview suggests, a number of factors have influenced the nature of resources and services at the NASA Langley Technical Library. The Library is struggling to keep up with its rapid growth and electronic development without sacrificing any of its services to users. Unfortunately, there can sometimes be a conflict between providing information comprehensively and rapidly, and providing it in a means easily understandable to users. Until the past few years, the Technical Library has concentrated more on getting new information out to users as quickly as possible, and less on teaching users about the new systems and resources they were providing. The following is an outline of problems related to the dissemination of information and resources at the NASA Langley Technical Library.

The Library supports research in many disciplines, including aeronautics, astronautics, computer science, and engineering. It has a wide range of users from across the Center, including scientists, engineers, and scholars. There are many types of users that come to the Library, from frequent users to others who come only once every two or three years to check out a book or document. The Library also has quite a few secondary and tertiary level users, including summer researchers, students, visitors from other NASA centers, and members of the general public. These "other" users, because their numbers are so considerable, have a significant impact on the flow of work at the Library.

A large and growing body of library users are short-term visitors to the Center, such as summer students. Summer students and researchers use the Library intensely; they need a brief introduction to the Library's services and resources in a relatively compressed time frame. In the past few years, the Library staff have found it more and more challenging to provide general bibliographic instruction to this group of users without impinging on the high level of service required by permanent Langley employees.

The collection of materials and resources at the NASA Langley Technical Library is becoming increasingly electronic in nature. The Library has already removed its print card catalog, relying on STILAS to provide access to the Library's books, journals, and document collection. Although STILAS is fairly user-friendly, the Reference staff must teach many patrons how to use an online catalog in searching for library materials. In addition to STILAS, the Library has added a number of other electronic tools to its collection, including the CD-ROM databases. The staff must keep up-to-date on all of the new technologies introduced into the Library; they often find themselves learning about a new CD-ROM one day, and teaching a group of users how to search it the next day.

The amount of formal user education provided at the Library has been minimal. While the Reference staff members perform a lot of informal bibliographic instruction as a normal part of their duties at the Reference Desk, they spend little time on formal BI programs of any sort. The only formal bibliographic instruction that has occurred regularly at the Library has been the STILAS overviews that accompany each of the weekly or monthly guided library tours. This year at the annual Library Open House in April, the Reference Staff offered a series of "brown bag lunches" for Langley researchers, instructing them on various library resources and services. The Library staff would like to be able to offer similar instructional programs on a regular basis, but due to staff shortages and work overload, this has not yet become possible. For now, most user training of resources and services occurs on a case-by-case basis, with impromptu demonstrations of STILAS or CD-ROM databases.

Unfortunately, the Library has little written documentation of its resources and services (for example, user guides) to compensate for the lack of formal BI programs. In the past, the Reference Staff had more time to conduct searches for patrons, or to explain strategies as they used a new library tool. This is not the case today. Users sit down alone in front of the online catalog, CD-ROMs, and other electronic systems, with little to guide them in their searching. The Library has produced a few guides for the STILAS catalog, but the latest version was done years ago and is not very useful, especially to a new library visitor. Currently, there is a project underway to produce help sheets for some of the Library's CD-ROM databases, but in the meantime, users must search alone or wait for the assistance of a reference librarian. The Library is also in desperate need of navigation aids, such as maps and signs, to assist first-time visitors in finding the resources and services within the building.

The Technical Library staff has attempted to solve some of these problems by sponsoring guided tours of the Library for interested researchers and visitors to the Center. For the past two summers, the Library has offered the tours on a weekly basis. During the remainder of the year, the tours are offered monthly, on the third Thursday of each month. Tour times are advertised in the Center's weekly newspaper, as well as on electronic mail and on signs in the Library. In addition to formal tours, the Library's two student interns also conduct separate tours for individuals or small groups.

The tours have been somewhat helpful in freeing up Reference Staff members to spend less time answering basic directional questions and more time on in-depth searches and reference requests. They have attracted new patrons to the Library and provided a higher level of formal library training than was previously offered. However, the guided tours do have some disadvantages. First of all, the scheduled weekly and monthly tours tend to be quite crowded, with as many as 17 people showing up at one time to take the tour. This is a large number of people for just one tour guide to show around, and it makes personalization of the tour very difficult. Another disadvantage to the guided tours is that they are too brief to be able to offer in-depth information or instruction to patrons who might want it. The tours generally last between a half-hour and forty-five minutes, and provide only a very brief overview of the collections, systems, and services. Not everything is covered in the library tour due to time constraints. An additional problem is the element of "human variation" on the tours. There are two regular tour guides, who generally switch off on a week-by-week basis. Although they try to maintain consistency in what they present to visitors, there is some variation, since there are no formal guidelines for what should and should not be discussed or shown on the tours.

C. Proposed solution

Because of the disadvantages of the traditional library tour, the Technical Library staff have been investigating alternatives. In keeping with the Library's commitment to new technology, the head of the Library has expressed interest in the use of intelligent interfaces, such as expert systems, which could provide an alternative to the traditional library tour. In response to this, the author, who serves as a student intern for the Technical Library, developed a prototype system for one of her information science classes at the University of North Carolina at Chapel Hill.

The prototype system, which is the focus of this paper, is a hypertext tour of the NASA Langley Technical Library. It combines maps with informational screens to provide an overview of the library's resources, systems, and services. Its purpose is to inform and educate Library users in the same way that the person-guided tour of the Library did. However, the electronic library tour may have some advantages over the traditional library tour. Users can view as much or as little of the hypertext tour as they want, skipping over sections that they are not interested in and focusing on those that they want to know more about. They can use the hypertext tour to get information about the Library whenever it is open, instead of being limited by the time constraints of the guided library tour. Finally, users can choose their own pace through the tour, spending as much time as they want viewing and reviewing informational screens.

In terms of the specific problems of the Technical Library, the hypertext tour should provide needed assistance to library users, as well as relieving reference librarians of some of the mundane questions they receive now. The hypertext tour would be available as an introduction to the Library for summer students and new Center employees. It would serve as a navigational tool, pointing out to new users the location of materials and parts of the Library. Finally, it it would serve in a bibliographic instruction capacity, providing help in using the Library's electronic resources, such as the STILAS online catalog.

The goals of the electronic library tour are fairly simple. The main goal of the system is to educate users about the services and resources available at the Technical Library, and to assist users in navigating what has been known as a confusing building. A second goal is that the interface be easily understandable and usable.

Even if the electronic tour includes useful information, it is not helpful if the interface does not allow easy access to it. A third goal is that the electronic tour stimulate interest in the Library and encourage users to solicit help from the Reference Desk in using the Library.

This paper will discuss the evolution of the hypertext library tour from its earliest design stages to the present, focusing on some of the major design decisions that were made throughout its development. It will demonstrate how the electronic tour provides patrons with a means for learning about the Library without the assistance of a Reference Staff member, allowing for learning at an individual pace. It will discuss a framework for formal evaluation of the interface's effectiveness. Finally, the paper will wrap up by predicting the future role of the hypertext library tour at the NASA Langley Technical Library.

III. Literature Review

This review of the literature examines hypertext programs for bibliographic instruction purposes in libraries. A common framework presented in the research outlines an existing hypertext library tour or CAI system, evaluates its positive and negative characteristics as a method of library instruction, and measures user satisfaction with the system (whether predicted or tested). Following is a summary of some important literature and research in hypertext library tours and bibliographic instruction systems.

Two comprehensive bibliographies on hypertext are Franklin's "A bibliography on hypertext and hypermedia with selected annotations" (1990) and Ramaiah's "Use of hypertext for teaching and training: a bibliography" (1993). Franklin's article includes some annotations; Ramaiah's bibliography, while more current, does not.

Vaccaro's columns on hypertext applications ("HyperTours! Part 1" and "HyperTours! Part 2") from Computers in Libraries (1989)provide a good introduction to the basics of HyperCard. Vaccaro examines HyperCard's usefulness in establishing semi-automated library tours, gives hints for planning a hypertext project, and shows some "sample" hypertext applications from real-life libraries.

Two good, general articles on the use of hypertext and other electronic bibliographic instruction aids in libraries are Feinman's article "Hypertext and library instruction" (1993) -- a good overview of the history of hypertext, focusing on its gradual introduction into libraries for bibliographic instruction and other educational purposes -- and Farmer's "Hyperlearning: library instruction through HyperCard" (1991), which discusses the formation of the Library Hypermedia Instruction Group, a coalition of librarians that meet several times a year to discuss the development of hypertext systems in libraries. The article proposes research to study the effectiveness of student instruction by hypertext.

More articles describe specific applications of hypertext bibliographic instruction modules and library navigation systems, particularly in college and university libraries. Tiefel (1991) outlines some of the major academic library projects in her report, Examining Innovative Applications of Technology in Libraries. Ms. Tiefel, herself a developer of the "Gateway to Information" hypertext program at Ohio State University, visited thirteen institutions across the United States to examine their projects relating to bibliographic instruction. Some of the projects examined in her report include library applications at Carnegie Mellon University, Arizona State University, the University of Houston, and Pennsylvania State University. Tiefel noticed that among all of the libraries surveyed, "...There is a perception that most libraries, as they function now, require users to know and understand how libraries are organized. Many librarians are trying to change this by developing systems that will meet users' needs and are easy to use" (p. iii). In other words, librarians are turning to technology to help familiarize users with today's libraries.

Tiefel's project at Ohio State University is described in her article "The Gateway to Information: Development, Implementation, and Evaluation" (1993), featured in a collection of articles on the changing roles of librarians. The "Gateway to Information" is a hypertext program that teaches the basics of bibliographic instruction to OSU undergraduate students. The article includes sample screens from several versions of the Gateway.

"Lessons for the teacher and the student: developing a HyperCard tutorial" (Son, Humphries, and Feldman, 1993) describes the development of a tutorial program for the Claude Moore Health Sciences Library at the University of Virginia. The tutorial uses computer-assisted instruction, through a HyperCard module, to teach library users how to use the online catalog, the journals list, and miniMEDLINE.

Piette and Smith, Jr.'s article "Hypermedia and library instruction: the challenge of design" (1991) describes Utah State University's hypermedia project. Project FORE, as it is known (Focus on Research and Evaluation), introduces the Merrill Library at Utah State. Piette and Smith concentrate on the qualities of good, effective design and encourage experimentation with the media: "Hypermedia programs are not textbooks in just another format. They offer more and challenge us to explore new structures and levels of design" (p.20).

The Library Handbook, a hypermedia library tour at the University of Texas Pan-American, is discussed in the article "A hypermedia system to explain library use" by Fowler, Hancock, and Fowler (1993). The tour features general information about the Texas Pan-American library, including floor maps and a campus map. The article is mostly descriptive in nature, featuring an abundance of screen dumps to illustrate the descriptions of various screens.

Other hypertext projects in colleges and universities that have been developed -- and written about -- include: Miller Library's Library Orientation Tour at Washington College (Chaffin, 1987), the University of Iowa Libraries' Library Navigator (Forys, et al, 1993), Pima Community College library's Orientation Express (Holleman, 1990), Wayne State University Libraries' Call Number Directory (Kane, 1989), and The Electric Undergrad library program at the University of Illinois at Urbana-Champaign (Norlin and Wright, 1993).

There are few articles describing hypertext applications in special libraries. "A tour of the stacks: HyperCard for libraries" by Ertel and Oros (1989) does discuss the development of a hypertext tour in a corporate library; in this case, Apple Computer, Inc.'s library. The article illustrates how HyperCard can create useful applications and interfaces for libraries. They use their computer tour of the Apple Library, which was created in HyperCard, as the focus of their discussion of HyperCard and its application to the library environment. The Apple Library Tour consists of maps of the library's layout linked to information screens, lists of available resources and services, etc. By clicking on one section of a map, a system user can zoom in on that section for more information. The article includes sample screens of the system layout, as well as documentation about how the system was developed.

In addition to descriptive articles of hypertext applications in libraries, some more evaluative articles attempt to measure the effectiveness of hypertext as a tool for library instruction. The article "Teaching with HyperCard in place of a textbook" by Mackey *et al* (1992) outlines the use of Macintosh computers in library instruction at Southwest Missouri State University. A HyperCard version of a library instruction textbook was created to alleviate some of the problems of providing a strictly textbook and lecture-oriented instruction method to new library users. The article compares the HyperCard program to traditional instruction with a formal evaluation of the overall effectiveness of HyperCard in the education of library users.

Bonnie MacFarlane's Master's paper A Computer-Assisted Library Tour (1988) reviews some of the existing literature on electronic versus traditional library tours and presents the results of her experiment using CAI (computer aided instruction) at the University of North Carolina at Chapel Hill's School of Information and Library Science library. She conducted a study to determine whether an electronic CAI program could be a useful method of instructing new users at the SILS library. Fifteen new students in the information and library science program at UNC-CH took the electronic tour and provided feedback in the form of posttest questionnaires. The questionnaires measured the amount of information learned through the computer tour and the attitudes of the library users toward the tour. Based on the results of her experiment, Ms. MacFarlane reported that, although the average score of the students on the cognitive posttest was not as high as desired, the students' attitudes toward the tour were generally favorable. She concluded that a computer-assisted library tour could be an effective alternative to a conventional, guided library tour.

Lawson's article, "Using a computer-assisted instruction program to replace the traditional library tour: an experimental study" (1989), describes a study which took place at Central Missouri State University's library. Lawson's study was designed to determine if college freshmen who used computer-assisted instruction had higher posttest scores than those taking a traditional library tour or those with no formal library instruction. The participants in Lawson's experiment were divided into three groups: a CAI group, a guided tour group, and a control group (no formal instruction). Each participant was given a pretest to determine his/her knowledge about the library. Following the pretest, each group received a certain type of library instruction, or no instruction, depending on study specifications. After the experimental treatment, each group was administered a posttest to measure the learning that was brought about by each form of bibliographic instruction. The results indicated that CAI was an effective alternative to the traditional library orientation/ instruction tour, and that both methods of instruction were far superior to providing no formal library instruction.

IV. Description of Interface

A. Choice of direct manipulation system/hypertext application

The first major decision in the design of the electronic library tour was deciding what type of interface to use. It was decided in the initial stages of planning the interface that there were two main possibilities for the design of the electronic tour: direct manipulation or menus. Upon consideration of task structure, user characteristics, and a number of other factors, direct manipulation seemed to be the more appropriate interface for the Technical Library electronic tour. Some of the advantages of direct manipulation systems are highlighted below, with emphasis on the implications of a hypertext library tour as it would be used at NASA Langley.

More attractive and interesting designs can be created to "lure" users with direct manipulation than with menus. Direct manipulation applications lend themselves to the use of graphics, imported pictures, and other visual displays. Such details seem to increase user interest in what they are doing; users like having the opportunity to directly move and click on objects.

Direct manipulation also offers a level of simplicity and comprehensibility of actions that menu systems do not. This is an especially important characteristic in developing a library tour, since it is important that users see where their actions are taking them. With direct manipulation, they can see what the different floors in the library look like as they travel from screen to screen, they can click on an icon for "book" to find out more about the Library's book collection, etc. Schneiderman (1992) gives an example of how using maps in direct manipulation can be useful: "A building floor plan showing offices might be shown, and when a department is chosen, individual offices become visible" (Mayhew, p. 299).

Because of the ease of operating a direct manipulation system, no prior training will be necessary for users to understand how to operate the library tour. The screens are self-explanatory; the only thing which might affect a new researcher's comfort level in using the system might be prior experience with using a mouse. If a researcher is familiar with the technique of "clicking" to select and activate objects, he or she should have no problem with the electronic library tour interface.

Another consideration in using the direct manipulation system in the electronic tour of the Library is the high percentage of young users who come to Langley for research, whether for school-related or work-related purposes. The graphical designs and "fun" interface will appeal most to younger generations who have grown up with more television, video games, and computers in general. It is important to remember this factor when setting up any system that will be used frequently by young adults and individuals under the age of 30.

Once the decision was made to use a direct manipulation interface rather than a menu interface, the author selected Asymetrix ToolBook as the application for creating the interface. The author liked the ease of creating hypertext screens in ToolBook, as well as the application's flexibility in incorporating graphics and imported text.

B. Original interface design

The concept of an actual, physical guided tour of the library was used as the metaphor for comparison and to provide guidelines for system design for the electronic tour of the Technical Library. In creating the system and its components, it was important to refer back to the chosen metaphor constantly. This conceptual model helped to shape the actual design of the tour structure, define and limit its scope, and provide a means of comparison and evaluation for the design.

The electronic tour is designed with the new Center employee, researcher, or library user in mind; its purpose is to take the user step-by-step through the Library, explain what is offered, and provide assistance in navigating through materials. The metaphor of the guided tour is easy for users to understand; because it follows real life conventions and is easily understood, users should have no trouble navigating through the system.

As it existed in its original form , the electronic library tour attempted to mimic the actions that a real user would take in conducting a walk-through, narrated tour of the library. The model in creating the system was based on the fact that there are two main types of information needed by new library users: directional (i.e., where are the photocopiers?) and informational (i.e., what types of resources do you have at the Library?). The interface in its original version consists of 30 screens, centered around two main branches in the hierarchy: a short QuickTour featuring maps of the Library only, and a more in-depth Tour of Library Resources with textual information about the Library's collection and services. The setup of the system is congruent with the way the library tours are conducted in person: a tour guide shows visitors the layout of the Library, primarily focusing on layout at the beginning of the tour but gradually talking more about what types of things the Library has to offer.

The electronic tour was built using a basic hierarchical structure, with branches and links providing more specific information the further down in the hierarchy that they travel. In addition to the main tours (QuickTour and Library Resources Tour) and their branches, there was a general information screen labeled "About the Tour..." and a map showing the layout of the system in terms of its hierarchical structure. Within the most specific branches of the tour (under the Library Resources Tour hierarchy), information was presented in textual, paragraph format, which is in contrast to the appearance of most other system screens. For the main menu screens attractive design and layout, including graphics, were used as much as possible. The screens were colorful and designed for their graphical impact on the user. The first screen was designed to be particularly eye-catching: it is a representation of the outside of the

Library building. Buttons and graphics with links were used to navigate from screen to screen in this direct manipulation system.

The hierarchy of screens for the original interface is as follows: a user enters the tour from the opening screen, which says "TO BEGIN YOUR ELECTRONIC TOUR OF THE LIBRARY, CLICK MOUSE ANYWHERE ON SCREEN". This brings him/her to the main menu, which then provides a choice between the QuickTour or the Library Resources Tour. Brief descriptions of the scope of each tour are also included on the main menu screen.

If the user selects the QuickTour option, another menu screen would allow the user to select a map of the Library to look at. The menu describes briefly what types of resources might be found on each floor. From the menu, a user is taken directly to a map of the floor which was selected. The maps of the floors include general information about where particular points of interest are located within the Library (ex., where the book stacks are located within the Reading Room). "Elevator buttons" allow navigation directly from one floor to another within the QuickTour section of the tour.

The Library Resources Tour is a more in-depth tour of the Technical Library's collection, resources, and services. After selecting that option from the main menu, a user can choose to find more information on one of three general areas: Print Resources, Electronic Resources, or Library Services. Selecting any one of these would bring the user to another level of menu screen. For example, under the Print Resources menu, a user could find out more about Journals, Books, Documents, Reference Tools, or Microfiche/Microfilm. Topics under the other two menus were as follows: Electronic Resources including the subtopics STILAS, RECON, IEEE/IEE Fulltext, CD-ROMs, Internet/HYTELNET, and Current Contents. The Library Services menu includes information on Reference Staff, Requests for Materials, Subject Searches, Special Programs, and General Information.

Each of the most specific screens of the menu hierarchy includes textual information about that resource or service. The information is in the format of a scroll bar, so users can page down to find what they are interested in. In addition to the maps on the QuickTour part of the system, each informational screen about a particular resource or service at the Library is linked to a locator map. Once users reach the most specific level of information in the tour (i.e., text screens on each library resource), they can select "Show location". There is one map of the third floor linked to all of these buttons. Each button has a specific script that links it to the Xs on the "Location" map. For example, when the user is in the "Journals" screen and selects "Show Location", the scripts on the button would move the X boxes on the map screen to the appropriate location (i.e., where the journals are).

In terms of general navigation, A HOME symbol is used on most screens to take the user back to the opening screen of the tour. This can be useful if a user becomes disoriented and unsure of his/her location in the hierarchy of screens. Most screens also include a button labeled "Previous menu", which sends users back one level in the hierarchy.

An Outline of Topics screen is included as a supplement to the Library Resources Tour menu. Users may want to know what subtopics are included under each heading (i.e., Print Resources, Electronic Resources, and Library Services). A system map, showing the hierarchy of the screen structure, is also included to help users navigate throughout the tour. This map is accessible from the "About the Tour..." screen.

Since its original design, the interface has undergone some changes, both major and minor in consequence. I will discuss these in more depth in the Evolution of Interface section under this heading.

C. Scenarios: examples of possible system use

Following are two scenarios which speculate on why a user might decide to use the electronic library tour, and detail some possible user interactions with the tour interface. These are included here to provide a feel for how the interface might be used on a typical day in the NASA Langley Technical Library.

Scenario 1 --

A college-age cooperative education student enters the Library. He is in search of some documents to supplement his research, but is unsure about how to find the documents he needs. The reference librarian on the third floor appears busy. A quick walk around the reading room does not yield any information about the location of the document collection. He sees some other researchers sitting at some computer workstations labeled "STILAS", but he does not know what STILAS is. On walking back out into the third floor lobby, he sees a computer terminal labeled "Library Tour". He is attracted by the colors and graphics, and wonders if the tour will provide the type of information he needs. He decides to try the tour.

When he clicks on the first screen (a design showing the outside of the Library), he enters the main menu screen of the tour. He sees that he can choose to navigate the system using QuickTour or a Library Resources Tour. Based on the description of the Library Resources Tour, which indicates that it is helpful to new library users, he decides to choose that tour. The system takes him to the Tour of Library Resources menu. He sees that there is a button specifying "Outline of Topics", and decides to take a look to see what he can find information on. He sees three subheadings which appeal to him: General Information (under the Library Services menu), STILAS (under the Electronic Resources menu), and Documents (under the Print Resources menu). He decides to go to Print Resources first to find out about the Library's document collection. He discovers that he needs to ask the

Reference librarian to help him locate documents, but that he can search for some documents on STILAS (the system tells him at this point that STILAS is the Library's online catalog). Upon reading about the documents, he decides to read more about STILAS. He backs up using the Print Resources button on the Documents screen and backs up one more time to the Tour of Library Resources menu. This time he follows the same procedure as before to reach the STILAS screen. He finds the information helpful, but wishes that it included more specific information about searching on STILAS. He decides to go directly to a STILAS terminal and try some searches -- but first he uses the "Show location" button to point him in the right direction. That button leads him to a screen showing a map of the Library's third floor: the location of the STILAS workstations is highlighted by a red X. He walks away from the workstation, leaving the system on the map screen; after 3 minutes of inactivity the system automatically resets to the first screen. (Note: the timeout feature was not implemented in the system prototype).

Scenario 2 --

A researcher enters the Library. He is middle aged, has been at the Library before but does not use the Library's facilities frequently. He usually sends requests for materials by mail and does not often visit the library building in person. He has a call number for a reference book which he used once before and needs to use again, but he can't remember where the general reference works are located. He is set to ask the Reference librarian to point him in the right direction, but she is busy with other researchers. Since he is in a hurry, he decides to use the electronic library tour. After traveling through the initial screen, he chooses the QuickTour menu -- all he needs is to glance at a map to refresh his memory about where the reference materials are located. He knows that the Reading Room and all book collections are on the third floor, so he selects the third floor map. He sees where the reference materials are located and heads off to retrieve his book.

These two scenarios seem to be fairly accurate representations of the two basic types of information needs that the electronic library tour will fill: answers to quick reference questions (such as the second researcher's directional question), and answers to more specific informational needs, or at least guidance for the researcher so that he or she knows who to ask for more information. However, there are also some Library users who may try out the electronic tour for totally different reasons than these; for example, because it looks interesting and fun. On the other hand, it also is important to consider that not all users with information needs will turn to the library tour as a means of answering their questions. There are other information tools available to the library user: Reference and Circulation staff members, brochures about some Library services, and other researchers who use the Library. The scenarios are intended to serve as examples of how the electronic tour might be used in the Technical Library.

D. Evolution of interface

The hypertext library tour of the Technical Library has undergone some changes since its first design. Suggestions from the author's classmates and coworkers led to changes in the layout and overall design of the tour. In addition, a "sneak preview" of the electronic library tour at the Technical Library's annual Open House in April provided some informal evaluation of the system by potential users.

The major change in interface design is the elimination of the dual tour hierarchy. The author was able to integrate the maps of the library building into the general tour setup in a way that seems less confusing for users to navigate. ToolBook has a menu bar feature, separate from the hypertext part of the application, that provides access pull-down menus from any point in the hypertext "book". The new version of the NASA Langley Technical Library tour features a custom menu bar, created by the author (the old version of the tour had the default menu bar which is standard for all ToolBook applications). The maps are included under the pull-down menu topic "Library maps".

In addition to the library maps, there are also other types of information available from the customized menu bar. The menu heading "Go to" provides the navigation capabilities that were formerly provided by the HOME and Previous Menu buttons. Another menu heading, "Information", provides access to the "About the Tour" and "List of Topics" screens (consistent from the old version of the tour). It also includes a new item, a "Library Directory", which provides a list of library staff, including their positions in the library and their telephone numbers. The author is hoping to expand this idea, and provide links from each staff member's name to a more detailed screen about each person. A final menu item, "Help", provides an index of topics covered on the hypertext tour.

Probably the major changes to the tour have been in the design of informational screens, which were formerly all text. In the latest version of the hypertext tour, the author is trying to make the screens more interesting by breaking up large paragraphs of text into outline or "bullet" form. From each bullet topic, a hypertext link to another screen provides access to more detailed information, additional graphics, etc... The new version of the tour also will include more detailed information than was included in the original version for some topics. For example, the informational screen on CD-ROMs will also include a list of the Library's CD databases. From there, users can find out more information about a particular database in which they are interested. Eventually, the idea is to integrate database descriptions, help sheets, etc., into the library tour so that users can access many types of information in one place.

In describing the new version of the hypertext system, it is important to note that it is not yet in its final stages of design. Although it could be used as is, the interface will be constantly changed, especially in terms of the specifics of information included in the tour information. The system in its current state is merely a prototype to be used for beta testing, an experimental system to test its effectiveness and usefulness in the library setting. When the electronic tour is implemented in the Library, it can be modified if necessary, depending on the needs of the user population (i.e., gradually introduce different types of information into the tour to make it more appealing to a wider spectrum of users).

V. Evaluation of Interface

Since the interface is still in an early stage of implementation, it has not yet been formally evaluated. This formal evaluation of the interface will need to occur in the near future. Before the electronic tour can be accepted for widespread installation and use within the Library, its potential effectiveness will need to be examined. If the Library Tour is badly designed, it will be useless -- library patrons will not find what they need when consulting the electronic tour, and they will be required to consult a human source for information anyway. However, if the electronic library tour is found to be useful and effective as a tool for teaching new library users, the results of the experiment will serve as justification for keeping the electronic tour in the Library. One way of measuring the effectiveness of the NASA Langley Technical Library hypertext tour is to conduct a formal evaluation of the interface. Such an evaluation might focus on comparing the effectiveness of a computer tour versus a person-guided tour of the Library. The author has created an experimental framework with which the effectiveness of the hypertext library tour might be measured.

In an evaluation of the Technical Library's electronic tour, the main research question would be the following: "Is a computerized tour of the Library more effective in educating users than a human-conducted library tour?" The research and experimentation centered around this question would involve examination of the entire electronic library tour system, its parts and its functioning as a whole. The experiment would attempt to determine 1) whether or not the electronic library tour as a medium is useful in bibliographic instruction, and 2) if this particular design of the Library tour is conducive to learning.

Anwers to the research question would be found by examining differences in learning between two groups of new library users who receive different types of library instruction. One group would participate in the traditional (guided) tour of the Library, another group would try out the electronic tour of the Library, and a third group (the control group) would receive no formal bibliographic instruction. The hypothesis for study may be stated as:

New library visitors who use the electronic library tour to familiarize themselves with library services and resources will have higher adjusted posttest means than new library users who take the traditional, guided library tour or new library users who have no formal library instruction.

The first requirement for inclusion in the study is that no participant may have previous experience with the Technical Library. From this point, a certain number of participants can be randomly selected from the pool of new library users. A good (and attainable) sample size might be 75: twenty-five to participate in the electronic tour, twenty-five to take the traditional library tour, and twenty-five to have no formal library instruction. The tasks surrounding the evaluation of the electronic library tour require that all participants in the study, regardless of experimental treatment, participate in a pretest and posttest to measure the differences in learning influenced by method of bibliographic instruction.

In the first scenario, after the user group has completed the pretest measuring general library knowledge, new library users will be required to use the electronic library tour to familiarize them with library resources. They will be given free rein to explore the electronic library tour as they see fit, much as they would "dabble" with the system if given the chance to use it on their own. They may anticipate the administering of a posttest, so motivation for thorough examination of the system will be somewhat high. However, the new library users will also need to learn about the Library's resources to conduct their research on Center, so they will also have personal reasons for needing to orient themselves to the Library.

In the second scenario, another group of new library users will be given a traditional library tour as a method of library instruction. The group of twenty-five participants will be divided into five groups of five individuals (average size for a guided library tour). All tour groups will receive the same tour through the Library, emphasizing navigation, a focus on collections, resources, and library services. Interest may be somewhat lower for this group than for the electronic library tour group, because there is less direct, one-on-one learning, but motivation for learning will still be rather high in anticipation of a posttest. Again, new Library users will be motivated to pay attention to the tour and learn about the Library's resources.

The third experimental group will have the same general goal as the other groups -- to learn about the Library -- but they will have no specified task structure for library education. Individuals in the third, control, group will be forced to research the library on their own. They will not be allowed to access the electronic library tour, nor will they be able to participate in the guided tours of the Library.

When treatment for all three groups has been rendered, the posttest will be administered to determine if there are any significant differences resulting from the various types of bibliographic instruction administered to new library users. The pretest will be designed to assure that all participants in the study have no prior experience with the Library; questions such as "Have you visited the Technical Library before?" and "Are you familiar with the Library's resources?" will be asked. The posttest will be designed to measure how much information the new users received, if any, from their respective experimental treatments. The posttest, which will be the same for all groups, will include a number of questions about specific library resources. Multiple choice questions will be used to minimize guesswork. Sample questions might read like the following:

1) STILAS is:

  a. A journal in the Library's collection,
  b. A special instrument for creating engineering graphics,
  c. The Library's online catalog,
  b. A CD-ROM full text database.

The posttest will have approximately 30 questions about library resources and services. The posttest administered to each of the tour groups will also include 10-15 questions of a more evaluative nature, designed to measure the users' attitudes about the tours that they participated in. For example, a question on the posttest of users taking the guided tour might read as follows:

1) The time necessary for taking this tour was too long.

   a. Strongly agree

   b. Agree

   c. Disagree

   d. Strongly disagree

Questions would be designed to measure the attitudes of the users toward the content and presentation of the tour, evaluation of the tour guide, and the overall effectiveness of the guided library tour.

The participants in the electronic library tour would have a different set of evaluative questions, such as the following:

1) The maps of the Library were easy to read and understand.

   a. Strongly agree

   b. Agree

   c. Disagree

   d. Strongly disagree

2) I would recommend that other new library users take the electronic tour of the Library to acquaint them with Library services and resources.

   a. Strongly agree

   b. Agree

   c. Disagree

d. Strongly disagree

The overall goal of the experiment will be for the electronic library tour users to achieve a higher posttest score than either of the other groups. However, a higher score in and of itself may not be enough to ensure a successful system. If the three groups score an average of 25%, 37% and 45% on the posttests, these are low scores even if the electronic library tour average is 45%. It is desirable that participants in the electronic library tour group should achieve a score above a certain level, say 65%, that will demonstrate its effectiveness as a learning tool.

In addition to formal testing, some informal comments can be solicited from users about the different methods of library instruction provided by the electronic tour and the traditional library tours. The experimenter can assess, through observation and casual conversation, new users' general attitudes about each type of tour. Observation may be especially useful in assessing the impact of the electronic library tours on users; unobtrusive observation may detect reluctant computer users more quickly than a paper test would.

According to previous research, such as the study by Lawson (1989), the electronic library tour group should perform significantly better than both other groups on the posttest. If the desired results of the experiment are achieved, we can hypothesize that the electronic library tour is a useful and effective method of instruction for new users at the NASA Langley Technical Library. Hopefully, we may also be able to conclude that the electronic library tour is also more effective than the traditional tour in bibliographic instruction. However, whatever the results of our experiment, we must be careful not to overgeneralize the results to "all new users" or "all libraries", because the framework for providing and using electronic instruction could be very different in a different type of library.

If the desired results of the experiment are not achieved, the electronic library tour may need to be further analyzed and experimented upon. If the experiment shows that users are dissatisfied or are not learning from the electronic tour, perhaps there are implicit features of the interface design that will need to be reconsidered. In this case, the interface will need to be further evaluated, and probably made the focus of additional experimental study.

VI. Future of system

The hypertext electronic library tour created for the NASA Langley Technical Library has not yet been fully implemented, but plans are underway to make it available to patrons in the Library as soon as possible. Initially, the tour system will probably be available in the Library building only, starting with one terminal on the third floor and perhaps increasing the number of terminals which feature the tour. However, it is something that the Library might want to consider networking, as a supplement to the already networked STILAS online catalog. Users across the Center could call up the Library tour at their desktops and see at a glance what types of materials the library offers. It would be useful in enticing more people to visit the actual physical location of the Library. The author is continuing to work on polishing her design and working out all of the bugs, so that it will be ready for implementation in the near future.

Sparked in part by the development of the hypertext electronic library tour, the author has also been working on a hypertext project for NASA Langley's Mosaic network. Mosaic is a hypertext browser for the World Wide Web; it is quite popular at NASA Langley. The Technical Library is revamping its Mosaic "home page", and plans are to include a hypertext library tour, similar to the one created on ToolBook, as part of the new home page design. Mosaic users could browse through information about the Langley Technical Library without ever leaving their offices. Plans are to complete the Library home page project on Mosaic by the end of August 1994.

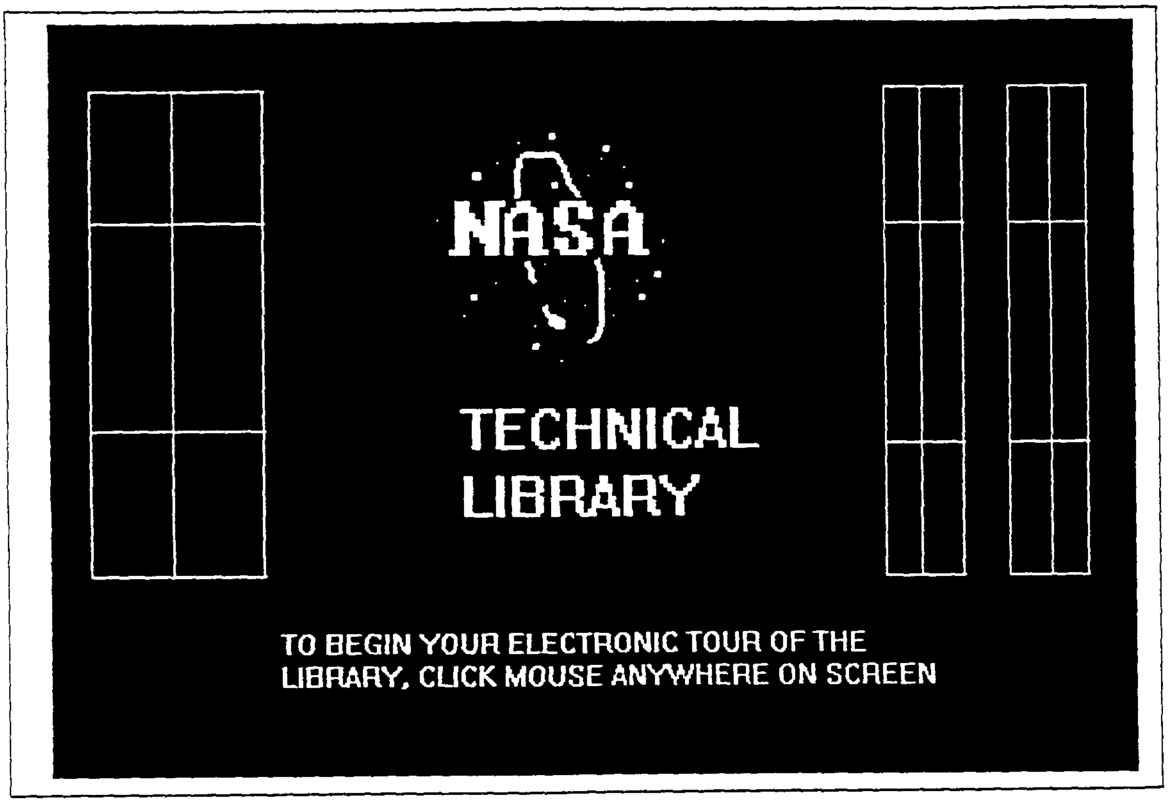
VII. Conclusion

In today's technologically advanced world, librarians are searching for new ways to organize and provide access to information. They are even beginning to become involved in designing bibliographic instruction systems for libraries. Applications such as hypertext systems are gaining popularity as instructional interfaces in libraries. They are successfully implemented because they are easy for users to understand; they provide a friendly interface in the midst of the information explosion.

The electronic library tour created for the NASA Langley Technical Library will provide such a friendly interface to new library users. It has already proven to be a successful source of instruction for users, based on feedback and reactions during its limited testing. It will be continually revised and modified as the information needs of the Technical Library and its users change. One of the advantages of hypertext technology is that it is extremely adaptable to the changing nature of information. For this reason, hypertext systems such as ToolBook and Mosaic are the future of bibliographic instruction in libraries.

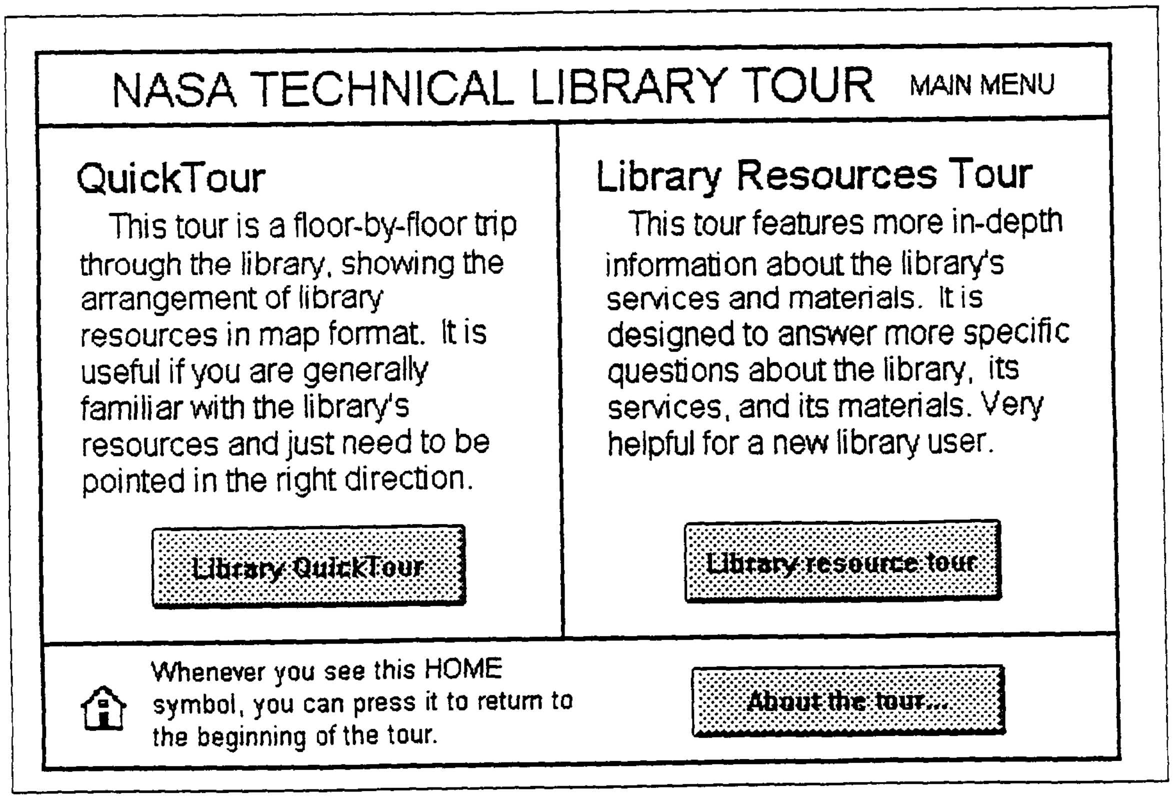
APPENDIX A

NASA Technical Library Hypertext Tour
(completed version)



TECHNICAL
LIBRARY

TO BEGIN YOUR ELECTRONIC TOUR OF THE
LIBRARY, CLICK MOUSE ANYWHERE ON SCREEN



NASA TECHNICAL LIBRARY TOUR MAIN MENU

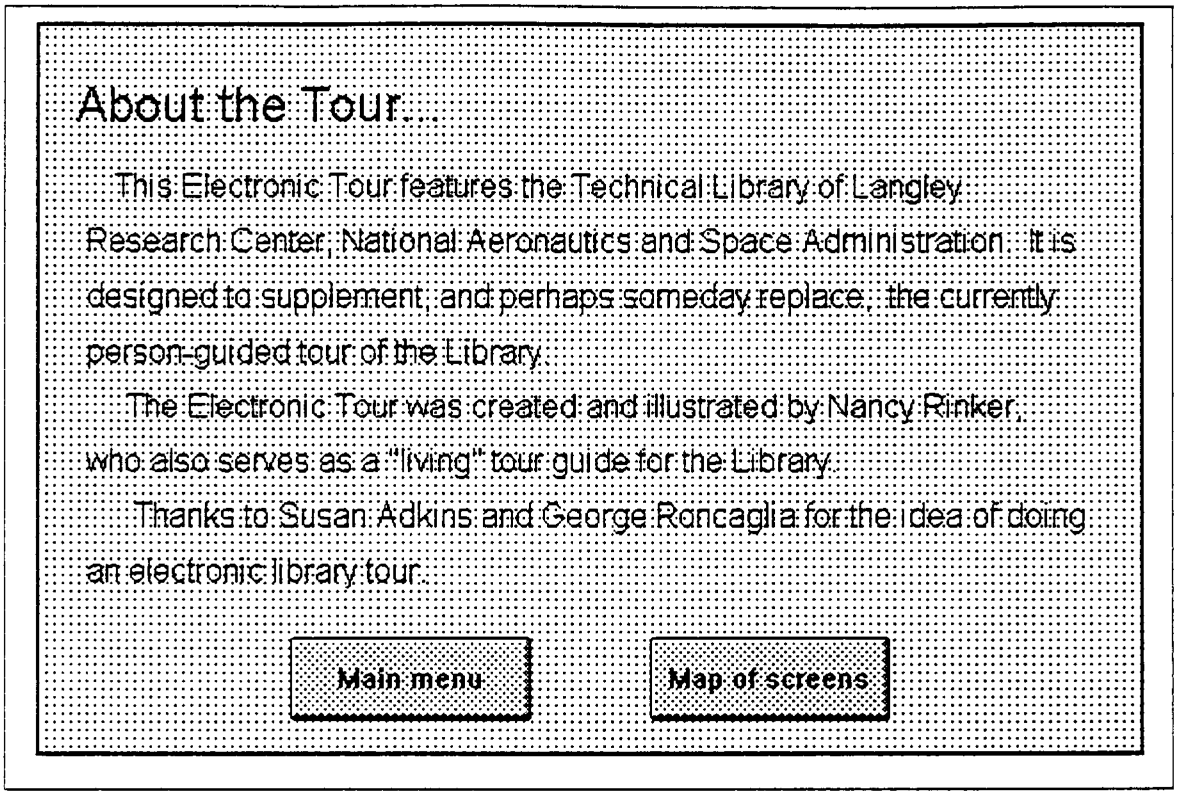
QuickTour

This tour is a floor-by-floor trip through the library, showing the arrangement of library resources in map format. It is useful if you are generally familiar with the library's resources and just need to be pointed in the right direction.

Library Resources Tour

This tour features more in-depth information about the library's services and materials. It is designed to answer more specific questions about the library, its services, and its materials. Very helpful for a new library user.

Whenever you see this HOME symbol, you can press it to return to the beginning of the tour.



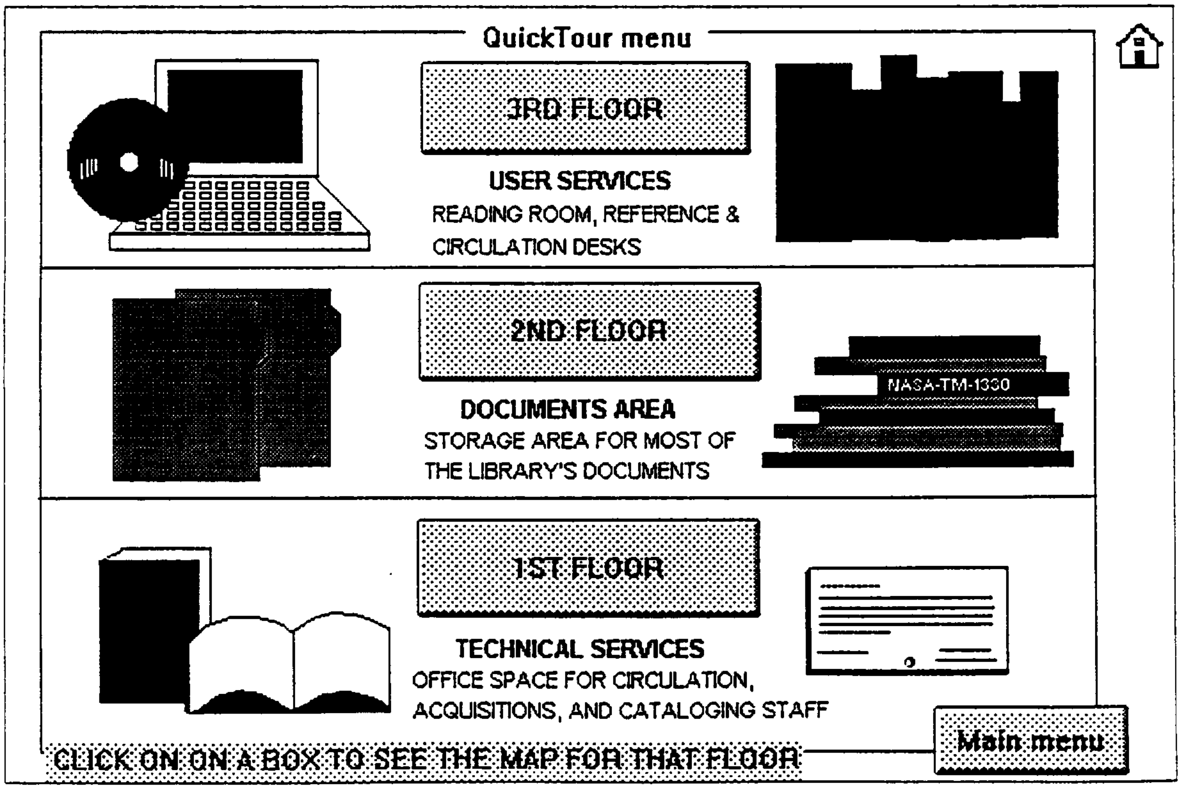
About the Tour...

This Electronic Tour features the Technical Library of Langley Research Center, National Aeronautics and Space Administration. It is designed to supplement, and perhaps someday replace, the currently person-guided tour of the Library.

The Electronic Tour was created and illustrated by Nancy Rinker, who also serves as a "living" tour guide for the Library.

Thanks to Susan Adkins and George Roncaglia for the idea of doing an electronic library tour.

Main menu
Map of screens



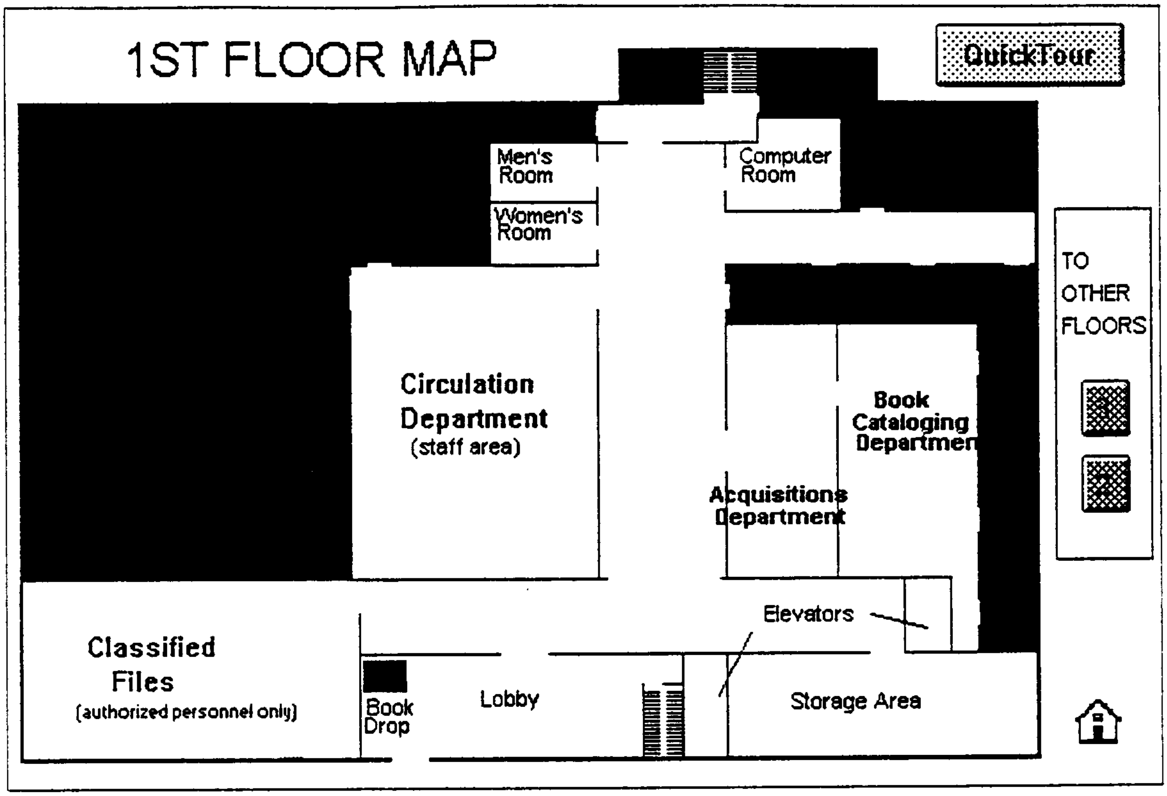
QuickTour menu
3RD FLOOR
2ND FLOOR
NASA-TM-1330
1ST FLOOR
Main menu

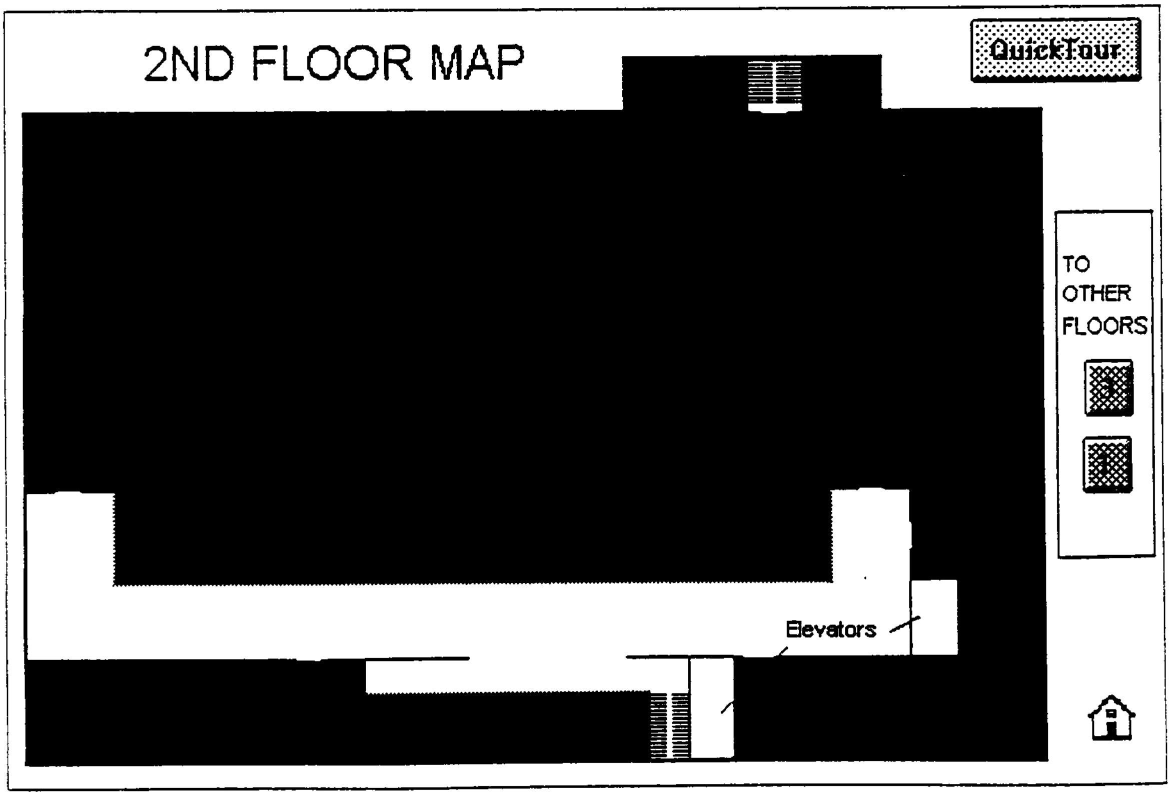
USER SERVICES
READING ROOM, REFERENCE & CIRCULATION DESKS

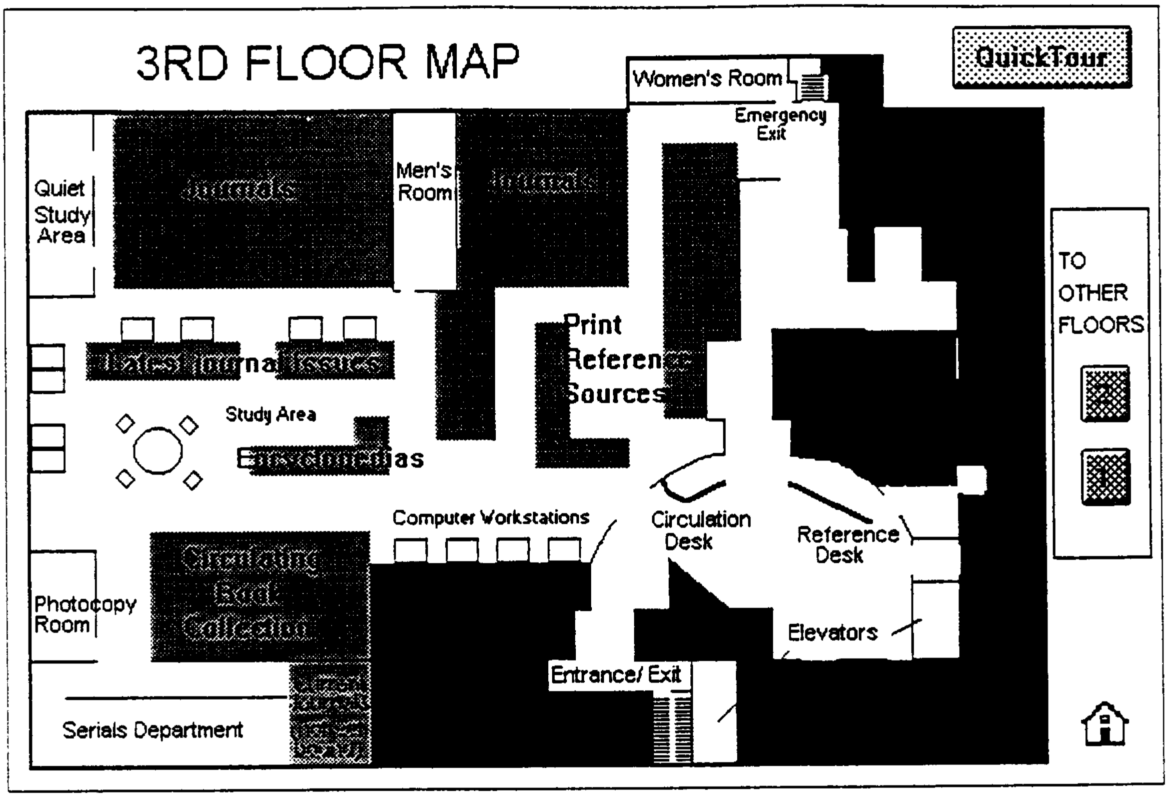
DOCUMENTS AREA
STORAGE AREA FOR MOST OF THE LIBRARY'S DOCUMENTS

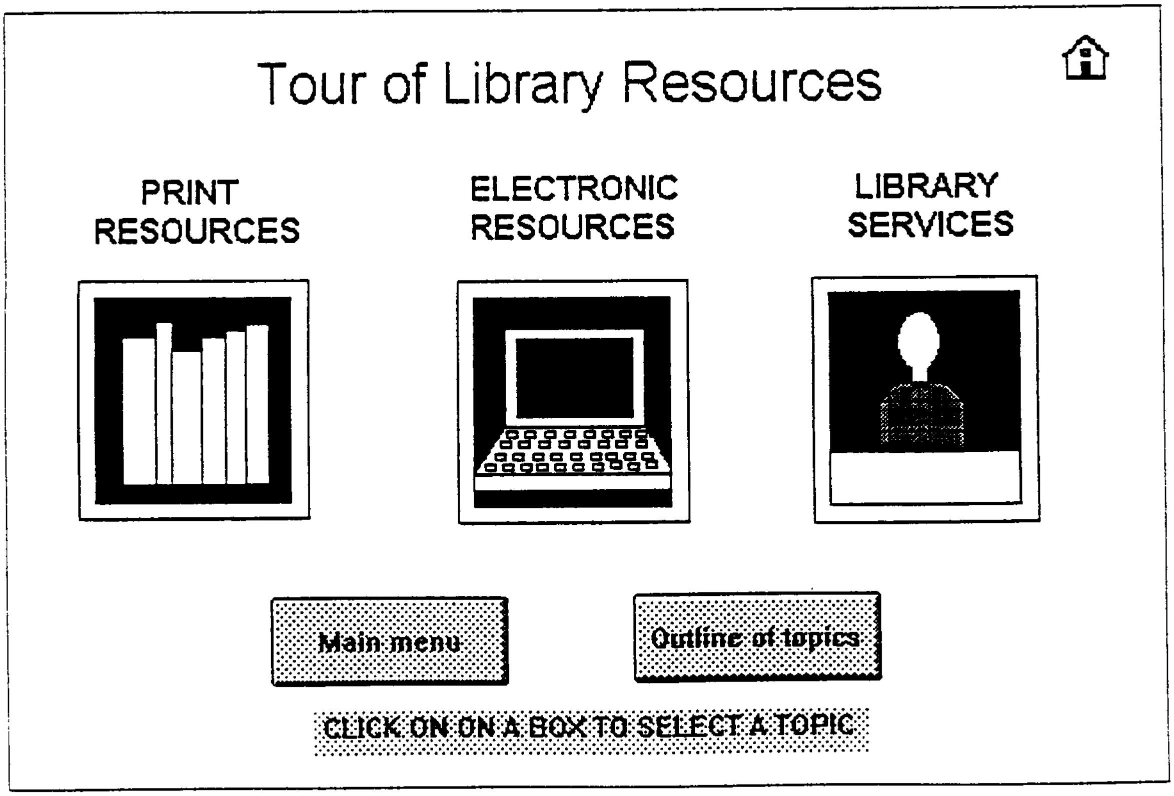
TECHNICAL SERVICES
OFFICE SPACE FOR CIRCULATION, ACQUISITIONS, AND CATALOGING STAFF

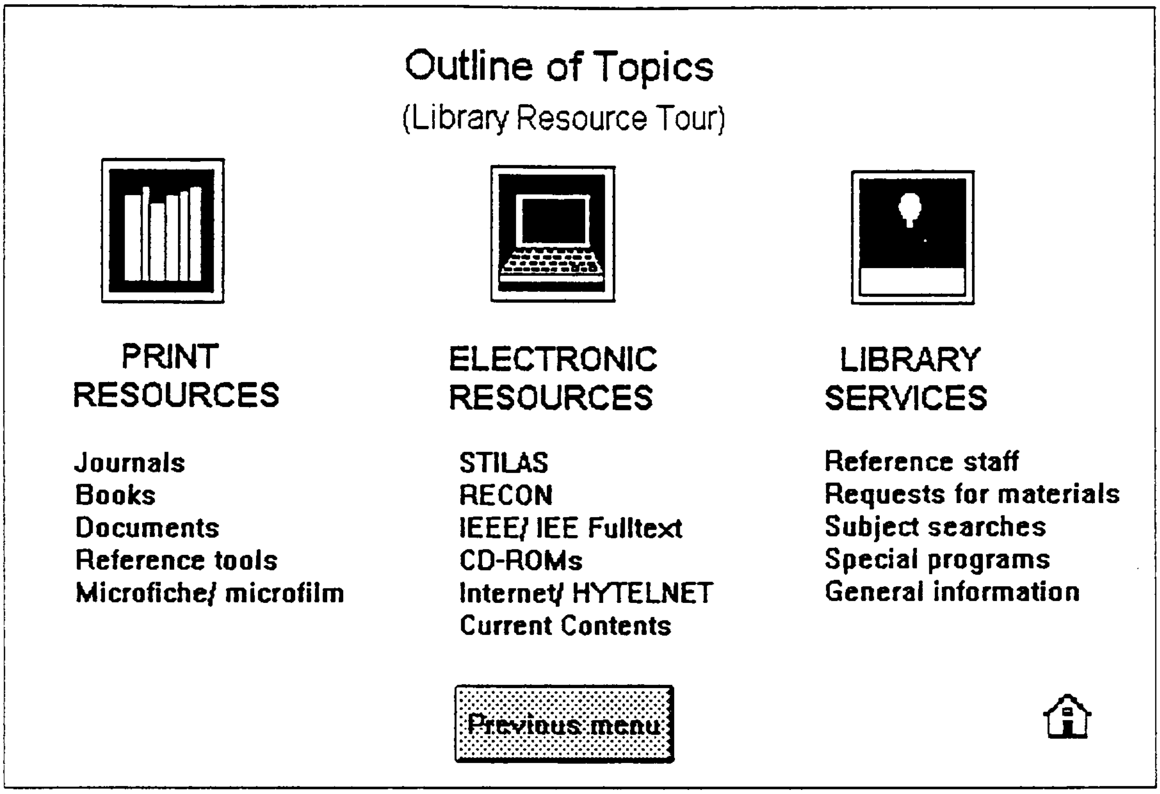
CLICK ON ON A BOX TO SEE THE MAP FOR THAT FLOOR


1ST FLOOR MAP
QuickTour
Men's Room
Women's Room
Computer Room
TO OTHER FLOORS
3
2
Circulation Department (staff area)
Book Cataloging Departmen
Acquisitions Department
Elevators
Classified Files (authorized personnel only)
Book Drop
Lobby
Storage Area


2ND FLOOR MAP
QuickTour
TO OTHER FLOORS
3
1
Elevators


3RD FLOOR MAP
QuickTour
Women's Room
Emergency Exit
Quiet Study Area
Journals
Men's Room
Journals
TO OTHER FLOORS
Latest Journal Issues
Print Reference Sources
Study Area
Encyclopedias
Computer Workstations
Circulation Desk
Reference Desk
Photocopy Room
Circulating Book Collection
Elevators
Entrance/ Exit
Serials Department


Tour of Library Resources
PRINT RESOURCES
ELECTRONIC RESOURCES
LIBRARY SERVICES
Main menu
Outline of topics
CLICK ON ON A BOX TO SELECT A TOPIC



Outline of Topics

(Library Resource Tour)

PRINT RESOURCES

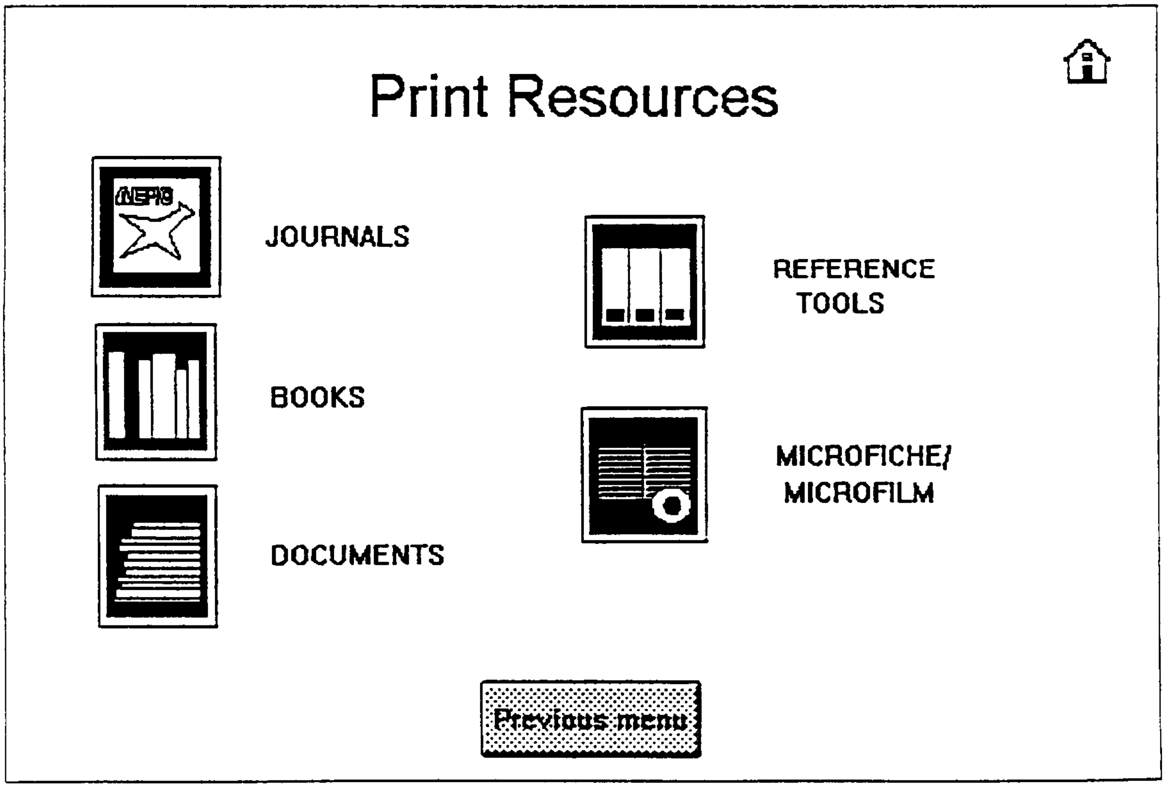
- Journals
- Books
- Documents
- Reference tools
- Microfiche/ microfilm

ELECTRONIC RESOURCES

- STILAS
- RECON
- IEEE/ IEE Fulltext
- CD-ROMs
- Internet/ HYTELNET
- Current Contents

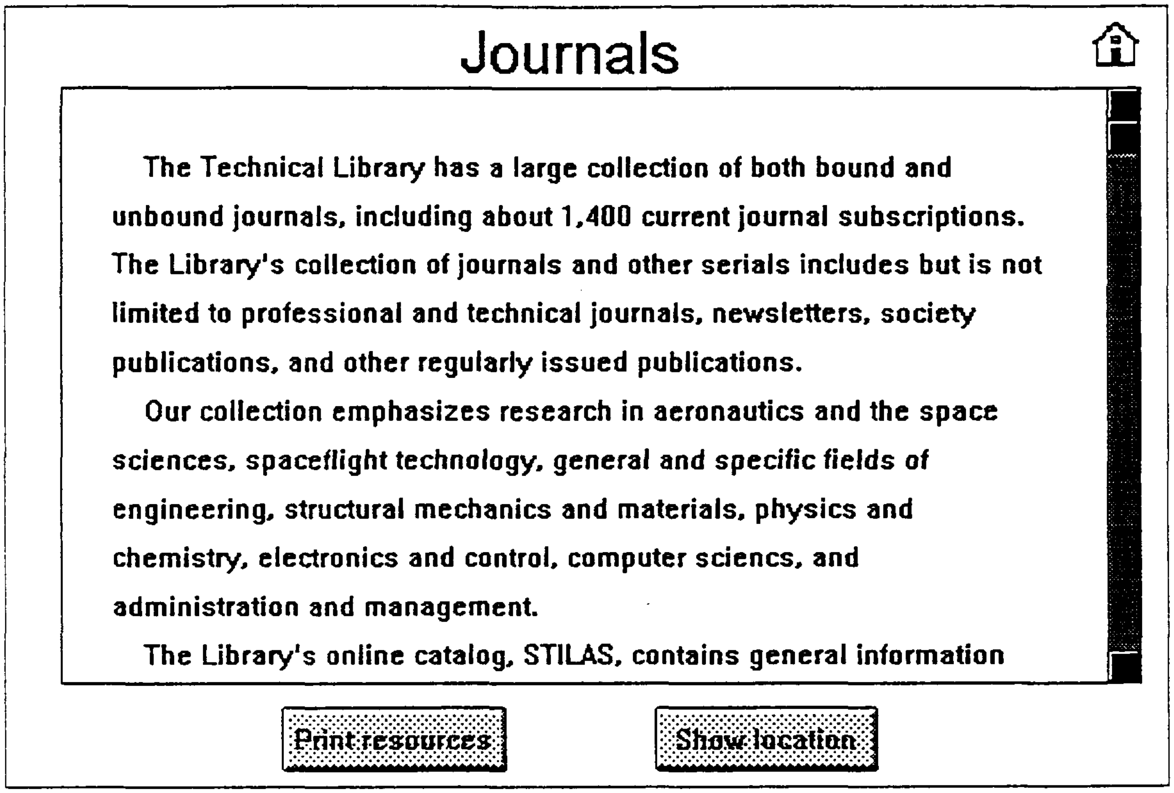
LIBRARY SERVICES

- Reference staff
- Requests for materials
- Subject searches
- Special programs
- General information



Print Resources

- JOURNALS
- BOOKS
- DOCUMENTS
- REFERENCE TOOLS
- MICROFICHE/ MICROFILM

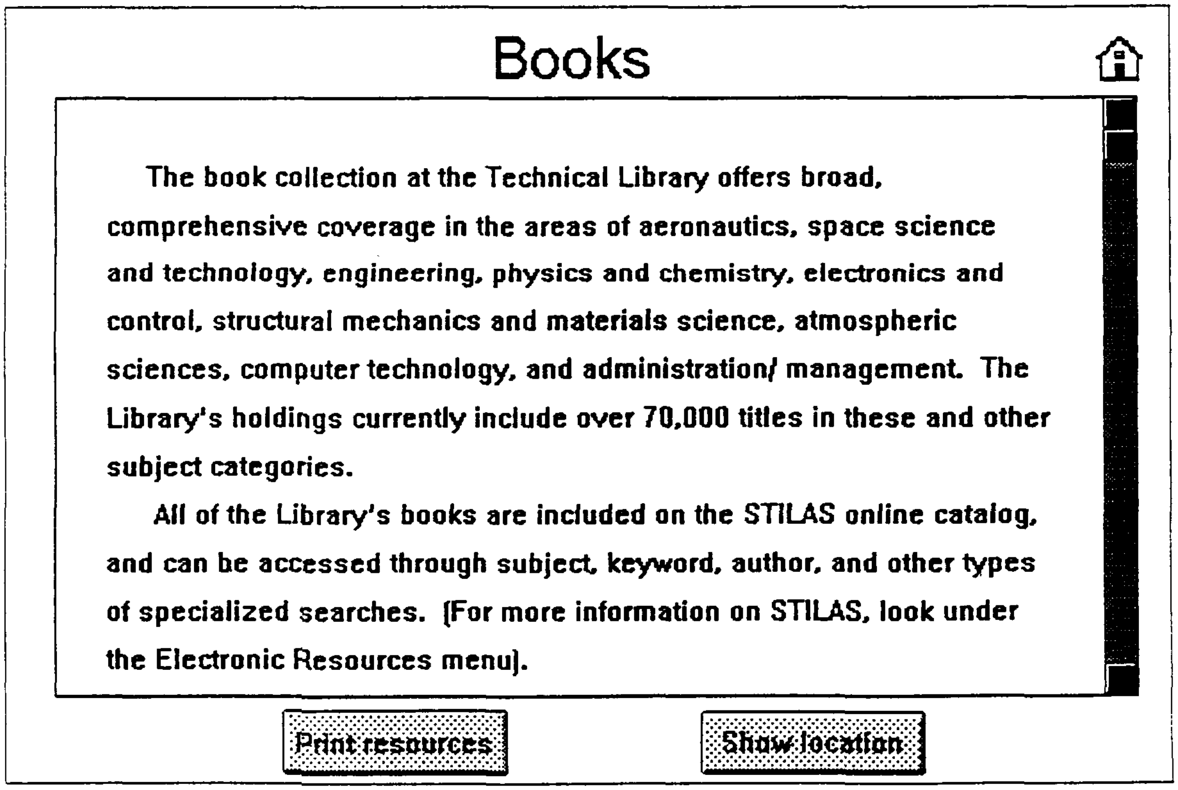


Journals

The Technical Library has a large collection of both bound and unbound journals, including about 1,400 current journal subscriptions. The Library's collection of journals and other serials includes but is not limited to professional and technical journals, newsletters, society publications, and other regularly issued publications.

Our collection emphasizes research in aeronautics and the space sciences, spaceflight technology, general and specific fields of engineering, structural mechanics and materials, physics and chemistry, electronics and control, computer sciencs, and administration and management.

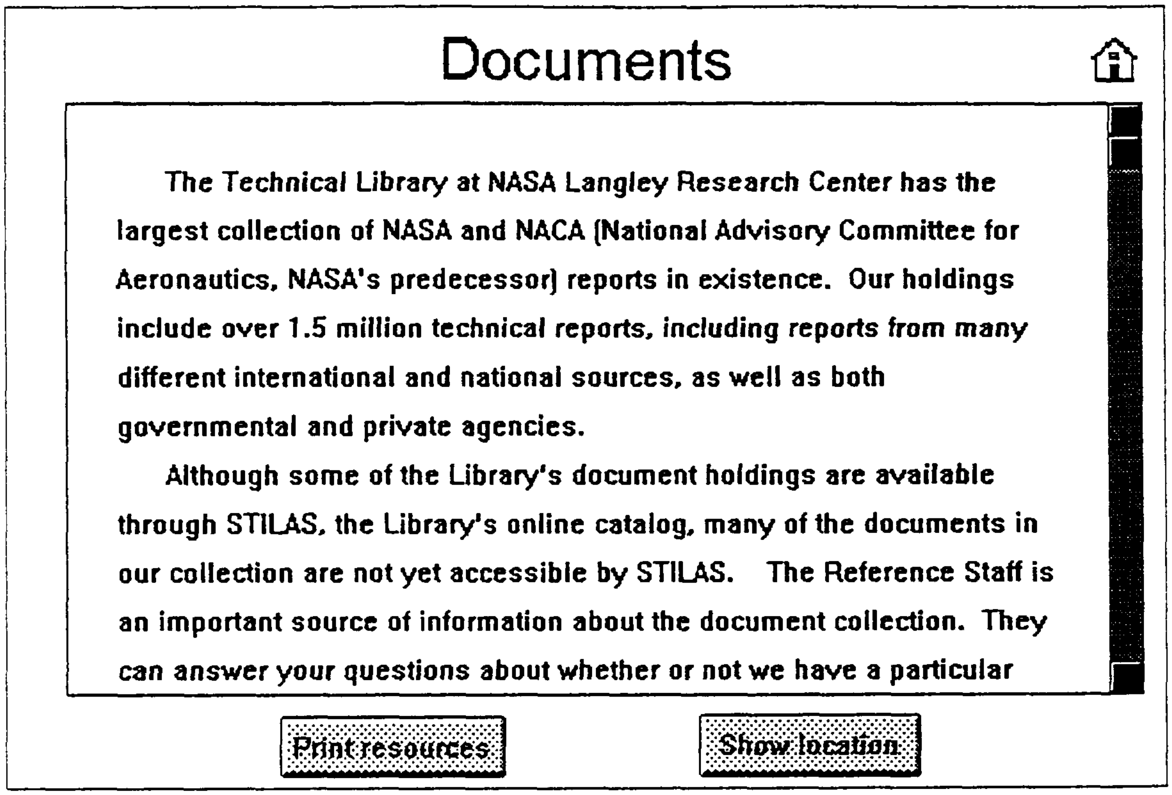
The Library's online catalog, STILAS, contains general information



Books

The book collection at the Technical Library offers broad, comprehensive coverage in the areas of aeronautics, space science and technology, engineering, physics and chemistry, electronics and control, structural mechanics and materials science, atmospheric sciences, computer technology, and administration/ management. The Library's holdings currently include over 70,000 titles in these and other subject categories.

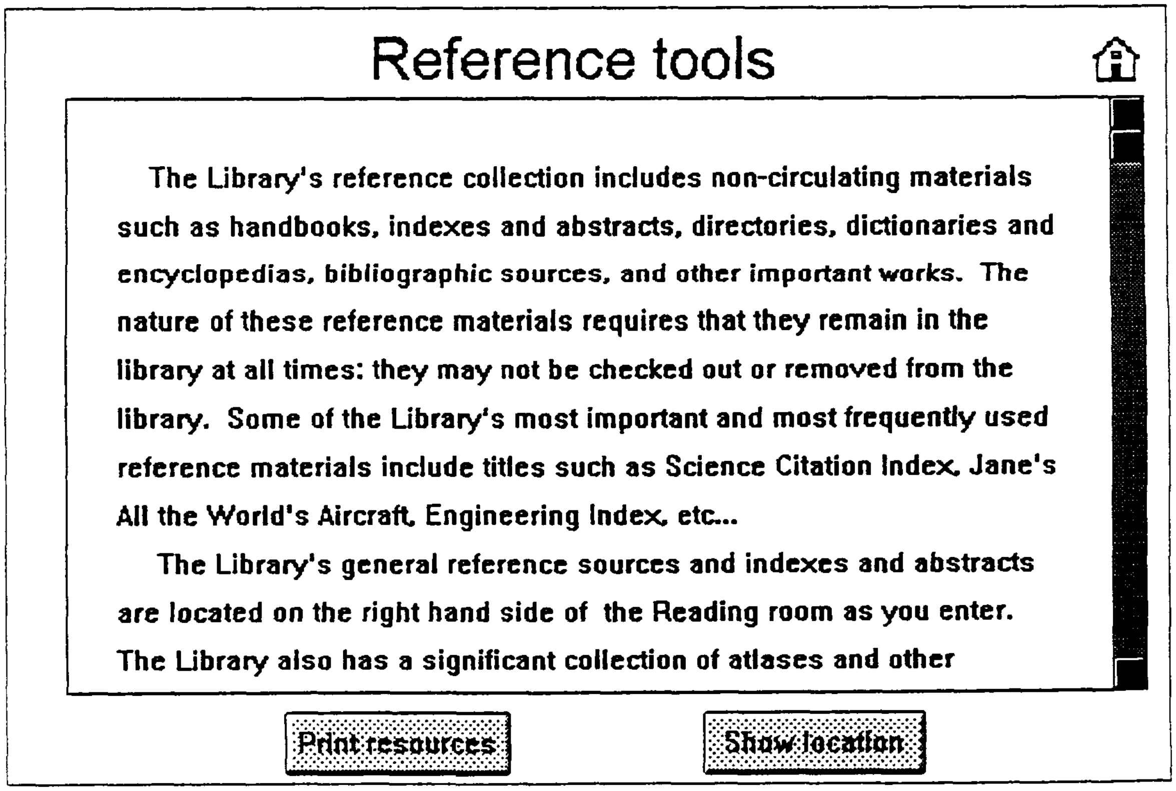
All of the Library's books are included on the STILAS online catalog, and can be accessed through subject, keyword, author, and other types of specialized searches. [For more information on STILAS, look under the Electronic Resources menu].



Documents

The Technical Library at NASA Langley Research Center has the largest collection of NASA and NACA (National Advisory Committee for Aeronautics, NASA's predecessor) reports in existence. Our holdings include over 1.5 million technical reports, including reports from many different international and national sources, as well as both governmental and private agencies.

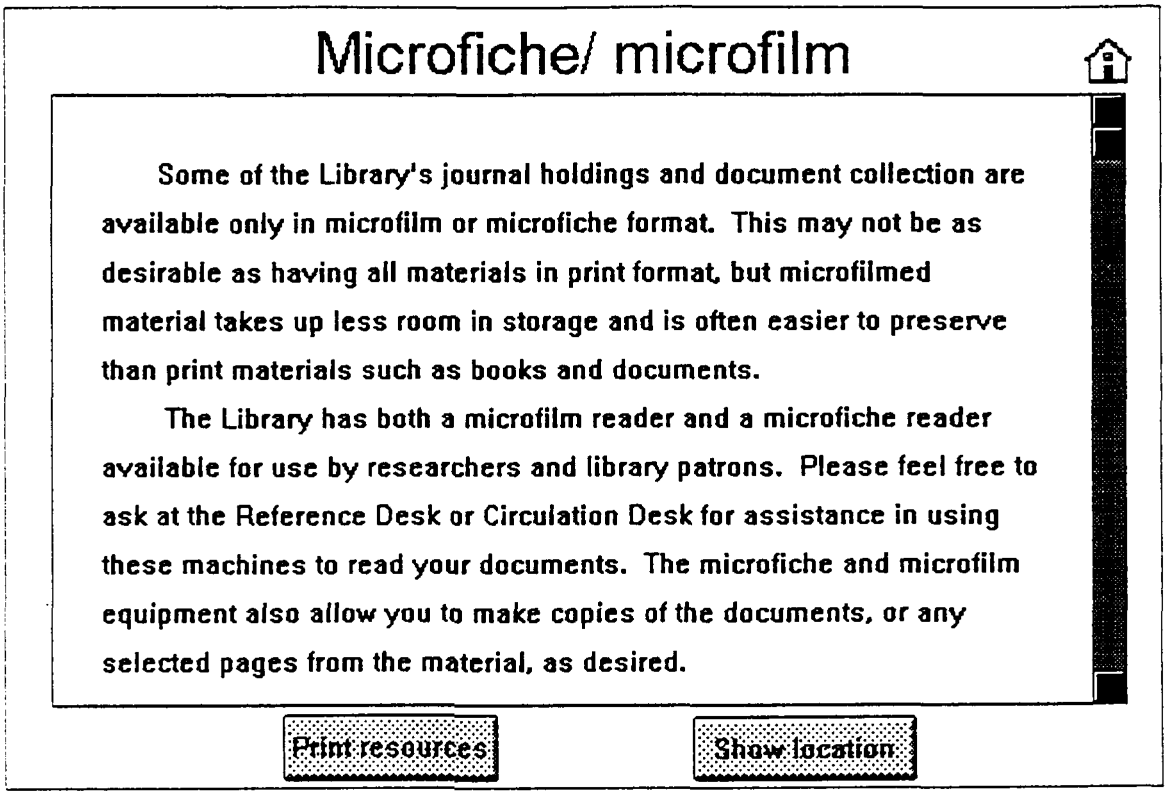
Although some of the Library's document holdings are available through STILAS, the Library's online catalog, many of the documents in our collection are not yet accessible by STILAS. The Reference Staff is an important source of information about the document collection. They can answer your questions about whether or not we have a particular



Reference tools

The Library's reference collection includes non-circulating materials such as handbooks, indexes and abstracts, directories, dictionaries and encyclopedias, bibliographic sources, and other important works. The nature of these reference materials requires that they remain in the library at all times: they may not be checked out or removed from the library. Some of the Library's most important and most frequently used reference materials include titles such as Science Citation Index, Jane's All the World's Aircraft, Engineering Index, etc...

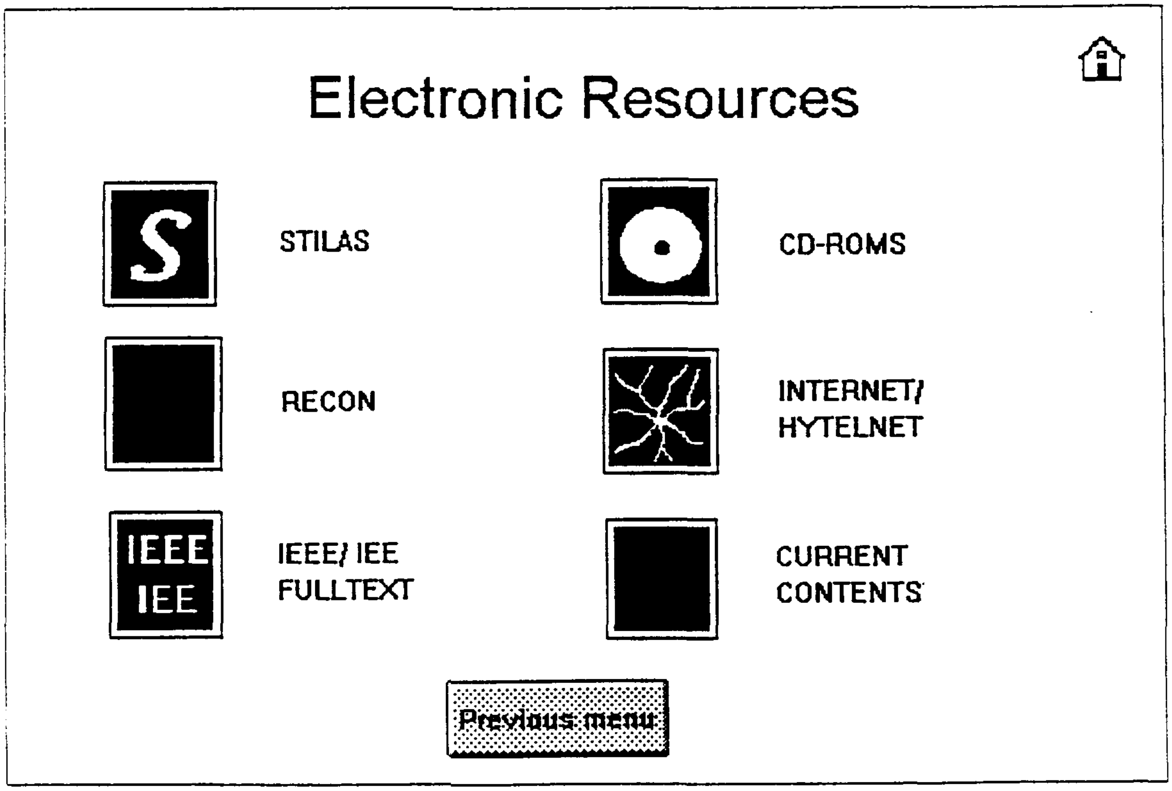
The Library's general reference sources and indexes and abstracts are located on the right hand side of the Reading room as you enter. The Library also has a significant collection of atlases and other


Print resources
Show location

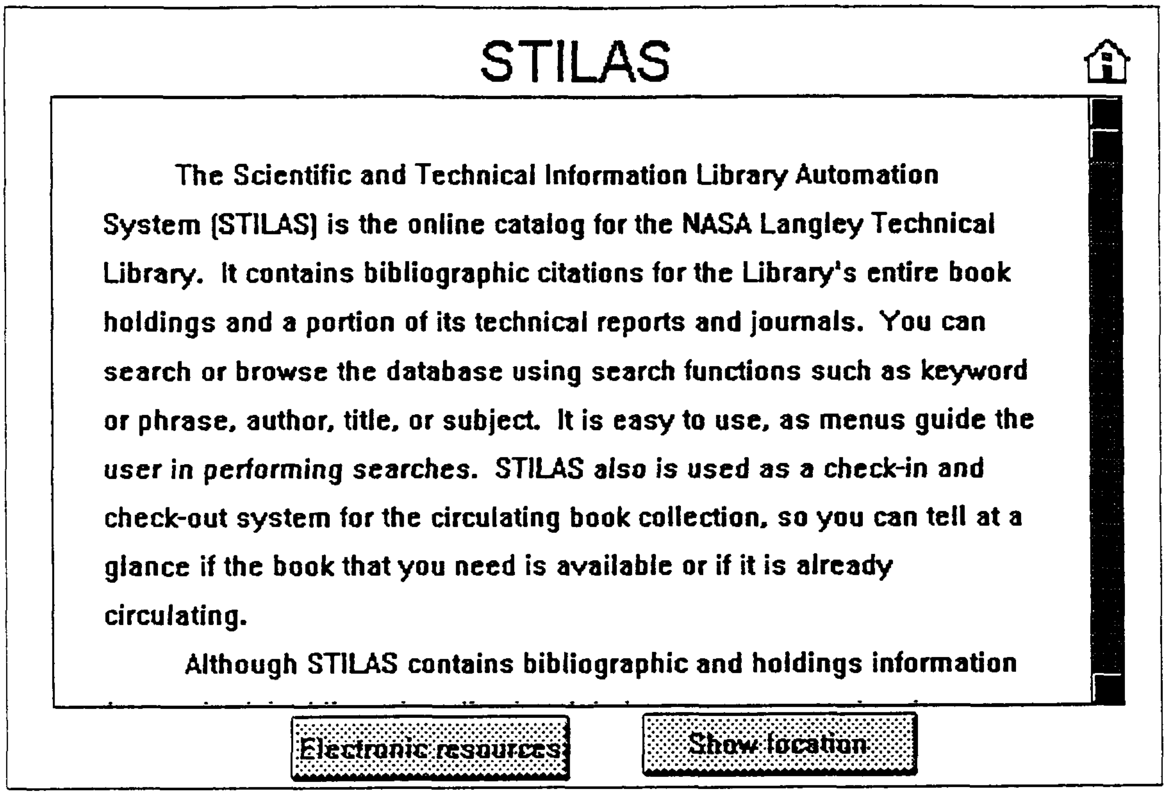
Microfiche/ microfilm

Some of the Library's journal holdings and document collection are available only in microfilm or microfiche format. This may not be as desirable as having all materials in print format, but microfilmed material takes up less room in storage and is often easier to preserve than print materials such as books and documents.

The Library has both a microfilm reader and a microfiche reader available for use by researchers and library patrons. Please feel free to ask at the Reference Desk or Circulation Desk for assistance in using these machines to read your documents. The microfiche and microfilm equipment also allow you to make copies of the documents, or any selected pages from the material, as desired.


S
STILAS
CD-ROMS
RECON
INTERNET/
HYTELNET
IEEE
IEE
IEEE/ IEE
FULLTEXT
CURRENT
CONTENTS
Previous menu

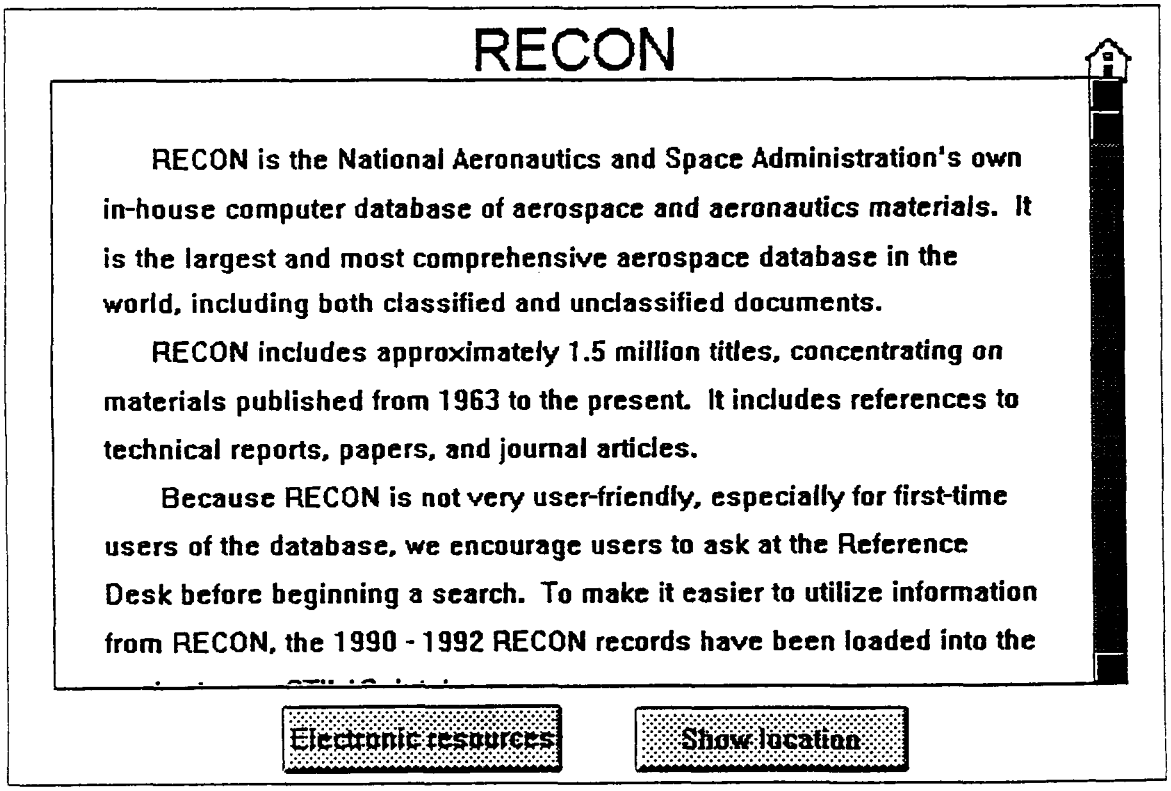
Electronic Resources



STILAS

The Scientific and Technical Information Library Automation System (STILAS) is the online catalog for the NASA Langley Technical Library. It contains bibliographic citations for the Library's entire book holdings and a portion of its technical reports and journals. You can search or browse the database using search functions such as keyword or phrase, author, title, or subject. It is easy to use, as menus guide the user in performing searches. STILAS also is used as a check-in and check-out system for the circulating book collection, so you can tell at a glance if the book that you need is available or if it is already circulating.

Although STILAS contains bibliographic and holdings information

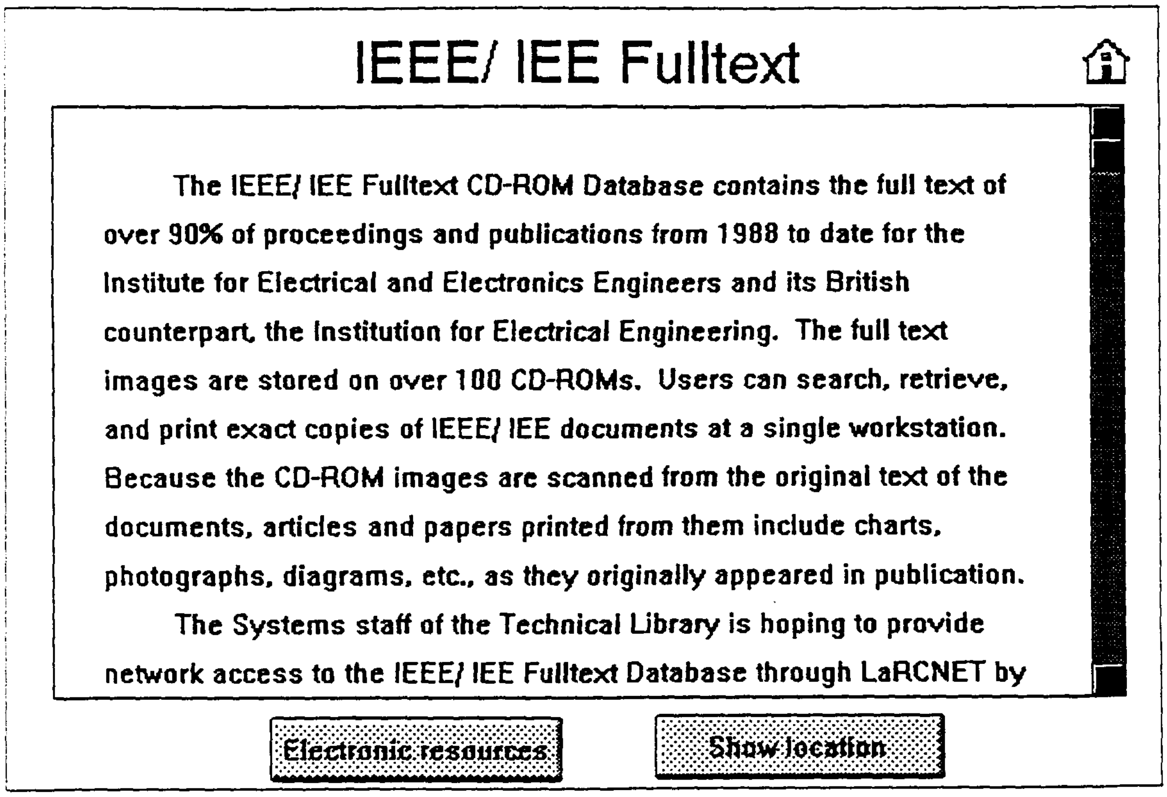


RECON

RECON is the National Aeronautics and Space Administration's own in-house computer database of aerospace and aeronautics materials. It is the largest and most comprehensive aerospace database in the world, including both classified and unclassified documents.

RECON includes approximately 1.5 million titles, concentrating on materials published from 1963 to the present. It includes references to technical reports, papers, and journal articles.

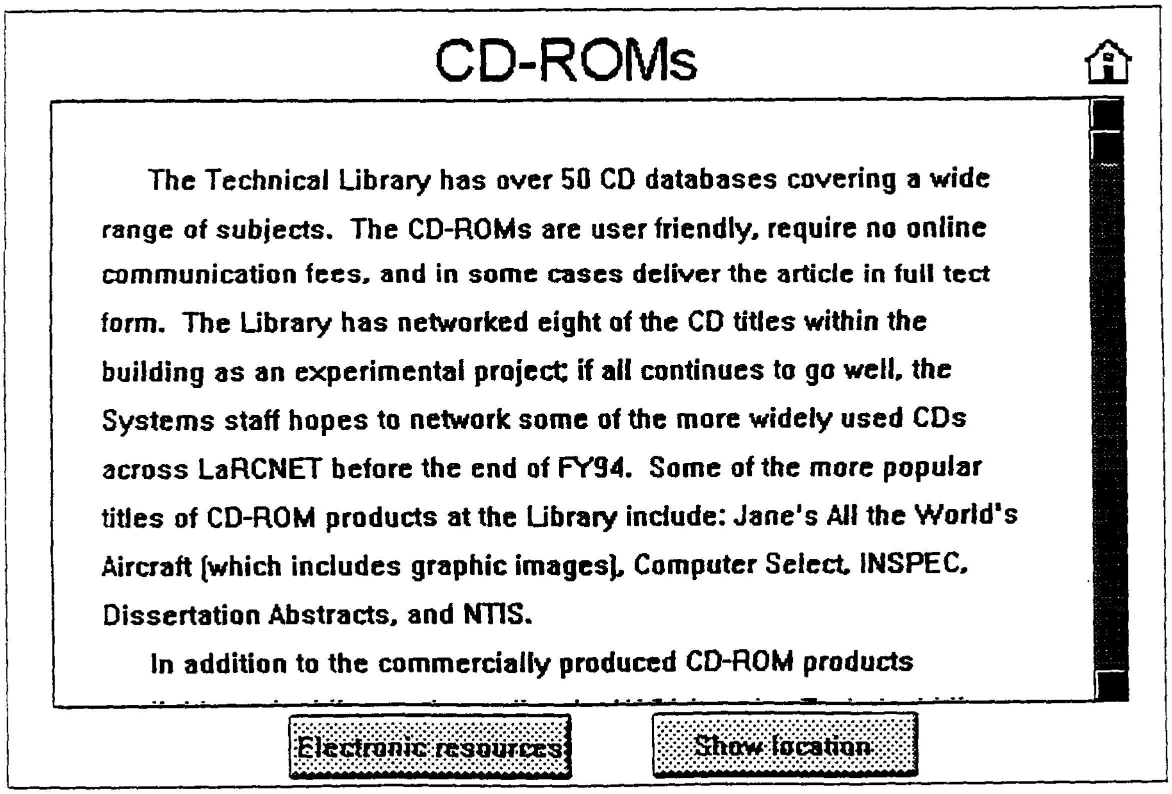
Because RECON is not very user-friendly, especially for first-time users of the database, we encourage users to ask at the Reference Desk before beginning a search. To make it easier to utilize information from RECON, the 1990 - 1992 RECON records have been loaded into the



IEEE/ IEE Fulltext

The IEEE/ IEE Fulltext CD-ROM Database contains the full text of over 90% of proceedings and publications from 1988 to date for the Institute for Electrical and Electronics Engineers and its British counterpart, the Institution for Electrical Engineering. The full text images are stored on over 100 CD-ROMs. Users can search, retrieve, and print exact copies of IEEE/ IEE documents at a single workstation. Because the CD-ROM images are scanned from the original text of the documents, articles and papers printed from them include charts, photographs, diagrams, etc., as they originally appeared in publication.

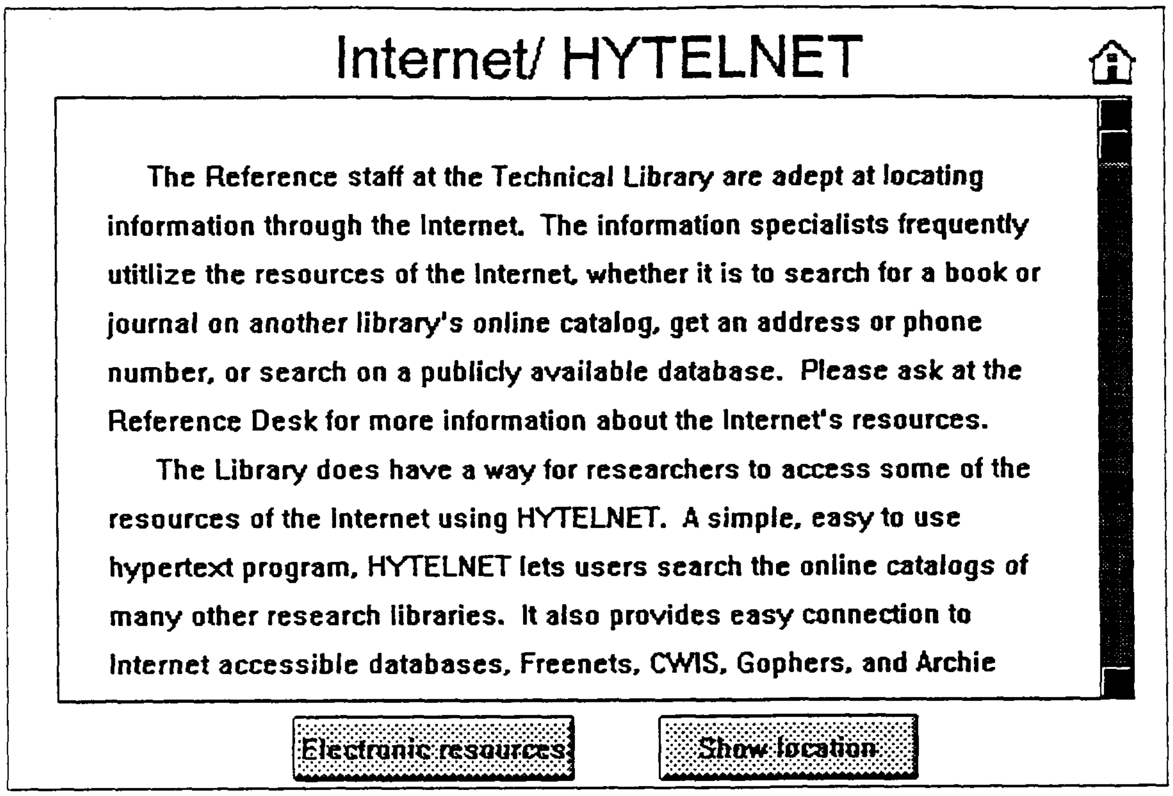
The Systems staff of the Technical Library is hoping to provide network access to the IEEE/ IEE Fulltext Database through LaRCNET by



CD-ROMs

The Technical Library has over 50 CD databases covering a wide range of subjects. The CD-ROMs are user friendly, require no online communication fees, and in some cases deliver the article in full tect form. The Library has networked eight of the CD titles within the building as an experimental project; if all continues to go well, the Systems staff hopes to network some of the more widely used CDs across LaRCNET before the end of FY94. Some of the more popular titles of CD-ROM products at the Library include: Jane's All the World's Aircraft (which includes graphic images), Computer Select, INSPEC, Dissertation Abstracts, and NTIS.

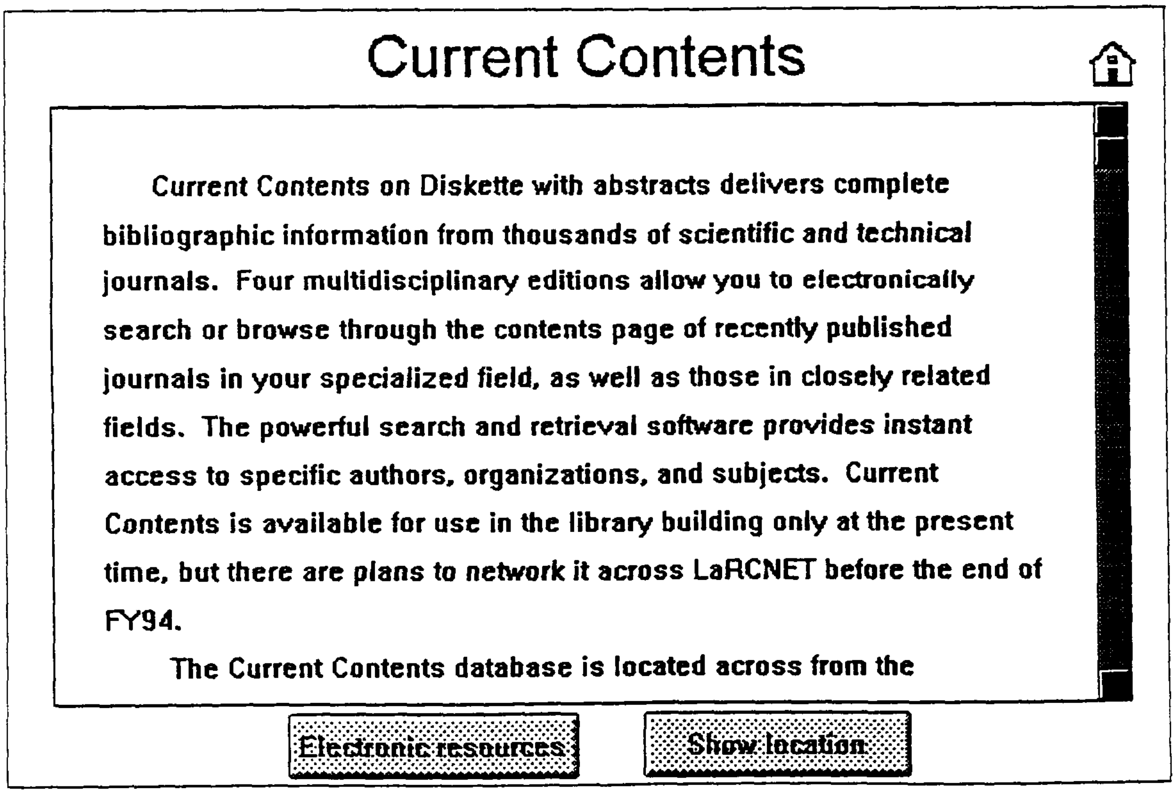
In addition to the commercially produced CD-ROM products



Internet/ HYTELNET

The Reference staff at the Technical Library are adept at locating information through the Internet. The information specialists frequently utitlize the resources of the Internet, whether it is to search for a book or journal on another library's online catalog, get an address or phone number, or search on a publicly available database. Please ask at the Reference Desk for more information about the Internet's resources.

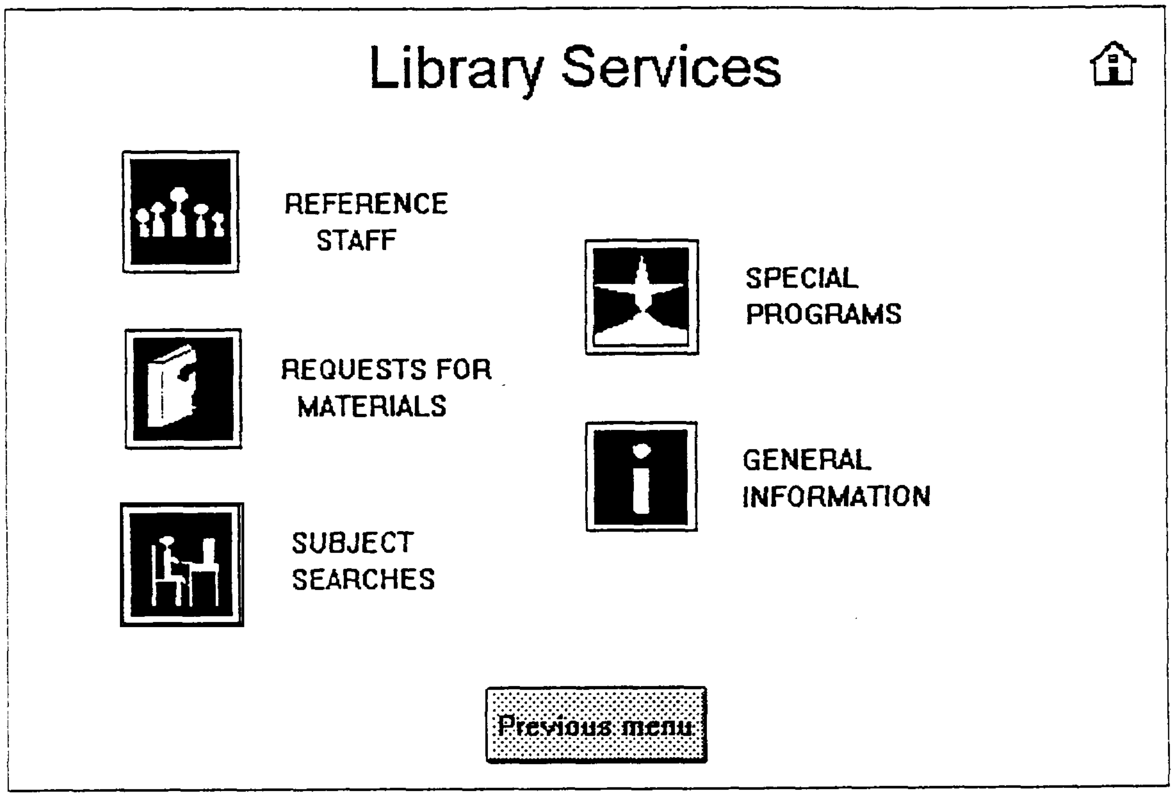
The Library does have a way for researchers to access some of the resources of the Internet using HYTELNET. A simple, easy to use hypertext program, HYTELNET lets users search the online catalogs of many other research libraries. It also provides easy connection to Internet accessible databases, Freenets, CWIS, Gophers, and Archie



Current Contents

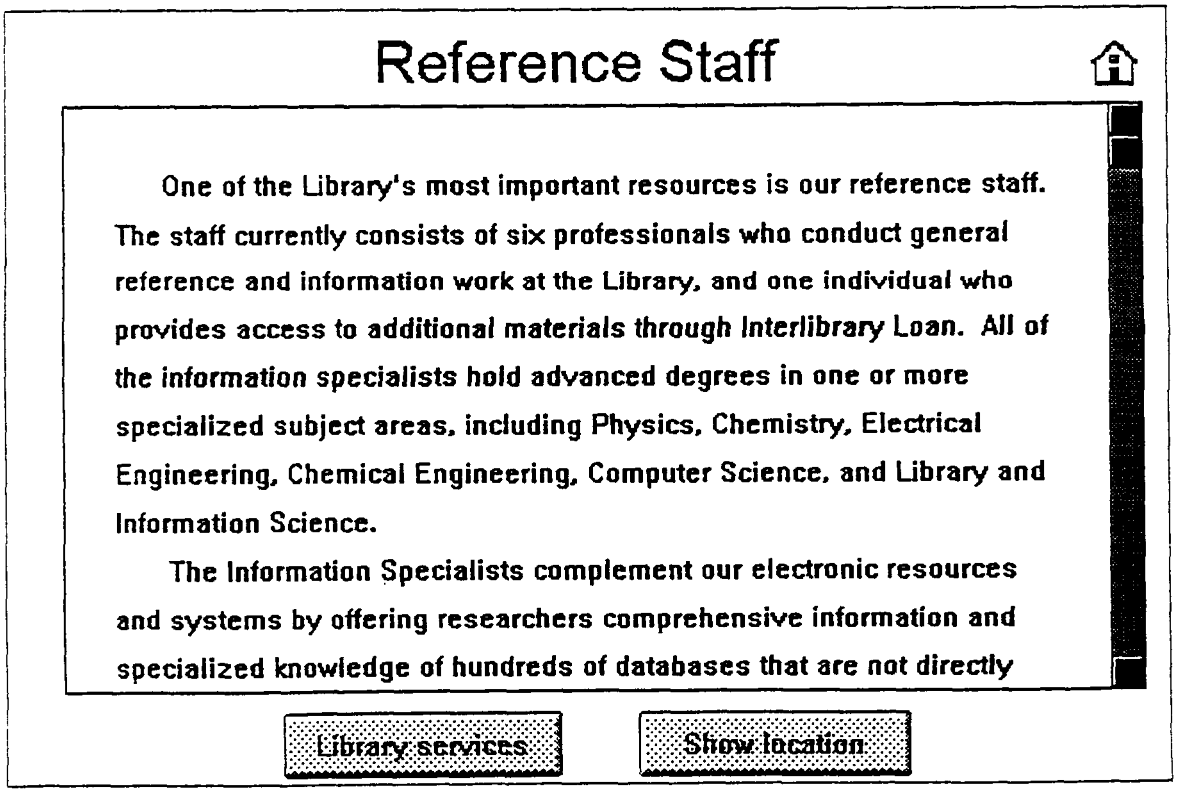
Current Contents on Diskette with abstracts delivers complete bibliographic information from thousands of scientific and technical journals. Four multidisciplinary editions allow you to electronically search or browse through the contents page of recently published journals in your specialized field, as well as those in closely related fields. The powerful search and retrieval software provides instant access to specific authors, organizations, and subjects. Current Contents is available for use in the library building only at the present time, but there are plans to network it across LaRCNET before the end of FY94.

The Current Contents database is located across from the



Library Services

REFERENCE STAFF
REQUESTS FOR MATERIALS
SUBJECT SEARCHES
SPECIAL PROGRAMS
GENERAL INFORMATION
Previous menu

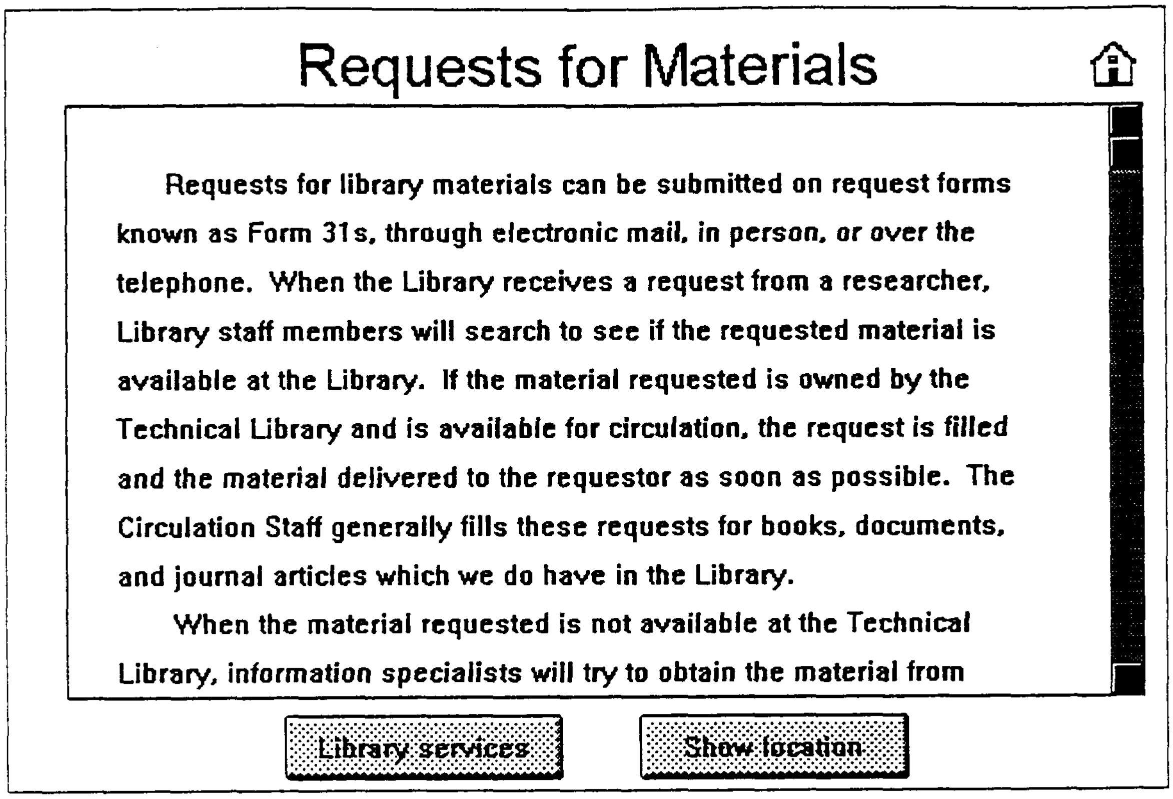


Reference Staff

One of the Library's most important resources is our reference staff. The staff currently consists of six professionals who conduct general reference and information work at the Library, and one individual who provides access to additional materials through Interlibrary Loan. All of the information specialists hold advanced degrees in one or more specialized subject areas, including Physics, Chemistry, Electrical Engineering, Chemical Engineering, Computer Science, and Library and Information Science.

The Information Specialists complement our electronic resources and systems by offering researchers comprehensive information and specialized knowledge of hundreds of databases that are not directly

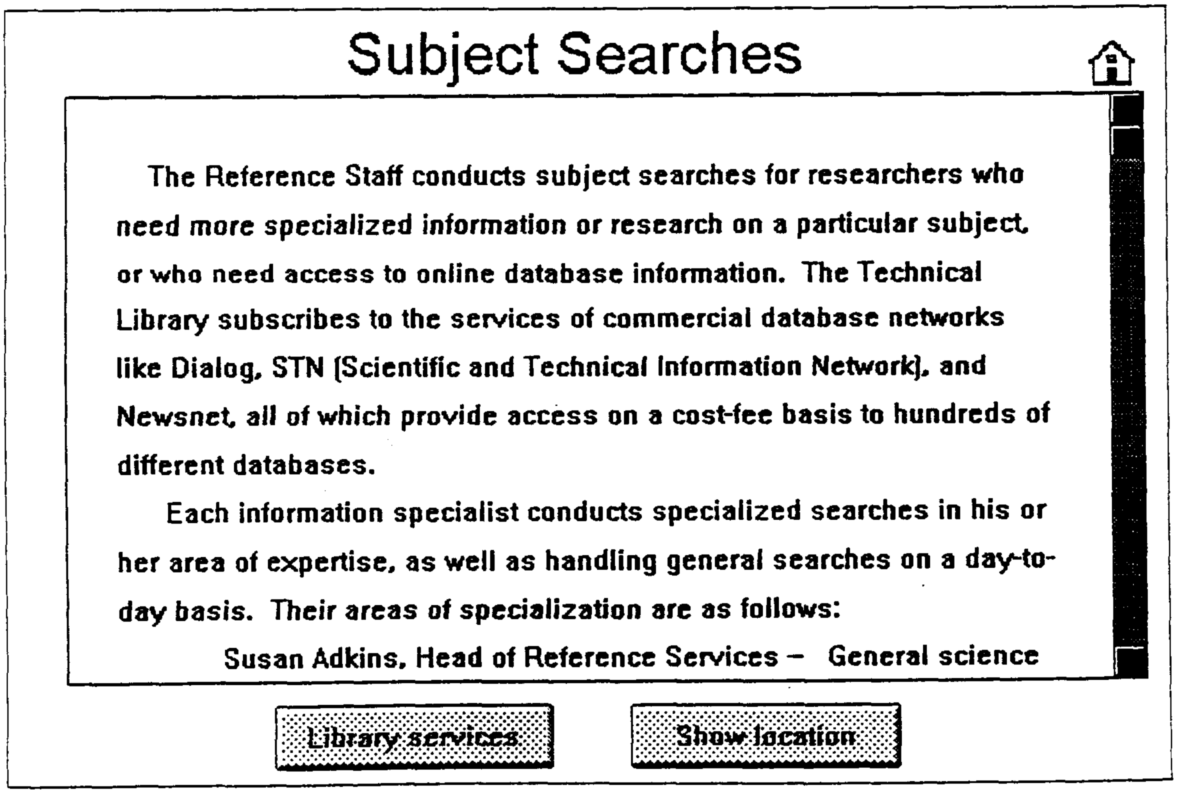
Library services
Show location



Requests for Materials

Requests for library materials can be submitted on request forms known as Form 31s, through electronic mail, in person, or over the telephone. When the Library receives a request from a researcher, Library staff members will search to see if the requested material is available at the Library. If the material requested is owned by the Technical Library and is available for circulation, the request is filled and the material delivered to the requestor as soon as possible. The Circulation Staff generally fills these requests for books, documents, and journal articles which we do have in the Library.

When the material requested is not available at the Technical Library, information specialists will try to obtain the material from

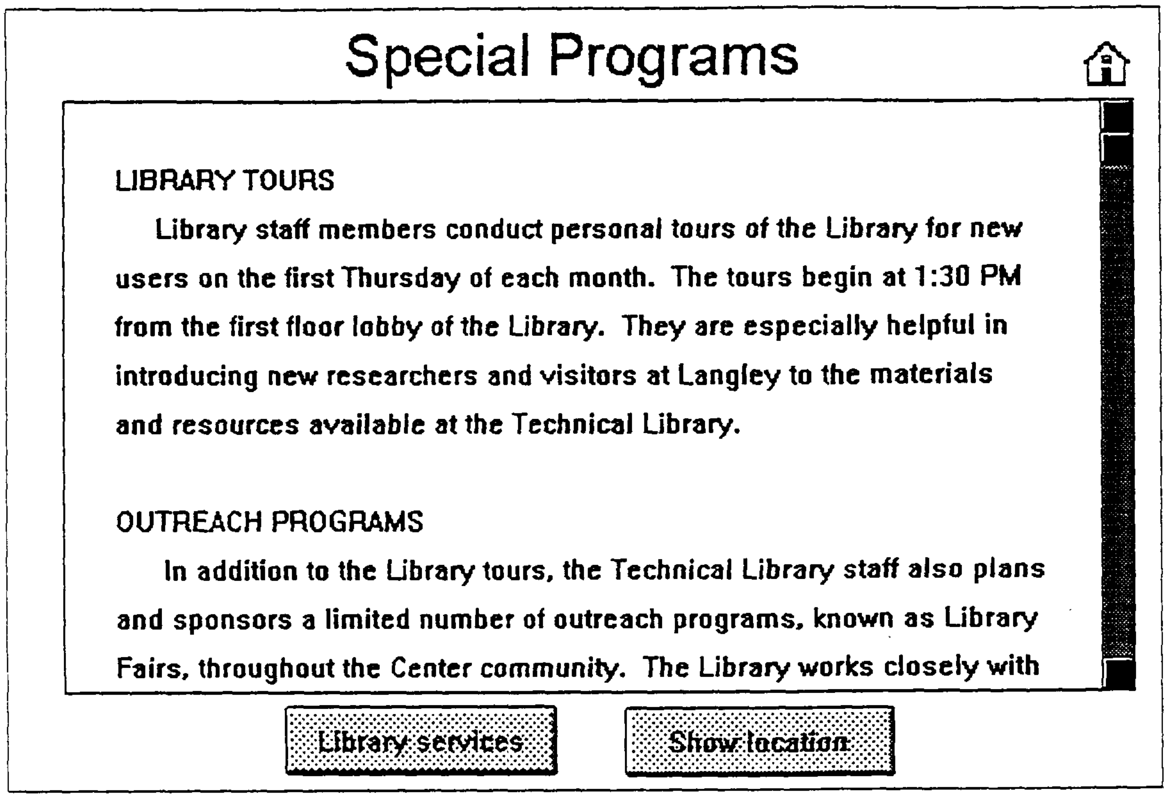


Subject Searches

The Reference Staff conducts subject searches for researchers who need more specialized information or research on a particular subject, or who need access to online database information. The Technical Library subscribes to the services of commercial database networks like Dialog, STN [Scientific and Technical Information Network], and Newsnet, all of which provide access on a cost-fee basis to hundreds of different databases.

Each information specialist conducts specialized searches in his or her area of expertise, as well as handling general searches on a day-to-day basis. Their areas of specialization are as follows:

Susan Adkins, Head of Reference Services – General science



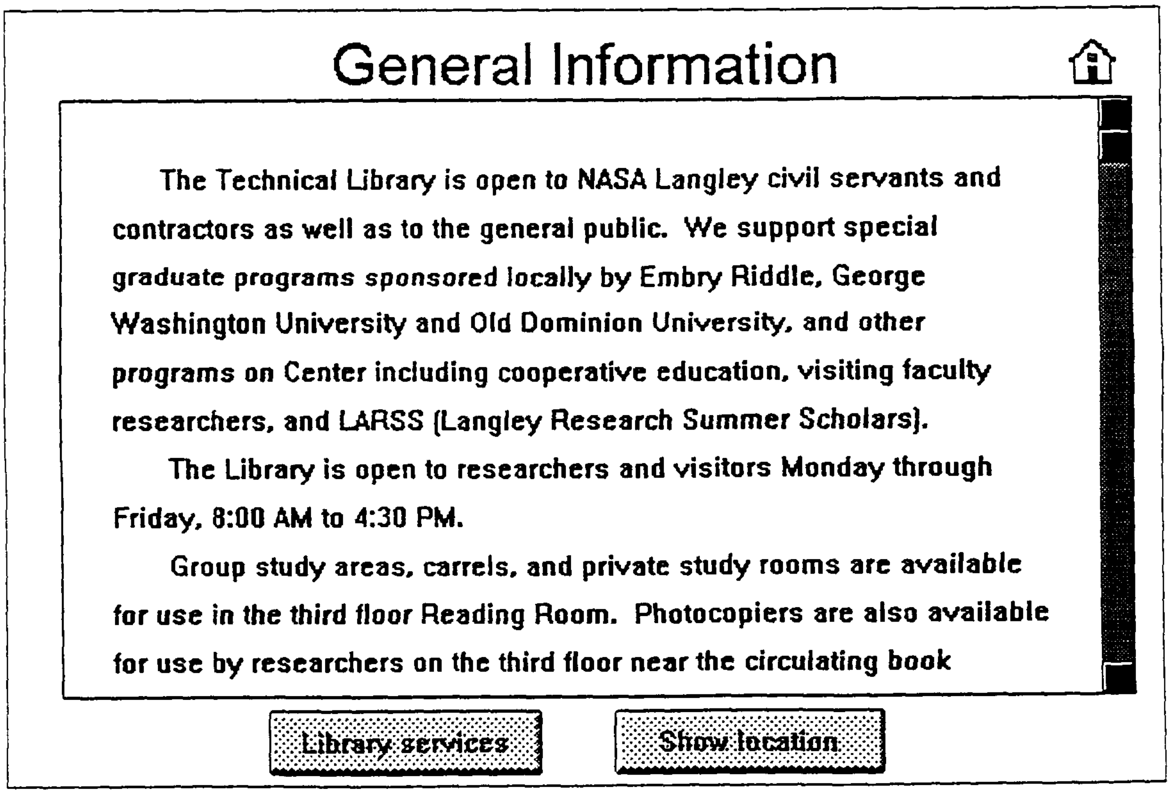
Special Programs

LIBRARY TOURS

Library staff members conduct personal tours of the Library for new users on the first Thursday of each month. The tours begin at 1:30 PM from the first floor lobby of the Library. They are especially helpful in introducing new researchers and visitors at Langley to the materials and resources available at the Technical Library.

OUTREACH PROGRAMS

In addition to the Library tours, the Technical Library staff also plans and sponsors a limited number of outreach programs, known as Library Fairs, throughout the Center community. The Library works closely with

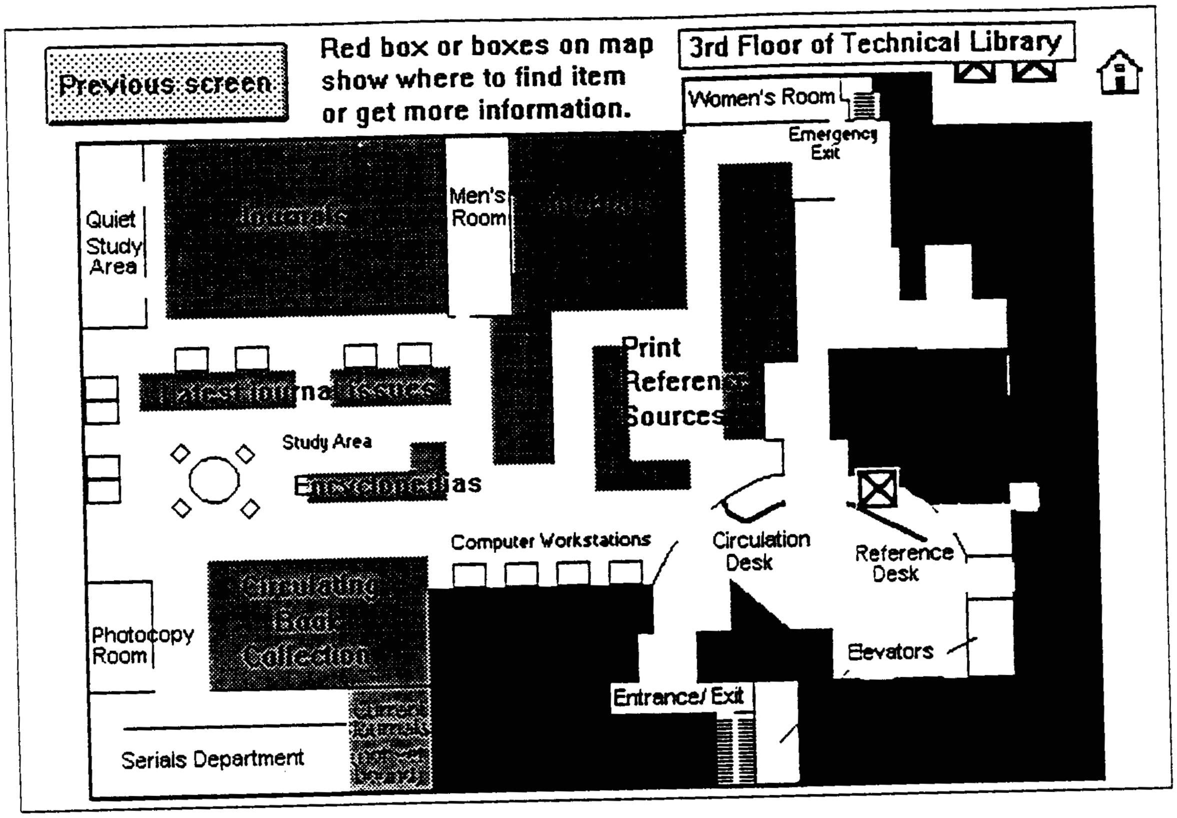


General Information

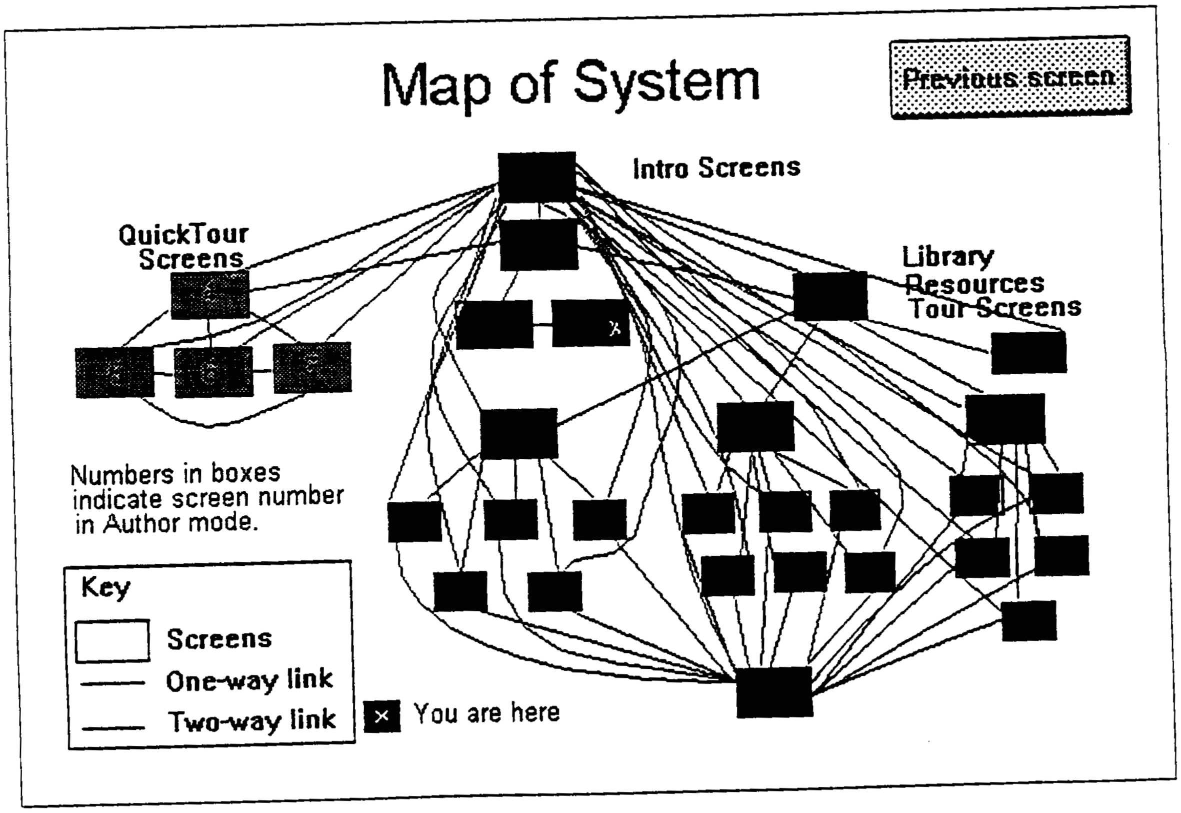
The Technical Library is open to NASA Langley civil servants and contractors as well as to the general public. We support special graduate programs sponsored locally by Embry Riddle, George Washington University and Old Dominion University, and other programs on Center including cooperative education, visiting faculty researchers, and LARSS (Langley Research Summer Scholars).

The Library is open to researchers and visitors Monday through Friday, 8:00 AM to 4:30 PM.

Group study areas, carrels, and private study rooms are available for use in the third floor Reading Room. Photocopiers are also available for use by researchers on the third floor near the circulating book


Previous screen
3rd Floor of Technical Library
Women's Room
Emergency Exit
Quiet Study Area
Journals
Men's Room
Print Reference Sources
Latest Journal Issues
Study Area
Encyclopedias
Computer Workstations
Circulation Desk
Reference Desk
Photocopy Room
Circulating Book Collection
Elevators
Entrance/ Exit
Serials Department

Red box or boxes on map show where to find item or get more information.



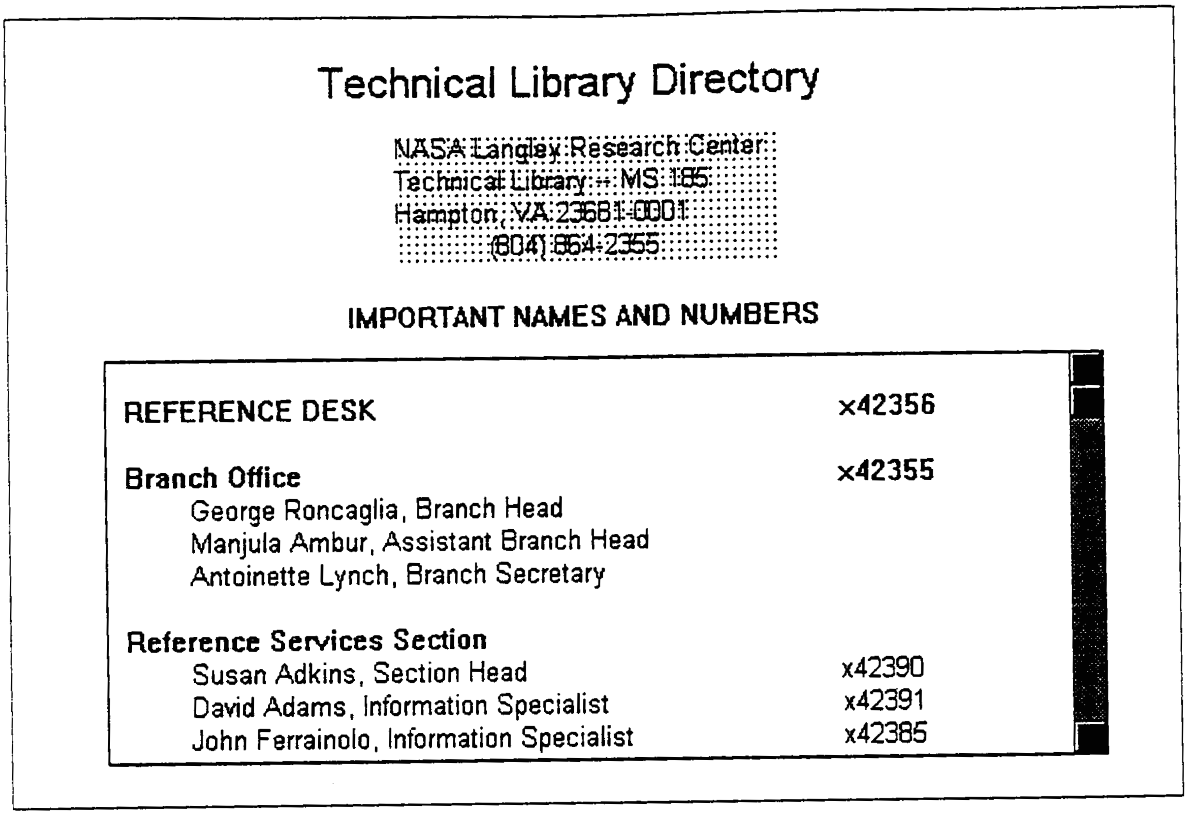
Map of System

Previous screen
Intro Screens
QuickTour Screens
Library Resources Tour Screens
Key
Screens
One-way link
Two-way link
You are here

Numbers in boxes indicate screen number in Author mode.

APPENDIX B

Sample screens from new version of hypertext tour
(editing in progress)

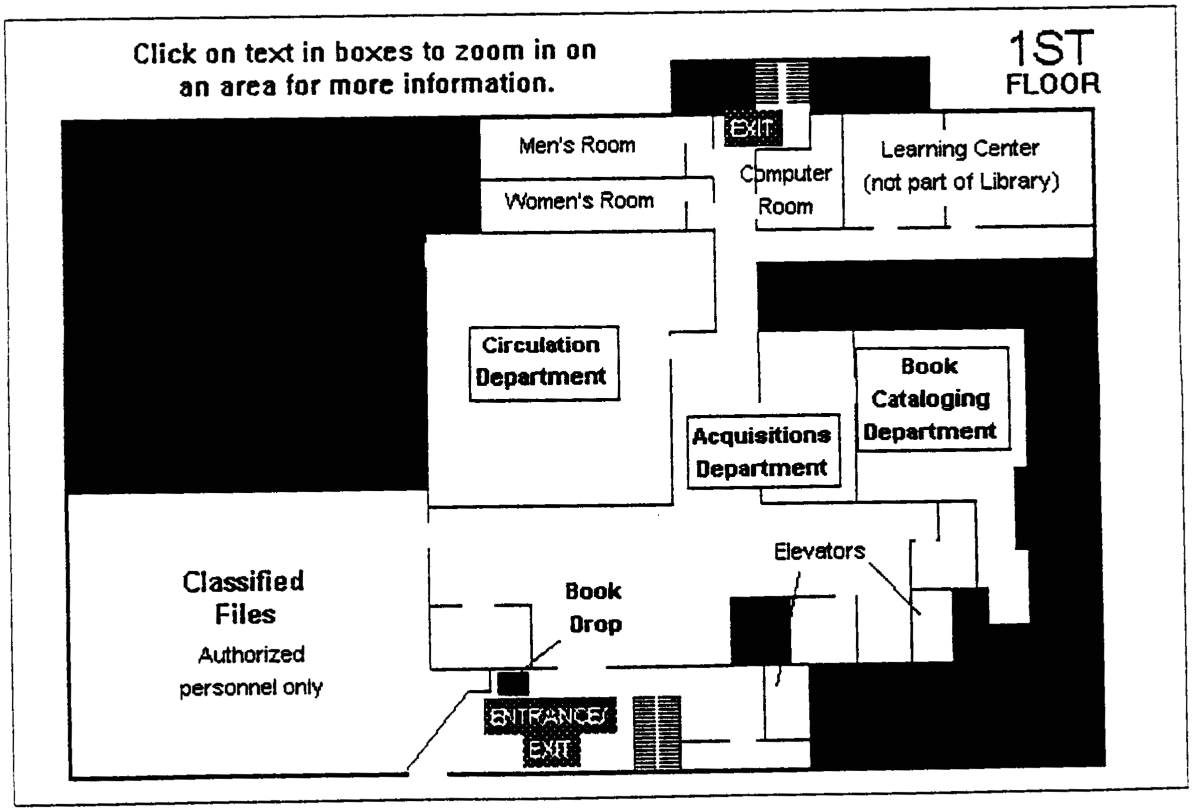


Technical Library Directory

NASA Langley Research Center
Technical Library -- MS 185
Hampton, VA 23681-0001
(804) 864-2355

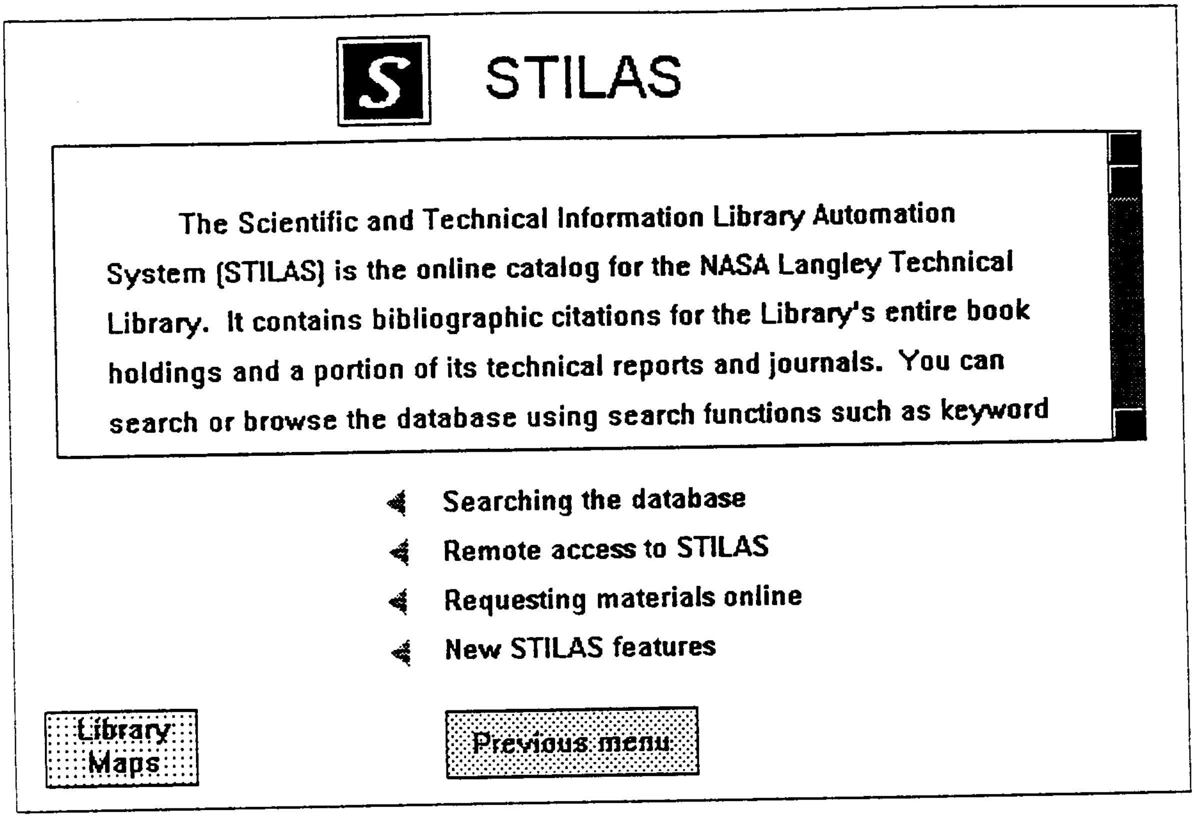
IMPORTANT NAMES AND NUMBERS

REFERENCE DESK	x42356
Branch Office	x42355
George Roncaglia, Branch Head	
Manjula Ambur, Assistant Branch Head	
Antoinette Lynch, Branch Secretary	
Reference Services Section	
Susan Adkins, Section Head	x42390
David Adams, Information Specialist	x42391
John Ferrainolo, Information Specialist	x42385



Click on text in boxes to zoom in on an area for more information.

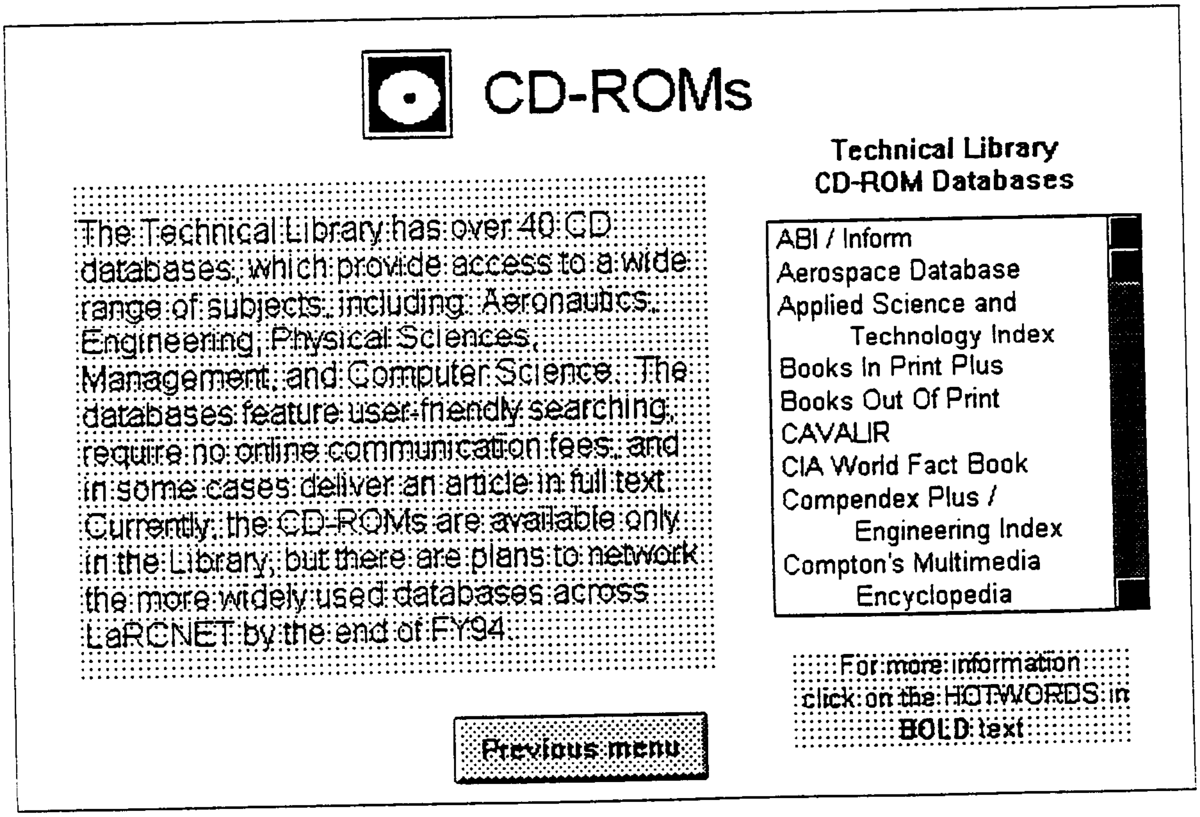
1ST
FLOOR
EXIT
Men's Room
Women's Room
Computer Room
Learning Center (not part of Library)
Circulation Department
Acquisitions Department
Book Cataloging Department
Classified Files
Authorized personnel only
Elevators
Book Drop
ENTRANCE/ EXIT



STILAS

The Scientific and Technical Information Library Automation System (STILAS) is the online catalog for the NASA Langley Technical Library. It contains bibliographic citations for the Library's entire book holdings and a portion of its technical reports and journals. You can search or browse the database using search functions such as keyword

- **Searching the database**
- **Remote access to STILAS**
- **Requesting materials online**
- **New STILAS features**



CD-ROMs

The Technical Library has over 40 CD databases, which provide access to a wide range of subjects, including: Aeronautics, Engineering, Physical Sciences, Management, and Computer Science. The databases feature user-friendly searching, require no online communication fees, and in some cases deliver an article in full text. Currently, the CD-ROMs are available only in the Library, but there are plans to network the more widely used databases across LaRCNET by the end of FY94.

Technical Library CD-ROM Databases

- ABI / Inform
- Aerospace Database
- Applied Science and Technology Index
- Books In Print Plus
- Books Out Of Print
- CAVALIR
- CIA World Fact Book
- Compendex Plus / Engineering Index
- Compton's Multimedia Encyclopedia

For more information click on the HOTWORDS in **BOLD** text

BIBLIOGRAPHIC REFERENCES

Allegra, M., Di Giuseppe, O., and Mangiaracina, S. "A hypermedia information system to manage the activities in a research institute". Human Aspects in Computing: Design and Use of Interactive Systems and Work with Terminals, edited by H.J. Bullinger. Amsterdam: Elsevier, 1991.

Benbasat, Izak and Todd, Peter. "An experimental investigation of interface design alternatives: icon vs. text and direct manipulation vs. menus". International Journal of Man-Machine Studies, March 1993, p. 369-402.

Carroll, J.M. and Rosson, M.B. "Getting around the task-artifact cycle: how to make claims and design by scenario". ACM Transactions on Information Systems, April 1992, p. 181-212.

Chaffin, Jeff. "Macintosh-assisted library orientation tour". College and Research News, June 1987, p. 332-334.

Ellis, David, Ford, Nigel, and Wood, Francis. "Hypertext and learning styles". Electronic Library 11(1), February 1993, p. 13-18.

Ertel, Monica and Oros, Jane. "A tour of the stacks: HyperCard for libraries". Online, January 1989, p. 45-53.

Farmer, Lesley S. J. "Hyperlearning: library instruction through HyperCard". Journal of Youth Services in Libraries 4(4), Summer 1991, p. 393-395.

Feinman, Valerie Jackson. "Computers and library instruction: expert systems". Computers in Libraries 13(3), March 1993, p.53-55.

Feinman, Valerie Jackson. "Hypertext and library instruction". Computers in Libraries 13(6), June 1993, p. 49-51.

Forys, Marsha, et al. "Library navigator: an electronic orientation to the University of Iowa Libraries". Research Strategies, Winter 1993, p. 39-41.

Fowler, Richard H., Hancock, Susan B., and Fowler, Wendy A. L. "A hypermedia system to explain library use". Computers in Libraries 13(10), Nov/Dec 1993, p.14-18.

Franklin, Carl (compiler). "A bibliography on hypertext and hypermedia with selected annotations". Database, February 1990, p. 24-32.

Holleman, Peggy. "Macintosh hypercard library instruction program". Community & Junior College Libraries 7(1), 1990, p. 59-75.

Kane, William P. "A HyperCard call number directory: using stacks to find stacks". College & Research Libraries News, July/August 1989, p. 576-577.

Lawson, V. Lonnie. "Using a computer-assisted instruction program to replace the traditional library tour: an experimental study". RQ, Fall 1989, 29(1), p. 71-79.

Lubans, John, Jr. Educating the Library User. New York: Bowker, 1974.

Lynch, M. J. "Library tours: the first step". In Educating the Library User. New York: Bowker, 1974.

MacFarlane, Bonnie L. A Computer-Assisted Library Tour. Master's Paper, School of Information and Library Science, University of North Carolina at Chapel Hill, 1988.

Mackey, Neosha, et al. "Teaching with HyperCard in place of a textbook". Computers in Libraries, 12(9), October 1992, p. 22-26.

Mayhew, Deborah J. Principles and Guidelines in Software User Interface Design. Engelwood Cliffs, NJ: Prentice-Hall, 1992.

Neuman, Delia. "Designing library instruction for undergraduates: combining instructional systems design and naturalistic inquiry". College & Research Libraries, March 1991, p. 165-176.

Norlin, Dennis, and Wright, Joyce C. "The electric undergrad: an interactive library program". College & Research Libraries, July/August 1993, p. 398-399.

Piette, Mary I. and Smith, Nathan M., Jr. "Evaluating a HyperCard library instruction program". Research Strategies 9(2), 1991, p. 87-94.

Piette, Mary I. and Smith, Nathan M., Jr. "Hypermedia and library instruction: the challenge of design". Reference Services Review, Winter 1991, p. 13-20.

Ramaiah, Chennupati K. "Use of hypertext for teaching and training: a bibliography". Electronic Library 11(6), December 1993, p. 409-417.

Rumsey, Eric. "HyperCard for bibliographic instruction". Computers in Libraries 12(5), May 1992, p. 43-45.

Schneiderman, Ben. "Direct manipulation: a step beyond programming languages". IEEE Computer, August 1983, p. 461.

Son, Inhye Kim, Humphries, Anne Wood, and Feldman, Jonquil D. "Lessons for the teacher and the student: developing a HyperCard tutorial". Computers in Libraries 13(5), May 1993, p. 18-20.

Tiefel, Virginia. Examining Innovative Applications of Technology in Libraries. Study prepared under the auspices of the Council on Library Resources, Ohio State University, Columbus, OH, September 1991.

Tiefel, Virginia. "The Gateway to Information: development, implementation, and evaluation". In: Designing Information: New Roles for Librarians, edited by Linda C. Smith and Prudence W. Dalrymple. Urbana-Champaign, IL : University of Illinois, 1993, p.34-47.

Vaccaro, Bill. "HyperTours! Part I". Computers in Libraries, January 1989, p. 28-31.

Vaccaro, Bill. "HyperTours! Part 2". Computers in Libraries, February 1989, p. 23-26.

Valauskas, Edward J. (editor). Macintoshed Libraries. Cupertino, CA: Apple Library Users Group, 1988.

Welsch, Erwin K. "Using Research Assistant for library instruction". Computers in Libraries, June 1990, p. 10-13.