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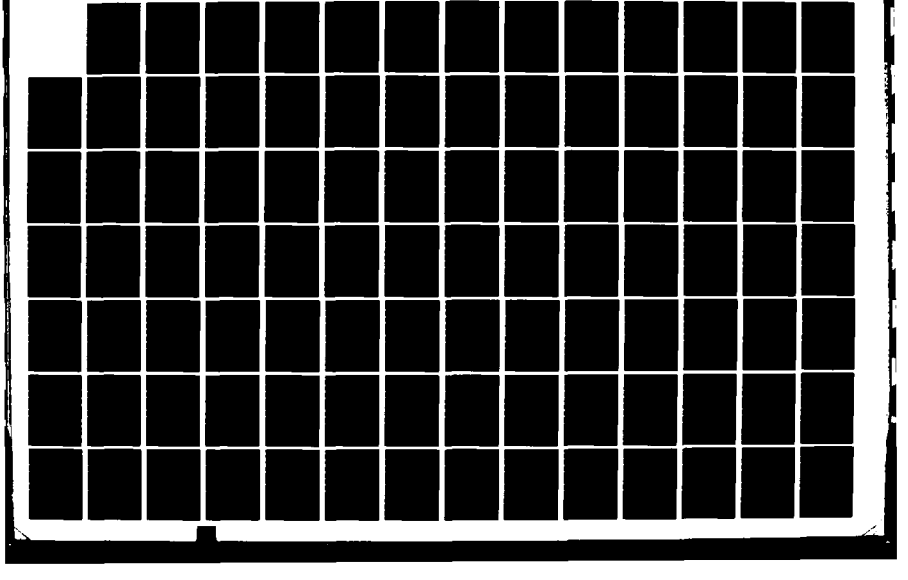

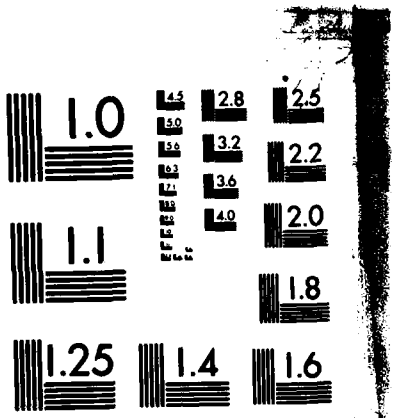

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

A133387

LOCAL AUTOMATION MODEL: FUNCTIONAL DESCRIPTION

September 1983

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DTIC
OCT 4 1983
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PREFACE

The Technical Reports (TR) data base maintained by the Defense Technical Information Center (DTIC) contains over one million abstracts covering a broad spectrum of research and studies conducted or sponsored by DoD organizations. The reports abstracted in the TR data base represent a significant DoD investment--billions of dollars--and offer substantial benefits to the DoD technical community involved in research, development, and engineering. Technical libraries supporting those efforts are facing an ever-increasing demand for information contained in sources such as the TR data base. Coincident with growth in demand for library services, the transaction costs of operating a library are increasing. Confronted with both increasing service demands and transaction costs, librarians are turning to automation as a means for providing, within budgetary constraints, the information services essential for supporting technical programs.

This functional description 1) describes a system called the Local Automation Model (LAM) designed to meet the operating and service needs of a DoD technical library, and 2) lays the groundwork for subsequent development by specifying the automated processing capabilities and applications for the system. Upon review by DTIC--the system sponsor--and potential users, the functional description will provide the basis for test site implementation of the LAM and will serve as a model for other libraries in planning future implementations.

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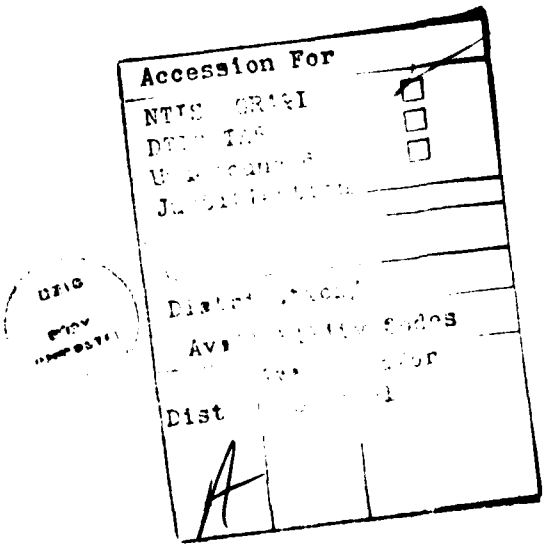

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SECTION 1. GENERAL

1.1 Purpose of the Functional Description.

This Functional Description (FD) of the Local Automation Model (LAM) is written to provide the following:

- The system requirements to be satisfied, which will serve as a basis for mutual understanding between the user and the developer
- Information on performance requirements, preliminary design, and user impacts
- A basis for the development of system tests.

This document adheres to the requirements for a Functional Description in "Department of Defense Automated Data Systems Documentation Standards," DoD 7935.1-S, and in "Defense Logistics Agency Information Processing Standards Handbook," DLAH 4730.1, May 1978.

1.2 Project References.

The development of this document is authorized by Logistics Management Institute (LMI) Task Order No. DL302 (MDA903-81-C-0166), "Local Automation Model," undertaken by LMI as requested by the Defense Logistics Agency (DLA). The project began on 1 November 1982 and is sponsored by the Defense Technical Information Center (DTIC), Information Research and Technology Division. The project is monitored by Office of Information Systems, DTIC. The test site for initial LAM development is the Defense Nuclear Agency (DNA), Washington, D.C.

This FD utilizes the documentation listed below as well as information obtained through direct contact with many of the potential users of the LAM. A list of potential users of the LAM is presented in Table 1-1. The following documents were referred to in the development of this report:

- LMI Task Order No. DL302, "Local Automation Model," Logistics Management Institute, 15 November 1982.

TABLE 1-1. POTENTIAL LAM USERS

ARMY

- U.S. Army Armament Research and Development Command
- U.S. Army Command & General Staff College/Combined Arms Research Library
- U.S. Army Missile Command/Redstone Scientific Information Center
- U.S. Army Training & Doctrine Command/Technical Library
- U.S. Army Ballistic Research Laboratory
- U.S. Army Training and Doctrine Command Combined Arms Test Activity/ Technical Information Center
- U.S. Army Mobility Equipment Research and Development Command
- U.S. Army Combat Developments Experimentation Command/Technical Information Center

NAVY

- Naval Research Laboratory/Technical Library
- Naval Coastal Systems Center/Technical Library
- Naval Surface Weapons Center

AIR FORCE

- Air Force Air Weather Service/Technical Library
- Air Force Wright Aeronautical Laboratories
- Air Force Human Resource Laboratory
- Air Force Flight Dynamics Laboratory

DoD AND OTHER ACTIVITIES

- Institute for Defense Analyses/Technical Library
- Defense Communications Agency
- Defense Nuclear Agency
- Los Alamos National Laboratory

- "Local Automation Model: Requirements Definition," Logistics Management Institute, 17 February 1983.

- "Local Automation Model: Conceptual Design Document," Logistics Management Institute, April 1983.

- "Department of Defense Automated Data Systems Documentation Standards," DoD Standard 7935.1-S, 13 September 1977.

- "Defense Logistics Agency Information Processing Standards Handbook; Volume 8: DLA ADS Life Cycle Management Specifications," DLA Handbook 4730.1, May 1978.

- "Data Element Dictionary, DTIC Uniform Data Systems," DTIC Handbook 4185.8, AD-A083800.

- "Department of Defense ADP Security Manual," DoD 5200.28-M, January 1973.

- "Guide to Library Automation," Barbara G. Toohill, The Mitre Corporation, McLean, Virginia, January 1980.

- "Automated Technical Library Accession System (ATLAS) Users Guide," Headquarters, Defense Nuclear Agency, July 1976.

- "Generalized Information Retrieval Language (GIRLII) Users Guide," Headquarters, Defense Nuclear Agency, May 1974.

- "Circulation Automated Program (CAP)," Headquarters, Defense Nuclear Agency, May 1980.

- "TIS--A Focal Point for Technology Transfer," V. E. Hampel, et. al., Lawrence Livermore National Laboratory, Livermore, California, September 1982.

1.3 Terms and Abbreviations.

The following acronyms, terms, and abbreviations are used in this document:

Ada	DoD Programming Language
ATLAS	Automated Technical Library Accession System used at DNA to maintain the records of technical library holdings
CAP	Circulation Automation Program used at DNA to maintain control of circulated library holdings
COM	Computer Output Microfilm
COSATI	Committee on Scientific and Technical Information, establishers of a library classification system used at DoD technical libraries
CPU	Central Processing Unit of a computer
Data Base	A collection of files maintained and accessed by an automated system for use by applications running on the system

DBMS	Data Base Management System--a software product that controls and facilitates a user's interaction (input, retrieval, and processing) with data files in an automated information system
DLA	Defense Logistics Agency
DNA	Defense Nuclear Agency
DoD	Department of Defense
DRIT	DTIC Retrieval and Indexing Terminology
DROLS	Defense RDT&E On-Line System
DTIC	Defense Technical Information Center
DTL	DNA Technical Library
FD	Functional Description--a document which defines the requirements of a system and provides the users with a statement of the operational capability to be developed
File	A collection of logically related records (generally all in the same format) maintained and accessed by an automated system as part of a data base for use by applications running on the automated system
GIRL-II	Generalized Information Retrieval Language used at DNA
Holding	A report, book, periodical, or microfilm in a library's collection
ILL	Interlibrary Loan
LAM	Local Automation Model
MARC	Machine-readable cataloging--a standard format or convention specified to facilitate the exchange of bibliographic information via machine-readable magnetic media
MASH	Mailing Address System for Headquarters used at DNA
NATO	North Atlantic Treaty Organization
NTPR	Nuclear Test Personnel Review
OCLC, Inc.	A private company (formerly known as the Ohio College Library Center) providing commercial cataloging services and distributing bibliographic information to libraries
On-line	In teleprocessing, a system in which the input data enters the computer directly from the point of origin or in which output data are transmitted directly to where they are used.
RDT&E	Research, Development, Test, and Evaluation
RSAG	Resource Sharing Advisory Group
RTIS	Remote Terminal Input Subsystem used by DoD libraries to input data to DTIC
SBIN	Shared Bibliographic Input Network
SDI	Selective Dissemination of Information
TR	Technical Report
TS	Top Secret
UNIX-C	Programming Language, Registered Trademark of Bell Laboratories

SECTION 2. SYSTEM SUMMARY

2.1 Background.

DTIC sponsors the Shared Bibliographic Input Network (SBIN) for on-line input of standardized descriptive data for technical reports from certain libraries. SBIN operates within the closed community of the DoD and its contractors because classified, proprietary, and sensitive information is involved. It uses the Defense RDT&E On-line System (DROLS) terminals. The Remote Terminal Input Subsystem (RTIS) is used to enter data.

Through SBIN, participant libraries can develop an on-line catalog of many of their technical report holdings, perform in-depth searches of this catalog, and produce output reports in hardcopy or microfiche. These capabilities enable SBIN libraries to save the staff time required to catalog holdings which have been cataloged by other SBIN members and thus reduce the library's cost per holding.

For much of the information maintained by DoD technical libraries, the SBIN concept is an effective way of providing cataloging and reference services. However, because some classified biliographic data cannot be transmitted to DTIC, SBIN libraries must maintain dual systems and procedures--one for local files and one for DTIC files. A goal of the SBIN program is to develop software to process and store all classes of bibliographic information by each site that originates input. The software would provide sites with a Local Automation Model (LAM) for their exclusive use.

Until now, most technical library functions have been manual or batch processing automated systems shared with non-library applications. Because of the growing demand for library services and the difficulty of meeting this

demand using current methods, DTIC and SBIN members find it necessary to develop a LAM. With such a model, a site would be able to perform library functions more quickly and efficiently.

Five functions are being recommended for initial LAM development: acquisition management, cataloging, referencing, circulation management and control, and serials management. The acquisition module will maintain accurate records of expenditures, accounts, and invoices; control new holdings as they are received and processed; and create a preliminary bibliographic record for transfer to other files and for use as input to the cataloging department. The cataloging module will support the maintenance, processing, exchange, and creation of bibliographic records. The reference module will enable a library to store and retrieve all of its local bibliographic data and to merge these data with data retrieved from the DTIC Technical Report (TR) data base using DROLS. The merged data can then be processed and stored at the local library. The circulation module will allow for better control of materials and improved service to patrons by providing identification of all holdings charged to any patron, the status of any holding, efficient patron checkout of materials, and production of statistical reports. The serials management module will maintain and update serial records, monitor binding operations, and prepare serials routing lists.

2.2 Objectives.

The primary objective of the LAM is to provide improved SBIN member capabilities for managing DoD and contractor bibliographic information. This objective will be achieved by enabling users to:

- Store and process bibliographic information on all library holdings, including those not eligible for DROLS
- Perform simultaneous searches of DTIC and local files

- Perform separate searches of DTIC or local files, as needed
- Accept and process inputs in machine-readable format, including key-to-disk data entry
- Access bibliographic data in a real-time interactive mode
- Process installation unique collections having special formats
- Define, generate, and store custom output reports
- Use a modular approach to implement the system, allowing a library to implement only those modules which are required
- Process and transmit data in accordance with DoD security and ADP regulations, including multilevel security protection (terminal, application system, user account, communication interface).

The system must also:

- Be transportable to two or three brands of computers
- Provide for a multi-user environment
- Allow for addition of new data elements and redefinition of data structures without complete reload or reorganization of the entire data base.

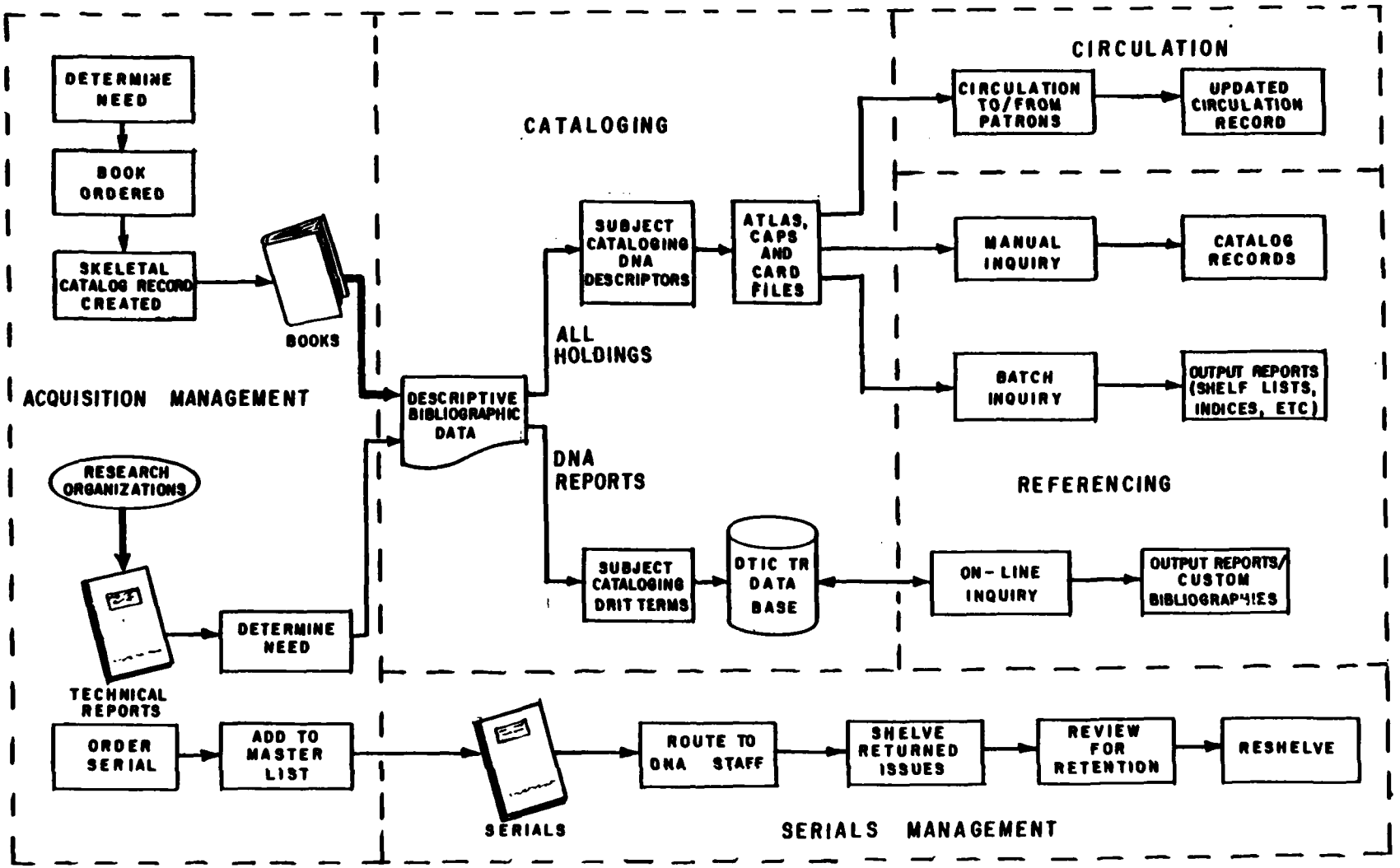
2.3 Existing Methods and Procedures.

This section describes the current methods and procedures employed by the test site (Defense Nuclear Agency) to support the five library functions recommended for inclusion in the LAM: acquisition management, cataloging, referencing, circulation management and control, and serials management. Figure 2-1 depicts the current DNA information flow, which is described in the following paragraphs.

a. Existing Acquisition Management.

The acquisition function includes work performed before a library holding is requested until the holding is ready to be cataloged. For DNA, the acquisition process pertains more to the procurement of books than to technical reports because DNA is included in the initial distribution of all reports produced or sponsored by federal agencies on the subject of nuclear

FIGURE 2-1. CURRENT DNA TECHNICAL LIBRARY INFORMATION FLOW



weapons. For books, the acquisition process begins when a librarian determines that a particular work is needed. The card catalog is then checked to see whether the book is already in the library collection. If not, the librarian uses a source listing such as "Books in Print" or the Government Printing Office catalog to obtain accurate bibliographic and ordering information. The book is then ordered either from a book store with which DNA has a blanket purchase agreement, from a wholesaler, or directly from the publisher. When the order is made, a temporary card containing a skeletal bibliographic record is placed in the card catalog to indicate that the book is on order. When the book arrives, the document custodian manually records its receipt. Then the cataloging technician creates a skeletal catalog record. All accounting related functions, except orders placed at book stores with which DNA has a blanket purchase agreement, are performed by the Acquisition Management Division of DNA and are not the responsibility of the DNA Technical Library. For serials management, all ordering and billing procedures are handled by a commercial subscription service.

As mentioned above, DNA automatically receives distribution of all Federal reports concerning nuclear weapons. These include all reports of studies performed on contract to DNA, reports of studies funded by DNA but carried out and monitored by another agency, and reports of studies funded by and conducted for another agency that are distributed to DNA. DNA also receives intelligence reports from Defense Intelligence Agency, Defense Security Agency, and other organizations in the intelligence community as well as Department of Energy laboratory reports. When a report is received at DNA, the document custodian records its arrival and gives it to the reference librarian, who determines whether it should be included in the library's collection. If it is judged to be useful, the report is kept and is assigned

a retention period after which its usefulness will be reevaluated. The reference librarian checks to see if the report is already in the library's collection. If no entry is found, the report is cataloged.

b. Existing Cataloging.

Cataloging is performed in two stages: descriptive cataloging and subject cataloging. The work in both stages in governed by the COSATI Guidelines for Descriptive Cataloging, used throughout the DoD Technical Library community. As part of this process, the reference librarian determines the category of the report (DNA sponsored, DNA funded, or other), the DNA office which monitored the work or has responsibility for the subject area of the report, and, if multiple copies of the report are received, determines if more than one copy is needed. The report is then forwarded to a cataloging technician, who assigns a DNA Technical Library (DTL) accession number and develops all required descriptive data about the report. The cataloging technician creates a bibliographic record for the holding containing fundamental information about the holding (such as title, author or originating agency, and publication date). These data are entered into the Automated Technical Library Accession System (ATLAS), which contains records on technical reports in the DNA Technical Library collection classified SECRET or below. Bibliographic data on books are maintained in a card catalog rather than in the ATLAS file.

Books are cataloged using the Library of Congress classification system and are not assigned DTL numbers. There are also at least three special classes of holdings which DNA maintains in its catalog. First is the Nuclear Test Personnel Review (NTPR) collection of reports, which is carefully monitored to insure that they are available to NTPR officials and affected individuals and to insure that the downgrading of these reports occurs on

schedule. Second are all TOP SECRET (TS) technical reports. In place of a DTL number, they are assigned to TS Control Number by the DNA Mail and Records Division and maintained on the DNA mailing system (MASH) rather than on ATLAS. Third, all NATO reports require special handling and distribution control and are shelved in a distinct area of the library apart from other holdings.

When all descriptive data for a holding have been entered, subject cataloging is performed. The holding is assigned up to 20 DNA descriptors/ keywords which can be used to locate it when searching the catalog. The descriptors/keywords are stored in a manual file and are not included in ATLAS. These keywords are, in most cases, not taken from the DTIC RDT&E Indexing Terminology (DRIT) but are more specific to DNA's requirements.

Once descriptive and subject data on a holding are entered into the appropriate files, the cataloging process is complete. The holding is shelved or immediately charged out to a patron. For DNA sponsored reports, the bibliographic data are modified and augmented for transmission to the DTIC Technical Report data base via DROLS/RTIS. The preparation of the data entails translating DNA descriptors into the more general DRIT terminology. A number of fields which DTIC requires for SBIN are also added to the record before transmission to DTIC. Reports not sponsored by DNA are not transmitted to DTIC since the sponsoring agency has this responsibility.

A major deficiency of the current cataloging methods is the manual keying of SBIN input data to DTIC. Since the primary source of these data is the local automated catalog, manual input to SBIN duplicates data entry to the local file and increases the possibility of transcription and keying error. Conversely, the use of SBIN records from DTIC for local cataloging requires manual entry of data which could be transmitted in machine-readable form if DTIC files and local files were linked.

c. Existing Referencing.

The primary goal of the reference function at DNA is to respond to document requests received from DNA staff members and contractors. Since access to the DNA catalog is limited to library personnel, all requests must be processed initially by a librarian. In response to a subject inquiry, the reference librarian searches the manual card catalog for potentially relevant holdings, pulls the cards for these holdings from the catalog file, and allows the patron to browse through this set of cards and select the holdings that appear most useful. In response to an inquiry for a specific document, the librarian refers to a hard-copy shelf list of DNA holdings which is sorted by significant fields such as title, author, contract number, and DTL number.

Several shortcomings are evident in the current methods and procedures used in the reference function. First, since DTIC files and local files are not linked, the reference librarian is required to search the two separately. This results in longer search times and in reduced responsiveness to bibliographic requests from patrons. The problem is compounded by the fragmentation of the local catalog into distinct parts: the automated file containing descriptive data on technical reports classified SECRET or below, a classified system for TOP SECRET reports, two separate manual card catalogs for technical reports and books in the library's collection, and a hard-copy shelf list organized by keyword for technical reports. This fragmentation causes additional delays, since it requires the reference librarian to search multiple sources. Further fragmentation is caused by the current methods used to catalog special collections, such as the Nuclear Test Personnel Review reports, which require special handling and processing and need to be easily distinguishable from other holdings. Lastly, all reports the library staff generates from the automated files are batch processed, usually running

overnight and not available until the next day. This includes not only shelf lists and other lengthy reports but also short searches which would normally be considered ad hoc requests. Overnight turnaround limits the staff's ability to respond to urgent requests.

d. Existing Circulation Management and Control.

Circulation of DNA library materials is limited to DNA personnel and approved contractors. DNA personnel are authorized to check out any holding for which they have the proper security clearance, while contractors are limited to holdings which fall within the subject areas listed on their "DNA Visitor Authorization Access Sheet." The reference librarian uses this sheet to determine each contractor's need-to-know. There are generally between 300 and 400 sheets on file at any time. For circulation control, DNA uses both a manual and an automated system. In the manual system, used for patrons working in the DNA building, a charge slip identifying the holding to be checked out is signed by the patron and retained in a file of all charged out holdings. When the holding is returned to the library, the slip is transferred to a file of completed transactions. This slip also serves as the accountability record/signature card required for transmission of classified documents. For patrons outside the building, the Circulation Automated Program (CAP) is used to generate a signature card and create a record for each holding checked out, containing data on the patron and the holding. This process is performed on-line via prompted CAP screen formats.

e. Existing Serial Management.

As mentioned earlier in this section, all ordering and billing of serials for the test site library is handled by a commercial subscription service. When a serial is received at the library, it is logged on the master serial list. A routing slip with the names of DNA staff members interested in

that serial is then generated and attached to the serial for distribution. When the serial is returned from distribution, it is stored with other issues of that serial on file. Back issues are generally kept for two years, although frequently used publications are sometimes kept longer.

2.4 Proposed Methods and Procedures.

The proposed methods and procedures involve the creation and maintenance of a local library bibliographic catalog combined with the capabilities to query the local catalog as well as the Technical Reports (TR) data base maintained by DTIC. Queries to either the DTIC TR data base or the local catalog will use the same query format, applicable to both catalogs and initiated from the same terminal. The exchange of bibliographic information between DTIC and the local library will be supported by this system to the extent permitted by existing information interchange agreements and rules (e.g., level of security classification, proprietary nature of the data). The proposed system will allow for accessing, down-loading, and modifying TR data base bibliographic information for local use. These capabilities--cataloging and referencing--form the core capabilities of the LAM and reflect the principal objective of SBIN membership--enhancing the exchange of bibliographic data.

While cataloging and referencing represent the LAM capabilities with the broadest applicability and economic value to the majority of SBIN members, it is likely that large libraries will require and can afford automated capabilities for circulation management and control, acquisition management, and serials management. It is essential that those libraries wishing to automate to a greater extent--either initially or in the future--have the opportunity, as SBIN members, to take advantage of LAM development and testing experience. For this reason, the proposed methods and procedures presented in

this document for functions beyond cataloging and referencing should be viewed as options selected by the local technical library based on need and affordability.

The design and development of the LAM will be for a "fully integrated library system" with capabilities for modular implementation. The pilot testing will include all five library functions. This approach provides the developer and the potential user with the opportunity to:

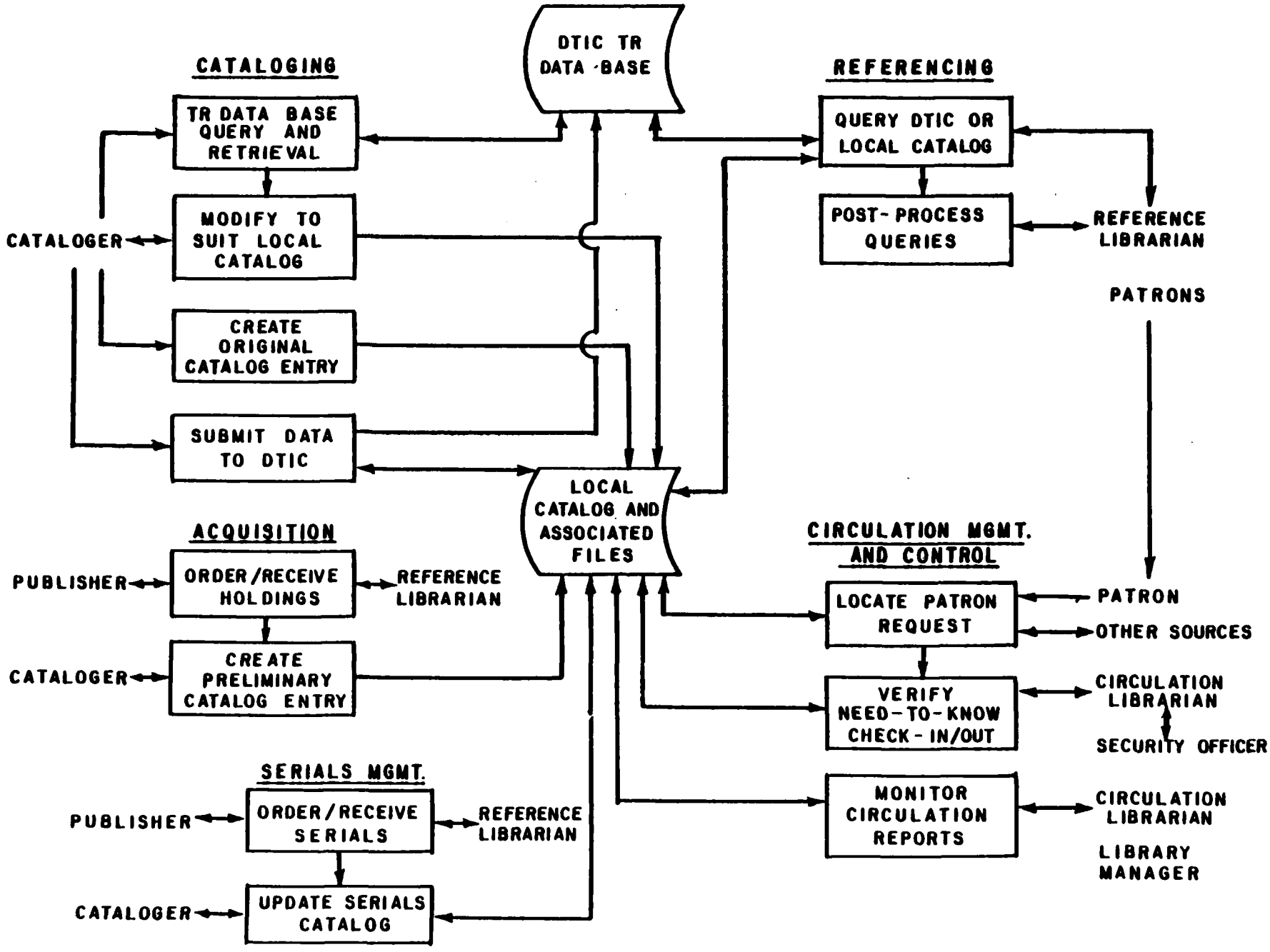
- Demonstrate and review the technical feasibility and economic value of implementing an improved technology for local catalog development and remote and local catalog query.
- Establish the framework for orderly, low-risk system expansion as needs and resources dictate.
- Reduce the risk inherent in system expansion or full-scale implementation by establishing, through pilot project implementation, the means for integrating automated support for a broad range of technical library functions.
- Identify the extent to which these functions can be integrated given reasonably available and economically justifiable automation technology.

Based on the user requirements identified during development and review of the Conceptual Design Document and during interviews with test site library staff members, the following methods and procedures are proposed for the LAM. The current work flow described in Figure 2-1 will not change significantly under the proposed methods and procedures. However, implementing these methods and procedures will significantly change the information flow between the library staff and the automated system supporting the library. The information flow supporting cataloging, referencing, circulation, serials management, and acquisition by the LAM is depicted in Figure 2-2. The following sections describe the various features of the LAM.

a. Proposed Cataloging.

(1) DTIC Access. The reference librarian will perform searches of the TR data base using DROLS search capabilities to locate bibliographic data

FIGURE 2-2. LOCAL AUTOMATION MODEL DATA FLOW AND ORGANIZATIONAL INTERACTION



potentially useful for developing a local catalog entry. The search criteria will be formatted by the local system to comply with the DROLS machine protocols. If the local library also has the holding, they may add the DROLS-supported library holding symbol to the TR data base record.

(2) Down-load Bibliographic Record. When bibliographic data on the TR data base can be used to develop a local catalog entry, these data will be transferred to the local system. Data will be converted by the LAM to the format required for compatibility with the local processor and processing software. No user intervention will be required to accomplish the data reformatting.

(3) Local Post-processing of Down-loaded Records. Once the data are transferred to the local system, the user will be able to modify or supplement the bibliographic data for use in the local catalog. Post-processing may include the addition of subject terms or descriptors, local accession numbers, or alternative data representations.

(4) Update Local Data Base with Down-loaded Records. When post-processing is complete, the revised bibliographic data may be added to the local catalog. Local libraries may choose to temporarily store the data pending a review of the entry for compliance with local cataloging rules and standards.

(5) Create Original, Local Bibliographic Records. Using facilities provided by the local system, the catalog technician will create a bibliographic record for entry into the local catalog, the TR data base, or both. Multiple copies of documents will be cataloged using a single catalog entry.

(6) Submit Catalog Records to DTIC. As SBIN members, local libraries may add catalog records to the TR data base for use by other SBIN members. Only bibliographic information meeting TR data base and DROLS criteria (e.g., security classification limitations, access limitations

imposed by proprietary information) may be transferred. When local library catalog records use other than DRIT subject terms or descriptors, the appropriate DRIT descriptors must be added to the catalog record prior to transmission to DTIC. Non-DRIT descriptors may be included on the "Document Data Worksheet" (DTIC Form 41) in Block 25, "Identifiers and/or Open-Ended Terms." Other data elements may be required for SBIN inputs which are not used in the local catalog.

(7) Update the Local Catalog with Local Bibliographic Records. Upon review and approval of either the locally created or modified catalog record, the catalog technician may add the new record to the local catalog.

(8) Prepare Catalog Back-up. Periodically, the LAM software will be used to create local catalog back-up copies. Machine-readable back-up copies will be used to reload the local catalog in the event of a system failure. This capability will also be available to produce any shelf lists on other listings of catalog required by the library staff, and thus provide an interim operational capability upon system failure.

(9) Maintain Special Collections. Local libraries may maintain special collections as part of the catalog. This will be accomplished through use of special collection identifiers within the catalog--permitting special collection catalog access via the reference search capabilities for authorized users.

(10) Access Other Catalog Sources. At the option of the local library, the LAM will read and store bibliographic information contained on transportable magnetic media (e.g., MARC-compatible magnetic tape, OCLC, Inc. commercial catalog tapes). When other commercial or governmental catalog sources are available via remote teleprocessing access, the LAM may be modified to incorporate automated search of these sources, thus eliminating the need for separate, stand-alone terminals for each catalog source.

b. Proposed Referencing.

(1) Types of Bibliographic Searches. The LAM will perform searches of the TR data base based on existing DROLS syntax. The local catalog may be searched by subject term/descriptor, author, title, date of publication, security classification, local or DTIC accession number, and other locally specified fields.

(2) Select Files to be Searched. The LAM will search the local catalog, the TR data base, or both sources simultaneously. The user will select the sources from a menu displayed during entry of the search criteria. A single format will be used for entering search criteria. The system will perform all translations necessary for compliance with DTIC and local catalog protocols and syntax.

(3) Down-load of DTIC Bibliographic Data. The LAM will transfer bibliographic information selected from the TR data base during a user search to the local system.

(4) Post-process DTIC References. Using the bibliographic data down-loaded from DTIC, the local library staff or user may sort the records in alternative sequences, perform additional searches on available data fields, and retrieve and review the information via a local terminal. The data also may be printed and/or temporarily stored for patron use.

(5) Local Data Base Queries. The LAM will perform searches of the local catalog. The types of searches available will depend on the bibliographic and cataloging information entered by the library staff during cataloging. As a minimum, the system will provide searches by author, title, subject terms/descriptors, and local accession number. The system will be capable of multiple key searches using Boolean logic arguments.

(6) Local Data Base Post-processing of Found References. As with the reference data down-loaded from the TR data base, the library staff or user will be able to sort, perform additional searches on available data keys, and review the contents of the results of the local catalog search.

c. Circulation Management and Control.

(1) Locate Patron Selection and Identify Status. The LAM will display the location of holdings requested by the patron on the basis of bibliographic information obtained from a local catalog search. If the holding is not available, it will determine the status of the holding (e.g., on loan to another patron, on order, reserved, being bound).

(2) Check-in/Check-out Holdings. The LAM will verify a patron's need-to-know and level of security clearance in conjunction with release of a classified holding, update the patron file to indicate the addition of the released holding, and update the patron file to reflect the return of a loaned holding.

(3) Prepare Classified Document Receipts. In conjunction with issuing a classified holding to a patron, the LAM will print a classified document receipt. Data on the receipt will be extracted from the local catalog and the patron file.

(4) Prepare Down-grading/Declassifying Schedules. At the option of the local library, data concerning down-grading/declassification schedules may be entered in the local catalog along with other bibliographic data. Periodically, the LAM will produce review schedules for holdings in the current catalog reflecting pending downgrade/declassification actions.

(5) Prepare Classified Document Destruction Schedule and Record. On the basis of down-grading and declassification schedule data entered in the local catalog, the LAM will produce a classified document destruction schedule and accompanying record for certification by the appointed document custodian.

(6) Create and Update Patron Files. The LAM will provide a patron file for recording the current holdings of each patron, the level of authorized clearance or access, and need-to-know as indicated by applicable subject terms or descriptors contained on the patron record. The level of clearance and need-to-know subject terms will be established and modified by designated library staff members in conjunction with the local installation/facility security officer.

(7) Prepare Reports on Circulation Statistics. Using holding check-out data contained in the local catalog and the patron file, the LAM will produce circulation statistics for the local collection. Recurring reports may be cataloged using the host data retrieval language. Ad hoc circulation reports will be developed by the library staff using a query language available within the data base management system.

(8) Identify Holdings by Patron. If a requested holding is part of the local collection, but is charged out to a patron, the LAM will identify that patron so that the holding may be requested.

d. Serials Management.

(1) Maintain and Update Serial Records. The LAM will establish a serial record for each periodical or serial subscription. As issues are received, the library staff will update the serial record to reflect current holdings. The serial record will contain the frequency of serial distribution, permitting the identification of issues not received.

(2) Monitor Binding Operations. When periodicals or serials are removed from the collection for binding or microfilming, the serials record will be annotated to reflect the status of the holding and provide an estimate of when the holding will be available for charge-out.

(3) Prepare Serials Routing Lists. Where libraries maintain a standing list of patrons routinely receiving new issues of serials, the LAM will automatically produce a circulation and routing slip containing the patron names and organizational addresses.

e. Acquisition Management.

As in the current procedures, books, reports, and serials will be processed. With the LAM, the following additional support is available:

(1) Maintain Acquisition Budget. For libraries acquiring holdings from commercial vendors or publishers, the LAM will support entering and updating an acquisition budget.

(2) Check for Order Duplication or Duplication of Existing Holding. Prior to submitting an order for a holding, the library staff can check for duplication within the local catalog or the TR data base, and check for duplication of orders.

(3) Prepare Preliminary Bibliographic Record for Cataloging. Upon placing an order for a holding, or upon receiving a publication likely to be added to the collection, the library staff will create a preliminary, skeletal bibliographic record for entry into the local catalog. This record identifies the status of the holding as on-order or pending further cataloging and can identify new holding arrival dates, check for duplication of orders, etc.

2.4.1 Summary of Improvements.

The use of the LAM will provide the following improvements:

- Functional Improvements (New Capabilities). The implementation of the capabilities proposed for the LAM will expand the local catalog search capabilities and permit, at the option of the user, simultaneous searches of the local catalog and the DTIC TR data base.

- Improvements to Existing Operations (Upgraded Capabilities). Libraries will realize a reduction in efforts associated with developing local catalog entries to the extent that bibliographic data contained in the TR data base are applicable to local holdings.

Submitting bibliographic data to the TR data base will be simplified through direct use of data already entered in the local catalog. Where local libraries currently maintain an automated catalog, but are restricted in their search capabilities, implementation of the LAM will provide expanded local catalog search capabilities.

- Timeliness (Decreased Response Time or Processing Time). Through use of the simultaneous search option, local libraries will reduce the time needed to conduct reference searches of currently available sources. Through use of multiple key searches and sorts, the local library will reduce the processing time needed to prepare shelf lists indexed by several different keys (e.g., author, title, subject, security classification).

- Elimination or Reduction of Existing Capabilities That Are No Longer Needed. Implementation of the on-line catalog will eliminate the card catalog as the primary reference source for library patrons.

2.4.2 Summary of Impacts.

The following subsections describe the expected equipment (hardware), software, organizational, operational and developmental impacts of the LAM.

2.4.2.1 Equipment Impacts.

Section 4.1, Equipment Environment, describes the types of equipment and operating characteristics needed to implement the LAM. Selection of software packages for implementing the LAM will influence the selection of equipment. The processor selected must support the operating system and compiler (if required) needed to operate the selected software package(s). Where a technical library has existing equipment available to provide adequate storage, support software, processing time, and communications support, it is recommended that the implementation be done on the existing equipment. This approach takes advantage of existing computer operations expertise and support, and eliminates the added risk of equipment installation and debugging inherent in implementing on a new piece of equipment. Where existing equipment is inadequate or where no equipment is currently available, it is recommended that a processor be selected which most closely matches the software package processor specifications. (There will be two or more

recommended processors for implementing the LAM, providing some flexibility for the implementing installation.) Further discussion of equipment impacts can be found in Sections 4 and 5 of this FD.

2.4.2.2 Software Impacts.

Development and implementation of the LAM will take advantage of existing software packages and capabilities to the maximum extent possible. On the basis of the system capabilities approved in the FD, existing software packages will be evaluated and selections made for test site implementation. It is likely that any existing package selected for implementation will require some modification or adaptation to meet all approved requirements and to be compatible with the test-site computer. Modifications to the software packages, adapting them to the pilot site installation, will be performed by the system developer. Where libraries currently maintain automated files such as a catalog, modifications to the file structure and accompanying software may be necessary to convert the files for use within the LAM. These modifications will be the responsibility of the data processing installation currently supporting or operating the existing files and systems. When implementation on existing equipment requires the support of special compilers or utilities, these will have to be obtained and installed in conjunction with LAM implementation. The purchase and installation of these items will be the responsibility of the local data processing installation.

2.4.2.3 Organizational Impacts.

a. Staff Responsibilities.

Operation of the LAM will require modifications to the methods and procedures used in the operation of the library. The following descriptions

of responsibilities categorized by functional area within the library delineate the minimum level of activity necessary to support operation of the LAM:

- Cataloger. Enter descriptive and subjective cataloging information, verify bibliographic (catalog) data prior to data base update, provide both DRIT and local subject terms or descriptors and abstracts prior to transferring local bibliographic data to DTIC.

- Reference Librarian. Provide assistance to patrons conducting catalog queries, perform catalog (local and DTIC) queries, provide catalog extracts for patrons, maintain and verify patron need-to-know in conjunction with catalog queries and extracts.

- Circulation Manager. Maintain patron access files, update patron and catalog files as holdings are checked in and out.

b. System Operator Responsibilities.

The system operator will have the following responsibilities: update and create file back-up copies as required, implement restart procedures as required, perform daily system start-up and shut-down procedures, and monitor system performance.

c. Program/System Maintenance Responsibilities.

The following items are performed by the system maintainer: implement revisions to vendor-provided software and accompanying utilities, schedule and perform needed hardware maintenance, coordinate hardware troubleshooting and repair with assigned maintenance personnel, and maintain and update the data dictionary used by the data base management system.

d. Training Requirements.

Library staff members will receive training on the specific aspects of system operation for their assigned responsibilities. The library staff may provide patron training in the use of the system for reference searches. This training may be obtained from outside sources (e.g., the software vendor) or may be conducted by the library staff after system implementation.

e. Additional Staffing Requirements.

Additional staffing may be required to convert existing card catalog data to a form usable by the local (automated) catalog. This may best be done through use of temporary employees or contractor-provided data entry services. This additional help will shorten the time needed for conversion without overburdening the existing library staff.

f. Host Computer Installation.

The data processing installation operating the LAM host equipment will be responsible for converting any existing files intended for use within the LAM. Additionally, the data processing installation will be required to purchase and install all compilers and system utilities required for LAM operation if not currently available. During testing of the system, sufficient operator and computer time must be made available to conduct all tests.

2.4.2.4 Operational Impacts.

a. Library Staff vs. Patron Referencing.

The library may permit patron access to the system for reference searches. This would reduce the workload on the reference staff but may require the implementation of a "two-tier" search capability reflecting the different levels of expertise in conducting a reference search. Additional provisions for limiting patron access to bibliographic data on the basis of security clearance and need-to-know will be necessary when the local catalog contains sensitive information.

b. Impacts from Implementations on Existing ADP Equipment.

Implementation of the LAM on equipment which is already supporting other applications may affect the performance of the host computer and the workload of the operations center. Large libraries requiring large catalogs and supporting a large number of patrons would pose the greatest impact. Since each LAM implementation will be unique in its existing hardware

environment, an individual site assessment will be necessary to determine if the existing hardware is adequate to support LAM implementation.

c. Data Retention--the Local Catalog.

Data contained in the local catalog will be retained as prescribed in current library operating procedures. Where current manual creation and storage methods limit extended data storage, local operating procedures may be modified to take advantage of expanded data storage capacity provided by the automated catalog.

d. Results of Suspension of Operations--System Failures.

A discussion of system failure contingencies is contained in Section 3.5 of this document.

e. Recommended Methods for Providing Input Data.

The following methods of input data will be provided by the LAM:

- Local Catalog. Information on local holdings must be entered into the LAM catalog prior to system implementation. Where card catalogs are used, they would be the primary source for bibliographic data entered into the LAM catalog. Where automated or partially automated catalogs are available, they should be used to load the LAM catalog. Additions or modifications to the data from automated catalogs could be performed using the cataloging capabilities inherent in the LAM.

- Patron Files. It is unlikely that many SBIN members will have automated patron files prior to LAM implementation. Where implemented, initial patron file entries should be keyboard-entered from data contained on existing manual charge-out files. Otherwise the patron file can be created as holdings are checked out during normal library operations.

- Other Locally-required Files or Data Bases. Libraries may have automated records covering other indirect library functions. These may be converted to LAM files if they are currently automated, or be keyboard-entered if they are kept manually.

2.4.2.5 Development Impacts.

a. Development of the Local Catalog.

Prior to LAM implementation, the catalog technician will create the local catalog. Where automated catalog records exist, these may be converted

for use in the system. If no automated catalog currently exists, the data base must be keyboard-entered from the existing card catalog. Assuming an average bibliographic record length of 400 characters, approximately 35-40 records can be keyboard-entered per hour. (This can be used as a planning factor for estimating the level of effort required to create the catalog.) If automated records exist, but are inadequate in content to support full system operation (e.g., subject term or descriptor searches), additional data elements will have to be developed and keyboard-entered.

b. Testing Requirements.

For implementations on existing equipment, sufficient operator time must be allocated to conduct system tests prior to public use of the system. Since LAM will use existing software packages requiring minor modifications to suit local equipment configurations, it is estimated that two to three man-weeks of operator time will be required to test the system.

c. Conversion Programs to Modify Existing Data Files.

When existing files are available for use in the LAM, programs for conversion must be written, tested, and debugged. For each file subject to conversion, it is estimated that 60-80 man-hours of application programmer time will be required to develop the conversion program. This is based on the assumption that the existing file is sequential (flat) and that major changes to the data characteristics are not required.

d. Parallel Operations During Testing and Implementation.

The library staff should plan to operate under existing methods and procedures (manual and automated) in parallel with the new system during testing and implementation. This will cause a temporary increase in staff workload, but will permit rapid system implementation and will speed problem identification and resolution.

2.5 Assumptions and Constraints.

a. Assumptions--Test Site Implementation.

The following assumptions have been made in planning the test site implementation at the DNA:

- The system developer will be responsible for modifying and installing the applications software and data base management system needed for LAM operation.
- The DNA will be responsible for obtaining and installing the associated operating system, compilers, and utilities (external to the applications software and data base management system) needed for LAM operation.
- Equipment needed to implement the system will be available no later than April 1984 at the test site.
- DROLS protocols, syntax, and operating procedures will not significantly change during system development and implementation.
- The DNA will be responsible for converting or modifying any existing files, data bases, or catalogs for use within the LAM or for exchanging data between these files and the LAM.
- The DNA library will be responsible for the day-to-day operation of the system with technical ADP operations support provided by the assigned responsible data processing installation.
- Once the LAM is implemented, DNA will provide demonstrations of the system to other SBIN members considering implementation of the system.

b. Assumptions--Other Implementations.

While the principal emphasis in this FD is on the test site implementation, much of the material is applicable to implementation at other SBIN member libraries. The following additional assumption pertains to LAM implementations at other libraries:

- Each library implementing the LAM will be responsible for obtaining, installing, and operating the local system.

c. Constraints.

The following constraints affect system development, implementation, and operation:

- The capability to query and retrieve data from the DTIC TR data base is based on the current and future capabilities provided by DROLS and RTIS or subsequent compatible replacement systems.

- Local catalog query and retrieval capabilities will be constrained by the number of searchable data elements selected and entered by the library staff during creation or conversion of catalog records.

- Existing agency and DoD security practices and rules will govern the library capabilities for processing and storing classified and proprietary information.

- Off-the-shelf software which most closely meets LAM processing requirements will be used subject to adaptation and modification to suit the local processing environment.

SECTION 3. DETAILED CHARACTERISTICS

3.1 Specific Performance Requirements.

Test site implementation of the LAM will use an existing DNA computer capable of supporting interactive queries of and updates to an on-line data base. Subsequent implementations at other SBIN libraries may use an existing computer if it has sufficient capacity to meet on-line storage requirements and query/update response times. Alternatively, other libraries may implement the LAM on a locally based, stand-alone minicomputer capable of meeting the query, retrieval, data storage, and communications requirements specified for the system. The data contained in the LAM data base will be derived from SBIN members' current files, manual and automated, and the DTIC TR data base. The LAM will provide for interactive queries to the local data base, the DTIC TR data base, or both data bases simultaneously. These queries will provide literature searches for library patrons, capture bibliographic data not contained in the local library, and produce standard and/or special reports.

The LAM data base will contain data elements needed to meet the SBIN libraries' objectives stated in Section 2.2 and the proposed methods and procedures delineated in Section 2.4. Implementation of the LAM data base will make use of existing software packages (i.e., data base and library systems) to the maximum extent possible. In addition to meeting the proposed methods and procedures listed in Section 2.4, candidate software packages will be evaluated on the basis of the following performance requirements:

- Interactive Data Base Query, Retrieval, and Display. LAM users must be able to search the LAM data base in an on-line interactive mode. The DBMS must provide the users with a query language using an English-like syntax that allows Boolean combinations of search arguments. The query language must be "user-friendly," in that it must have a "help" function for LAM users when they reach an impasse and

produce comprehensive diagnostic messages with errors clearly explained. In addition to the above requirements, the LAM must be capable of storing and retrieving frequently used queries.

- Automated Data Dictionary. The DBMS or companion software must support an on-line data dictionary that allows the data base administrator to create, modify, or delete data element definitions for the LAM data base. The data element definitions will include data element name, definition, format, design requirement(s), explanation, data use identifier(s), and current system field(s). These data element descriptors are the minimum required by the DROLS. Refer to the Data Element Dictionary, DTIC Uniform Data Systems, AD-A083800, DTIC Handbook 4185.8 for processing information and instructions. Additional data elements, processing, and verification procedures will be required for site-specific processing.

- Data Base Update. The DBMS must provide for or be compatible with software and procedures that automatically update input data according to DTIC Data Element Dictionary of the Technical Report (TR) data base and the library-specified criteria. LAM data validation will provide the following capabilities:

  -- Data elements must be verified for the correct physical format.

  -- Software must ascertain whether certain data elements or combinations of data elements that do not contain a value can be entered into the data base.

  -- Software must have the ability to check for uniqueness, valid values, or a range of values.

- Integrated Report Writer Package. The report writer of the DBMS must permit users to define and store report formats for later use. This software should be capable of allowing persons not oriented to data processing to use the system with minimal training. The LAM user must be provided the means to produce reports that require extensive data manipulation, arithmetic operations, and formatting.

- Data Base Security. The system operator must have the capability to define security/access requirements by application, record type, and data element. The DBMS or its associate software (data dictionary) will accomplish this.

- Procedural Language Interface. The DBMS must allow interactive and batch access from application programs written in a high-level language, such as COBOL, UNIX-C, or Ada.

- Simultaneous Searches. LAM will provide automatic and transparent access to homo/heterogeneous data bases. This will allow LAM libraries direct automated access to other library catalogs (i.e., DTIC). Users will have the ability to interrogate that catalog using a common query language and to capture and reformat bibliographic data suitable for input into the LAM.

- Teleprocessing System. The teleprocessing system software must provide interactive on-line processing with the LAM computer system/ DBMS for multiple users. This teleprocessing software must be capable of serving a variety of terminals.

- Operating System/Support Software. The LAM DBMS and applications software will be selected after publication of the System Specification. In selecting this software, a primary consideration will be given to the compatibility of required associated operating systems and utilities with available DNA processors.

3.1.1 Accuracy and Validity.

Very few arithmetic operations are required to support LAM functions. Basically an administrative as opposed to a scientific data processing application, the LAM will be capable of producing statistical reports related to library circulation operations and acquisition budget management. Some of these reports will contain data elements representing dollar amounts. These data are stored as real numbers and may represent a range of amounts of -100,000.00 to +100,000.00. The accuracy requirement for such fields is two digits to the right of the decimal point (representing hundredths of dollars). Computations using these amount fields must preserve that level of accuracy.

Data elements representing dates (e.g., report date) will be in the DTIC descriptive cataloging standard format. This format is one or two numeric digits, three alpha digits, and two numeric digits (e.g., 1 JAN 83 or 15 FEB 83).

The physical format and characteristics of all key data elements entered in the system will automatically be verified to ensure the integrity of the data base. These accuracy and validation edits should make use of the LAM DBMS data dictionary. These edit requirements are defined in the DTIC Data Element Dictionary.

The LAM will transmit and receive data via communication lines, magnetic disk, or tape. The LAM will be designed on the basis of current DTIC communication protocol standards (DROLS/RTIS). Data received on magnetic disk/tape

must adhere to the standard formats defined by brand-specific hardware and software at each local library.

3.1.2 Timing.

The timing constraints placed on the LAM are:

- The ability to produce recurring reports according to a schedule established by the library manager
- The ability to respond to batch-processed data base schema modifications overnight or over a weekend
- The ability to restore the data base or its associated software overnight
- The ability to complete reload/restart procedures within 3 hours of (hardware) system restart
- The ability to process an average search command within 7.5 seconds and an average non-search command within two or three seconds.

3.2 System Functions.

This section addresses the individual library functions as they relate to the specific performance requirements discussed in Section 2.4, and how the LAM will accommodate those requirements.

3.2.1 System Management Function.

Those functions related to overall data management or common to two or more library functions, such as editing, ad hoc reports, telecommunications, and querying, are as follows:

- LAM Edits. All data entered into the LAM data base will be subject to edit criteria checks built into the DBMS data dictionary. Additional edits may be made using tailored applications software. These checks (duplicate data, security, and others that are application or data-dependent) will be made to ensure data base integrity. All errors detected will be displayed along with the data associated with them. These displays will be hard-copy error listings or CRT displays. All erroneous data will be written on an error file for subsequent correction and entry into the LAM data base. Error-free data will be entered into the data base. All data entered into the LAM will be shown in an "edit and load" report. Copies of all reports will be maintained as an audit trail of the LAM operating cycle.
- Standard Report Production. LAM software will produce a set of standard management reports. The report names and sample report layouts

appear in Appendix B. The report writer software will support on-line interactive report preparation and submission under the control of DBMS command language. Authorized users will be able to use the report writer software to produce standard reports.

- Ad Hoc Report Production. The DBMS report generation facility will enable LAM users to develop and store ad hoc reports tailored to their specific needs. Users will have on-line interactive access to the report development and generation facilities of the DBMS.

- Data Base Archiving. A machine-readable copy of the LAM data base will be created after each major file update. This data base copy will be used to restore the data base in the event of system failure. A hard-copy printout of the data base will be produced at the same time as a basis for reconstructing the data base in the event of a catastrophic system failure.

- Data Base Maintenance. The DBMS must provide the means to perform routine maintenance tasks on the data base. These include: file maintenance, backup-recovery, usage monitoring, and audit trail creation for updating. The DBMS selected for the LAM application should provide standard utilities to accomplish these maintenance tasks and require no extensive custom software development.

- Telecommunications Support. The computer system software and DBMS selected for the LAM will provide direct access to DTIC via a telecommunications network during the required time period for daily system availability.

- Data Base Query. The DBMS selected for the LAM will provide, via the DBMS query language, for Boolean logic searches on data elements that have been defined as searchable. These search criteria must meet at least the minimum requirements defined by DTIC (e.g., title, author, descriptors). The DBMS must contain, or be compatible with, software that will perform simultaneous searches on the local library and DTIC TR data base. This software must translate the LAM and DTIC search commands into a common search argument and submit the query. The DBMS will provide the capability of displaying on a CRT terminal the documents user-specified search criteria.

- Screen Formats. The DBMS used for the LAM must contain or be compatible with a screen processor. This software will enable LAM users to communicate with the system via screen formats. These screens will be tailored for each function, allowing on-line data entry, query and update. In view of the divergence of users' talents, software must be provided to present the user with two levels of communications: first, a formatted screen where the user may simply fill in the blanks, and second, a screen capable of accepting abbreviated processing commands allowing the experienced user to rapidly enter and access system data. Appendix D shows samples of screen formats for both levels.

- Automatic Log-on. The LAM software will have the capability to automatically allow users to access DTIC and the local files, given

the proper destination code and security clearances/need-to-know. This software will establish proper communications links, verify access rights, and allow the terminal session to begin. Access rights will be issued and removed on the basis of patron need-to-know. The local security officer in conjunction with the library manager will be responsible for establishing and maintaining data on patron clearances and need-to-know.

- Downloading and Post-processing of Bibliographic Data. Since the LAM has the capability to search external files (such as DTIC), it is possible to retrieve citations from different data bases in different formats. The LAM software will retrieve and store these bibliographic data in a temporary file. This permits data to be reformatted, organized, and aggregated in a suitable manner. Redundant bibliographic records are eliminated by comparing like data elements. The resulting data can be reviewed and analyzed on-line using LAM post-processing software.

3.2.2 LAM Cataloging Function.

The LAM will perform the following processes as noted in Figure 3-1, LAM Cataloging Function:

- Batch Data Input. LAM software will allow the library manager to accept bibliographic data from governmental and/or commercial cataloging services, such as OCLC, Inc. These data will be read from magnetic nine track tape in a format compatible with the library's hardware and software specifications. Data entered into the LAM data base will be subjected to edit checks and formatting rules as defined by the data dictionary of the DBMS and by SBIN library specifications. These data will be entered into the data base as required. An error report will list all data records rejected by the LAM DBMS.

- Catalog Creation, Updating, and Editing. On-line access to the LAM will provide authorized library personnel the capability to verify the existence of records and to add new records to the LAM and DTIC TR data bases. Data will be entered into temporary files for verification and reformatting prior to entering into the data base. Error reports will be produced as errors are detected. Data entry and retrieval formats will be designed to conduct a prompted interactive dialogue with the LAM user to locate, display, modify, or add bibliographic records to the data bases. Sample screen formats are presented in Appendix D.

3.2.3 LAM Referencing Function.

The LAM will perform the basic referencing functions noted in Figure 3-2, LAM Referencing Function. The processing software listed in this figure for queries, downloading, and post-processing is described in Section 3.2.1: Data Base Query, Automatic Log-on, and Downloading and Post-processing.

FIGURE 3-1. LAM CATALOGING FUNCTION

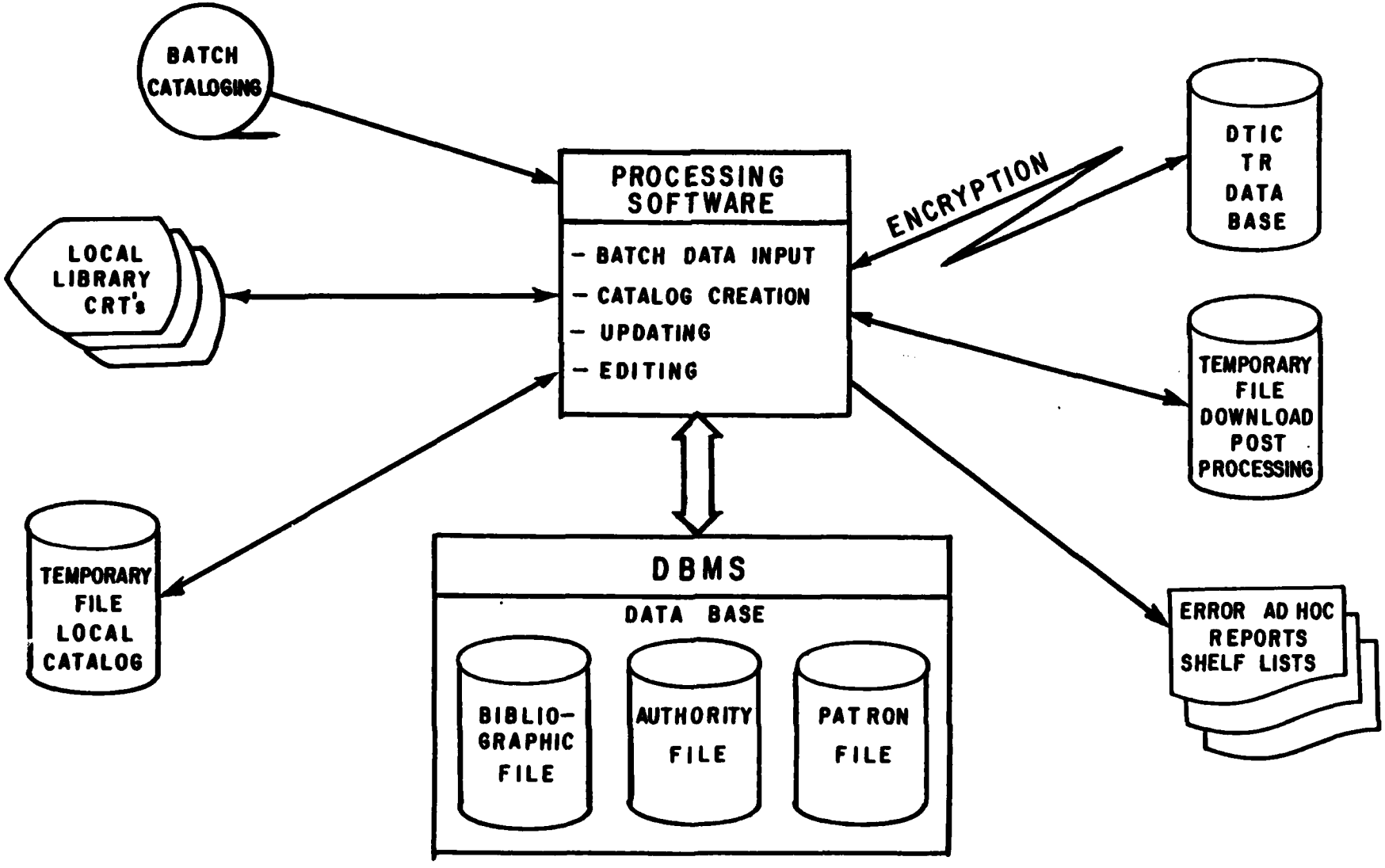
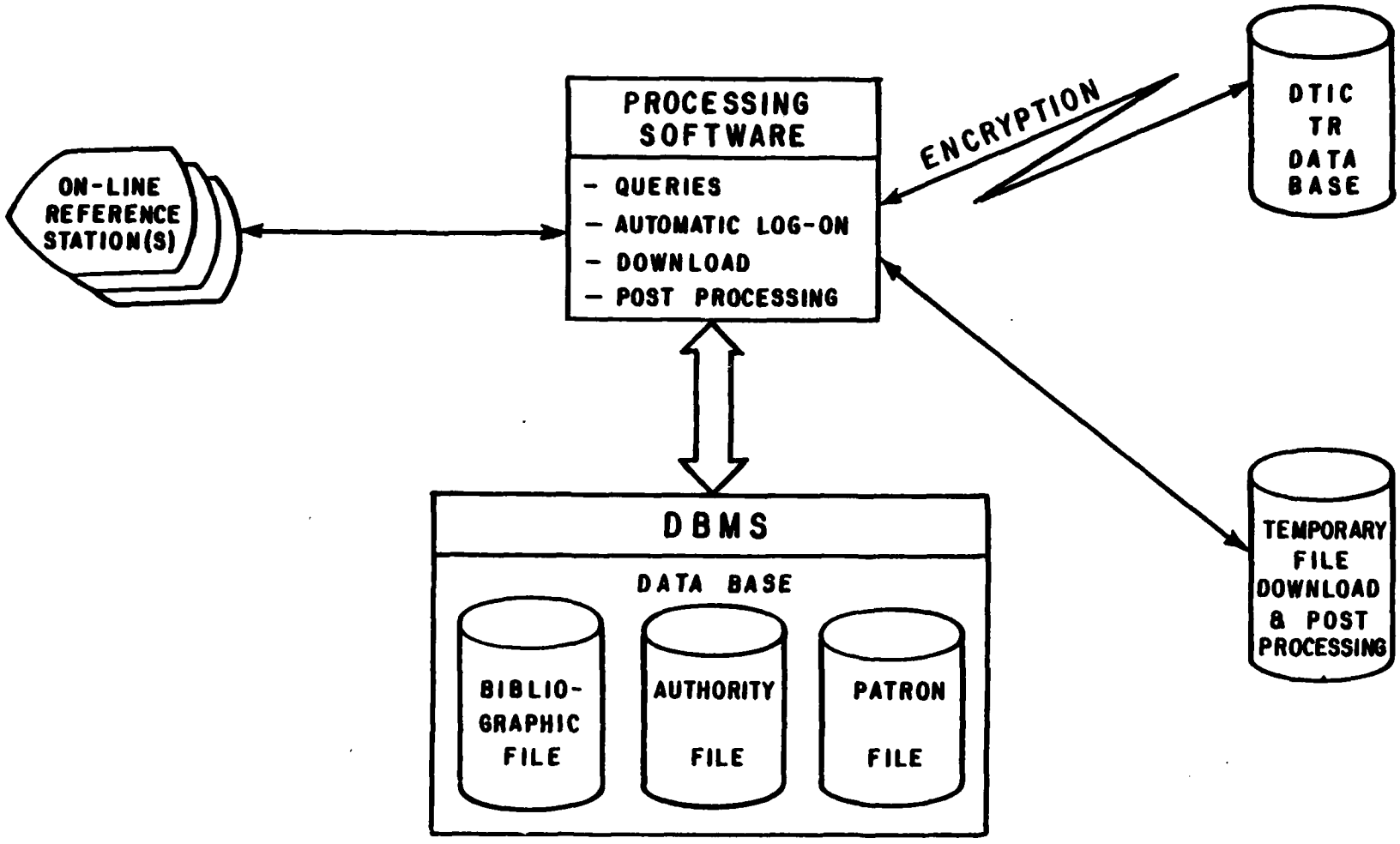


FIGURE 3-2. LAM REFERENCING FUNCTION



3.2.4 LAM Circulation Management and Control Function.

The LAM will perform the following basic circulation management and control process as noted in Figure 3-3:

- Patron File Query/Update. The LAM data base will contain a patron file for the library. The data in the patron file consist of patron name, patron ID, security clearance, need-to-know as indicated by subject term or descriptor, and the number and title documents currently checked out. The LAM will produce classified and unclassified document charge-out receipts, identify document status, identify patrons currently charged out for documents, and update this file in an on-line interactive mode.

- Data Base Query/Update. To support circulation management and control, the data base query and update capabilities described in Section 3.2.1 will be used to query the catalog to locate a patron holding. Holding status will be updated during check-in and check-out processing.

- Authority File. The system will provide on-line access to the LAM authority file. This on-line interactive file will contain subject headings or key words that characterize technical paper and documents in terms of similar attributes. On-line interactive access to this file will facilitate the stucture of search criteria for querying the data base. This software will allow designated library personnel to maintain this file (e.g., subject headings or key words) in an on-line interactive mode.

3.2.5 Serials Management Function.

The LAM DBMS must contain or be compatible with software that supports serials management activities (see Figure 3-4, LAM Serial Management Function). This software must provide information on:

- Ordering, renewing, and cancelling subscriptions
- Creating and updating serial records
- Acquiring new and tracking old issues
- Preparing for bindery activities
- Subscription data
- Statistical reporting.

The serial management software must maintain data on-line with the capability to process serials interactively. LAM software will produce receipts and reports depicting serial management activity.

FIGURE 3-3. LAM CIRCULATION MANAGEMENT AND CONTROL FUNCTION

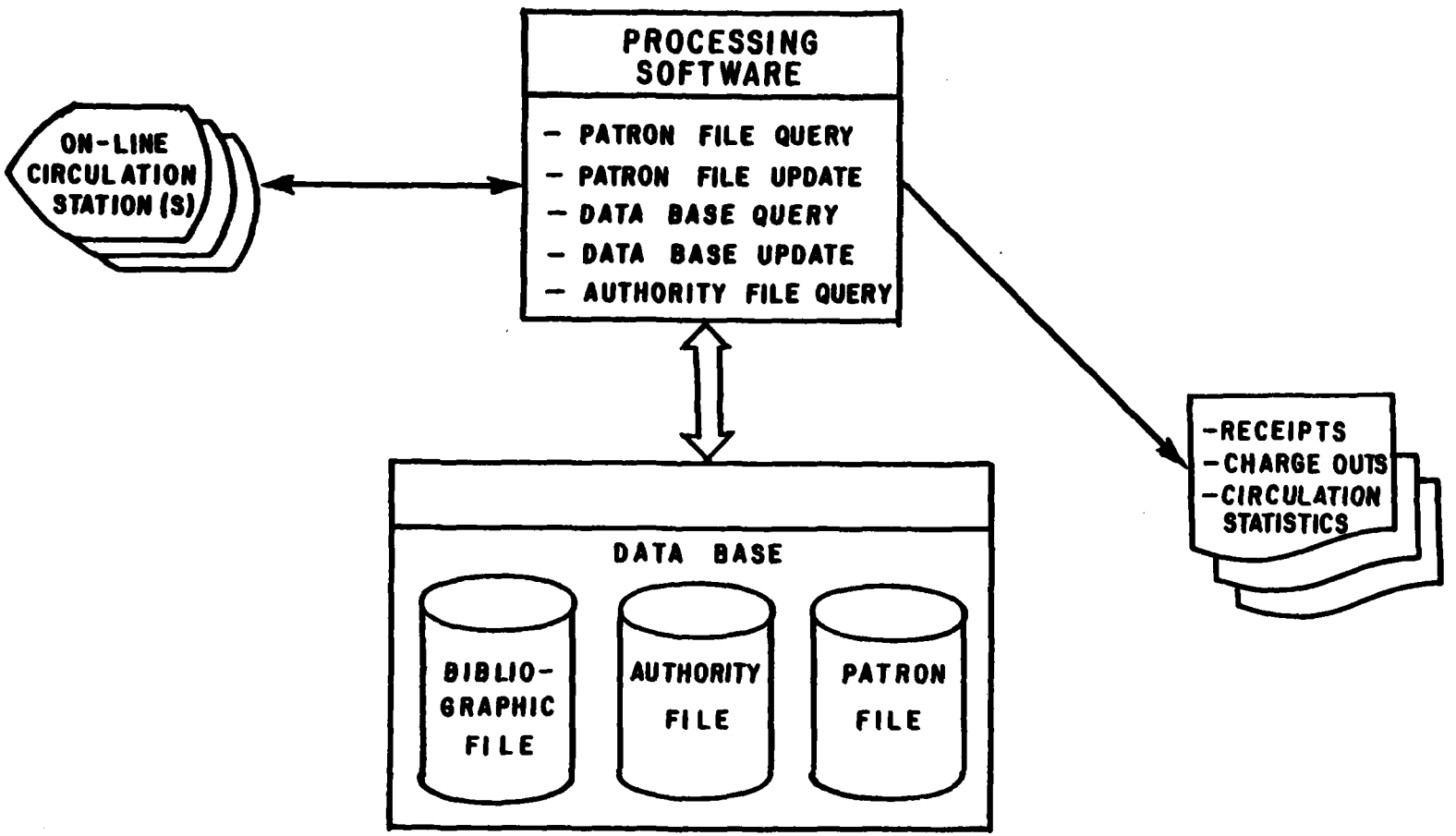
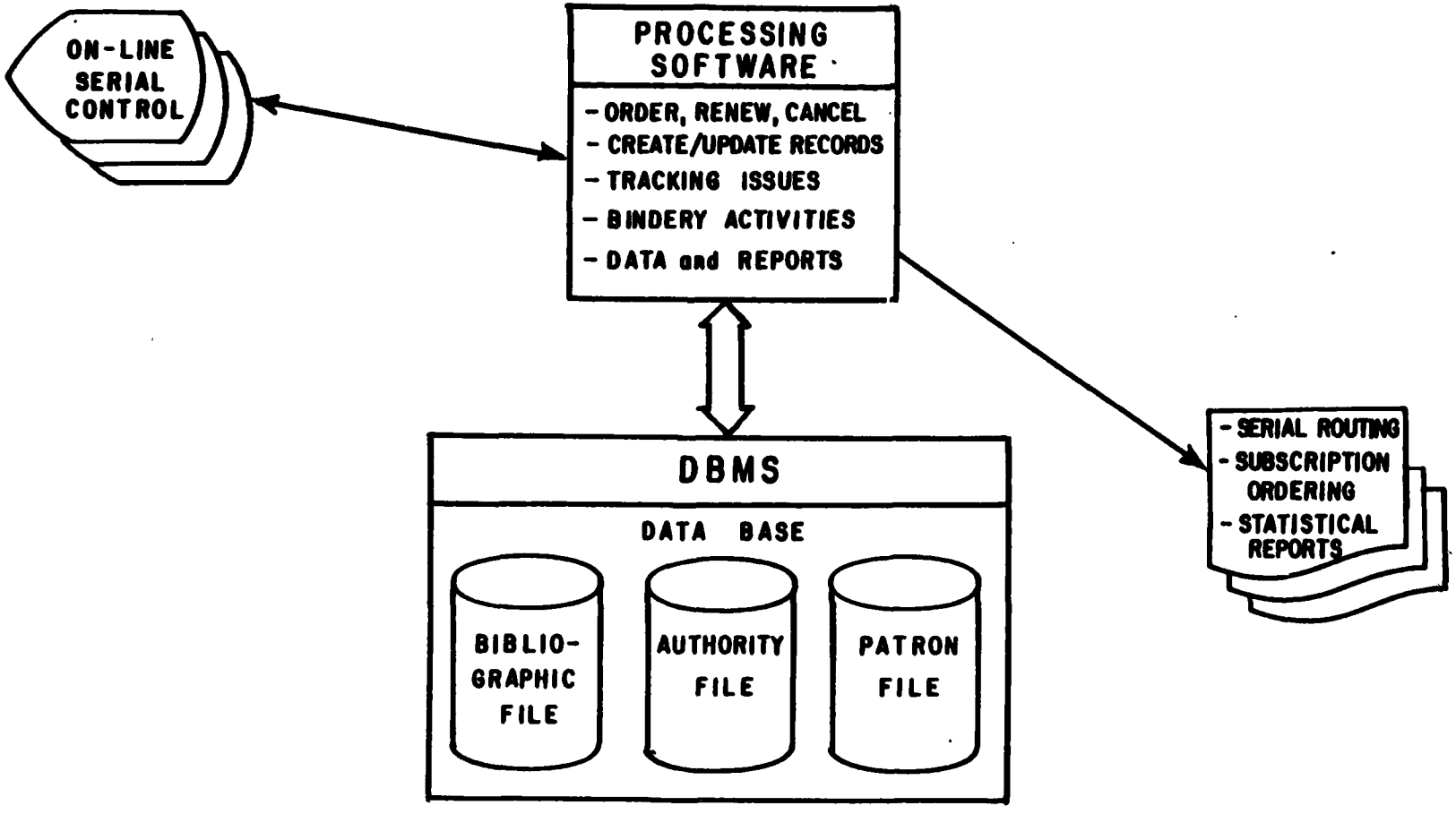


FIGURE 3-4. LAM SERIAL MANAGEMENT FUNCTION



3.2.6 Acquisition Management Function.

The LAM DBMS software must contain or be compatible with software that processes the acquisition management activities (see Figure 3-5, LAM Acquisition Management Function). This software must maintain a catalog of all documents on order and associated budget accounts. LAM software must maintain these data in an on-line mode with the capability to check an invoice status and update interactively. Reports will be produced depicting all acquisition processes.

3.3 Inputs-Outputs.

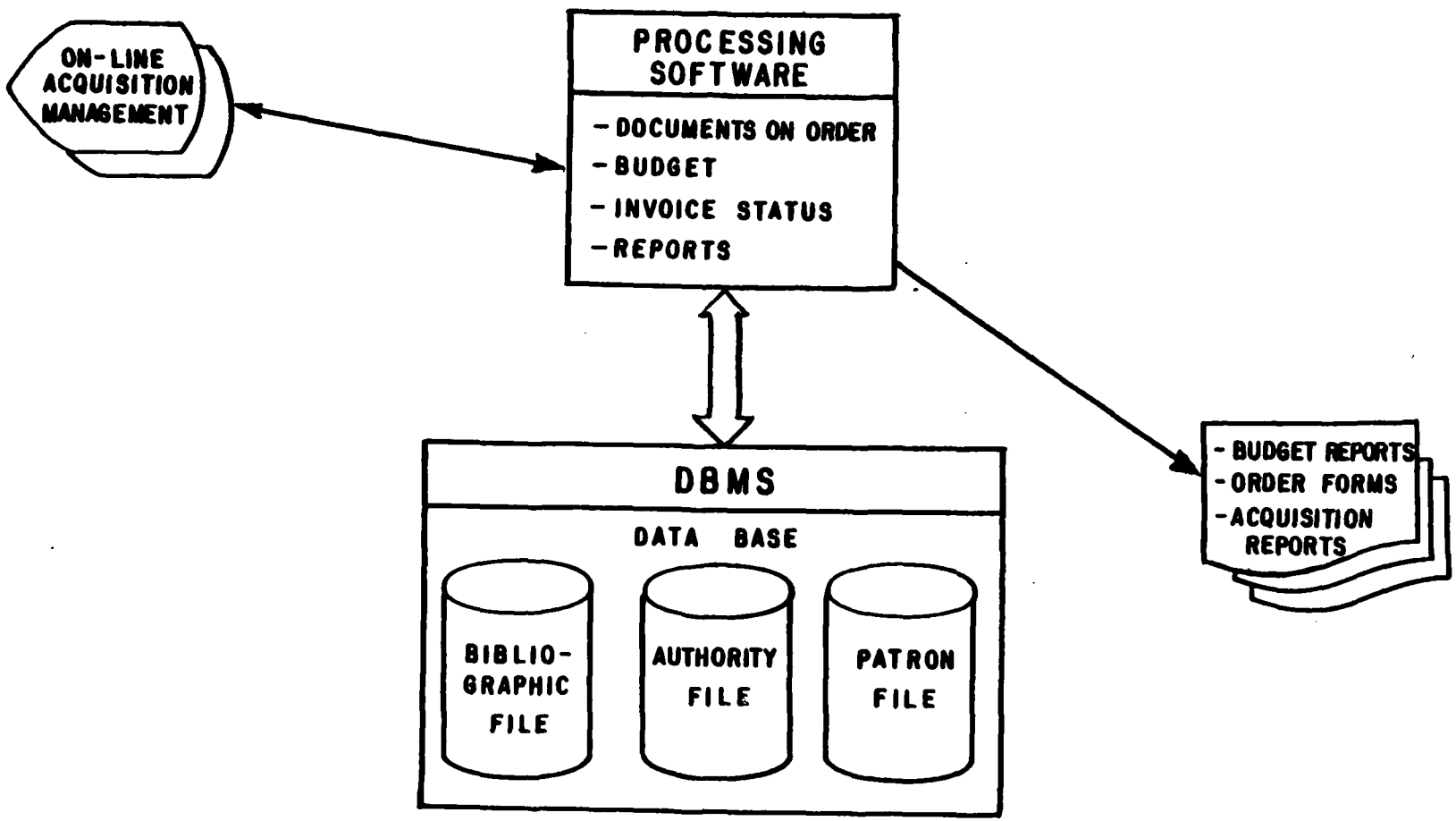
3.3.1 Inputs.

Several classes of input data have been identified as follows:

- Descriptive Bibliographic Information--information about each library holding: such as title, author, publication data, as provided on the holding itself or as extracted from a SBIN record.
- Patron Information--information about each person authorized to check out holdings such as name, mailing address, telephone number, security clearance.
- Subject Categories and Controlled Vocabulary--a list of all subject headings and authorized vocabulary terms used to categorize holdings.
- Circulation Information--information about the current status of a holding, including its due date (if checked out).
- Individual Library Files--files which are unique to a particular library, such as the Nuclear Test Personnel File at the DNA. Each LAM site will determine its own unique file requirements.

The test site data base will include data elements from the DTIC TR data base as well as DNA technical library data elements which do not duplicate those from DTIC. Inclusion of the DTIC elements will enable LAM sites to transmit SBIN data to DTIC without manual entry of data. Individual data elements considered for inclusion in the test site data base are presented in Appendix A, "Preliminary Data Element List for the LAM Data Base."

FIGURE 3-5. LAM ACQUISITION MANAGEMENT FUNCTION



The initial submission and entering of data into the data base will occur in two phases:

- Loading of Machine-readable Data.--These data will be extracted from existing automated library system files, converted to LAM format, entered into the LAM, and verified.

- Loading of Hard-copy Data--When the first phase is complete, the data base will be augmented by data which currently exists only in hard-copy. This data will be keyed into machine-readable form by each LAM site.

The preparation of input batches can begin when final record layouts, tape and disk characteristics, and telecommunications protocols have been defined. These requirements are dependent upon the final choice of a hardware/software environment for the LAM.

When the initial data are loaded, routine LAM inputs of new or revised data can be done at a CRT terminal using screen formats in either an on-line or batch mode.

3.3.2 Outputs.

The LAM data base will produce the following classes of outputs:

- Reports--designed to generate statistical summaries, indexes and shelf lists. Although reports will normally be generated on a predetermined schedule, a report can be run at any time. Sample report formats and contents are shown in Appendix B. Additionally, hard-copy abstracts and indexes may be produced.

- Signature Cards/accountability Records--the LAM will produce signature cards required for checkout of classified materials. A sample signature card is shown in Appendix C.

- Screen Displays--designed to display bibliographic data retrieved from DTIC and the LAM data base. The data displayed will be retrieved by ad hoc requests using the on-line query capability or previously defined and stored statements requesting specific data sets. Sample screen displays are shown in Appendix D.

- SBIN Records to DTIC--LAM terminals will be used to transmit SBIN input from local library files to DTIC. After all required SBIN data elements have been entered into a LAM record, the system will provide capabilities for modifying the data prior to submission to DTIC.

Each of the outputs will be designed such that library personnel can generate their own reports without the assistance of data processing personnel. Assistance from applications programmers will be required if significant changes are requested after system implementation.

3.4 Data Characteristics.

Data elements proposed for storage in the LAM data base are presented in Appendix A, "Preliminary Data Element List for the LAM Data Base." The elements selected reflect the capabilities proposed in Section 2.4 of this FD. The final list of elements along with characteristics and descriptors will be included in the next deliverable for this project--the System Specification.

The LAM test site implementation will require a central processing unit with two megabytes of main memory and approximately 200 million characters of disk storage. For an explanation of the external storage estimate, see Table 3-1. The equipment environment needed for data storage is described in Section 4.1. It is estimated that the data base will increase at a rate of five percent per year, on the basis of the growth of the library's collection and other nonbibliographic files maintained by the library staff.

3.5 Failure Contingencies.

The procedures for responding to failures or potential failures are described in the ensuing paragraphs.

3.5.1 Backup.

To minimize the amount of time lost due to damage of, or errors in, the data base and its associated software (e.g., program libraries, directories, tables), sets of back-up files will be created and maintained. These files will be created according to the schedules outlined in the following paragraphs.

TABLE 3-1. ESTIMATE OF EXTERNAL STORAGE REQUIRED FOR LAM AT TEST SITE

Catalog File		
150,000 records x 800 characters/record	=	120 million characters
Utilities	=	6 million characters
Authority File		
100,000 records x 50 chracters/record	=	5 million characters
Patron File		
1,000 records x 250 characters/record	<	1 million characters
Sub-Total		132 million characters
Overhead (Approx. 1/3 of Sub-total)		44 million characters
TOTAL		176 million characters

NOTE: The above figures for required storage could be reduced by suppression of null values in each file.

3.5.1.1 Data Base Backup.

A copy of the data base will be produced when the data base is declared operational. A back-up copy of the data base will be made after every major catalog update, but not less than once a week. The library manager will be responsible for notifying the system operator whenever a major catalog update is planned. Specific procedures relating to how many versions will be kept, where the back-up versions will be archived, purge dates, and documentation (audit trail) of the contents of each version will be decided by the library manager and the system operator. All backups of the data base should be created with password protection to ensure that the proper access with read-only permission is granted. The back-up software and its job control language should be stored using a password-controlled catalog procedure to ensure integrity and security.

3.5.1.2 Data Base Management System Software Backup.

A copy of the software (source statements, executable modules) and associated job control language used to process data, produce standard reports, and support the teleprocessing interfaces will be created when the software is declared operational, with additional copies made as enhancements are implemented. All failure contingencies discussed concerning data base backup apply to the DBMS software.

3.5.2 Fallback.

If access to the local catalog is lost (either through hardware failure, software processing interruption, or local network failure), temporary reference services will be provided using hard-copy shelf lists. These should be prepared after each major catalog update or at least once a week in the absence of a major update. Cataloging operations may be temporarily suspended until the system is operational. If a prolonged suspension of operations is anticipated and a significant cataloging work load remains, bibliographic data developed during cataloging may be recorded on specially formatted coding sheets. These coding sheets would then be used as source documents for entering catalog data from the library terminal upon restoration of system operations. Similarly, checking in and checking out holdings would be recorded on specially formatted coding sheets for key board entry upon resumption of system operations. Verifications of patron need-to-know and security clearances would have to be performed using hard-copy reports produced from the patron file periodically or from records (files) maintained by the installation or agency security officer.

In the event of an external teleprocessing failure, all information that is scheduled to be transmitted (i.e., to DTIC) via the teleprocessing subsystem will be stored in temporary files in the LAM until the ability to transmit has been restored.

3.5.3 Restart.

In the event an update program terminates because of a program or system failure, the system will possess the capability of restarting execution of the batch update at the latest checkpoint. The data base restoration procedure will be executed when the system operator determines that a program or system failure can be classified as an intermittent failure. In an intermittent failure, the data base contents remain intact and the data base is readable. The system operator will restart using the version of the data base that was being used at the time of the failure and reapply all transactions to the data base. This action will be initiated as soon as possible after error detection in order to restore the use of the system to all LAM users.

SECTION 4. ENVIRONMENT

4.1 Equipment Environment.

This section describes the equipment environment for the LAM test site and for use in developing preliminary hardware acquisition or utilization plans for other SBIN libraries. Specific equipment characteristics are provided for test site implementation and are based on the processing requirements and library characteristics of the test site--the DNA. Specific equipment requirements and characteristics for other implementation sites must be established in conjunction with implementation planning and site-specific requirements determination. The type of equipment needed to implement the LAM and the system functions supported by each type of equipment are described as follows:

- A central processor (computer) capable of performing designated operations on datum as prescribed by LAM functions. A central processor is required for all libraries; size and brand name are the only variables.

- A disk controller with magnetic disk(s) drives capable of dictating where, how, and which disk pack(s) will contain the data. Data base, authority, patron, and system files will be stored on these magnetic media. Magnetic disk may be used for system restoration.

- A magnetic tape controller and tape drive capable of accepting data on magnetic tape from external sources (e.g., commercial cataloging services) and creating a journal tape that would be used in restarting the system in the event of a system failure.

- A line printer and controller capable of producing standard system and ad hoc reports, or listings of data that are needed in a hard-copy form (e.g., computer paper, preprinted form).

- An alphanumeric display terminal consisting of a cathode-ray tube (CRT), keyboard, and hardware capable of sending and receiving data to and from a computer. Terminals in the cataloging and referencing sections will require off-line printers to capture retrieved and transmitted data.

- A computer output microfilm (COM) device capable of accessing computer-based information and producing output reports or listings of data on microfilm/fiche.

- A local communications network capable of transmitting and receiving classified data which links the local user terminals and printers with the local processor. Included as part of the network are encryption devices (if required), modems, communications controllers/multiplexer, and shielded transmission cable (if required). Encryption devices--which transform data making it unintelligible to all but the intended receiver--are required for transmitting and receiving classified data.

- An external network for transmitting and receiving classified data which links the LAM to the DTIC TR data base and, if required, other "branch" libraries or remote users.

The following equipment requirements and characteristics are recommended for DNA test site implementation:

- A local communications network capable of transmitting and receiving classified data which links the remote library terminals and printers with the host DNA processor. Included as part of the network are encryption devices, modems, communications controllers in the library and the computer site, a multiplexer servicing five terminals and printers in the library, and shielded transmission cable. The line rate for the local network should be at least 4800 baud. The communications protocol capabilities of the remote devices must be compatible with the protocol supported by the host processor.

- An external network consisting of the existing line connecting DNA and DTIC (DROLS/RTIS) and the existing modem and encryption device installed at DNA.

- A central processor with a word size of at least 16 bits, no less than one megabyte of real memory, an operator console, an input/output control unit and input/output channels adequate to service the input/output devices described herein, and a data communications processor able to support telecommunications access by five users simultaneously.

- A disk controller with two disk drives. On-line disk storage capacity available for LAM files must total at least 200 million characters.

- A magnetic tape controller and a 9-track tape drive able to read and record at densities of 1600 bpi.

- A line printer and controller capable of producing 132-column output at a rate of at least 300 lines/minute.

- Five alphanumeric display terminals that will transmit data generated from their own keyboards, as well as display data from a host or remote computer system. These terminals must provide the user with a visual, cathode-ray tube (CRT) means of data communications.

4.2 Support Software Environment.

Selection of specific software packages for implementing the LAM will be accomplished after development of the System Specification. However, general software characteristics based on test site processing requirements have been established and are presented in the following paragraphs. These characteristics are provided as guidance for implementation planning, development of the System Specification, and software selection, modification, and testing.

4.2.1 Operating System Requirements.

The operating system must allow "simultaneous" access to the computer system by multiple LAM users. This requirement will probably be met by an operating system that provides a timesharing capability. The system must have telecommunications software to support input and output operations performed by remote users. It must include disk-file access methods and file-maintenance procedures (such as file cataloging and backup). The system must provide utilities such as a sort/merge package, a procedural language compiler, and a linkage editor and loader system for program development. Specific compiler requirements and disk access methods will be established based on the DBMS selected.

4.2.2 DBMS Requirements.

The DBMS selected will support multi-user, on-line access to the data base permitting keyed-field searches and retrieval. It will provide a report-writer package to accommodate the development and storage of recurring and ad hoc reports. The DBMS will provide facilities for validation checking of input data and for batch and real-time updating of the data base. It must support a central computer language interface so that procedural language programs can be used to retrieve data from the LAM data base. The DBMS should

either incorporate software with COM and data dictionary capabilities, or allow data from the LAM data base to be passed to separate, compatible software packages with these features.

4.2.3 Data Dictionary.

To reduce the effort required for expanding catalog records and modifying existing data elements, data dictionary capabilities will be incorporated into the LAM. The "data dictionary" will, in conjunction with or as a part of the DBMS, provide capabilities for performing global data element restructuring, data base restructuring, data element documentation and definition. The data dictionary will aid application program interface and aid control of data element access by application programs and DBMS queries.

4.2.4 Protocol and Syntax Conversion.

To permit single terminal access to both the local files and the DTIC TR data base, the LAM requires a protocol and syntax conversion capability. With this feature, users will use a single query language for accessing both the local files and the TR data base. The LAM will perform the conversions necessary to access and query the source specified by the user. Additionally, this capability will be used to convert data downloaded from the TR data base to be compatible with the format and structure required by the local system.

4.3 Interfaces.

The principal interface of the LAM will be between the DTIC TR data base and the local library, using communications lines capable of transferring classified data. Data will be exchanged using DROLS/RTIS formats specified by DTIC. By using protocol translation capabilities, data will be exchanged directly from computer to computer. LAM users will provide to the TR data base bibliographic data for use by other SBIN members with access to the TR data base. DTIC will provide biliographic data contained in the TR data base

to the local library for use in local cataloging and patron referencing. As required, libraries may subscribe to other governmental and commercial cataloging services. Input from these sources is provided on machine-readable magnetic media adhering to existing formats (e.g., OCLC, Incorporated; Machine Readable Cataloging--MARC). Other SBIN members with remote or "branch" libraries and users should plan on expanding the system interfaces to include these sites when cost-effective, telecommunications links may be established to share LAM resources with branch libraries. Alternatively, cataloging and referencing by branches may be accomplished locally using less costly, less capable systems, with periodic exchanges of information with the main library accomplished using magnetic disks or hard-copy shelf lists.

4.4 Security and Privacy.

The DNA LAM catalog may store data up to a SECRET level of classification. This includes all of DNA's catalog. None of the application or DBMS software associated with operation of the LAM will be classified. However, access to the patron file will be restricted to the reference librarian, the circulation manager, and the installation/facility security officer. The highest classification level for data exchanged between the DTIC TR data base and the local system will be SECRET. Abstracts and indexes produced by the system in response to a patron query may be classified SECRET. These outputs may take the form of terminal screen displays or hardcopy print-outs. When classified titles and descriptors are used in the catalog, any title or subject term shelf list produced from the catalog must be classified to at least the same level. The patron file may contain data subject to privacy restrictions. Access to this file is restricted to the individuals identified in Section 4 for use in establishing and verifying need-to-know and security clearances in conjunction checking-out holdings.

4.4.1 System Security.

The specific computer-system security requirements for the LAM are as follows:

- Access--the system must limit access to authorized users by requiring user name and a password.

- Password--the system must restrict authority for the assignment of user passwords to the LAM data base administrator.

- Software Protection--the system must protect system software from unauthorized alterations.

- Unauthorized Try--the system must allow "n" attempts of access to the system. After "n" attempts, access is denied and the system manager is notified ("n" attempts will be dynamic and will be determined by the system manager).

4.4.2 Program Security.

The following security measures are applicable to the application programs of the LAM:

- Unauthorized Use--the system must contain a list of authorized users for each program and limit the use of specific programs to authorized users or categories of users.

- Program Modification--the system must provide users with a means of assigning passwords to their programs and must limit access to these programs to library, agency, DoD, Service, and other designated LAM users.

4.4.3 Data Security.

Data in the LAM data base will be protected in the following manner:

- Unauthorized Access--the system must have the capacity to maintain a list of authorized users for each data element and limit the access to specific data elements to authorized users or categories of users.

- Access Type--the system must allow the data base administrator (DBA) or a file creator to designate read only, write only, or modify (read/write) access to individual data elements.

- Unauthorized Try--the system must allow "n" attempts of access to the data base. After "n" attempts, access is denied and the system manager is notified (the number of attempts shall be determined by the system manager).

4.4.4 Communications Security.

In the DTIC/SBIN and LAM network communications, security will be focused in two major areas: access control and data protection. Access control involves protecting the mechanisms and environment that contain the data communications facility from unauthorized entry and use. Badges, guards, and personal recognition are used to limit access. Password protection will be used as an aid to protecting data. Local standards governing the issuance and protection of passwords will be followed. Additional protection can be added to the traditional rules governing password protection. For example, the additional protection should be achieved by actually encrypting the password.

Protecting data transmitted over communication networks is made difficult because data are transparent. Protecting data while on a communications path is accomplished by encryption. Encryption provides data security in that it prevents browsing, but it cannot protect against sophisticated electronic techniques. Encryption devices and information can be obtained through DoD, DTIC, Service, or agency security representatives.

SECTION 5. COST FACTORS

This section contains a discussion of the system development and implementation factors contributing to or influencing the cost of the proposed system. As test site implementation progresses, operating and software costs may be revised as a result of hands-on experience with the system. Some of the cost factors pertain solely to test site implementation. Development of the LAM software for the test site will result in reduced costs of implementation for subsequent sites.

5.1 Test Site Implementation.

Test site implementation will be jointly funded by the system sponsor-DTIC--and the test site agency--the DNA. Test site implementation includes development of system and program specifications, application and data base management system software modification and implementation, and system testing and documentation. It is estimated that these portions of test site implementation will cost approximately $220,000 and will be performed under contract by the system developer. Roughly half of this cost is associated with completing the system and software design and specifications.

5.1.1 Software Procurement and Modification.

As indicated above, LAM applications and DBMS software will be modified and implemented by the system developer. Acquisition of the selected applications and data base software will be the responsibility of the system sponsor and the test site installation. The system sponsor will provide software acquisition support to the test site installation only. System

utilities and compilers external to the applications and DBMS software will be implemented by the test site ADP organization. Conversion of files (manual and automated) intended for use within the LAM or intended to exchange data with the LAM is the responsibility of the test site ADP organization. Implementation of teleprocessing software for supporting locally generated queries of the DTIC TR data will be the responbibility of the system developer. Acquisition of this software will be the responsibility of the system sponsor and the test site installation.

5.1.2 Equipment Procurement and Installation.

Test site implementation will be done on a computer provided by DNA and will make use of existing DROLS communications lines and encryption equipment. Installation of a classified processing communications network will be necessary, tying the computer to the remote terminals located in the library. A minimum of five remote terminals and two medium-speed printers will be required in the library--one terminal each for descriptive cataloging, subjective cataloging, circulation management, referencing, and remote (DTIC) cataloging. Additional terminals may be added to permit patron referencing if that capability is selected. It is estimated that the LAM will require 200 million bytes of on-line (magnetic disk) storage for the the local catalog, associated files, and DBMS tables. This estimate provides for five percent growth per year in the size of the local catalog over a five-year operating cycle for the system.

5.1.3 Other Implementation Costs.

The test site library will be responsible for establishing the local catalog prior to system operation. On the basis of the performance parameters provided in Section 2.4.2.5, it is estimated that 2500 man-hours would be required to create the initial catalog from existing hard-copy shelf lists.

Automated conversion of the existing ATLAS file will significantly reduce this estimate. Converting the ATLAS file will require approximately 60 to 80 man-hours and will reduce the effort for creating the initial catalog to the entry of subject terms and other data elements not currently found in the ATLAS file. This alternative will require approximately 1200 man-hours. Conversion of the Circulation Automated Program (CAP) files, the Nuclear Test Personnel Review (NTPR) files, and the inactive holdings ATLAS file will take approximately 60 to 80 man-hours each and will provide data essential for start-up of the LAM.

In planning for system implementation, consideration must be given site preparation, especially within the library. The following items should be addressed when planning for system implementation:

- Sufficient space must be available along with appropriate furniture within the library to install and operate terminals and prints (this includes work areas and storage facilities for people operating the terminals).
- The environment (temperature, relative humidity, and dust content) must be controlled within operating specifications of the equipment and to insure operator comfort.
- Provisions for controlling static electricity must be implemented to prevent interference with equipment operation.
- Sufficient three-conductor shielded circuits (15 - 20amp) must be available within the library to provide power to each terminal and printer.

5.1.4 Operations Cost Factors.

Operation of the system will add to the work load of the DNA data processing staff. Periodically, an operator will be required to perform scheduled data base updates and prepare back-up copies of system files. In the event of system failure resulting in a loss of data or software, an operator will be required to execute restart/restore procedures. We estimate two-operator hours per week will be needed. Hardware maintenance will

increase slightly with the addition of the remote terminals and accompanying local network. We estimate between one and five hours per month for this maintenance. Services of a system or application programmer will be required to perform updates of vendor-provided software used within the LAM. This should rarely occur and would average 30 hours per year. In estimating peripheral (disk) storage requirements for the local catalog and associated files, a annual growth factor of five percent has been applied. Miscellaneous computer supplies will be required to support operation of the system: printer paper and ribbons for printers located in the library, magnetic disk packs used for software back-up and restart, and magnetic tape reels for data base archiving and back-up. This should add approximately five to ten percent to the current cost of computer supplies.

5.2 Preliminary Factors for Other Implementation Sites.

5.2.1 Equipment Factors.

If an existing computer is available which meets the operating specifications required for the LAM, libraries should plan implementation on the processor. However, the computer must be capable of providing the access and responsiveness needed to support interactive LAM operation characteristic of the library operating environment.

If existing computers are inadequate for the LAM implementation, the local library in conjunction with the supporting data processing installation will need to acquire, install, and make provisions for the operation of another computer. Acquiring the computer and required peripherals may take from 6 to 24 months, depending on organizational practices and procedures for ADP equipment procurement. If suitable equipment has to be purchased, local libraries will need to acquire: a processor and associated operator and control equipment, magnetic disk storage systems and controllers/interfaces,

and local telecommunications equipment capable of handling classified data. In the event the system will be used to process classified data, a secure, TEMPEST-certified facility will be needed to house the system. Preferably, this secure facility will be located within the library, reducing the cost and complexity of the local communications network. If not currently installed, a dedicated, secure communications line will be needed for cataloging and referencing classified data using the DTIC TR data base. Currently, it takes approximately 20 to 24 months to obtain the encryption devices needed for implementing remote classified processing capabilities. This should be taken into consideration when planning for a classified processing capability for the LAM.

As previously indicated, disk storage requirements for the system will depend on the size of the catalog and associated files maintained by the library. Similarly, the number of communications parts needed on the host processor will depend somewhat on the number of terminals operated within the library. On the basis of implementing the LAM on a library-based minicomputer with four to eight terminals and 100 to 150 million characters of disk storge (roughly corresponding to 50,000 holdings), it is estimated that equipment procurement costs will be $170,000 to $220,000. Software costs are not included in this estimate, nor are costs for software adaptation and system maintenance. Evolving technology related to commercial implementation of so-called "super microcomputers" could within 12 to 16 months, produce a system costing about $50,000 capable of supporting LAM operation. These systems appear capable of supporting 8 to 16 remote terminals and, using Winchester disks, providing up to 300 megabytes of on-line magnetic disk storage.

5.2.2 Software Factors.

The software developed or adapted for the test site will provide a basis for adapting software for subsequent implementation sites. It can not be directly transportable. The interdependence of off-the-shelf software and hardware adds to the complexity in implementing subsequent LAMs. In selecting the LAM software, particular consideration is being given to packages which can be implemented, with minimum adaptation and modification, on two to three brands of hardware. Consideration will be given to the adaptability of the software products selected for test site implementation to less expensive models of existing minicomputers and advanced micro processor-based computers. This is considered essential to meet the needs of smaller libraries and libraries with remotely-located "branches."

5.2.3 Schedules.

In planning for system implementation, provision must be made for acquiring and/or adapting software for the local system. To begin implementation planning, each library should sponsor or conduct a study to establish the methods, schedule, and associated costs for implementing its LAM modules. This Functional Description and other documentation developed for test site implementation should be used as a point of departure for future implementations. Doing so will reduce the front-end costs associated with system design and will potentially reduce implementation time.

Along with acquiring the software needed to implement LAM applications within the library, implementation planning must identify the compilers and system utilities required to implement the applications software. This software will generally be hardware-specific and may be available from either the hardware vendor or from a third-party software developer.

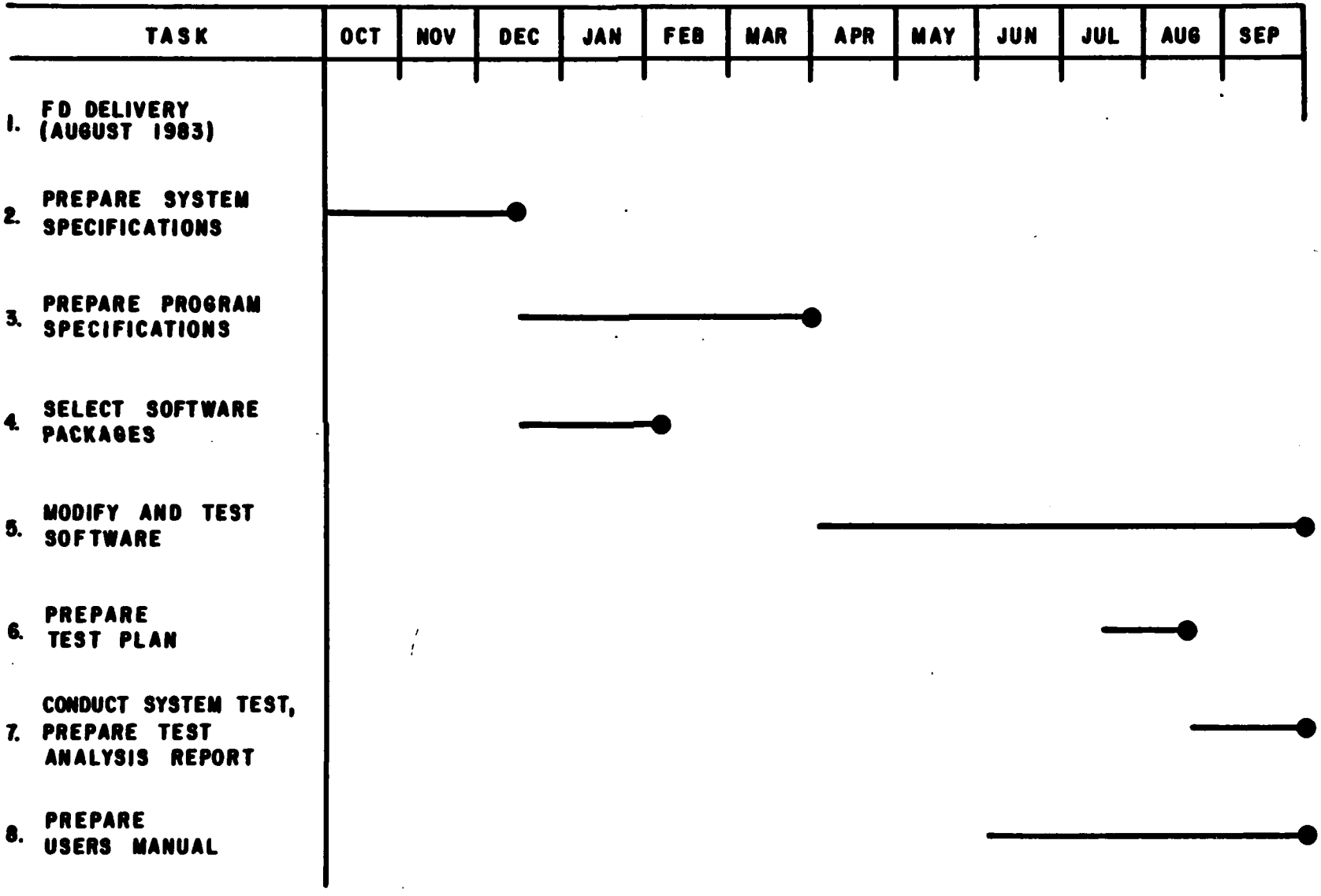
SECTION 6. SYSTEM DEVELOPMENT PLAN

The capabilities specified for the LAM in paragraph 2.4 of the Functional Description are generally applicable to all SBIN members and other DoD technical libraries. While these libraries may choose to independently pursue the development and implementation of enhanced automated precessing capabilities, each library doing so would incur the risks and costs associated with any large, complex system development. The Defense Technical Information Center, acting as the focal point for bibliographic resource sharing initiatives developed by SBIN members, has undertaken the design, development and testing of a library system reflecting DoD technical library needs. This system, referred to as the Local Automation Model (LAM), will serve as a test bed for establishing the feasibility of implementing a fully integrated library system on a locally-based computer capable of supporting the unique requirements of DoD technical libraries.

6.1 Test Site Development Schedule.

Figure 6-1 depicts the development schedule for the test site implementation. Beginning on 1 October 1983, the design details for the test site system will be developed and documented. This design step will result in publication of the System Specification for the LAM. On the basis of the System Specification, the applications needed to implement the LAM will be specified and documented in the Program Specification. Currently available, library-oriented software packages will be identified and compared with the applications in the System Specification and the Program Specification. A software package will be selected and modified, as required, adapting the package for implementation at the test site. Protocol and syntax conversion

FIGURE 6-1. FY 1984 LAM DEVELOPMENT SCHEDULE TEST SITE IMPLEMENTATION



software will be adapted for the test site system. Using the report generation capabilities of the selected software package, recurring reports identified in the Functional Description and the System Specification will be developed and cataloged on the host computer. Testing of the package will be conducted and documented during August and September 1984. Concurrently, a User Manual will be prepared for the library staff.

6.2 System Documentation.

During FY84, the following system documentation will be published:

- System Specification. Scheduled for delivery on 15 December 1983, the System Specification will contain further detail on the proposed system design, concentrating on methods for implementing the procedures detailed in this Functional Description. Additional details on data characteristics will be provided. These details will form the basis for selecting the software for test site implementation.

- Program Specification. Details on the processing steps and data flows within and between the application programs designed for the LAM will be published in the Program Specification, scheduled for delivery on 31 March 1984.

- Test Plan and Test Analysis Report. These documents detail the steps and methods for testing the system and document the results of system tests in terms of the procedures contained in this Functional Description and the applications published in the Program Specification.

- User Manual. Use of this reference document will enable the library staff to run the applications developed and tested for the LAM. Written in terms familiar to the library staff rather than computer operators or programmers, the User Manual serves as a basis for training users on operation of the LAM. This document will be delivered at the conclusion of system implementation and testing.

6.3 Participating Organizations.

DTIC is the system sponsor, providing funding and technical guidance for development of the LAM. DTIC serves as the focal point for reviewing and approving system design and requirements documents. DNA is the test site and will provide supplemental funding, the LAM computer, and related equipment and

software (exclusive of applications and syntax converter adaptation) for implementing, testing, and operating the LAM. The Logistics Management Institute is the system developer, responsible for system design and software adaptation. Other SBIN member libraries will participate in the review of system requirements and design documents, providing comments and recommendations to the system sponsor and developer.

APPENDIX A

PRELIMINARY DATA ELEMENT LIST FOR THE LAM DATA BASE

The data elements tentatively identified for inclusion in the LAM data base at DNA are listed in this appendix. Table A-1 lists all elements from the DTIC Technical Reports Data Base and Table A-2 combines all elements from the current automated and manual library files at DNA. These lists are intended to serve as a working tool for the DNA library and ADP staffs and the system design team, and are not intended as a final list. In the next phase of the project, the two lists will be merged into a single list and a definition of each element will be provided.

TABLE A-1. DATA ELEMENTS FROM THE DTIC TECHNICAL REPORTS DATA BASE

TR Data Field	Element Name
1	Accession Number
1A	Technical Report Processing Category
2	Subject Fields and Groups
3	Entry Classification or Catalog Card Classification
4	NTIS Price
5	Corporate Author
6	Unclassified Title
7	Classified Title
8	Title Classification
9	Descriptive Note
10	Personal Author
11	Report Data (Excluding Field 11A)
11a	Reclassification Date
12	Pagination
13	(Not used)
14	Source Series/Report Number
15	Contract (or Grant) Number
16	RDT&E Project Number
17	RDT&E Task Number
18	Monitor Acronym (of Monitor Series)
19	Monitor Series (excluding acronym)
20	Report Classification
21	Supplementary Note
22	Limitations (Alpha)/Distribution-Availability Statements also, Distribution Control Application Date
23/33	Specific Application: SBIN Distribution/Availability Statement
23	Posting Terms/Descriptors
24	Descriptor Classification
25	Army Project Serial Number also, Candidate Posting Terms/Identifiers Candidate Posting Terms/Open-ended Terms Organization Originate Project Number (Local Project Number) Program Element Number
25	RDT&E Work Unit Number
26	Identifiers and Open-Ended Terms Classification
27	Abstract
28	Abstract Classification
29	Initial Inventory/Inventory
30	Annotation/Index Annotation
31	Special Codes
32	Regrade Category/Reclassification Code
33	Limitation Availability Codes/Distribution Availability Codes
34	Serial Number/Source Series
35	Source Code
36	Document Location

37	Classification Authority/Classified By
38	Declassification Date/Declassify On
39	Downgrading Date/Confidential on
40	Geopolitical Code
41	Type Code
42	IAC Report Number
43	IAC Document Type and Location Code
44	IAC Subject Terms
45	Extended by
46	Review on
47	Reason Code(s)
48	Remote Terminal (SBIN) Site Holdings Symbol

TABLE A-2. DATA ELEMENTS FROM THE DNA TECHNICAL LIBRARY FILES

Fld. No.	Source File*	Element Name
1	1234 678	DTL Number (Reports)/Call Number (Books)
2	1234 8	Status
3	1 67	Date Coded (Date input into system)
4	1 34 8	Primary Report Number
5	1 4 8	Secondary Report Number
6	1 4	DTIC Accession Number
7	1	MIPR Number
8	1234 67	Originating Date (Date of document/date of publication)
9	1234 6 8	Originating Agency (Corporate author or publisher)
10	1	Security Control Number
11	1 4	Handling/classification (Includes following 5 fields)
12	1 4	Critical Nuclear Weapons Design Information
13	1 4	Handling (Public distribution or limited distribution)
14	1 4	Restricted data/formerly restricted data
15	1234	Classification
16	1 4	Downgrading Code
17	1 4 678	Page/leaf Count
18	1 8	Contract Number
19	1	Weeds (Includes following 3 fields)
20	1	Category (DNA, DNA sponsored/funded, or other)
21	1	Retention Cycle (Time period to retain document)
22	1	Office Symbol
23	1 67	Scope notes (includes series name/number for books)
24	1 8	Subtask number
25	123 678	Copy number
26	1	Copy deletion date
27	1	Microfiche copy number
28	1	Microfiche copy deletion date
29	1 3 6	Personal Author
30	1234 678	Title
31	1	Deletion message (includes certified destruction info.)
32	1	Record Classification
33	1	File maintenance
34	23	Name of patron
35	23	Agency of patron
36	23	Circulation date
37	23	Due date
38	23	Return date
39	4	Operation Name (in which test was performed)
40	4	Intelligence/Security Classification Management
41	4	Processing Date (Date available at NTIS)
42	4	Processing Status (In-process, determined to be releaseable, or releaseable)
43	67	Accession Number
44	678	Place of Publication

* Index to Source Files on the following page.

45	67	Volume Number
46	67	Issue Number
47	7	Subscriber (Primary Requesting Office)
48	7	Names of Recipients
49	78	Frequency
50	8	Subject Headings

Key to Source Files

1 = Automated Technical Library Accession System (ATLAS)
2 = Circulation Automated Program (CAP)
3 = Atlas System (Inactive records)
4 = Nuclear Test Personnel Report File (ATLAS-NTPR/TRLR-REC)
6 = Book Catalog
7 = Serials Catalog
8 = Subject Heading Catalog

NOTE: Files 1 thru 4 are automated files.
Files 6 thru 8 are manual files.

APPENDIX B

OUTPUT REPORT FORMATS

This appendix contains sample formats for reports which are planned for the LAM. These reports have been developed after extensive discussion with SBIN librarians, especially at the prototype site, and analysis of their information requirements. The formats are still preliminary in nature and subject to revision in subsequent phases of this project.

The categories of report types included in this appendix are as follows:

- Monthly Statistical Report, page B-2
- Monthly Downgrade Report, page B-5
- Report/Document Number Index, page B-8
- Subject Heading Index, page B-11
- Certified Destruction Report, page B-13

Report Title: Monthly Statistical Report

Purpose of Report: To tabulate library statistics for major library functions

Sequencing of Information: This report will be sequenced by library function

Heading: Includes security classification of the report, name of the LAM agency library and name of report

Body of the Report:

a. Within major library functions, statistics are generated for the current month, previous month and year to date (where applicable).

b. Statistics within each function (circulation, holdings, etc.) are tabulated by one or more characteristics, as follows:

- Circulation statistics reflect the number of holdings which have been checked out of the library, tabulated by: media of the holding, security classification of the holding, catagory of patron, and number of days elapsed since the document was checked out

- Holdings statistics reflect the number of documents in a library's collection, tabulated by media and security classification

- Acquisitions statistics refer to the number of documents which were recently procured by the library tabulated by media and security classification

- SBIN statistics refer to the number of records transmitted via the Shared Bibliographic Input Netwrok to DTIC

- Certified destruction statistics refer to the number of classified documents which were destroyed, tabulated by security classification of the document.

Sample Report: See Figure B-1

FIGURE B-1. SAMPLE MONTHLY STATISTICAL REPORT

PAGE: 1

CLASSIFICATION
HEADQUARTERS DEFENSE NUCLEAR AGENCY
TECHNICAL LIBRARY

MONTHLY STATISTICAL REPORT

CIRCULATION:	CURRENT MONTH	PREVIOUS MONTH	YEAR TO DATE
BY MEDIA			
REPORTS	9999	9999	99999
PERIODICALS			
BOOKS			
MICROFICHE			
MEMORANDA			
OTHER			
TOTAL	99999	99999	999999
BY CLASSIFICATION			
TOP SECRET	9999	9999	99999
SECRET			
CONFIDENTIAL			
UNCLASSIFIED			
TOTAL	99999	99999	999999
BY PATRON			
DNA STAFF	9999	9999	99999
DNA CONTRACTOR			
DNA-ALBEQUERQUE			
DNA-SANTA BARBARA			
OTHER			
TOTAL	99999	99999	999999
BY CALENDAR DAYS			
0-14 DAYS	9999	9999	99999
15-30 DAYS			
31-60 DAYS			
61-120 DAYS			
OVER 120 DAYS			
TOTAL	99999	99999	999999
HOLDINGS:			
BY MEDIA			
REPORTS	9999	9999	
PERIODICAL			
BOOKS			N/A
MICROFICHE			
MEMORANDA			
OTHER			
TOTAL	99999	99999	

CLASSIFICATION

FIGURE B-1. SAMPLE MONTHLY STATISTICAL REPORT (Continued)

MONTHLY STATISTICAL REPORT

HOLDINGS: (CONTINUED)	CURRENT MONTH	PREVIOUS MONTH	YEAR TO DATE
BY CLASSIFICATION			
TOP SECRET	9999	9999	99999
SECRET			
CONFIDENTIAL			
UNCLASSIFIED	99999	99999	999999
TOTAL			
ACQUISITIONS:			
BY MEDIA			
REPORTS	9999	9999	99999
PERIODICALS			
BOOKS			
MICROFICHE			
MEMORANDA			
OTHER			
TOTAL	99999	99999	999999
BY CLASSIFICATION			
TOP SECRET	9999	9999	99999
SECRET			
CONFIDENTIAL			
UNCLASSIFIED			
TOTAL	99999	99999	999999
SBIN:			
RECORDS TRAMSITTED TO:			
DTIC	9999	9999	99999
BRANCH LIBRARY			
OTHER SBIN LIBRARIES	9999	9999	99999
CERTIFIED DESTRUCTION:			
BY CLASSIFICATION			
TOP SECRET	9999	9999	99999
SECRET			
CONFIDENTIAL			
UNCLASSIFIED			
TOTAL	99999	99999	999999

CLASSIFICATION

Report Title: Monthly Downgrade Report

Purpose of Report: To identify documents scheduled for downgrading each month

Sequencing of Information: This report will be sequenced by security classification and, secondarily, by accession number

Heading: Includes security classification of the report, name of the LAM library, report title, date on which the report was generated, and page number

Body of the Report:

The body is divided into two parts:

a. Statistical summary:

- Current classification: Security classification of the library headings
- Previous month: The number of holdings, scheduled for downgrading in previous months, which were not downgraded
- Current month: The number of holdings scheduled for downgrading in the current month
- Next Month: The number of holdings scheduled for downgrading in the following month

b. Detailed listings; includes the following information on all holdings currently due for downgrading:

- Accession number: Call number assigned to a document, from the classification scheme used by an individual library in cataloging its holdings
- Status: Indicates whether a holding is currently on-hand or unavailable (checked out, being rebound, etc)
- Title: The name of the document, including the subtitle and alternate where cited
- Copy number: Number assigned to multi-copy holdings to uniquely identify each copy

- **Downgrade classification:** Security classification to which a holding is scheduled to be re-classified

- **Downgrade date:** Date on which a holding is scheduled to be re-classified.

Sample Report: See Figure B-2

FIGURE B-2. SAMPLE MONTHLY DOWNGRADE REPORT

CLASSIFICATION

HEADQUARTERS DEFENSE NUCLEAR AGENCY

TECHNICAL LIBRARY

MONTHLY DOWNGRADE REPORT

AS OF: XXXXXX PAGE: 99

NUMBER OF HOLDINGS TO BE DOWNGRADED

CURRENT CLASSIFICATION	PREVIOUS MONTHS	CURRENT MONTH	NEXT MONTH
TOP SECRET	999	999	999
SECRET	999	999	999
CONFIDENTIAL	999	999	999
TOTAL	9999	9999	9999

CONFIDENTIAL HOLDINGS TO BE DOWNGRADED THIS MONTH
(INCLUDING HOLDINGS NOT DOWNGRADED IN PREVIOUS MONTHS)*

ACCESSION NUMBER	STATUS	TITLE	COPY NO	DOWNGRADE CLASSIFICATION	DOWNGRADE DATE
99999	X	XXXXXXXXXXX	999	XXXXXX	XXXXXX
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.

*NOTE: THIS REPORT WILL BE SORTED BY ALL SECURITY CLASSIFICATIONS WITHIN A LIBRARY'S COLLECTION (i.e., TOP SECRET, SECRET, CONFIDENTIAL, ETC.)

Report Title: Report/Document Number Index

Purpose of Report: To provide a hard copy or COM reference document to be used in place of the on-line reference subsystem in the event of a system failure.

Sequencing of Information: This report will be sequenced by report/ document number. Information about each report/document will be presented on a single page.

Heading: Includes security classification of the report, name of the LAM library, report title, date on which report was generated, and page number.

Body of Report:

a. Call number: The number assigned to a document from the classification scheme used by an individual library in cataloging its holdings.

b. Report number (or source series): The number assigned to a document by the organization, whether government, military or contractor, which performed the research recorded in the report.

c. Title: The name of the document, including the subtitle and alternative title when cited.

d. Author:

- Personal author: The person credited with the preparation, writing or compiling of the content of the report

- Corporate author: The organization credited with the preparation, writing or composing of the content of the report

e. Document identification number

- DTIC accession number: A machine processing control number assigned uniquely to a technical report by DTIC

- Report number: Same as "B. Report Number" above

- MIPR number: Military Interdepartmental Purchase Request number

- Contract number: The contract, grant, or order funding that identifies the financial support of the research results recorded in the technical report

- Sub-task number: A component of a task representing a discrete unit of work performed by a single organization

- Monitor acronym: The acronym prefix and agency series number assigned to a technical report by the military

- Monitor series: Organization or government office monitoring or sponsoring the research in the report.

f. Security identification

- Document classification: Security classification of the document

- Document control number: Unique identification number assigned to a classified document by the security control point within an organization

- Citation classification: Security classification of the bibliographic record.

g. Document characteristics

- Media: Output format of the report (hard copy, microfiche, microfilm, etc)

- Report date: The date of publication of the document

- Volume and issue: For periodical publications, the numbers which uniquely identify a particular issue

- Weeds: Information used for reviewing and discarding unnecessary library holdings

- Pagination: Number of pages in the document

- Number of copies: Number of copies of the document in the library's catalog

- Copy numbers: Sequential numbering of documents for which a library has multiple copies.

NOTE:

Report indexes sequenced by the following fields can also be generated in this format:

- Monitor acronym/monitor series
- Subtask
- MIPR number
- Contract number
- Report title
- Personal author
- Corporate author.

Sample Report: See Figure B-3

FIGURE B-3. SAMPLE REPORT/DOCUMENT NUMBER INDEX

CLASSIFICATION

AS OF DATE: XXXXXX

HEADQUARTERS DEFENSE NUCLEAR AGENCY
TECHNICAL LIBRARY
REPORT NUMBER INDEX

PAGE: XXXXXXX

CALL NUMBER: DTL-XXXXXXX

REPORT NUMBER XXXXXX

Report Title: Subject Heading Index

Purpose of Report: To provide a hard-copy reference document in place of the on-line catalog in the event the system is not available.

Sequencing of Information: This report will be sequenced alphabetically by subject heading.

Heading: Includes security classification of the report, name of the LAM library, report title, date on which the report is generated

Body of the Report:

a. Subject heading: Any single word on phrases expressing the technical effort being reported.

b. Library accession number: A list of documents, identified and sorted by library accession number, which are cataloged under the given subject heading.

Sample Report: See Figure B-4

FIGURE B-4. SUBJECT HEADING INDEX

CLASSIFICATION

HEADQUARTERS DEFENSE NUCLEAR AGENCY

TECHNICAL LIBRARY

SUBJECT HEADING INDEX

AS OF DATE: MMDDYY PAGE: 999

SUBJECT HEADING: XXXXX XXX

DNA ACCESSION NO: DTL - 99,9999

DTL - 99,9999

DTL - 99,9999

DTL - 99,9999

SUBJECT HEADING: XXXXX XXXXX

DNA ACCESSION NO: DTL - 99,9999

DTL - 99,9999

DTL - 99,9999

DTL - 99,9999

Report Title: Certified Destruction Report

Purpose of Report: To document the destruction of a classified holding, in accordance with DoD security regulations

Sequencing of Information: Data contained in this report will be sequenced by DTL number

Heading: Consists of name of report

Body of the Report: The report consists of data describing the holding to be destroyed. All data appearing on the report is extracted directly from the automated record of the holding; no processing of the data is performed.

The data elements included in the report are:

DTL number: Identifier assigned to a document, using the numbering schema of the DNA Technical Library

Leaf count: Number of pages in the document

Copy series: For hard-copy holdings, number of the copy being destroyed

Microform: For microform holdings, number of the copy being destroyed

Date coded: Date that the document was originally entered into the system

DTIC AD number: Accession number assigned to the document by DTIC

MIPR number: Military Interdepartmental Purchase Request Number

Date of document: Data of document publication

Subtask number: DNA subtask under which the document was written

Scope notes: A phrase which indicates the class of document (for example, "Final", "Interim", and "Draft")

Classification: The security classification assigned to the document

Security control number: The number assigned to the holding by the DNA security Control point which originally received the document

Originating agency: Agency of organization which published the document

Author: Person credited with the preparation of the document

Contract number: DNA contract under which the document was written

Primary report number: Number assigned to the document by the military organization or government office sponsoring the research in the document

Secondary report number: Number assigned to the document by the organization performing the research

Deletion message: Information concerning destruction of the document and deletion of the document record from the data base

Document Title:

Signature blocks: Signature of the person who prepared the document for destruction and of the person who witnessed the destruction, as required by DoD security regulations.

Sample Report: See Figure B-5

FIGURE B-5. CERTIFIED DESTRUCTION REPORT

CERTIFIED DESTRUCTION REPORT

DTL NUMBER: _____ LEAF COUNT: _____

COPY SERIES 1:_____ 2:_____ 3:_____ 4:_____

MICROFORM 1:_____ 2:_____ 3:_____ 4:_____

DATE CODED: _____ DTIC AD NUMBER: _____ MIPR NUMBER:_____

DATE OF DOCUMENT: _____ SUBTASK NUMBER: _____

SCOPE NOTES: _____

CLASSIFICATION: _____ SECURITY CONTROL NO.:_____ WUDS:_____

ORIGINATING AGENCY: _____

AUTHOR: _____

CONTRACT NUMBER: _____ PRIMARY REPORT NO.:_____

DELETION MESSAGE: _____ SECONDARY REPORT NO: _____

DOCUMENT TITLE: _____

I have this date prepared the above listed documents for destruction, _____ pages.

Signature _____ Date _____

I have witnessed destruction of the above listed document.

Signature _____ Date _____

APPENDIX C

CLASSIFIED DOCUMENT ACCOUNTABILITY RECORD

When classified documents are checked out of a SBIN library, responsibility for the document passes from the library to the patron. To record this transfer of responsibility, as required by security regulations, an accountability record (or signature card) is signed by the patron and retained in the library files. The LAM will have the capability of producing signature cards on-line at the time a document is being checked out. A proposed format, based on DNA's current format, is shown on the following page.

FIGURE C-1. CLASSIFIED DOCUMENT ACCOUNTABILITY RECORD

CLASSIFIED DOCUMENT ACCOUNTABILITY RECORD

TO:

FROM: DIRECTOR
DEFENSE NUCLEAR AGENCY
ATTN: TITL
WASHINGTON, D.C. 20305

CONTROL NO: _____ CLASSIFICATION: _____ COPY NO: _____

TITLE: _____

ORIGINATING AGENCY: _____

DOCUMENT DATE: _____ DUE DATE: _____

CIRCULATION DATE: _____ TODAY'S DATE: _____

NAME OF PATRON: _____

PATRON'S TITLE OR GRADE: _____

PATRON'S MAILING ADDRESS: _____

_____

BY SIGNING, I ACKNOWLEDGE THAT I HAVE RECEIVED THE ABOVE MATERIAL AND THAT THE ABOVE INFORMATION IS ACCURATE.

PATRON'S SIGNATURE: _____

APPENDIX D

SCREEN FORMATS

This appendix contains sample screen formats to illustrate the levels of user interaction with the LAM. Figure D-1 depicts the novice level which is menu-driven and fully prompted. Figure D-2 illustrates the experienced level which uses briefer commands and requires the user to have prior knowledge of the system.

These screen formats are preliminary in nature and are presented to illustrate the levels of user interface. The actual screen format design and query language are dependent on the selection of LAM software and hardware.

FIGURE D-1. FORMATTED LAM SCREENS

WELCOME TO

DEFENSE NUCLEAR AGENCY

LIBRARY SYSTEM

CHOOSE THE FUNCTION YOU WISH TO PERFORM

1. REFERENCE/CATALOG SEARCH
2. CIRCULATION
3. CATALOGING
4. REPORTS (STATISTICS, INDEXES)
5. HELP

ENTER THE DESIRED NUMBER AND DEPRESS THE TRANSMIT (RETURN OR ENTER) KEY

1*

DEFENSE NUCLEAR AGENCY

REFERENCE SUBSYSTEM

SELECT THE DATA BASE YOU DESIRE TO SEARCH

1. DTIC
2. LOCAL (DNA)
3. BOTH

ENTER THE DESIRED NUMBER AND DEPRESS THE TRANSMIT (RETURN OR ENTER) KEY

3

*USER RESPONSES ARE UNDERLINED.

AD-A133 389 LOCAL AUTOMATION MODEL: FUNCTIONAL DESCRIPTION(U) 2/2
LOGISTICS MANAGEMENT INST WASHINGTON DC
W P HAMILTON ET AL. SEP 83 LMI-DL302 MDA903-81-C-0166
UNCLASSIFIED F/G 9/2 NL

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

FIGURE D-1. FORMATTED LAM SCREEN (CONTINUED)

SELECT THE TYPE OF SEARCH YOU WISH TO PERFORM

1. TITLE
2. AUTHOR
3. SUBJECT

ENTER THE DESIRED NUMBER AND DEPRESS TRANSMIT

2

DNA/DTIC CATALOG SEARCH BY AUTHOR

ENTER THE AUTHOR'S NAME AND DEPRESS TRANSMIT

LAST NAME: HAMILTON

FIRST NAME: DENNIS

MIDDLE INITIAL: E

TITLE(S)	AUTHOR
3	HAMILTON, DENNIS E.

DEPRESS TRANSMIT (RETURN OR ENTER) TO RETRIEVE DATA

AUTHOR: HAMILTON, DENNIS E.

ITEM	DATE	TITLE	ACCESSION #
1	1976	ANCIENT WASHINGTON; 2000 YEARS OF COMPUTER EXCELLENCE	DTL-1234578
2	1983	WASHINGTON D.C.; DEVELOPMENT OF THE SUPER DUPER THINKING COMPUTER	DTL-34567
3	1984	WALKING, TALKING, THINKING COMPUTERS OF THE FUTURE	ADB65327

STOP

FIGURE D-1. FORMATTED LAM SCREEN (CONTINUED)

```
TO SEE FULL REFERENCE INFORMATION ENTER ITEM NUMBER AND DEPRESS TRANSMIT
(RETURN OR ENTER)

1


DTL-1234578                                  REPORT:  UNCLASSIFIED

      TML-146327

FUTURE HORIZON TECHNOLOGY, INC. MCLEAN, VA

ANCIENT WASHINGTON; 200 YEARS OF COMPUTER EXCELLENCE,


BOOK. 84-01-01.  432P.      (DNA-5327A)

      CONT-DNA-021-83-D-0123

      SUBTASK-DNA-X123XA67B3

CIRCULATION INFO:

      COPY # 23     OK
      COPY # 23A    REFERENCE
      COPY # 14     CHECKED OUT

ENTER 1 FOR ADDITIONAL SEARCH; DEPRESS THE TRANSMIT (RETURN OR ENTER) KEY

ENTER 2 TO RETURN TO SELECT NEW FUNCTION; DEPRESS THE TRANSMIT (RETURN OR
ENTER) KEY

ENTER 3 TO STOP; DEPRESS THE TRANSMIT (RETURN OR ENTER) KEY

3
```

FIGURE D-2. SAMPLE NATURAL (COMMAND) LANGUAGE

WELCOME TO

DEFENSE NUCLEAR AGENCY

LIBRARY SYSTEM

REFSUB SHORT

REFERENCE SUBSYSTEM

EXTRACT FOR FILE = BOTH;AUTH = HAMILTON, DENNIS E.

3 ITEMS FOUND

LIST ITEM, DATE, TITLE, ACCESS

ITEM	DATE	TITLE	ACCESSION #
1	1976	ANCIENT WASHINGTON; 200 YEARS OF COMPUTER EXCELLENCE	DTL-1234578
2	1983	WASHINGTON D.C.; DEVELOPMENT OF THE SUPER DUPER THINKING COMPUTER	DTL-34567
3	1984	WALKING, TALKING, THINKING COMPUTERS OF THE FUTURE	ADB65327

STOP

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A133389
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle) Local Automation Model: Functional Description	5. TYPE OF REPORT & PERIOD COVERED
6. PERFORMING ORG. REPORT NUMBER LMI TASK DL302	
7. AUTHOR(s) Walter P. Hamilton, III Richard W. Hartt Dennis J. O'Connor	8. CONTRACT OR GRANT NUMBER(s) MDA 903-81-C-0166
9. PERFORMING ORGANIZATION NAME AND ADDRESS Logistics Management Institute 4701 Sangamore Road P.O. Box 9489, , Washington, D.C. 20016	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Defense Technical Information Center Cameron Station Alexandria, Virginia 22314	12. REPORT DATE August 1983
	13. NUMBER OF PAGES 104
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	15. SECURITY CLASS. (of this report) UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

"A" Approval for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Library Automation
Automated Information Systems
Teleprocessing

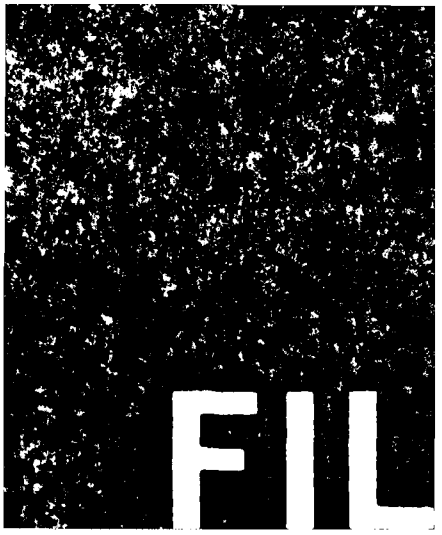
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This document contains a functional description of the Local Automation Model (LAM). The LAM will provide DoD Technical Libraries in the Shared Bibliographic Input Network a local automated information system to improve the management of DoD bibliographic information. The proposed system will replace the existing manual and batch procedures by technical library personnel. The system will

(Continued on next page)

DD 1473/Block 20
ABSTRACT (Cont.)

provide automated storage of local bibliographic files and access to both local files and the DTIC Technical Reports Data Base. Contained in this functional description are summary description, detailed characteristics and operating environment of the system, as well as the cost factors and development schedule of the LAM project.


FIL