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ABSTRACT

The National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress, administers a free library program for those unable to read standard printed materials, reproducing and distributing works in braille, recorded disc, and recorded cassette. Previous studies of the distribution network had identified costs and developed a centralized option for the storage and distribution of braille materials, with user services at regional centers. This study explores the implementation of the centralized services and the transitional period in the following sections: (1) introduction; (2) fundamental decisions; (3) automatic data-processing development; (4) equipment and facilities; (5) operations services; (6) setup; (7) beginning operations; (8) monitoring operations; (9) estimated costs; and (10) planning and control. Eight exhibits illustrate the process. Five appendixes provide details of estimated costs and implementation needs. (SLD)

IR

STUDY I, PART 2

FINAL REPORT

SPECIFICATIONS FOR BRAILLE CENTRALIZATION

Contract Number I70251

ManTech Technical Services Corporation

and

Wesley-Kind Associates, Inc.

August 4, 1993

This work was sponsored by the National Library Service for the Blind and Physically Handicapped, the Library of Congress.

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Library of Congress at the time of publication. This report does not constitute a standard or regulation.

IR

FINAL REPORT

STUDY I, PART 2

Submitted to:

LIBRARY OF CONGRESS
NATIONAL LIBRARY
SERVICE FOR THE
BLIND AND
PHYSICALLY
HANDICAPPED

For:

STUDY I -
IMPLEMENTATION STUDY
OF CENTRALIZED
BRAILLE BOOK
STORAGE AND
DISTRIBUTION SYSTEM

PART 2 -
SPECIFICATIONS
FOR BRAILLE
CENTRALIZATION

In response to:

CONTRACT NUMBER I70251

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AUGUST 4, 1993

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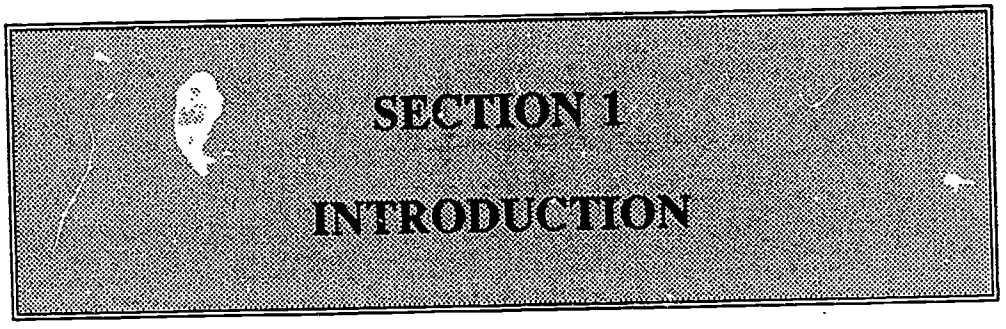
LIST OF ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
ADP	Automatic Data Processing
ALA	American Library Association
ASF	Auxiliary Service Facility
BBR	Braille Book Review
BLND	Database of Materials in NLS Collections
BMC	Bulk Mail Center
BR	The Standard Braille Collection Currently Housed in Network Libraries
BRA	Braille Collection Stored in MSCs
BRF	Braille Collection Stored in MSCE - Foreign Languages
BRJ	Braille Collection Stored in MSCW - Jewish Braille Guild Produced
BRX	Braille Collection Stored in MSCW - British Produced
CD-ROM	Compact Disk Read Only Memory
CMLS	Comprehensive Mailing List System
CPU	Central Processing Unit
DC	Distribution Center
DECNET	Digital Equipment Corporation Network
DMA	Data Management Associates, Inc.
DPA	Direct Patron Access
DRA	Data Research Associates
FAX	Telefax Communication
FTE	Full-Time Equivalent
FTP	File Transfer Protocol
FY	Fiscal Year (Federal)
GFE	Government Furnished Equipment
GSA	General Services Administration
HVAC	Heating, Ventilation and Air Conditioning
ICMP	Internet Control Message Protocol
ID	Identification (Number)
ILL	Interlibrary Loan
IPX/SPX	Internetwork Packet Exchange/Sequenced Packet Exchange
IVR	Interactive Voice Response
KRAS	Keystone Research Associates System
LAN	Local Area Network
LC	Library of Congress
LF	Lineal Feet
LIFO	Last In First Out
MARC	Library of Congress Cataloging System Record Structure
MLA	Machine Lending Agency
MLS	Master of Library Science
MSC	Multistate Center
MSCE	Multistate Center East
MSCW	Multistate Center West
MTSC	ManTech Technical Services Corporation

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

NLS	National Library Service
NLSNET	NLS Communications Network
OCR	Optical Character Recognition
OSHA	Occupational Safety and Health Administration
PC	Personal Computer
PICS	Production Information Control System
RA	Reader Advisor
RARL	Reader Advisor Regional Library
READS	Reader Enrollment and Delivery System
RFDC	Radio Frequency Data Communication
RFP	Request for Proposal
RIP	Routing Information Protocol
RL	Regional Library
SCSI	Small Computer Standard Interface
SF	Square Feet
SNA	Systems Network Architecture
SNMP	Simple Network Management Protocol
SRL	Subregional Library
TBD	To Be Determined
TCP/IP	Transmission Control Protocol/Internet Protocol
TDD	Telecommunications Device for the Deaf
TMC	Technology Management Corporation
TVSS	Transient Voltage Surge Suppressor
USPS	United States Postal Service
VAC	Volts Alternating Current
VGA	Video Graphics Array (Monitor)
WAN	Wide Area Network
XESS	Book Exchange System Used by Network Libraries



SECTION 1

INTRODUCTION

Section 1

INTRODUCTION

This section of the report presents an introduction to Study I, Part 2 of the implementation project. The background and objectives of this effort are initially presented, followed by a discussion of the format of the report. The contents of this section do not constitute a part of the specifications for the provision of centralized braille services.

1.1 BACKGROUND

The National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress, administers a free national library program for persons who are unable to read standard printed materials due to physical and/or visual impairments. In cooperation with authors and publishers of books and magazines, NLS is granted permission to mass-produce copyrighted works. NLS works with a network of state, local, and private libraries and agencies, which provides the necessary resources for the storage and distribution of the NLS materials, and provides a direct interface with the patrons of the service. Books and magazines in braille, recorded disc, and recorded cassette format, as well as specially designed playback machines and accessories, are delivered to eligible patrons by postage-free mail, and returned to network libraries and agencies in the same manner.

The free national library program consists of three major components, each with its associated responsibilities, costs, and revenue sources. NLS, funded by Congress, secures copyright permission from authors and publishers; contracts with commercial and not-for-profit firms for the mass production of braille and recorded books and magazines, playback machines, machine accessories, and repair parts; and administers the program. The United States Postal Service (USPS), funded directly by Congress for this program, provides transport of program materials among network facilities, patrons, NLS, and points of book and machine manufacture and repair. The network, consisting of state, local, and private libraries and agencies, and funded by various combinations of federal, state, local, and private sources, provides the personnel, facilities, and other resources necessary to provide NLS materials to patrons. The

combined expenditure for the entire program is approximately $120,000,000 annually, with the three major components bearing approximately equal portions of the total costs.

1.1.1 Network

There were four basic types of facilities in the network during federal fiscal year 1991. Fifty-six (56) Regional Libraries (RL) provide a comprehensive range of services, including services in addition to distributing NLS sponsored materials. Eighty-nine (89) Subregional Libraries (SRL) provide service to a specified part of a regional library's territory. Four (4) independent Machine Lending Agencies (MLA), in conjunction with the RLs, control and distribute NLS playback machines and accessories to patrons in a specified service area. Two (2) Multistate Centers (MSC), which are NLS agencies, distribute program materials and backup supplies to network libraries and agencies, as well as braille and recorded books from special and backup collections directly to patrons.

1.1.2 Previous Study

In 1989 and 1990, NLS contracted with Technology Management Corporation (TMC), a subsidiary of ManTech International and currently a division of ManTech Technical Services Corporation (MTSC), to perform a two-phase study of network operations. In the first phase of the previous study, TMC gathered information from a selected sample of network agencies, and network statistics compiled by NLS, and calculated both annual costs and a 15-year cost projection for NLS sponsored activities provided to patrons by the network. TMC found that the approximate costs of network operations for federal fiscal year 1989 (FY89) were $3,154,000 for braille book services, $7,724,000 for playback machine services, and $30,181,000 for recorded book services, for a total of $41,059,000 for all three services combined. In addition to the costs incurred directly by network agencies, NLS directly incurred approximately $805,000 in costs for its three multistate center operations of which $173,000 was for braille book services, $92,000 was for machine services, $387,000 was for recorded book services, and $153,000 was for publication and back-up supply services.

In the second phase of the previous study, TMC developed two alternative centralized service models, one for the provision of braille book storage and distribution services, and the other for the provision of audio playback machine storage, distribution, and repair. Both alternative models proposed that service be provided from two national centers, and each model was compared to existing service patterns at the time, i.e., 39 braille libraries and 57 machine lending agencies.

1.1.3 Study I, Part 1 Results

As a result of these previous studies, NLS determined that it was probably both feasible and economical to centralize braille book services and decided that the present implementation study be undertaken. The first phase of this implementation study, i.e. Study I, Part 1, was completed in November, 1992, the objective of which was to develop in detail the resource requirements, operating procedures, and projected costs of three options for centralized braille services. The three hypothetical options, selected by the study Advisory Committee in June, 1992, were then developed in sufficient detail in order to determine implementation feasibility on both a service and cost basis.

The analysis of each of the three options in Study I, Part 1 addressed resource requirements of all types, including automation, facilities, equipment, personnel, and other requirements. It also developed the most appropriate operating procedures to be employed at the braille centers. The analysis furthermore addressed operational goals and patron and network concerns about centralization as enumerated in RFP92-1 (which led to the current study) and as posed by the study Advisory Committee. Additionally, the analysis took into account results (not necessarily conclusions) from the previous studies, any applicable U.S. Government standards and requirements for automation and telecommunications, and any applicable existing or planned NLS systems. Finally, the analysis also addressed any impacts on agencies other than the centers themselves which would result from centralization implementation, and made recommendations on the most effective and efficient arrangement of the proposed centers vis-a-vis the existing MSCs.

The key elements of the three options evaluated in Study I, Part 1 as a result of the June, 1992 meeting with the Advisory Committee were:

Option A:
- Reader advisory services located at centers (and possibly at some network libraries)
- Profile Select circulation capability located at centers
- Direct patron contact with centers for all braille services

Option B:
- Reader advisory services located at network libraries
- Profile Select circulation capability at network libraries, with a batch transmission of selected orders
- Direct patron contact with network libraries for reader advisory services, and with centers to place specific orders (including a direct order feature)
- Real-time data telecommunications access to center's ADP system by regional libraries

Option C:
- Reader advisory services located at network libraries
- Profile Select circulation capability at network libraries, with a batch transmission of selected orders
- Direct patron contact only with network libraries, none with centers
- Real-time data telecommunications access to center's ADP system by regional libraries

For each of the above options evaluated and developed, the following assumptions applied:

- Braille books and back issues of magazines would be stored in, and distributed from, the centers.
- Some partial or complete collections could reside at some regional libraries... the extent of this deviation was never specified by NLS or the Advisory Committee.

- Automated systems at the centers would track only the NLS collections stored there, and would not track local collections that are not NLS property.

- Initial registration with the free library service would occur at network libraries only, not at the centers.

A draft report for Study I, Part 1 was then prepared which contained a discussion of the development and evaluation of each of the three options and included the recommended operating procedures to be employed, the resources required to effect implementation, and the estimated costs for each. This draft report was submitted to NLS September 8, 1992.

On October 13 and 14, 1992, a second meeting with the study Advisory Committee was held. At this meeting, the Study I, Part 1 draft report was reviewed and discussed, and a consensus was reached among ManTech, NLS, and the Advisory Committee on what should be the recommended centralized braille book distribution system.

The recommended system is Option A, as defined during the first meeting in June, 1992, and as explained above, together with the following three major enhancements/differences that were not included in Option A in the draft report, but were added as a result of the second Advisory Committee meeting:

- A real-time data telecommunications access to the centers' ADP system, identical to that to be provided in Options B and C, would be provided to allow network libraries to continue to provide reader advisory services at the local level if they choose to make the minimum and/or desired modifications to their own ADP systems to facilitate access to the data telecommunications link,

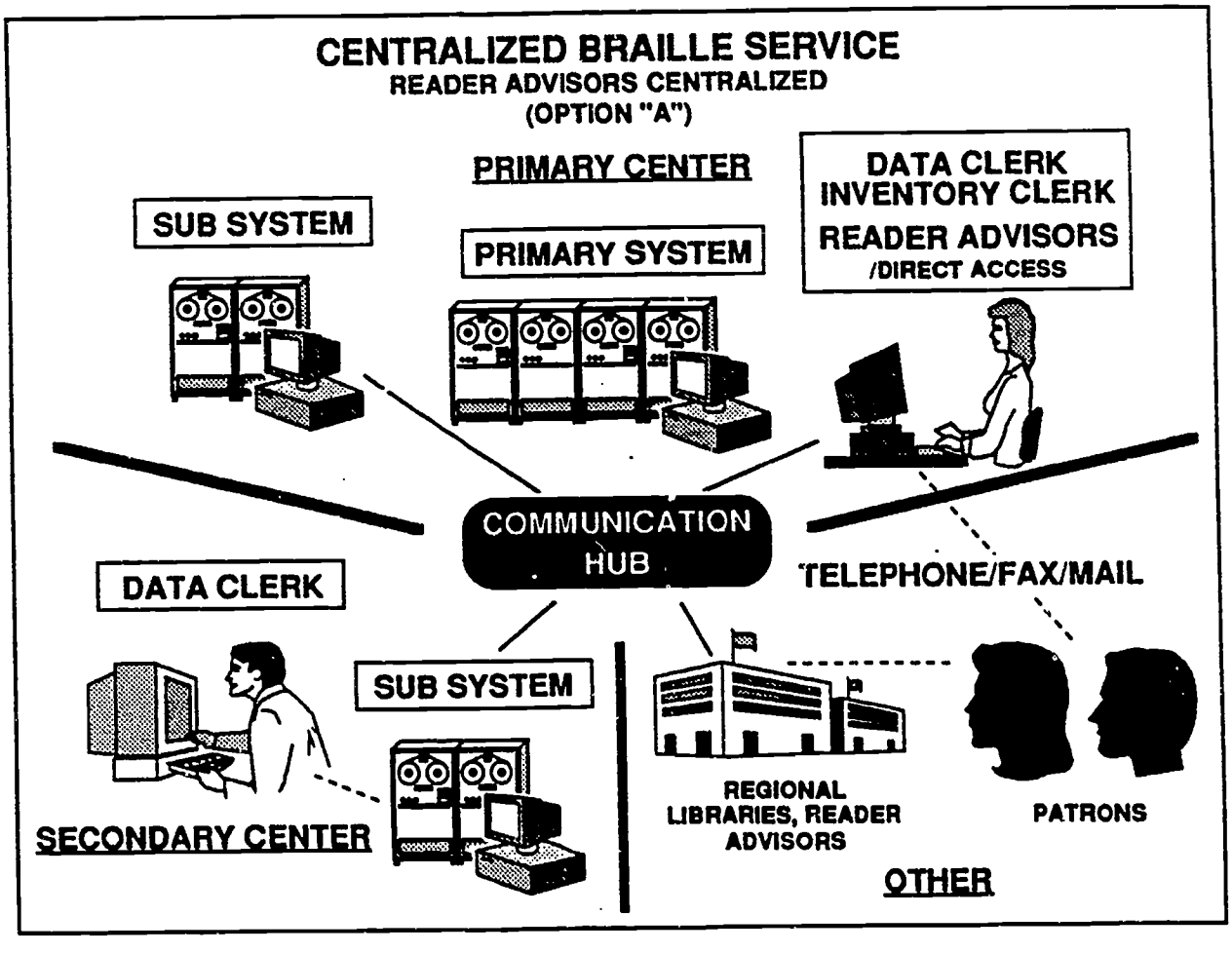
- A direct patron access, Interactive Voice Response (IVR) capability would also be provided, like that provided for in Option B, and

- A capability to enroll patrons of non-participating libraries (i.e. those libraries that would not turn over their collections to the centers) with the centralized braille service would also be provided, although this enrollment would be subsequent to initial registration of the patrons by the non-participating libraries.

Appendix 1-1 of this report describes the key features of the recommended service model as defined during the second Advisory Committee meeting, and Appendix 1-2 contains

a listing of other points that served as guidance during the development of the final report for Study I, Part 1, which was submitted to NLS November 22, 1992. Exhibit 1-A presents a diagrammatic representation of the final version of Option A at the highest level. For discussion purposes later in this report, the primary center as noted in Exhibit 1-A is the Western Center, and the secondary center is the Eastern Center; whether the Western or Eastern center is to be made the "primary" center (wherein the primary ADP system and reader advisory services would reside) must be determined either during the transition plan phase of the study, or at some other time prior to the procurement of the resources and services necessary to effect implementation.

Exhibit 1-A



1.2 OBJECTIVE OF STUDY I, PART 2

This final report presents specifications for the implementation of the enhanced Option A centralized braille services model described in Subsection 1.1.3, which was the option selected by the Advisory Committee for implementation, and additionally incorporates all modifications to the draft report resulting from an Advisory Committee meeting held May 11 and 12, 1993. At the request of NLS, the specifications for automated and telecommunications systems and those for all other components of the Option A service model have been combined into this single volume document.

The detailed specifications contained in this report are to be used as the basis for a statement of work and cost schedule (or multiple statements of work and cost schedules) in the subsequent development of requests for proposals (RFPs) for all goods and services that must be procured in order to successfully implement the Option A service model. However, this document is not, and was never intended to be, an RFP or bid request *per se*. The actual development of RFPs and bid schedules to be used in the solicitations for the required goods and services will be the responsibility of the Library of Congress.

In addition to specifications, ManTech has also included in this report some limited discussions of procurement issues in each of the major resource areas. These discussions are not a requirement of the study contract, nor a part of the specifications themselves, but are simply included to provide NLS with some recommendations that may prove useful when procurement is eventually undertaken.

1.3 FORMAT OF REPORT

The overall format of the Study I, Part 2 specifications report was determined at a meeting held with NLS on December 16, 1992. There was essentially one reason for employing the format used in this report - the procurement of the resources required for the successful implementation of the Option A service model will in all likelihood, but not necessarily, be provided by several, not one, commercial and/or not-for-profit firms. For this

reason, the report is structured as described below in order to facilitate the development of RFPs for the anticipated procurements.

- Section 2 contains a discussion of current free national library program braille services, an overview of the centralized braille services concept as defined by Option A, the benefits of the proposed operations, and a brief discussion of transition to the proposed service mode. This section: is mandatory background information for prospective bidders on the proposed ADP and telecommunications systems, and for prospective bidders for the conduct of the proposed operations; is optional, but recommended, background information for prospective bidders for the required facilities and shelving; and, also serves as a summary of the proposed service model for any other parties reviewing this document.

- Section 3 contains detailed specifications for the ADP systems that will be required to successfully implement Option A.

- Section 4 contains detailed specifications for the facilities and shelving that will be required to successfully implement Option A.

- Section 5 contains detailed specifications for the operation of the proposed centers that will be required to successfully implement Option A.

- The appendices contain various supporting documentation for Sections 1 through 5.

SECTION 2

OVERVIEW OF CENTRALIZED BRAILLE SERVICES

Section 2

OVERVIEW OF CENTRALIZED BRAILLE SERVICES

This section of the report contains a discussion of current free national library program braille services, an overview of the centralized braille services concept, the benefits of the proposed operations, and a general discussion of the transition to the proposed service model. This section of the report: is mandatory background information for prospective bidders for the development of the proposed ADP systems, and for prospective bidders for the conduct of the proposed operations; is optional, but recommended, background information for prospective bidders for the provision of the required facilities and shelving; and, also serves as a summary of the proposed service model for any other interested parties.

2.1 CURRENT OPERATIONS

This subsection contains a summary description of the salient aspects of current braille services operations as provided to patrons of the free national library service. Unless otherwise specified, the *modus operandi* described is representative of operations as of the first quarter of federal fiscal year 1993, and the workload statistics presented are for federal fiscal year 1991.

2.1.1 Free National Library Program

The National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress, administers a free national library program for persons who are unable to read standard printed materials due to physical and/or visual impairments. In cooperation with authors and publishers of books and magazines, NLS is granted permission to mass-produce copyrighted works. NLS works with a network of state, local, and private libraries and agencies, which provides the necessary resources for the storage and distribution of the NLS materials, and provides a direct interface with the patrons of the service. Books and magazines in braille, recorded disc, and recorded cassette format, as well as specially designed playback

machines and accessories, are delivered to eligible patrons by postage-free mail, and returned to network libraries and agencies in the same manner.

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There were four basic types of facilities in the network during federal fiscal year 1991. Fifty-six (56) Regional Libraries (RL) provide a comprehensive range of services, including services in addition to distributing NLS sponsored materials. Eighty-nine (89) Subregional Libraries (SRL) provide service to a specified part of a regional library's territory. Four (4) independent Machine Lending Agencies (MLA) in conjunction with the RLs, control and distribute NLS playback machines and accessories to patrons in a specified service area. Two (2) Multistate Centers (MSC), which are NLS agencies, distribute program materials and backup supplies to network libraries and agencies, as well as braille and recorded books from backup and special collections directly to patrons.

2.1.2 Decentralized Registration

Braille patrons of the free national library program are currently registered with the service on a decentralized basis. Registration is accomplished by the applicant providing information to the appropriate network library (or, in the case of overseas patrons, to the NLS)

on an NLS approved application form. The information on the form consists of basic patron personal data (i.e., name, address, telephone number, age, sex, nature of disability, and similar data), service specific information (i.e., what type(s) of media are desired (95% of braille patrons are also recorded book patrons), subject interests, restrictors regarding sex, violence, and/or profanity in the reading materials, desired frequency of service, book loan limits, and similar data), and a certification by an approved authority of the patron's disability which makes them eligible for the service.

After verification of the eligibility of a patron, the responsible network library registers the patron. However, braille services are not necessarily provided by the registering library. If a subregional library registers a patron, the patron is also registered with the associated regional library. If the patron's regional library does not provide braille services (only 39 of the libraries in the network store and circulate braille books), the patron is also registered with the regional library providing braille services to that service area (even though all other services are provided by the "home" regional library). NLS itself registers patrons who live overseas, and books are circulated to these patrons from the multistate center west (MSCW).

In addition to this "baseline" registration with network libraries, or the NLS, all patrons are also registered with the Comprehensive Mailing List System (CMLS) direct circulation magazine program. This program, operated by Data Management Associates, Inc. (DMA), an NLS contractor, directly distributes magazines (that are not returned) to patrons who desire magazine service. Although CMLS was originally strictly a database for the distribution of periodicals, NLS currently requires all patrons to be registered in it whether or not they receive magazine service (see subsection 2.1.8).

All patrons are classified as either individuals or institutions. Institutions, which are schools, nursing homes, or other such organizations, typically consist of multiple readers. The number of individual readers within an institution can vary greatly from one organization to another; the average number of individuals per institution was four at the time this study was begun.

Appendix 2-1 contains a profile of the free library program national braille readership for FY91. This profile shows the individual, institutional, and estimated total braille readership (individuals plus four times the number of institutions) for each regional library service area in the network (whether or not the braille service was actually provided from the library in that area). As Appendix 2-1 shows, there were an estimated 14,723 individual patrons and 1,385 institutional patrons constituting a total of 20,264 readers being served by the free library program during FY91.

2.1.3 Decentralized Reader Advisory Services

Braille patrons of the free national library program are currently provided with reader advisory services on a decentralized basis by network libraries (the MSCs do not provide reader advisory services). Reader advisory services consist of: performing initial patron registration; answering in-coming telephone calls from patrons, and placing out-going calls as necessary; placing specific orders (arriving by telephone, mail, or patron walk-in) into the circulation system (be it manual or automatic) for patrons; assisting patrons in making book selections; updating patron files (basic information and service oriented information); and, addressing service problems of any type.

The types of individuals used to staff reader advisory positions vary from library to library. Some libraries have an all professional (i.e. librarian) reader advisor staff, while others utilize a mix of professional and clerical staff. The ratio of reader advisors to patrons served also varies considerably among braille libraries in the network. Few, if any, network libraries have reader advisors that handle only braille patrons, but some libraries do have reader advisors that specialize in braille services.

2.1.4 Decentralized Collection Storage and Inventory Control

The primary braille collection of the national free library service, the BR collection, is currently stored in 39 regional libraries (although four of these 39 have very small and incomplete collections) and two subregional libraries, with backup collections in each of the

two multistate centers. Appendix 2-2 presents the BR collection of the free national library program as reported to NLS by the network libraries for FY91. Because of some inconsistencies among reporting network libraries with regard to the unit of measure that was being reported (volumes or copies), a "probable reporting unit" is shown for each collection at each reporting location. Shown in Appendix 2-2 are: the reported number of collection "volumes" (some are copies, some are volumes) by site; the reported number of collection titles, by site; the probable reporting unit, by site; the adjusted/estimated collection size in volumes, by site, and; the total size of all the collections managed by network libraries, which is approximately 974,000 volumes. It is estimated that approximately 15%-to-20% of the BR collection is in circulation at any given time.

In FY91, the BR collection consisted of approximately 8,600 titles, of which there were an average of 60 copies per title, with the average number of volumes per copy being 2.23. Approximately 60 copies of 325 new titles (roughly 43,500 volumes) are added to the BR collection each fiscal year. In addition to the NLS BR collection, some libraries have modest to moderate sized braille collections of local or special interest material that is not a part of the BR collection.

The network braille libraries are responsible for all collection storage and maintenance activities. These responsibilities include: housing the collection and ensuring its integrity; performing a three-tier follow-up contact of patrons, or patron contacts/survivors to obtain overdue materials; weeding (i.e. remaindering) of the collection periodically, which involves identifying titles for which the number of copies managed can be reduced due to low demand; developing copy allotment plans, which anticipate the demand for new titles being added to the collection; shifting portions of the collection as necessary; adding new production to the collection; repairing of damaged volumes, or disposing (forwarding to NLS) of unrepairable volumes, as necessary; conducting inventories of the collections for the NLS XESS program (whereby excess materials are reallocated among network libraries); and, annual reporting of gross collection size and circulation figures to the NLS.

The BR collections in network libraries are typically stored in either adjustable, cantilever type shelving, or fixed four-posted shelving, although a few libraries use compact mobile shelving. The collections are stored in ascending title number sequence, one layer deep and four volumes per linear foot (LF) on 1' deep shelves with the typical shelf width being 3' (there is also some limited use of 4' shelves). Shelf sections are typically configured six or seven-levels high, with shelf sections aligned back-to-back (except against walls), and the number of sections per range varying depending upon building size and internal configuration (column spacing being a major factor). Collections are usually stored in an area adjacent to the library office areas, but a few libraries store collections in remote facilities. Typical storage densities in regional libraries average 8-to-10 volumes per square foot of floor space for fixed shelving, and 16-to-20 volumes per square foot for compact mobile shelving.

In addition to the "stack" storage of the majority of a collection, some libraries also maintain modest to moderately sized browsing collections. These are usually located in the reading room of a library, and are stored up to six levels high in title number sequence.

2.1.5 Decentralized Circulation

Appendix 2-3 presents the BR collection circulation of the free national library program as reported to NLS by the network libraries for FY91. As was the case for the BR collections stored in network libraries, a "probable reporting unit" is assigned for each location due to differences in reporting units (volumes or copies). Shown in Appendix 2-3 are the individual, institutional, interlibrary loan (ILL, i.e. loans made to patrons of other network libraries), and total circulation by st[illegible]e/territory, and the total for the network, which is estimated at approximately 187,000 copies (417,000 volumes) per year. The adjusted total circulation indicates that the average reader reads between nine and 10 BR books per year.

Circulation is of one of two types; mail-order, which constitutes over 95% of total circulation, or walk-in, which constitutes under 5%. Walk-in is just as the name implies, i.e. a patron physically enters a network braille library (or in some cases calls ahead), requests a book(s), the materials are retrieved from storage, and are issued to the patron. Mail-order

circulation can originate from: patron telephone calls, which arrive over toll-free (800) lines, and may either contain requests for specific titles, or may request that reader advisors assist in making a selection(s); Braille Book Review (BBR, an NLS publication enumerating new offerings, published bi-monthly) order forms arriving via the mail; or profile select circulation, which consists of a computer program automatically selecting books for patrons based upon reader preferences, reader history, and available titles. Furthermore, some automated systems can tie the profile select feature to the return of books by patrons (turnaround service), to the time of month (calendar service), or by reader advisor specification. For libraries that have profile select circulation (which is most) it is estimated that, on average, 55% of total circulation arises from profile select, 40% from specific orders arriving by telephone, and 5% from specific orders arriving by mail (approximately two-thirds of all braille patrons elect to be served by profile select).

Most braille libraries have ADP circulation systems which automatically queue reserve (high priority) and request (regular priority) orders on a first-come, first-serve basis and generate combination pick-ticket/mailing address labels in title number sequence for distribution and mailing operations. Floor operations personnel retrieve materials from stack locations, convey them to the receiving/shipping area of the facility on book carts, load the books and mailing labels into NLS provided mailing containers (one or two volumes per container, depending upon the size of the volume(s)), and load USPS bulk mail containers with the day's shipments (in some localities, pre-sorting by zip-code is required, while in other localities it is not). Some library ADP systems rely upon a final verification step prior to issuance (wanding an OCR code), while other systems do not. Although a number of libraries are using a "quick-turnaround" (forward shelving) approach to circulation for recorded books, which is essentially a last-in-first-out (LIFO) turnaround procedure, it is generally not used for braille.

USPS mail pick-ups and deliveries occur once during the day, usually in the morning. Returned braille mailing containers are unloaded from postal bulk mail containers and/or hampers, staged on tables, and the books and cards are removed and separated from the containers. The returned cards are then either processed (discharged) in the receiving area, via

either key entry or wanding of data on the cards, or forwarded to the office area for discharging. Returned books are then loaded onto book carts, conveyed to the appropriate fixed storage location, and putaway on the shelves. If damaged books are identified upon receipt, they are either repaired prior to putaway, or are put aside into a queue for repair.

Most libraries have very flexible book loan periods, and somewhat flexible book loan limits. Nationwide, there are approximately four books outstanding per patron, with some patrons being extremely active readers and others the opposite; documented book loan limits (if any) are typically 20 or higher. Book loan periods of four-to-six weeks (excluding transit time) are generally encouraged, but there is considerable flexibility in enforcement depending upon demand for the title(s) in question.

2.1.6 Centralized Special Collection Storage and Circulation

In addition to the BR collection, patrons of the national free library program also have access to several other special NLS braille collections that are stored in, and distributed from, the MSCs. Because there are a very limited number of copies of titles in these special collections, these collections are centralized out of necessity. Appendix 2-4 presents various data on the size and configuration of all NLS braille collections, including both the special MSC collections and the network/MSC BR collections, showing names, locations, titles, copies, volumes, volumes per copy, and storage densities for each collection.

Appendix 2-5 presents the circulation of all braille books and back issue magazines (not direct circulation magazines) circulated to patrons of the free library program by the MSCs in FY91. All of these reported statistics are shown in copies, not volumes. This appendix shows: the site (state/territory) to which braille books were circulated; the number of books/magazines circulated by site, by braille collection, and the MSC that circulated the materials; and, the total quantity of books/magazines circulated from each collection and MSC. A total of 8,063 braille books (copies) and magazines were circulated from MSCs in FY91, of which the MSCW circulated 4,668 and the MSCE circulated 3,395.

The storage of braille in the MSCs is somewhat different from that used in the network libraries. The MSCs employ a higher-density storage layout, wherein books are stored two layers deep (as opposed to one) and 10-levels high (as opposed to six or seven), and storage aisles are 2'6" wide (instead of 3' or 3'6"). Fixed, back-to-back section ranges with four-posted shelving is also employed in the MSCs, as opposed to adjustable cantilevered shelving. However, one similarity to the network libraries is that the collections in the MSCs are stored in ascending title number sequence.

Distribution of the special collections stored in the MSCs is truly centralized, while the associated circulation duties are actually a combination of decentralized and centralized tasks. Patrons have no direct contact with MSCs; they contact their servicing braille library reader advisors with requests for books from the special collections. The network library then requests an interlibrary loan from the appropriate MSC by filling out a standard order form containing relevant patron and book information, and forwarding the form to the MSC via the mail, NLSNET, or fax. These orders are then entered into the Reader Enrollment and Delivery System (READS) at the MSCs, pick tickets/address labels are generated, and the orders are picked and shipped. Receiving and putaway of books is identical to that described for libraries. As is the case for network libraries, postal pick-up and delivery takes place at the same time each day, once per day.

2.1.7 Centralized Production Control and Network Monitoring

NLS is responsible for all braille production planning and control, and monitoring of network provided, and MSC provided, braille services. Production control involves determining which titles should be reproduced in braille, obtaining the right to reproduce the work, assimilating input on demand for the new titles, procuring the production, monitoring the production, and specifying the distribution of the new books. Monitoring of the network's and MSCs' braille operations involves requesting, collecting, and compiling data on braille readership, circulation, and collections; providing direction to libraries and MSCs via site visits by NLS consultants; and, attending and sponsoring n. tings and conferences to solicit patron

feedback on service quality, and to discuss other issues relevant to the advancement of the free library program's braille services.

2.1.8 Centralized Direct Circulation Magazine Service

All braille patrons who are registered with the national free library program are also registered by their home network library with the Comprehensive Mailing List System (CMLS). CMLS is the system used to support the direct circulation magazine program. This program, operated by an NLS contractor (DMA), maintains patron magazine subscription data. Magazines are sent from manufacturers to braille patrons who desire magazine service. Although CMLS was originally strictly a database used for the distribution of periodicals, NLS currently requires all patrons to be registered in it whether or not they receive magazine service.

2.2 PROPOSED OPERATIONS

This subsection contains a summary description of the salient aspects of proposed braille services to be provided to patrons of the free national library program under the centralized service model. Any major assumptions regarding the estimation of pro forma workload for the proposed service model are also enumerated.

2.2.1 Basic Configuration and Characteristics

The centralized service model would consist of two braille distribution centers, an eastern center located in the Cincinnati, Ohio metropolitan area, and a western center located in the Salt Lake City, Utah metropolitan area. The eastern center would primarily store and distribute books to an eastern service region consisting of all states and territories east of the Mississippi River, together with the states of Louisiana, Arkansas, and Missouri, while the western center would primarily store and distribute books to a western service region consisting of all other U.S. states and territories. Additionally, the western center would store and distribute several of the NLS special braille collections to all patrons.

The locations of the centers were chosen because: each has a USPS bulk mail center (BMC) or auxiliary service facility (ASF) in the metropolitan area; their location relative to patron location and patron demand results in minimal mailing time for any two-center model; both have favorable facility space prices relative to the national average; and, both have favorable labor prices relative to the national average. A two-center configuration was selected because this optimized the service model, taking into account economies of centralization, delivery time to patrons, and diversification of risk to the entire collection. The service regions formulated were based upon the minimization of delivery time of materials to patrons.

The braille centers would be free-standing, integrated distribution facilities employing modern technological features vis-a-vis information support and inventory control, and in full compliance with Occupational Safety and Health Administration (OSHA) standards, the Americans with Disabilities Act (ADA), and all relevant state and local building and safety codes. The centers' operations would be monitored by NLS and an Advisory Committee, and management of the contracted operations would be responsible to, and report to, NLS. The operations would have a strong customer orientation and rapid response time, with a requirement for shipping all orders received within one working day.

One of the two centers (TBD) would be designated the "primary center" and would house the central ADP system which would contain the inventory data for both centers, and all patron records. The primary center would also contain all reader advisory services offered by the centralized service model (all patron contact would be with the primary center), and the management of the overall operation. The "secondary center" would be strictly a distribution center for the storage and distribution of materials. Each of the floor operations at the two centers would utilize a computer subsystem that would be subservient to, and linked with, the primary ADP system at the primary center (the subsystem at the primary site would be directly connected to the primary system via a Local Area Network (LAN), while the subsystem at the secondary center would connect via modem with the primary system several times per day for batch transmissions and receipts of data). The subsystems alone would contain locator records for the inventory currently stored in that subsystem's center. Both the primary ADP system,

and both ADP subsystems, would utilize fault-tolerant processing and data backup features to maximize data integrity.

There would be flexibility with regard to the participation of network braille libraries in this program. Participation is defined as a network library turning over its existing BR collection to the centers for centralized storage and distribution. Although participation is not mandatory, all network braille libraries would be strongly encouraged to do so for the benefit of all patrons of the service, including their own patrons. Even if a network braille library chose not to participate, its patrons could still receive service from the centers, and would in any event still be circulated books from the special collections which would be stored in the centers. The assumption of full network participation was made in the sizing of all resource requirements, the determination of operating procedures to be employed, and the estimation of costs for centralized braille services.

2.2.2 Decentralized Registration

Initial registration of braille patrons with the free national library program would remain the sole responsibility of network libraries under the proposed operations. There would be no initial registration of patrons by the centers under any circumstances; network libraries would be the sole source and final authority of basic patron information, whether the library is participating or not, and whether or not the library chooses to utilize reader advisory services at the primary center for its patrons, or chooses to continue to provide them directly.

The source of basic braille patron data for the centers will be the CMLS database. The employment of this source for the data will require no incremental effort on the part of network libraries regarding the initial establishment or update of basic braille patron information. The primary ADP system would receive an initial download of basic data from CMLS for all braille patrons upon the commencement of operations and would, on a daily basis, extract data and update patron records with information that changed. Extraction of CMLS records for braille patrons only will be made possible by referencing a currently existing data element ("braille interest" field) in the CMLS record structure; the extraction of entire records, or individual

fields, for data that changed may require NLS to have the CMLS contractor make some minor modification (e.g. additional data flag) to facilitate the extraction. There would, however, be a feature built into the primary ADP system at the centers that would allow reader advisors at the primary center to record a "provisional address" if a patron directly informs the center of an address change prior to the patron notifying their home network library of the change. The center would also provide information to regional libraries on their own braille patrons' activities on a periodic, or on an as-required basis. However, Has Had data (i.e. reader histories) would not be supplied.

Appendix 2-1 contains the pro forma allocation of the FY91 national braille readership within the proposed centralized service model. The column entitled "Region" indicates the home service region for each current regional library area, while the rows entitled "Readership by Region" and "% Readership by Region" indicate the pro forma number of braille readers, by type of patron and in total, and the pro forma percentage of total patrons, to be directly served by each of the two centers with regard to circulation of materials from the BR, BRA, BRF and magazine collections (the western center would distribute the other collections to all patrons). As Appendix 2-1 shows, the eastern center would store and distribute materials for 10,002 individual patrons and 923 institutions for a total of 13,715 total readers (67.7% of the total), while the western center would store and distribute materials from these collections to 4,701 individual patrons and 462 institutional patrons for a total of 6,549 total readers (32.3% of the total).

2.2.3 Centralized Reader Advisory Services, With Network Option

Reader advisory services will be provided to all braille patrons of the free national library service from the primary center, and all reader advisors in the primary center will be professionals, possessing MLS degrees. The baseline assumption in the development of the staffing requirements for the primary center assumed that all patrons would be provided reader advisory services for braille from the primary center, although all participating network braille libraries would be given the option of continuing to provide these services directly to their patrons. The latter would be facilitated by the provision of data telecommunications access to

the primary ADP system at the primary center, whereby network based reader advisors could place orders for patrons, perform patron file maintenance (for their own patrons), query book availability and order status, and generally perform the same functions that a reader advisor located in the primary center could perform. However, it would be incumbent upon a network library to perform the necessary modification(s) to its own ADP system to facilitate its link to the wide-area network (WAN) that would link it to the primary ADP system at the primary center. This modification could range from a dedicated, standalone terminal with single modem line, to a split-screen, windowing feature on every workstation on a network library local area network (LAN) which would enable simultaneous access to both the library's and center's ADP systems. Also, the network library would bear the cost of any connect time to the WAN. Such "reader advisor regional libraries (RARLs)" would also be provided with "patron due for service" reports as necessary, generated by the primary ADP system, upon which the network library would have responsibility for acting.

Patrons residing in the 48 contiguous states receiving service directly from the primary center would be provided with a number of ways of contacting the center for placing orders and/or receiving assistance from reader advisors during the period from 8:00 AM to 5:00 PM local time, Monday through Friday; patrons residing in Alaska and Hawaii would have to make contact during the period from 8:00 AM to 5:00 PM Pacific Time. These methods of contact would include: toll-free (800) telephone access; mailing-in of Braille Book Review order forms; a Direct Patron Access (DPA) Interactive Voice Response (IVR) feature, whereby patrons could directly order books, put orders on request and reserve lists, or query order status (this would be made available 24 hours per day); modem access via the data telecommunications link (also to be available 24 hours per day); telefaxing of order forms and/or correspondence; and, a TDD feature for use by deaf/blind patrons.

2.2.4 Centralized Collection Storage and Inventory Control

All NLS owned braille collections, with the exception of the BR archives, the magazine archives, and braille music would be stored in, and controlled by, the proposed braille centers. These collections include the BR collections currently stored in network braille libraries, and

the BR backup and other special collections currently stored in the two MSCs (reference Appendix 2-4). However, regional libraries would be able to either retain, or borrow from the centers, modestly sized deposit/browsing collections for their reading rooms, if desired.

The centers would be responsible for all aspects of collection storage and maintenance activity. These responsibilities would include: housing the collections and ensuring their integrity; performing a three-tier follow-up contact of patrons, or patron contacts/survivors, to obtain overdue materials (the home network libraries of patrons would also assist in the second-tier follow-up); weeding (i.e. remaindering) of the collection periodically, after a circulation history by title has been developed (several years after commencement of operations), and in conjunction with, and with the approval of, the NLS; providing input to NLS regarding circulation and reader preferences to aid in the planning of new production; shifting portions of the collection as necessary; adding new production to the collection; adding transferred participating network libraries' BR collections to the centers' inventory; repairing of damaged volumes, or disposal (forwarding to NLS) of unrepairable volumes, as necessary; conducting physical inventories of the collections on an annual basis; and, conducting periodic inventory reconciliations between centers and transferring inventory as necessary to achieve an optimal balance. Subject coding of new production would be performed by NLS, and the primary ADP system would use these codes in its inventory records.

Appendix 2-6 presents the pro forma allocation of the various braille collections between the two centers. The three criteria applied in deriving this allocation scheme, in order of priority, were risk diversification, balance with expected circulation and readership, and leveling of workload between centers. Shown in Appendix 2-6 are the titles, copies, and volumes of each braille collection to be managed by each of the two centers.

Appendix 2-6 shows the allocation of collections to be physically managed by each center; however, the centers will not have to store all of these entire collections at any one time because some portions of the collections will be "in float," i.e., either in the possession of patrons or in the mail. Appendix 2-7 shows the estimated number of copies and volumes, for each collection, for each center, that are expected to be in float or "in-house" (i.e. stored) at

the centers at any instant in time. Also shown in Appendix 2-7 are the minimal required linear feet of shelf space (1-foot deep) required to store the collections expected to be in storage at any given time. The total braille collection managed by both centers, assuming full network participation in the program, would be approximately 1,260,000 volumes; of this total, approximately 15-to-20% would be in circulation at any given time.

The storage and control of collections in the braille centers would be very efficient, and facilitated by utilization of several types of modern storage and inventory control systems and techniques. The centers would utilize electrically powered, mobile compact shelving for book stack storage. Books would be stored 10 levels high, facilitating a storage density of 26.7 volumes/sf, which is 2.3 times higher than that for fixed shelving. In conjunction with both a fully automated inventory control and circulation system, and with the use of Radio Frequency Data Communication (RFDC) Integrated Portable Scanning Devices (bar code scanners), a random storage method rather than an ascending title number sequence storage method will be employed in both centers. This will require that every shelf position in all the shelving, and every volume in all the braille collections, be bar coded with unique machine and human readable identifiers. The use of automated system inventory control programs, the bar code scanning system, and the random storage technique will result in significant facility space, occupancy, and mobile shelving savings (15% to 20%) relative to conventional methods. The use of mobile shelving will more than pay for itself, relative to fixed shelving of the same capacity, due to the reduction in required facility space and associated occupancy costs.

2.2.5 Centralized Circulation

Assuming full participation by the network, all NLS braille circulation (with the exception of music, direct circulation magazines, and some minor activity from network library deposit collections) would be provided from the braille centers. Circulation, as used here, means direct distribution services; as previously discussed, specific orders from patrons could also be received by the centers from participating "reader advisor regional libraries" and from non-participating libraries for the issue of books from the special collections.

Appendix 2-8 presents the pro forma circulation for the braille centers. This exhibit shows the various braille collections that would be handled by the centers, the total annual and daily copy and volume circulation by collection, the average number of volumes per copy by collection, and the total annual and daily copy and volume circulation for each of the two centers by collection. The daily statistics assume there are 250 working days per year. All collections except the BRA Masters would be available for circulation to patrons; the BRA Masters are used only to produce copies, and hence are not circulated. Total annual circulation from both centers is estimated at approximately 203,000 copies, or 476,000 volumes, after complete implementation, and assuming full participation.

Circulation demand would be generated at the centers via: direct patron contact with the centers via telephone, mail order forms, telefax, DPA IVR, modem, TDD, or walk-in for the placement of specific orders; reader advisors at participating regional libraries placing orders on the primary ADP system via the data telecommunications link; reader advisors at non-participating libraries forwarding ILL orders for special collection circulation; and, profile select circulation executed on the primary ADP system at the primary center. The profile select application executed at the primary braille center would be completely independent of the profile select applications executed by participating regional libraries for recorded book selection, i.e., there would be no automated "pass-back" of Has-Hads from the centers to the libraries. Although a walk-in service would be provided to patrons, as would tours of the facilities, there would be no dedicated browsing collection within the centers, and the stack areas would be unsuitable for browsing given both the random storage sequencing of the titles in the collection, and the powered compact mobile shelving, which would have restricted access.

The distribution of the various collections in the braille centers would be very efficient, and facilitated by utilization of several types of modern distribution control systems and techniques that would allow the operations to perform same-day turnaround of orders. Bar code scanning equipment would be employed to expedite receiving, putaway, and shipping functions, whereby book bar code labels would be scanned upon receipt, putaway, and issue. A "quick-turnaround", i.e. forward shelving, technique would be employed, facilitated by the

ADP system which would preferentially screen the forward shelf locations (or the latest date received) to fill open orders thus minimizing book retrieval requirements. The mailing labels for the braille book containers would utilize bar-coded patron zip-codes (printed by the pick-ticket printer card-by-card) and bar-coded center address zip-codes (pre-printed) to expedite processing of the parcels within the USPS bulk mail system, thus expediting delivery of materials to patrons and return of the materials to the centers. Additionally, two transfers per day would be made between the centers and the USPS; the USPS would deliver incoming materials in the morning, and pick-up outgoing shipments in the late afternoon.

2.2.6 Centralized Production Control and Network Monitoring

The production control of braille books and magazines, and the monitoring of braille services provided under the auspices of the national free library program, would remain unchanged after the implementation of centralized braille services (ref. subsection 2.1.7), with two exceptions. The centers would be able to provide NLS with very detailed information on the circulation of specific titles and for all types of subject matter, and detailed information on reader preferences, that would aid NLS considerably in the production planning process. Second, the relationship, vis-a-vis monitoring, between NLS and the centers would be fundamentally different from the relationship between NLS and network braille libraries, the former being contractual and the latter being cooperative.

2.2.7 Centralized Direct Circulation Magazine Service

There would be no changes whatsoever to the current direct circulation magazine services offered via the NLS and CMLS (ref. subsection 2.1.8) to braille patrons of the national free library program. Patrons would continue to be registered on this database, and have their records updated by their home network libraries, not by the centers.

2.3 BENEFITS OF PROPOSED OPERATIONS

This subsection contains a summary of the benefits to be derived from implementation of the proposed centralized braille services model. The realization of these benefits to the extent of their maximum potential is dependent upon the full implementation of all recommendations in the Study I, Part 1 report and full, or at least majority, participation in the program by network braille libraries.

2.3.1 Better Availability of Materials for Patrons

The pooling of distributed BR inventories will mollify the effects of random demand and therefore reduce the incidence of stockouts for a BR collection of given total size. This concept can be described by a simple hypothetical example.

If two braille regional libraries each have one copy of a title available in their collections, and one library has a patron demand of two copies while the other has none, one request will go unfilled unless a transfer (ILL) is made between the libraries. With pooled inventories, supply and demand will be in better balance, and both patrons would be promptly served.

This theoretical argument for consolidation of the BR collection is shown in Appendix 2-9. This calculation relies upon the "Square Root Law," which is an approximation of the relationship between safety stock levels and the number of consolidated facilities, and measures the changes in safety stock levels required when inventory is consolidated. In brief, safety stock is retained to cushion against a variance in demand, otherwise it would be unnecessary, and the standard deviation of demand at a centralized facility is equal to the uniform decentralized standard deviation of demand multiplied by the square root of the number of consolidated facilities. As Appendix 2-9 shows, the total, average number of copies per title retained in two central facilities under an identical demand environment to the present would be 25.4, which is less than half of 60, which is the current national stockage level. Therefore, opportunities either exist for significant weeding (reducing storage and inventory control costs)

with no reduction whatsoever in the availability of books to patrons, or for moderate to no weeding with a significant increase in book availability to patrons relative to the current supply and demand configuration.

2.3.2 More Flexible New Production

Because of the advantages of inventory pooling at two storage locations (the centers) rather than the current 41 locations (39 RLs and two MSCs), new production of braille books can be made more flexible. Current production runs of new titles must always be in batches of 41 or more, just so that every braille service point in the network and MSCs will have one copy, and average 60 copies per title because some of the larger braille operations require more than one copy per new title.

However, under centralized storage and distribution operations there would be relatively greater flexibility with regard to the size of new production runs. For example, if 60 copies per title are produced on average, the production run of an anticipated popular title can be increased to 90 copies, and the production run of an anticipated slow mover can be decreased to 30 copies, thus tailoring the collection with respect to patron needs at the same total cost.

2.3.3 Better Inventory Control

Better inventory control of the braille collections would result for four reasons. First, other things being equal, centralized inventories can be controlled more efficiently and effectively than decentralized inventories simply due to inherent economies of scale and collection consolidation. Second, the centers' operators will be contractually responsible to NLS for inventory control, whereas the responsibility of the network braille libraries to NLS for inventory control is not contractual, but cooperative. Third, true physical inventories of the collections would be conducted annually by the centers, whereas only gross total counts of collection sizes are currently annually reported to NLS. Fourth, because of the employment of the proposed ADP system and operating procedures, which are "location oriented", the NLS will know at any time exactly how many copies and volumes of each title there are in the

collections, which copies are in-house or in circulation, who has what copies, and how long they have had them.

2.3.4 More Efficient Storage

The storage of the braille collections in the centers would be considerably more efficient than the *status quo* for three reasons. First, the unit facility space costs in the braille centers (probably $3-$5/sf) would be considerably less than the average unit facility space costs in network libraries ($10-$12/sf); this is because the centers would be housed in industrial one-level structures, not library buildings. Second, a much higher storage density would be achieved in the centers (26.7 volumes/sf) than is typical in most network libraries (8-10 volumes/sf) because of the use of mobile compact shelving and higher storage levels (10 in the centers versus 6 or 7 in libraries). Third, storage of books in random sequence versus storage of books in dedicated slot title number sequence, facilitated by the proposed ADP system and bar code scanning equipment, will be 15%-to-20% more efficient than in current operations because storage space is not required for the copies that are in circulation. The pro forma storage space required for both centers is approximately 38,000 sf, while the current storage space used in network libraries and MSCs for these collections is approximately 129,000 sf.

2.3.5 More Efficient Distribution

The distribution of materials in the proposed operations would be more efficient than is currently the case for five reasons. First, the use of quick turnaround forward shelving minimizes putaway and retrieval efforts for any given activity level. Second, the use of bar code scanning features will expedite the receiving, putaway, and issuing functions. Third, the use of random storage will reduce the effort associated with putaway, as title number sequence storage would be unnecessary. Fourth, the use of bar-coded zip-codes will expedite deliveries to patrons, and returns to the centers, by expediting processing within the USPS bulk mail network. Fifth, the morning deliveries and late afternoon pick-ups by the USPS at both centers will both facilitate same day shipment of orders and early input of receipts into the system, whereas a single daily interface with the USPS cannot facilitate both of these actions.

2.3.6 New Services for Patrons

Three new services would be offered to braille patrons of the free national library program in the proposed service model. The first, and most widely used of the three, would be the DPA IVR that would allow patrons with a touchtone telephone to directly place orders for books, reserve books, request books, and query reserve status on the primary ADP system. The second feature would be a TDD service for use by deaf-blind patrons. The third service would be modem access by patrons who have computers, which would facilitate the placement of orders, reserves and requests, and the performance of queries.

2.3.7 Better Information on Readership, Circulation, and Collections

The primary ADP system in the proposed operations will be able to provide NLS with better information on braille readership, braille circulation (by collection), and braille collections than is currently the case to aid in new production planning and collection weeding. Patron demographics, subject interests, and restrictor preferences will all be contained in the primary ADP system database, and will enable the NLS to refine the new production title selection process to better mesh with expressed reader interests and preferences. Similarly, a circulation history by title will be maintained by the system, and a universal (NLS established) subject coding scheme for all titles will be included in the primary database, to aid NLS in the planning of new production, and the centers' operators and NLS in weeding operations, which will be required at some time several years after commencement of operations. Also, an accurate knowledge of book inventories, both in-house and in circulation, will be fundamentally important to any weeding operations when the time comes to execute remaindering.

2.3.8 Flexibility of Provision of RA Services and Participation

The *modus vivendi* of the proposed service model is flexible with respect to both the provision of reader advisory services and participation in the program. Current network braille libraries would have the option of participating, but would be strongly encouraged to do so;

patrons from non-participating libraries would be eligible for service from the centers in any event. Current network braille libraries would also have the option of providing reader advisory services to their patrons, or could choose to have the primary center provide this service. However, if the former is elected, the responsibility for modifying a library's ADP system to facilitate hook-up to the WAN data telecommunications link to the primary center's ADP system would be entirely incumbent upon the network library, as would be the costs for the connect time to the WAN.

2.3.9 Inventory Control of Proposed New Mailing Containers

The NLS is considering the use of a new braille mailing container which would replace the existing inventory of mailing containers. The design of the new container is superior in several respects to the existing container, and NLS has expressed a requirement that, if the new container is put into use, it should be tracked and accounted for, preferably by the use of bar-coding for unique identification of each container. If this plan comes to fruition, the proposed centers would be positioned to accomplish this by scanning a bar-code on the container along with the pick-ticket transaction bar-code in the issuing function (thus linking the container to a patron), and scanning the container bar-code in the receiving function, to attain complete inventory control of the containers.

2.3.10 Lower Costs to Free Library Program

The implementation of the proposed service model would result in lower overall costs to the national free library program, all things considered. However, depending upon the method used to fund the braille centers (both start-up costs and on-going operations costs), i.e. how costs would be shared by the network, if at all, implementation may result in higher or lower costs to the NLS itself.

Costs associated with the proposed service model can be categorized as startup costs or annual operating costs, with conversion costs being incurred both before and after the start-up of normal operations. Startup costs are associated with capital investments in facility space,

equipment of all types, the purchase or development of software, and any other investment that results in the availability of long-lived capital assets to the centers' operations, whether the assets are purchased or leased long-term. Annual operating costs are associated with any expenditures that support the deployment of resources for normal, on-going operations, which include labor, occupancy costs of all types exclusive of the basic cost for the facility space itself, telecommunications connect time, materials and supplies, support services, administrative overhead, and miscellaneous expenditures. Conversion costs are associated with the costs of: initial and continuing collection conversions, i.e. physically, into the centers' storage facilities, and electronically, into the centers' ADP systems via scanning and data entry; initial and continuing conversions of patron reader histories, subject preferences, and similar patron profile data not stored in CMLS, but obtained directly from network libraries; and, a title conversion process, whereby book and magazine information obtained from NLS, the MSCs, and possibly one or several network libraries is initially loaded into the primary ADP system.

The timing of collection and patron conversion is somewhat variable and is dependent upon the transition plan yet to be formulated. It is assumed in these cost estimates that collection and patron conversion would occur uniformly over five-year and four-year time frames, respectively; this is by no means "a given," and could occur over a different time frame.

Cost estimates for implementation of the proposed service model are shown in Appendices 2-10 through 2-13 on both a five-year "cash-flow" basis, and on an average annualized cost basis because the most expensive assets required for successful implementation have useful lives far in excess of five years. Appendices 2-10 and 2-12 are "liberal" estimates, and Appendices 2-11 and 2-13 are "conservative" estimates. Two projections are shown for each of the annualized cost calculations; one assumes that NLS has a zero cost-of-capital, and the other assumes that NLS's cost-of-capital is the rate for long-term U.S. Government debt, which is currently 7.5% per annum. The projections in Appendices 2-10 and 2-11 assume that facilities and distribution and storage equipment are purchased, and Appendices 2-12 and 2-13 assume that they are leased. A 3% annual inflation rate has been assumed for all conversion and operating costs in the five-year "liberal" projections, and a 5% annual inflation rate has

been assumed for the "conservative" projections. Below follows a listing of major cost areas, what is included in each, and any relevant assumptions made.

- Labor - Includes total salary and benefits costs for all personnel in both centers exclusive of separately enumerated conversion costs. Reader advisor and floor operations staff assumed to start at 60% of full complement in year 1 and increase to 100% by year 5, and all other staff at full complement throughout.

- Telecommunications - Includes costs for voice and data communications hardware and software, that are to be borne by the centers, including the network link and FAX machine purchase and installation. Seven-year life assumed. Liberal estimate assumes 20% callbacks by RAs, conservative estimate 60%. Variable portions of costs phased in 20% per year over 5 years.

- Materials and Supplies - Includes all supplies for office and warehouse operations not directly borne by NLS.

- Hardware Maintenance - Includes all maintenance costs for computer hardware. Conservative estimates considerably more than liberal estimates.

- Administrative Overhead - It was assumed that administrative overhead for the centers' operations would be provided by an external entity, specifically the parent or administrating organization of the successful bidder. This cost was estimated as 10% of the total labor cost for the conservative estimates, and 5% for the liberal estimates.

- Software Maintenance - Includes all maintenance costs for all software. Liberal estimate a baseline, conservative estimate assumes annual costs are 20% of first costs.

- Occupancy - Includes all utilities and city services, maintenance and repairs to facilities and mobile shelving, and custodial and security services. Liberal estimate assumes $1.85/sf/year and conservative estimate $2/sf/year.

- Miscellaneous - Includes photocopy machine rental and servicing, and other, non-specified costs borne by centers.

- Conversion, Collection - Includes costs for conversion of existing collections to centralized system. This investment is amortized over 30 years for annualized cost calculation, and is assumed to occur over 5 years. Conservative estimate 10% higher than liberal estimate.

- Conversion, Patron Data - Includes costs for conversion of patron data to centralized system, excluding patron surveys by RAs which is accounted for in normal labor costs. This investment is amortized over 30 years for annualized

cost calculation, and is assumed to occur over four years. Conservative estimate 20% higher than liberal estimate.

- Conversion, Title Data - Includes costs for conversion of book and magazine title data to centralized system. This investment is amortized over 30 years for annualized cost calculation, and is assumed to occur in year 1 (future title conversions part of normal labor requirements). Conservative estimate 20% higher than liberal estimate.

- Facilities - Includes all costs associated with initial construction and site preparation, or leasing. If leased, annual cost is estimated at 10% of first costs. If owned, annual cost is estimated by 30-year amortization.

- Storage and Distribution Equipment - Includes all costs for mobile shelving, tables, shelf carts, ladder carts, and pallet jacks, owned or leased. If leased, annual cost is estimated at 10% of first costs. If owned, annual cost is estimated by 30-year amortization.

- ADP Hardware - Includes all costs for computers and peripherals, 7-year life assumed. Conservative estimate 10% higher than liberal estimate.

- ADP Software - Includes all costs for software exclusive of network software, including installation and training, 7-year life assumed. Conservative estimate 10% higher than liberal estimate.

- Office Equipment - Includes all costs associated with purchased office area equipment exclusive of ADP and telecommunications systems, 20-year life assumed. Conservative estimate 10% higher than liberal estimate.

The costs shown in Appendices 2-10 through 2-13 should be contrasted with the estimated total costs for network braille operations in FY89, which was approximately $3,154,000 per year incurred by network libraries, and $173,000 per year incurred by NLS for MSC provided braille services. The pro forma costs for the implementation of centralized braille services assume 100% of reader advisory services are centrally provided, and 100% of the network braille libraries participate in the program. The significant net cost savings resulting from implementation would occur for essentially three reasons; (1) the use of facility space with much lower average unit costs than the status quo, (2) economies of scale in the distribution and storage functions, and (3) streamlined distribution and storage operations employing comprehensive ADP support, optimal facility layout, and modern operating techniques.

2.4 TRANSITION TO PROPOSED OPERATIONS

The transition from current decentralized braille services to the proposed centralized service model would occur in five basic phases, some of which are overlapping to some degree, and others which must be performed after a prior phase is completed. The paragraphs below outline the major steps to be taken in the transition in the approximate order that they would occur. The details of the transition plan are to be developed in the next phase of the study.

2.4.1 Development and Procurement of ADP Systems

The first step in the transition would be the development and procurement of all necessary ADP systems. This would include: the development and/or purchase of all necessary application software to support the braille centers' primary ADP system and subsystems, including that required for the DPA IVR and the bar-code scanning subsystem interfaces, and any LAN software required; and, the purchase of all necessary ADP system hardware, including computers, peripherals, and cabling for the primary system and subsystems, bar-code scanning equipment, and telecommunications equipment. This first step would not include training on, and installation of, the various ADP systems, but it would include testing of all software.

2.4.2 Acquisition of Facilities and Shelving

The second step in the transition plan would be the acquisition, by purchase or lease, of all necessary facilities and shelving required to support the proposed operations in both centers. This step would, in all likelihood, begin during the performance of the first step, and in fact, could conceivably begin at about the same time. The major factors involved in this implementation step are: (1) whether the facilities would be purchased and owned by NLS, or leased from another party; and, (2) whether the facilities would be existing structures which would be modified and the mobile shelving subsequently installed, or would the facilities be "built-to-order", with the shelving rails an integral part of the structure's floor. If the latter is

the case, then it would be virtually certain that the same party would have to furnish the facility and the shelving to NLS, whether purchased or leased.

2.4.3 Initial Set-up of Operations

The third step in the transition plan would be the initial set-up of operations at both centers, and could not begin until all ADP systems are developed and/or procured, and all facility space, with installed shelving, is made available to the operators of the centers. This step would consist of: the installation and testing of all ADP systems in both facilities; the training of operations personnel in the use of the ADP systems; the labeling of all shelf positions in both facilities with bar-code labels; initial collection conversions, which would probably consist of all the MSC braille collections; the conversion of title data to the primary ADP system; and, initial patron data conversion, which would probably consist of an initial download of basic patron data from CMLS (which should first be reviewed by network libraries for accuracy and completeness), but no service profile data.

2.4.4 Commence Operations

The fourth step in the transition plan would be the commencement of normal operations with the conversion of collections and patrons to centralized service at a rate that is feasible given the resources committed to effect the conversions; this step could not begin until the set-up step is completed. With basic patron information already in the primary ADP system (extracted from CMLS), the conversion scheme will be for individual libraries to forward patron Has-Had data (preferably in a generic machine-readable format, and otherwise on printouts) to the centers at the same time that they forward their braille collections; patron service preference data will be obtained via direct survey/contact of patrons by the center RAs. In this manner, the collections in the centers will grow at a rate capable of supporting a readership that is also growing. New production would continue to be furnished to network braille libraries until their turn came for conversion, at which time that share of the new production would be shipped to the centers instead. After several years of circulation histories,

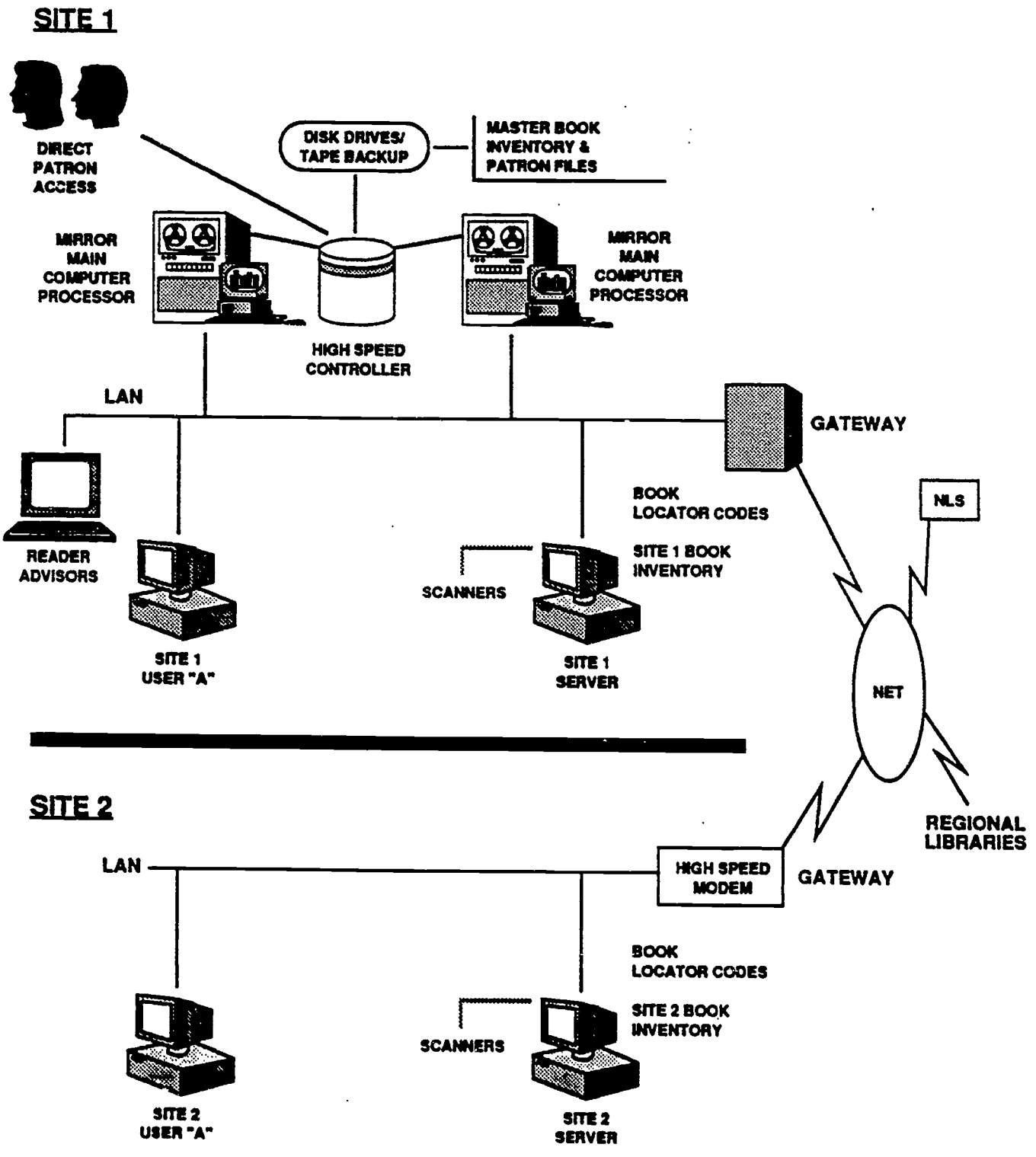
by title, are developed for the various collections, NLS would also begin to participate with the centers in weeding decisions.

2.4.5 Monitor and Modify Operations

The fifth and final step of transition will be to monitor the centers' operations and, if necessary, modify the operations as required. NLS will have the primary responsibility of monitoring the operations, and would both be provided with various management reports from the centers' operators for this purpose, and would also make periodic site visits to ensure contract compliance. An Advisory Committee would also be formed, consisting of network and patron representatives, which would also monitor and advise the centers' operators as required.

Exhibit 2-A

CENTRALIZED BRAILLE CONFIGURATION



SECTION 3

SPECIFICATIONS FOR ADP SYSTEMS

Section 3

SPECIFICATIONS FOR ADP SYSTEMS

This section presents the final specifications for ADP systems required to support the centralized braille book storage and distribution system described in Section 2 and the center operations discussed in Section 5 of this report. At a minimum, Section 2 and Appendices 3-1, 3-2, and 3-3 are to be furnished to prospective offerors of ADP systems as mandatory background information; providing Section 5 as mandatory background information is also strongly recommended. Section 3 provides an overview of the system requirements, followed by eight discussion areas: general requirements, functional requirements, hardware requirements, software requirements, capacity requirements, telecommunications requirements, maintenance requirements, and financial considerations. Some areas are intentionally repetitive to ensure that all requirements are clearly understood.

3.1 SYSTEM OVERVIEW

This introduction provides background information concerning the centralized braille concept and its environment, and reemphasizes the goals concerning the implementation of the ADP system, including expectations for future growth. This section also presents the standardized language that will be used to convey the priorities of the centralized braille distribution system and provides descriptions for terms used in discussing the centralized braille ADP system. It should be noted that the functional elements of the physical operations that are to be satisfied by the ADP system have been discussed in detail throughout other sections of this report. The physical operations that need to be performed to store, ship, and receive braille books and magazines will drive the functional design of the ADP system and the data requirements. The following discussions are, therefore, more process and data oriented than functionally oriented since the subject functions have already been clearly identified in other sections of this report.

3.1.1 Background Information

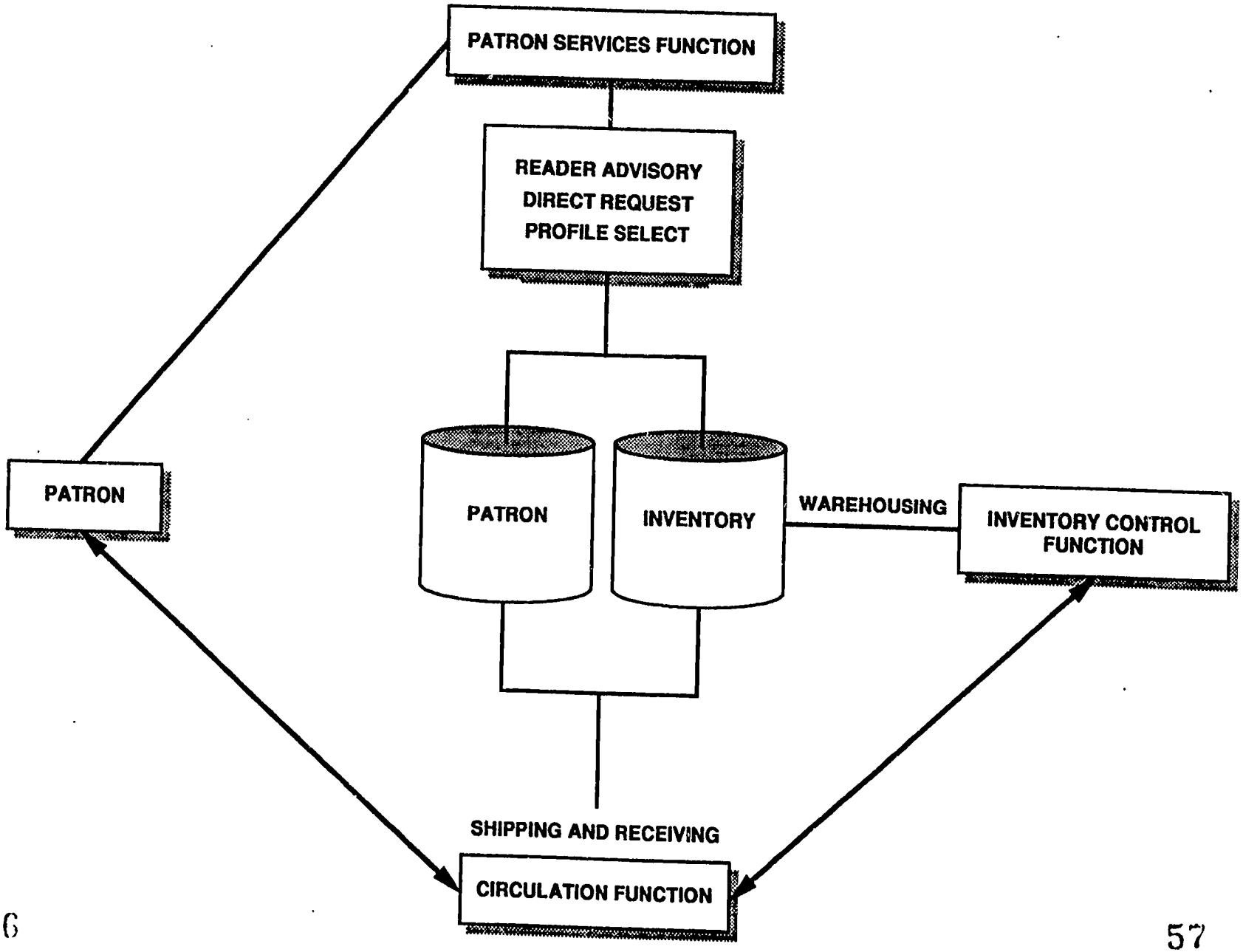
The centralized braille concept is essentially comprised of three functions: patron services, circulation, and inventory control. These functions will be accomplished by three distinct physical operations: reader advisory operations in support of patron services; shipping and receiving in support of the circulation function; and the warehousing operation in support of inventory control.

The specified automated system will support the operational areas in performing the required patron services, circulation, and inventory control functions for the NLS collection of braille books and magazines to be centralized in the two distribution centers. The system will be designed with a central ADP system (primary system) to support the reader advisory and book selection operations which will take place at the primary braille distribution center. It will also include two roughly identical subsystems to support the operations for storage, shipping, and receiving of books which will take place at both distribution centers. The subsystems will provide the capability of tracking the actual storage location of each volume in the particular distribution center. Exhibit 3-A provides a simplified view of the functions, operations, and ADP support relationships of the specified system.

The specified central ADP system will be able to provide NLS with better information on braille readership, braille circulation (by collection), and braille collections than is currently available. Patron demographics, subject interests, and restrictor preferences will be maintained in the central ADP system database. A circulation history by title will be maintained by the system, and a universal (NLS established) subject coding scheme for all titles will be included. The NLS will know, at any time, exactly how many copies and volumes of each title there are in the collections at each center, which copies are in-house or in circulation, who has which copies, and how long they have had them.

Exhibit 3-A

FUNCTIONAL CONCEPT



The storage and circulation of collections in the braille centers will be very efficient and responsive, facilitated by utilization of several types of modern storage and inventory control systems and techniques. In conjunction with both a fully automated inventory control and circulation system, and the use of Radio Frequency Data Communications (RFDC) Integrated Portable Scanning Devices (bar code scanners), a random storage method will be employed in both distribution centers, as will preferential selection of orders from forward shelving locations in close proximity to the receiving and shipping areas.

The primary purpose of the centralized ADP system is to document activities that bring about temporary and permanent change in custody or location of the braille inventory. Coupled with this capability is the requirement for the system to maintain information on patrons to facilitate the circulation function and shipping operations. The ADP system must document readership served, circulation generated, and collections housed for each center. Bar coding/scanning equipment will be employed to expedite receiving, putaway, and shipping operations. Mailing labels for the braille book containers, which are also pick tickets used in the distribution operations, will utilize bar-coded patron zip-codes and pre-printed bar-coded center address zip-codes to expedite processing of the parcels in the USPS bulk mail network, and a transaction bar code to expedite processing within the centers.

The proposed centralized braille concept provides for professional reader advisor (RA) staff at the primary braille distribution center. Patron services for braille books would be provided by the center, but this does not preclude RA services from being provided by regional libraries. The RAs, in performing the patron services function, will require full automation support in order to respond to a patron's request for service. Patrons will be able to call the primary center RAs (via 800 telephone lines) and be provided with essentially the same level of service now being provided by the RAs at the regional libraries. The essential differences are: patrons will continue to be registered by the network libraries, not by the primary distribution center, with the patron registrations forwarded from the network libraries to the center using CMLS; and the profile-select circulation function, performed by the center, will have access to braille book Has Had data, but not to any recorded book Has Had data (servicing patrons for recorded books requests will be maintained by the network libraries).

An automated interactive voice response (IVR) capability will be provided by the primary distribution center as a capability of the patron services function, to permit circulation services to include direct patron ordering of books and obtaining book reserve, request and availability information. Patrons will call the center (via 800 telephone lines) to access the IVR unit from their touch-tone telephones. Regional libraries will also have access to the primary system by means of an error-checking (Asynchronous) 2400 or 9600 baud modem, communications protocol software, and a Wide Area Network (WAN). Patrons will also be able to access the system via modem to place orders, place reserves and requests on the system, and query order status.

The following major activities will be supported by the specified centralized ADP system:

- Creating patron files initially from the CMLS database;
- Updating patron files (basic information from CMLS, and service oriented information from libraries and patrons);
- Tracking reader preferences;
- Tracking patron activity to include the book titles the patron has now and which books they have had in the past;
- Placing specific orders;
- Placing orders for available books, adding titles to a request list, adding titles to a reserve list, and querying request and reserve status on the central ADP system by patrons using DPA-IVR;
- Selecting reading materials automatically based on patron preferences, patron histories, and book availability;
- Preferential screening of book location for order filling;
- Creating and updating inventory records;
- Creating and updating book and magazine title records;
- Reconciling inventory records;

- Tracking inventory stored in random location within the distribution centers;
- Tracking inventory location when shipped to patrons;
- Tracking inactive inventory;
- Recording shipments;
- Recording receipts;
- Generating correspondence, such as notification letters and follow-up mailings to patrons with overdue books;
- Generating statistical and management reports regarding center workload, service activity, and performance to assist in decision making (e.g. production control, weeding of the collection);
- Collecting data on braille readership, circulation, and collections;
- Generating pick-ticket/mailing address labels;
- Outputting several types of labels and documents such as special shipping labels and bar codes; and,
- Providing on-line Help.

The proposed configuration of the centralized ADP system is presented in Exhibit 2-A of this report. The system data processing requirements can be divided into three categories, all of which must be able to operate simultaneously. These are:

- Transaction Applications - Transaction processing will provide the RAs and other users at a terminal workstation, and will provide patrons via the DPA-IVR and modem, access to the centralized database either for querying data, or for modifying the contents of the database (dependent upon access privileges). Transaction processing will be interactive in that every input transaction will be followed by an output message to the terminal, or a voice response to a patron. The message will contain either an answer or a validated update response. These transaction applications may include, but not be limited to: requesting a book, looking up a title, or changing a patron's address.
- Remote/Local Batch Processing - This category consists of pre-defined run streams invoked from user terminals at local (or remote) sites. This capability will permit the user to start a batch job from the interactive mode of processing.

Once a job is entered, background batch processes are executed and the job is completed accordingly. This facility is used by the centers' operations staff for performing pick-ticket runs for the primary and secondary facilities, and retrieving data from the communication services.

- Communication Services - The system requirements for communication services include inter and intra-facility communications, a telecommunications data link to allow access by network libraries that choose to provide reader advisory services and patrons accessing the system by modem, IVR access by patrons, and an interface to CMLS.

3.1.2 Application Overview

To illustrate the basic concepts of the envisioned application and to provide context to the detailed specifications, the following overview is provided. The overview demonstrates how the physical operations are intended to interface with the information processes and ADP system by showing both the information flow from the ADP system required to perform the physical operations and the information generated from the physical operations to be stored in the ADP system. This broad-brush illustration should demonstrate to the reader the fundamental purpose and use of the ADP system specified herein. The overview is organized around the three operational categories previously presented (Shipping/Receiving, Reader Advisory, and Warehousing) and concerns normal daily operations following transition to full functionality.

Shipping and Receiving

The shipping and receiving process is comprised of five fundamental steps:

- o receiving volumes returned by patrons and concurrently stocking forward shelves,
- o order filling run and pick ticket printing,
- o picking from forward shelves and packing both forward and stack picked volumes,

- o scanning, and
- o confirming and shipping.

As illustrated in Exhibit 3-B, and as discussed below, the ADP system plays an integral part in the execution of these five steps.

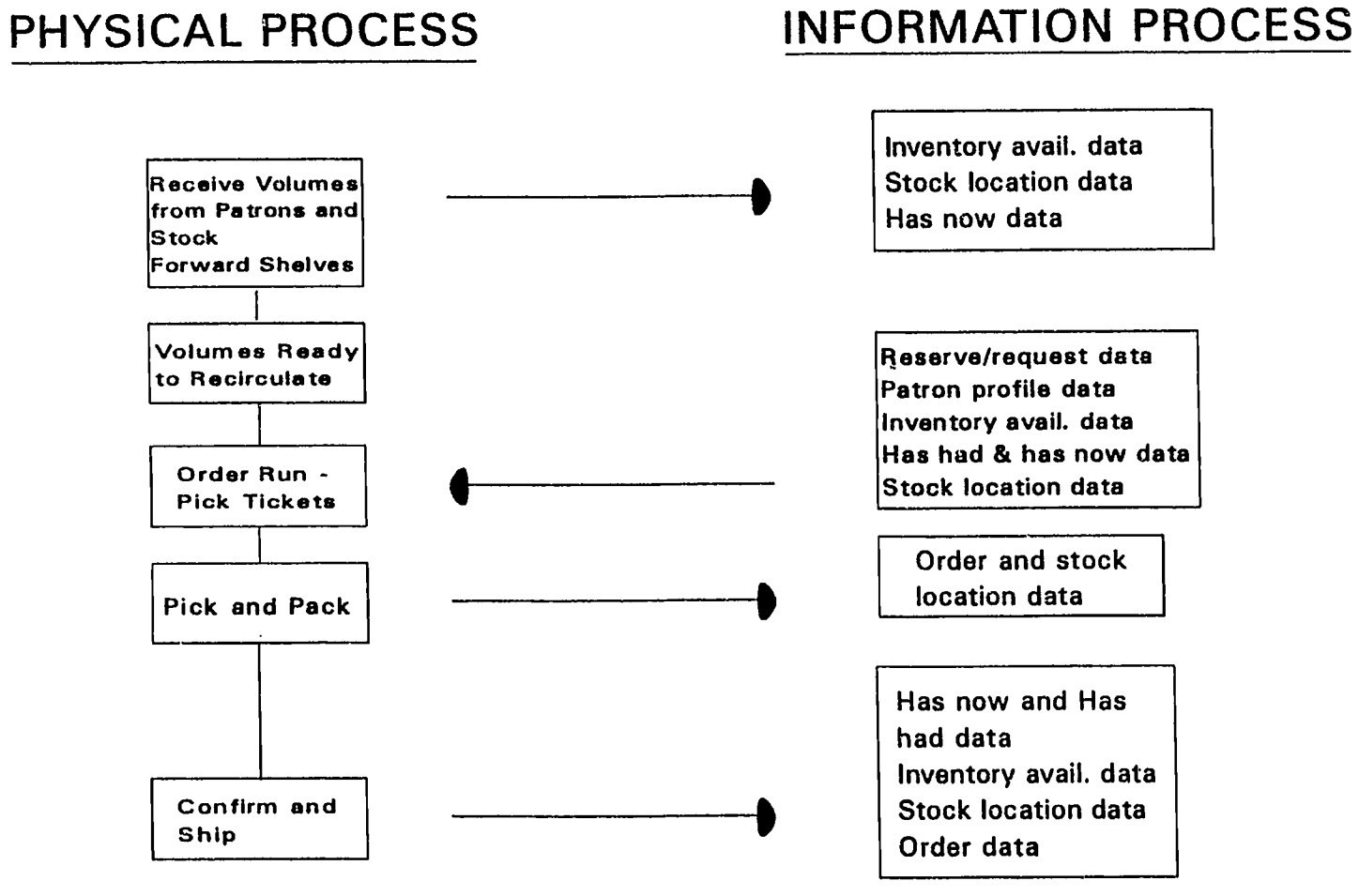
When a distribution center receives the returned volumes from the patrons, the volumes are removed from the mailing containers and placed en masse on the forward shelves and then the bar codes on the volumes, the bar codes on the shelves, and the bar codes on the mailing containers are scanned. The information generated in the scanning process updates information in the ADP system to incrementally increase the centers' inventory data of books and containers and to indicate the physical location of the volumes the center has. Importantly, the receiving process will also create information that is to be used to update patron Has Now data. Has Now data will be updated to indicate that the patron no longer is in possession of the volume.

Once the volume is processed through the receiving function, it will need to be re-shelved if not reissued within several days. A forward stock location is provided so as to provide a quick turnaround capability and all newly acquired receipts are stocked therein. This location, as well as all other locations, will be bar coded for inventory control purposes. When a volume is restocked, the bar code on the volume and the bar code on the shelf location are both to be scanned so that the stock location data in the ADP system is up-to-date and accurate. At this point, the volumes are ready to recirculate.

There will be three order filling runs each day as described elsewhere in the specification. The ADP system plays a significant role in the order filling process by accumulating demand against resources, by using priorities to allocate titles among competing demands, by using inventory data to identify what orders can be filled, and so on.

Exhibit 3-B

SHIPPING AND RECEIVING OPERATIONS



On an ongoing basis, the primary center will be accumulating book reserve and request data. This data is generated from patron demand for specific titles and is forwarded to the center in formats described elsewhere. Reserve and request data is input into the system and is used for the first order filling run each day. The ADP system should possibly be designed so that at the time the system identifies that a reserve or request can be satisfied for a particular patron, the system updates patron Has Had data... this would prevent the same title from being selected for the patron during the Profile Select process to be performed later that day.

The ADP system will use patron profile data as part of the Profile Select process in which patron reading preferences are used to automatically select and ship books to the patrons. The ADP system will use Has Had and Has Now data in the Profile Select process. Has Had and Has Now data are extremely important because the Profile Select capability must not send books to patrons that they have already read, or are currently reading.

The ADP systems will provide stock location data for the order run process. The systems will use this data to facilitate the order filling operation by printing pick tickets in order picking sequence. The location data will also be printed on the pick ticket so that the picker can find the volume in the stacks.

Next comes the pick and pack operation. This is essentially a physical operation with no input from the ADP system, and with little output to the ADP system. The exception is that the picker will scan the first and last pick tickets in the batch of 100 to provide control over the batch. This order data is resident in the ADP system until the entire batch is confirmed for shipment in the next and last shipping and receiving step.

During the confirm and ship step, a number of data outputs to the ADP system are generated. Has Now and Has Had allocated data records are updated via screening against confirmed shipments, inventory availability data is updated to show that the stock is no longer in the center, stock location data is updated to show that the volume has left the building, and standing order data are screened against confirmed shipments to ensure that all orders have been satisfied.

Reader Advisory Operations

The Reader Advisory operation is comprised of six basic processes that are primarily patron and book oriented. The six processes are:

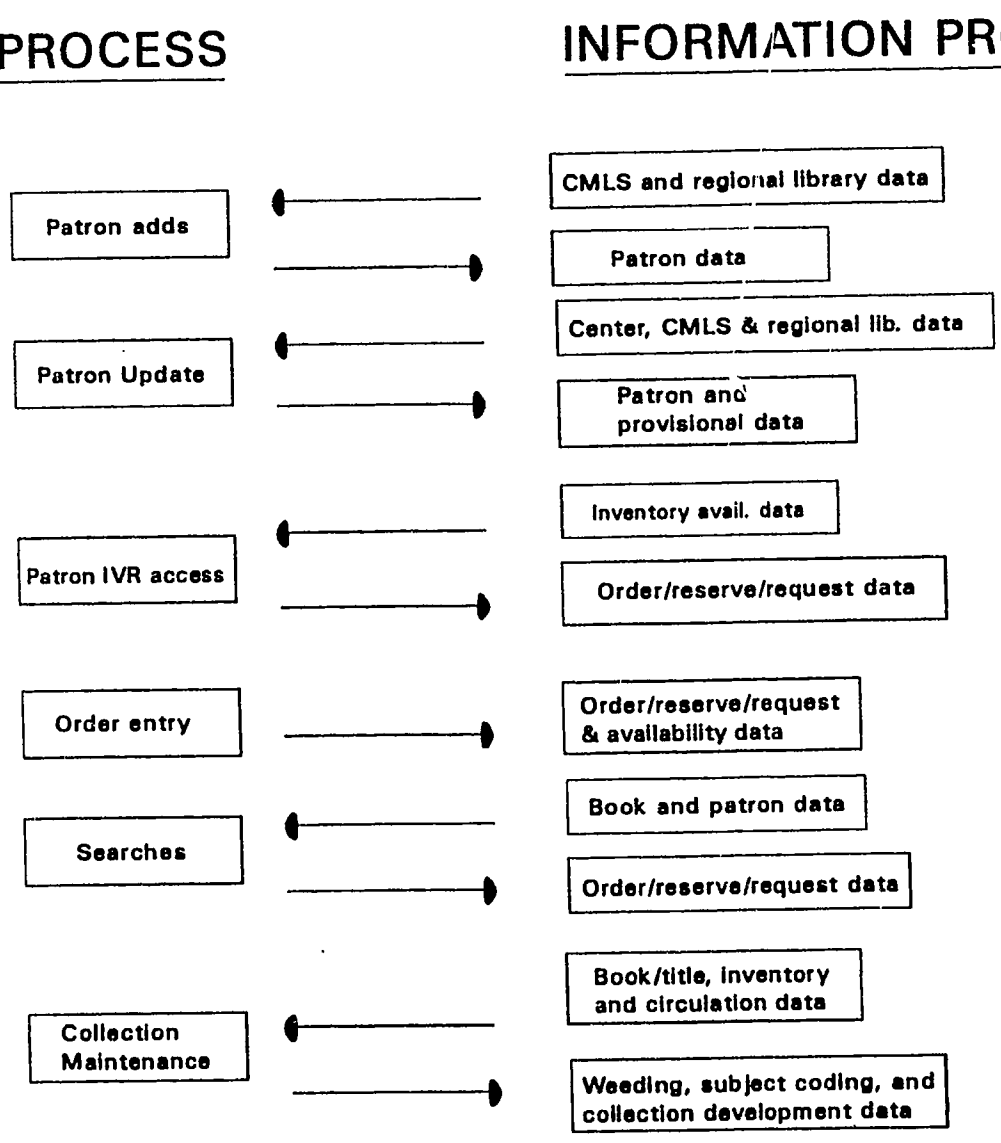
- o Patron adds - Creation of patron files,
- o Patron updates - Revisions of patron files,
- o Patron DPA-IVR and modem access - Direct access by patrons to book availability and book ordering,
- o Order entry - RA or clerical entry of orders,
- o Queries and searches, and
- o Collection maintenance.

The Reader Advisors, located at the primary center, will be intimately involved with the ADP system in the performance of their work, as illustrated in Exhibit 3-C.

Adding a person to the list of eligible patrons requires that the information be provided by CMLS and the regional libraries. Under the contemplated mode of operation, all patrons will be required to register for all NLS related services at the regional libraries. Registration data will be accumulated in CMLS, which will be interfaced with the primary center ADP system for the one-way transmission of patron data. The output of this patron add process will be the establishment of basic patron data at the center.

Updates to patron data will be generated by the center, by CMLS, and by the regional libraries. Examples of the types of updates to expect include reader preferences changes and adds, changes of address, and termination of services. The center will be capable of outputting provisional changes of address (changes communicated directly to the center by the patron) that will become permanent once confirmed by the regional libraries.

Exhibit 3-C
READER ADVISORY OPERATIONS



The centers have been designed to provide a full range of services to the patrons, with two examples of this being the provision of DPA-IVR and modem access. When a patron accesses the center using these capabilities, the ADP system will provide the patron inventory availability data with which the patron can make an order/reserve/request decision. The patron will interface with the ADP system and will be able to order, request, and/or reserve books through this capability. This patron input becomes part of the order run process.

Two primary Reader Advisor functions will be to place orders/requests/reserves into the system and to conduct queries and searches. The primary center will receive several types of hardcopy orders from patrons and non-participating libraries through FAX and mail. These orders will be entered into the ADP system by clerical staff on an ongoing basis and the system will accumulate them for the order run. Additionally, telephone orders will need to be input into the system by RAs. The ADP system will also support the RAs' searches and queries of book and patron data. Book data will include elements such as title, author, and subject. The RAs may input orders/requests/reserves into the ADP system as a result of these searches.

Collection maintenance will be another important area of concern to the RAs. The ADP system will support their efforts by providing book, inventory, and circulation data. This data will help the RAs decide whether copies can be weeded from the collections and how books should be subject coded, and can also help frame collection development inputs to NLS.

Warehouse Operations

The third and final operational area is warehousing. Within the warehousing operational area there are five discrete tasks that will be performed, which are:

- Stock new items,
- Weed,
- Relocate volumes within the stacks,

- o Pick books from stack area, and
- o Control inventory.

How the ADP system will support these five tasks is generally discussed below, and is graphically depicted in Exhibit 3-D.

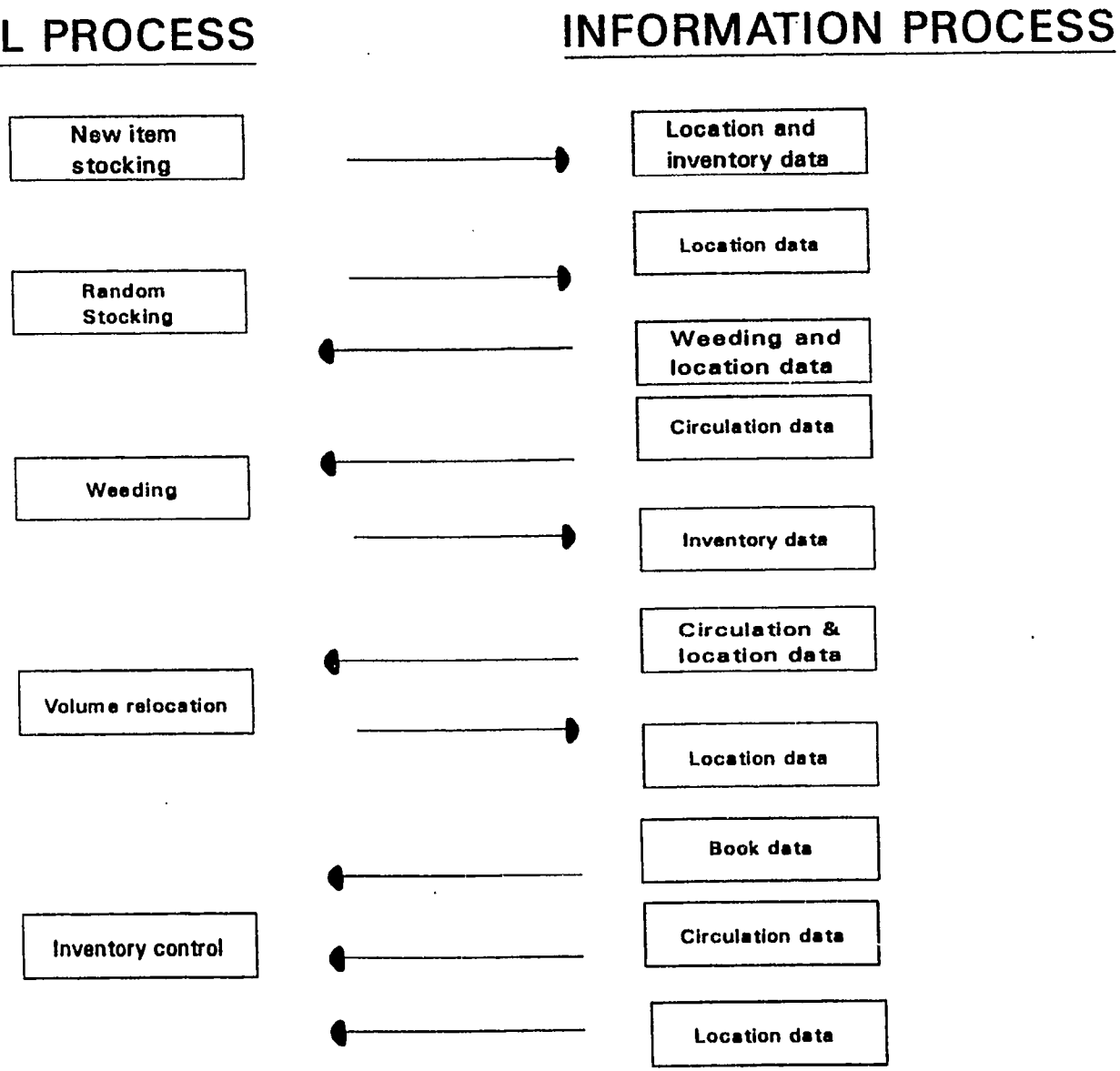
Based on production history it is anticipated that, on average, the centers will receive slightly over one new braille title per day. This new inventory will be processed into the system as a new item entry. Each volume of each copy for each new title will be entered as an item of inventory to be controlled, and each volume will have a unique bar code number applied to both its spine and inside cover. The data outputs from the new item receipt process will include inventory data and stock location data.

Warehouse personnel will not be making weeding decisions, which will be left up to the RAs. However, the circulation data provided by the ADP system to the RAs will support the weeding process by identifying slow movers. The RAs will use this data to direct the warehouse staff to weed volumes from the stacks. When the weeding is accomplished, there will be entries made by the warehouse staff into the ADP system to update the inventory data.

The Warehousing Operation is responsible for the movement of book volumes, be it from the forward shelves to the stacks, or relocation within the stacks. While random stocking is not a function, *per se*, but rather a feature of the warehouse, it would not be possible to randomly stock without automated support. The warehouse personnel will provide location data to the ADP system by scanning every time a volume is placed in a stock location. In turn, the ADP system will provide stock location data to warehouse personnel when an item is to be pulled from the stacks, for whatever reason.

Exhibit 3-D

WAREHOUSING OPERATION



The warehouse staff will not require RA input to relocate volumes within the stacks. Relocation will be required to move slow movers to remote locations, and to move fast movers to more accessible positions. Circulation and location data will be provided by the ADP system to identify the volumes to move and the locations where they can be found. New location data will be entered into the ADP system once the volumes have been moved.

A central feature of the ADP system will be to support physical inventory control. Book, circulation and location data will all be provided so that the collections can be managed by the warehouse.

3.1.3 Goals

The centralized braille book storage and distribution system requires a reliable, flexible, computer-based integrated system with on-line data files and a proven ability to operate efficiently and effectively. The system must be operable by trained staff, but must not require a high level of data processing expertise on the part of the staff. The system must enable the centers to achieve the following objectives:

- Braille service equal to or better than existing braille services from other libraries;
- The ability to determine, quickly and accurately, what titles are in the collection, how many items are owned, how many copies are available, the location of items, and current status of the items;
- The ability to determine, quickly and accurately, the current status of a patron including the patron's address, telephone number, and other basic information, and patron specific service information, such as reading preferences;
- The capability to maintain a high degree of accuracy and efficiency in supporting and tracking the movement of braille reading materials throughout the NLS network;
- The ability to ship a selected braille book within one workday from the time of selection;

- o An ability to operate a fault-tolerant system which provides 24-hour, seven-days-a-week service;
- o Associate books with patrons for requests, reserves, profile select, Has Now, and Has Had; and,
- o Provide bibliographic search and retrieval services to RAs and patrons.

3.1.4 Future Growth

The specified system must have the hardware and software capacity to accommodate the complete aggregate collection of braille books and back-issue magazines, and the entire braille patron population, within the NLS network, including growth in collection size and patron population for seven years; and the transaction load represented by all current and projected services, without degradation to the system in any way. This includes transaction response time, up-time rate, and functionality. The system must be easily expandable to accommodate subfunctions such as acquisitions, administration, and on-line catalogs.

3.1.5 Language Conventions and Terms

Standardized language has been used in the following specifications to indicate the relative importance of each requirement. The word "must" or "will," or the phrase "it is required that," are used to define a mandatory specification. The word "should," or the phrase "it is desirable," should be construed as a desirable option, but not a mandatory specification.

In the text of this document, "on-line", computer-based, integrated system shall be synonymous with "system". The term "primary system" will always indicate the main processing unit at the primary distribution center, even though a subsystem will also be physically located in the same center. The word "linked" will mean that there is an interface between two or more functions whereby data will be shared or transmitted. The phrase "batch file" will indicate a series of commands used to place data in a file for transmission.

The following provides definitions for some common terms used throughout the specifications. More detailed discussion and explanation is provided within the text of this report.

Circulation:

Direct distribution service demands generated at the centers through direct patron contact with the center via telephone, BBR order forms, FAX, DPA-IVR, TDD, modem, or walk-in for the placement of specific orders; reader advisors at participating regional libraries placing orders on the central ADP system via the data telecommunications link; reader advisors at non-participating libraries forwarding ILL requests for special collection circulation; and profile select circulation executed on the central ADP system at the primary center.

Patrons:

Classified as either individuals or institutions who register with a network library and are eligible for the service.

Primary Center:

One of the two centers (TBD) will be designated as the primary center, and will house the central ADP system containing the inventory data for both centers and all patron data. The primary center will also provide all reader advisory services offered by the centralized service model; all patron contact with the primary center will be either direct, or indirect via network libraries. Floor operations will utilize a subsystem, subservient to the central ADP system, which contains locator records for the inventory currently stored in the primary center. This subsystem will be directly connected to the central ADP system via a LAN.

Secondary Center:

Strictly a distribution center for the storage and distribution of materials. Floor operations will utilize a subsystem, subservient to the central ADP system, which contains locator records for the inventory currently stored at the

secondary center. This subsystem will connect via modem with the central ADP system at the Primary Center.

Central ADP System also referred to as Primary System:

Housed at the Primary Center. All shipments will be initiated through the central ADP System. A permanent record of each bar coded volume will reside in the central ADP System, and each volume will be charged to a "patron-of-record", be it a patron, one of the two centers, or a network library. The primary system will track both volumes in circulation, and volumes stored in the centers, so that the custody of all volumes and how long the volumes have been in custody are accounted for at all times. The Central ADP system will also contain all patron related information.

ADP Subsystem:

Shipping and receiving entries will be accumulated in the subsystems' working files and each transmitted to the central ADP System once each day. The subsystem at each distribution center will also contain shelf location information for all items currently stored at that center.

Has Now/Has Had:

Has Now and Has Had data are the result of a book being previously issued and accounted for. A Has Now status indicates the responsible party currently having custody of a specific book; i.e., the distribution center, a particular patron, or a network library. Has Had data indicates that a patron has previously had the book. The shipment of a volume from a distribution center will automatically charge the Has Now patron inventory file, charge the Has Had patron history file, and credit the Has Now inventory file of the center. The receipt of a volume being returned from a patron will credit the patron's Has Now file and charge the Has Now inventory file of the receiving center.

Patron Orders:

The patron will be able to select and order a book or magazine in several ways:

- o calling a reader advisor at the participating regional library;
- o calling a reader advisor at the primary central distribution center;
- o calling into the automated system directly to order a book via an interactive audio voice response (IVR) system;
- o calling into the automated system directly to order a book via a modem and a PC equipped with communications software;
- o mailing in BBR order forms; and,
- o establishing a profile for the automatic selection of books based on reader preferences.

For the day-to-day orders, if a book is available, the book will be immediately assigned to the patron, the order will be processed, and a pick ticket will be generated for the book to be pulled for shipping. If the item is not immediately available, the order may be placed on a patron's request list, or placed on a reserve list, and will then be processed on a first-come, first-served basis. There are basically four types of orders; day-to-day single orders, patron reserves, patron requests, and profile-select. The last three are defined in the following paragraphs.

Patron Reserves:

A patron reserve is a particular order status for a book that a patron wants, but was not immediately available for shipment. This status has a higher priority for shipment than books placed on a patron request list. From a book selection standpoint, patron reserves will be filled first before requests or profile-selects. The requirement for establishing a patron reserve status for a

book, vice a patron request, has been defined as a patron having an immediate need for the book and wanting the book as soon as it becomes available. The patron can reserve a book or magazine by calling an RA, by PC and modem via a direct connect to the system, or via the DPA-IVR. There will be a maximum allowable limit (25) established for the number of books a patron can place in reserve status. The patron will not be able to exceed the limit without first contacting an RA, who can override the limit by exception only.

Patron Requests:

A patron request is another order status for a book or magazine that a patron wants. This status has a lower priority for shipment than does a patron reserve. Patron orders for particular books placed on a request list will be filled second, after reserves have been filled, but before profile-selects. A patron request has been defined as a patron having a desire to read a particular book when it becomes available. The patron can place a book or magazine on his/her request list by calling an RA, by PC and modem via a direct connect to the system, or via the DPA-IVR, or by mailing in BBR order forms. There will be no maximum allowable limit set for requests (unlimited). Patrons will be able to change a request order to a reserve order using the same means for placing a reserve order.

Profile Select:

A process used to generate book orders automatically, using the patron's pre-established reading preference profile. Based on the type of service requested by the patron, i.e. how often or when a patron wants to receive books, the system will produce orders for the patron until the number of books has reached the patron's established limit. Profile-select will be an option, whereby patrons can receive books using this method, or the process can be by-passed for a particular patron who wants to receive books only through one of the other methods, i.e. reserves and requests only.

Requests Only:

A patron-selected type of service which stipulates that books only be issued to a patron upon his/her request. This option precludes the patron from receiving books by means of Profile Select. This service can only be initiated by either an RA at the Primary Center, or an RA at a regional library at the request of the patron.

Turnaround Service:

A patron-selected type of service which determines how often or when a patron will receive service, based on the number of books a patron wishes to have in his/her possession at any one time. As a patron returns books, the system will automatically generate orders to replenish the patron with books, therefore bringing the number of books in their possession back to the established level.

Calendar Service:

A patron-selected type of service that generates an order for a patron every "x" number of days (such as every ten days) or on a particular day of the month (such as the 10th day of the month). This service can only be initiated by either an RA at the Primary Center, or an RA at a regional library, at the request of the patron.

3.2 FUNCTIONAL SPECIFICATIONS

This section of the report presents the functional specifications for the centralized braille distribution system and describes what the system is expected to do. This section is divided into three main areas: General Requirements, Specific Requirements, and Management Reports. The General Requirements section provides an overview of the requirements to support the development of the centralized braille distribution system. The Specific Requirements section defines each process or capability required, and specifies what will, or should, be accomplished in order to meet the system requirements. The final section provides information for developing and producing the required management reports.

3.2.1 General Requirements

This section identifies overall requirements which are indirect and overarching in nature, yet play an important role in the success of the proposed system. This general area includes the user interface, supporting documentation, follow-on maintenance and support, the level of training required, and the requirement for data back-up. Also provided is a summary of the general capabilities required to support this automation effort and the three operational areas accomplishing the outlined functions.

User Friendly

The RAs must be able to access data within the time frame of a short phone call (3-5 minutes) and be able to update the databases quickly and accurately. Remote users should be able to connect to the system using simple, logical log-on procedures within as short a time as possible. Dial-up technology currently (1993) would require 60-90 seconds to connect with the system's main menu. Future network enhancements should be pursued to lower connect time to the 15-30 second range. The software needs to have an intuitive user interface that provides the user with clearly defined menus that are uncomplicated to follow and have related functions grouped together, and that are accessible to the user. NLS has directed that the system user interface parallel that of existing library programs such as; READS, DRA, Consortium, etc. It is envisioned that the system will employ a menu screen approach. These menus must be simple in design and be comprehensible by non-computer-literate users. Menus must also be accessible to all employees via adaptive devices, if required.

Detailed Documentation

Both the hardware and software selected for this centralized system will be well documented. At a minimum, software documentation will include a comprehensive User Manual, and a detailed Operations Manual. The hardware documentation will be easy to comprehend and provide detailed instructions for troubleshooting the components and system as a whole.

Maintenance/User Support

Based on the hardware and software selected, each center will be provided strong systems maintenance and user support, with priority given to support of the primary system. From a hardware viewpoint, the systems vendors must provide maintenance support on-site at both centers. The software vendors will provide user hotline support, with costs based on use.

Training

Training will be provided for every part of the system so as to eliminate or reduce vendor dependency. Training programs offered will be provided on-site at the centers, or alternatively at the vendor's location, and will be designed for the non-computer-literate user.

Data Backup Capability

Data redundancy and backup is required for this centralized approach, and as such, the system must have a set schedule for backing up data on the primary system and subsystems. The schedule for backing up data on the primary and sub-systems will be established in such a manner that it will not interfere with service to the patrons and network libraries.

Patron Services Function

The following provides discussion for general capabilities required to accomplish the patron services function, in support of the reader advisory operations.

Patron Information Capability

The system must be designed to permit the user, with the proper security access, easy entry into the patron database from both the central site and the regional libraries. Menu options will be constructed to provide a clear path for users to query the files on specific information, such as patron point of contact, subject interests, etc. Updates to the patron file

will be able to be accomplished by a regional library or the center. This capability will be as easy to execute from a remote site (via modem) as it is for a local user, and all communication connectivity will be invisible to the user.

Direct Patron Access Capability

There will be a capability whereby the patron can order a book via a touchtone telephone. This function will be performed using a direct patron access interactive audio voice response (DPA-IVR) system. The IVR system must provide the ability to query the databases, search the data files for the correct answer to the patron's request, translate this data into a digitized form, and generate an audible reply back to the patron. The selection formats provided by the system must be simple in nature, and consist of no more than three alternatives per question. Ordering a book via this process will generate an inventory transaction and pick ticket like any other circulation transaction, provided the patron has not exceeded quota. The process will also include a tracking and reporting capability for the number of calls processed, length of calls, number of requests filled, etc., for management control purposes.

Profile Select Circulation Capability

The profile select circulation capability will automatically select braille books for shipment to patrons based on a predetermined reader profile, patron history, and book availability. This will provide an option that allows the user to specify whether or not the patron wants this service, and how often books would be selected for a patron (weekly, monthly, etc.). This capability will select books using a systematic approach. Initially, the system will identify those patrons on profile select, how often they want the service, and whether they have met their quota of books. Profile select will then select titles for the patron based on the previously established reader profile and available inventory; titles that the patron has had or now has would be eliminated from consideration. Particular books, or a range of books (e.g. BR1234 - BR1238), will be excluded from being selected through profile select for a variety of reasons. Otherwise, if a book is available, the system will automatically generate a pick ticket.

Request and Reserve Capability

The system must be designed to accommodate patron orders placed on hold, i.e., a mechanism which will store orders that cannot be fulfilled immediately by the center. There are two types of on-hold orders which differ depending upon the urgency with which the materials are required by the patrons. The most common type is a "request", which is an order for books of average priority. The patron request list will be unlimited in terms of how many books may be placed on the list. The second type is a "reserve", which is an order of high priority. Reserves must have priority over requests, even if a request was placed prior to the placement of a reserve order. The patron reserve list will accept as large a list as possible (estimated 25 books), given operational considerations.

Has Had Capability

In support of the patron services function, the system will track the braille books a patron has previously read and provide the capability to query this information by specific title and/or book number range. This file's record contents will consist of, at a minimum, the patron ID, title ID, and date issued. Hardcopy reports, or on-line listings, will be available to the user upon request, and will also be automatically system generated.

Circulation Function

The following provides discussion for general capabilities required to accomplish the circulation function in support of the shipping and receiving operation.

Book/Magazine Availability Information Capability

In support of both the circulation and patron services functions, accessibility to book/magazine availability information will be controlled, yet will be simple to accomplish for the authorized user. As with patron information availability, menu options will be designed to supply users with an unobstructed query path for accessing specific data, such as number

of copies owned, number on hand (regardless of location, primary or secondary), number of reserves or requests open/closed against a particular book, etc.

Patrons will be able to order books via a telephone direct connect using an interactive audio voice response system (DPA IVR). This system will have the capability to process four telephone calls at one time. The interactive system will provide voice responses to query/input initiated by the patron via a touchtone phone.

Conventional Circulation Capability

The system must support book and back-issue magazine circulation and control functions. Circulation procedures will be initiated by selecting the appropriate menu option which would empower the user either to obtain specific information such as book availability or abstract details, or to initiate an order transaction to include shipment of a book or placement of a request or reserve order. This circulation capability will automatically credit the inventory record and debit the patron file, and vice versa, when an order transaction is initiated.

Inventory Control Function

The following provides a discussion of general capabilities required to accomplish the inventory control function and support the warehousing operation.

Has Now Capability

In support of the inventory control function, the system will keep track of what titles/volumes, and specific items, patrons currently have in their possession. The file that supports this capability will store the unique patron identification, title identification, unique volume identification number, and date the material was sent to the patron. This operation will be able to generate hardcopy or on-line Has Now listings upon user request, and also be automatically system generated. As soon as a book is selected for shipment, the inventory

record will be flagged and the volume(s) allocated to the patron so the same volume(s) cannot be selected again. Once the volume(s) are shipped, shipping confirmation will charge the volumes to the patron as Has Now and Has Had. When the book is returned, the Has Now status will be removed from the patron book record, and the inventory record will be updated to reflect that the book is in the distribution center.

Random Book Storage

The system must have the capability to accurately track the location of braille books and magazines throughout the centers when stored in random sequence. Books and magazines will be stored in one of three locations: (1) forward (temporary) shelves, (2) stocking carts, or (3) mobile shelving, all of which will have bar code labels to identify distinct shelf slot locations. As each book or magazine is placed in a storage location, the bar code label on the book will first be scanned and then the shelf locator bar code will be scanned to establish the location of the item. The system must also be capable of printing the location of each item when producing a pick ticket, which will require matching the inventory control number of the item to the item's location. This location data will only be used for floor level operations, and will not be accessible by the RAs and patrons.

Bar Code Capability

In support of the warehousing operation, the system will incorporate a bar code scanning capability to accept input from bar code scanners, and to generate bar code printer output. The interface between the bar code scanners and the bar code system receiver/processor will be through radio frequency communication links through which receiving, order filling, and putaway functions would be performed. The ADP subsystems in each center will interface with the bar code receiver/processor. The pick ticket/address label printers must support textual printing of patron and book information, USPS bar coded zip codes (per USPS Specification for the Zip Code Bar Code Symbol, Version 9.0), and a transaction bar code which will facilitate streamlining of distribution operations.

Quick Turnaround Capability

The ADP system supporting centralized braille distribution must also support "quick turnaround" of books. Inventory in the temporary holding area (forward shelves), from which quick turnaround would be performed, would be preferentially selected over copies of the same volumes stored in the stacks, and automatically put in the picking sequence first. The system will know that books are in the forward shelves, as these shelves will have their own bar code location identifiers. This procedure would only apply within a center, e.g. books requested in the eastern region would not be selected from the western center's forward shelves unless the book is also not available in the main shelves in the eastern center. Split transactions, whereby some volumes are available in the east and some in the west, would be performed for reserve orders only, and by exception with RA intervention.

BLND Collection Capability

As a separate database, the system will house the full BLND collection to include the full MARC record. This collection will be updated on a quarterly basis, and the system will provide a utility which will accommodate a key word search and bibliographic search functions. Utilities developed for the BLND collection will provide the user with a cut and paste function which permits data to be extracted (cut) from BLND and attached (pasted) to the central braille database so that data identified in BLND would not have to be manually entered (keyed twice) into the central database. It is anticipated that BLND will be in a CD-ROM format. With this in mind, a reasonable response time must be developed taking into account multiple user access.

CMLS Capability

The system will have the capability to accept (i.e., read and extract) data from the Comprehensive Mailing List System (CMLS). This data will include, but not be limited to, patron name, address, library ID, patron/subscriber ID, handicap code, and birth year. This

data will be used to initially establish a patron "straw-man" record in the primary system database, and to update changes.

3.2.2 Specific Requirements

This section conveys the importance and priority of specific requirements. To simplify the presentation, this functional review has been divided into five areas; Patrons, Books, Magazines, Circulation, and Miscellaneous. For every area identified, there are definitions of the operations and detailed explanations of supporting activities.

3.2.2.1 Patrons

The reader advisory operation in support of the patron services function consists of five primary ADP operational procedures: Patron Adds, Updates, Circulation, Direct Patron Access, and Address Change Interface. The basic purpose of the reader advisory operation in terms of the ADP system is to collect, store and maintain patron related data and to track specific patron activities as they relate to the circulation of braille books and back issue magazines.

Patron Initial Add

Definition: A process used to initially add a patron to the primary center's database with information being provided via CMLS extracted data, regional library input, and directly from the patron. This process will be used to initially establish the center's patron file and will also be used to add new patrons as required.

The system must track patron information to include unique identification, address, handicaps, services to be provided, reading preferences, and books read or currently in the patron's possession.

a) The system will be initially populated with patron data from the regional libraries via the CMLS database to ensure that only patrons with braille interests are added to the database. Data within CMLS will be reviewed and edited by the regional libraries prior to any initial transfer. The data received from CMLS will be patron unique data to include the patron identification code (Patron ID) along with the patron's name to include any prefix or suffix. Four addresses will be tracked: permanent, the mailing address most commonly used; alternate; temporary, a short-term address which must be accompanied with a termination date; and, a provisional address which will be added by the center, defined as an interim address provided to the center directly by a patron, but requiring confirmation from regional libraries prior to updating the permanent address. The system will permit the RA to toggle between these addresses, making any one of them active at any time. The address feature will also identify the country for the address, if overseas. The system will use this address data when preparing the combination pick tickets/mailing address cards.

Other patron information to be transferred from regional libraries via CMLS will be a code representing the patron's handicap. These handicap codes will be standard identifiers as set up by NLS, and the ADP system will only accept valid handicap codes. If no handicap code is provided, the default code for this utility will be "1", which indicates that the patron is blind. To ensure database integrity, edits of the data will be performed. If an invalid handicap code is encountered when reading the CMLS data, the data will not be added to the system and an exception report will be generated and forwarded to regional library representatives for resolution.

Identification of the patron's serving library will also come from CMLS. This will be a standard four-digit code set up by NLS. A look-up table will be available in the primary system to provide the user with library identification during data retrieval should the user want to identify the library by name vice code. The search capability will allow the user to specify search criteria for state and city within county for a given library. Information to be retrieved will include the NLS code, library name, address, and phone number.

Additional information to be transferred from CMLS will be a language code to show patron preference in reading language. Only two different languages will be permitted for each patron, e.g., 1 - English and 2 - Spanish. Values for these codes will be limited to NLS approved codes. To ensure data integrity, any language code being received from CMLS which does not match the NLS approved list will not be accepted. An edit report will automatically be generated and forwarded to CMLS representatives for resolution. If no preference for language is indicated, the default for this entry in the primary system will be English only (single selection).

b) The information required to be added from a regional library or directly by surveying patrons includes a reading level, which indicates the reading comprehension of the patron; patron preferences regarding fiction, non-fiction or both; and the patron's birth year. A method to show the circulation status of the patron will also be required. This will indicate the following: "A" - Active, "P" - Pre-Suspended, or "I" - Inactive. If an invalid code is entered, a listing will appear displaying the three possible options. If no code is provided, the default for this data element will be "A" for active. The system will not select books for patrons with a code of "I" - Inactive.

Patron status information will also include two dates related to service. The initial date, First Served, will be the first time a patron was added to the center's database. The second date, Last Served, will show the last time a patron was shipped a book from the distribution center. The Last Served date will be updated by the system every time the shipping confirmation data is sent from the two subsystems to the primary system.

The regional library or patron will also provide information identifying a person to contact regarding the patron. This data will include a name, telephone number, reason to contact, and a date to show when the individual was contacted.

Profile-select data, which permits the patron to receive books automatically from the centers, will also be required if the patron selects this type of service. If profile-select is established for the patron, there will be an automated link established between the patron

services function and the circulation function. This requirement is for a fully automated capability in that the system will select books for the patron automatically based on pre-established criteria, i.e. reader subject interests and exclusion matter, and upon book availability and reader history. The patron may prefer that books be selected only by the patron, i.e., "on request only." This selection, request only, will be identified in the system, and will provide the RA with a visual reference. The system will not permit selection for both this option and for profile select; if this is attempted, the system will issue a warning message.

A patron book priority selection capability will represent a particular patron's priority in terms of receiving one book prior to another, for reserves only. The priority will be a single digit numeric code. The numerical structure will be 0-9, with 0 having the highest priority and 5 being the default. This code will be used by the automated system during the book selection process to determine which book the patron will receive. This process will only prioritize books within the patron's reserve list. Selection of books among patrons will normally be processed on a first come, first served basis.

Subject interest code information must be obtained directly from patrons. This input will be provided as a three digit subject code, set up by NLS, which will represent the reader's preference for particular subjects, e.g. history, Civil War, etc. This information will be referenced during the automatic book selection process, and by RAs when assisting in title selection. Specific requests will still be honored, regardless of the subject interest criteria.

The braille center will obtain exclusion/restriction data, to define what type of reading material the patron wishes to receive, directly from the patron. There will be four separate classes; sex, violence, language, and long. The default answer for each of these categories will be "INCLUDE". An "EXCLUDE" response to any one of these criteria will indicate that the patron does not wish to receive the material containing any one of these classes.

The regional library or patron will indicate the type of reader service the patron wishes to receive, with four possible alternatives. This function will assist in establishing a due-for-

service date. The default will be a "T", which indicates a patron request for turnaround, or recurring, service. An "N" indicates that the patron wants book service every so many days. An "N" will automatically prompt the user for a two-digit, or less, entry to indicate the desired number of days between service. A "D" will allow the user to indicate what day of the month a patron would prefer book service. Selecting this option will prompt the user to enter a number from 1 to 28. The last alternative will be an "O", which shows that the patron only wants books upon specific request. The system will automatically generate the next service date a patron should receive book service for "N" and "D" codes. This date will be based on the last date the patron received service and the type of reader service selected. This feature will have a manual override which will permit the user to change the date, if the need arises.

For each patron, the regional library will also provide the center with a reader history (Has Had) of what the patron has read, whether or not these books have been returned, and books and magazines which are outstanding requests or have been placed on a reserve list.

c) With every patron add, the braille center will be required to enter information which is either braille center specific, or controlled by the braille center. The patron address will indicate the patron's primary serving distribution center, e.g. New Jersey will be East. The system will refer to this designator when selecting books to ensure that patrons receive books from their center, unless the book is not available; then the system will check the inventory of the other distribution center. The system will automatically know the region in which that patron resides.

The maximum number of book titles a patron wishes to have checked out at any one time will be defined by the RA in conjunction with the patron, on a patron-by-patron basis. The system will automatically track the number of books that a patron has at any one time. This will determine whether a patron is currently eligible to receive additional materials. The system will always initially refer to this number when determining whether to fill a book order to ensure that the patron does not exceed the maximum limit.

There will also be a feature to indicate the number of volumes a patron wants to receive at any one time (circulation quantity) and ensure that it is not exceeded. If the RA selects more books than the set quantity shows, a warning message will be generated. An override option will, however, permit the user to exceed the specified circulation quantity.

Patron Recurring Updates

Definition: A procedure used to update or modify patron information in the center's data files. This action would only involve revision to existing data in the center's database. Changes would come from the regional libraries or internally within the center.

a) Updates to patron information that are initiated by a regional library will be provided by the library via a modem connection to the center, by mail on diskette or tape, or by sending the changes in hardcopy format, in which case the center will be required to manually enter the revisions.

b) If the center initiates the change, depending on the type of change, the system will generate an electronic mail message directed to the regional library affected by the change. An example of a modification that would generate a mail message would be the addition of a provisional address to the database. It will be the responsibility of the regional library to access their mail box, retrieve this data, and act upon it. The system will advise the regional library, upon logging onto the system, that they have mail messages in their box. Regional libraries which do not have the capability to access the system will receive updates by FAX or by mail. In either case, the system will transmit the FAX or produce the mailing automatically.

Patron Circulation

Definition: A process used to collect and compile Has Now, Has Had, request/reserve data, and book and magazine circulation statistics by

patron and by title nomenclature based on the checking-in and checking-out of books.

a) The system will automatically keep track of the books and magazines a patron has in their possession. Has Now data will be updated by the system as books and magazines are confirmed as being shipped to the patron by the shipping confirmation routine, and returned by patrons by the receiving routine. This data will be displayed by title ID, title, volume number(s), and unique item ID(s) and date checked out, in descending order, by date.

b) The system will also automatically maintain a reader history of what the patron has read and returned (Has Had). This data could be collected as books and magazines are returned to the center and verified by the receiving confirmation routine, or the Has Had data could be incremented upon shipment; this option is left up to the system developer. This data will be displayed by title ID, title, volume number(s), unique ID(s) and date returned, in ascending order, by date.

c) The system will maintain data about the books which are in request or reserve status. This data will be automatically collected as books are requested/reserved by the patron verbally, or by mailed BBR order forms, by Direct Patron Access, by modem, or by an RA. This data will be displayed by title ID, title, volume number, and date requested or reserved. This information will be listed in descending order by date and subdivided by requested or reserved. As orders are filled, the order record will carry an indicator that shows how the book was ordered, i.e., reserved, requested, profile-select, etc. This data will be retained for statistical reporting purposes.

d) The last two requirements provide for reporting of statistical data regarding a patron. This data will be system generated and will be for information purposes only (i.e. data cannot be changed on the screen, but may be printed). These listings will include circulation activity for braille books and back issue magazines and will provide information on the number of books and magazines, shown separately, that the patron currently has (Now Has), the number currently on their request list, and the number they have reserved.

The second statistical reporting option will provide cumulative circulation statistics by patron. These statistics will represent the number of books and magazines the patron has had in the current month-to-date, the number the patron had in the prior month, and the number the patron had year-to-date. The data displayed will represent a total aggregate for these areas. The system will also produce a report on patrons who have been inactive. This report will be a listing, by patron, indicating the last date the patron checked out a book.

Direct Patron Access Integrated Voice Response (DPA-IVR)

Definition: A process which permits patrons to order books via a turn-key direct patron access interactive voice response (DPA-IVR) system by use of a touch-tone telephone. This process will not execute magazine orders. It will be able to place books on a reserve list up to an NLS defined limit.

a) Although the IVR system will provide front-end entry, the system must allow controlled access to the patron options for selecting books. This access will employ a user ID and password concept. The assigning, controlling and maintaining of these user IDs and passwords will be accomplished under the DPA option, and maintained by the primary center. Linking the user ID to the patron ID will ensure that the books are being checked out to the proper patron.

b) The patron will be able to order/request/reserve books using the DPA-IVR feature. The book order routine will perform the same operation as if the query were accomplished by an RA. The system will also determine if the patron has reached their maximum allowable limit; if so, the patron will be advised to contact their RA. The routine will have the IVR ask the patron for a title ID, the response from the patron will be interpreted as if the response were keyed in, and the routine will check to determine if the title ID is a valid code. If the title ID is invalid, the patron will be allowed to re-enter the correct title ID. Once a valid title ID is received, the system will determine if the material is available. If the material is available, the routine will convey the response through the IVR to the patron, and

the IVR will ask the patron if they wish to order the book. If the patron indicates that they wish to order the item, the IVR will translate the response to the system, the book will be allocated to the patron, and an order will be initiated automatically. As with any check-out of a book, the order will become a regular transaction with the book being logged out to the patron. If the book is not available, the patron will be provided the opportunity to place the book on their request or reserve list.

If the patron does not wish to order the book, the system will ask the patron if they wish to order another book. If the response is "yes", the system will perform the same routine as discussed in the previous paragraph. If the response is "no", the system will confirm that the patron is done and will then will log the patron out. It is desirable that the system and IVR provide the capability for entering a list of books to be checked for availability instead of one at a time. If several are available, the patron may order one or more.

Activity associated with the DPA will be tracked to include: number of queries generated, by patron ID; number of books ordered as a result of the query; the number queried, but not ordered; and the number of books placed on request and reserve. The system will also maintain a time-in, time-out log to track duration of on-line activity.

Address Change Interface

Definition: A process used to accept patron address changes, send this information to libraries, update addresses via CMLS, or change the current mailing address.

a) All permanent address change requests received from patrons by the center will be automatically placed in a provisional address status. The provisional address will be forwarded to a regional library for verification and for update of CMLS. Once the provisional information has been confirmed by the regional library through CMLS, the confirmation will be transferred back to the center, where the system will accept the CMLS data and update the permanent address with the verified provisional address. The provisional address will then be

deleted from the system, but the number of permanent address changes will be tracked for workload measurement purposes.

b) There will be space for four addresses in the patron database; permanent, alternate, provisional, and temporary. There must be a function which permits the user to toggle/select between these addresses making any one of them the active address at any given time. The active address will always be used to generate the mailing label for the patron.

3.2.2.2 Books

The system will provide for four primary processes associated with Books. They are: Book Title, Copy Maintenance, Query/Order/Request/Reserves, and Profile-Select. Options will be provided that allow the user to access any of these processes. For example, book information will be retrieved by entering either the title ID, or book title, and once the data is retrieved, the user will be able to modify the record.

Book Title

Definition: A mechanism used to add or change braille book data and track the book status in the collection. The book nomenclature will be received from NLS via an electronic data transfer. There will be two add routines, initial adds and new production.

a) Initial adds will be used to establish the center's book inventory using three possible sources of book information. The first source will be the BLND collection, which will be a separate database in the center that will provide the majority of the book information being added to the inventory. If a book is received, or is expected to be received, that is not in the BLND collection, the system must obtain MSC READS information that might have this data. The system will be required to interpret a READS book record and extract data from it.

If the book still cannot be identified, the inventory clerk in the primary center will contact the regional library that sent the book to the center, possibly another braille library, or the NLS.

b) When new books are shipped to the centers, NLS will notify the centers as to the number of copies they should expect to receive. New production books will be established by using the PICs information data file. In the event that the PICs file does not contain the book record, BLND will be used as a back-up source. If both sources fail, the inventory clerk will contact NLS for direction.

c) Once the data is extracted from these sources, and a book record is established, the book information will be verified. This process will prevent a book from being issued until the book data can be verified, and the number of copies entered into the inventory.

d) The system will indicate a braille book status line. This status provides statistical data relating to the number of complete sets available for issue, by center, the number in circulation, the number in repair, the number of outstanding requests, and the number of outstanding reserves. In addition, circulation activity will be compiled for the number of books circulated month-to-date, circulated the previous month, and circulated year-to-date. As a separate option, further information will be provided which is volume/copy specific. This information will contain a description of each volume within a title to include chapters contained within a volume, number of copies in the inventory, by center, number in repair, number in circulation, and the bar code number linked to the volume/copy.

Copy Maintenance (Books)

Definition: A process used to add or change the number of braille books for a particular title/volume/copy in the inventory. As volumes are received, they will be bar coded, scanned, and key entered into the inventory subsystem with pertinent data transferred to the primary system and linked to the title.

a) The copy maintenance process will be initiated at the centers and will support the warehousing operation. As the centers receive new or existing books, the system will permit the user to key enter the title ID along with the volume number. Two bar code labels will be affixed to the copy, and the label will be scanned in conjunction with a storage location bar code. The system will acknowledge receipt of the volumes and assign a receipt date to the items. This process will continue until all volumes have been accounted for and entered into the system. The system will use this data to track the location of the volume in storage, and also establish/update the inventory.

Title IDs will be confirmed, and the number of books available will be updated to include volume/copy for that particular Title ID. A report will be generated indicating the number of copies available; if this number disagrees with the number of copies the center should have received, the inventory clerk will resolve any mis-match discrepancies with the centers, or contact NLS. Once all input is in agreement, the inventory clerk will place the volumes in an available status. This routine will not be able to be overridden, and will have to be performed in order for a volume to be placed in an available status.

b) The copy maintenance process will permit the status of volumes to be changed in the braille book inventory. An option called status will permit the user to change the availability of a book to In Repair, Lost, or Deleted. This process will take a book out of an "available for issue" status. Volumes that are placed in a status of In Repair, or Lost, will be in a temporary state accompanied by a date which will be used to track the status of these volumes. On a recurring basis, to be determined by NLS, the system will generate a listing indicating the number of volumes in this status and provide the user with the capability to update a volume's status by placing it back in the inventory, or putting it in a Delete status. Volumes placed in a Delete status will be removed from the temporary state; however, a record of the deleted volume will remain in the system for a period of time which will be determined by NLS.

Once volume status changes are confirmed, the system will update the braille books in the inventory. The update will be a hands-on operation, whereby the inventory clerk will

process each title ID individually to ensure the accuracy of changes. As all records are updated, a report will be generated indicating the number of changes made, by title ID. The inventory clerk will verify this data by matching the printout against what the system indicates has changed. Once all input is in agreement, the user will be given the opportunity to place the volume in its new status. This procedure will be mandatory, and will have to be performed in order for a volume's status to be changed or updated.

Query/Order/Request/Reserve (Books)

Definition: A process used to query the inventory based on title ID, title or author. This capability will also support the order, request, or reserve of braille books from the center via the primary system.

a) The query process will permit the user to determine if a particular book is carried by the center, and to establish if the book is available for issue. This process will include entering of the title ID for the system to determine if the book is available. The query capability will also include data searches to be performed using an alternate key search for book by title ID, title, or author. This process will produce a response based on an exact match or partial key match.

b) The order process will permit the user to order a book for a patron if the item is currently available for check-out. The user must be able to order a book which has been identified by either a query action, or specifically by a patron/reader advisor. Books that are considered "series books" will be issued in order, unless otherwise requested. Before any book can be placed on order, the system will advise the user if the patron has had this book in the past, and if so, when. It will also provide warning messages should the book ordered conflict with the patron's profile (e.g. book has violence and patron did not want books with violence); however, these messages will be able to be overridden should the patron wish to receive the book regardless of the profile. Lastly, the system will also warn the user if the order will put the patron over their maximum limit. The system will then automatically fill the order, without intervention from the user, change the specific copies selected from an available status to an

allocated status, and place an indicator on the record to show what type of order was used, i.e. reserve, request, profile-select, etc. The system will then gather pertinent information to be produced on the pick ticket, i.e. mailing address, volume number, transaction bar code, etc. The system must also generate a zip code bar code for the mailing address.

c) The request process will permit the user, either RA or patron, to place a book on request status if the item is not immediately available for check-out, or the patron has met their allowable limit. Before the book is placed on the request list, the system will advise the user if the patron has had the book, and if so, when. It will also check to see if the book is already on their request list. The system will provide warning messages should the book ordered conflict with the patron's profile (e.g. book has violence and patron did not want books with violence); however, these messages will be able to be overridden should the patron wish to receive the book regardless of the profile. The user will be permitted to enter an expiration date at the time of the request action. If the date is left blank, the order will remain indefinitely on the system, unless manually removed. The system will automatically fill these requests as the books become available without intervention from the user. The system will tag each book record with a flag indicating that the book was ordered using the patron's request list. In checking out the item, the system will perform the same processes as with an order.

d) The reserve process will permit the user, patron or RA, to place a book in a reserve status if the patron has an urgent need for the item and it is not immediately available for check-out. Before any book is placed on a patron's reserve list, the system will advise the user if the patron has had the book before, if it is currently on the reserve list, or if the patron has reserved it in the past, and if so, when. The system must be able to tell the user how many patrons currently have that particular book on reserve and where the patron is in the queue for receiving the book. The system will automatically fill these reserves without intervention from the user. The system will tag each book record with a flag indicating that the book was ordered using the patron's reserve list. In checking out the item, the system will perform the same processes as with an order.

e) Rush delivery of books for patron orders and patron pickups/walk-ins will be accommodated by exception. The system will provide for special orders whereby the RAs will be permitted to apply special transaction codes. Once the order is activated, a special operation will send the order directly to the appropriate distribution center. The pick ticket will be generated, and the order will be filled and shipped, or handed to a walk-in patron.

f) Special delivery of books for legitimate patron orders not utilizing standard USPS delivery will be accommodated by exception. The system will provide for special orders whereby the RAs will be permitted to apply special transaction codes to the order to specify the carrier and type of service to be used. These codes will be obtained from an approved routing guide prepared by the primary distribution center. Once the order is activated, these transactions will be processed and forwarded to the distribution centers with the other orders.

Profile Select

Definition: A procedure used to produce book orders automatically, using the individual's reading preferences pre-established under the patron function. This will be a fully automated process requiring no user intervention at this level, only at the patron function level. A book or range of books which experience a high rate of demand will be marked by the system, and will be exempt from being selected by profile select until demand subsides. Also, series books will be issued in order.

a) Profile-Select will allow the user to specify that a patron wishes the system to select books automatically for the patron on a recurring basis. Profile-select is activated only after all reserves, requests, and day-to-day orders have been filled. The system will check to determine if the patron has reached their maximum allowable limit; if so, the system will establish a new service date and eliminate the patron from the current process. Once the system determines that the patron should be receiving new books, the system will determine how many books will be selected based on a pre-established maximum. If, by filling the order, the patron will exceed their maximum allowable limit, the system will automatically adjust the

number selected to meet the maximum allowable limit. The pre-established subject codes will also be used to select a population of books.

b) The initial pass by the system will eliminate those books which the patron Has Had, or Now Has. This will be accomplished by matching the pre-defined book population selected against the patron history.

c) There will be a cross-check of the remaining books, after eliminating the Has Had and Has Now books, against the exclusion/restrictor criteria. This process will eliminate those titles that do not satisfy all of the patron's exclusion criteria defined under the patron's profile. The final selections will be placed as orders into the check-out process.

d) At the end of each day, the system will automatically print out a list of all patrons that were due for service, but did not receive any books. The report will show each patron's name and reason why the patron did not receive any books, e.g. no books available based on profile select criteria, etc. This report will assist the RAs in determining if the patron should be contacted to rectify the problem.

3.2.2.3 Magazines

There are three primary processes associated with providing magazines for patrons: Magazine Title, Copy Maintenance, and Queries/Orders/Reserves. Magazines will be handled/processed in the same manner as books with some exceptions, which are noted in the following paragraphs.

Magazine Title

Definition: A process used to add or change braille back-issue magazines in the collection. New magazine information will be received from NLS via an electronic data transfer. Initial adds will come from the MSCW facility for existing collections.

a) Initial adds to establish the centers' back-issue magazine inventory will be added from the MSCW, and the system must obtain READS information from the MSCW for this purpose. This will establish the magazine inventory for both the secondary and primary distribution centers.

b) New production magazines will be added to the inventory by using the PICs information data file. When new back-issue magazines are shipped to the centers, NLS will notify the sites as to the number of copies they should expect to receive.

c) Braille magazine nomenclature information will be added to the database from NLS using the standard NLS format. The system will place the magazine in a temporary suspend status, which prevents the magazine from being issued, until the magazine data can be verified and the copies loaded into the inventory.

d) A braille magazine status line will be developed which provides statistical data relating the number of complete sets available, the number in circulation, the number not available due to loss, the number in repair, and the number of outstanding reserves. In addition, circulation activity will be computed for the number of magazines circulated month-to-date, circulated the previous month, and circulated year-to-date. As a separate action, further information will be provided which is copy specific. This information will contain a description of the copy to include the number of copies in the inventory, number in repair, number lost, and the bar code number associated with the copy.

Copy Maintenance (Magazines)

Definition: A process used to add or change the number of braille magazines for a particular title/issue date/copy in the inventory. As magazines are received, the volumes will be bar coded, scanned, and key entered into

the inventory with pertinent data being electronically transferred to the primary system.

a) The copy maintenance process will be initiated at the centers. As the centers receive new or MSCW magazines, the system will permit the user to key enter the magazine ID along with the volume number (issue date). Two bar code labels will be affixed to each volume, and the label will be scanned in conjunction with a storage location bar code. The system will acknowledge receipt of the magazine, and assign a receipt date to the copy. This process will continue until all magazines have been accounted for and entered into the system. The primary system will take this data and update the braille back-issue magazines in the same manner as the books are updated. The copy maintenance process will permit the status or title information of a magazine to be changed in the database. This process will operate in the same fashion as for books.

Query/Order/Reserve (Magazines)

Definition: A process used to query the magazine inventory based on Magazine ID. This process will also order and place on reserve braille back-issue magazines in the centers.

a) The query process will allow the user to determine if a particular magazine is carried, and if the magazine is available for issue. This procedure will focus on the entering of the magazine ID and issue date, and the system will perform a check of the inventory to make a determination. The query process will also allow data searches to be performed using an alternate key search for magazine by ID, or issue date. This process will produce a response based on an exact match or partial key match.

b) The order process for magazines will operate in the same manner as for books. The reserve process will permit the RA or patron to place a magazine in a reserve status if the patron has an urgent need for the item and if it is not immediately available for check-out. The

patron will only be able to perform this function directly via PC and modem. Reserve magazines will be processed the same way as book reserves.

3.2.2.4 Inventory Control & Circulation

The warehousing, and shipping and receiving operations will be supported by three primary processes: check-out, check-in and reshelving, and maintenance of the inventory. The main objectives of these processes are to keep track of inventory and control circulation activities. In addition to reading materials, the system will also have to account for all shipping containers at each distribution center. Each container will be labeled with its own bar code, and will be assigned to a patron when being shipped. The system will maintain a circulation history of the container for tracking and reporting purposes.

Check-Out

Definition: A process used to produce pick tickets, physically select and ship books, and provide shipping confirmation.

a) The specified check-out methodology is designed to accommodate single-volume and multi-volume shipments to all destinations. All shipments will be initiated through the ADP system as previously described. Stock will be rotated in last-in/first-out sequence, when allocating available volumes to shippable orders, thus insuring that all pending shipments are first sourced to volumes in the forward shelves. This sequencing will also track all inactive inventory.

The pick tickets will be produced at each center, with one pick ticket generated for each volume to be shipped. The tickets will be serially numbered when printed, beginning with the number 0001 each week, and each print run will be numbered and printed in strict shelf location sequence. The tickets will be left in continuous strip form during the picking process, and will be later separated when the individual orders are packed. The transaction code (which should *not* be 6, 10 or 15 characters to avoid potential problems caused by confusion with zip

codes by the postal service during shipping) will be appended to the pick ticket serial number when printed; the serial number and the transaction code will be both machine-readable and human-readable. The zip code bar code will also be printed in a machine-readable format. The volume bar code numbers and the storage location numbers on the pick tickets will be only human readable, and will be printed in bold-face type. The title and volume numbers will be only human readable, and printed in normal type.

Picking and packing will be combined in the forward shelf area, with the pick/pack sequencing being all the volumes in one shelf section. All volumes in one batch assignment must be picked, packed, and their shipment confirmed by the same individual and system, and all irregularities must be reconciled before the next sequence is begun. The picker will first remove a string of pick tickets from the print run and will then key into the scanner a packing transaction code, and scan the first and last transaction number on the batch of pick tickets. The system will then monitor the completion of all packing tasks in the batch, all batches in the print run, and all print runs for the day. The picker will note the storage location and volume number printed on the first pick ticket, remove the volume from its forward shelf location, and place it in a canvas shipping pouch. The pick ticket will then be removed from the string of tickets and placed in the window of the pouch to serve as an address card. The bar code on the volume, the bar code on the container, and the transaction bar code on the address card are then scanned. The scanning process will record the transaction number, the date of shipment, the volume shipped, and the container shipped. If the volume and transaction bar codes are mis-matched, the picker will be alerted by the system, and no further action will be possible until the error is corrected. The pouch is then closed and placed in a shipping hamper. This sequence is repeated until all volumes in the batch have been processed. The picker then queries the system to verify that all shipping transactions in the batch have been accounted for.

A picking task assignment in the stack area will be 100 volumes, which is the capacity of a full picking cart. The picker will remove a string of 100 pick tickets from the print run and pick the first designated volume and place it on a cart shelf. Subsequent volumes are picked and placed on the cart shelves in strict pick ticket sequence. On completion, the picker

takes the full cart to the packing area, and proceeds to scan the first and last transaction number on the batch of pick tickets, pack the volumes, and confirm their shipment in the same manner as for volumes picked from the forward shelves. Shipment will cause the Has Now file to be automatically updated, charging recipients, and crediting the distribution center.

b) The ADP system will screen all bar code numbers reported as shipped against all bar code numbers assigned to be shipped, and an exception report will be printed at the shipping center to conclude the daily transmission. Any unshipped transactions will remain in the working file and appear on subsequent exception reports until a volume is shipped or the transaction is canceled.

Check-In/Reshelve

Definition: A process used to check books in, provide return shipping confirmation, and shelve books.

a) The specified check-in methodology is designed to accommodate single-volume or multi-volume receipts from all sources, and for volumes that are bar coded and those that are not. Volumes that are not bar coded will not be in the inventory record of the system at the time of receipt, and a much more time-consuming documentation process is required to enter these transactions. Most bar coded receipts will be returns from patrons, but there will also be occasional transfers between distribution centers, returns of volumes from repairers, returns of library loans, and similar transactions. Receipts that are not bar coded will include transfers from regional libraries prior and subsequent to startup, some returns direct from patrons, newly printed titles from printer/binders, and possibly from other sources. The receiving of repaired volumes and newly printed volumes involves a contractual obligation with suppliers, and established accounting protocol must be followed when documenting these transactions.

The receiver will place bar coded volumes in the forward shelving. When all volumes are shelved for the day, the receiver will key a transaction code into the scanner, and proceed

to scan all bar codes on the volumes in each shelf opening, and their bar coded shelf location. This scanning records the bar code number, forward shelf location, and date of receipt for each newly received volume. Each returned mailing container will also be scanned.

A permanent record of each bar coded volume will reside in the system, and each volume will be charged to either a patron or a center. With the receipt of a previously bar coded volume, the system will automatically update the Has Now patron file, the Has Had patron file (unless the systems developer includes Has Nows in the Has Hads), and the Has Now for the distribution center. The system will screen all bar code numbers reported as received against the bar code numbers in the inventory, and reject any new bar code number that does not have an accompanying title ID and volume number. These rejections will be printed on an exception report at the receiving center to conclude the daily transmission.

b) The reshelving activity will consist of transferring volumes from the forward shelf area to the stacks, and relocating volumes within the stacks. These operations will always be performed in the morning hours, so that all new storage locations will be in the database before the order filling print runs. Picking carts will be used in making all stock transfers, and a full cart load constitutes a stocking task assignment.

To initiate a transfer, the stocker will fill a cart with volumes from the forward shelves, key into the scanner a stocking transaction code, and scan the volumes on the cart and the cart shelves to record the in-transit locations. The emptied shelves in the forward area will then be scanned to confirm that all recorded volume locations in the forward shelves have been cleared, and to account for all volumes. The stocker will then proceed to the appropriate storage zone in the stacks and place the first volume in the first available location. The bar code on the volume and its new shelf location will be scanned to record the new location and delete the in-transit location; once a bar code on a volume has been scanned, another volume should not be able to be scanned until the shelf location bar code has been scanned. When a cart shelf is emptied, the cart shelf label will be scanned to confirm that the stock location record has been cleared and to account for all volumes. This process will be repeated until the cart is empty.

The relocation of volumes in the stacks is a space management function. When a storage zone becomes congested, the center director will prepare a relocation plan for the affected zone. This plan will list the volume bar code numbers and shelf locations of all volumes that were received on or before a designated cutoff date. The candidate volumes should be listed by shelf elevation, so that inactive volumes on the lower shelves will always be relocated first. The stockers will then relocate the desired number of volumes, either to the upper shelves of the congested zone, or to a remote storage location.

When a storage zone becomes less than fully used, the director will prepare a listing of the bar code numbers of all titles that should be stored in the zone. The system will determine the out-of-zone storage locations of all volumes, and prepare a consolidation plan, listing the volume bar code numbers and shelf locations of all volumes that should be relocated. If this initial consolidation does not substantially fill all surplus space, the zone boundaries should then be changed.

Inventory

Definition: A process used to conduct inventory checks and assist in performing annual physical inventory procedures.

a) On a quarterly basis, inventory checks will be performed to confirm that the system is accounting for the location of books/magazines. The system will produce a random list of books from which the user will locate a book and verify its location by a visual inspection and scanning of the book. The system will keep track of the results of these reviews and produce reports of the findings. This operation will be performed randomly, but not less than quarterly.

b) An annual review of the inventory will also be performed. The purpose of this inventory will be to re-balance the collections between the secondary and primary distribution centers. The system will keep track of the results and produce a detailed report. The shipping containers will also be accounted for in a similar manner.

c) Transactions involved in receiving, stocking, and shipping activity in the centers will be automatically recorded. Daily summaries of the transaction counts for the measured activities will be retained in the database, and will be utilized for staffing, planning, scheduling, and NLS reporting. The transactions for receiving and stocking activities will be keyed into the scanners prior to scanning bar codes on the volumes, containers, and shelves. The codes for shipping and scrapping activities will be assigned by the system, and will be appended to the serial numbers on the pick tickets prior to printing. These daily transaction counts will be retained in the database for at least two full years, or as designated by NLS. For NLS reporting, the daily figures will be rolled-up into monthly, quarterly, year-to-date, or annual reports as desired.

3.2.2.5 Miscellaneous

This section defines functionality for those areas which have not been directly discussed, which include regional library access, follow-up for overdue books, file maintenance, and notes capability.

Regional Library Access

Definition: A process which permits regional libraries to access the book inventory, query, order/request/reserve books, and view and modify their patrons' files. The regional library will also be able to receive updates via electronic mail.

The system will have a capability which permits regional libraries to provide full service to their patrons only via a modem connection. The system must be able to identify the library and grant that library access to only those patron records associated with that particular library. The system will preclude the library from accessing other patron files even though it may know the patron's ID. The system will allow the regional library to order books for these patrons using the same functions as the reader advisors at the primary distribution center, i.e. order, query, etc. System access for the regional libraries will be limited to patron files, book

selection, and magazine selection. The system will track the number of times a regional library accesses the system, time on-line, number and type of transactions generated by the servicing library, and produce a monthly report of the activities.

Follow Up for Overdue Books

Definition: An automatic process that assists the reader advisors in following up on overdue books.

The system will track both volumes in circulation, and volumes stored in the centers, so that the custody of all braille volumes is accounted for at all times. The system must track materials checked out to individual patrons, institutions, non-participating libraries, browsing and reference collections in participating libraries, library loans, the NLS proper, the centers, and others. NLS will develop a policy for overdue books during the design phase.

Files Maintenance

Definition: A process used to audit or purge records from the centralized braille databases.

The system will allow the system administrator to conduct tests which audit database records for monitoring data integrity. The system will also enable the administrator to purge group of records from the databases. The purging process will contain controls that will ensure that records are not purged accidentally, or that the routine could be initiated from a remote source.

Notes Capability

Definition: A process used to compose comments and attach these comments to a patron, book/magazine, or circulation record.

The system will permit the user to enter comments pertaining to a patron, book or transaction, and will electronically affix the comments to the related action. Every time the action is retrieved, a message will appear that indicates that there are comments associated with that particular action. The system will also allow the user to edit or remove the comments, as required.

3.2.3 Management Reports

A report generator function will provide the user with the capability to produce standard reports along with an ability to generate *ad hoc* queries. The standard reports will be produced in accordance with NLS reporting requirements, and will consist of operational reports which will assist the user with regular operating activities, e.g. inactive patron, overdue books, etc. Statistical reports will be created which describe readership and circulation activity. Detailed listings will be generated for reference purposes on such things as listings of titles, titles by subject code, etc. All order transactions, i.e. reserves, requests, etc., will be by type of transaction for all reports pertaining to orders.

The *ad hoc* reporting capability will provide the user with a user-friendly and flexible tool, which will provide access to multiple files; a query capability which is flexible and free formatting; output generation to screen, disk or printer; report preview and browse; label generation; graphic symbols; total, subtotal and count; and title, subtitle and footers. Formatting options will allow for field concatenation, elimination of trailing blanks, word wrap, suppression of blank lines, multiple columns, 170 characters across, page breaks, numeric formats, and page number formats. The capabilities will include Boolean search criteria, multi-value selection, "IF" clause selection, word search within a text field, and parameter specifications. Sorting will be permitted on multiple fields, case sensitivity and insensitivity, and sorts on partial fields. Options will be provided to print in portrait, landscape, compressed, and multiple fonts.

For reports which require a lengthy period of time to process and print, e.g. 30 minutes or longer, the system will inform the user and will estimate how long the report will take to be compiled and printed.

3.3 HARDWARE

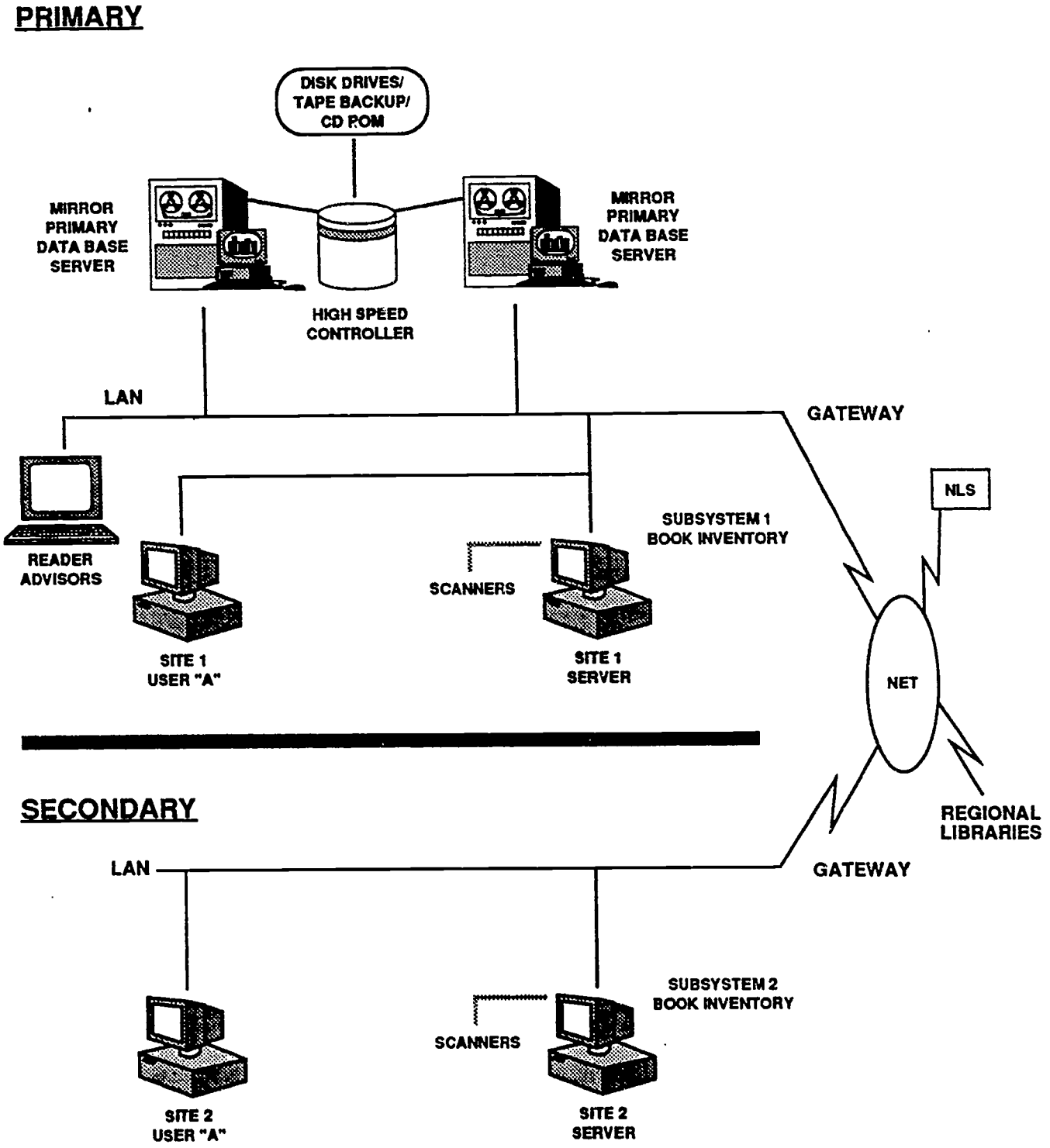
The system architecture, as illustrated in Exhibit 3-E, should consist of a primary database server with a direct connection through some type of local area network (LAN) to the co-located subsystem database server used for storing the primary site's inventory. Users should interact with the system through some type of client workstation, or terminal, that is connected directly to the LAN, or through a communications gateway. All peripheral devices such as client workstations or terminals, printers, bar code scanners, modems, FAX/modems, etc. will need to have specifications determined after the exact LAN and software have been specified during the design stage of development. The system architecture requires a primary database server for storage and access to the major assets of the database files. Each of the two centers requires a subsystem database server to provide maintenance and storage of the site specific inventory. Only the primary database server would require one or more client workstations or terminals on its LAN for on-site administration and reader advisory access services. Hardware selected for this system, in general, must be accessible to all employees via adaptive devices, if required.

3.3.1 Primary ADP System

A primary database server with a dual-redundant hardware architecture of two complete processing systems, and no single point of failure that operates in a fault-tolerant environment, is required for the primary distribution center. The primary database server will function as a multi-user computer, operating in an integrated LAN environment. It will support both remote users accessing the database via either workstations/terminals and a communications gateway, or DPA-IVR; and local users accessing the database across the installed LAN. The primary database server will utilize its local resources to provide storage, software support, and communication services to remote network users. The system must support at least 12 local

Exhibit 3-E

HARDWARE CONFIGURATION



and/or remote active users, expandable to 24, running any mix of the required applications software. The primary database server will also have the capability to read and write data from/to different types of media which may include diskettes (both 3.5" and 5.25"), tape (from 525 MB to 1-5 GB), and CD ROM.

The following components, capabilities, and features are minimum requirements for the primary database server system configuration:

- o Central Processing Unit
  - Two (2) interconnected CPUs, each with sufficient internal storage to perform all required system functions, capable of operating as a redundant fault-tolerant node on a local area network.
  - A bus architecture that is currently the most advanced (i.e., today it would be a 32 bit path between the CPU and memory).
  - Virtual memory operation, capable of processing batch and interactive jobs concurrently.
  - Cache memory to increase overall system performance.
  - Error checking and correcting system architecture.
  - An interrupt control and automatic system restart facility that automatically returns the system to an operating condition after certain types of interruptions and errors (e.g. power outages).
  - A real-time clock/calendar with battery backup.
  - Additional I/O expansion slots via a non-proprietary, open-system architecture expansion bus that permits the system to be configured with third-party function boards.
  - Multiple external/internal devices will require SCSI interface vice IDE.
- o Hard Disk Storage
  - Sufficient total capacity to meet permanent and temporary disk space storage requirements.
  - Internally/externally expandable to meet future growth requirements.

- Redundant disk modules to permit mirror image recording in order to fulfill fault-tolerant requirements.

- Architecture that uses an industry standard SCSI interface for fast system performance.

o Flexible Disk Storage

- 3.5 and 5.25 inch flexible diskette units are required.

- In addition to the system's native format, the unit must also read and write diskettes in the 360 kilobyte minimum MS-DOS compatible format.

- Provide a media write-protect feature that indicates status to the operating system.

o Cartridge Tape Storage

- A streaming cartridge tape unit, fully enclosed, and capable of storing the maximum size of the system files (i.e., 525 megabytes per cartridge or 1-5 GB per cartridge).

- Support read and write transfers on a file-by-file basis as well as files by directory.

- Ability to read tapes created on another unit.

- Error checking on read operations and read after write error checking on all write operations.

o CD ROM Drive

- A CD ROM unit capable of reading standard formats (i.e., BLND CD ROM discs)

o Console Monitor and Keyboard

- Support a system administrator's function through a directly connected console monitor and keyboard.

- Support a 15 inch VGA interface with a minimum resolution of 640 by 480 pixels.

- Use the IBM 101 key enhanced PC keyboard.

- External Interfaces
  - The processor would interface with a local area network via redundant network interfaces.
  - A minimum throughput rate of 10 megabits per second to the LAN.
  - One parallel printer port.
  - A minimum of four (4) ports for use with terminals, printers, modems, and other serial devices are required. Two of these ports must be configurable by the system administrator for synchronous or asynchronous operations.
  - The serial ports must provide user selectable speeds of 300, 600, 1200, 2400, 4800, 9600, and 19200 bits per second at a minimum.

3.3.2 Subsystems

Each of the two centers will require a subsystem database server to track site specific inventory and support local network users via a LAN. These subsystem database servers should support site specific inventory management with a client workstation having an interface for the bar code reading devices used to manage the warehousing, and shipping and receiving functions. These subsystem database servers should also support the processing and printing of the pick-tickets which are used in the selection of books from the collection. At least one client workstation, at each location, must be configured identically to the subsystem database server so as to provide a redundant backup capability. This configuration is depicted in Exhibit 3-E as site server 1 or 2 and site 1 or 2, user "A".

The following components, capabilities, and features are the minimum requirements for the two subsystem database servers needed to track site specific inventory:

- Central Processing Unit
  - One CPU with sufficient internal storage to perform all required system functions, capable of operating as a network connection on a local area network.

- A bus architecture that is currently the most advanced (i.e., today it would be a 32 bit path between the CPU and memory).

- Virtual memory operation capable of processing batch and interactive jobs concurrently.

- Cache memory to increase overall system performance.

- Error checking and correcting system architecture.

- A real-time clock/calendar with battery backup.

- Additional I/O expansion slots via a non-proprietary, open-system architecture expansion bus that permits the system to be configured with third-party function boards.

o Hard Disk Storage

- Sufficient total capacity to meet permanent and temporary disk storage space requirements.

- Drive heads that automatically retract and lock in place upon loss of power in order to prevent head crashes.

o Flexible Disk Storage

- 3.5 and 5.25 inch flexible diskette units are required.

- In addition to the system's native format, the unit must also read and write diskettes in the 360 kilobyte minimum MS-DOS compatible format.

- Provide a media write protect feature that indicates status to the operating system.

o Cartridge Tape Storage

- A streaming cartridge tape unit, fully enclosed, and capable of storing the maximum size of the system files (i.e., 60 megabytes per cartridge or 150-525 MB per cartridge).

- Support read and write transfers on a file-by-file basis as well as files by directory.

- Ability to read tapes created on another unit.

- Error checking on read operations and read after write error checking on all write operations.

o Monitor and Keyboard

- Support the network function through a directly connected console monitor and keyboard.
- Support a 15 inch VGA interface with a minimum resolution of 640 by 480 pixels.
- Use the IBM 101 key enhanced PC keyboard.

o External Interfaces

- The processor would interface with a local area network.
- A minimum throughput rate of 10 megabits per second to the LAN.
- One parallel printer port.
- A minimum of four (4) ports for use with terminals, printers, modems, and other serial devices.
- The serial ports must provide user selectable speeds of 300, 600, 1200, 2400, 4800, 9600, and 19200 bits per second at a minimum.

3.3.3 Electrical Requirements

All ADP equipment must operate from a commercially available, unconditioned power source of nominal 120 and/or 220 VAC at a frequency of 60 Hertz. Source voltage tolerances must be within the range set by industry standards, but extended operation beyond these tolerance limits would be possible by using a power backup capability.

In order to protect against database corruption and the loss of data caused by power source dropout or under-voltage conditions, the primary and subsystem equipment at both centers will require an uninterruptable power supply (UPS) capability. This capability must provide for continued operation of the system components to ensure an orderly shutdown during source dropout or under-voltage conditions. A minimum period of 10 minutes of

operation with a maximum equipment configuration is required. The maximum equipment configuration includes CPU units, memory and storage devices, keyboards, monitors, scanners, modems, and auxiliary boards (power backup of printers is not required).

A Transient Voltage Surge Suppressor (TVSS) capability is required to protect all components from failure and damage caused by electrical circuit transient voltage spikes, surges, and line noises. This requirement may be an integrated feature of the UPS facility, or a separately configured item(s). The unit must respond to, and limit, all transient voltages in excess of that which would cause damage to the protected equipment, and additionally eliminate both common mode and normal mode line noises. The TVSS device(s) are required to have visual and auditory indicators that monitor proper functioning of the protective circuits with alarms indicating trouble and the on/off status of the device.

The uninterruptable power supply device(s) may be either internal or external to the supported system and subsystem. During the transition from and return to commercial power, no noticeable change in operations or loss of data will be experienced by a system component. The minimum response to the power backup unit being activated, due to power loss or dropout, is an audible indicator made to sound until reset by a return to commercial power or other positive action. The power backup unit(s) must be designed to operate without environmental considerations such that, in the event internal batteries are used, the unit must recharge the batteries during normal operations and not vent corrosive or explosive gases.

3.4 SOFTWARE

This section is divided into five main areas: General Requirements, System Software, Application Software, Utility Software, and Data Security and Recovery. The General Requirements section provides an overview of the software requirements needed to support the centralized braille distribution system. The System Software section provides a description of the software that supports the network and database servers with access by users through a network node, a dial-up communications gateway, interactive voice response channel, or direct telecommunications through a modem. The Application Software section defines how

the software will support the centers' functional activities. The Utility Software section provides a description of the software that supports basic utility functions, such as support software for access to BLND. The Data Security and Recovery section discusses security control, access levels, and system recovery of the overall configuration.

3.4.1 General Requirements

The software must meet the requirements of the functional specifications, maintenance specifications, and the items discussed below.

User Friendly

All software selected and/or designed must use a menu screen approach. These menus must be simple in design and be comprehensible by non-computer-literate users. These menus may be Windows driven; however, the logical process and positioning of these windows must be effortless to understand. Selection of options will be controlled by arrow keys or point and shoot functions, and be accessible to all employees via adaptive devices, if required.

Detailed Documentation

The software developed for this centralized braille system must be well documented. The software documentation will include a clearly defined Users Manual, a detailed Operations Manual, a Database Design Document along with a Data Element Dictionary, a Network Design Document for the LAN/WAN/Telecommunications Requirements, and a System Administrator manual.

Maintenance/User Support

Both distribution centers will be provided strong software maintenance and user hotline support. The software maintenance will provide for release updates covering "bug" fixes, application software enhancements, and software product upgrades to include operating system,

network, and telecommunications. The software vendors will provide hotline support for all users at the centers, and hotline support for both regional network libraries with dial-in access and patrons using the direct patron access and "on-site" support, either in-person or via the dial-up port, within two hours.

Training

Software training for the application, system, network, and telecommunications software will be provided. Training programs offered for the centers' staff will be initially provided on-site at the centers, and must be designed for both the non-computer literate user and, in the case of the systems analyst and systems administrator, for computer literate users.

Patron Information Capability

The software must be designed to permit the user easy entry into all the database files controlled by the proper security access. Menu options will be constructed to provide a clear path for users to query the database files on specific information, such as patron point of contact, braille book titles available, subject interests, etc. Updates to the patron file will be accomplished by both regional libraries and the primary center. These processes will be as easy to operate from a remote site (modem) as they are for a center user, and all communication connectivity will be invisible to the user.

Book/Magazine Availability Information Capability

As with patron information availability, menu options will be designed to provide users with an unobstructed query path to database files for specific data, such as braille title availability, abstract information, subject codes, etc. Patrons will be able to query the files for information and also order books via a telephone using an interactive audio voice response system (IVR). The IVR system will provide the capability for four telephone calls at one time, provide voice responses to query/input by the patron via a touch-tone phone, and complete

updates to the databases for the book orders. The patron will also be able to establish and add titles to request and reserve lists.

Conventional Circulation Capability

As stated previously, software for this centralized braille system must support book circulation and control functions. Circulation procedures will be available to the user by selecting the appropriate menu option. This would empower the user to query the database files in order to obtain specific information such as book availability or abstract details, as well as any data resulting from queries which must be selected and transferred to patron files for order/request/reserve update purposes. This circulation capability will update the inventory and patron files appropriately.

Profile Select Circulation Capability

Since the system will provide the capability for automatically selecting braille books based on a predetermined reader profile, patron history, and book availability basis, an option will be provided that allows the user to specify whether or not the patron wants the profile-select service activated, and, if so, stipulate how often books will be selected for a patron. The software will then automatically select braille books during the check-out process using a systematic approach which will follow a predetermined priority schedule. When the process identifies a patron on profile-select, the system will first determine if the profile-select process needs to be executed based on how often the patron wants the service and whether or not the patron has met their quota of books. When the profile select process is executed, it will select titles for the patron based on the pre-established reader profile and then determine book availability by verifying that the Has Now indicator for custody of the title is set to the center servicing the particular patron. A desirable element of this process would be to preferentially screen unallocated volumes from the forward shelves prior to selecting other copies of the same from the stacks. Titles that the patron Has Had or Has Now will be eliminated from consideration. A utility will be provided that prevents a particular book, or range of books, in the inventory database from being selected through the profile-select process, if the book(s)

is experiencing a high rate of demand. When a selected braille book is available, the software will automatically generate an order. Also, series books will be issued in order.

Request and Reserve Capability

The software must be designed to accommodate patron orders placed on hold, i.e., a mechanism which will store orders that are not fulfilled immediately by the center. There are two types of on-hold orders which differ depending upon the urgency with which the materials are required by the patrons. The most common type is a "request", which is an order for materials of average priority. The patron request list will be unlimited in terms of how many books may be placed on the list. The second type is a "reserve", which is an order of high priority. Reserves must have priority over requests, even if a request was placed prior to the placement of a reserve. The patron reserve list will accept as large a list as possible (estimated 25 books), given operational considerations.

The database design may consist of two separate files for this data, as shown in Appendix 3-1, or one file with a data element distinguishing reserves from requests, in order for the software to process reserves before requests when the braille titles become available for issue during the check-out process.

Has Now Capability

The software will be able to produce hardcopy reports, or on-line listings upon user request, of Has Now data for patrons. The database will store and track what titles patrons currently have in their possession, and this data will also be a part of the screening process during the Check-out execution. The Has Now data indicating custody by the center should always match the inventory files of the subsystems.

Has Had Capability

The software will be able to produce hardcopy reports, or on-line listings upon user request, of titles the patron has previously received, i.e. Has Had. The database will maintain historical data to track braille books a patron has already received, and this data will also be a part of the screening process during the check-out execution.

Bar Code Capability

The software must be able to interface with bar code equipment by accepting input from bar code scanners and generating bar code printer output for the pick tickets/mailing labels. The bar code scanners will be linked through radio frequency communications to a transceiver with an interface to the LAN and access to the databases. The software will utilize data generated from the bar code readers when performing the warehousing operations, specifically the check-in, reshelve, and check-out processes. These processes involve display, confirmation, and updating of data for filling orders for patrons, receiving books, and book putaway functions. The software must generate output that is for both textual printing of patron, book, and location information, as well as USPS bar coded zip codes and a transaction bar code for internal use. Since the pick ticket is also the mailing card, the bar code also facilitates the shipping and receiving operations.

Quick Turnaround Capability

Since all the braille book copies will have a unique bar code identifier, and the shelves are also to be bar coded, the subsystem database will store a unique location code for each book volume. Both braille distribution centers will have a temporary holding area, or forward shelves, which will support quick turnaround of books. Returned/received books will be stored in the forward shelves before being moved to permanent shelves, or stacks. The software will utilize this unique location code to determine where the books are physically located so that during the check-out process volumes will be selected from the temporary holding area as a priority over the selection of other copies of the volumes stored in the stacks. Since a center

will be designated for each patron as the primary servicing center, priority for selecting patron ordered books will be to first select from that center's temporary holding area, second from that center's stacks, third from the other distribution center's temporary holding area, and finally from the other center's stacks.

Random Book Storage

The centralized braille centers will store braille books and magazines in random sequence by using three locations: (1) forward (temporary) shelves, (2) stocking carts, and (3) mobile shelving. All of these locations will have bar code labels to identify distinct shelf locations. During check-in, books and magazines will be placed in a forward shelving location and the bar code label will be scanned along with the shelf locator bar code. The software will record the location for that item in the database using data generated from the bar code readers. During check-out, the software will support the pickers by both matching the selected item on the pick ticket to the correct location code, and by printing the pick tickets to facilitate an optimal (serpentine) picking route. The database will keep this location data segregated to only be used by the software supporting warehouse level operations, and this data will not be accessible by the RAs and patrons. Location information for site specific inventory will only be stored at the subsystem level, not on the primary system. Since these subsystems will be the only source for this data, this location information must be fault-tolerant and backed up on a regular basis, i.e. at least daily, and transaction restorable.

Direct Patron Access Capability

Since there will be a capability provided whereby the patron can order a book via a touch-tone telephone utilizing an interactive audio voice response (IVR) system, the software must have a customized interface to the databases. This interface will provide the ability to query the databases, search the data files for the correct answer to the patron's query, translate this data into digitized form, and generate an audible reply back to the patron. This interface will be able to generate patron orders, requests, and reserves. Software will track and report statistics regarding the patron use of this capability which will include the number of calls

processed, length of calls, number of requests filled, and other management and operational data.

Data Backup Capability

The center management and ADP operations staff must be provided software to perform backups of the databases for both the primary and subsystems. At a minimum, the primary system will be backed-up on a daily basis, and this should be sufficient given that mirror systems will be operated at the primary level. The subsystems will be backed-up at least once, and preferably twice, a day or every time a major change occurs in the book inventory.

BLND Collection Capability

As a separate entity, the system will house the full BLND collection to include the full MARC record. Software utilities developed for the BLND will provide the user with a cut and paste function which permits data to be extracted (cut) from BLND and attached (pasted) to the central braille database so that data identified in BLND would not have to be manually entered (keyed twice) into the central database. It is anticipated that BLND will be in a CD ROM format. With this in mind, a reasonable response time must be developed taking into account multiple user access.

3.4.2 System Software

Since the configuration of the system will be a series of communications nodes of a local area network (LAN), the system software should provide interaction with the system through a network point, a dial-up communications gateway, interactive voice response channel, and modem. The system software requires access to the primary database server which provides storage and user access to the patron database files. There is also required access to an inventory server, which provides maintenance and storage of the site-specific inventory database, with one or more network user communication points for on-site administration and reader advisory access services. The system software must be able to

interface with the adaptive devices that will be accessible to all employees to include the blind and visually handicapped.

Primary and Secondary Systems

The primary system database server will have system software that supports: 1) remote terminal users accessing the database via modems and a communications gateway, 2) local terminal users accessing the database across the installed LAN, and 3) telephone users accessing the database through an interactive voice response channel. The primary system database server will utilize its local resources to provide storage, software support, and communication services to the network users. The operating system must support at least 12 local and/or remote active users running any mix of the required applications software. The primary distribution center system software should have the capability for multiple network user connections, with one network user connection acting as a terminal server supporting the on-site RAs requiring network accessibility.

Both subsystem database servers, one supporting each center, will have system software that supports an inventory server connection and a network user connection. The subsystem software for the site-specific inventory server should provide a network connection that supports the interface with the transceiver for the bar code reading devices used in distribution functions. The subsystem software must support at least one network user connection that is configured identically to the inventory connection, so as to provide a redundant backup capability.

Telecommunications

The required centralized braille book distribution system must have system software that provides accessibility to local and remote users for voice and data communications. Local users are defined as operations personnel at the primary center, in both the office and floor operations. Remote users are defined as the patrons, who are provided direct access through the IVR or by modem, regional library RAs, operations staff at the secondary center, and NLS

staff. Local users at the primary center will access the system through the LAN system software. The remote users will access the system in one of two different ways: 1) by having multi-users connected to the central site simultaneously through a wide area network that is accessed via modems through a local dial-up gateway, and 2) by having access over 800 lines using touch-tone telephone entry through services provided by the IVR system. The regional libraries should be able to interface with the system administrator, or RAs, by FAX to either an internal or external FAX/modem at the primary center with appropriate software, e.g., WINFAX PRO.

Data Transfer Capability

The system software should support communications capabilities for data transfer to include: 1) uploading and downloading files between the distribution centers, 2) downloading bibliographic information from NLS/PICS, BLND, and READS and, 3) downloading patron data from CMLS. This data transfer capability should be supported through: 1) lease services to a wide area network (WAN), 2) a network hub interface to the WAN for the primary center, 3) system software for the appropriate inter-networking and required transport protocols, and 4) various media used for data transfer (tape, diskette).

Interactive Access Capability

System software for interactive access to the primary system should be through LAN communications that would provide an integrated intra-facility capability for local users such as RAs, center management, ADP operations staff, clerical staff, and warehouse staff to share databases, printers, and other resources. This capability will require a network interface for each of the devices/connections attached to the LAN, cabling, and the appropriate networking software (e.g. Novell Netware). Special system software will control dial-in access and will provide interactive accessibility to the primary database by network library RAs for placing orders, making queries, and modifying patron files related to them as a servicing library.

3.4.3 Applications Software

This section describes in detail how the specific requirements of the functional specifications will be processed through the use of menus, screens, programs, queries, and reports related to the databases. This section will address several functional areas: Patrons, Books, Magazines, Circulation and Miscellaneous. Within each major functional area the operations to be performed are discussed along with detailed explanations of how the software will support these activities.

The applications software will use the NLS Reader Enrollment And Delivery System (READS) as a guideline, since it currently provides software capability for most of the functional areas required of the ADP system. The functional areas and the detailed support activities to be provided by the software include:

- o Patrons
  - Patron general information
  - Patron profile information
  - Patron circulation information
  - Has Now and Has Had information

- o Books
  - Book title maintenance
  - Book copy maintenance
  - Request and reserve information
  - Profile select, or automatic creation of book requests
  - Title abstract information

- o Magazines
  - Magazine title maintenance
  - Magazine copy maintenance
  - Magazine request and reserve information

- o Containers
  - Container copy maintenance
- o Circulation
  - Check-out of books, back issue magazines, and containers
  - Check-in and reshelving of books, back issue magazines, and containers
  - Tracking custody of books, magazines, and containers (Has Now)
- o Miscellaneous
  - Backup utilities
  - Recovery utilities
  - Validation table maintenance

3.4.3.1 Patrons

The patron area consists of several processes necessary for capturing, storing, and maintaining patron identification data as well as tracking specific patron activities related to circulation of braille books and back issue braille magazines. These processes include: Patron Adds, Updates, Circulation, Direct Patron Access, and Address Change Interface. The application software will group these processes on menus and sub-menus which will allow the user to: 1) access screens to enter, update, and view the detailed patron data, 2) execute batch programs related to patron data processing, and 3) run patron reports.

Patron Add

The patron add process will utilize a combination of batch programs and data capture screens to add patron data to the primary center's database. The batch programs will process data from transaction files generated from the national CMLS database, and also possibly from the regional library databases and systems such as READS, DRA, etc. The standard transaction file structure will be defined by NLS in order to maintain conformity of data coming from a diversity of automated regional library data processing systems. Data capture

screens will also allow a user to enter the same type of patron data manually from printed hardcopy, as well as enter braille center specific data.

a) The batch programs will process data from the CMLS transaction files to accomplish both the initial load of existing patron data into the database, and the creation of all new patron files in the future. This process will utilize the braille indicator in CMLS to ensure that only patrons with braille interests are added to the primary center database. The national CMLS ID will be used as the patron unique identification code (Patron ID) within the center's patron database. Detailed validation, as much as possible, of all data processed will be necessary to establish and maintain uniformity of codes and data integrity. All code standardization will be established by NLS, e.g., the four character code depicting the patron's serving library.

Information pertaining to each patron's handicap will be transferred from the regional library via CMLS. The ADP system will only accept valid handicap codes set up by NLS as standard identifiers of specific handicaps. If an invalid code is entered, a utility will provide the user with a list of acceptable entries from which to select. The default code will be "1", which indicates that the patron is blind. A code depicting the patron's serving library will also come from CMLS. This code will be a standard four-digit entry established by NLS. A cross-reference table will be provided to the user should they need to identify the library name for the code, and a look-up table will provide the user with search criteria for state and city within county for a given library. Information retrieved will include the NLS code, library name, address, and phone number.

b) The other information that is required to add the patron record to the primary system will be received from both regional libraries and directly from patrons. Depending on a library's automation and communications capabilities, the center could receive this data from the regional library in a batch file by modem (electronic transfer), FAX, letter, or telephone. Hinged on the complexities and data formats associated with accepting such electronic data transfers (batch files), the system will develop a method for entering this data directly into the center's data files. However, if transferred data is incompatible with the center's data format,

the information may have to be electronically reformatted, or even printed to hardcopy and manually entered. The standard transaction file structure is to be defined by NLS to preclude incompatibility problems.

The patron batch program will process this secondary data from transaction files generated from the regional library databases to initially load current patron data into the center's database, and to establish all new patron files in the future. Depending on the libraries' capabilities, the center could receive this data from a regional library in a batch file: 1) by modem (electronic transfer), 2) on diskette, or 3) on tape (cartridge/reel). If any of the batch file data is incompatible with the center's data format, the program will generate a transaction report of the patron data which will be printed and then used for data entry via the patron data capture screens.

c) Since patron data will also be received at the primary center in printed format, the center RAs and clerks will utilize the data capture screens to enter the data manually from the printed hardcopy, as well as to enter braille center specific data. The Patron processes will permit the user to add, change, or delete patron data as often as necessary. When a new patron is being added, the RA must begin with the Patron General Information screen to create the initial record. Only the Patron General Information screen will accept and save new Patron ID's (CMLS ID's). Once the RA has created the initial record for the patron, then the RA may add all the other remaining information on the screens in any order.

The Patron General Information screen will be used for entering information that consists primarily of patron personal data and the patron's type and service status. This data would include the patron's name, address, telephone number, service and handicap type, languages, dates of first and last service, etc. A more extensive, though not necessarily complete, list of data can be found in the model database table, Patron Main, in Appendix 3-1. This table has been included mainly to facilitate database sizing, but it also provides a representation of the data that most network libraries currently have in their systems.

With every patron add, the RA or clerk will be required to enter information which is either braille center specific or controlled by the braille center. One of the inputs on the Patron General Information screen will include assignment of a particular RA to a specific patron. Another input will be the designator of the distribution center which will service the patron, i.e., a patron to be served by the secondary site will be assigned a secondary site designator when they are added to the patron file, and the primary site will also have its own designator. The check-out process will refer to this designator when selecting books to ensure that secondary site patrons receive books from the secondary site first, unless the book is not available, then from the primary site inventory. This designator will be linked to the patron ID such that whenever patron data is accessed by any program, the process or user will automatically know which center serves that patron.

Patron Recurring Updates

The patron update process will utilize a combination of batch programs and data capture screens to modify patron data in the center's database. The patron batch update programs will process data from transaction files generated from the national CMLS database, and also from the regional library databases such as READS as previously discussed in the Patron Add section. The RAs will utilize the patron data capture screens to modify patron data. The RAs at regional libraries will only be permitted to change those patron records which contain their servicing library ID.

If an RA at the center initiates the change, depending on the type of change, the system will generate an electronic mail message directed to the regional library affected by the change. It will be the responsibility of the regional library to access their mail box, retrieve this data, and act upon it. The system will advise the regional library, upon logging onto the system, that they have mail messages in their box. Regional libraries which do not have the capability to access the system will receive updates by FAX or by mail. In either case, the system will transmit the FAX or produce the mailing automatically. Modifications that would not generate a mail message would be circulation information (Has Now/Has Had).

For address change requests provided to the center directly by a patron, a provisional address will be added by the center to store the information until the address change is confirmed by the regional library. The library will be notified by the center that an address change request has been received. Once the change has been confirmed and the address has been updated in CMLS, the permanent address will be updated at the center and the provisional address will be deleted.

Circulation

The Circulation process will utilize a combination of batch programs and data capture screens to maintain information about a patron's profile and circulation history for braille books. The patron batch update programs will process data from transaction files generated from the regional library databases such as READS.

The Patron Profile Information screen will be used for key entering information regarding patron's service arrangements, reading interests, and exclusion criteria. Again, a more extensive list of profile data can be found in the model database table entitled Patron Main in Appendix 3-1.

The Patron Circulation Information screens will be used to establish and/or maintain book circulation statistics, Has Now, Has Had, and request/reserve data by patron and title. This will require the use of several screens that can be accessed sequentially, or randomly, through the use of overlays. The data displayed must be sorted in various ways which include: title ID, date requested/reserved, and date checked out.

The Has Now Patron Circulation screen will display data to be used for identifying the titles and volumes a patron has in their possession (Has Now). This data will have already been automatically updated in the Patron Check-out database file (see Appendix 3-1) as books are confirmed for shipment. The screen will display the data by title ID, title, volume number, and date checked out, and will be in descending order, by date. Has Now information will not

be established through manual data entry, since it will be an automatic tracking mechanism in the inventory control function indicating a temporary change in custody.

The Has Had Patron Circulation screen will display data to be used for maintaining a reader history of what titles the patron has received. This data will have already been automatically updated in the Patron Has Had database file (see Appendix 3-1) as books are confirmed for shipment. The screen will display the data by title ID, title, volume number, date shipped and date returned and will be in ascending order by title ID and date. Has Had data will be maintained automatically by the system as books are shipped to the patron, and will be updated with the date returned as books are received from the patron.

The software will be developed to maintain data about the books which have been designated as being in request or reserve status. This data will be automatically collected as books are requested/reserved by the patron verbally, or by mailed BBR order forms, by Direct Patron Access, or by an RA. This data will be displayed on the Patron Circulation screen by title ID, title, volume number and date requested or reserved. This information will be listed in descending order, by date, and type of status, i.e. request or reserve.

The Circulation Activity and the Cumulative Circulation Statistic screens will be used to display/print, for informational purposes only, statistical data concerning a patron. The first will include circulation activity for braille books and back issue magazines, such as: the number of books and magazines received, shown separately; the titles that the patron currently has (Now-Has); and the number of titles currently on the patron's request list and on the reserve list. The second will include the number of books the patron has had (received) in the current month to date, the number the patron had in the prior month, and the number the patron had year-to-date. The system will also produce a report on patrons who have been inactive. This report will be a list, by patron, indicating the last date the patron checked out a book.

Direct Patron Access Integrated Voice Response (DPA-IVR)

The Direct Patron Access process will allow patrons to order only books, not magazines, via a turn-key interactive voice response (IVR) system through the use of a touch-tone telephone. This process will require customized software to interface with the databases and provide the results of any queries to the patron through the DPA-IVR system. Use of this DPA service by the patrons will require tightly controlled access by employing a user ID and password concept. The actual type/length of codes to be entered will be determined by NLS. The assigning, controlling, and maintaining of these user IDs and passwords will be accomplished through the use of a screen that will be maintained by the primary site inventory clerk. The DPA-IVR user ID will be linked directly to a patron ID. This process will ensure that the books being ordered through the use of the DPA-IVR are being checked out to the proper patron. In determining the correct user ID and password, the software that controls access to the DPA-IVR will perform a check of the DPA user ID and password entered against the patron ID in the Patron Main database file to be sure that the patron is eligible for access. It is imperative that the security measures preclude a patron from gaining access to data associated with another patron.

The patron will be able to order/request/reserve books through this capability. The DPA-IVR generated request will perform a query of the database, as if it were accomplished by an RA. The DPA process will have the IVR ask the patron for a title ID, the touch tone response from the IVR will be interpreted as if the response were entered on the screen and the process will validate the title ID against the database. If the title ID is invalid, the IVR will ask the patron to re-enter the correct title ID. Once a valid title ID is received, the process will query the database and determine if the book is available. If the book is available, the process will convey this response through the IVR to the patron, and the IVR will ask the patron if they wish to order the book. If the patron indicates that they wish to order the item with the proper touch tone entry, then the IVR will translate the response to the interface software which will initiate a check-out order for the book. Following the normal check-out process of a book, the order will become a regular transaction with the book being added to the Has Now database file for that patron once shipment of the book has been confirmed. The patron will

receive confirmation of the order once the system determines that the book is available for shipment. If the book is not available, the patron will be provided the opportunity to place the book on their request or reserve list.

If the patron does not wish to order the material, the IVR will ask the patron if they wish to order another book. If the response is "yes", the system will perform the same process as discussed in the previous paragraph. If the response is "no", the process will ask the patron if they are through, and if "yes" will log the patron out.

There will be statistical monitoring software to track activity associated with the DPA-IVR to include number of searches generated, by patron ID, number of books ordered as a result of the query, the number searched but not ordered, and the number of books placed on request and reserve lists. The software will also maintain a time-in, time-out log file to track duration of on-line activity of each patron access.

Address Change Interface

The Address Change Interface process will provide the RA the ability to enter a requested permanent address change from a patron into a provisional status, send the information to the regional library, and then receive confirmation from the RL via CMLS.

The Patron Update screen will allow a permanent address change to be entered for the patron, but it will be automatically placed in a provisional address status. There will be space for four addresses in the database; permanent, alternate, provisional, and temporary. The Patron Update screen will permit the RA to toggle/select between these addresses making any one of them the active address at any one time. The active address will always be used to generate the mailing label for the patron.

3.4.3.2 Books and Magazines

The book and magazine areas have three processes in common that are necessary for capturing, storing, and maintaining book and magazine identification data, as well as tracking specific activities related to circulation of braille books and magazines. These common processes include: Book/Magazine Title, Copy Maintenance, and Book/Magazine Distribution Maintenance; the Profile Select process is peculiar to books only. The application software will group these processes on menus and sub-menus which will allow the user to: 1) access screens to enter, update, and view the detailed book/magazine data by using either the book ID or magazine ID, 2) execute batch programs related to book and magazine data processing, and 3) run statistical book and magazine reports. The book/magazine data capture screens will provide options that allow the user to access any of the other book/magazine data capture screens, as an overlay, while in any one particular book/magazine data capture screen under the book and magazine functional areas. A query capability of the software must be able to retrieve book information by either the book ID or the book title, and the magazine information by both the magazine ID and issue date.

Book/Magazine Title

The book/magazine title process will utilize a combination of batch programs and data capture screens to add/change braille books and back issue magazines data in the center's database, track inventory and circulation statistics for the books/magazines, and provide summary status statistics. The batch programs will process book/magazine title data which will be received from NLS via an electronic data transfer. The data capture screens will allow the user to key enter or change the book/magazine title data.

a) In order to initialize the centers' inventory in the book/ magazine title database, a batch program will extract data from three possible sources of book information and one source of magazine information. The first source of book information will be the BLND database, a separate database to be resident in the center, that will provide the majority of the book title data to be added to the inventory database. The batch program will have to be able

to interpret the BLND record and extract the pertinent information to establish a book title database record. The second source of book information will be the Production Information Control System (PICS) information from NLS. The third source of information for special collection books, and the single source of magazine information, will be READS information from the MSCs. The batch program will also be required to interpret a READS record and extract magazine and special collection book data only from that file. If any book or magazine that has been received by the center cannot be identified from these sources, then the inventory clerk will contact the regional library or MSCs for resolution.

b) Book/magazine title data for any new production, or any other new titles being added to the inventory, will be established by a batch program which will extract data from the Production Information Control System (PICS) data file provided by NLS. The batch program must be able to interpret a PICS record and extract the pertinent information to establish a book or magazine title database record. In the event that any new production book or magazine is received that cannot be identified from the PICS file, provision must be made for its input manually. If identification is not successful, the inventory clerk will contact NLS.

c) Book/magazine title data will also need to be entered by the inventory clerk. The Book/Magazine Title Information screen will be used to enter: 1) title and volume data for books, and 2) title, issue, and volume data for magazines. Once the book/magazine title data is extracted from the identified data source and a book/magazine title database record has been established, the batch program will place the book/magazine title database record in a suspended status. This suspended status will prevent the book or magazine from being checked out until the book/magazine data is verified, and the volume's copies are loaded into the inventory subsystems using the copy maintenance routine.

d) The Book/Magazine Title Status screen will be used to establish and maintain statistical data relating the number of complete title sets available, the number of titles not available due to loss, the number of titles in repair, the number of titles with outstanding requests, and the number of titles with outstanding reserves. The Book/Magazine Volume/Issue

Status screen will be used to establish and maintain information which is volume/issue specific and contains a description of the volume/issue to include: chapters contained within a book volume, number of copies of a volume/issue in the inventory, number of copies of a volume/issue in repair, number of copies of a volume/issue lost, and the 12 digit bar code number for the copy linked to the volume/issue.

Copy Maintenance (Books and Magazines)

The Copy Maintenance process will utilize a combination of batch programs, bar code reader interface software, and data capture screens to add or change the number of braille books or magazines, along with the physical shelf location for each volume. When a book or magazine is received at either of the centers, the pertinent data will be entered into the appropriate inventory subsystem. All other data will be batch processed into the primary system database.

a) As the distribution centers receive either new books or books from existing collections, or new braille magazines, the Copy Maintenance screen receive mode will permit the user to enter: 1) the title ID, along with the volume number for books, and 2) the Magazine ID, along with the issue and volume number for database verification, with an override capability to facilitate shelving and resolution which will occur later. Two pressure sensitive bar code labels will be affixed to the copy, one on the spine and one on the inside front cover. The spine bar code label will be scanned, in conjunction with a storage location bar code. These entries will be processed by the bar code reader interface software to create related database entries for the copy along with its shelf location. The program will acknowledge receipt of the book/magazine copy and assign a receipt date for it (i.e. the current date). This process will continue until all volumes received have been accounted for and entered into the database. The software will process this data and, with the exception of the location bar code, will create a batch file to transfer the data into the primary system database.

b) The primary system copy maintenance batch program will process this transferred data and update the braille book and magazine records; in the case of new titles,

the books are initially placed in a suspended status. Once this matching process is complete and the book title ID or magazine ID has been confirmed, the number of books available by ID, including volume/copy for books and issue/volume/copy for magazines, will be added to that particular title ID or magazine ID inventory record and a report will be generated indicating the number of books and magazines available by ID. When the Copy Maintenance screen indicates there are complete sets of volumes for a new book title or magazine, then the inventory clerk will place the title in an available status on the system, i.e. ready for issue. This action by the inventory clerk will not be able to be overridden, and will have to be performed in order for a title to be placed in an available status. The inventory clerk will resolve any issue/volume/copy mis-match discrepancies with the centers, and also report details of all unresolved matters to NLS for resolution.

c) The Copy Maintenance screen operating in update mode will permit the user to view and modify the status or title information of volumes that need to be changed in the braille book and braille magazine inventory. Under this change status mode, the user will be able to change the availability of a volume to: 1) In Repair, or 2) Lost. When changes are made with this process, the volume will be automatically placed in a "not available for issue" status. Volumes that are placed in a status of In Repair or Lost will be in a temporary state accompanied by an action date. This action date will be used to track the status of these volumes. On a recurring basis, to be determined by NLS, the software will generate a report and a system operator message indicating the number of volumes in this status, and prompt the user to use the change status mode of the Copy Maintenance screen to update the volume status, as appropriate, by designating the volume as back in the inventory, or moving it to a delete status.

The Copy Maintenance screen operating in delete mode will permit the user to view and delete volume information from the inventory database. This delete mode will only be used when copies of volumes are determined to be unrecoverable or unrepairable. This delete mode will always operate with a verification statement, i.e. "Do You Want To Delete This Record, (Y/N)" at the end of the processing step. Volumes placed in a delete status will have data removed from the database; however, a record of the deleted volume will remain in the system

memory for a period of time to be determined by NLS, and statistical data will be able to be retrieved from these records.

Once actions initiated from the Copy Maintenance screen for changes and deletes of volumes are confirmed, the program will add data to a batch file which will be transferred to the primary system. The primary system will process this data with a batch copy maintenance program in order to update the braille book and braille magazine inventory records. The Copy Maintenance screen must be run in a verify-updates-mode which will allow the inventory clerk to process each volume ID individually to ensure the accuracy of the changes. The inventory clerk will verify this data by matching the printout against the data indicated on the screen as having changed. Once all input is in agreement, the user will be given the option to place the volume in its new status. This verification routine will not be able to be overridden, and will have to be performed in order for a volume's status to be changed or updated.

d) Any changes or modifications to the braille book or braille magazine inventory will be placed in a batch file for transfer between the primary system and subsystems. The importance of ensuring that the transfer of data between these systems is error-free cannot be over emphasized. Utilities developed to receive and interpret this data must be able to identify and separate data in a structured manner and forward this input to the appropriate routines.

Book/Magazine Distribution Maintenance

The Book/Magazine Distribution Maintenance process should use a series of screens to facilitate all its functions, one of which is to permit the user to query inventory based on title ID, title or author for books, and on magazine ID and issue date. The other functions will allow the user to order, request, or reserve braille books and braille magazines (no requests) from the center.

a) The Distribution Maintenance screen in query mode will allow the user to browse the book/magazine inventory. This query mode will permit the user to determine if a particular book is carried by the center, and to establish if the book is available for issue. This

screen will allow the user to enter the title ID, or magazine ID, which will cause the software to perform a query of the database and determine if the book/magazine is available. The screen will also allow an alternate method for finding a book by utilizing the title, or author, with either an exact match or a partial match. This alternate method will cause the software to query the database by using an alternate key search with either the complete, or partial, title or author.

b) The Distribution Maintenance screen in order mode will allow the user to order a book/magazine for a patron, if the item is currently available for check-out. After a user finishes a query, the user must be able to easily enter the order mode and the system automatically issue a book/magazine for a particular patron through the use of the patron ID. Before any book can be placed on order for a patron, the software will provide a warning message on the screen if the patron has had this book in the past, and if so when, by automatically executing a query of the patron's Has Had book data file. The software will also provide warning messages should the book ordered for the patron conflict with the patron's profile (i.e. book has violence, and patron did not want books with violence). However, these messages will have an override option (Y/N) should the patron wish to receive the book regardless of the established profile or of having received the book previously. The software will also warn the user if the order will put the patron over their maximum limit and provide an override option. The software will automatically fill the order by immediately removing the copies of the volume/issue for the book/magazine ordered from an availability status, but only after all the above checks have been done successfully and/or overrides have been exercised. The software will extract the pertinent information from the database in order to create a transaction record in a "secondary" or "primary" site batch file which will be used to produce the pick tickets, i.e. mailing address, volume number, book/magazine bar code, etc. The secondary and primary site batch files will be forwarded to the appropriate centers for storage location appending, pick sequence sorting, printing, and check-out processing.

c) The Distribution Maintenance screen in request mode will allow the user to place a book for a patron in a request status if the item is not currently available for check-out, or if the patron has met their allowable limit. Before the book is placed on the request list, the

system will advise the user if the patron has had the book, and if so, when. It will also check to see if the book has already been placed on their request list. The system will provide warning messages should the book ordered conflict with the patron's profile (e.g. book has violence and patron did not want books with violence); however, these messages will be able to be overridden should the patron wish to receive the book regardless of the profile. The user will be permitted to enter an expiration date at the time of the request action. If the date is left blank, the order will remain indefinitely on the system, unless manually removed. The system will automatically fill these requests as the books become available without intervention from the user. The system will tag each book record with a flag indicating that the book was ordered using the patron's request list. In checking out the item, the system will perform the same processes as with an order.

d) The Distribution Maintenance screen in reserve mode will allow the user to place a book/magazine in a reserve status for a patron that has an urgent need for the item that is currently not available for check-out. Before any book is placed on a patron's reserve list, the software will provide a warning message on the screen to the user if the patron has had the book before, or has reserved it in the past, and if so, when. The software must be able to display on the screen how many patrons have that particular book on reserve, and where the patron is in the queue for receiving the book according to the date reserved. In allocating orders, the software will tag each book record with a flag indicating that the book was ordered using the patron's reserve list. In checking out the item, the software will perform the same processes as with an order.

e) Rush delivery of books for patron pickups/walk-ins will be accommodated by exception. The software will provide for a rush order mode on the Distribution Maintenance screen, and under this mode the RA will have an override function that permits the order to be filled immediately and not processed in the normal batch file way. The software will provide for rush orders whereby the RAs will be permitted to apply special transaction codes. Once the order is activated, a special operation will send the order directly to the appropriate distribution center. The pick ticket will be generated, and the order will be filled and handed to a walk-in patron.

f) Special delivery of books for legitimate patron orders and other shipping transactions not utilizing standard USPS delivery will be accommodated by exception. This special order mode, under the Distribution Maintenance screen, would generate a transaction record in a special file which would have a code that is appended to the patron order. The software will provide for special orders whereby the RAs will be permitted to apply special transaction codes to the patron order to specify the carrier and type of service to be used. These codes will be obtained from an approved routing guide prepared by the primary distribution center. Once the order is activated, these transactions will be processed and forwarded to the distribution centers immediately.

Profile Select for Books

The profile select process for books will be a batch program set up to run once daily, by the system, in order to produce book orders automatically using the patron's reading preferences pre-established under the patron function. This batch program will perform numerous matching routines and edit checks to include patron subject preferences, service date, Has Had list, Has Now list, available inventory, and patron exclusion criteria to ensure correct automatic selection. This process will be a fully automated batch program requiring no user intervention.

a) The basic function in the profile select batch program is to check the service indicator for all patrons wishing to receive books automatically on a recurring basis. The patron service indicator will tell the batch program when it must select books for the patron. Every time books are selected for calendar-service patrons, the batch program will change the service date based on: 1) how often the patron wishes to receive books, and 2) on what day of the month service is required. Along with verifying the service date, the batch program will check to determine if the patron has reached their maximum allowable or self-imposed limit, and if so, the batch program will establish a new service date and begin to process the next patron. If the maximum limit has not been reached for a patron, then the batch program will determine how many books are needed to reach the pre-established maximum. The pre-established subject codes will be used to select a population of books. Selection using subject

codes will use a rotation pattern, i.e., a book from each subject code, not all from the same code. After the book population is defined, a screening process will take place to reduce the number down to the maximum amount to be shipped.

b) The initial screening done by the batch program will be to eliminate those books which the patron Has Had or Has Now. This will be accomplished by matching the pre-defined population selected against the patron history.

c) There will be a cross-check of the remaining books against the patron exclusion/restrictor criteria after eliminating the Has Had and Has Now books. This process will eliminate from consideration those titles which do not satisfy all of the patron's exclusion criteria defined under the patron's profile. The books that remain will be the final selections that will have pertinent data extracted and transaction records put into a batch file, which will be forwarded to the check-out process. A desirable element of this process would be to preferentially select unallocated volumes from the forward shelves prior to selecting other copies of the same from the stacks.

3.4.3.3 Circulation

The circulation functional area consists of several processes necessary to facilitate circulation at the centers and maintain data integrity between the primary level database and the subsystem level databases. These processes include: check-out, check-in and reshelving, and maintenance of the inventory, with transaction summary statistics. The circulation data capture screens will provide the user with options that allow access to any circulation data capture screens, as an overlay, while in any of the other particular circulation data capture screens under the circulation functional area. The user will be able to advance to the next record, or go back to the previous record, in document ID order.

In order for the primary and subsystems' inventories to remain in harmony, batch programs will automatically transmit data changes back and forth between the systems. The

subsystems' inventories will retain a minimum amount of data at their level, which will be limited to title bar code, location bar code, and date received or shipped.

The circulation functional area will also have to account for all shipping containers at each center. Each container will be labeled with its own bar code and assigned to a patron. The system will maintain a counter and circulation history of the container for reporting purposes, and each container will carry a status code of check-in or check-out.

Check-Out

The check-out process will be used to produce pick tickets, physically select books, and provide shipping confirmation. These processes will have batch programs for data transfer between the primary and subsystems level of the database.

a) There will be a pick ticket batch program which will process the batch file containing patron orders. This program will run at the subsystem level because each volume/issue will be matched to a particular copy's shelf location and sorted into a sequence that will provide efficiency in physically selecting the books/magazines in both centers. After sorting the orders by shelf location, the program will assign a serial number, beginning with the number 0001 each week, and append to the serial number the transaction code. These numbers/codes will be processed into the pick ticket print file in both machine-readable and human-readable form, and the pick ticket print file will be printed at both the centers. Each copy of a volume/issue of a book/magazine will have one pick ticket, i.e., each individual item will have a pick ticket. The pick tickets will be left in continuous strip fan-fold form during the picking process, and will be later separated when the individual items are packed. The volume bar code numbers and the storage location numbers on the pick tickets will be only human-readable, and will be printed in bold-face type, while the title IDs and volume numbers will be only human-readable, and printed in regular type.

The picking and packing process will follow the same procedures as described in Section 3.2.2.4, Inventory Control and Circulation (Check-out).

b) The shipping confirmation entries accumulated in a subsystem working file will be processed as a batch file at the primary system level once each day. The working file will include only the date shipped and the bar code number of the volumes/issue, which will cause the Has Now file to be automatically updated, charging recipients and crediting the distribution centers. An exception report will be generated by comparing the bar code numbers reported as shipped against all bar code numbers assigned to be shipped, and then be printed out at the shipping center to conclude the daily shipping process.

Check-In/Reshelve

This process will be used to check-in volumes, provide return shipping confirmation, and physically shelve the volumes.

a) The specified check-in methodology is designed to accommodate single-volume or multi-volume receipts from all sources, and also volumes that are either bar coded or are not. Volumes that are not bar coded will not be in the inventory record of the system at the time of receipt, and a much more time-consuming documentation process is required to enter these transactions. Most bar coded receipts will be returns from patrons, but there will also be occasional transfers between distribution centers, returns of volumes from repairers, returns of library loans, and similar transactions. Receipts that are not bar coded will include transfers from regional libraries prior and subsequent to startup, some possible returns direct from patrons, newly printed titles from printer/binders, and titles and collections from other sources. The receiving of repaired volumes and newly printed volumes involves a contractual obligation with suppliers, and established accounting protocol must be followed when documenting these transactions.

The receiver will first place bar coded volumes in the forward shelving. When all volumes are shelved for the day, the receiver will key a transaction code into the scanner, and proceed to scan all bar codes on the volumes in each shelf opening, and their bar coded shelf locations. This scanning will create records in the receiving batch working file of the

subsystem that includes: the bar code number, forward shelf location, and date of receipt for each newly received volume.

A permanent record of each bar coded volume will reside in the primary system, and each volume will be charged to either a patron or a center. With the receipt of a previously bar coded volume, the system will automatically update the Has Now patron file and the Has Now file for the distribution center. The Has Had data would have been previously updated when the volume was originally shipped. The batch program will screen all bar code numbers reported as received against the bar code numbers in the inventory, and reject any new bar code number that does not have an accompanying title ID and volume number. These rejections will be printed on an exception report at the receiving center to conclude the daily transmission.

b) The reshelving activity consists of transferring volumes from the forward shelf area to the stacks, and relocating volumes within the stacks. These operations will always be performed in the morning hours, so that all new storage locations are in the database before the order filling print runs. Picking carts will be used in making all stock transfers, and a full cart load will constitute a stocking task assignment.

To initiate a transfer, the stocker will fill a cart with volumes from the forward shelves, key into the scanner a stocking transaction code, and scan the volumes on the cart and the cart shelves to record the in-transit locations. The emptied shelves in the forward area will then be scanned to confirm that all recorded volume locations in the forward shelves have been cleared, and to account for all volumes. The stocker will then proceed to the appropriate storage zone in the stacks and place the first volume in the first available location. The bar code on the volume and its new shelf location will be scanned to record the new location and delete the in-transit location; once a bar code on a volume has been scanned, another volume should not be able to be scanned until the shelf location bar code has been scanned. When a cart shelf is emptied, the cart shelf label will be scanned to confirm that the stock location record has been cleared and to account for all volumes, and this process will be repeated until the cart is empty. This stocking process will be initiated out of a subsystem batch program.

The relocation of volumes within the stacks is a space management function. When a storage zone becomes congested, the center director will prepare a relocation plan for the affected zone. This plan will list the bar code numbers and shelf locations of all volumes that were received on or before a designated cutoff date. The candidate volumes should be listed by shelf elevation, so that inactive volumes on the lower shelves will always be relocated first. The stockers will then relocate the desired number of volumes, either to the upper shelves of the congested zone, or to a remote storage location.

When a storage zone becomes less than fully used, the director will prepare a listing, generated from a batch file program, of the bar code numbers of all titles that should be stored in the zone. The system will determine the out-of-zone storage locations of all volumes, and prepare a consolidation plan, listing the bar code numbers and shelf locations of all volumes that should be relocated. If this initial consolidation does not substantially fill all surplus space, the zone boundaries should then be changed.

Periodic Inventory Maintenance

The Periodic Inventory Maintenance functional area is used to conduct inventory checks and assist in performing annual physical inventory procedures. Transaction summary statistics for daily activities will also be tracked in the system.

a) On a quarterly basis, an inventory check batch program will be run to confirm that the subsystem inventory databases are accounting for the locations of books/magazines. The program will produce a random list of books in a batch file and also a printed report from which the user will locate a book and verify its location by a visual inspection. The user will then enter an inventory check transaction code into the bar code scanner and scan the book for verification. The entry of this inventory check transaction code will invoke an inventory verification batch program that will access the random list batch file. This program will keep track of the verification activities and produce statistical and reconciliation reports of the findings.

b) Once per year, at a time designated by NLS, the centers will have no inventory activity, and an annual review batch program will be run to perform an annual balancing of inventories between the two centers. The program will generate an internal inventory batch file of the records in each center and provide a status report of the current condition of the inventory. Since this process will be a separate routine, it will permit the user to analyze the internal inventory batch file, and then by using the application software, will aid in correcting shortfalls within the inventory. The shipping containers will also be accounted for in a similar manner.

c) All transactions involved in receiving, stocking, and shipping activities for the centers will be tracked by the accumulation of statistical records in a transaction database, with an individual transaction being the unit of measure. Daily summaries of the transaction counts for the measured activities will be retained in the database and will be utilized for staffing, planning, scheduling, and NLS reporting. These daily transaction counts will be retained in the database for at least two full years, or as designated by NLS, in fulfillment of the contractual requirement that an appropriate system be devised for gathering statistics required for NLS reporting. For NLS reporting, the daily figures will be rolled-up into monthly, quarterly, year-to-date, and annual reports as required.

3.4.3.4 Miscellaneous

This section defines functionality for those areas which were not directly covered or related to other areas previously discussed. These functions include regional library access, follow-up for overdue books, and notes capability.

Regional Library Access

Regional Library Access will be a feature of the primary system that permits regional libraries to query the book inventory, order/request/reserve books, and query and modify patrons files. The software will provide a dial-in access login that will limit regional libraries to ordering books and querying/modifying patron files only for their own patrons. The

software login program must be able to identify the library by its ID and grant that library access to records only for those patrons who have that library ID code in their patron file. The software will preclude a library from accessing other patron files, even though they may know a patron's ID. The software will allow the regional library to order books for a patron using the same book selection functions as the reader advisors at the primary system level, i.e. order, query, etc. System access for the regional libraries will be limited to the patron file, book selection, and magazine selection. The software will maintain a counter each time this function is accessed, which will compute time on-line, number and type of transactions generated, by servicing library ID, and produce a monthly report of the activities.

Follow Up for Overdue Books

The Follow Up for Overdue Books is a process that will assist the reader advisors in following up on overdue books. The system will track both volumes in circulation, and volumes stored in the centers, so that the custody of all braille volumes is accounted for at all times. The system must track individual patrons, institutions, non-participating libraries, browsing and reference collections in participating libraries, library loans, the NLS proper, the centers, and possibly others. Reports will be developed which provide listings of overdue books, the patron and address having custody of the book, and the date on which the book was shipped to the patron. NLS will develop a policy for overdue books during the design phase, which may include automatic generation of overdue book notices, and can be tailored by RAs prior to printing.

Files Maintenance

The Files Maintenance function will be a process used to audit or purge records from centralized braille databases. Software will be designed that permits the system administrator to conduct tests which audit database records, i.e. error checking, transaction comments, etc. in monitoring data integrity. The system will also enable the administrator to purge groups of records from the databases. The purging process will contain software controls that will ensure that records are neither purged accidentally, nor initiated from a remote source.

Notes Capability

The Notes Capability is a process used to compose comments and establish relationships between a patron, book/magazine, and circulation records. The software will provide the user with a comments field which permits the user to enter comments pertaining to a patron, book, or circulation transaction, and make an entry into a notes database that will relate it to the proper level of action. Every time the patron, book/magazine, or circulation record is accessed by the user, a message will appear that indicates that there are comments associated with that particular record. The software will also allow the user to edit or remove the comments as required.

3.4.4 Utility Software

There is a need for utility software that will support several system functions. These functions include: backup and recovery, LAN management, interactive communications including data transfer capabilities, and BLND access software from NLS. This utility software must operate within the constraints of the selected hardware and operating software environment, and must also be able to interface with any peripheral devices attached to this system that are necessary to carry out their functions. This software must be able to have customizable capabilities that allow it to be adapted to the particular system configuration and interface with application software and databases when necessary.

3.4.5 Data Security and Recovery

The system will provide security to prevent accidental or unauthorized modification of records in the databases, and have data recovery guidelines which must be followed to provide full recovery from any type of system failure on a fault tolerant computer system. Data security must be provided in a structured manner, and can be defined as having three areas: 1) the security area, which defines the highest level of access to all aspects of the system, including equipment and software; 2) the primary system area, which defines the highest level of access to the application software and databases, and 3) the access level area, which defines

a level of access for alteration and/or read access of patron, bibliographic, and item records with overrides of circulation functions.

Security Area Access

The Security Area Access defines the highest level of access to all aspects of the system including equipment and software. This access will be limited to ADP systems operations staff, and will employ user passwords. All aspects of this complex computer network system must be managed and controlled by knowledgeable staff with no restraints from the system through this type of access, and must be used with caution and extreme care so that the operations of the centers are not interrupted unnecessarily.

Primary System Security

The Primary System Security defines the highest level of access to the application software and databases. Access to individual functions, including all application software functions and system utility functions, will be controlled individually so that selected users can be regulated regarding the functions they operate. This access will be different from that applicable for the database administrator and users accessing the system from remote locations.

Access Level Security

The Access Level Security defines a level of access for alteration and/or read access of patron, bibliographic, and inventory records with overrides of circulation functions. Each type of user will have varying degrees of access to the databases. Reader advisors will have individual passwords which will limit them to a menu utility that provides them access to patron and title information. Reader advisors in the centers will have access to all patron records, while reader advisors in regional libraries will have access only to patron records with their own library code. The NLS will have the same access level as the center's reader advisors. Floor operations personnel will have access to inventory data contained on their subsystem server at their own location. Any interface between the primary system and the

subsystems would be via a multi-directional batch processing routine, and floor operations personnel will not have access to the database on the primary system. A patron will have direct access for ordering, requesting, and reserving books by means of the IVR, which will be controlled by a patron password and patron ID. A patron will only be able to order books for themselves, since the book allocation and pick ticket generation will be automatically associated with the patron user ID accessing the system.

Recovery

The specified system consists of multiple databases residing on separate computers: a network database server, and one inventory database server at each facility. The network database server will maintain the primary database with patron data, book title data, and other descriptive information. The subsystem servers will maintain the inventory database of copies of volumes/issue of books/magazines and their respective shelving location information for each site. The primary danger to the system would be in the form of a total electrical failure. Short of a catastrophic event, the system and its host computers would be relatively secure. The system would be most vulnerable to crashes or other events that cause a sudden and total loss of data. Requirements are specified to lessen the impact of these possibilities.

Because the primary system will reside in a fault-tolerant environment with no single failure points, the possibility of system downtime due to component failure is vastly reduced. A schedule of independent backups to preserve the primary database, and recording the database changes in mirror image, would provide 100% security to all primary system storage. Independent backups and transaction journaling will provide recovery and backup security for the subsystem databases.

The primary database server will be a totally redundant configuration without a single failure point. If one component fails, the other one will assume the workload providing a very high probability that the total system will not fail. A duplicate configuration of the subsystem server is a part of these requirements so that, in the event of a subsystem server failure, the backup user connection can be used to reload the database and journaled transactions.

Functions normally performed on the user connection will cease in this instance and the inventory functions would resume.

3.5 CAPACITY REQUIREMENTS

This section defines the required system capacities associated with data storage and processing, and the sizing of the fields and records contained in the databases. These minimum capacity requirements were established to assist with the system design, and the sizing information is considered to be an estimate and may change during the design and development phases.

3.5.1 Database Environment

The database environment was specified after an examination of several systems currently used by the network. These programs included Data Research Associates (DRA), Keystone (KRAS), the Pennsylvania Consortium, the Texas System, the Utah System, and READS. Each system was examined to the extent information was provided by the vendors or designers, and the attributes best suited to the envisioned centralized application were selected. The computations in support of this sizing estimate are contained in Appendix 3-1.

3.5.2 File Sizing

In determining the preliminary required fields and record layouts for the data, each software package identified above was analyzed to select required information, while maximizing economy for memory utilization. As previously discussed, it is required that the primary system support the use of bar coding. The bar code feature would reduce the amount of memory required to store patron and braille book detail data at the subsystem (primary/secondary) level and, in conjunction with the fact that the database would store only information on braille media, would substantially reduce the amount of data to be stored on the system relative to one supporting multiple types of media.

The Primary database would consist of 11 record layouts: Patron Main, Patron Check-out, Patron History, Patron Request List, Patron Reserve List, Book Record, Book Bar Code, Master Book, Master Bar Code, Magazine Record, and Magazine Bar Code. Each patron record would contain a common identifier which would link it to related records. The records would be linked by the patron_ID, which would be the same as a patron's CMLS ID. The Braille Book/Magazine records would be connected by means of the Title_ID, Master_ID, or Mag_ID. The eastern site subsystem database would contain two records, the Sub Book and the Sub Magazine, while the western site subsystem would have three records, the Sub Book, the Sub Master and the Sub Magazine (the Western Center would house the BRA master collection, regardless of the location of the primary center).

Patron Information

The Patron Main record would contain 524 bytes per patron; therefore, it is estimated that the entire Patron Main file would require approximately 10 megabytes of disk storage to accommodate the current braille readership. The data contained in the patron record are considered standard requirements based upon the databases reviewed. The fields which make up the patron record are the patron's identification code, name, permanent address, alternate address, provisional address, temporary address, point of contact, and phone numbers. The record also contains the patron's foreign language abilities, year of birth, sex, disability, patron activity (first & last date), center RA, subject interest codes (32), restrictors, profile select option, patron type (Individual or Institution), veteran status, frequency of desired service (daily, weekly, etc.), home regional library, and DPA password.

The Patron Check-out (Has Now) record would consist of five fields. These fields are the patron's identification code, the title identification, the unique volume number, the date the book was sent, and the due date. Books issued to institutions will be handled separately. Given a 25 book limit per individual patron (not institution) established for design purposes, the size of this file results in a requirement for 18 megabytes of disk storage. This value represents the maximum requirement in the unlikely event that every patron would have 25 books checked out at any one time.

The Patron History (Has Had) record has been designed to store the least amount of data possible, yet facilitate the profile select capability. The Has Had record will be stored on the primary system only. The Has Had record consists of two fields, the patron ID and the title ID. File size estimates for the Has Had records are based on the current per patron circulation of 10 books per year, and the assumption that a ten-year patron history (on average) would be transferred from network libraries to the primary center upon conversion. This function would, therefore, require disk storage of approximately 46.2 megabytes the first year and, based on a 1.5% patron net growth for five years, would eventually require 63 megabytes of storage to accommodate five additional years of data.

Records were also specified to accommodate patron orders placed on a request or reserve list. The Patron Request list would allow each patron to store an unlimited number of books. To estimate the data size of the request list, a 50 book average has been assumed. This average was applied to the total number of patrons resulting in a 29 megabyte storage requirement. The reserve list will have a maximum allowable limit, to be determined by NLS during the system design phase. For sizing purposes, a 25 book limit has been assumed and applied to the total patrons, the outcome of which is a 14 megabyte storage requirement.

Collection Information

Each title in the inventory will have three records linked by the Title_ID field. The first record will provide title information, the second record will identify the volume by bar code number (both will be maintained on the Primary system), while the third record will be located on the subsystems and house two bar code numbers, one for unique identification and one for storage location.

The first record (Book Record) holds the majority of the inventory information for the BR, BRA, BRF, BRJ, BRX, and PRE 13,000 BRA collections. Information in this file provides only a description of the title, not the volume. This record also contains the title identification along with the title name and four subject codes. Additional information includes the author's name, originating date, an abstract with a reference identification code, and subject

matter indicators to cover profanity, sex, violence, series, fiction/non-fiction, long or short, reading level, language, type of braille (i.e. thermoform, print braille, etc.), deposit type, profile select exclusion, and the date the book was received. This file was sized using the total number of titles currently in all collections (28,983), which yielded a storage requirement of 25 megabytes.

The second linking record (Book Bar Code) will be used to track each individual volume of the braille book collection. This record will contain four fields; the title identification number, the title volume number, the title bar code, and the shipping/receiving date. The title bar code field will contain a unique identifier that identifies an individual volume as a unit of inventory that will be linked to the Title_ID and Volume Number for tracking the item. The total file size for these records is estimated as 37 megabytes, assuming all collections (1,230,996 volumes) are to be managed by the centers, i.e. full participation of all network libraries.

The third record tied to the Book Record is the Sub Book, which is stored on each subsystem in the center wherein the braille book is physically located (primary or secondary). These data will be used to identify the shelf slot where the book is located in the facility. This record consists of 2 fields, the title bar code and the location bar code. The title bar code is linked to the primary system, and the location bar code indicates shelf location. The sizing of this file was based on the total volumes to be stored at each location (primary or secondary). The initial capacity requirements will be approximately 11 megabytes in the Western Center and 18 megabytes in the Eastern Center, which are based on the storage of 472,385 volumes in the west, and 758,611 volumes stored in the east.

Records for the BRA Masters will be maintained in a separate table (Master Book) to be configured in the same manner as the Book Record. This record will be comprised of basic title information to include the title ID, title name, author, origination date, abstract, language, and receipt date. There are 4,307 BRA Masters currently in the MSCW inventory, and based upon a total record length of 504 bytes, the size of this file would be 2 megabytes. These books will be stored in the western facility only.

A second record which will be used to trace the Braille Master books by volume is labeled the Master Bar Code, and is identical in structure and function to the Book Bar Code record. The total file size for these records is approximately 913 kilobytes.

The third record related to the Master Book is the Sub Master, which is identical in structure and function to the Sub Book record. The initial capacity requirements will be approximately 705 kilobytes for this file.

The Magazine Records will be used to identify the back-issue magazine collection. Although this media has very little circulation, the same considerations used for braille books have been applied for estimating capacity requirements. This file contains three records: the Magazine Master Record, the Magazine Bar Code, and the Sub Magazine. The Magazine Master Record provides a description of the magazine and contains the magazine identification along with the magazine name, volume identification, issue date, abstract matter, and date received. The storage requirement for these records was quantified considering the total back-issue magazine collection stored in the MSCW (7,496 copies), and is approximately 1.2 megabytes.

The Magazine Bar Code records will be used to track the back issues of braille magazines, and will contain four fields: the magazine identification, magazine volume ID, magazine bar code, and magazine shipping date. This record is identical in structure and function to the Book Bar Code and Master Bar Code. The total size for this file is approximately 102 kilobytes.

The final record associated with the Magazine Record is the Sub Magazine, which is identical in structure and function to the Sub Book and Sub Master records. The space requirements for this file will be approximately 88 kilobytes at each subsystem site, primary and secondary.

The total memory required to support the primary system will be approximately 199 megabytes. Allowing for 3% annual growth of the system across the board for seven years,

the capacity requirement will increase to 245 megabytes. The western subsystem will initially require 13 megabytes, and the eastern site subsystem 21 megabytes of memory. Using the same growth scenario as for the primary system, the western and eastern sites subsystems will require 16 and 26 megabytes, respectively, seven years after implementation.

3.6 TELECOMMUNICATIONS

This section provides a discussion of the communications requirements to include network communications, NLSNET compatibility, and data and voice communications. This area defines minimum requirements to ensure that the system functions properly from a communications standpoint.

3.6.1 Telecommunications Network

Network hardware and software to support the facilities and users of the centralized braille book storage and distribution system is required. There will be two methods for accessing the system: a non-local area network ("non-LAN") method, which must also support dial-up capabilities for remote terminal users; and a LAN method for intra-facility communications.

Non-LAN communications requirements include: uploading and downloading files between the primary and secondary facilities; downloading patron information, and new titles descriptive and ordering information, from the CMLS and network libraries, and from NLS, respectively; and, interactive accessibility to the primary database by network library RAs for placing orders, making queries, and modifying patron files, and to patrons using modems for making queries and placing orders. This accessibility will require lease services to a wide area network (WAN), a network hub interface to the WAN for the primary site, and software for the appropriate inter-networking and transport protocols (e.g., TCP/IP, SNA, DECnet, ICMP, UDP, SNMP, RIP, FTP, or IPX/SPX).

LAN communications requirements include an integrated intra-facility capability that permits all local users, including RAs, center management, ADP staff, clerical staff, and floor operations staff to share databases, printers, and other resources. This capability will require a network interface for each of the devices/connections attached to the LAN, cabling, and the appropriate networking software (e.g. Novell Netware).

3.6.2 NLSNET Compatibility

The NLSNET system uses an electronic data interchange store and forward capability whereby NLS and the network libraries store data files which are later retrieved by NLS, NLS vendors, and multistate centers for batch processing. The primary ADP system is required to interface with the NLSNET system for the purpose of possibly retrieving patron service information from the network libraries, and descriptive and ordering information for new titles from NLS. This information will be captured in electronic form, reformatted, and added to the centralized database. The interface will require a modification to the NLSNET functional capabilities, files, and formats in order to deliver the needed information to the centralized system.

3.6.3 Communications

The required centralized braille book distribution system must be accessible to internal and external users for voice and data communications. Internal users are defined as the staff at the primary center. External users are defined as the patrons who are provided direct access (via IVR or modem), regional library RAs, staff at the secondary site, and NLS. Internal users would access the primary system through the LAN, while external users would access the system through a wide area network for data communications, and over 800 lines using touch-tone telephone entry with interactive voice response. Furthermore, each regional library will be able to have multiple users connected to the primary site simultaneously.

Data

The communication of data between the primary and secondary distribution centers is necessary, and a minimum of three inter-site communication sessions per day will be required to exchange data and execute transactions to update and maintain the status and location of the collections, and patron information as well. Data communication needs would require using the services of a packet-switched Wide Area Network (WAN) (e.g. Telenet/Sprint). For this purpose, a high-speed feed from the WAN to the primary facility is required as well as a connection address identifying the facility for routing purposes

Data communications over the WAN should be achieved through a network of locally accessed telephone numbers. By using modems and dialing the local access to the WAN, regional libraries will access the primary ADP system, and the primary and secondary facilities would exchange data. Any additional user support interface connectivity required at the network library level (e.g. Windows compatible, user front-end interface) will have to be developed by the network libraries that require such a capability. In the event that the WAN should experience a temporary failure, a contingency will be required whereby external users could gain direct access to the primary ADP system via a modem and by-passing the WAN.

Voice

Voice communications for the primary distribution center will require a minimum of 4 separate telephone numbers and a telephone switching system capable of supporting ten lines, 24 users, and 325 calls a day with an average duration of 3 minutes. Two of the telephone lines will support 7 digit numbers, and 2 would be 800 lines. One of the 7 digit numbers should be used to support the management staff, ADP personnel, and the floor operations. The second 7 digit number should support the FAX machine. One of the 800 lines would be used to support the RAs and clerks with 6 stations for toll-free voice communications and the TDD. The second 800 line would be required to support the DPA-IVR system and support four calls at a time. This 800 line concept will permit 10 calls to be processed simultaneously.

An Auto-attendant will be used to process calls when lines are busy and permit the caller to select the DPA-IVR feature, or an RA, by use of a touch-tone telephone option (no selection by the caller will default the call to an RA). During after-hour operations, the RA telephones will be answered by an answering machine, and the DPA-IVR will be available 24 hours a day, 7 days a week.

The secondary site should have 3 direct lines, all being 7 digit numbers. One of the lines should be used for the FAX machine, the second line should be used for the site management/staff for general voice communications, and the third would be used for data telecommunications.

3.7 MAINTENANCE

Maintenance established to support hardware for this system will meet all of the following requirements. The first type of maintenance will be standard maintenance and cover a normal operation of 8:00 a.m. through 5:00 p.m., Monday through Friday (all times are local time). On-call maintenance at times outside the periods of standard maintenance must be available on a per-hour charge basis. The second type will be extended maintenance, and provide coverage for the periods of 5:00 p.m. through midnight Monday through Friday, and 8:00 a.m. through 5:00 p.m. Saturday and Sunday. Each piece of equipment proposed for the system will be accompanied by a mean-time-to-repair, the number of hours required per month for preventive maintenance, and the frequency and duration of such preventive maintenance. Any maintenance defined as third party will be identified separately.

Maintenance will be provided for all software as a feature of the system via a dial-up or remote basis. In the event of a software problem, it is required that a maintenance representative must be "on-site", either in person or via the dial-up port, within 2 hours of notification by an authorized representative that a problem exists.

3.8 FINANCIAL CONSIDERATIONS

Financial considerations included in this section should be regarded as a guide to ensuring that all cost issues related to this system are taken into consideration. Listed below are financial alternatives, maintenance options, and additional costs to consider.

3.8.1 Financial Alternatives

To simplify the financial evaluation process, equipment pricing should take the form of an equipment list (specific models cited) so that proposals can be compared easily. Where feasible, alternative pricing should be provided for a five-year installment purchase, a five-year lease with purchase option, or a five-year lease.

Each proposal must contain a complete price schedule itemized for all equipment and services proposed. Any element of recurring or non-recurring cost which must be borne by the center must be identified. This includes, but is not limited to: equipment maintenance, system engineering, manuals and documentation, education/training, bibliographic conversion, demonstrations, consultation, shipping charges, installation costs (excluding site preparation), testing, taxes, and manufacturer supplied programs. Rental rates and license fees proposed, if any, shall be the maximum permitted during the term of the contract executed by the center as a result of the acquisition. Vendors may propose either firm prices (lease, purchase, and maintenance) valid for the term of the contract, or propose prices with periodic incremental increases which will be evaluated financially at their maximum allowable values. Maintenance rate increases shall be permitted only upon written notice to the NLS at the termination of its fiscal year. Each vendor must specify in the proposal an upper limit percentage beyond which maintenance rates will not increase in any calendar year.

If the vendor receives a lower OEM (Original Equipment Manufacturer) price or maintenance rate for any equipment identified in the proposal during the contract period, the center shall have the benefit of such lower price, and the vendor shall notify the center and make necessary reductions.

3.8.2 Maintenance Costs

This section provides an explanation of cost issues associated with hardware/software maintenance support. Cost options to consider are response times and levels of service. Also to be considered are extended maintenance issues and annual rates of increase.

Most hardware maintenance costs are tiered depending on what level of response time the customer desires for a service representative to be on the premises for repair. The tier from highest to lowest is usually broken down as follows: 1) 2 hour response, 2) 4 hour response, and 3) 8 hour response. Most software maintenance costs for product/utility software are tiered depending on what hardware platform and operating system the customer has, with annual rates being fixed. The custom application software annual rate for maintenance will most likely be determined based on the complexity of the software regarding the number of functions and amount of system interface capabilities.

Maintenance contracts usually are defined for a specific number of days and period of time, i.e. 8:00 a.m. through 5:00 p.m., Monday through Friday, for on-call service. In order to acquire service for other days and other time frames, it is necessary to contract for extended maintenance.

Most maintenance contracts are for one-year increments, and rate increases are considered normal. The customer can ask for a multi-year contract with the annual rate of increase being fixed for all the years of the contract indicating the increase, but at the same time being fixed contractually. In times of inflation, this fixing of the annual rate of increase for maintenance can be advantageous to the customer.

3.8.3 Additional Costs

This section provides a discussion of additional cost items not previously addressed in this report. These areas include bar coding, site preparation, delivery and installation, database loading, and telecommunications.

Costs associated with the bar code system should address all facets of the operation to include unit costs and maintenance for the bar code readers, transceiver, system interface communication hardware and software, and bar code printers. Costs should be segmented as one-time and recurring, with recurring costs shown as a five-year projection. Pricing relating to bar code supplies should be guaranteed for twelve months.

The site preparation costs are considered one-time costs. Each item and/or task required in site preparation should be priced separately. Every priced item should be labelled as time sensitive or not. Items that are considered time sensitive should contain a contingency plan which indicates what actions will be taken if a delay is encountered.

Delivery and installation costs must be submitted in an itemized format indicating date of delivery and date of installation. Since delivery and installation are contingent upon the site preparation being completed on time, a plan must be developed to control and store delivered equipment prior to site preparation being completed. If at all possible, recuperation of some costs should be requested for milestone slippages in delivery dates.

Database loading costs or penalties should be based on well defined tasking. Depending on the methods used to implement the centralized braille system, loading of regional libraries databases will be performed incrementally. Incremental pricing should take into account the complications involved in interpreting the data files (i.e. READS, Consortium, etc.) and the type of tasking required. The types of labor categories required to perform the operation should be indicated in conjunction with loaded labor hour rates. Loading of data from larger databases, such as PICS or BLND, should be a coordinated effort between NLS and the primary center in relation to this task being accomplished in-house or contracted. During the design process, estimates should be provided for a trade-off between manually loading required data and developing software for automated loading.

Telecommunications costs will involve both data and voice communications telephone lines. Pricing should differentiate between voice and data telephone lines, and a unit or usage rate should be indicated. Where usage rates are indicated, pricing scales should accompany

the bid to indicate economies of scales based on volume of usage. The number of telephone lines and trunks should be indicated and priced separately. Telecommunications and communications equipment should be incrementally priced to include primary hardware, (i.e. modems, telephones, answering machines) in conjunction with unit costs for peripheral items such as RS-232 ports, cabling, etc. Long distance rates may vary significantly by direct supplier, regardless of the servicing vendor (e.g. AT&T, MCI, or SPRINT). Rates can be negotiated based on volume; therefore, it may prove beneficial to both NLS and the regional libraries to contract for a total minimum number of minutes per month, with individual billings possible.

SECTION 4

SPECIFICATIONS FOR FACILITIES AND SHELVING

Section 4

SPECIFICATIONS FOR FACILITIES AND SHELVING

This section of the Study I, Part 2 report presents the specifications for the facilities and shelving that would be required to successfully implement the proposed centralized braille services. These specifications assume full participation by all network braille libraries in the proposed program.

4.1 SPECIFICATIONS FOR FACILITIES

This subsection contains specifications for the provision of the facilities required to successfully implement the proposed centralized braille services model. The information in Section 2 of the report, exclusive of cost estimate information, should be provided to prospective offerors for the provision of the subject facilities. It should be stated that the information in Section 2 is background material and optional, but recommended, information for the prospective facilities offerors.

4.1.1 Number of Facilities

Two separate facilities must be provided through lease or purchase to the NLS to support the subject operations. One of these facilities will henceforth be referred to as the Western Center, and the other as the Eastern Center.

4.1.2 Location of Centers

The Western Center must be located in the Salt Lake City, Utah metropolitan area in such a location that it is in the immediate service zone of the USPS ASF in Salt Lake City, Utah. The Eastern Center must be located in the Cincinnati, Ohio metropolitan area in such a location that it is in the immediate service zone of the USPS BMC in Cincinnati, Ohio. The immediate service zone is defined as the area within which the respective USPS bulk mail operation will directly provide delivery and pickup services.

4.1.3 Size of Centers

The required facility sizes and approximate configurations for the Eastern and the Western centers, the major space allocations, and the approximate placements of the buildings on the sites are depicted in Appendix 4-1. The solid lines in the layout diagram and the facilities' component and total area values shown represent the minimum floor space that must be provided. The dashed lines shown in the layout diagram represent desirable site sizes and building expansion possibilities that should be provided. The requirements listed below must be satisfied.

Book Stacks - The Western Center must contain a minimum of 15,250 sf of floor space for book storage, and the Eastern Center must contain a minimum of 22,800 sf of floor space for book storage.

Shipping - The Western Center must contain a minimum of 1,530 sf of floor space for shipping and receiving, and the Eastern Center must contain a minimum of 3,130 sf of floor space for shipping and receiving.

Offices - The Western Center must contain a minimum of 2,140 sf of floor space for an office area, and the Eastern Center must contain a minimum of 1,520 sf of floor space for an office area (*note: these requirements assume the Western Center is to be the primary center*).

Sites - Both centers should be located on building sites having a usable area that is at least four times the footprints of the buildings themselves. This coverage ratio will provide adequate room for required setbacks, access and egress roads, off-street parking, truck aprons, utilities, landscaping, and future expansion. The minimum plot size for the Eastern Center should be 2.5 acres, and the minimum plot size for the Western Center should be 1.9 acres. The site configurations should be approximately as noted in Appendix 4-1. If these gross site size parameters and configurations are not precisely met, offerors should furnish both information on the specific deviations and statements ensuring that all requirements enumerated within this paragraph, other than the gross size requirements, shall be satisfied.

4.1.4 Configuration of Facility Space

Detailed layout drawings for each of the two required facilities may be found in the clear plastic envelopes immediately following the appendices. The desired internal building configuration showing features and details within the shelving ranges for the storage of book collections, the receiving-shipping areas, and the office areas are provided in these blueline drawings.

These layout drawings represent optimal configurations for the proposed facilities, and must be considered design requirements if the facilities are to be furnished by the offeror "built-to-order." The most important features in the optimal facility layouts with regard to the relative locations of component areas are; the adjacency of the receiving/shipping areas to truck dock(s), the adjacency of the receiving/shipping areas to the forward shelving areas, and the adjacency of the office areas to the receiving/shipping areas.

All offers for provision of the required facilities, whether supplied on a built-to-order or as-is basis, must contain detailed proposed floor plans and the costs of all alterations or additions to buildings and grounds that are required to accommodate the contemplated distribution operations, and the installation of all required equipment.

4.1.5 Usable Building Height

The vertical clearance in both the Eastern and Western centers must provide a minimum usable height of 13'-0" below all overhead obstructions, including lighting fixtures, space heaters, ductwork, sprinklers, and drain pipes.

4.1.6 Floors

The floors of both facilities must be capable of supporting mobile shelving fully loaded with the various book collections to be stored therein, and additionally permit the movement

of personnel and material handling equipment within the facility as described in Section 2 of this report. The requirements listed below apply to the floors of the facilities.

Epoxy Coated - The floors of both facilities must be poured-in-place concrete slabs, and should be epoxy coated for dust protection, ease of maintenance, and enhancement of lighting levels.

Levelness - The levelness of floors in both the stack areas and non-stack areas must be as specified in Appendix 4-2.

Floor Loading - The live load in a fully occupied storage module will be 604,800 pounds (ref. Appendix 4-2). This live load will be carried on rails imbedded in the floor, rather than on the floor itself. Assuming that the rails will be designed and installed to evenly distribute the load throughout a storage module, the minimum load-bearing capacity required of the floors in the stack areas must be 430 pounds per square foot. *There is a difference of opinion in the industry about the required load-bearing capacity of facility floors for compact shelving. The NLS should rely on the advice of the project architect to determine what is needed in any particular case.*

4.1.7 Lighting

Lighting in both centers must be ceiling mounted, and should consist of continuous rows of fluorescent fixtures oriented at right angles to the mobile shelving ranges to be housed. This fixture orientation also applies to the non-storage areas. Additionally, the following requirements also apply to the lighting at both centers.

Adequate - The lighting configuration in the facilities must provide a brightness of 25 foot-candles on a vertical plane at floor level.

Energy Efficient - Given the requirement for adequate illumination of the facilities, the lighting should nevertheless be as energy efficient as possible.

Clearance - The minimum vertical clearance between the lighting fixtures and the floor must be 13'-0".

Module Wiring - Each mobile shelving module must be independently wired, and the off/on controls must be provided on both end panels of the fixed shelf range. The modules will not be lighted except when

in use. However, the end aisles must be lighted during normal working hours, and each end aisle must have an independent multiple-module on-off control. (*Note - this requirement spans both facilities and shelving.*)

Night Lights - Night lights, exit lights, and exterior lighting must be provided in conformance with building and safety codes.

4.1.8 Utilities Access

Both the Western and Eastern Center facilities must have adequate access to the utilities listed below. Additionally, each facility must have adequate distribution of the subject utilities within the facilities in order to support the operations and equipment described in Section 2 of this report.

Electricity - Facilities must have electrical power access and distribution within the buildings adequate to support the envisioned operations, including mobile shelving, computer systems and peripherals, lighting, environmental and safety controls. If electrically powered, the mobile shelving will probably require power sources of 115 volts AC, 30 amps, single pole breaker protected (TBD). The outlets for power wiring, if required, and for lighting each mobile shelving module must be positioned as specified by the mobile shelving vendor, and provided at no extra cost.

Telephone - Facilities must have access to the local telephone company network that is sufficient to support all required voice and data telecommunications needs of the proposed operations.

Gas/Oil - Facilities must have access to the local natural gas network, or adequate oil storage tank equipment, if facility heat is provided by gas or oil, respectively.

Water - Facilities must have access to local municipal water systems to support the proposed operations, which would include water for drinking, cleaning, fire protection, sanitation, and landscaping requirements.

Sewage - Facilities must have access to local municipal sanitary sewage systems sufficient to support the proposed operations.

Refuse - Facilities must have access to either local municipal or private refuse containers and collection services sufficient to support the proposed operations.

4.1.9 Environmental Controls

The facilities must have environmental controls and equipment that will provide a stabilized storage environment for braille books, and a favorable working environment for personnel. Requirements will include:

Temperature - The entire facility must be heated and cooled, with separate controls for the office and floor operations areas. The office area must be air conditioned, and the floor operations areas must be cooled to a temperature of 80 degrees F at an elevation 7'-0" above floor level when outside temperatures exceed 85 degrees F.

Humidity - The heating system must be outfitted with a humidifier, and the cooling system must be outfitted with a dehumidifier that will maintain relative humidity in the stack areas below 50%.

Dust - The HVAC systems and the incoming air supply must be equipped with filters for dust control.

4.1.10 Access and Egress

Adequate access and egress to both facilities is an important requirement of the proposed operations. All of the requirements listed below must be met for both centers.

Front Door - A front door entrance to the facility, which leads into a secured vestibule area, and a buzzer and intercom must be provided. All operations personnel and visitors, exclusive of truck operators delivering or picking up loads, will enter and exit the facility through this door.

Ramps - A graded ramp must be provided leading to and from the front door entrance for use by employees and visitors, and at all fire exits.

Loading Dock(s) - A floor level loading dock(s) that is 4'-0" above grade and equipped with a built-in mechanical dockboard that is 6' wide x

8' long must be provided. The door must be 8' wide x 8' high and must be equipped with a dock seal for protection from the elements.

Trucker Door - A door must be provided adjacent to the loading dock(s) to permit truck operators and maintenance personnel to enter and leave the receiving and shipping area without having to use the front door to the facility.

Fire Exits - Fire exits, including exit lights, panic hardware, and signing must be provided in conformance with standard industry practice and local building codes. These would facilitate rapid evacuation from the back of the facilities in the event of emergencies.

4.1.11 Safety Features

Safety features in full conformance with applicable building and safety codes must be provided at both facilities in order to ensure the safety of employees and visitors. These safety provisions will include:

Smoke Detectors - Smoke detectors should be located in several strategic locations within the facilities.

Fire Extinguishers - Fire extinguishers should be located in several strategic locations within the facility.

Alarms - The facility must be equipped with an emergency alarm, which must be audible, and visible as well.

Exit Doors and Ramps - Ref. Subsection 4.1.10.

OSHA Compliance - The facility and all operating equipment must be in compliance with OSHA regulations.

4.1.12 Security of Collections

The facilities must be able to provide adequate security to protect the collections and other property against hazards, both natural and man-made. The following requirements must be met at both centers:

Fire Walls - A structural fire wall must be provided across the full width of the buildings (column line E on the layout drawings). The stack areas in the buildings, when fully expanded, will then consist of a front room four bays deep and a rear room three bays deep.

Sprinklers - Fire protection provisions must meet or exceed local and state government codes and ALA standards. An overhead sprinkler system, utilizing a zoned network of individually thermally activated heads, should be provided.

Theft Protection - Theft protection must be adequate to protect the property within the facility. Exterior and interior doors must have adequate and well functioning locks. Burglar alarms should be provided and should be connected to an outside security service when the premises are not occupied. Video camera surveillance should also be provided, if warranted.

Rain/Windstorm - The walls and roof of the facility must protect the collections and property inside from damage due to windstorm and rain, and must meet all applicable building codes in this regard.

Flood - The finished floors are to have an elevation above grade that will fully protect the collections from damage by rising flood water. The facilities also must not be located in a one-hundred year flood plain, or in any other location that has a history of flooding problems that would impede access to the facilities at any time.

4.1.13 Conformance with Laws and Codes

Both facilities must be in full conformance with all codes, and in compliance with all laws and regulations. The following considerations are applicable.

Building Codes - The facilities must be in full conformance with all applicable local, state, and federal building codes, including seismic protection.

OSHA - The facilities and equipment must be in full compliance with all applicable OSHA regulations.

ADA - The facilities and equipment must be in full compliance with all applicable ADA regulations.

4.1.14 Provision for Expansion

Each of the centers should be configured to permit modular expansion in two directions, with minimum disruption to ongoing operations. Expansion to the rear and sides would provide additional storage capacity for braille books or other conceivable, compatible logistics functions. The office areas should also be capable of being expanded in two directions, although this should not be necessary. Appendix 4-1 indicates the desired expansion potential for each of the two facilities.

4.1.15 Procurement Considerations

The following points are not a part of the specifications for facilities, but are rather considerations for NLS to take into account when procurement planning is initiated.

Build-to-Order and Buy - Having a facility built-to-order is optimal from the standpoint of maximizing the efficiency of the proposed operations, including the structural integration of the mobile shelving rails and the floor. Purchase of the property would require a larger up-front commitment and capital investment than leasing, but would afford NLS more control over repairs, maintenance, and improvements than would leasing.

Build-to-Order & Lease - If the facility is not purchased, it might still be possible for NLS to negotiate with a commercial firm, or possibly GSA, to have the facility built-to-order and then lease it back to the NLS. This would provide the benefits of optimal facility layout without legal ownership. However, since the mobile shelving would be an integral part of the structure in this scenario, and because of the required investment on the part of the lessor, the lease would certainly be long-term.

Retrofit and Buy - If the facility can neither be built-to-order and purchased, nor built-to-order and leased, another option would be to purchase and retrofit an existing facility. The result would not be an optimal configuration, but might suffice depending upon both the existing characteristics and the extent of the modifications necessary in the retrofit. One disadvantage to this is that the mobile shelving rails could

not be structurally integrated with the floor of the facility as in the built-to-order scenario.

Retrofit and Lease - The same considerations as above apply, but the facility would be leased rather than owned. This is probably the least desirable scenario from the perspective of the NLS, especially if the mobile shelving is NLS owned. However, if the mobile shelving requirement were to also be leased along with the facility, this would be a more desirable arrangement.

4.2 SPECIFICATIONS FOR SHELVING

This subsection contains specifications for the provision of the shelving required to successfully implement the proposed centralized braille services model. The information in Section 2 of the report, exclusive of cost estimate information, should be provided to prospective offerors for the provision of the subject shelving. It should be stated that the information in Section 2 is background material and optional, but recommended, information for the prospective shelving offerors.

4.2.1 Type and Location of Shelving

The required shelving must be of electrically or manually operated compact mobile library bookstack steel shelving design; ManTech strongly recommends that the shelving be electrically powered. The shelving must be transported to, and installed in, two facilities, the Western Center located in the Salt Lake City, Utah metropolitan area, and the Eastern Center located in the Cincinnati, Ohio metropolitan area. The NLS will either hold title or lease over these facilities.

4.2.2 Capacity Requirements

The gross capacity requirements for each facility are 152,900 LF of shelving for the Eastern Center, and 103,000 LF of shelving for the Western Center, for a total combined

requirement of 255,900 LF. These values represent the minimum shelving capacity that must be provided.

4.2.3 Configuration of Shelving Layout

The proposed shelving layouts (both mobile and fixed), module configurations, and shelving details are provided on the blueline layout drawings of the Western and Eastern centers contained at the end of the appendices, and are included as a part of this specification. Offerors are responsible for verifying dimensions that may be critical to their proposed layouts, which must be provided along with any bid. Ten (10) such modules, each with a nominal storage capacity of 10,280 LF, would be required for the Western Center, and 15 modules would be required for the Eastern Center.

4.2.4 Installation in Facilities

Installation into both centers must include prepaid transportation and all of the following: delivery of all equipment components to final building destination; movement to staging area; uncrating and setting in place; and, assembling and securing to floors. Together with the mobile shelving itself, the installation must include all labor, materials, tools, and services required to provide a complete, ready-to-use, operable compact system as specified on the layout drawings. The mobile shelving envelope, column spacing, power supply (if the shelving is electrically powered), lighting, floor loading, and rail installation must be closely integrated with construction, if installed in a built-to-order facility, or with existing building design, if installed in a retrofitted facility.

4.2.5 Other Requirements

Other requirements associated with the proposed type of shelving and module configuration are listed below, and are applicable for both facilities. Prospective offerors must conform to these requirements, or list any minor deviation(s) to enable evaluation of the criticality of the departure(s) from the proposed configuration.

Reliability	-	The shelving must have built-in fault protection and self-diagnostic features to ensure reliability and minimize downtime. Provision must be made for emergency operation of the equipment, if required.
Module Area	-	The nominal area of the standard storage module shall be 30' x 50'.
Module Configuration	-	Each module shall consist of 11 mobile ranges, 1 fixed range, and one 3'9" wide aisle.
Range Configuration	-	Each shelf range shall consist of 14 back-to-back cantilever shelf sections, with back-to-back sections having a common upright, and adjacent uprights bolted together. All ranges must also have top canopies.
Section Configuration	-	Each shelf section shall be 3' wide (nominal width) and 10 shelves high, and shall be fabricated of a welded frame design for good rigidity.
Module Capacity	-	Each module shall have a nominal capacity of 10,280 LF of shelf area.
Lighting Controls	-	Each module shall be independently wired, and the lights will be turned on or off at switches located on both end panels of the fixed range in each module.
Shelf Depth	-	All ranges are to have a usable shelf depth of 12", except for 10 mobile ranges of one storage module in each facility. Five of these ranges will have a usable shelf depth of 14" and five will have a usable shelf depth of 10".
Shelf Width	-	Useable shelf width shall be a minimum of 35.5".
Shelf Load Rating	-	Shelving shall have a minimum static load rating of 50 lb/sf, and each 12" deep shelf shall have an evenly distributed load rating of 150 lbs.
Shelving Type	-	The shelving shall be of a cantilever type and hung on uprights, not bolted.
Shelving Adjustments	-	The shelving shall be adjustable in standard vertical increments of 1".

4.2.6 Safety Requirements

The shelving installed in both facilities must have adequate features to ensure the safety of personnel. These required features are listed below.

Anti-Tip Device - All mobile ranges must have anti-tip protection devices; these features should be located overhead.

Dual Controls - Each module shall have separate power and control wiring, and the controls for opening an aisle shall be located on both end panels of each range. An aisle shall be openable only from controls located at the closing aisle, and a reset button must be depressed before the controls can be activated. An operator will stand facing the closing aisle with hands on the controls during the entire aisle opening process, thus ensuring that nobody is in the aisle.

Safety Sweep - There must also be a floor-level safety sweep running the full length of each mobile range facing each possible aisle. All aisle opening controls in a module must be deactivated when a sweep is tripped, and must remain inactive until the obstruction is removed. Emergency controls to clear obstructions must be located on the end panel of the fixed range of each module, and the controls shall be operable only by use of a master key.

Other Features - One or more safety devices, such as a second safety sweep per aisle, photocells, proximity sensors, alarms, horizontal hip-level tape switches along the ranges, and vertical tape switches on the end panels, shall be provided as required.

4.2.7 Procurement Considerations

The following points are not a part of the specifications for shelving, but are rather considerations for NLS to take into account when procurement planning is initiated.

Review Requirements - ManTech suggests that storage requirements be reviewed by NLS prior to finalizing the size of the storage areas and shelving in the proposed centers. The countervailing factors of less than 100% participation by network libraries, and the assimilation of new production between the time the capacity requirements were estimated and

actual implementation, should be taken into account prior to actual procurement.

Review Commitment - The estimated costs for the procurement and installation of the required shelving is by far the largest capital investment that is required for the successful implementation of centralized braille services, and exceeds the combined estimated costs of all other start-up costs, i.e. facilities, ADP systems, and patron, collection, and title conversion costs to be incurred. Because of the integral relationship of the mobile shelving with the facility in which it is to be installed, especially if the buildings are built-to-order and the rails are embedded in the floors, and because of the relatively large start-up cost for the shelving, procurement should only be executed when an irrevocable decision to implement the centralized services is made.

SECTION 5

SPECIFICATIONS FOR OPERATIONS

Section 5

SPECIFICATIONS FOR OPERATIONS

This section of the Study I, Part 2 report presents the specifications for the operations that are required to successfully implement the proposed centralized braille services as described in Section 2 of the report. The information in Section 2, exclusive of cost estimate information, should be provided as mandatory background information to prospective offerors for the provision of the subject operations. These specifications assume full participation by all network braille libraries in the program.

5.1 CONDUCT INITIAL SET-UP OF CENTRALIZED BRAILLE SERVICES

The operators of both the Western and Eastern centers must conduct initial set-up of centralized braille services prior to the commencement of normal operations, and the requirements of this set-up phase are enumerated below. Certain actions are assumed to have occurred prior to this set-up, otherwise it cannot commence. The specifications for normal operations contained in Subsection 5.2 of this report also apply to the set-up of operations to the extent that they are applicable given the more limited scope of services to be provided in this initial phase. It is assumed in this report that the Western Center is the primary center, and the Eastern Center is the secondary center, which is an assumption that may change either later in the study, or may be determined by NLS after the conclusion of the study.

5.1.1 Assumptions Regarding Set-up by Operators

Several steps must be taken prior to the set-up of operations which are not the responsibility of the operator, and these steps are listed below. These requirements apply to both centers unless stated otherwise.

Facility The facility as described in Subsection 4.1 of this report, or equivalent, must be procured or leased by the NLS for use by the operator. A Certificate of Occupancy must be provided by the owner precedent to occupancy of the premises by the operator. The Certificate

of Occupancy will be issued by the local Building Commission upon inspection of the premises and following correction of all indicated violations by the owner.

Shelving The shelving as described in Subsection 4.2 of this report, or equivalent, must be procured or leased by the NLS for use by the operator, and must be fully installed, tested, and ready for immediate use by the operator before final payment is made to the vendor.

ADP Systems The ADP systems as described in Section 3 of this report, or equivalent, must be procured or leased by the NLS for use by the operator, and be installed, tested, and ready for immediate use by the operator, with the following exceptions: the autoattendant with 800 service, DPA IVR, patron modem access, and TDD features would not be required at this stage in the transition because patron contact with the center will not have yet begun. The centers' operators must be trained in the use of the ADP systems by the systems developers/suppliers at the beginning of set-up, but subsequent to verification testing of the installed systems by the system vendors/developers.

Other GFE Additional GFE that is not listed above but is applicable to the set-up of operations, is listed in Subsection 5.2.9 of this report. This equipment must also be furnished to the operators prior to the beginning of the set-up phase.

5.1.2 Label All Shelf Locations

The center operators must label every shelf location and range in the stack areas, receiving and shipping areas, and office areas with bar code labels containing unique identification numbers so that each braille volume will have a machine-readable and human-readable storage location. The shelf bar code label must be positioned on the front lip of each shelf, so as to be readily visible for scanning. There will be one location number per 3-foot wide shelf, and all volumes in a shelf opening will have the same location number. Approximately 34,500 shelf locations must be labeled in the Western Center, and 51,750 shelf locations in the Eastern Center.

The front flange of a shelf will be ¾" high, including two rounded edges, and a shelf label of horizontal format is therefore required. The human-readable number should be positioned to the right of the bar-coded number, and both numbers should be the same height. The labels should be printed on white paper and laminated with a clear polyester to keep them clean.

The recommended shelf numbering system consists of an alpha character to designate the storage module location and four numeric characters to designate the shelf opening; the actual numbering scheme to be used will be specified by the ADP systems developer after receiving prior approval from the NLS. There will be 3,450 shelf openings in a typical storage module, and one alpha character will be assigned to each two storage modules. The first and last shelf number in a storage aisle must be prominently displayed on range finders (card holders) located on the end panels of each shelf row.

The shelf openings must be numbered by aisle, bin section and tier, in a formal grid pattern that will enable workers to readily locate volumes for shipment, because the pick tickets in an order filling run will be printed in optimum picking sequence. This sequencing will greatly reduce travel and search time, and minimize interference between workers, thus enhancing picking accuracy, productivity, and service effectiveness.

The stock locator record will be an adjunct of the storage record at each center, and the subsystems at each center will be programmed to reject any receiving or stocking entry that does not have an accompanying storage location. The recording of a new storage location for a volume will automatically delete the previous storage location. These built-in safeguards will ensure that all volumes on premises are always accounted for.

5.1.3 Convert Initial Existing Collections

The operators at both centers must convert several initial existing collections into the new operations, i.e. physically into storage, and electronically into the ADP system. The procedures that must be followed to accomplish this task are described in Subsection 5.2.7.

The initial collections to be converted in each of the centers will be the current MSC braille collections. The operators of each center must convert all of the collections as shown in Appendix 2-6 that are applicable to that center, using the above mentioned procedures, with the exception of the BR collections shown in that appendix, which is the total of all individual collections (i.e. network libraries and MSCs). Each of the operators must convert two full sets of the existing MSC BR collections (four in total) consisting of approximately 8,000 titles, 16,000 copies and 36,000 volumes in addition to the other collections listed.

5.1.4 Convert Existing Patron Data

The operator of the primary center must perform the initial download of basic patron data from the CMLS database per the procedures of the ADP system user manual. This task will load the center's database with basic patron data, but not with service preference and reader history data, which will be subsequently obtained directly from patrons and network libraries, respectively, and whose conversion will be timed to coincide with collection conversion from those same libraries. The total readership to be served is shown in Appendix 2-1 of the report, and this estimate should closely match the total contained in CMLS.

5.1.5 Convert Existing Title Data

The operator of the primary center must perform the initial loading of title data into the primary ADP system per the procedures of the ADP system user manual. This task will load the primary system database with machine readable title data obtained from a combination of the BLND database, the two MSC READS databases, and possibly one or several network braille library databases (if it is determined that the BLND and MSC READS databases are not inclusive of all titles in the BR collection). The total collection titles to be housed by the centers, and hence title information to be loaded into the database in the primary system, are shown in Appendix 2-4 of the report.

5.2 CONDUCT NORMAL OPERATIONS

The contemplated braille distribution centers will probably, but not necessarily, be operated by independent contractors each of whom will have a separate contractual relationship with the NLS. These arrangements will be similar to those made for operating the multistate centers, but the responsibilities of each contractor will be somewhat different.

The operators of each center must conduct operations as described in Section 2 of the report, and as described in the following subsections of the report. The proposed services will support a consumer-responsive program; therefore, NLS will thoroughly monitor the operations to ensure adherence to these specifications. *(Note - NLS should provide prospective offerors with either architectural plans or as-built drawings of the actual facilities and shelving configurations, and operating procedures that conform to the actual system developed, as part of the solicitation package).*

5.2.1 Operate Service in Accordance with Operating Schedule

The recommended facility operating schedules will provide a same-day shipping response for all shippable patron requests that are entered during normal working hours in the time zones served by each center. These schedules are shown in Exhibit 5-A, and the operators of both facilities must adhere to them. However, these schedules represent a preliminary design, with the final schedules to be designed and specified by the ADP systems developer.

Reader Advisor and ADP Schedules

With all reader advisors located in the Western Center, some advisors will begin work at 6:00AM Mountain Time to service patrons in the Eastern Time Zone, and others will start later in the morning and continue working until 6:00PM Mountain Time to service patrons in the Pacific Time Zone. This reader advisor staffing will provide 12-hour patron coverage in all time zones, beginning at 8:00AM in the Eastern time zone, and ending at 5:00PM in the

Exhibit 5-A

PROPOSED FACILITY OPERATING SCHEDULES			
Location Code[(A)]	Activity	Local Time At	
		Eastern Center	Western Center
O	Answer inquiries and enter shipping requests	- -	6:00AM - 6:00PM
O	Transmit shipment confirmations to primary system	9:30AM - 9:40AM	9:30AM - 9:40AM
O	Confirm shipments in inventory record	9:30AM - 9:40AM	9:30AM - 9:40AM
F	Unload postal deliveries	9:30AM - 9:40AM	9:30AM - 9:40AM
F	Unpack and shelve books	9:40AM - 1:00PM	9:40AM - 1:00PM
O	Transmit receipts to primary system	1:00PM - 1:10PM	1:00PM - 1:10PM
O	Enter receipts in inventory record	1:00PM - 1:10PM	1:00PM - 1:10PM
F/O	Lunch break	Floating	Floating
O	Run reserves/requests, and transmit to shipping center	1:10PM - 1:30PM	1:10PM - 1:30PM
O	Print pick tickets (40%)	1:30PM - 2:30PM	1:30PM - 2:30PM
F	Fill orders for patron reserves/requests	1:40PM - 3:30PM	1:40PM - 3:30PM
O	Run Profile Select and transmit to shipping center	1:30PM - 2:30PM	1:30PM - 2:30PM
O	Print pick tickets (55%)	2:30PM - 4:00PM	2:30PM - 4:00PM
F	Fill orders for Profile Select	3:40PM - 6:00PM	3:40PM - 6:00PM
O	Run late orders and transmit to shipping center	6:00PM - 6:05PM	6:00PM - 6:05PM
O	Print pick tickets (5%)	6:05PM - 6:10PM	6:05PM - 6:10PM
F	Fill late orders	6:10PM - 6:25PM	6:10PM - 6:25PM
F	Load post office pickups	6:25PM - 6:30PM	6:25PM - 6:30PM
Note [(A)] - O = Office Operations; F = Floor Operations			

Pacific time zone. Because of the extended patron coverage and the 2-hour time zone differential between the centers, there will be no fixed time for lunch breaks for either the reader advisors or ADP personnel.

Receiving, Stocking, and Fulfillment Schedules

The local time schedules for floor operations in the Eastern Center and the Western Center will be identical. Normal working hours in the Eastern Center will be 9:30AM to 6:30PM Eastern Time, and in the Western Center will be 9:30AM to 6:30PM Mountain Time. All receiving, stocking and rewarehousing functions, including entries to the storage and inventory records, will be completed before 1:00PM. All order filling, packing and shipping functions will be initiated and completed after 1:40PM. These shipments will be confirmed in the inventory record in the primary ADP system early the following day.

Pick Ticket Print Run Schedules

There will be three regularly scheduled pick ticket print runs for each center, and the timing of the runs will be keyed to the local times at the centers. The first filling run is for patron requests. The second batch of pick tickets is for Profile Select, and the filling run will be made while the first batch of pick tickets is being picked and packed. The third batch of pick tickets is for late orders, and will be made at a designated cutoff time near the end of the workday.

Pick tickets for closeouts (weeded volumes) and damaged volumes will carry special transaction codes, and will be batched as separate and special print runs. These print runs will be made only on days specified by the director of the shipping center.

Specially Routed Shipments

Rush delivery of books for legitimate patron requests, possibly shipments to patrons in Hawaii, patron pickups and any other shipping transactions not utilizing standard USPS free

matter delivery will be accommodated by exception, whereby special transaction codes will be appended to patron orders by the reader advisors. These special codes will specify the carrier and type of service to be used, and will be obtained from an approved routing guide prepared by the operator of the primary center. The resultant pick tickets will be prominently marked by the printer for special handling, and will be batched as a separate print run.

Post Office Delivery and Pickup Schedules

Early morning delivery of returns from patrons and early evening pickup of shipments to patrons must be arranged with the local postal authorities, and assurance must be received that all pickups processed through the local USPS bulk mail facilities will be loaded out the same evening.

5.2.2 Provide Patron and Library Access to Services

The operator of the Western (primary) facility must provide patrons and network libraries with all of the following types of access to the proposed centralized braille services, while the Eastern center must provide walk-in services only.

Toll-Free Telephones-Provide toll-free (800) voice telecommunications access to patrons and RLs, with minimal waiting time for patrons. If all network libraries participate in centralized service, and no network libraries retain reader advisory services locally, the average daily traffic is estimated at 325 calls, lasting 3 minutes on average, but ranging from less than one minute to more than 10 minutes. Service must be established with a telephone company; the autoattendant reception system will be furnished and installed for the operator.

DPA IVR- Provide DPA IVR access to patrons; this system will be furnished and installed for the operator to operate.

Mail- Provide BBR mail-in order form circulation service to patrons, and ILL mail-in order form circulation service to patrons of non-participating network libraries.

Telefax -Provide telefax access to patrons and libraries; the machines will be GFE.

Walk-In Provide walk-in/pick-up circulation service to patrons.

TDD Provide TDD service to deaf-blind patrons; the equipment would be GFE.

Data Telecommunications Provide data telecommunications access to the primary ADP system for RARLs (RLs retaining braille RA service), and patrons utilizing computer systems and modems, via the designed and installed ADP system interface, WAN, and gateway.

5.2.3 Provide Reader Advisory Services

The operator's reader advisors in the Western Center must provide the same services that are currently rendered to braille patrons by the braille regional libraries, except that patrons will not be initially registered by the primary center. RA duties will encompass all patron and most regional library contact, including referrals from the secondary center. The individuals possessing the special skills expected and required of reader advisors must have MLS or equivalent degrees.

One reader advisor should be designated as a working supervisor, to delegate work to others as required, and to personally handle all matters that require a high level of discretionary decision making. However, all subject coding of new titles must necessarily be done by the NLS during the new production initial screening and title selection processes.

The responsibilities to all braille patrons will include telephone contact, including call backs, and mail or fax correspondence with patrons and regional library personnel who place orders for specific titles, require assistance in making selections, inquire on the status of open orders, or have problems regarding service to discuss. Basic reference tools will be available for use by RAs in assisting patrons. File maintenance responsibilities will include the processing of patron advisories of temporary, permanent, and/or alternate address changes, temporary suspension of shipments, and requests to be added to, or removed from profile select, turnaround or calendar service. After entry, selected file maintenance changes (e.g. address changes) will be transmitted to the patron's regional library for updating the patron's record. In conjunction with these duties, the reader advisors will selectively solicit the return of overdue books, but only to supplement the weekly mailings of follow-up notices prepared by the primary ADP system.

5.2.4 Manage Operations

Each center must be headed by a full-time director, who will be devoted solely to center operations, and will serve as primary contact with the NLS and network libraries. The directors will be directly responsible for all aspects of operations and must be able to respond to all questions on operations, including all receiving, storage, shipping, patron service, ADP, inventory management, and administrative requirements of the contract; reporting requirements; regular monitoring of costs; and, planning with NLS for any necessary capital investments and/or modifications to any aspects of the program.

The directors must be given sufficient authority by the contracting agency to: interview, recommend (subject to NLS approval), train, and evaluate all staff members; assign responsibility; delegate authority; allocate work; and, be responsible for the positive motivation of all personnel. The directors will also coordinate all scheduled tours and orientations of the centers.

5.2.5 Operate and Maintain ADP Systems

Dedicated ADP personnel will be required only at the primary center; however, the director of the secondary center should have a moderate degree of computer literacy for operation of the subsystem. The primary center ADP staff would consist of one systems analyst and one systems programmer. In tandem, these individuals would have full responsibility for all aspects of ADP operations, including telecommunications of all types and tending the printers. However, ADP personnel will not be empowered to initiate shipping transactions, alter patron records, or make inventory adjustments of any kind.

Primary- The ADP staff must operate and maintain the primary ADP system, including all peripherals, at the primary center. This would include the execution of jobs, network administration, troubleshooting, programming of special utilities as required, scheduling and monitoring of vendor maintenance and/or modifications of software and hardware in the

system, and all other duties incumbent in these types of positions to support the subject centralized braille services.

Voice- The ADP staff must ensure the proper functioning of the toll-free telephone service, including any operator configuring of its features, and will be responsible for the scheduling and monitoring of any required repairs, maintenance, or upgrades by vendors or the telephone company.

Fax- The ADP staff (Director at the secondary center) must ensure the proper functioning of the telefax machine in the center, and schedule and monitor maintenance or repairs as necessary.

DPA IVR- The ADP staff must ensure the proper functioning of the DPA IVR service, including any operator configuring of its features, and will be responsible for the scheduling and monitoring of any required repairs, maintenance, or upgrades by vendors or the telephone company.

TDD -The ADP staff must ensure the proper functioning of the TDD service, including any operator configuring of its features, and will be responsible for the scheduling and monitoring of any required repairs, maintenance, or upgrades by vendors or the telephone company.

Subsystems-The ADP staff (Director at the secondary center) must operate and maintain the ADP subsystem, including all peripherals. At the primary center, this would include the execution of jobs, network administration, troubleshooting, programming of special utilities as required, scheduling and monitoring of vendor maintenance and/or modifications of software and hardware in the system, and all other duties incumbent in these types of positions to support the subject centralized braille services. At the secondary center, responsibilities would include the execution of jobs and the scheduling and monitoring of vendor maintenance (which would include network administration support).

Administration-The ADP staff must perform all necessary database and systems administration functions at the primary center.

Data Telecommunications-The ADP staff must operate and maintain the data telecommunications link(s) between the primary ADP system and network libraries, patrons, the secondary center, the CMLS, and NLSNET, including any scheduling and monitoring of maintenance, repairs or upgrades by vendors or the telephone company.

5.2.6 Provide Clerical Services

The office staffing requiring clerical support in the primary center will consist of approximately 8 people plus the director, whereas the office staffing requiring clerical support in the secondary center will only be the center director. However, some clerical support of floor operations will be required in both facilities, particularly in the areas of exception reporting and the documentation of specially routed shipments.

In the primary center, general clerical support would be provided to the reader advisors, who should be relieved of substantially all non-professional activities, the ADP staff, and the director. Clerical staff should assist in processing written correspondence (outgoing correspondence and reports, and incoming orders on mailed Braille Book Review and ILL forms), patron file maintenance, fax operation, duplication duties, filing, telephone answering, and visitor reception duties. Also, clerical staff could assist in processing incoming and outgoing mail, including follow-up notices to patrons for the return of overdue books. Clerical support provided to the director will include purchasing and accounting functions relating to facility operation and maintenance, and contractual reporting to the NLS.

In the secondary center, general clerical support will be provided to the director in telephone answering and reception duties, incoming and outgoing mail, faxing to the primary center all patron messages accompanying returns, tending the printers, and transmitting receiving and shipping information to the primary system. Also, this support will include

purchasing and accounting functions relating to facility operation and maintenance, and contractual reporting to the NLS.

5.2.7 Provide Distribution Services

The operators of both centers must provide distribution services as described in Section 2 of this report, and as described below, with a stated goal of shipping all orders within one-working day of generation, and a target goal of same-day turnaround. The pro forma readership to be served, circulation to be generated, and collections to be housed for each center are presented in Section 2 and shown in Appendices 2-1, 2-8, and 2-6 and 2-7, respectively. The pro forma distribution and storage workload is shown in Appendices 5-1 and 5-2 for the Eastern Center and the Western Center, respectively. Because there exists no operations manual for the proposed centers at this time, and because the procedures to be employed by the centers are somewhat different from those used by existing MSCs and network braille libraries, the procedures presented below are relatively detailed.

Receiving Mode

There will be common receiving and shipping areas under the contemplated mode of operation, but the two functions must always be performed at different times of the day. The receiving/shipping area in the Eastern center will be twice as large as the area in the Western center to provide for 100% more throughput, but their operating modes will be identical. The layout of the receiving/shipping area in the Western center will be referenced during the discussion.

Receiving and Shipping Layout

The proposed receiving/shipping area in the Western center is 50 feet wide x 31 feet deep. There will be one tailgate-height truck spot equipped with a built-in mechanical dock board, bumpers, dock seal, trailer restraint and loading light. A bulk storage area of 300 square feet is provided for mailing containers, forms and other supplies, and palletload movement will

be by hand pallet jack. A pedestrian door provides for truck driver access and egress, and the door will normally be locked.

The staging area has been sized to accommodate 14 P.O. hampers for normal receiving/shipping activity, and 28 P.O. hampers for peak activity. The capacity of a full hamper is 80 volumes. The staging area can also be used for staging pallet cages, if the local postal authorities desire to have some or all patron shipments presorted by destination. The capacity of a full pallet cage is 160 volumes.

There are two workstations for opening and recording receipts and for packing and recording shipments. Each work station has a slicktop work table 14 feet long x 4 feet deep, and one workstation has a package scale and a tape dispenser. There is a compartment below the work tables for temporary storage of empty mailing containers, and shelving for storage of damaged volumes awaiting disposition.

At the rear of the work tables is forward ("quick turn") shelving for transient storage of incoming volumes, and each workstation can store up to 700 volumes. The shelving is of the same design as the fixed shelving in the mobile storage modules, and the shelf locations are similarly bar coded.

All volumes entering the facility will be placed in the forward shelves and all inventory entries will be made while the volumes are shelved; if NLS chooses to track mailing containers as well, containers would be scanned as well upon receipt. Receipts will be recorded at the workstations by the use of Integrated Portable Scanning Devices (bar code scanners with keyboard entry and visual display) using Radio Frequency Data Communication (RFDC) capabilities. The scanners will also be utilized for data entry when performing shipping and stocking tasks, and for conversion of new production and transferred existing collections into the centers' inventories.

Receiving Transaction Types

The proposed receiving methodology is designed to accommodate single-volume or multi-volume receipts from all sources, and for volumes that are bar coded and those that are not. Volumes that are not bar coded will not be in the inventory record of the primary system at the time of receipt, and a much more time-consuming documentation process will be required to enter these transactions.

Most bar coded receipts will be returns from patrons, but there will also be occasional transfers between centers, returns of volumes from repairers, returns of library loans, and similar transactions. Receipts that are not bar coded will include transfers from regional libraries prior and subsequent to startup, returns direct from patrons, newly embossed titles from producers, and titles and collections from other sources. The receiving of repaired volumes and newly printed volumes involves a contractual obligation with suppliers, and established accounting protocol must therefore be followed when documenting these transactions.

Opening and Sorting Receipts

The contents of incoming P.O. hampers must be first opened, checked and sorted by transaction type (i.e. bar coded volumes or non-bar coded volumes), and any damaged volumes must be set aside for separate processing. Volumes that are not bar coded must be checked to verify that they are NLS property, and volumes owned by others should be promptly shipped to their proper destination or returned to sender. NLS shipping containers should not be used for these latter shipments unless going to an RL, and no record of such shipments should be retained in the shipping center.

All return address cards must be removed from the mailing pouches and checked for patron notations. Cards containing patron messages, or other papers that may accompany receipts, will be given to the data clerk in the office for further processing. The data clerk in

the secondary center will fax these documents to the data clerk in the primary center, and no records will be retained in the secondary center.

Receiving of Bar Coded Volumes

The receiver will place bar coded volumes in the forward shelving immediately upon their identification, making an initial sort by storage zone in the stacks (i.e. "zoned"). When all volumes are shelved for the day, the receiver keys a transaction code into the scanner, and proceeds to scan all bar codes on the volumes in each shelf opening, and their bar coded shelf location. This scanning records in the working file of the center subsystem the bar code number, forward shelf location, and date of receipt for each newly received volume. Container bar code labels would be scanned at this time as well, but would not require the scanning of a locator bar code as do books.

Receiving and Labeling of Volumes not Bar Coded

All volumes that are not bar coded must be bar coded at the receiving work stations before shelving, and any foreign labels or markings should be removed or obliterated. The receiver will then place the labeled volumes in a separate area of the forward shelving, making an initial sort by storage zone in the stacks. When all newly labeled volumes are shelved for the day, the receiver keys a transaction code into the scanner, and proceeds to individually scan the bar code number of a volume, key-in the title and volume number, verify the title number and volume number appearing on the scanner screen, and scan the volume's shelf location. This scanning and keying records in the working file of the subsystem the bar code number, title number, volume number, forward shelf location, and date of receipt for each newly received volume.

Receiving of Damaged Volumes

All incoming volumes must be inspected for damage as received, and minor repairs made on the spot. Volumes that have more extensive damage will be classified by the

receivers as being either repairable or scrappable. These volumes will be placed on special bar coded shelves located under the receiving work tables, and will remain in these locations until instructions are received for their disposition.

The procedures for receiving damaged volumes are the same as those followed in receiving other volumes, whether bar coded or uncoded, except that special transaction codes will be utilized in recording their receipt. These codes will place the volumes on non-shippable status in the primary system inventory record, but there will be no corresponding record in the subsystem.

Volumes that are damaged in-house, or which are later found to be damaged, must be transferred to the forward shelving under the workstations utilizing special relocation or shipment cancellation transaction codes. These transfers will be recorded as a location change in the subsystem and as a change to non-shippable status in the primary system inventory record.

Receiving Data Entries

The receiving entries accumulated in the subsystem working file must be transmitted to the primary system at the primary center once each day. This transmission will include all information recorded by the scanners except the shelf locations themselves, which will not be part of the primary system inventory record.

A permanent record of each bar coded volume owned by the NLS will reside in the primary system, and each volume will be charged to a patron-of-record. The receipt of a volume that has been previously bar coded will credit the Has Now patron inventory file and charge the Has Now inventory file of the receiving center.

Patron returns that must be bar coded (if any) will not be credited to a Has Now patron inventory file unless Has Now records are transferred from the regional libraries (TBD in final transition plan). In this eventuality, the return address card(s) accompanying the returned

volume(s) can be annotated with the new bar code number(s) applied, and Has Had entries could be keyed into the records by data clerks at the primary center, or preferably by an electronic transfer of data.

The primary system will screen all bar code numbers reported as received against the bar code numbers residing in the inventory record, and reject any new bar code number that does not have an accompanying title number and volume number. These rejections will be printed on an exception report at the receiving center to conclude the daily transmission.

The bar code number, storage location number, and date of receipt for all receiving entries accepted by the primary system will be transferred from the working file to the storage record by the system. Any rejected receipt will remain in the working file and appear on subsequent exception reports until the irregularity has been resolved. All irregularities must be resolved at the end of each week so that there is no week-to-week carryover.

Order Filling,Packing and Shipping Mode

The proposed order filling, packing and shipping methodology is designed to accommodate single-volume and multi-volume shipments to all destinations, and all volumes shipped will be bar coded. All shipments will be initiated through the primary system. An estimated 60% of the shipping requirement will be filled from forward shelves in the receiving area, and 40% will be filled from the stacks.

Books will be rotated in last-in/first-out sequence when allocating available volumes to shippable orders, thus insuring that all pending shipments are first sourced to volumes in the forward shelves. This sequencing will also produce a continuously updated record of all inactive inventory in both the primary system and the subsystems. This information could be utilized in weeding the collections, and in relocating dormant stock to relieve localized storage congestion in the centers.

Circulation Priorities

Patron reserves and requests, which are title specific, represent 45% of shipping demand in the regional libraries. Profile Select, which is triggered by title availability, reader history, and reader interest, represents the remaining 55%. Present practice is to give preference to patron reserves, then requests, and then profile select. A shipment for "Turnaround Service", which is triggered by a patron return, and "Calendar Service", which is date specific, can be filled as either reserves, requests, or by Profile Select.

Reserves will have first call on available books, requests will have second priority, and Profile Select will have third preference under the contemplated operating system. The reserves for a title will be queued by date and time of entry and the oldest order will be filled first, provided the patron is otherwise shippable. The primary system is therefore programmed to determine patron shipability before screening orders for stock availability.

The primary system will also be able, upon request of an RA only, to ship the individual volumes of a multiple-volume book from both centers, if a full book is not available at the patron's home center. However, this practice could create an inventory imbalance (if mailing return address cards are switched between books and mailing containers) that must later be corrected by inter-center transfers.

The reserves and requests of patrons assigned to a distribution center will have first call on available books, and the reserves and requests of patrons not assigned to that distribution center will not be backordered. However, if one distribution center is the sole source for a title, then all patrons will have equal access. The primary system will be programmed to make these "entry" or "no entry" decisions.

Non-Shippable Inventory

The inventory record in the primary system will be flagged to reject orders for non-circulated volumes and damaged volumes awaiting disposition. The system will also be

programmed to reject the shipment of a single volume of a multi-volume title unless a manual override has been executed by reader advisors.

Pick Tickets

A print run transmission from the primary system will include all information now printed on the present pick ticket/address card, plus the bar code number of the volume to be shipped, a type-of-transaction code, and the scheduled date of shipment. On receipt of this data, the subsystem will search the storage record and add the shelf location of each volume to the transmitted file.

The picking document will be the single-copy 3"x5" combination pick ticket/address card depicted in Appendix 3-3. There will be one pick ticket for each volume to be shipped. The tickets will be serially numbered when printed, beginning with the number 0001 each week, and each print run will be numbered and printed in strict shelf location sequence. The type-of-transaction code will be appended to the pick ticket serial number, and both the serial number and the transaction code will be machine-readable and human readable. The volume bar code number and the storage location number printed will be only human readable, and will be printed in bold-face type.

Pick tickets will be printed 1-up in fanfold form and will be left in strip form during the picking process. This safeguard will maintain established picking sequence and ensure that all tickets are accounted for. The individual pick tickets will be separated and used as address cards when the volumes are packed.

Picking/Stocking Carts

Shelf-type 4-wheel hand carts should be used in the stack areas for both picking and stocking. The cart shelves will be 4-high and of the same cantilever design as the shelving in the storage modules. Each cart shelf will be bar coded, but this feature will be utilized only in the stocking processes. The capacity of a full picking/stocking cart will be 100 volumes.

Picking and Packing from the Forward Shelves

Picking and packing will be combined in the forward shelf area, and a picking/packing task assignment will be all the volumes in one shelf section. All volumes in one batch assignment must be picked, packed, and their shipment confirmed by the same individual, and all irregularities must be reconciled before the next task assignment is begun.

The picker/packer first removes a string of pick tickets from the print run, proceeds to the designated forward shelf area, keys into the scanner a packing routine code, and scans the first and last transaction numbers on the batch of pick tickets. The subsystem will then monitor the completion of all packing tasks in the batch, all batches in the print run, and all print runs for the day.

The picker/packer will note the storage location and volume number printed on the first pick ticket, remove the volume from its forward shelf location, and place it in a canvas mailing container. The pick ticket is then removed from the string of tickets and placed in the window of the pouch to serve as an address card. The bar code on the volume, the transaction bar code on the pick ticket/address card, and the bar code on the mailing container are then scanned. This scanning records the transaction number, volume bar code number, container bar code number, and date of shipment in the working file of the subsystem.

A separate Has Now record must be established for bar-coded containers, as there is no absolute correlation between volumes and containers shipped. For example, magazines and children's books could have more than one volume per container. Also, shipments of damaged volumes to book repairers and the NLS, and most inter-facility transfers, will be packed in the corrugated containers in which new volumes are received from the producers.

If the transaction and volume bar codes are mismatched, the picker/packer will be alerted by the system, and no further action will be possible until the error is corrected. The pouch is then closed and placed in a shipping hamper. The picking/packing/scanning sequence

is repeated until all volumes in the batch have been processed. The picker/packer then queries the computer to verify that all shipping transactions in the batch have been accounted for.

Picking and Packing from the Stacks

A picking/packing task assignment in the stack area will be 100 volumes, which is the capacity of a full picking cart. To begin a task assignment, the picker/packer first removes a string of 100 pick tickets from the print run, proceeds to the storage module shown on the first pick ticket, and turns on the lights. The designated storage aisle is then opened, and the picker picks the first designated volume and places it on a cart shelf.

Subsequent volumes are picked and placed on the cart shelves in strict pick ticket sequence. On completion, the picker takes the full cart and the string of pick tickets to the packing area, and proceeds to scan the first and last transaction number on the batch of pick tickets, pack the volumes, and confirm their shipment in the same manner as for volumes picked from the forward shelves.

Shipping Data Entries

The shipping entries accumulated in the subsystem working file will be transmitted to the primary system at the primary center once each day. The transmission will include only the shipping date and the bar code numbers of the volumes and containers shipped. The Has Now files of recipients will then be charged, and the Has Now file of the shipping center will be credited.

The primary system will screen all bar code numbers reported as shipped against the bar code numbers assigned to be shipped, and an exception report will be printed at the shipping center to conclude the daily transmission. The working file and the storage file will then be cleared for all volumes shipped. Any unshipped transactions will remain in the working file and appear on subsequent exception reports until the volumes are shipped or the

transactions are canceled. All open shipping transactions must be resolved at the end of each week so that there is no carryover to the following week.

5.2.8 Manage and Control Collections

The operators of both centers must manage and control the various collections stored in, and circulated from, each center as described in Section 2 of this report, and as described below. The pro forma collections to be managed by each center are presented in Section 2 and shown in Appendices 2-6 and 2-7, and the pro forma storage workload is shown in Appendices 4-1 and 4-2 for the Eastern Center and the Western Center, respectively. Additionally, the Eastern Center must manage approximately 145,000 mailing containers, and the Western Center approximately 74,000 containers, over 90% of which will be in circulation at any given time.

Stocking Mode

Stocking activity will consist of both transferring volumes from the forward shelf area to the stacks, and relocating volumes within the stacks. These functions will always be performed in the morning hours, so that all new storage locations are in the subsystem databases before the order filling print runs for the day are begun. Picking/stocking carts will be used in making all stock transfers, and a full cartload will constitute a stocking task assignment.

Because of potential safety problems, only authorized personnel will be permitted in the stack areas without escort, and this restriction applies to most office personnel as well as visitors. Restricted access will also serve to ensure that the accuracy of the inventory and locator records is not compromised.

Stocking from the Forward Shelves

With an estimated 60% of the shipping requirement coming from the forward shelves, 40% of all receipts must later be transferred to the stacks, but not necessarily the same day as

received. The forward shelving in the new distribution centers has been sized to accommodate one full day's receipts plus three days' carryover, and not all forward shelves need be cleared in any one day. This storage buffer has been provided to help balance day-to-day variations in workload, as shipping transactions will always have first call on available time.

To initiate a transfer, the stocker fills a cart with volumes from the forward shelves, making sure that each shelf opening is emptied, and sorts the volumes by storage zone as they are placed on the cart. The stocker then keys into the scanner a stocking transaction code and scans the volumes on the cart and the cart shelves to record the in-transit locations. The emptied shelves in the forward area are then scanned to confirm that all recorded volume locations in the forward shelves have been cleared, and to account for all volumes.

The stocker will then proceed to the appropriate storage zone in the stacks and place the first volume in the first available location. The bar code on the volume and its new shelf location are scanned to record the new location and delete the in-transit location; once a bar code on a volume has been scanned, another volume should not be able to be scanned until the shelf location bar code has been scanned. When a cart shelf is emptied, the cart shelf label is scanned to confirm that the in-transit location record has been cleared and to account for all volumes. This process is repeated until the cart is empty.

Relocation of Volumes in the Stacks

The relocation of volumes in the stacks is a space management function that is occasioned by the wane in popularity of individual titles and the consequent need to enlarge the storage capacity of the affected storage zone. This congestion will at some point be relieved by weeding of the collections, which will then provide opportunities for consolidation within the same zone that was previously congested.

Random storage will permit any volume to be stored in any available storage location. However, the storage areas could be zoned by collection, and possibly by date of publication, both being simple measures of comparative activity. For example, the BRJ collection could

be separate from the BR collection, and all BR numbers from 4000 to 5000 could be stored in the same zone, but would not have to be. Within each zone, the volumes will be randomly stored.

There is also merit in storing childrens books and stapled books in separate zones, as shelf dividers should be provided to prevent these small volumes from tumbling. This zoning will also facilitate sorting before packing, so that two or more small volumes can be packed in the same shipping container. These and other zoning decisions will be made by floor operations personnel at the time of putaway, and there will be no zoning entries in the stock locator record.

When a storage zone becomes congested, the director will instruct the subsystem to prepare a relocation report for the affected zone. This report will list the bar code numbers and shelf locations of all volumes in the zone that were received on or before a designated cutoff date. The candidate volumes should be listed by shelf elevation, so that inactive volumes on the lower seven shelves will always be relocated first. The stockers will then relocate the desired number of volumes, either to the three upper shelves of the congested zone, or to a remote storage location.

When a storage zone becomes less than fully used, the director will instruct the primary system to prepare a listing of the bar code numbers of all titles that should be stored in the zone. The subsystem will then determine the out-of-zone storage locations of all volumes, and prepare a consolidation report, listing the bar code numbers and shelf locations of the volumes that should be relocated. If this initial consolidation does not substantially fill all surplus space, the zone boundaries should eventually be changed.

The procedure for relocating volumes within the stacks is identical to the procedure for transferring stock from the forward shelves, except that the stocker first keys a relocation transaction code into the scanner rather than a stocking transaction code.

Inventory Management Services

The inventory clerk at the primary center will initiate and execute all weeding transactions (in cooperation and working with NLS, after a circulation history by title has been developed in the primary ADP system), all transactions for the repair or scrapping of damaged books, and all transfers between centers that are not automatically generated by the primary system. The inventory clerk will also maintain liaison with the NLS, printers and book repairers, initiate all shipments to parties other than patrons, including the initial distribution of new titles to the centers; ensure that new title entries in the database are complete; initiate or approve any exception entries that must be made to the inventory record; and, initiate and assist in the conduct of an annual physical inventory.

Disposition of Damaged Volumes

Developing a proposed repair/scrap plan for damaged volumes, obtaining plan approval and disposition instructions from the NLS, initiating the required shipping or scrapping transactions, and all liaison with repairers is a responsibility of the operator of the primary center. All shipments to repairers will be tracked in the primary system in the same manner as shipments made to patrons.

Information on the number of damaged volumes in inventory, and recommendations of the receiving center as to whether the volumes should be repaired or scrapped, will be available in the primary system inventory record. However, inventory/activity records for the entire network must be reviewed to determine if volumes that have been classified as repairable are actually in surplus and should be scrapped, or whether volumes that have been classified as scrappable are in short supply and should be salvaged.

No entries will be made in the inventory record prior to plan approval and a decision on disposition by the NLS. The resultant shipping or scrapping transactions will then be entered into the primary system by the inventory clerk, using special transaction codes. These codes will release the volumes from non-shippable status in the inventory record.

Disposition instructions for damaged volumes must be held in the primary system until a sufficient number of volumes has been accumulated for batching. Disposition will then be scheduled as an off-peak shipping activity by the director of the center involved. Any required reporting of the titles, volume numbers and volume bar code numbers repaired or scrapped will be a responsibility of the operator of the primary center, and the primary system will be programmed to prepare all required reports.

Transfers Between Distribution Centers

A transfer between centers will be required whenever a volume that is authorized for storage in only one center is returned to the other center. The primary system will be programmed to recognize this irregularity from the authorization code assigned to the volume in the inventory record. In such instances, the primary system will automatically generate a shipping order bearing a transfer transaction code. The transfer will otherwise be treated as a patron order in the batching processes.

Other transfers between centers that may occasionally be required will be initiated only by the inventory clerk at the primary center, including a quarterly inventory reconciliation to determine what needs to be transferred, and these shipping orders will also be assigned a transfer transaction code. The inventory clerk will also authorize all transfers between patrons-of-record that by-pass the centers, and make the necessary entries in the primary system to update the Has Now and Has Had inventory and patron records.

All volumes transferred between centers will be recorded in the primary system as shipments to a Has Now transit account, until such time as the volumes have been recorded as received at destination. This safeguard will insure that the primary system does not recognize a volume as being available for shipment until it is actually available.

Follow Up for Overdue Books

The primary system will track both volumes in circulation, and volumes stored in the centers, so that the custody of all volumes and how long the volumes have been in custody are accounted for at all times. All potential recipients must therefore be assigned a patron-of-record number and a type-of-patron code. The type-of-patron codes will be utilized in preparing periodic inventory deployment reports for inventory management and NLS reporting, and the primary system will be programmed to prepare all required reports.

NLS will specify the permissible loan period for books shipped to individuals, institutions, and any other recipients, whose return of books should be monitored. The primary system will be programmed to notify RAs of patrons with overdue books that have been reserved or requested. The program should be run on Friday of each week, after all receipts have been entered into the system. However, a patron should receive a follow-up notification only once every three weeks, so that sufficient time is allowed the patron to respond to a previous notification. A patron's home library is to assist the center via the provision of additional information in the second (middle) attempt regarding book recovery.

The primary system could also be programmed to flag the patron file and the Has Now inventory file to indicate that books and/or specific volumes are overdue, and how long they have been overdue. However, reader advisors should initiate patron follow-up contact only during or following the 3-week grace period, and only by telephone. The primary system can thus be programmed with uniform and equitable decision rules to generate follow-up notices without prompting. These notices should be designed to be mailable immediately after printing and bursting, such that minimum clerical effort is subsequently required. No record of these mailings should be kept, except in the primary system.

5.2.9 Manage Government Furnished Equipment, Facilities and Services

The operators of both centers will be provided with facilities and equipment purchased or leased by the NLS, and support services directly provided by the NLS, specifically for the

conduct or enhancement of the specified operations. The operator of each center must manage any government furnished assets, as well as any additional equipment purchased using contract funds, according to the procedures listed below.

Inventory- All GFE must be marked with Federal Government property labels as provided by NLS, and remains the property of the U.S. Federal Government. It must be accounted for annually on the Inventory of U.S. Government Furnished Equipment contained in the annual report (ref. Subsection 5.2.12).

Disposals- The operator of each center must identify any malfunctioning or scrappable GFE, and notify the NLS in writing of all property that the center wishes to dispose. These requests will be evaluated by NLS, and the NLS will then notify the center in writing of the disposal action to be taken.

GFE- The operators of the centers will be furnished with the following GFE by the NLS for the sole purpose of facilitating the delivery of the specified services. Unless otherwise noted, both centers will be provided with all of the items listed below.

- ADP software and hardware to support circulation and inventory control(both);IVR,TDD and telephone autoattendant (primary).
- Facility and mobile shelving.
- Office furniture including fax,fiche reader(primary),phones,PCs.
- Shelf carts,ladder carts and pallet jacks.
- Work tables.
- Mailing containers.
- Label stock for labelling shelves, books, and possibly mailing containers (TBD).
- Forms for reporting to NLS.
- Documents cited in this section.
- Union catalog (primary).

5.2.10 Manage Utilities and Services

The operators of both centers must manage the consumption of utilities and other services required to perform their appointed operations. The providers of these utilities and services must be directly reimbursed by the centers, and the centers would then bill the NLS for the same. The exception to this is if repairs and/or maintenance of any GFE in the centers

is serviced via a contract that provides for NLS to directly pay the vendor (or warranty repairs), in which case the centers operators' roles would consist of monitoring the work, but not paying the vendor.

Utilities- The operators of both centers must manage the consumption and payment of all utilities required to support the operations, including electrical power, telephone service, natural gas and/or heating oil as applicable. Any problems with quality of service or billing discrepancies must be managed by the centers' operators.

City Services -The operators of both centers must manage the consumption and payment of all city services required to support the operations, including fresh water, sewage, and refuse collection (which might be provided by a commercial firm) as applicable. Any problems with quality of service or billing discrepancies must be managed by the centers' operators.

Other Services- The operators of both centers must manage the provision of, and payment for, all other services required to support the operations, including the repair and maintenance of equipment, and grounds maintenance services, as applicable. Any problems with quality of service or billing discrepancies must be managed by the centers' operators (note the exception re. GFE repairs, maintenance, and warranty repairs under separate contract).

5.2.11 Perform Travel and Attend Meetings

The operators of both centers must perform the travel, and attend the meetings and conferences, as listed below. The locations of the meeting sites will vary each year. All other proposed travel by either operator's personnel must be separately justified and approved in advance by NLS.

Advisory Committee- An advisory committee will be formed to provide guidance to NLS and the braille centers' directors on the service provided by the centers. The committee will be composed of representatives from the major blindness organizations, braille readers from each of the four regions of the U.S., two network librarians, and the two center directors. The

committee shall meet quarterly, at least for the first two years of the operation of the centers, but no less than twice annually. The director of the primary center shall make arrangements for the meetings and shall reimburse all members for expenses incurred in the course of attending the meetings.

Biennial Conference-Both directors must attend the NLS biennial conference during even-numbered years.

Regional Conferences-Both directors must attend the regional conferences, as specified by NLS, in alternate years from the Biennial Conference.

5.2.12 Provide Activity Reports

The operators of both centers must provide periodic and special reports to the NLS regarding operations at the centers. Because the primary center will house the primary ADP system, which will generate most of the required statistical data, the secondary center will be primarily responsible for the original reporting of narrative rather than statistical data. The types of reports required are listed below.

Quarterly- The operators of each center must provide quarterly reports to the NLS, which must address the major provisions of the contract. The format of these reports will be provided by NLS, and while most of the statistical reports regarding center workload, service activity, and performance will be generated by reporting routines in the primary ADP system and the two subsystems, others will require some manual collection and compilation. The narrative portion of the reports must be keyed to the specific headings in the contract with NLS. Any exceptions to meeting turnaround time requirements for the services must be included in these reports, along with explanations for the delays, whether a backlog has accumulated, and whether the backlog has been cleared. Quarterly reports must be mailed within 30 calendar days of the end of the reported quarter. The reports must contain a section reporting on last quarter goals and itemizing specific goals for the next quarter, and must report progress on recommendations made during the semiannual NLS monitoring visits.

Annually- The centers must provide an annual report summarizing the year's activities and listing accomplishments, and must list problems still to be overcome and major projects scheduled for the next calendar year. The report must be submitted within 45 calendar days after the end of the calendar (or fiscal) year. The annual report must contain: the annual cumulation of each quarterly report for the previous federal fiscal year; an annual fiscal summary, compiling total expenditures for the contractual year in each allotment; an updated inventory of GFE as of December 31, including location and condition, which must be based upon an actual physical count and review, respectively; an updated facility floor plan as of December 31; and, a shelving plan showing area and LF of shelving occupied, by collection (if zone storage is used), and that which is vacant.

Special- If either center falls more than (TBD) working days behind in the provision of the required services specified, the center's director must notify the NLS by telephone and send a follow-up report in writing which summarizes the backorders problem(s), the reasons for the delays, the steps being taken to remedy the problem(s), and the center's plans for contacting the affected patrons and/or network libraries.

5.2.13 Perform Administrative Functions

The operators of each center must perform all required purchasing, accounting, personnel and other similar administrative functions necessary to ensure the successful operation of the center. The resources required to perform some or all of these functions can be provided for directly within the center's organization, or by a parent or administering organization that furnishes such administrative overhead support, the choice of which is left up to the operator.

5.2.14 Provide Staffing

Accurate and complete position descriptions for each proposed center staff position must be submitted with offers, and are subject to NLS approval. During the contract period, proposed changes in position descriptions must be approved in advance by NLS, and final

copies of such position descriptions must also be provided to NLS. The duties of the various positions in both centers has been previously described.

The operators of each center must staff each operation so that service performance goals can be realized and all the operations specifications can be met. The operator will have discretion regarding exactly how staffing requirements are to be fulfilled in terms of full-time and part-time personnel, and their specific qualifications, with the following exceptions: (1) the director of each center must be a full-time employee totally dedicated to the overall management of each operation; (2) all reader advisors must possess MLS degrees; and,(3) each center must have one full-time administrative assistant/secretary/data clerk. Additionally, if the ALA ever develops staffing standards specifically for the braille centers, the incumbent operator would be bound by those standards in the next contracting phase following the development of such standards.

The minimum pro forma staffing requirements for each center, in terms of equivalent full-time (FTE) personnel, are: West - Director (1), Reader Advisors (5), Inventory Clerk (1), Data Clerk/Administrative Assistant (1), Systems Analyst (1), Systems Programmer (1), and Receiver/Stocker/Shipper (2); and, East- Director (1), Data Clerk/Administrative Assistant (1), and Receiver/Stocker/Shipper (4).

5.2.15 Adhere to Communications Procedures

The operators of both centers must adhere to the NLS communications procedures that are listed below.

Stationery - The centers must use locally printed, NLS-designated letterhead stationery in all written communications.

Memos - The primary center may communicate by memorandum and by other written means with network libraries, and these communications must be approved in advance by NLS; this

is exclusive of normal contact between the primary center and RAs located in network libraries as a part of daily operations.

Representation- Operators of both centers must receive advance approval from NLS before publicly representing the center(s) in speeches, forums, written articles or other outreach activities.

Newsletter - The operator of the primary center must maintain communications with all patrons of the centralized braille service via a quarterly newsletter that is produced in braille.

5.2.16 Adhere to Subcontracting Procedures

The operators of both centers must list all services that the operators are contracted to provide which will be subcontracted and provide an estimated unit cost(s) (if applicable), the name of the subcontractor(s), and a copy of the proposed service subcontract(s) for NLS approval in advance of the deployment of the subcontractor(s).

5.2.17 Cooperate in Semiannual Reviews

The operators of both centers must cooperate with NLS in semiannual review and assistance visits. These visits will be conducted to evaluate operations, w written reports and recommendations furnished to the operators as appropriate. During these semiannual site visits, each center's working files must be available for review.

5.2.18 Adhere to Applicable Documents

Below are listed several documents in addition to this specification that are applicable, and to various degrees important, to the operation of both centers. Prospective offerors should be provided with copies as required, and must adhere to any applicable provisions contained therein.

LC Technical Standards- Library of Congress Technical Standards #'s 10 (Braille Masters), 11 (Braille Copies), 12 (Labeling, Packing, and Handling of Braille) and 13 (Labeling, Packing, and Handling of Braille) apply to the extent that they do not conflict with the specifications specified herein.

LC Specifications- Library of Congress Specification # 800 (Braille Books and Pamphlets) applies to the extent that it does not conflict with the specifications specified herein.

Service Contract Act- The U.S. Department of Labor Register of Wage Determinations Under the Service Contract Act is applicable to the operations to be performed at both centers.

ALA Standards - The operators of both centers must conform with the minimum standards of service for network agencies established by the American Library Association in their Revised Standards and Guidelines of Service for the Library of Congress Network of Libraries for the Blind and Physically Handicapped 1984, or most recent revision date, to the extent that they are applicable to the operations.

ADA-The operators of both facilities must operate the centers in full compliance with The Americans with Disabilities Act.

APPENDICES

APPENDIX 1-1

Recommended Model for Centralized Braille Book Distribution System

Introduction:

In the following model, copies of all braille titles produced for or purchased by NLS will be held in two centers. These centers, located in Salt Lake City, Utah, and Cincinnati, Ohio, will be independent of the multistate centers. A participating library will be a regional library that chooses to provide braille books to its patrons from the centers. It may choose also to retain a browsing collection. Deposit collections will be furnished by the centers to qualified sites recommended by participating libraries. Magazine subscriptions will continue to be maintained by a patron's network library.

Model:

- All reader advisors for the central system will be located at one center, which will serve as the focal point for all communications between centers and patrons and between centers and regional libraries. Those participating libraries that wish to retain braille reader advisors on site ("reader-advisor libraries") may do so.

- Patrons nationwide will have access to the centers, regardless of their regional library's participation.

- Patron registration will occur at the regional library, or, for interested patrons of non-participating libraries, at the centers.

- The participating library will be the authority for patron information such as name, address, ID number, etc.

- Reader profiles will be created and maintained on the centers' database by reader advisors at either the center or the reader-advisor library. Regardless of where the profiles are created, both the center and the library may modify them in response to a patron's request.

- The automated selection of books based on reader profiles will be performed at the centers.

- Subject coding of books will be done centrally.

- Participating libraries will have on-line access to the centers' database to perform queries, create or modify patron profiles, input requests or reserves, etc.

- A single notification from participating libraries regarding patron information (patron adds and deletes, address changes, etc.) will update both CMLS and the centers' database.

- Reader-advisor libraries will be provided with a "patron due for service" report. Responsibility for acting on this report will lie with the participating library unless the patron prefers to be served by a reader advisor from the centers.

- Patron service information (address changes, patron deceased, etc.) will be provided only to participating libraries.

- If feasible, the centers' database will permit patrons to order books through an automated interface with patron input via a touchtone telephone.

APPENDIX 1-2

Committee Recommendations for Inclusion in Model

Visitors to a center should have the opportunity to tour the facility and to check out books on the spot.

Browsing collections maintained at participating libraries could contain a variety of materials but should generally not house books currently in high demand, as these would be best utilized in the circulating collection.

Reference books would be most useful if housed with browsing collections, but should also be available to be loaned via the central system.

The automated system must be accessible to all employees via adaptive devices.

System database should:

1. contain the full BLND collection,

2. contain the full MARC record,

3. accommodate keyword searching.

Contractor should investigate the possiblity of offering a Public Access Catalog feature.

Staffing pattern should include:

1. direct supervision of reader advisors by someone other than the center manager,

2. subject-coding staff.

Reader advisors should hold MLS degrees. Clerical support should be available for nonprofessional activities.

Hawaii should retain a full braille collection, since shipping time from the mainland is prohibitively long.

Center management must carry out plans for motivation of staff, especially clerical and materials handling.

Advisory committees for centers should be formed and should include patrons (majority of committee) and network-library representatives.

The test proposed by NLS to determine actual mailing times (rather than Postal Service standards) from center sites is needed.

Some method for providing rush delivery of books should be available for legitimate requests. It must allow for delivery even when patron is not at home to sign for receipt of package.

The automated system must generate a report on circulation for use with collection development activities.

Center facilities as a whole, and compact shelving units in particular, must be in compliance with the Americans with Disabilities Act.

APPENDIX 2-1

BRAILLE READERSHIP PROFILE AND PRO FORMA FY91

STATE	CITY(2)	REGION	INDIVIDUAL READERSHIP	DEPOSIT COLLECTION READERSHIP	ESTIMATED TOTAL READERS(1)
ALASKA	ANCHORAGE	WEST	19	2	27
ARIZONA	PHOENIX	WEST	66	1	70
CALIFORNIA	LOS ANGELES	WEST	573	53	785
CALIFORNIA	SACRAMENTO	WEST	601	49	797
COLORADO	DENVER	WEST	134	4	150
HAWAII	HONOLULU	WEST	83	1	87
IDAHO	BOISE	WEST	43	2	51
IOWA	DES MOINES	WEST	417	9	453
KANSAS	EMPORIA	WEST	80	1	84
MINNESOTA	FARIBAULT	WEST	432	15	492
MONTANA	HELENA	WEST	23		23
NEBRASKA	LINCOLN	WEST	69	10	109
NEVADA	CARSON CITY	WEST	16	1	20
NEW MEXICO	SANTA FE	WEST	82	2	90
NORTH DAKOTA	GRAND FORKS	WEST	20		20
OKLAHOMA	OKLAHOMA CITY	WEST	134	7	162
OREGON	SALEM	WEST	151	6	175
SOUTH DAKOTA	PIERRE	WEST	39		39
TEXAS	AUSTIN	WEST	1,165	254	2,181
UTAH	SALT LAKE CITY	WEST	166	13	218
WASHINGTON	SEATTLE	WEST	364	28	476
WYOMING	CHEYENNE	WEST	17	4	33
ALABAMA	MONTGOMERY	EAST	191	16	255
ARKANSAS	LITTLE ROCK	EAST	114	5	134
CONNECTICUT	ROCKY HILL	EAST	267	15	327
DELAWARE	DOVER	EAST	50	7	78
DIST.OF COL.	WASHINGTON	EAST	60	1	64
FLORIDA	DAYTONA BEACH	EAST	584	61	828
GEORGIA	ATLANTA	EAST	262	22	350
ILLINOIS	CHICAGO	EAST	584	49	780
INDIANA	INDIANAPOLIS	EAST	283	19	359
KENTUCKY	FRANKFORT	EAST	105	12	153
LOUISIANA	BATON ROUGE	EAST	303	18	375
MAINE	AUGUSTA	EAST	59	1	63
MARYLAND	BALTIMORE	EAST	133	6	157
MASSACHUSETTS	WATERTOWN	EAST	646	31	770
MICHIGAN	LANSING	EAST	913	127	1,421
MISSISSIPPI	JACKSON	EAST	95	1	99
MISSOURI	JEFFERSON CITY	EAST	522	57	750
NEW HAMPSHIRE	CONCORD	EAST	35	1	39
NEW JERSEY	TRENTON	EAST	510	4	526
NEW YORK	ALBANY (3)	EAST	573	159	1,210
NEW YORK	NEW YORK	EAST	619	17	687
NORTH CAROLINA	RALEIGH	EAST	404	29	520
OHIO	CINCINNATI	EAST	171	124	667
OHIO	CLEVELAND	EAST	450	34	586
PENNSYLVANIA	PHILADELPHIA	EAST	1,038	51	1,242

APPENDIX 2-1 (CONTINUED)

BRAILLE READERSHIP PROFILE AND PRO FORMA EST.

STATE	CITY(2)	REGION	INDIVIDUAL READERSHIP	DEPOSIT COLLECTION READERSHIP	ESTIMATED TOTAL READERS(1)
PUERTO RICO	SAN JUAN	EAST	81	15	141
RHODE ISLAND	PROVIDENCE	EAST	40		40
SOUTH CAROLINA	COLUMBIA	EAST	74	2	82
TENNESSEE	NASHVILLE	EAST	163	12	211
VERMONT	MONTPELIER	EAST	45	3	57
VIRGIN ISLANDS	ST.CROIX	EAST		1	4
VIRGINIA	RICHMOND	EAST	232	13	284
WEST VIRGINIA	CHARLESTON	EAST	131	9	167
WISCONSIN	MILWAUKEE	EAST	278	1	282
OVERSEAS	MSCs (4)	BOTH	14		14
TOTAL READERSHIP (5)		TOTAL	14,723	1,385	20,264
		MINIMUM	14	1	4
		MAXIMUM	1,165	254	2,181
		AVERAGE	263	27	356
		STD.DEV.	269	46	416
READERSHIP BY REGION		WEST	4,701	462	6,549
		EAST	10,022	923	13,715
% OF READERSHIP BY REGION		WEST	31.9%	33.4%	32.3%
		EAST	68.1%	66.6%	67.7%

NOTE:(1) EACH DEPOSIT COLLECTION ASSUMED TO HAVE FOUR BRAILLE PATRONS, THE STANDARD NLS APPROXIMATION. THIS AVERAGE COULD BE HIGHER, e.g. (SIX) READERS PER INSTITUTION, IN SOME STATES.

(2) CITY SHOWN HOUSES REGIONAL LIBRARY/MLA FOR THAT STATE/PART OF STATE. BRAILLE SERVICES MAY OR MAY NOT ORIGINATE FROM THESE LOCATIONS.

(3) ACTUAL NUMBER OF INDIVIDUALS SERVED WITHIN DEPOSIT COLLECTIONS REPORTED BY LIBRARY. NUMBER OF INSTITUTIONS SERVED ESTIMATED PER (1).

(4) OVERSEAS READERS CURRENTLY SERVED FROM MSCW ; PRO FORMA ASSUMES HALF SERVED FROM EASTERN CENTER, HALF SERVED FROM WESTERN CENTER.

(5) ALL FIGURES EXCLUDE MUSIC IN BRAILLE, WHICH WILL NOT BE HANDLED BY CENTERS.

APPENDIX 2-2

FY91 BRAILLE COLLECTION NETWORK LIBRARIES							
(Sorted by Region) STATE	CITY	REGION	REPORTED COLLECTION VOLUMES(1)	REPORTED COLLECTION TITLES	PROBABLE REPORTING UNIT	ADJUSTED/ ESTIMATED COLLECTION VOLUMES(2)	
ARIZONA	PHOENIX	WEST	250	250	COPIES	563	
CALIFORNIA	LOS ANGELES	WEST	19,442	8,994	COPIES	43,745	
CALIFORNIA	SACRAMENTO	WEST	8,734	8,374	COPIES	19,652	
HAWAII	HONOLULU	WEST	18,692	10,859	VOLUMES	18,692	
IOWA	DES MOINES	WEST	66,257	16,547	VOLUMES	66,257	
MINNESOTA	FARIBAULT	WEST	16,000		VOLUMES	16,000	
NEBRASKA	LINCOLN	WEST	402	380	COPIES	905	
OKLAHOMA	OKLAHOMA CITY	WEST	8,674	8,674	COPIES	19,517	
OREGON	SALEM	WEST	10,264	3,950	VOLUMES	10,264	
SOUTH DAKOTA	PIERRE	WEST	586	400	COPIES	1,319	
TEXAS	AUSTIN	WEST	20,634	10,415	COPIES	46,427	
UTAH	SALT LAKE CY.	WEST	33,599	8,558	COPIES	75,598	
WASHINGTON	SEATTLE	WEST	18,996	6,332	VOLUMES	18,996	
**KANSAS	KANSAS CITY	WEST	9,929	4,216	VOLUMES	9,929	
ALABAMA	MONTGOMERY	EAST	25,525	7,679	VOLUMES	25,525	
ARKANSAS	LITTLE ROCK	EAST	7,399	5,857	COPIES	16,648	
CONNECTICUT	ROCKY HILL	EAST	5,578	5,164	COPIES	12,551	
DIST.OF COL.	WASHINGTON	EAST	2,005	604	VOLUMES	2,005	
FLORIDA	DAYTONA BEACH	EAST	77,941	8,758	VOLUMES	77,941	
GEORGIA	ATLANTA	EAST	3,500	1,500	VOLUMES	3,500	
ILLINOIS	CHICAGO	EAST	12,570	7,929	COPIES	28,283	
INDIANA	INDIANAPOLIS	EAST	25,784	8,347	VOLUMES	25,784	
KENTUCKY	FRANKFORT	EAST	17,500	5,300	VOLUMES	17,500	
LOUISIANA	BATON ROUGE	EAST	22,267		VOLUMES	22,267	
MARYLAND	BALTIMORE	EAST	5,612	1,403	VOLUMES	5,612	
MASSACHUSETTS	WATERTOWN	EAST	21,091	8,916	VOLUMES	21,091	
MICHIGAN	LANSING	EAST	20,585	9,467	COPIES	46,316	
MISSISSIPPI	JACKSON	EAST	7,562	3,350	VOLUMES	7,562	
MISSOURI	JEFFERSON CY.	EAST	32,613	8,600	VOLUMES	32,613	
NEW JERSEY	TRENTON	EAST	29,438	7,835	VOLUMES	29,438	
NEW YORK	NEW YORK	EAST	15,771	6,165	VOLUMES	15,771	
NEW YORK	ALBANY	EAST	33,761		VOLUMES	33,761	
NORTH CAROLINA	RALEIGH	EAST	23,100		VOLUMES	23,100	
OHIO	CLEVELAND	EAST	7,359	7,359	COPIES	16,558	
OHIO	CINCINNATI	EAST	20,612	8,441	VOLUMES	20,612	
PENNSYLVANIA	PHILADELPHIA	EAST	33,124	8,700	COPIES	74,529	
PUERTO RICO	SAN JUAN	EAST	450	150	VOLUMES	450	
RHODE ISLAND	PROVIDENCE	EAST	394	335	COPIES	887	
TENNESSEE	NASHVILLE	EAST	24,577	8,332	VOLUMES	24,577	
VIRGINIA	RICHMOND	EAST	14,451	7,949	VOLUMES	14,451	
WISCONSIN	MILWAUKEE	EAST	12,600	5,171	VOLUMES	12,600	
**ALABAMA	TALLADEGA	EAST	7,433	2,530	VOLUMES	7,433	
**WEST VIRGINIA	ROMNEY	EAST	2,870	2,620	COPIES	6,458	
	TOTAL AS REPORTED=		745,931	/TOTAL AS ADJUSTED=		973,681	
		WEST=	232,459	31.2%	WEST=	347,861	35.7%
		EAST=	513,472	68.8%	EAST=	625,821	64.3%

1 • NOT ALL LIBRARIES ARE REPORTING VOLUMES AS REQUESTED, SOME ARE REPORTING COPIES.

2 • ADJUSTMENTS TAKE INTO ACCOUNT INFORMATION OBTAINED IN PREVIOUS AND CURRENT STUDIES SITE VISITS, ADDITIONAL INFORMATION ON COLLECTIONS OBTAINED FROM NLS, AND REPORTED TITLE COUNTS. AVERAGE 2.25 VOLUMES/COPY USED FOR ESTIMATION.

** - Subregional Library.

APPENDIX 2-3

BRAILLE CIRCULATION NETWORK LIBRARIES
FY91
SORTED BY REGION

STATE	CITY	REGION	INDIVIDUAL CIRCULATION	DEPOSIT COLLECTION CIRCULATION	INTER-LIBRARY LOAN	TOTAL(1) CIRC. (VOLUMES)	PROBABLE REPORTING UNIT	ESTIMATED ADJUSTED TOTAL(1) CIRC. (COPIES)
ALASKA	ANCHORAGE	WEST	200	60		260	COPIES	260
ARIZONA	PHOENIX	WEST	1,700	1		1,701	COPIES	1,701
CALIFORNIA	LOS ANGELES	WEST	8,800	500	30	9,330	COPIES	9,330
CALIFORNIA	SACRAMENTO	WEST	12,700	500	30	13,230	COPIES	13,230
COLORADO	DENVER	WEST	2,100	100		2,200	COPIES	2,200
HAWAII	HONOLULU	WEST	1,100	10		1,110	VOLUMES	493
IDAHO	BOISE	WEST	500	2		502	COPIES	502
IOWA	DES MOINES	WEST	9,900			9,900	VOLUMES	4,400
KANSAS	EMPORIA	WEST	1,400	17		1,417	VOLUMES	630
MINNESOTA	FARIBAULT	WEST	5,800	100		5,900	VOLUMES	2,622
MONTANA	HELENA	WEST	300			300	COPIES	300
NEBRASKA(2)	LINCOLN	WEST	300	100		400	COPIES	400
NEBRASKA(2)	VIA UTAH	WEST	1,100	100		1,200	COPIES	1,200
NEVADA	CARSON CITY	WEST	200	40		240	COPIES	240
NEW MEXICO	SANTA FE	WEST	900	100		1,000	COPIES	1,000
NORTH DAKOTA	GRAND FORKS	WEST	200			200	COPIES	200
OKLAHOMA(2)	VIA UTAH	WEST	800	20		820	COPIES	820
OKLAHOMA(2)	OKLAHOMA CITY	WEST	1,100		80	1,180	VOLUMES	524
OREGON	SALEM	WEST	3,600	100		3,700	VOLUMES	1,644
SOUTH DAKOTA	PIERRE	WEST	500			500	COPIES	500
TEXAS	AUSTIN	WEST	8,500	1,600		10,100	COPIES	10,100
UTAH	SALT LAKE CY.	WEST	1,500	50	600	2,150	COPIES	2,150
WASHINGTON	SEATTLE	WEST	25,300	600		25,900	VOLUMES	11,511
WYOMING	CHEYENNE	WEST	100	40		140	COPIES	140
ALABAMA	MONTGOMERY	EAST	3,200	200	60	3,460	VOLUMES	1,538
ARKANSAS	LITTLE ROCK	EAST	2,600	60	20	2,680	VOLUMES	1,191
CONNECTICUT	ROCKY HILL	EAST	3,200	30		3,230	COPIES	3,230
DELAWARE	DOVER	EAST	1,100	40		1,140	COPIES	1,140
DIST.OF COL.	WASHINGTON	EAST	1,000			1,000	VOLUMES	444
FLORIDA	DAYTONA BEACH	EAST	13,600	2,300	300	16,200	VOLUMES	7,200
GEORGIA	ATLANTA	EAST	3,100	60		3,160	COPIES	3,160
ILLINOIS	CHICAGO	EAST	8,100	300	7,800	16,200	VOLUMES	7,200
INDIANA	INDIANAPOLIS	EAST	6,200	100	80	6,380	VOLUMES	2,836
KENTUCKY	FRANKFORT	EAST	2,000	300	40	2,340	VOLUMES	1,040
LOUISIANA	BATON ROUGE	EAST	3,500	400		3,900	COPIES	3,900
MAINE	AUGUSTA	EAST	700	4		704	COPIES	704
MARYLAND	BALTIMORE	EAST	1,700	20		1,720	COPIES	1,720
MASSACHUSETTS	WATERTOWN	EAST	4,200	200		4,400	COPIES	4,400
MICHIGAN	LANSING	EAST	8,700	500		9,200	COPIES	9,200
MISSISSIPPI	JACKSON	EAST	1,200	10		1,210	VOLUMES	538
MISSOURI	JEFFERSON CY.	EAST	9,100	400	100	9,600	VOLUMES	4,267
NEW HAMPSHIRE	CONCORD	EAST	400	30		430	COPIES	430
NEW JERSEY	TRENTON	EAST	11,700	400		12,100	VOLUMES	5,378
NEW YORK	ALBANY	EAST	7,800	1,700		9,500	COPIES	9,500
NEW YORK	NEW YORK	EAST	8,700	300		9,000	COPIES	9,000
NORTH CAROLINA	RALEIGH	EAST	9,100	400		9,500	VOLUMES	4,222

APPENDIX 2-3 (CONTINUED)

BRAILLE CIRCULATION NETWORK LIBRARIES FY91 SORTED BY REGION								ESTIMATED ADJUSTED
STATE	CITY	REGION	INDIVIDUAL CIRCULATION	DEPOSIT COLLECTION CIRCULATION	INTER-LIBRARY LOAN	TOTAL(1) CIRC. (VOLUMES)	PROBABLE REPORTING UNIT	TOTAL(1) CIRC. (COPIES)
OHIO	CINCINNATI	EAST	4,000	1,600		5,600	COPIES	5,600
OHIO	CLEVELAND	EAST	9,400	700		10,100	VOLUMES	4,489
PENNSYLVANIA	PHILADELPHIA	EAST	15,300	1,700		17,000	COPIES	17,000
PUERTO RICO	SAN JUAN	EAST	200	0		200	COPIES	200
RHODE ISLAND	PROVIDENCE	EAST	200			200	COPIES	200
SOUTH CAROLINA	COLUMBIA	EAST	2,000	20		2,020	VOLUMES	898
TENNESSEE	NASHVILLE	EAST	2,900	200		3,100	VOLUMES	1,378
VERMONT	MONTPELIER	EAST	700	70		770	COPIES	770
VIRGIN ISLANDS	ST.CROIX	EAST				0	N/A	0
VIRGINIA	RICHMOND	EAST	1,800	100	400	2,300	COPIES	2,300
WEST VIRGINIA	CHARLESTON	EAST	2,800	40		2,840	COPIES	2,840
WISCONSIN(2)	MILWAUKEE	EAST	2,200	500	60	2,760	VOLUMES	1,227
WISCONSIN(2)	VIA ILLINOIS	EAST	1,300	10		1,310	COPIES	1,310
OVERSEAS	MSCs	BOTH	100		200	300	COPIES	300
		TOTAL	242,400	16,734	9,800	268,934		186,847
					WEST	93,530		66,248
					EAST	175,404		120,598
					WEST	34.8%		35.5%
					EAST	65.2%		64.5%

NOTES:(1) AS REPORTED BY NETWORK REGIONAL LIBRARIES;UNITS COULD DIFFER.

(2) BRAILLE CIRCULATION FROM MORE THAN ONE SOURCE DURING FY91.

APPENDIX 2-4

CURRENT NLS BRAILLE COLLECTIONS							
COLLECTION	CURRENT LOCATION	CURRENT NUMBER OF TITLES	CURRENT NUMBER OF COP./TIL.	CURRENT NUMBER OF COPIES	CURRENT NUMBER OF VOLUMES	AVERAGE NUMBER OF VOLUMES PER COPY	AVERAGE NUMBER OF VOLUMES PER LF
BR(1)	40 RLs,3 SRLs,2 MSCs	8,547	60 AVG.	462,269	1,030,860	2.23	4
BRA(2)	2 MSCs	5,000	3	15,000	104,700	6.98	5
BRF(3)	MSCE	1,524	3 AVG.	4,572	12,664	2.77	6
BRA MASTERS(4)	MSCW	4,307	1	4,307	30,063	6.98	4.7
BRA PRE-13,000 (5)	MSCW	11,000	1	11,000	62,920	5.72	4.7
BRJ (6)	MSCW	2,462	1	2,462	16,791	6.82	4.7
BRX(7)	MSCW	450	1	450	3,060	6.8	4.7
MAGAZINES,B.I.(8)	MSCW	1,860	4	7,440	7,440	1	12
TOTALS		35,150		507,500	1,268,499		

NOTES

(1) CURRENT COLLECTION SIZE BASED UPON NETWORK LIBRARY AND MSC REPORTED COLLECTIONS.

(2) CURRENTLY TWO SETS AT MSCE AND ONE SET AT MSCW.

(3) CURRENTLY ALL AT MSCE.

(4) NON-CIRCULATING TO PATRONS. CURRENTLY AT MSCW.

(5) CURRENTLY AT MSCW.

(6) CURRENTLY AT MSCW.

(7) NEW COLLECTION COMING INTO MSCW. AVERAGE VOLUMES PER COPY ESTIMATED.

(8) CURRENTLY AT MSCW.

TOTAL OF 31 PERIODICALS MAINTAINED. APPROXIMATELY 5-YR AVERAGE COLLECTION DEPTH.

BRAILLE MAGAZINE ARCHIVE COLLECTION (1 COPY PER ISSUE) WILL NOT BE STORED IN BRAILLE CENTERS.

APPENDIX 2-5

FY 91 BRAILLE CIRCULATION MULTISTATE CENTERS

STATE	CITY	WEST BR	WEST BRA	WEST PRE-13K BRA	WEST BRJ	WEST BR-MAG	EAST BR	EAST BRA	EAST BRF
ALABAMA	MONTGOMERY			7			7	21	
ALASKA	ANCHORAGE	6							
ARIZONA	PHOENIX								
ARKANSAS	LITTLE ROCK	57	70	46	8				
CALIFORNIA	LOS ANGELES	333	254	36	2	4			52
CALIFORNIA	SACRAMENTO	79	266	48	3	11			4
COLORADO	DENVER	7	5						
CONNECTICUT	ROCKY HILL			1			10	32	
DELAWARE	DOVER			2		1			
DIST.OF COL.	WASHINGTON						8	9	
FLORIDA	DAYTONA BEACH			24	5		20	359	6
GEORGIA	ATLANTA			32	2		103	39	2
HAWAII	HONOLULU	1	6						
IDAHO	BOISE	1							
ILLINOIS	CHICAGO			73	2	1	66	246	5
INDIANA	INDIANAPOLIS						11	58	
IOWA	DES MOINES		90	7					
KANSAS	EMPORIA	86	63	40	2				
KENTUCKY	FRANKFORT			1		1	14	62	
LOUISIANA	BATON ROUGE	12	46	3					
MAINE	AUGUSTA								
MARYLAND	BALTIMORE			17		1	304	90	3
MASSACHUSETTS	WATERTOWN			83	9		60	113	9
MICHIGAN	LANSING			16			8	118	3
MINNESOTA	FARIBAULT	63	96	79	5	2			
MISSISSIPPI	JACKSON						11	24	
MISSOURI	JEFFERSON CY.	4	66	7					
MONTANA	HELENA								
NEBRASKA	LINCOLN								
NEBRASKA	VIA UTAH								
NEVADA	CARSON CITY	1							
NEW HAMPSHIRE	CONCORD						3		
NEW JERSEY	TRENTON			6		1		16	9
NEW MEXICO	SANTA FE					2			
NEW YORK	ALBANY			7	1		1	86	
NEW YORK	NEW YORK			12			166	46	1
NORTH CAROLINA	RALEIGH			2			2	86	
NORTH DAKOTA	GRAND FORKS								
OHIO	CINCINNATI			8	1	1	18	36	1
OHIO	CLEVELAND			19	1	1	193	102	
OKLAHOMA	OKLAHOMA CITY	2	87	26	4				2
OKLAHOMA	VIA UTAH								
OREGON	SALEM	133	76	19					
OVERSEAS	MSCs	266	11	10			4		11
PENNSYLVANIA	PHILADELPHIA			45	5		10	225	10
PUERTO RICO	SAN JUAN				3		3		3

APPENDIX 2-5 (CONTINUED)

STATE	CITY	WEST BR	WEST BRA	WEST PRE-13K BRA	WEST BRJ	WEST BR-MAG	EAST BR	EAST BRA	EAST BRF
RHODE ISLAND	PROVIDENCE			2					
SOUTH CAROLINA	COLUMBIA								
SOUTH DAKOTA	PIERRE								
TENNESSEE	NASHVILLE			8			2	113	1
TEXAS	AUSTIN	10	471	115	2				21
UTAH	SALT LAKE CY.	274	327	184	21	4			3
VERMONT	MONTPELIER								
VIRGIN ISLANDS	ST.CROIX								
VIRGINIA	RICHMOND			47			93	107	18
WASHINGTON	SEATTLE	78	106	40	3				8
WEST VIRGINIA	CHARLESTON			6		6			
WISCONSIN	MILWAUKEE			20	2			118	
WISCONSIN	VIA ILLINOIS								
WYOMING	CHEYENNE								
		1,413	2,040	1,098	81	36	1,117	2,106	172

WEST BR	1,413	EAST BR	1,117
WEST OTI	3,255	EAST OTI	2,278
WEST TO'	4,668	EAST TOI	3,395

TOTAL BI	2,530
TOTAL O'	5,533
TOTAL T(	8,063

APPENDIX 2-6

PRO FORMA ALLOCATION OF COLLECTIONS						
COLLECTION	PRO FORMA WESTERN CENTER (TITLES)	PRO FORMA WESTERN CENTER (COPIES)	PRO FORMA WESTERN CENTER (VOLUMES)	PRO FORMA EASTERN CENTER (TITLES)	PRO FORMA EASTERN CENTER (COPIES)	PRO FORMA EASTERN CENTER (VOLUMES)
BR(1)	8,547	157,172	350,493	8,547	305,098	680,368
BRA(2)	5,000	5,000	34,900	5,000	10,000	69,800
BRF(3)	1,524	1,524	4,221	1,524	3,048	8,443
BRA MASTERS(4)	4,307	4,307	30,063	0	0	0
BRA PRE-13,000 (5)	11,000	11,000	62,920	0	0	0
BRJ (6)	2,462	2,462	16,791	0	0	0
BRX(7)	450	450	3,060	0	0	0
MAGAZINES,B.I.(8)	1,860	3,720	3,720	1,860	3,720	3,720
TOTALS	35,150	185,635	506,168	16,931	321,866	762,331

NOTES

(1) CURRENT COLLECTION SIZE BASED UPON NETWORK LIBRARY AND MSC REPORTED COLLECTIONS.
PRO FORMA 34% WEST,66 % EAST.

(2) CURRENTLY TWO SETS AT MSCE AND ONE SET AT MSCW;SAME PRO FORMA.

(3) CURRENTLY ALL AT MSCE; PRO FORMA SHIFTS 1/3 OF COLLECTION TO MSCW.

(4) NON-CIRCULATING TO PATRONS. CURRENTLY AT MSCW;SAME PRO FORMA.

(5) CURRENTLY AT MSCW; SAME PRO FORMA.

(6) CURRENTLY AT MSCW; SAME PRO FORMA.

(7) NEW COLLECTION COMING INTO MSCW;SAME PRO FORMA. AVERAGE VOLUMES PER COPY ESTIMATED.

(8) CURRENTLY AT MSCW; PRO FORMA SHIFTS 2 OF 4 SETS TO THE EAST.
TOTAL OF 31 PERIODICALS MAINTAINED. APPROXIMATELY 5-YR AVERAGE COLLECTION DEPTH.
BRAILLE MAGAZINE ARCHIVE COLLECTION (1 COPY PER ISSUE) WILL NOT BE STORED IN BRAILLE CENTERS.

PRO FORMA COLLECTION PROFILE

COLLECTION	PRO FORMA WESTERN CENTER (COPIES IN FLOAT)	PRO FORMA WESTERN CENTER (VOLUMES IN FLOAT)	PRO FORMA EASTERN CENTER (COPIES IN FLOAT)	PRO FORMA EASTERN CENTER (VOLUMES IN FLOAT)	PRO FORMA WESTERN CENTER (COPIES IN HOUSE)	PRO FORMA WESTERN CENTER (VOLUMES IN HOUSE)	PRO FORMA EASTERN CENTER (COPIES IN HOUSE)	PRO FORMA EASTERN CENTER (VOLUMES IN HOUSE)	PRO FORMA WESTERN CENTER SHELVING (IN LF)	PRO FORMA EASTERN CENTER SHELVING (IN LF)
BR(1)	26,196	58,417	54,860	122,338	130,976	292,075	250,238	558,030	73,019	139,508
BRA(2)	684	4,775	1,389	9,695	4,316	30,125	8,611	60,105	6,025	12,021
BRF(3)	28	79	58	160	1,496	4,143	2,990	8,283	690	1,381
BRA MASTERS(4)	0	0	0	0	4,307	30,063	0	0	6,396	0
BRA PRE-13,000 (5)	549	3,140	0	0	10,451	59,780	0	0	12,719	0
BRJ (6)	41	276	0	0	2,422	16,515	0	0	3,514	0
BRX(7)	10	68	0	0	440	2,992	0	0	637	0
MAGAZINES,B.I.(8)	6	6	12	12	(6)	(6)	(12)	(12)	(0)	(1)
TOTALS	**27,514**	**66,761**	**56,319**	**132,204**	**154,401**	**435,687**	**261,827**	**626,407**	**103,000**	**152,908**

NOTES
(1) CURRENT COLLECTION SIZE BASED UPON NETWORK LIBRARY AND MSC REPORTED COLLECTIONS. PRO FORMA 34% WEST,66 % EAST.
(2) CURRENTLY TWO SETS AT MSCE AND ONE SET AT MSCW;SAME PRO FORMA.
(3) CURRENTLY ALL AT MSCE; PRO FORMA SHIFTS 1/3 OF COLLECTION TO MSCW.
(4) NON-CIRCULATING TO PATRONS. CURRENTLY AT MSCW;SAME PRO FORMA.
(5) CURRENTLY AT MSCW; SAME PRO FORMA.
(6) CURRENTLY AT MSCW; SAME PRO FORMA.
(7) NEW COLLECTION COMING INTO MSCW;SAME PRO FORMA. AVERAGE VOLUMES PER COPY ESTIMATED.
(8) CURRENTLY AT MSCW; PRO FORMA SHIFTS 2 OF 4 SETS TO THE EAST.
TOTAL OF 31 PERIODICALS MAINTAINED. APPROXIMATELY 5-YR AVERAGE COLLECTION DEPTH.
BRAILLE MAGAZINE ARCHIVE COLLECTION (1 COPY PER ISSUE) WILL NOT BE STORED IN BRAILLE CENTERS.

PRO FORMA BRAILLE CIRCULATION
(ALL COLLECTIONS)

COLLECTION	NATIONAL TOTAL ANNUAL CIRC. COPIES	AVERAGE VOL./COPY	NATIONAL TOTAL ANNUAL CIRC. VOLUMES	NATIONAL TOTAL DAILY (5) CIRC. COPIES	NATIONAL TOTAL DAILY (5) CIRC. VOLUMES	EAST TOTAL ANNUAL CIRC. COPIES	EAST TOTAL ANNUAL CIRC. VOLUMES	WEST TOTAL ANNUAL CIRC. COPIES	WEST TOTAL ANNUAL CIRC. VOLUMES	EAST TOTAL DAILY(5) CIRC. COPIES	EAST TOTAL DAILY(5) CIRC. VOLUMES	WEST TOTAL DAILY(5) CIRC. COPIES(4)	WEST TOTAL DAILY(5) CIRC. VOLUMES(4)
MAGAZINES	36	1	36	0.1	0.1	24	24	12	12	0.1	0.1	0.0	0.0
BRF	172	2.77	476	0.7	1.9	115	319	57	157	0.5	1.3	0.2	0.6
BRJ	81	6.82	552	0.3	2.2	0	0	81	552	0.0	0.0	0.3	2.2
BRX (3)	20	6.8	136	0.1	0.5	0	0	20	136	0.0	0.0	0.1	0.5
BRA	4,146	6.98	28,939	16.6	115.8	2,806	19,586	1,340	9,353	11.2	78.3	5.4	37.4
PRE-13000 BRA	1,098	5.72	6,281	4.4	25.1	0	0	1,098	6,281	0.0	0.0	4.4	25.1
BRA MASTERS(1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BR	197,087	2.23	439,504	788.3	1,758.0	133,392	297,463	63,695	142,041	533.6	1,189.9	254.8	568.2
TOTAL	202,640 (2)		475,925	811	1,904	136,337	317,393	66,303	158,531	545	1,270	265	634

NOTES: (1) - BRA MASTERS DO NOT CIRCULATE TO PATRONS; UNPREDICTABLE CIRCULATION TO BRAILLE PRODUCERS FOR REPRODUCTION.
(2) - ASSUMPTION: 10 BOOKS (COPIES) PER PATRON PER YEAR.
(3) - BRX CIRCULATION IS ESTIMATED; THE COLLECTION IS NEW AND HAS NO HISTORY.
(4) - THERE IS MAGAZINE CIRCULATION FROM THE WESTEN CENTER,BUT IT IS LESS THAN 0.1 COPIES PER DAY.
(5) - 250 WORKING DAYS PER YEAR.

APPENDIX 2-9

THEORETICAL POTENTIAL OF BR COLLECTION SIZE REDUCTION UPON CENTRAL CONSOLIDATION

Assumptions:

- Current National BR Circulation = 200,000 copies/year
- Current National BR Collection Size = (8,500 titles) (60 copies/title) = 510,000 copies
- Current Number of Stockage Points = 39 sites
- Current Average Copies/Title = **60 copies/title**
- Pro Forma Number of Stockage Points = 2 sites

(1) Average Stockage Per Distributed Site = 60 ÷ 39 = 1.538 copies/title/site

(2) Average Circulation Per Title Per Year = 200,000 ÷ 510,000 = 0.392 copies/title/year

(3) Average Distributed Site Safety Stock Level (1) = 1.538 - 0.392 = 1.146 copies/title

(4) Consolidated Collection Requirement at 2 Centers (2) = 0.392 (20) + 0.392 (19) + 1.146 $\sqrt{20}$ + 1.146 $\sqrt{19}$ = **25.4 copies/title**

Notes: (1) - Assumes a book is in float for 1 year... otherwise required safety stocks are even lower than presented.

(2) - Two centers assumed to be of approximately equal size.

APPENDIX 2-10

LIBERAL ESTIMATE PROJECTED COSTS OF OPTION A PURCHASE OF FACILITY AND STORAGE EQUIPMENT (Assumes 3% Inflation)							
COST ELEMENT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	ANNUALIZED COST(1)	ANNUALIZED COST(2)
START-UP							
FACILITIES	1,740,000					147,328	58,000
STOR. & DIST. EQUIPMENT	4,007,190					339,294	133,573
ADP HARDWARE	130,951					24,724	18,707
ADP SOFTWARE	207,450					39,167	29,636
TELECOMMUNICATIONS	36,138					6,823	5,163
OFFICE EQUIPMENT	20,000					1,962	1,000
SUB-TOTAL	6,141,729	0	0	0	0	559,297	246,079
CONVERSION							
COLLECTION	45,000	46,350	47,741	49,173	50,648	7,500	7,500
PATRON HISTORY DATA	0	7,213	7,429	7,652	7,881	1,202	1,202
BOOK TITLE DATA	6,013	0	0	0	0	1,002	1,002
SUB-TOTAL	51,013	53,563	55,169	56,824	58,529	9,704	9,704
OPERATING							
LABOR	449,572	497,909	548,635	601,957	657,984	584,610	584,610
TELECOMMUNICATIONS	41,491	55,844	71,021	87,059	103,994	92,398	92,398
MATERIALS & SUPPLIES	15,000	15,450	15,914	16,391	16,883	15,000	15,000
HARDWARE MAINTENANCE	6,600	6,798	7,002	7,212	7,428	6,600	6,600
SOFTWARE MAINTENANCE	8,850	9,116	9,389	9,671	9,961	8,850	8,850
OCCUPANCY	85,785	88,358	91,009	93,739	96,551	85,785	85,785
MISCELLANEOUS	5,000	5,150	5,305	5,464	5,628	5,000	5,000
ADMINISTRATIVE OVERHEAD	22,484	24,895	27,432	30,098	32,899	29,231	29,231
SUB-TOTAL	634,881	703,520	775,705	851,589	931,328	827,473	827,473
TOTAL COSTS	6,827,623	757,082	830,875	908,414	989,857	1,396,474	1,083,255

(1) - ASSUMES A 7.5% COST-OF-CAPITAL FOR PURCHASED LONG-TERM ASSETS.

(2) - ASSUMES NO COST-OF-CAPITAL FOR PURCHASED LONG-TERM ASSETS.

APPENDIX 2-11

CONSERVATIVE ESTIMATE PROJECTED COSTS OF OPTION A PURCHASE OF FACILITY AND STORAGE EQUIPMENT (Assumes 5% Inflation)							
COST ELEMENT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	ANNUALIZED COST(1)	ANNUALIZED COST(2)
START-UP							
FACILITIES	1,740,000					147,328	58,000
STOR. & DIST. EQUIPMENT	4,007,190					339,294	133,573
ADP HARDWARE	144,046					27,196	20,578
ADP SOFTWARE	228,195					43,083	32,599
TELECOMMUNICATIONS	39,752					7,505	5,679
OFFICE EQUIPMENT	22,000					2,158	1,100
SUB-TOTAL	6,181,183	0	0	0	0	566,564	251,529
CONVERSION							
COLLECTION	49,500	51,975	54,574	57,302	60,168	8,250	8,250
PATRON HISTORY DATA	0	8,655	9,088	9,542	10,019	1,443	1,443
BOOK TITLE DATA	7,216	0	0	0	0	1,203	1,203
SUB-TOTAL	56,716	60,630	63,662	66,845	70,187	10,895	10,895
OPERATING							
LABOR	449,672	507,577	570,148	637,707	710,597	584,610	584,610
TELECOMMUNICATIONS	45,733	65,837	87,837	111,873	138,092	113,609	113,609
MATERIALS & SUPPLIES	15,000	15,750	16,538	17,364	18,233	15,000	15,000
HARDWARE MAINTENANCE	26,651	27,984	29,383	30,852	32,394	26,651	26,651
SOFTWARE MAINTENANCE	45,639	47,921	50,317	52,833	55,474	45,639	45,639
OCCUPANCY	92,740	97,377	102,246	107,358	112,726	92,740	92,740
MISCELLANEOUS	5,000	5,250	5,513	5,788	6,078	5,000	5,000
ADMINISTRATIVE OVERHEAD	44,967	50,758	57,015	63,771	71,060	58,461	58,461
SUB-TOTAL	725,402	818,453	918,995	1,027,546	1,144,654	941,710	941,710
TOTAL COSTS	6,963,301	879,083	982,657	1,094,391	1,214,841	1,519,169	1,204,134

(1) - ASSUMES A 7.5% COST-OF-CAPITAL FOR PURCHASED LONG-TERM ASSETS.
(2) - ASSUMES NO COST-OF-CAPITAL FOR PURCHASED LONG-TERM ASSETS.

APPENDIX 2-12

LIBERAL ESTIMATE PROJECTED COSTS OF OPTION A LEASE OF FACILITY AND STORAGE EQUIPMENT (Assumes 3% Inflation)							
COST ELEMENT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	ANNUALIZED COST(1)	ANNUALIZED COST(2)
START-UP							
FACILITIES	174,000	174,000	174,000	174,000	174,000	174,000	174,000
STOR. & DIST. EQUIPMENT	400,719	400,719	400,719	400,719	400,719	400,719	400,719
ADP HARDWARE	130,951					24,724	18,707
ADP SOFTWARE	207,450					39,167	29,636
TELECOMMUNICATIONS	36,138					6,823	5,163
OFFICE EQUIPMENT	20,000					1,962	1,000
SUB-TOTAL	969,258	574,719	574,719	574,719	574,719	647,394	629,225
CONVERSION							
COLLECTION	45,000	46,350	47,741	49,173	50,648	7,500	7,500
PATRON HISTORY DATA	0	7,213	7,429	7,652	7,881	1,202	1,202
BOOK TITLE DATA	6,013	0	0	0	0	1,002	1,002
SUB-TOTAL	51,013	53,563	55,169	56,824	58,529	9,704	9,704
OPERATING							
LABOR	449,672	497,909	548,635	601,957	657,984	584,610	584,610
TELECOMMUNICATIONS	41,491	55,844	71,021	87,059	103,994	92,398	92,398
MATERIALS & SUPPLIES	15,000	15,450	15,914	16,391	16,883	15,000	15,000
HARDWARE MAINTENANCE	6,600	6,798	7,002	7,212	7,428	6,600	6,600
SOFTWARE MAINTENANCE	8,850	9,116	9,389	9,671	9,961	8,850	8,850
OCCUPANCY	85,785	88,358	91,009	93,739	96,551	85,785	85,785
MISCELLANEOUS	5,000	5,150	5,305	5,464	5,628	5,000	5,000
ADMINISTRATIVE OVERHEAD	22,484	24,895	27,432	30,098	32,899	29,231	29,231
SUB-TOTAL	634,881	703,520	775,705	851,589	931,328	827,473	827,473
TOTAL COSTS	1,655,152	1,331,801	1,405,594	1,483,133	1,564,576	1,484,571	1,466,401

(1) - ASSUMES A 7.5% COST-OF-CAPITAL FOR PURCHASED LONG-TERM ASSETS.
(2) - ASSUMES NO COST-OF-CAPITAL FOR PURCHASED LONG-TERM ASSETS.

APPENDIX 2-13

CONSERVATIVE ESTIMATE PROJECTED COSTS OF OPTION A LEASE OF FACILITY AND STORAGE EQUIPMENT (Assumes 5% Inflation)							
COST ELEMENT	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	ANNUALIZED COST(1)	ANNUALIZED COST(2)
START-UP							
FACILITIES	174,000	174,000	174,000	174,000	174,000	174,000	174,000
STOR. & DIST. EQUIPMENT	400,719	400,719	400,719	400,719	400,719	400,719	400,719
ADP HARDWARE	144,046					27,196	20,578
ADP SOFTWARE	228,195					43,083	32,599
TELECOMMUNICATIONS	39,752					7,505	5,679
OFFICE EQUIPMENT	22,000					2,158	1,100
SUB-TOTAL	1,008,712	574,719	574,719	574,719	574,719	654,661	634,675
CONVERSION							
COLLECTION	49,500	51,975	54,574	57,302	60,168	8,250	8,250
PATRON HISTORY DATA	0	8,655	9,088	9,542	10,019	1,443	1,443
BOOK TITLE DATA	7,216	0	0	0	0	1,203	1,203
SUB-TOTAL	56,716	60,630	63,662	66,845	70,187	10,895	10,895
OPERATING							
LABOR	449,672	507,577	570,148	637,707	710,597	584,610	584,610
TELECOMMUNICATIONS	45,733	65,837	87,837	111,873	138,092	113,609	113,609
MATERIALS & SUPPLIES	15,000	15,750	16,538	17,364	18,233	15,000	15,000
HARDWARE MAINTENANCE	26,651	27,984	29,383	30,852	32,394	26,651	26,651
SOFTWARE MAINTENANCE	45,639	47,921	50,317	52,833	55,474	45,639	45,639
OCCUPANCY	92,740	97,377	102,246	107,358	112,726	92,740	92,740
MISCELLANEOUS	5,000	5,250	5,513	5,788	6,078	5,000	5,000
ADMINISTRATIVE OVERHEAD	44,967	50,758	57,015	63,771	71,060	58,461	58,461
SUB-TOTAL	725,402	818,453	918,995	1,027,546	1,144,654	941,710	941,710
TOTAL COSTS	1,790,830	1,453,802	1,557,376	1,669,110	1,789,560	1,607,266	1,587,280

(1) - ASSUMES A 7.5% COST-OF-CAPITAL FOR PURCHASED LONG-TERM ASSETS.
(2) - ASSUMES NO COST-OF-CAPITAL FOR PURCHASED LONG-TERM ASSETS.

APPENDIX 3-1

ESTIMATED DATABASE SIZING

NOTE: These data tables are provided as an example of what types of information should be included in the databases. However, these data tables should not be considered all inclusive or be used to drive the design of this system.

PRIMARY SYSTEM

PATRON MAIN			
IDENTIFIER	REC LGTH	(# PATRONs)	20,246
PATRON_ID	13		263,198
PATRON_LANG	1		20,246
PATRON_NAME_FIRST	10		202,460
PATRON_NAME_MI	1		20,246
PATRON_NAME_LAST	29		587,134
PATRON_CONTACT_NAME	40		809,840
PATRON_CONTACT_PHONE	10		202,460
PATRON_CONTACT_REASON	40		809,840
PATRON_CONTACT_DATE	8		161,968
PATRON_ACTIVITY_FIRST (DATE)	8		161,968
PATRON_ACTIVITY_LAST (DATE)	8		161,968
PATRON_ADDRESS_PERMANENT	26		526,396
PATRON_CITY_1	19		384,674
PATRON_STATE_1	2		40,492
PATRON_ZIP_1	5		101,230
PATRON_ZIP_PLUS_1	4		80,984
PATRON_ADDRESS_ALTERNATE	26		526,396
PATRON_CITY_2	19		384,674
PATRON_STATE_2	2		40,492
PATRON_ZIP_2	5		101,230
PATRON_ZIP_PLUS_2	4		80,984
PATRON_ADDRESS_PROVISIONAL	26		526,396
PATRON_CITY_3	19		384,674
PATRON_STATE_3	2		40,492
PATRON_ZIP_3	5		101,230
PATRON_ZIP_PLUS_3	4		80,984
PATRON_ADDRESS_TEMPORARY	26		526,396
PATRON_CITY_4	19		384,674
PATRON_STATE_4	2		40,492
PATRON_ZIP_4	5		101,230
PATRON_ZIP_PLUS_4	4		80,984
PATRON_ALT_POC	40		809,840
PATRON_AREA_CODE_2	3		60,738
PATRON_EXCHANGE_2	3		60,738
PATRON_PHONE_NUMBER_2	4		80,984
PATRON_YEAR_OF_BIRTH	4		80,984
PATRON_SEX	1		20,246
PATRON_DISABILITY	2		40,492
PATRON_AREA_CODE_1	3		60,738

APPENDIX 3-1 (CONTINUED)

PATRON_EXCHANGE_1	3	60,738
PATRON_PHONE_NUMBER_1	4	80,984
PATRON_READER_ADVISOR	30	607,380
PATRON_PROFILE_SELECT (Y/N)	1	20,246
PATRON_SUBJECT_CODES 1 thru 32	96	1,943,616
PATRON_PROFANITY	1	20,246
PATRON_SEX	1	20,246
PATRON_VIOLENCE	1	20,246
PATRON_QUOTA	3	60,738
READING_LEVEL	1	20,246
PATRON_TYPE (INDV/INST)	1	20,246
PATRON_VETERAN_STATUS (Y/N)	1	20,246
PATRON_FREQUENCY	1	20,246
PATRON_REG_LIBRARY_ID	4	80,984
PATRON_SITE_DESIGNATOR (E/W)	1	20,246
PATRON_PASSWORD_DPA	8	161,968
SUB-TOTAL	609	12,329,814

PATRON CHKCKOUT (HAS NOW) MAX 25 BOOKS		
IDENT	REC LGTH (# VOLs)	506,150
PATRON_ID	13	6,579,950
PATCHK_TITLE_ID	7	3,543,050
PATCHK_VOL_NUMBER	2	1,012,300
PATCHK_SENT_DATE	8	4,049,200
PATRON_DUE_DATE	8	4,049,200
SUB-TOTAL	38	19,233,700

PATRON HISTORY (HAS HAD)		
IDENT	REC LGTH BASED ON 10 A YR X 20,246	
PATRON_ID	13	28,951,780
PATRON_TITLE_ID	8	17,816,480
PATRON_CHKOUT_DATE	8	17,816,480
SUB-TOTAL	29	64,584,740

PATRON REQUEST LIST (UNLIMITED)		
IDENT	REC LGTH (# PATRONs)	20,246
PATRON_ID	13	13,159,900
PATRON_TITLE_ID	8	8,098,400
PATRON_DATE_SELECTED	8	8,098,400
SUB-TOTAL	29	29,356,700

PATRON RESERVE LIST (EST. 25 BOOKS)		
IDENT	REC LGTH (# PATRONs)	20,246
PATRON_ID	13	6,579,950
PATRON_TITLE_ID	8	4,049,200
PATRON_DATE_SELECTED	8	4,049,200
SUB-TOTAL	29	14,678,350

APPENDIX 3-1 (CONTINUED)

BOOK RECORD (TITLE) BR/BRA/BRP/BRJ/BRX/PRF 13,000			
IDENT	REC LGTH	(# TITLES)	28,983
TITLE_ID	8		231,864
TITLE_NAME	70		2,028,810
TITLE_SUBJECT_CODE 1	3		86,949
TITLE_SUBJECT_CODE 2	3		86,949
TITLE_SUBJECT_CODE 3	3		86,949
TITLE_SUBJECT_CODE 4	3		86,949
TITLE_PROFANITY	1		28,983
TITLE_SEX	1		28,983
TITLE_VIOLENCE	1		28,983
TITLE_AUTHOR_NAME	30		869,490
TITLE_ORIG_DATE	4		115,932
TITLE_ABSTRACT	400		11,593,200
TITLE_ABSTRACT_ID	6		173,898
TITLE_LANGUAGE	2		57,966
TITLE_ADULT/YOUTH	1		28,983
TITLE_GRADE_LEVEL	3		86,949
TITLE_LONG_SHORT	1		28,983
TITLE_FICT_NON-FICT	1		28,983
TITLE_SERIES	1		28,983
TITLE_THERMOFORM	1		28,983
TITLE_PRINT_BRAILLE	1		28,983
TITLE_BRITISH_BRAILLE	1		28,983
TITLE_DEPOSIT_TYPE	1		28,983
TITLE_NO_PROF_SELECT	1		28,983
TITLE_SITE_DESIGNATOR (E/W)	1		28,983
TITLE_REC_DATE	8		9,847,968
SUB-TOTAL	556		25,730,652

BOOK BAR CODE (TITLE) BR/BRA/BRP/BRJ/BRX/PRF 13,000			
IDENT	REC LGTH	(# VOLS)	1,230,996
TITLE_ID	8		9,847,968
TITLE_VOL_NUMBER	3		3,692,988
TITLE_BAR_CODE	12		14,771,952
TITLE_SHIP_DATE	8		9,847,968
SUB-TOTAL	31		38,160,876

APPENDIX 3-1 (CONTINUED)

MASTER BOOK (TITLE) BRM (BRA MASTERS)			
IDENT	REC LGTH	(# TITLES)	4,307
MASTER_ID	8		34,456
MASTER_NAME	70		301,490
MASTER_AUTHOR	6		25,842
MASTER_ORIG_DATE	4		17,228
MASTER_ABSTRACT	400		1,722,800
MASTER_ABSTRACT_ID	6		25,842
MASTER_LANGUAGE	2		8,614
MASTER_REC_DATE	8		34,456
SUB-TOTAL	504		2,170,728

MASTER BAR CODE (TITLE) BRM (BRA MASTERS)			
IDENT	REC LGTH	(# VOLs)	30,063
MASTER_ID	8		240,504
MASTER_VOL_NUMBER	3		90,189
MASTER_BAR_CODE	12		360,756
MASTER_SHIP_DATE	8		240,504
SUB-TOTAL	31		931,953

MAGAZINE MASTER (TITLE)			
IDENT	REC LGTH	(# MAGS)	7,496
MAG_ID	4		29,984
MAG_NAME	70		524,720
MAG_VOL_ID	4		29,984
MAG_ISSUE_DATE	6		44,976
MAG_ABSTRACT	70		524,720
MAG_ABSTRACT_ID	6		44,976
MAG_REC_DATE	8		59,968
SUB-TOTAL	168		1,259,328

MAGAZINE BAR CODE (TITLE)			
IDENT	REC LGTH	(# MAGS)	3,748
MAG_ID	4		14,992
MAG_VOL_ID	4		14,992
MAG_BAR_CODE	12		44,976
MAG_SHIP_DATE	8		29,984
SUB-TOTAL	28		104,944

TOTAL PRIMARY CAPACITY		
	TOTAL (# BYTES)	208,541,785
	MEGABYTES	199

1,048,576 Bytes = 1 Megabyte

APPENDIX 3-1 (CONTINUED)

SUBSYSTEMS

PRIMARY SUB BOOK (TITLE) BR/BRA/BRF/BRJ/BRX/PRE 13,006		
IDENT	REC LGTH (# VOLS)	472,385
TITLE_BAR_CODE	12	5,668,620
TITLE_BAR_CODE_LOCATOR	12	5,668,620
SUB-TOTAL	24	11,337,240

PRIMARY SUB MASTER (TITLE) BRM (BRA MASTERS)		
IDENT	REC LGTH (# VOLS)	30,063
MASTER_BAR_CODE	12	360,756
MASTER_BAR_CODE_LOCATOR	12	360,756
SUB-TOTAL	24	721,512

PRIMARY SUB MAGAZINE (TITLE)		
IDENT	REC LGTH (# MAGS)	3,748
MAG_BAR_CODE	12	44,976
MAG_BAR_CODE_LOCATOR	12	44,976
SUB-TOTAL	24	89,952

PRIMARY SUB CONTAINERS		
IDENT	REC LGTH (FLOAT = 10%)	74,000
SERIAL_NUMBER	12	888,000
CONTAINER_BAR_CODE	12	888,000
SUB-TOTAL	24	1,776,000

TOTAL CAPACITY PRIMARY SUB (WEST)		
	TOTAL (BYTES)	13,924,704
	MEGABYTES	13

1,048,576 Bytes = 1 Megabyte

SECONDARY SUB BOOK (TITLE) BR/BRA/BRF/BRJ/BRX/PRE 13,006		
IDENT	REC LGTH (VOLS)	758,611
TITLE_BAR_CODE	12	9,103,332
TITLE_BAR_CODE_LOCATOR	12	9,103,332
SUB-TOTAL	24	18,206,664

SECONDARY SUB MAGAZINE (TITLE)		
IDENT	REC LGTH (MAGS)	3,748
MAG_BAR_CODE	12	44,976
MAG_BAR_CODE_LOCATOR	12	44,976
SUB-TOTAL	24	89,952

APPENDIX 3-1 (CONTINUED)

SECONDARY SUB CONTAINERS		
IDENTIFIER	REC LGTH (FLOAT + 10%)	150,000
SERIAL_NUMBER	12	1,800,000
CONTAINER_BAR_CODE	12	1,800,000
SUB-TOTAL	24	3,600,000

TOTAL CAPACITY SECONDARY SUB (EAST)		
	TOTAL (BYTES)	21,896,616
	MEGABYTES	21

1,048,576 Bytes = 1 Megabyte

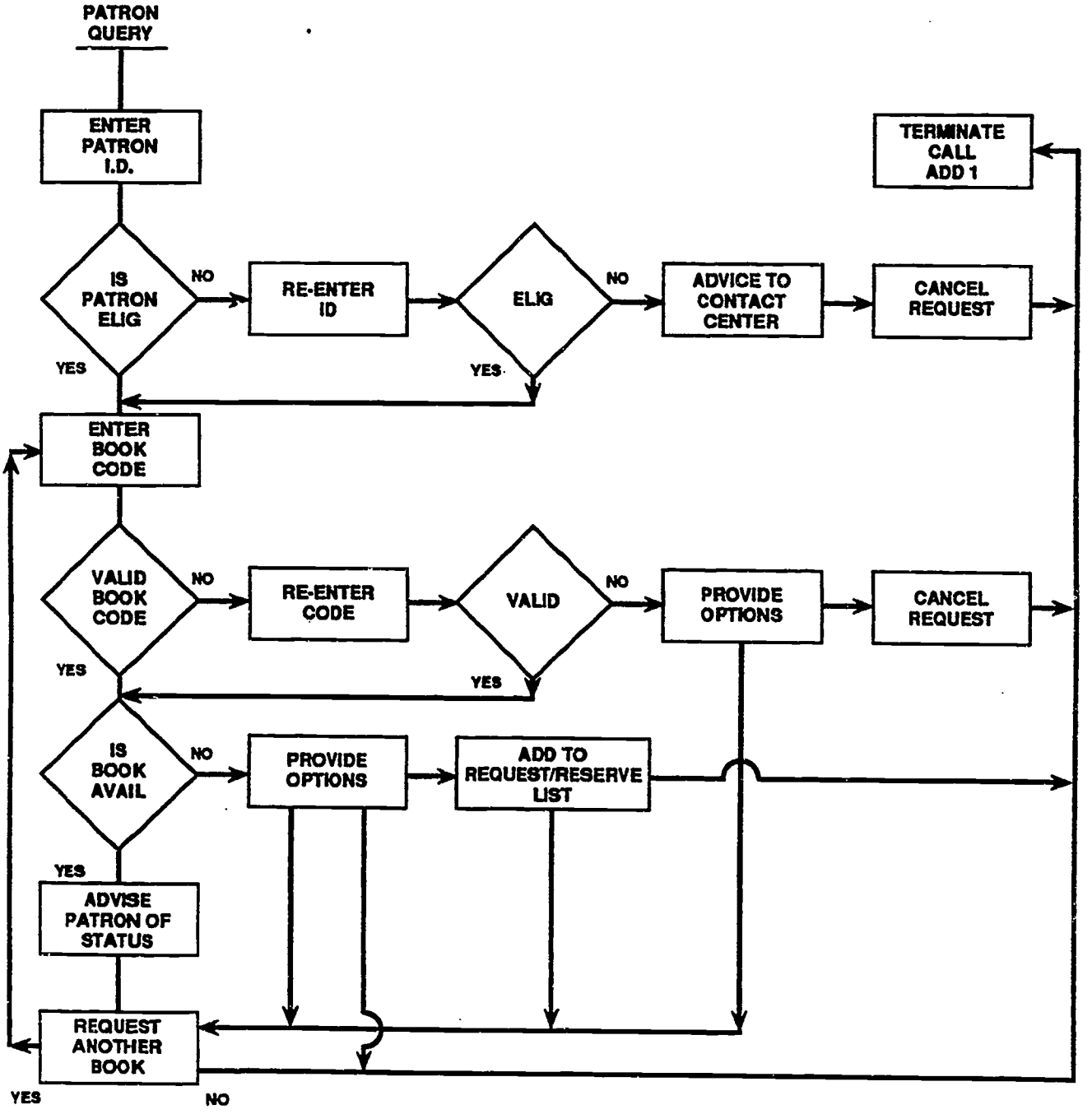
AGGREGATE TOTAL

GRAND TOTAL		
	TOTAL (BYTES)	244,363,105
	MEGABYTES	233

1,048,576 Bytes = 1 Megabyte

APPENDIX 3-2

DIRECT PATRON ACCESS

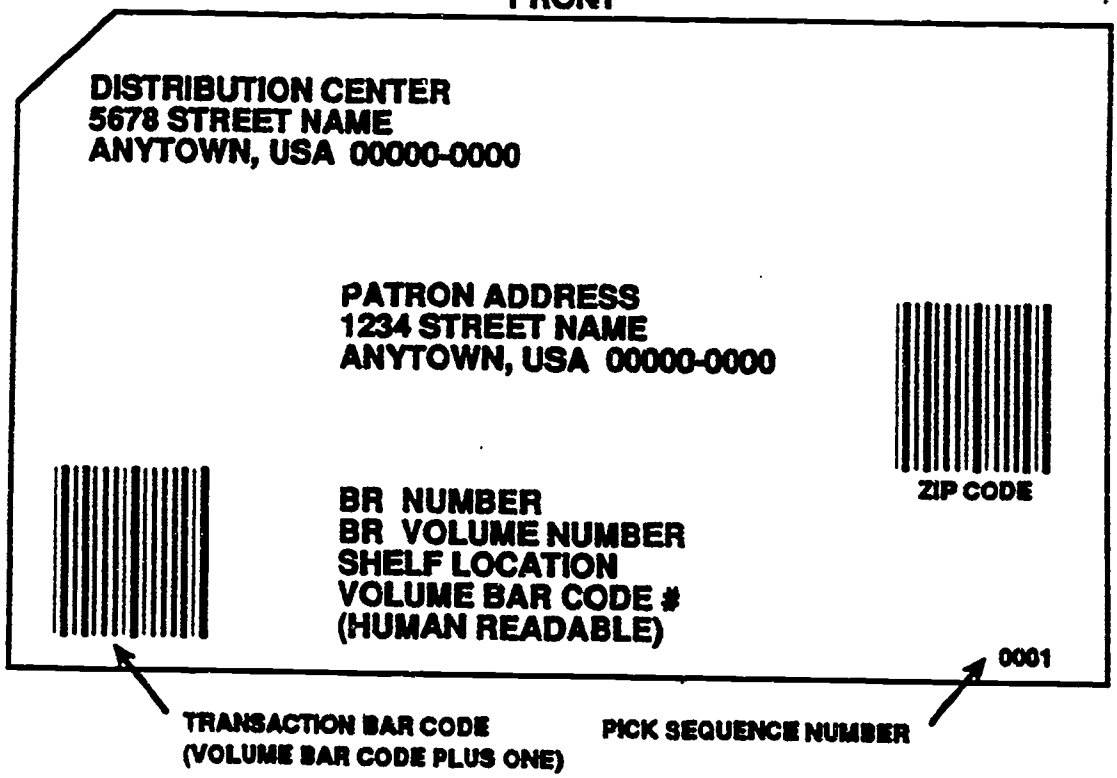


* Each response by the User should be reiterated, verbally, by the system and the system should also provide the User the opportunity to change the response

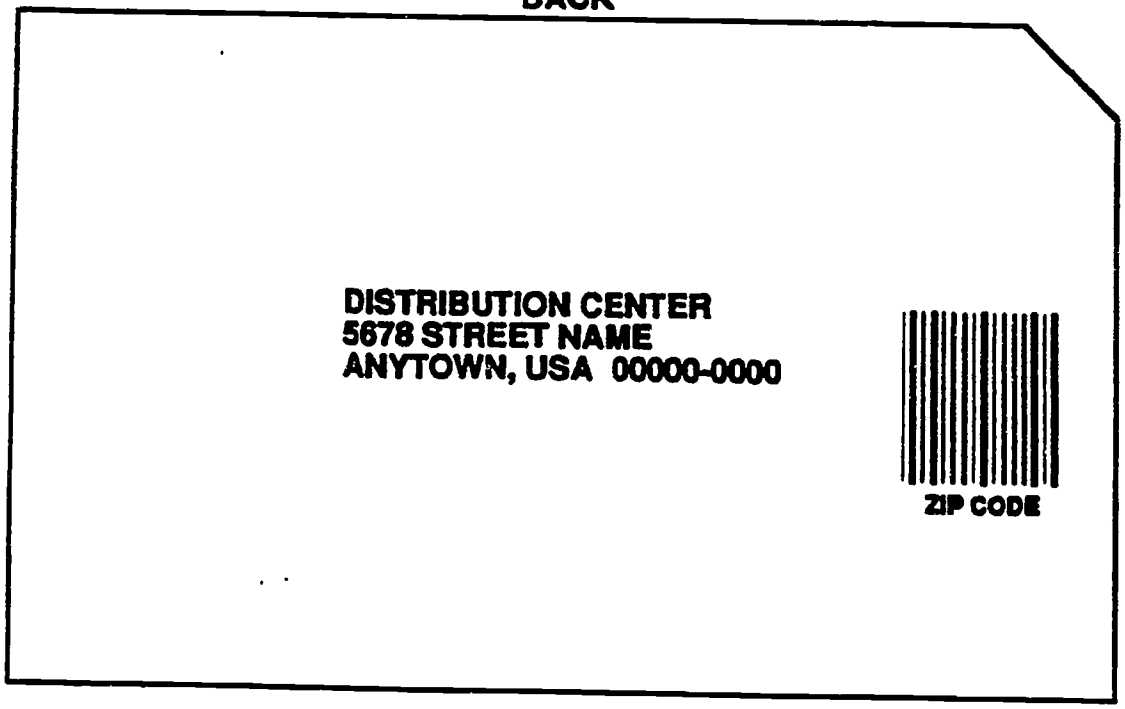
APPENDIX 3-3

PICK TICKET

FRONT

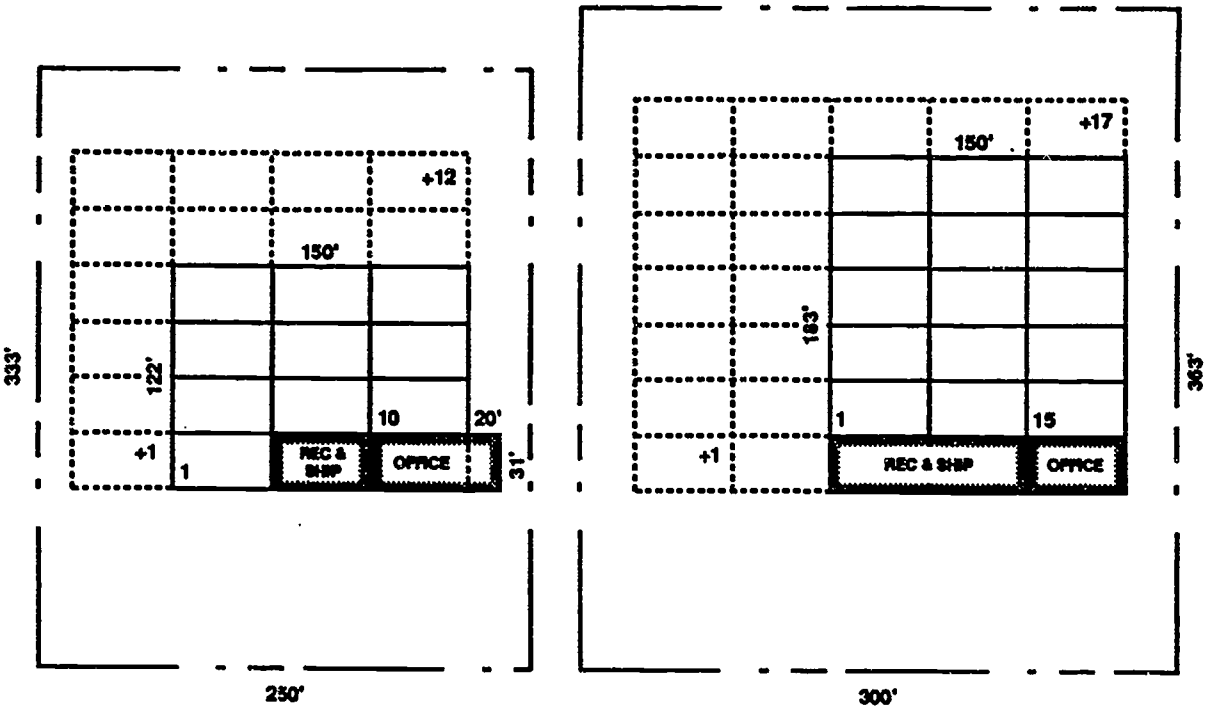


BACK



APPENDIX 4-1

PROPOSED BUILDING AND SITE CONFIGURATIONS FOR CONSOLIDATED BRAILLE DISTRIBUTION CENTERS



WESTERN D.C.		EASTERN D.C.
15,250 ϕ	STORAGE AREAS	22,800 ϕ
1,530	NON-STORAGE AREAS	3,130
2,140	OFFICE AREAS	1,520
18,920 ϕ	TOTAL AREA	27,450 ϕ

FLOOR-LOADING CAPACITY CALCULATION FOR MOBILE SHELVING

A.	WEIGHT PER RANGE		
	1. Volumes		
	Weight per shelf - 3 sq. ft. x 50 lbs./sq.ft.	=	150 lbs.
	Shelves per bin section - (2x10)	=	20
	Bin sections per range	=	14
	Total weight of volumes	=	42000 lbs.
	2. Carriage and Shelving		
	Weight per lineal foot	=	200 lbs.
	Lineal feet per range	=	42
	Total weight of equipment	=	8400 lbs.
	3. Total Weight of Loaded Range	=	50400 lbs.
B.	RANGES PER MODULE	=	12
C.	TOTAL LIVE LOAD PER MODULE	=	604,800 lbs.
D.	NET MODULE AREA (30 ft. x 47 ft.)	=	1410 sq. ft.
E.	FLOOR-LOADING CAPACITY REQUIREMENT	=	430 lbs./sq. ft.[A]

Note [A] - These loads will be carried on rails imbedded in the floor. The calculated floor-loading capacity requirement assumes that the rails will be designed and installed so that the loads will be evenly distributed throughout a storage module.

Track rails shall be installed flush with the top of the finished floor, and within 1/16" variation of true level within a module. The maximum variation in levelness between adjacent rails shall be 1/16", as measured perpendicular to rail length. The maximum variation in levelness along any rail shall be 1/32" in 10'-0" of rail length.

Track sections shall be leveled and held in place prior to grouting by expansion bolts or by a combination of expansion bolts and adjustment screws. There shall be no shims.

The properly positioned track shall have at least 1/4" of grout under the highest of the floor slabs. The grout shall be worked under the track assemblies along their entire length, so that any voids are completely filled, and the grouted sides shall be trimmed flush.

The finished floor shall be flush with the top of the rails and without any gaps or openings along the rails that would be a hazard to personnel or that would be reservoirs for collection of foreign material.

APPENDIX 5-1

PRO FORMA RECEIVING, STOCKING AND SHIPPING STAFFING EASTERN DC					
Line No.	Work Element	Unit of Measure	Units Per Day	Minutes Per Unit	Man-Hours Per Day
1.0	Input Functions	-	-	-	8.60
1.1	Unload Hampers	Hampers	23	1.00	.38
1.2	Misc. Requirements Including Mail	Lot	1	10.00	.17
1.3	Open Receipts and Shelve	Volumes	1270	.20	4.23
1.4	Scan Shelves	Volumes	1270	.03	1.06
1.5	Bar Code New Volumes	Volumes	56	1.00	.93
1.6	Reconcile Irregularities	Irreg.	4	6.00	.40
1.7	P.F.&D. Allowance (20%)	Lot	1	20%	1.43
2.0	Output Functions	-	-	-	13.90
2.1	Load Hampers	Hampers	23	1.00	.38
2.2	Misc. Shipping Including Mail	Lot	1	10.00	.17
2.3	Pick From Front Shelf (60%)	Volumes	762	.17	2.12
2.4	Pick From Stacks (40%)	Volumes	508	.33	2.82
2.5	Pack & Scan	Volumes	1270	.25	5.29
2.6	Reconcile Discrepancies	Irreg.	8	6.00	.80
2.7	P.F.&D. Allowance (20%)	Lot	1	20%	2.32
3.0	Storage Functions	-	-	-	5.82
3.1	Load Stocking Cart & Scan	Volumes	508	.17	1.41
3.2	Putaway & Scan	Volumes	508	.33	2.82
3.3	Rewarehouse & Scan	Volumes	112	.33	.62
3.4	P.F.&D. Allowance (20%)	Lot	1	20%	.97
4.0	Custodial & Maintenance	Lot	1	30.00	.50
5.0	Total Man-Hours Per Day				28.82
6.0	FTE People @ 7.5 Hours Per Day				3.84
7.0	Minutes Per Copy @ 545 Copies Per Day				3.17

PRO FORMA RECEIVING, STOCKING AND SHIPPING STAFFING WESTERN DC					
Line No.	Work Element	Unit of Measure	Units Per Day	Minutes Per Unit	Man-Hours Per Day
1.0	Input Functions	-	-	-	4.41
1.1	Unload Hampers	Hampers	12	1.00	.20
1.2	Misc. Requirements Including Mail	Lot	1	10.00	.17
1.3	Open Receipts and Shelve	Volumes	634	.20	2.11
1.4	Scan Shelves	Volumes	634	.03	.53
1.5	Bar Code New Volumes	Volumes	28	1.00	.47
1.6	Reconcile Irregularities	Irreg.	2	6.00	.20
1.7	P.F.&D. Allowance (20%)	Lot	1	20%	.73
2.0	Output Functions	-	-	-	7.06
2.1	Load Hampers	Hampers	12	1.00	.20
2.2	Misc. Shipping Including Mail	Lot	1	10.00	.17
2.3	Pick From Front Shelf (60%)	Volumes	380	.17	1.06
2.4	Pick From Stacks (40%)	Volumes	254	.33	1.41
2.5	Pack & Scan	Volumes	634	.25	2.64
2.6	Reconcile Discrepancies	Irreg.	4	6.00	.40
2.7	P.F.&D. Allowance (20%)	Lot	1	20%	1.18
3.0	Storage Functions	-	-	-	2.90
3.1	Load Stocking Cart & Scan	Volumes	254	.17	.71
3.2	Putaway & Scan	Volumes	254	.33	1.40
3.3	Rewarehouse & Scan	Volumes	56	.33	.31
3.4	P.F.&D. Allowance (20%)	Lot	1	20%	.48
4.0	Custodial & Maintenance	Lot	1	30.0	.50
5.0	Total Man-Hours Per Day				14.87
6.0	FTE People @ 7.5 Hours Per Day				1.98
7.0	Minutes Per Copy @ 265 Copies Per Day				3.37