



**National Library Service
for the Blind and
Physically Handicapped**

The Library of Congress

Specification 900:2008

Duplication of NLS Digital Talking-Book Format (Book and Magazine) Cartridges



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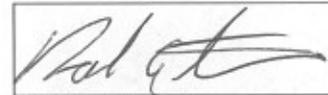
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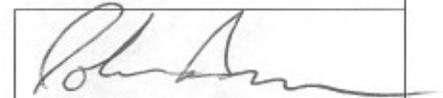
Release Approval:

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Quality Assurance Section



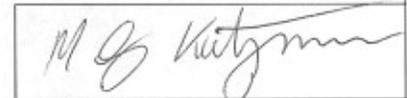
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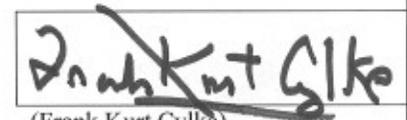
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Background

The National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress, administers a free library service to eligible residents of the United States and American citizens living abroad who cannot hold, handle, or read regular print media because of a temporary or permanent visual or physical limitation.

Using federal funds, NLS annually publishes approximately two thousand books and seventy magazines in audio and braille formats. Titles are selected to appeal to a wide variety of interests. Books and magazines are narrated and duplicated to a high professional standard. The number of copies produced of any title is dependent on anticipated reader demand.

Playback machines and their accessories are designed to facilitate convenient use by blind and physically handicapped people, provide maximum reliability under environmental conditions that are sometimes harsh, and survive handling that may be technically unsophisticated or inadvertently abusive. The equipment plays program materials in a special format compatible with NLS machines. All materials and equipment in the program can be sent to users and returned to libraries postage free.

A cooperating network of more than fifty regional libraries and more than sixty subregional libraries circulates recorded and braille materials to a readership of some seven hundred thousand adults and children out of a potential eligible population of three million. Magazine subscriptions are provided on a direct-mail basis from the producers. Patrons must generally deal with service centers in distant cities and so communicate by mail, e-mail, or phone with little or no in-person contact. All materials come and go through a mail-order system. Fifty percent of the patrons are more than sixty-five years old and depend on the NLS program for their major source of entertainment and their connection to print media; ninety-five percent read recorded materials, five percent read braille.

Patrons are informed about new books, magazines, and services through two bimonthly publications, annual catalogs, web-based catalogs, and subject bibliographies produced by NLS, as well as through various publications produced and circulated by the regional and subregional libraries.

User Materials

Contractors who consider submission of a bid to produce books, equipment, or other program products should be cognizant of the consumer-responsive nature of the program, and that the specifications for these products have been developed to meet the special needs of readers in the program. Materials are produced with those needs foremost in mind and are improved through constant monitoring and consumer input. Contractors are expected to familiarize themselves with the equipment-handling practices of blind and physically handicapped clientele and ensure that the equipment they produce will stand up under this type of use. A high degree of quality workmanship and product reliability is mandated by the product specification.

1. Scope

This specification covers the requirements for the duplication of digital talking books (DBs) and magazines produced for the National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress, to the NLS digital talking-book cartridge (DTBC). The DB must be produced according to the ANSI/NISO Z39.86-2002 standard and the DTBC must be of sufficient capacity to store the associated files as specified in *NLS Specification 1205 Protected Digital Talking Book*.

2. Reference Documents

The following documents and publications, in effect on the posting date of the RFP, form a part of this specification. In the event of conflict between the documents and publications referenced herein and the content of this specification, the content of this specification shall be considered the superseding requirement.

2.1 Specifications

American National Standards Institute (ANSI)

ANSI/NISO Z39.86-2002
Specifications for the Digital Talking Book

The document cited above is available from:

American National Standards Institute, Inc.
11 West 42nd Street
New York, NY 10036
Internet:
<http://www.niso.org/standards/resources/Z39-86-2002.html>

National Library Service for the Blind and Physically Handicapped

NLS Specification 1203
Construction of Digital Talking Books

NLS Specification 1204
Construction of Audio Magazines in the Digital Talking-Book Format

NLS Specification 1205
Protected Digital Talking Book

NLS Specification 420:2008
Labeling and Packaging of Books on Digital Talking-Book Cartridges

NLS Drawing 4824591013
Housing, Cartridge

NLS Document 4824590048
Cartridge Procurement Specification

The documents cited above are available from:

National Library Service for the Blind and Physically Handicapped
Library of Congress
1291 Taylor Street, NW
Washington, DC 20542
Internet:
<http://www.loc.gov/nls/specs/>

Internet Engineering Task Force Network Working Group

The MD5 Message-Digest Algorithm (RFC 1321, April 1992)
<http://www.ietf.org/rfc/rfc1321.txt>

2.2 Standards

American National Standards Institute (ANSI)

ANSI/ASQ Z1.4-2003
Sampling Procedures and Tables for Inspection by Attributes

The document cited above is available from:

American Society for Quality
Quality Press
611 East Wisconsin Ave.
P.O. Box 3005
Milwaukee, WI 53201-3005
Internet:
<http://www.asq.org/qualitypress/index.html>

DAISY Consortium

DAISY Protected Digital Talking-Book Specification, Version 2.0

Internet:
<http://www.daisy.org/projects/pdtb>

Microsoft

Microsoft Extensible Firmware Initiative FAT32 File System Specification, Rev 1.03

Internet:
<http://www.microsoft.com/whdc/system/platform/firmware/>

3. Requirements

3.1 Delivery Medium

3.1.1 Digital Talking-Book Cartridge

The digital talking book (DB) shall be written to a digital talking-book cartridge (DTBC) of sufficient capacity to hold the complete title or, where the title is created as a multicartridge title, the complete part.

Cartridges are provided to contractors as government furnished property (GFP). The contractor shall keep accurate records of cartridges received, cartridges sent to libraries as directed by NLS, and cartridges held by the contractor. This information shall be sent to NLS as directed by the contract monitor.

3.1.2 Contractor Responsibility for Digital Talking-Book Cartridges

The contractor is responsible for the safe keeping of GFP DTBCs. Cartridges destroyed by, stolen from, or otherwise rendered unusable by the contractor's actions shall be replaced at the contractor's expense or by a credit equal to the cost of the damaged/lost cartridge. Any loss or damage of cartridges shall be reported within seven (7) days to the contract monitor.

3.2 File System

3.2.1 File System Format

The DTBC volume shall be formatted with a single FAT32 file system according to FAT32 File System Specification, Rev 1.03 (see 2.2). The formatted partition shall be large enough to hold the required files but may be less than the total capacity of the cartridge.

3.2.2 Volume Name

The volume name of the DTBC containing a book shall be set in the form DBNNNNN, where "NNNNN" is the 5-digit book number. The volume name of the DTBC containing a magazine shall be set in the form NLMAGmmddy (where "mm" is the 2-digit month, "dd" is the 2-digit day if applicable, and "yy" is the 2-digit year).

3.3 Files

The cartridge shall contain only the files described in this section. The files comprising the NLS-approved protected digital talking book, with the exception of the MD5 checksum file, shall be written to the cartridge without alteration. An additional text file containing the duplicator's 3-letter code supplied by NLS shall be written to the cartridge. The name of this file will be "contractor.xml." An example of this file for a duplicator with a code of VWG is given in Appendix I.1.

3.4 Write Protection

3.4.1 DTBC Write-Enabled Passcode

The contractor will be supplied with cartridges write protected by a 16-digit, 8-bit binary sequence. The contract monitor shall provide this sequence to the contractor. The contractor shall enable the DTBC for writing by applying this sequence as described in Appendix I.2.

3.4.2 DTBC Write-Protected Passcode

The DTBC shall be protected to ensure only NLS authorized parties have the ability to alter files. The contract monitor shall provide a hexadecimal representation of a 16-byte passcode to the contractor to be used to write protect the cartridge. These numbers represent

a 16-digit, 8-bit binary string that forms the passcode used to write protect and subsequently write enable the cartridge. The contractor shall protect the DTBC from erasure or writing by applying this sequence as described in Appendix I.3.

3.4.3 Contractor to Protect DTBC Passphrase

The contractor is responsible for the security of the DTBC passphrases. The contractor shall identify no more than 3 persons who will have access to the NLS passphrases. Prior to obtaining passphrases from the contract monitor, the contractor shall provide NLS with a plan to secure the passphrases and its MD5 checksum from compromise. Equipment to be used in cartridge duplication shall not store either the passphrase or the passphrase digest in its unencrypted form.

The passphrase will only be supplied to the contractor upon the contract monitor's assessment that its security is assured.

4. Quality Assurance

4.1 Lot Inspection

4.1.1 Incoming Inspection

The contractor is required to perform an incoming lot-sampling inspection of the blank GFP DTBCs produced by the NLS cartridge manufacturer. A lot shall be considered the quantity received by the producer in a single shipment from the cartridge manufacturer.

The acceptable quality level (AQL) shall be level II 0.65 percent. The sampling shall be in accordance with *ANSI/ASQC Z1.4-2003, Sampling Procedures and Tables for Inspection by Attributes*.

The lot inspection shall consist of the following requirements from NLS Drawing Number 4824591013 *Housing, Cartridge* or this specification:

- Hardware interface:
 - The USB plug shall be flush or below external surfaces of the cartridge. See note 11 on NLS Drawing Number 4824591013.
 - The USB plug shall be oriented so that the electrical contacts face the bottom of the cartridge. See note 16 on NLS Drawing Number 4824591013.
- Housing text: A visual inspection and comparison with the control sample of the cartridge text is required to ensure contrast, clarity, and orientation. All markings shall be black. The following text shall be inspected:
 - PROPERTY OF THE U.S. GOVERNMENT
 - Further reproduction or distribution in other than a specialized format is prohibited
 - **FC**
- Housing barcode: The housing barcode shall be readable by a barcode scanner and appear clear to a visual inspection.
- Housing dimensions: The cartridge dimensions enclosed by an ellipse as defined by note 19 on NLS Drawing Number 4824591013 shall conform to the requirements specified.
- Housing color: A visual inspection and comparison with the control sample under natural sunlight is required to ensure a reasonable match in color.
- DTBC write-enabled passcode: Verification of the cartridge write-enabled passcode supplied to the contractor per Section 3.4.1 and Appendix I.2

The producer shall report any failed cartridge lot to NLS Quality Assurance Section, via e-mail address qas@loc.gov, within 24 hours.

4.1.2 Outgoing Inspection

The contractor is required to use an outgoing lot-inspection sampling plan of the finished product for the following requirements from this specification:

- Existence and validity of all files per Section 3.3 of this specification
- DTBC write-protected passcode per Section 3.4.2 and Appendix I.3

The contractor is required to check 1 cartridge per each title shipment for write-enable capability. The contractor shall perform this check by applying the write-enabled passcode to the cartridge and ensure it is writeable. Any failure to write enable a cartridge must be reported immediately to the NLS Quality Assurance Section, via e-mail at qas@loc.gov, and shipment halted. If the cartridge is successfully write enabled, then the cartridge must be write protected and included with the shipment.

4.2 Contractor's Quality Control Plan

The contractor is required to provide written documentation showing that the contractor's methods of quality control incorporate those standards established by this specification under Section 4.1.

4.3 Correction of Faults by Contractor

Should NLS determine that a significant fault or faults have been found in production units, then correction of the fault or faults in previously produced units and production inspections or controls for prevention shall be instituted without additional charge to NLS.

4.4 Contractor's Warranty

The contractor shall agree to unconditionally warrant each title the contractor produces for this program for a period of 1 year from the date the title is shipped. Titles that are found to not be in conformance with this specification will be returned to the contractor via the U.S. Postal Service. Defective titles sent to a contractor shall be replaced and returned within 2 working days.

Government-furnished DTBCs found to be defective shall be returned to the NLS Quality Assurance Section or, at the direction of the contract monitor, directly to the manufacturer. The contractor is responsible for all government-furnished cartridges and is liable for damage incurred during title production. This includes, but is not limited to, cartridges deliberately or inadvertently write protected by passcodes other than that supplied by NLS. Contractors should not dispose of any damaged or defective cartridges without written approval from the NLS contract monitor.

A monthly report on warranty returns shall be forwarded to the NLS Quality Assurance Section. This report should be sent to qas@loc.gov, and is due by the 7th of the following month. The monthly report document shall be submitted for approval as part of the written documentation described in Section 4.2.

4.5 Product Recall

Titles produced for the talking-book program are subject to recall and reduplication, based on the criteria in Section 4.3. It shall be the prerogative of the contracting officer's technical representative to institute a recall. When NLS determines that a recall is warranted, network libraries will be directed to remove the faulty title (container and cartridge) and return them to NLS's recycling contractor. The contractor shall reduplicate, repackage, and ship (with a revised date code) the corrected title within a period determined by the contracting officer through the NLS contract monitor.

4.6 Inspection of Contractor by NLS

NLS reserves the right to inspect any process or tests being performed. The NLS representative shall have the authority to select, at random, a sample for testing to the specified requirements at any time during the course of the contract. The right is reserved by NLS to reject any production lot represented by a sample that has been tested and rejected.

Appendix

I.1 Contractor.xml

```
<?xml version="1.0" encoding="utf-8"?>
<dtbc xmlns="http://www.loc.gov/nls/dtbc">
<!-- Duplicating contractor's 3-letter abbreviation, upper case -->
  <contractor>VWG</contractor>
</dtbc>
```

I.2 DTBC Write Enable

The digital talking-book cartridge (DTBC) is implemented as a mass storage class device using USB Bulk Only Transport and the SCSI Transparent Command Set. A vendor-specific SCSI command is used to write enable the cartridge.

The write-enable SCSI command block is 6 bytes long and contains an operation code byte (10h) and a passcode parameter length.

To enable a device for writing, once a “Set Passcode” command has been executed at any time since manufacture, the “Write-Enable” command shall be executed with the last passcode set each time power is applied to the device. The passcode is the 16-byte, 8-bit sequence represented by the hexadecimal passphrase supplied by NLS for cartridges provided as GFP. The passcode shall be contained in the parameter list and be 16 bytes.

Example hexadecimal representation of 16 byte passphrase:

“9E107D9D372BB6826BD81D3542A419D6”

Vendor Specific SCSI command 0x10

Bit Byte	7	6	5	4	3	2	1	0
0	Operation Code (10h)							
1	Reserved (0)							
2	Not Used (0)							
3	Not Used (0)							
4	Parameter List Length (10h)							
5	Control (0)							

Parameter List

Bit Byte	7	6	5	4	3	2	1	0
0	Byte 0 of passcode (0x9E)							
1	Byte 1 of passcode (0x10)							
2	Byte 2 of passcode (0x7D)							
3	Byte 3 of passcode (0x9D)							
4	Byte 4 of passcode (0x37)							
5	Byte 5 of passcode (0x2B)							
6	Byte 6 of passcode (0xB6)							
7	Byte 7 of passcode (0x82)							
8	Byte 8 of passcode (0x6B)							
9	Byte 9 of passcode (0xD8)							
10	Byte 10 of passcode (0x1D)							
11	Byte 11 of passcode (0x35)							
12	Byte 12 of passcode (0x42)							
13	Byte 13 of passcode (0xA4)							
14	Byte 14 of passcode (0x19)							
15	Byte 15 of passcode (0xD6)							

I.3 DTBC Write Protect

The digital talking-book cartridge (DTBC) is implemented as a mass storage class device using USB Bulk Only Transport and the SCSI Transparent Command Set. A vendor-specific SCSI command is used to write enable the cartridge.

The write-protect SCSI command block is 6 bytes long and contains an operation code byte (11h) and a passcode parameter length.

To protect a device against writing, the “Write-Protect” command shall be executed with the 16-byte passcode. The passcode is the 16-byte, 8-bit sequence represented by the hexadecimal passphrase supplied by NLS. The passcode shall be contained in the parameter list and be 16 bytes.

Example hexadecimal representation of 16-byte passphrase:

“076827E5E002E0A4CF3E8CDB3”

Vendor Specific SCSI command 0x11

Bit Byte	7	6	5	4	3	2	1	0
0	Operation Code (11h)							
1	Reserved (0)							
2	Not Used (0)							
3	Not Used (0)							
4	Parameter List Length (10h)							
5	Control (0)							

Parameter List

Bit Byte	7	6	5	4	3	2	1	0
0	Byte 0 of passcode (0x07)							
1	Byte 1 of passcode (0x68)							
2	Byte 2 of passcode (0x27)							
3	Byte 3 of passcode (0xE5)							
4	Byte 4 of passcode (0xE0)							
5	Byte 5 of passcode (0x02)							
6	Byte 6 of passcode (0xE0)							
7	Byte 7 of passcode (0xA4)							
8	Byte 8 of passcode (0xCF)							
9	Byte 9 of passcode (0xCB)							
10	Byte 10 of passcode (0x99)							
11	Byte 11 of passcode (0x0E)							
12	Byte 12 of passcode (0xF3)							
13	Byte 13 of passcode (0xE8)							
14	Byte 14 of passcode (0xCD)							
15	Byte 15 of passcode (0xB3)							