



The Library of Congress
National Library Service for the
Blind and Physically Handicapped



Approved by the Director, NLS/BPH

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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 standard 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 fifty-seven regional libraries and seventy-five 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. Users must generally deal with service centers in distant cities and communicate by mail, e-mail, or phone with little or no personal contact. All materials come and go through a mail-order system. Fifty percent of the users are more than sixty-four years old and depend on the NLS program for their major source of entertainment and their connection with the print world; ninety-five percent read recorded materials, five per cent read braille.

Users 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 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 need of readers in the program. Materials are produced with those needs foremost in mind and 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.

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Introduction

This specification defines requirements for the set of files making up a digital talking book (DTB) format produced for the National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress. These files consist of the compressed audio files, plus other files defined by ANSI/NISO Z39.86-2002.

NLS Specification 1202 defines requirements for WAV files recorded for production of both cassette and DTB versions of audiobooks. In some areas related to DTB production, the requirements of this specification supercede those of NLS Specification 1202. It is, therefore, essential that producers of DTBs reference both this specification and Specification 1202 in conjunction to ensure full compliance with all NLS requirements.

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1. Scope

This document describes the requirements for the set of files that comprise a complete Digital Talking Book (DTB) compliant with ANSI/NISO Z39.86-2002.

2. Reference Documents

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

2.1 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

Or from:
<http://www.niso.org/standards/resources/Z39-86-2002.html>

2.2 National Library Service for the Blind and Physically Handicapped

NLS Specification 300
Book Mastering

NLS Specification 1202
Requirements for Distribution Source Files, Review Copies, and Blank
Recordable Compact Disc

The documents cited above are available from:
National Library Service for the Blind & Physically Handicapped
Library of Congress
1291 Taylor Street., NW
Washington, DC 20542

Or from:
<http://www.loc.gov/nls/specs/>

2.3 European Telecommunications Standards Institute

Extended Adaptive Multi-rate- Wideband (AMR-WB+) codec;
Transcoding functions ETSI TS 126 290 release 6 / 3GPP TS 26.290
release 6

The document cited above is available from:

<http://www.3gpp.org/ftp/Specs/html-info/26290.htm>

Transparent end-to-end packet switched streaming service; 3GPP file
format (3GP) ETSI TS 126 244 release 7 / 3GPP TS 26.244 release 7

The document cited above is available from:

<http://www.3gpp.org/ftp/Specs/html-info/26244.htm>

2.4 Internet Engineering Task Force Network Working Group

The MD5 Message-Digest Algorithm (RFC 1321, April 1992)

The document cited above is available from:

<http://www.ietf.org/rfc/rfc1321.txt>

2.5 International Standards Organization

ISO 8601 Numeric Representation of Date and Time

The document cited above is available from:

<http://www.iso.org/iso/en/prods-services/popstds/datesandtime.html>

3. Requirements

3.1 Delivery Medium

3.1.1 Conformance with Specification 1202

The CD-R(s) on which a DTB is delivered shall conform to all applicable requirements of NLS Specification 1202.

3.1.2 Multiple CD-Rs

A DTB whose size exceeds 250 million bytes shall be delivered on multiple CD-Rs that conform to the requirements of sections 7.4.4, 8.4.2, and 11.2 of ANSI/NISO Z39.86-2002.

3.1.2.1 Media Change Messages

The contractor shall provide each required media change message in separate audio files. Each message shall be “insert cartridge n” where “n” is the number of the media unit to be inserted.

3.2 Files

3.2.1 General

The DTB files are defined by ANSI/NISO Z39.86-2002 and NLS Specification 1202.

3.2.1.1 File names

- a. All alphabetic characters shall be in lower case.
- b. File names shall be the five-digit book number assigned by NLS (including any leading zeroes needed to meet the five-digit requirement) followed by the appropriate file extension required by ANSI/NISO Z39.86-2002 or as specified elsewhere in this document.
- c. SMIL files, where a DTB contains more than one, and all audio files with the exception of the media change message, announcement and headings files, shall have a

sequence indicator consisting of a hyphen and four digits (including any leading zeroes needed to meet the four-digit requirement) appended to the book number in the file name. The range of sequence indicators shall begin with -0001 (e.g., 56123-0001.3gp), and the sequence shall be continuous. For audio files holding the content of the DTB, the last two digits of the sequence indicator shall equal the two-digit side number (described in Specification 1202, section 3.3.2.1e) for the corresponding WAV file. Any other audio files present in the DTB (other than the media change message, announcement and headings files, whose file names are prescribed) shall be assigned sequence indicators commencing after the number of the final audio content file.

- d. The DTB-specific audio files defined in NLS Specification 1202, section 3.4, shall maintain their file names, except that they shall carry the appropriate file extension required by ANSI/NISO Z39.86-2002 (e.g., 56123ann.3gp).
- e. Media change message files (see 3.1.2.1) shall be named "insertn.3gp" where "n" is the number of the cartridge to be inserted.
- f. The name of the file containing MD5 checksums shall be the five-digit book number concatenated with the suffix "dtb.md5", e.g., "12345dtb.md5". For DTBs spanning multiple media units, section 3.2.1.1c notwithstanding, a sequence indicator consisting of a hyphen and two digits shall be inserted before the filename extension, e.g., "12345dtb-01.md5".

3.2.1.2 Unique Identifier (UID)

The UID shall consist of the lower-case character string "us-nls-dbnnnnn" where "nnnnn" represents the five-digit book number.

3.2.2 Audio Files

3.2.2.1 Compression

All DTB audio files shall be compressed with an audio encoder conforming with the requirements of section 3.3.1 and using NLS-approved settings for bitrate and other parameters. The compressed audio files shall be encoded monaurally at a constant bitrate.

3.2.2.2 Time Offset

The clipEnd time for each audio fragment shall be placed no closer than 200ms following the end of the narration of that fragment.

It is anticipated that there will be a time offset of 50 to 80 milliseconds between the uncompressed and compressed/decompressed audio files. The timing references for all clipBegin and clipEnd attributes on audio elements in the SMIL, NCX, Distinfo and resource files are to be relative to the WAV file accepted by NLS as conforming to the requirements of Specification 1202. In determining the correct times for the start and end of audio clips, producers should assume that the time offset will be compensated for by the player, but these times can have an uncertainty of plus or minus 30 milliseconds when played.

3.2.2.3 Sound Quality

Compressed audio files shall be of acceptable subjective sound quality when compared to the WAV file accepted by NLS as conforming to the requirements of Specification 1202.

3.2.2.4 Source

The source for each compressed file shall be identical to the review file or DTB-specific WAV file submitted to NLS for approval.

3.2.3 SMIL Synchronization File

The SMIL file(s) shall conform to the normative requirements of section 7 of ANSI/NISO Z39.86-2002.

3.2.3.1 SMIL Validity

The SMIL file(s) shall be well-formed and valid to the DTB-specific SMIL DTD of Appendix 2 of ANSI/NISO Z39.86-2002.

3.2.3.2 SMIL Audio Clips

3.2.3.2.1 clipBegin and clipEnd Required

In all SMIL audio elements, both clipBegin and clipEnd must be present and valued.

3.2.3.2.2 SMIL Pauses

The clipBegin time for each audio fragment shall be placed not more than 100 milliseconds before the beginning of narration of that fragment. The clipEnd time shall be placed so as to preserve the pause that follows the end of the narration of that fragment. (See also section 3.2.2.2.)

3.2.3.3 SMIL Metadata

SMIL metadata shall conform to the requirements of section 7.5 of ANSI/NISO Z39.86-2002, and the element “dtb:generator” shall be completed by the contractor.

3.2.3.4 SMIL Granularity

If a textual content file is required by NLS, SMIL file(s) shall have a level of granularity matching that of the textual content file as recommended by section 7.2 of ANSI/NISO Z39.86-2002.

3.2.3.5 Escapable Structures

If NLS requires any structures to be escapable, the SMIL file(s) shall conform to the normative requirements of section 7.4.1 of ANSI/NISO Z39.86-2002.

3.2.3.6 Skippable Structures

If NLS requires any structures to be skippable, the SMIL file(s) shall conform to the normative requirements of section 7.4.3 of ANSI/NISO Z39.86-2002.

3.2.3.6.1 defaultState Values

Unless otherwise specified by NLS, the value of defaultState shall be set to “true” for all skippable structures. The value of the defaultState for a given customTest element must be the same in all SMIL files for a DTB.

3.2.3.7 Tables and Lists

If NLS requires tables and/or lists to allow special navigation modes, the SMIL file(s) shall conform to the normative requirements of section 7.4.2 of ANSI/NISO Z39.86-2002.

3.2.3.8 Links

If NLS requires links, the SMIL file(s) shall conform to the normative requirements of section 7.4.5 of ANSI/NISO Z39.86-2002.

3.2.3.9 Opening Announcements for DTB

The opening announcements described in section 3.4.2 of NLS Specification 1202 shall be referenced by the first SMIL file such that they are the first audio encountered in normal playback.

3.2.3.10 Excluded Audio

The SMIL shall be structured so that the items listed below are not played during DTB playback.

a. Beginning of Side One

All announcements listed in NLS Specification 300, sections 3.2.1 and 3.7.1.1.

b. Beginnings of All Sides Other Than Side One

All announcements listed in NLS Specification 300, section 3.2.2.

c. Ends of Sides Other Than Last Side

All announcements listed in NLS Specification 300, section 3.2.3.

d. End of Last Side

Announcements listed in NLS Specification 300, sections 3.2.3.3.d and 3.7.1.2.f.

3.2.3.11 SMIL Structure

At a minimum, one <par> (see ANSI/NISO Z39.86-2002, section 7.3 for definition) shall be included for each structural element in the book for which an NCX entry has been created.

3.2.3.12 SMIL File Size

SMIL files exceeding 100 kilobytes must be divided into multiple SMIL files.

3.2.3.13 Segments

A segment is a short section of text such as a paragraph, list item, table row, etc.; it has no heading and is not part of the hierarchical structure of the book. When required by NLS, specified segments shall be represented by <par>s or <seq>s in the SMIL file(s).

3.2.4 Navigation Control File (NCX)

The NCX file shall conform to the normative requirements of section 8 of ANSI/NISO Z39.86-2002.

3.2.4.1 NCX Validity

The NCX file shall be well-formed and valid to the NCX DTD of Appendix 3 of ANSI/NISO Z39.86-2002.

Non-ASCII characters in all <text> elements shall be represented as numeric character references or as UTF-8 multi-byte sequences.

3.2.4.2 Audio Heading Clips

The set of audio clips of the docTitle, docAuthor, and NCX headings shall be collected in a single, separate file that shall be compressed and shall be included on each CD-R.

3.2.4.2.1 clipBegin Timing

The clipBegin time for each audio clip shall be not more than 100 milliseconds before the beginning of narration in that clip. (See section 3.2.2.2.)

3.2.4.2.2 clipBegin and clipEnd Required

In all audio elements, both clipBegin and clipEnd must be present and valued.

3.2.4.3 navLabel Content

3.2.4.3.1 navLabel Content for navPoints

Each navLabel within a navPoint shall contain both text and audio elements. The audio element shall contain a pointer to an audio clip of the heading of the navigable section of the book referenced by its parent navPoint. The audio clip shall be contained in the Audio Heading Clip file described in section 3.2.4.2. The audio and text content shall match the print headings found in the body of the book, rather than the table of contents. Line breaks and font information cannot appear in the text element. However their intent should be captured, if possible, using punctuation.

3.2.4.3.2 navLabel Content for navTargets

Each navLabel within a navTarget shall contain both text and audio elements. The audio element shall contain a pointer to an audio clip as follows:

- a. For note references (noterefs), the audio clip shall contain the identifier (e.g. “note” or “footnote”) followed by the reference number. If the reference is a symbol, the audio clip shall contain only the identifier.
- b. For page numbers (pagenums), the audio clip shall contain the identifier “page” followed by the page number. For special page numbers, the audio clip shall contain the identifier followed by the number as it appears in the print book, e.g., “page roman four” for iv, “page A one” for A-1.
- c. For line numbers (linenums), the audio clip shall contain the identifier "line" followed by the line number.

The audio clip shall be contained in the Audio Heading Clip file described in section 3.2.4.2.

The text element shall contain only the appropriate number without the identifier “note”, “page” or “line,” except for noterefs indicated only by a symbol, for which it shall contain an asterisk. The text for special page numbers shall match the print book.

3.2.4.4 docTitle

The docTitle element shall contain an audio element containing a pointer to an audio clip of the book's title and a text element containing the book's title. The audio clip shall be contained in the Audio Heading Clip file described in section 3.2.4.2.

3.2.4.5 docAuthor

The docAuthor element shall contain an audio element containing a pointer to an audio clip of the book's author's name, preceded by the phrase indicated in the NLS production authorization record, e.g. "by," "edited by," "compiled by," in English, and a text element containing the book's author's name. The audio clip shall be contained in the Audio Heading Clip file described in section 3.2.4.2.

3.2.4.6 NCX Metadata

NCX metadata shall conform to the requirements of section 8.4.1 of ANSI/NISO Z39.86-2002, and the element "dtb:generator" shall be completed by the contractor.

3.2.4.7 NavPoints

3.2.4.7.1 NCX Nesting

When multiple levels of structures are included in the NCX, those levels must be reflected in properly nested navPoints.

3.2.4.7.2 Class Attribute on navPoints

Each navPoint shall have a class attribute drawn exactly from Table IV, corresponding as closely as possible to the type of book structure marked by the navPoint. If no term listed in the table is appropriate, a descriptive UTF-8 compliant single-word term shall, with the concurrence of the NLS Quality Assurance Section, be used.

3.2.4.7.3 pageRefs

Each navPoint beginning on a page whose number is included in a navList of page numbers shall contain a pageRef attribute.

3.2.4.8 NavLists

If NLS requires that any of the book structures listed below be made separately navigable in the SMIL file(s), a navList is required for each, conforming to the normative requirements of ANSI/NISO Z39.86-2002.

note reference (noteref)

page number (pagenum)

line number (linenum)

Each navList element shall have a class attribute describing the book structures it contains; the class attribute shall be the DTBook element name included in parentheses in the list above.

For each navTarget, the navLabel audio and text content shall be as specified in section 3.2.4.3.2; and the content element shall point to the SMIL time container that contains the footnote reference, page number or line number.

navLists are not required for other book structures, and are forbidden for segments.

3.2.4.8.1 Value Attribute

Each navTarget whose navLabel text element consists of an integer shall include a value attribute. The value attribute shall contain an arabic integer corresponding to the navTarget's text element value.

navTargets for frontmatter pages with roman numbers and for pages with compound numbers (e.g., A-15) shall not include a value attribute.

navTargets for page ranges (e.g., 25-26) shall have a value attribute equal to the first page number of the range. Note references and line numbers shall be repeated as necessary. Gaps in the sequence of values are acceptable, for example if only explanatory notes are read.

3.2.5 Package File (OPF)

The OPF file shall conform to the normative requirements of section 3 of ANSI/NISO Z39.86-2002.

3.2.5.1 OPF Validity

The OPF file shall be well-formed and valid to the Open eBook Forum (OEBF) Publication Structure 1.0.1 package DTD referenced by section 3 of ANSI/NISO Z39.86-2002.

3.2.5.2 OPF Metadata

The OPF metadata will be provided by NLS with the exception of the elements “dc:Date,” “dtb:narrator,” “dtb:producedDate,” “dtb:totalTime,” “dtb:revision,” “dtb:revisionDate,” and “dtb:revisionDescription,” which shall be completed by the contractor. The element “nls:recordingAgency” shall be included in the OPF x-metadata.

3.2.5.2.1 Metadata Content

The “dtb:producedDate” element shall contain the date of the first build of the DTB in the format “yyyy-mm-dd” and shall not be changed.

The “dtb:revision” element shall contain a non-negative integer. For the first build, the revision shall be “0,” and the revision shall be incremented for each subsequent build.

The “dtb:revisionDate” element shall contain the date of the most recent revision of the DTB in the format “yyyy-mm-dd” and shall equal

"dtb:producedDate" for revision "0."

The "dtb:revisionDescription" element shall contain a text string describing the reason for the revision; "dtb:revisionDescription" shall be present and valued for all revisions greater than "0," and shall not be present for revision "0."

The "dc:Date" element shall contain the year and month of "dtb:revisionDate" in the format "yyyy-mm."

The "dtb:narrator" element shall be entered last name first (e.g., Smith, John).

The "nls:recordingAgency" element shall contain the full name of the agency that made the original recording from which the DTB was created.

The "dtb:totalTime" element shall contain the total playing time of the DTB, i.e., the sum of the durations of all the audio elements of the SMIL files governing the playback of the book. For <seq>s and <par>s whose <customTest> elements have been set to defaultState="false," audio referenced by these SMIL nodes shall be counted toward "dtb:totalTime" as if the defaultState had been set to "true." This time value shall be accurate to within plus or minus 1 second.

Non-ASCII characters in all <metadata> element content shall be represented as numeric character references or as UTF-8 multi-byte sequences.

3.2.5.3 OPF Manifest

The manifest shall conform to the normative requirements of section 3.3 of ANSI/NISO Z39.86-2002.

3.2.5.4 OPF Spine

The spine shall conform to the normative requirements of section 3.4 of ANSI/NISO Z39.86-2002.

3.2.5.5 Tours and Guides

No tours or guides shall be included.

3.2.6 distInfo Files

If distInfo files are required, they shall conform to the normative requirements of section 11 of ANSI/NISO Z39.86-2002.

3.2.6.1 distInfo Validity

The distInfo files shall be well-formed and valid to the Distribution Information DTD of Appendix 6 of ANSI/NISO Z39.86-2002.

3.2.7 Textual Content File

If a textual content file is required by NLS, it shall conform to the normative requirements of section 4 of ANSI/NISO Z39.86-2002.

3.2.7.1 Textual Content File Validity

The textual content file shall be well-formed and valid to the DTBook DTD of Appendix 1 of ANSI/NISO Z39.86-2002.

3.2.8 Resource File

If a resource file is required by NLS, it shall conform to the normative requirements of section 10 of ANSI/NISO Z39.86-2002.

3.2.8.1 Resource Validity

The resource file shall be well-formed and valid to the Resource DTD of Appendix 5 of ANSI/NISO Z39.86-2002.

3.2.9 Checksum File

A checksum file shall be present on each CD-R submitted to NLS. This XML file shall contain a checksum for each file on the CD-R with the exception of the checksum file itself. All the files listed in the checksum file shall be present on the CD-R. The checksum shall be calculated using the MD5 algorithm as described in the reference cited in section 2.4 and shall be in the form of thirty-two hexadecimal digits. The checksums shall be generated from the source files prior to their transfer to the CD-R(s). This checksum file does not form part of the DTB and thus shall not be listed in the book manifest. The checksums contained in the checksum file must be identical to the checksums calculated from the source files and to those calculated from the corresponding files stored on the CD-R. The format of the XML file is described by the following DTD, which shall be placed at the beginning of each checksum file.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE diskcheck [
<!ELEMENT diskcheck (book, file+)>
<!ATTLIST diskcheck
version CDATA #FIXED "1.0"
>
<!ELEMENT book (#PCDATA)>
<!ELEMENT file (filename, checksum)>
<!ATTLIST file
type CDATA #IMPLIED
content CDATA #IMPLIED
>
<!ELEMENT filename (#PCDATA)>
<!ELEMENT checksum (#PCDATA)>
<!ATTLIST checksum
type CDATA #REQUIRED
>
]>
```

The <book> element shall contain the UID for the DTB, as defined in section 3.2.1.2.

The <filename> element shall contain the name of the file for which the checksum is calculated.

The “type” attribute on the <checksum> element shall contain the value “MD5”.

3.2.10 Complete DTB

3.2.10.1 Files to Include and Their Conformance

The complete DTB, consisting of all required files, shall conform to the normative requirements of ANSI/NISO Z39.86-2002 and all applicable requirements of this specification.

3.2.10.2 Files to Include on Each DTB CD-R

All document type definitions (DTDs) and entity files referenced by any DTB files or by any DTDs shall be included on each CD-R of the DTB and shall be listed in the Package File manifest.

An XML checksum file is to be generated in accordance with section 3.2.9 and included on the DTB disk.

3.3 Production Tools

3.3.1 Audio Compression

3.3.1.1 Audio Encoder

The encoder used to compress the audio files for the DTB shall be fully compliant with the standard for Extended Adaptive Multi-Rate-Wideband (AMR-WB+), ETSI TS 126 290 release 6.

3.3.1.2 Audio Encoder parameters

The encoder parameters shall generate AMR-WB+ with a frame type of 23 and an ISR index of 8, as described in section 8.1 of the above standard.

3.3.1.3 Audio File Format

The 3GP file format shall be used to store the compressed AMR-WB+ frames. The 3gp files will be fully compliant with ETSI TS 126 244 release 7 with the following restrictions:

3.3.1.2.1 Checksum Keyword

The 3GP file shall contain a User Data, “udta” box within the Movie, “moov” box. The “udta” box shall contain a Keyword sub-box that shall contain the keyword
“md5sum.ccccccccccccccccccccccccccccccc,”
where ccccccccccccccccccccccccccccccc is the ASCII hexadecimal representation of the 16 byte MD5 checksum of the entire source wav file.

3.3.1.2.2 Sample Size Box Format

The Sample Size box, “stsz” contained within the Sample Table, “stbl” box of the sound track’s Media Information, “minf” box shall contain only the elements “sample_size” and “sample_count.” “sample_size” shall be the size of, and “sample_count” the number of AMR-WB+ superframes contained within the track.

3.3.2 Parser

The parser used to validate the OPF, NCX, SMIL, distInfo, resource, and textual content files shall be a validating XML parser compliant with the applicable standard referenced by ANSI/NISO Z39.86-2002.

3.3.3 Other Validation Tools

Any other software or other tools used to validate DTB content shall be capable of detecting deviations from the requirements of ANSI/NISO Z39.86-2002.

4. Quality Assurance Provisions

4.1 Classification of Inspections

The inspection requirements specified herein are classified as follows:

- a. Qualification Inspection -- see section 4.3.
- b. Incoming Inspection -- see section 4.4.
- c. Contractor's Acceptance Inspection -- see section 4.5.1.
- d. NLS Acceptance Inspection -- see section 4.5.2.

4.2 Responsibility for Inspections

The contractor is responsible for the performance of the inspection requirements defined by sections 4.3, 4.4, and 4.5.1. NLS reserves the right to perform any of the inspections set forth in this specification when deemed necessary to ensure that products conform to the prescribed requirements.

4.2.1 Responsibility for Compliance

All items must meet all requirements of sections 3 and 5. The inspections set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to NLS for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize the submission of known defective material, either indicated or actual, nor does it commit NLS to acceptance of defective material. Should NLS determine that a fault or faults are found in production units within the warranty period, then correction of the fault or faults and production inspections or controls for prevention of future occurrences shall be instituted on request by NLS without additional charge to NLS.

4.2.2 Test Records

The contractor shall maintain complete records of all inspection results for the duration of the contract.

4.3 Qualification Inspection

Qualification inspection shall be performed by the contractor and by NLS on new products and on previously qualified products that have undergone any changes in materials, manufacturing process, or software version. All proposed changes shall be reported to the NLS contracting officer in writing, with a statement by the contractor describing the changes and the impact of the changes on the delivered product. NLS reserves the right to require six weeks for the evaluation of qualification samples prior to delivery of products incorporating the changes. The foregoing requirement does not relieve the contractor of any other requirements of this specification or the contract.

4.3.1 Qualification Samples

4.3.1.1 CD-R

Qualification samples are detailed in section 4.4.1 of NLS Specification 1202.

4.3.1.2 Audio Encoder

Samples shall consist of the set of compressed audio files submitted as part of the complete DTB required by section 4.3.1.5.

4.3.1.3 Parser

The XML parser to be used and its version shall be identified; if requested, a copy shall be submitted.

4.3.1.4 Other Validation Tools

Any other validation tools to be used and their versions shall be identified; if requested, copies shall be submitted.

4.3.1.5 Complete DTB

A complete DTB shall be submitted; the WAV files, metadata, and any other required source material will be provided by NLS.

4.3.2 Inspections

Qualification inspection shall consist of the inspections listed in Table I.

4.3.3 Quality Procedures

The contractor shall submit a document describing the quality assurance procedures used to achieve the requirements of this specification. Quality procedures shall contain provisions for configuration management of all software used in the production and validation of DTBs. NLS reserves the right to require the contractor to improve quality procedures.

Table I - Qualification Inspection

Requirement	Section	Test Method
CD-R	3.1.1	4.6.1
Compression	3.2.2.1	4.6.5.1
Time Offset	3.2.2.2	4.6.5.2
Sound Quality	3.2.2.3	4.6.5.3
Source	3.2.2.4	4.6.5.4
Complete DTB file Conformance	3.2.10.1	4.6.12.1
Files to Include on Each DTB CD-R	3.2.10.2	4.6.12.2
Audio Encoder	3.3.1	4.6.13
Parser	3.3.2	4.6.14
Other Validation Tools	3.3.3	4.6.15
Labeling	5.1	NLS review
Packaging	5.2	NLS review

4.4 Incoming Inspection

Incoming inspection shall be performed by the contractor on CD-Rs and on source materials provided by NLS.

4.4.1 Inspections

Incoming inspection shall consist of the inspections listed in Table II.

Table II - Incoming Inspection

Requirement	Section	Test Method
CD-R	3.1.1	4.6.1
WAV Files	See spec. 1202	See spec. 1202
OPF Metadata	3.2.5.2	4.6.8.2
Textual Content File Validity	3.2.7.1	4.6.10.1

4.5 Acceptance Inspection

4.5.1 Contractor's Acceptance Inspection

Acceptance inspection shall be performed by the contractor on 100% of every DTB and shall consist of the inspections listed in Table III.

4.5.2 NLS Acceptance Inspection

Acceptance inspection will be performed by NLS on every DTB and will consist of the inspections listed in Table III. The checksums calculated from all files on the DTB CD-R(s) will be compared to the corresponding checksums in the checksum file of the disk.

Table III - Acceptance Inspection

Requirement	Section	Test Method
Multiple CD-R	3.1.2	4.6.2
Filenames	3.2.1.1	4.6.3
Unique Identifier (UID)	3.2.1.2	4.6.4
Audio Compression	3.2.2.1	4.6.5.1
Time Offset	3.2.2.2	4.6.5.2
Sound Quality	3.2.2.3	4.6.5.3
SMIL Validity	3.2.3.1	4.6.6.1
SMIL Pauses	3.2.3.2.2	4.6.6.2
SMIL Metadata	3.2.3.3	4.6.6.3
SMIL Granularity	3.2.3.4	4.6.6.4
Escapable Structures	3.2.3.5	4.6.6.5
Skippable Structures	3.2.3.6	4.6.6.6
defaultState Values	3.2.3.6.1	4.6.6.6
Tables and Lists	3.2.3.7	4.6.6.7
Links	3.2.3.8	4.6.6.8
Opening Announcements for DTB	3.2.3.9	4.6.6.9
Excluded Audio	3.2.3.10	4.6.6.10
SMIL Structure	3.2.3.11	4.6.6.11
SMIL File Size	3.2.3.12	4.6.6.12
Segments	3.2.3.13	4.6.6.13
NCX Validity	3.2.4.1	4.6.7.1
Audio Heading Clips	3.2.4.2	4.6.7.2
clipBegin Timing	3.2.4.2.1	4.6.7.2.1
navLabel Content	3.2.4.3	4.6.7.3
docTitle	3.2.4.4	4.6.7.4
docAuthor	3.2.4.5	4.6.7.5
NCX Metadata	3.2.4.6	4.6.7.6
NCX Nesting	3.2.4.7.1	4.6.7.7
Class Attribute on navPoints	3.2.4.7.2	4.6.7.8
pageRefs	3.2.4.7.3	4.6.7.9
NavLists	3.2.4.8	4.6.7.10
OPF Validity	3.2.5.1	4.6.8.1
OPF Metadata	3.2.5.2	4.6.8.2
OPF Manifest	3.2.5.3	4.6.8.3
OPF Spine	3.2.5.4	4.6.8.4
distInfo Validity	3.2.6.1	4.6.9.1
Textual Content Validity	3.2.7.1	4.6.10.1
Resource File Validity	3.2.8.1	4.6.11.1
Complete DTB file Conformance	3.2.10.1	4.6.12.1

Table III - Acceptance Inspection (continued)

Requirement	Section	Test Method
Files to Include on each DTB CD-R	3.2.10.2	4.6.12.2
Checksum File	3.2.9	4.6.16
Labeling	5.1	NLS review
Label Information	5.1.3	NLS review
Packaging	5.2	NLS review

4.6 Methods of Inspection

4.6.1 Delivery Medium

Each CD-R shall be tested for compliance with all applicable requirements of NLS Specification 1202.

4.6.2 Multiple CD-Rs

A DTB that requires multiple discs shall have a distInfo file compliant with the requirements of section 3.2.6, a set of media-change message files compliant with the requirements of section 3.1.2.1, and the complete DTB shall conform to the requirements of section 3.2.10.

4.6.3 File names

File names shall be examined for compliance with the requirements of section 3.2.1.1.

4.6.4 Unique Identifier (UID)

UIDs shall be examined for compliance with the requirements of section 3.2.1.2.

4.6.5 Audio Files

4.6.5.1 Compression

Each compressed audio file shall be examined for compliance with the requirements of section 3.2.2.1.

4.6.5.2 Time Offset

Each compressed audio file shall be examined for compliance with the requirements of section 3.2.2.2.

4.6.5.3 Sound Quality

The sound quality of the compressed audio files shall conform to the requirements of section 3.2.2.3.

4.6.5.4 Source

Each compressed audio file shall be examined for compliance with the requirements of section 3.2.2.4.

4.6.6 SMIL File

4.6.6.1 Validity

The SMIL file(s) shall be tested for compliance with the requirements of section 3.2.3.1 using a qualified XML validating parser.

4.6.6.2 SMIL Pauses

SMIL pauses shall be examined for compliance with the requirements of section 3.2.3.2.

4.6.6.3 SMIL Metadata

The SMIL metadata shall be examined for compliance with the requirements of section 3.2.3.3 as determined by a subjective listening comparison with the WAV file accepted by NLS as conforming to the requirements of NLS Specification 1202. Acceptable sound quality shall be determined by the NLS Quality Assurance Section.

4.6.6.4 SMIL Granularity

The granularity of the SMIL files shall be examined for compliance with the requirements of section 3.2.3.4.

4.6.6.5 Escapable Structures

Escapable structures shall be examined for compliance with the requirements of section 3.2.3.5.

4.6.6.6 Skippable Structures

Skippable structures shall be examined for compliance with the requirements of section 3.2.3.6.

4.6.6.7 Tables and Lists

Tables and lists shall be examined for compliance with the requirements of section 3.2.3.7.

4.6.6.8 Links

Links shall be examined for compliance with the requirements of section 3.2.3.8.

4.6.6.9 Opening Announcements for DTB

The DTB shall be examined for compliance with the requirements of section 3.2.3.9.

4.6.6.10 Excluded Audio

The DTB shall be examined for compliance with the requirements of section 3.2.3.10.

4.6.6.11 SMIL Structure

The DTB shall be examined for compliance with the requirements of section 3.2.3.11.

4.6.6.12 SMIL File Size

The DTB shall be examined for compliance with the requirements of section 3.2.3.12.

4.6.6.13 Segments

The DTB shall be examined for compliance with the requirements of section 3.2.3.13.

4.6.7 NCX File

4.6.7.1 Validity

The NCX file shall be tested for compliance with the requirements of section 3.2.4.1 using a qualified XML validating parser.

4.6.7.2 Audio Heading Clips

The file containing the audio clips of the NCX headings shall be examined for compliance with the requirements of section 3.2.4.2.

4.6.7.2.1 clipBegin Timing

The file containing the audio clips of the NCX headings shall be examined for compliance with the requirements of section 3.2.4.2.1.

4.6.7.3 navLabel Content

The audio content, and text content if present, of each navLabel shall be examined for compliance with the requirements of section 3.2.4.3.

4.6.7.4 docTitle

The text and audio content of docTitle shall be examined for compliance with the requirements of section 3.2.4.4.

4.6.7.5 docAuthor

The text and audio content of docAuthor shall be examined for compliance with the requirements of section 3.2.4.5.

4.6.7.6 NCX Metadata

The NCX metadata shall be examined for compliance with the requirements of section 3.2.4.6.

4.6.7.7 NCX Nesting

The NCX file shall be examined for compliance with the requirements of section 3.2.4.7.1

4.6.7.8 Class Attribute on navPoints

Each Class Attribute on navPoints shall be examined for compliance with the requirements section 3.2.4.7.2

4.6.7.9 pageRefs

Each pageRefs shall be examine for compliance with the requirements of section 3.2.4.7.3

4.6.7.10 NavLists

Each NavList shall be examined for compliance with the requirements of section 3.2.4.8

4.6.8 OPF File

4.6.8.1 Validity

The OPF file shall be tested for compliance with the requirements of section 3.2.5.1 using a qualified XML validating parser.

4.6.8.2 OPF Metadata

The OPF metadata shall be examined for compliance with the requirements of section 3.2.5.2.

4.6.8.3 OPF Manifest

The OPF manifest shall be examined for compliance with the requirements of section 3.2.5.3.

4.6.8.4 OPF Spine

The OPF spine shall be examined for compliance with the requirements of section 3.2.5.4.

4.6.9 distInfo File

4.6.9.1 Validity

The distInfo file shall be tested for compliance with the requirements of section 3.2.6.1 using a qualified XML validating parser.

4.6.10 Textual Content File

4.6.10.1 Validity

The textual content file shall be tested for compliance with the requirements of section 3.2.7.1 using a qualified XML validating parser.

4.6.11 Resource File

4.6.11.1 Validity

The resource file shall be tested for compliance with the requirements of section 3.2.8.1 using a qualified XML validating parser.

4.6.12 Complete DTB

4.6.12.1 Conformance of Files

The complete set of files comprising the DTB shall be tested using playback software compliant with ANSI/NISO Z39.86-2002. This playback software must be approved by NLS. The DTB shall be tested for navigation using the NCX, local navigation as defined in section 1.2 of ANSI/NISO Z39.86-2002, and playback with particular attention to boundaries between files and media objects. Any required links shall be tested.

4.6.12.2 Included Files

Each CD-R of the DTB shall be examined for compliance with the requirements of section 3.2.10.2.

4.6.13 Audio Encoder

Compressed audio files shall be examined for compliance with the requirements of section 3.3.1.

4.6.14 Parser

The XML parser shall be examined for compliance with the applicable standard referenced by ANSI/NISO Z39.86-2002.

4.6.15 Other Validation Tools

Other validation tools shall be tested using a set of DTB files known to be good and a set of files having known defects. These sets of files will be provided by NLS.

4.6.16 Checksum File

The generated XML Checksum file for each file on the CD-R shall conform to the requirements of section 3.2.9

5. Labeling and Packaging

5.1 Labeling

5.1.1 Label on the Disc

Discs may be labeled with a paper label, or by ink-jet or thermal printing directly on the disc. All discs in a DTB must be labeled with the same labeling process.

5.1.2 Paper Label

When paper labels are used, the labels shall be of white stock and conform to the following:

- a. Each label shall be a circular label that has a center cutout. The diameter of the label shall be a nominal 116 millimeters and the diameter of the center cutout shall be a nominal 46 millimeters.
- b. The label may not interfere with disc playback in any manner.
- c. The label shall not be distorted, off center, or misaligned.
- d. The label must adhere firmly and uniformly to the label area without any bubbling, slipping, or peeling.

5.1.3 Label Information

The print for each label, whether paper, ink-jet, or thermal, shall be 14-point Times New Roman in black ink. No writing with any type of marking pen is permitted on either the disc or paper label. The label shall contain the following information as shown in figure 1.

- a. Book number
- b. Book title
- c. Date and time stamp of most recently altered file on the CD-R
- d. The designation “DTB” followed by the disc number of the total number of discs containing the complete DTB (e.g., DTB 1 of 1)
- e. Producer code as used on NLS production authorization record
- f. Filename: the unique identifier (UID) defined by section 3.2.1.2
- g. Identifier for complete DTB: “DTB”

5.2 Packaging

5.2.1 Order of Discs in Disc Storage Box

The CD(s) for the DTB shall be submitted in the same disc storage box(es) as the review copy. The discs shall be inserted in the storage box(es) in the following order: review file discs(s), DTB-specific WAV file disc(s), if any, disc(s) (in sequence) for complete DTB.

5.2.2 Label on Disc Storage Box

See NLS Specification 1202, section 5.2.2.

5.2.3 Packaging Disc Storage Boxes for Shipment

Storage boxes must be packaged for shipment to NLS in a manner that will provide a high degree of protection during shipment.

Table IV
Class Attributes

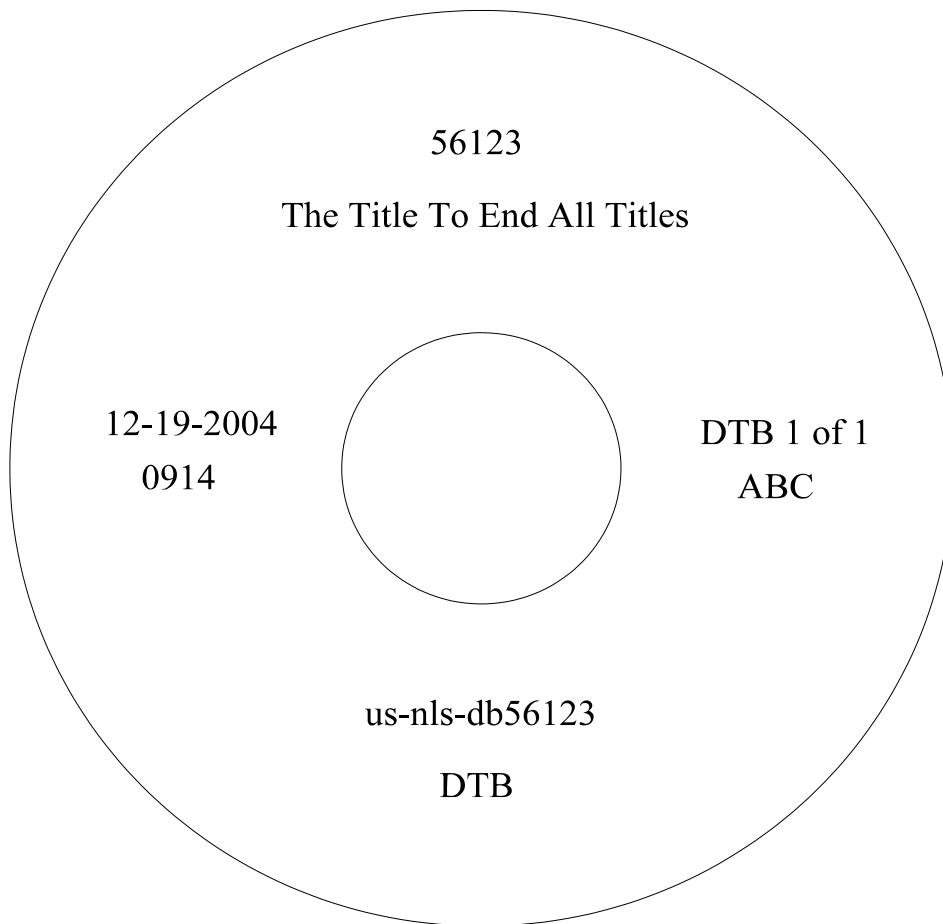
Book Structure	Description	Class Attribute	Item
Acknowledgments	acknowledgments before main book content	acknowledgements	preliminary
	acknowledgments after main book content	acknowledgements/c	concluding
Act	act in a play	act	
Activity	activity in a craft book for example	activity	
Address	Speech	speech	
Afterword		afterword	concluding
Alphabetical Division	division within index, glossary, etc.	alphadiv	
Annotation	Library of Congress annotation only	annotation	preliminary
Answers	collection of answers	answers	concluding
Appendices	collection of appendices	appendices	concluding
Appendix	single appendix	appendix	concluding
Article	magazine article	article	
Author's note	author's note before main book content	authnote	preliminary
	author's note after main book content	authnote/c	concluding
Biographical notes	collection of biographical notes	bionotes	concluding
Biography	biography of author, editor, illustrator, contributor, etc. (<i>not "about the author"</i>)	biography	concluding
Bibliography		bibliography	concluding
Book	portion of a large work, entitled "book"	book	
Captions	collection of captions to photos, illustrations, maps, etc.	captions	
Cast of characters	Cast of characters before main book content	cast	preliminary
	Cast of characters after main book content	cast/c	concluding
Chapter		chapter	
Chronology	chronology before main book content	chronology	preliminary
	chronology after main book content	chronology/c	concluding
Closing announcements	closing announcements of a DTB	close	concluding
Conclusion		conclusion	concluding
Contents	table of contents	contents	preliminary
Day	as a diary or journal entry	day	
Discography		discography	concluding
Dramatis personae	cast of characters	cast	preliminary
Entry	entry in a diary or journal	entry	
Epilogue		epilogue	concluding

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Essay		essay	
Exercise	exercise as in a "how to" book	exercise	
Fable		fable	
Family tree	family tree before main book content	tree	preliminary
	family tree after main book content	tree/c	concluding
Filmography		filmography	concluding
Foreword		foreword	preliminary
Further reading		readings	concluding
Genealogy	genealogy before main book content	tree	preliminary
	genealogy after main book content	tree/c	concluding
Glossary		glossary	concluding
Illustrations	collection of illustration captions	captions	
Index		index	concluding
Ingredients	list of ingredients within a recipe	ingredients	
Introduction		introduction	preliminary
Lesson	lesson in a "how to" book	lesson	
Letter	correspondence	letter	
Maps	collection of map captions	captions	
Materials	list of supplies as in a craft book	materials	
Month	as a diary or journal entry	month	
Notes	collection of end notes, author's notes, etc.	notes	concluding
Novelette		novelette	
Novella		novella	
Part		part	
Photographs	collection of photograph captions	captions	
Poem		poem	
Postscript		postscript	concluding
Prayer		prayer	
Preface		preface	preliminary
Prelude		prelude	preliminary
Project		project	
Prologue		prologue	preliminary
Proverb	as in the Bible or a book of proverbs	proverb	
Psalm	as in the Bible	psalm	
Questions	collection of questions	questions	
Questions and Answers	collection of questions and answers	qanda	
Recipe		recipe	
Recommended reading	recommended reading before main book content	readings/p	preliminary

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	recommended reading after main book content	readings	concluding
References	collection of references before main book content	references/p	preliminary
	collection of references after main book content	references	concluding
Resources	collection of resources before main book content	resources/p	preliminary
	collection of resources after main book content	resources	concluding
Scene	in a play	scene	
Section		section	
Selected references		references	concluding
Sources		sources	concluding
Song		song	
Sonnet		poem	
Speech		speech	
Stanza		stanza	
Steps	collection of steps as in a recipe or set of instructions	steps	
Story		story	
Subsection		subsection	
Suggested reading		readings	concluding
Summary		summary	concluding
Supplement		supplement	concluding
Supplies		supplies	
Synopsis		synopsis	preliminary
Table of contents		contents	preliminary
Tale		tale	
Testament		testament	
Time line	time line before main book content	timeline	preliminary
	time line after main book content	timeline/c	concluding
Title/Author	Title and Author (first audio encountered in normal playback)	title/author	preliminary
Unit		unit	
Verse	in Bible or poem	verse	
Vocabulary	vocabulary before main book content	vocabulary	preliminary
	vocabulary after main book content	vocabulary/c	concluding
Volume		volume	
Week	as a diary or journal entry	week	
Year	as a diary or journal entry	year	



Label Information for Complete DTB

Figure 1