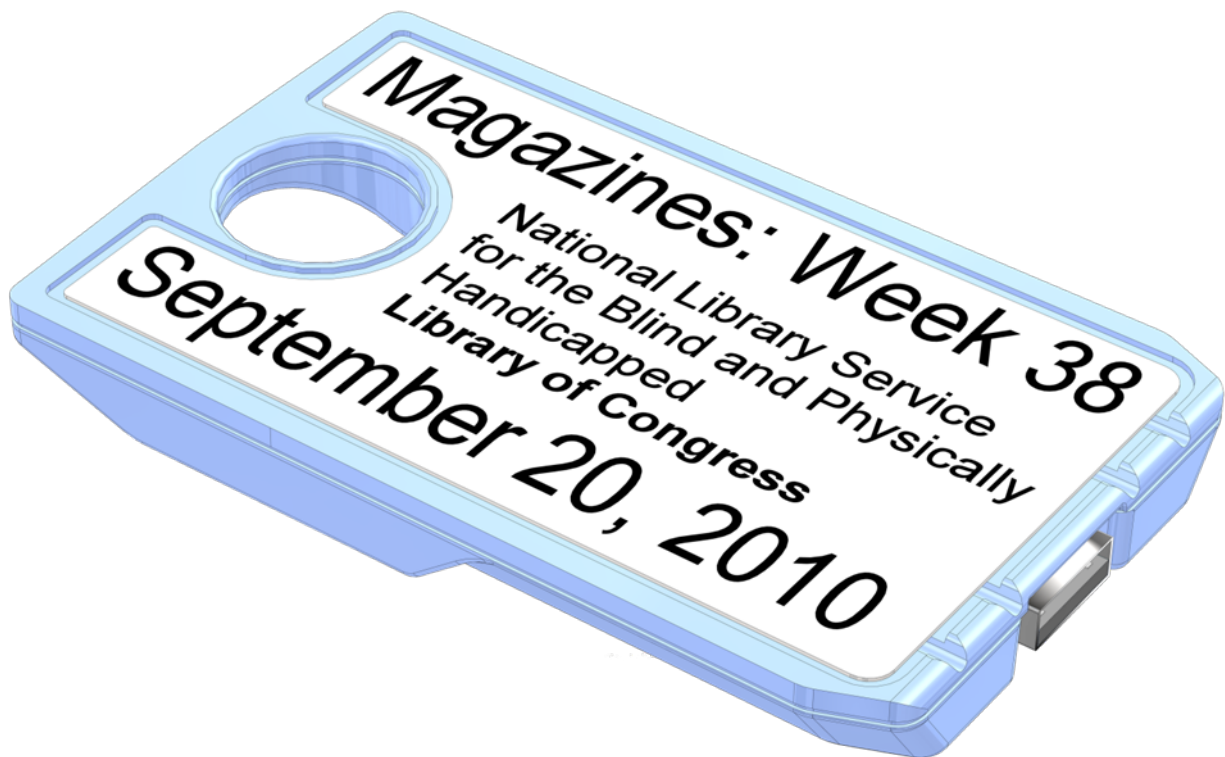


Specification 1203:2018

Digital Talking-Book Construction



Revision History

Revision Issue	Date	Change Description
Rev. 1.0	3/15/2007	First release
Rev. 1.1	6/30/2011	Remove CD reference Added new OPF items Added description of nls:toneLevel Update class attributes
Rev. 1.2	12/20/2014	Revised multiple cartridge instructions Added special SMIL elements description Relocated audio compression section to audio files section Reworked and revised document structure
Rev. 1.3	08/31/2018	Added magazine requirements Revised naming convention language Revised quality assurance section Created new section (5 and 6) for requirements for specific production types Added references to NLS Document QA201801

Final Approval

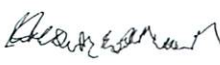
Head, Quality Assurance Section		Digitally signed by Margaret Goergen-Rood Date: 2019.01.28 16:26:19 -05'00'
Head, Engineering Section		(Margaret Goergen-Rood) Digitally signed by Lloyd Rasmussen Date: 2019.01.31 15:14:54 -05'00'
Chief, Materials Development Division		(John Brown) Digitally signed by Michael G. Katzmman Date: 2019.01.24 16:20:01 -05'00'
Director		(Michael Katzmman) 3/13/2019 (Karen Keninger)

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1. Scope

This specification defines the requirements for the set of files that comprise an unprotected digital talking-book (DTB) produced for the National Library Service for the Blind and Physically Handicapped (NLS), Library of Congress and compliant with ANSI/NISO Z39.86-2002.

2. Reference Documents

The following documents and publications 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 a 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.
25 West 43rd St.
4th Floor
New York, NY 10036
Tel: (212) 642-4900
Fax: (212) 398-0023
<http://www.daisy.org/z3986/specifications/Z39-86-2002.html>

National Library Service for the Blind and Physically Handicapped

NLS Specification 1201

Narration Requirements

NLS Specification 1202

Digital Talking-Book Mastering

NLS Specification 1205

Protected Digital Talking Book

NLS Specification 1206

Uploading Digital Talking Books and Magazines

NLS Specification 1208

Preparation of Audio Files from Commercial Audiobooks

NLS Document QA201401

Instructions for Bilingual Books

NLS Document QA201801

Instructions for Applying Navigation Markers

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

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 10

The document cited above is available from:

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 10

The document cited above is available from:

www.3gpp.org/ftp/Specs/html-info/26244.htm

Internet Engineering Task Force Network Working Group

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

The document cited above is available from:

www.ietf.org/rfc/rfc1321.txt

Tags for the Identification of Language (RFC 1766, March 1995)

The document cited above is available from:

<http://tools.ietf.org/html/rfc1766>

International Standards Organization

ISO 8601 Numeric Representation of Date and Time

The document cited above is available from:

<http://www.iso.org/iso/home/standards/iso8601.htm>

Codes for the Representation of Names of Languages — Part 1: Alpha-2 code (ISO 639-1:2002)

The document cited above is available from:

http://www.iso.org/iso/home/standards/language_codes.htm

2.2 Standards

American National Standards Institute (ANSI)

ANSI/ASQ Z1.4-2008
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
www.asq.org/quality-press/index.html

3. DTB File Requirements

3.1 General

The DTB files are defined by ANSI/NISO Z39.86-2002 and NLS Specification 1202 (current version) for audio masters recorded by NLS contract producers or Specification 1208 (current version) for audio masters recorded by commercial audiobook producers.

3.1.1 Production Identifier

NLS will supply a production identifier that shall be used for the file names and dc:Identifier of the DTB (see section 5.3 for the requirements of the dc:Identifier for book production and 6.4 for the requirements of the dc:Identifier for magazine production).

3.1.2 File Names

All alphabetic characters shall be in lower case.

The file names of the DTB shall be the production identifier as assigned by NLS followed by the appropriate file extension required by ANSI/NISO Z39.86-2002 (e.g. 561234.opf or u-s-news_2016-08-22.opf) or as specified below.

3.1.2.1 Audio File Names

All audio files, with the exception of the headings file and resource audio file, shall have a sequence indicator consisting of a hyphen and four digits appended to the production identifier in the file name (including any leading zeroes needed to meet the four-digit requirement). The range of sequence indicators shall begin with -0001 and the sequence shall be continuous (e.g., 561234-0001.3gp or u-s-news_2016-08-22-0001.3gp). For audio files holding the main content of the DTB, the sequence indicator shall equal the sequence indicator of the corresponding master (primary) WAV file (described in NLS specification 1202 or 1208).

3.1.2.2 SMIL File Names

When a DTB contains more than one SMIL file those files shall have a sequence indicator consisting of a hyphen and four digits appended to the production identifier in the file name (including any leading zeroes needed to meet the four-digit requirement). The range of sequence indicators shall begin with -0001 and the sequence shall be continuous (e.g., 561234-0001.smil or u-s-news_2016-08-22-0001.smil).

3.1.2.3 Headings File Name

The file name of the headings file shall be the identifier supplied by NLS concatenated with the suffix “hdgs”, (e.g., 561234hdgs.3gp or u-s-news_2016-08-22hdgs.3gp).

3.1.2.4 Checksum File Name

The name of the file containing MD5 checksums shall be the identifier as supplied by NLS concatenated with the suffix “dtb.md5”, (e.g., 561234dtb.md5 or u-s-news_2016-08-22dtb.md5). For DTBs spanning multiple media units, a sequence indicator consisting of a hyphen and two digits shall be inserted before the filename extension (e.g., 561234dtb-01.md5 or u-s-news_2016-08-22dtb-01.md5).

3.1.3 File Limits

The complete DTB shall contain no more than 250 files.

3.2 Audio Files

3.2.1 Source for Compressed Primary Audio Files

The source for each compressed audio file shall be identical to the primary audio file specified in Specification 1202 or 1208.

3.2.2 Source for Compressed Headings File

The source for the compressed headings file shall be identical to the headings WAV file specified in Specification 1202 or 1208.

3.2.3 Compression

All DTB audio files shall be compressed with an audio encoder conforming to the following requirements, and shall be encoded monaurally at a constant bitrate.

3.2.3.1 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.

3.2.3.2 Audio Encoder Parameters

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

3.2.3.3 Audio File Format

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

- **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.ccccccccccccccccccccccccccccccccccccc,” where

cccccccccccccccccccccccccccccccccccc is the ASCII hexadecimal representation of the 16 byte MD5 checksum of the entire source WAV file.

- **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.

3.2.4 Sound Quality

Compressed audio files shall be of acceptable subjective sound quality when compared to the WAV files accepted by NLS as conforming to the requirements of either Specification 1202 or 1208.

3.2.5 Time Offset

It is anticipated that there will be a time offset of 50 to 80 milliseconds (ms) 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 conforming to the requirements of either Specification 1202 or 1208. 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.

3.3 SMIL Synchronization File

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

3.3.1 SMIL Validity

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

3.3.2 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. If the SMIL contains elements containing customTest attributes, a customAttribute element with those customTest must be present in the SMIL head.

3.3.3 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 source material for which an NCX entry has been created.

3.3.4 SMIL Audio Elements

All navigable SMIL elements shall have an audio element. All audio elements shall point to the compressed primary audio file(s) containing the main content of the source material.

3.3.4.1 clipBegin and clipEnd Required

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

3.3.4.2 Clip Timing

The clipBegin time for each audio fragment shall be placed between 80 and 120 ms before the beginning of narration of that fragment. The clipEnd time for each audio fragment shall be placed between 150 to 300 ms following the end of the narration of that fragment. Clip times shall be placed within the silence between narration, adhering to the clip timing requirements for SMIL audio elements of both the preceding and succeeding narration (see section 3.1.2.5).

3.3.5 Opening Announcements for the DTB

The opening announcements, described in NLS Specification 1202 or 1208, shall be referenced by the first SMIL file such that they are the first audio encountered in normal playback.

3.3.6 Special SMIL Elements

Application of special SMIL elements in DTB production shall follow the instructions found in NLS Document QA201801 *Instructions for Applying Navigation Markers*.

3.3.6.1 Segments

Segments shall be represented by <par>s or <seq>s in the SMIL file(s).

3.3.6.2 Notes/Footnotes

Notes shall be represented in the SMIL file(s) as a <par> or <seq> with both class and customTest attributes having a value of “note.”

3.3.6.3 Reader’s Note

Reader’s notes shall be represented in the SMIL file(s) as a <par> or <seq> with both class and customTest attributes having a value of “prodnote.”

3.3.6.4 Sidebars

Sidebars shall be represented in a SMIL file as a <par> or <seq> with both class and customTest attributes having a value of “sidebar.”

3.3.7 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.

3.3.8 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.

3.3.9 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.

3.3.10 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.

3.3.11 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.

3.3.11.1 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.

3.3.12 SMIL File Size

SMIL files exceeding 100 kilobytes (where kilobytes equal 2^{10} bytes) must be divided into multiple SMIL files. All SMIL files, with the exception of the last, shall have as many elements as

can be contained given the size limit above. The number of SMIL files shall not exceed 50. A producer shall contact the NLS contract monitor before proceeding with source material that would exceed these limitations.

3.4 Navigation Control File (NCX)

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

3.4.1 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.

3.4.2 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.

3.4.3 navMap

The navMap shall contain the navPoints that represent the divisions of the source material. Application of hierarchical navigation elements in DTB production shall follow the instructions found in NLS Document QA201801 *Instructions for Applying Navigation Markers*. Final authority regarding proper application of navigation rests with the NLS Quality Assurance Section.

3.4.3.1 navPoint Nesting

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

3.4.3.2 Class Attribute on navPoints

Each navPoint shall have a class attribute drawn exactly from Appendix A, Table 1, corresponding as closely as possible to the type of structure marked by the navPoint. When appropriate to the source material a resource file may be used to create accessible navigation using a term not listed in appendix A. Application of resource files shall follow the instructions found in NLS Document QA201801 *Instructions for Applying Navigation Markers*. Resource files may be used upon approval from NLS Quality Assurance Section.

3.4.3.3 pageRef Attribute on navPoints

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

3.4.3.4 Content Element for navPoints

Each navPoint shall have a content element pointing to the SMIL element marking the heading within the compressed primary audio file (see section 3.1.3.3).

3.4.3.5 navLabel Content for navPoints

Each navLabel within a navPoint shall contain both text and audio elements.

The content of the text element shall contain the heading marked by its parent navPoint. The content shall match the heading found in the body of the source material, rather than the table of contents. Line breaks and font information shall not appear in the text element.

The audio element shall contain a pointer to the audio narration of the text element as defined above. This audio clip shall be contained in the compressed headings file described in Section 3.1.2.2.

3.4.3.6 navPoint Limits

The total number of navPoints for a DTB shall not exceed 5,000. If the total number of navPoints will exceed 1,000, the NLS contract monitor shall be contacted to ensure the total number of navPoints is appropriate.

3.4.4 NavLists

If the source material requires that any of the structures listed below be made navigable a navList is required for each, conforming to the normative requirements of section 8 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 structures it contains; the class attribute shall be the DTBook element name included in parentheses in the list above.

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

Application of non-hierarchical navigation elements in DTB production shall follow the instruction found in NLS Document QA201801 *Instructions for Applying Navigation Markers*. Final authority regarding proper application of navigation rests with the NLS Quality Assurance Section.

3.4.4.1 class Attribute on navTargets

Each navTarget shall have a class attribute of noteref, pagenum, or linenum corresponding to the type of structure represented by the navTarget. All navTarget elements with the same class attribute shall be siblings and shall have a parent navList element with the same class attribute.

3.4.4.2 Value Attribute on navTargets

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

3.4.4.3 Content Element for navTargets

Each navTarget shall have a content element pointing to the SMIL element marking the note reference, page number, or line number narration within the compressed primary audio file (see sections 3.1.3.6 and 3.1.3.4).

3.4.4.4 navLabel Content for navTargets

Each navLabel within a navTarget shall contain both text and audio elements. The text element shall contain the identifier “note,” “page,” or “line” and the appropriate reference text or number. The text for special page numbers shall match the source material. The text for note references shall match the source material as closely as possible. In cases where note references are indicated only by a symbol, the text element shall contain an asterisk.

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 text or 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 source material (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 3.1.2.2.

3.4.5 Heading Clips

The audio element source (src) attribute of the docTitle, docAuthor, and navLabels shall point to the collection of audio heading clips in the compressed headings file described in section 3.1.2.2 above. Also see section 3.4 of NLS Specification 1202 (current version).

3.4.5.1 clipBegin and clipEnd Required

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

3.4.5.2 Clip Timing

The clipBegin time for each audio clip shall be between 80 and 120 ms before the beginning of narration in that clip. The clipEnd time for each audio fragment shall be placed between 150 to 300 ms following the end of the narration of that. Clip times shall be placed within the silence between narration, adhering to the clip timing requirements for SMIL audio elements of both the preceding and succeeding narration (see section 3.1.2.5).

3.5 Package File (OPF)

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

3.5.1 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.

3.5.2 OPF Accuracy

The producer is responsible for the accuracy and correctness of all the dc:metadata and x-metadata. Accuracy shall be measured against the source material. An inaccuracy in the initial OPF provided by NLS does not relieve the contractor of responsibility for correctness. The contractor shall contact NLS contract monitor if the content provided is inaccurate.

3.5.3 Definition of OPF Metadata Content

See section 4.3 for definitions of OPF metadata for book production.

See section 5.3 for definitions of OPF metadata for magazine production.

3.5.4 OPF Manifest

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

3.5.5 OPF Spine

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

3.5.6 Tours and Guides

No tours or guides shall be included.

3.6 distInfo Files

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

3.6.1 distInfo Validity

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

3.7 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.

3.7.1 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.

3.8 Resource File

Upon approval from NLS Quality Assurance Section, when a resource file is included in a DTB it shall conform to the normative requirements of section 10 of ANSI/NISO Z39.86-2002 and section 3.3 of NLS Document QA201801.

3.8.1 Resource File Validity

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

3.9 Checksum File

An XML file shall be created containing a checksum for each file comprising the DTB as specified in section 3.2.10 except for the MD5 file itself. All the files listed in the checksum file shall be present in the single ZIP container file used for transmission of the DTB as described in NLS Specification 1206. The checksum shall be calculated using the MD5 algorithm as described in the reference cited in Section 2.1 and shall be in the form of 32 hexadecimal digits. The checksums shall be generated from the source files prior to their packaging and transmission. This checksum file does not form part of the DTB and thus shall not be listed in the DTB 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 extracted from the ZIP container file. 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 contents of <book> element shall match the UID as found in the content of the OPF dc:Identifier.

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.”

3.10 Complete DTB

3.10.1 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.

3.10.2 XML File Character Encoding

The character set encoding of all XML files shall be UTF-8.

3.10.3 Files to Include on Each DTB

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

An XML checksum file is to be generated in accordance with section 3.9 and shall be included on the DTB.

4. Delivery Medium

4.1 Conformance with Specification 1206

The DTB shall be delivered following all applicable requirements of NLS Specification 1206.

4.2 Multiple Flash Cartridges

A DTB whose size exceeds 2,000 million bytes shall be delivered on multiple flash cartridges that conform to the requirements of Sections 7.4.4, 8.4.2, and 11.2 of ANSI/NISO Z39.86-2002.

4.2.1 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.

5. NCX and OPF content for Book Production

5.1 NCX

5.1.1 docTitle

The docTitle shall contain an audio element pointing 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 compressed audio headings file described in Section 3.2.2.2.

5.1.2 docAuthor

The docAuthor shall contain an audio element pointing to an audio clip of the book author’s name, preceded by the phrase indicated in the NLS production authorization record, e.g., “by,” “edited by,” “compiled by,” in the appropriate language, and a text element containing the book’s author’s name preceded by the phrase indicated in the NLS production authorization record, as above. The audio clip shall be contained in the compressed audio headings file described in Section 3.2.2.2.

5.2 OPF Metadata Accuracy

The producer shall ensure the accuracy and correctness of all the dc:metadata and x-metadata. Where appropriate, all OPF metadata shall be obtained from the source material unless explicitly specified by NLS in writing. Errors in the initial OPF provided by NLS shall be corrected by the contractors. The contractor shall contact the NLS contract monitor if the content provided is inaccurate.

5.3 Definition of OPF Metadata Content for Books

- a. **dc:Title** — Book title
- b. **dc:Creator** — Name(s) of primary author, editor, etc. of the source material. Names shall be formatted as Last name, First name.

Note:

For multiple creators this element shall be repeated as needed.

- c. **dc:Subject** — Topic of the content of the publication. This is the NLS copy allotment subject heading.
- d. **dc:Description** — This is the full Library of Congress annotation, including taglines and date, contained on the NLS production authorization record (PAR).
- e. **dc:Publisher** — National Library Service for the Blind and Physically Handicapped, Library of Congress (This shall be rendered exactly to assure proper NLS DTB playback.)
- f. **dc:Date** — Date of publication of the DTB.

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

- g. **dc:Format** — ANSI/NISO Z39.86-2002.
- h. **dc:Identifier** — The element shall have an id attribute set to “uid” and a scheme attribute set to “dtb”. The content shall consist of the lowercase character string “us-nls-dbn[n]”, where “n” represents the production identifier supplied by NLS (see section 3.2.1.1 above).
- i. **dc:Source** — ISBN of the print book.
- j. **dc:Language** — Language of the DTB. (See RFC 1766 and ISO 639-1. English shall be done as “en.” Spanish shall be done as “es.”)
 Note:
 Language code is not case sensitive.
 For multiple languages this element shall be repeated as needed.
- k. **dc:Rights** — Further reproduction or distribution in other than a specialized format is prohibited. (This shall be rendered exactly.)
- l. **dtb:sourceDate** — Date of publication of the print book in the year format “yyyy.” See **dtb:sourceRights**.
- m. **dtb:sourcePublisher** — Publisher of the print book.
- n. **dtb:sourceRights** — Copyright year and holder of the U.S. copyright for the resource from which the DTB is derived (e.g., 1998 Ann Blackman).
- o. **dtb:multimediaType** – audioNCX (This shall be rendered exactly to assure proper NLS DTB playback.)
- p. **dtb:narrator** — Shall be entered last name first (e.g., Smith, John).
 Note:
 For multiple narrators this element shall be repeated as needed.
 For narrator names that are unknown use “Narrators(s) Unknown”
- q. **dtb:producer** — Full name of the DTB creator (producer).
- r. **dtb:producedDate** – Shall contain the date of the first build of the DTB submitted to NLS in the format “yyyy-mm-dd” and shall not be changed.

- s. **dtb:revision** – Shall contain a non-negative integer. For the first build submitted to NLS, the revision shall be “0,” and the revision shall be incremented for each subsequent build submitted to NLS.
- t. **dtb:revisionDate** – Shall contain the date of the most recent revision of the DTB in the format “yyyy-mm-dd.” When dtb:revision contains “0” dtb:revisionDate shall equal the content of dtb:producedDate.
- u. **dtb:revisionDescription** – Shall contain a text string describing the reason for each revision, listed in order; “dtb:revisionDescription” shall be present and valued for all revisions greater than “0.”
- v. **dtb:totalTime** — 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 DTB. 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 of the actual time.
- w. **dtb:audioFormat** — 3gpp
- x. **nls:recordingAgency** — Shall contain the full name of the agency (or for commercial masters the publisher) that made the original recording from which the DTB was created. Contact NLS for the correct spelling of any unknown recording agencies.
- y. **nls:toneLevel** — Shall only be used with prior written approval by NLS contract monitor. Approval shall be attached to the PAR that is submitted with the print book for NLS Quality Assurance Section review. Failure to follow these procedures will cause the DTB to be rejected. Final authority for judging the correct value of nls:toneLevel shall rest with the NLS Quality Assurance Section. (See Appendix B for description).

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

See NLS Specification 420 for OPF elements related to cartridge label information.

No metadata element shall be removed from the initial OPF provided by NLS. An element without content is acceptable in a DTB derived from either a commercial master or from an analog to digital conversion if NLS has not supplied the content for the element. Contact the NLS contract monitor if the content provided is inaccurate.

6. NCX and OPF content for Magazine Production

6.1 docTitle

The docTitle shall contain an audio element pointing to an audio clip of the magazine’s title and date of issue, and a text element containing the magazine’s title and date of issue. The audio clip shall be contained in the compressed audio headings file described in section 3.2.2.2.

6.2 navMap

The following items shall be included within the navMap of a magazine. All navPoints shall meet the requirements in section 3.2.4 of this specification.

6.2.1 Title and Issue Date

The contractor shall include a navPoint for the beginning of the magazine. Its navLabel shall contain the title and issue date of the magazine. The class attribute shall be “title/author”. Also see section 6.1 of NLS Specification 1202 (current version).

6.2.2 Table of Contents

The contractor shall include a navPoint for the table of contents. If no heading is found in the print magazine for the table of contents, the navLabel “Contents” shall be inserted. The class attribute shall be “contents”. Also see section 6.2 of NLS Specification 1202 (current version).

6.2.3 Ending Announcement

The contractor shall include a navPoint for the ending announcements, with the navLabel content being “End of (magazine title and issue date)”. The class attribute shall be “close”. Also see section 6.4 of NLS Specification 1202 (current version).

6.2.4 Absence of Print Headings

For divisions in the magazine that are to be made navigable via the NCX but which lack a heading in the print edition, the contractor shall contact NLS for guidance on how to proceed.

6.3 OPF Metadata Accuracy

The producer shall ensure the accuracy and correctness of all the dc:metadata and x-metadata. Where appropriate, all OPF metadata shall be obtained from the source material unless explicitly specified by NLS in writing. Errors in the initial OPF provided by NLS shall be corrected by the contractors. The contractor shall contact the NLS contract monitor if the content provided is inaccurate.

6.4 Definition of OPF Metadata Content for Magazines

- a. **dc:Title** - Title and issue date as they appear on the cover of the print magazine, except that the date is to be placed within parentheses; i.e., Smart Computing (December 2006).
- b. **dc:Publisher** — National Library Service for the Blind and Physically Handicapped, Library of Congress (This shall be rendered exactly to assure proper NLS DTB playback.)
- c. **dc:Date** — Date of publication of the DTB.

The “dc:Date” element shall contain the year and month of the “dtb:revisionDate” in the format “yyyy-mm.”
- d. **dc:Format** — ANSI/NISO Z39.86-2002.
- e. **dc:Identifier** — The element shall have an id attribute set to “uid” and a scheme attribute set to “dtb”. The content shall consist of the lowercase character string “us-nls-dm-xxxx,” where “xxxx” represents the magazine name and issue date supplied by NLS (see section 3.2.1.1 above).
- f. **dc:Source** – The ISSN number of the print magazine (e.g., 1093-4170). If the dtb magazine is a composite of several print magazines, dc:Source may be repeated to contain the ISSNs of all included magazines.

- g. **dc:Language** — Language of the DTB. (See RFC 1766 and ISO 639-1. English shall be done as “en.” Spanish shall be done as “es.”)
 Note:
 Language code is not case sensitive.
 For multiple languages this element shall be repeated as needed.
- h. **dc:Rights** — Further reproduction or distribution in other than a specialized format is prohibited (This shall be rendered exactly.)
- i. **dtb:sourceDate** — Date of publication of the print magazine as supplied by NLS. In the format of YYYY-MM-[DD] with a mandatory year and 2-digit month. The two digit day should be included, if applicable.
- j. **dtb:sourcePublisher** — Publisher of the print magazine (e.g., Time, Inc.). If the DTB magazine is a composite of several print magazines, dtb:sourcePublisher may be repeated.
- k. **dtb:sourceRights** — Copyright information for the print magazine (e.g., 2006 by Time, Inc.). If the DTB magazine is a composite of several print magazines, dtb:sourceRights may be repeated.
- l. **dtb:multimediaType** — audioNCX (This shall be rendered exactly to assure proper NLS DTB playback.)
- m. **dtb:narrator** — Shall be entered last name first (e.g., Smith, John).
 Note:
 For multiple narrators this element shall be repeated as needed.
 For narrator names that are unknown use “Narrator(s) Unknown”
- n. **dtb:producer** — Full name of the DTB creator (producer).
- o. **dtb:producedDate** — Shall contain the date of the first build of the DTB submitted to NLS in the format “yyyy-mm-dd” and shall not be changed.
- p. **dtb:revision** — Shall contain a non-negative integer. For the first build submitted to NLS, the revision shall be “0,” and the revision shall be incremented for each subsequent build submitted to NLS.
- q. **dtb:revisionDate** — Shall contain the date of the most recent revision of the DTB in the format “yyyy-mm-dd.” When dtb:revision contains “0” dtb:revisionDate shall equal the content of dtb:producedDate.
- r. **dtb:revisionDescription** — Shall contain a text string describing the reason for each revision, listed in order; “dtb:revisionDescription” shall be present and valued for all revisions greater than “0.”
- s. **dtb:totalTime** — 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 DTB. 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 of the actual time.
- t. **dtb:audioFormat** — 3gpp

- u. **nls:recordingAgency** — Shall contain the full name of the agency (or for commercial masters the publisher) that made the original recording from which the DTB was created. Contact NLS for the correct spelling of any unknown recording agencies.
- v. **nls:toneLevel** — Shall only be used with prior written approval by NLS contract monitor. Approval shall be attached to the PAR that is submitted with the print book for NLS Quality Assurance Section review. Failure to follow these procedures will cause the DTB to be rejected. Final authority for judging the correct value of nls:toneLevel shall rest with the NLS Quality Assurance Section. (See Appendix B for description).

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

7. Quality Assurance Provisions

7.1 Responsibility for Inspections

The contractor is responsible for the inspection of all files for compliance with the requirements of this specification. NLS reserves the right to perform inspections when deemed necessary to ensure that products conform to the prescribed requirements.

7.2 Quality Assurance Procedures (QAP)

The contractor shall prepare written documentation that describes the quality-assurance procedures used to achieve the requirements of the specification. The contractor shall submit this documentation to the NLS Quality Assurance Section at the beginning of each new contract or at any time required by NLS. NLS reserves the right to require the contractor to improve quality-assurance procedures. These shall be provided at no cost to NLS.

7.3 Reporting of Inspection Results

The contractor shall maintain complete records (in English) of all inspection results for the duration of the contract, including the warranty period. NLS reserves the right to request copies, for review, of any documentation related to this specification. These shall be provided at no cost to NLS.

7.4 Test Equipment and Inspection Facilities

The contractor shall ensure that test and inspection facilities of sufficient accuracy, quality, and quantity are established and maintained to permit performance of required inspections. Test equipment shall be calibrated annually. NLS reserves the right to request copies, for review, of any documentation related to this specification. These shall be provided at no cost to NLS.

7.5 Responsibility for Compliance

The requirements 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 the specification shall not relieve the contractor of the responsibility of assuring that all products submitted to NLS 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 the acceptance of defective material. Should NLS determine that a significant fault or faults are found in production materials, within the warranty period, then correction of the fault or faults and inspections or controls for prevention shall be instituted without additional charge to NLS.

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

7.7 Other Validation Tools

Any other software or tools used to validate DTB content shall be capable of detecting deviations from the requirements of ANSI/NISO Z39.86-2002 and NLS Specifications 1202, 1208, 1205, and 1206.

7.8 Production Change Report

A production change report shall be issued by the contractor to notify NLS QAS of any changes to materials, manufacturing/production process, or software used to produce DTBs.

7.9 Incoming Inspection

Incoming inspection shall be performed by the contractor on source materials provided by NLS including the audio source files, the OPF metadata, and textual content file validity.

7.10 Contractor's Acceptance Inspection

Acceptance inspection shall be performed by the contractor on 100% of every DTB. All files and the content of those files shall be examined for compliance with the requirements of specification.

7.11 Warranty

The contractor shall agree to unconditionally warrant that the audio recording conforms to the requirements set forth in this specification for a period of two (2) years from the date the DTB is approved by the NLS Quality Assurance Section.

7.12 DTB Correction

Should NLS determine that a noncompliance with the specifications exists on a DTB during the warranty period; then correction of the noncompliance and production inspections or controls for prevention shall be instituted at no cost to NLS.

7.13 NLS Testing

The right is reserved by the NLS, Library of Congress, to inspect any process or tests being performed. The library representative shall have the authority, without advance notice, to select at random a sample at any time during the course of the contract for testing to the specified requirements. The right is reserved by NLS to reject any DTB that does not meet specifications.

7.14 Facility Inspection

NLS reserves the right to inspect plant facilities or recording processes at any reasonable time. An NLS representative shall have the authority, without advance notice, to select at random a sample of the DTB productions at any time during the course of the contract for testing to the specified requirements.

7.15 NLS-Supplied Tools, Information, and Materials

NLS shall in some cases provide tools, information, and materials to assist in the production of DTBs. Use of these items does not release the producer from their contractual obligation to produce DTBs that meet the specifications. NLS reserves the right to update or discontinue supplied items at any time.

Appendices

A. Book Structure and Class-Attribute Relations

In the table below, book structures with the item “preliminary” will be rendered by the NLS hardware player as “front matter” and book structures with the item “concluding” will be rendered as “back matter” by the NLS player. Book structures that have a blank item field will be rendered by the NLS hardware player as described in the Class Attribute column (e.g., the book structure “sonnet” will be rendered as “poem”).

Care must be taken to avoid the use of a preliminary item when the book structure is at the end of the book or a concluding item when the book structure is at the beginning of a book.

Upon approval from NLS Quality Assurance Section a resource file may be used when creating navigation with a term not found in the table below. See the NLS Document QA201801 *Instructions for Applying Navigation Markers* for requirements when applying resource files in a DTB.

Final authority regarding proper use of class attributes rests with the NLS Quality Assurance Section.

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
Back matter	material after main body of the book not adequately described by any other category in this table	concluitem	concluding
Biographical notes	collection of biographical notes	bionotes	concluding
Biography	biography of author, editor, illustrator, contributor, etc. (Not to be confused with “About the Author...” in the opening announcements.)	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
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
Front matter	material before main body of the book not adequately described by any other category in this table	prelimitem	preliminary
Further reading		readings	concluding
Genealogy	genealogy before main book content	tree	preliminary
	genealogy after main book content	tree/c	concluding
Glossary	glossary before main book content	glossary/p	preliminary
	glossary after main book content	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	
Play		play	
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
	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	
Selection		selection	
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	

Table 1 — Class Attributes

B. OPF Element nls:toneLevel

B.1 Description

The digital talking-book player provided by NLS to patrons announces with a beep the crossing of specific navigational level boundaries when in rewind or fast-forward mode. By default, the navigation level (beep level) used for this function is the highest level, with navPoints having the class attribute equal to "chapter." If there are no levels with a class attribute having this value, the topmost level is used.

In some circumstances it may be necessary to explicitly set the beep level. This can be accomplished by defining and setting the "nls:toneLevel" element in the OPF file.

Figure 1 shows a typical NCX file with the nested structure of navPoints located within the navMap element. navPoints in blue font represent level 1, green font level 2, and red font level 3. The default behavior of the player would be to announce the crossing of level 2 navPoints, as this level is the highest with navPoints having a class attribute equal to "chapter."

```
<navMap>
  ...
  <navPoint id="np_0001" class="title/Author">
  </navPoint>
  <navPoint id="np_0002" class="annotation">
  </navPoint>
  <navPoint id="np_0003" class="contents">
  </navPoint>
  <navPoint id="np_0148" class="introduction">
  </navPoint>
  <navPoint id="np_0152" class="part">
    ...
    <navPoint id="np_0153" class="chapter">
    </navPoint>
    <navPoint id="np_0160" class="chapter">
      ...
      <navPoint id="np_0165" class="story">
      </navPoint>
    </navPoint>
    <navPoint id="np_0166" class="chapter">
    </navPoint>
    <navPoint id="np_0172" class="chapter">
      ...
      <navPoint id="np_0182" class="story">
      </navPoint>
    </navPoint>
    <navPoint id="np_0183" class="chapter">
    </navPoint>
    <navPoint id="np_0194" class="chapter">
      ...
      <navPoint id="np_0202" class="story">
      </navPoint>
    </navPoint>
    <navPoint id="np_0203" class="chapter">
      ...
      <navPoint id="np_0212" class="story">
      </navPoint>
    </navPoint>
  </navPoint>
</navMap>
```

Figure 1 – Typical NCX navPoint Structure

If it would be more appropriate in this book to have the player indicate the “story” navigation points, then add the x-metadata element:

```
<meta name="nls:toneLevel" content="3"/>
```

B.2 Practical Example

One example where nls:toneLevel could be used to improve the user experience would be DB68777, the “Scourby Bible.” In this DTB the navPoint with class attribute “Chapters” is located at level 3. When reading the “Scourby Bible” with a standard NLS player, the default behavior will result in every chapter of every book of the Bible being announced by “beep” when navigating by book structure. Making use of nls:toneLevel set to level 2 would allow the user to navigate by books of the Bible, skipping the individual chapters. This change will result in a much less time-consuming method of navigation.