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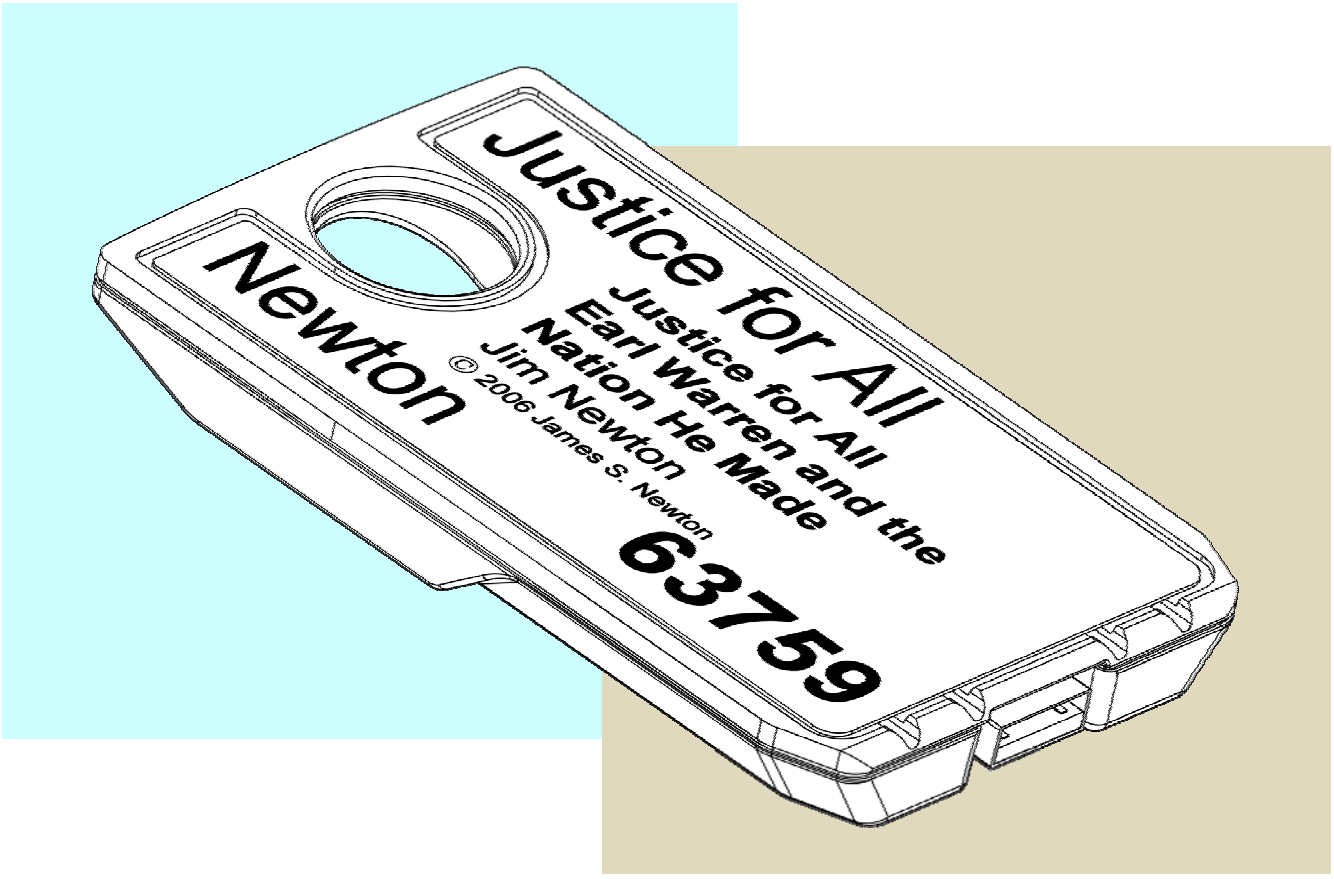
National Library Service
for the Blind and
Physically Handicapped

Specification 1203:2011

Construction of Digital Talking Books



Version 1.1, July 2011

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	Rev. 1.1	June/30/2011	Remove CD references Added new OPF items Added description of nls:toneLevel Update class attributes table

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Release Approval:

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Table of Contents

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. These files consist of compressed audio files, plus other files defined by ANSI/NISO Z39.86-2002.

NLS Specification 1202 defines requirements for digital audio WAV-files recorded for DTB versions of audiobooks. In some areas related to DTB production, the requirements of this specification augment 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 NLS requirements. Producers must also reference NLS Specifications 1205 and 1206 to ensure that all DTB creation requirements are met.

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 Street,
4th Floor
New York, NY 10036
Tel: (212) 642-4900
Fax: (212) 398-0023

and at

http://www.niso.org/workrooms/daisy/Z39-86-2002.html

National Library Service for the Blind and Physically Handicapped

NLS Specification 1202
Digital Talking-Book Mastering

NLS Specification 1205
Protected Digital Talking Book

NLS Specification 1206
Uploading Digital Talking Books and Magazines

Guidelines for Applying Navigation Markers to Digital Talking Books (DTBs)

The documents cited above are available from:

National Library Service for the Blind and Physically Handicapped
Library of Congress
1291 Taylor Street NW
Washington, DC 20542-0002
Tel: (202) 707-5100
Fax: (202) 707-0712

and at

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:

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 10

The document cited above is available from:

http://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:

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

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

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

The document cited above is available from:

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

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/iso_catalogue.htm

2.2 Standards

American National Standards Institute (ANSI)

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

The document cited above is available from:

American Society for Quality
Quality Press
611 East Wisconsin Avenue
PO Box 3005
Milwaukee, WI 53201-3005

and at

http://www.asq.org/quality-press/index.html

3. Requirements

3.1 Delivery Medium

3.1.1 Conformance with Specification 1206

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

3.1.2 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.

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 Specifications 1202 and 1205.

3.2.1.1 File Names

All alphabetic characters shall be lowercase.

File names shall be the five-digit book number assigned by NLS (including any leading zeroes needed to meet the five-digit minimum requirement) followed by the appropriate file extension required by ANSI/NISO Z39.86-2002 or as specified elsewhere in this document.

SMIL files, where a DTB contains more than one, and all audio files with the exception of the media-change message, announcement and headings (ancillary) 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 file number (described in Specification 1202, Master WAV Files) for the corresponding master WAV file.

The ancillary audio files defined in NLS Specification 1202, Ancillary WAV Files, shall maintain their file names, except that they shall carry the appropriate file extension required by ANSI/NISO Z39.86-2002 and this specification (e.g., 56123ann.3gp).

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.

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, a sequence indicator consisting of a hyphen and two digits shall be inserted before the filename extension, e.g., “12345dtb-01.md5.” (Refer to NLS Specification 1206 for further details about the checksum files.)

3.2.1.2 Unique Identifier (UID)

The UID shall consist of the lowercase character string “`us-nls-dbnnnnn`,” where “`nnnnn`” represents the five-digit book number. Include any leading zeros needed to meet the five-digit minimum requirement.

3.2.2 Audio Files

3.2.2.1 Compression

All DTB audio files shall be compressed with an audio encoder conforming to 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 200 milliseconds (ms) following the end of the narration of that fragment. It is anticipated that there will be a time offset of 50 to 80 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 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 ms 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 master or ancillary 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 document type definition (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 NLS Specification 1202 DTB Announcement (ann) File, shall be referenced by the first SMIL file such that they are the first audio encountered in normal playback.

3.2.3.10 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.

3.2.3.11 SMIL File Size

The size of SMIL files shall not exceed 100 kilobytes. 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 Quality Assurance Section before proceeding on a book that would exceed these limitations.

3.2.3.12 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 Headings Clips (Hdgs)

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 as part of the DTB.

3.2.4.2.1 clipBegin Timing

The clipBegin time for each audio clip shall be not more than 100 ms 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.

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

e. 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 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. 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 4, Appendix A, 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.

3.2.4.7.4 navPoint Limits

The total number of navPoints for a book shall not exceed 5,000. If the total number of navPoints for a book exceeds 5,000, the NLS contract monitor should be contacted and the navigation suggestions altered to ensure the total number of navPoints is at or below 5,000.

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 front-matter 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 ANSI/NISO Z39.86-2002.

3.2.5.2 OPF Metadata

The producer is responsible for the accuracy and correctness of all the OPF metadata and x-metadata. The OPF metadata and x-metadata will be provided by NLS, with the exception of the following elements, which shall be completed by the contractor:

OPF metadata

`dc:Date`

OPF x-metadata

`dtb:narrator`

`dtb:producedDate`

`dtb:revision`

`dtb:revisionDate`

`dtb:revisionDescription`

`dtb:totalTime`

`nls:labelPrintSequence`

`nls:labelBrailleSequence`

`nls:recordingAgency`

The element “nls:recordingAgency” shall be included in the OPF x-metadata.

`nls:toneLevel`

The element “nls:toneLevel” shall only be included in the OPF x-metadata with approval from NLS (see Section 3.2.5.2.1).

Note:

Refer to Section 3 of ANSI/NISO Z39.86-2002 for further information about the OPF. See also NLS Specification 420 for OPF elements related to cartridge label information.

3.2.5.2.1 Metadata Content

a. `dc:Title` - Book title

b. `dc:Creator` - Name(s) of primary author, editor, etc. of the print text

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 “dtb:revisionDate” in the format “yyyy-mm.”

g. `dc:Format` - ANSI/NISO Z39.86-2002.

h. `dc:Identifier` - Unique identifier (UID). See Section 3.2.1.2.

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.”)

k. `dc:Rights` - Further reproduction or distribution in other than a specialized format is prohibited

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 print book (e.g., 1998 Ann Blackman).

o. `dtb:multimediaType` - audioNCX

p. `dtb:narrator` - Shall be entered last name first (e.g., Smith, John).

q. `dtb:producer` - Full name of the DTB creator (producer).

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

s. `dtb:revision` - 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.

t. `dtb:revisionDate` - 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.”

u. `dtb:revisionDescription` - 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.”

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 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 of the actual time.

w. `dtb:audioFormat` - 3gpp

x. `nls:recordingAgency` - Shall contain the full name of the agency 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 QA Section. Approval shall be attached to the PAR that is submitted with the print book for NLS QA 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 QA 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.

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 File Validity

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

3.2.9 Checksum File

An XML file shall be created containing a checksum for each file comprising the DTB. 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 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 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 <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 unprotected 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

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 3.2.9 and included with the DTB. Refer to NLS Specification 1206 for further details about the checksum.

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 ISF 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:

3.3.1.3.1 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.

3.3.1.3.2 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 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, 1205, and 1206.

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 Section 3. 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 in English 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 Audio Encoder

Samples shall consist of the set of compressed audio files submitted as part of the complete DTB required by Section 4.3.1.4.

4.3.1.2 Parser

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

4.3.1.3 Other Validation Tools

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

4.3.1.4 Complete DTB

A complete DTB shall be submitted; the source 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 1.

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 at no cost to NLS.

Requirement	Section	Test Method
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	3.2.10.2	4.6.12.2
Audio Encoder	3.3.1.1	4.6.13

Parser	3.3.2	4.6.14
Other Validation Tools	3.3.3	4.6.15

Table 1 – Qualification Inspection

4.4 Incoming Inspection

Incoming inspection shall be performed by the contractor on source materials provided by NLS.

4.4.1 Inspections

Incoming inspection shall consist of the inspections listed in Table 2.

Requirement	Section	Test Method
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

Table 2 – Incoming Inspection

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 3.

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 3. The checksums calculated from all files on the DTB will be compared to the corresponding checksums in the checksum file.

Requirement	Section	Test Method
Multiple Flash Cartridge Titles	3.1.2	4.6.2
File Names	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
Table 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
SMIL Structure	3.2.3.10	4.6.6.10

SMIL File Size	3.2.3.11	4.6.6.11
Segments	3.2.3.12	4.6.6.12
NCX Validity	3.2.4.1	4.6.7.1
Audio Headings 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
Checksum File	3.2.9	4.6.16
Complete DTB File Conformance	3.2.10.1	4.6.12.1
Files to Include on Each DTB	3.2.10.2	4.6.12.2

Table 3 – Acceptance Inspection

4.6 Methods of Inspection

4.6.1 Delivery Medium

Each DTB shall be tested for compliance with all applicable requirements of NLS Specification 1206.

4.6.2 Multiple Flash Cartridge Titles

A DTB that requires multiple flash cartridges shall have a distInfo file compliant with the requirements of Section 3.2.6 and a set of media-change message files compliant with the requirements of Section 3.1.2.1. The complete DTB shall also 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.

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 SMIL Structure

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

4.6.6.11 SMIL File Size

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

4.6.6.12 Segments

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

4.6.7 Navigation Control File (NCX)

4.6.7.1 NCX 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 Headings 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. See Table 4, Appendix A, for class attributes.

4.6.7.9 pageRefs

Each pageRef shall be examined 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 Package File (OPF)

4.6.8.1 OPF 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 Files

4.6.9.1 distInfo Validity

The distInfo file, if present, 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 Textual Content File 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 Resource File 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 and the NLS hardware player (DA1 advanced player). The 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 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

Any contractor-developed 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 contractor-developed 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 DTB shall conform to the requirements of Section 3.2.9.

5. Warranty

The contractor shall agree to unconditionally warrant each DTB produced for the NLS program for a period of two (2) years. The warranty period shall begin when the NLS QA Section approves the DTB. Books that are found not to be in conformance with this specification shall be reported to the contractor for corrective action. Defective books shall be corrected within fourteen (14) working days.

5.1 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.

5.2 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 of the books at any time during the course of the contract for testing to the specified requirements. The right is reserved by NLS to reject any title that does not meet specifications.

5.3 Site Visits

The right is reserved by NLS to inspect contractor facilities at any reasonable time.

5.4 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 books that meet the specifications. NLS reserves the right to update or discontinue supplied items at any time.

Appendix

A. Book Structure and Class-Attribute Relations

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 "about the author")*	`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	collection of questions and answers	qanda	

Answers			
Recipe		recipe	
Recommended reading	recommended reading before main book content	readings/p	preliminary
References	recommended reading after main book content	readings	concluding
	collection of references before main book content	references/p	preliminary
Resources	collection of references after main book content	references	concluding
	collection of resources before main book content	resources/p	preliminary
Scene	collection of resources after main book content	resources	concluding
	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
Title/Author	time line after main book content	timeline/c	concluding
	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
Volume	vocabulary after main book content	vocabulary/c	concluding
		volume	

Week	as a diary or journal entry	`week`	
Year	as a diary or journal entry	`year`	

Table 4 – Class Attributes

Note:
Book structures with the item "preliminary" will be rendered by the NLS 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 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 when a concluding item is at the beginning of a book.

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

B. OPF Element nls:toneLevel

B.1 Description

The digital talking-book player provided by NLS to patrons annunciates 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 annunciate 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-metatdata element:

```
<meta name="dtb:nlstoneLevel" content="3"/>
```

B.2 Practical Example

One example where nls:toneLevel could be used to improve the user experience would be 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.