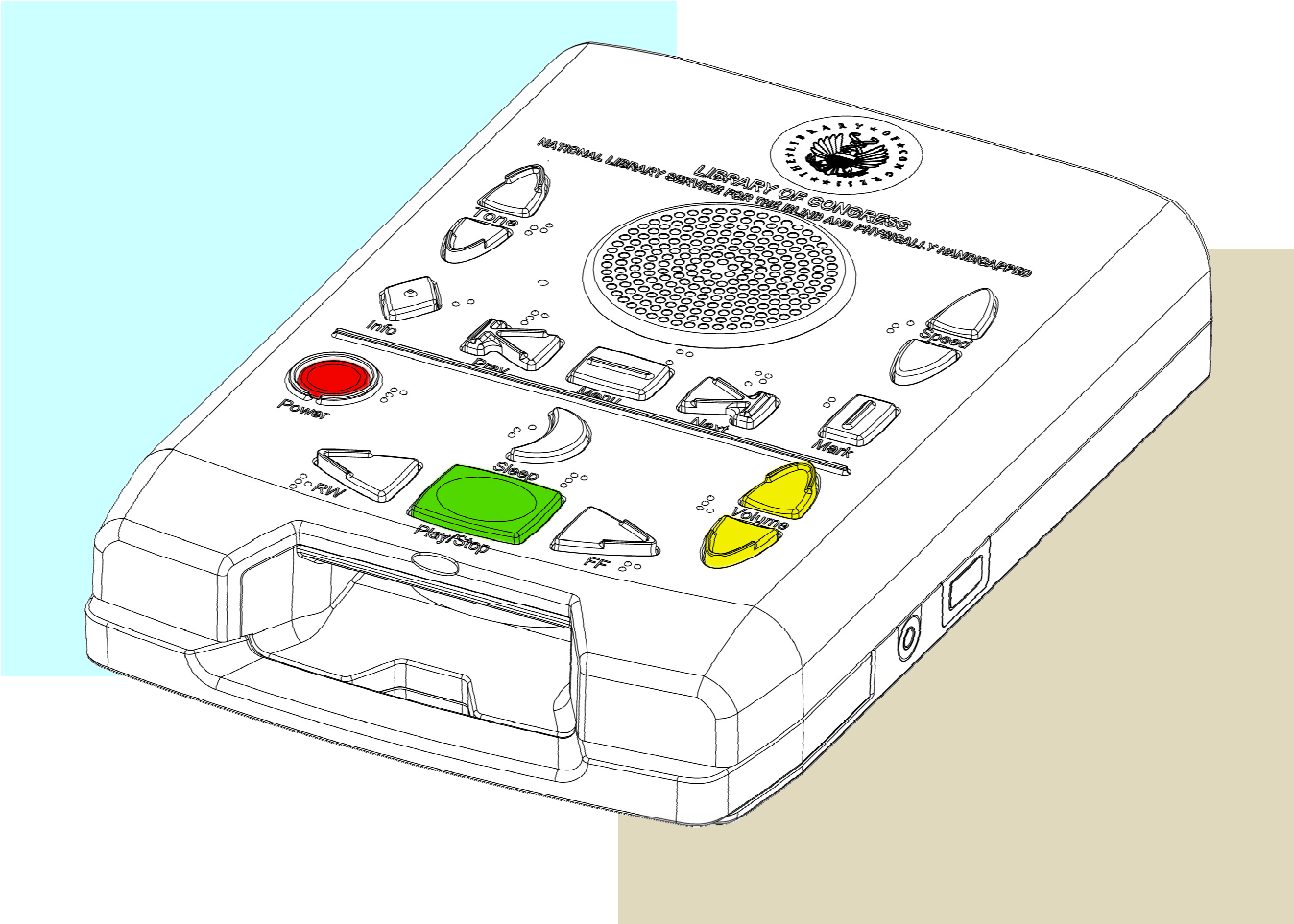
National Library Service for the Blind and Physically Handicapped

The Library of Congress

Digital Talking-Book Player
Models DS1 and DA1

Library Guide



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1 General Information

1.1 General Description

The digital-talking book player is used to play audiobooks stored on USB flash-drive cartridges. These players are supplied to eligible patrons through a network of co-operating libraries under the program administered by the National Library Service for the Blind and Physically Handicapped, Library of Congress in executing United States Public Law 89-522.

The player is able to play digital-talking books (DTBs) structured in ANSI/NISO Z39.86-2002, DAISY 2.02, or CEA-2003 formats. The player can play audio files stored as AMR-WB+, MPEG I/Layer 3 (MP3) and RIFF WAV format, either as part of a talking book or as stand-alone audio files.

The user operates the player using a number of buttons located on the top surface. In addition several player functions occur automatically in response to patron actions or inactions. The player automatically powers on and gives an audible greeting when the patron plugs the power cord into a live AC power outlet. When powered on, the player will start or resume the playing of a DTB automatically when the cartridge is inserted into the player. When operating on battery power and not playing a book, the player will turn off after 30 minutes of inactivity.

There are two models of the digital-talking book player, the Standard Model (DS1) and the Advanced Model (DA1).

Features Common to Both Models

The Rewind, Play/Stop, and Fast Forward controls are centered and located close to the front edge of the player. These primary controls are used to start and stop the book and to move the reading position.

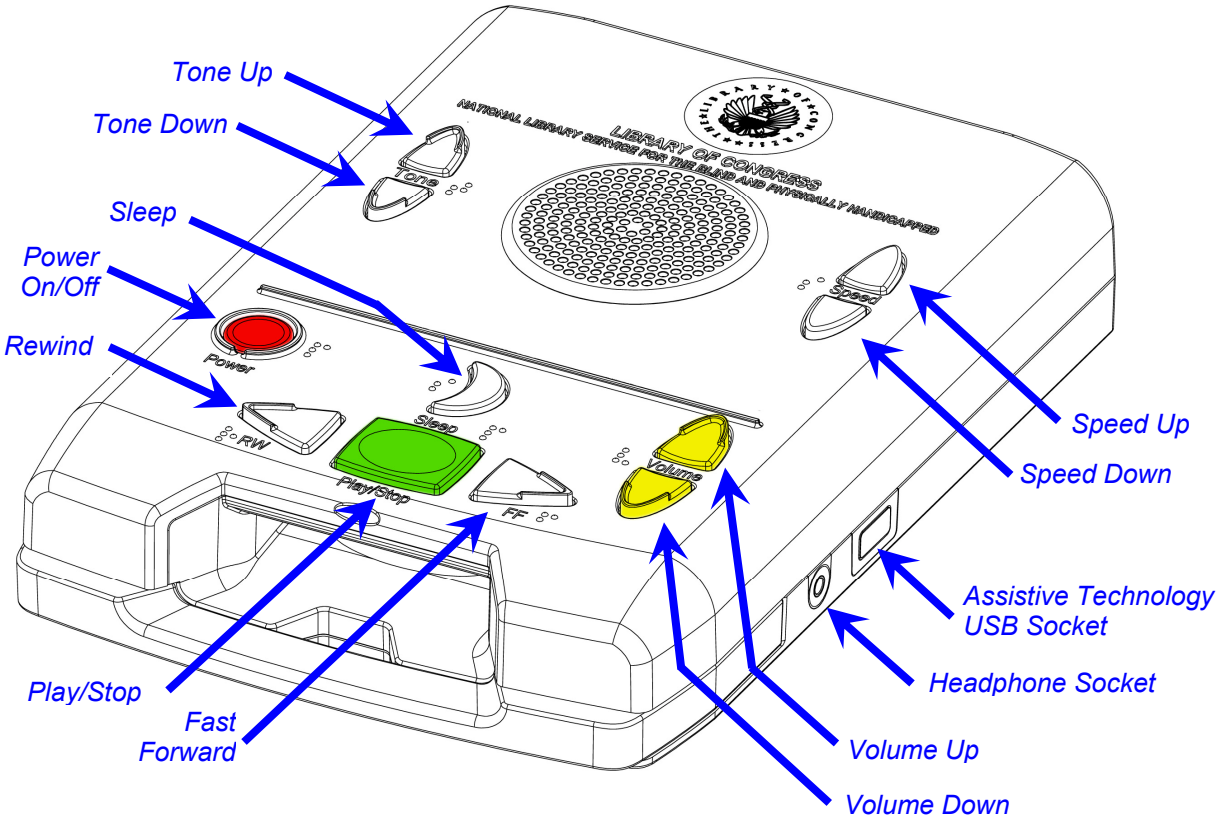

Figure 1-1. Standard Player (DS1)

- The **square, green Play/Stop button** initiates the playing of a book or stops a book or message already playing. Holding this button down on the Standard Player enters and exits the built-in User Guide.
- The **white, triangular Rewind** and **Fast Forward buttons** to the left and right of the Play/Stop button move the reading position through the book, further in time and book structure the longer the button is held down. Periodically the amount of book time traversed is announced, while beeps indicate the crossing of chapter boundaries during both Rewind and Fast Forward.

Just behind the Rewind, Play, and Fast Forward controls are the Power, Sleep, and Volume buttons.

- The **round, red Power button** is pressed to turn the player on and off.[1]
  It is located close to the left edge of the player.
  The Power button can also be used to perform a hardware reset to reboot the player. A hardware reset is accomplished by holding the button down until a beep is heard (more than 7 seconds).
- The **white Sleep button, shaped like a crescent moon**, is used to start or continue playback for 15, 30, 45 or 60 minutes.
  It is centered just behind the Play/Stop button.
  At the conclusion of the sleep period the player's volume will fade and playback will stop.
- The **yellow Volume buttons are shaped like arrowheads and point up and down**.
  They are close to the right edge of the player.

Behind the Power, Sleep, and Volume controls is a raised line running from one side of the player to the other. This line divides the six most frequently used controls on the front of the player from the Tone and Speed controls located behind the raised line and on either side of the round speaker.

The Tone and Speed buttons are shaped like up-and-down arrowheads, like the Volume buttons. They are located between the round speaker and the edges of the player.

- The **Tone buttons** are close to the **top left** edge.
- The **Speed buttons** are close to the **top right** edge.

The Volume, Tone, and Speed controls all announce the direction of adjustment with each press of the button (e.g., "Tone up" or "Tone down", with similar announcements for the other controls). When playing a book, the Advanced Model enunciates the adjustments only by simple beeps, with a second beep to represent the normal or middle setting. The Speed control changes the speed of the speech from 50 percent to 300 percent of normal, with no change in pitch.

The player can be powered from a 120 volt AC wall outlet or from an internal battery pack. The battery pack was designed specifically for this player. It is not replaceable by patrons.

The player is designed to resist entry of small liquid spills and insects. The speaker is water-resistant and further protected by a water-resistant speaker grill cloth. The keypad is seated into channels inside the player housing to resist liquid spills entering the player.

The digital talking-book cartridge is inserted into the cartridge dock opening on the front of the player directly below the Play/Stop button. The cartridge plugs into a USB type A receptacle socket at the rear of the cartridge dock. When the player is powered, inserting a cartridge will start playback automatically.

The player has a pull-out handle located below the cartridge dock opening.

A compartment in the back of the player can be used for power cord storage while using battery power or when the player is not in use.

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[1] When connected to AC power, turning the player off does not disconnect power from the electronics. Most of the controls are disabled; however, the circuit is still active so that battery charging can occur, if necessary.
When the player is turned off while using batteries, power is completely disconnected from all electronics except the battery monitoring integrated circuit.

The cartridge used with the player is about the size of a compact cassette, but with a more complex shape. The end of the cartridge with the round finger hole is beveled, so that when that end of the cartridge is pressed down on a flat surface in front of the player, the other end of the cartridge, with the USB Connector, tilts up and can slide smoothly into the player. The end of the cartridge with the USB connector is also beveled so it will fit into the player only one way.

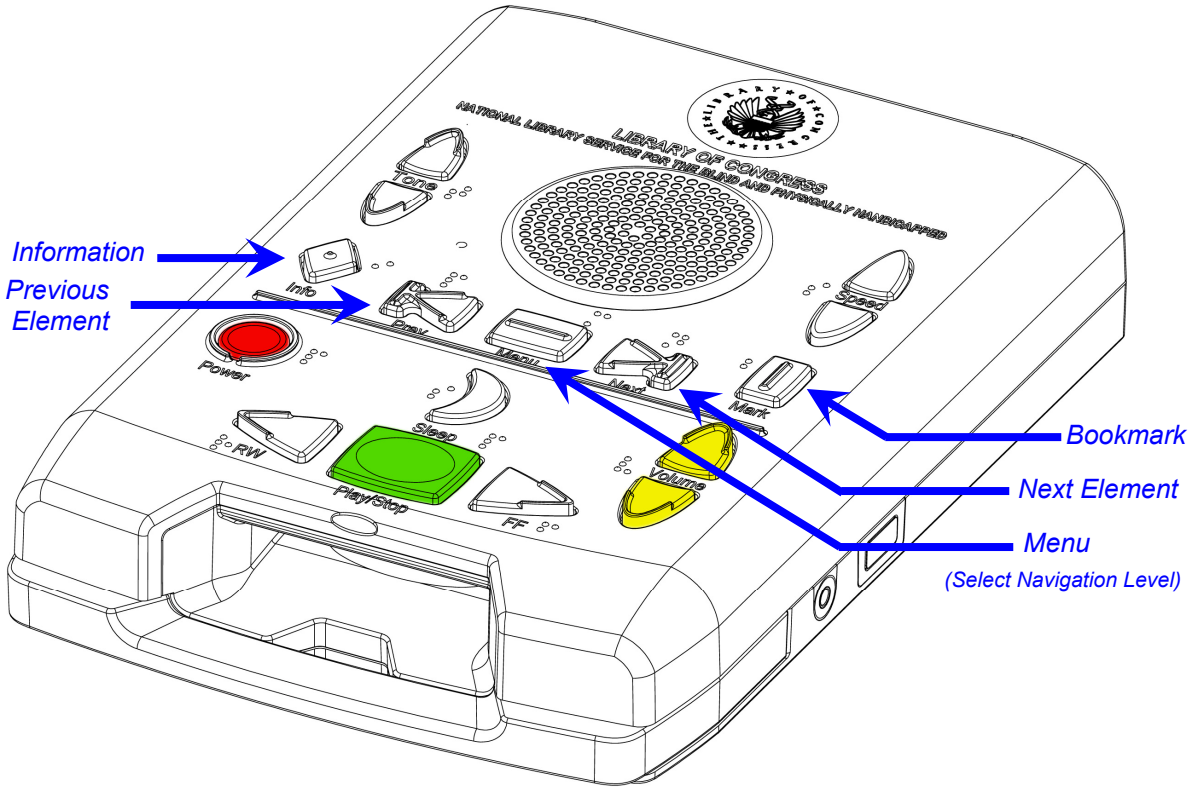


Figure 1-2. Additional Controls on the Advanced Model (DA1)

Advanced Features

The Advanced Model has an **additional row of controls** between the raised line and the round speaker. The advanced controls are for setting and retrieving bookmarks and for navigating through the structured levels of a NISO, Daisy 2.02, or CEA-2003 book.

- The **white, rectangular Menu button** in the center of the player selects the level at which step navigation by the Next and Previous buttons occurs. Pressing this button repeatedly selects progressively finer navigation levels available in a particular book. Navigation by phrase and by bookmark is also selectable.
- The **white, blunt arrow-shaped Previous** and **Next buttons** on the left and right sides of the Menu button respectively move the reading position to the previous or next element in the book. The level at which navigation occurs by the Previous and Next buttons is set by using the Menu button. When set to the bookmark level, the Previous button can be used to go to the beginning and the Next button to move to the end of the book. These are two non-erasable bookmarks.

- The **white, diamond-shaped Information button** near the left edge of the player is used to obtain information about the reading position, the book currently being read, and the power and battery status of the player.
- The **white, rectangular Bookmark button** near the right edge is used to insert and delete bookmarks. Once a bookmark is set, the reading position may be returned to the bookmark by using the Previous and Next buttons provided the bookmark navigation level has been selected with the Menu button. Pressing this button at a previously set bookmark will remove it.

External Connectors

Headphone

A bright green, circular headphone jack is located on the right side of the player. The player accepts headphones with a 3.5 mm (mini) ring, tip, and sleeve plug. It will also accept a mono 3.5 mm (mini) tip and sleeve connector. The player senses the presence of a connector and disconnects the speaker audio output. This output may be used to drive external amplified speakers or a pillow speaker.

USB host

Behind the headphone jack is a USB port. This USB port can be used for several purposes:

- Patrons may connect Assistive Technology (AT) remote control devices to control the player. (Refer to section 2.2.)
- Patrons can connect commercial off-the-shelf USB flash drives[2] to play books obtained from the NLS Internet library.
- Repair personnel may use this port to access diagnostic information during servicing.

This USB receptacle is provided with a cover to protect it when not in use.

Battery

The battery pack comprises 6 Nickel Metal Hydride (NiMH) cells, a self resetting fuse and a 70°C thermostat for safety, and a thermistor for end of charge detection. The nominal capacity of the battery is 2000mAH which will provide approximately 35 hours of play time (at normal speed and normal volume settings). To preserve the service life of the battery, a charge cycle is initiated only if the remaining capacity is estimated to have fallen to less than 75 percent of full capacity. (*Note: unlike many simple consumer devices, the battery is not recharged on application of AC power*)

The player continually monitors the charge state of the battery pack. The battery's self discharge[3] is estimated and is used to modify the capacity measurement.

The player reports the remaining capacity in number of hours of play time available unless this is greater than 75% of the full capacity in which case the player reports "greater than H hours" (where H is 75% of the number of hours that the player can play on a fully charged battery). When the player estimates that the capacity is than half an hour, the announcement will be "Battery Low". If the battery pack has been depleted so that the voltage is less than 6 Volts, and the player is powered on using battery power, the message "Battery Low, Powering Off" is played and the player will immediately power off. Due to the uncertainty of the capacity measurement the player underestimates the actual capacity.

[2] Most but not all commercially available USB flash drives will function correctly as a DTB storage medium. NLS maintains a list of known compatible and incompatible drives.
[3] Self discharge is the loss of stored charge due to chemical reactions within the battery. The rate of self discharge doubles for every 10°C rise in temperature.

It is estimated that the battery pack will have a service life in excess of 600 charge cycles. Under moderate battery usage (4 hours per day for 5 days per week), the battery life should exceed 4 years. At the end of its service life the capacity of the battery pack will be 75 percent of its initial value. A count of the number of charge cycles for the current battery pack is kept by the player. This may be read by library staff through a diagnostic function.

Digital Talking-Book Player Specifications	
Player size	157 mm (6.2 in.) width; 224 mm (8.8 in.) depth; 43 mm (1.7 in.) height
Player volume	151 l cm^3 (93 in^3)
Player weight	1.15 kg (2.52 lb)
Player box size	316.3 mm (12 in.) width; 232 mm (9.1 in.) depth; 97mm (3.8 in.) height
Player overpack (8 players)	480 mm (19 in.) width; 406 mm (16 in.) depth; 318 mm (12.5 in.) height
Book formats	ANSI/NISO Z39.86-2002, Daisy 2.02, CEA-2003
Audio formats	AMR-WB+ (3GP file format), MPEG 1/layer 3, RIFF WAV
Speaker frequency response	200 Hz to 10 kHz (+/- 6 dB)
Headphone frequency response	20 Hz to 20 kHz (+/- 3 dB)
Speaker power (max)	2 W
Headphone power (max)	60 mW
AT remote protocol	USB HID (keyboard and gamepad devices)
AC voltage	120 VAC nominal, 60 Hz
AC current draw	Maximum 9 mA RMS (when charging the battery pack)
DC current draw (nominal)	55 mA
AC protection	1 Ampere fuse: non-replaceable component of the internal AC/DC power supply
DC power	Battery pack: custom nickel-metal hydride, Part No. 42824591310 (7.2 volt nickel-metal-hydride pack: 6 cells in series with a nominal capacity of 2000 mAh)
DC protection	Within battery pack: 2.5 Amp resetable fuse. Thermal fuse at 70° C.

1.2 Abbreviations, Definitions, and Acronyms

Abbreviations and Acronyms	
AT	Assistive Technology
AMR-WB+	Adaptive MultiRate-WideBand+
ANSI	American National Standards Institute
DAISY	Digital Accessible Information System Consortium
DTB	Digital Talking Book
DTBM	Digital Talking-Book Machine
ESD	Electrostatic Discharge
HID	Human Interface Device
IPA	Isopropyl Alcohol
mAh	milliAmpere hour
MLA	Machine Lending Agency
MP3	MPEG-1 Audio Layer 3 Format
NISO	National Information Standards Organization
PC	Personal Computer
PDTB	Protected Digital Talking Book (Using DAISY PDTB2)
Service Center	During the warranty period: the manufacturer; post warranty, the contract repair entity specified by NLS
USB	Universal Serial Bus
VAC	Volts Alternating Current
VDC	Volts Direct Current
WAV	Waveform Audio Format (audio file format variant of RIFF bitstream format)
3GP	Multimedia Container Format defined by the Third Generation Partnership Project
3GPP	Third Generation Partnership Project

1.3 USB Flash Cartridge

The player plays DTBs stored on USB flash drive cartridges. These cartridges contain a type of solid state memory that is nonvolatile and can be rewritten thousands of times. They are resistant to damage by extremes of temperature, humidity, and other environmental conditions expected to be encountered by patrons and libraries.

The cartridge has a feature that enables erasing or rewriting of the contents, but only by authorized parties. Thus, it is impossible for patrons to inadvertently or maliciously alter the contents of the book.

Cartridges are manufactured in several sizes. The nominal capacities are 512 MB and 1 GB and 2GB. About 99.5 percent of NLS DTB titles are less than 1GB in size.

Cartridges accommodate a print and braille label in a slightly recessed area to protect the embossed braille. This label contains two 30-point print lines, four large-print (14-point) lines, and five rows of book information in braille. The underside of the cartridge has an area available for a library-specific label or identifier.

The cartridge has mechanical features that assist handling by physically handicapped persons. It can be inserted into the player in only one orientation.

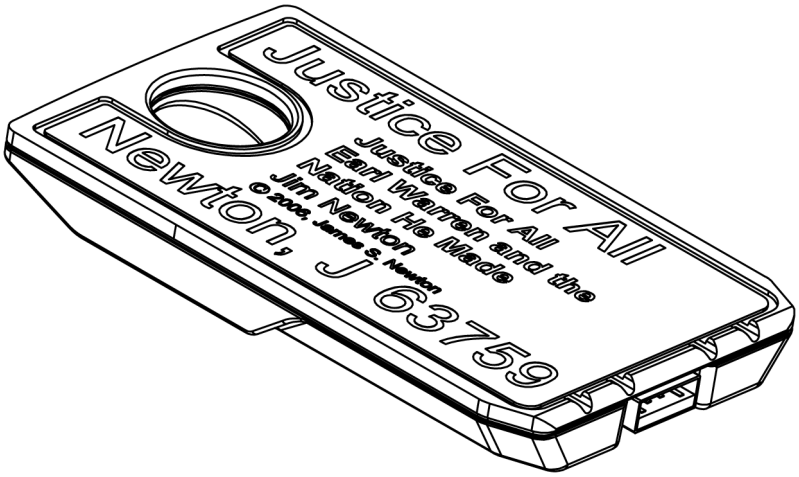


Figure 1-3. USB Flash Drive Cartridge (Top)

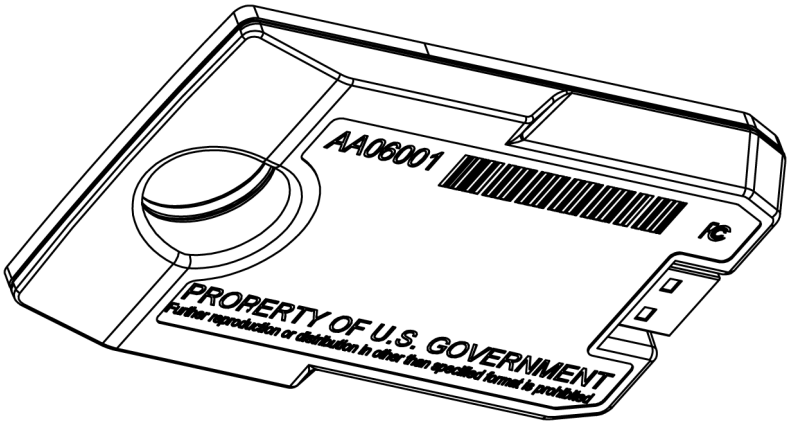


Figure 1-4. USB Flash Drive Cartridge (Underside)

Digital Talking-Book Cartridge Specifications	
Cartridge size	57 mm (2.25 in.) width; 95 mm (3.75 in.) depth; 10 mm (0.39 in.) height
Cartridge weight	37 g (1.3 oz)
Technology	USB high speed mass storage device
Capacity (unformatted)	512 MB, 1 GB, 2GB, 4GB
File system	FAT12, FAT16, FAT32, ext2, ext3
Container size	112 mm (4.4 in.) width; 152 mm (6 in.) depth; 19 mm (0.75 in.) height
Container weight	110 g (3.87 oz)

1.4 Digital Talking Book

A digital talking book is composed of a collection of computer files. These files contain the digitized audio content along with information on the book's structure to permit both random access and linear reading of the material. To play the book, a compatible player requires information on how all the audio files fit together and the location of the book structure elements such as parts, chapters, and optionally page numbers.

Digital talking books created for NLS are built to conform to the ANSI/NISO Z39.86-2002 standard. Using the complete standard, books can be created in many formats such as audio, text, or mixed text and audio. The content of NLS digital talking books contains only human narrated speech. In the following description of the DTB, only those parts of the standard relevant to NLS-produced books are described.

1.4.1 Files That Make Up a Typical DTB

File Name	Description	Purpose
db54321.ppf	Protected **Package file (PPF)**	Book structure
db54321.pncx	Protected **Navigation Control file (NCX)**	Book navigation
db54321-01.smil	**Synchronized Multimedia Integration Language (SMIL) files**	Audio clip organization
db54321-02.smil		
db54321-01.3gp	**AMR-WB+ files**	Compressed audio
db54321-02.3gp		
db54321-03.3gp		
db54321-04.3gp		
db54321-05.3gp		
db54321-06.3gp		
db54321-07.3gp		
db54321ann.3gp	**AMR-WB+ announcement file**	
db54321hdgs.3gp	**AMR-WB+ headings file**	
us-nls-db54321.ao	**Authorization object** contains the symmetric keys for the encrypted files encrypted in the NLS public key	Book protection
dtbsmil110.dtd	**Document Type Definition file**	Administrative files for book validation but not required to play the book
ncx110.dtd	**Document Type Definition file**	
oeb1.ent	**Entity file**	
oebpkg101.dtd	**Document Type Definition file**	
pdtb_protected.smil	Façade Book **SMIL presentation**	Façade Book
protected.mp3	Façade Book **announcement**	
db54321.ncx	Façade Book **Navigation Control file (NCX)**	
db54321.opf	Façade Book **Package file (OPF)**	

Figure 1-5. Example DTB files

1.4.1.1 Package File

The Package file contains administrative information about the DTB, the files that compose it, and how these files interrelate.

The major parts of the Package file are as follows:

- **Package Identity** – a unique identifier for the DTB
- **Metadata** – Publication metadata (title, author, publisher, etc.)
- **Manifest** – A list of files that make up the DTB
- **Spine** – An arrangement of files providing a linear reading order

1.4.1.2 Navigation Control File

The Navigation Control file (NCX) exposes the hierarchical structure of a DTB to allow the user to navigate through it. The NCX is similar to a table of contents in that it enables the reader to jump directly to any of the major structural elements of the document, i.e., part, chapter, or section. However, it will often contain more elements of the document than the publisher chooses to include in the original print table of contents. Other elements such as pages can be included in separate, nonhierarchical lists and can be accessed by the user as well. These NCX elements contain pointers to elements in the SMIL file. Each NCX element has an associated audio label (or tag) that the player renders to notify the user (e.g., "Chapter One"). These labels access clips in audio files directly, not through the SMIL files.

It is important to emphasize that these navigation features are intended as a convenience for users who want them, and not as a burden to those who do not. The NCX is used primarily by the Advanced Model. It does not contain information required for linear playback of the book.

1.4.1.3 SMIL Files

The SMIL (Synchronized Multimedia Integration Language) files contain information that weaves together the various parts of the audiobook into a complete presentation. These files define the order, timing, and location of the audio clips that compose the DTB. There will be one or more SMIL files in each DTB. Each SMIL element will identify an audio file that contains the clip. The start and end times of the clips referenced in the SMIL elements are relative to the audio file and not the entire DTB.

1.4.1.4 Audio Files

The digitized audio files are compressed during the production of the DTB to reduce their size. NLS uses AMR-Wideband Plus (WB+), an advanced compression standard specifically designed for high-quality voice compression. The compressed audio is stored on the cartridge in the 3GP file format.

1.4.1.5 Authorization Object File

The audio files and the content of some other files are encrypted to meet the requirements of copyright law. The keys to decrypt the audio and markup files are unique for each book and are themselves encrypted and stored in the Authorization Object file. The player contains a private key that is used to decrypt the Authorization Object file and recover the book keys required to decrypt the book content. Commercial players that have not been enabled to play NLS books do not contain this key and thus are unable to play NLS protected books.

1.4.1.6 Administrative Files

A DTB contains several files that play no role in rendering the book. These files describe the rules that the book content must follow to be valid. They are used in the production and validation of the DTB.

1.4.1.7 Façade Book

All NLS DTBs actually have a second book contained on the cartridge. This so called Façade Book is played only when the encrypted book cannot be played. A Façade Book will never be heard when playing a book on an NLS player, but it may be played on a third party commercial player that has not been authorized to play NLS books. The Façade Book merely informs users that they are not authorized to read the book.

1.4.2 How the Player Uses the Files

To read a book linearly, that is to say from beginning to end, the player opens the **Package File** and uses the "spine" to identify the sequence of one or more **SMIL file** presentations to play. The **SMIL file** contains a series of pointers to audio clips to be played. These clips are located in the compressed **3GP Audio Files**.

If a user wishes to use the features of the Advanced Model to move directly to a place in hierarchical book structure, such as a chapter, the player will use the information contained in the **NCX file** that will point to the position in a

SMIL file where the chapter begins. The **NCX file** will also have a direct pointer to the audio clip that will render the name of the chapter so that the user can quickly locate the navigation point of interest. Both the standard and advanced players use information in the NCX file to report the book title and reading position location.

Before a protected book can be played, the player examines the **Authorization Object** to determine the secret key required to extract the unique book keys from the **Authorization Object**. If the player has the key required, it will decrypt the book keys and use them in turn to decrypt the book's audio and navigation information. If it does not have the secret key that this book was protected with, it will play the Façade Book.

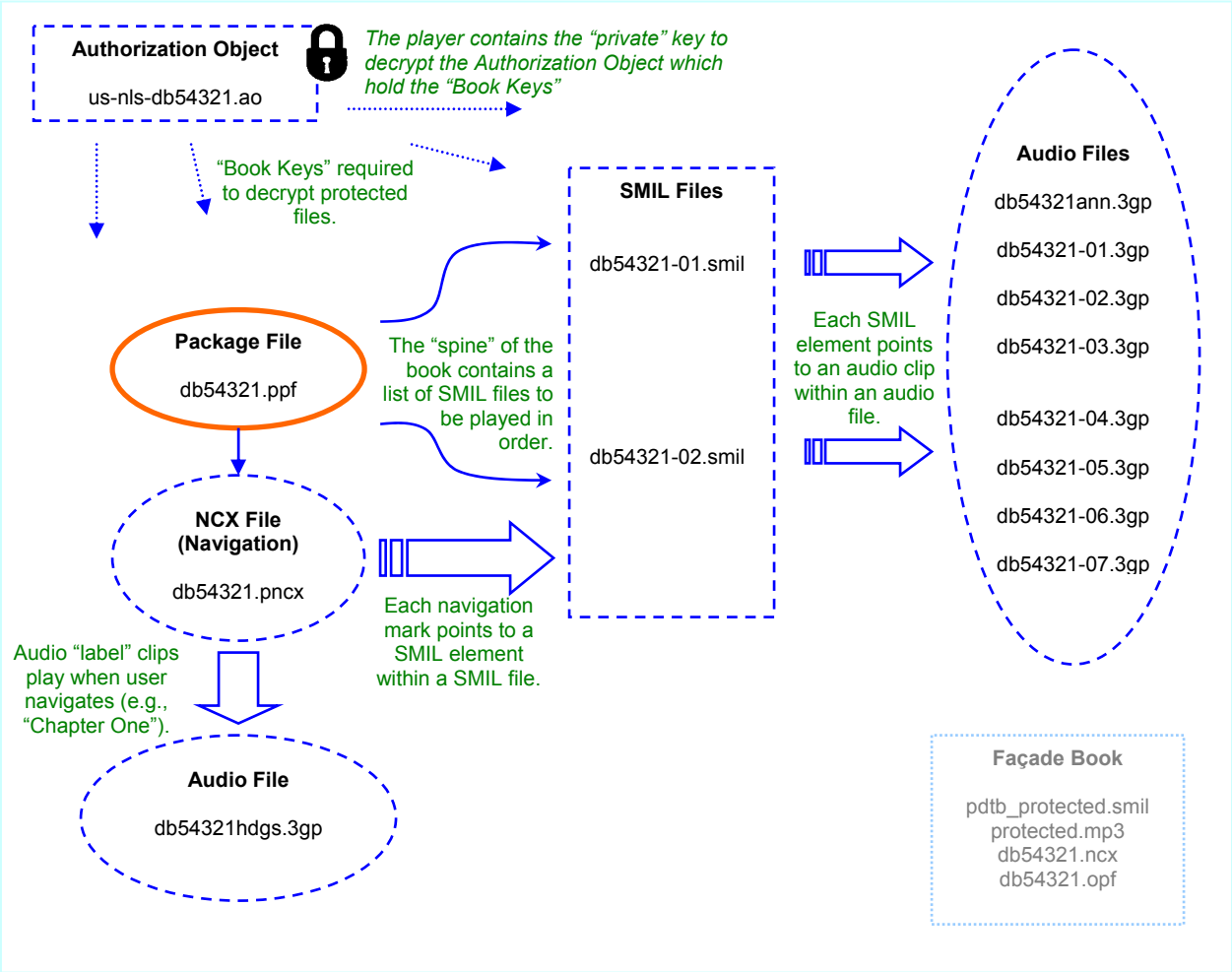


Figure 1-6. Representation of a Typical NLS Digital Talking Book

2 User Operation and Controls

The player responds to user actions by a combination of two processes. The first moves or stops moving the reading position (referred to as navigation) and the second initiates or alters the characteristics (volume, tone, or speed) of the audio rendered by the player.

The reaction of the player to user action is principally affected by

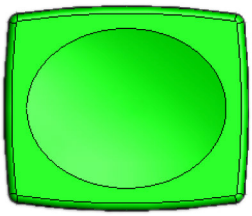
- Whether or not the player is playing a book
- How the book is "marked up," i.e., the type and number of navigation points created when the DTB was produced
- The format of the book on the cartridge (ANSI/NISO Z39.86, DAISY 2.02, CEA2003)
- Whether a cartridge is inserted into the player
- The type of player (Standard Model or Advanced Model) and its verbosity setting
- The sequence and timing of the user actions (e.g., the player may react differently to a press and hold on a control than to a faster press and release)

2.1 Player Controls

The description of player controls in this section refers to several player states:

1. **Primary**
   The usual function for the control. Most controls require a book cartridge with a DTB to be inserted into the player for this function to be available. A simple press and release will always initiate the primary function for the control.
2. **Secondary**
   A control may have several functions depending on how the user operates it. A secondary function will be accessed by an action other than a simple press and release such as holding the button for several seconds.
3. **Key Describer**
   When no book cartridge is inserted in the player, the player is in the Key Describer state. Unless otherwise noted, all buttons will give a brief explanation of their operation when the user presses them in this mode.

Play/Stop



Play/Stop

Primary

Pressing the **Play/Stop** button while the player is stopped starts or resumes playback of the book. Playback resumes from the reading position noted by the player for the current book when playback or navigation last ended.

Pressing the **Play/Stop** button while the player is playing a book or message stops playback and silences the player.

Playback commences automatically upon the insertion of a book cartridge from the last reading position recorded by the player for the particular book on the cartridge or from the beginning if the book has never been played.

When the player is stopped and the reading position is the end of the book, pressing **Play/Stop** once will play a message informing the user of this and that pressing **Play/Stop** again will move the reading position to the beginning of the book.

Secondary (Standard Model only)

Pressing and holding the **Play/Stop** button will switch playback from the DTB on the cartridge, or from the Key Describer, to the built-in **User Guide**. When the User Guide is enabled, it can be read just like a regular DTB. **Pressing and holding** the **Play/Stop** button, when the **User Guide** is enabled will return playback to the cartridge DTB. The User Guide can be entered at any time.

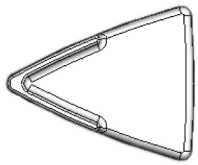
Rewind

Rewind and Fast Forward are the principal means of book navigation for the Standard Model player. The rewind and fast forward behavior of the Standard and Advanced Models are the same; however, users of the Advanced Model will most likely use its other controls to perform most navigation.

Pressing and releasing the **Rewind (RW)** button moves the reading position back 5 seconds.

Pressing and holding the **Rewind** button moves the reading position back at an accelerating rate.

When a **chapter**[4] **boundary** is crossed, a beep is heard. Releasing the Rewind button immediately following a beep will snap the reading position to the beginning of the chapter.



RW

If a chapter boundary is crossed after moving the reading position back 15 minutes, rewind proceeds by chapter (one chapter for each 2 seconds the RW button is held). Until a chapter boundary is crossed the acceleration will increase to a ceiling of 1 hour steps for each 3 seconds that the RW button is held.

Time Rewind held		Reading position moves	
Initial	Press	5	seconds
2	seconds	20	seconds
4	seconds	1	minute
7	seconds	5	minutes
10	seconds	15	minutes
Until a chapter boundary is crossed:			
13	seconds	30	minutes
16	seconds	1	hour
19	seconds	2	hours
Each 3	seconds	+1	hours
Once a chapter boundary is crossed:			
Each 2	seconds	1	chapter

On release of the Rewind button, the chapter name is announced if the reading position has crossed a chapter boundary.

Playback will continue following release of the Rewind button only if the book was playing prior to pressing Rewind.

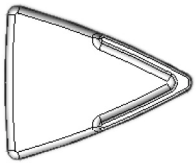
[4] The term "chapter" actually may refer to other navigation levels depending on the particular book. Some books may not be marked with chapter, in which case a navigation level of similar granularity will be chosen.

Fast Forward

Pressing and releasing the Fast Forward (FF) button moves the reading position forward 5 seconds.

Pressing and holding the **Fast Forward** button moves the reading position forward at an accelerating rate.

When a **chapter boundary** is crossed, a beep is heard. Releasing the Fast Forward (FF) button immediately following a beep will snap the reading position to the beginning of the chapter.



FF

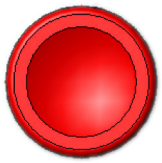
If a chapter boundary is crossed after moving the reading position forward 15 minutes, fast forward proceeds by chapter (one chapter for each 2 seconds the FF button is held). Until a chapter boundary is crossed, the acceleration will increase to 1 hour steps for each 3 seconds that the FF button is held.

Time Fast Forward held		Reading position moves	
Initial	Press	5	seconds
2	seconds	20	seconds
4	seconds	1	minute
7	seconds	5	minutes
10	seconds	15	minutes
Until a chapter boundary is crossed:			
13	seconds	30	minutes
16	seconds	1	hour
19	seconds	2	hours
each 3	seconds	+1	hours
Once a chapter boundary is crossed:			
each 2	seconds	1	chapter

On release of the Fast Forward button, the chapter name is announced if the reading position has crossed a chapter boundary.

Playback will continue following release of the Fast Forward button only if the book was playing prior to pressing Fast forward unless the end of the book is reached.

Power



Power

Primary

Pressing the **Power** button turns the player on and off when it is being powered from the battery. When the player is powered by AC, the **Power** button enables and disables the keypad and USB ports, but part of the circuit is always powered (battery monitoring/charging).

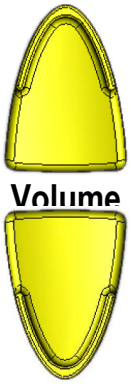
The player turns on automatically when AC power is applied.

Secondary

Pressing and holding the **Power** button for 7 seconds will apply a hardware reset to the microprocessor. This should be necessary only when the player has become unresponsive to other controls. Resetting the player does not erase any stored data or bookmarks.

Key Describer

If the player has no cartridge inserted, **pressing** the **Power** button plays an informative message describing the use of the **Power** control and the remaining battery capacity. Pressing the **Power** button again during this message or shortly thereafter turns the player off.



Volume

Pressing the **Volume Up** or **Volume Down** button adjusts the audio volume. Each press of the control will make one adjustment. There is a total of 45 dB of volume control in 15 steps. Each step is either three or four dB. The lowest volume setting will not mute the audio output.

A distinct double beep sounds when the volume is adjusted to the maximum or minimum to inform the user that no more adjustment is available.

If the volume is adjusted to the lowest setting when the machine is powered off, it will be reset at a slightly higher level when the player is subsequently turned on. This is done to ensure that the user can hear the player power up.

Sleep

Primary

Pressing the **Sleep** button starts both playback and a timer that will turn the player off after 15 minutes. If the button is pressed again, within 5 seconds, the sleep timer is increased in 15 minute steps up to 1 hour. When the timer expires the audio will fade out over 5 seconds and playback will stop.

Pressing the **Play/Stop** button while the sleep timer is active will disable the sleep function. Pressing any other controls, such as volume, will have no effect on the sleep timer.

Secondary

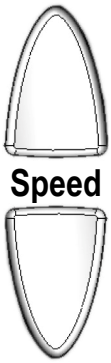
The player's **serial number** and **software version** can be played by rapidly pressing the **Sleep** button 10 times or more when a cartridge is not inserted. The informational message will repeat until the **Play/Stop** or **Power** button is pressed.

Tone

Pressing the **Tone Up** or **Tone Down** buttons adjusts the tonal quality of the player audio. The treble (high frequencies) can be boosted by up to 10 dB with the **tone up** control, and the bass (low frequencies) can be accentuated by the same amount with the **tone down** control (compared to the mid setting, which is flat). At the extreme **Tone Up** setting, there is a 10 dB boost in treble and a 10 dB cut in bass. An analogous effect occurs at the extreme **Tone Down** setting.

A distinct double beep sounds when the tone is adjusted to maximum or minimum to inform the user no more adjustment is available. A different beep and announcement sound at the neutral tone setting.

The tone adjustment is only active when a book cartridge is inserted. When a book cartridge is inserted for the first time, the player sets the tone level to neutral. The player remembers the setting for each book so that the tone setting for that book is recalled when the book cartridge is reinserted.



Speed

The speed of playback is adjustable using the **Speed Up** and **Speed Down** buttons. The speed is adjustable from one half to three times normal. That is to say if a book took a narrator 7 hours to narrate, it would take 2 hours and 20 minutes to render at the fastest setting. The pitch of the audio at all speed settings remains the same.

A distinct double beep sounds when the speed is adjusted to maximum or minimum to inform the user no more adjustment is available. A different beep and announcement sound at the normal speed setting.

The speed adjustment is only active when a book cartridge is inserted. When a book cartridge is inserted for the first time, the player sets the speed level to normal. The player remembers the setting for each book so that the speed setting for that book is recalled when the book cartridge is reinserted.

Controls Exclusive to the Advanced Model (DA1)

Information

Info

Primary

Pressing the **Information (Info)** button gives information on the book and on the player state. Information given for an ANSI/NISO book:

1. Current position in the book (i.e., chapter)
2. Current page number (if pages are marked in the book)
3. Total book time elapsed
   Total book time remaining (at 1x play speed)
   Total book time
4. Book Title
5. AC or battery powered
   Estimated time the player will play a book on battery

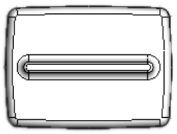
Different information plays for Daisy 2.02 or CEA2003 books or for a collection of audio files.

Pressing the **Info** button while a message is being played will interrupt the rendering of the information element and advance to the next information message.

Secondary

Pressing and holding the **Info** button for 1.5 seconds will switch playback from the DTB on the cartridge, or from the Key Describer, to the built-in **User Guide**. When the User Guide is enabled, it can be read just like a regular DTB. Pressing and holding the **Info** button, while the **User Guide** is enabled will return playback to the cartridge DTB.

Menu



Menu

Pressing the **Menu** button selects the navigation level at which the **Previous** element and **Next** element buttons operate. The levels available depend on the particular book. Many books will be marked at the chapter level only, while some will mark parts and chapters or chapters and sections. Recipe books are likely to have recipe and page levels.

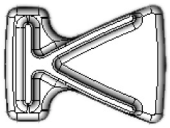
The **Phrase** level actually permits navigation by SMIL segments or one minute intervals, if its length is over one minute. The SMIL file weaves together all the components of the book (audio fragments for NLS books) into a continuous "presentation." Book producers can mark significant points as SMIL segments without explicitly making them navigation points such as chapters or pages. For example, each ingredient of a recipe may be a distinct SMIL segment. Thus, at the phrase level, a recipe can be heard ingredient by ingredient by using the **Next** element button.

The menu button is only active when a book cartridge is inserted. When a book cartridge is inserted for the first time, the player sets the navigation level to the highest (coarsest) available. The player remembers the setting for each book so that the navigation level set for that book is recalled when the book cartridge is reinserted.

Secondary

Pressing and holding the **Menu** button for 2 seconds will set the navigation level to the highest (coarsest) level.

Previous



Prev

Primary

Pressing the **Previous (Prev)** element button moves the reading position to the beginning of the previous navigation element at the hierarchical level selected by the **Menu** button (chapter, section, page, bookmark, etc.)

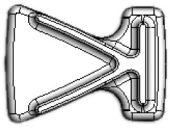
The player reacts differently depending on the current navigation level and whether the player is playing the book prior to the **Previous** element action:

Navigation level (set with Menu)	State	Action
Part, chapter, section, poem, etc.	Playing	1. The reading position moves to the beginning of the previous part, chapter, section, poem, etc. 2. The book will play continuously from the new reading position. NLS books will have the name of the part, chapter, section, poem, etc. recorded at this point.
	Stopped	1. The reading position moves to the beginning of the previous part, chapter, section, poem, etc. 2. The book will play the audio element tag associated with that part, chapter, section, poem, etc. of the book and then stop.
Bookmark	Playing	1. The reading position moves to the first bookmark prior to the current reading position or to the beginning of the book if no bookmark was set. 2. The book will play the lowest navigation level audio element (e.g., the section title if chapter and section is present) and the elapsed book time at the bookmark. Then the book will play from the bookmark.
	Stopped	1. The reading position moves to the first bookmark prior to the current reading position or to the beginning of the book if no bookmark was set. 2. The book will play the lowest navigation level audio element and the elapsed book time at the bookmark. Then at least 5 seconds of audio from the bookmark up to the end of the current SMIL segment or 10 seconds, whichever is shorter.
Phrase	Playing	1. The reading position moves back 1 minute or to the beginning of the SMIL segment prior to the current reading position, whichever is shorter. 2. The book will resume playing at that point.
	Stopped	1. The reading position moves back 1 minute or to the beginning of the SMIL segment prior to the current reading position, whichever is shorter. 2. The book will play at least 5 seconds of audio up to the end of the current SMIL segment or 10 seconds, whichever is shorter.

Secondary

Pressing and holding the **Previous** button moves the reading position back five navigation elements at the hierarchical level selected by the **Menu** button or 10 pages at the page level.

Next



Next

Primary

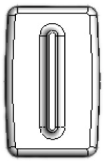
Pressing the **Next** element button moves the reading position to the beginning of the next navigation element at the hierarchical level selected by the **Menu** button (e.g., chapter, section, page, bookmark, etc.)

The player reacts differently depending on the current navigation level and whether the player is playing the book prior to the **Next** element action:

Navigation level (set with Menu)	State	Action
Part, chapter, section, poem, etc.	Playing	1. The reading position moves to the beginning of the next part, chapter, section, poem, etc. 2. The book will play continuously from the new reading position. NLS books will have the name of the part, chapter, section, poem, etc. recorded at this point.
	Stopped	1. The reading position moves to the beginning of the next part, chapter, section, poem, etc. 2. The book will play the audio element tag associated with that part, chapter, section, poem, etc. of the book and then stop.
Bookmark	Playing	1. The reading position moves to the first bookmark following the current reading position or to the end of the book if no bookmark was set. 2. The book will play the lowest navigation level audio element (e.g., the section title if chapter and section are present) and the elapsed book time at the bookmark. Then the book will play from the bookmark or will stop if at the end of the book.
	Stopped	1. The reading position moves to the first bookmark following the current reading position or to the end of the book if none was set. 2. The book will play the lowest navigation level audio element, the elapsed book time at the bookmark, then at least 5 seconds of audio from the bookmark up to the end of the current SMIL segment (or "End of book if appropriate), or 10 seconds, whichever is shorter.
Phrase	Playing	1. The reading position moves forward 1 minute or to the beginning of the SMIL segment following the current reading position, whatever is shorter. 2. The book will resume playing at that point.
	Stopped	1. The reading position moves forward 1 minute or to the beginning of the SMIL segment following the current reading position, whatever is shorter. 2. The book will play at least 5 seconds of audio up to the end of the current SMIL segment or 10 seconds, whichever is shorter.

Secondary

Pressing and holding the **Next** button moves the reading position forward five navigation elements at the hierarchical level selected by the **Menu** button or 10 pages at the page level



Bookmark

Pressing the **Bookmark (Mark)** button will insert a bookmark at the current reading position.

If the book is playing, pressing the **Bookmark** button when the reading position is within 5 seconds of an existing bookmark will remove it. If not playing, the reading position must be exactly at the existing bookmark to remove it.

2.2 Player Controls Using Assistive Technology Devices

The player has a second USB host port that may be used to control the player remotely. Assistive Technology (AT) devices acting as a keyboard or a gamepad can be used to operate the player like the integral keypad. The AT device can be configured to map its keys to each of the player's own keys (with the exception of the Power button). This mapping is performed through a learning mode. The regular controls are still active when an AT device is connected, thus the player can be controlled by either the integral keypad or the AT device.

2.2.1 Default AT Device Assignments

If a control has not been assigned through the learning process then the player controls will be mapped to default buttons on a keyboard or gamepad USB human interface device. These default assignments are shown in the table below.

Player control	Keyboard button (Numeric keypad)	Gamepad button
Play/ Stop	0	1
Sleep	. (decimal point)	2
Volume Up	8	3
Volume Down	2	4
Rewind	4	5
Fast Forward	6	6
Speed Up	9	7
Speed Down	3	8
Tone Up	7	9
Tone Down	1	10
Bookmark	/ (slash)	11
Menu	*	12
Previous	- (minus)	13
Next	+	14
Info	5	15

2.2.2 AT Device Learning Mode

The player can be instructed as to which controls on the AT device are to operate particular player functions. This assignment is performed through a learning process.

Entering AT Device Learning Mode

Connect the AT device to the USB port on the side of the player.

To enter the learning mode press and hold the Sleep button for 5 seconds **while in Key Describer mode** (the player is on but has no cartridge inserted). An **AT device must be connected** to the player in order to enter learning mode. If no AT device is found, the message **"No remote control device found. Ensure your remote control device is connected before entering learning mode"** is played. The player then returns to Key Describer mode.

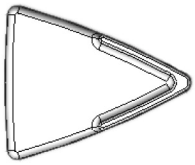
Press and hold for 5 seconds

Sleep

Initiating AT Learning Sequence

Audio prompts will lead the user through the learning sequence. The first prompt asks the user to press the **Fast Forward button to start** the learning process or **the Power button to exit**.

then press



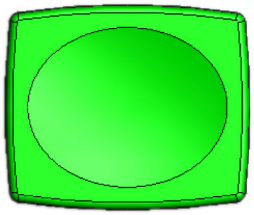
FF

Assigning Player Functions to the AT Device Buttons.

Player controls are assigned by first pressing the button on the player then pressing the control on the AT device that is to be assigned that function.

This is repeated for all controls to be assigned.

Press the player button to be assigned *(example: Play)*



Play

then

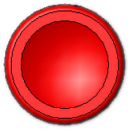
Press the control on the AT device to be assigned

Exit AT Learning Sequence

Press the Power button to exit the learning mode.

If an assignment has been started but not completed, pressing the Power button will cancel the assignment. The player will remain in AT learning mode.

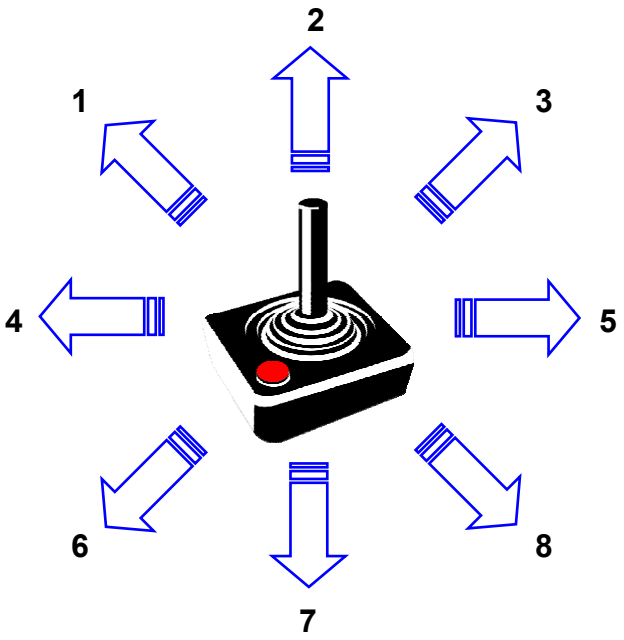
Press to exit



Power

2.2.3 USB Joystick

Patrons with physical disabilities may find it simpler to move a joystick than to press a button. The two-axis (x,y) USB joystick of a gamepad can be used to control the player. Movements of the joystick to the top-left, top-center, top-right, left, right, bottom-left, bottom-center, and bottom-right positions can be assigned to player controls using the learning mode. (Refer to diagram below.) There are no default assignments for these joystick movements.



3 Special Features for Libraries and Technicians

This section describes the different levels of error reporting and diagnostics available to personnel involved in lending and servicing players. Four diagnostic levels are available:

- **Library** level is intended for use by librarians, technicians and service center personnel.
  Control is through the keypad buttons and messages are rendered as audio.
  Note: *Patrons may hear Level 1 error announcements when problems occur.*
- **Technician** level is intended for use by librarians, technicians, and service center personnel.
  Control is through keypad buttons, and messages are rendered as audio.
- **Technician Plus** level is intended for use by advanced technicians and service center personnel.
  A serial terminal or computer running a terminal emulator program is attached to the player's USB AT port through a USB null modem cable or USB-to-serial adapter.
  Use of this mode is described in the Repair and Service Center Manuals.
- **Developer** level is intended for use by software developers and service center personnel.
  A serial terminal or computer running a terminal emulator program is attached to the player's internal serial port.
  Use of this mode is described in the Service Center Manual.

Descriptions of how to access and use the **Library** and **Technician** levels are provided in this section.

General Procedures

Hardware Reset

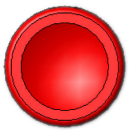
If the player stops responding to commands, it may be necessary to perform a hardware reset to restart the player. To perform a hardware reset, **press and hold the Power button** until a beep is heard (more than **7 seconds**).

The player will reboot. A hardware reset can be performed whether the player is plugged in or not, or whether a cartridge is inserted or not.

A hardware reset should not be necessary under normal circumstances.

Note: *A hardware reset will **not** erase any bookmarks or stored diagnostic information.*

Press for more than 7 seconds



Power

Obtaining Player Serial Number and Software Version Number with Keypad

The serial number and the version of software currently installed on a player can be obtained without entering a diagnostic level. Press the **Sleep** key **10 times** or more within 1minute, without the presence of a book cartridge, and the player will announce both the serial number and the installed software version number.

Press 10 times

Sleep

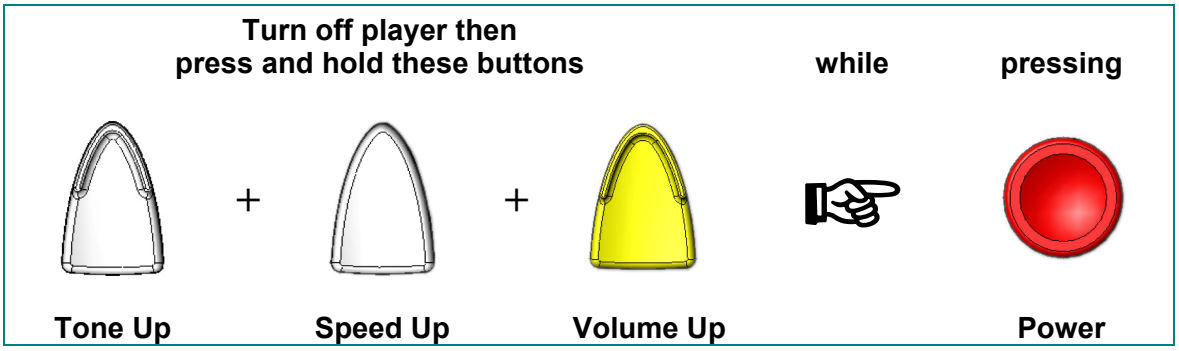
Resetting to Factory Default User Settings

Resetting the player to factory default user settings

- Erases the saved current position of the book's history
- Erases all bookmarks
- Restores the default values for the volume, tone, and speed settings
- Sets the machine language to English

Battery statistics are **not** affected.

To reset the player to factory default settings, turn the player on while pressing and holding the Tone Up, Speed Up, and Volume Up buttons.



The message "Creating new profile" is played to confirm the operation has been performed successfully and the profile data in the volatile memory have been reset. **The player must then be powered off normally to save the newly blanked profile data to nonvolatile memory.**

Memory Test

To enter the different diagnostic levels described in this section, the player RAM memory needs to be functional. To ensure that the player's memory is functional, a memory test is automatically executed upon entering any diagnostic level.

This step will take several seconds during which time the player will not make any sounds or announcements.

If the memory test succeeds, the player will proceed to the selected diagnostic level.

If the memory is nonfunctional, the player will attempt to "beep" repeatedly for 5 seconds before shutting down. If the audio is not operational or if the memory is too damaged, users will not receive any feedback. In this event, the player will need to be sent for servicing.

The reliability of the player's memory is extremely high. It is very unlikely that libraries will find players with memory problems.

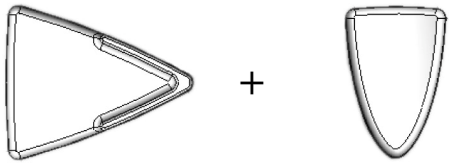
Changing Level of Verbosity

The verbosity of the player's announcements can be modified. In the **reduced verbosity** configuration the following messages are not rendered:

- The initial "forward" or "back" message in response to the user pressing the **Rewind** or **Fast Forward** button.
- The tone, volume, and speed up and down messages in response to users pressing those buttons while the book is playing. ***Note:*** *This is the default behavior of the Advanced Model (DA1); it is only a change in behavior of the Standard Model(DS1).*

To configure the player for **reduced verbosity**, press and hold the Fast Forward button then the Speed Down button so that both buttons are held down simultaneously for 2 seconds when the player is in Key Describer mode (no cartridge inserted).

Reduced Verbosity: With no cartridge inserted, Press and hold these buttons simultaneously for 2 seconds

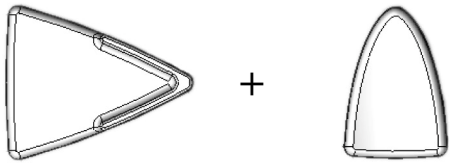


Fast Forward **Speed Down**

The message "Reduced verbosity" confirms the operation has been performed successfully.

To return the player to **normal verbosity**, press and hold the Fast Forward button then the Speed Up button so that both buttons are held down simultaneously for 2 seconds when the player is in Key Describer mode (no cartridge inserted).

Normal Verbosity: With no cartridge inserted, press and hold these buttons simultaneously for 2 seconds



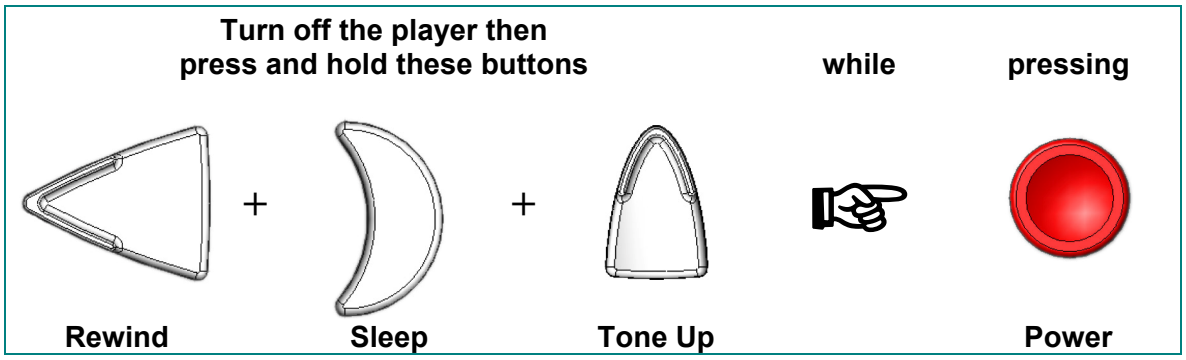
Fast Forward **Speed Up**

The message "Normal Verbosity" confirms the operation has been performed successfully.

3.1 Library Diagnostic Operations (via Keypad)

The Library diagnostic level is accessed using only the keypad, with prompts and results rendered as audio announcements. Library-level errors are announced at the time they occur and are recorded for later analysis. Patrons may hear library-level error messages when they occur.

To enter the Library diagnostic level:



To exit the Library Diagnostic level

- Power off the player, or to exit and erase the errors, hold the Sleep button down for 5 seconds.

Errors may occur in the normal course of operating the player causing a descriptive message to be played regarding the nature of the error detected. Player subsystems that generate error messages are

- **Cartridge:** Problem with the main USB port (over-current), an unreadable cartridge, any cartridge playback problem under normal conditions, or an unsupported USB device at the cartridge USB port

  Note: *Cartridge errors can occur if a cartridge is removed while playing a book. This error is benign and can be ignored.*
- **AT device:** Problem with the AT device port (over-current), an unreadable cartridge, any cartridge playback problem under normal conditions, or an unsupported USB device at the AT USB port.
- **Power:** Problems related to a bad battery or battery recharge
- **System:** Writing problem related to the internal flash memory during a software upgrade

It is expected that patrons encountering a recurring and persistent status "error" during use will seek technical support from the appropriate lending institution.

Possible audio announcements indicating a problem are **"Cartridge error," "AT device error," "Power error,"** and **"System error."**

The occurrence of an error of each type is recorded in the player's memory and can be retrieved in either Library or Technician diagnostic level (menu item: Player Status).
Note that cartridge and AT device errors could be caused by a cartridge or device not connected to the player when the status information is given. The information is saved for later analysis when the errors actually occur.

Depending on the severity of a System error, **the system may not be able to save the information related to the problem in the player's memory**. Minimal information from the internal flash memory must be read to execute this diagnostic level. If a system error is announced, the player should be returned to the library for service.

3.1.1 Library-Level Diagnostic Message Retrieval

Library diagnostic functions enable the playback and erasure of error messages that have been recorded in the player's memory. This capacity is expected to be useful for telephone support when librarians may be able to instruct patrons to enable their player to recall saved error messages. By holding the telephone microphone near the player speaker, the librarian can hear the error codes and then discuss the recent history of the player with the patron to try to establish what caused the error and the appropriate action to take.

The player must be turned off before activating the Library diagnostic level. To activate the Library diagnostic level, turn off the player then press and hold the **Rewind**, **Sleep** and **Tone Up** keys and then press the **Power** key.

When the Library diagnostic level is entered, the following steps and announcements occur:

1. **Power On beep:** The player boots, and the memory test is performed.
   This step may take a few moments.
2. Audio announcement **"Player Status"**
3. Audio announcement **"Cartridge OK"** or **"Cartridge Error"**
4. Audio announcement **"AT Device OK"** or **"AT Device Error"**
5. Audio announcement **"Power OK"** or **"Power Error"**
6. Audio announcement **"System OK"** or **"System Error"**

The five audio announcements listed above are repeated in a loop until the **Power** key is pressed and held for at least 2 seconds or the **Sleep** key is pressed and held for 5 seconds.

Pressing and holding the **Power** key for at least 2 seconds will cause the player to exit the Library diagnostic level and turn off. Errors are NOT erased from memory so the error messages can be replayed at a later time by returning to the Library diagnostic level.

Pressing the **Sleep** key and holding it for at least 5 seconds will cause the player to exit the Library diagnostic level, erase errors from memory, and turn off.

Audio on the player must be functioning for the Library diagnostic level to be used. If no sound is audible, try the following steps to restore audio:

- Increase the volume level.
- Reset the player by pressing and holding the Power button for 7 seconds (until a beep is heard).
- Try using headphones. It is possible that the speaker audio has failed but the headphone audio is functioning normally.

If these efforts fail, the player requires service.

Announcement	What the Announcement Means
Cartridge OK	The player has not recorded any error codes related to book cartridges or the cartridge USB port.
Cartridge Error	An error event has occurred related to a cartridge (or another device) inserted into the cartridge USB port. The player was unable to read the cartridge, but was able to detect that a USB device had been inserted. ***Troubleshooting****[first exit the Library diagnostic level (hold Sleep button for 5 seconds)]* ***Note:*** *Cartridge errors can occur if a cartridge is removed while playing a book. This error is benign and can be ignored. Cartridge errors are significant only if they are persistent and repeatable.* Try another cartridge: • If it works, return the bad cartridge to the library. • If several cartridges fail, the player should be returned to the library for serving.

Announcement	What the Announcement Means
AT Device OK	The player has not recorded any error codes related to the AT device port.
AT Device Error	An error event occurred when a USB device was plugged into the AT device port. The player was unable to recognize it as a supported device but was able to detect that a USB device had been plugged in. ***Troubleshooting****[first exit the Library diagnostic level (hold Sleep button for 5 seconds)]* ***Note:*** *AT Device errors can occur if an AT device or USB flash drive is removed while playing a book. This error is benign and can be ignored.* If the AT device or USB flash drive that caused the error will not work correctly with the player, perform the following steps: **1. Is a detection "beep" heard when plugging a device into the port?** **a) No**, the device was not detected by the player. ⇒ Perform the same test with an AT device or USB flash drive that is known to be functional. If a detection beep is not heard, there is a problem with the AT USB port. The player should be returned to the library for serving. **b) Yes**, a USB device has been detected by the player. ⇒ Continue with step 2. **2. Is the device that is plugged in the AT device port supported by the player?** **a) No**, not supported or unsure. ⇒ If unsupported, the device cannot be used with the player. ⇒ The AT device or USB flash drive may be faulty: • Test the AT device port with a supported device known to be functional. **b) Yes**, supported devices are USB flash memory drives or AT devices (implemented as keyboard or gamepad USB human interface devices). ⇒ Continue with step 3.

Announcement	What the Announcement Means
	3. In the case of a **USB flash memory drive**, files contained must be in main directory. The drive may contain an NISO/DAISY/CEA book or individual audio files. Audio files must be in 3GP, MP3, or WAV format (ex: 57739-0003.3gp, 57833-0004.mp3 or P010.wav). **Is the cartridge content valid?** **a) Yes**, the USB flash drive contents are valid. ⇒ Try a USB flash drive that is known to work correctly. ⇒ Redo tests by erasing all files, reformatting, and copying a single 3GP, MP3, or WAV file to the USB flash drive. • If the player is able to the read file, the USB flash drive and player are in proper working order. The problem resides with the contents of the cartridge. • If the player is unable to read the file, the player should be returned to the library for serving. **b) No**, cartridge contents are not valid. ⇒ The player is working correctly but cannot be used to play the material. **4.** In the case of an **AT device**, redo the preceding tests with a cartridge or other AT device supported by the player to validate proper functioning of AT device port.

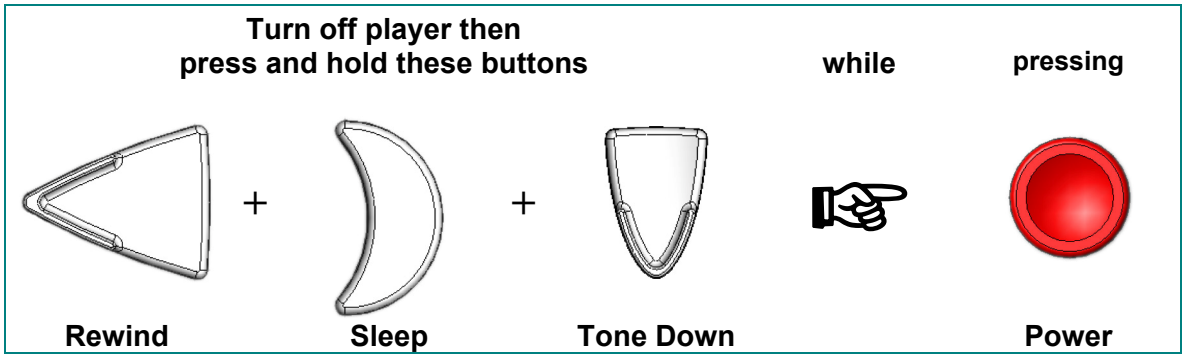
Announcement	What the Announcement Means
Power OK	The player has not recorded any error codes related to the battery or the battery recharge.
Power Error	A problem with the battery pack was detected. A critical fault occurred when attempting to recharge the battery. ***Troubleshooting*** The battery pack may have faulty cell(s) or the player's battery charger may have a problem. ⇒ The player should be returned to the library for servicing.

System Announcement	What the Announcement Means
System OK	The player has not recorded any error codes related to the RAM or flash memory.
System Error	The player has detected an internal error. This error is generated if a player runs out of memory or when an error writing to the flash memory has been detected during a software upgrade. ***Troubleshooting*** If the player does not function correctly **and this error is persistent**, the player must be sent to an NLS service center for repair.

3.2 Technician Diagnostic Operations *(via Keypad)*

The Technician diagnostic level is accessed using only the keypad, with prompts and results rendered as audio announcements. There are two methods to enter the Technician diagnostic level. The first is by holding the Rewind, Sleep and Tone Down buttons while turning the player on by pressing the Power button. The second method is to use a USB flash cartridge containing a file named options.xml that contains the directive to do this.

To enter the Technician diagnostic level:



or

Insert a USB cartridge containing the file 'options.xml' containing:

```
<?xml version="1.0" encoding="utf-8"?>
<dtbm xmlns="http://www.loc.gov/nls/DTBM">
    <configuration>
        <InitialMode value="technician">
    </configuration>
</dtbm>
```

To exit the Technician diagnostic level:

Power off the player.

3.2.1 Introduction

The Technician diagnostic level is intended primarily for use by librarians and technicians. At this level, access to an audio interactive menu is provided to check the current condition of the player's systems, read accumulated usage statistics, and adjust various settings.

Audio on the player must be functioning to use the Technician diagnostic level.

A series of diagnostics is available from a menu that it is entered with a special key combination at start-up.

3.2.2 Accessing and Navigating Using the Keypad

Press **Fast Forward** or **Rewind** key to cycle through the Main Menu until you reach the submenu of your choice. Press **Play/Stop** to enter a submenu. Use the **Fast Forward** or **Rewind** key to cycle through the commands within a submenu. Press the **Play/Stop** to execute a command within the submenu.

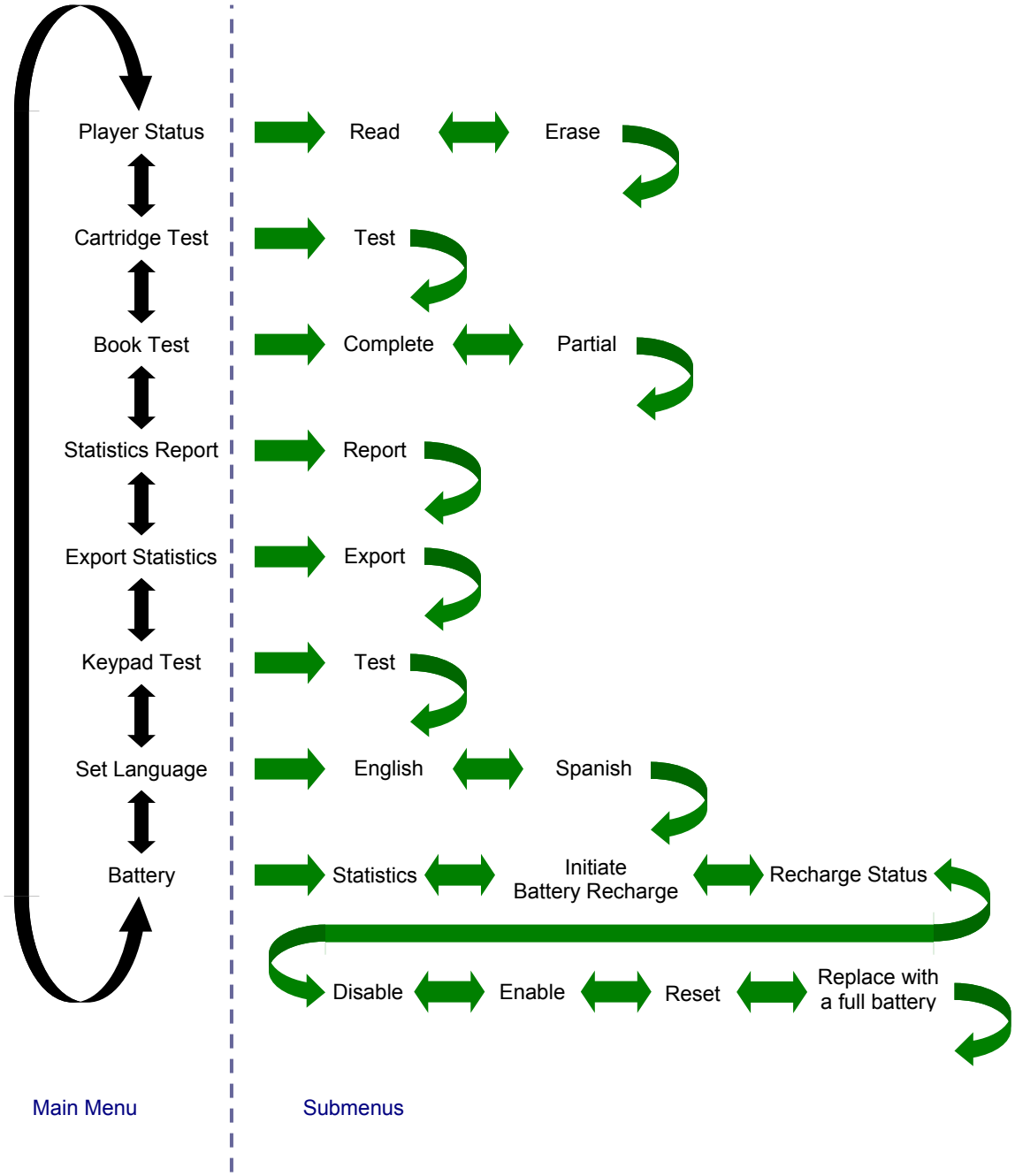
A diagram of menu navigation is provided in section 3.2.3.

When the Technician diagnostic level is entered, the player announces the following information:

- **Power On beep:** The player is booting, memory test is being performed. This step may take a few moments.
- **Audio Message:** "Player on"
- **Audio Message:** "Player status"

As noted in section 0, if the player is unable to enter the diagnostic level, it should be returned to a repair center for service.

3.2.3 Technician Diagnostic Level Menu Items



- Use the **Rewind** and **Fast Forward** to select a **Main Menu** item.
  - Press **Play** to enter the **Submenu** for the **Command.**
- Use the **Rewind** and **Fast Forward** to select a **Command** within the **Submenus.**
  - Press **Play** to execute a **Command.**

Player Status		
Retrieve and reset error messages stored in player memory.		
Commands	Read	
	The player reports the errors saved in the internal memory. At the end of the report the player returns to the current menu item.	
	Response	The player reports the errors (see section 3.1.1 for details) followed by the current menu item **"Player status."**
	Erase	
	Erase the current errors stored in the internal memory.	
	Response	The player announces **"Press Play/Stop to confirm or any other key to cancel."** Pressing Play/Stop: The player announces "**Player Information has been erased from the internal memory.**" Pressing any other button: The player announces **"Cancel."** The player then announces the current menu item **"Player status."**

Cartridge Test		
Verify the cartridge file system integrity (clusters). This test can be done on the cartridge port or the AT device port. If no cartridge is present, the test is stopped. If a cartridge is present, the test is launched. If the cartridge's file system integrity is compromised, the test will return an error announcement. If two cartridges are present (on both the cartridge and AT device ports) when the test is started, only the one on the cartridge port will be analyzed.		
Command	Test	
	Response	If the test is successful, the player announces **"Cartridge OK."** If no cartridge is present, the player announces **"No cartridge."** If the cartridge's file system integrity is compromised, the player announces **"Cartridge error."** The player then announces the current menu item **"Cartridge test."**

Book Test

Problems with a player may sometimes be due to a faulty book structure. This test can be helpful to validate the structure of a book.

This test will work only with DAISY 2.02 and NISO books. This test only validates the book information needed to play the book. It is not meant as a complete NISO validation, and some book information not required to play the book is not analyzed.

During the test, progress information is played in the form of "Heading X" where "X" is the current SMIL heading.

If an error is encountered, the heading number will be repeated along with the standard error announcement, and the test will abort.

At the end of a book test, the player goes to Key Describer mode (as if no book cartridge were inserted in the player) and waits for either a new book to test or the Power button to be pressed to quit the book test.
The only way to exit the book test is to power off the player.

Commands		
	Complete	
	The audio files are decoded but audio is not played. This is a long test that can be used to validate a whole book, including format. Audio feedback during the book test is in the form of periodic beeps. The time taken to perform this test is approximately one sixth of the book's normal reading time.	
	Response	If the test is successful, the player announces **"Book OK."** If an error occurs, the player announces **"Book error."** **"Heading X"** where X = SMIL Heading number.
	Partial	
	The structure of the book is tested but audio files are not decoded. This is much faster than the first test but it will detect only book format errors since it will not validate the contents of the audio files.	
	Response	If no book format errors are found, the player announces **"Book OK."** If an error occurs, the player announces **"Book error."** **"Heading X"** where X = Spine Heading number.

Statistics Report

List of different statistics saved by the player.
Refer to the Statistics Table in the Appendix, section 8.1.

Note: Information about the following items is not rendered:
- Number of Key Exchange Objects
- Key Exchange Object name list
- Last service date
- Service comments

Commands	Report
Response	The player announces the **"Item X, Y"** (repeat for each item in the list) where "X" is an assigned number for each statistic. "Y" is the actual value for that statistic. The player then announces the current menu item **"Statistics report."**

Export Statistics

Export statistics are saved by the player in a text file.

To export statistics, insert a USB memory stick in the player's AT-device port.
Statistics will be saved in an ASCII file that can be viewed with text editor on a PC. The file name will be the player's serial number.
Note: *No cartridge may be inserted in the cartridge port when exporting statistics.*

Command	Export
Response	If a USB memory stick is detected in the AT device port, the player announces **"Exporting statistics."** When the file is transferred, the player announces **"Statistics exported."** If a writable USB memory stick is not detected on the AT-device port, the player announces **"Unable to export statistics; insert a USB memory stick in the player's AT device port."** The player then announces the current menu item **"Export statistics."**

Keypad Test

The Keypad test works like the Key Describer, except that only short announcements will be reported so the tester doesn't get bored or disturbed by long, repetitive messages. This test will terminate if no key is pressed for 5 seconds. Note that it is possible to test all supported Human Interface Devices (HID) connected to the AT device port (not just Keypad). However, the device will need to act like a keyboard or gamepad.

Command	Test	
	Response	Depending on the key press, the player will announce the following messages: • **"Tone Up"** • **"Tone Down"** • **"Speed Up"** • **"Speed Down"** • **"Volume Up"** • **"Volume Down"** • **"Info"** • **"Previous"** • **"Menu"** • **"Next"** • **"Power"** • **"Sleep"** • **"Rewind"** • **"Play/Stop"** • **"Fast Forward"** After 5 seconds of inactivity, the player exits this option. The player then announces the current menu item **"Keypad test."**

Set Language

Switch the default language of the player to English or Spanish.

Commands	English	
	Switch the default language to English.	
	Response	The player announces **"Default language, English."** The player then announces the current menu item **"Set language."**
	Spanish	
	Switch the default language to Spanish.	
	Response	The player announces **"Default language, Spanish."** The player then announces the current menu item **"Set language."**

Battery

Battery Settings and Statistics

Note: *There may be a delay in updating the battery status information after adding, removing, plugging, unplugging, or resetting a battery; after plugging or unplugging the player; and after initiating a manual recharge. Some extreme scenarios may require 5 minutes to produce the expected status announcement. If you get unexpected results, retry another battery status 5 minutes later to confirm the results.*

Commands

Statistics

Report the number of battery charge cycles for the current battery and the current software version.

Response

The player announces **"Number of battery charge cycle X," "Version Y"** where

X is the number of battery recharges = number of times the current battery has been recharged (less than 25 percent + between 25 percent and 50 percent + between 50 percent and 75 percent + between 75 percent and 100 percent).

Y is the current software version number of the player.

The player then announces the current menu item **"Battery."**

Initiate Battery Recharge

The player starts charging the battery regardless of the battery's charge state.

Note: *It takes at least 5 seconds before the status is updated. If the status is queried before that 5 second delay elapses, the result will be inaccurate.*

Response

The player announces **"Recharge initiated."**

The player then announces the current menu item **"Battery."**

Recharge Status

Determine battery status.

Response

If the battery is not detected, the player announces **"Battery not detected."**

If the battery recharge is in progress, the player announces **"Battery recharge in progress."**

If the battery recharge is complete, the player announces **"Battery recharge completed."**

If any other problem is detected, the player will announce "**Power error.**"

The player then announces the current menu item **"Battery."**

Commands	**Disable**	
	Set the player to be used without a battery. If the player is to be used without a battery and this option is set, error messages related to battery-charge status are not reported to the patron. ***Note:*** *Selecting this option, even if a battery is present, will not damage the player. However, the player's volatile memory life may be shortened.*	
	Response	The player announces **"Battery disabled."** The player then announces the current menu item **"Battery."**
	Enable	
	Set the player to be used with a battery (normal state). When the player has a battery installed, enabling this option will also enable reporting of battery condition to the patron. Do not unplug the player without powering off when operating without a battery. Certain parameters could be lost if the player is unplugged without powering off.	
	Response	The player announces **"Battery enabled."** The player then announces the current menu item **"Battery."**
	Reset	
	This option resets all the battery statistics relative to the **current** battery pack.	
	Response	The player announces **"Battery statistics for the current battery have been erased from the internal memory."** The player then announces the current menu item **"Battery."**
	Replace with Full Battery	
	This option resets all the battery statistics relative to the current battery pack and announces that a fully charged battery has been inserted in the player. ***Note:*** *It takes at least 5 seconds before the status is updated. If the status is queried before that 5-second delay elapses, the result will be inaccurate.*	
	Response	The player announces **"Battery statistics for the current battery have been erased from the internal memory."** The player then announces the current menu item **"Battery."**

3.3 Player Configuration and Operation with an XML file

It is possible to automate some configuration and service operations of the player by using an XML file containing one or more text instructions. The player will examine this file, called `options.xml`, if present in top most (root) directory of the cartridge or USB drive. The file has two parts. The first is the configuration section which contains the commands that set non–volatile settings such as the language or verbosity. The other section contains one time directives such as clearing the book profile or exporting the statistics to the USB drive.

Example of an 'options.xml' file used to setup a player prior to distribution to a patron

`<?xml version="1.0" encoding="utf-8"?>`	
`<dtbm xmlns="http://www.loc.gov/nls/DTBM">`	
`  <configuration>`	
`  <Language value="spanish" />`	Set the player to Spanish
`  <Verbosity value="normal" />`	Set the verbosity to normal
`  </configuration>`	
`  <directive>`	
`  <ResetProfile value="all" />`	Clear the bookmarks, last marks & keys
`  <BatteryLife />`	Report the battery condition & software version
`  <ExportStatistics />`	Save the accumulated player data to USB drive
`  <Off />`	Turn off the player
`  </directive>`	
`</dtbm>`	

Configuration elements in 'options.xml'

Tag	Value	Effect
`Language`	`English, Spanish, Inglese, Espaniol`	Change the language setting of the player if different from current configuration.
`Verbosity`	`Normal, Reduced`	Change the verbosity setting of the player if different from current configuration.

Directive elements in 'options.xml'

Tag	Value	Effect
`InitialMode`	`Normal, Service2, Service3`	Change the mode to the technician or technician plus service level or leave in normal mode.
`ResetProfile`	`Profile, Keys, All`	Clear the bookmarks/lastmarks and/or the user added PDTB1 and PDTB2 keys.
`BatteryLife`		Announce the current charge state, number of charges for this battery and the software version.
`ExportStatistics`		Save the accumulated statistical data on the player to a file on the USB drive.
`ExportKey`		Save the player's public instance key to the USB drive.
`Off`		Turn the player off after acting on these directives.

4 Player Checkout Procedure

The following sections describe the sequence of inspections and tests required to checkout a player.

The **player is not opened** during these procedures, but it can be examined in more detail by a technician.

Tools Needed
Flashlight
USB flash memory device
Headphones or PC speaker system
Test cartridge
2.5mm hex wrench

The player checkout procedure is designed to be completed using the Library or Technician diagnostic level capabilities described in section 3.

4.1 General Inspection

Note: *If there are no serial number labels on the housing of the player, press the sleep button 10 times within 1 minute. The player will announce the serial number along with the number of the software version.*

1. Visually examine the player to identify problems listed below. A flashlight or other light source may be needed to examine the cartridge dock and AT device port.

   - Check the following for damage or excessive contamination:
     Keypad
     Speaker grill
     Cartridge dock
     Headphone port
     AT device port
     Power input cord
     Upper housing
     Lower housing
     Handle
     Battery access panel
     Handle motion (jammed or excessively loose)

   - Check for missing components:
     Skid-resistant feet
     AT device port cover
     Battery access panel
     Housing fasteners

2. Examine the player for loose internal items by listening while gently shaking the player.

4.2 Operation on AC Power

Preconditions:

1. No DTB cartridge is inserted in the player.
2. No AT-device or USB flash drive is inserted in the AT device USB port.
3. The AC power cord is not connected to AC mains power.
4. The player is off.

Methodology:

The player will power on when its cord is plugged into an AC power source and render a **"Player on"** message. Apply AC power and listen for this message.

1. Plug the player into a power outlet.

? Did the player announce **"Player on"** without an additional error message?

✓ **Yes:**	The player operates on AC power.	Continue to section 4.3.
✗ **No:**	There may be a fault with the AC subsystem, speaker audio subsystem, or microprocessor system. If the player announces **"Player on"** and **"Power error"** there may be a fault with the battery power system. If the player announces **"Player on"** and **"System error"** there may be a fault with the microprocessor system.	Send the player for servicing.

4.3 Operation on Battery Power

Preconditions:

1. No DTB cartridge is inserted in the player.
2. No AT-device or USB flash drive is inserted in the AT device USB port.
3. The player has a charged (not necessarily fully charged) battery or has been plugged in for a sufficient time to minimally charge the battery.
4. The AC power cord is not connected to AC mains power.
5. The player is off.

Methodology:

The player will announce **"Player on"** when it is turned on.

Turn on the player and listen for this message.

1. Turn the player on by pressing the Power button.
   Listen for the **"Player on"** message.

? Did the player announce "Player On" when powered on?

✓ **Yes:**	The player operates on battery power.	Continue to section 4.4.
✗ **No:**	There may be a fault in the battery power subsystem.	Send the player for servicing.

4.4 Battery Condition and Player Statistics

The player saves usage statistics in its non-volatile memory that can be recovered and saved.

Preconditions:

(for steps 4-7 only)

1. No DTB cartridge is inserted in the player.
2. An USB flash drive is inserted in the USB AT device port.

Methodology:

Battery charge statistics are reported as an audio message using a diagnostic operation.
A diagnostic function is used to transfer accumulated player statistics to a USB flash drive.

The player collects gross statistics on the usage of various systems (e.g., the number of hours that the player has been used on battery power and on AC power, number of charge cycles, etc.). These data will be used by NLS to better tailor the next version of the player to the needs of the patron.

No personal information is obtained in this procedure nor is any information obtained that identifies the books read.

NLS requests that cooperating agencies obtain these data when players are returned from patrons and send them to NLS engineering (NLSplayerdata@loc.gov). The data exported from the player take the form of a file with the player's serial number as part of the file name. A library should accumulate many such files and at convenient intervals (3 to 6 months) send them together as one or more zip compressed files.

1. a) Enter the Technician diagnostic level as described in section 3.2.
   b) Press the Rewind key to step through the Technician diagnostic level main menu until the player announces the **"Battery"** submenu.
   c) Press the Play/Stop key to select the battery submenu.
   d) Press the Rewind key to step through the submenu until the player announces the **"Statistics"** function.
   e) Press Play/Stop to select battery statistics.
   f) The player will then announce the total number of battery recharge cycles and the version number of the software in the player.
   Note: *To repeat the battery and software version information, press the Play/Stop key. The player will announce **"Statistics."** Press Play/Stop to select this function.*

   ? Has this battery had **less than 400** charge cycles?

   ✓ **Yes:** The battery pack has sufficient remaining service life. Continue to step 2.

   ✗ **No:** Replace the battery.

2. **?** Is the player software the latest version released by NLS?

   ✓ **Yes:** The software is up to date. Continue to step 3

   ✗ **No:** Update the software.

3. a) Press the Fast Forward key to step through the battery submenu until the player announces the **"Main menu"** option. Press the Play/Stop key to select "Main menu."
   b) Press the Fast Forward key to step through submenus until the player announces the **"Statistics"** submenu.
   c) Press Play/Stop to select the statistics submenu.
   d) Press the Fast Forward key to step through the statistics submenu until the player announces the **"Export statistics"** function.
   e) With a USB flash drive in the AT device port and no cartridge inserted, press the Play/Stop key to begin the "Export statistics" operation.
   f) Save the file for later transmission to NLS engineering.

   Note: *The same USB flash drive may be used to export statistics from many players. Since each player will write a file with a name derived from its serial number.*

   ? Did the player report **"Statistics exported"?**

   ✓ **Yes:** The data were saved to the USB flash drive. Continue to section 4.5.

   ✗ **No:** Try again with a different USB flash drive.

4.5 Keypad Check

Preconditions:

1. No DTB cartridge is inserted in the player.
2. The player is powered on.

Methodology:

The keypad functionality is assessed by pressing each key in Key Describer mode. Each time a key is pressed, a key identifier is announced. When released, the key should return to the full up position.

Note: *It is not necessary to listen to the entire key identifier announcement with each key press. As soon as the key identifier starts, you may press again on a different key.*

1. Press each key in the center, corners, and edges.

   ? Do all the keys correctly identify themselves and do they move freely without sticking?

   ✓ **Yes:** The keypad is operating correctly Continue to section 4.6.

   ✗ **No:** The keypad may be damaged or contaminated. Send the player for servicing.

4.6 Cartridge Check

Preconditions:

1. No DTB cartridge is inserted in the player.
2. The player is powered on.

Methodology:

A cartridge is inserted into the player and it plays a book without error.

This step is intended to confirm that three player functions are operating properly:

- A cartridge can be inserted into the player
- The player can play a cartridge
- The internal connectors are not worn out

1. Insert a DTB cartridge into the player.

   ? Does the player play the test book cartridge automatically?

✓ **Yes:**	The cartridge USB electrical interface is functional.	Continue to step 2
✗ **No:**	There may be a fault with the cartridge USB interface. If you hear the message **"Cartridge error,"** restart the player and try the test with a different cartridge.	Send the player for servicing.

2. With the DTB cartridge playing, pick up the player with the front edge (cartridge end) of the player facing down.

   ? Is the cartridge still firmly in the connector and does the book continue to play?

✓ **Yes:**	The cartridge USB mechanical interface is functional.	Continue to section 4.7
✗ **No:**	If the cartridge falls out of the player under these circumstances, there may be a fault with the cartridge USB connector.	Send the player for servicing.

4.7 Audio Quality

Preconditions:

None

Methodology:

A cartridge is inserted into the player and the audio is assessed for excessive audio distortion or noise.

1. a) Insert a DTB cartridge into the player.
   b) Set the tone and speed controls to their normal (mid) setting.
   c) With the player reading the DTB cartridge, press the Volume Up button until the player announces **"Maximum Volume."**
   d) Listen for excessive distortion, noise, or buzz.

   ? Does the audio sound good?

✓ **Yes:**	The main amplifier and speaker system is functioning correctly.	Continue to section 4.8.
✗ **No:**	There may be a fault with the speaker, amplifier, or upper housing.	Send the player for servicing.

2. Return the volume setting to a comfortable level.

4.8 Headphone Check

Preconditions:

None

Methodology:

The plug of a set of headphones is inserted into the headphone jack and its audio is monitored for presence (in both left and right sides) and for quality. The speaker audio is monitored to confirm that the microprocessor has detected the presence of headphones and has deactivated the speaker circuitry.

This test section is intended to inspect three headphone functions:

- Insertion of the headphone plug causes the player to turn off the speaker.
- Both sides of the headphones play with good audio quality.
- The contacts inside the headphone jack are not worn out.

Note: *You can use a PC speaker system that allows left and right channel selection instead of headphones for this test.*

1. Insert the plug of the headphones into the headphone jack while a DTB cartridge is playing.

   ? Does the speaker audio stop?

✓ **Yes:**	The player has detected the headphone correctly.	Continue to step 2.
✗ **No:**	There may be a fault with the headphone subsystem.	Send the player for servicing.

2. Listen to the audio in both the left and right sides of the headphones.

   ? Is the audio present in both sides and is the audio quality good?

✓ **Yes:**	The player has is operating correctly using headphones.	Continue to step 3.
✗ **No:**	There may be a fault with the headphone subsystem.	Send the player for servicing.

3. Listen to the audio in the headphones while rotating the plug in the headphone jack. Gently pull the plug to ensure that it remains inserted under normal operation.

   ? Is the audio uninterrupted with no scratches or audio distortion perceived?

✓ **Yes:**	The player has is operating correctly using headphones.	Continue to section 4.9.
✗ **No:**	The connector may be contaminated, corroded, or faulty.	Send the player for servicing.

4.9 AT Device Port Check

Preconditions:

1. No DTB cartridge is inserted in the cartridge USB port.
2. No device is inserted in the AT device USB port.

Methodology:

A USB flash drive containing a DTB is inserted into the AT device USB port. If the book plays, the port is functional.

1. a) Remove the cover from the AT device USB port by placing a finger nail or small screw driver in the recess on the bottom of the cover and gently prying outward.

   b) Plug a USB flash drive containing a DTB into the AT device USB port.

   ? Does the book play?

✓ **Yes:**	The AT device port is operating correctly.	Checkout complete.
✗ **No:**	If there was no “beep” when the drive was inserted or the player announces **“AT error,”** there may be a fault with the AT USB device port.	Send the player for servicing.

2. Replace the cover

5 General Upkeep Activities

5.1 Exterior Cleaning

Materials Needed
Water-based, all-purpose cleaning solutions such as Johnson Diversey Whistle® 91249 cleaner, Simple Green, or 409.
Soft cloths, soft brushes, cotton swabs

Note: ***Never immerse*** *the player in cleaning liquids or water.*

Note: *Avoid abrasive cleaning solutions or materials that may damage player markings.*

1. Use a moistened cloth, brush, or cotton swab to clean the player.
   Avoid using excess liquid cleaning solution especially near the connectors and the speaker.
2. If the speaker grill is heavily soiled, hold the player upside down (so the speaker faces down) and clean the grill with a wet soapy cloth.
3. If the Cartridge Dock is severely contaminated, it may be necessary to replace the cartridge USB cable. In this case send the player for service.
4. Clean and dry the Cartridge Dock thoroughly.

5.2 Battery Replacement

CAUTION: **Do not strain the battery cable** when lifting the battery pack out.

Tools Needed	Parts Needed
2.5mm hex wrench	Battery Pack, 4824591310
	Foam, Battery Compartment, 4824591316 (as needed)

Note: *Battery panel screws are captured in the battery access panel by nylon washers.* ***Loosen*** *the screws, but* ***do not pull them out*** *of the panel.*

Note: ***Grip*** *the connectors when separating them.* ***Avoid pulling*** *on the battery cable wires to prevent possible damage.*

1. Turn the player over so the bottom is facing up and loosen the two battery panel screws until each spins freely. *Note: The* ***screws are captive*** *and should not be removed from the panel.*
2. Lift the battery access panel up and away from the player. Set the panel aside.
3. Lift the battery pack out of the compartment. Set it on the bottom of the housing.
4. Grasp the two sides of the battery cable connector.

5. **Press the connector release latch down** while pulling the connectors apart to remove the battery.
6. Check that two foam strips are secured to the sides of battery compartment. These foam strips prevent the battery pack from vibrating during player use. Replace missing foam strips.
7. Install a replacement battery pack and close the player using steps 1-5 above in reverse order.

5.3 Software Upgrade

The NLS Engineering Section will provide software updates for the player periodically or when necessary. The updates will be used to correct problems, enhance usability and to add functionality. The new software is applied to a player using a cartridge or USB flash drive and occurs automatically upon insertion.

The software update files may be present on, and distributed with, regular book cartridges provided by NLS or may be downloaded by the library or patrons and explicitly applied to the player. The player will only update the software if the version on the cartridge is later than that already stored in the player. If the version on the cartridge is the same, or earlier, the software files are ignored.

The duration of the software update process can be up to 30 seconds but is usually shorter. A message is announced and a “ping-pong” tone is repeated during the upgrade. When complete, the player will reboot and play any book coexisting with the update files on the cartridge.

The software, if retrieved from the NLS via the Internet, will be a single zip file of approximately 30 MB in size. This file must be unziped onto a cartridge or USB drive preserving the file structure. The root directory of the update software tree is called “upgrade” and must be located in the top most directory of the drive when unzipped.

Tools Needed
Software upgrade cartridge (current software version)

This procedure describes how to load the current version of software to a player that is received with an older software version.

Note: *To determine what version of software is currently in the player, without a cartridge inserted in the player, press the Sleep button 10 or more times within 1 minute. The player will announce the serial number followed by the software version. Press the Power button to end the announcement.*

Note: *If a software upgrade cartridge containing an older version of software is inserted into the player, the player will not load the older software. It will announce **“No book available on cartridge.”** If the cartridge contains both a software upgrade and a book recording, the player will play only the book.*

1. Insert the software upgrade cartridge into the player.
2. When the software upgrade is complete, the player will announce **“Software upgrade completed; stand-by while your player is restarted.”**
3. Remove the software upgrade cartridge.

6 Preparation for Shipping

Note: *Battery packs must be connected before players are shipped to patrons.*

Note: *Players and shipping containers must be kept together so the serial number label on the container matches the player serial number.*

1. Place the player in the shipping bag.
2. Fold the excess flap under the player.
3. Press foam inserts onto each end of the player.
4. With buttons facing up, lower the player into the shipping container.
5. Place instructional material on the top of the player.
6. Close the container lid.
7. Secure with packaging tape.

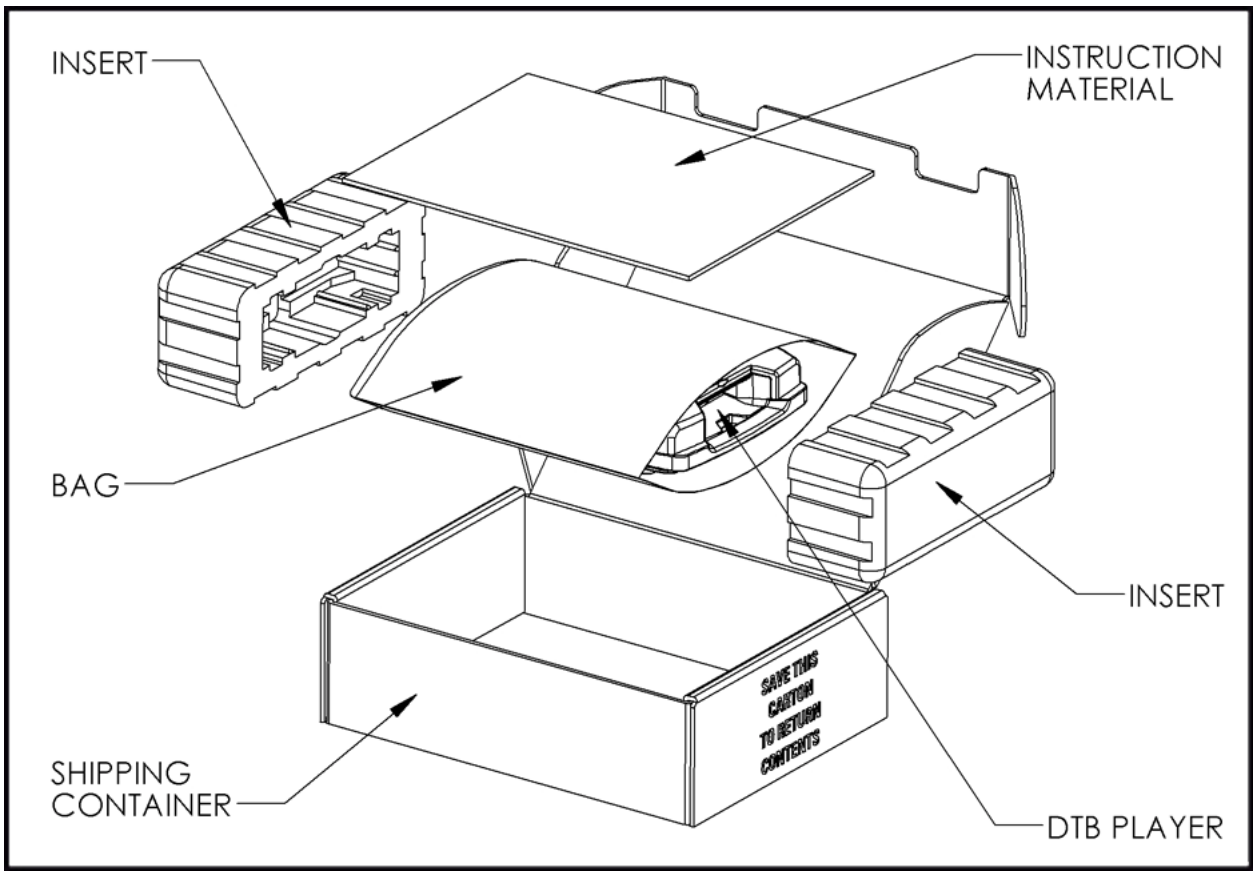


Figure 6-1. Player Package

7 Long-Term Player Storage

The battery packs shall be disconnected in players that will be stored for longer than 3 months.

This is because even when the player is off the battery pack is always powering a “gas gauge” integrated circuit that determines the state of battery charge. This circuit consumes very little current but over a long period will deplete the battery. More significantly, typical self discharge of the NiMH battery is approximately 20 percent per month at room temperature (20ºC) and more at higher temperatures. Store the battery or player with battery in a cool dry place.

To disconnect the battery pack:

1. Turn the player over so the bottom is facing up and loosen the two battery panel screws until each spins freely.
2. Lift the battery access panel up and away from the player. Set the panel aside.
3. Lift the battery pack out of the compartment. Set it on the bottom of the housing.
4. Grasp the two sides of the battery cable connector.
5. Press the connector release latch down while pulling the connectors apart.
6. Return the battery pack to the compartment with the connectors positioned as shown in **Error! Reference source not found.**.

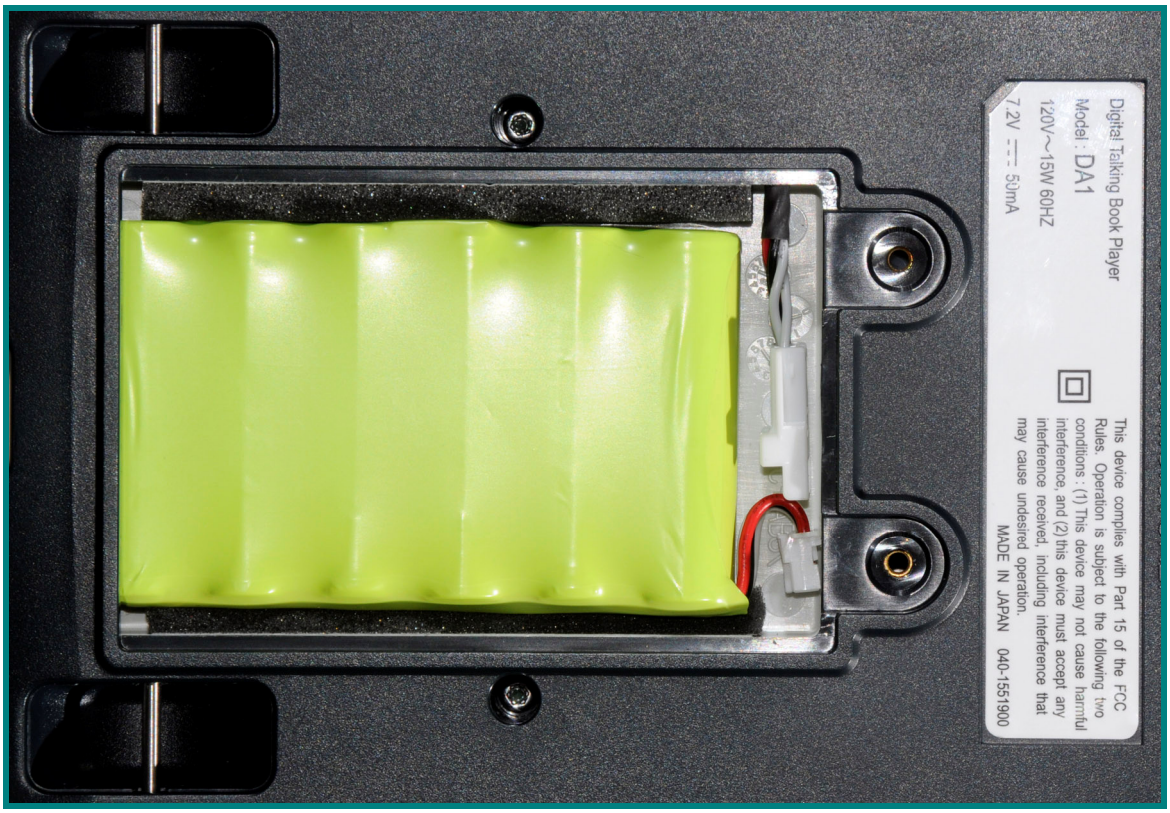


Figure 7-1 Disconnected battery

8 Appendix

8.1 Statistics Table

Type	No.	Elements	Description
General	1	Statistics Table Revision	Statistics Table (this table) revision
	2	Player Serial Number	Serial number
	3	Player Type	Standard or Advanced Model
	4	Battery in player	Player is set to expect that a battery is installed.
	5	Number of Key Exchange Object	Number of PTDB1 and PDTB2 keys in the player
	6	Key Exchange Object Name List	Names list of the keys in the player
	7	Last Service Date	Entered manually by a technician
	8	Service Comments	Service code/comments
User Interface	9	Verbosity	Verbosity (normal/reduced)
Software	10	Software version	Current software version number
	11	User Guide	Current User Guide version
	12	Software Errors	Number of times, from the birth of the player, that the watchdog timer has been used to reset the player when the software was unable to execute parts of the code
Statistics	13	Play Time	Total playtime of the player **on AC power**
	14		Total play time of the player **on battery for the current battery pack**
	15		Total play time of the player **on battery since the birth of the player**
	16	Total Time	Total time the player has been powered **on AC power**
	17		Total time the player has been powered **on battery for the current battery pack**
	18		Total time the player has been powered **on battery since the birth of the player**

	19	Idle Time	Total idle time while the player **is powered by AC.** *Three conditions must be met to be idle: no button pressed, no audio played, and power is coming from AC power source.*
	20		Total idle time while the player is **powered by battery for the current battery pack**. *Three conditions must be met to be idle: no button pressed, no audio played, and power is coming from batteries.*
	21		Total idle time while the player **is powered by battery since the birth of the player**.
	22	Percentage play time on batteries	Total battery play time /Total play time
	23	Battery usage data	1 min < # of battery usages < 30 min
	24		30 min < # of battery usages < 1 hr
	25		1hr < # of battery usages < 3 hrs
	26		3hrs < # of battery usages < 10 hrs
	27		10 hrs < # of battery usage
	28	Number of cartridges inserted	Total number of times a USB drive was plugged in
	29	Number of Battery Errors	Total communication errors from the "gas gauge" device **since the birth of the player**
	30		Total communication errors from the "gas gauge" device **for the current battery pack**.
	31	Number of Power On	Number of times the player was turned on
	32	Charge data (with current battery)	full < # of battery charges < 75% full
	33		75% full < # of battery charges < 50% full
	34		50% full < # of battery charges < 25% full
	35		25% full < # of battery charges < empty
	36	Charge data (since birth of player)	full < # of battery charges < 75% full
	37		75% full < # of battery charges < 50% full
	38		50% full < # of battery charges < 25% full
	39		25% full < # of battery charges < empty
	40	AC Cord	Number of times plugged in
	41	Button Presses	Play/Stop
	42		Rewind
	43		Fast Forward
	44		Volume Up

	45		Volume Down
	46		Speed Up
	47		Speed Down
	48		Tone Up
	49		Tone Down
	50		Sleep
	51		Bookmark
	52		Info
	53		Menu
	54		Previous
	55		Next
	56	Books	Number of different books (for current profile)

8.2 List of Error Announcements

Error Message	Level	Error types
“Cartridge error”	L,T	At this level, all cartridge errors will be reported as: "Cartridge Error"
“Cartridge unreadable”	T	Unreadable (read)
“Cartridge content error”		Unable to decode book content (Player was unable to understand book structure OR player was unable to decode audio data)
“Cartridge, driver error”		Driver problem (Operating System drivers) (Player was unable to open, close, mount, un-mount the files/directory on the cartridge)
“AT Device error”	L,T	At this level, all AT device errors will be reported as: "AT device Error"
“AT Device unreadable”	T	Unreadable (read)
“AT Device content error”		Unable to decode book content (Player was unable to understand book structure OR player was unable to decode audio data)
“AT Device, driver error”		Driver problem (Operating System drivers) (Player was unable to open, close, mount, un-mount the files/directory on the cartridge OR player was unable to mount, unmount an AT device)
“Power error”	L,T	At this level, all AT device errors will be reported as: "AT device Error"

Error Message	Level	Error types
"Battery setup is wrong"	T	Battery detection (Player is configured to operate without battery but a battery has been detected OR player is configured to operate with a battery but no battery has been detected)
"Battery fault"		Battery recharge (Battery voltage too low OR Battery voltage too high OR Charge time too long OR Too many failed charge attempts (recharge does not initiate) OR Too many invalid charge attempts (charge terminates normally with a low voltage))
"System error"	L,T	Unable to write in the internal Flash memory during a software upgrade OR player has run out of memory. ***Note:*** *Due to the severity of this error, the player may not be able to save and report this information. The unit needs to be fixed.*
"System upgrade error"	T	Unable to write in the internal flash memory during a software upgrade
"System memory error"		Player has run out of memory.

8.3 Frequently Asked Questions

8.3.1 General

1. How do I clear all information from the player?

Turn off the player. Hold down the Tone Up, Speed Up, and Volume Up buttons and press the Power button. The player will say "Creating New Profile." This will remove all bookmarks, set the language to English, and reset all controls to their default position.

2. How do I change the language to/from Spanish?

Turn off the player. Hold down the Tone Down, Sleep, and Rewind buttons and press the Power button. After a few seconds the player will beep and say "Player Status." Press the Rewind button twice and you will hear "Set Language." Press the Play button and you will hear "English." Press Rewind or Fast Forward if you wish to select Spanish and then press Play. If you wish to return the player to English, press Play without pressing another button.

3. The player has become unresponsive. Every time I press a button it beeps but nothing happens.

In the unlikely event that the player has entered this condition, ask the patron to hold down the Power button firmly for at least 7 seconds (a reset beep will be heard).

4. How do I reset the player?

Hold down the Power button firmly for at least 7 seconds. A reset beep will be heard. This will not erase any bookmarks or prior book "last marks" from the player. The player will only need to be reset in the unlikely event that it becomes unresponsive in normal operation.

5. The player said "cartridge error" when I removed the book. Have I damaged the book?

No. The cartridge cannot be damaged by this action. A cartridge error may occur if the book cartridge is removed while the book is playing. The book will play normally after this has occurred. The player keeps a record that a cartridge error has occurred and this record can be reviewed when the player is returned to the library.

6. Every time I put the cartridge in the player the machine says "cartridge error."

This may indicate a problem with the files on the cartridge or with the cartridge itself. Power cycle the player to clear the error but if this is unsuccessful, the book should be marked as defective and returned to the library for further testing. If this occurred using a patron's USB flash drive, suggest they reformat the drive then recopy the book.

7. The player is dirty. How do I clean it?

Use only soap and water or a mild cleaner like 409 or Simple Green. Do not use harsh abrasives or bleach. Moisten a cloth and wipe the player. Do not get liquid inside the player or in the speaker area. Turn the player upside down when cleaning the speaker grill with the wet cloth/sponge to avoid getting liquid into this sensitive area.

8. When I turned on the player this morning it announced "greater than 27 hours" of battery time. I have been playing a book all morning and it still says "greater than 27 hours." Is it broken?

The player has a large battery capacity. You still have greater than 27 hours of play time remaining even after playing all morning.

(Note to Librarians: To preserve battery service life, a recharge is not performed until the battery has been discharged to 75 percent of full capacity. A patron is likely to be more confused if they noticed that the player was not recharging every time they connected it to the AC power.)

9. When I turned on the player this morning it announced "less than 1 hour" of battery time. I have been playing a book for 2 hours and it's still going. Is it broken?

The battery estimation may be inaccurate when discharged to this level. The player will always underestimate the remaining capacity.

10. The book I am reading gets to the middle of chapter 4 and says "Book Error." What does that mean?

This is an error in the book itself, not in the individual cartridge. If it is a book produced by NLS, report the book number and any information about where the error occurred to NLS Quality Assurance Section.

11. The narrator sounds like an auctioneer (or a drunk). How do I return it to normal?

Turn the player on. With the particular book cartridge in the player, but not playing, use the Speed Up and Speed Down buttons until you hear a "Speed Normal" message. The player remembers the speed and tone setting for each book. If a new book is played, the speed will be set not normal and the tone to neutral.

12. If I don't turn off the player, will I wear out the player sooner?

No. The player draws very little power when not playing. It is not necessary to turn off the player.

13. If I don't turn off the player, how much electricity is it consuming?

Even if you do not use the Power button to turn the player off, it will reduce its power consumption when not playing to less than 1 watt.

14. How do I get to the User Guide with a Standard Model?

Press and hold the Play button for a few seconds.

15. How do I get out of the User Guide when I'm done with it?

Press and hold the Play button again for a few seconds.

16. Can I read the User Guide when a book is inserted?

Yes.

17. Can I leave the player plugged in when I am reading a book? Should I unplug it when I'm done reading? Is there anything I should know to avoid damaging the battery?

The player can remain connected to the mains power indefinitely with no ill effects. You don't need to worry about charging patterns in order to maximize battery life. The player does not have the battery "memory" issues that were common with the batteries in cassette book players.

18. How long do I need to leave the player plugged in to fully charge the battery?

The battery will fully charge from a completely discharged state in less than 3 hours. The battery does not recharge each time you plug it in. To extend the service life of the battery, it will only charge after you have used it for several hours or after being unused for several weeks.

19. What is the rectangular socket on the side of the player?

It is a USB port intended for assistive technology devices for people with physical impairments and for playing books from a patron's own USB flash drive.

20. Can I put a book on a thumb drive and use the side port?

Yes, most USB flash drives can be used to store a book; however, not all USB drives will work correctly.

21. Can I safely remove the cartridge without stopping playback first?

Yes.

22. Can other people see my bookmarks?

No, the bookmarks are stored on your player, not on the book.

23. How many bookmarks will the player hold?

Over 1,000.

24. How long will the bookmarks be stored?

Bookmarks don't expire but if you run out, the oldest ones will be deleted first.

25. Can I copy multiple books onto one of my own blank cartridges?

You can copy multiple books onto a blank cartridge but only one will be readable.

26. Sometimes the machine doesn't seem to want to turn on. Why is that?

The player needs a second to power on when using batteries. Pressing the Power button again in the middle of the wake-up process can sometimes turn the player off.

27. Can I plug the book cartridge into my computer?

You can plug it in and copy the book on another USB drive for later use. You won't be able to read it from the computer because of the copyright protection of the book.

8.3.2 Book Navigation

1. How do I go to the beginning (end) of the book?

Standard Player: With the player on, press and hold the Rewind button until you hear "Beginning of book". Similarly use the Fast Forward button to go to the end of the book.

Advance Player: Select the bookmark level by pressing the Menu button until you hear "Bookmark Jump." Press and hold the Previous button to move the reading position to the beginning of the book. Similarly use the Next button to move to the end of the book.

2. How can I navigate by page numbers?

If a book includes page numbers, there will be a page number option in the Menu (Advanced Model only). Press the Menu button until you hear "Page jump," then use the Next and Prev buttons to move the reading position to page boundaries in the book. Most NLS books do not include page numbers.
There is no method to navigate by page on the Standard Model.

3. What does "Jump by phrase" mean? (Advanced Model)

Jump by phrase is a jump by a small amount – up to 1 minute in duration. In some cases it may jump by a verse, an ingredient in a recipe, or an item in a list or table if the book was created with those points explicitly marked. If the book does not have this markup, the Next and Prev buttons at Phrase level will move to the end of the next marked passage (a chapter or section) or by 1 minute, whichever is closer.

4. How do I skip over the front matter (Annotation)?

With the Standard Model, press and hold Fast Forward and listen for a beep. With an Advanced Model, use the Next button.

5. How will I know how long a book is when there is always only one cartridge?

The narrator will tell you the total duration at the beginning of the book. The player can also tell you the current position when you insert the book (Standard Model) or when you press Info (Advanced Model).

6. How do I go back to where I was when I pressed the Sleep button?

Press the Rewind button and hold it until it says, "Back 15 minutes." Repeat this, if you had set the sleep timer for a multiple of 15 minutes, until you return to the desired reading position.

7. **It seems like sometimes when fast forwarding to the beginning of the next chapter, it doesn't actually land on the beginning.**

   The player will announce the chapter title when you lift the Fast Forward button after crossing a chapter boundary. If you lift up immediately after a chapter beep, it will snap to the beginning of the chapter; otherwise you will hear "Within" and the chapter title.

8.3.3 Playing Non-NLS books and audio

1. **Can I play RFB&D books in my machine?**

   It is possible for RFB&D to format their books to play in the NLS player. Contact RFB&D to see if the specific book is available in a format that will play in the NLS player. The player may need to be enabled to play protected RFB&D books. The patron can do this by inserting a cartridge containing a Key Exchange file provided by RFB&D.

2. **Can I play MP3 files in my machine?**

   Yes, the player will play MP3, AMR-WB+, and WAV audio files copied to a cartridge or USB drive. They are played in the alphabetical/numerical order of their file name.

3. **Does the NLS DTB player play text-based DAISY files?**

   No.

4. **Does the NLS player play DAISY2 books?**

   Yes, but not if they are encrypted by the publisher and the player has not been enabled to play protected books.

5. **Does the NLS player play Audible.com recorded audio books?**

   No.