



Australian Government
National Archives of Australia

Manifest Maker v3.x User Manual

Document Version 2.5

RKS: 2009/4025

the archives

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Document Change Record

Version	Changed By	Description of Changes	Change Date
1.0	Allan Cunliffe	Approved for release	04/02/2010
1.1	Allan Cunliffe	Added instructions for installing Chardet character detection software	16/02/2010
1.2	Allan Cunliffe	Additional information about barcode lists	24/02/2010
1.3	Allan Cunliffe	Added wxWidgets Cross-platform C++ GUI toolkit (wxPython binding) dependency for Linux installation	29/03/2010
1.4	Allan Cunliffe	Changed download location for Manifest Maker	18/05/2010
2.0	Allan Cunliffe	Major revision to incorporate changes in Manifest Maker version 3	30/07/2010
2.1	Allan Cunliffe	Minor edits after internal review	02/08/2010
2.2	Allan Cunliffe	Added section on setup for Mac OS X and updated screen shots following UI changes	22/09/2010
2.3	Allan Cunliffe	Minor edits	22/03/2011
2.4	Allan Cunliffe	Updated installation section	04/05/2011
2.5	Allan Cunliffe	Minor edits	09/06/2011

Related Documentation

Title	Author	Date	Location
An Approach to the Preservation of Digital Records	Helen Heslop Simon Davis Andrew Wilson	December 2002	
Transferring Records to the Archives – Advice for Agencies (draft)	John Lovejoy	01/03/09	R223392009
How to deposit your valuable records for long-term preservation and management			http://www.naa.gov.au/records-management/keep-destroy-transfer/to-archives/index.aspx

Glossary

Term	Definition
Agency	The organisation that transfers the digital objects to be archived.
Base Directory	The location of the directory containing all digital objects being transferred.
Barcode	See Item Number .
Barcode List	<p>A text file listing the digital objects in a transfer job.</p> <p>The barcode list contains:</p> <ul style="list-style-type: none"> • Filename • Item Number.
Chardet	<p>Open source character encoding auto-detection software for Python</p> <p>http://chardet.feedparser.org/</p>
Checksum	<p>A numerical value calculated from the contents of a digital object.</p> <p>It is used to determine the integrity of the digital object by comparing a recently determined checksum with an older one. If the checksums are not identical, the digital object has been changed.</p>
Control Symbol	An agency-allocated unique identifier, reflecting the arrangement of items.
Digital Archive	Archival storage for digital material.
Digital Object	A single digital file or document to be archived. An object composed of a set of bit sequences.
Item	<p>A discrete unit within a series. For paper records, an item is equivalent to a file. For digital records, an item can be one or more digital objects grouped together (in a similar way to a paper file).</p> <p>An item is uniquely identified by the item number.</p>
Item List	<p>A tab-separated file or spreadsheet which contains:</p> <ul style="list-style-type: none"> • Item Title • Item Number (barcode) • Control Symbol • Contents Start Date • Contents End Date • Disposal Class • Other relevant metadata.

Term	Definition
Item Number	The item number is the same as the item barcode. Each Item is assigned an item number in RecordSearch.
Manifest File	A tab-separated file listing the digital objects in a transfer job. The manifest file contains: <ul style="list-style-type: none"> • Media ID • Filename • Checksum • Checksum Algorithm • Item Number.
Output Directory	The location where Manifest Maker creates the manifest file.
Records	See Item
RecordSearch	The National Archives' collection database. Objects in the collection (including digital objects) are identified by the item number/barcode.
Transfer Job	A group of records from the same series proposed for transfer to the National Archives at the same time. For a digital transfer, the transfer job consists of a grouping of one or more digital objects.
Transfer Job Number	Unique identifier given to each transfer job. The transfer job number is allocated by RecordSearch.

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1 Purpose

The purpose of this document is to describe the Manifest Maker application and how to use it.

2 Introduction

The Manifest Maker software was created by the National Archives of Australia (National Archives).

Manifest Maker supports the transfer of digital objects from agencies to the National Archives by producing a manifest file which satisfies the requirements for a digital transfer.

For all digital transfers, the digital objects in the transfer must be copied to one or more portable storage devices. One of the storage devices must also include a manifest file and an item list.

The manifest file associates digital objects to items and is used to track digital objects through the digital preservation process.

3 Background

The main purpose of Manifest Maker is to produce a manifest file. Manifest Maker also supports the production of a basic item list if one cannot be generated by the agency's recordkeeping system.

The following sections explain the concepts and terminology associated with Manifest Maker.

3.1 *Transfer jobs*

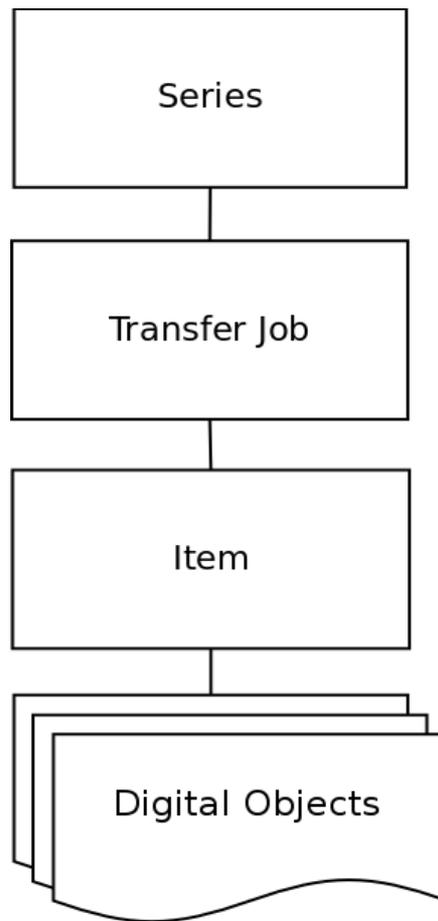
A transfer job is a group of records from the same series proposed for transfer to the National Archives at the same time.

A digital transfer job is any transfer of digital objects in to the National Archives' digital archive. A digital transfer must be accompanied by:

- item list
- manifest file
- the digital objects being transferred.

A digital transfer will contain one or more items. A single item can include any number of digital objects.

The following diagram describes the relationship between the series, transfer job, item and digital objects:



For more information about the transfer process, refer to:
<http://www.naa.gov.au/records-management/keep-destroy-transfer/to-archives/index.aspx>.

3.2 Items and item numbers

An item is a discrete unit within a series which can contain one or more digital objects.

An item is uniquely identified by the item number. The item number is used to identify, locate and request items on RecordSearch.

Each agency is provided with a range of unique barcode numbers to be used for a specific transfer. A barcode number is the same as an item number. The concept of a barcode number comes from the use of barcode stickers which are placed on physical archival records in the National Archives' collection. The barcode aids in tracking and scanning of the physical records.

3.3 Transfer job directory structure

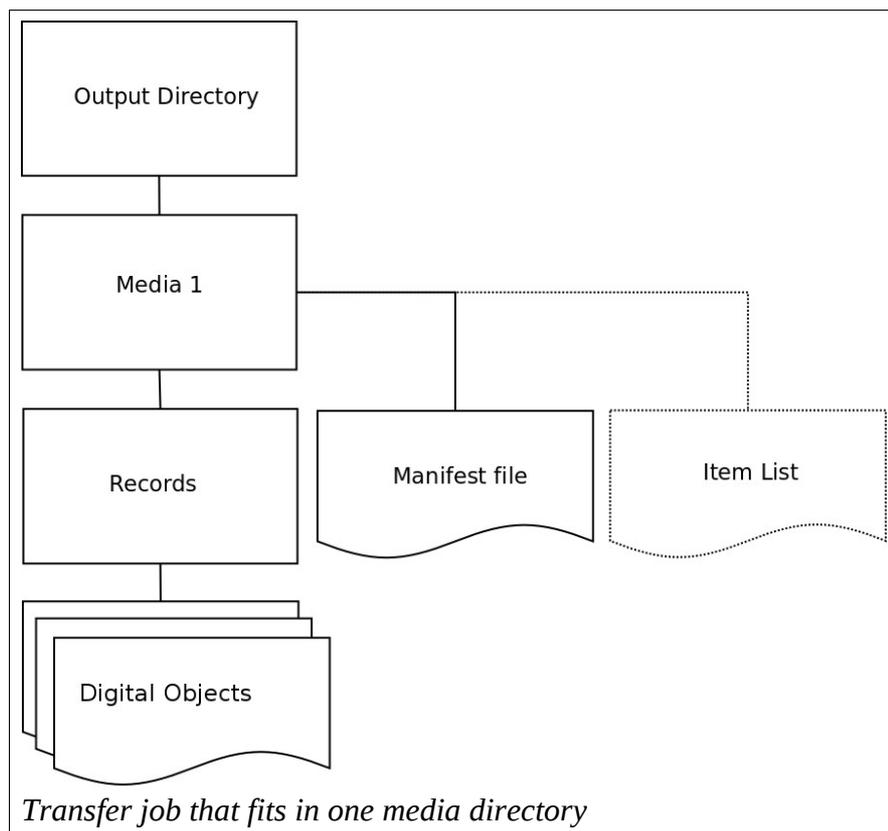
By selecting the *Prepare Data Objects for Media* option (in the *Media Arrangement* step of the Manifest Maker wizard), Manifest Maker can copy the digital objects to a nominated output directory.

Within the output directory, Manifest Maker produces the following:

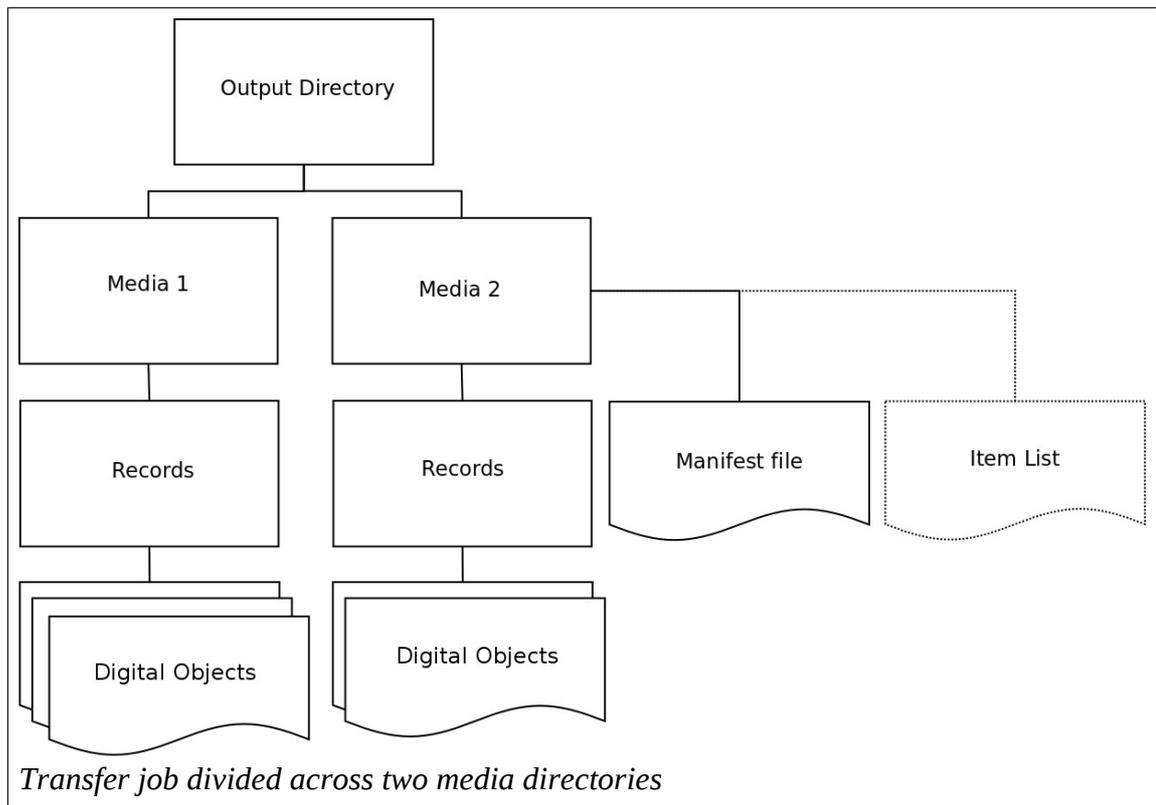
- one or more *media* sub-directories (*media1*, *media2* and so on)
 - each *media* contains a *records* directory
 - each *records* directory contains the actual digital objects
- manifest file stored in the last media directory (for example, if three media directories are created, it would be stored in *media3*)
- optional item list file (stored in the last media directory).

The media sub-directories contain the actual digital objects to be archived.

The following diagram describes the directory structure of a transfer job that fits in one media directory.



The following diagram describes the directory structure of a transfer job that is divided across two media directories.



3.4 Transfer media

To transfer digital objects to the National Archives, you will need to transfer the data onto some kind of portable storage media. This can be any sort of storage media, such as an external hard drive, CD or DVD.

By selecting the *Prepare Data Objects for Media* option (in the *Media Arrangement* step of the Manifest Maker wizard), Manifest Maker can group digital objects so that they can be copied to external storage media.

The following table describes the media options available.

Media	Stated Size	Space Available
CD	700 MB	650 MB
DVD	4.7 GB	4.65 GB
No size limit	None specified	Not applicable
Other	User specified	Specified size minus 50 MB

Note: Manifest Maker reserves 50 MB of space on each transfer device.

3.4.1 CD/DVD media

If you intend to use CDs or DVDs, Manifest Maker will not burn digital objects to the disks for you. You will need to nominate an interim location (output directory). Manifest Maker will then copy the digital objects to the output directory. You select the Output Directory step of the Manifest Maker wizard.

If there are more digital objects than can fit on a single DVD or CD, Manifest Maker will break up the digital objects in to separate media directories (each corresponding to a single DVD or CD).

Once the manifest creation process is completed, you need to manually burn the created media directories to the CDs or DVDs using your own software.

3.4.2 No size limit

Select this option if you want to copy the digital objects to the nominated output directory without breaking them up in to media directories of a particular size. Reasons for doing this may be that you don't care about size limitations, or you are not sure about the total size of the digital objects in the transfer.

3.4.3 Other media

If you are copying the digital objects to a portable storage device, such as an external hard drive or USB key, you should select the *Other* media option and enter the space available on the device.

In the *Output Directory* step of the Manifest Maker wizard, you can select a portable storage device as the output directory (for example, **F:**) but it must have sufficient space to store **all** of the digital objects.

If you plan to copy the digital objects to more than one storage device, you will need to treat them in the same way as a CD or DVD – that is, nominate an interim location as the output directory, then manually copy each media directory to a storage device. You must also ensure that all storage devices have the same storage capacity.

3.5 Manifest file

The manifest file is a tab-separated plain text file that comprises:

- media identifier (for example, *media1*)
- path and filename of each digital object in the transfer
- checksum of each digital object
- checksum algorithm used
- item number to which the digital object belongs.

A sample manifest file (formatted in a spreadsheet) is shown below.

Media ID	Filename	Checksum	Checksum Algorithm	Item
1	BWF WAV/Linear BWF.wav	f1e99d9cdb24b186a3e56371535df1	SHA-512	1
1	BWF WAV/MPEG BWF.wav	724080adbc2d5f600d2096b9089a7	SHA-512	1
1	Error Samples/FW Kevin Price - Beresfords	dc98e48860443d989141ef0a982b7	SHA-512	2
1	Error Samples/GPAC teleconference 170908	8f9fb8c58dc1102ae1722c56e8fc22	SHA-512	2
1	More file types/Lotus Wordpro.LWP	4481bbccd2bf41ca40519f4c3dc756	SHA-512	3
1	More file types/MS Write.wri	007362e97ea432f72796709f251691	SHA-512	3
1	More file types/Recent word.docx	c9998c7b8f68e6aad2f3b183ccb9ba	SHA-512	3
1	More file types/lotus 123.wks	cafccb02033c11403fcd5bb69506b6e	SHA-512	3
1	Transfer x55/media1/manifest.tsv	7c8e944b98598057d2cfbe0d5901b	SHA-512	4
1	Transfer x55/media1/records/yawara cell 1.jp	2c60c219fd01bcbf8fa32bcd1b9d54	SHA-512	5
1	WRI files/plaintext.wri	007362e97ea432f72796709f251691	SHA-512	6
1	WRI files/rtf.wri	4a868b979d17fb92f0c0fa193b1501	SHA-512	6

3.6 Item list

As part of the manifest creation process, Manifest Maker can create an optional item list. The item list is a tab-separated file which lists all items in the transfer job.

The item list option is intended to provide an item listing where items are being transferred from a recordkeeping system that cannot produce an item list (for example, where the recordkeeping system consists of a basic directory structure). You should select this option if you do not have a suitable item list prepared from another source.

Manifest Maker applies the following business rules when allocating item numbers in the manifest file and the item list:

- each directory which contains one or more digital objects (for example, **C:\audio** and **C:\images**) is treated as an item
- each digital object stored in the base directory (for example, **C:\audiofile.mp3**) is treated as an item
- all digital objects which belong to an item are assigned the same item number.

A sample item list (formatted in a spreadsheet) is shown below.

Item	Control Symbol	Title	Start Date	End Date
1	1234/2010	Audio masters 1 to 3	13/02/2009	13/02/2009
2	1235/2010	Audio masters 4 to 5	04/04/2009	04/04/2009
3	1236/2010	Images 1 to 300	23/03/1999	10/09/2008
4	1237/2010	Images 301 to 456	12/03/2009	12/03/2009
5	1238/2010	Documents A to K	18/09/2008	18/09/2008
6	1239/2010	Documents L to O	29/08/2008	27/02/2009
7	1240/2010	Documents P to Z	30/01/2009	10/04/2009
8	1241/2010	Exhibit listing	01/11/2006	13/03/2009
9	1242/2010	Exhibit images	13/03/2009	13/03/2009
10	1243/2010	Supporting documents	16/05/2009	26/06/2009

Note: The item list produced by Manifest Maker may not meet the requirements for a transfer. You will need to amend the *Title* field and add a column for *Disposal Class* information. Contact the Agency Service Centre for more information: <http://www.naa.gov.au/records-management/help/index.aspx>.

3.7 Barcode List

Manifest Maker supports the creation of a manifest file based on an imported barcode list.

The barcode list is a listing of digital objects in a transfer job. It consists of pairs of digital object filenames (and/or directories), and associated item numbers.

If a digital object is not listed in the barcode list, it will not be added to the manifest. The extension of this is that if you elect to move the digital objects to the output directory at the same time the manifest is created, only the files in the barcode list will be moved.

For more information about acceptable barcode list formats, please refer to **Appendix B**.

A sample comma-separated barcode list is shown below.

```
audio_master1.flac,10002587
audio_master2.flac,10002587
DocumentA.doc,10002588
DocumentB.doc,10002589
Linear BWF.wav,10002590
BWF.wav,10002591
FW Price.htm,10002592
GPAC teleconference 170908.wav,10002593
Lotus Wordpro.LWP,10002594
MS Write.wri,10002595
Recent word.docx,10002595
lotus 123.wks,10002595
cell 1.jpg,10002598
plaintext.txt,10002599
WRIRtf.wri,10002600
```

4 Installing and starting Manifest Maker

Manifest Maker is available as an archive file (TAR) or a Windows executable.

The following procedures assume that you have administrator access on your system.

Note: Chardet software must be installed before you start Manifest Maker. Chardet is open source character detection software for Python. For Windows users, the Chardet software will automatically be installed as part of the Windows executable installation process. For Linux users, you can install Chardet via your package management system or download it from: <http://chardet.feedparser.org/>.

4.1 Windows

1. Download the Windows Manifest Maker executable from:

<https://sourceforge.net/projects/manifestmaker/files/>

2. Double-click the *Manifest Maker <version> Setup.exe*

Result: The installation wizard is displayed.

3. To start the installation, click **Next**.
4. Select the installation type and click **Next**.
5. Read the README file and click **Next**.
6. Select an installation location and click **Next**.
7. To complete the installation, click **Install**.

Result: A shortcut to Manifest Maker is added to your Start Menu and Manifest Maker is installed in the location specified in step 6.

8. To exit the installation wizard, click **Finish**.
9. To start Manifest Maker, select **Start – Programs – National Archives of Australia – Manifest Maker**.

4.2 Linux

Manifest Maker requires Python to run. This procedure assumes that you have Python 2.x installed.

1. Install Chardet and wxWidgets Cross-platform C++ GUI toolkit (wxPython binding):
 - In Ubuntu, run the following from the command line:

```
sudo apt-get install python-chardet python-wxgtk2.8
```
 - In Fedora, run the following from the command line:

```
su -c "yum install python-chardet pygtk2 wxPython"
```

2. Download the Manifest Maker TAR file from:

<https://sourceforge.net/projects/manifestmaker/files/>

3. Extract the Manifest Maker TAR file into your home folder:

```
tar -xvf <ManifestMaker TAR file>
```

Result: This will create the directory: `~/ManifestMaker-<version>/`

4. From the command line, enter:

```
python ~/manifest-<version>/src/manifest/ManifestMakerFrame.py
```

4.3 Mac OS X

This procedure assumes that you already have Python 2.6 installed.

Note: You will need to ensure that Python starts in 32-bit mode. Python will start in 64-bit mode by default but Manifest Maker will only start if Python starts in 32-bit mode.

1. Make Python run in 32-bit mode by default. From the terminal, type the following:

```
defaults write com.apple.versioner.python Prefer-32-Bit -bool yes
```

2. Install Chardet:

- Download Chardet from: <http://chardet.feedparser.org/>
- Extract the archive
- From the terminal navigate to the `python2-chardet-2.0.1` directory (the location of the `setup.py` file) and type:

```
python setup.py install
```

3. Download the Manifest Maker TAR file from:

<https://sourceforge.net/projects/manifestmaker/files/>

4. Extract the Manifest Maker TAR file into your home folder, this will create the directory:

```
/manifest-<version>/
```

5. From the terminal, enter:

```
python ~/manifest-<version>/src/manifest/ManifestMakerFrame.py
```

5 Using Manifest Maker

The following procedures describe how to use Manifest Maker to produce a manifest file.

Manifest Maker can produce a manifest file by either:

- allocating of a range of sequential item numbers to one or more items, or
- loading a barcode list. The barcode list is a list of items and corresponding item/barcode numbers. The item numbering may or may not be sequential.

5.1 Configuring Manifest Maker

The following sections describe how to alter the default item numbering method and checksum algorithm.

Note: You should adjust these settings before adding information in to the Manifest Maker wizard.

5.1.1 Select item numbering method

The default item numbering method is *number range plus increment top-level directories*. To alter the item numbering method:

1. Select **Settings – Number range**.
2. Select the desired numbering method from the list of options.

Note: For a description of the available numbering methods, refer to **Appendix A**.

5.1.2 Select checksum algorithm

The default checksum algorithm is SHA-512. To alter the checksum algorithm:

1. Select **Settings – Checksum algorithm**.
2. Select the desired checksum algorithm from the list of options.

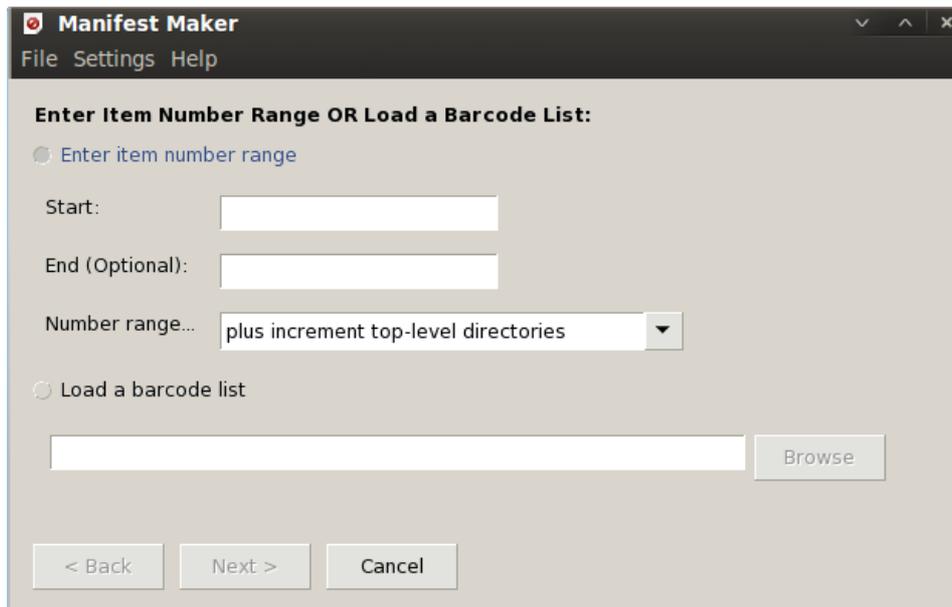
5.2 Creating a manifest by allocating a range of item numbers

This procedure assumes that the National Archives has allocated a range of item numbers for the items in the transfer.

5.2.1 Select the item number range

1. Start Manifest Maker.

Result: The first step of the Manifest Maker wizard is displayed.



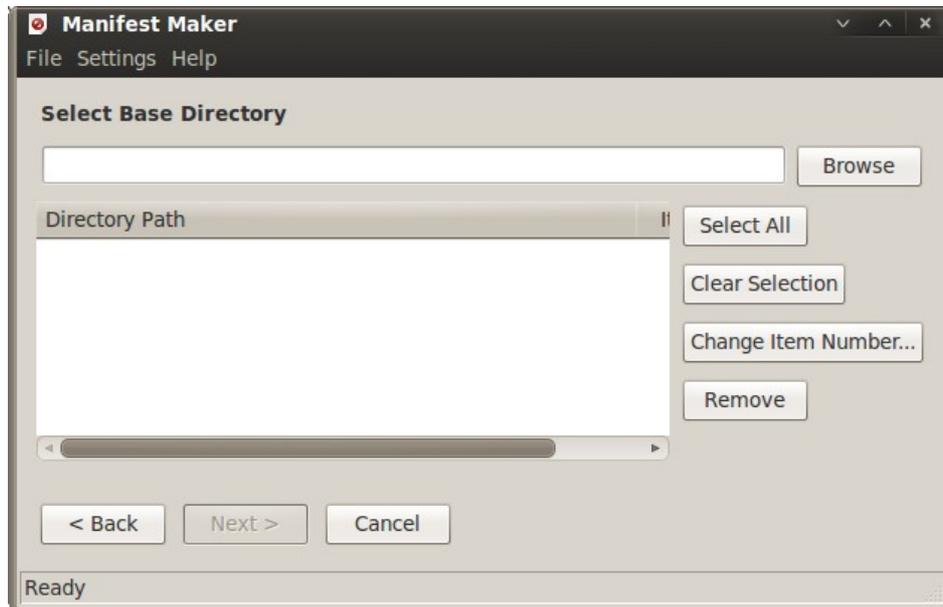
The screenshot shows the 'Manifest Maker' application window. The title bar includes 'Manifest Maker' and standard window controls. The menu bar contains 'File', 'Settings', and 'Help'. The main content area is titled 'Enter Item Number Range OR Load a Barcode List:'. There are two radio buttons: 'Enter item number range' (selected) and 'Load a barcode list'. Under 'Enter item number range', there are three input fields: 'Start:', 'End (Optional):', and 'Number range...'. The 'Number range...' field is a dropdown menu currently showing 'plus increment top-level directories'. Below the 'Load a barcode list' radio button is a text input field and a 'Browse' button. At the bottom of the window are three buttons: '< Back', 'Next >', and 'Cancel'.

2. Enter the Item Number Range:
 - In the *Start* field, enter the first number in the item number range.
 - Optional. In the *End* field, enter the last number in the item barcode number range.
3. Optional. Select the desired numbering method from the Number Range drop-down list.
4. Click **Next**

Result: The *Select Base Directory* step of the of the Manifest Maker wizard is displayed.

5.2.2 Select base directory

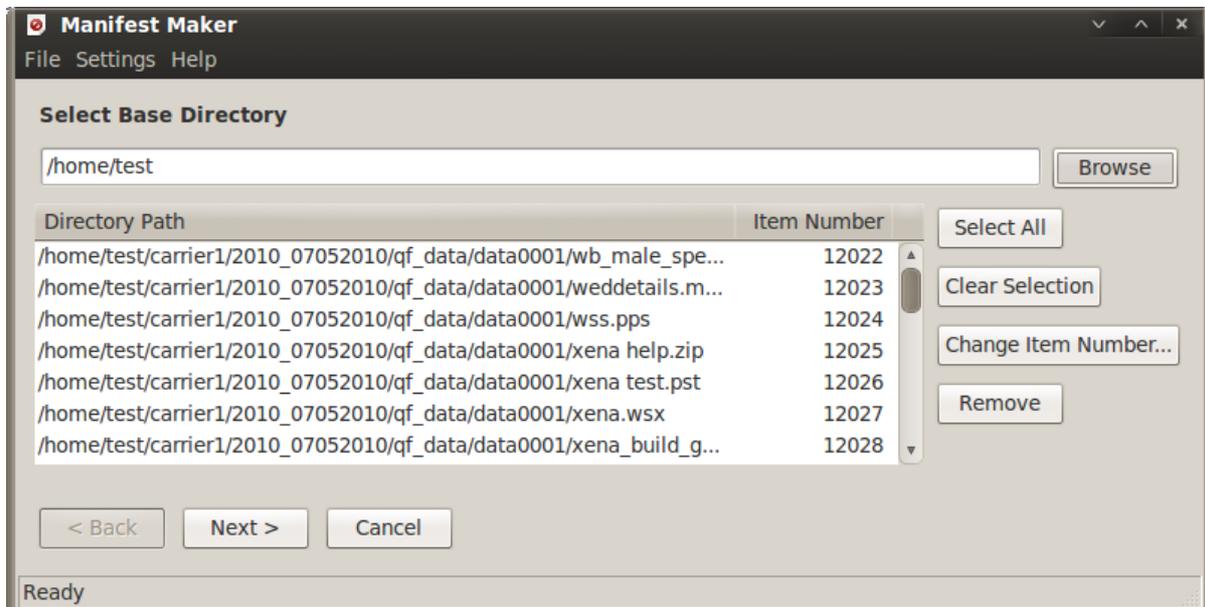
Select the base directory containing the digital objects to be included in the manifest.



1. In the *Select Base Directory* field, do **one** of the following:

- enter the path to the base directory, or
- click the **Browse** button and navigate to the base directory.

Result: The *Directory*, *Directory Path* and *Item Number* are populated:



2. Optional. You can manually alter the list of items contained in the *Directory Path* field using the following options:

- Select one or more items in the *Directory Path* field.

Tip: To select more than one item, use **Shift+click** or **Ctrl+click**, or to select all items, click the **Select All** button.

- Deselect any selected items with the **Clear Selection** button
- Launch the *Change Item Number* window with the **Change Item Number** button. This option allows you to specify the item barcode number for any selected items.
- Remove selected items from the *Directory Path* field with the **Remove** button.

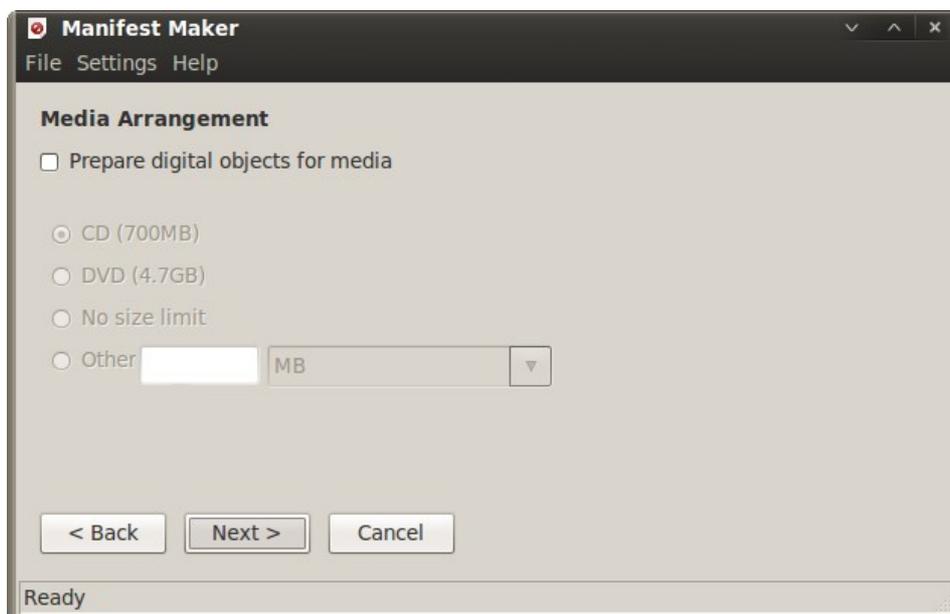
3. Click **Next**.

Result: The *Media Arrangement* step of the of the Manifest Maker wizard is displayed.

5.2.3 Select media arrangement

This step assumes that you are copying the digital objects to an output directory when the manifest file is created.

Note: If you do not want to copy the digital objects at the same time you create the manifest file, click **Next**.



1. Click the *Prepare Digital Objects for Media* checkbox

2. In the *Media Size* section, select the type of media size required.

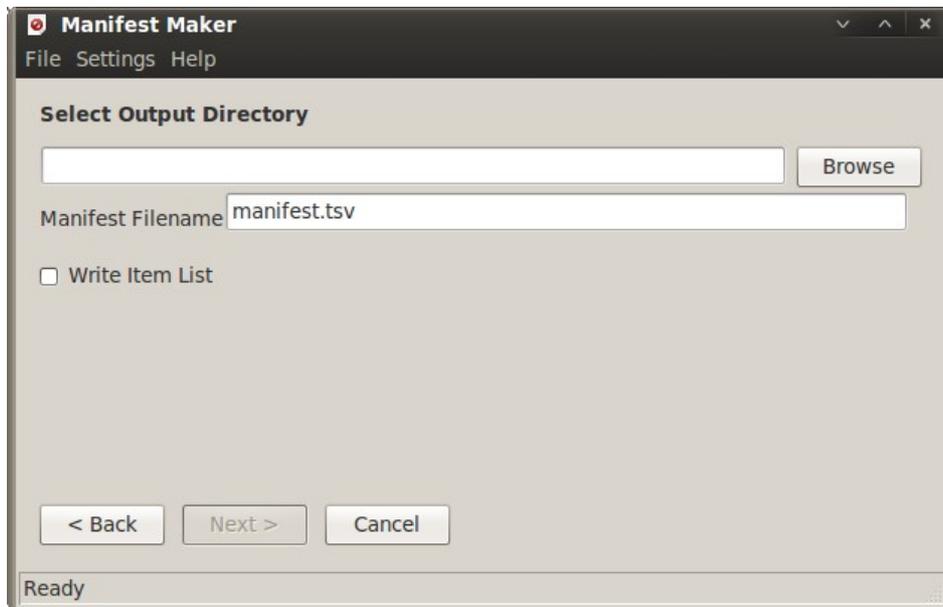
3. Click **Next**.

Result: The *Select Output Directory* step of the Manifest Maker wizard is displayed.

5.2.4 Select output directory

The output directory is where the manifest file will be created.

Note: If you selected the *Prepare Digital Objects for Media* option in the *Media Arrangement* step of the Manifest Maker wizard, the digital objects will also be copied to the selected output directory.



1. Select the output directory.

Note: If you selected the the *Prepare Digital Objects for Media* checkbox in the *Media Arrangement* step, the output directory you select must be empty and have sufficient space to store the digital objects.

2. Optional. Change the Manifest Filename. The default filename for the manifest file is *manifest.tsv*.
3. Optional. Check the *Write an Item List* checkbox. Manifest Maker will produce a tab-separated list of all items in the manifest file.
4. Click **Next**

Result: The manifest and, optionally, the item list are created in the selected output directory. Once the manifest is created, the *Continue, New or Quit* step of the Manifest Maker wizard is displayed.

5.2.5 New, Continue or quit

You now have the option to create another manifest, make additions to your previous manifest, or quit.



- To quit, click the **Quit** button. If you are using CDs or DVDs you can now burn each of the media directories to a single disk.
- To create a new manifest:

1. Ensure the *New manifest* radio button is selected.
2. Click **Next**.

Result: The first step of the Manifest Maker wizard is displayed.

- To add to your previous manifest:

1. Select the *Continue with new media* radio button.
2. Click **Next**.

Result: The Select Base Directory step of the Manifest Maker wizard is displayed.

3. Enter the base directory (see section 5.2.2).
4. Click **Next**.

Result: Manifest Maker adds the new digital objects to the previous manifest and displays the *Continue, New or Quit* step of the Manifest Maker wizard.

5. To keep adding to your manifest, repeat steps 1 to 4 above.

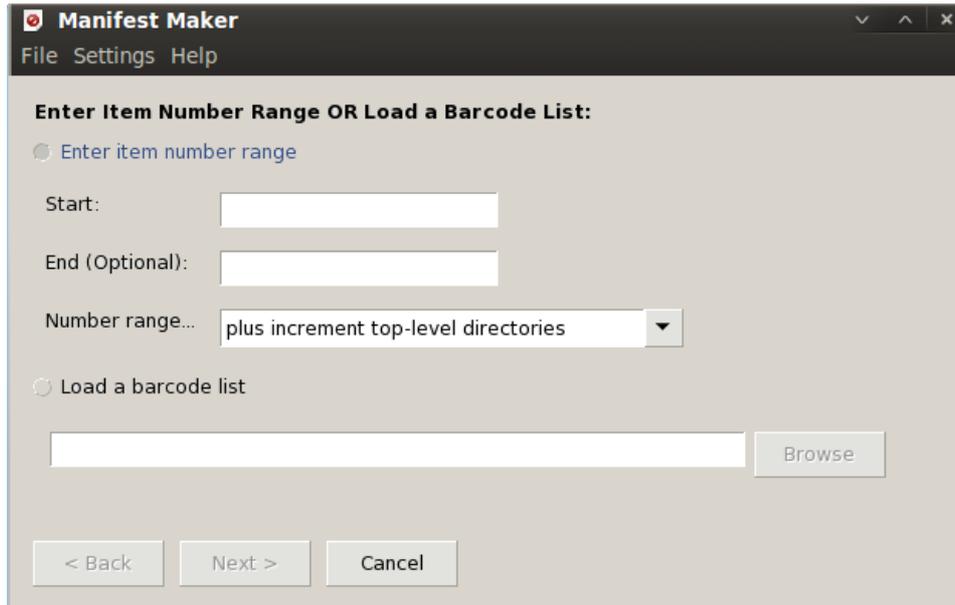
5.3 Creating a manifest by loading a barcode list

This procedure assumes that you have a barcode list in the appropriate format (digital objects and corresponding item/barcode numbers - refer to **Appendix B** for more information).

5.3.1 Select a barcode list

1. Start Manifest Maker.

Result: The first step of the Manifest Maker wizard is displayed.



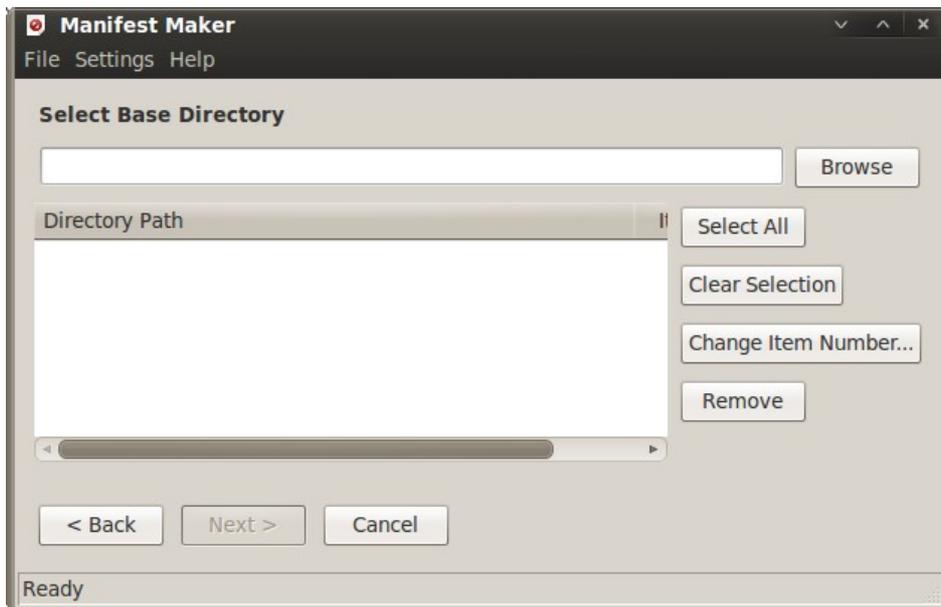
The screenshot shows the 'Manifest Maker' application window. The title bar includes 'Manifest Maker' and standard window controls. The menu bar contains 'File', 'Settings', and 'Help'. The main content area is titled 'Enter Item Number Range OR Load a Barcode List:'. There are two radio buttons: 'Enter item number range' (which is selected) and 'Load a barcode list'. Under 'Enter item number range', there are three input fields: 'Start:', 'End (Optional):', and 'Number range...'. The 'Number range...' field has a dropdown menu with the selected option 'plus increment top-level directories'. Under 'Load a barcode list', there is a text input field and a 'Browse' button. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

2. Select the *Load a Barcode List* radio button.
3. Navigate to the location of the barcode list.
4. Click **Next**.

Result: The *Select Base Directory* step of the of the Manifest Maker wizard is displayed.

5.3.2 Select base directory

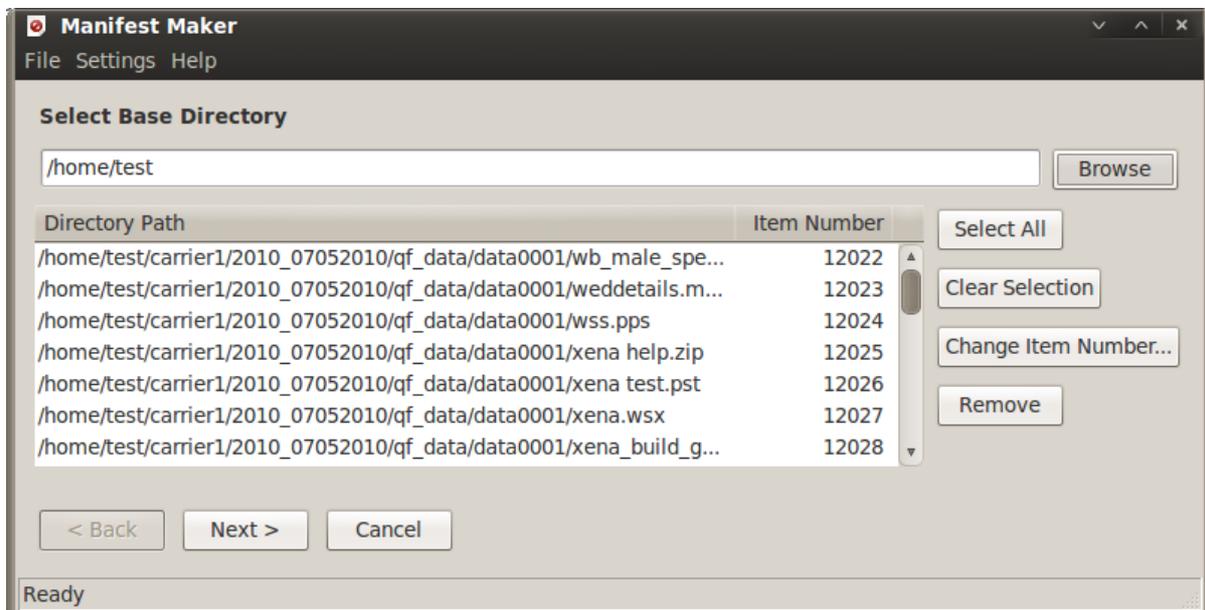
Select the directory containing the digital objects listed in the barcode list.



1. In the *Select Base Directory* field, do **one** of the following:

- enter the path to the base directory, or
- click the **Browse** button and navigate to the base directory.

Result: The *Directory*, *Directory Path* and *Item Number* are populated:



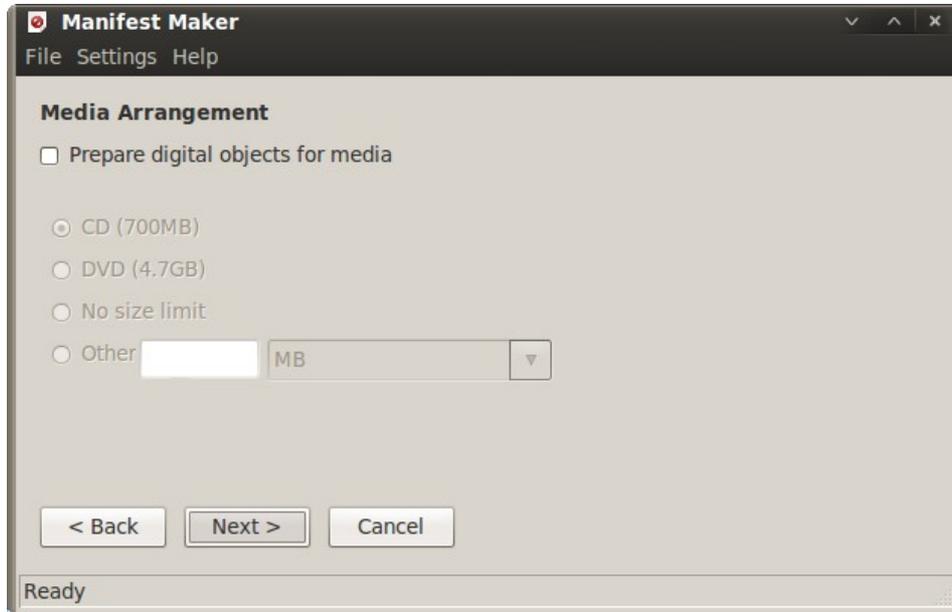
2. Click **Next**.

Result: The *Media Arrangement* step of the Manifest Maker wizard is displayed.

5.3.3 Select media arrangement

This step assumes that you are copying the digital objects to an output directory when the manifest file is created.

Note: If you do not want to copy the digital objects at the same time you create the manifest file, click **Next**.



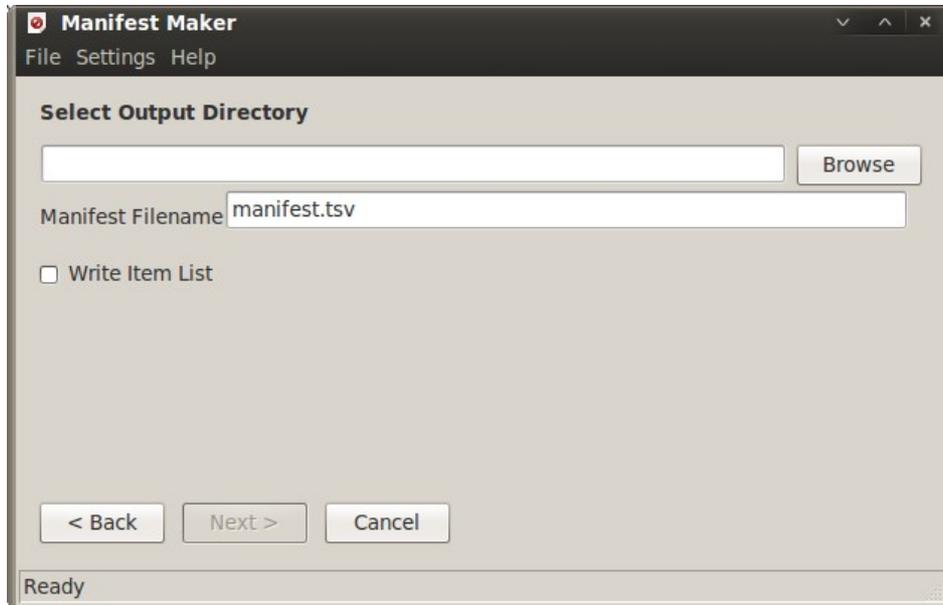
1. Click the *Prepare Digital Objects for Media* checkbox
2. In the *Media Size* section, select the type of media required.
3. Click **Next**.

Result: The *Select Output Directory* step of the Manifest Maker wizard is displayed.

5.3.4 Select output directory

The output directory is where the manifest file will be created.

Note: If you selected the *Prepare Digital Objects for Media* option in the *Media Arrangement* step of the Manifest Maker wizard, the digital objects will also be copied to the selected output directory.



1. Select the output directory.

Note: If you selected the *Prepare Digital Objects for Media* checkbox in the *Media Arrangement* step, the output directory you select must be empty and have sufficient space to store the digital objects.

2. Optional. Change the Manifest Filename. The default filename for the manifest file is *manifest.tsv*.
3. Optional. Check the *Write an Item List* checkbox. This produces a tab-separated list of all items in the manifest file.
4. Click **Next**.

Result: The manifest and, optionally, the item list are created in the selected output directory. Once the manifest is created, the *Continue, New or Quit* step of the Manifest Maker wizard is displayed.

If you are using CDs or DVDs you can now burn each of the media directories to a single disk.

5.3.5 New, Continue or quit

You now have the option to create another manifest, or quit.



- To quit, click the **Quit** button.
- To create a new manifest:
 - ensure the *New manifest* radio button is selected
 - click **Next**.

6 Appendix A – Numbering methods

When creating a manifest based on an item number range, you can select from several item numbering methods.

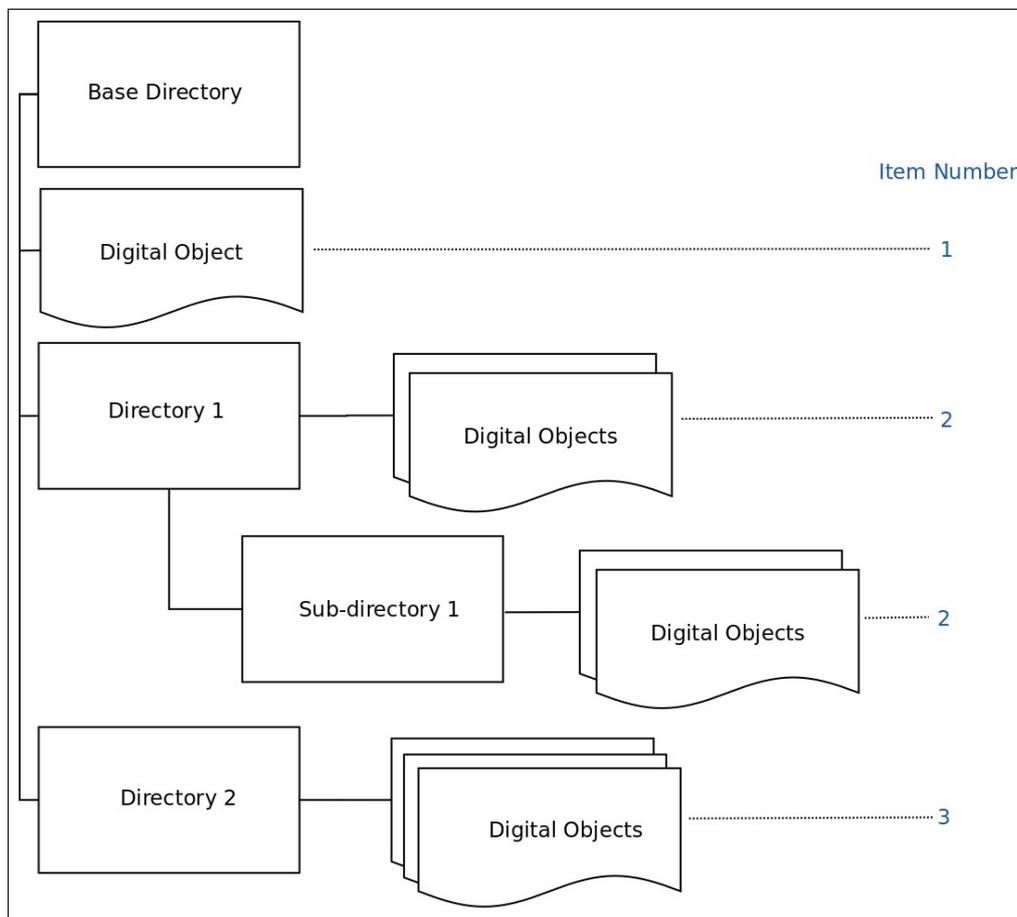
To apply a numbering method to your digital objects, select **Settings – Number Range**.

Each of the item numbering methods available are described below.

6.1 Number range plus increment top-level directories

This is the default numbering method. Item numbers are assigned sequentially to all digital objects in the base directory (starting from the item number you enter in the *Start* field of the item number range). If the digital objects are arranged by directories, each directory is numbered sequentially. The contents of each directory will be numbered according to the item number of that directory.

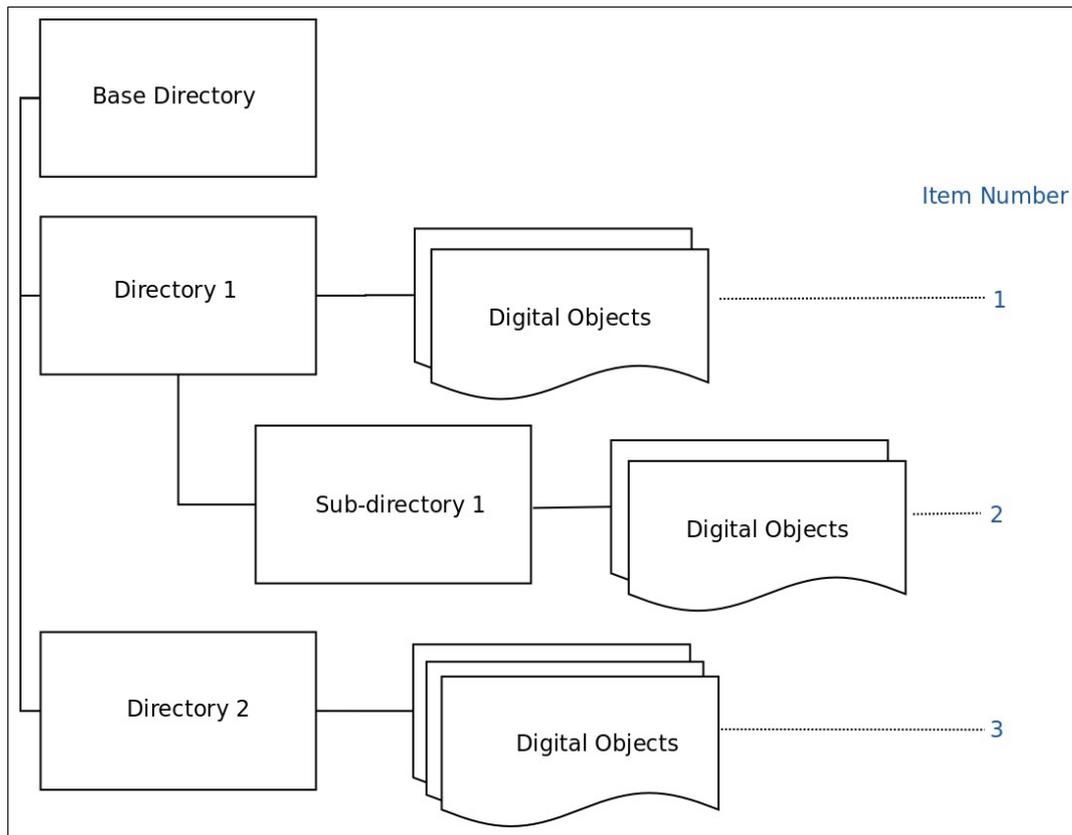
The following diagram shows how item numbers are applied using this method. In this example, the *Start* number allocated is 1:



6.2 Number range plus increment sub-directories

This numbering method will assign item numbers in a similar way to *number range plus increment top-level directories*. The main difference is that if there are directories with sub-directories, their contents will be numbered **differently** to the containing directory.

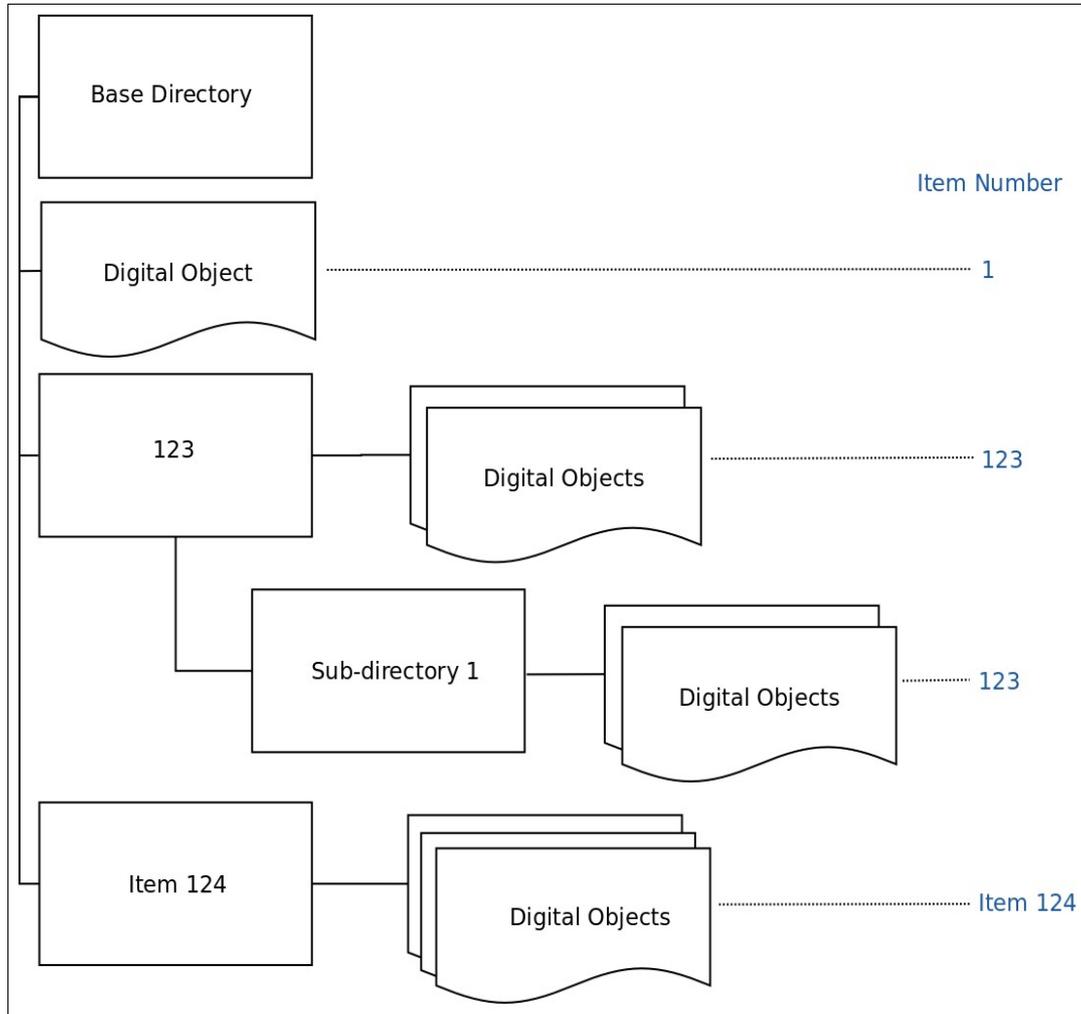
The following diagram shows how item numbers are applied using this method. In this example, the *Start* number allocated is 1:



6.3 Number range plus use names of top-level directories

This is similar to *number range plus increment top-level directories*, except that the contents of any top-level directories will be numbered according to the name of the containing directory.

For example, if one of the top-level directories is called “Item 124”, all of the items within that directory will receive the item number, “Item 124”:



6.4 Number range – use same item number

Regardless of the structure of directories or sub-directories, all digital objects in the base directory are given the **same** item number - the *Start* number entered in the item number range.

6.5 Number range – use different item numbers

Regardless of the structure of directories or sub-directories, each digital object under the base directory is given a **different** item number, starting from the *Start* number entered in the item number range.

7 Appendix B – Barcode list formats

The following sections describe barcode list formats accepted by Manifest Maker.

7.1 Format requirements

Barcode lists must contain a filename and item number, separated by one of the following field delimiters:

- comma-separated
- tab-separated
- semicolon-separated.

Note: You cannot mix field delimiters in the same barcode list. For example, if you create a comma-separated barcode list, all field delimiters in that barcode list must be commas.

Text strings (filenames and/or item numbers) in the barcode list can be delimited by any of the following:

- single quotes
- double-quotes
- a mixture of single or double quotes or no quotes.

7.2 Sub-directories

A barcode list can specify sub-directories of the base directory. In such cases, the following rules apply:

- The item number of the sub-directory determines the item numbering of its contents.
- Item numbers are allocated sequentially.
- Sequential item numbering can be overridden by explicitly stating item numbers for individual digital objects (or sub-sub-directories).

For example, the following comma-separated barcode list will allocate item numbers 1 to 3 to the separate digital objects (filename delimiter is double-quotes) and allocate item number 87898 to all digital objects in *directory1*.

```
"a1.txt",1  
"a2.txt",2  
"a3.txt",3  
"directory1/",87898
```

Note: Manifest Maker will automatically determine if an entry in the barcode list refers to a directory or a digital object.

If you are explicitly indicating a directory (as done in the above list), the direction of the slash is important. The above sample is written for a Linux operating system - the *directory1* sub-directory is written with a forward slash. For a Windows operating system, indicate sub-directories with a backslash.