RoboBraille Service Summary

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1 Introduction

RoboBraille is a web and email-based service capable of converting documents into a range of accessible formats including Braille, mp3, Daisy and various e-book formats. The service can furthermore be used to convert otherwise inaccessible documents such as scanned images, pdf files and PowerPoint presentations into more accessible formats. RoboBraille has been in operation since 2004 and currently serves thousands of user requests each month from users across the world.

The service is developed jointly by the National Danish Center for Visual Impairment for Children and Youth and Sensus ApS. RoboBraille is available free of charge to individual, non-commercial users and users need not register to use the service. For institutional use, the RoboBraille web interface is available in customised versions to academic institutions and other organisations that wish to include it on their websites. The document conversion capabilities of RoboBraille can also be integrated with digital library systems and learning management systems in order to support users with special needs. Institutional use is subject to a subscription fee.

The development and operation of RoboBraille has been funded by the Danish Government, the European Commission and private foundations.

In November 2012, the RoboBraille service received the prestigious WISE 2012 Award for its support of Inclusion in Education. The service has previously received the 2010 BETT Award for best Special Education Needs solution, the 2009 Access IT Award for Learning for most affordable eLearning solution, the 2009 National eWell-Being Award for "Reaching the Digitally Excluded", the 2008 European Commission eInclusion Award for e-Accessibility, the 2008 Well-Tech Award for Innovation and Accessibility and the 2007 Social Contribution Award from the British Computer Society.

RoboBraille offers four main categories of services:

1. **Braille services**: Translation to and from Braille (contracted, un-contracted) in Danish, British English, American English, Italian, French, Greek, German, Icelandic, Norwegian, Polish, Portuguese and Spanish. Supported document types include text files (DOS and Windows), Microsoft Word documents (doc, docx, Word xml), html documents, rtf files, tiff, gif, jpg, bmp, pcx, dcx, j2k, jp2, jpx, djv and all types of pdf documents. Before the Braille document is returned to the user, it may be converted to a particular Braille character set based on user settings. Documents can also be returned in Unicode Braille or formatted in either text format or PEF (Portable Embosser Format).

2. **Audio services**: All document types listed in the previous section may be converted into mp3 files. Furthermore, RoboBraille is capable of converting well-structured Word documents (doc, docx, xml) into Daisy Talking Books complete with audio. Similarly, RoboBraille can convert docx documents containing math (written in MathType) into Daisy books witg spoken math. The audio conversion services currently include high-quality voices for the following languages: Arabic, Arabic/English bilingual, Bulgarian, Danish, Dutch (male, female), English/American, English/British, French, German, Hungarian, Italian, Lithuanian, Polish, Portuguese, Romanian, Slovenian Spanish/Castilian and Spanish/Latin American.

3. **E-Book services**: Most document types listed above may be converted into the popular EPUB and Mobi Pocket (Amazon Kindle) e-book formats. The service also supports conversion of documents into the EPUB3 format. Furthermore, EPUB may be converted to Mobi Pocket and vice versa. To accommodate users with low vision, the base line of the body text in an e-book may be raised to allow for more appropriate text scaling in mainstream e-book readers.

4. **Accessibility services**: Otherwise inaccessible documents such as image files in gif, tiff, jpg, bmp, pcx, dcx, j2k, jp2, jpx, djv and image-only pdf, as well as all types of pdf files can be converted to more accessible formats including tagged pdf, doc, docx, Word xml, xls, xlsx, csv, text, rtf and html. Word and rtf files are converted into text or tagged pdf files subject to the format specified by the user in the subject

line, e.g., txt or pdf. PowerPoint files are converted into tagged pdf, web projects or rtf files.

RoboBraille furthermore offers several auxiliary services:

5. **Visual Braille services**: To support the requirements of pharmaceutical companies, RoboBraille can create graphical Braille artwork based on the Braille codes of many European countries. Pharmaceuticals, printers and designers submit control files with the product name and strength, Braille number encoding regime and language codes. A subscription is required for these services.

6. **RoboBraille Tools**: A number of utility accounts support functions such as file partitioning, file conversion and file export to particular Braille character sets.

The remainder of this document explains the various user web interfaces, email accounts and options available in RoboBraille, as well as how to format and emboss Braille documents. As such, the document is the closest thing to an actual RoboBraille manual.

The main source of information and the primary user interface to RoboBraille is the RoboBraille website at www.robobraille.org.
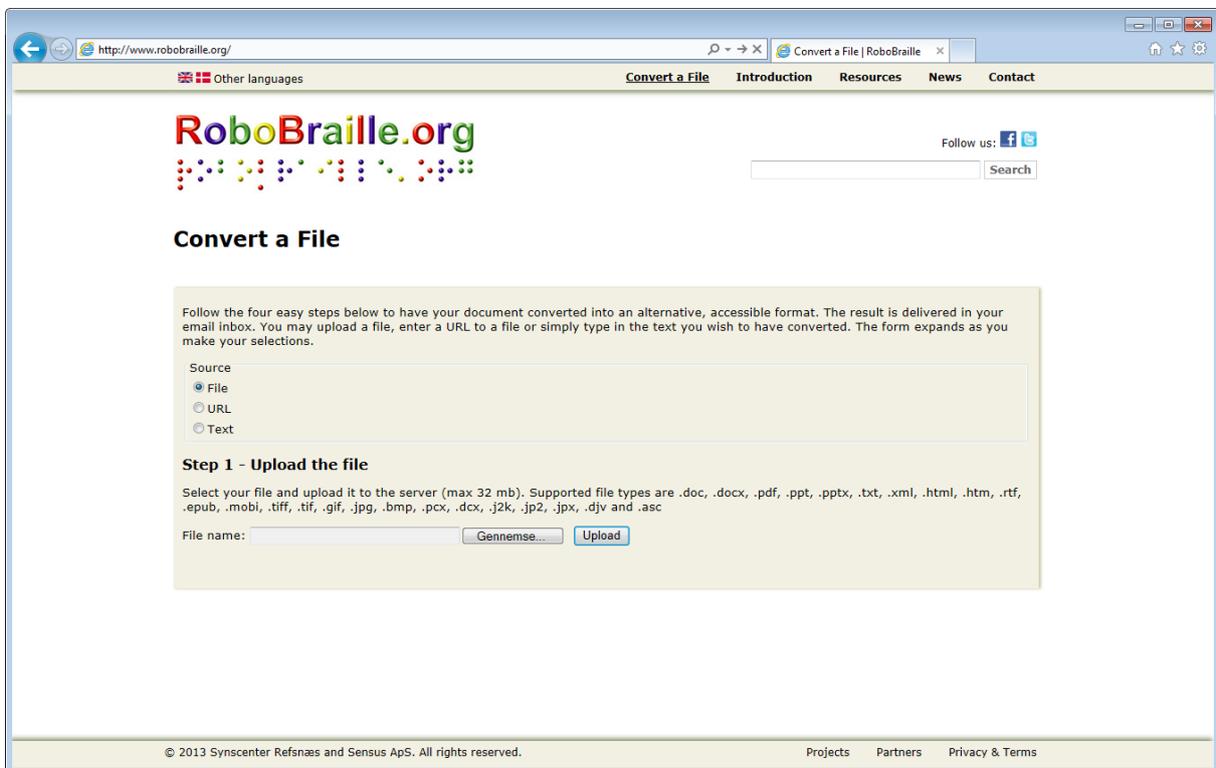
Comments, requests for support, suggestions or questions regarding the RoboBraille service should be mailed to the main service account: contact@robobraille.org.

2 The RoboBraille Web Interface

The main interface to the RoboBraille service is the RoboBraille Web Form. The form complies with the W3C WCAG2 guidelines and can be used by screen reader users and others with special needs. The RoboBraille web Form exists in a number of different versions, including but not limited to the following:

www.robobraille.org/web3. A stable form with a wide range of RoboBraille functions, features and options.

The RoboBraille Web Form can furthermore be found at the main RoboBraille web page at www.robobraille.org.

2.1 Main RoboBraille Web Form

While attempting to reduce potential user input errors, the RoboBraille Web Form is designed to guide the user through four steps of converting a document into an alternate format.

Each version of the web form is defined to default to a specific language. If the form is configured to allow users to change the user interface language, a set of flags are displayed at the top of the form. In addition to changing the user interface language of the form, the language selection also affects the defaults used throughout the form. Hence, selecting American English as the user interface language will also change the default setting of Braille conversions to the North American Braille code and a US Braille paper format, whereas selecting German as the user interface language will change the Braille default to the German Braille code.

Having selected the user interface language, the form guides the user through the following four steps:

1. Upload the document to the RoboBraille server
2. Select the target format for the conversion. The list of available target formats is presented based on the file type of the uploaded document.
3. Provide options to the conversion. These options are specific to the target format selected, e.g., contraction level and Braille code for Braille conversion, TTS language and speed for mp3 audio conversions and e-book format and base line font text size for e-book conversions.
4. Provide a valid email address. The result of the document conversion will be mailed to the email address provided.

After pressing the "Submit" button, the user is presented with a receipt page.

Below is an illustration of the main RoboBraille web form at www.robobraille.org/web3

In addition to new functionality, the experimental RoboBraille Web Form allows the user to select between three modes of input: As previously, documents may be uploaded to the RoboBraille server. Furthermore, documents may be referenced by an URL or text may be typed or pasted into the form.

2.2 Customising the RoboBraille Web Form

The RoboBraille Web Form is intended to be included on a host page in an iframe. The following aspects of the RoboBraille form can be customised:

- Default language
- Language selector. Whether or not to display the banner of flags.
- Headline. Whether or not to include the initial H1 header "Alternative Media Made Easy"
- Mail restrictions. Whether or not the form should be restricted to users on a particular mail domain.

- Font face. The default font face and possibly a font family. This is controlled in the style sheet for the form. All CSS syntax is available.
- Font size. The relative or absolute size of the fonts used for each of the structural elements of the form. This is controlled in the style sheet for the form. All CSS syntax is available.
- Foreground colours. The colour of the text. Different colours can be used for each structural element. This is controlled in the style sheet for the form. All CSS syntax is available.
- Background colour. The colour of the background. This is controlled in the style sheet for the form. All CSS syntax is available.
- Legal disclaimer. A single paragraph legal disclaimer that can be displayed between the introduction and heading for Step 1. More comprehensive disclaimers should be placed elsewhere in the surroundings of the form or on a separate page.
- Donation option. Whether or not to display the option to donate money to the RoboBraille service on the receipts page of the service.
- Form ID. A form ID must be agreed with Sensus in order to collect usage statistics for the form. Daisy reports on usage of the form can be provided through email.

Integrating the RoboBraille Web Form on a host page can be done using an iframe element:

```
<iframe src="http://www.robobraille.org/web3" width="640" height="550"></iframe>
```

A collection of different web forms can be found at www.robobraille.org/iframeview.

Institutional use of RoboBraille, e.g., as an official accommodation provided by an academic institution or a library, is subject to an annual subscription fee. Organisations interested in deploying the RoboBraille Web Form should write to contact@robobraille.org.

3 The RoboBraille Email Interface

The original interface to RoboBraille is based on email where users submit documents to various email accounts in order to have the documents converted into alternate formats. Options are provided through the subject field of the email. In fact, the RoboBraille Web Form merely composes and submits an email to match the requested document conversion. Thus, all functions available through the web interface are available through email. The email interface even supports functions and options that are not made available through the web interface.

Users may find the email interface more efficient, easier accessible and available on more platforms compared with the web interface.

In addition to being used directly by users to submit documents to RoboBraille, the email interface may be used by developers to create integrations to other systems such as learning management systems, digital libraries, portals and web sites. Such institutional use of RoboBraille is subject to an annual subscription fee. Organisations interested in deploying the RoboBraille Web Form should write to contact@robobraille.org

3.1 Braille accounts

Account	Function
sixdot@robobraille.org	Translates the document into six-dot, Grade II Braille according to the British English Braille code.
eightdot@robobraille.org	Translates the document into eight-dot, Grade II Braille according to the British English Braille code.
fulltext6@robobralle.org	Translates the document into six-dot, Grade I Braille according to the British English Braille code.
fulltext8@robobralle.org	Translates the document into eight-dot, Grade I Braille according to the British English Braille code.
banagrade2@robobraille.org	Translates the document into six-dot, Grade II Braille according to the American English Braille code (BANA)
banagrade1@robobraille.org	Translates the document into six-dot, Grade I Braille according to the American English Braille code (BANA)
sekspunkt@robobraille.org	Translates the document into six-dot, Grade II Braille according to the Danish Braille code.
ottepunkt@robobraille.org	Translates the document into eight-dot, Grade II Braille according to the Danish Braille code.
fuldskrift6@robobraille.org	Translates the document into six-dot, Grade I Braille according to the Danish Braille code.
fuldskrift8@robobraille.org	Translates the document into eight-dot, Grade I Braille according to the Danish Braille code.
820da@robobraille.org	Decontracts the document from Danish eight-dot Grade II Braille into ordinary text.
textoparabraille@robobraille.org	Translates the document into six-dot, Grade I Braille according to the Portuguese Braille code.
brailleseipunti@robobraille.org	Translates the document into six-dot, Grade I Braille according to the Italian Braille code.
potbraille@robobraille.org	Translates the document into six-dot, Grade I Braille according to the Greek Braille code.
Icebraille6@robobraille.org	Translates the document into six-dot, Grade I Braille according to the Icelandic Braille code.

Account	Function
Icebraille8@robobraille.org	Translates the document into eight-dot, Grade I Braille according to the Icelandic Braille code
vollschrift@robobraille.org	Translates the document into six-dot, Grade I Braille according to the German Braille code.
kurzschrift@robobraille.org	Translates the document into six-dot, Grade II Braille according to the German Braille code.
vollschrift8@robobraille.org	Translates the document into eight-dot, Grade I Braille according to the German Braille code.
Kurzschrift8@robobraille.org	Translates the document into eight-dot, Grade II Braille according to the German Braille code.
fullskrift@robobraille.org	Translates the document into six-dot, Grade I Braille according to the Norwegian Braille code.
kortskrift1@robobraille.org	Translates the document into six-dot, Level 1 contracted Braille according to the Norwegian Braille code.
kortskrift2@robobraille.org	Translates the document into six-dot, Level 2 contracted Braille according to the Norwegian Braille code.
braille@robobraille.org	Translates the document into six-dot, Grade I Braille according to the French Braille code.
integral@robobraille.org	Translates the document into six-dot, Grade I Braille according to the Spanish Braille code.
brajl@robobraille.org	Translates the document into six-dot, Grade I Braille according to the Polish Braille code.
brajica6@robobraille.org	Translates the document into six-dot, Grade I Braille according to the Slovenian Braille code.

Users can specify the name of the target Braille character set by writing the name of the appropriate export filter in the subject line of the mail, e.g., *nacb* for North American Computer Braille and *unicode* for Unicode Braille.

Users can also specify particular formats such as *format3028p* for 30 characters per line, 28 lines per page with pagination, *format3227* for 32 characters per line, 27 lines per page without pagination, *pef3227p* for delivery on pef (portable embosser format) with 32 characters per line, 27 lines per page with pagination and *pef3329pd* for a pef file with 33 characters per line, 29 lines per page, pagination and duplex embossing. A number of combinations exist. For extended information on how to format and emboss Braille documents, please refer to the section below entitled ***Formatting and embossing documents***.

3.2 MP3 accounts

Account	Function
britspeech@robobraille.org	Converts the document to an mp3-file using a British English voice.
usspeech@robobraille.org	Converts the document to an mp3-file using an American English TTS.
tale@robobraille.org	Converts the document to an mp3-file using a Danish voice.

Account	Function
tydeligtale@robobraille.org	Converts the document to an mp3-file using an alternative Danish voice (more distinct pronunciation).
deutsch@robobraille.org	Converts the document to an mp3-file using a German voice.
audio@robobraille.org	Converts the document to an mp3-file using an Italian voice.
potspeech@robobraille.org	Converts the document to an mp3-file using a Greek voice.
textoparavoz@robobraille.org	Converts the document to an mp3-file using a Portuguese voice.
castellano@robobraille.org	Converts the document to an mp3-file using a Castilian Spanish voice.
leeme@robobraille.org	Converts the document to an mp3-file using a Latin American Spanish voice.
parlefrancais@robobraille.org	Converts the document to an mp3-file using a French voice.
mowa@robobraille.org	Converts the document to an mp3-file using a Polish voice.
preberi@robobraille.org	Converts the document to an mp3-file using a Slovenian voice.
aistis2@robobraille.org	Converts the document to an mp3-file using a Lithuanian voice.
arabic@robobraille.org	Converts the document to an mp3-file using an Arabic voice. See note below regarding document types.
arabicbilingual@robobraille.org	Converts the document containing bilingual text in Arabic and English into to an mp3-file using an Arabic and a British English voice. See note below regarding document types.
v@robobraille.org	Converts the document to an mp3-file using a Dutch female voice.
m@robobraille.org	Converts the document to an mp3-file using a Dutch female voice.
bulgarian@robobraille.org	Converts the document to an mp3-file using a Bulgarian voice.
hungarian@robobraille.org	Converts the document to an mp3-file using a Hungarian voice.
romanian@robobraille.org	Converts the document to an mp3-file using a Romanian voice.

Users can specify the required speed of the audio via pluses or minuses in the subject line of the mail: + = fast; ++ = faster; +++ = fastest; - = slow; -- = slower; --- = slowest.

Note regarding documents in Arabic: Text documents (ANSI and Unicode) as well as Word documents have been successfully tested with RoboBraille. Be aware that pdf files, images and similar documents that require OCR processing will be processed but are unlikely to be recognized correctly due to limitations of in the RoboBraille OCR engine.

3.3 Daisy accounts

Account	Function
daisy@robobraille.org	Main Daisy account. Produces a full Daisy project complete with audio.
englishdaisy@robobraille.org	Produces a full Daisy project complete with audio with a user response in English.
danishdaisy@robobraille.org	Produces a full Daisy project complete with audio with a user response in Danish.
deutschdaisy@robobraille.org	Produces a full Daisy project complete with audio with a user response in German.
pldaisy@robobraille.org	Produces a full Daisy project complete with audio with a user response in Polish.
nldaisy@robobraille.org	Produces a full Daisy project complete with audio with a user response in Dutch.

To produce a Daisy project, submit a Word document (.doc, .docx, .xml or .rtf) to one of the accounts above. The author and title of the document must be specified in the document meta data, and the first element in the document must be a level heading 1.

The Daisy accounts are implemented using the Daisy Pipeline. The TTS is selected via the main language attribute of the submitted document. The current implementation of Daisy Pipeline does not support changes in the natural language of a document, nor is it possible to change the speed of the generated audio. The audio speed can often be adjusted in the Daisy player.

3.4 Daisy Math accounts

Account	Function
daisymath@robobraille.org	Main Daisy Math account. Produces a full text, full audio Daisy project of documents that may contain math or other scientific expressions.

This is an experimental function that is currently limited to American English. Other languages are expected to be added during 2013.

To produce a Daisy project with math or other scientific notation, the math or science notation must be created using the MathType editor from Design Science in Microsoft Word, and the document must subsequently be stored as a .docx file. RoboBraille uses SaveAsDaisy and the Daisy Pipeline to create the Daisy project. Use of the built-in math editor in Microsoft Word is not supported.

3.5 Accessibility accounts

Account	Function
convert@robobraille.org	Converts image files, pdf, DOS text, rtf and Microsoft Word documents into other more accessible formats with a user response in English.
konverter@robobraille.org converter@robobraille.org konvertiere@robobraille.org converti@robobraille.org potconvert@robobraille.org konwersja@robobraille.org converteer@robobraille.org	As above but with user responses in Danish, Portuguese, German, Italian, Greek, Polish, Dutch.

Word and rtf files are converted into text or tagged pdf files subject to the format specified by the user in the subject line, e.g., txt or pdf. PowerPoint files are converted

into tagged pdf, web projects or rtf files subject to the format specified by the user in the subject line, e.g., pdf, html or rtf. Text files in the old DOS format (with .asc extension) are converted into corresponding Windows text files. Pdf, tiff, gif jpg, bmp, pcx, dcx, j2k, jp2, jpx, and djv files are converted into the format specified by the user in the subject line of the mail, e.g., pdf, htm, txt, rtf, doc, docx, xml, xls, xlsx and csv. In case the target format for this latter conversion is doc, docx or rtf, RoboBraille will attempt to remove optional hyphens from the result.

Note: It is usually not a good idea to convert a tagged pdf file into tagged pdf. As all pdf files are subject to OCR processing, any accessibility features and/or semantic markup already present in a tagged pdf file may be erased in such an attempt.

3.6 E-Book accounts

Account	Function
epub@robobraille.org	Converts pdf, rtf, Microsoft Word, html, image files, lit and mobi documents into the EPUB e-book format, with user response in English.
mobi@robobraille.org	Converts pdf, rtf, Microsoft Word, html, image files, lit and epub documents into the Mobi Pocket e-book format, with user response in English.
epubda@robobraille.org, mobida@robobraille.org	As above but with user response in Danish.

E-books are created using Calibre. Prior to conversion into EPUB or Mobi Pocket, some document types are pre-converted. The table below summarises the intermediate formats utilised by prior to e-book conversion RoboBraille:

Input format	Intermediate format
Image documents	OCR processed and converted to tagged pdf
Pdf documents	OCR processed and converted tagged pdf
Word documents (.doc, .docx)	Converted to RTF
RTF	No conversion
Html files	No conversion
Epub	No conversion
Mobi	No conversion
Lit	No conversion
Text	No conversion

It is possible to change the base line of the text, i.e., the text size of the body text. This feature may be used to adapt e-books for people with low vision for reading in commercial e-book readers. While many e-books have a base line of 10 or 12 points, RoboBraille makes it possible to increase this base line to 16, 24 or 40 points using the following parameters in the subject line:

Base line parameter	Base line effect
Large	Move base line to 16 points
XLarge	Move base line to 24 points
Huge	Move base line to 40 points

Note that not all a-book readers recognize changes to the base line.

3.7 EPUB3

Account	Function
epub3@robobraille.org	Main EPUB3 account. Produces an EPUB3 project. The source document may contain math or other scientific expressions.

This is an experimental function. World documents stored in docx format may be converted into EPUB3 format. Math and other scientific notation created using the MathType editor from Design Science in Microsoft Word is also converted. RoboBraille uses SaveAsDaisy and DaisyPipelie 2 for the conversion. Use of the built-in math editor in Microsoft Word is not supported.

3.8 RoboBraille tools accounts

Account	Function
export@robobraille.org	Exports (converts and/or formats) the attached file into the target Braille character set and/or format specified in the subject line of the mail. For further information about the formatting options, please refer to the section below entitled **Formatting and embossing documents**.
eksport@robobraille.org exporter@robobraille.org exportiere@robobraille.org esporta@robobraille.org potexport@robobraille.org zmienbrl@robobraille.org exporteer@robobraille.org	As above but with user responses in Danish, Portuguese, German, Italian, Greek, Polish, Dutch
filepart@robobraille.org	Partitions the attached mail into smaller parts as per the size (in bytes) specified in the subject line of the mail.
filpart@robobraille.org partirficheiro@robobraille.org verdeel@robobraille.org	As above but with user responses in Danish, Portuguese, Dutch

4 Formatting and embossing documents

RoboBraille includes a number of facilities to convert character sets, format and emboss Braille documents. Internally, RoboBraille uses the OctoBraille character set, a Braille variant of the standard Windows 1252 character set also known as Latin 1.

4.1 Converting to the character set of the embosser

If your Braille embosser is capable of formatting, word-wrapping and paginating Braille documents, then you may only want RoboBraille to return your document in the Braille character set that your embosser uses, and let the embosser handle the rest. To do that, simply specify the Braille character set of your Braille embosser in the subject line of your mail to RoboBraille. In RoboBraille terminology, such a character set specification is called an export filter. The table below lists the export filters currently supported by RoboBraille:

Export filter	Function
logtext5	Log-Text Braille notetaker with old character set.
logtext	Log-Text Braille notetaker with old character set.
braillelite	Braille Lite with US character set.
braille-lite	Braille Lite with US character set.
nacb	North American Computer Braille. This is the standard character set of many Braille embossers.
computerbraille	North American Computer Braille. This is the standard character set of many Braille embossers.
uscomputerbraille2	North American Computer Braille. This is the standard character set of many Braille embossers.
us437	IBM code page 437.
germanascii	German computer ASCII.
german_ascii	German computer ASCII.
ibm850	IBM code page 850.
eurobraille	EuroBraille.
italianjaws	Italian JAWS.
italian_jaws	Italian JAWS.
braillenote	Braillenote note taker.
braille-note	Braillenote note taker.
dbs	InterpointElekul at the Danish Association of the Blind.
dbs_elekul	InterpointElekul at the Danish Association of the Blind.
ibos_elekul6	InterpointElekul at the Institute for the Blind and Partially Sighted
Unicode	Unicode Braille (in the 2800-28FF range).

If your Braille character set is not included in the list above, please send an email to contact@robobraille.org with a character-by-character specification of the character set. The character set will then be added to RoboBraille when the system is next updated.

The figure below illustrates how to specify that the Braille should be returned by RoboBraille in North American Computer Braille:
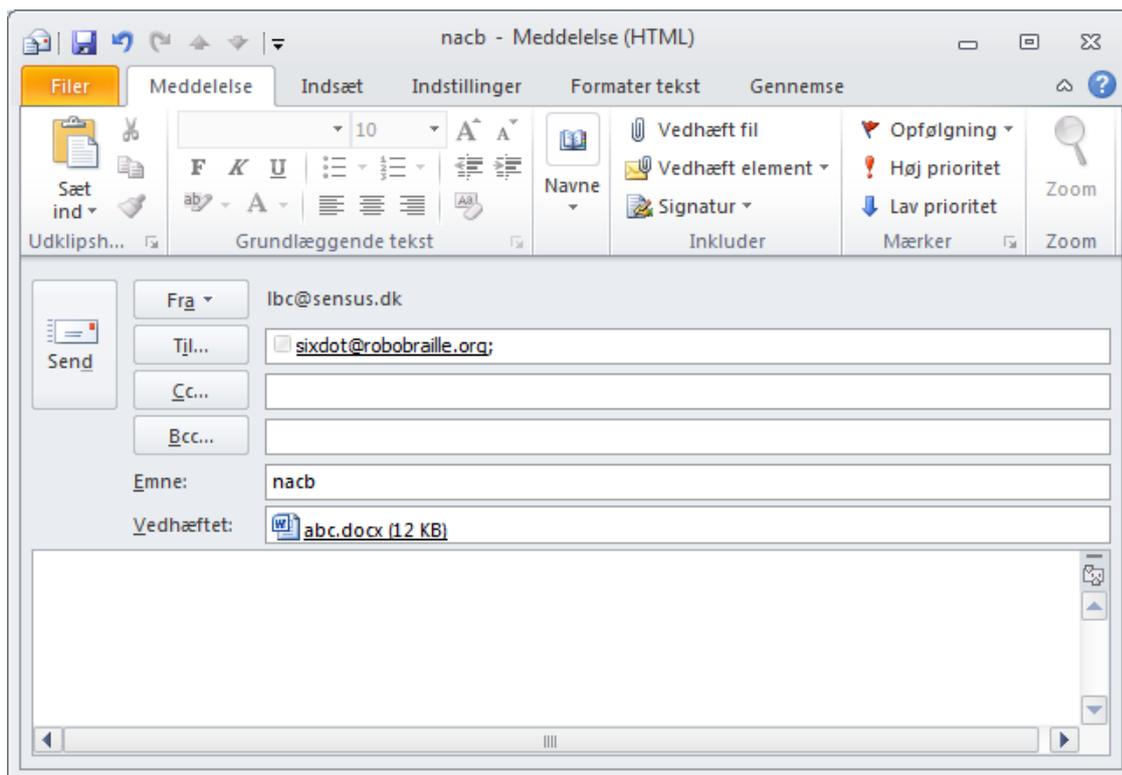
4.2 Formatting your document

To format your Braille document to a particular paper format, you can use a special export filter called *format*. Along with the keyword *format*, you need to specify the requested page width, page length and whether you want your document paginated, in the form *formatXXYYp* where *XX* specifies the number of characters per line, *YY* the number of lines per page and *p* pagination. The use of p is optional. The table below lists the formatting options currently supported by RoboBraille:

Format filters	Function
format2131	21 characters per line, 31 lines per page without pagination. Experimental format suitable for 8-dot Braille.
format2131p	21 characters per line, 31 lines per page with pagination. Experimental format suitable for 8-dot Braille.
format2929	29 characters per line, 29 lines per page without pagination
format2929p	29 characters per line, 29 lines per page with pagination
format3025	30 characters per line, 25 lines per page without pagination
format3025p	30 characters per line, 25 lines per page with pagination
format3028	30 characters per line, 28 lines per page without pagination
format3028p	30 characters per line, 28 lines per page with pagination
format3227	32 characters per line, 27 lines per page without pagination
format3227p	32 characters per line, 27 lines per page with pagination
format3228	32 characters per line, 28 lines per page without pagination
format3228p	32 characters per line, 28 lines per page with pagination
format3229	32 characters per line, 29 lines per page without pagination
format3229p	32 characters per line, 29 lines per page with pagination

Format filters	Function
format3329	33 characters per line, 29 lines per page without pagination
format3329p	33 characters per line, 29 lines per page with pagination
format4025	40 characters per line, 25 lines per page without pagination
format4025p	40 characters per line, 25 lines per page with pagination

If your paper format is not included in the list above, please send an email to contact@robobraille.org with a specification of format. The format will then be added to RoboBraille when the system is next updated.

The figure below illustrates how to specify that the Braille should be returned by RoboBraille formatted to 40 characters per line, 25 lines per page with pagination:
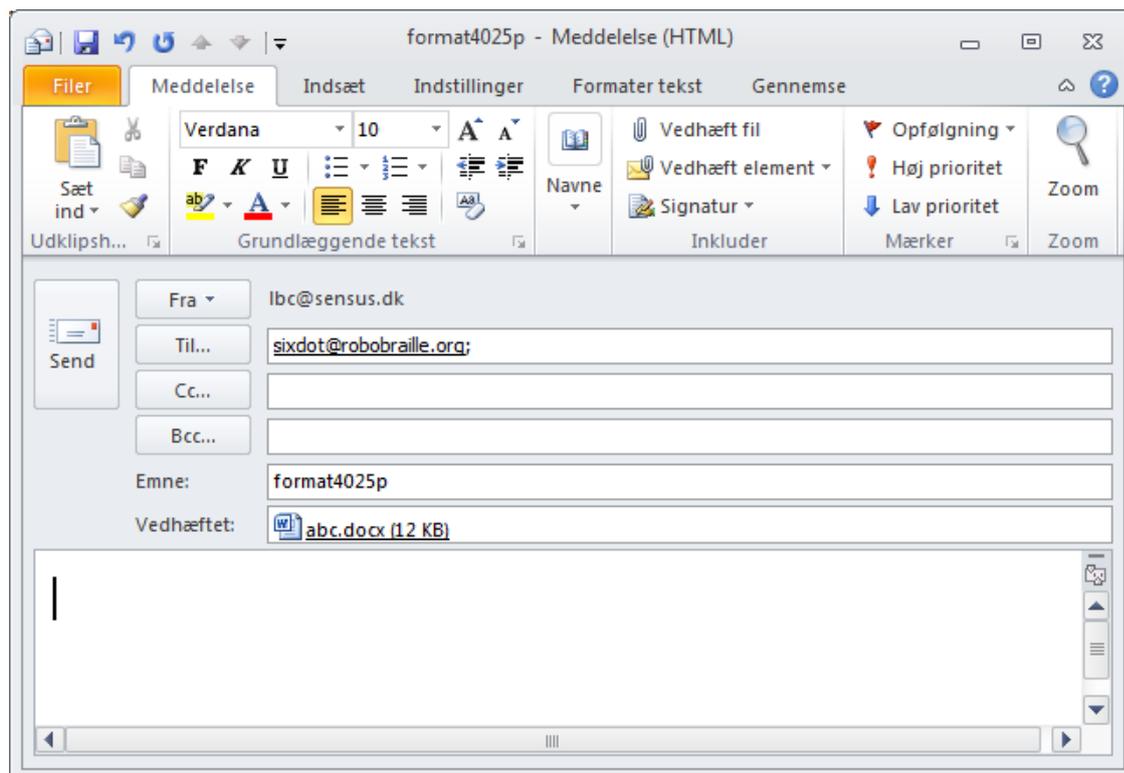
In many cases, you will need both formatting and conversion to the character set of your Braille embosser. In such cases, you will need to go through two steps:

1. Transcribe and format your document by submitting it to an appropriate Braille account (say, sixdot@robobraille.org) specifying the formatting details in the subject line (e.g., format4025p).

2. Convert the resulting document to the correct Braille character set by submitting it to export@robobraille.org, specifying the export filter in the subject line of the email.

4.3 Using Portable Embosser Format

Portable Embosser Format – or PEF – constitutes a standardised way of embossing Braille documents, and is the recommended format for Braille produced by RoboBraille. Based on XML and Unicode, PEF is a document type that represents braille pages in digital form, accurately and unambiguously; regardless of language, location, embosser settings, braille code and computer environment. It can be used for Braille embossing and archiving anywhere in the world, no matter where nor how it was produced.

RoboBraille uses a special export filter called pef to render Braille in PEF. Along with the keyword *pef*, you need to specify the requested page width, page length, whether you want your document paginated, and whether you want duplex printing in the form

pefXXYYpd where *XX* specifies the number of characters per line, *YY* the number of lines per page, p pagination and d duplex. The use of p and d are optional, and either one can be used irrespective of the other. The table below lists the pef options currently supported by RoboBraille:

PEF filters	Function
pef2929	29 characters per line, 29 lines per page without pagination.
pef2929p	29 characters per line, 29 lines per page with pagination.
pef2929d	29 characters per line, 29 lines per page with duplex.
pef2929pd	29 characters per line, 29 lines per page with pagination and duplex.
pef3025	30 characters per line, 25 lines per page without pagination.
pef3025p	30 characters per line, 25 lines per page with pagination.
pef3025d	30 characters per line, 25 lines per page with duplex.
pef3025pd	30 characters per line, 25 lines per page with pagination and duplex.
pef3028	30 characters per line, 28 lines per page without pagination.
pef3028p	30 characters per line, 28 lines per page with pagination.
pef3028d	30 characters per line, 28 lines per page with duplex.
pef3028pd	30 characters per line, 28 lines per page with pagination and duplex.
pef3227	32 characters per line, 27 lines per page without pagination.
pef3227p	32 characters per line, 27 lines per page with pagination.
pef3227d	32 characters per line, 27 lines per page without duplex.
pef3227pd	32 characters per line, 27 lines per page with pagination and duplex.
pef3228	32 characters per line, 28 lines per page without pagination.
pef3228p	32 characters per line, 28 lines per page with pagination.
pef3228d	32 characters per line, 28 lines per page without duplex.
pef3228pd	32 characters per line, 28 lines per page with pagination and duplex.
pef3229	32 characters per line, 29 lines per page without pagination.
pef3229p	32 characters per line, 29 lines per page with pagination.
pef3229d	32 characters per line, 29 lines per page without duplex.

PEF filters	Function
pef3229pd	32 characters per line, 29 lines per page with pagination and duplex.
pef3329	33 characters per line, 29 lines per page without pagination.
pef3329p	33 characters per line, 29 lines per page with pagination.
pef3329d	33 characters per line, 29 lines per page without duplex.
pef3329pd	33 characters per line, 29 lines per page with pagination and duplex.
pef4025	40 characters per line, 25 lines per page without pagination.
pef4025p	40 characters per line, 25 lines per page with pagination.
pef4025d	40 characters per line, 25 lines per page without duplex.
pef4025pd	40 characters per line, 25 lines per page with pagination and duplex.

If your paper format is not included in the list above, please send an email to contact@robobraille.org with a specification of format. The format will then be added to RoboBraille when the system is next updated.

The figure below illustrates how to specify that the Braille should be returned by RoboBraille in PEF formatted to 40 characters per line, 25 lines per page with pagination and duplex printing:
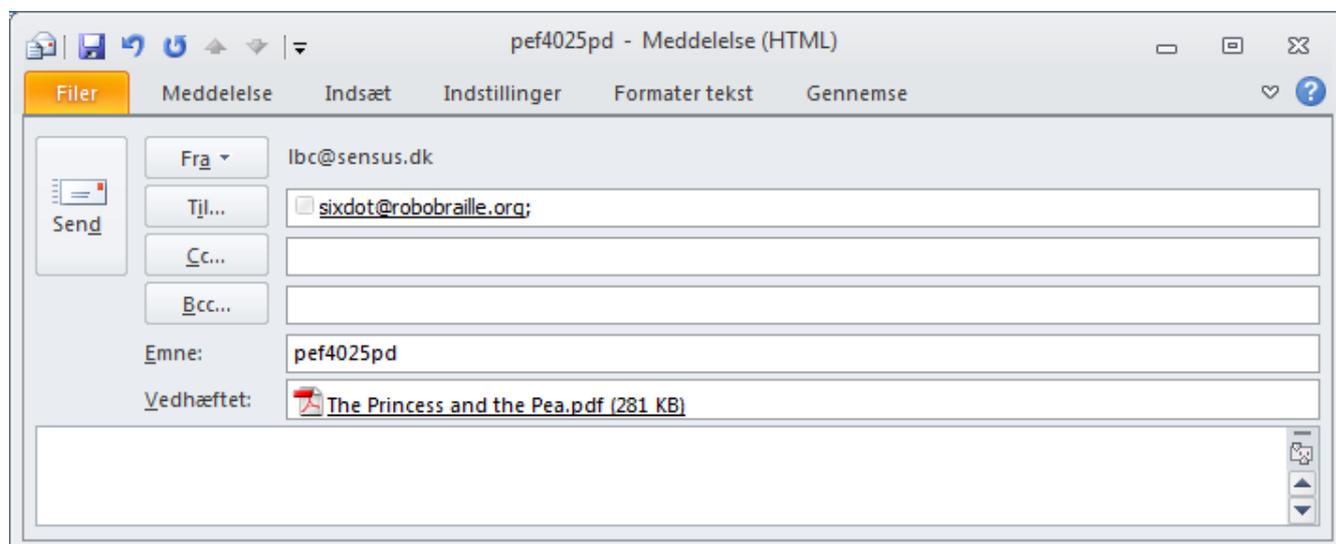
Similarly, the RoboBraille web interface can be used to the same effect by selecting pef4025pd as the target format:

Follow the four easy steps below to have your document converted into an alternative, accessible format. The result is delivered in your email inbox. The form expands as you make your selections.

Step 1 - Upload the file

Select your file and upload it to the server (max 32 mb). Supported file types are .doc, .docx, .pdf, .txt, .xml, .html, .htm, .rtf, .epub, .mobi, .tiff, .tif, .gif, .jpg, .bmp, .pcx, .dcx, .j2k, .jp2, .jpx, .djv and .asc

File name: [_____] [Gennemse...] [Upload]

The file The Princess and the Pea.pdf has been successfully uploaded to the server.

Step 2 - Select output format

Specify the target format of your document. For this document type, the following formats are available:

┌─ Target format ──────────────────────────────┐
│ ○ mp3 audio   │
│ ○ e-Book   │
│ ○ Document conversion   │
│ ⦿ Braille   │
└───┘

Step 3 - Specify Braille options

Specify the natural language of your document, requested contraction level and target format of the Braille document. Note that American Braille is currently produced according to the British English Braille rule set.

┌─ Options ─────────────────────────────────────┐
│ Language: [American English ▼]   │
│   │
│ Contraction level: [Grade 2 ▼]   │
│   │
│ Target format: [pef4025d ▼]   │
└───┘

Step 4 - Enter email address and submit request

Email address: [_____] [Submit]

The result from RoboBraille is an xml file in Unicode with a *.pef* extension. In order to emboss the file on a Braille embosser, you will need an embossing application.

It is also possible to produce a Braille document, conduct minor editing in the result convert the end result to PEF. In order to achieve this, submit the document to the appropriate Braille account without specifying an export filter (or by using a format-filter), edit the result in a text editor and finally submit the edited Braille document to an export-account with the requested pef format in the subject line. The example below

shows how to convert an already transcribed Braille document into PEF, formatted to 33 characters per line, 29 lines per page with pagination and duplex printing:
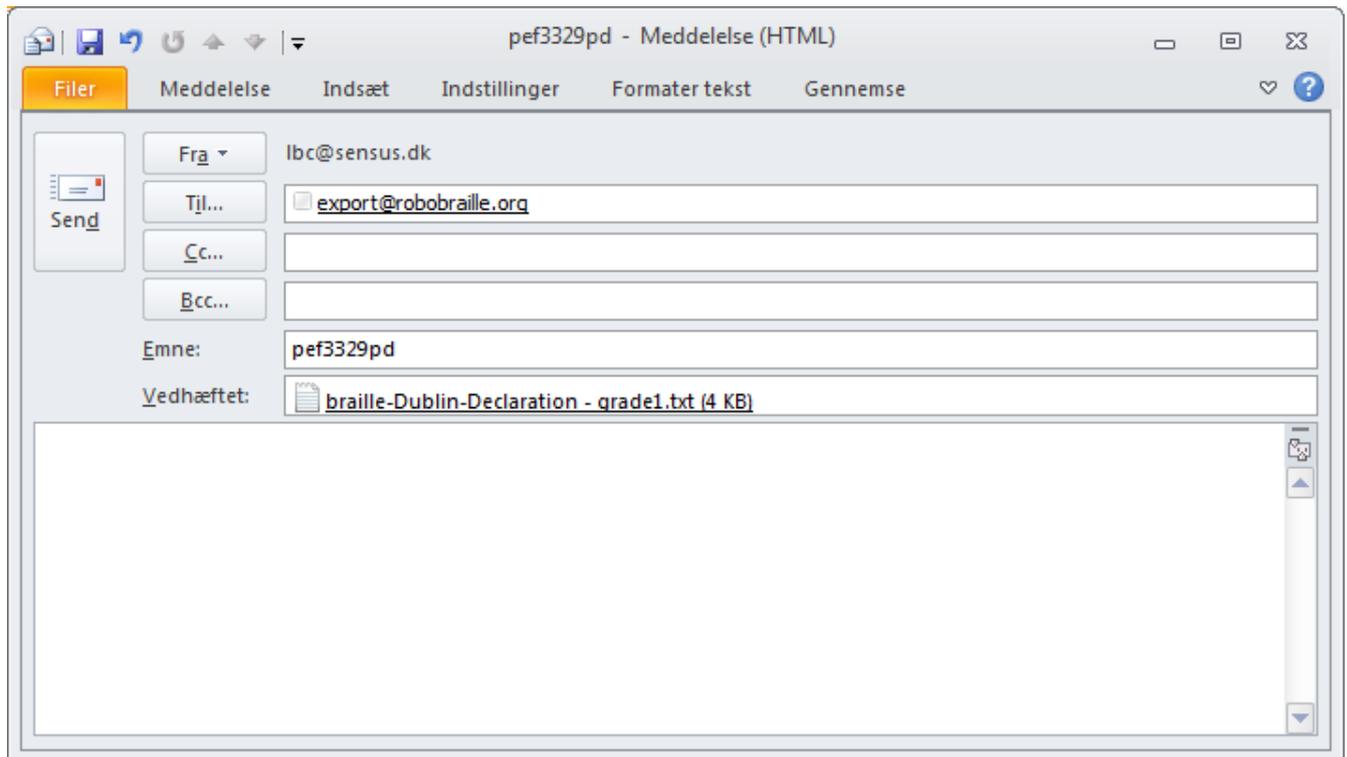
RoboBraille recommends the use of the freeware Easy Embossing Utility, developed by the inventors of PEF. The PEF Easy Embossing Utility supports most available Braille embossers and can be downloaded from the following link: www.pef-format.org. As an alternative, the Daisy Pipeline includes a script for embossing PEF files.

Once installed, files with the *.pef* extension are associated with the PEF Easy Embossing Utility and double-clicking on a pef file will open the interface to the utility. The first time the application is launched, you will need to specify the brand and model of your Braille embosser, the paper format and the Braille character set used by the embosser.

In addition to embossing, the PEF Easy Embossing Utility also features a preview option.

In order to view the contents of a PEF file in a text editor, it may be necessary to install a Unicode font that includes the Braille range of characters. An example is the Code2000 shareware font that can be downloaded from the web.

The figure below shows the main interface to the PEF Easy Embossing Utility.
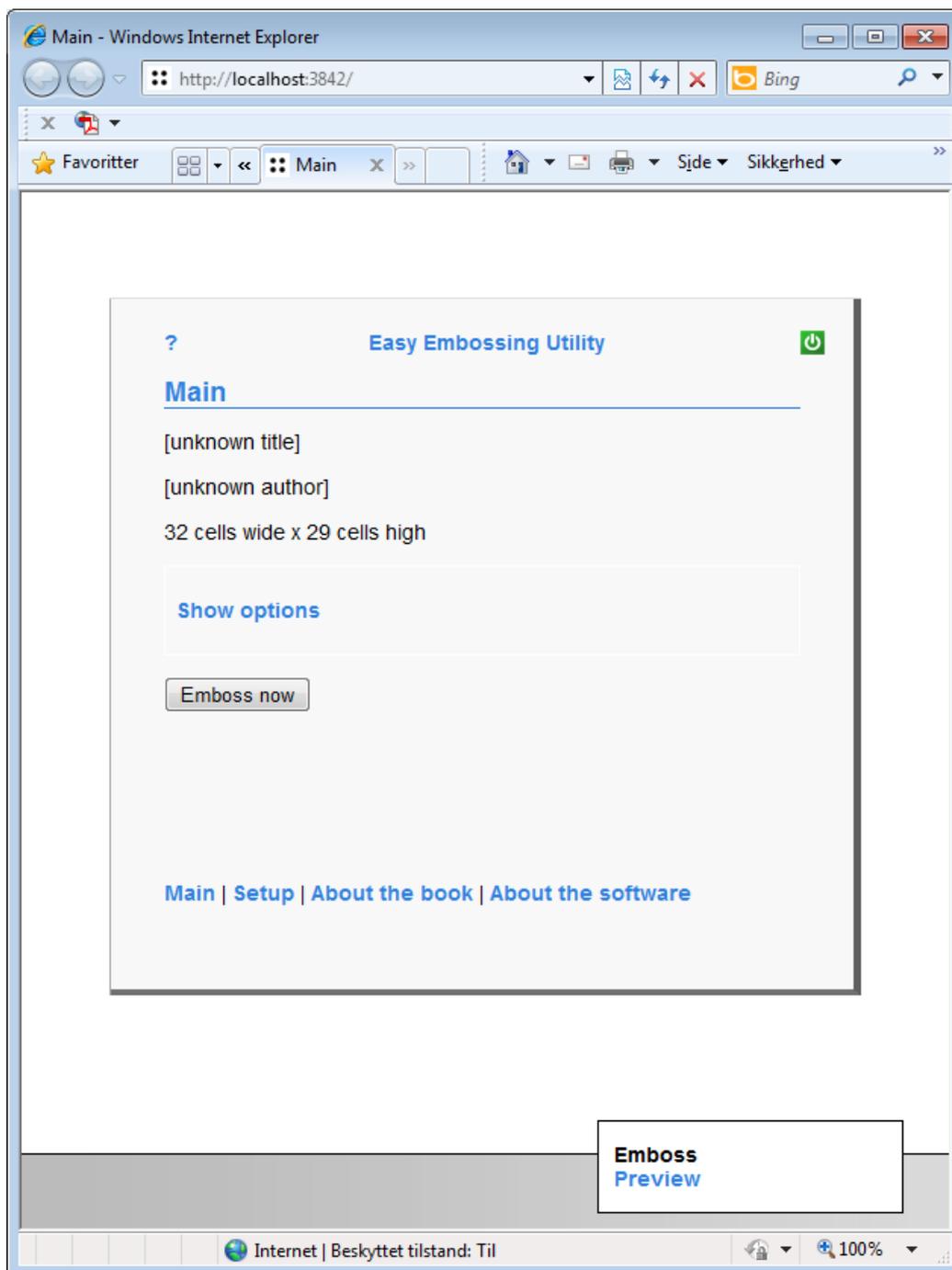
The figure below shows how the text and Braille contents of a PEF file can be previewed in a standard text editor such as Notepad:

```
sb4exported.pef - Notesblok

Filer   Rediger   Formater   Vis   Hjælp

<head>
  <meta xmlns:dc="http://purl.org/dc/elements/1.1/">
    <dc:format>application/x-pef+xml</dc:format>
    <dc:identifier>Sensus Braille</dc:identifier>
  </meta>
</head>
<body>
  <volume cols="32" rows="29" rowgap="0" duplex="true">
    <section>
      <page>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
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        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
        <row>⠿⠿…⠿</row>
```

5 The RoboBraille Conversion Matrix

Output formats		doc	docx	pdf	txt, asc	xml	htm, html	rtf	tiff	gif	jpg	bmp	pcx	dcx	j2k	jp2	jpx	djv	epub	mobi	ppt	pptx
Braille																						
	txt	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	pef	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	htm						✓															
ebook																						
	mobi	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	epub	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	epub3		✓																			
Conversion																						
	txt	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	pdf (tagged)	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
	doc			✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	docx			✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	csv			✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	xls			✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	xlsx			✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	rtf			✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
	xml			✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	htm			✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
	htm (zip)																				✓	✓
Daisy																						
	full text/audio	✓	✓			✓		✓														
	text only	✓	✓			✓		✓														
Daisy Math																						
	full text/audio		✓																			
Audio																						
	mp3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				