

FenForm

A document production system
from Fenland Software Ltd.

Version 2.0

User Guide

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Introduction

The purpose of FenForm is to merge text with a form in the same way that the text could be printed on pre-printed stationery by a line printer or a dot matrix printer. The forms are stored as images on a disk thus saving the expense and inconvenience of keeping stocks of, often expensive, pre-printed stationery such as Invoices, Credit Notes, Purchase Orders, Remittance Advices etc. This also allows details on a form to be changed quickly and easily. If, for example, your telephone number changes, you just amend the form file accordingly: there is no need to scrap, or “overprint”, old stationery. When printing documents, the need to change stationery for different forms is also avoided.

FenForm is designed to act as a direct replacement for a dot-matrix type printer. It accepts most of the control codes used by Epson® dot-matrix printers, embedded in the print file, so there should be no need to make any changes to existing applications software. Many of those control codes which are either irrelevant to, or cannot be actioned by, FenForm are silently ignored. In the majority of cases, FenForm is completely interchangeable with a dot-matrix printer. In addition, FenForm has features which are either unique to FenForm or can only be found on some of the more expensive dot-matrix printers.

Forms can be designed with your preferred software. Just save, or convert, your work to a PDF file then use **makeform** to convert it to a form file. OpenOffice.org is ideal for designing your forms as it can export your work directly to a PDF file.

FenForm is not an “all or nothing” solution - company letterheads, perhaps using corporate colours, can be used as the base stationery with FenForm adding the specifics of the required form.

Using FenForm

The text is read from STDIN or a specified input file, merged with a form, and written to STDOUT, or a specified output, file in the PostScript® format. For example, a command like -

application-pgm | lpr -Pdot-matrix

can be replaced with -

application-pgm | fenform -f form-name | lpr -Pink-jet-printer

To print the contents of a text file, either 'cat' the file to FenForm -

cat text-file | fenform -f form-name | lpr -P ink-jet-printer

or specify it as an input file -

fenform -i text-file -f form-name | lpr -P ink-jet-printer

The form is optional. If omitted, FenForm just prints the plain text.

To print FenForm output, a suitable filter, such as Ghostscript®, is required. This is usually part of the “printcap” set-up and is outside the scope of this document.

FenForm is very versatile and can be implemented in various ways to suit your preferred method of working. With some printing systems, FenForm can be included in a printer filter, with a specified form, to give a dedicated virtual printer for that form type. For example, you could have a printer called “invoice-printer” with FenForm in the filter with “invoice” specified as the form name. All text sent to that printer would be printed on invoice stationery just as if one had a dedicated dot-matrix printer permanently loaded with invoice stationery. The great advantage of FenForm is that these dedicated printers are "virtual" - just different names for one real printer.

All this is transparent to the user who, in most cases, can simply treat FenForm as just another printer permanently loaded with the appropriate stationery.

e-Documents

As well as avoiding the need for pre-printed stationery, FenForm is ideal for creating e-documents. The output from FenForm can be easily converted to a suitable format and sent as an email attachment or by fax - saving on both stationery and postage charges.

FenForm is under constant development and future versions will incorporate email routines to simplify sending eDocuments.

Command Line Parameters

FenForm accepts both long and short style command line parameters. The two styles are equivalent and can be mixed.

-c *configuration-file-name*

--config-file *configuration-file-name*

Specify a configuration file. When FenForm starts, it reads parameters from the configuration file **/opt/fenform/etc/fenform.cfg** and, if specified in the configuration file, from the user's configuration file **~/.fenform/fenform.cfg**. This command line parameter allows a different configuration file to be used. FenForm will use default values if no configuration is found.

-f *form-name*

--form *form-name*

The form to be used for the print. If omitted, the effect is the same as printing to a blank sheet of paper.

-i *input-file*

--input-file *input-file*

Read from *input-file* instead of stdin.

-o *output-file*

--output-file *output-file*

Write to *output-file* instead of stdout. These options allow the command

cat print-file | fenform -f form-name > output-file

to be replaced with

fenform -f form-name -i print-file -o output-file

-V

--verbose

Verbose mode. This parameter writes additional details to the log files. This can be useful when setting up FenForm or for debugging but, in normal use, it is not needed.

-t

--test

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Test the configuration file. Calling FenForm with this parameter causes it to read and list the configuration file, identifying any invalid parameters found. This option can be used with the **-c** option to specify the configuration file.

--help

-h

--version

-v

Show version information.

The Configuration File

Most users will not need to use a configuration file as the defaults built in to FenForm will be sufficient. However, for those users with specific requirements, all the fonts and directories used by FenForm can be specified in a configuration file. By default, this file is **/opt/fenform/etc/fenform.cfg** but even that can be changed by specifying a different configuration file with the **-c** command line parameter.

e.g.

```
cat textfile | fenform -c config-file -f form-name | lpr
```

or, using the **-i** parameter,

```
fenform -c config-file -f form-name -i textfile | lpr
```

The following options can be set in the configuration file and are given in the form -

parameter	value
------------------	--------------

The "parameter" is not case sensitive (the example configuration file uses upper case purely for clarity) and is separated by some "white space" from the "value". FenForm still recognizes the **PARAMETER=value** format (as used in version 1) but this format is deprecated and may not be recognized by future versions.

The values shown in the following list are the defaults.

FORMDIR	/opt/fenform/etc/forms
----------------	-------------------------------

This is the directory which contains the forms.

FONTMAP	/opt/fenform/etc/fonts/Fontmap.FF
----------------	------------------------------------------

This file maps font name to the font files.

MEDIASIZE	a4
------------------	-----------

The size of the media to be used.

MEDIAFILE	/opt/fenform/etc/stationery.sizes
------------------	------------------------------------------

This file holds the dimensions of various stationery.

STDFONT	Courier
BOLDFONT	Courier-Bold
DBLSTRIKEFONT	Courier-Bold
ITALICS	Courier-Oblique
BOLDITALICS	Courier-BoldOblique
DBLSTRIKEITALICS	Courier-BoldOblique
NLQFONT	Times-Roman
BOLDNLQFONT	Times-Bold
DBLSTRIKENLQFONT	Times-Bold
NLQITALICS	Times-Italic
BOLDNLQITALICS	Times-BoldItalic
DBLSTRIKENLQITALICS	Times-BoldItalic

These options allow different fonts to be selected.

COLOUR

This parameter allows the print file to control the colour of the text. If this parameter is not set, colour control commands in the print file will be silently ignored. See the **Colour Printing** section for details. NOTE - this parameter does not have a "value".

ALLOW_OVERRIDE

This parameter causes FenForm to look for an additional configuration file in the user's home directory (**~/fenform/fenform.cfg**). Parameters set in the user's file will override those set in the main configuration file.

AUTO_LF

This parameter causes a Carriage Return to be immediately followed by a Line Feed. In most cases, this parameter should not be needed as the operating system will send a Line Feed automatically.

FenForm Control Code Reference

As well as plain text, a print file may contain control characters to format the page. Below is a list of those characters showing the action FenForm will take upon receiving them.

Character Formatting Codes

Italics	ASCII	Hex.	Decimal
Set Italics	ESC 4	1B 34	27 52
Cancel Italics	ESC 5	1B 35	27 53

Select or cancel the font defined as **ITALICS**. By default, this font is Courier-Oblique.

Condensed Print	ASCII	Hex.	Decimal
Set Condensed Printing	SI	0F	15
Cancel Condensed Printing	DC2	12	18

Reduce the character size and pitch. If the current size is 10 cpi it will be reduced to 17 cpi in other cases it will be reduced to 20 cpi.

Bold	ASCII	Hex.	Decimal
Set Bold	ESC E	1B 45	27 69
Cancel Bold	ESC F	1B 46	27 70

Select or cancel the font defined as **BOLDFONT**. By default, this is Courier-Bold. See also “Double Strike”.

Double Strike	ASCII	Hex.	Decimal
Set Double Strike	ESC G	1B 47	27 71
Cancel Double Strike	ESC H	1B 48	27 72

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Select or cancel the font defined as **DBLSTRIKEFONT**. By default, this is Courier-Bold. Double Strike and Bold fonts cannot be selected together. If this is attempted, the later selection will override the former but, when that one is cancelled, the former selection will be used until that, too, is cancelled.

Proportional Font	ASCII	Hex.	Decimal
Set Proportional font	ESC p SOH	1B 70 01	27 112 1
Cancel proportional font	ESC p NUL	1B 70 00	27 112 0

Select or cancel the font defined as **NLQFONT**. By default, this is Times-Roman which is a “proportional spaced” font. This is the same as selecting/cancelling NLQ.

NLQ	ASCII	Hex.	Decimal
Set NLQ	ESC x SOH	1B 78 01	27 120 1
Cancel NLQ	ESC x NUL	1B 78 00	27 120 0

Select or cancel the font defined as **NLQFONT**. By default, this is Times-Roman which is a “proportional spaced” font. This is the same as selecting/cancelling Proportional Font.

Character Size	ASCII	Hex.	Decimal
Set 12 CPI	ESC M	1B 4D	27 77
Set 10 CPI	ESC P	1B 50	27 80
Set 15 CPI	ESC g	1B 67	27 103

Set the character size and pitch of the current font.

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Double Size	ASCII	Hex.	Decimal
Set Double Size	ESC W SOH	1B 57 01	27 87 1
	or	or	or
	FS E SOH	1C 45 01	28 69 1
Cancel Double Size	ESC W NULL	1B 58 00	27 87 0
	or	or	or
	FS E NULL	1C 45 00	28 69 0

Select or cancel double size (height and width) characters.

Multi-Size	ASCII	Hex.	Decimal
Set Multi-Size	ESC w n	1B 77 n	27 119 n
	or	or	or
	ESC US n	1B 1F n	27 31 n
	or	or	or
Cancel Multi-Size	FS V n	1C 56 n	28 86 n
	ESC w NULL	1B 55 00	27 87 0
	or	or	or
	FS E NULL	1C 45 00	28 69 0

Select or cancel multi-size (height and width) characters. The character size is multiplied by 'n' (n=1 also sets double size).

Superscript	ASCII	Hex.	Decimal
Set Superscript	ESC S NULL	1B 53 00	27 83 0
Cancel Superscript	ESC T	1B 54	27 84

Select or cancel the superscript mode. When selected, characters are printed 1/3 of the line spacing above the base line at 1/1.5 of their base size. e.g. If superscript is selected whilst printing 10 cpi at 6 lpi (standard print) the superscripted characters will be printed at 15cpi, 0.056 inches above the base line.

Subscript	ASCII	Hex.	Decimal
Set Subscript	ESC S SOH	1B 53 01	27 83 1
Cancel Superscript/Subscript	ESC T	1B 54	27 84

Select or cancel the subscript mode. When selected, characters are printed 1/9 of the line spacing below the base line at 1/1.5 of their base size. e.g. If subscript is selected whilst printing 10 cpi at 6 lpi (standard print) the subscripted characters will be printed at 15cpi, 0.019 inches below the base line.

Barcodes

Barcodes	ASCII	Hex.	Decimal
Select Barcode	ESC DLE A	1B 10 41	27 16 65
Print Barcode	ESC DLE B	1B 10 42	27 16 66

Height Modulated Barcodes	ASCII	Hex.	Decimal
Print RM4SCC Barcode	ESC DLE C n	1B 10 43 n	27 16 67 n
Print POSTNET Barcode	ESC DLE D n	1B 10 44 n	27 16 68 n
Print PLANET Barcode	ESC DLE E n	1B 10 45 n	27 16 69 n

2 Dimensional Barcodes	ASCII	Hex.	Decimal
Print PDF417 Barcode	ESC DLE F n	1B 10 46 n	27 16 70 n

Select and print barcodes. See the “Barcode Printing” section for details of how to use these commands.

Page Formatting Codes

Left Margin	ASCII	Hex.	Decimal
Set Left Margin	ESC l n	1B 6C n	27 108 n

Add 'n' characters to the form's horizontal offset at the current character size. If the offset, defined in the form file, is 0 (as will be usual) this command will set the first character position to 'n' characters in from the left hand side of the page. This setting does not affect the position of the “form”.

Right Margin	ASCII	Hex.	Decimal
Set Right Margin	ESC Q	1B 51 n	27 81 n

Set the right hand margin 'n' characters, at the current character size, from the left hand side of the page.

Line Spacing

8 Lines per Inch	ASCII	Hex.	Decimal
Set 8 lpi	ESC 0	1B 30	27 48

Set the line feed to 8 lines per inch.

7/72 Inch Line Spacing	ASCII	Hex.	Decimal
Set line spacing to 7/72 inches	ESC 1	1B 31	27 49

6 Lines per Inch	ASCII	Hex.	Decimal
Set 6 lpi	ESC 2	1B 32	27 50

Set the line feed to 6 lines per inch (default setting).

Variable n/216 Inch Line Spacing	ASCII	Hex.	Decimal
Set line spacing to n/216 inches	ESC 3 n	1B 33 n	27 51 n

Set the line feed to n/216 inches. This allows very fine control over line feeds.

Variable n/72 Inch Line Spacing	ASCII	Hex.	Decimal
Set line spacing to n/72 inches	ESC A n	1B 41 n	27 65 n

Set the line feed to n/72 inches. This allows fine control over line feeds.

Line Feed	ASCII	Hex.	Decimal
Move to next line	LF	0A	10

Move to the next line as determined by the current line spacing. A carriage return is also performed.

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Single-shot Reverse Line Feed	ASCII	Hex.	Decimal
Move n/216 inches up the page	ESC j n	1B 6A n	27 106 n

Execute a single, reverse, line feed n/216 inches up the page. On a physical printer, the value of 'n' has to be kept small to avoid damage to the paper or printer. This limitation does not apply to FenForm and the value of 'n' can be anything up to a maximum of 255.

Single-shot Line Feed	ASCII	Hex.	Decimal
Move n/216 inches down the page	ESC J n	1B 4A n	27 74 n

Execute a single line feed n/216 inches down the page.

Single-shot Line Feed	ASCII	Hex.	Decimal
Move n/360 inches down the page	ESC +	1B 2B	23 43
	or	or	or
	ESC [1B 5B	27 91
	or	or	or
	FS 3	1C 33	28 51

Printing Features

Underlining	ASCII	Hex.	Decimal
Set Underlining	ESC – 1	1B 2D 31	27 45 49
Cancel Underlining	ESC – 0	1B 2D 30	27 45 48

Select or cancel underline mode. Underlining remains on until explicitly deselected. It is not cancelled by a line feed nor a new page.

Overscoring	ASCII	Hex.	Decimal
Set Overscoring	ESC _ 1	1B 5F 31	27 95 49
Cancel Overscoring	ESC _ 0	1B 5F 30	27 95 48

Select or cancel underline mode. Underlining remains on until explicitly deselected. It is not cancelled by a line feed nor a new page.

Colour Printing	ASCII	Hex.	Decimal
Set Colour	ESC r n	1B 72 n	27 114 n

Set the ink colour. See the “Colour Printing” section for details of how to use this command.

Carriage Movement

Backspace	ASCII	Hex.	Decimal
Backspace	BS	08	8

Move the print position back by one character. This command will have no effect if the current position is the first of the line: it will not move back to the previous line.

Horizontal Tab	ASCII	Hex.	Decimal
Horizontal Tab	HT	09	9

Move to the next horizontal tab position.

Vertical Tab	ASCII	Hex.	Decimal
Vertical Tab	VT	0B	11

Move to the next vertical tab position.

Form Feed	ASCII	Hex.	Decimal
Advance to TOF	FF	0C	12

Complete the current page and go to the next page.

Carriage Return	ASCII	Hex.	Decimal
Carriage Return	CR	0D	13

This command is silently ignored. If it were executed, printing would continue on the same line, overwriting anything already printed. Some operating systems send a carriage return with a line feed whilst others just send a line feed. FenForm adds a carriage return to a line feed so there is no need for a separate carriage return to be sent.

Set Horizontal Tabs	ASCII	Hex.	Decimal
Set Horizontal Tabs	ESC D n1 n2 n3...NUL	1B 44 n1 n2 n3...00	27 68 n1 n2 n3...0

Set horizontal tabs at character positions n1, n2, n3 etc. using the current character size. A maximum of 32 tabs can be set. Once set, the tab positions are not changed if the character size is changed.

Set Vertical Tabs	ASCII	Hex.	Decimal
Set Vertical Tabs	ESC B n1 n2 n3...NUL	1B 42 n1 n2 n3...NUL	27 66 n1 n2 n3...NUL

Set vertical tabs at lines,n1, n2, n3 etc. using the current character size. A maximum of 16 tabs can be set. Once set, the tab positions are not changed if the line spacing is changed.

Utility Commands

Print Suppress	ASCII	Hex.	Decimal
Set Print Suppress	DC3	13	19
Cancel Print Suppress	DC1	11	17

Setting the “Print Suppress Mode” causes FenForm to ignore everything it receives until it receives a DC1.

Reset	ASCII	Hex.	Decimal
Reset Printer	ESC @	1B 40	27 64
	or	or	or
	FS @	1C 40	28 64

This sets all the parameters back to their initial state as they were when the program was first called.

FenForm Control Codes (Summary)

The codes marked as (IGNORED) are either irrelevant or cannot be actioned by FenForm. By silently ignoring them, FenForm is able to process print files written for other printers which do use these codes.

Code	Dec	Hex	Function
BEL	7	&07	(IGNORED)
BS	8	&08	Backspace
HT	9	&09	Horizontal Tab Jump
LF	10	&0A	Line Feed
VT	11	&0B	Vertical Tab Jump
FF	12	&0C	Form Feed
CR	13	&0D	Carriage Return
SO	14	&0E	Set Double Size
SI	15	&0F	Select Condensed
DC1	17	&11	Cancel Print Suppress Mode
DC2	18	&12	Cancel Condensed
DC3	19	&13	Set Print Suppress Mode
DC4	20	&14	Cancel Double Size
CAN	24	&18	(IGNORED)
DEL	127	&7F	(IGNORED)
ESC SO	27 14	&1B &0E	Set Double Size
ESC SI	27 15	&1B &0F	Select Condensed
ESC DLE A	27 16 65	&1B &10 &41	Select Barcode
ESC DLE B	27 16 66	&1B &10 &42	Print Barcode
ESC DLE C <n>	27 16 67 <n>	&1B &10 &43 <n>	Print RM4SCC Barcode
ESC DLE D <n>	27 16 68 <n>	&1B &10 &44 <n>	Print POSTNET Barcode
ESC DLE E <n>	27 16 69 <n>	&1B &10 &45 <n>	Print PLANET Barcode
ESC DLE F	27 16 70	&1B &10 &46	Print PDF417 (2D) Barcode
ESC EM <n>	27 25 <n>	&1B &19 <n>	(IGNORED)
ESC US <n>	27 31 <n>	&1B &1F <n>	Multiply character size by 'n'
ESC SP <n>	27 32 <n>	&1B &20 <n>	(IGNORED)
ESC ! <n>	27 33 <n>	&1B &21 <n>	Select Print Mode
ESC #	27 35	&1B &23	(IGNORED)
ESC \$ <n>	27 36 <n>	&1B &24 <n>	Absolute Horizontal Tab
ESC % <n>	27 37 <n>	&1B &25	(IGNORED)
ESC (<n>	27 40 <n>	&1B &28 <n>	(IGNORED)
ESC + <n>	27 43 <n>	&1B &2B <n>	Set n/360 lpi
ESC - <n>	27 45 <n>	&1B &2D <n>	Select/Cancel Underline
ESC / <n>	27 47 <n>	&1B &2F <n>	Select Vertical Tab Channel
ESC 0	27 48	&1B &30	Set 8 lpi
ESC 1	27 49	&1B &31	Set 7/72 lpi
ESC 2	27 50	&1B &32	Set 6 lpi
ESC 3 <n>	27 51 <n>	&1B &33 <n>	Set n/180 lpi
ESC 4	27 52	&1B &34	Select Italic Font
ESC 5	27 53	&1B &35	Cancel Italic Font
ESC 6	27 54	&1B &36	(IGNORED)
ESC 7	27 55	&1B &37	(IGNORED)
ESC 8	27 56	&1B &38	(IGNORED)

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ESC 9	27 57	&1B &39	(IGNORED)
ESC <	27 60	&1B &3C	(IGNORED)
ESC =	27 61	&1B &3D	(IGNORED)
ESC >	27 62	&1B &3E	(IGNORED)
ESC @	27 64	&1B &40	Reset Printer
ESC A <n>	27 65 <n>	&1B &41 <n>	Set n/60 lpi
ESC B <n>..0	27 66 <n>..0	&1B &42 <n>..0	Set Vertical Tabs
ESC C <n>	27 67 <n>	&1B &43 <n>	(IGNORED)
ESC D <n>..0	27 68 <n>..0	&1B &44 <n>..0	Set Horizontal Tabs
ESC E	27 69	&1B &45	Set Bold
ESC F	27 70	&1B &46	Cancel Bold
ESC G	27 71	&1B &47	Set Double Strike
ESC H	27 72	&1B &48	Cancel Double Strike
ESC I <n>	27 73 <n>	&1B &49	(IGNORED)
ESC J <n>	27 74 <n>	&1B &4A <n>	One-shot n/180 inch fwd feed
ESC M	27 77	&1B &4D	Select 12 cpi
ESC N <n>	27 78 <n>	&1B &4E <n>	(IGNORED)
ESC O	27 79	&1B &4F	(IGNORED)
ESC P	27 80	&1B &50	Select 10 cpi
ESC Q <n>	27 81 <n>	&1B &51 <n>	Set Right Margin
ESC R <n>	27 82 <n>	&1B &52 <n>	(IGNORED)
ESC S <n>	27 83 <n>	&1B &53 <n>	Select Sub/Super Script
ESC T <n>	27 84 <n>	&1B &54 <n>	Cancel Sub/Super Script
ESC U <n>	27 85 <n>	&1B &55 <n>	(IGNORED)
ESC W <n>	27 87 <n>	&1B &57 <n>	Set/Cancel Double Size
ESC [<n>	27 91 <n>	&1B &5B <n>	Set n/360 line spacing
ESC _ <n>	27 95 <n>	&1B &5F <n>	Select/Cancel Overscore
ESC b <n>..0	27 98 <n>..0	&1B &62 <n>..0	Set Vertical Tabs for a channel
ESC g	27 103	&1B &67	Select 15 cpi
ESC i <n>	27 105 <n>	&1B &69 <n>	(IGNORED)
ESC j <n>	27 106 <n>	&1B &6A <n>	One-shot n/180 inch rvrse feed
ESC k <n>	27 107 <n>	&1B &6B <n>	(IGNORED)
ESC l	27 108	&1B &6C <n>	Set Left Margin
ESC m	27 109	&1B &6D	Set Triple Size
ESC p <n>	27 112 <n>	&1B &70 <n>	Select/Cancel NLQ
ESC q <n>	27 113 <n>	&1B &70 <n>	Select/Cancel "Shadow"
ESC r <n>	27 114 <n>	&1B &72 <n>	Select Colour
ESC s <n>	27 115 <n>	&1B &73 <n>	(IGNORED)
ESC t <n>	27 116 <n>	&1B &74 <n>	(IGNORED)
ESC w <n>	27 119 <n>	&1B &77 <n>	Multiply character size by 'n'
ESC x <n>	27 120 <n>	&1B &78 <n>	Select/Cancel NLQ
FS @	28 64	&1C &40	Reset Printer
FS 3 <n>	28 51 <n>	&1C &33 <n>	Set n/360 lpi
FS E <n>	28 69 <n>	&1C &45 <n>	Set/Cancel Double Size
FS F	28 70	&1C &46	Line Feed Direction - Forward
FS I <n>	28 73 <n>	&1C &49 <n>	(IGNORED)
FS R	28 82	&1C &52	Line Feed Direction - Reverse
FS V <n>	28 86 <n>	&1C &56 <n>	Multiply character size by 'n'

Notes.

<n> after a code indicates that one or more parameters are required (if followed by .. multiple parameters may be given, terminated with NULL). Parameters must be given as character codes (i.e. a parameter value of 56 should be sent as the character &38). For details of parameters, see the Control Code Reference.

Barcode Printing

FenForm can print several different types of standard barcode. First the barcode type, height and width need to be set with the control codes **ESC DLE A** *type height width* . The *height* and *width* must be given in 'points' (1 point = 1/72 inch = 0.35mm) and the *type* can be one of the following -

0	Autoselect
1	EAN
2	UPC
3	ISBN
4	Code 39
5	Code 128 (a,b,c autoselection)
6	Code 128 (Compact form for digits)
7	Code 128 (Full printable ASCII)
8	Interleaved 2 of 5 (Only digits)
9	Code 128 (Raw code 128)
10	Codabar
11	MSI
12	Plessey
13	Code 93

Once this is done, the barcode can be printed using the control sequence **ESC DLE B** *text-length*. The subsequent *text-length* characters will be printed as a barcode. If an invalid *type* is specified or if an attempt is made to print an invalid barcode (e.g. alpha characters in a numeric only format) a rectangular box with two diagonal lines will be printed in the space reserved for the barcode.

To avoid over-printing text on a previous line with the barcode, ensure there is enough space above the line to accommodate it. At 6 LPI, one line feed is 12 points.

The readability of a barcode is highly dependent on the quality of the print. It is sometimes possible to compensate for poor quality printing by increasing the width of the barcode.

FenForm can also print the RM4SCC, POSTNET and PLANET “height modulated” barcodes. The height of these barcodes is fixed and the length is determined by the number of characters. These barcodes can be printed with the control sequence **ESC DLE** *type length*. The *type* is **C**, **D**, or **E** for RM4SCC, POSTNET or PLANET barcodes respectively and the *length* is the number of characters immediately following the control sequence to be incorporated in the barcode.

RMSCC is an alphanumeric code. All characters are converted to upper case; illegal characters with a character code of 32 or less are silently ignored; other illegal

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characters are converted to an 'X'. POSTNET and PLANET barcodes are numeric only and any illegal characters will cause a single horizontal bar to be printed in the space the barcode would have occupied.

Barcodes can be printed in colour but, for good readability, black on white is best.

As well as the standard (one dimensional) barcodes, FenForm can now print the PDF417 two dimensional barcode. This barcode is selected with the control code sequence **ESC DLE F length**. The height and width are determined by the amount of information it contains.

Colour Printing

If the configuration option **COLOUR** is set, FenForm will action colour control codes in the print file. Colours can be specified in two ways. For simple, coarse, control of colours, the control sequence **ESC r n (1B 72 n)**, where *n* has a value between 0 and 7 (inclusive), can be used to select the colour -

0	Black
1	Red (Magenta)
2	Blue (Cyan)
3	Violet
4	Yellow
5	Orange
6	Green
7	White (This is a special case, see “reverse image printing”).)

For fine colour control, set *n* to 255 (&ff) and specify the red, green and blue levels in the following three bytes e.g. **1B 72 FF 00 AA FF**.

The **palette** program will print out a table of colours with their corresponding RGB values. The values are given both in hexadecimal for FenForm control sequences and as a decimal for use in form files.

palette > *output.ps*

Reverse Image Printing

By selecting an ink colour of 7 (white), FenForm will print in reverse image. The background will be whatever colour was being used immediately before white was selected. For example, if the current ink colour is black, the control sequence **ESC r 7** will give white characters on a black background. To use a different background colour, first select that colour and then select “white” - e.g. **ESC r 1 ESC r 7** will give white characters on a red background. To cancel reverse image, simply select another colour – e.g. **ESC r 0**

FenForm Forms

Normal Forms

Form stationery is built from PDF files using the **makeform** command -

makeform *pdf-file*

This will put the form into your forms directory ready for use.

Two, optional, command line parameters can be given to **makeform** -

-c *configuration-file-name*

--config-file *configuration-file-name*

Specify a configuration file. This command line parameter allows a different configuration file to be used. **makeform** will use the default values if no configuration is found.

-f *form-name*

--form *form-name*

By default, the form name will be the same as the name of the PDF file. This parameter allows a different name to be given to the form.

The form can be designed and converted to PDF using your preferred software. We recommend OpenOffice.org¹ which can produce PDF files directly.

There are some sample forms in the **etc/forms/samples** directory. For each sample there is a corresponding **.odt** (Open Document Format - Text Document) and **.pdf** file. The **.odt** file can be edited with OpenOffice.org, or any similar standards compliant software, and converted to PDF ready for **makeform**.

"Special" Forms

These are blank forms used for specifying media sizes and orientation. FenForm has a default form and orientation of A4 Portrait, which can be overridden by a configuration file. The command -

cat *text-file* | **fenform** | **lpr -P** *ink-jet-printer*

¹ OpenOffice.org runs on Linux, Mac, and Windows and can be downloaded (free of charge) from the internet. A multi-platform OpenOffice.org DVD (which also contains other "open source" software) is available from Fenland Software Ltd.

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will print the contents of *text-file* using the default orientation and media size. To print *text-file* using a different media size or orientation, use a "special form" - e.g.

```
cat text-file | fenform -f A4-Landscape | lpr -P ink-jet-printer
```

will print the contents of *text-file* on A4 Landscape.

The A4-Landscape and A4-Portrait forms are in the forms directory as part of the standard installation.

To make a "special form" use **makeform** -

```
makeform -f form-name *Pletter
```

will create a form called *form-name* with American media size of "letter" and portrait orientation. The '*' of the last parameter tells **makeform** to create a special form. The next character specifies the orientation (**P**ortrait or **L**andscape). The rest of that parameter is the media size as found in the stationery.sizes file.

When using **makeform** to create special forms, the form name parameter must be given - with normal forms it is optional.

Post Installation Procedures

Configure FenForm

Set the configuration parameters as required. For most installations, this step will be unnecessary as the default configuration will be suitable.

Set Your Path

The FenForm programs are in **/opt/fenform/bin** so you may want to add this directory to your **PATH**. Alternatively, you may prefer to add links to a directory already in your default path such as **/usr/local/bin**. Choose whichever method you prefer for your system.

Test the Installation

As an initial test, just send some ASCII text to FenForm to produce an output file -

```
cat text-file | fenform -V -o output-file.pdf
```

or

```
cat text-file | fenform -V > output-file.pdf
```

and check that the output file displays properly.

Next, try again specifying a form.

```
cat text-file | fenform -V -f A4-Landscape -o output-file.pdf
```

The **/opt/etc/forms** directory contains both an A4-Portrait and an A4-Landscape form which are suitable for this test. If you encounter any problems, check the system logs for error reports. The "verbose" (-V) flag will cause more details to be written to the system logs, which might be helpful in diagnosing problems.

Load Your Forms

Create your form stationery using your preferred program and save your work as PDF files. You should also keep a copy of your work in a format that your editor can read so you can amend your forms later, if necessary. Some basic form layouts are provided in **etc/forms/samples** on the CD to help get you started.

Use Up Your Existing Stocks Of Pre-Printed Stationery

FenForm is not an "all or nothing" solution. To avoid wasting your stocks of pre-printed stationery, use it with FenForm and a "special" (blank) form. For example, create a "special" form called "**Invoice**" -

makeform -f Invoice *PA4

and use it with FenForm and your pre-printed stationery -

application-pgm | **fenform -f Invoice** | **lpr**

Then, when you have exhausted your stocks of invoice forms, create a "normal" invoice form and continue with your printer loaded with plain paper. The transition will be transparent to your users.

Further Assistance

User support contracts, via email, telephone or remote access, for FenForm can be obtained from Fenland Software Ltd. Support levels can be tailored to your exact requirements. See www.fenform.co.uk/support for details.