1.1 Introduction

While processing a text TeX makes use of the actual \hsize (width) and \vsize (height). As soon as \vsize is exceeded TeX's output routine is launched. The output routine deals with the typeset part — most of the time this will be a page. It takes care of typesetting the headers and footers, the page number, the backgrounds and footnotes, tables and figures. This rather complex process makes it obvious that the output routine actually makes use of more dimensions than \hsize and \vsize.

1.2 Paper dimensions

With the command \setuppapersize the dimensions of the paper being used are defined. There is a difference between the dimensions for typesetting and printing.

```
\setuppapersize [..., ...] [..., ...]

OPTIONAL

1 A3 A4 A5 A6 letter ... CD IDENTIFIER landscape mirrored rotated 90 180 270

2 negative inherits from \setuppapersize
```

The dimensions of DIN formats are given in table 1.1.

size in mm
841×1189
594×841
420×594
297×420
210×297

format	size in mm
A 5	148×210
A6	105×148
A7	74×105
A8	52×74
A9	37×52

Table 1.1 Default paper dimensions

There are a great number of standardized formats like B0-B9 and C0-C9. These formats are predefined inConTEXt as well. You can also use: letter, legal, folio and executive, envelope 9-14, monarch, check, DL and CD. Another series of predefined formats comprise the RA and SRA types of paper sizes.

A new format can be defined by:

Introduction 1

```
\definepapersize [.1.] [..,.2.,..]

1 IDENTIFIER

2 width = DIMENSION
   height = DIMENSION
   offset = DIMENSION
   scale = NUMBER
```

For example CD was defined as:

\definepapersize[CD][width=12cm,height=12cm]

After defining CD you can type:

\setuppapersize[CD][A4]

This means that for typesetting ConTEXt will use the newly defined size CD. The resulting, rather small page, is positioned on an A4 paper size. This second argument is explained in detail later.

ConTEXt can also be used to produce screen documents. For that purpose a number of screen formats are available that relate to the screen dimensions. You can use: S3–S6. These generate screens with widths varying from 300 to 600 pt and a height of 3/4 of the width.

When one chooses another paper format than A4, the default settings are scaled to fit the new size.

All defined paper sizes can be used either in portrait or landscape orientation. You can tell ConT_EXt the orientation of the paper in the \setupapersize command:

\setuppapersize[CD][A4,landscape]

1.3 Page texts

Page texts are texts that are placed in the headers, footers, margins and edges of the so called pagebody. This sentence is for instance typeset in the bodyfont in the running text. The fonts of the page texts are set up by means of different commands. The values of the parameters may be something like style=bold but style=\ss\bf is also allowed. Setups like style=\ssbf are less obvious because commands like \cap will not behave the way you expect.

Switching to a new font style (\ss) will cost some time. Usually this is no problem but in interactive documents where we may use interactive menus with dozens of items and related font switches the effect can be considerable. In that case a more efficient font switching is:

\setuplayout[style=\ss]

Border texts are setup by its command and the related key. For example footers may be set up with the key letter:

\setupfooter[style=bold]

1.4 Page composition

In page composition we distinguish the main text area, headers and footers, and the margins (top, bottom, right and left). The main text flows inside the main text area. When defining a

1 Page texts

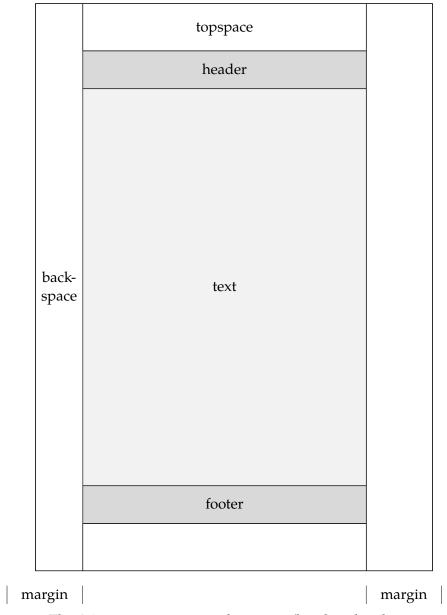


Figure 1.1 The A4 typesetting area and margins (height = header + text + footer).

layout, one should realize that the header, text and footer areas are treated as a whole. Their position on the page is determined by the topspace and backspace dimensions (see picture 1.1).

The header is located on top and the footer below of the main text area. Normally, in the header and footer page numbers and running titles are placed. The left and/or right margins are often used for structural components like marginal notes and/or chapter and section numbers. The margins are located in the backspace (along the spine) and in the white space to the right/left of the main text area. Their width has no influence on the location of the typesetting area on |right| the page.

left

On the contrary, the height of the header and footer influences the height of the text area. When talking about the height, we think of the sum of the header, text and footer areas. This approach

enables you to occasionally hide the header and/or footer, without introducing inconsistency in the layout.

The dimensions and location of all those areas are set up with \setuplayout.

Setting up the left or right margin has no influence on the typesetting area. In paper documents this parameter is only of use when keywords or other text are placed in the margin (hyphenation).

For paper documents it is sufficient to set up the height, header, footer, top space and back space. For electronic and screen documents however we need some extra space for navigational tools (see chapter ??). In screen documents it is common practice to use backgrounds. Therefore it is also possible to set up the space between the text area and the header and footer on a page, and thereby visually separating those areas.

Parameter width	Value dimension	Comment Determines the width of the typesetting area. Middle sets the white space right to the typesetting area to the value of the backspace. typeFit takes values set for margins, edges and margin and edge distances into account.
height	dimension	The height is the sum of the text height, header, footer, headerdistance, footerdistance. Middle sets the bottom white space to the value of the topspace. Fit calculates the text height based on the other vertical height-elements.
backspace	dimension	Backspace determines the left boundary of the typesetting area.
topspace	dimension	Topspace determines the top bound- ary of the typesetting area. Together backspace and topspace determine the left top corner of the typesetting area.
margin	dimension	Setting this parameters makes left and right margin equally large.
leftmargin	dimension	For documents with different size of the left and right margin, the left margin size is determined.
rightmargin	dimension	For documents with different size of the left and right margin, the right margin size is determined.
header	dimension	Determines the height of a running header. The header height is part of the height parameter.
footer	dimension	Determines the height of the footer. The footer height is part of the height parameter.

```
\setuplayout [..., \stackrel{*}{=}.,..]
                 width = DIMENSION fit middle
height = DIMENSION fit middle
backspace = DIMENSION
topspace = DIMENSION
margin = DIMENSION
leftmargin = DIMENSION
rightmargin = DIMENSION
header = DIMENSION
footer = DIMENSION
top = DIMENSION
bottom = DIMENSION
leftedge = DIMENSION
rightedge = DIMENSION
rightedge = DIMENSION
headerdistance = DIMENSION
footerdistance = DIMENSION
topdistance = DIMENSION
footerdistance = DIMENSION
topdistance = DIMENSION
topdistance = DIMENSION
leftmargindistance = DIMENSION
* width
                      leftmargindistance = DIMENSION
                      rightmargindistance = DIMENSION
                      leftedgedistance = DIMENSION
                 rightedgedistance = DIMENSION
horoffset = DIMENSION
veroffset = DIMENSION
style = normal bold slanted boldslanted type cap small... COMMAND
color = IDENTIFIER
marking = on off color screen TEXT
location = left middle right bottom top singlesided doublesided
scale = DIMENSION
nx = NUMBER
ny = NUMBER
dx = DIMENSION
dy = DIMENSION
lines = NUMBER
columns = NUMBER
columndistance = DIMENSION
grid = yes no
bottomspace = DIMENSION
textdistance = DIMENSION
                        rightedgedistance = DIMENSION
                                                                                                                                                           = IDENTIFIER
                        paper
```

top	dimension	Makes space available in the topspace
		area. This parameter is not part of the
		text height.
bottom	dimension	Makes space available underneath the
		typesetting area. This parameter is not
		part of the text height.
leftedge	dimension	This space located left to the left margin
		is for screen documents only.

rightedge	dimension	This space located right to the right margin is for screen documents only.
headerdistance	dimension	All parameters ending ondistance create white space between adjacent elements.
footerdistance	dimension	
leftmargindistance	dimension	
rightmargindistance	dimension	
leftedgedistance	dimension	
rightedgedistance	dimension	
topdistance	dimension	
bottomdistance	dimension	
horoffset	dimension	A horizontal offset moves the complete
		layout horizontally, starting from the place indicated by the parameter location.
veroffset	dimension	A vertical offset moves the complete lay-
		out vertically, starting from the place in-
		dicated by the parameter location.
style	normal bold slanted boldslante	edWith the style parameter one can setup
	type cap small COMMAND	the general style of the font(s) used in the document.
marking	on off color screen TEXT	When this parameter is set to on, then
		crop marks are placed around the page.
		Color displays a color bar, whereas screen
		shows a gray-values bar.
location	left middle right bottom top	location determines where the page
	singlesided doublesided du-	is placed on the paper. It allows to
	plex	typeset single and double sided docu-
		ments and documents for duplex print-
		ing (see: 1.6).
scale	number	With scale it is possible to scale a page
		before placing it on the defined paper.
nx	number	In case that a given text should be placed
		multiple times on a defined paper, nx
		gives the number of pages on the x-axis
		and ny the number of pages on the
		y-axis.
ny	number	
dx	dimension	With dx and dy the distances of the
		pages indicated in nx and ny can be ma-
		nipulated.
dy	dimension	•
lines	number	Determines the textheight in terms of
		the number of lines-heights.
columns	number	0
columndistance	dimension	

grid	yes no	Typsetting on the grid is activated with grid=on.
bottomspace	dimension	Bottomspace increases the white space at the bottom of the page without altering the page-layout.
cutspace	dimension	Cutspace increases the white space at the right side of the page without alter- ing the page-layout.
textdistance	dimension	
textwidth	dimension	
textmargin	dimension	
clipoffset	dimension	
page	identifier	
paper	identifier	

In order to get information on the current settings the following commands can be issued:

```
\showframe [.*.]
OPTIONAL

* TEXT margin edge
```

The dimensions can be displayed by:

```
\showsetups
```

A multi-page combination of both is generated with:

```
\showlayout
```

The width of a text is available as \hsize and the height as \vsize. To be on the safe side one can better use ConTEXt's \dimen-registers \textwidth and \textheight, \makeupwidth and \makeupheight.

When we are typesetting in one column of text \textwidth and \makeupwidth are identical. In case of a two columned text the \textwidth is somewhat less than half the makeupwidth. The \textheight is the \makeupheight minus the height of the header and footer.

variable	meaning
\makeupwidth	width of a text
\makeupheight	height of a text
\textwidth	width of a column
\textheight	height – header – footer

Table 1.2 Some \dimen variables

There are also other dimensions available like \leftmarginwidth and \footerheight, but be aware of the fact that you can only use these variables, you can not set them up. The width of a figure could for instance be specified as width=.9\leftmarginwidth.

Basically documents are typeset automatically. However, in some cases the output would become much better if a line would be moved to another page. For these situations you can adjust the layout temporarily (just for that page) by typing:

```
\adaptlayout [..., ...] [.., ...]

1 NUMBER

2 height = DIMENSION max
lines = NUMBER
```

The use of this command should be avoided inside a text, because after altering your document the adjustment could possibly not be necessary anymore. So, if you use this command, use it at the top of your document. For example:

```
\adaptlayout [21,38] [height=+.5cm]
```

The layout of page 21 and 38 will temporarily be 0.5 cm higher though the footer will be maintained at the same height. The numbers to be specified are the page numbers in the output file

If the layout is disturbed you can reset the layout by:

```
\setuplayout[reset]
```

In some commands you can set up the parameters width and height with the value fit. In that case the width and height are calculated automatically.

On the next pages we will show a number of A5 page layouts centered on an A4. The default setups (dimensions) are adequate for standard documents like manuals and papers. The setup adjusts automatically to the paper size. Note the use of middle while setting up the parameters width and height.

Grids				
There are many ways alignment of the wor	2		ple below and notice t Is on the mini pages.	he vertical
alpha beta gamma	alpha beta gamma	alpha beta gamma	alpha beta gamma	
The first three alternates pages with unequal leadle. 1		-	e fourth alternative w between the lines a lit	
alpha	alpha	alpha	alpha	
beta	beta	1	beta	
	gamma	beta	gamma	
gamma delta	delta	gamma		
L			·······	
A stretchable line spa tage that lines of two	pages or two colu	mns ited but ConT	ans to do this in TEX ar EXt has some features	,
that are displayed cl		0 11	ng. ³	
seldom align. This i reader. ²	is very disturbing f	1		
reauct.		Hey, watch this. Here! Another for	A footnote!	
In those situations w	e prefer to typeset			
			d the running text a	
1 0	71 0 1		on is not placed on th	e grid one
can snap this compor	nent to the grid with	:		
\fram	ed{This is like a	a snapshot.}}		
This will result in:				
This is like a snapsho	ot.			

1.5

Grids 1

```
This mechanism can be influenced with an argument:
\placeongrid[bottom]{\framed{Do you like the snapshot?}}
Now an empty line will appear below the framed text. Other parameters are: top and both. _5
The last parameter divides the linespace between over and below the framed text.
Now the snapshot looks better.
These examples don't show pretty typesetting. The reason is that \framed has no depth because_10
TEX handles spacing before and after a line in a different way than text. ConTEXt has a solution __11
to this:
\startlinecorrection
\framed{This is something for hotshots.}
\stoplinecorrection
The command \startlinecorrection tries to typeset the lines as good as possible and takes 18
the use of grid in account.
This is something for hotshots.
Because line correction takes care of the grid we have to use yet another command to stretch_24
the framed text:
\startlinecorrection
\framed{Anyhow it is good to know how this works.}
\stoplinecorrection
As you can see this results in somewhat more space:
Anyhow it is good to know how this works.
 \placeongrid [.1] \{.2.\}
 \showgrid [...,\frac{1}{...}] \{...\}
 1 reset top bottom none all lines frame nonumber right left
 2 CONTENT
```

1 Grids

1.6 Printing

In an earlier section we used page and paper dimensions. In this section we will discuss how these two can be manipulated to yield a good output on paper.

In figure 1.3 and 1.4 we see some alternatives to manipulate the page composition by means of \setuppapersize and\setuplayout. So it is possible to put a page in a corner or in the middle of the paper, to copy a page and to use cutting marks.

When the parameter paper size is set to landscape width and height are interchanged. This is not the same as rotation! Rotation is done by typing 90, 180 and 270 in the first argument of \setuppapersize.

\setuppapersize[A5,landscape][A4]

These examples don't show that we can correct for duplex printing. For example when we type:

\setuppapersize[A5][A4]

\setuplayout[location=middle,marking=on]

the front and back side will be placed in the middle of the paper. The markings enable you to cut the paper at the correct size. If we only want to cut twice, we type:

\setupppapersize[A5][A4] \setuplayout[location=duplex]

This has the same meaning as {duplex,left}. At this setup ConTEXt will automatically move front and back side to the correct corner. In figure 1.2 we show both alternatives.

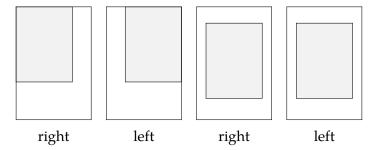


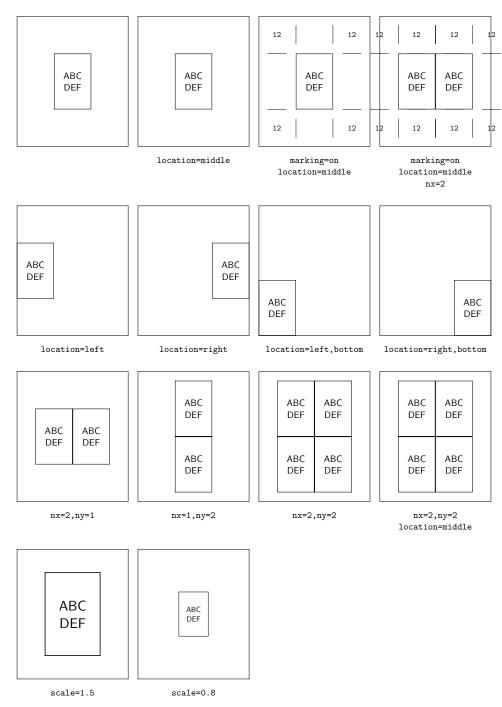
Figure 1.2 Positioning the page on paper for cutting.

Rotating, mirroring, scaling, duplicating and placing pages on paper are independent operations. By combining these operations the desired effects can be reached. Rotating and mirroring and page and paper size are set up at the same time. The other operations are set up with \setuplayout.

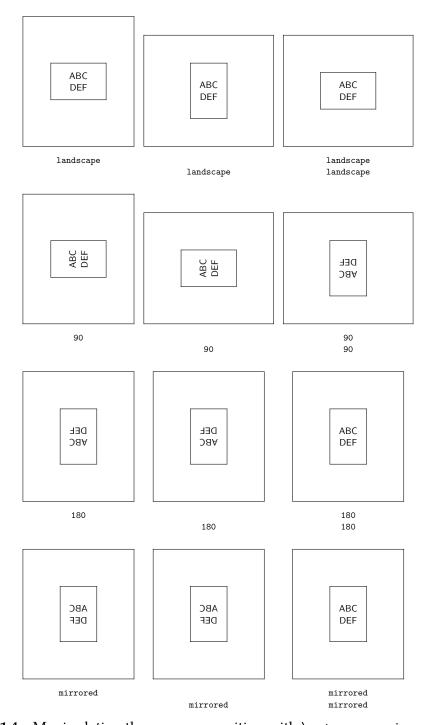
1.7 Arranging pages

Simplified we can say that TEX typesets pages. If the typeset material should become a book, then there are two options. Firstly the book will be produced on multiple sheets carrying only one page either on one or on both sides of the sheet. Second option is to produce arrangements of multiple pages per sheet of paper which will be folded into sections, using imposition schemes.

Printing 1



 $\textbf{Figure 1.3} \quad \text{Manipulating the page composition with $$ \verb|\setuplayout|.}$



 $\textbf{Figure 1.4} \quad \text{Manipulating the page composition with $$ \verb|\setuppapersize| .}$

ConTEXt offers tools to achieve both options.

When talking about book-printing the industry produces different kinds of sections, consisting commonly out of 32 or 16 pages. Consider, that sections of 32 pages may be quite thick. At binding if the sections are sewn and the spine is rounded the fore edge can become stepped. This is aesthetically less satisfying. Best results are normally obtained with sections of 16 pages.

For special purposes or in case of special papers also less than 16 pages per section are arranged.

The command to arrange pages with ConTEXt is

For (standard) sections the following list of schemes is available:

Arrangement		Result		Number of pages
\setuparranging	[2*16]	section: one sheet 2×16 pages	=	32 pages
\setuparranging	[2*8]	section: one sheet 2×8 pages	=	16 pages
\setuparranging	[2*4]	section: one sheet 2×4 pages	=	8 pages
\setuparranging	[2*2]	section: one sheet 2×2 pages	=	4 pages

On the following pages we show pictures of arranged pages for the mentioned imposition schemes.

The above mentioned imposition schemes are meant for the professional printing industry. – But also with an office printer one can produce sections. The simplest version is booklet-printing. In this case all pages are arranged in such a way, that with a single fold a booklet is formed.

```
\setuparranging [2UP] 2 pages next to each other, n sheets arranged for a single booklet \setuparranging [2DOWN] 2 pages above each other, n sheets arranged for a single booklet
```

'2UP' results in a booklet with the fold on the long egde of the page. '2DOWN' gives a booklet with a short-edge binding of the pages.

For those who want to print their own book with sections on the office printer ConTEXt offers two schemes which use 2 and 4 sheets of paper respectively to form a section of 16 pages.

Arrangement		Result	Number of pages
\setuparranging	[2*4*2]	section: 2×4 pages on 2 sheets =	= 16 pages
\setuparranging	[2*2*4]	section: 2×2 pages on 4 sheets =	= 16 pages

Next to the imposition schemes involving folding ConTEXt offers possibilities to arrange pages in such a way, that after cutting the pile of sheets book blocks can be assembled. The resulting bookblock consists of loose sheets of paper and will be glued along the spine to prepare e.g. a paperback.

ConTEXt has an arranging scheme for two odd pages above each other and two even pages on the backside of the sheet. In order to build the book block the sheets need to be cut and the two piles must be merged.

Arrangement	Result	Number of pages
\setuparranging [2TOPSIDE]	recto 2 odd pages, verso 2 even pages =	4 pages
	per sheet	

For building book blocks from single sided printed sheets ConTeXt offers three different schemes. The first scheme arranges 4 pages on the front side of the sheet. The pages are arranged in such a way that they can be folded, however the verso face of the sheet is blank. An other option is to cut the sheet in four parts. The book block must be assembled from the 4 piles of cut sheets.

The second scheme puts two pages on the front side of a sheet next to each other. After cutting the book block is build through merging the two piles. The third scheme works like the previous one but instead of putting the pages next to each other the pages are placed on top of each other.

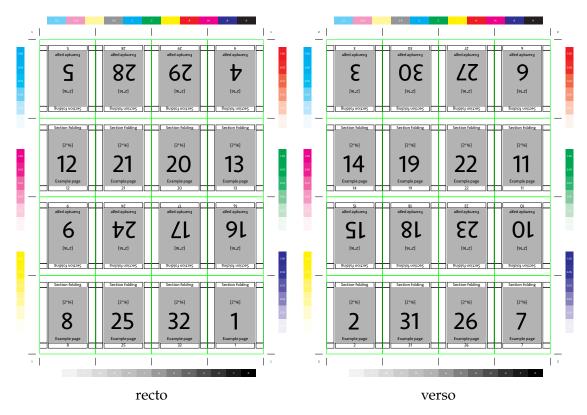


Figure 1.5 32 pages

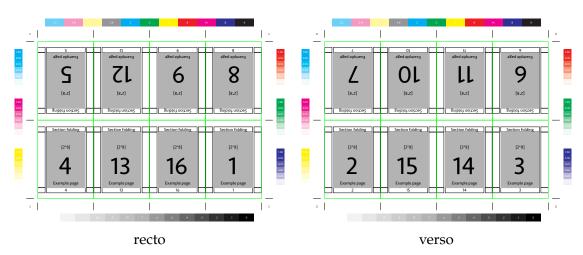


Figure 1.6 16 pages

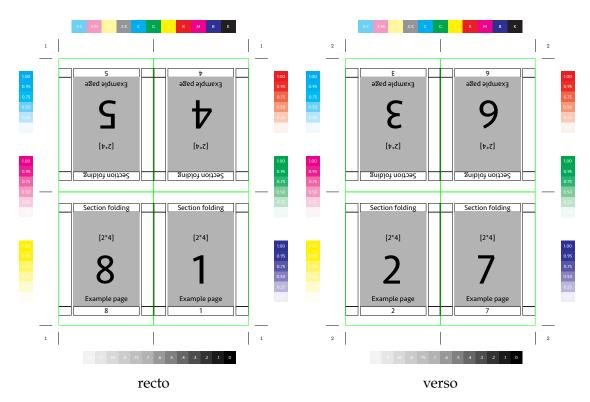


Figure 1.7 8 pages

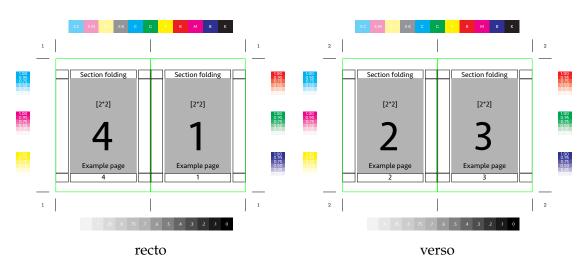


Figure 1.8 4 pages

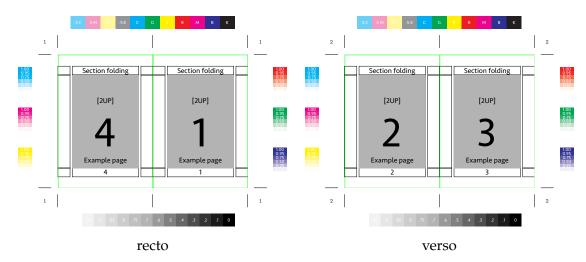


Figure 1.9 2 UP booklet: long edge binding

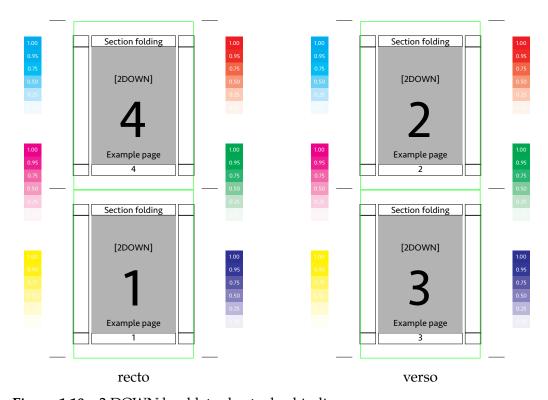


Figure 1.10 2 DOWN booklet: short edge binding

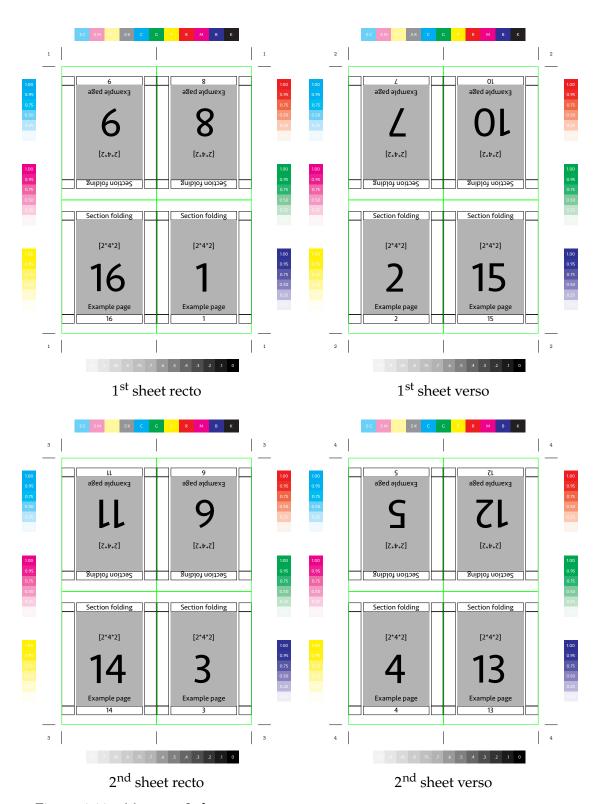


Figure 1.11 16 pages, 2 sheets

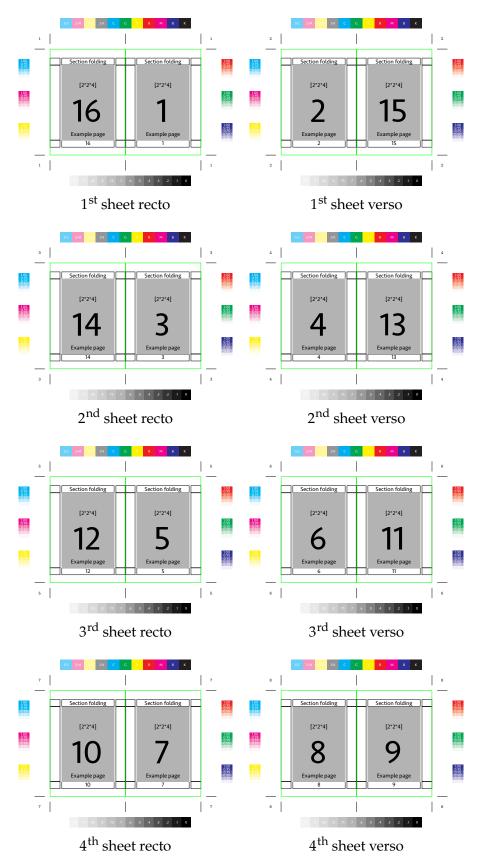


Figure 1.12 16 pages, 4 sheets

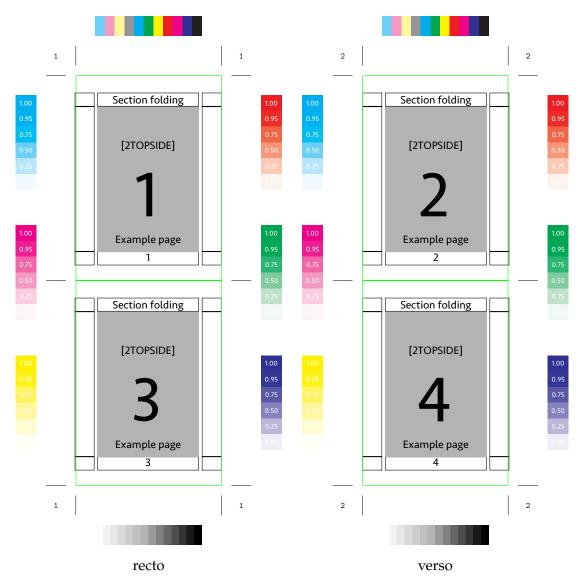


Figure 1.13 4 pages, 1 sheet

Arrangement		Result	Number of pages
\setuparranging	[1*4]	one sheet recto 4 pages =	4 pages
\setuparranging	[2SIDE]	one sheet recto 2 pages =	2 pages
\setuparranging	[2TOP]	one sheet recto 2 pages =	2 pages

Last but not least is the X-Y-arrangement of pages. This scheme is not intended for the production of book blocks but for the placement of pages e.g. on sheets carrying labels or for the placement of other information which must return several times on a sheet.

Arrangement	Result	Number of pages
\setuparranging [XY]	$nx \times my$ pages, single sided =	$n \times m$ pages

There is another culprit in arranging pages. If multiple layers of paper are folded, the outermost paper will require more width because it has to turn around the inner paper layers. This effect occurs as well in the spine folds as also in the head folds. How much width is required depends

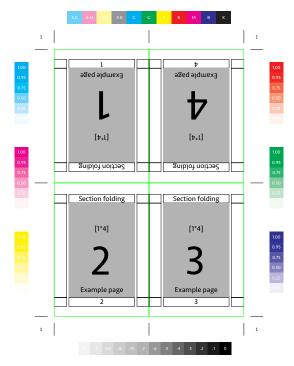


Figure 1.14 4 pages, singlesided, 1 sheet

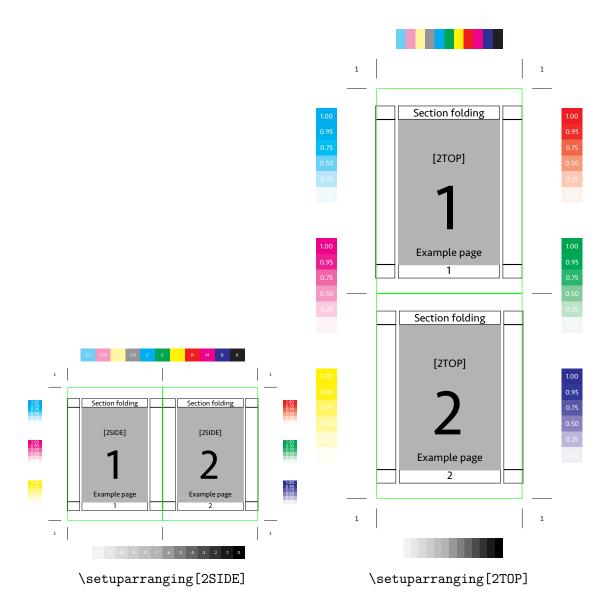


Figure 1.15 2 pages, single sided, 1 sheet

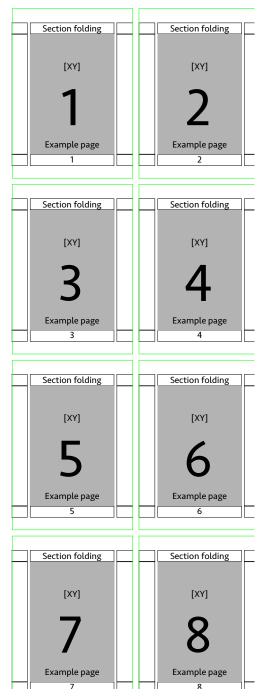


Figure 1.16 8 pages, singlesided, 1 sheet, XY-arrangement

on the number of folds and the thickness of the paper. In professional book printing this effect is accounted for by displacing the pages depending on their position in horizontal and vertical direction. The result is that there will be a perfect look-through registering of all pages. There are no simple rules to indicate the required amount of displacement. Mostly it is a matter of experience to set up the page shift information.

ConT_EXt is equipped with a mechanism, which allows to move pages on a sheet apart from each other in horizontal as well as in vertical direction. The mechanism is build on two shift-lists, one

for horizontal and one for vertical page shifting. The mechanism works through cycling over the lists which contain a shift amount for each page in a section. For filling in such a shift-list knowledge and understanding the position of a page on the printed sheet is necessary.

In order to use a horizontal shift list this list must be defined and setup.

For a section of 16 pages a horizontal shift list is filled in where for each page the amount of displacement is given. Such a list could look as follows:

```
\definepageshift[Hor][horizontal]
```

```
[0.25mm, %1
-0.25mm, %2
          %3
0.15mm,
-0.15mm, %4
0.05mm,
          %5
-0.05mm, %6
          %7
Omm,
Omm,
          %8
          %9
Omm,
          %10
Omm,
0.05mm,
         %11
-0.05mm, %12
0.15mm,
         %13
-0.15mm, %14
0.25 \mathrm{mm},
         %15
-0.25mm] %16
```

For illustration purposes the following list for horizontal page-shift with exaggerated values is used in a Z-folding with 12 pages.

```
\definepageshift[Hor][horizontal]
```

```
[1mm,
         %1
         %2
-1mm,
0.5 mm,
         %3
-0.5mm,
         %4
         %5
Omm,
         %6
Omm,
Omm,
         %7
         %8
Omm,
         %9
0.5 mm,
-0.5mm, %10
1mm,
         %11
         %12
-1mm]
```

In a similar fashion also vertical shift lists can be defined.

```
\definepageshift[Vert][vertical]
```

```
[1.5mm, %1
1.25mm, %2
0.75mm, %3
1.0mm, %4
```

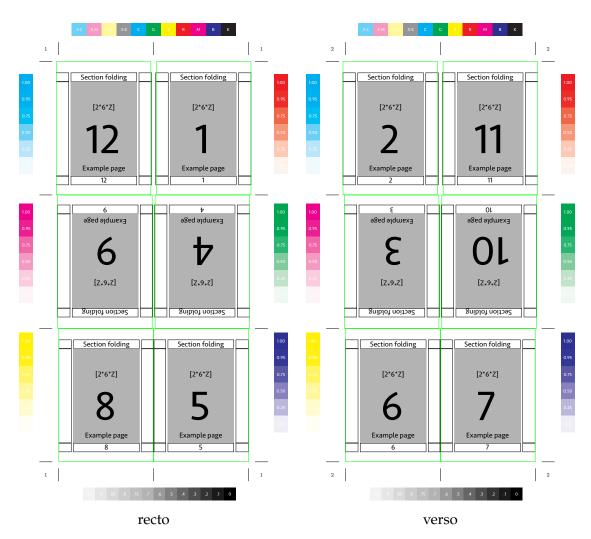


Figure 1.17 Horizontal page-shift

- 1.0mm, %5
- 0.75mm, %6
- 1.25mm, %7
- 1.5mm, %8
- 1.5mm, %9
- 1.25mm, %10
- 0.75mm, %11
- 1.0mm, %12
- 1.0mm, %13
- 0.75mm, %14
- 1.25mm, %15
- 1.5mm] %16

For each page in a section the shift amount must be indicated. The above presented list has exaggerated values just for making clear what happens:

While arranging these lists can be used in the following way:

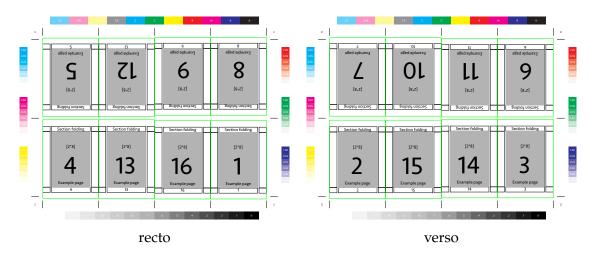


Figure 1.18 Vertical page-shift

Only one list is used:

\setuppageshift[paper][Hor]

or

\setuppageshift[paper][Vert]

Both lists are used:

\setuppageshift[paper][Hor][Vert]

The next examples show the cooperation of the commands \setuppapersize, \setuplayout and \setuparranging.

\setuppapersize [A7][A3,mirrored] %negative creates an out of memory error

in Acrobat 8.2.2. on the MAc OSX 10.6.3 \setuparranging [2*8,rotated,doublesided] \setuppagenumbering [alternative=doublesided]

With the above shown preamble you get sections of 16 pages of the size of A7, where both sides of the A3 paper carry 8 pages [2*8]. For two reasons the A7 pages must be rotated on the paper. First in this imposition scheme there will be 4 A7 pages next to each other so they need to be aligned along the long edge of the A3. Secondly and this is important for book-printing, the grain direction of the paper must be in the direction of the spine i.e. in the height of the A7. Since A3 has its grain direction normally along the short edge it is correct to rotate the A7 pages. Further more there is the 'doublesided' directive in the \setuparranging command. This is to rotate the whole content of the verso side of the A3 paper by 180°in order to enable automatic double sided printing on the printing machine. \setuppagenumbering tells ConTEXt to use a doublesided lay-out, resulting in left and right pages.

Yet there is inside the \setuppapersize command the directive 'mirrored'. Using this directive, the content of the A3 paper is mirrored along the long edge of the paper, this results in mirrored typeset text.

\setuppapersize [A5][A3]

\setuparranging [2UP,rotated,doublesided] \setuppagenumbering [alternative=doublesided]

What this does is placing two A5 pages side by side on a A3 sheet of paper. Both the page and the paper are in portrait orientation. Because A5 fits better on a A3 when the page is rotated the \setuparranging command carries the 'rotated' directive. The resulting sheet of paper will be printed on an automatic double-sided printing machine. Often these machines require, that the verso side of the paper is printed reversed, this is achieved with 'doublesided' in the \setuparranging command.

Instead of using the 'rotated' directive in \setuparanging you can also say:

\setuppapersize [A7][A3,landscape] \setuparranging [2*8,doublesided]

\setuppagenumbering [alternative=doublesided]

You rotate the A3 paper by means of the 'rotated' directive in \setuppapersize.

There is one thing which should be kept in mind when using \setuparranging: TeX compilations with ConTeXt are most of the time multi-pass runs. If there is a table of content or other lists, this information is stored in auxiliary files or tables in LuaTeX. In order not to loose the content of those lists it is important to run the file first without the \setuparranging command enabled. If all went well, run the file a single time with the \setuparranging command enabled.

1.8 Logo types

Logos were removed in mkiv.

Logo types 1