

Lollipop Unwrapped

<https://github.com/persian-tex/lollipop>

Victor Eijkhout (Original author)

Vafa Khalighi (Current developer)

A manual for the Lollipop T_EX format

Version 1.07

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Chapter 1

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1.2 All of the options

(You know, this section and the next look much better if you sort the `manual.oix` and `manual.cix` files before you format the document the last time. Do put lines

```
\Writeopindex:no
\Writecsindex:no
```

somewhere in the top of the `manual.tex` file in order to prevent overwriting of these files after you've sorted them.)

```
title 3  indentafter 3  item 5  indentation 5  itemsign 6  itemCounter 6
labeloverflow 6  description 6  text 7  breakbetween 8  whitebetween 8
indentinside 8  text 9  height 11  text 12  textband 12  band 12
pagerule 14  topskip 14  PageCounter 14  NextPageGrid 16  label 20
haslabel 23  external 24  file 25  item 25  FooLabel 25  title 26
HasTitle 26  counter 27  HasCounter 27  block 27  stickout 28
line 29  textcolumn 29  label 30  breakbefore 30  breakafter 30
```

1 Contents

indentafter 30 indentinside 30 indentfirst 30 hrule 30 embedded 31
noimplicitclose 32

1.3 All of the commands

\StartCommand 1 \OptionsMacro 2 \DefineHeading 3 \DefineList 5
\SetItemSign 6 \SetItemCounterRepresentation 6 \PopIndentLevel 7
\DefineTextBlock 9 \DefinePageGrid 11 \Height 11 \PageCounter 14
\FirstPlaced 15 \LastPlaced 15 \PreviousPlaced 15 \EjectPage 17
\ToRecto 17 \ToVerso 18 \NoPages 18 \PagesOut 18 \WholePage 18
\CurrentShipout 18 \CountSheetsno 18 \SuspendOutput 18 \ResumeOutput 18
\ref 19 \pgref 19 \label 19 \LocalReferences 22 \DefineBBL 23
\bibref 23 \RefLabel 23 \DefineExternalFile 24 \WriteFoo 24
\WriteExtern 24 \LoadExternalFile 24 \ToExternalFile 25
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\TheList 41 \AppendToList 41 \UndefinedCS 41 \EqualString 41
\EqualStringX 41 \StringBefore 41 \NextChar 42 \IsEmptyList 42 \loop 42
\EveryParagraph 42 \EveryMath 42 \EveryDisplay 42 \SaveAlloc 42
\RestoreAlloc 42

1.4 Bibliography

- [1-] Victor Eijkhout. *T_EX by topic*. <http://eijkhout.net/texbytopic/texbytopic.html>, 1992.
- [2-] Victor Eijkhout. Just give me a lollipop (it makes my heart go giddy-up). *TUGboat*, 13:341–346, 1992.
- [3-] Victor Eijkhout and Andries Lenstra. The document style designer as a separate entity. *TUGboat*, 12:31–34, 1991.
- [4-] Donald E. Knuth. *The T_EX Book*. Addison-Wesley, 1984, reprinted with corrections 1989.
- [5-] Leslie Lamport. *L^AT_EX A Document Preparation System*. Addison-Wesley, 1986.
- [6-] Alan Perlis. Epigrams on programming. *ACM Sigplan Notices*, 17:7–13, 1982.
- [7-] Raymond Seroul and Silvio Levy. *A Beginner's Book of T_EX*. Springer Verlag, 1990.

Chapter 2

Preliminaries

2.1 What is Lollipop?

Lollipop is ‘ \TeX made easy’. Lollipop is a macro package that functions as a toolbox for writing \TeX macros. It was my intention to make macro writing so easy that implementing a fully new layout in \TeX would become a matter of less than an hour for an average document, and that it would be a task that could be accomplished by someone with only a very basic training in \TeX programming.

Lollipop is an attempt to make structured text formatting available for environments where previously only wysiwyg packages could be used because adapting the layout is so much more easy with them than with traditional \TeX macro packages.

2.2 But is it compatible?

Lollipop, like \LaTeX , is not compatible with plain \TeX . I don’t consider this a real problem. Most plain \TeX commands will work in Lollipop with the exception of anything output routine related. (See also below.)

Lollipop is also not compatible with \LaTeX , although it has a lot of the same functionality. There are two reasons why Lollipop still has a reason for existing, even though \LaTeX is used pretty much all over the scientific world.

For one, Lollipop is targeted in part to different users than the typical plain \TeX or \LaTeX user. For another, I have a vain hope that I can capture some of the \LaTeX market share. Since developing styles in Lollipop is so much more easier than in \LaTeX , I may stand a fighting chance.

2.2.1 Lollipop and plain \TeX

Having said the above, I’ll conceded that Lollipop is more compatible with plain \TeX than with \LaTeX . You can use quite some plain \TeX commands in Lollipop. However, stay away from the following:

`\everypar` This one is heavily used by Lollipop. You may use `\EveryParagraph` instead, which functions pretty much like `\everypar`; see section 11.10.3.

`\everymath` This one is heavily used by Lollipop. You may use `\EveryMath` instead, which functions pretty much like `\everymath`; see section 11.10.4.

`\everydisplay` This one is heavily used by Lollipop. You may use `\EveryDisplay` instead, which functions pretty much like `\everydisplay`; see section 11.10.5.

`\output` Page output is done so very differently from plain \TeX that all commands pertaining to page numbers and head/footlines have been eradicated. (Well, `\pageno` still gives the page number.) See chapter 7.

The current version of Lollipop is based on the plain \TeX file that comes with \TeX version 3.141592653.

2.2.2 Lollipop and \TeX programming

The tools in Lollipop allow you to program in a simple manner quite complicated macros. Still v

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you may want to have some knowledge of ordinary \TeX macro programming. If you are just starting in \TeX you can pick up the basics from the book by Seroul and Levy [7], and after that there is the book by the original author of \TeX [4] and my own \TeX reference guide [1].

2.3 *How to Use Lollipop*

The following files comprise the Lollipop format:

<code>lollipop-define.tex</code>	<code>lollipop-document.tex</code>
<code>lollipop-float.tex</code>	<code>lollipop-fontdefs.tex</code>
<code>lollipop-fonts.tex</code>	<code>lollipop-heading.tex</code>
<code>lollipop-lists.tex</code>	<code>lollipop-output.tex</code>
<code>lollipop-plain.tex</code>	<code>lollipop-text.tex</code>
<code>lollipop-tools.tex</code>	<code>lollipop.tex</code>

To process a file, say `test.tex`, with Lollipop you then type:

```
> lollipop test.tex
```

to get the dvi output.

2.4 *Processing a Lollipop file*

Files that you make to be processed with Lollipop contain of course the input text, but they also have to contain the design macros that determine the layout. There are two possibilities for these design macros:

- You can simply put them in the same file, either in the beginning or wherever they are first needed, or
- You can put the layout definition in a separate file and call this definition file in your main file. For instance, you can put the layout definition of a book in a file `bookstyle.tex`, and then call this definition file in your main Lollipop file by putting `\InputLollipop:bookstyle.tex` somewhere in your main Lollipop file.

If you have used \TeX before, you will notice that the page numbers get reported slightly differently from the usual way. See section 7.4 for the explanation.

2.5 *The errors of Lollipop/ known bugs*

Since Lollipop is an order of magnitude more powerful (and hence complicated) than formats such as \LaTeX , its error messages can also be an order of magnitude more cryptic (see section 3.4 for the possible origin of some of the more obscure error messages).

Fortunately, Lollipop is also quite a bit better than existing formats at catching potential errors. Typos in a style definition will usually lead to warning messages, and also during run time Lollipop is able to track down omissions.

In addition, you can switch on various trace modes to get more detailed information about Lollipop's thought processes. See chapter 12.

These are the known bugs in Lollipop at the moment.

- 1 Local references have been insufficiently tested, and the code definitely is buggy.
- 2 The 'firstpage' test in the page grids does not work.
- 3 The table of contents example is slightly wrong.
- 4 Titles get written to the aux file with double spaces. This shouldn't cause any problem, but it has to be fixed.

- 5 Rules in page grids get white space around them.
- 6 External items shouldn't declare `\FooTitle` or `\FooCounter`.
- 7 `\ToExternalFile` doesn't work.

If you find any other issues, or if you have any fixes/workarounds for any existing issues, then please post them on GitHub.

2.6 *About this manual*

This manual consists of a main file `lollipop-manual.tex`, and the following input files:

```
titlepag.tex prelim.tex struct.tex head.tex list.tex
out.tex extern.tex opt.tex comm.tex trace.tex appendix.tex
and the style definition file mandefs.tex.
```

In addition, you need `comment.tex` which is used to format this manual, and `btxmac.tex` for the Bib \TeX interface, but these are not really a part of Lollipop.

If you format this manual (which you'll have to do three times to get the page numbering and the table of contents straight) you'll notice something strange. The file `example.tex` is read in many, many times. This is because this manual formats its examples along the way, first writing them out, and then reading them in to show both their code and their output. This way it is guaranteed that the examples in the manual will always work.

As a result of formatting this manual you will wind up with, apart from the usual pdf and log file, with `lollipop-manual` files with extensions `aux`, `toc`, and `imp`; `oix` and `cix` for indexes of options and commands, and `tct`, `filetix` which are for the examples. For the bibliography there are the Bib \TeX input file `lollipop-manual.bib` and output file `lollipop-manual.bbl`.

This manual needs quite some resources: here's what \TeX told me it needed.

Here is how much of TeX's memory you used:

```
1194 strings out of 496579
16173 string characters out of 6202690
72655 words of memory out of 5000000
3270 multiletter control sequences out of 15000+600000
11241 words of font info for 40 fonts, out of 8000000 for 9000
19 hyphenation exceptions out of 8191
24i,4n,24p,187b,562s stack positions out of 5000i,500n,10000p,20000b,80000s
```

Because of all the examples this manual takes quite some time to process. A factor of four over the time for a regular document of similar length should be expected. Ordinary Lollipop documents will proceed far faster.

2.7 *The most boring section in this manual*

There are a few things about Lollipop that I want to be clear about.

2.7.1 *I am going to hurt you and I am not sorry*

In the secret handbook for the software industry it says that the final test phase of a product consists of putting it in stores and having innocent suckers pay good money for it. (You guessed it, this is the disclaimer section.) So let me just say that Lollipop is probably good for nothing, at least, I don't claim it is. And if you hurt yourself by using it, don't blame me. I warned you.

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2.7.2 *Get a Lollipop, give one away*

Lollipop is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

The easiest way to get the current copy of Lollipop is to use a more recent T_EX distribution (T_EXLive or MikT_EX).

2.7.3 *The status of Lollipop*

Lollipop is still under development. Although I will try not to make any drastic changes in the user interface (this says nothing about the internals!) I really cannot guarantee anything. However, I do listen to complaints and suggestions.

If you have suggestions or complaints about the useability of Lollipop or the implementation, feel free to contact me at `persian-tex@tug.org` on the Internet.

2.7.4 *The wish list*

Lollipop is not quite perfect. Here's a list of things that I am going to be adding in the near future. If you want to add items to this list, just open a ticket on the tickets.

- 1 Raggedbottom should really, really be added. Soon!
 - 2 Capitalization and initial capping of titles. If a title appears in mixed case, it should be possible to have it in all uppercase in running heads. Some code has been disabled now.
 - 3 A better multi-column mode.
 - 4 Interface to BibT_EX seems to largely in place; what happens if you don't load `btxmac`?
 - 5 Inserts, in particular footnotes. At the moment floating figures are entirely lacking. (As a matter of fact, the plain T_EX macros are availble, but I'm not telling that.)
 - 6 A 'nomarks' option to prevent wasting two token lists. Maybe other recourse saving optio for the expert designer?
 - 7 More sophisticated white space right before and after page breaks. (Use at least so and so much.)
 - 8 Dynamic topskip.
 - 9 Support for RTL languages (such as Persian).
- The following points are debatable: maybe I should just steal a few components from L^AT_EX. Maybe this sort of stuff does not belong in Lollipop.
- 10 A tabular mode. Personally I always felt `\halign` to be more than sufficient, but some people seem to think otherwise.
 - 11 Maths constructs. Some things in the `\eqalign` vein would be nice.

2.7.5 *A bit of history*

The Lollipop format was begun in late 1989 to typeset Victor Eijkhout's Ph.D. thesis, '*Vectorizable and Parallelizable Preconditioners for the Conjugate Gradient Method*'. At that time Victor was using T_EX on an Atari 1040ST. Loading the style definition for the thesis took about two minutes. Lollipop was heavily augmented in late 1991 to typeset his book '*T_EX by Topic*', for which he used Sun 3 and Sun 4 computers. Writing this manual brought Lollipop to its version 0.96; the first public release (version 0.9) was announced on the internet in October 1992.

Between 1992 and 2014, Lollipop was unmaintained and Vafa Khalighi took over the development of Lollipop in April 2014.

The name ‘Lollipop’ refers to a quote by Alan Perlis [6], quoted on page 365 of the `TEXbook` [4]. In a way it’s rather pretentious. The philosophy of the Lollipop format is described [3, 2].

Chapter 3

The structure of Lollipop

Lollipop provides tools for realizing the style or layout of a document. Some of these tools are macros ready to be used by the end user; they concern for instance selection of fonts. Others, the ‘generic constructs’, are for the style designer so that she can use them to program the macros for the user.

3.1 *Lollipop Files*

Any Lollipop document has to have a `\Start` and `\Stop` command. Before the `\Start` there can be style definition commands, but no text. For a number of reasons it is advisable to put as much of the style definition before the `\Start` command as possible. You can do that easily by loading the style as an input file, or by first dumping it as a format (see section 2.4).

Both the start and the stop file load the `.aux` auxiliary file. None of this should concern you, really. Expert users who want to have certain actions performed at the start of the document may want to use `\StartCommand` to specify what they wish done. See section 11.7.2 for an example.

3.2 *Generic Constructs*

There are five ‘generic constructs’: headings, lists, text blocks, page grids, and external items. For each construct type there is a defining command, for instance `\DefineHeading` which is followed a list of ‘options’, terminated by the word ‘Stop’.

Options (possibly with values) have to be separated by a space or a line end; the keyword `Stop` has to be followed by a space or a line end. Options may have zero, one or two values; if there are values, then the first one is separated from the option by a colon, the second is separated from the first by an equals sign.

```
\DefineFoo:Bar optiona optionb optionc:value
    optiond:valuea=valueb optione
    optionf Stop
```

As a result of this definition, a command `\Bar` is created. If the `Foo` construct was a `List` or `TextBlock`, an additional command `\BarStop` is created.

This command can then be used in the ordinary way, for instance after

```
\DefineHeading:Foo you can type
\Foo The title
and after \DefineList:Foo you can type
\Foo
\item One item
\item And another
\FooStop
```

3.3 *Options*

Options are mostly used to specify how a construct will look. Some options, for instance `title`, indicate material that will appear on the page. Other options are interpreted as commands, for instance `IndentAfter:yes` in the definition of a heading indicates that the first paragraph after such a heading will indent.

3 The structure of Lollipop

In addition to keywords that only exist as options, commands can be used as options. Also, single characters are accepted as options. For instance a definition of a subsection heading can contain:

```
\DefineHeading:SubSection
  [...]
  SectionCounter . SubSectionCounter
  [...] Stop
```

(Here and later the [...] will denote arbitrary omitted text.) This definition contains the commands `\SectionCounter` and `\SubSectionCounter` and the `.` character.

If a number of options appears together in a number of constructs it is convenient to have an abbreviation for them. This can be done with the command `\OptionsMacro` as follows. The options that appear together are given a common name

```
\OptionsMacro:baz=optiona optionb:value optionc
  Stop
```

(be sure to leave no spaces around the equals sign) and this name is then used as

```
macro:baz
```

in the option list wherever the options are needed.

This is for instance a good way of specifying identical white space around all sorts of constructs without duplicating the typing each time. However, it is only for your convenience: it doesn't save any TeX resources or processing time.

3.4 Popular error messages. *Not!*

Lollipop is a macro package on top of an existing program, TeX. Therefore it is inevitable that you will get TeX error messages every once in a while. Some of these may confuse you.

Here are a few of the errors that I keep making.

3.4.1 Missing `\endcsname` inserted

If you forget the second parameter in a `\Distance` or `\SetCounter` command, writing for instance `\Distance:TheWidth`

instead of

```
\Distance:TheWidth=15pt
```

TeX will scan forward, and it can easily bump into something that is highly unexpected given the context. If this is a `\def` or `\Define...` command, a 'missing `\endcsname`' results. If a blank line follows the incomplete declaration, the following section applies.

3.4.2 Paragraph ended before something was complete

TeX has found a blank line (or a `\par` command) where this was not expected. See for instance the previous section.

3.4.3 Missing number

You have used something that you thought was the name of a control sequence, but it wasn't.

Example:

```
\Distance:parskip=parundent
```

Since `\parundent` is undefined, Lollipop thought you were writing something like

```
\Distance:parskip=5pt
```

And yes, the message refers to 'number' even though what is missing is a distance.

Chapter 4

Headings

Headings for sections, chapters, and such, are an essential part of any T_EX macro package. In Lollipop they are maybe a bit less special: all options for headings are general options, meaning that they also apply to text blocks and lists. There are only two things that distinguish headings:

- 1 there will be no page break after a heading;
- 2 there is no closing command for a heading.

4.1 Examples

Headings are defined by `\DefineHeading`. The most obvious element in a heading is the title, marked by the option `title`. The title is anything that follows the heading command, upto the first empty line.

```
\SomeHeading Some title
```

And some text following it.

The title has to be included in a line or a textcolumn for proper handling (see also section 10.3.5). For titles that do not exceed one line, the `line` option suffices (section 10.3.3); if a title is possibly more than one line long, the `textcolumn` option has to be used (section 10.3.4).

Example 4.1

```
\DefineHeading:TestSection Style:bold
  line:start TestSectionCounter Spaces:2 title line:stop
  Stop
\TestSection The Title
```

The text after the heading.

1 The Title

The text after the heading.

By default, the text after a heading is indented. Overriding this default behaviour is done with the option `indentafter`.

Example 4.2

```
\AlwaysIndent:no % as a default, don't indent paragraphs
\DefineHeading:TestSection Style:bold
  line:start TestSectionCounter Spaces:2 title line:stop
  indentafter:yes Stop
\TestSection The Title
```

The text after the heading.\par

The second paragraph after the heading

1 The Title

The text after the heading.

The second paragraph after the heading

4 Headings

Usually headings come in a hierarchy, where the counter of one type, for instance a subsection, is reset everytime the counter of a higher level is stepped. In Lollipop, this subordinating of headings is done by declaring one counter to be governed by another (counters are explained in full detail in section 11.1).

Example 4.3

```
\DefineHeading:TestChapter Style:bold
  line:start TestChapterCounter Spaces:1 title line:stop
  Stop
\DefineHeading:TestSection Style:italic
  line:start TestChapterCounter : TestSectionCounter . Spaces:1
  title line:stop Stop
\GoverningCounter:TestSection=TestChapter
```

```
\TestChapter Level One Heading\par
\TestSection Level Two Heading\par
Some text.
\TestSection Level Two again\par
More text.
\TestChapter Level One is Stepped\par
\TestSection Level Two\par
Again text.
```

1 Level One Heading

1:1. Level Two Heading

Some text.

1:2. Level Two again

More text.

2 Level One is Stepped

2:1. Level Two

Again text.

Headings will often wind up in a table of contents. For this, the table of contents will have to be declared:

```
\DefineExternalFile:contents=toc
```

and its formatting will have to be specified, but also every construct that writes to this file has to be declared as such.

```
\DefineHeading:TestSection
  [...]
  external:contents title external:stop
  Stop
```

Usually, the title is all that has to be written out (the counter value is written by default), but the possibility exists for writing out other information as well. See section 9.2.

Chapter 5

Lists

Lists in Lollipop are defined by `\DefineList`:

```
\DefineList:Foo [...]
  item:start [...] item:stop
  [...] Stop
```

and the resulting list is used as

```
\Foo
\item [ ..text.. ]
\item [ ... ]
\FooStop
```

where the closing command can be abbreviated as `\>`.

5.1 Label alignment

In general there is a default position for labels; either aligning with the left or the right side of the margin over which the list is indented. The two ways are indicated with the option `item:`

```
item:left [...] item:stop
```

and

```
item:right [...] item:stop
```

respectively. Specifying `item:start` gives the default left aligning position.

Example 5.1

```
\DefineList:enumerate
  item:start itemCounter ) item:stop Stop
\DefineList:enumerateright
  item:right ( itemCounter ) Spaces:1 item:stop Stop
\enumerate\item Some item
\item And another
\enumerateright\item First nested item
\item Next nested item\>
\item And back to the original list.\>
```

-
- 1) Some item
 - 2) And another
 - (A) First nested item
 - (B) Next nested item
 - 3) And back to the original list.
-

5.2 List indentation

The amount over which the text of a list (excluding the item labels) is indented is controlled by a list of indentations. This is explained in section 11.4. The indentation amount is most of the time also equal to the value of the paragraph indentation outside that list.

In the rare case where the indentation of a list has to be controlled explicitly, there is an option `indentation` with one value.

```
\DefineList:SomeList indentation=30pt [...] Stop
```

5.3 *Label style*

Every list that uses the `itemsign` option is an ‘itemize’ list, no matter what it’s name, and there is a counter in Lollipop that keeps track of how deep you are in itemize lists. Similarly, every list that uses `itemcounter` is an ‘enumerate’ lists, and these are counted too.

On every next level a new style of item sign or counter is used. For item signs this is in sequence: `•`, `◦`, `–`, and `·` for all higher levels. The style of sign can be changed by `\SetItemSign:`
`\SetItemSign:6=m`

where the letter indicating the sign is interpreted as: `b` `•` (bullet), `c` `◦` (circle), `d` `◊` (diamond), `m` `—` (em-dash), `n` `-` (en-dash), `.` `·`.

Similarly, the counter style can be set by `\SetItemCounterRepresentation:`
`\SetItemCounterRepresentation:2=i`

where the letter representing the style is interpreted as: `1` Arabic, `I` uppercase roman, `i` lowercase roman, `A` uppercase characters, `a` lowercase characters.

5.4 *Label width*

The default width for a label is at most the width of the margin over which the list is indented. Using `item:left` or `item:right` will have the label pushed to the left or right side of this margin respectively. Now what if the label material is wider than this margin? Usually you want the label then to expand to the right, and that is indeed what happens, unless you specify `labeloverflow` with value `left`, in which case the right boundary of the label will not budge, and the label will start protruding into the outer margin.

5.5 *Description lists*

A common type of list is the type where each item label consists of a piece of text. Such a list is called a ‘description’ list in Lollipop, and it recognized by the occurrence of the option `description` in its definition. A description list can also use the item sign or the item counter, of course.

Using a description list, the description text is everything that follows the command `\item`, up to the end of the line.

Example 5.2

```
\DefineList:TestList
  item:left Style:bold itemCounter . Spaces:1 description
    Spaces:2 item:stop Stop
\TestList\item Do
A deer, a female deer.\item Re
According to mr. Fowler only a legal term.
\item Mimi Jett
The owner/founder of ETP\>
```

1. **Do** A deer, a female deer.
 2. **Re** According to mr. Fowler only a legal term.
 3. **Mimi Jett** The owner/founder of ETP
-

As you can see, the problem of label overflow can easily occur with description lists. Thus it is a good idea to end the item material with some white space, as in the above example.

5.6 *Suspended lists*

Occasionally there is a need to resume an enumerate list, that is, after a piece of text that is not part of the list an enumerate list should start counting from the previous value on. In Lollipop this phenomenon can be realized by never ending the enumerate list, and simply moving the text one indentation level back with `\PopIndentLevel`.

Example 5.3

```
\DefineList:enumerate item:left itemCounter item:stop Stop
\enumerate\item First some item\par
{\PopIndentLevel \Indent:no
This text seems to be outside the list. Don't you believe it.\par}
\item And another item\>
```

```
1      First some item
This text seems to be outside the list. Don't you believe it.
2      And another item
```

Note that the ‘popped’ text has to be in a group (otherwise the subsequent items will also be popped back), and it has to be separated from the preceding and following text by `\par`; the trailing `\par` has to be in the group.

5.7 *Item counter manipulation*

The item counter can be manipulated explicitly. This is necessary for instance for starting a list at another value than one. What you need to realize here is that the command `\item` starts by incrementing the counter. Furthermore, the only way to access the item counter is through the commands for counters; see section 11.1.

Example 5.4

```
\DefineList:enumerate item:left itemCounter item:stop Stop
\enumerate \SetCounter:item=-1
\item Escape: usually the backslash.
\item Begin Group.\>
```

```
0      Escape: usually the backslash.
1      Begin Group.
```

5.8 *List titles and list tails*

Lists can have titles. The title follows the command that invokes the list, in the usual manner. Material to follow the list can also be specified: anything following the option `text` is considered to be trailing material.

Example 5.5

```
\DefineList:TestList hrule line:start Style:bold title line:stop
  item:left Style:italic itemCounter item:stop
  text vwhite:3pt hrule Stop
\TestList In the last fiscal year, have you:\par
\item Eaten peanuts? \item Walked the dog?
```

```
\item Bought a Frank Zappa record?\>
```

In the last fiscal year, have you:

- 1 Eaten peanuts?
 - 2 Walked the dog?
 - 3 Bought a Frank Zappa record?
-

In case you wonder what happens with textual material after `item:stop` and before any `text`, well, that is taken to be inserted immediately after each item label.

5.9 *Between the items*

There are special list options controlling what happens in between items. Lollipop has an option `breakbetween`, analogous to `breakbefore` and `breakafter`; see section 10.5. This item by default has a value of `-50`, implying that breaks in between items should be preferred slightly over breaks in between the lines of an item.

Similarly, there is an option `whitebetween` controlling the amount of white space in between items that is analogous to `whitebefore` and `whiteafter`. Like these two options, it can also be set by the `\Distance` command (section 11.7).

5.10 *Indentation in lists*

An item can be considered to be consisting of at least one paragraph. That paragraph is never indented. For the behaviour of any next paragraph within the same item, the option `indentinside` can be used. This option has values `yes/no`. In case paragraphs inside an item indent, the indentation amount is level-controlled; see section 11.4.

Chapter 6

Text Blocks

The ‘text block’ is a way of treating a moderate sized chunk of text in a different way from the surrounding text. Text blocks are created by `\DefineTextBlock`. Here is a small example.

Example 6.1

```
\DefineTextBlock:Quote
  PushIndentLevel PointSize:9 SetFont text Stop
\Indent:no In some context it has been written that
\Quote No man is an island.\QuoteStop
In another:
\Quote Run don't walk to the nearest island.\>
Sometimes one would wish women weren't so logical.
```

In some context it has been written that

No man is an island.

In another:

Run don't walk to the nearest island.

Sometimes one would wish women weren't so logical.

Note that the text block has an explicit closing command, consisting of the name of the block followed by `Stop`, and that implicit closing by `\>` is possible.

6.1 *The text option*

Text blocks have only one specific option: `text`. This option is used to separate material heading the block from material trailing the block. Example:

Example 6.2

```
\DefineTextBlock:DisplayEq
  whitebefore:abovedisplayskip whiteafter:belowdisplayskip
  line:start white:parindent $ displaystyle text $ line:stop Stop
The formula
\DisplayEq e^{\pi i}+1=0\>
contains nature's five most interesting constants.
```

The formula

$$e^{\pi i} + 1 = 0$$

contains nature's five most interesting constants.

Here one dollar comes before the text, and one after, so the first is inserted by `\DisplayEq` and the second by the corresponding closing command.

Material before and after the text should usually not be broken. Hence `\nobreak` is automatically inserted. See the `\Example` macro for this manual: pages should not be broken after rules, or around the text ‘example xyz’.

6.2 *More examples*

A text block can encompass more than one paragraph, so the options `indentinside` and `indentfirst` are particularly useful here.

Example 6.3

```
\AlwaysIndent:no
\DefineTextBlock:TestBlock PushIndentLevel
  indentafter:yes indentfirst:no indentinside:yes
  text unskip hfill $ bullet $ par Stop
One paragraph.\par The next paragraph
\TestBlock Inside the block one paragraph.\par
Inside the block the next paragraph.\>
Outside the following paragraph.\par And the last paragraph.
```

One paragraph.

The next paragraph

 Inside the block one paragraph.

 Inside the block the next paragraph. •

 Outside the following paragraph.

And the last paragraph.

Chapter 7

Output

Every page is formatted according to a ‘page grid’ consisting of three elements:

- 1 the page head, this is everything that’s over the running text;
- 2 the page foot, this is everything that is below the running text;
- 3 the running text. \TeX acts as if text is on a long scroll, and the running text part of a page is simply a portion cut off from this scroll.

Either or both of the head and foot of the page can be empty, but usually one of the two contains a page number.

Example 7.1

```
\OptionsMacro:ManPageSize=raggedbottom:10pt topskip:12pt
height:page=5cm width:page=6cm Stop
\DefinePageGrid:TestPage macro:ManPageSize
pagerule textband:start text textband:stop
pagerule band:start PageCounter band:stop Stop
\TestPage
This page does not contain much special.\EjectPage
This page is hardly better.
```

This page does not contain much special.

This page is hardly better.

11

12

This example illustrates how you first define a page grid by `\DefinePageGrid`, and then activate it by calling its name. That last action is in fact not necessary: each definition of a page grid automatically installs that grid as the current one.

7.1 Page dimensions

Most of the time it is easiest to specify the total height of a page, that is, including head and bottom, but sometimes it is more convenient to specify the height of the text, and let the head and foot simply go over and under that.

In the first case you can give the command `\Height` with two parameters:

```
\Height:Page=23.5cm
```

or inside a page grid definition the option `height:page=...`

In the second case you can give the command

```
\Height:Text=19.55cm
```

7 Output

or inside a page grid definition the option `height:text=...`

In page grid definitions there is the additional option `height:lines=23`.

The `\Height` command cannot be used in a page grid definition.

7.2 Positioning the page on the paper

If your printer driver is up to specs (and you have not done any creative macro writing) it should have the upper left corner of the text landing at 2.54cm from the top and left side of the paper.

If the result is not to your liking, you can shift the page by

```
\Distance:hoffset= ...
```

```
\Distance:voffset= ...
```

These offset parameters are zero ordinarily, and they indicate the extra shift added to the customary 2.54cm in horizontal and vertical direction.

7.3 Page head, foot, text

Somewhere in the page grid the option `text` has to appear. This option has to be inside a `textband`:

```
textband:start text textband:stop
```

This is not a case of overspecification, because inside a `textband` the `text` option can appear more than once. In this manner a multicolumn page grid can be specified.

Example 7.2

```
\DefinePageGrid:TestPage macro:ManPageSize
  pagerule textband:start text hwhite:10pt text textband:stop
  pagerule band:start PageCounter band:stop Stop
\FlushRight:no \sometext
```

Just a bit of words, words.	words, words. Just a bit of words, words.	Just a bit of words, words.
Just a bit of words, words.	Just a bit of words, words.	
Just a bit of words, words.	Just a bit of words, words.	
Just a bit of words, words.	Just a bit of words, words.	
Just a bit of words, words.	Just a bit of words, words.	
Just a bit of words, words.	Just a bit of words, words.	
Just a bit of words, words.	Just a bit of words, words.	
Just a bit of words, words.	Just a bit of words, words.	

12

13

Next to the option `textband` there is `band`. Both are ways of creating a page wide band. The option `band` is used for all material that is not a text column, for instance footers, as in the above examples.

The option `band` can have one unusual parameter: `invisible`. This makes the band act as if it has zero height or width, depending on whether it is below or above the text, respectively.

Example 7.3

```
\DefinePageGrid:TestPage macro:ManPageSize
  pagerule textband:start text hwhite:10pt text textband:stop
  pagerule
  band:invisible block:start Style:bold PageCounter Spaces:2
```

12

```
stickout:left band:stop Stop
\FlushRight:no \sometext
```

Just a bit of words, words.
 words, words. Just a bit of
 Just a bit of words, words.
 words, words. Just a bit of
 Just a bit of words, words.
 words, words. Just a bit of
 Just a bit of words, words.
 words, words. Just a bit of
 Just a bit of words, words.
 words, words. Just a bit of
 Just a bit of words, words.

Just a bit of
 words, words.

13

14

7.3.1 More about text bands

The text band is that part of the page that has the text in it. You can also put other material in it, such as rules or white space.

Example 7.4

```
\DefinePageGrid:TestPage macro:ManPageSize pagerule
textband:start vrule white:3pt text white:3pt vrule textband:stop
pagerule band:start white:fillup PageCounter band:stop Stop
\TestPage This page contains some text, a bit more text,
and even more than that. In all still just a few lines.\EjectPage
This page contains more text, still more text, and still more.
```

This page contains some text, a bit more text, and even more than that. In all still just a few lines.

This page contains more text, still more text, and still more.

13

14

In the previous example the width of the page was specified. If we only give the width of the text, the page width is calculated dynamically.

Example 7.5

```
\DefinePageGrid:TestPage macro:ManPageSize
textband:start vrule white:3pt text white:3pt vrule textband:stop
pagerule band:start white:fillup PageCounter band:stop Stop
\noindent This page contains some text, a bit more text,
and even more than that. In all still just a few lines.\EjectPage
This page contains more text, still more text, and still more.
```

7 Output

This page contains some text, a bit more text, and even more than that. In all still just a few lines.

13

This page contains more text, still more text, and still more.

14

Note how the `pagerule` and `band` objects stretch with the page.

7.3.2 *Topskip*

In between the page head and the text is some white space, the `topskip`, with special properties. The `topskip` is defined from the bottom of the head to the bottom of the first line of the text. If the height of this first line varies from page to page the `topskip` acts as a buffer, keeping the bottom-to-bottom distance constant.

`Topskip` is set by the option `topskip`, for example

```
topskip:25pt
```

but if this option is left out, the page grid uses the value of `\topskip` that was current at the time of the definition. Unfortunately there is no way to change this value after the definition.

7.4 *The page number*

The page number behaves as if it had been defined by

```
\NewCounter:Page
```

```
\CounterRepresentation:Page=1
```

Thus you can use any command from section 11.1 on it. For instance, you can have page numbers in roman numerals by specifying

```
\CounterRepresentation:Page=I
```

The page number is typically used as the option `PageCounter`, but for some applications the corresponding command `\PageCounter` can be used.

If you process a Lollipop document you see that everytime a page is generated, an item such as `[8,7]` is written on the log file or the screen. Most of the time the two numbers will be the same, as in `[8,8]`, but they will differ if you have tinkered with the page number. The first number is the ‘sheet counter’: it counts how many pages you have produced so far. The second number is the value of `\PageCounter` for the page that was written out. Take a look at the log file for this manual for an example.

7.5 *Page tests*

The page grid definition can set/query several properties of the page. The following tests have been provided (see section 11.9 for tests):

```
\DefineTest:IsRightPage
```

```
\DefineTest:IsLeftPage
```

```
\DefineTest:FirstPage
```

```
\DefineTest>LastPage
```

```
14 \DefineTest:FlushBottom
```

- The tests for left/right pages are done by testing whether the page number of odd or even.
- The first/last page tests can be used either for the whole document, or for a file that's loaded as an `\InputFile`.
- The first page test doesn't work at present.

Example 7.6

```
\DefinePageGrid:TestPage macro:ManPageSize
  pagerule textband:start text textband:stop pagerule
  band:start ifIsLeftPage else hwhite:fillup fi PageCounter
  band:stop Stop \SetCounter:Page=12
This is a left hand page. \EjectPage
This page is on the right side of a spread.
```

This is a left hand page.

This page is on the right side
of a spread.

12

13

7.6 *Running heads / footers*

Above it was explained how pages can be given a head and foot part. Quite often you want changing information in such parts, for instance the head of a left page often contains the number or title of section that was current when that page started; the head of a right page often contains the number or title of the section that was current when that page ended.

In Lollipop all constructs that have a title or a counter can have that information referenced in page grids.

`\FirstPlaced:SectionTitle` Take the title of the first section that started on this page, or the last one that started before this page if no section started on this page.

`\LastPlaced:SubSectionCounter` Take the title of the last subsection that started on this page, or the last one that started before this page if no subsection started on this page.

`\PreviousPlaced:SectionCounter` Take the counter value of the last section that started before this page.

Example 7.7

```
\DefinePageGrid:TestPage macro:ManPageSize
  pagerule textband:start text textband:stop pagerule
  band:start Style:italic FirstPlaced:HeadTitle
  white:fillup PageCounter band:stop Stop
\DefineHeading:TestHeading Style:bold
  line:start TestHeadingCounter Spaces:2 title line:stop Stop
\TestHeading A first section\par And some text.\EjectPage
```

7 Output

This page contains text. \TestHeading A second Section\par
And more text.

1 A first section

And some text.

This page contains text.

2 A second Section

And more text.

16

17

The commands \FirstPlaced and \PreviousPlaced are typically used on left pages; \LastPlaced is more common on right pages. You can test on what sort of page you are; see section 7.5.

Example 7.8

```
\DefinePageGrid:TestPage macro:ManPageSize
  pagerule textband:start text textband:stop pagerule
  band:start Style:italic
    ifIsLeftPage FirstPlaced:HeadTitle white:fillup fi
    PageCounter
    ifIsRightPage white:fillup LastPlaced:HeadTitle fi
  band:stop Stop \SetCounter:Page=10
\DefineHeading:TestHeading Style:bold
  line:start TestHeadingCounter Spaces:2 title line:stop Stop
\TestHeading A first section\par And some text.
\TestHeading Second section\par More text.\EjectPage
\TestHeading Third section\par Is on the right page.
\TestHeading Fourth section\par Concludes this page.
```

1 A first section

And some text.

2 Second section

More text.

3 Third section

Is on the right page.

4 Fourth section

Concludes this page.

10

11

7.7 *Alternating page grids*

16 In Lollipop it is very easy to switch page grids with the option `NextPageGrid`: you simply specify

`NextPageGrid:otherpage`

as one of the options in the definition. If no next grid is indicated, the same page grid keeps being used continuously until another page grid is activated explicitly.

Example 7.9

```
\DefinePageGrid:LTestPage macro:ManPageSize
  pagerule textband:start text textband:stop pagerule
  band:start Style:italic
    PageCounter white:fillup FirstPlaced:HeadTitle
    band:stop NextPageGrid:RTestPage Stop
\DefinePageGrid:RTestPage macro:ManPageSize
  pagerule textband:start text textband:stop pagerule
  band:start Style:italic
    LastPlaced:HeadTitle white:fillup PageCounter
    band:stop NextPageGrid:LTestPage Stop
\SetCounter:Page=42
\DefineHeading:TestHeading Style:bold
  line:start TestHeadingCounter Spaces:2 title line:stop Stop
\LTestPage
\TestHeading A first section\par And some text.
\TestHeading Second section\par More text.\EjectPage
\TestHeading Third section\par Is on the right page.
\TestHeading Fourth section\par Concludes this page.
```

1 A first section

And some text.

2 Second section

More text.

3 Third section

Is on the right page.

4 Fourth section

Concludes this page.

42

43

Another very useful application of this mechanism is to have a special definition for the opening page of a chapter. This manual uses a one-shot page grid `\EmptyPage` to remove the header and footer on the title page. It installs `\LeftPage` as the next grid.

7.8 Additional User Control

7.8.1 Elementary manipulation

There are a few commands for simple page manipulation:

`\EjectPage` The current page is filled up with white space, and a new page is started.

`\ToRecto` As `\EjectPage` but if the next page is a left page (meaning that the page number is even) then the page number is increased by one, so that the next page is a right hand page.

7 Output

`\ToVerso` As `\ToRecto`, except that the next page is a left page.

Additionally, `\NoPages` lets all formatting and updating of values be performed, but no pages are written to the dvi file; `\PagesOut` reverts the effect of previous command. Note that `\NoPages` does not incur any savings in time: full processing of the document is performed.

When a page is finished it rests in box `\WholePage`. Then a call is made to `\CurrentShipout`, which is by default `\shipout\box\WholePage`. However, you are free to define it otherwise. If your `\CurrentShipout` does not actually ship out pages, you may want to set `\CountSheetsno` to prevent the effective page counter from being updated.

Redefining `\CurrentShipout` usually goes together with `\SuspendOutput` and `\ResumeOutput`. These commands temporarily save the page number and the current state of the page, including the current definition of `\CurrentOutput`. (This is necessary because a number of parameters concerned are changed by global assignments.) See the definition of `\OutputExample` in the appendix of this manual for an elaborate example.

If you want to see the output routines in action, specify

`\Trace:out`

In addition

`\Trace:mark`

tells you what information is being saved for running head and foot lines.

Chapter 8

Referencing

In manuals and scientific documents you often want to write something like ‘see Chapter 4’. But what if you shuffle the chapters a bit? It would be nice if the number would be updated automatically. With Lollipop, as with many other \TeX macro packages, this is easily done.

Here is an example to set the mood for the rest of this chapter. The sort of thing that is referred to most is a heading. So suppose you want to refer to a section number.

Example 8.1

```
\DefineHeading:TestSection
  line:start Style:italic TestSectionCounter Spaces:2 title
  line:stop Stop
\TestSection[one:section?] First section\par
After this section will come section~\ref[other:section!].

\TestSection[other:section!] Another section\par
This is the section that came after section~\ref[one:section?].
```

1 First section

After this section will come section 2.

2 Another section

This is the section that came after section 1.

8.1 *What and how do you reference?*

You can reference not only headings but everything that has a counter. Thus all generic constructs can be referenced, and in addition you can reference item numbers in a list (there are examples of this latter possibility in section 8.4). The simplest way of referencing something is to put the key in square brackets behind it:

```
\Section[this:section] The title of This Section
```

You can then reference the key by `\ref`, or the page where it appeared by `\pgref`:

```
Section \ref[this:section] on page \pgref[this:section]
```

As you may have guessed from the above examples, keys can contain all sorts of characters. Only brackets, braces, and the hash sign are excepted. You get an error message if you try to use the same key twice.

Another way of declaring a key is to use the command `\label` carrying the key

```
\label[the:key]
```

This can be useful if you want to declare two keys for a single reference. Make sure that the `\label` command is not part of the title. Unexplained phenomena occur if you do that. Instead put the label after the construct you want to reference:

```
\Section Precautions and remedies
```

```
\label[sec:precautions]\label[sec:remedies]
```

In this section ...

8.2 *The shape of the reference*

By default, a reference consists of just the number of the thing you reference. There are two ways in which you can change this, one systematic, and one on-the-fly.

8.2.1 *Defining the shape of the reference*

You can customize the way an object is referenced by using the option `label` in its definition. For instance, often you want things like parentheses around references. Putting this information in the label definition saves you a lot of work in case you change your mind later.

Example 8.2

```
\DefineHeading:TestSection
  line:start Style:italic TestSectionCounter Spaces:2 title line:stop
  label:start ( TestSectionCounter ) label:stop Stop
\TestSection[one:section?2] First section\par
After this section will come section~\ref[other:section!2].

\TestSection[other:section!2] Another section\par
This is the section that came after section~\ref[one:section?2].
```

1 *First section*

After this section will come section (2).

2 *Another section*

This is the section that came after section (1).

Another use of customized labels is including other counters in the reference:

Example 8.3

```
\DefineHeading:TestChapter
  line:start Style:bold TestChapterCounter / title line:stop Stop
\DefineHeading:TestSection
  line:start Style:italic TestSectionCounter Spaces:2 title line:stop
  label:start TestChapterCounter .
          TestSectionCounter label:stop Stop
\TestChapter First chapter\par
Pretty short chapter
\TestChapter Second chapter\par
\TestSection[one:section?3] First section\par
After this section will come section~\ref[other:section!3].

\TestSection[other:section!3] Another section\par
This is the section that came after section~\ref[one:section?3].
```

1/**First chapter**

Pretty short chapter

2/**Second chapter**

1 *First section*

20 After this section will come section 2.2.

2 *Another section*

This is the section that came after section 2.1.

A more surprising application of explicit definition of labels is inclusion of the title in the reference.

Example 8.4

```
\DefineHeading:TestSection
  line:start Style:italic TestSectionCounter Spaces:2 title line:stop
  label:start TestSectionCounter literal: Spaces:1
           Style:italic title label:stop Stop
\TestSection[one:section?4] First section\par
After this section will come section~\ref[other:section!4].

\TestSection[other:section!4] Another section\par
This is the section that came after section~\ref[one:section?4].
```

1 *First section*

After this section will come section 2 *Another section*.

2 *Another section*

This is the section that came after section 1 *First section*.

8.2.2 *Explicit specification of the reference*

For every specific object referenced you can specify the reference by using an optional argument before the label key. Have a look at the next example.

Example 8.5

```
\DefineHeading:TestSection counter:A
  line:start Style:bold TestSectionCounter . Spaces:2 title line:stop
  Stop
\TestSection[ref:one] Lalala\par
This is before section \ref[ref:two].
\TestSection<'the Didi section'>[ref:two] Dididi\par
This is after section \ref[ref:one].
```

A. **Lalala**

This is before section ‘the Didi section’.

B. **Dididi**

This is after section A.

This mechanism is also used in lists, where it’s mostly useful for bibliographies generated by BibT_EX; see section 8.4.2.

8.3 *Local references*

Some documents are collated out of parts that were documents in themselves. The Lollipop command `\InputFile` facilitates in a number of ways working with such a segmented file (see section 11.8). One of the problems with input files is that in such a case it may happen that the

same reference key is used in more than one part of the document. This phenomenon is not at all unknown in multiple authored documents. Ordinarily this would result in incorrect references.

To prevent such collisions Lollipop can use local references: the command `\LocalReferences` has default `no`, and specifying `LocalReferences:yes` creates local `aux` files for each input file.

8.4 Bibliography citations

Lollipop has an interface to Bib_{TEX}. However, since a bibliography is just a list, referencing items in it is quite easy, even if you don't use Bib_{TEX}.

8.4.1 Bibliographies without Bib_{TEX}

This section doesn't tell you anything that cannot be found elsewhere in this manual. The following two examples define a bibliography as just a list, and by giving labels to the items you can refer to them.

Example 8.6

```
\DefineList:BibList item:left [ itemCounter ] item:stop
  label:start [ itemCounter ] label:stop Stop
In this example we shall have occasion to refer to
\ref[Abee80] and~\ref[Ceede79].\par
\Indent:no Bibliography
\BibList \item[Ace55] C.D. Ace, Inscrutable title.
\item[Abee80] E.F. Abee, Worthless drivell.
\item[Ceede79] G.H. Ceede, Contractual obligation.
\>
```

In this example we shall have occasion to refer to [2] and [3].
Bibliography

- [1] C.D. Ace, Inscrutable title.
 - [2] E.F. Abee, Worthless drivell.
 - [3] G.H. Ceede, Contractual obligation.
-

Here is a way to customize the label (if you need to refresh your memory about description lists, see section 5.5).

Example 8.7

```
\DefineList:BibList item:left [ itemCounter ] item:stop
  label:start ( description ) label:stop Stop
In this example we shall have occasion to refer to
\ref[Abe80] and~\ref[Ceedee79].\par
\Indent:no Bibliography
\BibList \item[Aace55] Aace55
C.D. Aace, Inscrutable title.
\item[Abe80] Abe80
E.F. Abe, Worthless drivell.
\item[Ceedee79] Ceedee79
G.H. Ceedee, Contractual obligation.
\>
```

In this example we shall have occasion to refer to (Abe80) and (Ceedee79).
Bibliography

- [1] C.D. Aace, Inscrutable title.
- [2] E.F. Abe, Worthless drivell.
- [3] G.H. Ceedee, Contractual obligation.

8.4.2 Bibliographies with BibTeX

Lollipop has an interface to the popular BibTeX bibliography database program, based on the ‘BtxMac’ macros by Karl Berry and Oren Patashnik. Lollipop is set up for them, you only have to `\input` the file `btxmac.tex`. (The version of `btxmac` used to test this is 0.99h.) You can find global information about BibTeX in the L^AT_EX book [5], since BibTeX was originally written for L^AT_EX.

Since there is some redefining going on between `btxmac` and Lollipop you have to load the `btxmac` file before the `\Start` command (see section 3.1).

Since the `btxmac` file already has a default way of formatting the bibliography you can get away with just putting the lines

```
\bibliography{ <bfile> }
\bibliographystyle{ <bstyle> }
```

in your file wherever you want the bibliography.

If you want to define your own bibliography, you have to use `\DefineBBL` which is practically a synonym for `\DefineList:BBL`, so you can see in the ‘lists’ chapter of this manual what options apply.

For example:

```
\DefineBBL line:start Style:italic literal:Literature line:stop
  item:left [ begingroup Style:bold itemCounter
             endgroup ] item:stop
```

Stop

You refer to a bibliography item by `\bibref`, as in `\bibref[Knuth80]`. This command has a very simple definition

```
\def\bibref[#1]{[\ref[#1]]\nocite{#1}}
```

so you can easily redefine it. For instance

```
\def\supref[#1]{${\rm \ref[#1]}\$}\nocite{#1}}
```

will make your references into superscripts. Make sure that the call to `\nocite` appears, because that generates the request for BibTeX.

The Lollipop command `\WriteExtern:no` (see section 9.1) defines `\noauxfile` to prevent regeneration of the bib entries in the `.aux` file. You don’t have to do that anymore.

8.5 Obscure details

For the sake of efficiency, not all macros in Lollipop automatically accept labels for referencing, only the ones that use the `label` option, or that have a counter (remember, the default form of the reference is just the counter). If you want a macro that has no counter and no label specification to accept a label, use the option `haslabel`. One reason for doing this is that you have access to the label itself through the control sequence `\RefLabel`.

Chapter 9

External Files

Some documents require information to be collected during a run. Such information typically is a table of contents or index, and it is gathered in an external file. (The reason for gathering such information in a file at all is that often some external manipulation, for instance sorting of an index, is needed.) Since there are many possibilities for external files (mathematical monographs may have a list of definitions, or a list of notations) Lollipop does not predefine such files, but supplies all of the tools for creating them.

External files involve four actions:

- 1 The file should be declared.
- 2 It should be specified what information is to be written to the file.
- 3 The formatting of the contents of the file has to be specified.
- 4 The file has to be loaded.

You can have at most 15 external files per document.

9.1 *Declaring and loading an external file*

The first act, declaring the existence of the external file is very easy with the command `\DefineExternalFile`: an internal name and a three-character file name extension have to be given as parameters.

```
\DefineExternalFile:contents=toc
```

With this definition, if the document is called `book.tex` then the ‘contents’ will be gathered in a file called `book.toc`. (The declaration of an external file has to come before any calls to `\ExternalItem` or any options `external` that write to this file.)

For each external file `Foo` there is a command to determine whether that file will be regenerated in the next run of `TEX`: `\WriteFoo` with values `yes/no` will allow or prevent the file being regenerated. The value `yes` is default. The command `\WriteExtern` (values `yes/no`) can be used to prevent writing out any external files (including the `.aux` file that keeps track of references).

The final act, loading an external file, is as easy as declaring it: use

```
\LoadExternalFile as in
\LoadExternalFile:contents
```

This does not cause any page breaks or headings to be set over the loaded material, so you have to do that explicitly.

9.2 *Generating external files*

Next, macros that write to the table of contents have to declare this information. The `external` option is used for this. Any counter that the construct has will be written out automatically, and the style designer usually has to specify only that the title will be written out.

```
\DefineHeading:Section
[...]
external:contents title external:stop
```

There is no objection to a construct writing information to more than one external file.

- If you write more than just `title` to an external file, know that any control sequence
- 24 you specify is automatically protected from expansion. See section ?? for an exception to this.

Other titles can be included by specifying `title:OtherThing`. Using `OtherThingTitle` would not work, because of the protection of control sequences mentioned above.

You can write arbitrary information to an external file, if you see a reason to do so, by `\ToExternalFile`, which takes a file name and an text argument. The example below has an instance of this command. In order to format this information you have to define an external construct of type `\anon`.

9.3 *Formatting an external file*

The hardest part is declaring the formatting of an external file. For this a separate generic construct exists: the ‘external item’ with defining command `\DefineExternalItem`. For example, if `\Section` writes to `contents`, than an external item `Section` corresponding to this file has to be declared. The option `file` is use to declare to which file the external item belongs. This way the same name can be reused for more than one file.

```
\DefineExternalItem:Section file:contents
[...] Stop
```

An external item is basically a list with just one item. Thus, the option `item` is available. The elements of an external item are the label (the counter value), the page number where the information was generated, and the title. For the label (say for a construct `\Foo`) an option `FooLabel` is created. Thus the typical formating looks like

```
\DefineExternalItem:Chapter file:contents
  item:left ChapterLabel item:stop
  title begingroup Spaces:2 Style:italic Page endgroup
Stop
```

In fact, a control sequence `\FooLabel` is created, which can be used in other external items.

Since an external item is a list in itself, you have to pull a certain trick to get items for subsections to indent further than those for sections. This is what the command `\PushIndentLevel` was designed for.

A typical indented item looks like:

```
\DefineExternalItem:SubSection file:contents
  PushIndentLevel PushIndentLevel
  item:left SectionLabel . SubSectionLabel item:stop
  title begingroup Spaces:2 Style:italic Page endgroup
Stop
```

9.4 *Example*

The following example is for a typical table of contents that records sections and subsections. In good old-fashioned style, the subsections are indented with respect to the sections.

Chapter 10

Options

This chapter discusses the various options that are common to all Lollipop constructs.

10.1 *Titles*

Any construct can have a title, although of course it is most useful for headings. A construct has a title if the option `title` appears. Example:

```
\DefineHeading:Section [...]
  Style:bold title
  [...] Stop
```

will define a `\Section` macro that has a title. The macro is then used as

```
\Section The title of this section
```

Some text in this section.

that is, the title is delimited by an empty line.

The title is actually available as a macro `\FooTitle`, so that you can write a macro, for instance

```
\def\ComplicatedTitle{ .. \hrule ...
  \vrule ... \vbox \bgroup ...
  \FooTitle ...
}
```

and use this macro instead of the `title` option

```
\DefineBar:Foo ...
  ComplicatedTitle
  ... Stop
```

However, since the option `title` now doesn't appear anymore, it becomes necessary to specify explicitly that there is a title. This can be done with the `HasTitle` option. For instance, you define

```
\DefineBar:Foo ...
  HasTitle
  ComplicatedTitle
  ... Stop
```

where `\ComplicatedTitle` is a macro that formats the title.

10.1.1 *Short titles*

The option `HasTitle` can have a parameter `short`, denoting that the title is not delimited by an empty line (or `\par`) but by the line end. For an example see section 13.2.

10.2 *Counters*

There are three ways for Lollipop to figure out that a generic construct has a counter. First of all, in

```
\DefineFoo:Bar [...]
  BarCounter [...]
```

26 the `\BarCounter` will be defined automatically.

Additionally there is the option `counter`, which can be used to declare the representation of the option, for instance `counter:i` allocated a counter that is printed in lowercase roman numerals. For the available representations, see 11.1.1.

Finally, if the counter is only used in a macro, the option `HasCounter` will cause the counter to be created anyhow. This is analogous to the `HasTitle` option.

10.2.1 Counter synonyms

Every once in a while you may want different constructs to use the same counter. For instance, if your book has definitions, theorems, lemmas, corollaries and notations, it may confuse the reader if they all have their own counter. The numbering would seem to jump all over the place.

A ‘counter synonym’ can be declared in Lollipop by a slight abuse of the `counter` option.

Example 10.1

```
\DefineTextBlock:Theorem counter:1 begingroup Style:bold
  literal:Theorem Spaces:1 TheoremCounter Spaces:2 endgroup
  text Stop
\DefineTextBlock:Corollary counter:Theorem begingroup Style:italic
  literal:Corollary Spaces:1 CorollaryCounter Spaces:2 endgroup
  text Stop
\DefineTextBlock:Definition counter:Theorem begingroup Style:roman
  literal:Definition Spaces:1 DefinitionCounter Spaces:2 endgroup
  text Stop
\Definition We define a {\it Foo} to be an arbitrary object\>
\Theorem Foos have arbitrary properties\>
\Corollary Foos are extremely valuable\>
\Corollary Foos are extremely worthless\>
\Theorem Foos don't exist\>
```

Definition 1 We define a *Foo* to be an arbitrary object

Theorem 2 Foos have arbitrary properties

Corollary 3 Foos are extremely valuable

Corollary 4 Foos are extremely worthless

Theorem 5 Foos don't exist

You can only declare a counter to be synonym for something that has already been created. In the above example you cannot define the `\Theorem` after the `\Corollary`.

10.3 Chunks of text

Especially in headings, short chunks of text may need a special treatment. For instance, the number may have to be filled to a certain width, or a line may have to be drawn of the exact length of the title. Lollipop have various general options (so they can also be used in other contexts than headings) for handling pieces of text.

10.3.1 The `block` option

The `block` option takes up a piece of text and fits it on one line. It can measure the text, or set the size. Also there are a number of ways of placing a block.

Basic usage:

```
block:start [...] block:stop
```

This takes the enclosed text, and reproduces it. This is mostly interesting in combination with `textcolumn`, see 10.3.4.

```
block:hang [...] block:stop
```

The resulting block is dropped until its top touches the baseline. For uniformity of appearance, the resulting width of the block can be specified:

```
block:start [...] fillupto:20pt
```

The name of a `\Distance` parameter can be used here.

Example 10.2

```
\DefineHeading:TestHeading
line:start block:hang PointSize:8 SetFont
      TestHeadingCounter fillupto:20pt
      block:hang PointSize:14 SetFont title block:stop
line:stop Stop
\TestHeading Top Aligning the Title
```

¹ Top Aligning the Title

The block is usually in between the margins of the text, but it can be made to stick out into the margin, by closing it with the option `stickout`. For the left margin this done as

```
block:start [...] stickout:left
```

and for the right margin

```
block:start [...] stickout:right
```

The size of the box can be specified, for instance as

```
block:start [...] stickout:left=20pt
```

For a left box the material in it is pushed to the left edge, for a right sticking box it is shifted to the right.

10.3.2 Block Measuring

All blocks are immediately measured when they are placed. This makes it possible for instance to underline a title exactly. After a block has been placed, its width is available as `\BlockWidth`.

Example 10.3

```
\def\rulespecs{height 1pt width \BlockWidth\relax}
\DefineHeading:TestHeading Style:bold
line:start block:start TestHeadingCounter . Spaces:2 stickout:left
      block:start title block:stop line:stop
vwhite:2pt hrule rulespecs vwhite:10pt Stop
\TestHeading The Title Is Underlined
```

The text follows.

1. The Title Is Underlined

The text follows.

Observe how a control sequence `\rulespecs` is used to sneak the height and width of the rule into the definition. This is necessary because control sequences are not allowed in a construct definition.

 Example 10.7

```
\DefineHeading:TestHeading
  block:start TestHeadingCounter Spaces:2 block:stop
  title Stop
\TestHeading Where does the title go?
```

```
1
Where does the title go?
```

10.4 Labels

References to any counter will always be correct, no matter if that counter has changed after retypesetting the document, if symbolic references are used. Referencing is explained in detail in chapter 8.

The way a symbolic reference is formatted can be altered from the default (just give the counter) by using the `label` option.

```
\DefineHeading:TestSection
  line:start Style:italic TestSectionCounter Spaces:2 title line:stop
  label:start ( TestSectionCounter ) label:stop Stop
```

See further section 8.2.

10.5 Break before / after

The options `breakbefore` and `breakafter` control how eager \TeX will be to break the page before or after a construct. These options take one value, a so-called ‘penalty’ value, meaning that the higher the value you specify, the higher the penalty is, and therefore the less likely it is that the page will be broken there.

Numerical values are typically in the tens or hundreds; any value of 10 000 or more means that there will never be a break at that point; a value of -10 000 or less means a guaranteed break. If you don’t want to remember these rules, values of `yes` and `no` mean a guaranteed break, and no break respectively.

A further exceptional value is `breakbefore/after:0`, this will cause no penalty to be placed. The reason for this is highly \TeX nical.

10.6 Indentation

The option `indentafter` controls the behaviour of the first paragraph after a generic construct., `indentinside`, `indentfirst`.

10.7 Rules

There is an option `hrule`. You should not write

```
\def\rulemacro{\hrule height [...] }
\DefineHeading [...] rulemacro [...] Stop
```

because then Lollipop cannot prevent page breaks around the rule. Instead write

```
30 \def\rulespecs{ height [...] }
```

`\DefineHeading [...] hrule rulespecs [...] Stop`
 so that the option `hrule` is used. See section 10.3.2 for an example.

10.8 *Embedded constructs*

Most generic constructs will be vertically separated from the surrounding text. However, in rare cases (and for unusual applications) it be desired to have a construct that is part of a paragraph. For this the option `embedded` exists.

This option has the following values.

`embedded:no`

This is the default.

`embedded:left`

The construct continues an already started paragraph, but after the construct a vertical break follows.

`embedded:right`

After the construct a paragraph can continue, but the construct is separated vertically from preceding text.

`embedded:yes`

The construct is both left and right embedded.

Embedding a construct has an interesting application to generating indexes. (See chapter 9 for general information about external files.) This can be done by having embedded headings that write their title to the index file.

Example 10.8

```
\DefineExternalFile:tIndex=tix
\DefineHeading:NewWord embedded:yes
  block:start Style:bold title block:stop
  external:tIndex title external:stop Stop
\def\introword#1{\NewWord #1\par}
In this sentence two \introword{flubrious} words are
\introword{stinselsed}.
```

In this sentence two **flubrious** words are **stinselsed**.

Cute, ain't it?

A word of warning though. Headings and such generate T_EX ‘marks’ which take up main memory. You only need these if you are going to be referring to that object with `\LastPlaced` or such; see section 7.6. Embedded headings used as above usually don't need these marks, so you can prevent T_EX overflow by putting the option `nomarks` in their definition.

10.9 *Obscure options*

10.9.1 *Arguments*

In case you want to interface to other macro packages, you may want to let a construct generate a call to the other package. For this, the Lollipop macro should be able to produce sequences such as `\begin{itemize}`. The problem here is the braces. The option `\arg` produces a braced expression.

For instance

```
\DefineTextBlock:LaTeXlist begin arg:{itemize} text
  end arg:{itemize} Stop
```

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makes it possible to use call L^AT_EX macros from Lollipop.

10.9.2 *Implicit closing*

The control sequence `\>` closes the current group, and `\>]` closes all currently open groups. Every once in a while this is too drastic. Hence there is an option `noimplicitclose` that can be used to prevent a construct from being closed implicitly. Using `\>]` inside such a construct will close all enclosed constructs.

See the definition of `\EExample` in this manual for an example.

10.10 *Testing*

There is an option `test`.

Chapter 11

Commands

11.1 Counters

Counters can be declared explicitly by the user, but more often they are defined automatically in some generic construct:

The `\Foo` defined by

```
\DefineBar:Foo ...
  counter:i ...
  Stop
```

will have a counter that counts in roman lowercase, and which is accessible as `\FooCounter`. Everytime `\Foo` is used, this counter is increased by one.

The use of the `counter` option is described in 10.2. Here are the commands for explicit manipulation of counters.

11.1.1 Allocation and representation

A counter is created by for instance

```
\NewCounter:Things
```

This will create control sequence `\ThingsCounter` that will print the value of the counter. The counter will usually be printed as an Arabic numeral, but other counter representations can be specified by `\CounterRepresentation`. Here are their codes:

1	numeric
a	lowercase character
A	uppercase character
i	lowercase roman
I	lowercase roman

for instance

```
\CounterRepresentation:Things=i
```

will cause `\ThingsCounter` to print a lowercase Roman numeral.

However, a call such as

```
\CounterRepresentation:Theorem=Lemma
```

will make the `\TheoremCounter` a synonym of an earlier created `\LemmaCounter`

11.1.2 Counter manipulation

The following commands can be used to manipulate counters, both when they are created by hand using `\NewCounter` and when they were generated automatically in some generic construct:

With `\StartCounter` reset the counter to one:

```
\StartCounter:things
```

With `\StepCounter` increase the counter by one:

```
\StepCounter:things
```

With `\BackStepCounter` decrease the counter by one:

```
\BackStepCounter:things
```

With `\SetCounter` set the counter to some specified value:

```
\SetCounter:things=5
```

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With `\AddToCounter` increase the counter by some specified value:

```
\AddToCounter:things=7
```

The last two commands accept names of numerical parameters, for instance the value of a counter:

```
\NewCounter:Favourite  
\AddToCounter:things=FavouriteValue
```

More about this ‘value’ thing in the next section.

11.1.3 What do you get when you define a counter?

After you define a counter as

```
\NewCounter:MyThings
```

there are two commands that it is important to distinguish between. First of all, `\MyThingsCounter` gives the *printed* value of the counter. This is the command that you will use mostly. It uses whatever representation you have specified for the counter, or plain Arabic numerals if haven’t specified anything.

Secondly, `\MyThingsValue` gives the value of the counter. You can not use this command on its own: you will get a ‘number expected’ error.

11.1.4 Counter hierarchies

Often counters are related to each other. For instance, when a new section begins, the subsection counter has to be reset. The same may be true for equation counters. In Lollipop such a relation is indicated by a call to `\GoverningCounter`, for instance

```
\GoverningCounter:SubSection=Section
```

All of the counter manipulation commands applied to a governing counter will cause all governed counters to be reset. Such a reset also occurs if the counter was created in some generic construct.

For examples, see section 4.1.

11.1.5 Referencing counters

All counters that are declared as part of a generic construct, or explicitly through

```
\NewCounter
```

 automatically become the current reference when they are altered. Thus `\label[bar]` will make `\ref[bar]` refer to the value of the counter most recently changed.

The way the counter is referenced can be altered by the `label` option in generic constructs; see section 10.4.

For generic constructs with a counter no explicit `\label` commands need to be given; such commands take an optional argument with the label key:

```
\Section[sec:examples] Examples
```

11.1.6 Adaptive counters

It may happen that you want to compute a value during one run of `TEX`, and use it in the next. An example is the fact that this manual states the total number of pages on the title page. For this you can use `\AdaptiveCounter`

```
\AdaptiveCounter>LastPage
```

which is like `\NewCounter`, except that the value of this counter gets written to the `.aux` file.

There are two ways of setting an adaptive counter: you can simply use it in some construct (for instance through a counter synonym; section `ref[sec:counter:repr]`), or you can set it explicitly, for instance as

```
\SetCounter>LastPage=PageValue
```

11.1.7 Examples of counter usage

Items start at the value of one, so if a starting value of zero is necessary, the following will work

```
\Enumerate \SetCounter:item=-1
\item ...
```

11.2 Font selection

In Lollipop, choosing a font is done through three parameters:

Typeface A collection of related styles and sizes. The typeface is set by the command `\Typeface`.

Style Italic, bold, roman, typewriter. You know. The style is set by the command `\Style`.

PointSize The size of a font in typographical points (72.27 per inch). The pointsize is set by the command `\PointSize`.

The most common change of font is a change in style. Therefore, issuing a command such as `\Style:bold`

immediately changes the font to the bold of the current typeface in the current pointsize.

However, issuing a command such as

```
\Typeface:GoudyOldStyle
```

or

```
\PointSize:28
```

will not change the font, since such changes are usually accompanied by a change in style. In case that an immediate switch is necessary, the command `\SetFont` can be given. This evaluates the current value of the typeface, style, and pointsize commands, and sets the font accordingly.

A number of typeface names have been predefined in Lollipop, however, in order to print them your printer (software) must have them available.

Example 11.1

```
\SerifFace \PointSize:12
\Style:roman This \Style:italic sentence \PointSize:10 has
\SetFont way \SansFace \Style:roman too \SetFont many
\PointSize:12 \SetFont font \Style:bold changes.
```

This *sentence has way* too many font **changes**.

(The commands `\SerifFace` and `\SansFace` are defined in the master file of this manual, and serve to make this manual formattable on any system.)

11.2.1 Relative size changes

Apart from setting the pointsize explicitly, it is also possible to make size changes relative to the current size. For instance, `\PointSizeLarger` and `\PointSizeSmaller` with an optional argument indicating the size of the change can be used. These commands are not cumulative.

Example 11.2

```
\SerifFace
\PointSize:9 \SetFont Every once in a while,\SaveFont
\PointSizeLarger[2] shouting \PointSizeLarger helps.
\PointSizeSmaller[2]But most of the times it doesn't.
\RestoreFont Unfortunately.
```

Every once in a while, shouting helps. But most of the times it doesn't. Unfortunately.

Similar to the changes in mathematics mode to script and scriptscript size, the same relative changes are available in text mode through the control sequences `\script` and `\scriptscript`. The control sequence `\normal` can be used to restore the default size.

Here is one application of such relative changes:

```
L\kern -.3em\raise .35ex\hbox {\script A}\kern -.1em\TeX
```

which gives definition of the L^AT_EX logo that is independent of typeface, size and style.

The relative sizes of script and scriptscript fonts are by default at 70% and 50%, but they can be set explicitly by

```
\PointSizeScriptSizes:10=10,7,5
```

This also gives the possibility to have the `\normal` size to be different from the surrounding pointsize.

11.2.2 Typeface definition

Defining a typeface means telling Lollipop how the external font name, that is, the name of the `tfm` file, is to be constructed from the internal parameters. The command `\DefineTypeface` takes four parameters and an optional fifth. The parameters are in sequence

- 1 The internal name of the typeface: the name that is given to the `\Typeface` command.
- 2 The root of the external file name. It is assumed that all font names of different styles and sizes are constructed by appending characters to this base.
- 3 Suffixes corresponding to the styles that are available.
- 4 Suffixes corresponding to the sizes that are available.

Here is the definition of the Computer Modern typeface:

```
\DefineTypeface{ComputerModern}{cm}
  {roman:r; slant:sl; italic:ti; mitalic:mi; bold:bx; typewriter:tt;
  default:r;}
  {<6:5; <7:6; <8:7; <9:8; <10:9; <11:10;
  <12:10 \scaled\magstephalf;
  <14:10 \scaled\magstep1; <16:10 \scaled\magstep2;
  <20:10 \scaled\magstep3; >19:10 \scaled\magstep4;
  default:10;}
```

Actually, not all combinations of styles and sizes are available. That's where the optional argument comes in. This argument can be used to specify with T_EX conditionals exceptional style/size combinations. Here some trickery is needed: internally the size is stored in `\Fsize`, and in order to use this parameter we need to make the at-sign a letter temporarily.

```
\makeatletter
\DefineTypeface{Compu ...
  ...
  default:10;}
  [\ifStyle:italic \ifnum\Fsize<7 ti7\fi\fi
  \ifStyle:typewriter \ifnum\Fsize<8 tt8\fi\fi]
```

You may have noticed that this scheme is not all-powerful. Thus I found it easier to move all Computer Modern sans serif fonts into a new typeface: `ComputerSans`.

For other typefaces specifying the size suffix may be much easier than for Computer Modern. For instance, here is the definition of the PostScript Helvetica typeface.

```
\makeatletter
\DefineTypeface{psHelvetica}{helv}
  {roman:; italic:i; mitalic:i; bold:b; default:;}
  {default: at \Fsize pt;}
```

11.2.3 Math fonts

Switching styles in math mode should be possible:

`xyz`

11.2.4 Other font matters

The combination `\SaveFont` with a subsequent `\RestoreFont` can be used to save and restore the current font.

An abbreviation for a font can be defined by

```
\DefineFont:name=face,size,style
```

This has the same effect as

```
\def\name{\TypeFace:face \PointSize:size \Style:style }
```

but it takes considerable less processing inside \TeX .

Even if you don't use Computer Modern as your main typeface, the typewriter style is not bad, so a control sequence

```
\def\tt{\Typeface:ComputerModern \Style:typewriter }
```

has been given that makes `\tt` always refer to the `cmtt` fonts. You're at liberty to change this, of course.

11.3 Baselineskip

Corresponding to a font size usually the baseline skip has to change. By default a fixed ratio of 1.2 for this is taken, for instance using a 12 point baseline skip for 10 point fonts. Changing the ratio can be done by

```
\BaselineSkipPointSizeRatio:1.3
```

If only for some specific size the baseline skip has to deviate from the default ratio, then this can be set by

```
\SetPointSizeBaselineSkip:9=12
```

11.4 Indentation Control

11.4.1 To indent or not to indent

In most documents there is a general rule that all paragraphs indent unless a certain condition, or that they do not indent unless certain special conditions hold. For Lollipop documents this is determined by the command `\AlwaysIndent`, with values `yes/no`.

To override this default setting a command `\Indent` (with values `yes/no`) exists, but that is mostly useful as an option in generic constructs, and even there it will not be used much. See section 10.6 for options relating to indentation.

Important: never set `\parindent` to zero. Preventing indentation globally should be done through `\AlwaysIndent:no`.

11.4.2 Basic indent

There is a quantity `\basicindent` that is used on the first indentation level (see the next section for an explanation of these levels). At the start of a document it is set to the then current value of `\parindent`. You can override that by `\BasicIndentIsSet`: give

```
\BasicIndentIsSet:no
```

before the `\Start` command.

11 Commands

This way, setting `\parindent` in the style definition controls the indentation in the whole document.

11.4.3 Indentation levels; indentation size

When Lollipop decides that text should be indented, it refers to a list of indentations for the exact amount. This list contains indentation amounts for each ‘level’ of indentation: initially the level is one, and if you nest constructs that indent (for instance using a list inside a list) the level goes up one step per nested construct.

By default the indentation on different levels is a fraction of the `\basicindent`. Thus you can regulate the indentation on all levels simultaneously by resetting the `\basicindent`.

Example 11.3

```
\Distance:basicindent=15pt
\DefineList:TestList item:left itemCounter item:stop Stop
\TestList\item Level one \TestList\item Level two
\TestList\item Level three\>]
\Distance:basicindent=25pt
\TestList\item Level one \TestList\item Level two
\TestList\item Level three\>]
```

```
1      Level one
      A Level two
      I Level three
```

```
1      Level one
      A  Level two
      I  Level three
```

The amount of indentation on a certain level can be set explicitly with `\LevelIndent`.

Example 11.4

```
\Distance:basicindent=15pt
\LevelIndent:2=20pt
\DefineList:TestList item:left itemCounter item:stop Stop
\TestList\item Level one \TestList\item Level two
\TestList\item Level three\>]
```

```
1      Level one
      A  Level two
      I  Level three
```

In fact, sometimes you may want to know the name of the indentation on a certain level. This is a control sequence such as `\levelindentii` for the second level. You get the idea.

11.4.4 Manipulating the indentation level

Every once in a while it can be useful to move to a next indentation level, or to return to a previous level. For this the two commands `\PushIndentLevel` and `\PopIndentLevel` are available. One application is for ‘interrupted lists’:

Example 11.5

```
\Itemize\item One
{\par\PopIndentLevel Interrupted text!\par}
\item Two\>
```

- One
Interrupted text!
 - Two
-

See chapter 9 for examples of the use of `\PushIndentLevel`

11.5 Margins

By default, Lollipop tries to keep straight margins. You can change its mind about that by `\FlushRight` and `\FlushLeft` which are tests:

```
\FlushRight:no \FlushLeft:no
```

If the margins are not flush, the stretchable white space used is `\rightmarginstretch` and `\leftmarginstretch`, which can be set by `\Distance`.

You have to set the amount of stretch *before* specifying that the margins will not be flush. The `\FlushRight/Left` commands take the current value whenever they are called.

11.6 White Space

White space can be indicated by `\hwhite` and `\vwhite`. They are often useful in style definitions. Use:

```
\vwhite:15pt
```

or

```
\hwhite:{15pt minus 3pt}
```

for stretch and shrink. The command `\white` is independent of the mode, and it expands to `\hwhite` or `\vwhite` depending on the prevailing mode of \TeX .

The command `\fillup` is mostly useful in style definitions: it tries to fill up as much white space as is possible. For instance

```
line:start litteral:foo fillup litteral:bar line:stop
```

will push `foo` and `bar` as far apart as is possibly within the margins.

11.7 Distances

The command `\Distance` can be used to declare a name for a certain distance, or in more correct \TeX nical lingo, for a certain piece of glue. For instance, declaring that

```
\Distance:online=15pt
```

means that you can specify in some constructs

```
\DefineFoo:Bar whitebefore:online whiteafter:online
```

If you change your mind later about the value of `online` you only need to change one line in the style definition.

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Since the second parameter of `\Distance` is bounded by a space (or the line end, whatever comes first), you can specify stretchable distances by enclosing `plus` and `minus` parts in braces:

```
\Distance:online={15pt plus 2pt minus 3pt}
```

The effect of `\Distance` is global. Let me know if you don't like it.

11.7.1 Distance synonyms

Another use of `\Distance` is to define one distance as a synonym of another. This may come in handy if you use some basic distance, such as `online` for several purposes. Example: if you specify

```
\Distance:whitebefore=online
```

than the whitespace before a construct will be taken to be `online` if you don't use the `whitebefore` option explicitly.

11.7.2 Adaptive distances

Suppose you want to declare a section heading as

```
\DefineHeading:Section ...
```

```
  block:start [...] fillupto:widelabel title
```

where `\widelabel` is the width of the widest label that occurs in your document. This requires just a tad of `TEX` programming. Just copy the details from the example below, which is the definition of `\Section` in this manual.

By declaring something a `\AdaptiveDistance` instead of just `\Distance` its value gets written to the `.aux` file at the end of the run, and restored in the next run. The second argument is simply the default value, in case you don't have an auxiliary file yet.

```
\AdaptiveDistance:WidestLabel=15pt
```

```
\def\MeasureLabel{\ifdim\BlockWidth>\WidestLabel
```

```
  \global\WidestLabel\BlockWidth\fi}
```

```
\DefineHeading:Section
```

```
  whitebefore:{20pt plus 2pt} whiteafter:14pt
```

```
  line:start PointSize:14 Style:italic
```

```
    block:start block:start ChapterCounter . SectionCounter
```

```
      Spaces:1 block:stop MeasureLabel
```

```
      fillupto:WidestLabel
```

```
    title line:stop
```

```
  external:contents title external:stop
```

```
  label:start ChapterCounter . SectionCounter label:stop
```

```
  Stop
```

Note how two nested blocks are used: the first is to measure the label, and the width is written to the adaptive distance by means of a small macro; the second block is to fill out the white space.

If you want the paragraph indentation to depend on this adaptive width, you can give

```
\StartCommand{\Distance:parindent=WidestLabel }
```

to set `\parindent` at the start of the document. See section 3.1 and 11.4.2.

11.8 Input Files

Parts of a document can be loaded by

```
\InputFile:parta
```

```
\InputFile:partb
```

et cetera. A document part loaded by `\InputFile` always starts on a new page. In section 8.3 it

40 was already explained how local references for such files can be created.

Perhaps most importantly, loading files this way provides a form of error checking; Lollipop checks at the end of such a file whether all used constructs are balanced properly.

11.9 Tests

Users can define tests:

```
\DefineTest:SomethingTheMatter
```

which are set like any other test:

```
\SomethingTheMatter:yes
```

or

```
\SomethingTheMatter:no
```

Tests can be used as

```
\ifSomethingTheMatter ... \else ... \fi
```

Like any other conditional, test can be used inside constructs.

```
\DefineFoo:Bar [...]
```

```
  ifSomethingTheMatter [...] fi
```

```
  [...] Stop
```

11.10 Goodies

11.10.1 List commands

Lollipop does a lot of list processing internally, and a few of the commands have been made available to the user.

`\NewList` creates a list, and sets it to empty:

```
\NewList:mylist
```

`\EmptyList` just empty a list.

`\TheList` inserts the list. This will typeset the contents of it.

```
\TheList:mylist
```

`\AppendToList` adds data to a list.

```
\AppendToList:mylist={my data}
```

The data are terminated by a space or line end, hence the braces.

11.10.2 Programming Tools

A few commands are useful for the Lollipop style designer who wants to write more sophisticated macros (see for instance the address book macros in the last chapter).

`\UndefinedCS` is a test on control sequences.

```
\if\UndefinedCS{testcs} ... \else ... \fi
```

`\EqualString` tests equality of strings.

```
\if\EqualString{one}{two} ... \else ... \fi
```

`\EqualStringX` tests equality of strings, using only expansion.

```
\if\EqualStringX{one}{two} ... \else ... \fi
```

`\StringBefore` tests lexicographic ordering of strings. The string are not supposed to contain characters with char codes 0, 127, 255.

```
\if\StringBefore{one}{two} ... \else ... \fi
```

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`\NextChar` chooses between two actions, based on the next character.
`\if\NextChar[{\macro}{\macro[default]}] ...`

`\IsEmptyList` can test whether an argument is empty.
`\if\IsEmptyList{#1} ...`
is true for calls such as `\macro{}`.

`\loop` can be used for repeated execution of statements. (Users of plain `TEX` may recognize this macro; it is slightly extended here to include the `\else` case.) It is used as:
`\loop ... \if ... \repeat`
of
`\loop ... \if ... \else ... \repeat`

11.10.3 `\everypar`

The `TEX` primitive `\everypar` should not be used any more. Instead use the command `\EveryParagraph` as if you are setting a token list:
`\EveryParagraph{ ... }`

11.10.4 `\everymath`

The `TEX` primitive `\everymath` should not be used any more. Instead use the command `\EveryMath` as if you are setting a token list:
`\EveryMath{ ... }`

11.10.5 `\everydisplay`

The `TEX` primitive `\everydisplay` should not be used any more. Instead use the command `\EveryDisplay` as if you are setting a token list:
`\EveryDisplay{ ... }`

11.10.6 *Allocation*

The commands `\SaveAlloc` and subsequent `\RestoreAlloc` save and reset the internal `TEX` allocation counters.

Chapter 12

Tracing

12.1 Do you really want to see this?

You can get glimpses of Lollipop's internal workings by enabling some of the internal traces. The extreme positions

```
\Trace:yes
```

and

```
\Trace:no
```

cause all trace information and no trace at all respectively to be generated. You may find this trace interesting, or it may dumbfound you. Of course, if your name is Victor you find it pretty useful.

The following traces are available:

```
\NewTrace:def % definition of user constructs  
\NewTrace:ref % cross references  
\NewTrace:ext % external files  
\NewTrace:doc % document structure  
\NewTrace:font % font loading  
\NewTrace:out % output routine  
\NewTrace:indent % indentation control  
\NewTrace:gen % general tools
```

Chapter 13

Example styles

To show you the strength of Lollipop, this chapter collects a few example style definitions. The first one is that of this manual.

13.1 The style definition for this book

In case you were wondering how this book was typeset, here is the full style definition. By the standards of what Lollipop can do it is pretty pedestrian.

One thing that may have provide intellectual titillation is the definition of `\Example` and `\OutExample`. It allowed me to keep the examples in sync with their output.

Of course that doesn't really rely on Lollipop. It does illustrate the fact that Lollipop is interfaceable to arbitrary macros. (But don't try loading Lollipop on top of L^AT_EX! On second thought, do. It disables most of L^AT_EX. Just kidding.)

```
% mandefs.tex style definition for the Lollipop manual
% copyright 1992/3 Victor Eijkhout
% copyright 2014--2016 Vafa Khalighi
%
%
% This program is free software: you can redistribute it and/or modify
% it under the terms of the GNU General Public License as published by
% the Free Software Foundation, either version 3 of the License, or
% (at your option) any later version.
%
% This program is distributed in the hope that it will be useful,
% but WITHOUT ANY WARRANTY; without even the implied warranty of
% MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
% GNU General Public License for more details.
%
% You should have received a copy of the GNU General Public License
% along with this program. If not, see <http://www.gnu.org/licenses/>.
%
%
\def\con#1{\tt#1}
\def\n#1{\tt#1}
\def\file#1{\tt#1}

\def\Lollipop{Lollipop}

\Distance:rightmarginstretch={0cm plus 2.54cm}
\Distance:whitebefore={6pt plus 3pt minus 2pt}
\Distance:whiteafter=whitebefore
\FlushRight:no

\DefineExternalFile:contents=toc

\DefineHeading:Chapter
  breakbefore:yes whiteafter:20pt
  line:start PointSize:14 Style:bold literal:Chapter
    Spaces:1 ChapterCounter line:stop
  vwhite:15pt
  line:start PointSize:16 Style:bold title line:stop
  external:contents title external:stop
  Stop

\AdaptiveDistance:WidestLabel=15pt
\def\MeasureLabel{\ifdim\BlockWidth>\WidestLabel
```

```

\global\WidestLabel\BlockWidth\fi}
\StartCommand{\Distance:parindent=WidestLabel }
\DefineHeading:Section
  whitebefore:{20pt plus 2pt} whiteafter:14pt
  line:start PointSize:14 Style:italic
    block:start block:start ChapterCounter . SectionCounter
      Spaces:1 block:stop MeasureLabel
      fillupto:WidestLabel
    title line:stop
  external:contents title external:stop
  label:start ChapterCounter . SectionCounter label:stop
  Stop
\GoverningCounter:Section=Chapter

\DefineHeading:SubSection
  whitebefore:{14pt plus 2pt} whiteafter:8pt
  line:start PointSize:10 Style:italic
    ChapterCounter . SectionCounter . SubSectionCounter
    Spaces:1 title line:stop
  label:start ChapterCounter . Spaces:.2 SectionCounter
    . Spaces:.2 SubSectionCounter label:stop
  Stop
\GoverningCounter:SubSection=Section

\DefineExternalFile:impnotes=imp
\DefineHeading:iSection
  whitebefore:{10pt plus 1pt} whiteafter:8pt
  line:start PointSize:12 Style:bold I -
    Style:italic iSectionCounter
    Spaces:1 title line:stop
  label:start I - iSectionCounter label:stop
  external:impnotes title external:stop
  Stop
%\GoverningCounter:iSection=Chapter
\DefineExternalItem:iSection file:impnotes PushIndentLevel
  item:left I - Style:italic iSectionLabel item:stop
  title begingroup Spaces:2 Style:italic Page endgroup
  Stop

\DefineExternalItem:Chapter file:contents
  item:left ChapterLabel item:stop
  title begingroup Spaces:2 Style:italic Page endgroup
  Stop
\DefineExternalItem:Section file:contents PushIndentLevel
  item:left ChapterLabel . SectionLabel item:stop
  title begingroup Spaces:2 Style:italic Page endgroup
  Stop

\def\impnotetxt{Implementor's Note}
\DefineTextBlock:ImpNote PushIndentLevel
  whitebefore:12pt whiteafter:11pt
  line:start PointSize:12 Style:italic impnotetxt line:stop
  SansFace PointSize:9 SetFont text
  Stop
\excludecomment{ImpNote}

\DefineTextBlock:WizNote
  PushIndentLevel PointSize:9 SetFont text
  Stop

\DefineList:Description
  item:left description Spaces:2 item:stop whitebetween:6pt
  Stop

\DefineList:cDescription
  item:left tt char busje description Spaces:2 item:stop

```

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```

whitebetween:6pt
Stop

\DefineList:Enumerate
item:left itemCounter item:stop
Stop

\DefineList:Itemize
item:left itemsign item:stop
Stop

\DefineBBL
item:left [ - itemCounter - ] item:stop
Stop

\SerifFace \SetFont

\newwrite\exfile
\def\HereAndOut#1{\immediate\write\exfile{#1}}
\specialcomment{Example}
{\EExample
\immediate\openout\exfile=example.tex\relax
\let\ThisComment\HereAndOut}
{\immediate\closeout\exfile
\begingroup \tt \SetFont
\verbatimfile{example.tex}\endgroup
\SaveAlloc \input example.tex\relax \RestoreAlloc
\EExampleStop}
\DefineTextBlock:EExample whiteafter:{6pt plus 5pt}
noimplicitclose rule:h vwhite:3pt
line:start literal:Example Spaces:1.5
ChapterCounter . EExampleCounter
line:stop
vwhite:3pt rule:h vwhite:3pt text vwhite:3pt rule:h
Stop
\GoverningCounter:EExample=Chapter

\specialcomment{OutExample}
{\EExample
\immediate\openout\exfile=example.tex\relax
\let\ThisComment\HereAndOut}
{\immediate\closeout\exfile
\begingroup \tt \SetFont
\verbatimfile{example.tex}\endgroup
\par\penalty0\relax
\SaveAlloc \SuspendOutput \begingroup \CountSheetsno
\global\setbox\PageRow\hbox{}}%
\let\CurrentShipout\ToPageRow
\xInputFile:example
\endgroup
\ResumeOutput \RestoreAlloc
\noindent\unhbox\PageRow\hbox{}}\par
\EExampleStop}
\newbox\PageRow\newbox\RowPage
\def\ToPageRow{\setbox\RowPage\box\WholePage \xToPageRow}
\def\xToPageRow{\global\setbox\PageRow
\hbox{\unhbox\PageRow\box\RowPage\hfill}}

\def\opt#1{\tt#1}
\DefineExternalFile:optindex=oix
\def\refopt#1{\OptToIdx #1}\par}
\DefineHeading:OptToIdx embedded:yes
block:start tt title block:stop
external:optindex title external:stop
nomarks Stop
\DefineExternalItem:OptToIdx file:optindex

```

```

embedded:yes
beginingroup tt title endgroup
nobreak Spaces:1.5 Page Spaces:2.5 Stop

\DefineExternalFile:csindex=cix
\def\refcs#1{\CsToIdx #1\par}
\DefineHeading:CsToIdx embedded:yes
  block:start tt char busje title block:stop
  external:csindex title external:stop
  nomarks Stop
\DefineExternalItem:CsToIdx file:csindex
  embedded:yes
  beginingroup tt char busje title endgroup
  nobreak Spaces:1.5 Page Spaces:2.5 Stop

\topskip20pt
\OptionsMacro:PageDims=width:page=15cm height:page=23cm Stop
\DefinePageGrid:LeftPage macro:PageDims
  band:start block:start PointSize:9 Style:italic
    FirstPlaced:ChapterCounter Spaces:2 stickout:left
    FirstPlaced:ChapterTitle band:stop
  textband:start text textband:stop
  band:invisible block:start PointSize:9 Style:bold
    PageCounter Spaces:2 stickout:left band:stop
  NextPageGrid:RightPage Stop
\DefinePageGrid:RightPage macro:PageDims
  band:start fillup PointSize:9 Style:italic
    LastPlaced:SectionTitle
    block:start Spaces:2 LastPlaced:ChapterCounter .
    LastPlaced:SectionCounter stickout:right
  band:stop
  textband:start text textband:stop
  band:invisible fillup
    block:start PointSize:9 Style:bold Spaces:2
    PageCounter stickout:right band:stop
  NextPageGrid:LeftPage Stop
\DefinePageGrid:EmptyPage macro:PageDims
  textband:start text textband:stop
  NextPageGrid:LeftPage Stop

\AdaptiveCounter>LastInPage \CounterRepresentation>LastInPage=i
\AdaptiveCounter>LastRegPage \CounterRepresentation>LastRegPage=1
%\SetCounter>LastInPage=PageValue -- at the end of prelim.tex
%\SetCounter>LastRegPage=PageValue -- at the end of manual.tex

\endinput

% 92/11/05 stretch added
% 92/11/18 adaptive label width
% 92/11/19 adaptive last page

```

13.2 Address book

The following macros generate an address book. Several noteworthy features:

- Most titles are short, that is, delimited by the line end.
- Since a page will now have several dozens of headings, the number of marks placed will become a problem, therefore the option `nomarks` is included everywhere. Without this you would easily have memory overflows.
- The `\At` heading writes its information to an external file. This is then parsed by the macro `\CompNam`. A slight amount of knowledge of Lollipop internals is used here

for parameter parsing, but not more than can be gleaned from simply looking at the external file.

Then a token list is created for each company, and these lists are printed somewhere down the file. This is a bit of T_EX programming that is not quite elementary, but still Lollipop saves you a lot of work.

If you want to see the output, run T_EX with Lollipop twice on the `address.tex` file.

```
% address book macros
% copyright 1993 Victor Eijkhout
% copyright 2014--2016 Vafa Khalighi
%
%
% This program is free software: you can redistribute it and/or modify
% it under the terms of the GNU General Public License as published by
% the Free Software Foundation, either version 3 of the License, or
% (at your option) any later version.
%
% This program is distributed in the hope that it will be useful,
% but WITHOUT ANY WARRANTY; without even the implied warranty of
% MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
% GNU General Public License for more details.
%
% You should have received a copy of the GNU General Public License
% along with this program. If not, see <http://www.gnu.org/licenses/>.
%
%
% These macros are based on the Lollipop macro package,
% copyright 1992/3 Victor Eijkhout
% copyright 2014--2016 Vafa Khalighi
%
% Format this file twice to get external files right.
%
%
% Some general options.
% Please use another typeface if you have it!
%
\Distance:whitebefore=0pt \Distance:whiteafter=0pt
\AlwaysIndent:no \FlushRight:no
\TypeFace:ComputerSans \PointSize:8 \Style:roman
\def\{\,\Spaces:1 }

% The page is four columns, no footers etc
%
\DefinePageGrid:ThePage width:page=6.5in height:page=5in
textband:start text white:10pt text white:10pt
text white:10pt text textband:stop Stop

% The main macro is the text block \Entity, representing one item
% in the address book.
%
\DefineTextBlock:Entity HasTitle:short
whitebefore:{6pt plus 6pt minus 3pt} whiteafter:whitebefore
line:start rule:v={height 7pt width7pt depth0pt} Spaces:2
Style:italic title line:stop Stop

% Data in an entity is formatted as a number of headings.
% We declare all headings to be embedded, ie, they form a paragraph.
% The 'nomarks' option is to prevent memory overflow.
%
\OptionsMacro:embed=embedded:yes nomarks
whitebefore:0pt whiteafter:0pt Stop
\DefineHeading:phone HasTitle:short macro:embed
literal:phone : Spaces:1.5 title , Spaces:2 Stop
\DefineHeading:fax HasTitle:short macro:embed
literal:fax : Spaces:1.5 title , Spaces:2 Stop
```

```

\DefineHeading:Address HasTitle:short macro:embed
  title , Spaces:2 Stop
\DefineHeading:Note HasTitle:short macro:embed
  ( title ) Spaces:2 Stop

% Here's an example of non-standard handling of the title:
% email addresses are set in \tt, and can be broken differently
%
\def\breakemail{\hyphenchar\font='. }
\DefineHeading:email HasTitle:short macro:embed
  begingroup tt breakemail title endgroup , Spaces:2 Stop

% This is invisible information; maybe later we'll do something
% with it.
\DefineHeading:Route HasTitle:short Stop

% Here is the first really cute application.
% If a person is declared to be \At a certain company, then
% that fact is written out to an external file, which can be loaded
% later.
%
\DefineExternalFile:companies=ats
\def\WorksAt{Works at: }
\DefineHeading:At macro:embed
  HasTitle:short WorksAt title Spaces:2
  external:companies title unhskip title:Entity unhskip external:stop Stop
% When the 'companies' file gets loaded the title only gets
% parsed by the macro \CompNam, and nothing else happens.
% The title is split into company and person; #1 becomes the name
% of a list to which #2 is added.
%
\def\CompNam#1\unhskip#2\unhskip{
  \ifUndefinedCS{#1}\NewList:{#1} \fi
  \AppendToList:#1={#2}\unhskip, } }
\DefineExternalItem:At file:companies
  expandafter CompNam title Stop
% The company lists are later simply loaded; see below.

% Even more complicated: birthdays.
% All birthdays are written to an external file.
%
\DefineExternalFile:births=brt
\DefineHeading:birthday HasTitle:short macro:embed
  literal:Born : title Spaces:2
  external:births title unhskip title:Entity unhskip external:stop Stop
% Later every month becomes something like an entity;
% here is how we generate a token list for each month.
%
\def\month#1{\ifcase#1\or jan\or feb\or mar\or apr\or may\or jun\or
  jul\or aug\or sep\or oct\or nov\or dec\fi}
\tempcounta=1 \loop\ifnum\tempcounta<13
  \xp\NewList\xp:\xp{\month\tempcounta}
  \advance\tempcounta1 \repeat
% Formatting the caboodle means:
% -- loading the 'births' file
% -- formatting each month separately by \OneMonth
% which is essentially a call to the text block \Month
%
\def\AllBirths{\LoadExternalFile:births
  \tempcounta=1 \loop\ifnum\tempcounta<13
  \OneMonth \advance\tempcounta1 \repeat}
\def\OneMonth{\xp\Month\month\tempcounta\par
  \TheList:{\month\tempcounta} \>}
% Month is much like \Entity, just a bit different visually.
%
\DefineTextBlock:Month

```

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```
whitebefore:{6pt plus 6pt minus 3pt} whiteafter:whitebefore
line:start rule:v={height 7pt width7pt depth0pt} Spaces:2
  Style:italic title Spaces:2
  fillup rule:v={height 7pt width7pt depth0pt} line:stop
Stop
% When the external file is loaded, every birthday is processed
% by \BirNam which splits it into #1 year #2 month #3 day and
% #4 person's name. This is then written to the list for the
% appropriate month.
%
\def\BirNam#1 #2 #3\unhskip #4\unhskip
  {\tempcounta#2\relax
  \AppendToList:{\month\tempcounta}={\JollyFellow #3 #4 (#1)\par}
  }
\DefineExternalItem:birthday file:births
  expandafter BirNam title Stop
\DefineHeading:JollyFellow title nomarks Stop

% Phooeew! Now we can get down to business!

\WriteExtern:yes
\Start
\LoadExternalFile:companies

\Entity Adam Aardvark
\Address Page~1, English Language Dictionary
\>

\Entity Barbara Beeton
\At Tugbt
\Note Editor in chief
\>

\Entity Jane Doe
\email doe@re.mi.sol
\>

\Entity John Doe
\phone +1 212 555 4141
\>

\Entity Victor Eijkhout
\Address Department of Computer Science, University of Tennessee
\phone +1 615 974 8298
\At Tugbt
\Note merely associate editor
\email eijkhout@cs.utk.edu
\birthday 1959 11 29
\>

\Entity Elvis Presley
\birthday 1938(?) 01 08
\>

\Entity Tugboat
\TheList:Tugbt
\>

\AllBirths

\Stop
```