The LaTeX 2ε *TUGboat* macros

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1 Introduction

This is the documentation for the LaTeX 2ε macros to be used by *TUGboat* authors. The macros represent a development of the earlier ltugboat and ltugproc styles that were written for use with LaTeX 2.09; major contributors have been Robin Fairbairns, Sebastian Rahtz, Michel Goossens, Nico Poppelier and Johannes Braams. Many others have been involved, including Barbara Beeton, Karl Berry, Mimi Burbank, and the LaTeX3 team.

2 Availability

The *TUGboat* web pages are at:

`https://tug.org/TUGboat`

They include an article template, information for authors and reviewers, all the back issues, and more.

The macros are released for general use, and are distributed via CTAN (directory `macros/latex/contrib/tugboat`) in the usual LaTeX way as files `tugboat.dtx` and `tugboat.ins`. When the `.ins` file is processed by LaTeX, the files `ltugboat.cls` and `ltugbib.bst` (for use with articles) and `ltugcomn.sty` (a cooking pot of perhaps-useful macros, for documentation, etc.) are produced. (`ltugproc.cls` is also produced for compatibility, but is no longer used for proceedings or anything else.)

The `.dtx` file may itself be processed by LaTeX to produce a formatted (somewhat 'literate') source listing for those who would like more detailed descriptions of the *TUGboat* macros.

3 The general structure of a paper

The basic idea is to start your LaTeX document with `\documentclass{ltugboat}`, which defines the appearance of *TUGboat* articles. This uses the file `ltugboat.cls` as usual.

Each paper, therefore, is written as a document that may stand on its own. It starts with a `\documentclass` command, and its body is enclosed in a document environment. There are some options to the document class, described in the next section, but ordinarily the author needn't bother with them. The defaults are designed for creating proof copies of papers.

The proof output differs from the final production output with respect to page numbers and other material. The changes required for final production are the responsibility of the *TUGboat* editors, and the author need not be concerned with them.

4 Class options: The ltugboat class

The ltugboat class accepts many of the options of the article class (it suppresses the font-size selection and one/two-side options).

draft Set up for a draft copy of a paper (this is the default setting — the author need not explicitly set it): page numbering starts at a high number, black marks for overfull boxes.

extralabel Use the extra label-distinguishing mark in the body of the reference; see section 12.

final Set up for the final copy of a paper: page numbering to come from elsewhere, no cropmarks.

harvardcite Specify Harvard-style citation (not especially recommended in general, though they are used in the present document); see section 12.

noextralabel Don't use the extra label-distinguishing mark in the body of the reference; see section 12.

nonumber Sections are not to be numbered; section heading layout is to be as in the 'plain' tugboat styles.

numbersec Sections, subsections and subsubsections are to be numbered (this is the default setting — the author need not explicitly set it).

onecolumn Typeset article in one column.

preprint Set up for a preprint.

rawcite Specify default (unnumbered) citation; see section 12.

runningfull Information in both header and footer (default).

runningminimal Information in header only.

runningoff Information in neither header nor footer.

Again, normally there is no need to use any document options. They are listed here for completeness.

5 Command syntax

In general, we have sought simply to keep to the spirit of LaTeX in the commands provided by the *TUGboat* class (`ltugboat`).

In the few cases that it has proved possible to emulate (what seems to a staid old LaTeX programmer, such as the original author here) the gay abandon of the syntax of the 'plain' tugboat styles [6], we have done so. Nevertheless, on the whole, the new ltugboat macros define LaTeX commands and environments, or modify the definitions of LaTeX 'standard' commands. Section 13 lists equivalences between macros defined by the 'plain' package and those defined by the new package.

The 'down' side of this decision is, of course, the 'welter of LaTeX braces' that Barbara Beeton has been heard to complain of in production team discussions. One has to hope that the (near) uniformity

of syntax offers those who think like Barbara some small recompense!

6 Divisions of the paper

Papers in *TUGboat* may be subdivided in the normal way of a LaTeX article (the classes are defined in terms of LaTeX's article class). Thus the author may use `\section`, `\subsection`, ..., `\paragraph` commands (but `\part` and `\subparagraph` from article are suppressed, and `\chapter`, which doesn't even appear in the parent class, receives the same treatment).

Authors should note that the style of ordinary issues of *TUGboat* makes no distinction between the titles of the divisions; the visual style relies on the section numbers to indicate where the divisions lie in the hierarchy. As a result, the un-numbered '`*`' forms of the `\section`, etc., commands, are inappropriate. The ltugboat class therefore warns the author who (possibly inadvertently) uses one of these forms. (An author who wishes to use un-numbered sections throughout the paper may use the nonumber class option (see 4).

Reference may, however, be made to the 'title' of divisions of the paper, whether they are numbered or not. The `\nameref` command (which uses the technique developed for the hyperref package [3]) permits such references; for example, the present section was introduced by:

```
\section{Divisions of the paper}
\label{sec:divs-paper}
```

and the command `\nameref{sec:divs-paper}` produces 'Divisions of the paper'.

6.1 Abstracts

The classes make provision for abstracts, but the provision is different for the two classes.

The ltugboat class provides two environments, abstract and longabstract. The abstract environment simply typesets its body as an un-numbered section whose title is 'Abstract'. The longabstract environment typesets its body in small text, and separates the abstract from the rest of the paper with a decorative line.

6.2 Appendices

A paper may have appendices, which are expressed in exactly the same way as they would be in the LaTeX article class:

```
\appendix
\section{This is appendix A}
...
\section{This is appendix B}
```

Which will produce 'section' headings similar to:

A This is appendix A

TUGboat articles may have a small extension to this format: this extension was originally developed for proceedings of past years, but is also available in normal issues:

```
\begin{appendix}
\section{This is the first one}
...
\end{appendix}
```

Which will produce 'section' headings similar to:

Appendix A This is the first one

In both cases, the subsections are numbered as normal (i.e., as 'A.*n*' in normal *TUGboat* papers):

7 Titles, addresses and so on

The title and author(s) of a paper are quoted using commands that are familiar (in syntax, at least) to most LaTeX users; the `\title` command is exactly that used in the standard LaTeX classes. There is also `\shortTitle{`⟨*your-short-title*⟩`}` to define the form used in running heads or footers; similarly `\shortAuthor`.

The `\author` command is used once for each co-author of the paper, and for each `\author` there should be a `\address` command that gives a (postal) correspondence address. In addition (wherever possible), *TUGboat* likes to quote an email address for authors: for this, the `\netaddress` command is used. Finally, each author may advertise a 'home' Web page, using a `\personalURL` command.

For example, the present paper has at its start:

```
\title{The \LaTeXe\ \TUB{} Macros}
\author{TUGboat editors}
\EDITORnoaddress
\netaddress{tugboat@tug.org}
\personalURL{https://tug.org/TUGboat}
\maketitle
```

Lines in the title information can get quite long. If the information being given is to be typeset as ordinary text (as in the case of the `\address` line above), it can be 'wrapped' perfectly happily, as in normal text. If one of the verbatim items (`\netaddress` or `\personalURL` commands) is going to be too wide for the column, what is the author to do? (Abbreviating the text, as in the `\personalURL` above, is *not* usually an acceptable option!) Unfortunately, the `%` sign is an entirely acceptable element of both email addresses and URLs, so that the normal 'fall-back' isn't available. Therefore, the classes typeset these electronic addresses in an environment where some of the characters (notably '`.`' and '`/`') are treated as word-divisions for the purposes of laying out the line.

If the paper is the result of more than one author's labours, a sequence of `\author`, `\address`, `\netaddress` and `\personalURL` commands may be given, as in the following, which comes from a paper given at TUG'95 (abbreviated):

```
\author{Michel Goossens}
\address{CN Division, CERN\\
  ...}
\netaddress{...}

\author{Sebastian Rahtz}
\address{Elsevier Science Ltd\\
  ...}
\netaddress{...}

\author{Robin Fairbairns}
\address{University of Cambridge
    Computer Laboratory\\
  ...}
\netaddress{...}
\personalURL{...}
```

The class files will take care of arranging author names and addresses between the `\maketitle` and (possibly) `\makesignature` commands.

7.1 Compilation articles

Compilation articles are built from a set of contributed parts, and are under the general (sub-) editorship of the author[1] of the article. The author of the article is presented (using `\author` and suchlike commands) in the usual way, and writes the introductory text. Each contributors' part then follows. The contributor's name is quoted in the `\contributor` command, which is an analogue of the `\author` command; contributors' `\address`, `\netaddress` or `\personalURL`. The `\contributor` command opens a group in which the contribution appears, and the contributor's signature (produced with a `\makesignature` command) closes the group. The general scheme looks like:

```
\title{Example compilation article}
\author{Robin Fairbairns}
\address{University of Cambridge ...}
\netaddress{...}
 ... introductory text ...
\makesignature

\contributor{Betsy the Dog}
\address{Romsey Town, Cambridge}
 ... Betsy's contribution ...
...
\makesignature ...
```

[1] Or authors: there's no reason in particular that compilation articles should not be put together by more than one person.

8 Verbatim text

The classes do not at present provide the same wide range of facilities as the 'plain' tugboat style [6]; the author had hoped to 'borrow' facilities from a package which is believed to be in development, but in the event that package has not materialised.

For in-line verbatim text, authors should ordinarily employ the facilities of LaTeX itself (the `\verb` macro). This macro, of course, is highly restricted as to its usage (primarily, that it may not appear in the argument of *any* other macro, even `\footnote`).

For displayed verbatim text, the classes add a small increment to the functionality of LaTeX's verbatim environment, by introducing an optional argument. The optional argument may contain commands to be executed before starting the verbatim text; the set of commands which have useful effect is strictly limited, but the following are commonly used:

- Font size selection commands: for example, all the display verbatim in the present paper starts with `\begin{verbatim}[\small]`.
- The command `\ruled`, which is available *only* in verbatim's optional argument, and specifies that a column-wide rule should be drawn before and after the verbatim text. (This is not the recommended style in general, but it's available for when it helps.)
- The command `\makevmeta`, also available only in verbatim's optional argument, and makes the construct `!<...>` inside verbatim execute `\meta{...}`. For example,

  ```
  \begin{verbatim}[\small\makevmeta]
  The !<duration> is long ...
  ```

  produces:

  The ⟨*duration*⟩ is long ...
- More generally, one of the `\make*` commands,[2] which change the category code of characters within the verbatim text. This is (of course) a facility that should only be used with the utmost caution.

Two caveats about these optional arguments:

- The search for the optional argument can be confused by the appearance of a `[` character as the first character of the displayed verbatim. An author who wishes to start verbatim text with a `[` character should provide an empty optional argument (i.e., '`[]`') to the verbatim environment.

[2] `\makeescape`, `\makebgroup`, ..., `\makecomment`; used, for example, as `\makeescape\|`.

- The *TUGboat* facility is lost when anything is loaded that also defines the `verbatim` environment, as discussed next.

Authors may wish to use a more featureful verbatim package, such as such as verbatim [4], listings [2], or fancyvrb [7]. This is ok; it just means the *TUGboat* optional-argument feature is not available.

If you use the listings package, please specify:

```
\lstset{columns=flexible}
```

The other values for the `columns` option don't work well in *TUGboat*. Also, if you use `\small` for displayed verbatim, please reset inline verbatim to the normal text size:

```
\lstset{columns=flexible,
        basicstyle=\ttfamily\small}
\lstdefinestyle{inline}
  {basicstyle=\ttfamily\normalsize}
```

9 Floating inserts

The classes do not make any change to LaTeX's built-in provision for floating inserts, so that authors may generate figures and tables just as they would in any 'normal' LaTeX document. Figure and table captions, and labels referring to them, are also substantially untouched.

However, since both classes typeset in two columns, authors must distinguish between the figure and table environments (which produce floats that are the same width as the column) and the figure* and table* (which produce floats that are the same width as the page).

10 Special-purpose typesetting

The classes define a rather large set of commands for special-purpose typesetting. Some of them are available for historical reasons only, and many are only useful in somewhat restricted circumstances. For this reason, the present paper only outlines a representative, small set of the macros.

10.1 Acronyms and logos

The classes provide macros that produce 'correct' representations of a large number of acronyms and logos; a small representative selection is shown in figure 1. The sample documents at `https://tug.org/TUGboat/location.html` have a more complete list, and of course the class sources are the ultimate reference.

Authors are especially urged to note the `\acro` command, which is defined in the classes. The visual appearance of (mostly) lower-case English text, with interpolated acronyms in the same point size, is generally unpleasing in Computer Modern. Therefore, the `\acro` command typesets its argument slightly smaller than it would otherwise appear: compare 'DANTE' (`\acro{DANTE}`) with 'DANTE'. Many of the provided macros merely generate calls to `\acro`; two examples, `\CTAN` and `\tug` of the list in figure 1 have already been used in the present paper.

Macro	*Output*
`\ConTeXt`	ConTEXt
`\Cplusplus`	C++
`\CTAN`	CTAN
`\eTex`	ε-TEX
`\FAQ`	FAQ
`\HTML`	HTML
`\ISBN`	ISBN
`\KOMAScript`	KOMA-Script
`\LaTeXe`	LATEX 2ε
`\MacOSX`	Mac OS X
`\MathML`	MathML
`\MF`	METAFONT
`\MP`	METAPOST
`\OMEGA`	Ω
`\PDF`	PDF
`\SGML`	SGML
`\TUB`	*TUGboat*
`\TUG`	TEX Users Group
`\tug`	TUG
`\XML`	XML

Figure 1: A few of the provided acronyms and logos

10.2 Other special typesetting

A small list of special typesetting commands follows: a large set of such commands is defined in the classes, but the list covers most of the 'everyday' ones.

`\Dash` Typeset an em-dash, ignoring preceding and following space, surrounded by thin spaces, only breakable *after* the dash; this is the preferred method of specifying a dash in running text.

`\cs{`*cmd*`}` Typeset a control sequence name: `\cs{fred}` produces `\fred`.

`\env{`*environ*`}` Typeset the command to begin an environment: `\env{fred}` produces `\begin{fred}`.

`\meta{`*var*`}` Typeset meta-syntactic text: `\meta{fred}` produces ⟨*fred*⟩.

`\tubbraced{`*text*`}` Typeset typewriter text in typewriter braces: `\tubbraced{fred}` produces `{fred}`.

`\nth{`*n*`}` Typeset an ordinal number; `\nth{1}` is set as 1st, `\nth{27}` is set as 27th, and so on.

11 Use of packages

In general, the *TUGboat* team will be sympathetic to authors who wish to use non-standard packages in their papers; indeed, in a journal devoted to the usage of TEX, the editor would be churlish indeed to refuse such usage. However, the team does need to be able to process the paper on the *TUGboat* production computers.

In general, packages currently on CTAN, and known to work with *current* LATEX are unlikely to give problems.

In particular, the team is happy to accept papers using packages that are supported by members of the LATEX3 team,[3] subject to the warning:

- Use of the verbatim package has implications for the verbatim facilities provided by the classes — see section 8.

Usage of other packages should always be subject to negotiation with the team. If the team does not have access to a copy of the package, life is going to be very difficult; authors need to be sensible in this regard. A sensible mechanism for submitting out-of-the-ordinary packages (as for paper-specific bibliographies) is by use of the filecontents environment.

TUG has a policy that macro packages described in *TUGboat* should be available for readers to use. Since typing macros from printed sources is such an error-prone undertaking, authors of publicly available packages are urged to submit their macros to the CTAN archives. If a package is only available under restricted terms, authors are urged to make this fact clear when first submitting an article to the editor.

Some facilities are considered inappropriate for delivery by the *TUGboat* classes, and as a result, the *TUGboat* team recommend certain packages to authors.

At present, the list of canonically recommended packages consists of only two, `mflogo.sty` [5] and `url.sty` [1].

Both classes will load the mflogo package if it is present on the author's system; if the package is not present, the classes will emulate its more important features; the package defines METAFONT and METAPOST logos using recent versions of Knuth's `logo10` font family.

The url package is useful when one is typesetting significant numbers of file names, network addresses or URLs; it is being used in the present paper (not least in the bibliography).

[3] Those in the LATEX base distribution, or one of those in the `macros/latex/required` sub-tree on CTAN.

Although not necessarily recommended in all cases, many additional packages are commonly used: `microtype` can help reduce overfull boxes, sometimes it may be preferable to use the Latin Modern fonts via `lmodern`, `hyperref` allows for many internal links and other features, and of course individual papers may need to load particular packages for the subject at hand.

12 Bibliography

In short: our basic recommendation for handling bibliographies is to use BIBTEX and the plain bibliography style. No document options are needed or recommended. All that is required in the article source (as shown in the template available from `https://tug.org/TUGboat`) is the following:

```
\bibliographystyle{plain}
\bibliography{yourbibfile}
```

The rest of this section is about cases where, for whatever reason, you don't want to do that.

Bibliographic citations give much grief to the editorial team. Good publishing practice requires that there be editorial control of the way citations in a journal are presented yet, all too often, authors submit articles whose bibliography is formatted according to their preference. The important rules for authors, then, are that they *shouldn't* supply a `.bbl` file (BIBTEX processed output), and that they *shouldn't* write out a thebibliography environment, but should rather submit a working `.bib` file with their paper.[4] As with uncommon packages, the filecontents environment is a convenient way to deliver the bibliography file.

A special case is the accumulated bibliography of *TUGboat* itself;[5] it is always available to the production team, so authors may reference items from the `tugboat.bib` file without further ado.

Notwithstanding the general recommendation for the plain BIBTEX style, two citation styles are supported within *TUGboat* articles, '`raw`' and '`harvard`'. The raw citation style uses the 'standard' BIBTEX 'plain' (numeric) citation style. Raw citation is selected by default (by execution of class option rawcite).

Harvard citation may be selected by specifying harvardcite as an option of the `\documentclass` command. The macros used derive rather directly from the 'harvard' styles written by Glenn Paulley and

[4] The program bibextract, available from CTAN in directory `biblio/bibtex/utils/bibextract`, provides a convenient mechanism for extracting just the relevant portions of your bibliography database for submitting your paper; many of the common BIBTEX-database management packages, such as BIBDB or BIBTools offer similar facilities.

[5] Available on CTAN as `digests/tugboat/biblio/tugboat.bib`

now maintained by Peter Williams; the BibTeX style derives from one developed by Patrick Daly.

The basic citation format is 'author-year', but the macros are capable of many variations: this in turn places somewhat of a load on the author to use the correct citation macro. The macros available are shown in figure 2; the figure assumes an entry in the bibliography with authors Tom, Dick, and Harry, and with a 1990 date.

Macro	*Output*
`\cite{key}`	(Tom, Dick, and Harry, 1990)
`\citeA{key}`	(Tom, Dick, and Harry)
`\citeNP{key}`	Tom, Dick, and Harry, 1990
`\citeANP{key}`	Tom, Dick, and Harry
`\citeN{key}`	Tom, Dick, and Harry (1990)
`\shortcite{key}`	(Tom et al., 1990)
	[also has `A` and `NP` variants]
`\citeyear{key}`	(1990)
	[also has an `NP` variant]

Figure 2: The range of citations in harvard style

Note that, if Tom, Dick, and Harry are a prolific team, there can easily be more than one reference to their work in one year. In such a case, the citations will be (Tom, Dick, and Harry, 1990a), (Tom, Dick, and Harry, 1990b), and so on. These extra 'a', 'b', etc., tags may also appear in the references section of the paper, attached to the year recorded for the reference: whether this indeed happens is controlled by the extralabel and noextralabel class options. The default state (option extralabel) attaches the extra characters.

Bibliographies provide further problems because they're notoriously difficult to typeset at the best of times. LaTeX sets `\sloppy` when typesetting the bibliography, but this often leads to unpleasant output in the narrow columns typical of *TUGboat*. The author can control the typesetting using the command `\SetBibJustification`. The classes set `\sloppy`, by default (just like LaTeX), but the author may (for example) say:

```
\SetBibJustification{\raggedright}
```

as the present article does, to achieve somewhat better results.

A final note for citations: for references to other issues of *TUGboat*, please use the format *volno:issno*, e.g., "*TUGboat* 32:1" for volume 32, number 1.

13 Equivalences between the 'plain' and LaTeX *TUGboat* packages

A good proportion of the commands in the 'plain' packages also appear (with the same meaning) in the LaTeX classes. Figure 3 gives a brief summary of where the macros differ significantly.

Plain macro	LaTeX macro
`\head`	`\section`
`\subhead`	`\subsection`
`\subsubhead`	`\subsubsection`
`\list`	itemize, enumerate, etc., environments
`\verbatim`	verbatim or `\verb`
`\figure`	figure or figure* environments

Figure 3: Equivalences between plain and LaTeX *TUGboat* macros

LaTeX itself makes comprehensive provision for lists; the *TUGboat* classes make no attempt to emulate the list facilities of the 'plain' macros.

The 'plain' styles' provision for verbatim text is also somewhat different from the LaTeX approach; the *TUGboat* classes offer a small subset of the extra facilities that the 'plain' styles provide; for more elaborate facilities, the user is referred to the verbatim, listings, and fancyvrb packages (see section 8).

Of course, the syntax of commands given to the LaTeX classes is different (as discussed in section 5); arguments are (almost always) enclosed in braces, and neither of the forms of argument provision promulgated by the 'plain' macros (`\macro`⟨*argument*⟩ `\endmacro` and `\macro * ⟨argument⟩ *`) are provided by the LaTeX classes.

References

[1] Donald Arseneau. The url package. `https://ctan.org/pkg/url`, 2013.

[2] Carsten Heinz et al. The listings package. `https://ctan.org/pkg/listings`, 2015.

[3] Sebastian Rahtz, Heiko Oberdiek, et al. The hyperref package. `https://ctan.org/pkg/hyperref`, 2017.

[4] Rainer Schöpf. The verbatim package. `https://ctan.org/pkg/mflogo`, June 1996.

[5] Ulrik Vieth. The mflogo package. `https://ctan.org/pkg/mflogo`, 1999.

[6] Ron Whitney and Barbara Beeton. *TUGboat* authors' guide. *TUGboat*, 10(3):378–385, November 1989. `https://ctan.org/pkg/tugboat-plain`.

[7] Timothy Van Zandt et al. The fancyvrb package. `https://ctan.org/pkg/fancyvrb`, 2015.

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