The \LaTeX\ 2\epsilon TUGboat macros

Robin Fairbairns & TUGboat editors

1 Introduction

This is the documentation for the \LaTeX\ 2\epsilon macros to be used by TUGboat authors. The macros represent a development of the earlier \texttt{ltugboat} and \texttt{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 \LaTeX\3 team.

2 Availability

The TUGboat web pages are at: https://tug.org/TUGboat

They provide an article template, information for authors and reviewers, and the complete run of all published TUGboat issues, among other things.

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 ltugcomm.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 \texttt{\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 \texttt{\documentclass} command, and its body is enclosed in a \texttt{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 \texttt{ltugboat} class

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

\texttt{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.

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

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

\texttt{harvardcite} Specify Harvard-style citation (not recommended in general; see section 12); see section 12.

\texttt{noextralabel} Don’t use the extra label-distinguishing mark in the body of the reference; see section 12.

\texttt{nonumber} Sections are not numbered; section heading layout is to be as in the ‘plain’ tugboat styles.

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

\texttt{onecolumn} Typeset article in one column.

\texttt{preprint} Set up for a preprint.

\texttt{rawcite} Explicitly specify the standard \LaTeX\ citation method, which is the default; see section 12.

\texttt{runningfull} Information in both header and footer (default).

\texttt{runningminimal} Information in header only.

\texttt{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 (\texttt{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 \texttt{ltugboat} macros define \LaTeX\ commands and environments, or modify the definitions of \LaTeX\ ‘standard’ commands. Section 14 lists equivalences between macros defined by the ‘plain’ package and those defined by the new package.

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 \texttt{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 may 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.

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:
\begin{verbatim}
\section{Divisions of the paper}
\label{sec:divs-paper}
\end{verbatim}
and the command \nameref{sec:divs-paper} produces ‘Divisions of the paper’.

6.1 Abstracts

The ltugboat class provides two environments for abstracts, 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; this is rarely used.

6.2 Appendices

A paper may have appendices, which can be expressed in exactly the same way as they would be in the \LaTeX\ article class (confusing as that may be):
\begin{verbatim}
\appendix
\section{This is appendix A}
...
\section{This is appendix B}
\end{verbatim}
Which will produce ‘section’ headings similar to:

A This is appendix A

TUGboat articles may have a small extension to this format using an appendix environment:
\begin{verbatim}
\begin{appendix}
\section{This is the first one}
...
\end{appendix}
\end{verbatim}
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):

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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. Each author may also mention a web page, using a \personalURL command, and an ORCID (from orcid.org), using \ORCID.

For example, the present paper has (approximately) this at its start:
\begin{verbatim}
\title{The \LaTeX\ \TUB{} Macros}
\author{TUGboat editors}
\address{\TeX\ Users Group}
\netaddress{tugboat@tug.org}
\personalURL{https://tug.org/TUGboat}
\maketitle
\end{verbatim}

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):
\begin{verbatim}
\author{Michel Goossens}
\address{CN Division, CERN\%
	...
}
\netaddress{...}
\personalURL{...}
\author{Sebastian Rahtz}
\address{Elsevier Science Ltd\%
	...
}
\end{verbatim}
The general scheme looks like:
\begin{verbatim}
[small]
\[ ... \]
\end{verbatim}

The !<duration> is long ...

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.

- The \texttt{word} facility is lost when any package is loaded that also defines the \texttt{verbatim} environment, as discussed next.

Authors may wish to use a more featureful verbatim package, such as such as \texttt{verbatim} [4], \texttt{listings} [2], or \texttt{fancyverb} [7]. This is ok: it just means the \texttt{TUGboat} optional-argument feature is not available.

If you use the \texttt{listings} package, please specify:
\begin{verbatim}
\lstset{columns=flexible}
\end{verbatim}

The other values for the \texttt{columns} option don’t work well in \texttt{TUGboat}. Also, if you use \texttt{small} for displayed verbatim, please reset inline verbatim to the normal text size:
\begin{verbatim}
\lstdefinestyle{inline}
{basicstyle=ttfamily
ormalsize}
\end{verbatim}

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.

\footnote{\texttt{makeescape}, \texttt{makegroup}, ..., \texttt{makecomment}; used, for example, as \texttt{\makeescape\}}
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 tug.org/TUGboat/location.html have a more complete list, and of course the class sources are the ultimate reference.

<table>
<thead>
<tr>
<th>Macro</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>\ConText</td>
<td>ConTEXt</td>
</tr>
<tr>
<td>\Cplusplus</td>
<td>C++</td>
</tr>
<tr>
<td>\CTAN</td>
<td>CTAN</td>
</tr>
<tr>
<td>\LaTeXe</td>
<td>\LaTeX</td>
</tr>
<tr>
<td>\FAQ</td>
<td>FAQ</td>
</tr>
<tr>
<td>\HTML</td>
<td>HTML</td>
</tr>
<tr>
<td>\ISBN</td>
<td>ISBN</td>
</tr>
<tr>
<td>\KOMAScript</td>
<td>KOMA-Script</td>
</tr>
<tr>
<td>\LaTeXeX</td>
<td>\LaTeXX</td>
</tr>
<tr>
<td>\MacOSX</td>
<td>Mac OS X</td>
</tr>
<tr>
<td>\MathML</td>
<td>MathML</td>
</tr>
<tr>
<td>\MF</td>
<td>METAFONT</td>
</tr>
<tr>
<td>\MP</td>
<td>METAPOST</td>
</tr>
<tr>
<td>\OMEGA</td>
<td>\Omega</td>
</tr>
<tr>
<td>\PDF</td>
<td>PDF</td>
</tr>
<tr>
<td>\SGML</td>
<td>SGML</td>
</tr>
<tr>
<td>\TUB</td>
<td>TUGboat</td>
</tr>
<tr>
<td>\TUG</td>
<td>\TeX Users Group</td>
</tr>
<tr>
<td>\tug</td>
<td>TUG</td>
</tr>
<tr>
<td>\XML</td>
<td>XML</td>
</tr>
</tbody>
</table>

Figure 1: A few of the provided acronyms and logos

Authors are especially urged to note the `\acro` command, which is defined in the classes. The visual appearance of all-caps sequences among normal text is rather unpleasing in Computer Modern, unfortunately. Therefore, the `\acro` command typesets its argument one point size smaller than the surrounding text: 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.

### 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, authors can use non-standard packages in their papers. However, the paper does need to be processable on the TUGboat production computers (running current \TeX Live). A sensible mechanism for submitting out-of-the-ordinary packages (as for paper-specific bibliographies) is by use of the `filecontents` environment.

In general, packages currently on CTAN, and known to work with current \TeXX are unlikely to give problems. In particular, the team is happy to accept papers using packages that are supported by members of the \TeXX team, subject to the warning already mentioned (section 8): that use of the standard `verbatim` package eliminates the special `verbatim` facilities provided by the TUGboat classes.

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.

2 Those in the \TeXX base distribution, or one of those in the macros/latex/required sub-tree on CTAN.
At present, the list of canonically recommended packages consists of only two, mfllogo.sty [5] and url.sty [1].

Both classes will load the mfllogo 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 used in being used in the present paper (not least in the bibliography). Speaking of urls, nowadays we generally omit a leading http:// or https://.

Although not necessarily recommended in all cases, many additional packages are commonly used. To mention a few: microtype can help reduce overfull boxes; sometimes it may be preferable to use the Latin Modern fonts via lmodern; and hyperref allows for many internal links and other features.

12 Bibliography

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

\bibliographystyle{tugboat}
\bibliography{yourbibfile}

If you don’t have tugboat.bst, which was released in 2018, it’s fine to use plain or abbrv. If you do have it, though, you may enjoy the following small but useful features:

- It is based on abbrvurl.bst (see ctan.org/pkg/urlbst),
- thus supports url and doi fields, among others.
- The url field is ignored if either the doi or how-published field is present, since in practice we observe that people put the same information in all those fields, and we don’t want to use up space typesetting redundant information.
- Has even more abbreviations than abbrv, including printing only two author names (plus “et al.”) if there are more than four authors (thanks to Mico Loretan).
- Defines an @online entry type as an alias for @misc.
- For completeness only: tugboat.bst provides “secret” fields newpage to force a page break after the current item, and urlnewline to force a line break before the url value. We’ve found that these presentation tweaks are often necessary for the final typeset output. Authors need not worry about them.

If you use BibTeX, feel free to take advantage of the accumulated bibliography of TUGboat itself (info/tugboat.bib on CTAN), and the various compilations by Nelson Beebe in that same directory.

Bibliographies provide further problems because they’re notoriously difficult to typeset at the best of times. \TeX 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 \TeX), but the author may (for example) say:

\SetBibJustification{\raggedright}

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

A last note for bibliographies: for references to other issues of TUGboat, please use the format volno/issno, e.g., “TUGboat 32:1” for volume 32, number 1.

13 Non-recommended bibliography facilities

The preceding gives the bibliography recommendations for current TUGboat article. If, for whatever reason, you cannot follow the recommendation, this section is about some of the myriad historical and other possibilities.

Notwithstanding the general recommendation for the tugboat (falling back to plain) \TeX style, TUGboat’s Harvard citation support may be selected by specifying harvardcite as an option of the \documentclass command. If your article demands Harvard-style citations, you may prefer to load natbib or similar instead of using TUGboat’s facilities; that’s ok.

The basic citation format is ‘author(s), 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.

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

\[\text{\footnotesize \begin{itemize}
\item \cite{tom2010}
\item \cite{dick2010, harry2010}
\end{itemize}\]
Average 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)
\citeyear{key} (1990)

**Figure 2:** The range of citations in `harvard` style 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.

As for `BibTeX`, we don’t recommend it for `TUGboat`. If you feel you must use it, that is ok, but we may still change it to using the default `\LaTeX` and `BibTeX` facilities in processing for publication if the output from `BibTeX` is problematic, as we have often seen it to be.

### 14 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.

<table>
<thead>
<tr>
<th>Plain macro</th>
<th><code>\LaTeX</code> macro</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>\head</code></td>
<td><code>\section</code></td>
</tr>
<tr>
<td><code>\subhead</code></td>
<td><code>\subsection</code></td>
</tr>
<tr>
<td><code>\subsubhead</code></td>
<td><code>\subsubsection</code></td>
</tr>
<tr>
<td><code>\list</code></td>
<td><code>itemize</code>, <code>enumerate</code>, etc., environments</td>
</tr>
<tr>
<td><code>\verbatim</code></td>
<td><code>verbatim</code> or <code>\verb</code></td>
</tr>
<tr>
<td><code>\figure</code></td>
<td><code>figure</code> or <code>figure*</code> environments</td>
</tr>
</tbody>
</table>

**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} \endmacro`) are provided by the `\LaTeX` classes.

### References


Robin Fairbairns & `TUGboat` editors

tugboat@tug.org
tug.org/TUGboat