Volunteer work for the \LaTeX{}3 project

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1 Introduction

This is a call for volunteers to help in the development of \LaTeX{}3. There are many tasks needing to be done in support of the \LaTeX{}3 project which can be worked on concurrently with the development of the \LaTeX{}3 kernel. Furthermore, some tasks require special expertise not found among the core programming team. Initial research, analysis, and work on these tasks by volunteers can greatly speed up the process of integrating a number of desirable features into \LaTeX{}3. Many of these features can be extensively developed and tested under \LaTeX{}2.09 even before the \LaTeX{}3 kernel is available.

Therefore we are publishing a list of tasks to the \LaTeX{} user community through various channels and we ask readers to consider contributing some time and effort (particularly, but not exclusively, readers with expertise in the various areas touched on). The task list is distributed in the form of a UTEX article; it is fairly readable in electronic form, and it can be printed on paper if desired.

If you are interested in working on a particular task, see Appendix A for details on how to volunteer. The task list will be updated at regular intervals. For instructions on obtaining a copy from the public archives, see Appendix B.¹

2 General tasks

2.1 Volunteer list management

Organization, publication and maintenance of the general volunteer task list.

*List manager:* George Greenwade.

2.2 Validating \LaTeX{}2.09

Writing test files for regression testing: checking bug fixes and improvements to verify that they don’t have undesirable side effects; making sure that bug fixes really correct the problem they were intended to correct; testing interaction with various document styles, style options, and environments.

We would like three kinds of validation files:

1. General documents.
2. Exhaustive tests of special environments/modules such as tables, displayed equations, theorems, floating figures, pictures, etc.
3. Bug files containing tests of all bugs that are supposed to be fixed (as well as those that are not fixed, with comments about their status).

A procedure for processing validation files has been devised; details will be furnished to anyone interested in this task.

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3 Syntax questions

3.1 *.sty* metacomments for smart editors

Develop conventions for documentation of styles which could be picked up by editor packages to provide editing help.

The idea is to place metacomments in *.sty* files which smart text editors (in particular) can use to get information about the ‘exported’ (user interface) macros for that particular style. The information would be useful for word completion and spelling checking, at least. (The auc-tex package for GNU Emacs currently has such information hard-wired for a number of common styles.) If the editor has access to the \verline{documentstyle} line or suitable alternative instructions it can poke about in the appropriate style files rather than using its own database. Such information could be written out by a run with \doc*.sty on the basis of \Describe {Macro, Env} commands in the .doc file and subsequently included in the docstrip’ped .sty file. That’s easy enough, but if it’s to be generally useful the result ought to be somewhat standardized and in a form suitable for use by as many editors or other tools as possible.

Would conventions for supplying other information this way be useful (along the lines of the PostScript structuring conventions)?

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3.2 Syntax proposal for bibliographical commands

Extensions of current \LaTeX{} syntax for \cite commands and bibliography commands. A number of specialties have conventions for citations and bibliographies that \LaTeX{} 2.09 is ill equipped to handle.
David Rhead published several papers concerning the handling of bibliographies and citations [Rhe90, Rhe91a, Rhe92a, Rhe92b]. Some of them have been distributed via the \texttt{latex-1} mail list. Counter-proposals or further argumentation for David Rhead's ideas would be useful.

\textit{Coordinator: Open}

### 3.3 Research on syntax for tables

What features are important (and not covered)? Logical representation of tabular material versus visual representation. Syntax proposal and report.

About tabular material presentation many interesting papers are published. For example, general articles [Bea86, Bea85]; \LaTeX\ related [Car90, Car91, Rhe91b]; logical table representation [Van92]. Important work was done by Michael Spivak in [Spi89] and of course in his "Tables to die for" (T2D4). Standard books on typesetting (But81, McL80, Chi82, Whi88), to name only a few) also usually contain important information about tabular typesetting. What is necessary is a survey of the requirements for tabular material in printing, a proposal for an extended standard syntax, and perhaps a proposal for syntax of extra features that could be provided through a separate 'super tables' module that is not loaded until the user requests it.

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### 3.4 Research on syntax for chemistry

The typography of chemical texts is rather different from, say, mathematics. We need a taxonomist to classify the primary elements of an article or book on chemistry and suggest syntax for user commands to handle each element. What proportion of chemical diagrams can be constructed with primitive line graphics such as given by the \LaTeX\ picture environment (with suitable extensions)? Or should diagrams just always be done in some other graphics language and imported via \texttt{\textbackslash special}? What happens if... and so on. This would also make a good article for \textit{TUGboat} if the report were given some finishing touches afterwards.

\textit{Coordinator: Open}

### 4.1 Experimenting with \textbackslash emergencystretch

Testing the new features of \TeX\ where no experience is available so far. Writing up a report.

Research on \texttt{\textbackslash emergencystretch}, in particular, is an important area where the \TeX\ community doesn't have enough experience so far, e.g., what are good values in what situations, why? What happens if... and so on. This would also make a good article for \textit{TUGboat} if the report were given some finishing touches afterwards.

\textit{Coordinator: Open}

### 4.2 Research on indexing commands

What kinds of indexes are needed for various fields? What kinds of indexes are needed for various specialties? What kinds of \texttt{\index} commands/syntax need to be provided for marking entries? What kinds of commands need to be provided for printing indexes after they have been processed by a program like \texttt{MakeIndex}?

\textit{Coordinator: Open}

### 4.3 Research footnote/endnotes conventions

What conventions are used for various specialties? What user commands and syntax would be recommended? Report on the results.

\textit{Coordinator: Open}

### 4.4 Syntax diagrams

Designing a command syntax (and implementation in \texttt{\LaTeX}2.09) for syntax diagrams used to illustrate programming language syntax.

The described syntax is probably not appropriate for \LaTeX{} and the implementation needs refinement since it was done for \TeX{} 78 but it is a good starting point.

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### 4.5 BNF notation

Designing command syntax and prototype \LaTeX{}-2.09 implementation for BNF (Backus-Naur) notation used to describe syntax of programming languages.

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### 5 Research tasks (cont.)

#### 5.1 Research on use of shorthand forms

In SGML there is a concept called ‘short ref’ which means for example that the double quote character ” can be defined to produce directional quotes, blank line can be interpreted as end of paragraph, and so forth.

What kind of similar shorthand forms in ASCII files may be desirable for \LaTeX{} users, e.g., => to be converted to \&\& or <> to be converted to \&\& \&, ? to be converted to upside-down Spanish question mark, "u to be converted to umlaut ü, and so forth. What conventions are currently in use for various kinds of documents?

Something along these lines is currently done in \AmS-\TeX{} with the $ character: $ is a shorthand meaning ‘nonbreaking hyphen’, $ is a shorthand meaning one-tenth of a thinspace, $ is a shorthand for an extensible right arrow, and so forth.

It is envisioned that in \LaTeX{}3 the user will be allowed to designate certain characters to be shorthand initiator characters. For efficiency reasons, the set of allowed initial characters will probably be restricted to nonalphanumeric only.

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#### 5.2 Research on figures and captions

What rules are in common use for placement and formatting of floating figures and their associated captions? Propose syntax for user commands. Write report.

Placement rules for floats and their captions are so far very limited in batch formatters like \TeX{}. We are interested in rules for such placement which are used in practice, algorithms, and possible user syntax. What could be a good user syntax for putting captions above, below, on the side, centered or top or bottom or left or right? Do we need to allow different action for different classes of floats? What do we need for multi-figure groups and their captions?

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#### 5.3 Research on the use of $ conventions

Check the actual use of the $ convention for special characters in the \LaTeX{} community by polling as many users, organizations, mail-lists, usenet groups, etc., as possible. Write report.

In \TeX{} the $ notation is sometimes used for access to unusual characters (< 32 or > 126). It would be useful to separate this function from the superscript function by assigning it to some character other than $, if that would not be too large an inconvenience for users. One approach, for example, would be to change $ and $ to be active characters so that they can always keep track of current math style, which would allow a better definition for \texttt{\mathchoice} and simplify many things having to do with math fonts. It seems that the $ notation is indispensable only when the character is used in a control sequence name or as a macro argument delimiter (or in hyphenation patterns?). Note: document styles are of less concern since they will have to be mostly rewritten for \LaTeX{}3 anyway.

**Coordinator:** Open

#### 5.4 Research on typographic conventions and requirements in multilingual environments

Typographic conventions differ from one language/country to another. Collect information about such conventions and try to identify the basic data-types and operations required in \LaTeX{}3, so that most or, ideally, all features necessary for the support of many languages can be implemented in the \LaTeX{}3 programming language.

It would be helpful also to include anything whose provision is already supported by the babel system and/or other systems: e.g., hyphenation.

**Coordinator:** Open

### 6 Miscellaneous items

#### 6.1 Math font handling

Test math font handling in the latest release of NFSS and write up detailed comments.

Last year there was some discussion among the \LaTeX{}3 programmers and others on how to handle math fonts under an enhanced release of NFSS for \LaTeX{}3. The discussion finally drifted off into areas that are far beyond the scope of the \LaTeX{}3 project but the actual questions that were raised have not
yet been answered. The only contribution that came close was the detailed suggestion and experience report by Sebastian Rahtz about the alpha release for an extended text font handling which was sent around via the latex-1 list.

A related, but separate, subtask involves thinking about proper math font handling taking into account the papers already sent around.

**Coordinator:** Open

### 6.2 Converting numbers to textual form

Currently counter values can be displayed in certain styles, e.g., as roman numerals. But it may be interesting to extend the available commands by cardinal and ordinal representations, e.g., $5 \rightarrow$ ‘five’ or ‘fifth’ (for example, if you wanted to refer to ‘the fifth item’ in a list using something like \textit{LATEX}'s \texttt{\textbackslash ref}). Spivak’s \texttt{LAM\textsc{E}X} has \texttt{\textbackslash cardinal} and \texttt{\textbackslash ordinal} macros to do this, for handling cross-references such as ‘the fifth item in the list’ where ‘fifth’ is supposed to be generated by a \texttt{\textbackslash ref} command. The main question: How much do we need this capability? Should it be standard, or merely a nice option for those who want it? Can it be easily extended to support various language conventions? Are there other significant uses besides the cross-reference idea?

**Coordinator:** Open

### 7 Miscellaneous items (cont.)

#### 7.1 Rewrite MakeIndex in WEB

Convert/rewrite the C source code of MakeIndex. For consistency it would seem desirable to have all auxiliary programs designed for use with \textit{LATEX} to be compilable in the same way as \texttt{T\textit{E}X}. Currently this means use of the \texttt{WEB} language, with or without the \texttt{CWEB} intermediate step.

Furthermore, the MakeIndex program could use some work to deal with a few shortcomings that have become evident with the passing of time and extended usage.

**Coordinator:** Open

#### 7.2 Write other auxiliary programs

Create programs for support tasks related to \textit{LATEX} documents but not part of the primary typesetting functions.

Question: what other auxiliary programs do we need? Conjectures: Compiled version of docstrip? Programs to help designers in creating document styles? Program for dealing with graphics files in various formats (e.g., read Bounding Box comments from a PostScript file and compute scaling and translation numbers for passing to a \texttt{\textsc{IP-TEX}} \texttt{\textbackslash special} command)? Checksum utility by R. Solovay for updating Nelson Beebe’s standardized file headers. Auxiliary program to help in constructing complicated tables (decimal point alignment, row spanning, other fancy effects that are hard to do in \texttt{T\textit{E}X} currently)? Auxiliary program similar to Type & Set to do interactive page-breaking/float placement?

**Coordinator:** Open

#### 7.3 Bibliography style programming

Write bibliography styles for \texttt{BIB\textsc{T}EX}. The current version of \texttt{BN\textsc{T}EX} is 0.99. A reimplementation of \texttt{BN\textsc{T}EX} for \texttt{IA\textsc{T}EX}3 is under way, by Oren Patashnik. When this is finished, or perhaps even before, suitable standard bibliography styles for \texttt{IA\textsc{T}EX}3 need to be written.

Pending because of status of \texttt{BN\textsc{T}EX}

#### 7.4 Bibliography style requirements

Collect available \texttt{BN\textsc{T}EX} versions and, if possible, further journal and publisher requirements regarding bibliographies and analyze them. Summarize the functionality of each style, whether or not it is easily programmable with the current \texttt{BN\textsc{T}EX}, what special functions would be helpful, etc.

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#### 7.5 Survey of existing \texttt{IA\textsc{T}EX} style options

Using David Jones’ \texttt{TeX-Index} (and any other useful sources), evaluate the status of the many \texttt{IA\textsc{T}EX}2.0\texttt{9} options currently available, e.g., whether they are up-to-date, whether the authors still support them, or if unsupported, whether they are interesting enough to make it worthwhile to seek a new maintainer for them.

Write a report indicating the status of each style option, a short description of its features and, if it is not maintained, if you think it is worth upgrading or maintaining it.

\texttt{TeX-Index} is an index of \texttt{(IA)\textsc{T}EX} macros. From its documentation:

The most recent version is always available by anonymous FTP from \texttt{theory.lcs.mit.edu} in the directory \texttt{pub/\texttt{tex}/\texttt{TeX-Index}}.

Copies can also be obtained from the following locations:

- archive.cs.ruu.nl \texttt{TEX/DOC/\texttt{TeX-index.Z}}
- ftp.th-darmstadt.de \texttt{pub/\texttt{tex}/\texttt{documentation/\texttt{styles-and-macros.Index.Z}}}
- ftp.math.utah.edu \texttt{pub/\texttt{tex}/\texttt{tex-index}}