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## General Information

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A brief history of the project and a description of its aims is contained in `13d001.tex`.

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- For offers of technical assistance, contact the project at one of the above addresses.
- For technical enquiries and suggestions, send e-mail to the LaTeX-L list (see above) or contact the project by letter or FAX at the address above.

# Validation of L<sup>A</sup>T<sub>E</sub>X 2.09 as part of the L<sup>A</sup>T<sub>E</sub>X3 project

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25 March 1993  
Version 1.02

## Abstract

This is both a call for volunteers to help us in validating L<sup>A</sup>T<sub>E</sub>X 2.09 (one of the tasks of the L<sup>A</sup>T<sub>E</sub>X3 project), and a brief explanation of the kind of work to be done in this area.

## 1 Task description

The following is a short task description as it appears in the volunteer task list document for the L<sup>A</sup>T<sub>E</sub>X3 project [?]:

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).

## 2 Introduction

As coordinator of the task called "Validating L<sup>A</sup>T<sub>E</sub>X 2.09", I would like to invite some of the L<sup>A</sup>T<sub>E</sub>X users to join our group. Some work has been done already, but a lot remains to be done; at present only two people are working on this task and I am afraid it is not enough if we want to be able to complete the job in a reasonable amount of time. The total amount of time required was estimated by Frank Mittelbach around 2 to 3 weeks, but Knuth's well known correcting rule should probably be applied to these figures...

I expect that a small team of four to five persons, spending each a limited amount of time for the project could be much more efficient and complete the job by the end of 93 or even earlier.

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This task does not require a T<sub>E</sub>Xpert (I'm not one myself but T<sub>E</sub>Xperts are welcome!) and offers anybody wanting to help the L<sup>A</sup>T<sub>E</sub>X3 project a good opportunity to support this ambitious and motivating project.

I imagine that anybody having taken part in the project, even in a very tiny bit of it, will feel a lot happier using L<sup>A</sup>T<sub>E</sub>X3 when it is available and this pleasure will 'overcompensate' the time spent.

### 3 Goals and methods

The idea is to have a suite of test files, each one exercising a particular set of related commands. These should be called in such a way that one can tell from the .log file (not the .dvi file) that the command has 'met its specification'. The .log file is then edited to remove certain irrelevant information and will then be stored, as a .tlg file. Before a new release is issued, all the test files will be run through the new version, and the resulting .tlg files will be automatically compared with the saved original versions. Any tests which do not produce identical results will then be notified to the maintainer of L<sup>A</sup>T<sub>E</sub>X, who can visually compare the .tlg files to see whether the differences are due to an 'improvement' or are the result of a newly introduced bug!

The first thing we started with was to get the bug lists of the parts of L<sup>A</sup>T<sub>E</sub>X 2.09 which are used as basis for L<sup>A</sup>T<sub>E</sub>X3, that is latex.tex, the standard style files (article, book...), the so-called Mainz files (nfss, array.sty, verbatim.sty...). The testing of reported problems usually exercises tricky parts of the code and I believe that making sure that the reported bugs are no longer present (or to *know* that they are not corrected yet) is a better start than trying random texts.

When I start a series of validation tests, I first copy all the bug reports of the part I am testing into the .lvt file (the L<sup>A</sup>T<sub>E</sub>X sourcefile containing the tests). Then, for each bug I try to build a short text that is supposed to show the bug. If I can't (either because I do not fully understand the bug report or for any reason) I leave the bug report with no test following it, in order to keep the full list of what should be tested; someday myself or somebody else might find a way to check it.

What seemed not so easy (for me anyway) at the beginning was to manage to get the meaningful information into the .log file and not just on the screen or the .dvi file. Fortunately, Frank Mittelbach provided an input file called test209.tex which contains helpful macros and David Carlisle wrote a paper explaining what to do [?].

There are two main methods of passing relevant information to the .log file.

#### 3.1 The \showoutput command

The easiest way is to use the standard L<sup>A</sup>T<sub>E</sub>X command `\showoutput`; all the material present in the part of the .dvi file following that command will appear in the .log file. The main drawback of this is that you get a huge .log file containing a lot of uninteresting things. Nevertheless I use this command for instance when I am checking the contents of headers, footnotes, margin notes or margin dimensions.

Here is an example: bugs 190 and 198 in latex.tex. The problem is the use of fragile commands in a footnote. I make a (nearly) empty page containing only a line of text calling the footnote.

```
%190. Fragile commands in the definition of \thefootnote led to
%an error, even with the use of \protect. (Found by Chris Hamlin.
%Corrected 1 Nov 91.)
%198. Fix 190 did not go far enough. (Found by Chris Rowley.
```

```

% Corrected 22 Nov 91.)
%
\newpage {

\bugid1{190-198}

Let's make a footnote\footnote%
{This footnote includes fragile commands:\\
\begin{enumerate}
\item[\protect\(\ * \protect\)] First,
\item[\protect\(\ ** \protect\)] second,
\item[\protect\(\ *** \protect\)] third.
\end{enumerate}
}

\showoutput

\newpage
}\nonstopmode

```

The whole page is included in braces to restrict the scope of the `\showoutput` command and prevent the following tests falling into the `.log` file.

### 3.2 The `\showbox` command

Another possibility is to build a box containing just the material related to one precise bug. Suppose you have privatized a box (one for the whole test file) using the T<sub>E</sub>X command

```
\newbox\test
```

then you can use `\setbox` to fill it with a `\hbox` or `\vbox` containing your material, as in the following example which deals with bugs 138, 158 and 217 of `latex.tex`:

```

%138. A command like \index or \label could incorrectly suppress a
%space after the next \end command. (Reported by Johannes Braams.
%Partially fixed on 30 Nov 88. Problem can still occur if \index
%or \label command comes inside the \end's environment.)
%158. The fix mentioned in 138 was added to the comments, but not
%to the code. (Reported by Piet van Oostrum in TeXhax V90 #42,
%corrected 2 May 90.)
%217. The fix mentioned in 138 and 158 was done wrong in the code.
%Also the problem was now corrected completely by introducing a
%new control sequence. (Suggested by Piet van Oostrum.
%Corrected 18 Mar 92.)
%
\bugid{138-158-217}

\setbox\test\vbox{%
This is a tabular environment\label{tab1}\\
\begin{tabular}{lcr}

```

---

<sup>1</sup>`\bugid` is a command provided in `test209.tex` which prints its argument (the bug number), in both `.dvi` and `.log` files.

```

aaa &bbb &ccc\label{tab2}\\
\end{tabular} followed by a space.
Compare with the same\\
\begin{tabular}{lcr} aaa &bbb &ccc\label{tab3}\\ \end{tabular}NOT followed by a space.}
{\showboxdepth3\showboxbreadth999\showbox\test} \box\test

```

The command `\showbox` copies the box to the `.log` file and the commands `\showboxdepth` and `\showboxbreath` allow you to control the exact amount of information you want in the `.log` file (see the T<sub>E</sub>Xbook p. 302 for the details).

`\box\test` prints the box into the `.dvi` file, so that you can check the result on your previewer: the first tabular should be followed by a space, and not the second.

## 4 What is already done

As mentioned above, we have chosen to first of all tackle the bug lists of the main L<sup>A</sup>T<sub>E</sub>X files. Tests already completed or about to be are:

- `nfss.tex` (version 1), a new version called `nfss 2` is about to be released, some new checking will probably be required.
- `latex.tex` most of the checking is done, the remaining part is on the way.
- the basic styles files are being checked by Chris Martin<sup>2</sup>.

All the `.lvt` test files already completed, as well as the tools provided by Frank Mittelbach, are of course available on request to those who want to help us in validating L<sup>A</sup>T<sub>E</sub>X 2.09.

## 5 What remains to be done

I would like to have the validation of the Mainz files completed as the next step:

- `array.sty`
- `ftn.sty`
- `multicol.sty`
- `theorem.sty`
- `verbatim.sty`<sup>3</sup>

Another direction would be (drifting apart from checking previous bugs) exhaustive tests of special environments or modules such as tables, floating figures, pictures etc.

It would also be interesting to imagine complicated combinations of environments to check the robustness of L<sup>A</sup>T<sub>E</sub>X 2.09 when different environments interact together. If anybody has experience in this area, having, for instance, found a workaround where L<sup>A</sup>T<sub>E</sub>X doesn't behave as would be expected or desirable, it would be of great interest for us to hear about these experiments.

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<sup>3</sup>very recently Mark Senn `mds@stat.purdue.edu` volunteered to validate `verbatim.sty`.

## References

- [1] Frank Mittelbach and David Carlisle. The `validation` package. Distribution of tools for automatic validation of changes in large macro packages, June 1992.
- [2] Frank Mittelbach, Chris Rowley, and Michael Downes. Volunteer work for the L<sup>A</sup>T<sub>E</sub>X3 project. *TUGboat*, 13(4):510–515, December 1992.