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LaTeX Memos and Letters

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ABSTRACT

Letters and memos at Los Alamos National Laboratory (LANL) are formatted in accordance with rules established in the Laboratory's Office Procedures Manual. LaTeX style files were written to let people produce letters and memos without worrying about a complicated set of rules. Macro and template files are distributed through the Laboratory's Change Control system for use on VAX/UNIX, VAX/VMS, Sun, Apollo, and IBMPC. A testbed of several hundred test files is used to minimize bugs in the distributed versions.

There is a choice of Computer Modern fonts or PostScript fonts. Memos and letters can be printed in Roman or typewriter typefaces. When called for, classification labels will be printed on every page. Headers on pages following the first page are compiled from information found on the first page. Letters can handle multiple addresses. Default options are provided where applicable, and error messages warn users about missing information fields.

1. Introduction

In 1984 a Publication Strategy Team was formed at Los Alamos National Laboratory to make decisions about future directions to be taken in text formatting and publication. One of the decisions reached was to choose LaTeX, TeX, and `troff` as the text formatters that would be supported by the Computing and Communications Division. LaTeX was picked as the formatter of choice due to its ease of use and declarative interface. LaTeX, written by Leslie Lamport, is a document preparation system based on TeX.

To encourage people to use LaTeX the Computing and Communications Division embarked on a project to provide LaTeX style files for the commonly used Laboratory documents, such as memos, letters, and reports. The formats of these document types are well established at LANL, and have been formalized in the *Office Procedures Manual* (OPM).

2. Approach

We started with the memo style because it is the most frequently used document type. We wanted to provide an easy to use, well documented utility, that was capable of producing memos in accordance with the OPM. I became the designated LaTeX macro writer. At the time I knew how to use and install TeX, but I had no experience with LaTeX or with writing TeX macros.

My hope was to be able to write the LaTeX style file using nothing but LaTeX commands. I began by using LaTeX's picture environment to format the memo header and the list environment to format the opening and closing lists in the memo. When I began to work on the user interface and second-page headers, however, it became obvious that I was going to have to learn a lot about writing macros in TeX. LaTeX by itself is not well equipped to handle the loops, the ifs, and the token manipulation that is necessary for writing a sophisticated macro package. To increase my limited knowledge of TeX I took TUG's courses on writing TeX macros, LaTeX macros, and output routines.

Studying LaTeX's macro files was essential in writing the memo macros. The macro files that I borrowed from include latex.tex, lfonts.tex, letter.doc, article.doc, and art10.doc. I began by copying over half of letter.doc, Lamport's letter style file, into the memo style file. This was useful for defining

basic elements of the memo such as page layout, paragraphing, and many of LaTeX's environments. The article style files provided the figure, table, and bibliography environments. Code taken directly from the letter and article styles provided over one quarter of the final memo style file.

The latex.tex file is a large collection of macros that define elements of LaTeX that are common to all LaTeX styles. Some of latex.tex's macros, such as **\@item** and **\@outputpage**, were lacking one or two features that were needed for memos. In these cases, I copied the macros into the memo style file, making and commenting changes to the necessary lines. During debugging stages, faulty interaction between latex.tex and the memo style file was common. It was helpful to temporarily move selected latex.tex macros into the memo style file, where **\typeout** commands could be used to follow execution.

After the memo style file had been distributed to LANL's TeX community, I began to work on the letter style file. Most of the memo style transferred directly to the letter style. New features were added to the letter style file where needed.

It took about three person months of work to complete the memo style file, and another month or two to finish LaTeX letters. A month or so of this time was devoted to learning TeX inside and out. There was perhaps a two week investment in getting familiar with LaTeX's macro files. Several weeks were spent working on the testbed for memos and several more weeks on the testbed for letters.

In the sections below I will talk about many of the features and some of the programming tricks used in the memo style file. I will then talk about some of the features unique to the LANL letter style file.

3. LaTeX Memos

3.1 Layout of a LaTeX file

The format of a memo's source file is similar to the general layout of any LaTeX document.

```
\documentstyle{memo}
      .
  The preamble, commands such as
      .
    \to{...}
    \from{...}
    \headerfonts{...}
    \enclosures{...}
       .
       .
       .
\begin{document}
\opening
      .
  Body of memo
      .
\closing
\end{document}
```

The **\documentstyle** command is used by LaTeX to load in the memo.sty style file. The memo.sty file defines all the commands used to print a memo. An optional argument asks for eleven or twelve point size rather than the default ten point size.

The philosophy of the preamble is to free the user from having to know anything about the layout of the opening or the closing of the memo. The preamble contains all the commands that affect the opening and closing of the memo. These commands may be entered in any order. The style file ensures that everything will be printed in the right place. One doesn't need to know, for example, whether the distribution list comes before or after the list of enclosures.

All of the preamble commands are optional. When a preamble command is omitted from the preamble, one of three things happens. One, that part of the memo, such as a list of enclosures, may not be required in a memo, so it is simply omitted from the memo. Two, there may be a default for

that command. For example, if no font is given for the body of the memo, the Computer Modern fonts will be used. Three, if the omitted command is required, such as the \to command, the memo will be printed with that field left blank. A warning message will be printed in the log file that tells the user how to fix up his input file.

The \opening command prints the header on the first page of the memo, including the information that tells who the memo is going to, the sender's mail stop, and so forth.

The body of the memo comes after the \opening command. One can use any of the standard LaTeX commands within the body of the memo.

The \closing command prints the part of the memo that comes after the body of the memo. This includes the sender's initials, the distribution list, the list of enclosures, and so on.

3.2 Opening of a Memo

Here is an example of the beginning of a memo file that uses all of the fields that can be printed in a memo header. Figure 0.1 shows the top of the printed memo from this example.

```
\documentstyle{memo}
\to{A. S. Harris, X-7, MS B257}
\from{S. R. Groves, X-7, MS B257}
\thru{L. S. Steele, X-5, MS B567}
\subject{Interruption of Building Schedule}
\reference{Memo, Maestas to Platz, March 12, 1989, CT-6-88}
\reference{Subject OPM-1-3, Office Procedures Manual}
\mailstop{B257}
\telephone{7-4555}
\symbol{X-7}
\serialnumber{111}
\headerfonts{postscript}
```

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: A. S. Harris, X-7, MS B257 DATE: June 19, 1989

THRU: L. S. Steele, X-5, MS B567 MAIL STOP/TELEPHONE: B257/7-4555

FROM: S. R. Groves, X-7, MS B257 SYMBOL: X-7-111

SUBJECT: INTERRUPTION OF BUILDING SCHEDULE

REFERENCES: 1. MEMO, MAESTAS TO PLATZ, MARCH 12, 1989, CT-6-88
2. SUBJECT OPM-1-3, OFFICE PROCEDURES MANUAL

A series of unfortunate events has interrupted the building schedule of the RTX project, causing us to request a postponement of the work shown

Figure 0.1: Opening and first paragraph of a memo.

Notice that the subject line is always printed in uppercase In this example, two references were mentioned. When one reference is given, the word "REFERENCE" is printed rather than "REFERENCES" (see figure 0.2). The \thru, \serialnumber, and \reference information is optional. When the \serialnumber is not given, the \symbol will be printed by itself, without the trailing dash.

When the \thru command is not used, a different style of header is printed. Figure 0.2 shows an example of a memo printed in the "thruless" style. It is worth noting that the user does not have to

be aware that there are two different styles of memo headers. The style file selects the right header on the basis of the information given in the preamble.

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

memorandum

TO: A. S. Harris, X-7, MS B257 DATE: June 16, 1989

FROM: S. R. Groves, X-7, MS B257 MAIL STOP/TELEPHONE: B257/7-4555

SYMBOL: X-7-111

SUBJECT: INTERRUPTION OF BUILDING SCHEDULE

REFERENCE: MEMO, MAESTAS TO PLATZ, MARCH 12, 1989, CT-6-88

A series of unfortunate events has interrupted the building schedule of the RTX project, causing us to request a postponement of the work shown on Job Order J87940.

Figure 0.2: Opening of a memo with no THRU.

3.3 Fonts

There are four possible arguments to the **\headerfonts** command: tex, postscript, lafonts, and memopaper. Each does its best to mimic the preprinted memo paper that secretaries push into a typewriter. When TEX fonts are used, the Computer Modern fonts closest in appearance and size are used. While this provides only a rough approximation to the correct fonts, this option is the default for the **headerfonts** command. Computer Modern fonts allow printing of a memo with a bare-bones installation of TEX.

When **\headerfonts{postscript}** is used, PostScript fonts are used to print the header. The hollow letters used to print "Los Alamos" are created by using a **\special** command to include PostScript code into the **dvi** file. In order for this to work, Arbortext's DVIPS must be used to create a PostScript file. At Los Alamos we have standardized on DVIPS as the PostScript driver. All the commonly used systems (VAX/UNIX, VAX/VMS, Sun, Apollo, and IBMPC) have site licenses for DVIPS.

The best looking fonts for Los Alamos headers come from Metafoundry in Dublin, Ohio. The **\headerfonts{lafonts}** command calls for the Metafoundry fonts. We bought a site license for these fonts so that all our users have access to them. If a user has installed these fonts, a header that is indistinguishable from the preprinted memo paper can be printed.

Users also use **\headerfonts{memopaper}** to print their memos on preprinted memo paper. In this case a piece of memo paper is put into the printer. Of course, there is usually a problem when trying to print onto a preprinted piece of paper. The LATEX output will very rarely line up just right with the "TO:," the "FROM:," and so forth. To overcome this problem, the user can specify a horizontal and vertical correction to match any particular combination of printer and preprinted header paper.

3.4 The Body of the Memo

Any command mentioned in the Lamport's LATEX manual can be used in the body of a LANL memo. The first version of the memo style followed Lamport's letter style in leaving out the table, figure, and bibliography environments. Some of the first calls I got were from people asking why they could not use the figure and bibliography environments in their memos. So I added them into the second version.

There are two styles of memos at LANL. The commonly used one is single-spaced with block paragraphs. There is another one for memos of ten lines or less that is double-spaced with indented paragraphs.

For the body of the memo, a user can specify either PostScript or Computer Modern fonts. The user can also choose between the Roman or typewriter typefaces. Some users feel (strongly) that a memo that looks like it came out of a typewriter looks more professional than one that came out of a printer. Others feel that the typewritten look is humbler and less extravagant looking, therefore better for obtaining grants and funds. So I provided the typewriter typeface.

One of the more difficult challenges in writing LANL's style files was to accommodate the typewriter typeface. In regards to everything from hyphenation to vertical spacing to list formats, TeX and LaTeX are designed with a variable spaced font in mind. To truly emulate a typewriter, it is necessary to have all the lines spaced evenly down the page and characters spaced evenly across the page. This requires an if statement and parallel code at nearly every turn.

3.5 Closing of a Memo

Here is the input that creates a memo with most of the options that can be printed in the closing of a memo. Figure 0.3 shows the closing of the printed memo from this example. Not shown in this example are command calls that print "Enc. a/s" and "Attachments a/s."

```
\originator{srg}
\typist{jak}
\signature{Betty J. Donaldson}
\signer{bjd}
\approval{R. J. O'Conner \\ ST Division Leader}
\cy{T. J. Benton, WX-5, MS G780 \\ A. L. Salazar, X-7, MS B257}
\enc{Graph, Dan K. Lookce, TP-3, MS B882}
\enc{Drawing No. 3988-R}
\attachments{Graph, Fallout v.s. Image Time, TP-3, MS B881}
\attachments{Memo, Maestas to Platz, March 12, 1989, CT-6-88}
\distribution{K. C. Jordan, C-5, MS B775 \\
              M. K. Solomon, TP-1, MS B233 \\
              A. J. Gomez, TP-2, MS B234 }
```

LaTeX's list environment provides an easy set of tools for formatting the various types of lists used in the memo macros. The list environment does not keep track of widow and orphan lines, however, so code was added to LaTeX's \@item definition to keep the first two and last two items of a closing list together on the same page. There are also page breaking commands that allow the user to begin a specified closing list on a new page.

3.6 Classification Labels

At Los Alamos some memos are classified secret, confidential, or unclassified. When using a typewriter, paper is used that has the classification marked on the top and bottom of the page. If TeX fonts are being used in the memo, the font cmss10 scaled \magstep5 is used to approximate the preprinted classification paper. If PostScript fonts are used, a \special command uses PostScript code to simulate the tall, skinny, and bold font used on preprinted classification paper. DVIPS's overlay facility is used to overlay the classification labels on each page. A 29-point Helvetica font is compressed horizontally and then overstruck to give the desired look.

4. Token Formats

Many of the lists used by the memo commands can have multiple entries. The list of items can be specified in one command call with \\s separating items on the list. A list of items can also be built up by multiple calls to the same command. For example,

```
\cy{R. T. Smith, C-2, MS B263 \\ Files}
```

and

```
\cy{R. T. Smith, C-2, MS B263}
\cy{Files}
```

```
We will not need your services until the torus has arrived and has been
installed by our technicians.  Work may then proceed as outlined in the
original set of milestones.


Betty J. Donaldson

BJD-SRG:jak


APPROVED BY: ____________________________________________________
             R. J. O'Conner                                  date
             ST Division Leader

Enc. 1. Graph, Dan K. Lookce, TP-3, MS B882
     2. Drawing No.  3988-R

Attachments:
1. Graph, Fallout v.s.  Image Time, TP-3, MS B881
2. Memo, Maestas to Platz, March 12, 1989, CT-6-88

Distribution:
K. C. Jordan, C-5, MS B775
M. K. Solomon, TP-1, MS B233
A. J. Gomez, TP-2, MS B234

Cy:  T. J. Benton, WX-5, MS G780
     A. L. Salazar, X-7, MS B257
```

Figure 0.3: Last paragraph and closing of a memo.

are equivalent.

A macro named **\@toksinput** takes care of building up these lists. When a command such as the **\cy** above is called, it in turn issues a command of the form

```
\@toksinput{cy}{R. T. Smith, C-2, MS B263 \\ Files}
```

\@toksinput then increments a counter that keeps track of how many cy's there are on the list. The list items are appended to a token variable that has the form

```
\@tokscy={R. T. Smith, C-2, MS B263\\Files}
```

5. Parsing Token Variables

The construction of second-page headers will illustrate the parsing of variables that have embedded newlines. Second-page headers mention everybody's name that the memo is addressed to. On page one, the addressee's name, group, and mail stop are given, separated by commas. On the second-page headers however, only the name is listed. For example, if the addresses are specified by

```
\to{A. B. Carroway, Z-1, MS B234 \\
    D. E. Fritz, Y-2, MS B345}
```

the second-page header appears as in figure 0.4.

The internal representation of the "TO" field for this example would be the token variable

```
\@toksto={A. B. Carroway, Z-1, MS B234\\D. E. Fritz, Y-2, MS B345}
```

The parsing of this token variable is done by macros based on Knuth's dirty trick mentioned on page 375 of "The TEXbook," Appendix D: Dirty Tricks. This dirty trick is called **\btest**. It searches for a "*" in a token variable and returns true or false depending on the success of the search.

Two clones of **\btest** are needed to parse **\@toksto**; one parses for the "\\" token and the other parses for a ",". Besides reporting the success of the search, the macros store the parts of the token variable that come before and after the search token.

```
A. B. Carroway                    - 2 -                    June 15, 1989
D. E. Fritz


The recent period of inclement weather has delayed delivery of the metal
torus being trucked in from Brown and Armbruster Metalworks, Inc., in
```

Figure 0.4: Second-page header.

To parse \@toksto, a loop is executed until all the persons' names have been extracted from \@toksto. First the macro \@tonewlinepull is called (see below) with \@toksto as its argument. The tokens before the "\\" in \@toksto are put into the token variable \@toksbeforenewline and the tokens after the "\\" are put into \@toksafternewline.

```
\def\@tonewlinepull#1{\let\@nlsave=\\\let\\=\relax
  \expandafter\@tonewlinepullone\the#1\\\@empty
  \if@newline\expandafter\@tonewlinepullthree\the#1\@empty
  \else\fi\let\\=\@nlsave}%
\def\@tonewlinepullone#1\\{\@toksbeforenewline={#1}%
  \futurelet\next\@tonewlinepulltwo}%
\def\@tonewlinepulltwo#1\@empty{\@toksafternewline={#1}%
  \ifx\@empty\next\@newlinefalse
  \else\@newlinetrue\fi}%
\def\@tonewlinepullthree#1\\{\@toksbeforenewline={#1}%
  \futurelet\next\@tonewlinepullfour}%
\def\@tonewlinepullfour#1\@empty{\@toksafternewline={#1}%
  \ifx\@empty\next\@newlinefalse
  \else\@newlinetrue\fi}%
```

When

```
\@toksto={A. B. Carroway, Z-1, MS B234\\D. E. Fritz, Y-2, MS B345}
```

executing \@tonewlinepull\@toksto will leave

```
\@toksbeforenewline={A. B. Carroway, Z-1, MS B234}
```

and

```
\@toksafternewline={D. E. Fritz, Y-2, MS B345}
```

A macro named \@tocommapull (see below) is then called with \@toksbeforenewline as its argument.

```
\def\@tocommapull#1{\expandafter\@tocommapullone\the#1,\@empty}%
\def\@tocommapullone#1,{\@toksbeforecomma={#1}%
  \futurelet\next\@tocommapulltwo}%
\def\@tocommapulltwo#1\@empty{\ifx\@empty\next \@commafalse
  \else \@commatrue \fi}%
```

The \@tocommapull macro definition is a bit simpler than \@tonewlinepull, since it is not necessary to determine \@toksaftercomma. Executing \@tocommapull\@toksbeforenewline in the above example leaves

```
\@toksbeforecomma={A. B. Carroway}
```

which is saved into another token variable named \@toksheader. This finishes the first time through the loop. After a second time through the loop,

```
\@toksheader={A. B. Carroway\\D. E. Fritz}
```

which can then be used to print the second-page's header.

The height of the second-page header is calculated and is used to set the values of **\topskip**, **\headsep**, and **\textheight**. These values change between the first-page and the second-page, so they are set to their new values after outputting page one in LaTeX's **\@outputpage** macro.

6. LaTeX Letters

LaTeX letters are quite similar to LaTeX memos. Most of the information needed on the first page header of a letter is entered into the file the same way as for memos. The closing portion of a letter is virtually identical to that of a memo.

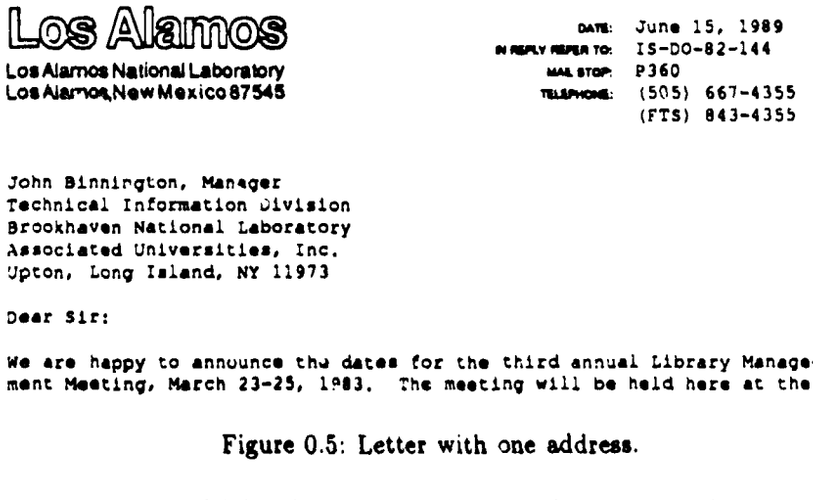
LaTeX letters do have several features that memos do not offer. For example, it is possible to adjust the width and height of the body of a letter to give it a balanced look. Two interesting features in LaTeX letters are the ability to print multiple addresses and the ability to print mailing labels.

6.1 Multiple Addresses

In letters a single address is specified like this:

```
\to{John Binnington, Manager\\
    Technical Information Division\\
    Brookhaven National Laboratory\\
    Associated Universities, Inc.\\
    Upton, Long Island, NY 11973}
```

A single address is printed on the left side of the header, as shown in figure 0.5. For multiple addresses one **\to** command is used for each address. If two addresses are called for, they will both be put on the left side of the header. When three or more addresses are called for, the addresses are split into two columns. Half of the addresses go in the left column and the other half go in the right column. If there is an odd number of addresses, the extra address goes in the left column. Figure 0.6 shows a letter with five addresses.


Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

DATE: June 15, 1989
IN REPLY REFER TO: IS-DO-82-144
MAIL STOP: P360
TELEPHONE: (505) 667-4355
(FTS) 843-4355

John Binnington, Manager
Technical Information Division
Brookhaven National Laboratory
Associated Universities, Inc.
Upton, Long Island, NY 11973

Dear Sir:

We are happy to announce the dates for the third annual Library Management Meeting, March 23-25, 1983. The meeting will be held here at the

Figure 0.5: Letter with one address.

The user can override a multiple address layout by using **\leftto** and **\rightto** to specify which addresses should go in which column.

6.2 Mailing Labels

The way I do mailing labels is similar to the way Lamport does them. I have added macros so that the user can print onto labels of any size, so long as the labels are in a two-column format. If the following is specified

```
\labelheight{1in}
\labeltopmargin{.5in}
```

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

DATE: June 15, 1989
IN REPLY REFER TO: IS-DO-82-144
MAIL STOP: P360
TELEPHONE: (505) 667-4355
(FTS) 843-4355

John Binnington, Manager
Technical Information Division
Brookhaven National Laboratory
Associated Universities, Inc.
Upton, Long Island, NY 11973

R. R. Dickison, Manager
Library System
Oak Ridge National Laboratory
Oak Ridge, TN 37830

Juanita L. Garcia
Library Science Specialist
Technical Library
Sandia National Laboratories
Albuquerque, NM 87115

Roy Nielson, Head
Library Department
Lawrence Berkeley Laboratory
University of California
Library, Bldg. 50, Room 134
Berkeley, CA 94720

Wayne Snyder, Manager
Technical Information
Batelle-Northwest
Pacific Northwest National
Laboratory
P.O. Box 999
Richland, WA 99352

Ladies and Gentlemen:

We are happy to announce the dates for the third annual Library Management Meeting, March 23-25, 1983. The meeting will be held here at the

Figure 0.6: Letter with five addresses.

the labels will be printed on label paper that has one inch tall labels, with the top label being one half inch from the top of the paper.

The easiest way to print labels is to print them onto a regular piece of paper in a laser printer. If you like the way the labels look, you can then copy them onto any label paper that can be used in a copying machine. Most letters only have one address and a return address. After Xeroxing and peeling the two labels off, you can turn the label paper end to end and Xerox one more set of labels. This leaves you with a bunch of unusable labels in the middle of the label paper. To overcome this problem, there is another command that lets the user specify how many labels have been peeled of his sheet of labels. The command

```
\skiplabels{2}
```

will print the first label on the third label of the mailing label paper.

6.3 When an Inch Is Not an Inch

Unfortunately, if you try to print a sheetfull of one inch tall labels on the Apple LaserWriter or QMS-800 PostScript printers that we have around here, the printing at the bottom of the page will be higher on the page than the labels. This is because these two printers do not accurately print a vertical inch. If you ask for 9 inches, these printers will actually print 8.8 inches. To compensate for this we use

```
\labelheight{1.01in}  %  For our QMS-800
\labeltopmargin{.6in}  %  For our QMS-800
```

The newer printers that we have, such as the Varityper, the Dataproducts, and the NeXT printers do not need this correction.

6.4 Printing and Parsing Address Tokens

From an internal point of view, the token variable for addresses is different than the other token variables. An `\@endto` token is inserted after each address. For example, if the following two addresses are called for,

```
\to{Person One\\Town One}
\to{Person Two\\Town Two}
```

the information is stored in a token variable like this:

```
\@toksto{Person One\\Town One\@endto Person Two\\Town Two\@endto}
```

Address tokens are parsed to retrieve individual lines in the addresses for two reasons. For one thing, the second-page's header uses, by default, the top line of each address. For another, if a line of an address is too long to fit on a single line, the remainder will be indented on the next line (see figure 0.6). This is accomplished by printing each line of an address as an item in LaTeX's list environment.

To print the addresses, a loop within a loop is executed. The outer loop calls a macro named `\@toendtopull` that is quite similar to `\@tonewlinepull` described above. `\@toendtopull` stores the next address to be printed in a token variable named `\@toksbeforeendto`. An inner loop then pulls out individual lines from `\@toksbeforeendto` by calling `\@tonewlinepull`. Without going into gruesome details, the general form of this is as follows:

```
\begin{list}{}{.....}
  % Goes thru longloop once per address.
  \longloop
  \if (there . another address)
    ...
    % extract next address
    \item
    % Goes thru innerloop once per printed line.
    \innerloop
      ...
      % extract next line
      ...
      % Print the next line.
      \the\@toksbeforenewline
      ...
    \if (there are more lines in this address)
      \par
    \innerrepeat
  \longrepeat
\end{list}
```

The macros `\longloop` and `\innerloop` are clones of plain.tex's `\loop` definition. The trick is to have different names for all the macro names used by `\loop`, `\longloop`, and `\innerloop`.

6.5 The mlb file

Ordinarily, the aux file would be used to store the mailing label information for printing at the end of the job. However, the figure, table, and bibliography environments also use the aux file in a way that is incompatible with mailing labels. So I defined a new file suffix mlb to indicate the file that is used for printing mailing labels.

7. UNIX Tools

I use the Emacs editor on a Sun workstation with ArborText's Preview to write and debug the style files. Emacs makes it easy to write editor macros for doing such things as commenting out lines or adding various kinds of `\typeout` commands.

Sccs, UNIX's source code control utility, is a great help for keeping track of incremental changes in the style files. Sccs allows you to recover previous versions of a file. There were several times when attempted methods went awry. Sccs made it easy to go back to the latest version that worked and to try a better method.

During development of the sty file, I indent to indicate structure, and I comment as much as possible. When distribution time comes around, the sty file is copied to the doc file. I use sed,

UNIX's stream editor, to automatically strip unwanted indentation and comments from the sty file.

8. Testing

I have 240 test files for the memo style and 350 for the letter style. I try to keep the individual tests simple, so there's not too much to look at in any test. I print the purpose of each test in four places: in a comment at the top of the file, at the top and bottom of the printed output, and in the log file.

The test directory is divided into subdirectories to group various kinds of tests. For example, there are directories for testing headers, page breaks, error messages, and classification labels. There is a script that will run LaTeX on all the test files. Another script collates all the log files, filtering out almost everything except filenames and error messages. Most dvi files can be previewed on the Sun, although some dvi files contain PostScript code that cannot be previewed on a Sun.

When the style file gets to an almost debugged stage, small changes are often made that affect the output of only a few of the test files. To avoid having to repreview all the test files, I wrote a utility DVIDIFF based on UNIX'S diff command that compares dvi files. The differences are printed out in clumps of ASCII lines corresponding to places in the dvi file that are ASCII, and lines of hex corresponding to places in the dvi file that are binary. When a difference between two dvi files is found, DVIDIFF shows where to look in the printed output.

9. Version 2.09 ≠ Version 2.09

Using LaTeX commands in my style files turned out to be a pain in the neck. When I upgraded LaTeX from version 2.09 <9 Mar 1987> to version 2.09 <4 Aug 1988>, LaTeX's definition of \parbox changed, and vertical space disappeared from my memo output in several places. It was not so difficult to fix up the problem, but it did point out the vulnerability of LaTeX. Many users are not even aware when their version of LaTeX changes, and therefore cannot be expected to look around for a new versions of the memo and letter style files. In future upgrades I will try to incorporate supporting LaTeX macros into my style files to make my code impervious to changes in LaTeX. It sure would be nice if there were a tripLaTeX to bring TeX's stability to the world of LaTeX.

10. Documentation and Distribution

At LANL we have a group that writes local documents. They wrote documents that explain how to use LaTeX memos and letters. The documents include instructions for usage and installation, a list of error messages, and sample memos and letters.

Files are distributed for all the commonly used operating systems. The distributed files are the sty file, the doc file, a sample input file that uses most of the available commands, and a readme file that has installation instructions.

At LANL software changes for the commonly used operating systems are regulated through the Change Control system. The Computing and Communications Division distributes a monthly *ICN Change Bulletin* that announces new utilities and new versions of existing utilities. Software changes on mainframes are installed on a given day of the month. System managers of workstation networks have more flexibility as to when they want to install software.

The Change Control system makes it easy to announce software, since one Bulletin article announces a new version of the style file for most of the major system. The files are available to most users through our Common File System, which can be accessed by most of our computers. The exception to this rule is the IBMPCs. Style files for IBMPCs are distributed on diskettes through an organization called PC STORE.

11. Conclusions

LaTeX memos and letters are useful utilities to have in an organization. Almost everybody writes a memo or a letter once in a while. LaTeX memos and letters are welcomed by LaTeX users and encourage others to learn LaTeX.

LaTeX is a popular document system for many reasons. The user works on the content and leaves the formatting to LaTeX; the user doesn't have to continually fuss with fonts and vertical spacing; LaTeX macros are consistent across document types; most desired document features are there and well

documented.

These strengths were compelling enough to make it worthwhile for us to provide our users with LaTeX memos and letters. LaTeX's structure and existing array of commands encourages the macro writer to go the extra nine yards to write a complete and easy-to-use command set.

Bibliography

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