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# The TEX Report Macro Package

K. T. Barry
S. P. Ketterer
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Publications Division

# The TEX Report Macro Package

K. T. Barry, S. P. Ketterer, R. W. McGaffey

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# LIST OF FIGURES


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| 2 | Sample of a renumbered figure | 5 |
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# ACKNOWLEDGMENTS

The authors would like to thank W. R. Wing for helpful discussions in the early stages of the work. Sue Damewood of the Engineering Physics and Mathematics Division provided helpful suggestions and spent countless hours testing the macro package.

# ABSTRACT

The following document is a user's guide to production of Martin Marietta Energy Systems reports using the typesetting program TEX. Much of the standard formatting of these reports has been automated, including headings, figures, and contents. This automation will improve the speed and accuracy of user input. Each feature is explained in detail along with examples. A basic familiarity with TEX and its commands is assumed.

# 1. INTRODUCTION

The report macro package developed thus far illustrates the capability of TEX to simplify input, providing reliable and efficient document preparation. TEX users may want create their own macros to meet their particular document preparation needs.[1]

Attached as Appendix B is the input for this sample ORNL/TM which illustrates the current features of the TEX report macro package which was used to create it. The guidelines used in setting up the style of the report macro package are set forth in the Martin Marietta Energy Systems *Document Preparation Guide* (DPG).

# 2. MACRO FEATURES

## 2.1 PAGE SIZE AND LINE SPACING DEFAULTS

All pages of a report are automatically set at 6-in. wide by 9-in. long. The text is 10 points and single spaced (12 points). If there is math in the text of the document, the `\baselineskip` may need to be increased by at least two points. The paragraphs are indented 20 points, and there is no extra vertical skip between paragraphs.

TEX not only right-justifies the lines on a page, but also "bottom-justifies," or "vertically justifies" the text on each page for a uniform appearance. This feature requires some spacing adjustments on TEX's part, either addition of more or the reduction of existing space. These adjustments will usually be done around headings and displays, and will be minimal. Occasionally, however, the instruction to vertically justify may conflict with other page-formatting requirements. An abnormally stretched out page may result. In this case, the command `\vfill\eject` can be placed at the page break, indicating that no vertical justification is desired for that page. Another option is to suppress the vertical justification for the entire document with the `\raggedbottom` command at the beginning of the file.

## 2.2 REPORT AND CATEGORY DISTRIBUTION NUMBERS

The input file for a report should begin with the commands

```
\input mmes
\input mmreport
```

The command

```
\matoffset
```

will adjust the placement of the output for printing on $8\frac{1}{2} \times 11$-in. photomats.

If an ORNL/TM report is being generated, the number is then input as

| | |
|---|---|
| `\tmno{...}` | for an ORNL/TM report |
| `\ornlno{...}` | for an ORNL report |
| `\reportno{...}` | for other types of reports |

The report number is output in the upper right corner of the title page and distribution list. The distribution category is input after the report number with the command

```
\category{...}
```

An ENDF distribution is indicated as follows:

```
\endf{...}
```

The category section can be omitted if no classification is needed.

## 2.3 ACKNOWLEDGMENTS AND ABSTRACT

The Acknowledgments and Abstract sections are specified by simply inputting `\acknowledgments` and `\abstract` commands, followed by the text of each

respective section. The output for these two sections automatically begins on odd-numbered, right-hand pages and is automatically numbered with small roman numerals. The headings are properly formatted according to accepted Energy Systems document style.

The Acknowledgments section is programmed to begin on page number v. If the contents is more than two pages or if there is a list of figures, the page number for the Acknowledgments may need to be reset. To get the page number to appear in roman numerals, a minus sign (-) should precede the desired page number. For example,

```
\acknowledgments
\pageno=-7
```

will produce page number vii.

## 2.4 HEADING NUMBERS

Headings are automatically numbered and formatted according to the DPG. The headings are specified with

```
\firsthead{...}
\secondhead{...}
\thirdhead{...}
\fourthhead{...}
```

The `\firsthead` command will split long headings into several centered lines. If you do not like the line break choices TEX makes, a `\break` command can be used where the desired line breaks should occur. The `\secondhead`, `\thirdhead`, and `\fourthhead` commands will also split long headings. As with the `\firsthead` command, breaks can be forced with the `\break` command.

To generate an unnumbered, first-order heading, the command

```
\heading{...}
```

can be used. If the entire document is to contain unnumbered headings, the command

```
\noheadingnumbers
```

should be input after `\input mmreport` at the beginning of the document.

It is sometimes necessary (or desirable) to split a large report into several sections. It may be necessary, then, to reset the heading numbers. The following example will produce a first-level heading with the number 3. Keep in mind that the `\firsthead` command *advances* the number before typesetting the heading.

```
\firstheadnum=2
\firsthead{THE HEADING}
```

Second-, third-, and fourth-level headings can be reset in similar fashion.

Footnotes occurring in headings need special attention. Because of the construction of the heading macros, footnotes input in the usual way will be lost. (See *The TEXbook*, page 117.) The `\footmark` command should be used to place a reference mark in the heading, but the mark will not appear in the Contents. Following the heading command, use `\vfootnote`. For example,

```
\firsthead{HEADING WITH A FOOTNOTE\footmark*}
\vfootnote*{The footnote.}
The first paragraph of the section ...
```

## 2.5 RUNNING HEADINGS

Running headings are automatically generated from the first-order headings and are appropriately placed in the upper left and right corners for two-sided copies. To override the running heading, `\runhead{...}` can be used after the heading command:

```
\firsthead{Some Folks May Consider This Much
Too Long to be Used for a Running Heading}
\runhead{Too Long}
```

To generate a report with no running headings, the command

`\norunningheads`

should be inserted after `\input mmreport`. The command

`\toppagenumbers`

can also be used to suppress running headings and place all page numbers at the top of the page.

## 2.6 FIGURE DISPLAYS AND LIST OF FIGURES

The TEX report macro package allows for in-text display of automatically numbered figures (see following example) and an automatically generated figure list. Only the width and height, respectively, of the figure need be specified in order to obtain correct in-text spacing. Figure captions are input after the figure dimensions and appear in eight-point bold face, properly positioned, and indented. The `\figure` command is ended with an `\endfigure` command.

`\figure` *width,height,{caption}*
`\endfigure`

**Because no period is used in the List of Figures, a period should not be input at the end of the caption** (before the `\endfigure` command). When the caption is output onto the page, TEX will supply the ending period. If this automatic period needs to be suppressed (for example, if the caption ends with quoted text), place the period where needed, and use the command

`\noperiod`

before the `\endfigure`.

A good place to put the `\figure` command is following the paragraph where the figure is referenced. If there is not enough room on the current page for the figure, TEX will float the figure to the next available space on the next page. If TEX chooses an unsuitable placement of the figure, the `\figure` command can be moved back or ahead to produce the desired result. In this example, Fig. 1 is 3 in. wide by 2.75 in. high, so the end of this paragraph is followed by

```
\figure 3in,2.75in,{Space can be allocated for
the addition of figures along with
prenumbered captions}
\endfigure
```

**Fig. 1. Space can be allocated for the addition of figures along with prenumbered captions.**

If for any reason you need to reset the automatic figure numbering, use the command

`\figno=`*n*

The number, *n*, should be *one less* than the desired figure number. The next `\figure` command will advance the number by one and use the resulting number in the figure caption. For example, if a Fig. 2 is needed, type

```
\figno=1
\figure 3in,1in,{Sample of a renumbered figure}
\endfigure
```

**Fig. 2. Sample of a renumbered figure.**

An optional argument to the `\figure` command is available to replace or override the automatic numbering. It should be placed before the width specification, in square brackets followed by a comma. The following example will produce "Fig. 1a."

```
\figure [2a],3in,2.75in,{Space can be allocated
for the addition of figures along with captions
numbered any way you wish}
\endfigure
```

One important thing to note is that TEX's automatic numbering is not advanced when an optional label is used. After specifying, for example, `\figure [2a]...` and `\figure [2b]...`, the next `\figure` command with no optional argument would produce "Fig. 2." The numbering can be reset as follows:

```
\figno=2
\figure ...
```

to produce "Fig. 3."

To generate the List of Figures, the command

```
\figlist
```

should be inserted in the document wherever the List of Figures should appear (usually after the contents). The List of Figures is set ragged right. In the event that a line is too long or the user wants to force a line break for any reason, the command

```
\listbreak
```

can be used at the appropriate breaks in the caption. This will affect only the List of Figures, not the caption itself. And conversely, to break the caption at a certain point and not affect the List of Figures,

```
\hfil\break
```

can be inserted at the desired breaking point in the caption.

To comply with the guidelines set forth in the DPG that only the first sentence of a long caption should be bold and that sentence only should appear in the List of Figures, mark the end of the first sentence with a

```
\listend
```

command on a line by itself. (The period should be left off the sentence appearing before the `\listend` command.) The remaining text up to the `\endfigure` command will appear in the caption in roman type but will not appear in the List of Figures. Notice the following example of input for a long figure caption and then refer to both the resulting caption output and the List of Figures.

```
\figure 3in,1in,{This is the first sentence of a figure
caption containing more than one sentence
\listend
This is the second sentence.  It will appear in the
caption but not in the list of figures}
\endfigure
```

**Fig. 3. This is the first sentence of a figure caption containing more than one sentence.** This is the second sentence. It will appear in the caption but not in the list of figures.

The List of Figures is written to a file with the extension `.lof` which can be run separately if another format is desired. In order to run this file by itself, the commands

```
\input mmes
\input mmreport
```

should be placed at the beginning of the `.lof` file along with an `\halign` preamble or any other special formatting commands desired. If you want to use the default preamble, insert the command `\lofsetup`, as follows:

```
\input mmes
\input mmreport
\lofsetup
```

An ending } should be placed at the end of the file before the `\bye` command if the default `\halign` format is used. It is important to note that the report macro package writes a new `.lof` with each run, so the file should be renamed if the changes need to be kept.

A `\sidefigure` command, which also generates automatically numbered figures and figure list, can be used instead of the `\figure` command. The caption is output to the right of the figure, centered vertically.

## 2.7 LIST OF TABLES

The `\table` command automatically numbers and outputs the word "Table" followed by that number:

```
\centerline{\table{This is the first table.}}
```

The result of this command would be

Table 1. This is the first table.

The `\table` command does no formatting, so that it can be used anywhere — within a `\centerline`, `\halign`, `\multispan`, with any font. It creates a file with the extension `.lot` for the List of Tables.

The `\table` command, like the `\figure` command, can take an optional argument to override the default numbering:

```
\table [2a]{Table Title }
```

The numbering can be reset:

`\tableno=`*n*

The List of Tables is generated with the `\tablelist` command, in a format similar to that of the List of Figures.

## 2.8 APPENDIXES

Appendixes are designated by

```
\appendix{...}
```

and appear as first-order headings. For example, `\appendix{A}` gives a centered heading

# APPENDIX A

and sets the running heading and contents entry appropriately. To add a title as shown in the following example,

# APPENDIX A
## COMPUTER LISTINGS

some of the macro's formatting must be overridden:

```
\appendix{A}
\vskip -18pt
\centerline{\bf COMPUTER LISTINGS}
\biggskip
```

If the title is too long for one line, the following series of commands may be used.

```
\appendix{A}
\vskip -18pt
{\raggedcenter\bf\noindent
COMPUTER LISTINGS OF VARIOUS CODES WHICH DO ABSOLUTELY
NOTHING DESCRIBED HEREIN\par}
\biggskip
```

# APPENDIX A
## COMPUTER LISTINGS OF VARIOUS CODES WHICH DO ABSOLUTELY NOTHING DESCRIBED HEREIN

In all the previous cases, only "Appendix A" will appear as the running heading and contents entry. The following example illustrates two methods to get the entire heading in the contents.

```
\appendix{A. COMPUTER LISTINGS}
```

*or*

```
\heading{APPENDIX A. COMPUTER LISTINGS OF
VARIOUS CODES WHICH DO ABSOLUTELY NOTHING
DESCRIBED HEREIN}
```

## 2.9 REFERENCE NUMBERING

References are numbered automatically and can be obtained with either the `\references` or `\bibliography` command. A blank line should be left between entries in the reference list. For example, the references for this document were input as follows:

```
\references
D. E. Knuth, {\it The \TeX book}, Addison Wesley
Publishing Company, Massachusetts, 199 (1986).

D. E. Knuth, {\it The METAFONTbook}, Addison Wesley
Publishing Company, Massachusetts (1986).
```

## 2.10 DISTRIBUTION

The distribution list for any internally generated report (ORNL/TM, ORNL Numbered Report, etc.) is specified with the

`\distribution`

command, and internal and external distribution lists are specified as follows:

`\internal`
*and*
`\external`

Both lists are automatically numbered, and multiple copies are easily indicated by noting beside the person's name the number of copies required (for example, `John Doe \copies5` for five copies). Required distribution is automatically appended to the internal distribution list (Laboratory Records Department, Laboratory Records—ORNL-RC, Document Reference Section, Central Research Library, and ORNL Patent Section).

Internal distribution list names are input in a single column, and TEX automatically outputs the names in double columns. There should *not* be a blank line between entries, particularly between the last internal name and the `\external` command—that blank line would cause a blank numbered entry in the internal list.

The external distribution list is input with names and addresses on separate lines, and TEX converts each end of line to a comma in formatting the external distribution list. Unlike the internal list, a blank line *must* separate the entries. The following is a short example of input for a distribution. Appendix B details the input used to produce the distribution list for this document.

```
\distribution
\internal
K. T. Barry
K. M. Dobbs
S. P. Ketterer\copies2
R. W. McGaffey
\external
Office of the Assistant Manager for Energy %
Research and Development
Department of Energy
Oak Ridge Operations
P. O. Box 2001
Oak Ridge, TN 37831\copies5
```

## 2.11 STANDARD TITLE PAGE "BLURBS"

One unusual feature of this macro package is that the title page, contents, and list of figures are output last, after all other sections of the report. The reason for this has to do with the page numbers in the contents and list of figures. TEX will not know what all of the page numbers are until it finishes the document. In order to output the pages in order, a second pass (or a second run of `tex`) would

be required to get these numbers in the contents. This packages avoids the "second pass" by simply outputting these pages last. They are numbered correctly (with the exception noted in Section 2.3, page 3), but are printed last.

The title page and the standard "blurbs" contained on the title page begin with the command

```
\titlepage
```

inserted after the completion of the distribution lists. The division(s), title, author(s), and date published are indicated by the corresponding commands,

```
\division{...} or \divisions{...}
\title{...}
\author{...} or \authors{...}
\datepub{...}
```

TEX will break multiple-line divisions, titles, and authors and center each line. If TEX does not make the desired choice for the line breaks, the `\break` command can be placed at the appropriate points. In the case where one or more of the authors is associated with a division or organization other than the one producing the report, the command

```
\organization{...}
```

provides a centered line under the list of authors for indicating the additional division(s) or organization(s) represented.

The command

```
\sponsor{...}
```

is also available for referencing the DOE office for which the report is prepared.

```
\sponsor{DOE Funding Office}
```

will produce

Prepared for the
DOE Funding Office

The preliminary notice appears on the title page by using the command

```
\notice
```

which will produce

| | |
|---|---|
| **NOTICE:** | This document contains information of a preliminary nature. It is subject to revision or correction and therefore does not represent a final report. |

Two options are available for specifying the contractor. The

```
\contractorornl
```

command produces

Prepared by the
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831
operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE–AC05–84OR21400

and the

```
\contractormultisite
```

command produces

MARTIN MARIETTA ENERGY SYSTEMS, INC.
operating the
Oak Ridge National Laboratory  Oak Ridge Y-12 Plant
Oak Ridge Gaseous Diffusion Plant  Paducah Gaseous Diffusion Plant
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

## 2.12 CONTENTS

The contents using this macro package is written to a file with the extension `.toc`, and is generated by simply inputting

```
\contents
```

after the title page information. The information for the contents comes from the first-, second-, third-, and fourth-order headings, and leaders and page numbers are generated automatically.

The contents can be run separately, but the file should be renamed first, because a new contents file is created each time you run TEX. Edit the renamed file, adding

```
\input mmes
\input mmreport
```

at the beginning. The end of the file will contain a line that looks like

```
\tskip=13.33336pt\ttskip=...
```

Move this line after `\input mmreport` and add the command

```
\tocsetup
```

Add a `\bye` to the end of the file and continue editing as necessary.

# APPENDIX A

Following are further refinements to the report macro package that will be added as time and support permit.

- Forward and backward references
- Easy multiple columns
- Mailing labels
- Expanded font selection

# APPENDIX B

This section demonstrates how the appendices are generated and how this ORNL/TM was produced.

```
\input mmes
\input mmreport
\matoffset
\tmno{10826}
\hyphenation{auto-mat-i-cally input-ting title numer-als appended
  author}
\def\\{\char'134}

\acknowledgments
   The authors would like to thank W.~R.~Wing for helpful
   discussions in the early stages of the work. Sue~Damewood
   of the Engineering Physics and Mathematics Division provided
   helpful suggestions and spent countless hours testing the
   macro package.

\abstract
   The following document is a user's guide to production of
   Martin Marietta Energy Systems reports using the typesetting
   program \TeX . Much of the standard formatting of these
   reports has been automated, including headings, figures, and
   contents. This automation will improve the
   speed and accuracy of user input. Each feature is explained
   in detail along with examples. A basic familiarity with
   \TeX\ and its commands is assumed.



\firsthead{INTRODUCTION}
   {\baselineskip=13pt
   The report macro package developed thus far
   illustrates the capability of \TeX\ to simplify input,
   providing reliable and efficient document preparation.
   \TeX\ users may want create their own macros to meet
   their particular document preparation needs.$^1$

   Attached as Appendix~B is the input for this sample ORNL/TM
   which illustrates the current features of the \TeX\
   report macro package which was used to create it. The
   guidelines used in setting up the style of the report
   macro package are set forth in the Martin Marietta Energy
   Systems {\it Document Preparation Guide} (DPG).\par}

\firsthead{Macro Features}

\secondhead{Page Size and Line Spacing Defaults}
   All pages of a report are automatically
```

```
   set at 6-in.\ wide by 9-in.\ long. The text is 10 points and
   single spaced (12 points). If there is math in the
   text of the document, the {\tt \\baselineskip} may need to be
   increased by at least two points.
   The paragraphs are indented 20~points, and there is no extra
   vertical skip between paragraphs.

   \TeX\ not only right-justifies the lines on a page, but also
   ``bottom-justifies,'' or ``vertically justifies'' the text on
   each page for a uniform appearance. This feature requires some
   spacing adjustments on \TeX 's part, either addition of more
   or the reduction of existing space. These adjustments will
   usually be done around headings and displays, and will be
   minimal. Occasionally, however, the instruction to vertically
   justify may conflict with other page-formatting
   requirements. An abnormally stretched out page may result.
   In this case, the command {\tt \\vfill\\eject} can be placed
   at the page break, indicating that no vertical justification
   is desired for that page. Another option is to suppress the
   vertical justification for the entire document with the
   {\tt \\raggedbottom} command at the beginning of the file.


\secondhead{Report and Category Distribution Numbers}
   The input file for a report should begin with the commands

   $$\vbox{\hbox{\tt\\input mmes}
   \hbox{\tt\\input mmreport}}$$
   \noindent
   The command
   \vskip 6pt
   \centerline{\tt\\matoffset}
   \vskip 6pt
   \noindent
   will adjust the placement of the output for printing on
   $8{1\over 2}\times 11$-in.\ photomats.

   If an ORNL/TM report is being generated, the number is then
   input as
   $$\vbox{\halign{\tabskip=2em #\hfil&#\hfil\cr
      {\tt \\tmno\char'173$\ldots$\char'175}&for an ORNL/TM
      report\cr
      \noalign{\vskip 6pt}
      {\tt\\ornlno\char'173$\ldots$\char'175}&for an ORNL
      report\cr
      \noalign{\vskip 6pt}
      {\tt\\reportno\char'173$\ldots$\char'175}& for other types of
      reports\cr
      }}$$
   \noindent
   The report number is output in the upper
```

```
   right corner of the title page and distribution list.
   The distribution category is input after the report number
   with the command
   \vskip 6pt
   \centerline{\tt\\category\char'173$\ldots$\char'175}
   \vskip 6pt
   \noindent
   An ENDF distribution is indicated as follows:
   \vskip 6pt
   \centerline{\tt\\endf\char'173$\ldots$\char'175}
   \vskip 6pt

   \noindent
   The category section can be omitted if no classification is
   needed.

\secondhead{Acknowledgments and Abstract}
   The Acknowledgments and Abstract sections are specified by
   simply inputting {\tt \\acknowledgments} and {\tt \\abstract}
   commands, followed by the text of each respective section.
   The output for these two sections automatically begins on
   odd-numbered, right-hand pages and is automatically numbered
   with small roman numerals. The headings are properly
   formatted according to accepted Energy Systems
   document style.

   The Acknowledgments section is programmed to begin on page
   number~v. If the contents is more than two pages or if there
   is a list of figures, the page number for the Acknowledgments may
   need to be reset. To get the page number to appear in roman
   numerals, a minus sign ({\tt -}) should precede the desired page
   number. For example,

   $$\vbox{\baselineskip=12pt
   \halign{
         \tt#\hfil
   \cr
        \\acknowledgments\cr
        \\pageno=-7\cr
   }}$$
   \noindent
   will produce page number vii.

\secondhead{Heading Numbers}
   Headings are automatically numbered and formatted according to
   the DPG. The headings are specified with
   $$\vbox{\hbox{\tt\\firsthead\char'173$\ldots$\char'175}
           \hbox{\tt\\secondhead\char'173$\ldots$\char'175}
           \hbox{\tt\\thirdhead\char'173$\ldots$\char'175}
           \hbox{\tt\\fourthhead\char'173$\ldots$\char'175}}$$
   The {\tt\\firsthead} command
```

```
will split long headings into several centered lines. If you
do not like the line break choices \TeX\ makes, a
{\tt\\break} command can be used where the desired line
breaks should occur. The {\tt\\secondhead}, {\tt\\thirdhead},
and {\tt\\fourthhead} commands will also split long headings.
As with the {\tt\\firsthead} command, breaks can be forced
with the {\tt\\break} command.

To generate an unnumbered, first-order heading, the command
$$\vbox{\hbox{\tt\\heading\char'173$\ldots$\char'175}}$$
can be used.
If the entire document is to contain unnumbered headings, the
command
$$\vbox{\hbox{\tt\\noheadingnumbers}}$$
should be input after {\tt\\input mmreport} at
the beginning of the document.

It is sometimes necessary (or desirable) to split a large report
into several sections. It may be necessary, then, to reset the
heading numbers. The following example will produce a first-level
heading with the number 3. Keep in mind that the {\tt\\firsthead}
command {\it advances} the number before typesetting the heading.
$$\vbox{\hbox{\tt\\firstheadnum=2}
        \hbox{\tt\\firsthead\char'173THE HEADING\char'175}}$$
Second-, third-, and fourth-level headings can be reset in
similar fashion.

Footnotes occurring in headings need special attention. Because
of the construction of the heading macros, footnotes input in the
usual way will be lost. (See {\sl The \TeX book}, page 117.)
The {\tt\\footmark} command should be used to place a reference
mark in the heading, but the mark will not appear in the
Contents. Following the heading command, use {\tt\\vfootnote}.
For example,

$$\vbox{\tt\hbox{\\firsthead\char'173HEADING WITH A
                 FOOTNOTE\\footmark*\char'175}
           \hbox{\\vfootnote*\char'173The footnote.\char'175}
           \hbox{The first paragraph of the section $\ldots$}}$$

\secondhead{Running Headings}
Running headings are automatically generated from the
first-order headings and are appropriately placed in the
upper left and right corners for two-sided copies. To override
the running heading, {\tt\\runhead\char'173$\ldots$\char'175}
can be used after the heading command:

$$\vbox{\baselineskip=12pt
\halign{\vbox{\hsize=4in\parindent=0pt\tt #}\cr
     \\firsthead\char'173 Some Folks May Consider This Much
     Too Long to be Used for a Running Heading\char'175 \cr
```

```
     \\runhead\char'173 Too Long\char'175\cr
}}$$


To generate a report with no running headings,
the command
$$\vbox{\hbox{\tt\\norunningheads}}$$
should be inserted after
{\tt\\input mmreport}. The command
$$\vbox{\hbox{\tt\\toppagenumbers}}$$
can also be used to suppress running headings and place all
page numbers at the top of the page.

\secondhead{Figure Displays and List of Figures}
The \TeX\ report macro package allows for in-text display of
automatically numbered figures (see following example) and an
automatically generated figure list. Only the width and
height, respectively, of the figure need be specified in
order to obtain correct in-text spacing.
Figure captions are input after the figure dimensions and
appear in eight-point bold face,
properly positioned, and indented. The {\tt\\figure} command
is ended with an {\tt\\endfigure} command.

{\baselineskip=12pt
$$\vbox{
\halign{
    \tt#\hfil\cr
    \\figure {\sl width},{\sl height},\char'173{\sl
      caption}\char'175\cr
    \\endfigure\cr
}}$$\par}

{\bf Because no period is used in the List of Figures, a
period should not be input at the end of the caption} (before
the {\tt\\endfigure} command). When the caption is output
onto the page, \TeX\ will supply the ending period.
If this automatic period needs to be suppressed (for example,
if the caption ends with quoted text), place the period where
needed, and use the command

\medskip
\centerline{\tt\\noperiod}

\noindent
before the {\tt\\endfigure}.

A good place to put the {\tt\\figure}
command is following the paragraph where the figure is
referenced. If there is not enough room on the current page
for the figure, \TeX\ will float the figure to the next
```

```
available space on the next page. If \TeX\ chooses an
unsuitable placement of the figure, the {\tt\\figure} command
can be moved back or ahead to produce the desired result.
In this example, Fig.~1 is 3~in. wide by 2.75~in. high, so
the end of this paragraph is followed by

{\baselineskip=12pt
$$\vbox{
\halign{
    \tt#\hfil\cr
    \\figure 3in,2.75in,\char'173Space can be allocated for\cr
    the addition of figures along with\cr
    prenumbered captions\char'175\cr
    \\endfigure\cr
}}$$\par}

\figure 3in,2.75in,{Space can be allocated for the addition
of figures along with prenumbered captions}
\endfigure

If for any reason you need to reset the automatic figure
numbering, use the command
$$\vbox{\hbox{\tt\\figno={\sl n}}}$$
The number, {\sl n\/}, should
be {\it one less} than the desired figure number. The
next {\tt\\figure} command will advance the number by
one and use the resulting number in the figure caption.
For example, if a Fig.~2 is needed, type
$$\vbox{
\halign{
     \tt#\hfil
\cr
     \\figno=1\cr
     \\figure 3in,1in,\char'173Sample of a renumbered
       figure\char'175\cr
     \\endfigure\cr
}}$$

\figno=1
\figure 3in,1in,{Sample of a renumbered figure}
\endfigure

An optional argument to the {\tt\\figure} command is available
to replace or override the automatic numbering. It should be
placed before the width specification, in square
brackets followed by a comma. The following
example will produce ``Fig.~1a.''

{\baselineskip=12pt
$$\vbox{%
\halign{%
```

```
   \tt#\hfil\cr
   \\figure [2a],3in,2.75in,\char'173Space can be allocated \cr
   for the addition of figures along with captions \cr
   numbered any way you wish\char'175\cr
   \\endfigure\cr
 }}$$\par}
```

One important thing to note is that \TeX 's automatic numbering is not advanced when an optional label is used. After specifying, for example, {\tt\\figure [2a]$\ldots$ {\rm and} \\figure [2b]$\ldots$}, the next {\tt\\figure} command with no optional argument would produce ''Fig. 2.'' The numbering can be reset as follows:

```
{\baselineskip=12pt
 $$\vbox{\tt\hbox{\\figno=2}\hbox{\\figure $\ldots$}}$$\par}

\noindent
```

to produce ''Fig. 3.''

To generate the List of Figures, the command
$$\vbox{\hbox{\tt\\figlist}}$$
should be
inserted in the document wherever the List of Figures should appear (usually after the contents). The List of Figures is set ragged right. In the event
that a line is too long or the user wants to force a line break for any reason, the command
$$\vbox{\hbox{\tt\\listbreak}}$$
can be used at the appropriate breaks in the
caption. This will affect only the List of Figures, not the caption itself. And conversely, to break the caption at a certain point and not affect the List of Figures,
$$\vbox{\hbox{\tt\\hfil\\break}}$$
can be inserted at the desired breaking point in the caption.

To comply with the guidelines set forth in the DPG that only the first sentence of a long caption should be bold and that sentence only should appear in the List of Figures, mark the end of the first sentence with a
$$\vbox{\hbox{\tt\\listend}}$$
command on a line by itself. (The period should be left off the sentence appearing before the {\tt\\listend} command.) The remaining text up to the {\tt\\endfigure} command will appear in the caption in roman type but will not appear in the List of Figures. Notice the following example of input for a long figure caption and then refer to both the resulting caption output and the List of Figures.

```
{\baselineskip=12pt
$$\vbox{
```

```
\halign{
     \vtop{\hsize=5in\parindent=0pt\parskip=0pt\strut#\strut}
\cr
     {\tt\\figure 3in,1in,\char'173This is the first sentence
     of a figure caption containing more than one sentence}\cr
     {\tt\\listend}\cr
     {\tt This is the second sentence. It will appear in the
     caption but not in the list of figures\char'175}\cr
     {\tt\\endfigure}\cr
}}$$\par}

\figure 3in,1in,{This is the first sentence of a
figure caption containing more than one sentence
\listend
This is the second sentence. It will appear in the
caption but not in the list of figures}
\endfigure

The List of Figures is written to a file with the extension
{\tt .lof} which can be run separately if another
format is desired. In order to run this file by itself, the
commands

{\baselineskip=12pt
$$\vbox{
\halign{
     \tt#\hfil\cr
     \\input mmes\cr
     \\input mmreport\cr
}}$$\par}
\noindent should be placed at the beginning of the
{\tt .lof} file along with an {\tt\\halign}
preamble or any other special formatting commands desired.
If you want to use the default preamble, insert the
command {\tt\\lofsetup}, as follows:

{\baselineskip=12pt
$$\vbox{
\halign{
     \tt#\hfil\cr
     \\input mmes\cr
     \\input mmreport\cr
     \\lofsetup\cr
}}$$\par}
\noindent
An ending {\tt\char'175} should be placed at the end of the
file before the {\tt\\bye} command
if the default {\tt\\halign} format is used. It is important to
note that the report macro package
writes a new {\tt .lof} with each run, so the file
should be renamed if the changes need to be kept.
```

```
   A {\tt\\sidefigure} command, which also generates
   automatically numbered figures and figure list, can be used
   instead of the {\tt\\figure} command.
   The caption is output to the right of the figure, centered
   vertically.

\secondhead{List of Tables}
   The {\tt\\table} command automatically numbers and outputs the
   word ``Table'' followed by that number:
    \medskip
    \centerline{\tt\\centerline\char'173\\table\char'173This is
                the first table.\char'175\char'175}
    \medskip
    \noindent
    The result of this command would be
    \medskip
    \centerline{Table 1. This is the first table.}
    \medskip
    \noindent
    The {\tt\\table} command does no formatting, so that it can be
    used anywhere --- within a {\tt\\centerline}, {\tt\\halign},
    {\tt\\multispan}, with any font. It creates a file with the
    extension {\tt .lot} for the List of Tables.

    The {\tt\\table} command, like the {\tt\\figure} command, can
    take an optional argument to override the default numbering:

    \medskip
    \centerline{\tt\\table [2a]\char'173Table Title \char'175}
    \medskip

    The numbering can be reset:

    \centerline{\tt\\tableno=\it n}
    \medskip

    The List of Tables is generated with the {\tt\\tablelist}
    command, in a format similar to that of the List of Figures.

\secondhead{Appendixes}
   Appendixes are designated by
   $$\vbox{\hbox{\tt\\appendix\char'173$\ldots$\char'175}}$$
   and appear as first-order headings. For example,
   {\tt\\appendix\char'173A\char'175} gives a centered heading
   \vskip 12pt
   \centerline{\bbf APPENDIX A}
   \vskip 12pt
   \noindent and sets the running heading and contents entry
   appropriately. To add a title as shown in the following
   example,
```

```
\vskip 12pt
\centerline{\bbf APPENDIX A}
\vskip 6pt
\centerline{\bf COMPUTER LISTINGS}
\vskip 12pt
\noindent some of the macro's formatting must be overridden:

{\baselineskip=12pt
$$\vbox{
\halign{
     \tt#\hfil
\cr
     \\appendix\char'173A\char'175\cr
     \\vskip -18pt\cr
     \\centerline\char'173\\bf COMPUTER LISTINGS\char'175\cr
     \\biggskip\cr
}}$$\par}

\noindent
If the title is too long for one line, the following
series of commands may be used.

{\baselineskip=12pt
$$\vbox{
\halign{
     \tt#\hfil
\cr
     \\appendix\char'173A\char'175\cr
     \\vskip -18pt\cr
     \char'173\\raggedcenter\\bf\\noindent\cr
     COMPUTER LISTINGS OF VARIOUS CODES WHICH DO ABSOLUTELY\cr
     NOTHING DESCRIBED HEREIN\\par\char'175\cr
     \\biggskip\cr
}}$$\par}

\vskip 6pt
\centerline{\bbf APPENDIX A}
\vskip 6pt
{\raggedcenter\bf \noindent
 COMPUTER LISTINGS OF VARIOUS CODES WHICH DO ABSOLUTELY
 NOTHING DESCRIBED HEREIN\par}
\vskip 12pt

In all the previous cases, only ``Appendix~A'' will appear as
the running heading and contents entry. The following example
illustrates two methods to get the entire heading
in the contents.

{\baselineskip=12pt
$$\vbox{
\halign{\vbox{\tt\hsize=4in\parindent=0pt #}\cr
```

```
        \\appendix\char'173 A. COMPUTER LISTINGS\char'175\cr
        \noalign{\vskip 6pt}
        \omit\hfil\it or\hfil\cr
        \noalign{\vskip 6pt}
        \\heading\char'173APPENDIX A. COMPUTER LISTINGS OF
          VARIOUS CODES WHICH DO ABSOLUTELY NOTHING DESCRIBED
          HEREIN\char'175\cr
   }}$$\par}

\secondhead{Reference Numbering}
   References are numbered automatically and can be obtained with
   either the {\tt\\references} or {\tt\\bibliography} command.
   A blank line should be left between entries in the reference
   list. For example, the references for this document were input
   as follows:

   $$\vbox{\hsize=4.5in\raggedright\parindent=0pt\tt
           \hyphenpenalty=10000
          \\references\hfil\break
          D. E. Knuth, \char'173\\it The \\TeX book\char'175,
          Addison Wesley Publishing Company, Massachusetts, 199
          (1986).
          \vskip 12pt
          D. E. Knuth, \char'173\\it The METAFONTbook\char'175,
          Addison Wesley Publishing Company, Massachusetts
          (1986).
          \par}$$

\secondhead{Distribution}
   The distribution list for any internally generated report
   (ORNL/TM, ORNL Numbered Report, etc.) is specified with the
   $$\vbox{\hbox{\tt\\distribution}}$$
   command, and internal and external distribution lists are
   specified as follows:
   $$\vbox{\halign{#\hfil\cr
            {\tt\\internal}\cr
            \noalign{\vskip 4pt}
            \hfil{\it and}\cr
            \noalign{\vskip 4pt}
            {\tt\\external}\cr}}$$
   Both lists are automatically numbered, and multiple copies
   are easily indicated by noting beside the person's name
   the number of copies required (for example,
   {\tt John~Doe~\\copies5}
   for five copies). Required distribution is automatically
   appended to the internal distribution list (Laboratory Records
   Department, Laboratory Records---\hbox{ORNL-RC}, Document
   Reference Section, Central Research Library, and ORNL Patent
   Section).

   Internal distribution list names are input in a single column,
```

```
   and \TeX\ automatically outputs the names in double columns.
   There should {\it not}
   be a blank line between entries, particularly between the last
   internal name and the {\tt\\external} command---that blank
   line would cause a blank numbered entry in the internal list.

   The external distribution list is input with names and
   addresses on separate lines, and \TeX\ converts each end of
   line to a comma in formatting the external distribution list.
   Unlike the internal list, a blank line {\it must} separate
   the entries. The following is a short example of input for a
   distribution.  Appendix~B details the input used to produce
   the distribution list for this document.
   $$\vbox{\hsize=4in\parindent=0pt\obeylines\tt
      \\distribution
      \\internal
      K. T. Barry
      K. M. Dobbs
      S. P. Ketterer\\copies2
      R. W. McGaffey
      \\external
      Office of the Assistant Manager for Energy \% Research and %
        Development
      Department of Energy
      Oak Ridge Operations
      P. O. Box 2001
      Oak Ridge, TN 37831\\copies5
      \vskip 12pt
   }$$

\secondhead{Standard Title Page ``Blurbs''}
   One unusual feature of this macro package is that the title page,
   contents, and list of figures are output last, after all other
   sections of the report.  The reason for this has to do with the
   page numbers in the contents and list of figures. \TeX\ will not
   know what all of the page numbers are until it finishes the
   document. In order to output the pages in order, a second pass
   (or a second run of {\tt tex}) would be required to get these
   numbers in the contents. This packages avoids the ``second
   pass'' by simply outputting these pages last.  They are
   numbered correctly (with the exception noted in Section 2.3,
   page 3), but are printed last.

   The title page and the standard ``blurbs'' contained on the
   title page begin with the command
   \vskip 12pt
   \centerline{\tt\\titlepage}
   \vskip 12pt
   \noindent inserted after the completion
   of the distribution lists. The division(s), title, author(s),
   and date published are indicated by the corresponding
```

```
commands,
$$\vbox{\halign{#\hfil\cr
 {\tt \\division\char'173$\ldots$\char'175 \ {\it or}
  \\divisions\char'173$\ldots$\char'175}\cr
 {\tt \\title\char'173$\ldots$\char'175}\cr
 {\tt \\author\char'173$\ldots$\char'175 \ {\it or}
   \\authors\char'173$\ldots$\char'175}\cr
 {\tt \\datepub\char'173$\ldots$\char'175}\cr
 }}$$

\TeX\ will break multiple-line divisions, titles, and authors
and center each line. If \TeX\ does not make the desired
choice for the line breaks, the {\tt \\break} command can
be placed at the appropriate points. In the case where one or
more of the authors is associated with a division or
organization other than the one producing the report, the
command
\vskip 12pt
\centerline{\tt\\organization\char'173$\ldots$\char'175}
\vskip 12pt
\noindent
provides a centered line under the list of authors for
indicating the additional division(s) or organization(s)
represented.

The command
\vskip 6pt
\centerline{\tt\\sponsor\char'173$\ldots$\char'175}
\vskip 12pt
\noindent is also available
for referencing the DOE office for which the report is
prepared.
\vskip 12pt
\centerline{\tt\\sponsor\char'173 DOE Funding Office%
\char'175}
\vskip 6pt
\noindent will produce
\sponsor{DOE Funding Office}

The preliminary notice  appears on the title page by using the
command
\vskip 12pt
\centerline{\tt \\notice}
\vskip 6pt
\noindent
which will produce
\notice

Two options are available for specifying the contractor.
The
\vskip 6pt
```

```
   \centerline{\tt\\contractorornl}
   \vskip 6pt
   \noindent command produces
   $$\vbox{\baselineskip=12pt
   \halign{
        \hfil#\hfil
   \cr
        Prepared by the\cr
        OAK RIDGE NATIONAL LABORATORY\cr
        Oak Ridge, Tennessee 37831\cr
        operated by\cr
        MARTIN MARIETTA ENERGY SYSTEMS, INC.\cr
        for the\cr
        U.S. DEPARTMENT OF ENERGY\cr
        under contract DE--AC05--84OR21400\cr
   }}$$
   \noindent and the
   \vskip 6pt
   \centerline{\tt\\contractormultisite}
   \vskip 6pt
   \noindent command produces
   $$\vbox{\baselineskip=12pt
   \halign{
        #\hfil\qquad&#\hfil
   \cr
        \multispan2\hfil{MARTIN MARIETTA ENERGY SYSTEMS,
        INC.}\hfil\cr
        \multispan2\hfil{operating the}\hfil\cr
        Oak Ridge National Laboratory&     Oak Ridge Y-12
        Plant\cr
        Oak Ridge Gaseous Diffusion Plant& Paducah Gaseous
        Diffusion Plant\cr
        \multispan2\hfil{for the}\hfil\cr
        \multispan2\hfil{U.S. DEPARTMENT OF ENERGY}\hfil\cr
        \multispan2\hfil{under contract DE-AC05-84OR21400}\hfil
        \cr
   }}$$

\secondhead{Contents}
   The contents using this macro package is written to a file
   with the extension {\tt .toc}, and is generated by simply
   inputting
   \vskip 6pt
   \centerline{\tt \\contents}
   \vskip 12pt
   \noindent
   after the title page information. The information for the
   contents comes from the first-, \hbox{second-,} third-, and
   fourth-order headings, and leaders and page numbers are
   generated automatically.
```

```
   The contents can be run separately, but the file should be
   renamed first, because a new contents file is created each time
   you run \TeX .
   Edit the renamed file, adding
   $$\vbox{
   \halign{
        \tt#\hfil
   \cr
        \\input mmes\cr
        \\input mmreport\cr
   }}$$
   \noindent
   at the beginning.
   The end of the file will contain a line that looks like
   \vskip 6pt
   \centerline{\tt\\tskip=13.33336pt\\ttskip=\dots}
   \vskip 6pt
   \noindent
   Move this line after {\tt\\input mmreport} and add the command
   \vskip 6pt
   \centerline{\tt\\tocsetup}
   \vskip 6pt
   \noindent
   Add a {\tt\\bye} to the end of the file and continue
   editing as necessary.


\appendix{A}
   Following are further refinements to the report macro package
   that will be added as time and support permit.
   \def\blist{\item{$\bullet$}}
   $$\vbox{\hsize=2.75in
   \blist Forward and backward references
   \blist Easy multiple columns
   \blist Mailing labels
   \blist Expanded font selection}$$


\appendix{B}
   This section demonstrates how the appendices are generated and
   how this ORNL/TM was produced.

\input appb

\references
   D. E. Knuth, {\it The \TeX book}, Addison Wesley Publishing
   Company, Massachusetts, 199 (1986).

   D. E. Knuth, {\it The METAFONTbook}, Addison Wesley Publishing
   Company, Massachusetts (1986).
```

```
\distribution
\internal
J. T. Addison
D. L. Akers
A. C. Alford
T. D. Anderson
K. T. Barry \copies10
P. A. Beeler
M. Blair
A. W. Brown
J. A. Bucholz
D. R. Burton
R. O. Chester
F. Cole
L. E. Collins
J. G. Craven
D. C. Crowell
J. W. Crutcher
N. S. Currence
L. S. Dale
S. R. Damewood
I. Datskou
D. L. DeAngelis
K. M. Dobbs
W. R. Emanuel
L. M. Floyd
J. F. Francis
K. S. Gaddis
L. F. Goins
W. H. Gray
D. S. Griffith
J. Hamby
G. Hamilton
K. S. Harber
R. F. Harbison
A. L. Harkey
J. T. Holdeman
A. L. Houston
S. E. Huckaba
D. C. Human
M. M. Hutchinson
O. V. Jett
D. Y. Johnson
S. P. Ketterer
P. L. Kienlen
S. P. King
R. D. Lawson
F. Lin
L. K. Lovette
R. W. McGaffey\copies5
W. J. Merriweather
```

```
L. F. Norris
E. M. Passmore
T. H. Peng
H. A. Pfuderer
S. T. Piotrowski
D. B. Poker
W. M. Post
L. R. Pyles
S. A. Raby
A. F. Rice
S. L. Rider
K. E. Rothe
G. A. Russell
R. O. Sayer
E. M. Schorn
A. L. Sjoreen
B. J. Smith
M. S. Smith
D. J. Tate
M. F. Theofanos
M. S. Uziel
S. F. Vaughan
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J. W. Wooten
N. F. Wright
T. Zacharia
C. H. Zeigler
K. L. Zell
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Department of Energy
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Oak Ridge, TN~37831\copies10

\titlepage
\division{Publications Division}
\title{The \TeX\ Report Macro Package}
\author{K. T. Barry, S. P. Ketterer, R. W. \Mc Gaffey}
\datepub{June 1989}
```

```
\notice
\contractormultisite
\contents
\figlist
\bye
```

## REFERENCES


1. D. E. Knuth, *The TEXbook*, Addison Wesley Publishing Company, Massachusetts, 199 (1986).
2. D. E. Knuth, *The METAFONTbook*, Addison Wesley Publishing Company, Massachusetts (1986).

## INTERNAL DISTRIBUTION

1. J. T. Addison
2. D. L. Akers
3. A. C. Alford
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5–14. K. T. Barry
15. P. A. Beeler
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17. A. W. Brown
18. J. A. Bucholz
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39. J. Hamby
40. G. Hamilton
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42. R. F. Harbison
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45. A. L. Houston
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52. P. L. Kienlen
53. S. P. King
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55. F. Lin
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79. B. J. Smith
80. M. S. Smith
81. D. J. Tate
82. M. F. Theofanos
83. M. S. Uziel
84. S. F. Vaughan
85. R. R. Weston
86. L. C. Whitman
87. W. R. Wing
88. J. W. Wooten
89. N. F. Wright
90. T. Zacharia
91. C. H. Zeigler
92. K. L. Zell
93–94. Laboratory Records Department
95. Laboratory Records, ORNL-RC
96. Document Reference Section
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