

```

1 % LATEX VERSION 2.09 <25 March 1992>
2 % Copyright (C) 1992 by Leslie Lamport
3
4 \everyjob{\typeout{LaTeX Version 2.09 <25 March 1992>}}
5 \immediate\write10{LaTeX Version 2.09 <25 March 1992>}
6
7 %                TABLE OF CONTENTS
8 % COMMAND LIST ..... 2
9 % GENERAL CONVENTIONS ..... 6
10 % COUNTERS, ETC. .... 7
11 % USEFUL HACKS ..... 8
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40 % OUTPUT ..... 113
41 % DEBUGGING AND TEST INITIALIZATIONS ..... 137
42
43
44 \catcode'\~ =13 \def~{\penalty\@M \ }
45
46
47 % *****
48 % *                COMMAND LIST                *
49 % *****
50 %
51 % DECLARATIONS:
52 % PREAMBLE:      \nofiles \documentstyle \includeonly
53 %                \makeindex \makeglossary
54 % IN DOCUMENT :
55 % FONT SELECTION:
56 %     SIZE: \normalsize \small \footnotesize \scriptsize \tiny
57 %           \large \Large \LARGE \huge \Huge
58 %     STYLE: \bf \it \rm \sl \ss \tt \mit[math mode only]
59 % STYLE:
60 %     PAGE: [all global] \pagestyle \thispagestyle \pagenumbering \head
61 %     MISC: \raggedright \thicklines \thinlines

```

```

62 %   PARAMETER: \setlength \settowidth \addtolength \setcounter \addtocounter
63 %   NEW:       \newlength \newtheorem \newcommand
64 %   MISC:      \savebox \sbox \obeycr \restorecr
65 %
66 % ENVIRONMENTS:
67 %   ?   -> PAR: document
68 %   PAR -> PAR: list enumerate itemize description
69 %           center flushright flushleft
70 %           verbatim picture float
71 %   PAR -> BOX: tabular tabbing
72 %   PAR -> MATH: math displaymath equation
73 %   MATH -> MATH: array
74 %   ANY -> PAR: minipage
75 %   ANY -> BOX: stack
76 %
77 % TEXT-PRODUCING:
78 %   WITH TEXT ARGUMENT:
79 %       ANY -> BOX: \makebox \mbox \framebox \fbox \dashbox
80 %                   \shortstack \footnotemark \cite[] \raisebox
81 %       ANY -> PAR: \parbox[inner]
82 %       PAR -> PAR: \chapter \section ... \footnote \footnotetext
83 %                   \topnewpage \verb
84 %       MATH:      \sqrt \underline \overline
85 %       PICTURE:   \put \multiput
86 %       LIST:      \item
87 %   WITHOUT TEXT ARGUMENT:
88 %       ANY MODE:
89 %           SYMBOLS: \$ \{ \} \_ \@ \& \#
90 %           ACCENTS: See TeXbook
91 %           OTHER:  \rule \ref \pageref \today \usebox \typein \input \cite
92 %       MATH:      \over
93 %       PAR MODE:  \include \bibliography \tableofcontents \listoffigures ...
94 %       LIST:      \item \arabic \roman \Roman \alph \Alph
95 %       PICTURE:  \line \vector \circle \oval
96 %       ARRAY & TABULAR: \hline \vline
97 %
98 % SPACING & BREAKING:
99 %   ANY       : \hfill \hspace
100 %   PAR       : \newpage \newpage \vspace \noindent
101 %   PAR & INNER MATH
102 %           : \newpage \clearpage \cleardoublepage
103 %           : \pagebreak \nopagebreak \linebreak \nolinebreak \newline
104 %   MATH      : \over \; \, \!
105 %   MULTILINE : \\
106 %   TABBING   : \pushtab \poptab \> \< \+ \- \kill ...
107 %   ARRAY & TABULAR
108 %           : \multicolumn \noalign
109 %
110 % NO DIRECT CHANGES TO DOCUMENT:
111 %   \index \glossary \typeout \label \tableentry \stop \protect
112 %
113 % PARAMETERS:
114 %
115 % \columnsep           \skip\footin           \intertextsep
116 % \columnseprule      \oddsidemargin
117 % \columnwidth        \textfloatsep
118 % \evensidemargin     \footsep           \textheight
119 % \floatsep           \headheight       \textwidth
120 % \headsep            \topmargin
121 %
122 %

```

```

123 % ALPHABETIZED LIST:
124 %
125 % ORDINARY COMMANDS:
126 %
127 % \Alph          \include          \parbox
128 % \Roman         \index           \put
129 % \\\            \item           \raisebox
130 % \alph          \label         \ref
131 % \appendix     \line         \roman
132 % \arabic       \linebreak    \rule
133 % \bibliography \listoffigures \section
134 % \chapter      \listoftables \shortstack
135 % \circle       \makebox     \stop
136 % \cite         \mbox        \subsection
137 % \cite         \multicolumn \subsubsection
138 % \cleardoublepage \multiput    \tableentry
139 % \clearpage    \tableofcontents
140 % \dashbox     \newline     \today
141 % \fbox        \newpage     \typein
142 % \footnotemark \noindent    \typeout
143 % \footnotetext \nolinebreak \usebox
144 % \framebox    \nopagebreak \vector
145 % \glossary    \oval        \vline
146 % \hline       \pagebreak   \vspace
147 % \hspace     \pageref     \protect
148 %
149 %
150 % ENVIRONMENTS & DECLARATIONS:
151 %
152 % For each of these commands, the same command name prefixed by 'end'
153 % is also reserved--e.g., \enddocument.
154 %
155 % \BIG           \footnotesize \pagestyle
156 % \Big          \head         \picture
157 % \addtocounter \includeonly  \raggedright
158 % \addtolength \itemize     \restorecr
159 % \array        \list        \savebox
160 % \big         \makeglossary \sbox
161 % \center      \makeindex   \scriptscriptsize
162 % \description \math        \scriptsize
163 % \displaymath \minipage    \setcounter
164 % \document    \newcommand  \setlength
165 % \documentstyle \newlength  \settowidth
166 % \enumerate   \newtheorem  \small
167 % \equation    \nofiles     \shortstack\tabbing
168 %             \normalsize \tabular
169 % \float       \obeycr     \thicklines
170 % \flushleft  \pagelayout \thinlines
171 % \flushright \pagenumbering \thispagestyle
172 %             \verb, \verbatim
173 %
174 % PARAMETERS :
175 %
176 % \columnsep    \footinsertskip \intextsep
177 % \columnseprule \oddsidemargin
178 % \columnwidth  \textfloatsep
179 % \evensidemargin \footsep       \textheight
180 % \floatsep     \headheight    \textwidth
181 % \headsep     \topmargin
182 %
183 %

```

```

184 % TABBING COMMANDS:
185 %
186 % These commannds are defined only within a tabbing environment.
187 %
188 % \kill      \>   \-
189 % \pushtab   \<   \=
190 % \poptab    \+
191
192
193 % COMPLETE LIST :
194 % Below is a complete list of every command starting with '\ ' that
195 % appears in LATEX.TEX.
196
197 % \
198 % \!
199 % \#
200 % \$
201 % \&
202 % \'
203 % \ (
204 % \ )
205 % \+
206 % \,
207 % \-
208 % \.
209 % \:
210 % \;
211 % \<
212 % \=
213 % \>
214 % \@
215 % \@@
216 % \@@end
217 % \@@endpbox
218 % \@@eqnocr
219 % \@@hyph
220 % \@@input
221 % \@@par
222 % \@@sqrt
223 % \@@startpbox
224 % \@@underline
225 % \@@warning
226 % \@acci
227 % \@accii
228 % \@acciii
229 % \@acol
230 % \@acolampacol
231 % \@addamp
232 % \@addfield
233 % \@addmarginpar
234 % \@addtobot
235 % \@addtocurcol
236 % \@addtodblcol
237 % \@addtonextcol
238 % \@addtopreamble
239 % \@addtoreset
240 % \@addtotoporbot
241 % \@afterheading
242 % \@afterindentfalse
243 % \@afterindenttrue
244 % \@Alph

```

245 % \@alph
246 % \@ampacol
247 % \@arabic
248 % \@argarraycr
249 % \@argdef
250 % \@argrsbox
251 % \@argtabularcr
252 % \@array
253 % \@arrayacol
254 % \@arrayclassiv
255 % \@arrayclassv
256 % \@arrayclassz
257 % \@arraycr
258 % \@arrayparboxrestore
259 % \@arrayrule
260 % \@arstrut
261 % \@arstrutbox
262 % \@auxout
263 % \@badcrerr
264 % \@badend
265 % \@badlinearg
266 % \@badmath
267 % \@badpoptabs
268 % \@badtab
269 % \@beginparpenalty
270 % \@begintheorem
271 % \@bibitem
272 % \@biblabel
273 % \@bitor
274 % \@botlist
275 % \@botnum
276 % \@botroom
277 % \@bsphack
278 % \@caption
279 % \@capttype
280 % \@car
281 % \@carcube
282 % \@cclv
283 % \@cdr
284 % \@centercr
285 % \@centering
286 % \@cfla
287 % \@cflb
288 % \@charlb
289 % \@charrb
290 % \@chclass
291 % \@checkend
292 % \@chnum
293 % \@circ
294 % \@circle
295 % \@circlefnt
296 % \@cite
297 % \@citea
298 % \@citeb
299 % \@citex
300 % \@cla % counter used in \cline
301 % \@classi
302 % \@classii
303 % \@classiii
304 % \@classiv
305 % \@classv

```

306 % \@classz
307 % \@clb          % counter used in \cline
308 % \@cline
309 % \@clnht
310 % \@clnwd
311 % \@clubpenalty
312 % \@colht
313 % \@colnum
314 % \@colroom
315 % \@combinedblfloats
316 % \@combinefloats
317 % \@comdblfloat
318 % \@comflelt
319 % \@cons
320 % \@contfield
321 % \@ctrerr
322 % \@curfield
323 % \@curline
324 % \@currbox
325 % \@currentlabel
326 % \@currentreference
327 % \@currenvir
328 % \@currlist
329 % \@currtype
330 % \@curtab
331 % \@curtabmar
332 % \@dasnt
333 % \@dashbox
334 % \@dashcnt
335 % \@dashdim
336 % \@dblarg
337 % \@dbldeferlist
338 % \@dblfloat
339 % \@dblfloatplacement
340 % \@dblfloatsep
341 % \@dblfpbot
342 % \@dblfpsep
343 % \@dblfpstop
344 % \@dblmaxsep
345 % \@dbltextfloatsep
346 % \@dbltoplist
347 % \@dbltopnum
348 % \@dbltoproom
349 % \@deferlist
350 % \@definecounter
351 % \@defpar
352 % \@depth
353 % \@dischyph
354 % \@docclearpage
355 % \@documentstyle
356 % \@doendpe
357 % \@donoparitem
358 % \@dot
359 % \@dotsep
360 % \@dottedtocline
361 % \@downline
362 % \@downvector
363 % \@eha
364 % \@ehb
365 % \@ehc
366 % \@ehd

```

367 % \@elt
368 % \@empty
369 % \@endparenv
370 % \@endparpenalty
371 % \@endpbox
372 % \@endpefalse
373 % \@endpetrue
374 % \@endtabbing
375 % \@endtheorem
376 % \@enumctr
377 % \@enumdepth
378 % \@enumsparing
379 % \@eqnocr
380 % \@eqnnum
381 % \@eqnset
382 % \@eqnswtrue
383 % \@esphack
384 % \@Esphack
385 % \@evenfoot
386 % \@evenhead
387 % \@expast
388 % \@failedlist
389 % \@fcolmadefalse
390 % \@filesw
391 % \@fileswfalse
392 % \@fileswtrue
393 % \@firstampfalse
394 % \@firstamptrue
395 % \@firstcolumntrue
396 % \@firsttab
397 % \@flfail
398 % \@float
399 % \@floatpenalty
400 % \@floatplacement
401 % \@floatsep
402 % \@flsucceed
403 % \@fltovf
404 % \@flushglue
405 % \@fnsymbol
406 % \@footnotemark
407 % \@footnotetext
408 % \@for
409 % \@forloop
410 % \@fornoop
411 % \@fpbot
412 % \@fpmin
413 % \@fpsep
414 % \@fptop
415 % \@framebox
416 % \@framepicbox
417 % \@freelist
418 % \@getcirc
419 % \@getlarrow
420 % \@getlinechar
421 % \@getpen
422 % \@getrarrow
423 % \@glossaryfile
424 % \@gobble
425 % \@gobblecr
426 % \@gobbletwo
427 % \@gtempa

```

428 % \@halfwidth
429 % \@halignto
430 % \@hangfrom
431 % \@height
432 % \@highpenalty
433 % \@hightab
434 % \@hline
435 % \@holdpg
436 % \@hspace
437 % \@hspacer
438 % \@hvector
439 % \@icentercr
440 % \@iden
441 % \@ifatmargin
442 % \@ifdefinable
443 % \@ifnch
444 % \@ifnextchar
445 % \@iforloop
446 % \@iframebox
447 % \@iframepicbox
448 % \@ifstar
449 % \@ifundefined
450 % \@iinput           % used in \input
451 % \@iirsbox
452 % \@imakebox
453 % \@imakepicbox
454 % \@iminipage
455 % \@index
456 % \@indexfile
457 % \@inlabelfalse
458 % \@input
459 % \@inputcheck
460 % \@insertfalse
461 % \@inserttrue
462 % \@iparbox
463 % \@irsbox
464 % \@isavebox
465 % \@isavepicbox
466 % \@ishortstack
467 % \@istackcr
468 % \@itabcr
469 % \@item
470 % \@itemdepth
471 % \@itemfudge
472 % \@itemitem
473 % \@itemlabel
474 % \@itempenalty
475 % \@itemspacing
476 % \@iwhiledim
477 % \@iwhilenum
478 % \@iwhilesw
479 % \@ixstackcr
480 % \@killglue
481 % \@labels
482 % \@lastchclass
483 % \@latexbug
484 % \@latexerr
485 % \@lbibitem
486 % \@leftcolumn
487 % \@leftmargin skip
488 % \@leftmark

```


489 % \@lhead
490 % \@linechar
491 % \@linefnt
492 % \@linelen
493 % \@list
494 % \@listctr
495 % \@listdepth
496 % \@listi
497 % \@listii
498 % \@listvi
499 % \@lnbk
500 % \@lowpenalty
501 % \@lquote
502 % \@ltab
503 % \@M
504 % \@m
505 % \@mainaux
506 % \@mainout
507 % \@makebox
508 % \@makecaption
509 % \@makecol
510 % \@makefcolumn
511 % \@makefnmark
512 % \@makefntext
513 % \@makeonecolumn
514 % \@makeother
515 % \@makepicbox
516 % \@maketwocolumn
517 % \@marbox
518 % \@markright
519 % \@maxdepth
520 % \@maxsep
521 % \@maxtab
522 % \@medpenalty
523 % \@Mi
524 % \@midlist
525 % \@Mii
526 % \@Miii
527 % \@minipagefalse
528 % \@minipagerestore
529 % \@Miv
530 % \@mkboth
531 % \@mklab
532 % \@mkpream
533 % \@MM
534 % \@mparbottom
535 % \@mparswitchfalse
536 % \@mpfn
537 % \@mpfnnumber
538 % \@mpfootins
539 % \@mpfootnotetext
540 % \@mplistdepth
541 % \@multicnt
542 % \@namedef
543 % \@nameuse
544 % \@nbitem
545 % \@ne
546 % \@negargfalse
547 % \@negargtrue
548 % \@newctr
549 % \@newenv

550 % \@newline
551 % \@newlist
552 % \@newlistfalse
553 % \@next
554 % \@nextchar
555 % \@nextwhile
556 % \@nil
557 % \@nmbulistfalse
558 % \@nmbulisttrue
559 % \@nnil
560 % \@nobreakfalse
561 % \@nocnterr
562 % \@nodocument
563 % \@nofonterror
564 % \@noitemargfalse
565 % \@noitemargtrue
566 % \@noitemerr
567 % \@noligs
568 % \@nolnkb
569 % \@nolnerr
570 % \@noparitemfalse
571 % \@noparitemtrue
572 % \@noparlistfalse
573 % \@noparlisttrue
574 % \@nopgbk
575 % \@normalcr
576 % \@normalsize
577 % \@noskipsecfalse
578 % \@notdefinable
579 % \@notprerr
580 % \@nthm
581 % \@nxctabmar
582 % \@oddfoot
583 % \@oddhead
584 % \@opargbegintheorem
585 % \@opcol
586 % \@optionfiles
587 % \@optionlist
588 % \@options
589 % \@othm
590 % \@outerparskip
591 % \@outputbox
592 % \@outputdblcol
593 % \@outputpage
594 % \@oval
595 % \@ovbtrue
596 % \@ovdx
597 % \@ovdy
598 % \@ovhorz
599 % \@ovltrue
600 % \@ovri
601 % \@ovro
602 % \@ovrtrue
603 % \@ovttrue
604 % \@ovvert
605 % \@ovxx
606 % \@ovyy
607 % \@pagedp
608 % \@pageht
609 % \@par
610 % \@parboxrestore

611 % \@parmoderr
612 % \@partaux
613 % \@partlist
614 % \@partout
615 % \@partsw
616 % \@partswfalse
617 % \@partswtrue
618 % \@pboxswfalse
619 % \@pboxswtrue
620 % \@pgbk
621 % \@picbox
622 % \@picht
623 % \@picture
624 % \@pnumwidth
625 % \@preamble
626 % \@preamblecmds
627 % \@preamerr
628 % \@put
629 % \@qend
630 % \@qrelax
631 % \@reargdef
632 % \@renewenv
633 % \@restorepar
634 % \@reversemarginfalse
635 % \@reversemargintrue
636 % \@rhead
637 % \@rightmark
638 % \@rightskip
639 % \@Roman
640 % \@roman
641 % \@rsbox
642 % \@rtab
643 % \@rule
644 % \@sanitize
645 % \@savebox
646 % \@savemarbox
647 % \@savepicbox
648 % \@savsf
649 % \@savsk
650 % \@scolelt
651 % \@sdblcolelt
652 % \@secpenalty
653 % \@sect
654 % \@setpar
655 % \@settab
656 % \@sharp
657 % \@shortstack
658 % \@sline
659 % \@spaces
660 % \@specialoutput
661 % \@specialpagefalse
662 % \@specialstyle
663 % \@sptoken
664 % \@sqrt
665 % \@ssect
666 % \@startcolumn
667 % \@startdblcolumn
668 % \@startfield
669 % \@startline
670 % \@startpbox
671 % \@startsection

672 % \@starttoc
673 % \@stopfield
674 % \@stopline
675 % \@stpelt
676 % \@svector
677 % \@sverb
678 % \@svsec
679 % \@svsechd
680 % \@tabacol
681 % \@tabarray
682 % \@tabclassiv
683 % \@tabclassz
684 % \@tabcr
685 % \@tablab
686 % \@tabminus
687 % \@tabplus
688 % \@tabpush
689 % \@tabrj
690 % \@tabular
691 % \@tabularcr
692 % \@temp
693 % \@tempa
694 % \@tempb
695 % \@tempbox
696 % \@tempboxa
697 % \@tempc
698 % \@tempcnta
699 % \@tempcntb
700 % \@tempd
701 % \@tempdima
702 % \@tempdimb
703 % \@tempe
704 % \@tempskipa
705 % \@tempskipb
706 % \@tempswa
707 % \@tempswafalse
708 % \@tempswatru
709 % \@temptokena
710 % \@testdef
711 % \@testfp
712 % \@testpach
713 % \@textbottom
714 % \@textfloatsep
715 % \@textmin
716 % \@texttop
717 % \@tfor
718 % \@tforloop
719 % \@thanks
720 % \@thefnmark
721 % \@thefoot
722 % \@thehead
723 % \@themargin
724 % \@themark
725 % \@thm
726 % \@thmcounter
727 % \@thmcountersep
728 % \@tocrmarg
729 % \@toodeep
730 % \@toplist
731 % \@topnewpage
732 % \@topnum

733 % \@toproom
734 % \@topsep
735 % \@topsepadd
736 % \@totalleftmargin
737 % \@trivlist
738 % \@tryfcolumn
739 % \@trylist
740 % \@twocolumnfalse
741 % \@twoside
742 % \@twosidefalse
743 % \@typein
744 % \@upline
745 % \@upordown
746 % \@upvector
747 % \@verb
748 % \@verbatim
749 % \@vline
750 % \@vobeyspaces
751 % \@vspace
752 % \@vspacer
753 % \@vtryfc
754 % \@vvector
755 % \@warning
756 % \@wckptelt
757 % \@whiledim
758 % \@whilenoop
759 % \@whilenum
760 % \@whilesw
761 % \@whileswnoop
762 % \@wholewidth
763 % \@width
764 % \@wrindex
765 % \@writeckpt
766 % \@writefile
767 % \@wtryfc
768 % \@x@sf
769 % \@xarg
770 % \@xargarraycr
771 % \@xarraycr
772 % \@xbitor
773 % \@xcentercr
774 % \@xdblarg
775 % \@xdblfloat
776 % \@xdim
777 % \@xeqncr
778 % \@exnoop
779 % \@expast
780 % \@xfloat
781 % \@xfootnote
782 % \@xfootnotemark
783 % \@xfootnotenext
784 % \@xhead
785 % \@xifnch
786 % \@xmpar
787 % \@xnewline
788 % \@xnthm
789 % \@xobeysp
790 % \@xsect
791 % \@xstartcol
792 % \@xtabcr
793 % \@xtabularcr

794 % \@xthm
795 % \@xtryfc
796 % \@xtypein
797 % \@xverbatim
798 % \@xxxii
799 % \@xympar
800 % \@yarg
801 % \@yargarraycr
802 % \@ydim
803 % \@yeqncr
804 % \@yhead
805 % \@ympar
806 % \@ynthm
807 % \@ythm
808 % \@ytryfc
809 % \@yyarg
810 % \@ztryfc
811 % \a
812 % \active
813 % \addcontentsline
814 % \addpenalty
815 % \addtocontents
816 % \addtocounter
817 % \addtolength
818 % \addvspace
819 % \advance
820 % \alloc@
821 % \allocationnumber
822 % \Alph
823 % \alph
824 % \and
825 % \appendix
826 % \arabic
827 % \array
828 % \arraycolsep
829 % \arrayrulewidth
830 % \arraystretch
831 % \author
832 % \bar
833 % \baselineskip
834 % \begin
835 % \begingroup
836 % \bf
837 % \bgroup
838 % \bibcite
839 % \bibdata
840 % \bibitem
841 % \bibliography
842 % \bibliographystyle
843 % \bibstyle
844 % \BIG
845 % \Big
846 % \big
847 % \bigskip
848 % \botfigrule
849 % \botmark
850 % \botnum
851 % \bottomfraction
852 % \box
853 % \boxmaxdepth
854 % \buildrel

855 % \bullet
856 % \c@bottomnumber
857 % \c@chapter
858 % \c@dbltopnumber
859 % \c@equation
860 % \c@eval
861 % \c@footnote
862 % \c@mpfootnote
863 % \c@page
864 % \c@secnumdepth
865 % \c@section
866 % \c@tocdepth
867 % \c@topnumber
868 % \c@totalnumber
869 % \caption
870 % \catcode
871 % \catcoded
872 % \center
873 % \centering
874 % \chapter
875 % \chaptermark
876 % \char
877 % \chardef
878 % \circle
879 % \cite
880 % \cl@ckpt
881 % \cleardoublepage
882 % \clearpage
883 % \cline
884 % \closeout
885 % \clubpenalty
886 % \columnsep
887 % \columnseprule
888 % \columnwidth
889 % \contentsline
890 % \copy
891 % \count
892 % \countdef
893 % \cr
894 % \crrr
895 % \csname
896 % \dag
897 % \dagger
898 % \dashbox
899 % \date
900 % \dblfigrule
901 % \dblfloatpagefraction
902 % \dblfloatsep
903 % \dbltextfloatsep
904 % \dbltextfloatsep
905 % \dbltopfraction
906 % \ddagger
907 % \deadcycles
908 % \def
909 % \description
910 % \dimen
911 % \dimen@
912 % \discretionary
913 % \displaymath
914 % \displaystyle
915 % \displaywidth

916 % \divide
 917 % \do
 918 % \document
 919 % \documentstyle
 920 % \dospecials
 921 % \doublerulesep
 922 % \dp
 923 % \edef
 924 % \egroup
 925 % \else
 926 % \end
 927 % \end@dblfloat
 928 % \end@float
 929 % \endarray
 930 % \endcsname
 931 % \enddocument
 932 % \endenumerate
 933 % \endequation
 934 % \endfigure
 935 % \endgroup
 936 % \enditemize
 937 % \endlist
 938 % \endpicture
 939 % \endsloppypar
 940 % \endtabbing
 941 % \endtabular
 942 % \endthebibliography
 943 % \endtrivlist
 944 % \enumerate
 945 % \eqnarray
 946 % \eqno
 947 % \equation
 948 % \errmessage
 949 % \errorstopmode
 950 % \eval
 951 % \evensidemargin
 952 % \everyjob
 953 % \everypar
 954 % \expandafter
 955 % \extracolsep
 956 % \fbox
 957 % \fboxrule
 958 % \fboxsep
 959 % \fi
 960 % \figure
 961 % \fill
 962 % \firstmark
 963 % \float
 964 % \floatingpenalty
 965 % \floatpagefraction
 966 % \floatsep
 967 % \flushbottom
 968 % \flushleft
 969 % \flushright
 970 % \fnsymbol
 971 % \footins
 972 % \footinsertskip
 973 % \footnote
 974 % \footnotemark
 975 % \footnoterule
 976 % \footnotesep

977 % \footnotesize
 978 % \footnotetext
 979 % \footsep
 980 % \footskip
 981 % \frac
 982 % \frame
 983 % \framebox
 984 % \frenchspacing
 985 % \fussy
 986 % \futurelet
 987 % \gdef
 988 % \global
 989 % \glossary
 990 % \halfwidth
 991 % \halign
 992 % \hangindent
 993 % \hbox
 994 % \head
 995 % \headheight
 996 % \headsep
 997 % \hfil
 998 % \hfill
 999 % \hfuzz
 1000 % \hline
 1001 % \hrule
 1002 % \hsize
 1003 % \hskip
 1004 % \hspace
 1005 % \hss
 1006 % \ht
 1007 % \Huge
 1008 % \huge
 1009 % \hyphenchar
 1010 % \if
 1011 % \if@afterindent
 1012 % \if@eqnsw
 1013 % \if@endpe
 1014 % \if@fcolmade
 1015 % \if@filesw
 1016 % \if@firstamp
 1017 % \if@firstcolumn
 1018 % \if@ignore
 1019 % \if@inlabel
 1020 % \if@insert
 1021 % \if@minipage
 1022 % \if@mparswitch
 1023 % \if@negarg
 1024 % \if@newlist
 1025 % \if@nmbrrlist
 1026 % \if@nobreak
 1027 % \if@noitemarg
 1028 % \if@nparitem
 1029 % \if@nparlist
 1030 % \if@noskipsec
 1031 % \if@ovb
 1032 % \if@ovl
 1033 % \if@ovr
 1034 % \if@ovt
 1035 % \if@pboxsw
 1036 % \if@reversemargin
 1037 % \if@rjfield

1038 % \if@specialpage
1039 % \if@tempwa
1040 % \if@test
1041 % \if@twocolumn
1042 % \if@twoside
1043 % \ifcase
1044 % \ifdim
1045 % \ifeof
1046 % \ifhmode
1047 % \ifinner
1048 % \ifmmode
1049 % \ifnum
1050 % \ifodd
1051 % \ifvmode
1052 % \ifvoid
1053 % \ifx
1054 % \ignorespaces
1055 % \immediate
1056 % \include
1057 % \includeonly
1058 % \indent
1059 % \index
1060 % \indexentry
1061 % \input
1062 % \insecunt
1063 % \insert
1064 % \interdisplaylinepenalty
1065 % \interfootnotelinepenalty
1066 % \interlinepenalty
1067 % \intextsep
1068 % \it
1069 % \item
1070 % \itemindent
1071 % \itemize
1072 % \itemsep
1073 % \jobname
1074 % \kern
1075 % \kill
1076 % \label
1077 % \labelenumi
1078 % \labelenumiv
1079 % \labelitemi
1080 % \labelitemii
1081 % \labelitemiii
1082 % \labelitemiv
1083 % \labelsep
1084 % \labelwidth
1085 % \LARGE
1086 % \Large
1087 % \large
1088 % \lastbox
1089 % \lastskip
1090 % \LaTeX
1091 % \lbrace
1092 % \leaders
1093 % \leavevmode
1094 % \lefteqn
1095 % \leftmargin
1096 % \leftmargini
1097 % \leftmarginiv
1098 % \leftmark

1099 % \leftskip
1100 % \let
1101 % \limits
1102 % \line
1103 % \linebreak
1104 % \lineskip
1105 % \linethickness
1106 % \linewidth
1107 % \list
1108 % \listoffigures
1109 % \listoftables
1110 % \listparindent
1111 % \llap
1112 % \long
1113 % \lower
1114 % \m@ne
1115 % \m@th
1116 % \makeatletter
1117 % \makeatother
1118 % \makebox
1119 % \makeglossary
1120 % \makeindex
1121 % \makelabel
1122 % \maketitle
1123 % \marginpar
1124 % \marginparpush
1125 % \marginparsep
1126 % \marginparwidth
1127 % \mark
1128 % \markboth
1129 % \markright
1130 % \math
1131 % \mathchar
1132 % \mathchardef
1133 % \mathop
1134 % \mathrel
1135 % \maxdeadcycles
1136 % \maxdepth
1137 % \maxdimen
1138 % \mb@b
1139 % \mb@eval
1140 % \mb@l
1141 % \mb@r
1142 % \mb@t
1143 % \mbox
1144 % \medskip
1145 % \message
1146 % \minipage
1147 % \mit
1148 % \mkern
1149 % \moveright
1150 % \mskip
1151 % \multicolumn
1152 % \multiply
1153 % \multipt
1154 % \multispan
1155 % \newbox
1156 % \newcommand
1157 % \newcount
1158 % \newcounter
1159 % \newdimen

1160 % \newenvironment
1161 % \newif
1162 % \newinsert
1163 % \newlabel
1164 % \newlength
1165 % \newline
1166 % \newlinechar
1167 % \newpage
1168 % \newsavebox
1169 % \newskip
1170 % \newswitch
1171 % \newtheorem
1172 % \newtoks
1173 % \newwrite
1174 % \noalign
1175 % \nobreak
1176 % \nocite
1177 % \noexpand
1178 % \nofiles
1179 % \noindent
1180 % \nointerlineskip
1181 % \nolinebreak
1182 % \nonumber
1183 % \nopagebreak
1184 % \normalbaselineskip
1185 % \normallineskip
1186 % \normalmarginpar
1187 % \normalsize
1188 % \nullfont
1189 % \number
1190 % \numberline
1191 % \obeycr
1192 % \obeylines
1193 % \obeyspaces
1194 % \oddsidemargin
1195 % \of
1196 % \on@line
1197 % \onecolumn
1198 % \openin
1199 % \or
1200 % \outer
1201 % \output
1202 % \outputpenalty
1203 % \oval
1204 % \over
1205 % \overfullrule
1206 % \overline
1207 % \p@
1208 % \pagebreak
1209 % \pagelayout
1210 % \pagenumbering
1211 % \pageref
1212 % \pagestyle
1213 % \par
1214 % \paragraph
1215 % \parbox
1216 % \parfillskip
1217 % \parindent
1218 % \parsep
1219 % \parshape
1220 % \parskip

1221 % \partopsep
1222 % \partsw
1223 % \penalty
1224 % \picture
1225 % \poptab
1226 % \poptabs
1227 % \postdisplaypenalty
1228 % \prevdepth
1229 % \protect
1230 % \ps@empty
1231 % \ps@plain
1232 % \pushtab
1233 % \pushtabs
1234 % \put
1235 % \quotation
1236 % \raggedbottom
1237 % \raggedleft
1238 % \raggedright
1239 % \raise
1240 % \raisebox
1241 % \rbrace
1242 % \read
1243 % \ref
1244 % \refstepcounter
1245 % \relax
1246 % \renewcommand
1247 % \renewenvironment
1248 % \reset@font
1249 % \restorecr
1250 % \reversemarginpar
1251 % \right
1252 % \rightmargin
1253 % \rightmark
1254 % \rightskip
1255 % \rlap
1256 % \rm
1257 % \Roman
1258 % \roman
1259 % \romannumeral
1260 % \root
1261 % \rule
1262 % \samepage
1263 % \savebox
1264 % \sbox
1265 % \sc
1266 % \scriptscriptsize
1267 % \scriptsize
1268 % \secdef
1269 % \section
1270 % \sectionmark
1271 % \setbox
1272 % \setcounter
1273 % \setlength
1274 % \settowidth
1275 % \shipout
1276 % \shortstack
1277 % \showboxbreadth
1278 % \showboxdepth
1279 % \sift@@n
1280 % \skip
1281 % \sl

1282 % \SLiTeX
1283 % \sloppy
1284 % \sloppypar
1285 % \small
1286 % \smallskip
1287 % \space
1288 % \spacefactor
1289 % \splitmaxdepth
1290 % \splittopskip
1291 % \sqrt
1292 % \ss
1293 % \stackrel
1294 % \stepcounter
1295 % \stop
1296 % \stretch
1297 % \string
1298 % \strut
1299 % \subsection
1300 % \subsubsection
1301 % \tabalign
1302 % \tabbing
1303 % \tabbingsep
1304 % \tabcolsep
1305 % \tableentry
1306 % \tableofcontents
1307 % \tabskip
1308 % \tabular
1309 % \tencirc
1310 % \tencircw
1311 % \tenln
1312 % \tenlnw
1313 % \textfloatsep
1314 % \textfraction
1315 % \textheight
1316 % \textwidth
1317 % \thanks
1318 % \the
1319 % \thebibliography
1320 % \theenumi
1321 % \theenumii
1322 % \theequation
1323 % \thefigure
1324 % \thefootnote
1325 % \thempfn
1326 % \thempfootnote
1327 % \thepage
1328 % \thesection
1329 % \thicklines
1330 % \thinlines
1331 % \thinspace
1332 % \thispagestyle
1333 % \tiny
1334 % \title
1335 % \today
1336 % \tolerance
1337 % \topfigrule
1338 % \topfraction
1339 % \topmargin
1340 % \topnewpage
1341 % \topnum
1342 % \topsep

```

1343 % \topskip
1344 % \tracingonline
1345 % \tracingoutput
1346 % \tracingstats
1347 % \trivlist
1348 % \tt
1349 % \tw@
1350 % \twocolumn
1351 % \typein
1352 % \typeout
1353 % \unbox
1354 % \underline
1355 % \unhbox
1356 % \unitlength
1357 % \unskip
1358 % \unvbox
1359 % \usebox
1360 % \usecounter
1361 % \vadjust
1362 % \value
1363 % \vbox
1364 % \vcenter
1365 % \vector
1366 % \verb
1367 % \verbatim
1368 % \vfil
1369 % \vfuzz
1370 % \vline
1371 % \vrule
1372 % \vsize
1373 % \vskip
1374 % \vspace
1375 % \vsplit
1376 % \vss
1377 % \vtop
1378 % \wd
1379 % \write
1380 % \writes
1381 % \xdef
1382 % \z@
1383 % \[
1384 % \]
1385 % \]
1386 % \^
1387 % \_
1388 % \‘
1389 % \{
1390 % \}
1391 % \}
1392 % \~
1393
1394
1395
1396
1397 % *****
1398 % *          GENERAL CONVENTIONS          *
1399 % *****
1400 %
1401 % THE \LaTeX AND \SLiTeX LOGOS ARE DEFINED HERE.
1402 %
1403 %% RmS 91/09/29: \reset@font added to \LaTeX logo.

```

```

1404 \def\p@LaTeX{\reset@font\rm L\kern-.36em\raise.3ex\hbox{\sc a}\kern-.15em%
1405   T\kern-.1667em\lower.7ex\hbox{E}\kern-.125emX}}
1406
1407 %% RmS 91/09/29: \SLiTeX logo added.
1408 \def\p@SLiTeX{\reset@font\rm S\kern-.06em{\sc l\kern-.035emi}\kern-.06emT\kern
1409   -.1667em\lower.7ex\hbox{E}\kern-.125emX}}
1410
1411 %% RmS 91/10/17: \protect'ed the logos
1412 \def\LaTeX{\protect\p@LaTeX}
1413 \def\SLiTeX{\protect\p@SLiTeX}
1414
1415
1416 % SAVED VERSIONS OF TeX PRIMITIVES:
1417 %
1418 % The TeX primitive \foo is saved as \@foo . The following primitives
1419 % are handled in this way:
1420
1421 \let\@par=\par
1422 %\let\@relax=\relax % This was needed at one time, but seems to be obsolete.
1423 \let\@input=\input
1424 \let\@end=\end
1425
1426 % The following was added 19 April 1986:
1427 % The \- command is redefined to allow it to work in the \tt type style,
1428 % where automatic hyphenation is suppressed by setting \hyphenchar to -1.
1429 % The original definition is saved as \@hyph just in case anyone needs it.
1430
1431 \let\@hyph=\- % Original defin
1432 \def\-\{\discretionary{-}{-}{-}}
1433
1434 % SAVED VERSIONS OF TeX PARAMETERS
1435 %
1436 % \normalbaselineskip and \normallineskip hold the
1437 % normal values of \baselineskip and \lineskip
1438
1439 % Any font-changing commands that change the normal value of \lineskip
1440 % and \baselineskip should change their saved values.
1441
1442 % The following definitions save token space. E.g., using \@height
1443 % instead of height saves 5 tokens at the cost in time of one macro
1444 % expansion.
1445
1446 \def\@height{height}
1447 \def\@depth{depth}
1448 \def\@width{width}
1449
1450 % The following implements the LaTeX \{ and \} commands.
1451 % Changed 21 Apr 87 to make them robust.
1452
1453 \def\{\protect\@lb}
1454 \def\@lb{\relax\ifmmode\lbrace\else$\m@th\lbrace$\fi}
1455 \def\}\protect\@rb}
1456 \def\@rb{\relax\ifmmode\rbrace\else$\m@th\rbrace$\fi}
1457
1458 \message{counters,}
1459 % *****
1460 % *           COUNTERS, ETC.           *
1461 % *****
1462 %
1463 % THE FOLLOWING ARE FROM PLAIN:
1464 % \z@           : A zero dimen or number. It's more efficient to write

```



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1465 %           \parindent\z@ than \parindent Opt.
1466 % \@one      : The number 1.
1467 % \m@one     : The number -1.
1468 % \tw@       : The number 2.
1469 % \sxt@@n    : The number 16.
1470 % \@m        : The number 1000.
1471 % \@xxxii    : The number 32
1472 % \@M        : The number 10000.
1473 % \@Mi       : The number 10001.
1474 % \@Mii      : The number 10002.
1475 % \@Miii     : The number 10003.
1476 % \@Miv      : The number 10004.
1477 % \@MM       : The number 20000.
1478 %
1479 % \@flushglue : Glue used for \right- & \leftskip to = Opt plus ifil
1480
1481 \chardef\@xxxii=32
1482 \mathchardef\@Mi=10001
1483 \mathchardef\@Mii=10002
1484 \mathchardef\@Miii=10003
1485 \mathchardef\@Miv=10004
1486
1487 % Redefine PLAIN.TEX macros not to be \outer
1488
1489 \def\newcount{\alloc@0\count\countdef\insc@unt}
1490 \def\newdimen{\alloc@1\dimen\dimendef\insc@unt}
1491 \def\newskip{\alloc@2\skip\skipdef\insc@unt}
1492 \def\newbox{\alloc@4\box\chardef\insc@unt}
1493 \def\newwrite{\alloc@7\write\chardef\sixt@@n}
1494
1495 \newwrite\@unused
1496 \newcount\@tempcnta
1497 \newcount\@tempcntb
1498 \newif\if@tempswa\@tempswatruer
1499
1500 \newdimen\@tempdima
1501 \newdimen\@tempdimb
1502
1503 \newbox\@tempboxa
1504
1505 \newskip\@flushglue \@flushglue = Opt plus ifil
1506 \newskip\@tempskipa
1507 \newskip\@tempskipb
1508 \newtoks\@temptokena
1509
1510 \message{hacks,}
1511 % *****
1512 % *           USEFUL HACKS           *
1513 % *****
1514 %
1515 % \@namedef{NAME} : Expands to \def\NAME , except name can contain any
1516 %                  characters.
1517 % \@nameuse{NAME} : Expands to \NAME .
1518 %
1519 % \@ifnextchar X{YES}{NO}
1520 %                  : Expands to YES if next character is an 'X',
1521 %                  and to NO otherwise. (Uses temps a-c.)
1522 %                  NOTE: GOBBLES ANY SPACE FOLLOWING IT.
1523 %
1524 % \@ifstar{YES}{NO} : Gobbles following spaces and then tests if next the
1525 %                  character is a '*'. If it is, then it gobbles the

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```

1526 %          '*' and expands to YES, otherwise it expands to NO.
1527 %
1528 % \@dblarg{CMD}{ARG} : \@dblarg{CMD}{ARG} expands to CMD[ARG]{ARG}. Use
1529 %          \@dblarg{CS} when \CS takes arguments [ARG1]{ARG2},
1530 %          where default is ARG1 = ARG2.
1531 %
1532 % \@ifundefined{NAME}{YES}{NO}
1533 %          : If \NAME is undefined then it executes YES,
1534 %          otherwise it executes NO. More precisely,
1535 %          true if \NAME either undefined or = \relax.
1536 % \@ifdefinable \NAME {YES}
1537 %          : Executes YES if the user is allowed to define \NAME,
1538 %          otherwise it gives an error. The user can define \NAME
1539 %          if \@ifundefined{NAME} is true, 'NAME' /= 'relax'
1540 %          and the first three letters of 'NAME' are not
1541 %          'end'.
1542 % \newcommand{\FOO}[i]{TEXT}
1543 %          : User command to define \FOO to be a macro with
1544 %          i arguments (i = 0 if missing) having the definition
1545 %          TEXT. Produces an error if \FOO already defined.
1546 %
1547 % \renewcommand{\FOO}[i]{TEXT} : Same as \newcommand, except it
1548 %          checks if \FOO already defined.
1549 %
1550 % \newenvironment{FOO}[i]{DEF1}{DEF2}
1551 %          equivalent to
1552 %          \newcommand{\FOO}[i]{DEF1} \def{endFOO}{DEF2}
1553 %
1554 % \renewenvironment : obvious companion to \newenvironment
1555 %
1556 % \@cons : See description of \output routine.
1557 %
1558 % \@car T1 T2 ... Tn\@nil == T1 (unexpanded)
1559 %
1560 % \@cdr T1 T2 ... Tn\@nil == T2 ... Tn (unexpanded)
1561 %
1562 % \typeout{message} : produces a warning message on the terminal
1563 %
1564 % \@warning{message}: prints 'LaTeX Warning: message.'
1565 %          With TeX 3.x, it also prints line number.
1566 %          (Changed 24 Jun 91 RmS)
1567 % \@@warning{message}: like \@warning, except that it never prints
1568 %          the line number (added 24 Jun 91 RmS).
1569 %
1570 % \typein{message} : Types message, asks the user to type in a command, then
1571 %          executes it
1572 %
1573 % \typein[\CS]{MSG} : Same as above, except defines \CS to be the input
1574 %          instead of executing it.
1575 %
1576 %% RmS 92/03/18: changed input channel from 0 to \@inputcheck to avoid conflicts
1577 %%          with other channels allocated by \newread
1578 \newread\@inputcheck
1579 \def\typein{\let\@typein\relax\@ifnextchar[{\@xtypein}{\@xtypein[\@typein]}}
1580 \def\@xtypein[#1]#2{\typeout{#2}\read\@inputcheck to#1\ifx #1\@defpar \def#1{\else
1581 \@iden{\expandafter\@strip\expandafter
1582 #1#\@gobble\@gobble} \@gobble\fi\@typein}
1583 \def\@strip#1#2 \@gobble{\def #1{#2}}
1584 \def\@defpar{\par}
1585 \def\@iden#1{#1}
1586

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```

1587 \ifx\inputlineno\undefined
1588 \let\on@line\empty
1589 \else
1590 \ifnum\inputlineno=\m@ne
1591 \let\on@line\empty
1592 \else
1593 \def\on@line{ on input line \the\inputlineno}
1594 \fi
1595 \fi
1596
1597 \def\typeout#1{\let\protect\string\immediate\write\@unused{#1}}
1598 \def\@warning#1{\typeout{LaTeX Warning: #1.}}
1599 \def\@warning#1{\@warning{#1\on@line}}
1600 \def\@namedef#1{\expandafter\def\csname #1\endcsname}
1601 \def\@nameuse#1{\csname #1\endcsname}
1602
1603 \def\@cons#1#2{\begingroup\let\@elt\relax\xdef#1{#1\@elt #2}\endgroup}
1604
1605 \def\@car#1#2\@nil{#1}
1606 \def\@cdr#1#2\@nil{#2}
1607
1608 % \@carcube T1 ... Tn\@nil = T1 T2 T3 , n > 3
1609 \def\@carcube#1#2#3#4\@nil{#1#2#3}
1610
1611 \def\newcommand#1{\@ifnextchar [{\@argdef#1}{\@argdef#1[0]}}
1612
1613 \def\renewcommand#1{\edef\@tempa{\expandafter\@cdr\string
1614 #1\@nil}\@ifundefined{\@tempa}{\@latexerr{\string#1\space undefined}\@ehc
1615 }{\@ifnextchar [{\@reargdef#1}{\@reargdef#1[0]}}
1616
1617 \def\newenvironment#1{\@ifnextchar
1618 [{\@newenv{#1}}{\@newenv{#1}[0]}}
1619
1620 \long\def\@newenv#1[#2]#3#4{\expandafter\newcommand
1621 \csname #1\endcsname[#2]{#3}\long
1622 \expandafter\def\csname end#1\endcsname{#4}}
1623
1624 \def\renewenvironment#1{\@ifnextchar
1625 [{\@renewenv{#1}}{\@renewenv{#1}[0]}}
1626
1627 \long\def\@renewenv#1[#2]#3#4{\expandafter\renewcommand
1628 \csname #1\endcsname[#2]{#3}\long
1629 \expandafter\def\csname end#1\endcsname{#4}}
1630
1631 \long\def\@argdef#1[#2]#3{\@ifdefinable #1{\@reargdef#1[#2]{#3}}}
1632
1633 % Absolutely untypable control sequence \@?@? substituted for \@tempb in
1634 % definition of \@reargdef because it (and therefore \newcommand and
1635 % \renewcommand) leaves the control sequence dangerously \let to #.
1636 % (Change made 23 November 87.)
1637 %
1638 \catcode'\?=11\relax
1639 \long\def\@reargdef#1[#2]#3{\@tempcnta#2\relax\let#1\relax
1640 \edef\@tempa{\long\def#1}\@tempcntb \@ne
1641 \let\@?@?\relax\@whilenum\@tempcnta>\z@
1642 \do{\edef\@tempa{\@tempa\@?@?\the\@tempcntb}\advance\@tempcntb \@ne \advance
1643 \@tempcnta \m@ne}\let\@?@?##\@tempa{#3}}
1644 \catcode'\?=12\relax
1645
1646
1647 % 9 Jan 90 : Missing % added to following definition.

```

```

1648 \long\def\@ifdefinable #1#2{\edef\@tempa{\expandafter\@cdr\string #1\@nil}%
1649 \@ifundefined{\@tempa}{\edef\@tempb{\expandafter\@carcube \@tempa xxxx\@nil}%
1650 \ifx \@tempb\@qend \@notdefinable\else
1651 \ifx \@tempa\@qrelax \@notdefinable\else #2\fi\fi}{\@notdefinable}}
1652
1653 \long\def\@ifundefined#1#2#3{\expandafter\ifx\csname
1654 #1\endcsname\relax#2\else#3\fi}
1655
1656
1657 % The following define \@qend and \@qrelax to be the strings 'end' and
1658 % 'relax' with the characters \catcoded 12.
1659
1660 \edef\@qend{\expandafter\@cdr\string\end\@nil}
1661 \edef\@qrelax{\expandafter\@cdr\string\relax\@nil}
1662
1663 % \@ifnextchar X{YES}{NO}
1664 % BEGIN
1665 %   \@tempe := X % uses \let
1666 %   \@tempa := YES
1667 %   \@tempb := NO
1668 %   \futurelet\@tempc
1669 %   \@ifnch
1670 % END
1671 %
1672 % \@ifnch ==
1673 % BEGIN
1674 %   if \@tempc = blank space
1675 %     then \@tempd := def(\@xifnch)
1676 %     else if \@tempc = \@tempe
1677 %       then \@tempd := def(\@tempa)
1678 %       else \@tempd := def(\@tempb)
1679 %     fi
1680 %   fi
1681 %   \@tempd
1682 % END
1683 %
1684 % \@xifnch ==
1685 % BEGIN
1686 %   gobble blanks
1687 %   \futurelet\@tempc
1688 %   \@ifnch
1689 % END
1690 %
1691 \def\@ifnextchar#1#2#3{\let\@tempe #1\def\@tempa{#2}\def\@tempb{#3}\futurelet
1692   \@tempc\@ifnch}
1693 \def\@ifnch{\ifx \@tempc \@sptoken \let\@tempd\@xifnch
1694   \else \ifx \@tempc \@tempe\let\@tempd\@tempa\else\let\@tempd\@tempb\fi
1695   \fi \@tempd}
1696
1697 % NOTE: the following hacking must precede the definition of \:
1698 % as math medium space.
1699
1700 \def\:{\let\@sptoken= } \: % this makes \@sptoken a space token
1701
1702 \def\:{\@xifnch} \expandafter\def\:{\futurelet\@tempc\@ifnch}
1703
1704 \def\@ifstar#1#2{\@ifnextchar *{\def\@tempa*{#1}\@tempa}{#2}}
1705
1706 \long\def\@dblarg#1{\@ifnextchar[{\#1}{\@xdblarg{#1}}}
1707 \long\def\@xdblarg#1#2{#1[{\#2}]{#2}}
1708

```

```

1709 % The command \@sanitize changes the catcode of all special characters
1710 % except for braces to 'other'. It can be used for commands like
1711 % \index that want to write their arguments verbatim. Needless to
1712 % say, this command should only be executed within a group, or chaos
1713 % will ensue.
1714
1715 \def\@sanitize{\@makeother\ \@makeother\\\@makeother\$\@makeother\&%
1716 \@makeother#\@makeother^\@makeother_\@makeother%\@makeother\~}
1717
1718
1719 \message{errors,}
1720 % *****
1721 % *          ERROR HANDLING          *
1722 % *****
1723 %
1724 % \@latexerr{MSG}{HLP}: Types a LaTeX error message MSG and gives an error
1725 % halt with error help message HLP.
1726 %
1727 \newlinechar'\^^J
1728
1729 % 19 Jun 86, took out the grouping. re: John Hobby
1730 \def\@latexerr#1#2{%
1731 \edef\@tempc{#2}\errhelp\expandafter{\@tempc}%
1732 \typeout{LaTeX error. \space See LaTeX manual for explanation.^^J
1733 \space\@spaces\@spaces\@spaces Type \space H <return> \space for
1734 immediate help.}\errmessage{#1}}
1735
1736 \def\@spaces{\space\space\space\space}
1737
1738 %% error help message pieces.
1739 \def\@eha{Your command was ignored.
1740 ^^JType \space I <command> <return> \space to replace it
1741 with another command,^^Jor \space <return> \space to continue without it.}
1742 \def\@ehb{You've lost some text. \space \@ehc}
1743 \def\@ehc{Try typing \space <return>
1744 \space to proceed.^^JIf that doesn't work, type \space X <return> \space to
1745 quit.}
1746 \def\@ehd{You're in trouble here. \space\@ehc}
1747
1748 % Here are all the error message-generating commands of LaTeX.
1749 %
1750 % \@notdefinable : Error message generated in \@ifdefinable from calls
1751 % by \newcommand, \newlength, \newtheorem specifying an
1752 % already-defined command name.
1753 %
1754 % \@nolnerr : Generated by \newline and \\ when called in vertical mode.
1755 %
1756 % '\... undefined' : Generated in \renewcommand.
1757 %
1758 % \@nocnterr : Generated by \setcounter, \addtocounter or \newcounter
1759 % for undefined counter.
1760 %
1761 % \@ctrerr : Called when trying to print the value of a counter
1762 % numbered by letters that's greater than 26.
1763 %
1764 % 'Environment --- undefined' : Issued by \begin for undefined environment.
1765 %
1766 % \@badend : Called by \end that doesn't match its \begin.
1767 %
1768 % \@badmath : Called by \[, \], \( or \) when used in wrong mode.
1769 %

```

1770 % \@toodeep : Called by a list environment nested more than six levels
1771 % deep, or an enumerate or itemize nested more than four
1772 % levels.
1773 %
1774 % \@badpoptabs : Called by \endtabbing when not enough \poptabs have
1775 % occurred, or by \poptabs when too many have occurred.
1776 %
1777 % \@badtab : Called by \>, \+ , \- or \< when stepping to an undefined tab.
1778 %
1779 % 'tab overflow' : Occurs in \= when maximum number of tabs exceeded.
1780 %
1781 % '\< in mid line' : Occurs in \< when it appears in middle of line.
1782 %
1783 % \@preamerr : Occurs in array or tabular environment, or in \multicolumn
1784 % command, when error in argument detected.
1785 %
1786 % \@badlinearg : Occurs in \line and \vector command when a bad slope
1787 % argument is encountered.
1788 %
1789 % \@parmoderr : Occurs in a float environment or a \marginpar when
1790 % encountered in inner vertical mode.
1791 %
1792 % \@fltovf : Occurs in float environment or \marginpar when there
1793 % are no more free boxes for storing floats.
1794 %
1795 % \@latexbug : Occurs in output routine. This is bad news.
1796 %
1797 % 'Float(s) lost' : In output routine, caused by a float environment or
1798 % \marginpar occurring in inner vertical mode.
1799 %
1800 % \@nofonterror : Typeface not available. %%% OBSOLETE; DELETED.
1801 %
1802 % \@badcrerr : A \\ used where it shouldn't be in a centering or flushing
1803 % environment.
1804 %
1805 % \@noitemerr : \addvspace or \addpenalty was called when not in vmode.
1806 % Probably caused by a missing \item.
1807 %
1808 % \@notprerr : A command that can be used only in the preamble
1809 % appears after the \begin{document} command.
1810
1811 \def\@notdefinable{\@latexerr{Command name '\@tempa' already used}\@eha}
1812
1813 \def\@nolnerr{\@latexerr{There's no line here to end}\@eha}
1814
1815 \def\@nocnterr{\@latexerr{No such counter}\@eha}
1816
1817 \def\@ctrerr{\@latexerr{Counter too large}\@ehb}
1818
1819 \def\@nodocument{\@latexerr{Missing \string\begin{document}}\@ehd}
1820
1821 \def\@badend#1{\@latexerr{\string\begin{\@currenvir} ended by
1822 \string\end{#1}}\@eha}
1823
1824 \def\@badmath{\@latexerr{Bad math environment delimiter}\@eha}
1825
1826 \def\@toodeep{\@latexerr{Too deeply nested}\@ehd}
1827
1828 \def\@badpoptabs{\@latexerr{\string\pushtabs \space and \string\poptabs
1829 \space don't match}\@ehd}
1830

```

1831 \def\@badtab{\@latexerr{Undefined tab position}\@ehd}
1832
1833 \def\@preamerr#1{\@latexerr{\ifcase #1 Illegal character\or
1834     Missing @-exp\or Missing p-arg\fi\space
1835     in array arg}\@ehd}
1836
1837 \def\@badlinearg{\@latexerr{Bad \string\line\space or \string\vector
1838     \space argument}\@ehb}
1839
1840 \def\@parmoderr{\@latexerr{Not in outer par mode}\@ehb}
1841
1842 \def\@fltovf{\@latexerr{Too many unprocessed floats}\@ehb}
1843
1844 \def\@latexbug{\@latexerr{This may be a LaTeX bug}{Call for help}}
1845
1846 % \def\@nofonterror{\@latexerr{Typeface not available}\@eha}
1847
1848 \def\@badcrerr {\@latexerr{Bad use of \string\\}\@ehc}
1849
1850 \def\@noitemerr{\@latexerr{Something's wrong--perhaps a missing
1851 \string\item}\@ehc}
1852
1853 \def\@notprerr {\@latexerr{Can be used only in preamble}\@eha}
1854
1855 \message{par,}
1856 % *****
1857 % *      \par AND \everypar      *
1858 % *****
1859 %
1860 % There are two situations in which \par may be changed:
1861 %
1862 % - Long-term changes, in which the new value is to remain in effect
1863 %   until the current environment is left. The environments that
1864 %   change \par in this way are the following:
1865 %
1866 %     * All list environments (itemize, quote, etc.)
1867 %     * Environments that turn \par into a noop:
1868 %       tabbing, array and tabular.
1869 %
1870 % - Temporary changes, in which \par is restored to its previous value the
1871 %   next time it is executed. The following are all such uses.
1872 %     * \end [when preceded by \endparent, which is called by
1873 %       \endtrivlist]
1874 %     * The mechanism for avoiding page breaks and getting the
1875 %       spacing right after section heads.
1876 %
1877 % To permit the proper interaction of these two situations, long-term
1878 % changes are made by the following command:
1879 %   \@setpar{VAL}      : To set \par. It \def's \par and \@par to VAL.
1880 % Short-term changes are made by the usual \def\par commands.
1881 % The original values are restored after a short-term change
1882 % by the \@restorepar commands.
1883 %
1884 % NOTE: \@@par always is defined to be the original TeX \par.
1885 %
1886 % \everypar is changed only for the short term. Whenever \everypar
1887 % is set non-null, it should restore itself to null when executed.
1888 % The following commands change \everypar in this way:
1889 %     * \item
1890 %     * \end [when preceded by \endparent, which is called by
1891 %       \endtrivlist]

```

```

1892 %          * \minipage
1893 %
1894 % WARNING: Commands that make short-term changes to \par and \everypar
1895 % must take account of the possibility that the new commands and the
1896 % ones that do the restoration may be executed inside a group. In
1897 % particular, \everypar is executed inside a group whenever a new paragraph
1898 % begins with a left brace. The \everypar command that restores its
1899 % definition should be local to the current group (in case the command
1900 % is inside a minipage used inside someplace where \everypar has been
1901 % redefined). Thus, if \everypar is redefined to do an \everypar{}
1902 % it could take several executions of \everypar before
1903 % the restoration 'holds'. This usually causes no problem. However, to
1904 % prevent the extra executions from doing harm, use a global switch
1905 % to keep anything harmful in the new \everypar from being done twice.
1906 %
1907 % WARNING: Commands that change \everypar should remember that \everypar
1908 % might be supposed to set the following switches false:
1909 %          @nobreak
1910 %          @minipage
1911 % they should do the setting if necessary.
1912 %
1913 % \def\@par{\let\par\@par\par}
1914 %
1915 % \def\@setpar#1{\def\par{#1}\def\@par{#1}}
1916 % \def\@restorepar{\def\par{\@par}}
1917 %
1918 % \message{spacing,}
1919 % *****
1920 % *      SPACING / LINE AND PAGE BREAKING      *
1921 % *****
1922 %
1923 % USER COMMANDS:
1924 % \nopagebreak[i] : i = 0,...,4. Default argument = 4. Puts a penalty
1925 %                   into the vertical list output as follows:
1926 %                   0 : penalty = 0
1927 %                   1 : penalty = \@lowpenalty
1928 %                   2 : penalty = \@medpenalty
1929 %                   3 : penalty = \@highpenalty
1930 %                   4 : penalty = 10000
1931 % \pagebreak[i]   : same as \nopagebreak except negatives of its penalty
1932 % \linebreak[i], \nolinebreak[i] : analogs of the above
1933 % \samepage : inhibits page breaking most places by setting the following
1934 %             penalties to 10000
1935 %             \interlinepenalty
1936 %             \postdisplaypenalty
1937 %             \interdisplaylinepenalty
1938 %             \@beginparpenalty
1939 %             \@endparpenalty
1940 %             \@itempenalty
1941 %             \@secpenalty
1942 %             \interfootnotelinepenalty
1943 %
1944 % \obeycr      : defines <CR> == \\.
1945 % \restorecr   : restores <CR> to its usual meaning.
1946 %
1947 % \\          : initially defined to be \newline
1948 % \\[LENGTH] : initially defined to be \space{LENGTH}\newline
1949 %             Note: \\* adds a \adjust{\penalty 10000}
1950 %
1951 % \def\nopagebreak{\@ifnextchar[{\@nopgbk}{\@nopgbk[4]}}
1952 % \def\@nopgbk#1{\ifvmode \penalty \@getpen{#1}\else

```



```

1953 \@bsphack\vadjust{\penalty \@getpen{#1}}\@esphack\fi}
1954
1955 \def\pagebreak{\@ifnextchar[{\@pgbk}{\@pgbk[4]}}
1956 \def\@pgbk[#1]{\ifvmode \penalty -\@getpen{#1}\else
1957 \@bsphack\vadjust{\penalty -\@getpen{#1}}\@esphack\fi}
1958
1959 \def\nolinebreak{\@ifnextchar[{\@nolnkb}{\@nolnkb[4]}}
1960 \def\@nolnkb[#1]{\ifvmode \@nolnerr\else \@tempskipa\lastskip
1961 \unskip \penalty \@getpen{#1}\ifdim \@tempskipa >\z@
1962 \hskip\@tempskipa\ignorespaces\fi\fi}
1963
1964 \def\linebreak{\@ifnextchar[{\@lnbk}{\@lnbk[4]}}
1965 \def\@lnbk[#1]{\ifvmode \@nolnerr\else
1966 \unskip\penalty -\@getpen{#1}\fi}
1967
1968 \def\samepage{\interlinepenalty\@M
1969 \postdisplaypenalty\@M
1970 \interdisplaylinepenalty\@M
1971 \@beginparpenalty\@M
1972 \@endparpenalty\@M
1973 \@itempenalty\@M
1974 \@secpenalty\@M
1975 \interfootnotelinepenalty\@M}
1976
1977 % \nobreak added to \newline to prevent null lines when \newline
1978 % ends an overfull line. Change made 24 May 89 as suggested by
1979 % Frank Mittelbach and Rainer Sch\"opf
1980 %
1981 \def\newline{\ifvmode \@nolnerr \else \unskip\nobreak\hfil
1982 \penalty -\@M\fi}
1983
1984
1985 \def\@normalcr{\@ifstar{\vadjust{\penalty\@M}\@xnewline}{\@xnewline}}
1986
1987 \def\@xnewline{\@ifnextchar[{\@newline}{\newline}}
1988
1989 \def\@newline[#1]{\ifhmode\unskip\fi\vspace{#1}\newline}
1990
1991 \let\@=\@normalcr
1992
1993 \def\@getpen#1{\ifcase #1 0 \or \@lowpenalty\or
1994 \@medpenalty \or \@highpenalty
1995 \else \@M \fi}
1996
1997 % @nobreak : Switch used to avoid page breaks caused by \label after a section
1998 % heading, etc. It should be GLOBALLY set true after the \nobreak
1999 % and GLOBALLY set false by the next invocation of \everypar.
2000 % Commands that reset \everypar should globally set it false
2001 % if appropriate.
2002 %
2003 \newif\if@nobreak \@nobreakfalse
2004
2005 % \@bsphack ... \@esphack
2006 % used by macros such as \index and \begin{@float} ... \end{@float}
2007 % that want to be invisible -- i.e.,
2008 % not leave any extra space when used in the middle of text. Such
2009 % a macro should begin with \@bsphack and end with \@esphack
2010 % The macro in question should not create any text, nor change the
2011 % mode.
2012 %
2013 % \@Esphack is a variant of \@esphack that sets the @ignore switch to true

```

```

2014 % (as \@esphack used to do previously). This is currently used only
2015 % for float and similar environments.
2016 %
2017 % \@bsphack ==
2018 % BEGIN
2019 % if not mmode then %% Test for math mode added 18 Dec 89
2020 % \dimen\@savsk := \lastskip
2021 % if hmode then \@savsf := \spacefactor fi
2022 % fi
2023 % END
2024 %
2025 % \@esphack ==
2026 % BEGIN
2027 % if not mmode then %% Test for math mode added 18 Dec 89
2028 % if hmode
2029 % then \spacefactor := \@savsf
2030 % if \dimen\@savsk > Opt then \ignorespaces fi
2031 % fi
2032 % fi
2033 % END
2034 %
2035 % \@Esphack ==
2036 % BEGIN
2037 % if not mmode then
2038 % if hmode
2039 % then \spacefactor := \@savsf
2040 % if \dimen\@savsk > Opt then \ignorespaces
2041 % \global\@ignoretrue fi
2042 % fi
2043 % fi
2044 % END
2045 %
2046
2047 \newdimen\@savsk
2048 \newcount\@savsf
2049
2050 \def\@bsphack{\relax\ifmmode\else\@savsk\lastskip
2051 \ifhmode\@savsf\spacefactor\fi\fi}
2052
2053 \def\@esphack{\relax\ifmmode\else\ifhmode\spacefactor\@savsf
2054 {} \ifdim \@savsk > \z@ \ignorespaces
2055 \fi \fi\fi}
2056
2057 \def\@Esphack{\relax\ifmmode\else\ifhmode\spacefactor\@savsf
2058 {} \ifdim \@savsk > \z@ \global\@ignoretrue \ignorespaces
2059 \fi \fi\fi}
2060
2061 % VERTICAL SPACING:
2062 %
2063 % LaTeX supports the PLAIN TeX commands \smallskip, \medskip and \bigskip.
2064 % However, it redefines them using \vspace instead of \vskip.
2065 %
2066 % Extra vertical space is added by the command \addvspace{SKIP},
2067 % which adds a vertical skip of SKIP to the document. The sequence
2068 % \addvspace{S1} \addvspace{S2}
2069 % is equivalent to
2070 % \addvspace{maximum of S1, S2}.
2071 % \addvspace should be used only in vertical mode, and gives an error if it's
2072 % not. The \addvspace command does NOT add vertical space if
2073 % @minipage = T. The minipage environment uses this to inhibit
2074 % the addition of extra vertical space at the beginning.

```

```

2075 %
2076 % Penalties are put into the vertical list with the \addpenalty{PENALTY}
2077 % command. It works properly when \addpenalty and \addvspace commands
2078 % are mixed.
2079 %
2080 % The @nobreak switch is set true used when in vertical mode and no page
2081 % break should occur. (Right now, it is used only by the section heading
2082 % commands to inhibit page breaking after a heading.)
2083 %
2084 %
2085 % \addvspace{SKIP} ==
2086 % BEGIN
2087 %   if vmode
2088 %     then if @minipage
2089 %       else if \lastskip =0
2090 %         then \vskip SKIP
2091 %         else if \lastskip < SKIP
2092 %           then \vskip -\lastskip
2093 %             \vskip SKIP
2094 %           else if SKIP < 0 and \lastskip >= 0
2095 %             then \vskip -\lastskip
2096 %               \vskip \lastskip + SKIP
2097 %         fi      fi      fi      fi
2098 %     else 'missing \item' error.
2099 %   fi
2100 % END
2101
2102 \def\addvspace#1{\ifvmode
2103   \if@minipage\else
2104     \ifdim \lastskip =\z@ \vskip #1\relax
2105     \else \@tempskipb#1\relax\@xaddvskip
2106   \fi\fi
2107   \else\@noitemerr\fi}
2108
2109 \def\@xaddvskip{\ifdim \lastskip < \@tempskipb\vskip-\lastskip\vskip
2110   \@tempskipb
2111   \else \ifdim \@tempskipb<\z@
2112     \ifdim \lastskip <\z@
2113       \else \advance\@tempskipb\lastskip
2114       \vskip -\lastskip \vskip \@tempskipb
2115   \fi\fi\fi}
2116
2117 \def\addpenalty#1{\ifvmode
2118   \if@minipage\else\if@nobreak\else
2119     \ifdim\lastskip=\z@ \penalty#1\relax
2120     \else \@tempskipb\lastskip
2121     \vskip -\lastskip \penalty#1\vskip\@tempskipb
2122   \fi\fi\fi
2123   \else\@noitemerr\fi}
2124
2125 \def\vspace{\@ifstar{\@vspacer}{\@vspace}}
2126 \def\@vspace#1{\ifvmode
2127   \dimen@\prevdepth \vskip #1\vskip\z@ \prevdepth\dimen@
2128   \else
2129     \@bsphack\vadjust{\dimen@\prevdepth
2130       \vskip #1\vskip\z@ \prevdepth\dimen@}\@esphack\fi}
2131 \def\@vspacer#1{\ifvmode \dimen@\prevdepth
2132   \hrule \@height\z@ \nobreak \vskip #1\vskip\z@
2133   \prevdepth\dimen@
2134   \else
2135     \@bsphack\vadjust{\dimen@\prevdepth \hrule \@height\z@ \nobreak

```

```

2136         \vskip #1\vskip\z@ \prevdepth\dimen@}\@esphack\fi}
2137
2138 \def\smallskip{\vspace\smallskipamount}
2139 \def\medskip{\vspace\medskipamount}
2140 \def\bigskip{\vspace\bigskipamount}
2141
2142
2143 % See list environment for explanation of the following macros.
2144
2145 \def\endtrivlist{\if@newlist\@noitemerr\fi
2146   \if@inlabel\indent\fi
2147   \ifhmode\unskip \par\fi
2148   \if@nolist \else
2149     \ifdim\lastskip >\z@ \@tempskipa\lastskip \vskip -\lastskip
2150     \advance\@tempskipa\parskip \advance\@tempskipa -\@outerparskip
2151     \vskip\@tempskipa
2152   \fi\@endparenv\fi}
2153
2154 % CHANGES TO \@endparenv:
2155 % Changed \hskip -\parindent to \setbox0=\lastbox so a \noindent
2156 % becomes a no-op when used before a line immediately following a
2157 % list environment. (Changed 23 Oct 86)
2158 %
2159 % To suppress the paragraph indentation in text immediately following
2160 % a paragraph-making environment, \everypar is changed to remove the
2161 % space, and \par is redefined to restore \everypar. Instead of redefining
2162 % \par and \everpar, \@endparenv was changed to set the @endpe switch,
2163 % letting \end redefine \par and \everypar. This allows paragraph-
2164 % making environments work right when called by other environments.
2165 % (Changed 27 Oct 86)
2166
2167 \def\@endparenv{\addpenalty\@endparpenalty\addvspace\@topsepadd\@endpetrue}
2168
2169 \def\@doendpe{\@endpetrue
2170   \def\par{\@restorepar\everypar{}}\par\@endpefalse}\everypar
2171   {\setbox\z@\lastbox\everypar{}}\@endpefalse}}
2172
2173 \newif\if@endpe
2174 \@endpefalse
2175
2176 % HORIZONTAL SPACE
2177 %
2178 % \, : used in paragraph mode produces a \thinspace. It has the ordinary
2179 % definition in math mode. Useful for quotes inside quotes, as in
2180 % ‘\,‘Foo’, he said.’
2181 %
2182 % \@ : placed before a ‘.’, makes it a sentence-ending period. Does the
2183 % right thing for other punctuation marks as well. Does this by
2184 % setting spacefactor to 1000.
2185
2186 \def\,\{\protect\pcomma}
2187 \def\pcomma{\relax\ifmmode\mskip\thinmuskip\else\thinspace\fi}
2188
2189
2190 \def\@{\spacefactor\@m}
2191
2192 \def\hspace{\protect\phspace}
2193 \def\phspace{\@ifstar{\@hspacer}{\@hspace}}
2194 \def\@hspace#1{\leavevmode\hskip #1\relax}
2195
2196 \def\@hspacer#1{\leavevmode\vrule \@width\z@\nobreak

```

```

2197             \hskip #1\hskip \z@skip}
2198                 %% extra \hskip Opt added 12/17/85 to guard
2199                 %% against a following \unskip
2200                 %% \relax added 13 Oct 88 for usual TeX lossage
2201                 %% replaced both changes by \hskip\z@skip 27 Nov 91
2202
2203 % define \fill to = Opt plus 1fill
2204 \newskip\fill \fill = Opt plus 1fill
2205
2206 % \stretch{N} == Opt plus N fill
2207 \def\stretch#1{\z@ plus #1fill\relax}
2208
2209 {\catcode'\^M=13 \gdef\obeycr{\catcode'\^M=13 \def^^M{\}\@gobblecr}%
2210 \gdef\restorecr{\catcode'\^M=5 }} %} BRACE MATCHING
2211
2212
2213 \message{control,}
2214 % *****
2215 % *      PROGRAM CONTROL STRUCTURE MACROS      *
2216 % *****
2217 %
2218 % \@whilenum TEST \do {BODY}
2219 % \@whiledim TEST \do {BODY} : These implement the loop
2220 %       while TEST do BODY od
2221 %       where TEST is a TeX \ifnum or \ifdim test, respectively.
2222 %       They are optimized for the normal case of TEST initially false.
2223 %
2224 % \@whilesw SWITCH \fi {BODY} : Implements the loop
2225 %       while SWITCH do BODY od
2226 %       where SWITCH is a command defined by \news witch.
2227 %       Optimized for normal case of SWITCH initially false.
2228 %
2229 % \@for NAME := LIST \do {BODY} : Assumes that LIST expands to A1,A2, ... ,An .
2230 %       Executes BODY n times, with NAME = Ai on the i-th iteration.
2231 %       Optimized for the normal case of n = 1. Works for n=0.
2232 %
2233 % \@tfor NAME := LIST \do {BODY}
2234 %       if, before expansion, LIST = T1 ... Tn where each Ti is a
2235 %       token or {...}, then executes BODY n times, with NAME = Ti
2236 %       on the i-th iteration. Works for n=0.
2237 %
2238 % NOTES: 1. These macros use no \@temp sequences.
2239 %        2. These macros do not work if the body contains anything that looks
2240 %           syntactically to TeX like an improperly balanced \if \else \fi.
2241 %
2242 % \@whilenum TEST \do {BODY} ==
2243 % BEGIN
2244 %   if TEST
2245 %     then BODY
2246 %       \@iwhilenum{TEST \relax BODY}
2247 %   END
2248 %
2249 % \@iwhilenum {TEST BODY} ==
2250 % BEGIN
2251 %   if TEST
2252 %     then BODY
2253 %       \@nextwhile = def(\@iwhilenum)
2254 %     else \@nextwhile = def(\@whilenoop)
2255 %   fi
2256 %   \@nextwhile {TEST BODY}
2257 % END

```

```

2258 %
2259 % \@whilesw SWITCH \fi {BODY} ==
2260 % BEGIN
2261 %   if SWITCH
2262 %     then BODY
2263 %       \@iwhilesw {SWITCH BODY}\fi
2264 %   fi
2265 % END
2266 %
2267 % \@iwhilesw {SWITCH BODY} \fi ==
2268 % BEGIN
2269 %   if SWITCH
2270 %     then BODY
2271 %       \@nextwhile = def(\@iwhilesw)
2272 %     else \@nextwhile = def(\@whileswnoop)
2273 %   fi
2274 %   \@nextwhile {SWITCH BODY} \fi
2275 % END
2276
2277 \def\@whilenoop#1{}
2278 \def\@whilenum#1\do #2{\ifnum #1\relax #2\relax\@iwhilenum{#1\relax
2279   #2\relax}\fi}
2280 \def\@iwhilenum#1{\ifnum #1\let\@nextwhile\@iwhilenum
2281   \else\let\@nextwhile\@whilenoop\fi\@nextwhile{#1}}
2282
2283 \def\@whiledim#1\do #2{\ifdim #1\relax#2\@iwhiledim{#1\relax#2}\fi}
2284 \def\@iwhiledim#1{\ifdim #1\let\@nextwhile\@iwhiledim
2285   \else\let\@nextwhile\@whilenoop\fi\@nextwhile{#1}}
2286
2287 \long\def\@whileswnoop#1\fi{}
2288 \long\def\@whilesw#1\fi#2{#1#2\@iwhilesw{#1#2}\fi\fi}
2289 \long\def\@iwhilesw#1\fi{#1\let\@nextwhile\@iwhilesw
2290   \else\let\@nextwhile\@whileswnoop\fi\@nextwhile{#1}\fi}
2291
2292 % \@for NAME := LIST \do {BODY} ==
2293 %   BEGIN \@forloop expand(LIST),\@nil,\@nil \@@ NAME {BODY} END
2294 %
2295 % \@forloop CAR, CARCDR, CDRCDR \@@ NAME {BODY} ==
2296 %   BEGIN
2297 %     NAME = CAR
2298 %     if def(NAME) = def(\@nnil)
2299 %       else BODY;
2300 %       NAME = CARCDR
2301 %       if def(NAME) = def(\@nnil)
2302 %         else BODY
2303 %           \@iforloop CDRCDR \@@ NAME \do {BODY}
2304 %     fi
2305 %   fi
2306 % END
2307 %
2308 % \@iforloop CAR, CDR \@@ NAME {BODY} =
2309 %   NAME = CAR
2310 %   if def(NAME) = def(\@nnil)
2311 %     then \@nextwhile = def(\@fornoop)
2312 %     else BODY ;
2313 %       \@nextwhile = def(\@iforloop)
2314 %   fi
2315 %   \@nextwhile name cdr {body}
2316 %
2317 % \@tfor NAME := LIST \do {BODY}
2318 %   = \@tforloop LIST \@nil \@@ NAME {BODY}

```

```

2319 %
2320 % \@tforloop car cdr \@@ name {body} =
2321 %     name = car
2322 %     if def(name) = def(\@nnil)
2323 %         then \@nextwhile == \@fornoop
2324 %         else body ;
2325 %             \@nextwhile == \@forloop
2326 %     fi
2327 %     \@nextwhile name cdr {body}
2328 %
2329
2330 \def\@nnil{\@nil}
2331 \def\@empty{}
2332 \def\@fornoop#1\@@#2#3{
2333
2334 \def\@for#1:=#2\do#3{\edef\@fortmp{#2}\ifx\@fortmp\@empty \else
2335     \expandafter\@forloop#2,\@nil,\@nil\@@#1{#3}\fi}
2336
2337 \def\@forloop#1,#2,#3\@@#4#5{\def#4{#1}\ifx #4\@nnil \else
2338     #5\def#4{#2}\ifx #4\@nnil \else#5\@iforloop #3\@@#4{#5}\fi\fi}
2339
2340 \def\@iforloop#1,#2\@@#3#4{\def#3{#1}\ifx #3\@nnil
2341     \let\@nextwhile\@fornoop \else
2342     #4\relax\let\@nextwhile\@iforloop\fi\@nextwhile#2\@@#3{#4}}
2343
2344 %%RmS 91/10/17: Corrected bug in \@tfor: \xdef replaced by \def
2345 %% (See FMi's array.doc)
2346 \def\@tfor#1:=#2\do#3{\def\@fortmp{#2}\ifx\@fortmp\@empty \else
2347     \@tforloop#2\@nil\@nil\@@#1{#3}\fi}
2348 \def\@tforloop#1#2\@@#3#4{\def#3{#1}\ifx #3\@nnil
2349     \let\@nextwhile\@fornoop \else
2350     #4\relax\let\@nextwhile\@tforloop\fi\@nextwhile#2\@@#3{#4}}
2351
2352
2353 \message{files,}
2354 % *****
2355 % *          FILE HANDLING          *
2356 % *****
2357 %
2358 % THE FOLLOWING USER COMMANDS ARE DEFINED IN THIS PART:
2359 % \document          : Reads in the .AUX files and \catcode's @ to 12.
2360 % \nofiles           : Suppresses all file output by setting \@filesw false.
2361 % \includeonly{NAME1, ... ,NAMEn}
2362 %                   : Causes only parts NAME1, ... ,NAMEn to be read by
2363 %                   their \include commands. Works by setting \@partsw true
2364 %                   and setting \@partlist to NAME1, ... ,NAMEn.
2365 % \include{NAME}    : Does an \input NAME unless \partsw is true and
2366 %                   NAME is not in \@partlist. If \@filesw is true, then
2367 %                   it directs .AUX output to NAME.AUX, including a
2368 %                   checkpoint at the end.
2369 % \input{NAME}      : The same as TeX's \input, except it allows optional
2370 %                   braces around the file name.
2371 %
2372 % VARIABLES, SWITCHES AND INTERNAL COMMANDS:
2373 % \@mainaux          : Output file number for main .AUX file.
2374 % \@partaux          : Output file number for current part's .AUX file.
2375 % \@auxout           : Either \@mainout or \@partout, depending on which .AUX
2376 %                   file output goes to.
2377 % \@input{foo}      : If file foo exists, then \input's it, otherwise types
2378 %                   a warning message.
2379 % @filesw           : Switch -- set false if no .AUX, .TOC, .IDX etc files are

```

```

2380 %           to be
2381 %   \@partsw       : Set true by a \includeonly command.
2382 %   \@partlist     : Set to the argument of the \includeonly command.
2383 %
2384 %   \cp@FOO         : The checkpoint for \include'd file FOO.TEX, written
2385 %                   by \@writeckpt at the end of file FOO.AUX
2386 %
2387 % \document ==
2388 %   BEGIN
2389 %     \endgroup    % cancels \begingroup generated by \begin command
2390 %     \@colht := \@colroom := \vsize := \textheight
2391 %     \columnwidth := \textwidth
2392 %     \@clubpenalty := \clubpenalty           % \@clubpenalty saves value.
2393 %     IF @twocolumn = T
2394 %       THEN \columnwidth := (\columnwidth - \columnsep)/2
2395 %           @firstcolumn := T
2396 %     FI
2397 %     \hsize := \linewidth := \columnwidth
2398 %     \begingroup
2399 %       \@floatplacement \@dblfloatplacement
2400 %       \@input{\jobname.aux}
2401 %     \endgroup
2402 %     IF \@filesw = T
2403 %       THEN open file \@mainaux for writing
2404 %            write '\relax' on file \@mainaux
2405 %     FI
2406 %     \do{COMMAND} == BEGIN \let COMMAND = \@notprerr END
2407 %     \@preamblecmds
2408 %     \do == \noexpand
2409 %     \@normalsize
2410 %     \everypar{}
2411 %     @noskipsec := F
2412 %   END
2413 %
2414 % \includeonly{FILELIST} ==
2415 %   BEGIN
2416 %     \@partsw := T
2417 %     \@partlist := FILELIST
2418 %   END
2419 %
2420 % \include{FILE} ==
2421 %   BEGIN
2422 %     \clearpage
2423 %     if \@filesw = T
2424 %       then \immediate\write\@mainaux{\string\@input{FILE.AUX}}
2425 %     fi
2426 %     if \@partsw = T
2427 %       then \@tempswa := F
2428 %            \@tempb == FILE
2429 %            for \@tempa := \@partlist
2430 %              do if eval(\@tempa) = eval(\@tempb)
2431 %                then \@tempswa := T           fi
2432 %              od
2433 %     fi
2434 %
2435 %     if \@tempswa = T
2436 %       then \@auxout := \@partaux
2437 %            if \@filesw = T
2438 %              then \immediate\openout\@partaux{FILE.AUX}
2439 %                 \immediate\write\@partaux{\relax}
2440 %            fi

```



```

2441 %          \@input{FILE.TEX}
2442 %          \clearpage
2443 %          \@writeckpt{FILE}
2444 %          if @filesw then \closeout \@partaux fi
2445 %          \@auxout := \@mainaux
2446 %      else \cp@FILE
2447 %  fi
2448 % END
2449 %
2450 % \@writeckpt{FILE} ==
2451 % BEGIN
2452 %   if \@filesw = T
2453 %     \immediate\write on file \@partaux:
2454 %       \gdef\cp@FILE{          %% }
2455 %     for \@tempa := \cl@ckpt
2456 %       do \immediate\write on file \@partaux:
2457 %         \global\string\setcounter
2458 %           {eval(\@tempa)}{eval(\c@eval(\@tempa))}
2459 %       od          %% {
2460 %     \immediate\write on file \@partaux: }
2461 %   fi
2462 % END
2463 %
2464 % INITIALIZATION
2465 %   \@tempswa := T
2466 %
2467 % \newif\if@filesw \@fileswtrue
2468 % \newif\if@partsw \@partswfalse
2469 % \newwrite\@mainaux
2470 % \newwrite\@partaux
2471 %
2472 % \newcount\@clubpenalty
2473 %
2474 %%% FMi & RmS 91/08/26 set @noskipsec switch to true in the preamble
2475 %%% and to false by \begin{document} to catch lists in the preamble,
2476 %%% i.e., to produce a ‘nodocument’ error when things like
2477 %%% \maketitle appear before \begin{document}.
2478 %
2479 % \noskipsectrue %% set below where switch is defined
2480 %
2481 % 91/03/26 FMi: |\process@table| added to support NFSS.
2482 % This will also work with old lfonts if no other style defines
2483 % |\process@table|.
2484 %
2485 % \def\document{\endgroup
2486 %   \@colht\textheight \@colroom\textheight \vsize\textheight
2487 %   \columnwidth\textwidth \@clubpenalty\clubpenalty
2488 %   \if@twocolumn \advance\columnwidth -\columnsep
2489 %     \divide\columnwidth\tw@ \hsize\columnwidth \@firstcolumntrue
2490 %   \fi
2491 %   \hsize\columnwidth \linewidth\hsize
2492 %   \begingroup\@floatplacement\@dblfloatplacement
2493 %     \makeatletter\let\@writefile\@gobbletwo
2494 %     \@input{\jobname.aux}\endgroup
2495 %   \if@filesw \immediate\openout\@mainaux=\jobname.aux
2496 %     \immediate\write\@mainaux{\relax}\fi
2497 %   \csname process@table\endcsname
2498 %   \let\glb\currsize\@empty %% Force \baselineskip initialisation.
2499 %   \def\do##1{\let ##1\@notprerr}%
2500 %   \@preamblecmds
2501 %   \let\do\noexpand

```

```

2502 \@normalsize\everypar{}\@noskipsecfalse}
2503
2504 \def@gobbletwo#1#2{}
2505
2506 \def\nofiles{\@fileswfalse \typeout
2507   {No auxiliary output files.}\typeout{}}
2508
2509 %% RmS 92/03/18: changed input channel from 1 to \@inputcheck to avoid
2510 %% conflicts with other channels allocated by \newread
2511 \def@input#1{\openin@inputcheck #1 \ifeof@inputcheck \typeout
2512   {No file #1.}\else\closein@inputcheck \relax\@input #1 \fi}
2513 \let@auxout=@mainaux
2514
2515 \def\includeonly#1{\@partswtrue\edef@partlist{#1}}
2516
2517 % In the definition of \include, \def@tempb changed to \edef@tempb to
2518 % be consistent with the \edef in \includeonly. (Suggested by Rainer
2519 % Sch"opf & Frank Mittelbach. Change made 20 Jul 88.)
2520 %
2521 % Changed definition of \include to allow space at end of file name--
2522 % otherwise, typing \include{foo } would cause LaTeX to overwrite
2523 % foo.tex. Change made 24 May 89, suggested by Rainer Sch"opf and
2524 % Frank Mittelbach
2525
2526 \def\include#1{\@include#1 }
2527 \def@include#1 {\clearpage
2528   \if@filesw \immediate\write@mainaux{\string@input{#1.aux}}\fi
2529   \@tempswtrue\if@partsw \@tempswafalse\edef@tempb{#1}\@for
2530   \@tempa:=\@partlist\do{\ifx@tempa@tempb@tempswtrue\fi}\fi
2531   \if@tempswa \if@filesw \let@auxout@partaux
2532   \immediate\openout@partaux #1.aux
2533   \immediate\write@partaux{\relax}\fi@input{#1.tex}\clearpage
2534   \writeckpt{#1}\if@filesw \immediate\closeout@partaux \fi
2535   \let@auxout@mainaux\else\@nameuse{cp@#1}\fi}
2536
2537 \def@writeckpt#1{\if@filesw
2538   \immediate\write@partaux{\string\global\string\@namedef{cp@#1}\@charlb}%
2539   {\let@elt@wckptelt \cl@ckpt}\immediate\write@partaux{\@charrb}\fi}
2540
2541 \def@wckptelt#1{\immediate\write@partaux
2542   {\string\setcounter{#1}{\the\@nameuse{c@#1}}}}
2543
2544 \def\input{\@ifnextchar \bgroup{\@iinput}{\@input }}
2545 \def@iinput#1{\@input #1 }
2546
2547 % The following defines \@charlb and \@charrb to be { and }, respectively
2548 % with \catcode 11.
2549 {\catcode' [=1 \catcode' ]=2
2550 \catcode' {=11 \catcode' }=11
2551 \gdef@charlb[{}
2552 \gdef@charrb[{}
2553 ]% }brace matching
2554
2555
2556 \message{env. counters,}
2557 % *****
2558 % * ENVIRONMENT COUNTER MACROS *
2559 % *****
2560 %
2561 % An environment foo has an associated counter defined by the
2562 % following control sequences:

```

2563 % \c@foo : Contains the counter's numerical value. It is defined by
2564 % \newcount\foocounter.
2565 % \thefoo : Macro that expands to the printed value of \foocounter.
2566 % For example, if sections are numbered within chapters,
2567 % and section headings look like
2568 % Section II-3. The Nature of Counters
2569 % then \thesection might be defined by:
2570 % \def\thesection{\@Roman{\c@chapter}-\@arabic{\c@section}}
2571 %
2572 % \p@foo : Macro that expands to a printed 'reference prefix' of
2573 % counter foo. Any \ref to a value created by counter
2574 % foo will produce the expansion of \p@foo\thefoo when the
2575 % the \label command is executed.
2576 %
2577 % NOTE: \thefoo and \p@foo MUST BE DEFINED IN SUCH A WAY THAT
2578 % \edef\bar{\thefoo} OR \edef\bar{\p@foo}
2579 % DEFINES \bar SO THAT IT WILL EVALUATE TO THE COUNTER VALUE AT THE TIME
2580 % OF THE \edef, EVEN AFTER \foocounter AND ANY OTHER COUNTERS HAVE BEEN
2581 % CHANGED. THIS WILL HAPPEN IF YOU USE THE STANDARD COMMANDS \@arabic,
2582 % \@Roman, ETC.
2583 %
2584 % \cl@foo : List of counters to be reset when foo stepped. Has format
2585 % \@elt{countera}\@elt{counterb}\@elt{counterc}.
2586 %
2587 % The following commands are used to define and modify counters.
2588 % \setcounter{FOO}{VAL} : Globally sets \foocounter equal to VAL.
2589 % \addtocounter{FOO}{VAL}: Globally increments \foocounter by VAL.
2590 % \newcounter{NEWCTR}[OLDCTR] : Defines NEWCTR to be a counter, which is
2591 % reset when counter OLDCTR is stepped. If
2592 % NEWCTR already defined produces 'c@NEWCTR
2593 % already defined' error.
2594 % \value{CTR} : produces the value of counter CTR, for use with
2595 % a \setcounter or \addtocounter command.
2596 % \stepcounter{FOO} : Globally increments counter \c@FOO
2597 % and resets all subsidiary counters.
2598 % \refstepcounter{FOO} : Same a \stepcounter, but it also defines
2599 % \@currentreference so that a subsequent
2600 % \label{bar} command causes \ref{bar} to
2601 % generate the current value of counter foo.
2602 % \@definecounter{FOO} : Initializes counter FOO (with empty reset list),
2603 % defines \p@FOO and \theFOO to be null.
2604 % Also adds FOO to \cl@ckpt -- the reset
2605 % list of a dummy counter @ckpt used for
2606 % taking checkpoints.
2607 % \@addtoreset{FOO}{BAR} : Adds counter FOO to the list of counters
2608 % \cl@BAR to be reset when counter bar is stepped.
2609 %
2610 % NUMBERING MACROS:
2611 % \arabic{COUNTER} : Representation of COUNTER as arabic numerals.
2612 % Changed 29 Apr 86 to make it print the obvious thing
2613 % it COUNTER not positive.
2614 %
2615 % \roman{COUNTER} : Representation of COUNTER as lower-case
2616 % Roman numerals.
2617 % \Roman{COUNTER} : Representation of COUNTER as upper-case
2618 % Roman numerals.
2619 % \alph{COUNTER} : Representation of COUNTER as a lower-case
2620 % letter: 1 = a, 2 = b, etc.
2621 % \Alph{COUNTER} : Representation of COUNTER as an upper-case
2622 % letter: 1 = A, 2 = B, etc.
2623 % \fnsymbol{COUNTER} : Representation of COUNTER as a footnote

```

2624 %                symbol: 1 = *, 2 = \dagger, etc.  Can be
2625 %                used only in math mode.
2626 %
2627 %  THE ABOVE ARE IMPLEMENTED IN TERMS OF THE FOLLOWING:
2628 %    \@arabic\F00counter : Representation of \F00counter as arabic numerals.
2629 %    \@roman\F00counter  : Representation of \F00counter as lower-case
2630 %                        Roman numerals.
2631 %    \@Roman\F00counter  : Representation of \F00counter as upper-case
2632 %                        Roman numerals.
2633 %    \@alph\F00counter   : Representation of \F00counter as a lower-case
2634 %                        letter: 1 = a, 2 = b, etc.
2635 %    \@Alph\F00counter   : Representation of \F00counter as an upper-case
2636 %                        letter: 1 = A, 2 = B, etc.
2637 %    \@fnsymbol\F00counter : Representation of \F00counter as a footnote
2638 %                        symbol.  Can be used only in math mode.
2639
2640 \def\setcounter#1#2{\@ifundefined{c@#1}{\@nocnterr}%
2641 {\global\csname c@#1\endcsname#2\relax}}
2642
2643 \def\addtocounter#1#2{\@ifundefined{c@#1}{\@nocnterr}%
2644 {\global\advance\csname c@#1\endcsname #2\relax}}
2645
2646 \def\newcounter#1{\expandafter\@ifdefinable \csname c@#1\endcsname
2647   {\@definecounter{#1}}\@ifnextchar[{\@newctr{#1}}{-}}
2648
2649 \def\value#1{\csname c@#1\endcsname}
2650
2651 \def\@newctr#1[#2]{\@ifundefined{c@#2}{\@nocnterr}{\@addtoreset{#1}{#2}}}
2652
2653 \def\stepcounter#1{\global\advance\csname c@#1\endcsname \@ne
2654   {\let\@elt\@stpelt \csname cl@#1\endcsname}}
2655
2656 \def\@stpelt#1{\global\csname c@#1\endcsname \z@}
2657
2658 \def\cl@ckpt{\@elt{page}}
2659
2660 \def\@definecounter#1{\expandafter\newcount\csname c@#1\endcsname
2661   \setcounter{#1}0 \expandafter\gdef\csname cl@#1\endcsname{\@addtoreset
2662   {#1}{@ckpt}}\expandafter\gdef\csname p@#1\endcsname{\expandafter
2663   \gdef\csname the#1\endcsname{\arabic{#1}}}}
2664
2665 \def\@addtoreset#1#2{\expandafter\@cons\csname cl@#2\endcsname {{#1}}}
2666
2667 % Numbering commands for definitions of \theCOUNTER and \list arguments.
2668 % \fnsymbol produces the standard footnoting symbols: asterisk, dagger, etc.
2669 % They can be used only in math mode.
2670
2671 \def\arabic#1{\@arabic{\@nameuse{c@#1}}}
2672 \def\roman#1{\@roman{\@nameuse{c@#1}}}
2673 \def\Roman#1{\@Roman{\@nameuse{c@#1}}}
2674 \def\alph#1{\@alph{\@nameuse{c@#1}}}
2675 \def\Alph#1{\@Alph{\@nameuse{c@#1}}}
2676 \def\fnsymbol#1{\@fnsymbol{\@nameuse{c@#1}}}
2677
2678 \def\@arabic#1{\number #1} %% changed 29 Apr 86
2679 \def\@roman#1{\romannumeral #1}
2680 \def\@Roman#1{\expandafter\uppercase\expandafter{\romannumeral #1}}
2681 \def\@alph#1{\ifcase#1\or a\or b\or c\or d\else\@ialph{#1}\fi}
2682 \def\@ialph#1{\ifcase#1\or \or \or \or \or e\or f\or g\or h\or i\or j\or
2683   k\or l\or m\or n\or o\or p\or q\or r\or s\or t\or u\or v\or w\or x\or y\or
2684   z\else\@ctrerr\fi}

```

```

2685 \def\@Alph#1{\ifcase#1\or A\or B\or C\or D\else\@Ialph{#1}\fi}
2686 \def\@Ialph#1{\ifcase#1\or \or \or \or \or E\or F\or G\or H\or I\or J\or
2687 K\or L\or M\or N\or O\or P\or Q\or R\or S\or T\or U\or V\or W\or X\or Y\or
2688 Z\else\@ctrerr\fi}
2689 \def\@fnsymbol#1{\ifcase#1\or *\or \dagger\or \ddagger\or
2690 \mathchar "278\or \mathchar "27B\or \|\or **\or \dagger\dagger
2691 \or \ddagger\ddagger \else\@ctrerr\fi\relax}
2692
2693
2694
2695
2696 \message{page nos.,}
2697 % *****
2698 % * PAGE NUMBERING *
2699 % *****
2700 %
2701 % Page numbers are produced by a page counter, used just like any other
2702 % counter. The only difference is that \c@page contains the number of
2703 % the next page to be output (the one currently being produced), rather
2704 % than one minus it. Thus, it is normally initialized to 1 rather than
2705 % 0. \c@page is defined to be \count0, rather than a count assigned by
2706 % \newcount.
2707 %
2708 % The user sets the pagenumber style with the \pagenumbering{FOO}
2709 % command, which sets the page counter to 1 and defines \thepage to be
2710 % \FOO. For example, \pagenumbering{roman} causes pages to be numbered
2711 % i, ii, etc.
2712
2713
2714 \countdef\c@page=0 \c@page=1
2715 \def\c@page{}
2716 \def\pagenumbering#1{\global\c@page \@ne \gdef\thepage{\csname @#1\endcsname
2717 \c@page}}
2718
2719
2720 \message{x-ref,}
2721 % *****
2722 % * CROSS REFERENCING MACROS *
2723 % *****
2724 %
2725 % The user writes \label{foo} to define the following cross-references:
2726 % \ref{foo} : value of most recently incremented referencable counter.
2727 % in the current environment. (Chapter, section, theorem
2728 % and enumeration counters are referencable,
2729 % footnote counters are not.)
2730 % \pageref{foo} : page number at which \label{foo} command appeared.
2731 % where foo can be any string of characters not containing '\', '{' or '}'.
2732 %
2733 % Note: The scope of the \label command is delimited by environments, so
2734 % \begin{theorem} \label{foo} ... \end{theorem} \label{bar}
2735 % defines \ref{foo} to be the theorem number and \ref{bar} to be
2736 % the current section number.
2737 %
2738 % Note: \label does the right thing in terms of spacing -- i.e.,
2739 % leaving a space on both sides of it is equivalent to leaving
2740 % a space on either side.
2741 %
2742 % This is implemented as follows. A referencable counter CNT is
2743 % incremented by the command \refstepcounter{CNT}, which sets
2744 % \@currentlabel == {CNT}{eval(\p@cnt\theCNT)}. The command
2745 % \label{FOO} then writes the following on file \@auxout :

```

```

2746 %      \newlabel{FOO}{\eval(\@currentlabel)}{\eval(\thepage)}}
2747 %
2748 % \ref{FOO} ==
2749 % BEGIN
2750 %   if \r@foo undefined
2751 %     then ??
2752 %       Warning: 'reference foo on page ... undefined'
2753 %     else \@car \eval(\r@FOO)\@nil
2754 %   fi
2755 % END
2756 %
2757 % \pageref{foo} =
2758 % BEGIN
2759 %   if \r@foo undefined
2760 %     then ??
2761 %       Warning: 'reference foo on page ... undefined'
2762 %     else \@cdr \eval(\r@FOO)\@nil
2763 %   fi
2764 % END
2765 %
2766 %
2767 %% RmS 91/10/25: added a few extra \reset@font,
2768 %%      as suggested by Bernd Raichle
2769 \def\ref#1{\@ifundefined{r@#1}{\reset@font\bf ??}\@warning
2770 {Reference '#1' on page \thepage \space
2771 undefined}}{\edef\@tempa{\@nameuse{r@#1}}\expandafter
2772 \@car\@tempa \@nil\@nil}}
2773
2774 \def\pageref#1{\@ifundefined{r@#1}{\reset@font\bf ??}\@warning
2775 {Reference '#1' on page \thepage \space
2776 undefined}}{\edef\@tempa{\@nameuse{r@#1}}\expandafter
2777 \@cdr\@tempa\@nil\@nil}}
2778
2779 \def\newlabel#1#2{\@ifundefined{r@#1}{\@warning{Label '#1' multiply
2780 defined}}\global\@namedef{r@#1}{#2}}
2781
2782 % \label and \refstepcounter changed to allow \protect'ed commands to
2783 % work properly. For example,
2784 % \def\thechapter{\protect\foo{\arabic{chapter}.\roman{section}}}}
2785 % will cause a \label{bar} command to define \ref{bar} to expand to
2786 % something like \foo{4.d}. Change made 20 Jul 88.
2787
2788 \def\label#1{\@bsphack\if@filesw {\let\thepage\relax
2789 \def\protect{\noexpand\noexpand\noexpand}%
2790 \edef\@tempa{\write\@auxout{\string
2791 \newlabel{#1}{\@currentlabel}{\thepage}}}}}%
2792 \expandafter\@tempa
2793 \if@nobreak \ifvmode\nobreak\fi\fi\fi\@esphack}
2794
2795 \def\refstepcounter#1{\stepcounter{#1}\let\@tempa\protect
2796 \def\protect{\noexpand\protect\noexpand}%
2797 \edef\@currentlabel{\csname p@#1\endcsname\csname the#1\endcsname}%
2798 \let\protect\@tempa}
2799
2800 \def\@currentlabel{} % For \label commands that come before any environment
2801
2802 \message{environments,}
2803 % *****
2804 % * ENVIRONMENTS *
2805 % *****
2806 %

```

```

2807 % \begin{foo} and \end{foo} are used to delimit environment foo.
2808 % \begin{foo} starts a group and calls \foo if it is defined, otherwise
2809 % it does nothing. \end{foo} checks to see that it matches the
2810 % corresponding \begin and if so, it calls \endfoo and does an
2811 % \endgroup. Otherwise, \end{foo} does nothing.
2812 %
2813 % If \end{foo} needs to ignore blanks after it, then \endfoo should
2814 % globally set the @ignore switch true with \global\@ignoretrue.
2815 %
2816 % \@currentvir : the name of the current environment. Initialized to
2817 % 'document' to make \end{document} work right.
2818 %
2819 % \@preamblecmds : a list of commands that can be used only in the
2820 % preamble (before the \begin{document}), in the
2821 % form \do \CMDA \do \CMDB ... . These commands
2822 % are redefined to \@notprerr by \begin{document}
2823 % to save space. They include the following:
2824 %     \document \documentstyle \@documentstyle
2825 %     \@options \@preamblecmds \@optionlist
2826 %     \@optionfiles \nofiles \includeonly \makeindex
2827 %     \makeglossary
2828 % The document style can add any other commands to
2829 % this list by
2830 %     \def\do{\noexpand\do\noexpand}
2831 %     \edef\@preamblecmds{\@preamblecmds \do ...}
2832 %
2833 % NOTE: \@@end is defined to be the \end command of TeX82.
2834 %
2835 % \enddocument is the user's command for ending the manuscript file.
2836 %
2837 % \stop is a panic button -- to end TeX in the middle.
2838 %
2839 % \enddocument ==
2840 % BEGIN
2841 %   \@checkend{document}   %% checks for unmatched \begin
2842 %   \clearpage
2843 %   \begingroup
2844 %     if @filesw = true
2845 %       then close file @mainaux
2846 %         \global \@namedef {ARG1}{ARG2} == null
2847 %         \newlabel{LABEL}{VAL} ==
2848 %           BEGIN
2849 %             \@tempa == VAL
2850 %             if def(\@tempa) = def(\r@LABEL)
2851 %               else @tempswa := true           fi
2852 %           END
2853 %         \bibtocite{LABEL}{VAL} == null
2854 %         BEGIN
2855 %           \@tempa == VAL
2856 %           if def(\@tempa) = def(\g@LABEL)
2857 %             else @tempswa := true           fi
2858 %         END
2859 %       @tempswa := false
2860 %       make @ a letter
2861 %       \input \jobname.AUX
2862 %       if @tempswa = true
2863 %         then LaTeX Warning: 'Label may have changed.
2864 %           Rerun to get cross-references right.'
2865 %       fi     fi
2866 %   \endgroup
2867 % finish up

```

```

2868 %   END
2869 %
2870 %   \@writefile{EXT}{ENTRY} ==
2871 %       if tf@EXT undefined
2872 %           else \write\tf@EXT{ENTRY}
2873 %       fi
2874 %
2875 \def\@currenvir{document}
2876
2877 \def\@preamblecmds{\do\document \do\documentstyle \do\@documentstyle
2878 \do\@options \do\@preamblecmds \do\@optionlist \do\@optionfiles
2879 \do\nofiles \do\includeonly \do\makeindex \do\makeglossary}
2880
2881 \newif\if@ignore
2882
2883 \def\enddocument{\@checkend{document}\clearpage\beginingroup
2884 \if@filesw \immediate\closeout\@mainaux
2885 \def\global\@namedef##1##2{\def\newlabel{\@testdef r}%
2886 \def\bibcite{\@testdef b}\@tempswafalse \makeatletter\input \jobname.aux
2887 \if@tempswa \@warning{Label(s) may have changed. Rerun to get
2888 cross-references right}\fi\fi\endgroup\deadcycles\z@\@end}
2889
2890 \def\@testdef #1#2#3{\def\@tempa{#3}\expandafter \ifx \cename #1@#2\endcename
2891 \@tempa \else \@tempswatruer \fi}
2892
2893 \long\def\@writefile#1#2{\@ifundefined{tf@#1}{}{%
2894 \immediate\write\cename tf@#1\endcename{#2}}}}
2895 % \long added 8 Feb 90, as suggested by Chris Rowley
2896
2897 \def\stop{\clearpage\deadcycles\z@\let\par\@par\@end}
2898
2899 \everypar{\@nodocument} %% To get an error if text appears before the
2900 \nullfont                %% \begin{document}
2901
2902 % \begin, \end, and \@checkend changed so \end{document} will catch
2903 % an unmatched \begin. Changed 24 May 89 as suggested by
2904 % Frank Mittelbach and Rainer Sch"opf.
2905
2906
2907 % \begin{NAME} ==
2908 % BEGIN
2909 %   IF \NAME undefined THEN \@tempa == BEGIN report error END
2910 %   ELSE \@tempa == (\@currenvir :=L NAME) \NAME
2911 %   FI
2912 %   @ignore :=G F           %% Added 30 Nov 88
2913 %   \beginingroup
2914 %   \@currenvir :=L NAME
2915 %   \NAME
2916 %   END
2917
2918 % \end{NAME} ==
2919 % BEGIN
2920 %   \endNAME
2921 %   \@checkend{NAME}
2922 %   IF @endpe = T           %% @endpe set True by \@endparenv
2923 %       THEN \@gtempa :=G \@doendpe %% \@doendpe redefines \par and \everypar
2924 %       ELSE \@gtempa :=G \relax    %% to suppress paragraph indentation in
2925 %       FI                          %% immediately following text
2926 %   \endgroup
2927 %   \@gtempa
2928 %   IF @ignore = T

```



```

2929 %      THEN @ignore :=G F
2930 %          \ignorespaces
2931 %      FI
2932 %  END
2933
2934 % \@checkend{NAME} ==
2935 %  BEGIN
2936 %    IF \@currenvir = NAME
2937 %      ELSE \@badend{NAME}
2938 %    FI
2939 %  END
2940
2941 %% RmS 92/03/18: changed \@ignoretrue to \@ignorefalse (as documented)
2942 \def\begin#1{\@ifundefined{#1}{\def\@tempa{\@latexerr{Environment #1
2943   undefined}\@eha}}{\def\@tempa{\def\@currenvir{#1}%
2944   \csname #1\endcsname}}\global\@ignorefalse %% \global... added 2 May 90
2945   \begingroup\@endpfalse\@tempa}
2946
2947 \def\end#1{\csname end#1\endcsname\@checkend{#1}%
2948   \expandafter\endgroup \if@endpe \@doendpe \fi
2949   \if@ignore \global\@ignorefalse \ignorespaces\fi}
2950
2951 \def\@checkend#1{\def\@tempa{#1}\ifx
2952   \@tempa\@currenvir \else\@badend{#1}\fi}
2953
2954
2955 \message{math,}
2956 % *****
2957 % *          MATH ENVIRONMENTS          *
2958 % *****
2959 %
2960 % \(\ == BEGIN if math mode
2961 %           then error: '\( in math mode'
2962 %           else $
2963 %         fi
2964 %     END
2965 %
2966 % \) == BEGIN if math mode
2967 %           then if inner mode
2968 %             then $
2969 %             else error '\[ closed with \)'
2970 %           else error 'unmatched \)'
2971 %         fi
2972 %     END
2973 %
2974 % \[ == BEGIN if math mode
2975 %           then error: '\[ in math mode'
2976 %           else $$
2977 %         fi
2978 %     END
2979 %
2980 % \] == BEGIN if math mode
2981 %           then if inner mode
2982 %             then error '\( closed with \]'
2983 %             else $$
2984 %           else error 'unmatched \]'
2985 %         fi
2986 %     END
2987 %
2988 % \equation == BEGIN \refstepcounter{equation} $$ END
2989 %

```

```

2990 % \endequation == BEGIN \eqno (\theequation) $$\ignorespaces END
2991 %
2992 % NOTE: The document style must define \theequation etc., and do
2993 % the appropriate \@addtoreset. It should also redefine \@eqnnum
2994 % if another format for the equation number is desired other than the
2995 % standard (...), or to move the equation numbers to the flushleft.
2996 % (See comment on the \def of \@eqnnum.)
2997 %
2998 % \stackrel{TOP}{BOT} == PLAIN TeX's \buildrel {TOP} \over {BOT}
2999 %
3000 % \frac{TOP}{BOT} == {TOP \over BOT}
3001 %
3002 % \sqrt[N]{EXP} produces an Nth root of EXP formula.
3003 %
3004 % \: == \> (medium space)
3005
3006 \def\{\relax\ifmmode\@badmath\else%%$BRACE MATCH HACK
3007 \fi}
3008
3009 \def\}\relax\ifmmode\ifinner$\else\@badmath%%$ BRACE MATCH HACK
3010 \fi\else \@badmath\fi}
3011
3012 \def\[\relax\ifmmode\@badmath\else
3013 \ifvmode \nointerlineskip \makebox[.6\linewidth]\fi%%$ BRACE MATCH HACK
3014 \fi}
3015
3016 \def\]\relax\ifmmode\ifinner\@badmath\else%%\fi%%$ BRACE MATCH HACK
3017 \else \@badmath \fi\ignorespaces}
3018
3019 \let\math=\(
3020 \let\endmath=\)
3021 \def\displaymath{\[}
3022 \def\enddisplaymath{\]\global\@ignoretrue}
3023
3024 \@definecounter{equation}
3025 \def\equation{$$ % $$ BRACE MATCHING HACK
3026 \refstepcounter{equation}}
3027
3028 %% RmS 92/01/10: put \hbox around \@eqnnum to typeset the equation
3029 %% number in text mode (as in the eqnarray env.).
3030 \def\endequation{\eqno \hbox{\@eqnnum}% $$ BRACE MATCHING HACK
3031 $$\global\@ignoretrue}
3032
3033 % \@eqnnum: Produces the equation number for equation and
3034 % eqnarray environments. The following definition is for
3035 % flushright numbers; for flushleft numbers, see leqno.doc.
3036 % The {\rm ... } puts the equation number in roman type even if
3037 % an eqnarray environment appears in an italic environment.
3038 %
3039 %% RmS 91/09/29: \reset@font added.
3040 \def\@eqnnum{\reset@font\rm (\theequation)}
3041
3042
3043 \def\stackrel#1#2{\mathrel{\mathop{#2}\limits^{#1}}}
3044 \def\frac#1#2{{#1\over #2}}
3045
3046 \let\@sqrt=\sqrt
3047 \def\sqrt{\@ifnextchar[{\@sqrt}{\@sqrt}}
3048 \def\@sqrt[#1]{\root #1\of}
3049
3050 \let\:=\>

```

```

3051
3052 % Here's the eqnarray environment:
3053 % Default is for left-hand side of equations to be flushleft.
3054 % To make them flushright, \let\@eqnset = \hfil
3055
3056 \newcount\@eqcnt
3057 \newcount\@eqpen
3058 \newif\if@eqnsw\@eqnswtrue
3059
3060 \@centering = Opt plus 1000pt % Changed 11/4/85 to produce warning message
3061                                % if line extends into margin. Doesn't warn
3062                                % about formula overprinting equation number.
3063
3064 \def\eqnarray{\stepcounter{equation}\let\@currentlabel\theequation
3065 \global\@eqnswtrue\m@th
3066 \global\@eqcnt\z@\tabskip\@centering\let\\\@eqncr
3067 $$\halign to\displaywidth\bgroup\@eqnset\hskip\@centering
3068 $\displaystyle\tabskip\z@{##}$\global\@eqcnt\@ne
3069 \hskip 2\arraycolsep \hfil${##}$\hfil
3070 &\global\@eqcnt\tw@ \hskip 2\arraycolsep $\displaystyle\tabskip\z@{##}$\hfil
3071 \tabskip\@centering&\llap{##}\tabskip\z@\cr}
3072
3073 \def\endeqnarray{\@eqncr\egroup
3074 \global\advance\c@equation\m@ne$$\global\@ignoretrue}
3075
3076 \let\@eqnset=\relax
3077
3078 \def\nonumber{\global\@eqnswfalse}
3079
3080 \def\@eqncr{\ifnum0=} \fi\ifstar{\global\@eqpen\@M
3081 \@yeqncr}{\global\@eqpen\interdisplaylinepenalty \@yeqncr}}
3082
3083 \def\@yeqncr{\ifnextchar [{\@xeqncr}{\@xeqncr[\z@]}}
3084
3085 \def\@xeqncr[#1]{\ifnum0={\fi}\@eqncr
3086 \noalign{\penalty\@eqpen\vskip\jot\vskip #1\relax}}
3087
3088 \def\@eqncr{\let\@tempa\relax
3089 \ifcase\@eqcnt \def\@tempa{& &} \or \def\@tempa{& &}%
3090 \else \def\@tempa{&}\fi
3091 \@tempa \if@eqnsw\@eqnnum\stepcounter{equation}\fi
3092 \global\@eqnswtrue\global\@eqcnt\z@\cr}
3093
3094 % Here's the eqnarray* environment:
3095
3096 \let\@seqncr=\@eqncr
3097 \@namedef{eqnarray*}{\def\@eqncr{\nonumber\@seqncr}\eqnarray}
3098 \@namedef{endeqnarray*}{\nonumber\endeqnarray}
3099
3100 % \lefteqn{FORMULA} typesets FORMULA in display math style
3101 % flushleft in a box of width zero.
3102 %
3103
3104 \def\lefteqn#1{\hbox to\z@{\displaystyle #1$\hss}}
3105
3106
3107 \message{center,}
3108 % *****
3109 % * CENTER, FLUSHRIGHT, FLUSHLEFT, ETC. *
3110 % *****
3111 %

```

```

3112 %
3113 % \center, \flushright and \flushleft set
3114 % \rightskip = Opt or \@flushglue (as appropriate)
3115 % \leftskip = Opt or \@flushglue (as appropriate)
3116 % \parindent = Opt
3117 % \parfillskip = Opt. (except \flushleft)
3118 % \ \ == \par \vskip -\parskip
3119 % \[LENGTH] == \ \vskip LENGTH
3120 % \ \* == \par \penalty 10000 \vskip -\parskip
3121 % \ \*[LEN] == \ \* \vskip LENGTH
3122 %
3123 % They invoke the trivlist environment to handle vertical spacing before
3124 % and after them.
3125 %
3126 % \centering, \raggedright and \raggedleft are the declaration analogs
3127 % of the above.
3128 %
3129 % \raggedright has a more universal effect, however. It sets
3130 % \@rightskip := flushglue. Every environment, like the list environments,
3131 % that set \rightskip to its 'normal' value set it to \@rightskip
3132
3133 \def\@centercr{\ifhmode \unskip\else \@badcrrerr\fi
3134 \par\@ifstar{\penalty \@M\@xcentercr}{\@xcentercr}}
3135
3136 \def\@xcentercr{\advvspace{-\parskip}\@ifnextchar
3137 [{\@icentercr}{\ignorespaces}}
3138
3139 \def\@icentercr[#1]{\vskip #1\ignorespaces}
3140
3141 \def\center{\trivlist \centering\item[]}
3142 \def\centering{\let\=\@centercr\rightskip\@flushglue\leftskip\@flushglue
3143 \parindent\z@\parfillskip\z@}
3144 \let\endcenter=\endtrivlist
3145
3146 \newskip\@rightskip \@rightskip \z@
3147
3148 \def\flushleft{\trivlist \raggedright\item[]}
3149 \def\raggedright{\let\=\@centercr\@rightskip\@flushglue \rightskip\@rightskip
3150 \leftskip\z@
3151 \parindent\z@}
3152 \let\endflushleft=\endtrivlist
3153
3154 \def\flushright{\trivlist \raggedleft\item[]}
3155 \def\raggedleft{\let\=\@centercr\rightskip\z@\leftskip\@flushglue
3156 \parindent\z@\parfillskip\z@}
3157 \let\endflushright=\endtrivlist
3158
3159 \message{verbatim,}
3160 % *****
3161 % * VERBATIM *
3162 % *****
3163 %
3164 % The verbatim environment uses the fixed-width \tt font, turns blanks into
3165 % spaces, starts a new line for each carriage return (or sequence of
3166 % consecutive carriage returns), and interprets EVERY character literally.
3167 % I.e., all special characters \, {, $, etc. are \catcode'd to 'other'.
3168 %
3169 % The command \verb produces in-line verbatim text, where the argument
3170 % is delimited by any pair of characters. E.g., \verb #...# takes
3171 % '...' as its argument, and sets it verbatim in \tt font.
3172 %

```

```

3173 % The *-variants of these commands is the same, except that spaces
3174 % print as the TeXbook's space character instead of as blank spaces.
3175
3176 {\catcode'\^M=13 \gdef@gobblecr{\@ifnextchar
3177 {\@gobble}{\ignorespaces}}
3178
3179 {\catcode\' =\active\gdef@vobeyspaces{\catcode\' \active\let \@xobeysp}}
3180
3181 % Definition of \@xobeysp changed on 19 Nov 86 from
3182 % \def@xobeysp{\leavevmode{ }
3183 % to prevent line breaks at spaces. Change suggested by
3184 % Nelson Beebe
3185 %
3186 \def@xobeysp{\leavevmode\penalty10000\ }
3187
3188
3189
3190 \begingroup \catcode '|=0 \catcode '[= 1
3191 \catcode']=2 \catcode '\{=12 \catcode '\}=12
3192 \catcode'\|=12 |gdef|@xverbatim#1\end{verbatim}[#1\end[verbatim]]
3193 |gdef|@sxverbatim#1\end{verbatim*}[#1\end[verbatim*]]
3194 \endgroup
3195
3196 % \@sverbatim obsolete -- removed 24 May 89, as suggested by
3197 % Rainer Sch\"opf and Frank Mittelbach
3198 % \def@sverbatim{\obeyspaces\@verbatim}
3199
3200 \def@gobble#1{}
3201
3202 % 91/07/24 RmS: added \penalty\interlinepenalty to definition
3203 % of \par so that \samepage works.
3204
3205 \def@verbatim{\trivlist \item[]\if@minipage\else\vskip\parskip\fi
3206 \leftskip\@totalleftmargin\rightskip\z@
3207 \parindent\z@\parfillskip\@flushglue\parskip\z@
3208 %%RmS 91/08/26 Added \@@par to clear possible \parshape definition
3209 %%from a surrounding list (the verbatim guru says)
3210 \@@par
3211 \@tempswafalse \def\par{\if@tempswa\hbox{} \fi \@tempwatruel\@@par
3212 \penalty\interlinepenalty}%
3213 \obeylines \tt \catcode' '=13 \@noligs \let\do\@makeother \dospecials}
3214
3215 \def\verbatim{\@verbatim \frenchspacing\@vobeyspaces \@xverbatim}
3216 \let\endverbatim=\endtrivlist
3217
3218 \@namedef{verbatim*}{\@verbatim\@sxverbatim}
3219 \expandafter\let\csname endverbatim*\endcsname =\endtrivlist
3220
3221
3222 \def@makeoother#1{\catcode'#1=12\relax}
3223
3224 \def\verb{\begingroup \catcode' '=13 \@noligs
3225 \tt \let\do\@makeother \dospecials
3226 \@ifstar{\@sverb}{\@verb}}
3227
3228 % Definitions of \@sverb and \@verb changed so \verb+ foo+ does not lose
3229 % leading blanks when it comes at the beginning of a line.
3230 % Change made 24 May 89. Suggested by Frank Mittelbach and Rainer Sch\"opf.
3231 %
3232 \def@sverb#1{\def@tempa ##1#1{\leavevmode\null##1\endgroup}\@tempa}
3233

```

```

3234 \def\@verb{\@vobeyspaces \frenchspacing \@sverb}
3235
3236
3237 %% \@noligs prevents ?' and !' from being treated as ligatures
3238 %% added 19 April 86
3239
3240 \begingroup
3241 \catcode'='13
3242 \gdef\@noligs{\let'\@lquote}
3243 \endgroup
3244
3245 %% RmS 91/06/21: added \leavevmode to definition of \@lquote
3246 %% to avoid the \kern being processed in vertical mode
3247
3248 \def\@lquote{\leavevmode{\kern\z@}' }
3249 \message{list,}
3250 % *****
3251 % * THE LIST ENVIRONMENT *
3252 % *****
3253 %
3254 % The generic commands for creating an indented environment -- enumerate,
3255 % itemize, quote, etc -- are
3256 % \list{LABEL}{COMMANDS} ... \endlist
3257 % which can be invoked by the user as the list environment. The LABEL
3258 % argument specifies item labeling. COMMANDS contains commands for
3259 % changing the horizontal and vertical spacing parameters.
3260 %
3261 % Each item of the environment is begun by the command \item[ITEMLABEL]
3262 % which produces an item labeled by ITEMLABEL. If the argument is
3263 % missing, then the LABEL argument of the \list command is used as the
3264 % item label.
3265 %
3266 % The label is formed by putting \makelabel{ITEMLABEL} in an hbox whose
3267 % width is either its natural width or else \labelwidth, whichever is
3268 % larger. The \list command defines \makelabel to have the default
3269 % definition
3270 % \makelabel{ARG} == BEGIN \hfil ARG END
3271 % which, for a label of width less than \labelwidth, puts the label
3272 % flushright, \labelsep to the left of the item's text. However,
3273 % \makelabel can be \let to another command by the \list's COMMANDS
3274 % argument.
3275 %
3276 % A \usecounter{foo} command in the second argument causes the counter
3277 % foo to be initialized to zero, and stepped by every \item command
3278 % without an argument. (\label commands within the list refer to this
3279 % counter.)
3280 %
3281 % When you leave a list environment, returning either to an enclosing
3282 % list or normal text mode, LaTeX begins a new paragraph if and only if
3283 % you leave a blank line after the \end command. This is accomplished
3284 % by the \@endparenv command.
3285 %
3286 % Blank lines are ignored every other reasonable place--i.e.:
3287 % - Between the \begin{list} and the first \item,
3288 % - Between the \item and the text of that item.
3289 % - Between the end of the last item and the \end{list}.
3290 %
3291 % For an environment like quotation, in which items are not labeled,
3292 % the entire environment is a single item. It is defined by
3293 % letting \quotation == \list{}{...}\item[]. (Note the [], there in
3294 % case the first character in the environment is a '['.) The spacing

```

3295 % parameters provide a great deal of flexibility in designing the
3296 % format, including the ability to let the indentation of the first
3297 % paragraph be different from that of the subsequent ones.
3298 %

3299 % The trivlist environment is equivalent to a list environment
3300 % whose second argument sets the following parameter values:
3301 % \leftmargin = 0 : causes no indentation of left margin
3302 % \labelwidth = 0 : see below for precise effect this has.
3303 % \itemindent = 0 : with a null label, makes first paragraph
3304 % have no indentation. Succeeding paragraphs have \parindent
3305 % indentation. To give first paragraph same indentation, set
3306 % \itemindent = \parindent before the \item[].
3307 % Every \item in a trivlist environment must have an argument---in many
3308 % cases, this will be the null argument (\item[]). The trivlist
3309 % environment is mainly used for paragraphing environments, like
3310 % verbatim, in which there is no margin change. It provides the same
3311 % vertical spacing as the list environment, and works reasonably well
3312 % when it occurs immediately after an \item command in an enclosing list.
3313 %

3314 % The following variables are used inside a list environment:
3315 % \@totalleftmargin : The distance that the prevailing left margin is
3316 % indented from the outermost left margin,
3317 % \linewidth : The width of the current line. Must be
3318 % initialized to \hsize.
3319 % \@listdepth : A count for holding current list nesting depth.
3320 % \makelabel : A macro with a single argument, used to generate
3321 % the label from the argument (given or implied) of the
3322 % \item command. Initialized to \@mklab by the \list
3323 % command. This command must produce some stretch--i.e.,
3324 % an \hfil.
3325 % @inlabel : A switch that is false except between the time an
3326 % \item is encountered and the time that TeX actually
3327 % enters horizontal mode. Should be tested by
3328 % commands that can be messed up by the list
3329 % environment's use of \everypar.
3330 % \box\@labels : When @inlabel = true, it holds the labels
3331 % to be put out by \everypar.
3332 % @noparitem : A switch set by \list when @inlabel = true.
3333 % Handles the case of a \list being the first thing
3334 % in an item.
3335 % @noparlist : A switch set true for a list that begins an
3336 % item. No \topsep space is added before or after
3337 % such a list.
3338 % @newlist : Set true by \list, set false by the first \item's
3339 % text (by \everypar).
3340 % @noitemarg : Set true when executing an \item with no explicit
3341 % argument. Used to save space. To save time,
3342 % make two separate \@item commands.
3343 % @nbrlist : Set true by \usecounter command, causes list to
3344 % be numbered.
3345 % \@listctr : \def'ed by \usecounter to name of counter.
3346 % @noskipsec : A switch set true by a sectioning command when it is
3347 % creating an in-text heading with \everypar.
3348 %

3349 % Throughout a list environment, \hsize is the width of the current
3350 % line, measured from the outermost left margin to the outermost right
3351 % margin. Environments like tabbing should use \linewidth instead of
3352 % \hsize.
3353 %

3354 % Here are the parameters of a list that can be set by commands in
3355 % the \list's COMMANDS argument. These parameters are all TeX

```

3356 % skips or dimensions (defined by \newskip or \newdimen), so the usual
3357 % TeX or LaTeX commands can be used to set them. The commands will
3358 % be executed in vmode if and only if the \list was preceded by a
3359 % \par (or something like an \end{list}), so the spacing parameters
3360 % can be set according to whether the list is inside a paragraph
3361 % or is its own paragraph.
3362 %
3363 % VERTICAL SPACING (skips):
3364 %
3365 %     \topsep : Space between first item and preceding paragraph.
3366 %     \partopsep : Extra space added to \topsep when environment starts
3367 %                 a new paragraph (is called in vmode).
3368 %     \itemsep : Space between successive items.
3369 %     \parsep : Space between paragraphs within an item -- the \parskip
3370 %              for this environment.
3371 %
3372 % PENALTIES
3373 %     \@beginparpenalty : put at the beginning of a list
3374 %     \@endparpenalty : put at end of list
3375 %     \@itempenalty : put between items.
3376 %
3377 % HORIZONTAL SPACING (dimens)
3378 %     \leftmargin : space between left margin of enclosing environment
3379 %                  (or of page if top level list) and left margin of
3380 %                  this list. Must be nonnegative.
3381 %     \rightmargin : analogous.
3382 %     \listparindent : extra indentation at beginning of every paragraph
3383 %                    of a list except the one started by the \item
3384 %                    command. May be negative! Usually, labeled lists
3385 %                    have \listparindent equal to zero.
3386 %     \itemindent : extra indentation added right BEFORE an item label.
3387 %     \labelwidth : nominal width of box that contains the label.
3388 %                  If the natural width of the label <= \labelwidth,
3389 %                  then the label is flushed right inside a box
3390 %                  of width \labelwidth (with an \hfil). Otherwise,
3391 %                  a box of the natural width is employed, which causes
3392 %                  an indentation of the text on that line.
3393 %     \labelsep : space between end of label box and text of
3394 %               first item.
3395 %
3396 % DEFAULT VALUES:
3397 %     Defaults for the list environment are set as follows.
3398 %     First, \rightmargin, \listparindent and \itemindent are set
3399 %     to Opt. Then, one of the commands \@listi, \@listii, ... , \@listvi
3400 %     is called, depending upon the current level of the list.
3401 %     The \@list... commands should be defined by the document
3402 %     style. A convention that the document style should follow is
3403 %     to set \leftmargin to \leftmargini, ... , \leftmarginvi for
3404 %     the appropriate level. Items that aren't changed may be left
3405 %     alone, but everything that could possibly be changed must be
3406 %     reset.
3407 %
3408 % \list{LABEL}{COMMANDS} ==
3409 % BEGIN
3410 %     if \@listdepth > 5
3411 %         then LaTeX error: 'Too deeply nested'
3412 %         else \@listdepth :=G \@listdepth + 1
3413 %     fi
3414 %     \rightmargin := Opt
3415 %     \listparindent := Opt
3416 %     \itemindent := Opt

```



```

3417 % \eval{@list \romannumeral\the\@listdepth} %% Set default values:
3418 % \itemlabel :=L LABEL
3419 % \makelabel == \@mklab
3420 % @nmbrrlist :=L false
3421 % COMMANDS
3422 %
3423 % \@trivlist % commands common to \list and \trivlist
3424 %
3425 % \parskip :=L \parsep
3426 % \parindent :=L \listparindent
3427 % \linewidth :=L \linewidth - \rightmargin -\leftmargin
3428 % \@totalleftmargin :=L \@totalleftmargin + \leftmargin
3429 % \parshape 1 \@totalleftmargin \linewidth
3430 % \ignorespaces % gobble space up to \item
3431 % END
3432 %
3433 % \endlist == BEGIN \@listdepth :=G \@listdepth -1
3434 % \endtrivlist
3435 % END
3436 %
3437 % \@trivlist ==
3438 % BEGIN
3439 % if @newlist = T then \@noitemerr fi %% This command removed for some
3440 % %% forgotten reason.
3441 % \@topsepadd :=L \topsep
3442 % if @noskipsec then leave vertical mode fi %% Added 11 Jun 85
3443 % if vertical mode
3444 % then \@topsepadd :=L \@topsepadd + \partopsep
3445 % else \unskip \par % remove glue from end of last line
3446 % fi
3447 % if @inlabel = true
3448 % then @nparitem :=L true
3449 % @nparlist :=L true
3450 % else @nparlist :=L false
3451 % \@topsep :=L \@topsepadd
3452 % fi
3453 % \@topsep :=L \@topsep + \parskip %% Change 4 Sep 85
3454 % \leftskip :=L Opt % Restore paragraphing parameters
3455 % \rightskip :=L \@rightskip
3456 % \parfillskip :=L Opt + 1fil
3457 %
3458 % NOTE: \@setpar called on every \list in case \par has been temporarily
3459 % munged before the \list command.
3460 % \@setpar{if @newlist = false then {\@@par} fi}
3461 % \@newlist :=G T
3462 % \@outerparskip :=L \parskip
3463 % END
3464 %
3465 % \trivlist ==
3466 % BEGIN
3467 % \parsep := \parskip
3468 % \@trivlist
3469 % \labelwidth := 0
3470 % \leftmargin := 0
3471 % \itemindent := \parindent
3472 % \makelabel{LABEL} == LABEL
3473 % END
3474 %
3475 % \endtrivlist ==
3476 % BEGIN
3477 % if @inlabel = T then \indent fi

```

```

3478 %     if horizontal mode then \unskip \par fi
3479 %     if @nparlist = true
3480 %         else if \lastskip > 0
3481 %             then \@tempkipa := \lastskip
3482 %                 \vskip - \lastskip
3483 %                 \vskip \@tempkipa -\@outerparskip + \parskip
3484 %             fi
3485 %         \@endparenv
3486 %     fi
3487 % END
3488 %
3489 % \@endparenv ==
3490 % BEGIN
3491 %     \addpenalty{@endparpenalty}
3492 %     \addvspace{\@topsepadd}
3493 %     \endgroup %% ends the \begin command's \begingroup
3494 %     \par == BEGIN
3495 %         \@restorepar
3496 %         \everypar{}
3497 %         \par
3498 %     END
3499 %     \everypar == BEGIN remove \lastbox \everypar{} END
3500 %     \begingroup %% to match the \end commands \endgroup
3501 % END
3502 %
3503 % \item == BEGIN if next char = [
3504 %     then \item
3505 %     else @noitemarg := true
3506 %         \item[@itemlabel]
3507 %     END
3508 %
3509 % \@item[LAB] ==
3510 % BEGIN
3511 %     if @nparitem = true
3512 %         then @nparitem := false % NOTE: then clause
3513 %                                     % hardly every taken,
3514 %         \box\@labels :=G \hbox{\hskip -\leftmargin % so made a macro
3515 %                                     \box\@labels % \@donoparitem
3516 %                                     \hskip \leftmargin }
3517 %         if @minipage = false then
3518 %             \@tempkipa := \lastskip
3519 %             \vskip -\lastskip
3520 %             \vskip \@tempkipa + \@outerparskip - \parskip
3521 %         fi
3522 %     else if @inlabel = true
3523 %         then \indent \par % previous item empty.
3524 %     fi
3525 %     if hmode then 2 \unskip's % To remove any space at end of prev.
3526 %         \par % paragraph that could cause a blank
3527 %     fi % line.
3528 %     if @newlist = T
3529 %         then if @nobreak = T % Kludge if list follows \section
3530 %             then \addvspace{\@outerparskip - \parskip}
3531 %             else \addpenalty{\@beginparpenalty}
3532 %                 \addvspace{\@topsep}
3533 %                 \addvspace{-\parskip} %% added 4 Sep 85
3534 %             fi
3535 %         else \addpenalty{\@itempenalty}
3536 %             \addvspace{\itemsep}
3537 %         fi
3538 %     @inlabel :=G true

```

```

3539 %      fi
3540 %
3541 %      \everypar{ @minipage :=G F
3542 %                @newlist :=G F
3543 %                if @inlabel = true
3544 %                    then @inlabel :=G false
3545 %                        \hskip -\parindent
3546 %                        \box\@labels
3547 %                        \penalty 0          %% 3 Oct 85 -- allow line break here
3548 %                        \box\@labels :=G null
3549 %                fi
3550 %            \everypar{} }
3551 % @nobreak :=G false
3552 % if @noitemarg = true
3553 %     then @noitemarg := false
3554 %         if @nmbrlist
3555 %             then \refstepcounter{\@listctr}
3556 %         fi      fi
3557 %     \@tempboxa :=L \hbox{\makelabel{LAB}}
3558 %     \box\@labels :=G \@labels \hskip \itemindent
3559 %                 \hskip - (\labelwidth + \labelsep)
3560 %                 if \wd \@tempboxa > \labelwidth
3561 %                     then \box\@tempboxa
3562 %                     else \hbox to \labelwidth {\makelabel{LAB}}
3563 %                 fi
3564 %                 \hskip\labelsep
3565 %     \ignorespaces          %gobble space up to text
3566 % END
3567 %
3568 % \usecounter{CTR} == BEGIN @nmbrlist :=L true
3569 %                          \@listctr == CTR
3570 %                          \setcounter{CTR}{0}
3571 %                          END
3572 %
3573 % DEFINE \dimen's and \count
3574 \newskip\topsep
3575 \newskip\partopsep
3576 \newskip\itemsep
3577 \newskip\parsep
3578 \newskip\@topsep
3579 \newskip\@topsepadd
3580 \newskip\@outerparskip
3581
3582 \newdimen\leftmargin
3583 \newdimen\rightmargin
3584 \newdimen\listparindent
3585 \newdimen\itemindent
3586 \newdimen\labelwidth
3587 \newdimen\labelsep
3588 \newdimen\linewidth
3589 \newdimen\@totalleftmargin \@totalleftmargin=\z@
3590 \newdimen\leftmargini
3591 \newdimen\leftmarginii
3592 \newdimen\leftmarginiii
3593 \newdimen\leftmarginiv
3594 \newdimen\leftmarginv
3595 \newdimen\leftmarginvi
3596
3597 \newcount\@listdepth \@listdepth=0
3598 \newcount\@itempenalty
3599 \newcount\@beginparpenalty

```

```

3600 \newcount\@endparpenalty
3601
3602 \newbox\@labels
3603
3604 \newif\if@inlabel \@inlabelfalse
3605 \newif\if@newlist \@newlistfalse
3606 \newif\if@noperitem \@noperitemfalse
3607 \newif\if@noperlist \@noperlistfalse
3608 \newif\if@noitemarg \@noitemargfalse
3609 \newif\if@nbrlist \@nbrlistfalse
3610
3611 \def\list#1#2{\ifnum \@listdepth >5\relax \@toodeep
3612   \else \global\advance\@listdepth\@ne \fi
3613   \rightmargin \z@ \listparindent\z@ \itemindent\z@
3614   \csname @list\romannumeral\the\@listdepth\endcsname
3615   \def\@itemlabel{#1}\let\makelabel\@mklab \@nbrlistfalse #2\relax
3616   \@trivlist
3617   \parskip\parsep \parindent\listparindent
3618   \advance\linewidth -\rightmargin \advance\linewidth -\leftmargin
3619   \advance\@totalleftmargin \leftmargin
3620   \parshape \@ne \@totalleftmargin \linewidth
3621   \ignorespaces}
3622
3623 \def\@trivlist{\@topsepadd\topsep
3624   \if@noskipsec \leavevmode \fi
3625   \ifvmode \advance\@topsepadd\partopsep \else \unskip\par\fi
3626   \if@inlabel \@noperitemtrue \@noperlisttrue
3627   \else \@noperlistfalse \@topsep\@topsepadd \fi
3628   \advance\@topsep \parskip
3629   \leftskip\z@\rightskip\@rightskip \parfillskip\@flushglue
3630   \@setpar{\if@newlist\else{\@par}\fi}%
3631   \global\@newlisttrue \@outerparskip\parskip}
3632
3633 %% RmS 92/03/18 added \@nbrlistfalse
3634 \def\trivlist{\parsep\parskip\@nbrlistfalse
3635   \@trivlist \labelwidth\z@ \leftmargin\z@
3636   \itemindent\z@ \def\makelabel##1{##1}}
3637
3638 \def\endlist{\global\advance\@listdepth\m@ne
3639   \endtrivlist}
3640
3641 % Definition of \endtrivlist moved earlier in file so other commands
3642 % can be \let = to it.
3643
3644 \def\@mklab#1{\hfil #1}
3645
3646 \def\item{\@ifnextchar [{\@item}{\@noitemargtrue \@item[\@itemlabel]}}
3647
3648 \def\@donoparitem{\@noperitemfalse
3649   \global\setbox\@labels\hbox{\hskip -\leftmargin
3650     \unhbox\@labels
3651     \hskip \leftmargin}\if@minipage\else
3652   \@tempskipa\lastskip
3653   \vskip -\lastskip \advance\@tempskipa\@outerparskip
3654   \advance\@tempskipa -\parskip \vskip\@tempskipa\fi}
3655
3656 \def\@item[#1]{\if@noperitem \@donoparitem
3657   \else \if@inlabel \indent \par \fi
3658   \ifhmode \unskip\unskip \par \fi
3659   \if@newlist \if@nbreak \@nbitem \else
3660   \addpenalty\@beginparpenalty

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3661             \addvspace{@topsep \addvspace{-\parskip}}\fi
3662         \else \addpenalty@itempenalty \addvspace\itemsep
3663         \fi
3664     \global\@inlabeltrue
3665 \fi
3666 \everypar{\global\@minipagefalse\global\@newlistfalse
3667         \if@inlabel\global\@inlabelfalse \hskip -\parindent \box\@labels
3668         \penalty\z@ \fi
3669         \everypar{}}\global\@nbreakfalse
3670 \if@noitemarg \@noitemargfalse \if@nmbrrlist \refstepcounter{\@listctr}\fi \fi
3671 \setbox\@tempboxa\hbox{\makelabel{#1}}%
3672 \global\setbox\@labels
3673 \hbox{\unhbox\@labels \hskip \itemindent
3674     \hskip -\labelwidth \hskip -\labelsep
3675     \ifdim \wd\@tempboxa >\labelwidth
3676     \box\@tempboxa
3677 %% RmS 91/11/22: Changed second call to \makelabel to \unhbox\@tempboxa.
3678 %%         Avoids problems with side effects in \makelabel and is
3679 %%         more efficient.
3680 %     \else \hbox to\labelwidth {\makelabel{#1}}\fi
3681     \else \hbox to\labelwidth {\unhbox\@tempboxa}\fi
3682     \hskip \labelsep\ignorespaces}
3683
3684 %% RmS 91/11/04: added default definition for \makelabel,
3685 %%         to produce an error message.
3686 \def\makelabel#1{\@latexerr{Lonely \string\item--perhaps a missing
3687     list environment}}\@ehc}
3688
3689 \def\@nbitem{\@tempskipa\@outerparskip \advance\@tempskipa -\parskip
3690     \addvspace{\@tempskipa}}
3691
3692 \def\usecounter#1{\@nmbrrlisttrue\def\@listctr{#1}\setcounter{#1}\z@}
3693
3694 \message{itemize,}
3695 % *****
3696 % *           ITEMIZE AND ENUMERATE           *
3697 % *****
3698 %
3699 % Enumeration is done with four counters: enumi, enumii, enumiii
3700 % and enumiv, where enumN controls the numbering of the Nth level
3701 % enumeration. The label is generated by the commands
3702 % \labelenumi ... \labelenumiv, which should be defined by the
3703 % document style. Note that \p@enumN\theenumN defines the output
3704 % of a \ref command. A typical definition might be:
3705 %     \def\theenumii{\alph{enumii}}
3706 %     \def\p@enumii{\theenumi\theenumii}
3707 %     \def\labelenumii{(\theenumii)}
3708 % which will print the labels as '(a)', '(b)', ... and print a \ref as
3709 % '3a'.
3710 %
3711 % The item numbers are moved to the right of the label box, so they are
3712 % always a distance of \labelsep from the item.
3713 %
3714 % \@enumdepth holds the current enumeration nesting depth.
3715 %
3716 % Itemization is controlled by four commands: \labelitemi, \labelitemii,
3717 % \labelitemiii, and \labelitemiv. To cause the second-level list to be
3718 % bulleted, you just define \labelitemii to be $\bullet$. \@itemspacing
3719 % and \@itemdepth are the analogs of \@enumspacing and \@enumdepth.
3720 %
3721 % \enumerate ==

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```

3722 % BEGIN
3723 %   if \@enumdepth > 3
3724 %     then errormessage: 'Too deeply nested'.
3725 %     else \@enumdepth :=L \@enumdepth + 1
3726 %       \@enumctr :=L eval(enum@\romannumeral\the\@enumdepth)
3727 %       \list{\label{\@enumctr}}
3728 %         {\usecounter{\@enumctr}}
3729 %         \makelabel{LABEL} == \hss \llap{LABEL}}
3730 %   fi
3731 % END
3732 %
3733 % \endenumerate == \endlist
3734 %
3735 \newcount\@enumdepth \@enumdepth = 0
3736
3737 \@definecounter{enumi}
3738 \@definecounter{enumii}
3739 \@definecounter{enumiii}
3740 \@definecounter{enumiv}
3741
3742 \def\enumerate{\ifnum \@enumdepth >3 \@toodeep\else
3743   \advance\@enumdepth \@one
3744   \edef\@enumctr{enum\romannumeral\the\@enumdepth}\list
3745   {\csname label\@enumctr\endcsname}{\usecounter
3746     {\@enumctr}\def\makelabel##1{\hss\llap{##1}}}\fi}
3747
3748 \let\endenumerate =\endlist
3749
3750
3751 % \itemize ==
3752 % BEGIN
3753 %   if \@itemdepth > 3
3754 %     then errormessage: 'Too deeply nested'.
3755 %     else \@itemdepth :=L \@itemdepth + 1
3756 %       \@itemitem == eval(labelitem\romannumeral\the\@itemdepth)
3757 %       \list{\@nameuse{\@itemitem}}
3758 %         {\makelabel{LABEL} == \hss \llap{LABEL}}
3759 %   fi
3760 % END
3761 %
3762 % \enditemize == \endlist
3763 %
3764 \newcount\@itemdepth \@itemdepth = 0
3765
3766 \def\itemize{\ifnum \@itemdepth >3 \@toodeep\else \advance\@itemdepth \@one
3767 \edef\@itemitem{labelitem\romannumeral\the\@itemdepth}%
3768 \list{\csname\@itemitem\endcsname}{\def\makelabel##1{\hss\llap{##1}}}\fi}
3769
3770 \let\enditemize =\endlist
3771
3772 \message{boxes,}
3773 % *****
3774 % * BOXES *
3775 % *****
3776 %
3777 % USER COMMANDS:
3778 %
3779 % \makebox [WID] [POS]{OBJ}
3780 % : puts OBJ in an \hbox of width WID, positioned by POS.
3781 % POS = l -> flushleft, POS = r -> flushright.
3782 % Default is centered.

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3783 % If WID is missing, then POS is also missing and OBJ
3784 % is put in an \hbox of its natural width.
3785 %
3786 % \mbox{OBJ} == \makebox{OBJ}, and is more efficient.
3787 %
3788 % \makebox (X,Y)[POS]{OBJ}
3789 % : puts OBJ in an \hbox of width X * \unitlength
3790 % and height Y * \unitlength. POS arguments are
3791 % l or r for flushleft, flushright and t or b
3792 % for top, bottom -- or combinations like tr or rb.
3793 % Default for horizontal and vertical are centered.
3794 %
3795 % \newsavebox{\CMD} : If \CMD is undefined, then defines it
3796 % to be a TeX box register.
3797 %
3798 % \savebox {\CMD} ... : \CMD is defined to be a TeX box register,
3799 % and the '...' are any \makebox arguments. It is
3800 % like \makebox, except it doesn't produce text but
3801 % saves the value in \box \CMD.
3802 % \sbox N{OBJ} is an efficient abbreviation for
3803 % \savebox N{OBJ}.
3804 %
3805 % \framebox ... : like \makebox, except it puts a 'frame' around
3806 % the box. The frame is made of lines of thickness
3807 % \fboxrule, separated by space \fboxsep from the
3808 % text -- except for \framebox(X,Y) ... , where the
3809 % thickness of the lines is as for the picture environment,
3810 % and there is no separation added.
3811 % \fbox{OBJ} is an efficient abbreviation for \framebox{OBJ}
3812 %
3813 % \parbox[POS]{WIDTH}{TEXT} : Makes a box with \hsize TEXT, positioned
3814 % by POS as follows:
3815 % c : \vcenter (placed in \$...\$ if not in math mode)
3816 % b : \vbox
3817 % t : \vtop
3818 % default value is c.
3819 % Sets \hsize := WIDTH and calls \@parboxrestore, which does
3820 % the following:
3821 % Restores the original definitions of:
3822 % \par
3823 % \\
3824 % \ - \ ' \ ' \ =
3825 % Resets the following parameters:
3826 % \parindent = Opt
3827 % \parskip = Opt %% added 20 Jan 87
3828 % \linewidth = \hsize
3829 % \@totalleftmargin = Opt
3830 % \leftskip = Opt
3831 % \rightskip = Opt
3832 % \@rightskip = Opt
3833 % \parfillskip = Opt plus 1fil
3834 % \lineskip = \normallineskip
3835 % \baselineskip = \normalbaselineskip
3836 % Calls \sloppy
3837 %
3838 % Note: \arrayparboxrestore same as \@parboxrestore
3839 % but it doesn't restore \\.
3840 %
3841 % \minipage : Similar to parbox, except it also
3842 % makes this look like a page by setting
3843 % \textwidth == \columnwidth == box width

```

3844 %      changes footnotes by redefining:
3845 %          \@mpfn      == mpfootnote
3846 %          \thempfn    == \thempfootnote
3847 %          \@footnotetext == \@mpfootnotetext
3848 %      resets the following list environment parameters
3849 %          \@listdepth  == \@mplistdepth
3850 %      where \@mplistdepth is initialized to zero,
3851 %      and executes \@minipagerestore to allow the document
3852 %      style to reset any other parameters it desires.
3853 %      It sets @minipage := T, and resets \everypar to set
3854 %      it false. This switch keeps \addvspace from putting space
3855 %      at the top of a minipage.
3856 %
3857 %      Change added 24 May 89: \minipage sets @minipage globally;
3858 %      \endminipage resets it false.
3859 %
3860 %
3861 % \rule [RAISED]{WIDTH}{HEIGHT} : Makes a WIDTH X HEIGHT rule, raised
3862 %      RAISED.
3863 %
3864 % \underline {TEXT} : Makes an underlined hbox with TEXT in it.
3865 %
3866 % \raisebox{DISTANCE}[HEIGHT][DEPTH]{BOX} : Raises BOX up by DISTANCE
3867 %      length (down if DISTANCE negative). Makes TeX think that
3868 %      the new box extends HEIGHT above the line and DEPTH below, for
3869 %      a total vertical length of HEIGHT+DEPTH. Default values of
3870 %      HEIGHT & DEPTH = actual height and depth of box in new position.
3871 %
3872 % \makebox ==
3873 % BEGIN
3874 %   if next char = (
3875 %     then \@makepicbox
3876 %     else if next char = [
3877 %       then \@makebox
3878 %       else \mbox    fi
3879 %   fi
3880 % END
3881 %
3882 % \@makebox[LEN] ==
3883 % BEGIN
3884 %   leave vertical mode
3885 %   if next char '[' then \@imakebox[LEN]
3886 %     else \@imakebox[LEN][x] fi
3887 % END
3888 %
3889 % \@imakebox[LEN][POS]{OBJ} ==
3890 % BEGIN
3891 %   \hbox to LEN
3892 %     { \mb@l :=L \mb@r :=L \hss
3893 %       \let\mb@POS = \relax
3894 %       \mb@l OBJ \mb@r }
3895 % END
3896 %
3897 % \@makepicbox(X,Y) ==
3898 % BEGIN
3899 %   leave vertical mode
3900 %   if next char = [ then \@imakepicbox(X,Y)
3901 %     else \@imakepicbox(X,Y) [] fi
3902 % END
3903 %
3904 % \@imakepicbox(X,Y)[POS]{OBJ} ==

```



```

3905 % BEGIN
3906 %   \vbox to Y * \unitlength
3907 %     { \mb@l :=L \mb@r :=L \hss
3908 %       \mb@t :=L \mb@b :=L \hss
3909 %       tfor \@tempa := POS   % one iteration for each token in POS
3910 %         do \mb@eval(\@tempa) :=L null od
3911 %       \mb@t
3912 %     \hbox to X * \unitlength
3913 %       {\mb@l OBJ \mb@r }
3914 %     \mb@b}
3915 % END
3916 %
3917
3918 \def\makebox{\@ifnextchar ({\@makepicbox}{\@ifnextchar
3919   [ {\@makebox}{\mbox}}}
3920
3921 \def\mbox#1{\leavevmode\hbox{#1}}
3922
3923 \def\@makebox[#1]{\leavevmode\@ifnextchar [ {\@imakebox[#1]}{\@imakebox[#1][x]}}
3924
3925 \long\def\@imakebox[#1][#2]#3{\hbox to#1{\let\mb@l\hss
3926 \let\mb@r\hss \expandafter\let\csname mb@#2\endcsname\relax
3927 \mb@l #3\mb@r}}}
3928
3929 \def\@makepicbox(#1,#2){\leavevmode\@ifnextchar
3930   [ {\@imakepicbox(#1,#2)}{\@imakepicbox(#1,#2) []}}
3931
3932 \long\def\@imakepicbox(#1,#2)[#3]#4{\vbox to#2\unitlength
3933   {\let\mb@b\vss \let\mb@l\hss\let\mb@r\hss
3934     \let\mb@t\vss
3935     \@tfor\@tempa :=#3\do{\expandafter\let
3936       \csname mb@\@tempa\endcsname\relax}%
3937     \mb@t\hbox to #1\unitlength{\mb@l #4\mb@r}\mb@b}}
3938
3939 \def\newsavebox#1{\@ifdefinable#1{\newbox#1}}
3940
3941 \def\savebox#1{\@ifnextchar ({\@savepicbox#1}{\@ifnextchar
3942   [ {\@savebox#1}{\sbox#1}}}
3943
3944 \def\sbox#1#2{\setbox#1\hbox{#2}}
3945
3946 \def\@savebox#1[#2]{\@ifnextchar [ {\@isavebox#1[#2]}{\@isavebox#1[#2][x]}}
3947
3948 \long\def\@isavebox#1[#2][#3]#4{\setbox#1 \hbox{\@imakebox[#2][#3]{#4}}}
3949
3950 \def\@savepicbox#1(#2,#3){\@ifnextchar
3951   [ {\@isavepicbox#1(#2,#3)}{\@isavepicbox#1(#2,#3) []}}
3952
3953 \long\def\@isavepicbox#1(#2,#3)[#4]#5{\setbox#1 \hbox{\@imakepicbox
3954   (#2,#3)[#4]{#5}}}
3955
3956 \def\usebox#1{\leavevmode\copy #1\relax}
3957
3958 %% The following definition of \frame was written by Pavel Curtis
3959 %% (Extra space removed 14 Jan 88)
3960 \long\def\frame#1{\leavevmode
3961   \hbox{\hskip-\@wholewidth
3962     \vbox{\vskip-\@wholewidth
3963       \hrule \@height\@wholewidth
3964       \hbox{\vrule \@width\@wholewidth #1\vrule \@width\@wholewidth}\hrule
3965       \@height \@wholewidth\vskip -\@halfwidth}\hskip-\@wholewidth}}

```

```

3966
3967 \newdimen\fbxrule
3968 \newdimen\fbxsep
3969
3970 %% (Extra space removed 21 Jun 1991)
3971 \long\def\fbx#1{\leavevmode\setbox\@tempboxa\hbox{#1}\@tempdima\fbxrule
3972   \advance\@tempdima \fbxsep \advance\@tempdima \dp\@tempboxa
3973   \hbox{\lower \@tempdima\hbox
3974     {\vbox{\hrule \@height \fbxrule
3975       \hbox{\vrule \@width \fbxrule \hskip\fbxsep
3976         \vbox{\vskip\fbxsep \box\@tempboxa\vskip\fbxsep}\hskip
3977           \fbxsep\vrule \@width \fbxrule}%
3978         \hrule \@height \fbxrule}}}}
3979
3980 \def\framebox{\@ifnextchar ({\@framepicbox}{\@ifnextchar
3981   [{\@framebox}{\fbx}}}}
3982
3983 \def\@framebox[#1]{\@ifnextchar [{{\@ifframebox[#1]}{\@ifframebox[#1] [x]}}
3984
3985 %% (Extra space removed 21 Jun 1991)
3986 \long\def\@ifframebox[#1][#2]#3{\leavevmode
3987   \savebox\@tempboxa[#1][#2]{\kern\fbxsep #3\kern\fbxsep}\@tempdima\fbxrule
3988   \advance\@tempdima \fbxsep \advance\@tempdima \dp\@tempboxa
3989   \hbox{\lower \@tempdima\hbox
3990     {\vbox{\hrule \@height \fbxrule
3991       \hbox{\vrule \@width \fbxrule \hskip-\fbxrule
3992         \vbox{\vskip\fbxsep \box\@tempboxa\vskip\fbxsep}\hskip
3993           -\fbxrule\vrule \@width \fbxrule}%
3994         \hrule \@height \fbxrule}}}}
3995
3996 \def\@framepicbox(#1,#2){\@ifnextchar
3997   [{{\@ifframepicbox(#1,#2)}{\@ifframepicbox(#1,#2) []}}
3998
3999 \long\def\@ifframepicbox(#1,#2)[#3]#4{\frame{\@imakepicbox(#1,#2)[#3]{#4}}}
4000
4001 \def\parbox{\@ifnextchar [{{\@iparbox}{\@iparbox[c]}}
4002
4003 \long\def\@iparbox[#1]#2#3{\leavevmode \@pboxswfalse
4004   \if #1b\vbox
4005     \else \if #1t\vtop
4006       \else \ifmode \vcenter
4007         \else \@pboxswtrue $\vcenter
4008         \fi
4009       \fi
4010   %% RmS 91/11/04 added \m@th
4011   \fi{\hsize #2\@parboxrestore #3}\if@pboxsw \m@th$\fi}
4012
4013 \let\@dischyph=-
4014 \let\@acci='
4015 \let\@accii=\`
4016 \let\@acciii=\=
4017
4018
4019 \def\@arrayparboxrestore{\let\par\@par
4020   \let\-\@dischyph
4021   \let'\@acci \let'\@accii \let\=\@acciii
4022   \parindent\z@ \parskip\z@
4023   \everypar{\linewidth\hsize
4024     \@totalleftmargin\z@ \leftskip\z@ \rightskip\z@ \@rightskip\z@
4025     \parfillskip\@flushglue \lineskip\normallineskip
4026     \baselineskip\normalbaselineskip\slippy}

```

```

4027
4028 \def\@parboxrestore{\@arrayparboxrestore\let\=\@normalcr}
4029
4030 \newif\if@minipage \@minipagefalse
4031
4032 \def\minipage{\@ifnextchar [{\@iminipage}{\@iminipage[c]}}
4033
4034 \def\@iminipage[#1]#2{\leavevmode \@pboxswfalse
4035   \if #1b\vbox
4036     \else \if #1t\vtop
4037       \else \ifmode \vcenter
4038         \else \@pboxswtrue $\vcenter
4039       \fi
4040     \fi
4041   \fi\bgroup
4042   \hsize #2\textwidth\hsize \columnwidth\hsize
4043   \@parboxrestore
4044   \def\@mpfn{\mpfootnote}\def\thempfn{\thempfootnote}\c@mpfootnote\z@
4045   \let\@footnotetext\@mpfootnotetext
4046   \let\@listdepth\@mplistdepth \@mplistdepth\z@
4047   \@minipagerestore\global\@minipagetrue %% \global added 24 May 89
4048   \everypar{\global\@minipagefalse\everypar{}}
4049
4050
4051 \let\@minipagerestore=\relax
4052
4053 \def\endminipage{\par\vskip-\lastskip
4054 \ifvoid\@mpfootins\else
4055 \vskip\skip\@mpfootins\footnoterule\unvbox\@mpfootins\fi
4056 \global\@minipagefalse %% added 24 May 89
4057 \egroup\if@pboxsw \m@th$\fi} %% RmS 91/11/04 added \m@th
4058
4059 \newcount\@mplistdepth
4060 \newinsert\@mpfootins
4061
4062 %% RmS 91/09/29: added \reset@font
4063 \long\def\@mpfootnotetext#1{\global\setbox\@mpfootins
4064   \vbox{\unvbox\@mpfootins
4065     \reset@font\footnotesize
4066     \hsize\columnwidth \@parboxrestore
4067     \edef\@currentlabel{\csname p@mpfootnote\endcsname\@thefnmark}\@makefnctext
4068     {\rule{\z@}{\footnotesep}\ignorespaces #1\strut}}}
4069   % \strut added 27 Mar 89, on suggestion by Don Hosek
4070
4071 \newif\if@pboxsw
4072
4073 \def\rule{\@ifnextchar [{\@rule}{\@rule[\z@]}}
4074
4075 \def\@rule[#1]#2#3{\@tempdima#3\advance\@tempdima #1\leavevmode\hbox{\vrule
4076   \@width#2 \@height\@tempdima \@depth-#1}}
4077
4078 \let\@@underline\underline
4079 \def\underline#1{\relax\ifmode
4080   \@@underline{#1}\else $\@@underline{\hbox{#1}}\m@th$\relax\fi}
4081
4082 \def\raisebox#1{\@ifnextchar [{\@argsbox{#1}]{\@rsbox{#1}}}
4083
4084 \def\@argsbox#1[#2]{%
4085 \@ifnextchar [{\@iirsbox{#1}[#2]}{\@irsbox{#1}[#2]}}
4086
4087 \long\def\@rsbox#1#2{\leavevmode\hbox{\raise #1\hbox{#2}}}

```

```

4088
4089 \long\def\@irsbox#1[#2]#3{\setbox\@tempboxa \hbox
4090   {\raise #1\hbox{#3}}\ht\@tempboxa#2\leavevmode\box\@tempboxa}
4091
4092 \long\def\@iirsbox#1[#2] [#3]#4{\setbox\@tempboxa \hbox
4093   {\raise #1\hbox{#4}}\ht\@tempboxa#2\dp\@tempboxa#3\leavevmode\box\@tempboxa}
4094
4095
4096 \message{tabbing,}
4097 % *****
4098 % *       THE TABBING ENVIRONMENT       *
4099 % *****
4100 %
4101 % \dimen(\@firsttab + i) = distance of tab stop i from left margin
4102 %       0 <= i <= 15 (?).
4103 %
4104 % \dimen\@firsttab is initialized to \@totalleftmargin, so it starts
4105 %       at the prevailing left margin.
4106 %
4107 % \@maxtab           = number of highest defined tab register
4108 %                   probably = \@firsttab + 12
4109 % \@nxttabmar = tab stop number of next line's left margin
4110 % \@curtabmar = tab stop number of current line's left margin
4111 % \@curtab      = number of the current tab. At start of line,
4112 %                   it equals \@curtabmar
4113 % \@hightab     = largest tab number currently defined.
4114 % \@tabpush     = depth of \pushtab's
4115 %
4116 % \box\@curline     = contents of current line, excluding left margin skip,
4117 %                   and excluding contents of current field
4118 % \box\@curfield    = contents of current field
4119 %
4120 % @rjfield         = switch: T iff the last field of the line should be
4121 %                   right-justified at the right margin.
4122 %
4123 % \tabbingsep      = distance left by the \ command between the current
4124 %                   position and the field that is 'left-shifted'.
4125 %
4126 % UTILITY MACROS
4127 % \@stopfield : closes the current field
4128 % \@addfield  : adds the current field to the current line.
4129 % \@contfield : continues the current field
4130 % \@startfield : begins the next field
4131 % \@stopline  : closes the current line and outputs it
4132 % \@startline : starts the next line
4133 % \@ifatmargin : an \if that is true iff the current line.
4134 %               has width zero
4135 %
4136 % \@startline ==
4137 % BEGIN
4138 %   \@curtabmar :=G \@nxttabmar
4139 %   \@curtab :=G \@curtabmar
4140 %   \box\@curline :=G null
4141 %   \@startfield
4142 %   \strut
4143 % END
4144 %
4145 % \@stopline ==
4146 % BEGIN
4147 %   \unskip
4148 %   \@stopfield

```

```

4149 %   if @rjfield = T
4150 %       then @rjfield :=G F
4151 %           \@tempdima := \@totalleftmargin + \linewidth
4152 %           \hbox to \@tempdima{\@itemfudge
4153 %               \hskip \dimen\@curtabmar
4154 %               \box\@curline
4155 %               \hfil
4156 %               \box\@curfield}
4157 %       else \@addfield
4158 %           \hbox {\@itemfudge
4159 %               \hskip \dimen\@curtabmar
4160 %               \box\@curline}
4161 %   fi
4162 % END
4163 %
4164 % \@startfield ==
4165 % BEGIN
4166 %   \box\@curfield :=G \hbox {
4167 % END
4168 %
4169 % \@stopfield ==
4170 % BEGIN
4171 %   }
4172 % END
4173 %
4174 % \@contfield ==
4175 % BEGIN
4176 %   \box\@curfield :=G \hbox { \unhbox\@currfield %} brace matching
4177 % END
4178 % \@addfield ==
4179 % BEGIN
4180 %   \box\@curline :=G \unbox\@curline * \unbox\@curfield
4181 % END
4182 %
4183 % \@ifatmargin ==
4184 % BEGIN
4185 %   if dim of box\@curline = Opt then
4186 % END
4187 %
4188 %
4189 % \tabbing ==
4190 % BEGIN
4191 %   \lineskip :=L Opt
4192 %   \> == \@rtab
4193 %   \< == \@ltab
4194 %   \= == \@settab
4195 %   \+ == \@tabplus
4196 %   \- == \@tabminus
4197 %   \‘ == \@tabrj
4198 %   \’ == \@tablab
4199 %   \\ == BEGIN \@stopline \@startline END
4200 %   \\[DIST] == BEGIN \@stopline \vskip DIST \@startline\ignorespaces END
4201 %   \\* == BEGIN \@stopline \penalty 10000 \@startline END
4202 %   \\*[DIST] == BEGIN \@stopline \penalty 10000 \vskip DIST
4203 %               \@startline\ignorespaces           END
4204 %   \@hightab :=G \@nxttabmar :=G \@firsttab
4205 %   \@tabpush :=G 0
4206 %   \dimen\@firsttab := \@totalleftmargin
4207 %   @rjfield :=G F
4208 %   \trivlist \item[]
4209 %   if @minipage = F then \vskip \parskip fi

```

```

4210 % \box\@tabfbox = \rlap{\indent\the\everypar} % note: \the\everypar sets
4211 % \@itemfudge == BEGIN \box\@tabfbox END % @inlabel :=G F
4212 % \@startline
4213 % \ignorespaces
4214 % END
4215 %
4216 % \@endtabbing ==
4217 % BEGIN
4218 % \@stopline
4219 % if \@tabpush > 0 then error message: 'unmatched \poptabs' fi
4220 % \endtrivlist
4221 % END
4222 %
4223 % \@rtab ==
4224 % BEGIN
4225 % \@stopfield
4226 % \@addfield
4227 % if \@curtab < \@hightab
4228 % then \@curtab :=G \@curtab + 1
4229 % else error message 'Undefined Tab' fi
4230 % \@tempdima := \dimen\@curtab - \dimen\@curtabmar
4231 % - width of box \@curline
4232 % \box\@curline :=G \hbox{\unhbox\@curline + \hskip\@tempdima}
4233 % \@startfield
4234 % END
4235 %
4236 % \@settab ==
4237 % BEGIN
4238 % \@stopfield
4239 % \@addfield
4240 % if \@curtab < \@maxtab
4241 % then \@curtab :=G \@curtab+1
4242 % else error message: 'Too many tabs' fi
4243 % if \@curtab > \@hightab
4244 % then \@hightab :=L \@curtab fi
4245 % \dimen\@curtab :=L \dimen\@curtabmar + width of \box\@curline
4246 % \@startfield
4247 % END
4248 %
4249 % \@ltab ==
4250 % BEGIN
4251 % \@ifatmargin
4252 % then if \@curtabmar > \@firsttab
4253 % then \@curtab :=G \@curtab - 1
4254 % \@curtabmar :=G \@curtabmar - 1
4255 % else error message 'Too many untab' fi
4256 % else error message 'Left tab in middle of line'
4257 % fi
4258 % END
4259 %
4260 % \@tabplus ==
4261 % BEGIN
4262 % if \@nxttabmar < \@hightab
4263 % then \@nxttabmar :=G \@nxttabmar+1
4264 % else error message 'Undefined tab'
4265 % fi
4266 % END
4267 %
4268 % \@tabminus ==
4269 % BEGIN
4270 % if \@nxttabmar > \@firsttab

```

```

4271 %           then \@nxttabmar :=G \@nxttabmar-1
4272 %           else error message ‘‘Too many untab’’
4273 %       fi
4274 %   END
4275 %
4276 % \@tabrj ==
4277 % BEGIN \@stopfield
4278 %     \@addfield
4279 %     @rjfield :=G T
4280 %     \@startfield
4281 % END
4282 %
4283 % \@tablab ==
4284 % BEGIN \@stopfield
4285 %     \box\@curline G:= \hbox{ \box\@curline %% ‘G’ added 17 Jun 86
4286 %                               \hskip - width of \box\@curfield
4287 %                               \hskip -\tabbingsep
4288 %                               \box\@curfield
4289 %                               \hskip \tabbingsep }
4290 %     \@startfield
4291 % END
4292 %
4293 % \pushtabs ==
4294 % BEGIN
4295 %     \@stopfield
4296 %     \@tabpush :=G \@tabpush + 1
4297 %     \begingroup
4298 %     \@contfield
4299 % END
4300 %
4301 % \poptabs ==
4302 % BEGIN
4303 %     \@stopfield
4304 %     if \@tabpush > 0
4305 %     then \endgroup
4306 %         \@tabpush :=G \@tabpush - 1
4307 %     else error message: ‘‘Too many \poptabs’’
4308 %     fi
4309 %     \@contfield
4310 % END
4311 %
4312 % The accents \‘ , \’ , and \= that have been redefined inside a tabbing
4313 % environment can be called by typing \a‘ , \a’ , and \a=.
4314 %
4315
4316 \expandafter \let \csname a‘\endcsname = \‘
4317 \expandafter \let \csname a’\endcsname = \’
4318 \expandafter \let \csname a=\endcsname = \=
4319 \def\a#1{\csname a#1\endcsname}
4320
4321 \newif\if@rjfield
4322 \newcount\@firsttab
4323 \newcount\@maxtab
4324 \newdimen\@gtempa \@firsttab=\allocationnumber
4325 \newdimen\@gtempa\newdimen\@gtempa\newdimen\@gtempa\newdimen\@gtempa
4326 \newdimen\@gtempa\newdimen\@gtempa\newdimen\@gtempa\newdimen\@gtempa
4327 \newdimen\@gtempa\newdimen\@gtempa\newdimen\@gtempa\newdimen\@gtempa
4328 \newdimen\@gtempa \@maxtab=\allocationnumber
4329 \dimen\@firsttab=0pt
4330 \newcount\@nxttabmar
4331 \newcount\@curtabmar

```

```

4332 \newcount\@curtab
4333 \newcount\@hightab
4334 \newcount\@tabpush
4335 \newbox\@curline
4336 \newbox\@curfield
4337 \newbox\@tabfbox
4338
4339 \def\@startline{\global\@curtabmar\@nxttabmar
4340   \global\@curtab\@curtabmar\global\setbox\@curline\hbox % missing \global
4341   }\@startfield\strut} % added 17 Jun 86
4342
4343 \def\@stopline{\unskip\@stopfield\if@rjfield \global\@rjfieldfalse
4344   \@tempdima\@totalleftmargin \advance\@tempdima\linewidth
4345   \hbox to\@tempdima{\@itemfudge\hskip\dimen\@curtabmar
4346   \box\@curline\hfil\box\@curfield}\else\@addfield
4347   \hbox{\@itemfudge\hskip\dimen\@curtabmar\box\@curline}\fi}
4348
4349 \def\@startfield{\global\setbox\@curfield\hbox\bgroup}{%{ BRACE MATCH HACK
4350 \let\@stopfield=}
4351 \def\@contfield{\global\setbox\@curfield\hbox\bgroup\unhbox\@curfield}
4352 \def\@addfield{\global\setbox\@curline\hbox{\unhbox
4353   \@curline\unhbox\@curfield}}
4354 \def\@ifatmargin{\ifdim \wd\@curline =\z@}
4355
4356 \def\@tabcr{\@stopline \@ifstar{\penalty \@M \@xtabcr}{\@xtabcr}}
4357
4358 \def\@xtabcr{\@ifnextchar[{\@itabcr}{\@startline\ignorespaces}}
4359
4360 \def\@itabcr[#1]{\vskip #1\@startline\ignorespaces}
4361
4362 \def\kill{\@stopfield\@startline\ignorespaces}
4363
4364 % REMOVE \outer FROM PLAIN'S DEF OF \+
4365
4366 \def\+{\tabalign}
4367
4368
4369 \def\tabbing{\lineskip \z@\let\>\@rtab\let\<\@ltab\let\=\@settab
4370   \let\+\@tabplus\let\-\@tabminus\let\'\@tabrj\let\'\@tablab
4371   \let\=\@tabcr
4372   \global\@hightab\@firsttab
4373   \global\@nxttabmar\@firsttab
4374   \dimen\@firsttab\@totalleftmargin
4375   \global\@tabpush\z@ \global\@rjfieldfalse
4376   \trivlist \item[]\if@minipage\else\vskip\parskip\fi
4377   \setbox\@tabfbox\hbox{\rlap{\indent\hskip\@totalleftmargin
4378     \the\everypar}}}\def\@itemfudge{\box\@tabfbox}\@startline\ignorespaces}
4379
4380 \def\endtabbing{\@stopline\ifnum\@tabpush >\z@ \@badpoptabs \fi\endtrivlist}
4381
4382 \def\@rtab{\@stopfield\@addfield\ifnum \@curtab<\@hightab
4383   \global\advance\@curtab \@ne \else\@badtab\fi
4384   \@tempdima\dimen\@curtab
4385   \advance\@tempdima -\dimen\@curtabmar
4386   \advance\@tempdima -\wd\@curline
4387   \global\setbox\@curline\hbox{\unhbox\@curline\hskip\@tempdima}%
4388   \@startfield\ignorespaces}
4389 % Omitted \global added to \@rtab 17 Jun 86
4390
4391 \def\@settab{\@stopfield\@addfield\ifnum \@curtab <\@maxtab
4392   \global\advance\@curtab \@ne \else\@latexerr{Tab overflow}\@ehd\fi

```



```

4393     \ifnum\@curtab >\@hightab
4394     \@hightab\@curtab\fi
4395     \dimen\@curtab\dimen\@curtabmar
4396     \advance\dimen\@curtab \wd\@curline\@startfield\ignorespaces}
4397 \def\@ltab{\@ifmargin\ifnum\@curtabmar >\@firsttab
4398     \global\advance\@curtab \m@ne \global\advance\@curtabmar \m@ne \else
4399     \@badtab\fi\else
4400     \@latexerr{\string\<\space in mid line}\@ehd\fi\ignorespaces}
4401 \def\@tabplus {\ifnum \@nxttabmar <\@hightab
4402     \global\advance\@nxttabmar \@ne \else
4403     \@badtab\fi\ignorespaces}
4404 \def\@tabminus{\ifnum\@nxttabmar >\@firsttab
4405     \global\advance\@nxttabmar \m@ne \else
4406     \@badtab\fi\ignorespaces}
4407 \def\@tabrj{\@stopfield\@addfield\global\@rjfieldtrue\@startfield\ignorespaces}
4408
4409 \def\@tablab{\@stopfield\global\setbox\@curline\hbox{\box\@curline
4410     \hskip -\wd\@curfield \hskip -\tabbingsep \box\@curfield
4411     \hskip \tabbingsep}\@startfield\ignorespaces}
4412 % \setbox\@curline made \global in \@tablab. 17 Jun 86
4413
4414 \def\pushtabs{\@stopfield\@addfield\global\advance\@tabpush \@ne \begingroup
4415     \@contfield}
4416 \def\poptabs{\@stopfield\@addfield\ifnum\@tabpush >\z@ \endgroup
4417     \global\advance\@tabpush \m@ne \else
4418     \@badpoptabs\fi\@contfield}
4419
4420 \newdimen\tabbingsep
4421
4422 \message{array,}
4423 % *****
4424 % *   ARRAY AND TABULAR ENVIRONMENTS   *
4425 % *****
4426 %
4427 % ARRAY PARMETERS:
4428 % \arraycolsep : half the width separating columns in an array environment
4429 % \tabcolsep   : half the width separating columns in a tabular environment
4430 % \arrayrulewidth : width of rules
4431 % \doublerulesep : space between adjacent rules in array or tabular
4432 % \arraystretch  : line spacing in array and tabular environments is done by
4433 %                   placing a strut in every row of height and depth
4434 %                   \arraystretch times the height and depth of the strut
4435 %                   produced by an ordinary \strut command.
4436 %
4437 % PREAMBLE:
4438 % The PREAMBLE argument of an array or tabular environment can contain
4439 % the following:
4440 % l,r,c : indicate where entry is to be placed.
4441 % |     : for vertical rule
4442 % @{EXP} : inserts the text EXP in every column. \arraycolsep or \tabcolsep
4443 %         spacing is suppressed.
4444 % *{N}{PRE} : equivalent to writing N copies of PRE in the preamble. PRE
4445 %             may contain *{N'}{EXP'} expressions.
4446 % p{LEN} : makes entry in parbox of width LEN.
4447 %
4448 % SPECIAL ARRAY COMMANDS:
4449 % \multicolumn{N}{FORMAT}{ITEM} : replaces the next N column items by
4450 %     ITEM, formatted according to FORMAT. FORMAT should contain at most
4451 %     one l,r or c. If it contains none, then ITEM is ignored.
4452 %
4453 % \vline : draws a vertical line the height of the current row. May

```

```

4454 %         appear in an array element entry.
4455 % \hline : draws a horizontal line between rows. Must appear either
4456 %         before the first entry (to appear above the first row) or right
4457 %         after a \\ command. If followed by another \hline, then adds
4458 %         a \vskip of \doublerulesep.
4459 %
4460 % \cline[i-j] : draws horizontal lines between rows covering columns
4461 %         i through j, inclusive. Multiple commands may follow
4462 %         one another to provide lines covering several disjoint
4463 %         columns
4464 % \extracolsep{WIDTH} : for use inside an @ in the preamble. Causes a WIDTH
4465 %         space to be added between columns for the rest of the
4466 %         columns. This is in addition to the ordinary intercolumn
4467 %         space.
4468 %
4469 % \array ==
4470 %     BEGIN
4471 %         \@acol    == \@arrayacol
4472 %         \@classz  == \@arrayclassz
4473 %         \@classiv == \@arrayclassiv
4474 %         \\        == \@arraycr
4475 %         \@halignto == NULL
4476 %         \@tabarray
4477 %     END
4478 %
4479 % \endarray{NAME} == BEGIN \crrc }} END
4480 %
4481 % \tabular ==
4482 %     BEGIN
4483 %         \@halignto == NULL
4484 %         \@tabular
4485 %     END
4486 %
4487 % \tabular*{WIDTH} ==
4488 %     BEGIN
4489 %         \@halignto == to WIDTH
4490 %         \@tabular
4491 %     END
4492 %
4493 % \@tabular ==
4494 %     BEGIN
4495 %         \leavevmode
4496 %         \hbox { $
4497 %             \@acol    == \@tabacol
4498 %             \@classz  == \@tabclassz
4499 %             \@classiv == \@tabclassiv
4500 %             \\        == \@tabularcr
4501 %             \@tabarray
4502 %     END
4503 %
4504 % \endtabular == BEGIN \crrc }} $} END
4505 %
4506 % \@tabarray == if next char = [ then \@array else \@array[c] fi
4507 %
4508 % \@array[POS]{PREAMBLE} ==
4509 %     BEGIN
4510 %         define \@arstrutbox to make \@arstrut produce strut of height
4511 %             and depth \arraystretch times the height and
4512 %             depth of a normal strut.
4513 %         \mkpream{PREAMBLE}
4514 %         \@preamble == \halign \@halignto {\tabskip=0pt\@arstrut

```

```

4515 %                               eval{\@preamble}\tabskip = Opt\cr %% }
4516 %   \@startpbox == \@startpbox
4517 %   \@endpbox == \@endpbox
4518 %   if POS = t then \vtop
4519 %               else if POS = b then \vbox
4520 %                   else \vcenter
4521 %   fi                fi
4522 %   {
4523 %       \par           ==L \relax
4524 %       \@sharp       == #
4525 %       \protect      == \relax
4526 %       \lineskip     :=L Opt
4527 %       \baselineskip :=L Opt
4528 %       \@preamble
4529 %   END
4530 %
4531 %
4532 % \@arraycr ==
4533 % BEGIN
4534 %   $                %% Prevents extra space at end of row's last entry.
4535 %   if next char = [
4536 %       then \@argarraycr
4537 %       else $ \cr    %% Needed to balance $
4538 %   END
4539 %
4540 % \@argarraycr[LENGTH] ==
4541 % BEGIN
4542 %   $                %% Needed to balance $ of \@arraycr
4543 %   if LENGTH > 0
4544 %       then \@tempdima := depth of \@arstrutbox + LENGTH
4545 %           \vrule height Opt width Opt depth \@tempdima
4546 %           \cr
4547 %       else \cr \noalign{\vskip LENGTH}
4548 %   END
4549 %
4550 % \@tabularcr and \@argtabularcr same as \@arraycr and \@argarraycr
4551 % except without the extra $'s.
4552 %
4553 % \def\extracolsep#1{\tabskip #1\relax}
4554 %
4555 % \def\array{\let\@acol\@arrayacol \let\@classz\@arrayclassz
4556 % \let\@classiv\@arrayclassiv \let\@arraycr\let\@halignto\@empty\@tabarray}
4557 %
4558 % \def\endarray{\crr\egroup\egroup}
4559 % \def\endtabular{\crr\egroup\egroup $\egroup}
4560 % \expandafter \let \csname endtabular*\endcsname = \endtabular
4561 %
4562 % \def\tabular{\let\@halignto\@empty\@tabular}
4563 %
4564 % \expandafter \def\csname tabular*\endcsname #1{\def\@halignto{to#1}\@tabular}
4565 %
4566 % \def\@tabular{\leavevmode \hbox \bgroup $\let\@acol\@tabacol
4567 % \let\@classz\@tabclassz
4568 % \let\@classiv\@tabclassiv \let\@tabularcr\@tabarray}
4569 %
4570 % %% RmS 91/11/04 added \m@th
4571 % \def\@tabarray{\m@th\@ifnextchar[{\@array}{\@array[c]}}
4572 %
4573 % \def\@array[#1]#2{\setbox\@arstrutbox\hbox{\vrule
4574 % \@height\arraystretch \ht\strutbox
4575 % \@depth\arraystretch \dp\strutbox

```

```

4576     \@width\z@}\@mkpream{#2}\edef\@preamble{\halign \noexpand\@halignto
4577 \bgroup \tabskip\z@ \@arstrut \@preamble \tabskip\z@ \cr}%
4578 \let\@startpbox\@startpbox \let\@endpbox\@endpbox
4579 \if #1\vtop \else \if#1b\vbox \else \vcenter \fi\fi
4580 \bgroup \let\par\relax
4581 \let\@sharp#\let\protect\relax \lineskip\z@\baselineskip\z@\@preamble}
4582
4583 \def\@arraycr{${\ifnum0=} \fi\@ifstar{\@xarraycr}{\@arraycr}}
4584 \def\@xarraycr{\@ifnextchar[{\@argarraycr}{\ifnum0={\fi}$}\cr}}
4585
4586 \def\@argarraycr[#1]{\ifnum0={\fi}$}\ifdim #1>\z@ \@xargarraycr[#1]\else
4587 \@yargarraycr[#1]\fi}
4588
4589 \def\@tabularcr{{\ifnum0=} \fi\@ifstar{\@xtabularcr}{\@tabularcr}}
4590 \def\@xtabularcr{\@ifnextchar[{\@argtabularcr}{\ifnum0={\fi}\cr}}
4591
4592 \def\@argtabularcr[#1]{\ifnum0={\fi}\ifdim #1>\z@
4593 \unskip\@xargarraycr[#1]\else \@yargarraycr[#1]\fi}
4594
4595 \def\@xargarraycr#1{\@tempdima #1\advance\@tempdima \dp \@arstrutbox
4596 \vrule \@height\z@ \@depth\@tempdima \@width\z@ \cr}
4597
4598 \def\@yargarraycr#1{\cr\noalign{\vskip #1}}
4599
4600
4601 % \multicolumn{NUMBER}{FORMAT}{ITEM} ==
4602 % BEGIN
4603 % \multispan{NUMBER}
4604 % \begingroup
4605 % \@addamp == null
4606 % \@mkpream{FORMAT}
4607 % \@sharp == ITEM
4608 % \protect == \relax
4609 % \@startpbox == \@startpbox
4610 % \@endpbox == \@endpbox
4611 % \@arstrut
4612 % \@preamble
4613 % \endgroup
4614 % END
4615
4616 % The command \def\@addamp{} was removed from \multicolumn on 6 Dec 86
4617 % because it caused embedded array environments not to work. I think
4618 % that it was included originally to prevent an error message if
4619 % the 2nd argument to the \multicolumn command had two column specifiers.
4620 %
4621 % 8 Feb 89 - \hbox{} added after \@preamble to correct bug that
4622 % occurred if \multicolumn preceded \\[D] with D > 0,
4623 % caused by \\[] command doing an \unskip, which removed
4624 % \tabcolsep glue inserted by \multicolumn
4625
4626 \def\multicolumn#1#2#3{\multispan{#1}\begingroup
4627 \@mkpream{#2}%
4628 \def\@sharp{#3}\let\protect\relax
4629 \let\@startpbox\@startpbox\let\@endpbox\@endpbox
4630 \@arstrut \@preamble\hbox{}\endgroup\ignorespaces}
4631
4632
4633 % Codes for classes and character numbers of array, tabular and
4634 % multicolumn arguments.
4635 %
4636 % Character Class Number

```

```

4637 % -----
4638 %      c      0      0
4639 %      l      0      1
4640 %      r      0      2
4641 %
4642 %      |      1      -
4643 %      @      2      -
4644 %      p      3      -
4645 %      {@-exp} 4      -
4646 %      {p-arg} 5      -
4647 %
4648 % \@testpach \foo : expands \foo, which should be an array parameter token,
4649 %                  and sets \@chclass and \@chnum to its class and number.
4650 %                  Uses \@lastchclass to distinguish 4 and 5
4651 %
4652 % Preamble error codes
4653 %      0: 'illegal character'
4654 %      1: 'Missing @-exp'
4655 %      2: 'Missing p-arg'
4656 %
4657 % \@addamp ==
4658 %      BEGIN if @firstamp = true then @firstamp := false
4659 %                  else &
4660 %      END
4661 %
4662 % \@mkpream TOKENLIST ==
4663 %      BEGIN
4664 %      @firstamp := T
4665 %      \@lastchclass := 6
4666 %      \@preamble == null
4667 %      \@sharp == \relax
4668 %      \@protect == BEGIN \noexpand\protect\noexpand END
4669 %      \@startpbox == \relax
4670 %      \@endpbox == \relax
4671 %      \@expast{TOKENLIST}
4672 %      for \@nextchar := expand(\@tempa)
4673 %      do \@testpach{\@nextchar}
4674 %      case of \@chclass
4675 %      0 -> \@classz
4676 %      1 -> \@classi
4677 %      ...
4678 %      5 -> \@classv
4679 %      end case
4680 %      \@lastchclass := \@chclass
4681 %      od
4682 %      case of \@lastchclass
4683 %      0 -> \hskip \arraycolsep % lrc
4684 %      1 -> % |
4685 %      2 -> \@preamerr1 % 'Missing @-exp' % @
4686 %      3 -> \@preamerr2 % 'Missing p-arg' % p
4687 %      4 -> % @-exp
4688 %      5 -> \hskip \arraycolsep % p-exp
4689 %      end case
4690 %      END
4691 %
4692 % \@arrayclassz ==
4693 %      BEGIN
4694 %      \@preamble := \@preamble *
4695 %      case of \@lastchclass
4696 %      0 -> \hskip \arraycolsep \@addamp \hskip \arraycolsep
4697 %      1 -> \@addamp \hskip \arraycolsep

```

```

4698 %           2 -> % impossible
4699 %           3 -> % impossible
4700 %           4 -> \@addamp
4701 %           5 -> \hskip \arraycolsep \@addamp \hskip \arraycolsep
4702 %           6 -> \@addamp \hskip \arraycolsep
4703 %         end case
4704 %       * case of \@chnum
4705 %         0 -> \hfil$\relax\@sharp$\hfil
4706 %         1 -> $\relax\@sharp$\hfil
4707 %         2 -> \hfil$\relax\@sharp$
4708 %       end case
4709 %     END
4710 %
4711 % \@tabclassz == similar to \@arrayclassz
4712 %
4713 % \@classi ==
4714 % BEGIN
4715 %   \@preamble := \@preamble *
4716 %   case of \@lastchclass
4717 %     0 -> \hskip \arraycolsep \@arrayrule
4718 %     1 -> \hskip \doublerulesep \@arrayrule
4719 %     2 -> % impossible
4720 %     3 -> % impossible
4721 %     4 -> \@arrayrule
4722 %     5 -> \hskip \arraycolsep \@arrayrule
4723 %     6 -> \@arrayrule
4724 %   end case
4725 % END
4726 %
4727 % \@classii ==
4728 % BEGIN
4729 %   \@preamble := \@preamble *
4730 %   case of \@lastchclass
4731 %     0 ->
4732 %     1 -> \hskip .5\arrayrulewidth
4733 %     2 -> % impossible
4734 %   else ->
4735 %   end case
4736 % END
4737 %
4738 % \@classiii ==
4739 % BEGIN
4740 %   \@preamble := \@preamble *
4741 %   case of \@lastchclass
4742 %     0 -> \hskip \arraycolsep \@addamp \hskip \arraycolsep
4743 %     1 -> \@addamp \hskip \arraycolsep
4744 %     2 -> % impossible
4745 %     3 -> % impossible
4746 %     4 -> \@addamp
4747 %     5 -> \hskip \arraycolsep \@addamp \hskip \arraycolsep
4748 %     6 -> \@addamp \hskip \arraycolsep
4749 %   end case
4750 % END
4751 %
4752 % \@arrayclassiv == BEGIN \@preamble := \@preamble * $\@nextchar$ END
4753 %
4754 % \@tabclassiv == same as \@arrayclassv except without the $ ... $
4755 %
4756 % \@classv ==
4757 % BEGIN
4758 %   \@preamble := \@preamble * \@startpbox{\@nextchar}\ignorespaces\@sharp

```

```

4759 %                                     \@endpbox
4760 %   END
4761 %
4762 % \@expast{S}: Sets \@tempa := S with all instances of *{N}{STRING}
4763 %           replaced by N copies of STRING, where N > 0. An *
4764 %           appearing inside braces is ignored, but *-expressions
4765 %           inside STRING are expanded, so nested *-expressions are
4766 %           handled properly.
4767 %
4768 % \@expast{S} == BEGIN \@xexpast S *0x\@@ END
4769 %
4770 % \@xexpast S1 *{N}{S2} S3 \@@ ==
4771 % BEGIN
4772 %   \@tempa := S1
4773 %   \@tempcnta := N
4774 %   if \@tempcnta > 0
4775 %       then while \@tempcnta > 0 do \@tempa := \@tempa S2
4776 %                               \@tempcnta := \@tempcnta - 1 od
4777 %       \@tempb == \@xexpast
4778 %       else \@tempb == \@xexnoop
4779 %       fi
4780 %   \expandafter \@tempb \@tempa S3 \@@
4781 % END
4782 %
4783 %
4784 % \def\@xexnoop #1\@@{ }
4785 %
4786 % \def\@expast#1{\@xexpast #1*0x\@@}
4787 %
4788 % \def\@xexpast#1*#2#3#4\@@{\edef\@tempa{#1}\@tempcnta#2\relax
4789 %   \ifnum\@tempcnta >\z@ \@whilenum\@tempcnta >\z@\do
4790 %     {\edef\@tempa{\@tempa#3}\advance\@tempcnta \m@ne}\let\@tempb\@xexpast
4791 %     \else \let\@tempb\@xexnoop\fi
4792 %   \expandafter\@tempb \@tempa #4\@@}
4793 %
4794 %
4795 % \newif\if@firstamp
4796 % \def\@addamp{\if@firstamp \@firstampfalse \else
4797 %   \edef\@preamble{\@preamble &}\fi}
4798 % \def\@arrayacol{\edef\@preamble{\@preamble \hskip \arraycolsep}}
4799 % \def\@tabacol{\edef\@preamble{\@preamble \hskip \tabcolsep}}
4800 % \def\@ampacol{\@addamp \@acol}
4801 % \def\@acolampacol{\@acol\@addamp\@acol}
4802 %
4803 % \def\@mkpream#1{\@firstamptrue\@lastchclass6
4804 % \let\@preamble\@empty\def\protect{\noexpand\protect\noexpand}\let\@sharp\relax
4805 % \let\@startpbox\relax\let\@endpbox\relax
4806 % \@expast{#1}\expandafter\@tfor \expandafter
4807 %   \@nextchar \expandafter:\expandafter=\@tempa\do{\@testpach\@nextchar
4808 %   \ifcase \@chclass \@classz \or \@classi \or \@classii \or \@classiii
4809 %     \or \@classiv \or \@classv \fi\@lastchclass\@chclass}%
4810 % \ifcase \@lastchclass \@acol
4811 %   \or \or \@preamerr \@ne\or \@preamerr \tw@\or \or \@acol \fi}
4812 %
4813 % \def\@arrayclassz{\ifcase \@lastchclass \@acolampacol \or \@ampacol \or
4814 %   \or \or \@addamp \or
4815 %   \@acolampacol \or \@firstampfalse \@acol \fi
4816 % \edef\@preamble{\@preamble
4817 %   \ifcase \@chnum
4818 %     \hfil$\relax\@sharp$\hfil \or $\relax\@sharp$\hfil
4819 %     \or \hfil$\relax\@sharp$\fi}}

```

```

4820
4821 %% RmS 91/08/14 inserted extra braces around entry for NFSS
4822 \def\@tabclassz{\ifcase \@lastchclass \@acolampacol \or \@ampacol \or
4823 \or \or \@addamp \or
4824 \@acolampacol \or \@firstampfalse \@acol \fi
4825 \edef\@preamble{\@preamble{
4826 \ifcase \@chnum
4827 \hfil\ignorespaces\@sharp\unskip\hfil
4828 \or \ignorespaces\@sharp\unskip\hfil
4829 \or \hfil\hskip\z@ \ignorespaces\@sharp\unskip\fi}}
4830
4831 \def\@classi{\ifcase \@lastchclass \@acol \@arrayrule \or
4832 \@addtopreamble{\hskip \doublerulesep}\@arrayrule\or
4833 \or \or \@arrayrule \or
4834 \@acol \@arrayrule \or \@arrayrule \fi}
4835
4836
4837 \def\@classii{\ifcase \@lastchclass \or
4838 \@addtopreamble{\hskip .5\arrayrulewidth}\fi}
4839
4840 \def\@classiii{\ifcase \@lastchclass \@acolampacol \or
4841 \@addamp\@acol \or
4842 \or \or \@addamp \or
4843 \@acolampacol \or \@ampacol \fi}
4844
4845 \def\@tabclassiv{\@addtopreamble\@nextchar}
4846
4847 \def\@arrayclassiv{\@addtopreamble{\$\@nextchar$}}
4848
4849 \def\@classv{\@addtopreamble{\@startpbox{\@nextchar}\ignorespaces
4850 \@sharp\@endpbox}}
4851
4852 \def\@addtopreamble#1{\edef\@preamble{\@preamble #1}}
4853
4854 \newcount\@chclass
4855 \newcount\@lastchclass
4856 \newcount\@chnum
4857
4858 \newdimen\arraycolsep
4859 \newdimen\tabcolsep
4860 \newdimen\arrayrulewidth
4861 \newdimen\doublerulesep
4862
4863 \def\arraystretch{1} % Default value.
4864
4865 \newbox\@arstrutbox
4866 \def\@arstrut{\relax\ifmmode\copy\@arstrutbox\else\unhcopy\@arstrutbox\fi}
4867
4868
4869 \def\@arrayrule{\@addtopreamble{\hskip -.5\arrayrulewidth
4870 \vrule \@width \arrayrulewidth\hskip -.5\arrayrulewidth}}
4871
4872 \def\@testpach#1{\@chclass \ifnum \@lastchclass=\tw@ 4 \else
4873 \ifnum \@lastchclass=3 5 \else
4874 \z@ \if #1c\@chnum \z@ \else
4875 \if #1l\@chnum \@ne \else
4876 \if #1r\@chnum \tw@ \else
4877 \@chclass \if #1|\@ne \else
4878 \if #1@\tw@ \else
4879 \if #1p3 \else \z@ \@preamerr 0\fi
4880 \fi \fi \fi \fi \fi \fi

```



```

4881 \fi}
4882
4883 \def\hline{\noalign{\ifnum0='}\fi\hrule \@height \arrayrulewidth \futurelet
4884   \@tempa\@xhline}
4885
4886 \def\@xhline{\ifx\@tempa\hline\vskip \doublerulesep\fi
4887   \ifnum0='{\fi}}
4888
4889 \def\vline{\vrule \@width \arrayrulewidth}
4890
4891 \newcount\@cla
4892 \newcount\@clb
4893
4894 \def\cline#1{\@cline[#1]}
4895 \def\@cline[#1-#2]{\noalign{\global\@cla#1\relax
4896 \global\advance\@cla\m@ne
4897 \ifnum\@cla>\z@\global\let\@gtempa\@clinea\else
4898   \global\let\@gtempa\@clineb\fi
4899 \global\@clb#2\relax
4900 \global\advance\@clb-\@cla}\@gtempa
4901 \noalign{\vskip-\arrayrulewidth}}
4902
4903 \def\@clinea{\multispan\@cla&\multispan\@clb
4904 \unskip\leaders\hrule \@height \arrayrulewidth \hfill
4905 \cr}
4906
4907 \def\@clineb{\multispan\@clb
4908 \unskip\leaders\hrule \@height \arrayrulewidth \hfill
4909 \cr}
4910
4911 % \startpbox{WIDTH} TEXT \egroup == \parbox{WIDTH}{TEXT}
4912 % \endpbox == \unskip \strut \par \egroup\hfil (Changed 14 Jan 89)
4913 %
4914
4915 \def\@startpbox#1{\vtop\bgroup \hsize #1\@arrayparboxrestore}
4916 \def\@endpbox{\unskip\strut\par\egroup\hfil}
4917
4918 % 14 Jan 89: Def of \@endpbox changed from
4919 %   \def\@endpbox{\par\vskip\dp\@arstrutbox\egroup\hfil}
4920 % so vertical spacing works out right if the last line of a 'p' entry
4921 % has a descender.
4922
4923 \let\@@startpbox=\@startpbox
4924 \let\@@endpbox=\@endpbox
4925
4926 \message{picture,}
4927 % *****
4928 % *       THE PICTURE ENVIRONMENT       *
4929 % *****
4930 %
4931 % \unitlength      = value of dimension argument
4932 % \@wholewidth     = current line width
4933 % \@halfwidth      = half of current line width
4934 % \@linefont       = font for drawing lines
4935 % \@circlefont     = font for drawing circles
4936 %
4937 % \linethickness{DIM} : Sets the width of horizontal and vertical lines
4938 %   in a picture to DIM. Does not change width of slanted lines
4939 %   or circles. Width of all lines reset by \thinlines and
4940 %   \thicklines
4941 %

```

```

4942 % \picture(XSIZE,YSIZE)(XORG,YORG)
4943 % BEGIN
4944 %   \@picht :=L YSIZE * \unitlength
4945 %   box \@picbox :=
4946 %     \hbox to XSIZE * \unitlength
4947 %       {\hskip -XORG * \unitlength
4948 %         \lower YORG * \unitlength
4949 %         \hbox{
4950 %           \ignorespaces   %% added 13 June 89
4951 %         }
4952 %       }
4953 % \endpicture ==
4954 % BEGIN
4955 %   } \hss }
4956 %   height of \@picbox := \@picht
4957 %   depth of \@picbox := 0
4958 %   \mbox{\box\@picbox}   %% change 26 Aug 91
4959 % END
4960 %
4961 % \put(X, Y){OBJ} ==
4962 % BEGIN
4963 %   \@killglue
4964 %   \raise Y * \unitlength \hbox to Opt { \hskip X * \unitlength
4965 %                                           OBJ \hss }
4966 %   \ignorespaces
4967 % END
4968 %
4969 % \multiput(X,Y)(DELX,DELY){N}{OBJ} ==
4970 % BEGIN
4971 %   \@killglue
4972 %   \@multicnt := N
4973 %   \@xdim := X * \unitlength
4974 %   \@ydim := Y * \unitlength
4975 %   while \@multicnt > 0
4976 %     do \raise \@ydim \hbox to Opt { \hskip \@xdim
4977 %                                     OBJ \hss }
4978 %     \@multicnt := \@multicnt - 1
4979 %     \@xdim := \@xdim + DELX * \unitlength
4980 %     \@ydim := \@ydim + DELY * \unitlength
4981 %   od
4982 %   \ignorespaces
4983 % END
4984 %
4985 % \shortstack[POS]{TEXT} : Makes a \vbox containing TEXT stacked as
4986 %   a one-column array, positioned l, r or c as indicated by POS.
4987
4988 \newdimen\@wholewidth
4989 \newdimen\@halfwidth
4990 \newdimen\unitlength \unitlength =1pt
4991 \newbox\@picbox
4992 \newdimen\@picht
4993
4994 \def\picture(#1,#2){\ifnextchar({\@picture(#1,#2)}{\@picture(#1,#2)(0,0)}}
4995
4996 \def\@picture(#1,#2)(#3,#4){\@picht #2\unitlength
4997 \setbox\@picbox\hbox to#1\unitlength\bgroup
4998 \hskip -#3\unitlength \lower #4\unitlength \hbox\bgroup\ignorespaces}
4999
5000 %% 91/08/26 RmS & Fmi: extra boxing level around \@picbox
5001 %%   to guard against unboxing in math mode
5002 %%   (proposed by John Hobby)

```

```

5003
5004 \def\endpicture{\egroup\hss\egroup\ht\@picbox\@picht
5005 \dp\@picbox\z@\mbox{\box\@picbox}}
5006
5007 % In the definitions of \put and \multiput, \hskip was replaced by \kern
5008 % just in case arg #3 = ‘plus’. (Bug detected by Don Knuth.
5009 % changed 20 Jul 87).
5010 %
5011 \long\def\put(#1,#2)#3{\@killglue\raise#2\unitlength\hbox to\z@{\kern
5012 #1\unitlength #3\hss}\ignorespaces}
5013
5014 \long\def\multiput(#1,#2)(#3,#4)#5#6{\@killglue\@multicnt #5\relax
5015 \@xdim #1\unitlength
5016 \@ydim #2\unitlength
5017 \@whilenum \@multicnt >\z@\do
5018 {\raise\@ydim\hbox to\z@{\kern
5019 \@xdim #6\hss}\advance\@multicnt \m@ne\advance\@xdim
5020 #3\unitlength\advance\@ydim #4\unitlength}\ignorespaces}
5021
5022 \def\@killglue{\unskip\@whiledim \lastskip >\z@\do{\unskip}}
5023
5024 \def\thinlines{\let\@linefnt\tenln \let\@circlefnt\tencirc
5025 \@wholewidth\fontdimen8\tenln \@halfwidth .5\@wholewidth}
5026 \def\thicklines{\let\@linefnt\tenlnw \let\@circlefnt\tencircw
5027 \@wholewidth\fontdimen8\tenlnw \@halfwidth .5\@wholewidth}
5028
5029 \def\linethickness#1{\@wholewidth #1\relax \@halfwidth .5\@wholewidth}
5030
5031 \def\shortstack{\@ifnextchar[{\@shortstack}{\@shortstack[c]}}
5032
5033 \def\@shortstack[#1]{\leavevmode
5034 \vbox\bgroup\baselineskip-\p@\lineskip 3\p@\let\mb@l\hss
5035 \let\mb@r\hss \expandafter\let\csname mb@#1\endcsname\relax
5036 \let\\\@stackcr\@ishortstack}
5037
5038 %% RmS 91/08/14 inserted extra braces around entry for NFSS
5039 \def\@ishortstack#1{\halign{\mb@l {##}\unskip\mb@r\cr #1\cr}\egroup}
5040
5041
5042 \def\@stackcr{\@ifstar{\@ixstackcr}{\@ixstackcr}}
5043 \def\@ixstackcr{\@ifnextchar[{\@istackcr}{\cr\ignorespaces}}
5044
5045 \def\@istackcr[#1]{\cr\noalign{\vskip #1}\ignorespaces}
5046
5047
5048 % \line(X,Y){LEN} ==
5049 % BEGIN
5050 % \@xarg := X
5051 % \@yarg := Y
5052 % \@linelen := LEN * \unitlength
5053 % if \@xarg = 0
5054 % then \@vline
5055 % else if \@yarg = 0
5056 % then \@hline
5057 % else \@sline
5058 % if
5059 % if
5060 % END
5061 %
5062 % \@sline ==
5063 % BEGIN

```

```

5064 %   if \@xarg < 0
5065 %       then @negarg := T
5066 %           \@xarg := -\@xarg
5067 %           \@yyarg := -\@yarg
5068 %       else @negarg := F
5069 %           \@yyarg := \@yarg
5070 %   fi
5071 %   \@tempcnta := |\@yyarg|
5072 %   if \@tempcnta > 6
5073 %       then error: 'LATEX ERROR: Illegal \line or \vector argument.'
5074 %           \@tempcnta := 0
5075 %   fi
5076 %   \box\@linechar := \hbox{\@linefnt \@getlinechar(\@xarg,\@yyarg) }
5077 %   if \@yarg > 0 then \@upordown = \raise
5078 %       \@clnht := 0
5079 %       else \@upordown = \lower
5080 %           \@clnht := height of \box\@linechar
5081 %   fi
5082 %   \@clnwd := width of \box\@linechar
5083 %   if @negarg
5084 %       then \hskip - width of \box\@linechar
5085 %           \@tempa == \hskip - 2* width of box \@linechar
5086 %       else \@tempa == \relax
5087 %   fi
5088 % %% Put out integral number of line segments
5089 %   while \@clnwd < \@linelen
5090 %       do \@upordown \@clnht \copy\@linechar
5091 %           \@tempa
5092 %           \@clnht := \@clnht + ht of \box\@linechar
5093 %           \@clnwd := \@clnwd + width of \box\@linechar
5094 %       od
5095 %
5096 % %% Put out last segment
5097 %   \@clnht := \@clnht - height of \box\@linechar
5098 %   \@clnwd := \@clnwd - width of \box\@linechar
5099 %   \@tempdima := \@linelen - \@clnwd
5100 %   \@tempdimb := \@tempdima - width of \box\@linechar
5101 %   if @negarg then \hskip -\@tempdimb
5102 %       else \hskip \@tempdimb
5103 %   fi
5104 %   \@tempdima := 1000 * \@tempdima
5105 %   \@tempcnta := \@tempdima / width of \box\@linechar
5106 %   \@tempdima := (\@tempcnta * ht of \box\@linechar)/1000
5107 %   \@clnht := \@clnht + \@tempdima
5108 %   if \@linelen < width of box\@linechar
5109 %       then \hskip width of box\@linechar
5110 %       else \hbox{\@upordown \@clnht \copy\@linechar}
5111 %   fi
5112 % END
5113 %
5114 % \@hline ==
5115 %   BEGIN
5116 %       if \@xarg < 0 then \hskip -\@linelen \fi
5117 %       \vrule height \@halfwidth depth \@halfwidth width \@linelen
5118 %       if \@xarg < 0 then \hskip -\@linelen \fi
5119 %   END
5120 %
5121 % \@vline == if \@yarg < 0 \downline else \upline fi
5122 %
5123 %
5124 % \@getlinechar(X,Y) ==

```

```

5125 % BEGIN
5126 %   \@tempcnta := 8*X - 9
5127 %   if Y > 0
5128 %     then \@tempcnta := \@tempcnta + Y
5129 %     else \@tempcnta := \@tempcnta - Y + 64
5130 %   fi
5131 %   \char\@tempcnta
5132 % END
5133 %
5134 % \vector(X,Y){LEN} ==
5135 % BEGIN
5136 %   \@xarg := X
5137 %   \@yarg := Y
5138 %   \@linelen := LEN * \unitlength
5139 %   if \@xarg = 0
5140 %     then \@vvector
5141 %     else if \@yarg = 0
5142 %       then \@hvector
5143 %       else \@svector
5144 %     if
5145 %   if
5146 % END
5147 %
5148 % \@hvector ==
5149 % BEGIN
5150 %   \@hline
5151 %   {\@linefnt if \@xarg < 0 then \@getlarrow(1,0)
5152 %     else \@getrarrow(1,0)
5153 %   fi}
5154 % END
5155 %
5156 % \@vvector == if \@yarg < 0 \@downvector else \@upvector fi
5157 %
5158 % \@svector ==
5159 % BEGIN
5160 %   \@sline
5161 %   \@tempcnta := |\@yarg|
5162 %   if \@tempcnta < 5
5163 %     then \hskip - width of \box\@linechar
5164 %       \upordown \@clnht \hbox
5165 %         {\@linefnt
5166 %           if @negarg then \@getlarrow(\@xarg,\@yyarg)
5167 %           else \@getrarrow(\@xarg,\@yyarg)
5168 %         fi }
5169 %     else error: 'LATEX ERROR: Illegal \line or \vector argument.'
5170 %   fi
5171 % END
5172 %
5173 % \@getlarrow(X,Y) ==
5174 % BEGIN
5175 %   if Y = 0
5176 %     then \@tempcnta := '33
5177 %     else \@tempcnta := 16 * X - 9
5178 %       \@tempcntb := 2 * Y
5179 %       if \@tempcntb > 0
5180 %         then \@tempcnta := \@tempcnta + \@tempcntb
5181 %         else \@tempcnta := \@tempcnta - \@tempcntb + 64
5182 %       fi
5183 %   fi
5184 %   \char\@tempcnta
5185 % END

```

```

5186 %
5187 % \@getrarrow(X,Y) ==
5188 % BEGIN
5189 %   \@tempcntb := |Y|
5190 %   case of \@tempcntb
5191 %     0 : \@tempcnta := '55
5192 %     1 : if X < 3
5193 %         then \@tempcnta := 24*X - 6
5194 %         else if X = 3
5195 %             then \@tempcnta := 49
5196 %             else \@tempcnta := 58 fi
5197 %     fi
5198 %     2 : if X < 3
5199 %         then \@tempcnta := 24*X - 3
5200 %         else \@tempcnta := 51 % X must = 3
5201 %     fi
5202 %     3 : \@tempcnta := 16*X - 2
5203 %     4 : \@tempcnta := 16*X + 7
5204 %   endcase
5205 %   if Y < 0
5206 %     then \@tempcnta := \@tempcnta + 64
5207 %   fi
5208 %   \char\@tempcnta
5209 % END
5210
5211 \newif\if@negarg
5212
5213 \def\line(#1,#2)#3{\@xarg #1\relax \@yarg #2\relax
5214 \@linelen #3\unitlength
5215 \ifnum \@xarg =\z@ \@vline
5216 \else \ifnum \@yarg =\z@ \@hline \else \@sline\fi
5217 \fi}
5218
5219 \def\@sline{\ifnum \@xarg <\z@ \@negargtrue \@xarg -\@xarg \@yyarg -\@yarg
5220 \else \@negargfalse \@yyarg \@yarg \fi
5221 \ifnum \@yyarg >\z@ \@tempcnta\@yyarg \else \@tempcnta -\@yyarg \fi
5222 \ifnum \@tempcnta >6 \@badlinearg\@tempcnta\z@ \fi
5223 \ifnum \@xarg >6 \@badlinearg\@xarg \@one \fi
5224 \setbox\@linechar\hbox{\@linefont\@getlinechar(\@xarg,\@yyarg)}%
5225 \ifnum \@yarg >\z@ \let\@upordown\raise \@clnht\z@
5226 \else\let\@upordown\lower \@clnht \ht\@linechar\fi
5227 \@clnwd \wd\@linechar
5228 \if@negarg \hskip -\wd\@linechar \def\@tempa{\hskip -2\wd\@linechar}\else
5229 \let\@tempa\relax \fi
5230 \@whiledim \@clnwd <\@linelen \do
5231 {\@upordown\@clnht\copy\@linechar
5232 \@tempa
5233 \advance\@clnht \ht\@linechar
5234 \advance\@clnwd \wd\@linechar}%
5235 \advance\@clnht -\ht\@linechar
5236 \advance\@clnwd -\wd\@linechar
5237 \@tempdima\@linelen\advance\@tempdima -\@clnwd
5238 \@tempdimb\@tempdima\advance\@tempdimb -\wd\@linechar
5239 \if@negarg \hskip -\@tempdimb \else \hskip \@tempdimb \fi
5240 \multiply\@tempdima \@m
5241 \@tempcnta \@tempdima \@tempdima \wd\@linechar \divide\@tempcnta \@tempdima
5242 \@tempdima \ht\@linechar \multiply\@tempdima \@tempcnta
5243 \divide\@tempdima \@m
5244 \advance\@clnht \@tempdima
5245 \ifdim \@linelen <\wd\@linechar
5246 \hskip \wd\@linechar

```

```

5247 \else\@upordown\@clnht\copy\@linechar\fi}
5248
5249 \def\@hline{\ifnum \@xarg <\z@ \hskip -\@linelen \fi
5250 \vrule \@height \@halfwidth \@depth \@halfwidth \@width \@linelen
5251 \ifnum \@xarg <\z@ \hskip -\@linelen \fi}
5252
5253 \def\@getlinechar(#1,#2){\@tempcnta#1\relax\multiply\@tempcnta 8%
5254 \advance\@tempcnta -9\ifnum #2>\z@ \advance\@tempcnta #2\relax\else
5255 \advance\@tempcnta -#2\relax\advance\@tempcnta 64 \fi
5256 \char\@tempcnta}
5257
5258 \def\vector(#1,#2)#3{\@xarg #1\relax \@yarg #2\relax
5259 \@tempcnta \ifnum\@xarg<\z@ -\@xarg\else\@xarg\fi
5260 \ifnum\@tempcnta<5\relax
5261 \@linelen #3\unitlength
5262 \ifnum\@xarg =\z@ \@vvector
5263 \else \ifnum\@yarg =\z@ \@hvector \else \@svector\fi
5264 \fi
5265 \else\@badlinearg\fi}
5266
5267 \def\@hvector{\@hline\hbox to\z@{\@linefnt
5268 \ifnum \@xarg <\z@ \@getlarrow(1,0)\hss\else
5269 \hss\@getrarrow(1,0)\fi}}
5270
5271 \def\@vvector{\ifnum \@yarg <\z@ \@downvector \else \@upvector \fi}
5272
5273 \def\@svector{\@sline
5274 \@tempcnta\@yarg \ifnum\@tempcnta <\z@ \@tempcnta -\@tempcnta\fi
5275 \ifnum\@tempcnta <5%
5276 \hskip -\wd\@linechar
5277 \@upordown\@clnht \hbox{\@linefnt \if@negarg
5278 \@getlarrow(\@xarg,\@yyarg)\else \@getrarrow(\@xarg,\@yyarg)\fi}%
5279 \else\@badlinearg\fi}
5280
5281 \def\@getlarrow(#1,#2){\ifnum #2=\z@ \@tempcnta'33 \else
5282 \@tempcnta #1\relax\multiply\@tempcnta \sixt@@n \advance\@tempcnta
5283 -9 \@tempcntb #2\relax\multiply\@tempcntb \tw@
5284 \ifnum \@tempcntb >\z@ \advance\@tempcnta \@tempcntb
5285 \else\advance\@tempcnta -\@tempcntb\advance\@tempcnta 64
5286 \fi\fi\char\@tempcnta}
5287
5288 \def\@getrarrow(#1,#2){\@tempcntb #2\relax
5289 \ifnum\@tempcntb <\z@ \@tempcntb -\@tempcntb\relax\fi
5290 \ifcase \@tempcntb\relax \@tempcnta'55 \or
5291 \ifnum #1<\thr@@ \@tempcnta #1\relax\multiply\@tempcnta
5292 24\advance\@tempcnta -6 \else \ifnum #1=\thr@@ \@tempcnta 49
5293 \else\@tempcnta 58 \fi\fi\or
5294 \ifnum #1<\thr@@ \@tempcnta=#1\relax\multiply\@tempcnta
5295 24\advance\@tempcnta -\thr@@ \else \@tempcnta 51 \fi\or
5296 \@tempcnta #1\relax\multiply\@tempcnta
5297 \sixt@@n \advance\@tempcnta -\tw@ \else
5298 \@tempcnta #1\relax\multiply\@tempcnta
5299 \sixt@@n \advance\@tempcnta 7 \fi\ifnum #2<\z@ \advance\@tempcnta 64 \fi
5300 \char\@tempcnta}
5301
5302
5303
5304 \def\@vline{\ifnum \@yarg <\z@ \@downline \else \@upline\fi}
5305
5306 \def\@upline{\hbox to \z@{\hskip -\@halfwidth \vrule \@width \@wholewidth
5307 \@height \@linelen \@depth \z@\hss}}

```

```

5308
5309 \def\@downline{\hbox to \z@{\hskip -\@halfwidth \vrule \@width \@wholewidth
5310   \@height \z@ \@depth \@linelen \hss}}
5311
5312 \def\@upvector{\@upline\setbox\@tempboxa\hbox{\@linefnt\char'66}\raise
5313   \@linelen \hbox to \z@{\lower \ht\@tempboxa\box\@tempboxa\hss}}
5314
5315 \def\@downvector{\@downline\lower \@linelen
5316   \hbox to \z@{\@linefnt\char'77\hss}}
5317
5318 % \dashbox{D}(X,Y) ==
5319 % BEGIN
5320 % leave vertical mode
5321 % \hbox to Opt {
5322 %   \baselineskip := Opt
5323 %   \lineskip     := Opt
5324 %   %% HORIZONTAL DASHES
5325 %   \@dashdim := X * \unitlength
5326 %   \@dashcnt := \@dashdim + 200 % to prevent roundoff error
5327 %   \@dashdim := D * \unitlength
5328 %   \@dashcnt := \@dashcnt / \@dashdim
5329 %   if \@dashcnt is odd
5330 %     then \@dashdim := Opt
5331 %       \@dashcnt := (\@dashcnt + 1) / 2
5332 %     else \@dashdim := \@dashdim / 2
5333 %       \@dashcnt := \@dashcnt / 2 - 1
5334 %       \box\@dashbox := \hbox{\vrule height \@halfwidth
5335 %                             depth \@halfwidth width \@dashdim}
5336 %       \put(0,0){\copy\@dashbox}
5337 %       \put(0,Y){\copy\@dashbox}
5338 %       \put(X,0){\hskip -\@dashdim\copy\@dashbox}
5339 %       \put(X,Y){\hskip -\@dashdim\box\@dashbox}
5340 %       \@dashdim := 3 * \@dashdim
5341 %   fi
5342 %   \box\@dashbox := \hbox{\vrule height \@halfwidth
5343 %                             depth \@halfwidth width D * \unitlength
5344 %                             \hskip D * \unitlength}
5345 %   \@tempcnta := 0
5346 %   \put(0,0){\hskip \@dashdim
5347 %             while \@tempcnta < \@dashcnt
5348 %               do \copy\@dashbox
5349 %                 \@tempcnta := \@tempcnta + 1
5350 %               od
5351 %             }
5352 %   \@tempcnta := 0
5353 %   \put(0,Y){\hskip \@dashdim
5354 %             while \@tempcnta < \@dashcnt
5355 %               do \copy\@dashbox
5356 %                 \@tempcnta := \@tempcnta + 1
5357 %               od
5358 %             }
5359 %
5360 % %% vertical dashes
5361 %   \@dashdim := Y * \unitlength
5362 %   \@dashcnt := \@dashdim + 200 % to prevent roundoff error
5363 %   \@dashdim := D * \unitlength
5364 %   \@dashcnt := \@dashcnt / \@dashdim
5365 %   if \@dashcnt is odd
5366 %     then \@dashdim := Opt
5367 %       \@dashcnt := (\@dashcnt + 1) / 2
5368 %     else \@dashdim := \@dashdim / 2

```



```

5369 %          \@dashcnt := \@dashcnt / 2 - 1
5370 %          \box\@dashbox := \hbox{\hskip -\@halfwidth
5371 %                               \vrule width \@wholewidth
5372 %                               height \@dashdim }
5373 %          \put(0,0){\copy\@dashbox}
5374 %          \put(X,0){\copy\@dashbox}
5375 %          \put(0,Y){\lower\@dashdim\copy\@dashbox}
5376 %          \put(X,Y){\lower\@dashdim\copy\@dashbox}
5377 %          \@dashdim := 3 * \@dashdim
5378 %      fi
5379 %      \box\@dashbox := \hbox{\vrule width \@wholewidth
5380 %                               height D * \unitlength }
5381 %      \@tempcnta := 0
5382 %      put(0,0){\hskip -\halfwidth
5383 %              \vbox{while \@tempcnta < \@dashcnt
5384 %                    do \vskip D*\unitlength
5385 %                      \copy\@dashbox
5386 %                      \@tempcnta := \@tempcnta + 1
5387 %                    od
5388 %                    \vskip \@dashdim
5389 %                  } }
5390 %      \@tempcnta := 0
5391 %      put(X,0){\hskip -\halfwidth
5392 %              \vbox{while \@tempcnta < \@dashcnt
5393 %                    do \vskip D*\unitlength
5394 %                      \copy\@dashbox
5395 %                      \@tempcnta := \@tempcnta + 1
5396 %                    od
5397 %                    \vskip \@dashdim
5398 %                  }
5399 %      }
5400 % } % END DASHES
5401 %
5402 % \@makepicbox(X,Y)
5403 % END
5404
5405 \def\dashbox#1(#2,#3){\leavevmode\hbox to\z@{\baselineskip \z@
5406 \lineskip \z@
5407 \@dashdim #2\unitlength
5408 \@dashcnt \@dashdim \advance\@dashcnt 200
5409 \@dashdim #1\unitlength\divide\@dashcnt \@dashdim
5410 \ifodd\@dashcnt\@dashdim \z@
5411 \advance\@dashcnt \@ne \divide\@dashcnt \tw@
5412 \else \divide\@dashdim \tw@ \divide\@dashcnt \tw@
5413 \advance\@dashcnt \m@ne
5414 \setbox\@dashbox \hbox{\vrule \@height \@halfwidth \@depth \@halfwidth
5415 \@width \@dashdim}\put(0,0){\copy\@dashbox}%
5416 \put(0,#3){\copy\@dashbox}%
5417 \put(#2,0){\hskip-\@dashdim\copy\@dashbox}%
5418 \put(#2,#3){\hskip-\@dashdim\box\@dashbox}%
5419 \multiply\@dashdim \thr@@
5420 \fi
5421 \setbox\@dashbox \hbox{\vrule \@height \@halfwidth \@depth \@halfwidth
5422 \@width #1\unitlength\hskip #1\unitlength}\@tempcnta\z@
5423 \put(0,0){\hskip\@dashdim \@whilenum \@tempcnta <\@dashcnt
5424 \do{\copy\@dashbox\advance\@tempcnta \@ne }}\@tempcnta\z@
5425 \put(0,#3){\hskip\@dashdim \@whilenum \@tempcnta <\@dashcnt
5426 \do{\copy\@dashbox\advance\@tempcnta \@ne }}%
5427 \@dashdim #3\unitlength
5428 \@dashcnt \@dashdim \advance\@dashcnt 200
5429 \@dashdim #1\unitlength\divide\@dashcnt \@dashdim

```

```

5430 \ifodd\@dashcnt \@dashdim \z@
5431 \advance\@dashcnt \@ne \divide\@dashcnt \tw@
5432 \else
5433 \divide\@dashdim \tw@ \divide\@dashcnt \tw@
5434 \advance\@dashcnt \m@ne
5435 \setbox\@dashbox\hbox{\hskip -\@halfwidth
5436 \vrule \@width \@wholewidth
5437 \@height \@dashdim}\put(0,0){\copy\@dashbox}%
5438 \put(#2,0){\copy\@dashbox}%
5439 \put(0,#3){\lower\@dashdim\copy\@dashbox}%
5440 \put(#2,#3){\lower\@dashdim\copy\@dashbox}%
5441 \multiply\@dashdim \thr@@
5442 \fi
5443 \setbox\@dashbox\hbox{\vrule \@width \@wholewidth
5444 \@height #1\unitlength}\@tempcnta\z@
5445 \put(0,0){\hskip -\@halfwidth \vbox{\@whilenum \@tempcnta <\@dashcnt
5446 \do{\vskip #1\unitlength\copy\@dashbox\advance\@tempcnta \@ne }%
5447 \vskip\@dashdim}}\@tempcnta\z@
5448 \put(#2,0){\hskip -\@halfwidth \vbox{\@whilenum \@tempcnta<\@dashcnt
5449 \do{\vskip #1\unitlength\copy\@dashbox\advance\@tempcnta \@ne }%
5450 \vskip\@dashdim}}\@makepicbox(#2,#3)}
5451
5452 % CIRCLES AND OVALS
5453 %
5454 % USER COMMANDS:
5455 %
5456 % \circle{D} : Produces the circle with the diameter as close as
5457 % possible to D * \unitlength. \put(X,Y){\circle{D}}
5458 % puts the circle with its center at (X,Y).
5459 %
5460 % \oval(X,Y) : Makes an oval as round as possible that fits in the
5461 % rectangle of width X * \unitlength and height
5462 % Y * \unitlength. The reference point is the center.
5463 %
5464 % \oval(X,Y)[POS] : Save as \oval(X,Y) except it draws only the
5465 % half or quadrant of the oval indicated by POS.
5466 % E.G., \oval(X,Y)[t] draws just the top half
5467 % and \oval(X,Y)[br] draws just the bottom right
5468 % quadrant. In all cases, the reference point is
5469 % the same as the unqualified \oval(X,Y) command.
5470 %
5471 % \@ovvert {DELTA1} {DELTA2} : Makes a vbox containing either the left side
5472 % or the right side of the oval being constructed. The baseline
5473 % will coincide with the outside bottom edge of the oval; the left
5474 % side of the box will coincide with the left edge of the vertical
5475 % rule. The width of the box will be \@tempdima.
5476 % DELTA1 and DELTA2 are added to the character number in \@tempcnta
5477 % to get the characters for the top and bottom quarter circle pieces.
5478 %
5479 % \@ovhorz : Makes an hbox containing the straight rule for either the
5480 % top or the bottom of the oval being constructed. The baseline
5481 % will coincide with bottom edge of the rule; the left side of
5482 % the box will coincide with the left side of the oval.
5483 % The width of the box will be \@ovxxx.
5484 %
5485 % \@getcirc {DIAM} : Sets \@tempcnta to the character number
5486 % of the top-right quarter circle with the largest
5487 % diameter less than or equal to DIAM.
5488 % Sets \@tempboxa to an hbox containing that character.
5489 % Sets \@tempdima to \wd \@tempboxa, which is the distance
5490 % from the circle's left outside edge to its right

```

```

5491 %             inside edge.
5492 %             (These characters are like those described in the
5493 %             TeXbook, pp. 389-90.)
5494 %
5495 % \@getcirc {DIAM} ==
5496 % BEGIN
5497 %   \@tempcnta      := integer coercion of (DIAM + 2pt)    %% + 2pt added
5498 %   \@tempcnta      := \@tempcnta / integer coercion of 4pt %%    1 Nov 88
5499 %   if \@tempcnta > 10
5500 %     then \@tempcnta := 10 fi
5501 %   if \@tempcnta > 0
5502 %     then \@tempcnta := \@tempcnta-1
5503 %     else LaTeX Warning: Oval too small.
5504 %   fi
5505 %   \@tempcnta      := 4 * \@tempcnta
5506 %   \@tempboxa      := \hbox{\@circlefnt \char \@tempcnta}
5507 %   \@tempdima      := \wd \@tempboxa
5508 % END
5509 %
5510 % \@put{X}{Y}{OBJ} ==
5511 % BEGIN
5512 %   \raise Y \hbox to Opt{\hskip X OBJ \hss}
5513 % END
5514 %
5515 % \@oval(X,Y)[POS] ==
5516 % BEGIN
5517 %   \begingroup
5518 %     \boxmaxdepth := \maxdimen
5519 %     @ovt := @ovb := @ovl := @ovr := true
5520 %     for all E in POS
5521 %       do @ovE := false od
5522 %     \@ovxx      := X * \unitlength
5523 %     \@ovyy      := Y * \unitlength
5524 %     \@tempdimb := min(\@ovxx,\@ovyy)
5525 %     \@getcirc{\@tempdimb-2pt}    %% "-2pt" added 7 Dec 89
5526 %     \@ovro      := \ht \@tempboxa
5527 %     \@ovri      := \dp \@tempboxa
5528 %     \@ovdx      := \@ovxx - \@tempdima
5529 %     \@ovdx      := \@ovdx/2
5530 %     \@ovdy      := \@ovyy - \@tempdima
5531 %     \@ovdy      := \@ovdy/2
5532 %     \@circlefnt
5533 %     \@tempboxa :=
5534 %       \hbox{
5535 %         if @ovr
5536 %           then \@ovvert{3}{2} \kern -\@tempdima
5537 %         fi
5538 %         if @ovl
5539 %           then \kern \@ovxx \@ovvert{0}{1} \kern -\@tempdima
5540 %             \kern -\@ovxx
5541 %         fi
5542 %         if @ovt
5543 %           then \@ovhorz \kern -\@ovxx
5544 %         fi
5545 %         if @ovb
5546 %           then \raise \@ovyy \@ovhorz
5547 %         fi
5548 %       }
5549 %     \@ovdx      := \@ovdx + \@ovro
5550 %     \@ovdy      := \@ovdy + \@ovro
5551 %     \ht\@tempboxa := \dp\@tempboxa := 0

```

```

5552 %      \@put{-\@ovdx}{-\@ovdy}{\box\@tempboxa}
5553 %      \endgroup
5554 %      END
5555 %
5556 % \@ovvert {DELTA1} {DELTA2} ==
5557 %      BEGIN
5558 %      \vbox to \@ovyy {
5559 %          if @ovb
5560 %              then \@tempcntb := \@tempcnta + DELTA1
5561 %                  \kern -\@ovro
5562 %                  \hbox { \char \@tempcntb }
5563 %                  \nointerlineskip
5564 %              else \kern \@ovri \kern \@ovdy
5565 %              fi
5566 %              \leaders \vrule width \@wholewidth \vfil
5567 %              \nointerlineskip
5568 %              if @ovt
5569 %                  then \@tempcntb := \@tempcnta + DELTA2
5570 %                      \hbox { \char \@tempcntb }
5571 %                  else \kern \@ovdy \kern \@ovro
5572 %                  fi
5573 %              }
5574 %      END
5575 %
5576 % \@ovhorz ==
5577 %      BEGIN
5578 %      \hbox to \@ovxx{
5579 %          \kern \@ovro
5580 %          if @ovr
5581 %              then
5582 %                  else \kern \@ovdx
5583 %              fi
5584 %          \leaders \hrule height \@wholewidth \hfil
5585 %          if @ovl
5586 %              then
5587 %                  else \kern \@ovdx
5588 %              fi
5589 %          \kern \@ovri
5590 %      }
5591 %      END
5592 %
5593 % \circle{DIAM} ==
5594 %      BEGIN
5595 %      \begingroup
5596 %      \boxmaxdepth := maxdimen
5597 %      \@tempdimb := DIAM *\unitlength
5598 %      if \@tempdimb > 15.5pt
5599 %          then \@getcirc{\@tempdimb}
5600 %              \@ovro := \ht \@tempboxa
5601 %              \@tempboxa := \hbox{
5602 %                  \@circlefnt
5603 %                  \@tempcnta := \@tempcnta + 2
5604 %                  \char \@tempcnta
5605 %                  \@tempcnta := \@tempcnta - 1
5606 %                  \char \@tempcnta
5607 %                  \kern -2\@tempdima
5608 %                  \@tempcnta := \@tempcnta + 2
5609 %                  \raise \@tempdima \hbox { \char \@tempcnta }
5610 %                  \raise \@tempdima \box\@tempboxa
5611 %              }
5612 %              \ht\@tempboxa := \dp\@tempboxa := 0

```

```

5613 %          \@put{-\@ovro}{-\@ovro}{\@tempboxa}
5614 %      else
5615 %          \@circ{\@tempdimb}{96}
5616 %      fi
5617 %  \endgroup
5618 %  END
5619 %
5620 % \circle*{DIAM} == \@dot{DIAM} == \@circ{DIAM*\unitlength}{112}
5621 %
5622 % \@circ{DIAM}{CHAR} ==
5623 % BEGIN
5624 %   \@tempcnta := integer coercion of (DIAM + .5pt)/1pt.
5625 %   if \@tempcnta > 15 then \@tempcnta := 15 fi
5626 %   if \@tempcnta > 1 then \@tempcnta := \@tempcnta - 1 fi
5627 %   \@tempcnta := \@tempcnta + CHAR
5628 %   \@circlefnt
5629 %   \char \@tempcnta
5630 % END
5631 %
5632 %
5633 %\newif\if@ovt
5634 %\newif\if@ovb
5635 %\newif\if@ovl
5636 %\newif\if@ovr
5637 %\newdimen\@ovxx
5638 %\newdimen\@ovyy
5639 %\newdimen\@ovdx
5640 %\newdimen\@ovdy
5641 %\newdimen\@ovro
5642 %\newdimen\@ovri
5643 %
5644 %% \advance\@tempdima 2pt\relax added 1 Nov 88 to fix bug in which
5645 %% size of drawn circle not monotonic function of argument of \circle,
5646 %% caused by different rounding for dimensions of large and small circles.
5647 %
5648 \def\@getcirc#1{\@tempdima #1\relax \advance\@tempdima 2\p@
5649   \@tempcnta\@tempdima
5650   \@tempdima 4\p@ \divide\@tempcnta\@tempdima
5651   \ifnum \@tempcnta >10\relax \@tempcnta 10\relax\fi
5652   \ifnum \@tempcnta >\z@ \advance\@tempcnta\m@ne
5653     \else \@warning{Oval too small}\fi
5654   \multiply\@tempcnta 4\relax
5655   \setbox \@tempboxa \hbox{\@circlefnt
5656     \char \@tempcnta}\@tempdima \wd \@tempboxa}
5657 %
5658 \def\@put#1#2#3{\raise #2\hbox to\z@{\hskip #1#3\hss}}
5659 %
5660 \def\oval(#1,#2){\@ifnextchar[{\@oval(#1,#2)}{\@oval(#1,#2) []}}
5661 %
5662 \def\@oval(#1,#2)[#3]{\begingroup\boxmaxdepth \maxdimen
5663   \@ovttrue \@ovbtrue \@ovltrue \@ovrtrue
5664   \@tfor\@tempa :=#3\do{\csname @ov\@tempa false\endcsname}\@ovxx
5665   #1\unitlength \@ovyy #2\unitlength
5666   \@tempdimb \ifdim \@ovyy >\@ovxx \@ovxx\else \@ovyy \fi
5667   \advance \@tempdimb -2\p@
5668   \@getcirc \@tempdimb
5669   \@ovro \ht\@tempboxa \@ovri \dp\@tempboxa
5670   \@ovdx\@ovxx \advance\@ovdx -\@tempdima \divide\@ovdx \tw@
5671   \@ovdy\@ovyy \advance\@ovdy -\@tempdima \divide\@ovdy \tw@
5672   \@circlefnt \setbox\@tempboxa
5673   \hbox{\if@ovr \@ovvert32\kern -\@tempdima \fi

```

```

5674 \if@ovl \kern \@ovxx \@ovvert01\kern -\@tempdima \kern -\@ovxx \fi
5675 \if@ovt \@ovhorz \kern -\@ovxx \fi
5676 \if@ovb \raise \@ovvy \@ovhorz \fi}\advance\@ovdx\@ovro
5677 \advance\@ovdy\@ovro \ht\@tempboxa\z@ \dp\@tempboxa\z@
5678 \@put{-\@ovdx}{-\@ovdy}{\box\@tempboxa}%
5679 \endgroup}
5680
5681 \def\@ovvert#1#2{\vbox to\@ovvy{%
5682   \if@ovb \@tempcntb \@tempcnta \advance \@tempcntb #1\relax
5683   \kern -\@ovro \hbox{\char \@tempcntb}\nointerlineskip
5684   \else \kern \@ovri \kern \@ovdy \fi
5685   \leaders\vrule \@width \@wholewidth\vfil \nointerlineskip
5686   \if@ovt \@tempcntb \@tempcnta \advance \@tempcntb #2\relax
5687   \hbox{\char \@tempcntb}%
5688   \else \kern \@ovdy \kern \@ovro \fi}}
5689
5690 \def\@ovhorz{\hbox to \@ovxx{\kern \@ovro
5691   \if@ovr \else \kern \@ovdx \fi
5692   \leaders \hrule \@height \@wholewidth \hfil
5693   \if@ovl \else \kern \@ovdx \fi
5694   \kern \@ovri}}
5695
5696 \def\circle{\@ifstar{\@dot}{\@circle}}
5697 \def\@circle#1{\begingroup \boxmaxdepth \maxdimen \@tempdimb #1\unitlength
5698   \ifdim \@tempdimb >15.5\p@ \getcirc\@tempdimb
5699   \@ovro\ht\@tempboxa
5700   \setbox\@tempboxa\hbox{\@circlefnt
5701     \advance\@tempcnta\tw@ \char \@tempcnta
5702     \advance\@tempcnta\m@ne \char \@tempcnta \kern -2\@tempdima
5703     \advance\@tempcnta\tw@
5704     \raise \@tempdima \hbox{\char\@tempcnta}\raise \@tempdima
5705     \box\@tempboxa}\ht\@tempboxa\z@ \dp\@tempboxa\z@
5706     \@put{-\@ovro}{-\@ovro}{\box\@tempboxa}%
5707   \else \@circ\@tempdimb{96}\fi\endgroup}
5708
5709 \def\@dot#1{\@tempdimb #1\unitlength \@circ\@tempdimb{112}}
5710
5711 \def\@circ#1#2{\@tempdima #1\relax \advance\@tempdima .5\p@
5712   \@tempcnta\@tempdima \@tempdima \p@
5713   \divide\@tempcnta\@tempdima
5714   \ifnum\@tempcnta >15\relax \@tempcnta 15\relax \fi
5715   \ifnum \@tempcnta >\z@ \advance\@tempcnta\m@ne\fi
5716   \advance\@tempcnta #2\relax
5717   \@circlefnt \char\@tempcnta}
5718
5719
5720 %INITIALIZATION
5721 \thinlines
5722
5723 \newcount\@xarg
5724 \newcount\@yarg
5725 \newcount\@yyarg
5726 \newcount\@multicnt
5727 \newdimen\@xdim
5728 \newdimen\@ydim
5729 \newbox\@linechar
5730 \newdimen\@linelen
5731 \newdimen\@clnwd
5732 \newdimen\@clnht
5733 \newdimen\@dashdim
5734 \newbox\@dashbox

```

```

5735 \newcount\@dashcnt
5736
5737
5738
5739 \message{theorem,}
5740 % *****
5741 % * THEOREM ENVIRONMENTS *
5742 % *****
5743 %
5744 % The user creates his own theorem-like environments with the command
5745 % \newtheorem{NAME}{TEXT}[COUNTER] or
5746 % \newtheorem{NAME}[OLDNAME]{TEXT}
5747 % This defines the environment NAME to be just as one would expect a
5748 % theorem environment to be, except that it prints ‘‘TEXT’’ instead of
5749 % ‘‘Theorem’’.
5750 %
5751 % If OLDNAME is given, then environments NAME and OLDNAME use the same
5752 % counter, so using a NAME environment advances the number of the next
5753 % NAME environment, and vice-versa.
5754 %
5755 % If COUNTER is given, then environment NAME is numbered within COUNTER.
5756 % E.g., if COUNTER = subsection, then the first NAME in subsection 7.2
5757 % is numbered TEXT 7.2.1.
5758 %
5759 % The way NAME environments are numbered can be changed by redefining
5760 % \theNAME.
5761 %
5762 % DOCUMENT STYLE PARAMETERS
5763 %
5764 % \@thmcounter{COUNTER} : A command such that
5765 % \edef\theCOUNTER{\@thmcounter{COUNTER}}
5766 % defines \theCOUNTER to produce a number for a theorem environment.
5767 % The default is:
5768 % BEGIN \noexpand\arabic{COUNTER} END
5769 %
5770 % \@thmcountersep : A separator placed between a theorem number and
5771 % the number of the counter within which it is numbered.
5772 % E.g., to make the third theorem of section 7.2 be numbered
5773 % 7.2-3, \@thmcountersep should be \def'ed to '-'. Its
5774 % default is '.'.
5775 %
5776 % \@begintheorem{NAME}{NUMBER} : A command that begins a theorem
5777 % environment for a 'theorem' named 'NAME NUMBER' --
5778 % e.g., \@begintheorem{Lemma}{3.7} starts Lemma 3.7.
5779 %
5780 % \@opargbegintheorem{NAME}{NUMBER}{OPARG} : A command that begins a theorem
5781 % environment for a 'theorem' named 'NAME NUMBER' with optional
5782 % argument OPARG -- e.g., \@begintheorem{Lemma}{3.7}{Jones}
5783 % starts 'Lemma 3.7 (Jones):'.
5784 %
5785 % \@endtheorem : A command that ends a theorem environment.
5786 %
5787 % \newtheorem{NAME}{TEXT}[COUNTER] ==
5788 % BEGIN
5789 % if \NAME is definable
5790 % then \@definecounter{NAME}
5791 % if COUNTER present
5792 % then \@addtoreset{NAME}{COUNTER} fi
5793 % \theNAME == BEGIN \theCOUNTER \@thmcountersep
5794 % eval\@thmcounter{NAME} END
5795 % else \theNAME == BEGIN eval\@thmcounter{NAME} END

```

```

5796 %           \NAME == \@thm{NAME}{TEXT}
5797 %           \endNAME == \@endtheorem
5798 %     else error
5799 %     fi
5800 % END
5801 %
5802 % \newtheorem{NAME}[OLDNAME]{TEXT}==
5803 % BEGIN
5804 %   if \NAME is definable
5805 %     then \theNAME == \theOLDNAME
5806 %         \NAME == \@thm{OLDNAME}{TEXT}
5807 %         \endNAME == \@endtheorem
5808 %     else error
5809 %     fi
5810 % END
5811 %
5812 % \@thm{NAME}{TEXT} ==
5813 % BEGIN
5814 %   \refstepcounter{NAME}
5815 %   if next char = [
5816 %     then \@ythm{NAME}{TEXT}
5817 %     else \@xthm{NAME}{TEXT}
5818 %   fi
5819 % END
5820 %
5821 % \@xthm{NAME}{TEXT} ==
5822 % BEGIN
5823 %   \@begintheorem{TEXT}{\theNAME}
5824 %   \ignorespaces
5825 % END
5826 %
5827 % \@ythm{NAME}{TEXT}[OPARG] ==
5828 % BEGIN
5829 %   \@opargbegintheorem{TEXT}{\theNAME}{OPARG}
5830 %   \ignorespaces
5831 % END
5832 %
5833 \def\newtheorem#1{\@ifnextchar[{\@othm{#1}}{\@nthm{#1}}}
5834
5835 \def\@nthm#1#2{%
5836 \@ifnextchar[{\@xnthm{#1}{#2}}{\@ynthm{#1}{#2}}}
5837
5838 \def\@xnthm#1#2[#3]{\expandafter\@ifdefinable\csname #1\endcsname
5839 {\@definecounter{#1}\@addtoreset{#1}{#3}%
5840 \expandafter\xdef\csname the#1\endcsname{\expandafter\noexpand
5841 \csname the#3\endcsname \@thmcountersep \@thmcounter{#1}}%
5842 \global\@namedef{#1}{\@thm{#1}{#2}}\global\@namedef{end#1}{\@endtheorem}}}
5843
5844 \def\@ynthm#1#2{\expandafter\@ifdefinable\csname #1\endcsname
5845 {\@definecounter{#1}%
5846 \expandafter\xdef\csname the#1\endcsname{\@thmcounter{#1}}%
5847 \global\@namedef{#1}{\@thm{#1}{#2}}\global\@namedef{end#1}{\@endtheorem}}}
5848
5849 %% RmS 92/01/10: check for existence of theorem environment #2
5850 \def\@othm#1[#2]#3{%
5851   \@ifundefined{c@#2}{\@latexerr{No theorem environment ‘#2’ defined}\@eha}%
5852   {\expandafter\@ifdefinable\csname #1\endcsname
5853     {\global\@namedef{the#1}{\@nameuse{the#2}}}%
5854   \global\@namedef{#1}{\@thm{#2}{#3}}%
5855   \global\@namedef{end#1}{\@endtheorem}}}
5856

```



```

5857 \def\thm#1#2{\refstepcounter
5858   {#1}\@ifnextchar[{\@ythm{#1}{#2}}{\@xthm{#1}{#2}}}
5859
5860 \def\@xthm#1#2{\@begintheorem{#2}{\csname the#1\endcsname}\ignorespaces}
5861 \def\@ythm#1#2[#3]{\@opargbegintheorem{#2}{\csname
5862   the#1\endcsname}{#3}\ignorespaces}
5863
5864 %DEFAULT VALUES
5865 \def\@thmcounter#1{\noexpand\arabic{#1}}
5866 \def\@thmcountersep{.}
5867 %deleted September 2, 1986 MDK
5868 %\def\@makethmnumber#1#2{\bf #1 #2:}
5869
5870 %% RmS 91/08/14 Moved \it after \item to make it work with NFSS
5871 \def\@begintheorem#1#2{\trivlist \item[\hskip \labelsep{\bf #1\ #2}]\it}
5872 \def\@opargbegintheorem#1#2#3{\trivlist
5873   \item[\hskip \labelsep{\bf #1\ #2\ (#3)}]\it}
5874 \def\@endtheorem{\endtrivlist}
5875
5876
5877 \message{lengths,}
5878 % *****
5879 % *           LENGTHS           *
5880 % *****
5881 %
5882 % USER COMMANDS:
5883 %
5884 % \newlength{\NAME}           == \newskip\NAME
5885 % \setlength{\NAME}{VALUE}   == \NAME :=L VALUE
5886 % \addtolength{\NAME}{VALUE} == \NAME :=L \NAME + VALUE
5887 % \settowidth{\NAME}{TEXT}   == \NAME :=L width of \hbox{TEXT}
5888 %
5889 \def\newlength#1{\@ifdefinable#1{\newskip#1}}
5890 \def\setlength#1#2{#1#2\relax}
5891 \def\addtolength#1#2{\advance#1 #2\relax}
5892 \def\settowidth#1#2{\setbox\@tempboxa\hbox{#2}#1\wd\@tempboxa\relax}
5893 %% \relax added 24 Mar 86
5894
5895 \message{title,}
5896 % *****
5897 % *           THE TITLE           *
5898 % *****
5899 %
5900 % The user defines the title, author, date by the declarations \title{NAME},
5901 % \author{NAME} and \date{DATE}. Inside these, he can use the \thanks
5902 % command to make footnoted acknowledgements, notice of address, etc.
5903 % The \maketitle command produces the actual title. Note: multiple authors
5904 % are separated with the \and command.
5905
5906 \def\title#1{\gdef\@title{#1}}
5907
5908 \def\author#1{\gdef\@author{#1}}
5909
5910 \def\date#1{\gdef\@date{#1}}
5911 \gdef\@date{\today}           %Default is today's date
5912
5913 \def\thanks#1{\footnotemark\begin{group}
5914 \def\protect{\noexpand\protect\noexpand}\xdef\@thanks{\@thanks
5915 \protect\footnotetext[\the\c@footnote]{#1}}\end{group}}
5916
5917 \def\@thanks{}

```

```

5918
5919 \def\and{%%                                % \begin{tabular}
5920 \end{tabular}\hskip 1em plus.17fil\begin{tabular}[t]{c}%% \end{tabular}
5921 }
5922
5923
5924
5925 \message{sectioning,}
5926 % *****
5927 % *                SECTIONING                *
5928 % *****
5929 %
5930 %
5931 % \@startsection {NAME}-{LEVEL}{INDENT}{BEFORESKIP}{AFTERSKIP}{STYLE}
5932 %         optional * [ALTHEADING]{HEADING}
5933 % Generic command to start a section.
5934 % NAME      : e.g., 'subsection'
5935 % LEVEL     : a number, denoting depth of section -- e.g., chapter=1,
5936 %             section = 2, etc.
5937 % INDENT    : Indentation of heading from left margin
5938 % BEFORESKIP : Absolute value = skip to leave above the heading.
5939 %             If negative, then paragraph indent of text following
5940 %             heading is suppressed.
5941 % AFTERSKIP : if positive, then skip to leave below heading, else
5942 %             negative of skip to leave to right of run-in heading.
5943 % STYLE     : commands to set style
5944 % If '*' missing, then increments the counter. If it is present, then
5945 % there should be no [ALTHEADING] argument.
5946 % Uses the counter 'secnumdepth' whose value is the highest section
5947 % level that is to be numbered.
5948 %
5949 % WARNING: The \@startsection command should be at the same or higher
5950 % grouping level as the text that follows it. For example, you
5951 % should NOT do something like
5952 %     \def\foo{ \begingroup ...
5953 %               \paragraph{...}
5954 %               \endgroup}
5955 %
5956 % \@startsection {NAME}{LEVEL}{INDENT}{BEFORESKIP}{AFTERSKIP}{STYLE} ==
5957 % BEGIN
5958 % IF @noskipsec = T THEN \leavevmode FI % true if previous section
5959 %                               % had no body.
5960 % \par
5961 % \@tempskipa := BEFORESKIP
5962 % @afterindent := T
5963 % IF \@tempskipa < 0 THEN \@tempskipa := -\@tempskipa
5964 %                               @afterindent := F
5965 % FI
5966 % IF @nobreak = true
5967 % THEN \everypar == null
5968 % ELSE \addpenalty{\@secpenalty}
5969 %       \addvspace{\@tempskipa}
5970 % FI
5971 % IF * next
5972 % THEN \@ssect{INDENT}{BEFORESKIP}{AFTERSKIP}{STYLE}
5973 % ELSE \@dblarg{\@ssect
5974 %             {NAME}{LEVEL}{INDENT}{BEFORESKIP}{AFTERSKIP}{STYLE}}
5975 % FI
5976 % END
5977 %
5978 % \@ssect{NAME}{LEVEL}{INDENT}{BEFORESKIP}{AFTERSKIP}{STYLE} [ARG1]{ARG2} ==

```

```

5979 % BEGIN
5980 %   IF LEVEL > \c@secnumdepth
5981 %     THEN \@svsec :=L null
5982 %     ELSE \refstepcounter{NAME}
5983 %       \@svsec :=L BEGIN \theNAME END
5984 %   FI
5985 %   IF AFTERSKIP > 0
5986 %     THEN \beginngroup
5987 %       STYLE
5988 %         \@hangfrom{\hskip INDENT\@svsec}
5989 %         {\interlinepenalty 10000 ARG2\par}
5990 %       \endgroup
5991 %       \NAMEmark{ARG1}
5992 %       \addcontentsline{toc}{NAME}
5993 %       { IF LEVEL > \c@secnumdepth
5994 %         ELSE \protect\numberline{\theNAME} FI
5995 %       ARG1 }
5996 %     ELSE \@svsechd == BEGIN STYLE
5997 %       \hskip INDENT\@svsec
5998 %       ARG2
5999 %       \NAMEmark{ARG1}
6000 %       \addcontentsline{toc}{NAME}
6001 %       { IF LEVEL > \c@secnumdepth
6002 %         ELSE \protect\numberline{\theNAME} FI
6003 %       ARG1 }
6004 %     END
6005 %   FI
6006 %   \@xsect{AFTERSKIP}
6007 % END
6008 %
6009 % \@xsect{AFTERSKIP} ==
6010 % BEGIN
6011 %   IF AFTERSKIP > 0
6012 %     THEN \par \nobreak
6013 %       \vskip AFTERSKIP
6014 %       \@afterheading
6015 %     ELSE @nobreak :=G F
6016 %       @noskipsec :=G T
6017 %       \everypar{ IF @noskipsec = T
6018 %         THEN @noskipsec :=G F
6019 %           \clubpenalty :=G 10000
6020 %           \hskip -\parindent
6021 %           \beginngroup
6022 %             \@svsechd
6023 %           \endgroup
6024 %           \unskip
6025 %           \hskip -AFTERSKIP \relax %% relax added 14 Jan 91
6026 %         ELSE \clubpenalty :=G \@clubpenalty
6027 %           \everypar := NULL
6028 %       FI
6029 %     }
6030 %   FI
6031 %
6032 % END
6033 %
6034 % \@ssect{INDENT}{BEFORESKIP}{AFTERSKIP}{STYLE}{ARG} ==
6035 % BEGIN
6036 %   IF AFTERSKIP > 0
6037 %     THEN \beginngroup
6038 %       STYLE
6039 %       \@hangfrom{\hskip INDENT}{\interlinepenalty 10000 ARG\par}

```

```

6040 %         \endgroup
6041 %     ELSE \@svsechd == BEGIN STYLE
6042 %                 \hskip INDENT
6043 %                 ARG
6044 %                 END
6045 %     FI
6046 %     \@xsect{AFTERSKIP}
6047 % END
6048 %
6049 % \@afterheading ==
6050 % BEGIN
6051 %     @nobreak :=G true
6052 %     \everypar := BEGIN IF @nobreak = T
6053 %                 THEN @nobreak :=G false
6054 %                 \clubpenalty :=G 10000
6055 %                 IF @afterindent = F
6056 %                 THEN remove \lastbox
6057 %                 FI
6058 %                 ELSE \clubpenalty :=G \@clubpenalty
6059 %                 \everypar := NULL
6060 %                 FI
6061 %     END
6062 % END
6063 %
6064 % \@secpenalty : The penalty (usually negative) put before a section
6065 %                 heading unless it immediately follows another one.
6066 %
6067 % \newcount\@secpenalty
6068 % \@secpenalty = -300
6069 %
6070 %
6071 % \newif\if@noskipsec \@noskipsectrue
6072 %
6073 %
6074 % \def\@startsection#1#2#3#4#5#6{\if@noskipsec \leavevmode \fi
6075 %     \par \@tempkipa #4\relax
6076 %     \@afterindenttrue
6077 %     \ifdim \@tempkipa <\z@ \@tempkipa -\@tempkipa \@afterindentfalse\fi
6078 %     \if@nobreak \everypar{}\else
6079 %         \addpenalty{\@secpenalty}\addvspace{\@tempkipa}\fi \@ifstar
6080 %         {\@ssect{#3}{#4}{#5}{#6}}{\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}}
6081 %
6082 % \def\@sect#1#2#3#4#5#6[#7]#8{\ifnum #2>\c@secnumdepth
6083 %     \let\@svsec\@empty\else
6084 %     \refstepcounter{#1}\edef\@svsec{\csname the#1\endcsname\hskip 1em}\fi
6085 %     \@tempkipa #5\relax
6086 %     \ifdim \@tempkipa>\z@
6087 %         \begingroup #6\relax
6088 %             \@hangfrom{\hskip #3\relax\@svsec}{\interlinepenalty \@M #8\par}%
6089 %         \endgroup
6090 %         \csname #1mark\endcsname{#7}\addcontentsline
6091 %             {toc}{#1}{\ifnum #2>\c@secnumdepth \else
6092 %                 \protect\numberline{\csname the#1\endcsname}\fi
6093 %                 #7}\else
6094 %         \def\@svsechd{#6\hskip #3\relax %% \relax added 2 May 90
6095 %             \@svsec #8\csname #1mark\endcsname
6096 %             {#7}\addcontentsline
6097 %                 {toc}{#1}{\ifnum #2>\c@secnumdepth \else
6098 %                     \protect\numberline{\csname the#1\endcsname}\fi
6099 %                     #7}}\fi
6100 %     \@xsect{#5}}

```

```

6101
6102 \def\xsect#1{\@tempskipa #1\relax
6103     \ifdim \@tempskipa>\z@
6104     \par \nobreak
6105     \vskip \@tempskipa
6106     \@afterheading
6107 \else \global\@nobreakfalse \global\@noskipsectrue
6108     \everypar{\if@noskipsec \global\@noskipsecfalse
6109         \clubpenalty\@M \hskip -\parindent
6110         \begingroup \svsechd \endgroup \unskip
6111         \hskip -#1\relax % relax added 14 Jan 91
6112         \else \clubpenalty \@clubpenalty
6113         \everypar{}\fi}\fi\ignorespaces}
6114
6115 \def\sssect#1#2#3#4#5{\@tempskipa #3\relax
6116     \ifdim \@tempskipa>\z@
6117     \begingroup #4\@hangfrom{\hskip #1}{\interlinepenalty \@M #5\par}\endgroup
6118 \else \def\svsechd{#4\hskip #1\relax #5}\fi
6119 \xsect{#3}}
6120
6121 \newif\if@afterindent \@afterindenttrue
6122
6123 \def\@afterheading{\global\@nobreaktrue
6124     \everypar{\if@nobreak
6125         \global\@nobreakfalse
6126         \clubpenalty \@M
6127         \if@afterindent \else {\setbox\z@\lastbox}\fi
6128         \else \clubpenalty \@clubpenalty
6129         \everypar{}\fi}}
6130
6131
6132 % \@hangfrom{TEXT} : Puts TEXT in a box, and makes a hanging indentation
6133 %   of the following material up to the first \par. Should be used
6134 %   in vertical mode.
6135 %
6136 \def\@hangfrom#1{\setbox\@tempboxa\hbox{#1}%
6137     \hangindent \wd\@tempboxa\noindent\box\@tempboxa}
6138
6139 \newcount\c@secnumdepth
6140 \newcount\c@tocdepth
6141
6142 % \secdef{UNSTARCMDs}{STARCMDs} :
6143 %   When defining a \chapter or \section command without using
6144 %   \@startsection, you can use \secdef as follows:
6145 %       \def\chapter { ... \secdef \CMDA \Cmdb }
6146 %       \def\CMDA    [#1]#2{ ... } % Command to define \chapter[...]{...}
6147 %       \def\Cmdb    #1{ ... }   % Command to define \chapter*{...}
6148
6149 \def\secdef#1#2{\@ifstar{#2}{\@dblarg{#1}}}
6150
6151 % Initializations
6152 %
6153 \def\sectionmark#1{}
6154 \def\subsectionmark#1{}
6155 \def\subsubsectionmark#1{}
6156 \def\paragraphmark#1{}
6157 \def\subparagraphmark#1{}
6158
6159 \message{contents,}
6160 % *****
6161 % *          TABLE OF CONTENTS, ETC.          *

```

```

6162 %      *****
6163 %
6164 % CONVENTIONS:
6165 % \tf@foo = file number for output for table foo. The file is
6166 %         opened only if @filesw = true.
6167 %
6168 % \contentsline{TYPE}{ENTRY}{PAGE}
6169 %     Macro to produce a TYPE entry in a table of contents, etc.
6170 %     It will appear in the .TOC or other file. For example,
6171 %     The entry for subsection 1.4.3 in the table of contents might
6172 %     be produced by:
6173 %     \contentsline{subsection}{\makebox[30pt][r]{1.4.3} Gnats and Gnus}{22}
6174 %     The \protect command causes command sequences to be written
6175 %     without expanding them.
6176 %
6177 % \l@TYPE{ENTRY}{PAGE}
6178 %     Macro defined by document style for making an entry of
6179 %     type TYPE in a table of contents, etc. E.g., the document
6180 %     style should define \l@chapter, \l@section, etc.
6181 %
6182 % \addcontentsline{TABLE}{TYPE}{ENTRY}
6183 %     User command for adding his own entry to a table of contents, etc.
6184 %     It adds the entry
6185 %         \contentsline{TYPE}{ENTRY}{page}
6186 %     to the .TABLE file.
6187 %
6188 % \addtocontents{TABLE}{TEXT} : Adds TEXT to the .TABLE file, with no
6189 %     page number.
6190 %
6191 % Note: When used in the ENTRY or TEXT of one of the above commands,
6192 % \protect causes the following control sequence to be written
6193 % on the file without being expanded. The sequence will be expanded
6194 % when the table of contents entry is processed.
6195 %
6196 % SURPRISE: \index, \glossary, and \label are no-ops inside an
6197 % \addcontentsline or \addtocontents command argument. This could cause a
6198 % problem if the user puts an \index or \label into one of the commands he
6199 % writes, or into the optional 'short version' argument of a \section or
6200 % \caption command.
6201 %
6202 % \addcontentsline{TABLE}{TYPE}{ENTRY} ==
6203 % BEGIN
6204 %     if @filesw = true
6205 %     then \begingroup
6206 %         \index == \label == \glossary == \@gobble
6207 %         \protect{ARG} == \string\string\string ARG \string\space\space
6208 %         \@temptokena := \thepage
6209 %         \@tempa == write \string\contentsline
6210 %                 {TYPE}{ENTRY}{\the\@temptokena}
6211 %         \@tempa
6212 %         IF vmode and @nobeak = true THEN \nobeak FI
6213 %     \endgroup
6214 % fi
6215 % END
6216 %
6217 % \@starttoc{EXT} : Used to define \tableofcontents, \listoffigures, etc.--
6218 %     e.g., \@starttoc{lof} is used in \listoffigures. This command reads
6219 %     the .EXT file and sets up to write the new .EXT file.
6220 %
6221 % \@starttoc{EXT} ==
6222 % BEGIN

```

```

6223 % \begingroup
6224 % \makeatletter
6225 % read file \jobname.EXT
6226 % IF @filesw = true
6227 % THEN open \jobname.EXT as file \tf@EXT
6228 % FI
6229 % @nobreak :=G FALSE %% added 24 May 89
6230 % \endgroup
6231 % END
6232
6233 %% RmS 92/01/14: added \immediate to \openout as all \write commands
6234 %% are also executed \immediate
6235 \def\starttoc#1{\begingroup
6236 \makeatletter
6237 \input{\jobname.#1}\if@filesw \expandafter\newwrite\csname tf@#1\endcsname
6238 \immediate\openout \csname tf@#1\endcsname \jobname.#1\relax
6239 \fi \global\@nobreakfalse \endgroup}
6240
6241
6242 \let\protect=\relax
6243
6244 \def\addcontentsline#1#2#3{\if@filesw \begingroup
6245 \let\label\@gobble \let\index\@gobble \let\glossary\@gobble
6246 \def\protect##1{\string\string\string##1\string\space
6247 \space}\@temptokena{\thepage}%
6248 \edef\@tempa{\write \@auxout{\string\@writefile{#1}{\protect
6249 \contentsline{#2}{#3}{\the\@temptokena}}}\@tempa
6250 \if@nobreak \ifvmode\nobreak\fi\fi\endgroup\fi}
6251
6252 \long\def\addtocontents#1#2{\if@filesw \begingroup
6253 \let\label\@gobble \let\index\@gobble \let\glossary\@gobble
6254 \def\protect##1{\string\string\string##1\string\space\space}%
6255 \edef\@tempa{\write \@auxout {\string\@writefile{#1}{#2}}}\@tempa
6256 \if@nobreak \ifvmode\nobreak\fi\fi\endgroup\fi}
6257
6258 \def\contentsline#1{\csname l@#1\endcsname}
6259
6260 % \dottedtocline{LEVEL}{INDENT}{NUMWIDTH}{TITLE}{PAGE} :
6261 % Macro to produce a table of contents line with the following
6262 % parameters:
6263 % LEVEL : If LEVEL > \c@tocdepth, then no line produced.
6264 % INDENT : Total indentation from the left margin.
6265 % NUMWIDTH : Width of box for number if the TITLE has a
6266 % \numberline command.
6267 % As of 25 Jan 88, this is also the amount of extra indentation
6268 % added to second and later lines of a multiple line entry.
6269 % TITLE : Contents of entry.
6270 % PAGE : Page number.
6271 %
6272 % Uses the following parameters, which must be set by the document style.
6273 % They should be defined with \def's.
6274 % \@pnumwidth : Width of box in which page number is set.
6275 % \@tocrmarg : Right margin indentation for all but last line of
6276 % multiple-line entries.
6277 % \@dotsep : Separation between dots, in mu units. Should be \def'd to
6278 % a number like 2 or 1.7
6279 %
6280
6281 %% RmS 91/09/29: added \reset@font for page number
6282 \def\@dottedtocline#1#2#3#4#5{\ifnum #1>\c@tocdepth \else
6283 \vskip \z@ plus.2\p@

```

```

6284 {\leftskip #2\relax \rightskip \@tocrmarg \parfillskip -\rightskip
6285 \parindent #2\relax\@afterindenttrue
6286 \interlinepenalty\@M
6287 \leavevmode
6288 \@tempdima #3\relax \advance\leftskip \@tempdima \hbox{}\hskip -\leftskip
6289 #4\nobreak\leaders\hbox{$\m@th \mkern \@dotsep mu.\mkern \@dotsep
6290 mu$}\hfill \nobreak
6291 \hbox to\@pnumwidth{\hfil\reset@font\rm #5}\par}\fi}
6292
6293
6294 %%% Note: \nobreak's added 7 Jan 86 to prevent bad line break that
6295 %%% left the page number dangling by itself at left edge of a new line.
6296 %%%
6297 %%% Changed 25 Jan 88 to use \leftskip instead of \hangindent so
6298 %%% leaders of multiple-line contents entries would line up properly.
6299
6300 % \numberline{NUMBER} : For use in a \contentsline command.
6301 % It puts NUMBER flushleft in a box of width \@tempdima
6302 % (Before 25 Jan 88 change, it also added \@tempdima to the hanging
6303 % indentation.)
6304
6305 \def\numberline#1{\hbox to\@tempdima{#1\hfil}}
6306
6307
6308 \message{index,}
6309 % *****
6310 % * INDEX COMMANDS AND GLOSSARY *
6311 % *****
6312 %
6313 % \makeindex ==
6314 % BEGIN
6315 % if \@filesw = T
6316 % then open file \jobname.IDX as \@indexfile
6317 % \index == BEGIN \bsphack
6318 % \beginingroup
6319 % \protect{X} == \string X\space
6320 % %% added 3 Feb 87 for \index commands
6321 % %% in \footnotes
6322 % re-\catcode special characters to 'other'
6323 % \@wrindex
6324 % fi
6325 % END
6326 %
6327 % \@wrindex{ITEM} ==
6328 % BEGIN
6329 % write of {\indexentry{ITEM}{page number}}
6330 % \endgroup
6331 % \@esphack
6332 % END
6333
6334 % INITIALIZATION:
6335 %
6336 % \index == BEGIN \bsphack
6337 % \beginingroup
6338 % re-\catcode special characters (in case '%' there)
6339 % \@index
6340 % END
6341 %
6342 % \@index{ITEM} == BEGIN \endgroup \@esphack END
6343 %
6344 % Changes made 14 Apr 89 to write \glossaryentry's instead of

```



```

6345 % \indexentry's on the .glo file.
6346
6347 \def\makeindex{\if@filesw \newwrite\@indexfile
6348 \immediate\openout\@indexfile=\jobname.idx
6349 \def\index{\@bsphack\beginingroup
6350         \def\protect####1{\string####1\space}\@sanitize
6351         \@windex}\typeout
6352 {Writing index file \jobname.idx }\fi}
6353
6354 \def\@windex#1{\let\thepage\relax
6355 \edef\@tempa{\write\@indexfile{\string
6356 \indexentry{#1}{\thepage}}}\expandafter\endgroup\@tempa
6357 \if@nobreak \ifvmode\nobreak\fi\fi\@esphack}
6358
6359 \def\index{\@bsphack\beginingroup \@sanitize\@index}
6360
6361 \def\@index#1{\endgroup\@esphack}
6362
6363 \def\makeglossary{\if@filesw \newwrite\@glossaryfile
6364 \immediate\openout\@glossaryfile=\jobname.glo
6365 \def\glossary{\@bsphack\beginingroup\@sanitize\@wrglossary}\typeout
6366 {Writing glossary file \jobname.glo }\fi}
6367
6368 \def\@wrglossary#1{\let\thepage\relax
6369 \edef\@tempa{\write\@glossaryfile{\string
6370 \glossaryentry{#1}{\thepage}}}\expandafter\endgroup\@tempa
6371 \if@nobreak \ifvmode\nobreak\fi\fi\@esphack}
6372
6373 \def\glossary{\@bsphack\beginingroup\@sanitize\@index}
6374
6375 \message{bibliography,}
6376 % *****
6377 % *          BIBLIOGRAPHY          *
6378 % *****
6379 %
6380 % A bibliography is created by the bibliography environment, which
6381 % generates a title such as ‘References’, and a list of entries.
6382 % The BIBTeX program will create a file containing such an environment,
6383 % which will be read in by the \bibliography command. With
6384 % BIBTeX, the following commands will be used.
6385 %
6386 % \bibliography{FILE1,FILE2, ... ,FILEn} : specifies
6387 % the bibdata files. Writes a \bibdata entry on the .aux file
6388 % and tries to read in mainfile.BBL.
6389 %
6390 % \bibliographystyle{STYLE} : Writes a \bibstyle entry on the .aux file.
6391 %
6392 % The thebibliography environment is a list environment. To save the
6393 % use of an extra counter, it should use enumiv as the item counter.
6394 % Instead of using \item, items in the bibliography are produced by the
6395 % following commands:
6396 % \bibitem{NAME} : Produces a numbered entry cited as NAME.
6397 % \bibitem[LABEL]{NAME} : Produces an entry labeled by LABEL and
6398 % cited by NAME.
6399 % The former is used for bibliographies with citations like [1], [2], etc.;
6400 % the latter is used for citations like [Knuth82].
6401 %
6402 % The document style must define the thebibliography environment. This
6403 % environment has a single argument, which is the widest bibliography
6404 % label-- e.g., if the [Knuth67] is the widest entry, then thist argument
6405 % will be Knuth67. The \thebibliography command must begin a list

```

```

6406 % environment, which the \endthebibliography command ends.
6407 %
6408 % Entries are cited by the command \cite{NAME}.
6409 %
6410 % PARAMETERS
6411 %
6412 % \cite      : A macro such that \cite{LABEL1,LABEL2}{NOTE}
6413 %             produces the output for a \cite[NOTE]{FOO1,FOO2} command,
6414 %             where entry FOOi is defined by \bibitem[LABELi]{FOOi}.
6415 %             The switch @tempswa is true if the optional NOTE argument
6416 %             is present.
6417 %             The default definition is :
6418 %             \cite{LABELS}{NOTE} ==
6419 %             BEGIN [LABELS
6420 %                   IF @tempswa = T THEN , NOTE FI
6421 %                   ]
6422 %             END
6423 %
6424 % \biblabel  : A macro to produce the label in the bibliography
6425 %             entry. For \bibitem[LABEL]{NAME}, the label is
6426 %             generated by \biblabel{LABEL}. It has the default
6427 %             definition \biblabel{LABEL} -> [LABEL].
6428 % CONVENTION
6429 %
6430 % \b@FOO    : The name or number of the reference created by \cite{FOO}
6431 %             E.g., if \cite{FOO} -> [17] , then \b@FOO -> 17.
6432 %
6433 %
6434 %
6435 \def\bibitem{\@ifnextchar[{\@lbibitem}{\@bibitem}}
6436 %
6437 %% RmS 92/02/26: Added \hfill to restore left-alignment of
6438 %%             bibliography labels in alpha style
6439 \def\@lbibitem[#1]#2{\item[\@biblabel{#1}\hfill]\if@filesw
6440   {\def\protect##1{\string ##1\space}\immediate
6441     \write\@auxout{\string\bibcite{#2}{#1}}}\fi\ignorespaces}
6442 %% Placement of '}' in def of \@lbibitem corrected 29 Apr 87
6443 %% (Error found by Arthur Ogawa.)
6444 %
6445 %% RmS 91/11/13: Changed counter enumi to enumiv,
6446 %%             as it says in the comment above
6447 %% RmS 92/01/10: Changed \c@enumiv to \value{\@listctr}.
6448 \def\@bibitem#1{\item\if@filesw \immediate\write\@auxout
6449   {\string\bibcite{#1}{\the\value{\@listctr}}}\fi\ignorespaces}
6450 %
6451 \def\bibcite#1#2{\global\@namedef{b@#1}{#2}}
6452 %
6453 \let\citation@gobble
6454 %
6455 \def\cite{\@ifnextchar [ {\@tempwatrue\@citex} {\@tempwafalse\@citex [] }}
6456 %
6457 % \penalty\@m added to definition of \@citex to allow a line
6458 % break after the ',' in citations like [Jones80,Smith77]
6459 % (Added 23 Oct 86)
6460 %
6461 % space added after the ',' (21 Nov 87)
6462 %
6463 %% RmS 91/10/25: added \reset@font, suggested by Bernd Raichle.
6464 %% RmS 91/11/06: added code to remove a leading blank
6465 \def\@citex[#1]#2{\if@filesw\immediate\write\@auxout{\string\citation{#2}}\fi
6466   \let\@citea\@empty

```

```

6467 \@cite{\@for\@citeb:=#2\do
6468   {\@citea\def\@citea{\penalty\@m } }%
6469   \def\@tempa##1##2\@nil{\edef\@citeb{\if##1\space##2\else##1##2\fi}}%
6470   \expandafter\@tempa\@citeb\@nil
6471   \@ifundefined{b@\@citeb}{\reset@font\bf ?}\@warning
6472     {Citation '\@citeb' on page \thepage \space undefined}}%
6473   \hbox{\csname b@\@citeb\endcsname}}{#1}}
6474
6475 \let\bibdata=\@gobble
6476 \let\bibstyle=\@gobble
6477
6478 \def\bibliography#1{\if@files\immediate\write\@auxout{\string\bibdata{#1}}\fi
6479 \input{\jobname.bbl}}
6480
6481 \def\bibliographystyle#1{\if@files\immediate\write\@auxout
6482   {\string\bibstyle{#1}}\fi}
6483
6484 % \nocite{CITATIONS} : puts information on .AUX file to cause
6485 % BibTeX to include the CITATIONS list in the bibliography,
6486 % but puts nothing in the text. (Added 14 Jun 85)
6487
6488 \def\nocite#1{\@bsphack
6489 \if@files\immediate\write\@auxout{\string\citation{#1}}\fi
6490 \@esphack}
6491
6492
6493
6494 %DEFAULT DEFINITIONS
6495
6496 \def\@cite#1#2{[#1\if@tempswa , #2\fi]}
6497 % RmS 92/01/14: removed \hfill in definition of \@biblabel
6498 \def\@biblabel#1{[#1]}
6499
6500 \message{floats,}
6501 % *****
6502 % * FLOATS *
6503 % *****
6504 %
6505 % The different types of floats are identified by a TYPE name, which is
6506 % the name of the counter for that kind of float. For example, figures
6507 % are of type 'figure' and tables are of type 'table'. Each TYPE has
6508 % associated a positive TYPE NUMBER, which is a power of two. E.g.,
6509 % figures might be have type number 1, tables type number 2, programs
6510 % type number 4, etc.
6511 %
6512 % The locations where a float can go are specified by a PLACEMENT
6513 % SPECIFIER, which is a list of the possible locations, each denoted
6514 % by a letter as follows:
6515 % h : here - at the current location in the text.
6516 % t : top - at the top of a text page.
6517 % b : bottom - at the bottom of a text page.
6518 % p : page - on a separate float page.
6519 % For example, 'pht' specifies that the float can appear in any of three
6520 % locations: page, here or top.
6521 %
6522 % Where floats may appear on a page, and how many may appear there
6523 % are specified by the following float placement parameters. The
6524 % numbers are named like counters so the user can set them with
6525 % the ordinary counter-setting commands.
6526 %
6527 % \c@topnumber : Number of floats allowed at the top of a column.

```

```

6528 % \topfraction           : Fraction of column that can be devoted to floats.
6529 % \cdbltopnumber, \dbltopfraction : Same as above, but for double-column
6530 %                               floats.
6531 % \c@bottomnumber, \bottomfraction : Same as above for bottom of page.
6532 % \c@totalnumber          : Number of floats allowed in a single column,
6533 %                               including in-text floats.
6534 % \textfraction           : Minimum fraction of column that must contain text.
6535 % \floatpagefraction      : Minimum fraction of page that must be taken
6536 %                               up by float page.
6537 % \dblfloatpagefraction : Same as above, for double-column floats.
6538 %
6539 % The document style must define the following.
6540 %
6541 % \fps@TYPE : The default placement specifier for floats of type TYPE.
6542 %
6543 % \ftype@TYPE : The type number for floats of type TYPE.
6544 %
6545 % \ext@TYPE : The file extension indicating the file on which the
6546 %           contents list for float type TYPE is stored. For example,
6547 %           \ext@figure = 'lof'.
6548 %
6549 % \fnum@TYPE : A macro to generate the figure number for a caption.
6550 %           For example, \fnum@TYPE == Figure \thefigure.
6551 %
6552 % \@makecaption{NUM}{TEXT} : A macro to make a caption, with NUM the value
6553 %           produced by \fnum@... and TEXT the text of the caption.
6554 %           It can assume it's in a \parbox of the appropriate width.
6555 %
6556 % \@float{TYPE}[PLACEMENT] : This macro begins a float environment for a
6557 %           single-column float of type TYPE with PLACEMENT as the placement
6558 %           specifier. The default value of PLACEMENT is defined by \fps@TYPE.
6559 %           The environment is ended by \end@float.
6560 %           E.g., \figure == \@float{figure}, \endfigure == \end@float.
6561 %
6562 % \caption ==
6563 % BEGIN
6564 %   \refstepcounter{\@capttype}
6565 %   \@dblarg{\@caption{\@capttype}}
6566 % END
6567 %
6568 %% In following definition, \par moved from after \addcontentsline to
6569 %% before \addcontentsline because the \write could cause
6570 %% an extra blank line to be added to the paragraph above the
6571 %% caption. (Change made 12 Jun 87)
6572 %
6573 % \@caption{TYPE}[STEXT]{TEXT} ==
6574 % BEGIN
6575 %   \par
6576 %   \addcontentsline{\ext@TYPE}{TYPE}{\numberline{\thetype}{STEXT}}
6577 %   \begingroup
6578 %     \@parboxrestore
6579 %     \normalsize
6580 %     \@makecaption{\fnum@TYPE}{TEXT}
6581 %     \par
6582 %   \endgroup
6583 % END
6584 %
6585 % \@float{TYPE}[PLACEMENT] ==
6586 % BEGIN
6587 %   if hmode then \bsphack
6588 %     \@floatpenalty := -10002

```

```

6589 %           else \@floatpenalty := -10003
6590 % fi
6591 % \@capytype ==L TYPE
6592 % if inner
6593 %   then LaTeX Error: 'Not in outer paragraph mode.'
6594 %     \@floatpenalty := 0
6595 %   else if \@freelist nonempty
6596 %     then \@currbox :=L head of \@freelist
6597 %       \@freelist :=G tail of \@freelist
6598 %       \count\@currbox :=G 32*\ftype@TYPE + 16 +
6599 %         bits determined by PLACEMENT
6600 %     else \@floatpenalty := 0
6601 %       LaTeX Error: 'Too many unprocessed floats'
6602 %   fi
6603 % fi
6604 % \@currbox :=G \vbox{ %% 15 Dec 87 -- removed \boxmaxdepth :=L Opt
6605 %                   %% that made box zero depth because it screwed
6606 %                   %% things up. Instead, added \vskip Opt at end
6607 %                   \hsize = \columnwidth
6608 %                   \@parboxrestore
6609 % END
6610 %
6611 % \end@float ==
6612 % BEGIN
6613 %   \vskip Opt %% makes 0 depth box -- added 15 Dec 87
6614 % }
6615 % if \@floatpenalty < 0
6616 %   then add \@currbox to \@currlist
6617 %     if \ht\@currbox > \textheight
6618 %       then \ht\@currbox :=G \textheight fi
6619 %   if \@floatpenalty < -10002
6620 %     then \penalty -10004
6621 %         \vbox{}
6622 %         \penalty \@floatpenalty
6623 %     else \vadjust{\penalty -10004
6624 %             \vbox{}
6625 %             \penalty \@floatpenalty}
6626 %         \@Esphack
6627 %   fi fi
6628 % END
6629 %
6630 % \@dblfloat{TYPE}[PLACEMENT] : Macro to begin a float environment for a
6631 % double-column float of type TYPE with PLACEMENT as the placement
6632 % specifier. The default value of PLACEMENT is 'tp'
6633 % The environment is ended by \end@dblfloat.
6634 % E.g., \figure* == \@dblfloat{figure}, \endfigure* == \end@dblfloat.
6635 %
6636 % \@dblfloat{TYPE}[PLACEMENT] ==
6637 % Identical to \@float{TYPE}[PLACEMENT] except \hsize and \linewidth
6638 % are set to \textwidth.
6639 %
6640 % \end@dblfloat ==
6641 % BEGIN   %% { BRACE MATCHING
6642 %   \vskip Opt %% makes 0 depth box -- added 15 Dec 87
6643 % }
6644 % if \@floatpenalty < 0
6645 %   then \@dbldeferlist :=G \@dbldeferlist * \@currbox
6646 % fi
6647 % if \@floatpenalty = -10002 then \@Esphack fi
6648 % END
6649 %

```

```

6650 \newcount\@floatpenalty
6651
6652 \def\caption{\refstepcounter\@capttype \@dblarg{\@caption\@capttype}}
6653
6654
6655 \long\def\@caption#1[#2]#3{\par\addcontentsline{\csname
6656 ext@#1\endcsname}{#1}{\protect\numberline{\csname
6657 the#1\endcsname}{\ignorespaces #2}}\begingroup
6658   \@parboxrestore
6659   \normalsize
6660   \@makecaption{\csname fnum@#1\endcsname}{\ignorespaces #3}\par
6661 \endgroup}
6662
6663 \def\@float#1{\@ifnextchar[{\@xfloat{#1}}{\edef\@tempa{\noexpand\@xfloat
6664   {#1}[\csname fps@#1\endcsname]}\@tempa}}
6665
6666 \def\@xfloat#1[#2]{\ifhmode \@bsphack\@floatpenalty -\@Mii\else
6667   \@floatpenalty-\@Miii\fi\def\@capttype{#1}\ifinner
6668   \@parmoderr\@floatpenalty\z@
6669   \else\@next\@currbox\@freelist{\@tempcnta\csname ftype@#1\endcsname
6670     \multiply\@tempcnta\@xxxii\advance\@tempcnta\sixt@n
6671     \@tfor \@tempa :=#2\do
6672       {\if\@tempa h\advance\@tempcnta \@ne\fi
6673         \if\@tempa t\advance\@tempcnta \tw@\fi
6674         \if\@tempa b\advance\@tempcnta 4\relax\fi
6675         \if\@tempa p\advance\@tempcnta 8\relax\fi
6676       }\global\count\@currbox\@tempcnta}\@fltovf\fi
6677   \global\setbox\@currbox\ vbox\bgroup
6678   % \boxmaxdepth\z@ % commented out 15 Dec 87
6679   \hsize\columnwidth \@parboxrestore}
6680
6681 \def\end@float{\par\vskip\z@\egroup %% \par\vskip\z@ added 15 Dec 87
6682   \ifnum\@floatpenalty <\z@
6683     \@cons\@currlist\@currbox
6684     \ifdim \ht\@currbox >\textheight
6685     %% RmS 91/11/06 added warning message
6686     % perhaps we should use an error message
6687     \@warning{Float larger than \string\textheight}%
6688     \ht\@currbox\textheight \fi
6689     \ifnum\@floatpenalty <-\@Mii
6690     \penalty -\@Miv
6691     \@tempdima\prevdepth %% saving and restoring \prevdepth added
6692     \vbox{ } %% 26 May 87 to prevent extra vertical
6693     \prevdepth \@tempdima %% space when used in vertical mode
6694     \penalty\@floatpenalty
6695     %% RmS 92/03/18 changed \@esphack to \@Esphack
6696     \else \vadjust{\penalty -\@Miv \vbox{ }\penalty\@floatpenalty}\@Esphack
6697     \fi\fi}
6698
6699
6700 \def\@dblfloat{\if@twocolumn\let\@tempa\@dbflt\else\let\@tempa\@float\fi
6701   \@tempa}
6702
6703 \def\@dbflt#1{\@ifnextchar[{\@xdblfloat{#1}}{\@xdblfloat{#1}[tp]}}
6704
6705 \def\@xdblfloat#1[#2]{\@xfloat{#1}[#2]\hsize\textwidth\linewidth\textwidth}
6706
6707 \def\end@dblfloat{\if@twocolumn
6708   \par\vskip\z@\egroup %% \par\vskip\z@ added 15 Dec 87\egroup
6709   \ifnum\@floatpenalty <\z@
6710   % make sure that we never exceed \textheight, otherwise float

```

```

6711 % will never get typeset =91/03/15 FMi=
6712     \ifdim\ht\@currbox >\textheight
6713 % perhaps we should use an error message
6714     \@warning{Float larger than \string\textheight}%
6715     \ht\@currbox\textheight \fi
6716     \@cons\@dbldeferlist\@currbox\fi
6717 %% RmS 92/03/18 changed \@esphack to \@Esphack
6718     \ifnum \@floatpenalty =-\@Mii \@Esphack\fi\else\end@float\fi}
6719
6720 \newcount\c@topnumber
6721 \newcount\c@dbltopnumber
6722 \newcount\c@bottomnumber
6723 \newcount\c@totalnumber
6724
6725 \def\@floatplacement{\global\@topnum\c@topnumber
6726     \global\@toproom \topfraction\@colht
6727     \global\@botnum \c@bottomnumber
6728     \global\@botroom \bottomfraction\@colht
6729     \global\@colnum \c@totalnumber
6730     \@fpmin \floatpagefraction\@colht}
6731
6732 \def\@dblfloatplacement{\global\@dbltopnum\c@dbltopnumber
6733     \global\@dbltoproom \dbltopfraction\@colht
6734     \@fpmin \dblfloatpagefraction\textheight
6735     \@fptop \@dblftop
6736     \@fpsep \@dblfpsep
6737     \@fpbot \@dblfpbot}
6738
6739 % MARGINAL NOTES:
6740 %
6741 % Marginal notes use the same mechanism as floats to communicate
6742 % with the \output routine. Marginal notes are distinguished from
6743 % floats by having a negative placement specification. The command
6744 % \marginpar [LTEXT]{RTEXT} generates a marginal note in a parbox,
6745 % using LTEXT if it's on the left and RTEXT if it's on the right.
6746 % (Default is RTEXT = LTEXT.) It uses the following parameters.
6747 %
6748 % \marginparwidth : Width of marginal notes.
6749 % \marginparsep : Distance between marginal note and text.
6750 % the page layout to determine how to move the marginal
6751 % note into the margin. E.g., \@leftmargin skip ==
6752 % \hskip -\marginparwidth \hskip -\marginparsep .
6753 % \marginparpush : Minimum vertical separation between \marginpar's
6754 %
6755 % Marginal notes are normally put on the outside of the page
6756 % if @mparswitch = true, and on the right if @mparswitch = false.
6757 % The command \reversemarginpar reverses the side where they
6758 % are put. \normalmarginpar undoes \reversemarginpar.
6759 % These commands have no effect for two-column output.
6760 %
6761 % SURPRISE: if two marginal notes appear on the same line of
6762 % text, then the second one could appear on the next page, in
6763 % a funny position.
6764 %
6765 %
6766 % \marginpar [LTEXT]{RTEXT} ==
6767 % BEGIN
6768 % if hmode then \@bsphack
6769 %             \@floatpenalty := -10002
6770 %             else \@floatpenalty := -10003
6771 % fi

```

```

6772 %   if inner
6773 %       then LaTeX Error: 'Not in outer paragraph mode.'
6774 %           \@floatpenalty := 0
6775 %       else if \@freelist has two elements:
6776 %           then get \@marbox, \@currbox from \@freelist
6777 %               \count\@marbox :=G -1
6778 %           else \@floatpenalty := 0
6779 %               LaTeX Error: 'Too many unprocessed floats'
6780 %               \@currbox, \@marbox := \@tempboxa    %%use \def
6781 %           fi
6782 %       fi
6783 %   if optional argument
6784 %       then %% \@xmpar ==
6785 %           \@savemarbox\@marbox{LTEXT}
6786 %           \@savemarbox\@currbox{RTEXT}
6787 %       else %% \@ympar ==
6788 %           \@savemarbox\@marbox{RTEXT}
6789 %           \box\@currbox :=G \box\@marbox
6790 %       fi
6791 %       %% \@xympar ==
6792 %       if \@floatpenalty < 0 then add \@marbox to \@currlist fi
6793 %       \setbox\@tempboxa =L    %% added 3 Jan 88 to correct bug introduced
6794 %           { \end@float %%% BRACE MATCHING}          %% by 15 Dec 87 change
6795 %   END
6796 %
6797 % \@savemarbox\BOX{TEXT} ==
6798 %   BEGIN
6799 %       \BOX :=G \vtop{ \hsize = \marginparwidth
6800 %                   \@parboxrestore
6801 %                   TEXT
6802 %                   }
6803 %   END
6804 %
6805 % \reversemarginpar == BEGIN \@mparbottom :=G 0
6806 %                       @reversemargin :=G true
6807 %   END
6808 %
6809 % \normalmarginpar == BEGIN \@mparbottom :=G 0
6810 %                       @reversemargin :=G false
6811 %   END
6812 %
6813 %
6814 % \def\marginpar{\ifhmode \@bsphack\@floatpenalty -\@Mii\else
6815 %   \@floatpenalty-\@Miii\fi\ifinner
6816 %     \@parmoderr\@floatpenalty\z@
6817 %   \else\@next\@currbox\@freelist{}{}\@next\@marbox\@freelist{\global
6818 %     \count\@marbox\m@ne}{\@floatpenalty\z@ \@fltovf\def\@currbox{\@tempboxa
6819 %       }\def\@marbox{\@tempboxa}}\fi
6820 %   \@ifnextchar [{\@xmpar}{\@ympar}}
6821 %
6822 % \long\def\@xmpar[#1]#2{\@savemarbox\@marbox{#1}\@savemarbox\@currbox
6823 %   {#2}\@xympar}
6824 %
6825 % \long\def\@ympar#1{\@savemarbox\@marbox{#1}\global\setbox\@currbox
6826 %   \copy\@marbox\@xympar}
6827 %
6828 % \long\def\@savemarbox#1#2{\global\setbox#1\vtop{\hsize\marginparwidth
6829 %   \@parboxrestore #2}}
6830 %
6831 % \def\@xympar{\ifnum\@floatpenalty <\z@\@cons\@currlist\@marbox\fi
6832 %   \setbox\@tempboxa\ vbox    %% added 3 Jan 88

```



```

6833 %% RmS 92/03/18 added \global\@ignorefalse
6834 \bgroup\end@float\global\@ignorefalse\@esphack}
6835
6836 \def\reversemarginpar{\global\@mparbottom\z@ \@reversemargintrue}
6837 \def\normalmarginpar{\global\@mparbottom\z@ \@reversemarginfalse}
6838
6839
6840 \message{footnotes,}
6841 % *****
6842 % * FOOTNOTES *
6843 % *****
6844 %
6845 % \footnote{NOTE} : User command to insert a footnote.
6846 %
6847 % \footnote[NUM]{NOTE} : User command to insert a footnote numbered
6848 % NUM, where NUM is a number -- 1, 2,
6849 % etc. For example, if footnotes are numbered
6850 % *, **, etc. within pages, then \footnote[2]{...}
6851 % produces footnote '**'. This command does not
6852 % step the footnote counter.
6853 %
6854 % \footnotemark[NUM] : Command to produce just the footnote mark in
6855 % the text, but no footnote. With no argument,
6856 % it steps the footnote counter before generating
6857 % the mark.
6858 %
6859 % \footnotetext[NUM]{TEXT} : Command to produce the footnote but no
6860 % mark. \footnote is equivalent to
6861 % \footnotemark \footnotetext .
6862 %
6863 % As in PLAIN, footnotes use \insert\footins, and the following parameters:
6864 %
6865 % \footnotesize : Size-changing command for footnotes.
6866 %
6867 % \footnotesep : The height of a strut placed at the beginning of
6868 % every footnote.
6869 % \skip\footins : Space between main text and footnotes. The rule
6870 % separating footnotes from text occurs in this space.
6871 % This space lies above the strut of height \footnotesep
6872 % which is at the beginning of the first footnote.
6873 % \footnoterule : Macro to draw the rule separating footnotes from text.
6874 % It is executed right after a \vspace of \skip\footins.
6875 % It should take zero vertical space--i.e., it should to
6876 % a negative skip to compensate for any positive space
6877 % it occupies. (See PLAIN.TEX.)
6878 %
6879 % \interfootnotelinepenalty : Interline penalty for footnotes.
6880 %
6881 % \thefootnote : In usual LaTeX style, produces the footnote number.
6882 % If footnotes are to be numbered within pages, then the
6883 % document style file must include an \@addtoreset command
6884 % to cause the footnote counter to be reset when the page
6885 % counter is stepped. This is not a good idea, though,
6886 % because the counter will not always be reset in time
6887 % to ensure that the first footnote on a page is footnote
6888 % number one.
6889 %
6890 % \@thefnmark : Holds the current footnote's mark--e.g., \dag or '1' or 'a'.
6891 %
6892 % \@mpfnnumber : A macro that generates the numbers for \footnote
6893 % and \footnotemark commands. It == \thefootnote

```

```

6894 %                 outside a minipage environment, but can be changed
6895 %                 inside to generate numbers for \footnote's.
6896 %
6897 % \@makefnmark : A macro to generate the footnote marker from \@thefnmark
6898 %                 The default definition is \hbox{$^\@thefnmark$}.
6899 %
6900 % \@makefntext{NOTE} :
6901 %     Must produce the actual footnote, using \@thefnmark as the mark
6902 %     of the footnote and NOTE as the text. It is called when effectively
6903 %     inside a \parbox, with \hsize = \columnwidth. For example, it might
6904 %     be as simple as
6905 %         $^\@thefnmark$ NOTE
6906 %
6907 % In a minipage environment, \footnote and \footnotetext are redefined
6908 % so that
6909 %     (a) they use the counter mpfootnote
6910 %     (b) the footnotes they produce go at the bottom of the minipage.
6911 % The switch is accomplished by letting \@mpfn == footnote or mpfootnote
6912 % and \thempfn == \thefootnote or \thempfootnote, and by redefining
6913 % \@footnotetext to be \@mpfootnotetext in the minipage.
6914 %
6915 % \footnote{NOTE} ==
6916 % BEGIN
6917 %     \stepcounter{\@mpfn}
6918 %     \@thefnmark :=G eval (\thempfn)
6919 %     \@footnotemark
6920 %     \@footnotetext{NOTE}
6921 % END
6922 %
6923 % \footnote[NUM]{NOTE} ==
6924 % BEGIN
6925 %     begingroup
6926 %         counter \@mpfn :=L NUM
6927 %         \@thefnmark :=G eval (\thempfn)
6928 %     endgroup
6929 %     \@footnotemark
6930 %     \@footnotetext{NOTE}
6931 % END
6932 %
6933 % \@footnotetext{NOTE} ==
6934 % BEGIN
6935 %     \insert into \footins
6936 %         {\footnotesize
6937 %          \interlinepenalty :=L \interfootnotelinepenalty
6938 %          \splittopskip :=L \footnotesep
6939 %          \splitmaxdepth :=L \dp\strutbox
6940 %          \floatingpenalty :=L 20000
6941 %          \hsize :=L \columnwidth
6942 %          \@parboxrestore
6943 %          set \@currentlabel to make \label command work right
6944 %          \@makefntext{\rule{0pt}{\footnotesep} NOTE}
6945 %        }
6946 % END
6947 %
6948 % \footnotemark ==
6949 % BEGIN \stepcounter{footnote}
6950 %     \@thefnmark :=G eval(\thefootnote)
6951 %     \@footnotemark
6952 % END
6953 %
6954 % \footnotemark[NUM] ==

```

```

6955 % BEGIN
6956 %     begingroup
6957 %         footnote counter :=L NUM
6958 %         \@thefnmark :=G eval(\thefootnote)
6959 %     endgroup
6960 %     \@footnotemark
6961 % END
6962 %
6963 % \@footnotemark ==
6964 % BEGIN
6965 %     \leavevmode
6966 %     IF hmode THEN \@x@sf := \the\spacefactor FI
6967 %     \@makefnmark           % put number in main text
6968 %     IF hmode THEN \spacefactor := \@x@sf FI
6969 % END
6970 %
6971 % \footnotetext      ==
6972 %     BEGIN \@thefnmark :=G eval (\thempfn)
6973 %         \footnotetext
6974 %     END
6975 %
6976 % \footnotetext[NUM] ==
6977 %     BEGIN begingroup counter \@mpfn :=L NUM
6978 %         \@thefnmark :=G eval (\thempfn)
6979 %     endgroup
6980 %     \footnotetext
6981 % END
6982 %
6983
6984 \@definecounter{footnote}
6985 \def\thefootnote{\arabic{footnote}}
6986
6987 \@definecounter{mpfootnote}
6988 \def\thempfootnote{\alph{mpfootnote}}
6989
6990 % Default definition
6991 \def\@makefnmark{\hbox{\$^{\@thefnmark}\m{th$}}}
6992
6993 \newdimen\footnotesep
6994
6995 %% RmS 91/11/01: Added \let\protect\noexpand in \footnote, \footnotemark,
6996 %%               and \footnotetext, since \xdef is used.
6997 %% RmS 91/11/22: Added \let\protect\noexpand in \@xfootnote, \@xfootnotemark,
6998 %%               and \@xfootnotetext.
6999
7000 \def\footnote{\@ifnextchar[{\@xfootnote}{\stepcounter{\@mpfn}}%
7001     \begingroup\let\protect\noexpand
7002     \xdef\@thefnmark{\thempfn}\endgroup
7003     \@footnotemark\@footnotetext}}
7004
7005 \def\@xfootnote[#1]{\begingroup \csname c@\@mpfn\endcsname #1\relax
7006     \let\protect\noexpand
7007     \xdef\@thefnmark{\thempfn}\endgroup
7008     \@footnotemark\@footnotetext}
7009
7010 %% RmS 91/09/29: added \reset@font
7011 \long\def\@footnotetext#1{\insert\footins{\reset@font\footnotesize
7012     \interlinepenalty\interfootnotelinepenalty
7013     \splittopskip\footnotesep
7014     \splitmaxdepth \dp\strutbox \floatingpenalty \@MM
7015     \hsize\columnwidth \@parboxrestore

```

```

7016 \edef\@currentlabel{\csname p@footnote\endcsname\@thefnmark}\@makefnmark
7017 {\rule{\z@}{\footnotesep}\ignorespaces
7018 #1\strut}}
7019
7020 \def\footnotemark{\@ifnextchar[{\@xfootnotemark}{\stepcounter{footnote}%
7021 \begingroup\let\protect\noexpand
7022 \xdef\@thefnmark{\thefootnote}\endgroup
7023 \@footnotemark}}
7024
7025 \def\@xfootnotemark[#1]{\begingroup \c@footnote #1\relax
7026 \let\protect\noexpand
7027 \xdef\@thefnmark{\thefootnote}\endgroup \@footnotemark}
7028
7029 \def\@footnotemark{\leavevmode\ifhmode
7030 \edef\@xsf{\the\spacefactor}\fi \@makefnmark
7031 \ifhmode\spacefactor\@xsf\fi\relax}
7032
7033 \def\footnotetext{\@ifnextchar[{\@xfootnotenext}%
7034 {\begingroup\let\protect\noexpand
7035 \xdef\@thefnmark{\thempfn}\endgroup
7036 \@footnotetext}}
7037
7038 \def\@xfootnotenext[#1]{\begingroup \csname c@\mpfn\endcsname #1\relax
7039 \let\protect\noexpand
7040 \xdef\@thefnmark{\thempfn}\endgroup \@footnotetext}
7041
7042 \def\@mpfn{footnote}
7043 \def\thempfn{\thefootnote}
7044
7045 \message{initial,}
7046 % *****
7047 % * INITIAL DECLARATION COMMANDS *
7048 % *****
7049 %
7050 % DOCUMENT STYLE
7051 % -----
7052 %
7053 % The user starts his file with the command
7054 % \documentstyle [OPTION1, ... ,OPTIONk]{STYLE}
7055 % which saves the OPTION's and \input's the file STYLE.STY. When the
7056 % STYLE.STY file issues the command \@options, the following happens
7057 % for each i :
7058 % IF \ds@OPTIONi is defined
7059 % THEN execute \ds@OPTIONi
7060 % ELSE save OPTIONi on a list of unprocessed options.
7061 % FI
7062 % After STYLE.STY has been executed, the file OPTIONi.STY is read for
7063 % each OPTIONi on the list of unprocessed options.
7064 %
7065 % \documentstyle ==
7066 % BEGIN
7067 % IF next char = [
7068 % THEN \@documentstyle
7069 % ELSE \@documentstyle[]
7070 % FI
7071 % END
7072 %
7073 % \@documentstyle[OPTIONS]{STYLE} ==
7074 % BEGIN
7075 % \makeatletter
7076 % \@optionlist := OPTIONS

```

```

7077 % \optionfiles :=G null
7078 % \input STYLE.STY
7079 % \@elt == \input
7080 % \optionfiles
7081 % \@elt == \relax
7082 % \makeatother
7083 % END
7084 %
7085 % \options ==
7086 % BEGIN
7087 % \elt := \relax
7088 % FOR \@tempa := \optionlist
7089 % DO IF \ds@[eval(\@tempa)] defined
7090 % THEN \ds@[eval(\@tempa)]
7091 % ELSE \optionfiles :=G \optionfiles *
7092 % \elt eval(\@tempa) \relax
7093 % OD FI
7094 % END
7095 %
7096 % PAGE STYLE COMMANDS
7097 % -----
7098 % \pagestyle{STYLE} : sets the page style of the current and succeeding
7099 % pages to STYLE
7100 %
7101 % \thispagestyle{STYLE} : sets the page style of the current page only
7102 % to STYLE
7103 %
7104 % To define a page style STYLE, you must define \ps@STYLE to set the page
7105 % style parameters.
7106 %
7107 % HOW A PAGE STYLE MAKES RUNNING HEADS AND FEET:
7108 %
7109 % The \ps@... command defines the macros \@oddhead, \@oddfoot,
7110 % \@evenhead, and \@evenfoot to define the running heads and feet.
7111 % (See output routine.) To make headings determined by the sectioning
7112 % commands, the page style defines the commands \chaptermark,
7113 % \sectionmark, etc., where \chaptermark{TEXT} is called by \chapter to
7114 % set a mark. The \...mark commands and the \...head macros are defined
7115 % with the help of the following macros. (All the \...mark commands
7116 % should be initialized to no-ops.)
7117 %
7118 % MARKING CONVENTIONS:
7119 % LaTeX extends TeX's \mark facility by producing two kinds of marks
7120 % a 'left' and a 'right' mark, using the following commands:
7121 % \markboth{LEFT}{RIGHT} : Adds both marks.
7122 % \markright{RIGHT} : Adds a 'right' mark.
7123 % \leftmark : Used in the output routine, gets the current 'left' mark.
7124 % Works like TeX's \botmark.
7125 % \rightmark : Used in the output routine, gets the current 'right' mark.
7126 % Works like TeX's \firstmark.
7127 % The marking commands work reasonably well for right marks 'numbered
7128 % within' left marks--e.g., the left mark is changed by a \chapter command and
7129 % the right mark is changed by a \section command. However, it does
7130 % produce somewhat anomalous results if 2 \markboth's occur on the same page.
7131 %
7132 % Commands like \tableofcontents that should set the marks in some page styles
7133 % use a \@mkboth command, which is \let by the pagestyle command (\ps@...)
7134 % to \markboth for setting the heading or to \@gobbletwo to do nothing.
7135 %
7136 % \def\documentstyle{\@ifnextchar[{\@documentstyle}{\@documentstyle[]}}
7137 %

```

```

7138 \def\documentstyle[#1]#2{\makeatletter
7139   \def\@optionlist{#1}\gdef\@optionfiles{\input #2.sty\relax
7140   \let\@elt\input \@optionfiles \let\@elt\relax \makeatother}
7141
7142 \def\@options{\let\@elt\relax
7143   \@for\@tempa:=\@optionlist\do
7144     {\@ifundefined{ds@\@tempa}{\xdef\@optionfiles{\@optionfiles
7145       \@elt \@tempa.sty\relax}}{\csname ds@\@tempa\endcsname}}}
7146
7147 \def\pagestyle#1{\@nameuse{ps@#1}}
7148 \def\thispagestyle#1{\global\@specialpagetrue\gdef\@specialstyle{#1}}
7149
7150 % \head : An obsolete command that was used in the 'myheadings'
7151 %       page style. (Removed 14 Jun 85)
7152 % \def\head{\@ifnextchar[{\@xhead}{\@yhead}}
7153 % \def\@xhead[#1]#2{\if #1l \def\@lhead{#2}\else \def\@rhead{#2}\fi}
7154 % \def\@yhead#1{\def\@lhead{#1}\def\@rhead{#1}}
7155
7156 % Initialization
7157 %
7158 %\def\@lhead{} %% RmS 91/09/29: removed since no longer used
7159 %\def\@rhead{} %% ditto
7160
7161
7162 % Default Initializations
7163 %
7164 \def\ps@empty{\let\@mkboth\@gobbletwo\let\@oddhead\@empty\let\@oddfoot\@empty
7165 \let\@evenhead\@empty\let\@evenfoot\@empty}
7166
7167 \def\ps@plain{\let\@mkboth\@gobbletwo
7168   \let\@oddhead\@empty\def\@oddfoot{\reset@font\rm\hfil\thepage
7169   \hfil}\let\@evenhead\@empty\let\@evenfoot\@oddfoot}
7170
7171 \def\@leftmark#1#2{#1}
7172 \def\@rightmark#1#2{#2}
7173
7174 %% test for @nobreak added 15 Apr 86 in \markboth and \markright
7175 %% letting \label and \index to \relax added 22 Feb 86 so these
7176 %% commands can appear in sectioning command arguments
7177 %% RmS 91/06/21 Same for \glossary
7178 %%
7179
7180 \def\markboth#1#2{\gdef\@themark{#1}{#2}}{\let\protect\noexpand
7181   \let\label\relax \let\index\relax \let\glossary\relax
7182   \mark{\@themark}}\if@nobreak\ifvmode\nobreak\fi\fi}
7183 \def\markright#1{{\let\protect\noexpand
7184   \let\label\relax \let\index\relax \let\glossary\relax
7185   \expandafter\@markright\@themark
7186   #1}\mark{\@themark}}\if@nobreak\ifvmode\nobreak\fi\fi}
7187
7188 \def\@markright#1#2#3{\gdef\@themark{#1}{#3}}
7189 \def\leftmark{\expandafter\@leftmark\botmark}
7190 \def\rightmark{\expandafter\@rightmark\firstmark}
7191
7192 % Initialization
7193 %
7194 \def\@themark{ }
7195
7196
7197 % OTHER
7198 % -----

```

```

7199 %
7200 % \raggedbottom : Typesets pages with no vertical stretch, so they have
7201 %             their natural height instead of all being exactly the
7202 %             same height. (Uses a space of .0001fil to avoid
7203 %             interfering with the 1fil space of \newpage.)
7204 %
7205 % \flushbottom : Inverse of \raggedbottom - makes all pages the same
7206 %             height.
7207 %
7208 % \sloppy : Resets TeX's parameters so it accepts worse line and page
7209 %             breaks, and slightly more overfull boxes.
7210 %
7211 % \fussy : Resets TeX's parameters to their normal finicky values.
7212 %
7213
7214 \def\raggedbottom{\def\@textbottom{\vskip \z@ plus.0001fil}\let\@texttop\relax}
7215 \def\flushbottom{\let\@textbottom\relax \let\@texttop\relax}
7216
7217 % Default definitions
7218 % \sloppy will never (well, hardly ever) produce overfull boxes, but may
7219 % produce underfull ones. (14 June 85)
7220 % A sloppypar environment is equivalent to {\par \sloppy ... \par}.
7221 \def\sloppy{\tolerance \@M \hfuzz .5\p@ \vfuzz .5\p@}
7222 \def\sloppypar{\par\sloppy}
7223 \def\endsloppypar{\par}
7224 \def\fussy{\tolerance 200 \hfuzz .1\p@ \vfuzz .1\p@}
7225
7226
7227
7228 % LaTeX default is no overfull box rule. Changed by document
7229 % style option
7230
7231 \overfullrule Opt
7232
7233 \message{output,}
7234 % *****
7235 % *                OUTPUT                *
7236 % *****
7237 %
7238 %
7239 % PAGE LAYOUT PARAMETERS
7240 %
7241 % \topmargin      : Extra space added to top of page.
7242 % @twoside       : boolean. T if two-sided printing
7243 % \oddsidemargin : IF @twoside = T
7244 %                 THEN extra space added to left of odd-numbered
7245 %                 pages.
7246 %                 ELSE extra space added to left of all pages.
7247 % \evensidemargin : IF @twoside = T
7248 %                 THEN extra space added to left of even-numbered
7249 %                 pages.
7250 % \headheight    : height of head
7251 % \headsep       : separation between head and text
7252 % \footskip      : distance separation between baseline of last
7253 %                 line of text and baseline of foot.
7254 %                 Note difference between \footSKIP and \headSEP.
7255 % \textheight    : height of text on page, excluding head and foot
7256 % \textwidth     : width of printing on page
7257 % \columnsep     : IF @twocolumn = T
7258 %                 THEN width of space between columns
7259 % \columnseprule : IF @twocolumn = T

```

7260 % THEN width of rule between columns (0 if none).
7261 % \columnwidth : IF @twocolumn = T
7262 % THEN (\textwidth - \columnsep)/2
7263 % ELSE \textwidth
7264 % It is set by the \@maketwocolumn and \@makeonecolumn
7265 % commands.
7266 % \@textbottom : Command executed at bottom of vbox holding text of page
7267 % (including figures). The \raggedbottom command
7268 % almost \let's this to \vfil (actually sets it to
7269 % \vskip \z@ plus.0001fil). %expanded 18 Jun 86
7270 %
7271 % \@texttop : Command executed at top of vbox holding text of page
7272 % (including figures). Used by letter style; can also
7273 % be used to produce centered pages. Is \let to \relax
7274 % by \raggedbottom and \flushbottom.
7275 %
7276 % Page layout must also initialize \@colht and \@colroom to \textheight.
7277 %
7278 % PAGE STYLE PARAMETERS:
7279 %
7280 % \floatsep : Space left between floats.
7281 % \textfloatsep : Space between last top float or first bottom float
7282 % and the text.
7283 % \topfigrule : Command to place rule (or whatever) between floats
7284 % at top of page and text. Executed in inner vertical
7285 % mode right before the \textfloatsep skip separating
7286 % the floats from the text. Must occupy zero vertical
7287 % space. (See \footnoterule.)
7288 % \botfigrule : Same as \topfigrule, but put after the \textfloatsep
7289 % skip separating text from the floats at bottom of page.
7290 % \intextsep : Space left on top and bottom of an in-text float.
7291 % \@maxsep : The maximum of \floatsep, \textfloatsep and \intextsep
7292 % \dblfloatsep : Space between double-column floats.
7293 % \dbltextfloatsep : Space between top or bottom double-column floats
7294 % and text.
7295 % \dblfigrule : Similar to \topfigrule, but for double-column floats.
7296 % \@dblmaxsep : The maximum of \dblfloatsep and \dbltextfloatsep
7297 % \@fptop : Glue to go at top of float column -- must be Opt +
7298 % stretch
7299 % \@fpsep : Glue to go between floats in a float column.
7300 % \@fpbot : Glue to go at bottom of float column -- must be Opt +
7301 % stretch
7302 % \@dblfpsep, \@dblfpbot
7303 % : Analogous for double-column float page in two-column
7304 % format.
7305 %
7306 % FOOTNOTES: As in PLAIN, footnotes use \insert\footins.
7307 %
7308 % PAGE LAYOUT SWITCHES AND MACROS
7309 %
7310 % @twocolumn : Boolean. T if two columns per page.
7311 %
7312 % PAGE STYLE MACROS AND SWITCHES
7313 %
7314 % \@oddhead : IF @twoside = T
7315 % THEN macro to generate head of odd-numbered pages.
7316 % ELSE macro to generate head of all pages.
7317 % \@evenhead : IF @twoside = T
7318 % THEN macro to generate head of even-numbered pages.
7319 % \@oddfoot : IF @twoside = T
7320 % THEN macro to generate foot of odd-numbered pages.


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7321 %             ELSE macro to generate foot of all pages.
7322 % \@evenfoot      : IF @twoside = T
7323 %                 THEN macro to generate foot of even-numbered pages.
7324 % \@specialpage   : boolean. T if current page is to have a special format.
7325 % \@specialstyle  : If its value is foo then
7326 %                 IF \@specialpage = T
7327 %                 THEN the command \ps@foo is executed to temporarily
7328 %                 reset the page style parameters before composing
7329 %                 the current page. This command should execute
7330 %                 only \def's and \edef's, making only local
7331 %                 definitions.
7332 %
7333 %
7334 % FLOAT PLACEMENT PARAMETERS
7335 %
7336 % The following parameters are set by the macro \@floatplacement.
7337 % When \@floatplacement is called,
7338 % \@colht is the height of the page or column being built. I.e.:
7339 %     * For single-column page it equals \textheight.
7340 %     * For double-column page it equals \textheight - height
7341 %       of double-column floats on page.
7342 % Note that some are set globally and some locally:
7343 %     \@topnum      :=G Maximum number of floats allowed on the top of a column.
7344 %     \@toproom     :=G Maximum amount of top of column devoted to floats--
7345 %                   excluding \textfloatsep separation below the floats and
7346 %                   \floatsep separation between them. For two-column
7347 %                   output, should be computed as a function of \@colht.
7348 %     \@botnum, \@botroom
7349 %                 : Analogous to above.
7350 %     \@colnum      :=G Maximum number of floats allowed in a column, including
7351 %                   in-text floats.
7352 %     \@textmin     :=L Minimum amount of text (excluding footnotes) that must
7353 %                   appear on a text page. %% 27 Sep 85 : made local to
7354 %                   %% \@addtocurcol and \@addtonextcol
7355 %     \@fpmin       :=L Minimum height of floats in a float column.
7356 %
7357 % The macro \@dblfloatplacement sets the following parameters.
7358 %     \@dbltopnum   :=G Maximum number of double-column floats allowed at the
7359 %                   top of a two-column page.
7360 %     \@dbltoproom  :=G Maximum height of double-column floats allowed at
7361 %                   top of two-column page.
7362 %     \@fpmin       :=L Minimum height of floats in a float column.
7363 % It should also perform the following local assignments where necessary
7364 % -- i.e., where the new value differs from the old one:
7365 %     \@fptop       :=L \@dblfpptop
7366 %     \@fpsep       :=L \@dblfpsep
7367 %     \@fpbot       :=L \@dblfpbot
7368 %
7369 % OUTPUT ROUTINE VARIABLES
7370 %
7371 % \@colht : The total height of the current column. In single column
7372 %           style, it equals \textheight. In two-column style, it is
7373 %           \textheight minus the height of the double-column floats
7374 %           on the current page. MUST BE INITIALIZED TO \textheight.
7375 %
7376 % \@colroom : The height available in the current column for text and
7377 %             footnotes. It equals \@colht minus the height of all
7378 %             floats committed to the top and bottom of the current
7379 %             column.
7380 %
7381 % \footins : Footnote insertion number.

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7382 %
7383 % \@maxdepth : Saved value of TeX's \maxdepth. Must be set
7384 %           when any routine sets \maxdepth.
7385 %
7386 %           CALLING THE OUTPUT ROUTINE
7387 %           -----
7388 %
7389 % The output routine is called either by TeX's normal page-breaking
7390 % mechanism, or by a macro putting a penalty < or = -10000 in the output
7391 % list. In the latter case, the penalty indicates why the output
7392 % routine was called, using the following code.
7393 %
7394 %   penalty   reason
7395 %   -----   -----
7396 %   -10000    \pagebreak
7397 %            \newpage
7398 %   -10001    \clearpage (called with \penalty -10000 \vbox{} \penalty -10001
7399 %   -10002    float insertion, called from horizontal mode
7400 %   -10003    float insertion, called from vertical mode.
7401 %   -10004    float insertion.
7402 %
7403 % Note: A float or marginpar puts the following sequence in the output
7404 % list: (i) a penalty of -10004,
7405 %        (ii) a null \vbox
7406 %        (iii) a penalty of -10002 or -10003.
7407 % This solves two special problems:
7408 %     1. If the float comes right after a \newpage or \clearpage,
7409 %        then the first penalty is ignored, but the second one
7410 %        invokes the output routine.
7411 %     2. If there is a split footnote on the page, the second 'page'
7412 %        puts out the rest of the footnote.
7413 %
7414 %           THE OUTPUT ROUTINE
7415 %           -----
7416 %
7417 % FUNCTIONS USED IN THE OUTPUT ROUTINE:
7418 %
7419 % \@outputpage : Produces an output page with the contents of box
7420 %               \@outputbox as the text part. Also sets
7421 %               \@colht :=G \textheight. The page style is determined
7422 %               as follows.
7423 %               IF @thispagestyle = true
7424 %               THEN use \thispagestyle style
7425 %               ELSE use ordinary page style.
7426 %
7427 % \@tryfcolumn\FLIST : Tries to form a float column composed of floats from
7428 %                       \FLIST with with the following parameters:
7429 %                       \@colht : height of box
7430 %                       \@fpmin : minimum height of floats in the box
7431 %                       \@fpsep : interfloat space
7432 %                       \@fptop : glue at top of box
7433 %                       \@fpbot : glue at bottom of box.
7434 % If it succeeds, then it does the following:
7435 % * \@outputbox :=L the composed float box.
7436 % * @fcolmade :=L true
7437 % * \FLIST :=G \FLIST - floats put in box
7438 % * \@freelist :=G \@freelist + floats put in box
7439 % If it fails, then:
7440 % * @fcolmade :=L false
7441 % NOTE: BIT MUST BE A SINGLE TOKEN!
7442 %

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7443 % \@makefcolumn \FLIST : Same as \@tryfcolumn except that it
7444 %           fails to make a float column only if \FLIST is empty.
7445 %           Otherwise, it makes a float column containing at least
7446 %           the first box in \FLIST, disregarding \@fpmin.
7447 %
7448 % \@startcolumn :
7449 %           Calls \@tryfcolumn\@deferlist{8}. If \@tryfcolumn returns with
7450 %           @fcolmade = false, then:
7451 %           * Globally sets \@toplist and \@botlist to floats
7452 %           from \@deferlist to go at top and bottom of column,
7453 %           deleting them from \@deferlist. It does
7454 %           this using \@colht as the total height, the page
7455 %           style parameters \@floatsep and \@textfloatsep, and
7456 %           the float placement parameters \@topnum, \@toproom,
7457 %           \@botnum, \@botroom, \@colnum and \textfraction.
7458 %           * Globally sets \@colroom to \@colht minus the height
7459 %           of the added floats.
7460 %
7461 % \@startdblcolumn :
7462 %           Calls \@tryfcolumn\@dbldeferlist{8}. If \@tryfcolumn returns
7463 %           with @fcolmade = false, then:
7464 %           * Globally sets \@dbltoplist to floats from \@dbldeferlist
7465 %           to go at top and bottom of column, deleting them from
7466 %           \@dbldeferlist. It does this using \textheight as the
7467 %           total height, and the parameters \@dblfloatsep, etc.
7468 %           * Globally sets \@colht to \textheight minus the height
7469 %           of the added floats.
7470 %
7471 % \@combinefloats : Combines the text from box
7472 %           \@outputbox with the floats from \@toplist and \@botlist,
7473 %           putting the new box in \@outputbox. It uses \@floatsep and
7474 %           \@textfloatsep for the appropriate separations. It puts the
7475 %           elements of \TOPLIST and \BOTLIST onto \@freelist, and makes
7476 %           those lists null.
7477 %
7478 % \@makecol : Makes the contents of \box255 plus the accumulated
7479 %           footnotes, plus the floats in \@toplist and \@botlist,
7480 %           into a single column of height \@colht, which it puts
7481 %           into box \@outputbox. It puts boxes in \@midlist back
7482 %           onto \@freelist and restores \maxdepth.
7483 %
7484 % \@opcol : Outputs a column whose text is in box \@outputbox
7485 %           If @twocolumn = false, then it calls \@outputpage,
7486 %           sets \@colht :=G \textheight, and calls \@floatplacement.
7487 %
7488 %           If @twocolumn = true, then:
7489 %           If @firstcolumn = true, then it puts box \@outputbox
7490 %           into \@leftcolumn and sets @firstcolumn :=G false.
7491 %
7492 %           If @firstcolumn = false, then it puts out the current
7493 %           two-column page, any possible two-column float pages,
7494 %           and determines \@dbltoplist for the next page.
7495 %
7496 % \@opcol ==
7497 % BEGIN
7498 %   \@mparbottom :=G Opt
7499 %   if @twocolumn = true
7500 %     then %% \@outputdblcol ==
7501 %       if @firstcolumn = true
7502 %         then @firstcolumn :=G false
7503 %         \@leftcolumn :=G \@outputbox

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```

7504 %         else @firstcolumn :=G true
7505 %             \@outputbox := \vbox{
7506 %                 \hbox to \textwidth{
7507 %                     \hbox to\columnwidth{\box\@leftcolumn
7508 %                         \hss}
7509 %                     \hfil \vrule width \columnseprule \hfil
7510 %                     \hbox to\columnwidth{\box\@outputbox}
7511 %                         \hss}
7512 %                 \@combinedblfloats
7513 %                 \@outputpage
7514 %                 \begingroup
7515 %                     \@dblfloatplacement
7516 %                     \@startdblcolumn
7517 %                     while @fcolmade = true
7518 %                     do \@outputpage
7519 %                         \@startdblcolumn od
7520 %                 \endgroup
7521 %             fi
7522 %         else
7523 %             \@outputpage
7524 %             \@colht :=G \textheight
7525 %         fi
7526 %     END
7527 %
7528 % \@makecol ==
7529 % BEGIN
7530 %     ifvoid \insert\footins
7531 %     then \@outputbox := \box255
7532 %     else \@outputbox := \vbox {\boxmaxdepth :=L \maxdepth
7533 %                                     %added 21 Jan 87
7534 %                                     \unvbox255
7535 %                                     \vskip \skip\footins
7536 %                                     \footnoterule
7537 %                                     \unvbox\footins
7538 %                                     }
7539 %     fi
7540 %     \@freelist :=G \@freelist * \@midlist
7541 %     \@midlist :=G empty
7542 %     \@combinefloats
7543 %     \@outputbox := \vbox to \@colht{\boxmaxdepth := \maxdepth
7544 %                                     \@texttop
7545 %                                     temp :=L \dp\@outputbox
7546 %                                     \unvbox\@outputbox
7547 %                                     \vskip -temp
7548 %                                     \@textbottom}
7549 %     \maxdepth :=G \@maxdepth
7550 %     END
7551 %
7552 % \@outputpage ==
7553 % BEGIN
7554 %     \begingroup           %%% added 11 Jun 85 to keep special page
7555 %                         %%% declarations local to this output page
7556 %     \catcode'\ := 10     %%%make sure space is really a space
7557 %     \- := \@dischyph    %%% Added 4 Aug 88 in event output routine
7558 %     \' := \@acci       %%% called inside a tabbing environment.
7559 %     \' := \@accii
7560 %     \= := \@acciii
7561 %     if @specialpage = T
7562 %     then @specialpage :=G F
7563 %         execute \ps@[eval(\@specialstyle)] fi
7564 %     if \@twoside = T

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```

7565 %      then if \count0 odd
7566 %          \@thehead      ==L \@oddhead
7567 %          \@thefoot      ==L \@oddfoot
7568 %          \@themargin    ==L \@oddsidemargin
7569 %      else \@thehead      ==L \@evenhead
7570 %          \@thefoot      ==L \@evenfoot
7571 %          \@themargin    ==L \@evensidemargin fi fi
7572 % \shipout\vbox
7573 %     {\normalsize          % set fonts size for head and foot
7574 %      \baselineskip :=L \lineskip :=L Opt
7575 %      \par :=L \@@par      %% added 15 Sep 87 for robustness
7576 %      \vskip \topmargin
7577 %      \moveright\@themargin\vbox
7578 %          { \box\@tempboxa := \vbox to \headheight{\vfil
7579 %              \hbox to \textwidth
7580 %                  {\index == \label ==
7581 %                      \glossary == \@gobble
7582 %                          %% Added 22 Feb 87 as bug fix
7583 %                          %% RmS 91/06/21 \glossary added
7584 %                          \@thehead}}
7585 %          \dp\@tempboxa := Opt % Don't skip space for descenders in
7586 %          \box\@tempboxa      % running head.
7587 %          \vskip \headsep
7588 %          \box\@outputbox
7589 %          \baselineskip\footskip
7590 %          \hbox to \textwidth{\index == \label == \glossary == \@gobble
7591 %              %%% added 22 Feb 87 as bug fix
7592 %              %%% RmS 91/06/21 \glossary added
7593 %              \@thefoot}
7594 %      }
7595 %  }
7596 % \@colht :=G \textheight
7597 % \endgroup          %% added 11 Jun 85
7598 % \stepcounter{page}
7599 % \firstmark ==L \botmark %% So marks work properly on float
7600 %                    %% pages. (14 Jun 85)
7601 % END
7602 %
7603 % \@startcolumn ==
7604 % BEGIN
7605 %   \@colroom :=G \@colht
7606 %   if \@deferlist is empty
7607 %     then @fcolmade := false
7608 %   else \@tryfcolumn\@deferlist      %% else clause == \@xstartcol
7609 %     if @fcolmade = false
7610 %       then \begingroup
7611 %         \@tempb      :=L \@deferlist
7612 %         \@deferlist :=G empty
7613 %         \@elt \BOX == BEGIN \@currbox == \BOX      % use \gdef
7614 %                 \@addtonextcol
7615 %                 END == \@scolelt
7616 %       \@tempb
7617 %       \endgroup
7618 %     fi fi
7619 %   END
7620 %
7621 % \@startdblcolumn ==
7622 % BEGIN
7623 %   \@colht :=G \textheight
7624 %   \@tryfcolumn\@dbldeferlist      %% else clause == \@xstartcol
7625 %   if @fcolmade = false

```

```

7626 %         then \begingroup
7627 %             \@tempb      :=L \@dbldeferlist
7628 %             \@dbldeferlist :=G empty
7629 %             \@elt \BOX   == BEGIN \@currbox == \BOX      % use \gdef
7630 %                             \@addtodblcol
7631 %                             END == \@sdblcolelt
7632 %             \@tempb
7633 %         \endgroup
7634 %     fi     fi
7635 % END
7636 %
7637 % \output ==
7638 % BEGIN
7639 %     case of \outputpenalty
7640 %         > -10001 -> \@makecol
7641 %             \@opcol
7642 %             \@floatplacement
7643 %             \@startcolumn
7644 %             while @fcolmade = true
7645 %                 do \@opcol
7646 %                     \@startcolumn
7647 %                 od
7648 %
7649 %     %%% \@specialoutput ==
7650 %
7651 %     -10001 -> %%% \@docclearpage ==
7652 %         if there are no footnote insertions
7653 %             then unbox the \writes at the head of \box255
7654 %                 and throw away the rest
7655 %                 \@deferlist :=G \@toplist * \@botlist
7656 %                     * \@deferlist
7657 %                 \@toplist :=G \@botlist :=G empty
7658 %                 \@colroom :=G \@colht
7659 %                 if \@currlist not empty
7660 %                     then LaTeX error: float(s) lost
7661 %                         \@currlist :=G empty
7662 %                 fi
7663 %                 \@makefcolumn\@deferlist
7664 %                 while @fcolmade = true
7665 %                     do \@opcol
7666 %                         \@makefcolumn\@deferlist
7667 %                     od
7668 %                 if @twocolumn
7669 %                     then
7670 %                         if @firstcolumn = true
7671 %                             then \@dbldeferlist :=G \@dbltoplist *
7672 %                                 \@dbldeferlist
7673 %                             \@dbltoplist :=G empty
7674 %                             \@colht :=G \textheight
7675 %                             \begingroup
7676 %                                 \@dblfloatplacement
7677 %                                 \@makefcolumn\@dbldeferlist
7678 %                                 while @fcolmade = true
7679 %                                     do \@outputpage
7680 %                                         \@makefcolumn\@dbldeferlist
7681 %                                     od
7682 %                                 \endgroup
7683 %                             else \vbox{} \clearpage
7684 %                         fi fi
7685 %                     else \box255 := \vbox{\box255\fil}
7686 %                         \@makecol

```

```

7687 %                \@opcol
7688 %                \clearpage
7689 %                fi
7690 % < -10001    ->
7691 %            if \outputpenalty < -10003
7692 %                then if \outputpenalty <-20000 %% true only at end
7693 %                    then \deadcycles := 0
7694 %                fi
7695 %                box \@holdpg :=G box255
7696 %            else throw away box 255
7697 %                \@pagedp :=L natural depth of box \@holdpg
7698 %                \@pageht :=L natural ht of box \@holdpg
7699 %                \unvbox box \@holdpg %% put text back
7700 %            if \@currlist nonempty
7701 %                then \@currbox :=L head of \@currlist
7702 %                    \@currlist :=G tail of \@currlist
7703 %                    if \count\@currbox > 0
7704 %                        %% Changed 28 Feb 88 so \@pageht and \@pagedp
7705 %                        %% aren't changed for a marginal note
7706 %                        then %% this is a float
7707 %                            if there are footnote insertions
7708 %                                then advance \@pageht and \@pagedp and
7709 %                                    reinsert footnotes
7710 %                            fi
7711 %                            \@addtocurcol
7712 %                        else %% this is a marginal note
7713 %                            if there are footnote insertions
7714 %                                reinsert footnotes
7715 %                            fi
7716 %                            \@addmarginpar
7717 %                        fi
7718 %                    else THIS SHOULDN'T HAPPEN
7719 %                fi
7720 %            if \outputpenalty < 0                %% TO PERMIT PAGE BREAK
7721 %                then \penalty\interlinepenalty fi %% IF \@addtocurcol
7722 %                    %% DIDN'T INSERT A PENALTY
7723 %            fi
7724 %        end case
7725 %        \vsize :=G if \outputpenalty > -10004 then \@colroom %%normal case
7726 %                    else \maxdimen %%processing float
7727 %        fi
7728 %    END
7729 %
7730 % \@combinefloats ==
7731 % BEGIN
7732 %     if \@toplist nonempty
7733 %         then %%\@cfla ==
7734 %             \@elt\BOX == BEGIN   \@tempbox := \vbox{\unvbox\@tempbox
7735 %                                     \box\BOX
7736 %                                     \vskip \floatsep}
7737 %             END == \@comflelt
7738 %             \@tempbox := null
7739 %             \@toplist
7740 %             \@outputbox := \vbox{\boxmaxdepth :=L \maxdepth
7741 %                                     %added 21 Jan 87
7742 %                                     \unvbox\@tempbox
7743 %                                     \vskip - \floatsep
7744 %                                     \topfigrule
7745 %                                     \vskip \textfloatsep
7746 %                                     \unvbox\@outputbox }
7747 %         \@elt == \relax

```

```

7748 %           \@freelist :=G \@freelist * \@toplist
7749 %           \@toplist :=G null
7750 %   fi
7751 %   if \@botlist nonempty
7752 %     then %\@cflb ==
7753 %       \@elt == \@comflelt
7754 %       \@tempbox := null
7755 %       \@botlist
7756 %       \@outputbox := \vbox{ \unvbox\@outputbox
7757 %                           \vskip \textfloatsep
7758 %                           \botfigrule
7759 %                           \unvbox\@tempbox
7760 %                           \vskip - \floatsep }
7761 %       \@elt == \relax
7762 %       \@freelist :=G \@freelist * \@botlist
7763 %       \@botlist :=G null
7764 %   fi
7765 % END
7766 %
7767 % \@combinedblfloats ==
7768 % BEGIN
7769 %   if \@dbltoplist nonempty
7770 %     then \@elt == \@comdblfelet
7771 %       \@tempbox := null
7772 %       \@dbltoplist
7773 %       \@outputbox := \vbox to \textheight
7774 %                       {\boxmaxdepth :=L \maxdepth
7775 %                        \unvbox\@tempbox
7776 %                        \vskip - \dblfloatsep
7777 %                        \dblfigrule
7778 %                        \vskip \dbltextfloatsep
7779 %                        \box\@outputbox }
7780 %       \@elt == \relax
7781 %       \@freelist :=G \@freelist * \@dbltoplist
7782 %       \@dbltoplist :=G null
7783 %   fi
7784 % END
7785 %
7786 %
7787 %           USER COMMANDS THAT CALL OR AFFECT THE OUTPUT ROUTINE
7788 %           -----
7789 %
7790 % \newpage == BEGIN \par\vfil\penalty -10000 END
7791 %
7792 % \clearpage == BEGIN \newpage
7793 %                   \write -1{} % Part of hack to make sure no
7794 %                   \vbox{} % \write's get lost.
7795 %                   \penalty -10001
7796 %                   END
7797 %
7798 % \cleardoublepage == BEGIN \clearpage
7799 %                           if @twoside = true and c@page is even
7800 %                           then \hbox{} \newpage fi
7801 %                           END
7802 %
7803 % \twocolumn ==
7804 % BEGIN
7805 %   \clearpage
7806 %   \columnwidth :=G .5(\textwidth - \columnsep)
7807 %   \hsize :=G \columnwidth
7808 %   @twocolumn :=G true

```



```

7809 %   @firstcolumn :=G true
7810 %   \@dblfloatplacement
7811 % END
7812 %
7813 % \onecolumn ==
7814 % BEGIN
7815 %   \clearpage
7816 %   \columnwidth :=G \textwidth
7817 %   \hsize       :=G \columnwidth
7818 %   @twocolumn   :=G false
7819 %   \@floatplacement
7820 % END
7821 %
7822 %
7823 % \topnewpage{BOX} : starts a new page and puts BOX in a parbox of width
7824 %   \textwidth across the top. Useful for full-width titles for
7825 %   double-column pages.
7826 %   SURPRISE: The stretch from \@dbltextfloatsep will be inserted
7827 %   between the BOX and the top of the two columns.
7828 %
7829 % \topnewpage{BOX} ==
7830 % BEGIN
7831 %   \clearpage
7832 %   Take \@currbox from \@freelist
7833 %   \box\@currbox :=G \parbox{BOX \par
7834 %                       \vskip - \@dbltextfloatsep}
7835 %   \count\@currbox :=G 2
7836 %   \@dbltopnum     :=G 1
7837 %   \@dbltoproom    :=G maxdimension
7838 %   \@addtodblcol
7839 %   \vsize          :=G \@colht
7840 %   \@colroom       :=G \@colht
7841 % END
7842 %
7843 %
7844 %           FLOAT-HANDLING MECHANISMS
7845 %   -----
7846 %
7847 % The float environment obtains an insertion number B from the
7848 % \@freelist (see below for a description of list manipulation), puts
7849 % the float into box B and sets \count B to a FLOAT SPECIFIER. For
7850 % a normal (not double-column) float, it then causes a page break
7851 % in one of the following two ways:
7852 %   - In outer hmode: \vadjust{\penalty -10002}
7853 %   - In vmode :      \penalty -10003.
7854 % For a double-column float, it puts B onto the \@dbldeferlist.
7855 % The float specifier has two components:
7856 %   * A PLACEMENT SPECIFICATION, describing where the float may
7857 %     be placed.
7858 %   * A TYPE, which is a power of two--e.g., figures might be
7859 %     type 1 floats, tables type 2 floats, programs type 4 floats, etc.
7860 % The float specifier is encoded as follows, where bit 0 is the least
7861 % significant bit.
7862 %
7863 % Bit   Meaning
7864 % ---   -
7865 % 0     1 iff the float may go where it appears in the text.
7866 % 1     1 iff the float may go on the top of a page.
7867 % 2     1 iff the float may go on the bottom of a page.
7868 % 3     1 iff the float may go on a float page.
7869 % 4     always 1

```

```

7870 % 5      1 iff a type 1 float
7871 % 6      1 iff a type 2 float
7872 % etc.
7873 %
7874 % A negative float specifier is used to indicate a marginal note.
7875 %
7876 %     MACROS AND DATA STRUCTURES FOR PROCESSING FLOATS
7877 %     -----
7878 %
7879 % A FLOAT LIST consisting of the floats in boxes \boxa ... \boxN has the form:
7880 %     \@elt \boxa ... \@elt \boxN
7881 % where \boxI is defined by
7882 %     \newinsert\boxI
7883 % Normally, \@elt is \let to \relax. A test can be performed on the entire
7884 % float list by locally \def'ing \@elt appropriately and executing
7885 % the list. This is a lot more efficient than looping through the list.
7886 %
7887 % The following macros are used for manipulating float lists.
7888 %
7889 % \@next \CS \LIST {NONEMPTY}{EMPTY} == %% NOTE: ASSUME \@elt = \relax
7890 % BEGIN assume that \LIST == \@elt \B1 ... \@elt \Bn
7891 %     if n = 0
7892 %         then EMPTY
7893 %         else \CS      :=L \B1
7894 %             \LIST :=G \@elt \B2 ... \@elt \Bn
7895 %             NONEMPTY
7896 %     fi
7897 % END
7898 %
7899 %
7900 % \@bitor\NUM\LIST : Globally sets switch @test to the disjunction for all I
7901 % of bit log2 \NUM of the float specifiers of all the floats in
7902 % \LIST. I.e., @test is set to true iff there is at least one
7903 % float in \LIST having bit log2 \NUM of its float specifier
7904 % equal to 1.
7905 %
7906 % Note: log2 [(\count I)/32] is the bit number corresponding to the
7907 % type of float I. To see if there is any float in \LIST having
7908 % the same type as float I, you run \@bitor with \NUM = [(\count I)/32] * 32.
7909 %
7910 % \@bitor\NUM\LIST ==
7911 % BEGIN
7912 %     @test :=G false
7913 %     { \@elt \CTR == if \count\CTR / \NUM is odd
7914 %         then @test := true         fi
7915 %     \LIST
7916 % }
7917 % END
7918 %
7919 %
7920 % \@cons\LIST\NUM : Globally sets \LIST := \LIST * \@elt \NUM
7921 %
7922 % \@cons\LIST\NUM ==
7923 % BEGIN { \@elt == \relax
7924 %     \LIST :=G \LIST \@elt \NUM
7925 % }
7926 %
7927 % BOX LISTS FOR FLOAT-PLACEMENT ALGORITHMS
7928 %
7929 % \@freelist      : List of empty boxes for placing new floats.
7930 % \@toplist       : List of floats to go at top of current column.

```

```

7931 % \@midlist      : List of floats in middle of current column.
7932 % \@botlist      : List of floats to go at bottom of current column.
7933 % \@deferlist    : List of floats to go after current column.
7934 % \@dbltoplist   : List of double-col. floats to go at top of current page.
7935 % \@dbldeferlist : List of double-column floats to go on subsequent pages.
7936 %
7937 % FLOAT-PLACEMENT ALGORITHMS
7938 %
7939 % \@tryfccolumn \FLIST ==
7940 % BEGIN
7941 %   @fcolmade      :=G false
7942 %   \@trylist      :=G \FLIST
7943 %   \@failedlist   :=G empty
7944 %   \begingroup
7945 %   \@elt == \@xtryfc
7946 %   \@trylist
7947 %   \endgroup
7948 %   if @fcolmade = true
7949 %     then \@vtryfc \FLIST
7950 %   fi
7951 % END
7952 %
7953 % \@vtryfc ==
7954 % BEGIN
7955 %   \@outputbox :=G \vbox{}
7956 %   \@elt\BOX == BEGIN
7957 %                 \@outputbox :=L \vbox{ \unvbox \@outputbox
7958 %                                     \vskip \@fpsep
7959 %                                     \box\BOX          }
7960 %   END == \@wtryfc
7961 %   \@flsucceed
7962 %   \@outputbox :=G \vbox to \@colht{ \vskip \@fptop
7963 %                                   \vskip -\@fpsep
7964 %                                   \unvbox \@outputbox
7965 %                                   \vskip \@fpbot      }
7966 %   \@elt      == \relax
7967 %   \@freelist :=G \@freelist * \@flsucceed
7968 %   \FLIST     :=G \@failedlist * \@flfail
7969 % END
7970 %
7971 % \@xtryfc \BOX ==
7972 % BEGIN
7973 %   remove first element from \@trylist
7974 %   \@currtype := (\count\BOX / 32) * 32
7975 %   \@bitor \@currtype \@failedlist    % @test := true if type on list
7976 %   \@testfp \BOX                      % @test := true if no p-option
7977 %   if ht of \BOX > \@colht
7978 %     then @test :=G true
7979 %   fi
7980 %   if @test = true
7981 %     then add \BOX to \@failedlist
7982 %     else \@ytryfc \BOX
7983 %   fi
7984 % END
7985 %
7986 % \@ytryfc ==
7987 % BEGIN
7988 %   \begingroup
7989 %   \@flsucceed :=G \@elt\BOX
7990 %   \@flfail    :=G empty
7991 %   \@tempdima := \ht\BOX

```

```

7992 %   \@elt == \@ztryfc
7993 %   \@trylist
7994 %   if \@tempdima > \@fpmin
7995 %       then @fcolmade :=G true
7996 %       else add \BOX to \@failedlist
7997 %   fi
7998 %   \endgroup
7999 %   if @fcolmade = true then \@elt == \@gobble fi
8000 % END
8001 %
8002 % \@ztryfc \BOX ==
8003 % BEGIN
8004 %   \@tempcnta := (\count\BOX / 32) * 32
8005 %   \@bitor \@tempcnta {\@failedlist \@flfail} % @test := true if on a list
8006 %   \@testfp \BOX % @test := true if not p-option
8007 %   \@tempdimb := \@tempdima + ht of \BOX + \@fpsep
8008 %   if \@tempdimb > \@colht
8009 %       then @test :=G true
8010 %   fi
8011 %   if @test = true
8012 %       then add \BOX to \@flfail
8013 %       else add \BOX to \@flsucceed
8014 %           \@tempdima := \@tempdimb
8015 %   fi
8016 % END
8017 %
8018 % \@testfp \BOX == BEGIN if bit 3 of \count\BOX = 0
8019 %                       then @test :=G true fi
8020 %                       END
8021 %
8022 % \@makefcolumn \FLIST ==
8023 % BEGIN
8024 %   \begingroup
8025 %     \@fpmin =:L 0
8026 %     \@testfp == \@gobble
8027 %     \@tryfcolumn \FLIST
8028 %   \endgroup
8029 % END
8030 %
8031 % \@addtobot : Tries to put insert \@currbox on \@botlist. Called only when:
8032 %             * \ht BOX + \@maxsep < \@colroom
8033 %             * type of \@currbox not on \@deferlist
8034 %             * \@colnum > 0
8035 %             * @insert = false
8036 %             If it succeeds, then:
8037 %             * sets @insert true
8038 %             * decrements \@botroom by \ht BOX
8039 %             * decrements \@botnum and \@colnum by 1
8040 %             * decrements \@colroom by \ht BOX + either \floatsep
8041 %               or \textfloatsep, as appropriate.
8042 %             * sets \maxdepth to Opt
8043 %
8044 % \@addtotoporbot : Tries to put insert \@currbox on \@toplist or \@botlist.
8045 %                   Called only under same conditions as \@addtobot.
8046 %                   If it succeeds, then:
8047 %                   * sets @insert true
8048 %                   * decrements either \@toproom or \@botroom by \ht BOX
8049 %                   * decrements \@colnum and either \@topnum or
8050 %                     \@botnum by 1
8051 %                   * decrements \@colroom by \ht BOX + either \floatsep
8052 %                     or \textfloatsep, as appropriate.

```

```

8053 %
8054 % \@addtocurcol : Tries to add \@currbox to current column, setting @insert
8055 % true if it succeeds, false otherwise. It will add
8056 % \@currbox to top only if bit 0 of \count \@currbox is 0, and
8057 % to the bottom only if bit 0 = 0 or an earlier float of
8058 % the same type is put on the bottom.
8059 % If the float is put in the text, then
8060 % \penalty\interlinepenalty is put
8061 % right after the float, before the following \vskip, and
8062 % \outputpenalty :=L 0.
8063 %
8064 % \@addtonextcol : Tries to add \@currbox to the next column, setting @insert
8065 % true if it succeeds, false otherwise.
8066 %
8067 % \@addtodblcol : Tries to add \@currbox to the next double-column page,
8068 % adding it to \@dbltoplist if it succeeds and \@dbldeferlist
8069 % if it fails.
8070 %
8071 % \@addtobot ==
8072 % BEGIN
8073 %   if bit 2 of \count \@currbox = 1
8074 %     then if \@botnum > 0
8075 %       then if \@botroom > \ht \@currbox
8076 %         then \@botnum :=G \@botnum - 1
8077 %           \@colnum :=G \@colnum - 1
8078 %             \@tempdima :=L - \ht\@currbox -
8079 %               if \@botlist empty
8080 %                 then \textfloatsep
8081 %                 else \floatsep
8082 %               fi
8083 %             \@botroom :=G \@botroom + \@tempdima
8084 %             \@colroom :=G \@colroom + \@tempdima
8085 %             add \@currbox to \@botlist
8086 %             \maxdepth :=G 0pt
8087 %             @insert :=L true
8088 %           fi      fi      fi
8089 %         END
8090 %
8091 % \@addtotoporbot ==
8092 % BEGIN
8093 %   if bit 1 of \count \@currbox = 1
8094 %     then if \@topnum > 0
8095 %       then if \@toproom > \ht \@currbox
8096 %         then if \@currtype not on \@midlist or \@botlist
8097 %           then \@topnum :=G \@topnum - 1
8098 %             \@colnum :=G \@colnum - 1
8099 %             \@tempdima :=L - \ht\@currbox -
8100 %               if \@toplist empty
8101 %                 then \textfloatsep
8102 %                 else \floatsep
8103 %               fi
8104 %             \@toproom :=G \@toproom + \@tempdima
8105 %             \@colroom :=G \@colroom + \@tempdima
8106 %             add \@currbox to \@toplist
8107 %             @insert :=L true
8108 %           fi      fi      fi      fi
8109 %         if @insert = false then \@addtobot fi
8110 %       END
8111 %
8112 % \@addtocurcol ==
8113 % BEGIN

```

```

8114 % @insert :=L false
8115 % \@textmin := \textfraction\@colht      %% added 27 Sep 85
8116 % if \@colroom > \ht \@currbox + max(\@pageht+\@pagedp, \@textmin)
8117 %     + \@maxsep
8118 %     then if \@colnum > 0
8119 %         then \@currtype := type of \@currbox
8120 %         if \@currtype not on \@deferlist
8121 %             then if \@currtype on \@botlist
8122 %                 then \@addtobot
8123 %                 else if bit0 of \count \@currbox = 1
8124 %                     then decrement \@colnum
8125 %                     put \@currbox on \@midlist
8126 %                     add \@currbox + space +
8127 %                         \penalty \interlinepenalty to text
8128 %                     \outputpenalty :=L 0
8129 %                     @insert := true
8130 %                 else \@addtotopbot
8131 %             fi      fi      fi      fi      fi
8132 %         if @insert = false
8133 %             then add \@currbox to \@deferlist
8134 %         fi
8135 %     END
8136 %
8137 % \@addtonextcol ==
8138 % BEGIN
8139 % @insert :=L false
8140 % \@textmin := \textfraction\@colht      %% added 27 Sep 85
8141 % if \@colroom > \ht \@currbox + \@textmin + \@maxsep
8142 %     then if \@colnum > 0
8143 %         \@currtype := type of \@currbox
8144 %         then if \@currtype not on \@deferlist
8145 %             then \@addtotopbot
8146 %         fi      fi      fi
8147 %     if @insert = false
8148 %         then add \@currbox to \@deferlist
8149 %     fi
8150 % END
8151 %
8152 % \@addtodblcol ==
8153 % BEGIN
8154 % @insert :=L false
8155 % if bit 1 of \count \@currbox = 1
8156 %     then if \@dbltopnum > 0
8157 %         then if \@dbltoproom > \ht \@currbox
8158 %             then if type of \@currbox not on \@dbldeferlist
8159 %                 then \@dbltopnum :=G \@dbltopnum - 1
8160 %                 \@tempdima := -\ht\@currbox -
8161 %                     if \@dbltoplist empty
8162 %                         then \dbltextfloatsep
8163 %                         else \dblfloatsep
8164 %                     fi
8165 %                 \@dbltoproom :=G \@dbltoproom+\@tempdima
8166 %                 \@colht :=G \@colht+\@tempdima
8167 %                 add \@currbox to \@dbltoplist
8168 %                 @insert :=L true
8169 %             fi      fi      fi      fi
8170 %         if @insert = false then add \@currbox to \@dbldeferlist
8171 %     END
8172 %
8173 % \@addmarginpar ==
8174 % BEGIN

```

```

8175 %   if \@currlist nonempty
8176 %       then remove \@marbox from \@currlist %% NOTE: \@currbox = left box
8177 %           add \@marbox and \@currbox to \@freelist
8178 %       else LaTeX error: ? %% shouldn't happen
8179 %   fi
8180 %   \@tempcnta := 1 %% 1 = right, -1 = left
8181 %   if @twocolumn = true
8182 %       then if @firstcolumn = true
8183 %           then \@tempcnta := -1
8184 %       fi
8185 %       else if @mparswitch = true
8186 %           then if count0 odd
8187 %               else \@tempcnta := -1
8188 %           fi
8189 %       fi
8190 %       if @reversemargin = true
8191 %           then \@tempcnta := -\@tempcnta
8192 %       fi
8193 %   fi
8194 %   if \@tempcnta < 0 then \box\@marbox :=G \box\@currbox fi
8195 %   \@tempdima :=L maximum(\@mparbottom - \@pageht + ht of \@marbox, 0)
8196 %   if \@tempdima > 0 then LaTeX warning: 'marginpar moved' fi
8197 %   \@mparbottom :=G \@pageht + \@tempdima + depth of \@marbox
8198 %               + \marginparpush
8199 %   \@tempdima :=L \@tempdima - ht of \@marbox
8200 %   height of \@marbox :=G depth of \@marbox :=G 0
8201 %   \vskip -\@pagedp
8202 %   \vskip \@tempdima
8203 %   \nointerlineskip
8204 %   \hbox{ if @tempcnta > 0 then \hskip \columnwidth
8205 %               \hskip \marginparsep
8206 %               else \hskip -\marginparsep
8207 %               \hskip -\marginparwidth
8208 %           fi
8209 %           \box\@marbox
8210 %           \hss
8211 %       }
8212 %   \vskip -\@tempdima
8213 %   \nointerlineskip
8214 %   \hbox{\vrule height 0 width 0 depth \@pagedp}
8215 %   END
8216
8217
8218 \maxdeadcycles = 100 % floats and \marginpar's add a lot of dead cycles
8219
8220 \let\@elt\relax
8221
8222 \def\@next#1#2#3#4{\ifx#2\@empty #4\else
8223   \expandafter\@xnext #2\@#1#2#3\fi}
8224
8225 \def\@xnext \@elt #1#2\@#3#4{\def#3{#1}\gdef#4{#2}}
8226
8227 \newif\if@test
8228
8229 \def\@bitor#1#2{\global\@testfalse {\let\@elt\@xbitor
8230   \@tempcnta #1\relax #2}}
8231
8232 %% RmS 91/11/22: Added test for \count#1 being 0.
8233 %%           Suggested by Chris Rowley.
8234 \def\@xbitor #1{\@tempcntb \count#1
8235   \ifnum \@tempcnta =\z@

```

```

8236 \else
8237 \divide\@tempcntb\@tempcnta
8238 \ifodd\@tempcntb \global\@testtrue\fi
8239 \fi}
8240
8241 % DEFINITION OF FLOAT BOXES:
8242 \newinsert\bx@A
8243 \newinsert\bx@B
8244 \newinsert\bx@C
8245 \newinsert\bx@D
8246 \newinsert\bx@E
8247 \newinsert\bx@F
8248 \newinsert\bx@G
8249 \newinsert\bx@H
8250 \newinsert\bx@I
8251 \newinsert\bx@J
8252 \newinsert\bx@K
8253 \newinsert\bx@L
8254 \newinsert\bx@M
8255 \newinsert\bx@N
8256 \newinsert\bx@O
8257 \newinsert\bx@P
8258 \newinsert\bx@Q
8259 \newinsert\bx@R
8260
8261
8262
8263 \gdef\@freelist{\@elt\bx@A\@elt\bx@B\@elt\bx@C\@elt\bx@D\@elt\bx@E
8264 \@elt\bx@F\@elt\bx@G\@elt\bx@H\@elt\bx@I\@elt\bx@J
8265 \@elt\bx@K\@elt\bx@L\@elt\bx@M\@elt\bx@N
8266 \@elt\bx@O\@elt\bx@P\@elt\bx@Q\@elt\bx@R}
8267
8268 \gdef\@toplist{}
8269 \gdef\@botlist{}
8270 \gdef\@midlist{}
8271 \gdef\@currlist{}
8272 \gdef\@deferlist{}
8273 \gdef\@dbltoplist{}
8274 \gdef\@dbldeferlist{}
8275
8276 % PAGE LAYOUT PARAMETERS
8277 \newdimen\topmargin
8278 \newdimen\oddsidemargin
8279 \newdimen\evensidemargin
8280 \let\@themargin=\oddsidemargin
8281 \newdimen\headheight
8282 \newdimen\headsep
8283 \newdimen\footskip
8284 \newdimen\footheight % even though it never gets used.
8285 \newdimen\textheight
8286 \newdimen\textwidth
8287 \newdimen\columnwidth
8288 \newdimen\columnsep
8289 \newdimen\columnseprule
8290 \newdimen\@maxdepth \@maxdepth = \maxdepth
8291 \newdimen\marginparwidth
8292 \newdimen\marginparsep
8293 \newdimen\marginparpush
8294
8295 % PAGE STYLE PARAMETERS
8296 \newskip\floatsep

```



```

8297 \newskip\textfloatsep
8298 \newskip\intextsep
8299 \newdimen\@maxsep
8300 \newskip\dblfloatsep
8301 \newskip\dbltextfloatsep
8302 \newdimen\@dblmaxsep
8303 \newskip\@fptop
8304 \newskip\@fpsep
8305 \newskip\@fpbot
8306 \newskip\@dblfpptop
8307 \newskip\@dblfpsep
8308 \newskip\@dblfpbot
8309 \let\topfigrule=\relax
8310 \let\botfigrule=\relax
8311 \let\dblfigrule=\relax
8312
8313 % INTERNAL REGISTERS
8314
8315 \newcount\@topnum
8316 \newdimen\@toproom
8317 \newcount\@dbltopnum
8318 \newdimen\@dbltoproom
8319 \newcount\@botnum
8320 \newdimen\@botroom
8321 \newcount\@colnum
8322 \newdimen\@textmin
8323 \newdimen\@fpmin
8324 \newdimen\@colht
8325 \newdimen\@colroom
8326 \newdimen\@pageht
8327 \newdimen\@pagedp
8328 \newdimen\@mparbottom \@mparbottom\z@
8329 \newcount\@currtype
8330 \newbox\@outputbox
8331 \newbox\@leftcolumn
8332 \newbox\@holdpg
8333
8334 \newif\if@insert
8335 \newif\if@fcolmade
8336 \newif\if@specialpage \@specialpagefalse
8337 \newif\if@twoside \@twosidefalse
8338 \newif\if@firstcolumn \@firstcolumntrue
8339 \newif\if@twocolumn \@twocolumnfalse
8340 \newif\if@reversemargin \@reversemarginfalse
8341 \newif\if@mparswitch \@mparswitchfalse
8342
8343 \def\@thehead{\@oddhead} % initialization
8344 \def\@thefoot{\@oddfoot}
8345
8346 \def\newpage{\par\vfil\penalty -\@M}
8347
8348 \def\clearpage{\newpage \write\m@ne{\vbox{}}\penalty -\@Mi}
8349
8350 \def\cleardoublepage{\clearpage\if@twoside \ifodd\c@page\else
8351 \hbox{\newpage\if@twocolumn\hbox{\newpage\fi\fi}}
8352
8353 \def\twocolumn{\clearpage \global\columnwidth\textwidth
8354 \global\advance\columnwidth -\columnsep \global\divide\columnwidth\tw@
8355 \global\hsize\columnwidth \global\linewidth\columnwidth
8356 \global\@twocolumntrue \global\@firstcolumntrue
8357 \@dblfloatplacement\@ifnextchar [{\@topnewpage}{}}

```

```

8358
8359 \def\onecolumn{\clearpage\global\columnwidth\textwidth
8360   \global\hsize\columnwidth \global\linewidth\columnwidth
8361   \global\@twocolumnfalse \@floatplacement}
8362
8363 \long\def\@topnewpage[#1]{\@next\@currbox\@freelist{}}%
8364   \global\setbox\@currbox\vbox{\hsize\textwidth \parboxrestore
8365   #1\par\vskip -\dbltextfloatsep}\global\count\@currbox\@tw@
8366   \global\@dbltopnum\@ne \global\@dbltoproom\maxdimen\@addtodblcol
8367   \global\vsizel\@colht \global\@colroom\@colht}
8368
8369 %% RmS 91/09/29: added reset of \par to the output routine.
8370 %%           This avoids problems when the output routine is
8371 %%           called within a list where \par may be a no-op.
8372
8373 \output{\let\par\@par
8374   \ifnum\outputpenalty <-\@M\@specialoutput\else
8375   \makecol\@opcol\@floatplacement\@startcolumn
8376   \whilesw\if@fcolmade \fi{\@opcol\@startcolumn}\fi
8377   \global\vsizel\ifnum\outputpenalty >-\@Miv \@colroom
8378   \else \maxdimen\fi}
8379
8380 % CHANGES TO \@specialoutput:
8381 % * \penalty\z@ changed to \penalty\interlinepenalty so \samepage
8382 %   works properly with figure and table environments.
8383 %   (Changed 23 Oct 86)
8384 %
8385 % * Definition of \@specialoutput changed 26 Feb 88 so \pageht and \pagedp
8386 %   aren't changed for a marginal note. (Change suggested by
8387 %   Chris Rowley.)
8388 %
8389 \def\@specialoutput{\ifnum\outputpenalty >-\@Mii
8390   \doclearpage
8391   \else
8392     \ifnum \outputpenalty <-\@Miii
8393       \ifnum\outputpenalty<-\@MM \deadcycles\z@\fi
8394       \global\setbox\@holdpg\vbox{\unvbox\@cclv}%
8395     \else \setbox\@tempboxa\box\@cclv
8396       \@pagedp\dp\@holdpg \pageht\ht\@holdpg
8397       \unvbox\@holdpg
8398       \@next\@currbox\@currlist{\ifnum\count\@currbox >\z@
8399         \ifvoid\footins\else\advance\@pageht\ht\footins
8400         \advance\@pageht\skip\footins \advance\@pagedp\dp\footins
8401         \insert\footins{\unvbox\footins}\fi
8402         \@addtocurcol\else
8403         \ifvoid\footins\else\insert\footins{\unvbox\footins}\fi
8404         \@addmarginpar\fi}\@latexbug
8405     \ifnum \outputpenalty <\z@ \penalty\interlinepenalty\fi
8406   \fi\fi}
8407
8408
8409 \def\@docclearpage{\ifvoid\footins
8410   \setbox\@tempboxa\vsplit\@cclv to\z@ \unvbox\@tempboxa
8411   \setbox\@tempboxa\box\@cclv
8412   \xdef\@deferlist{\@toplist\@botlist
8413     \deferlist}\gdef\@toplist{\gdef\@botlist}\global\@colroom\@colht
8414   \ifx\@currlist
8415     \empty\else\@latexerr{Float(s)
8416     lost}\@ehb\gdef\@currlist}\fi
8417   \makefcolumn\@deferlist
8418   \whilesw\if@fcolmade \fi{\@opcol

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```

8419                                     \@makefcolumn\@deferlist}\if@twocolumn
8420     \if@firstcolumn
8421         \xdef\@dbldeferlist{\@dbltoplist
8422             \@dbldeferlist}\gdef\@dbltoplist{\global\@colht\textheight
8423             \begingroup \@dblfloatplacement \@makefcolumn\@dbldeferlist
8424             \@whiles\if@fcolmade \fi{\@outputpage
8425                 \@makefcolumn\@dbldeferlist}\endgroup
8426         \else \vbox{}\clearpage
8427         \fi\fi
8428     \else\setbox\@cclv\vbox{\box\@cclv\vfil}\@makecol\@opcol
8429     \clearpage
8430     \fi}
8431
8432 \def\@opcol{\global\@mparbottom\z@\if@twocolumn\@outputdblcol\else
8433     \@outputpage \global\@colht\textheight \fi}
8434
8435 \def\@outputdblcol{\if@firstcolumn \global\@firstcolumnfalse
8436     \global\setbox\@leftcolumn\box\@outputbox
8437     \else \global\@firstcolumntrue
8438     \setbox\@outputbox\vbox{\hbox to\textwidth{\hbox to\columnwidth
8439         {\box\@leftcolumn \hss}\hfil \vrule width\columnseprule\hfil
8440         \hbox to\columnwidth{\box\@outputbox \hss}}}\@combinedblfloats
8441     \@outputpage \begingroup \@dblfloatplacement \@startdblcolumn
8442     \@whiles\if@fcolmade \fi{\@outputpage\@startdblcolumn}\endgroup
8443     \fi}
8444
8445 % Extra \@texttop somehow found its way into \@makecol. Deleted
8446 % 1 Dec 86. (Found by Mike Harrison)
8447 %% RmS 91/10/22: Replaced \dimen128 by \dimen@.
8448 \def\@makecol{\ifvoid\footins \setbox\@outputbox\box\@cclv
8449     \else\setbox\@outputbox
8450         \vbox{\boxmaxdepth \maxdepth
8451             \unvbox\@cclv\skip\skip\footins\footnoterule\unvbox\footins}\fi
8452     \xdef\@freelist{\@freelist\@midlist}\gdef\@midlist{\@combinefloats
8453     \setbox\@outputbox\vbox to\@colht{\boxmaxdepth\maxdepth
8454         \@texttop\dimen@\dp\@outputbox\unvbox\@outputbox
8455         \vskip-\dimen@\@textbottom}}%
8456     \global\maxdepth\@maxdepth}
8457
8458 \let\@texttop=\relax
8459 \let\@textbottom=\relax
8460
8461 \def\@outputpage{\begingroup\catcode'\ =10
8462     \let-\@dischyp \let'\@acci \let'\@accii \let=\@acciii
8463     \if@specialpage
8464         \global\@specialpagefalse\@nameuse{ps@\@specialstyle}\fi
8465     \if@twoside
8466         \ifodd\count\z@ \let\@thehead\@oddhead \let\@thefoot\@oddfoot
8467         \let\@themargin\oddsidemargin
8468         \else \let\@thehead\@evenhead
8469         \let\@thefoot\@evenfoot \let\@themargin\evensidemargin
8470     \fi\fi
8471     \shipout
8472     \vbox{\reset@font %% RmS 91/08/15
8473         \normalsize \baselineskip\z@ \lineskip\z@
8474         \let\par\@par %% 15 Sep 87
8475         \vskip \topmargin \moveright\@themargin
8476         \vbox{\setbox\@tempboxa
8477             \vbox to\headheight{\vfil \hbox to\textwidth
8478                 {\let\label\@gobble \let\index\@gobble
8479                 \let\glossary\@gobble %% 21 Jun 91

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8480                                     \@thehead}}% %% 22 Feb 87
8481         \dp\@tempboxa\z@
8482         \box\@tempboxa
8483         \vskip \headsep
8484         \box\@outputbox
8485         \baselineskip\footskip
8486         \hbox to\textwidth{\let\label@gobble
8487             \let\index@gobble %% 22 Feb 87
8488             \let\glossary@gobble %% 21 Jun 91
8489             \@thefoot}}}\global\colht\textheight
8490     \endgroup\stepcounter{page}\let\firstmark\botmark}
8491
8492
8493 \def\@combinefloats{\boxmaxdepth\maxdepth \ifx\@toplist\@empty\else\@cfla\fi
8494     \ifx\@botlist\@empty\else\@cflb\fi}
8495
8496 \def\@cfla{\let\@elt\@comflelt \setbox\@tempboxa\vbox{}\@toplist
8497     \setbox\@outputbox\vbox{\unvbox\@tempboxa\vskip-\floatsep
8498     \topfigrule\vskip\textfloatsep \unvbox\@outputbox}\let\@elt\relax
8499     \xdef\@freelist{\@freelist\@toplist}\gdef\@toplist{}}
8500
8501 \def\@cflb{\let\@elt\@comflelt \setbox\@tempboxa\vbox{}\@botlist
8502     \setbox\@outputbox\vbox{\unvbox\@outputbox \vskip\textfloatsep
8503     \botfigrule\unvbox\@tempboxa \vskip-\floatsep}\let\@elt\relax
8504     \xdef\@freelist{\@freelist\@botlist}\gdef\@botlist{}}
8505
8506 \def\@comflelt#1{\setbox\@tempboxa
8507     \vbox{\unvbox\@tempboxa\box #1\vskip\floatsep}}
8508
8509 \def\@combinedblfloats{\ifx\@dbltoplist\@empty\else
8510     \let\@elt\@comdblfelet \setbox\@tempboxa\vbox{}\@dbltoplist
8511     \setbox\@outputbox\vbox to\textheight
8512         {\boxmaxdepth\maxdepth
8513         \unvbox\@tempboxa\vskip-\dblfloatsep
8514         \dblfigrule\vskip\dbltextfloatsep \box\@outputbox}\let\@elt\relax
8515     \xdef\@freelist{\@freelist\@dbltoplist}\gdef\@dbltoplist{}}\fi}
8516
8517
8518 \def\@comdblfelet#1{\setbox\@tempboxa
8519     \vbox{\unvbox\@tempboxa\box #1\vskip\dblfloatsep}}
8520
8521
8522 \def\@startcolumn{\global\@colroom\@colht
8523     \ifx\@deferlist\@empty\global\@fcolmadefalse\else\@xstartcol\fi}
8524
8525 \def\@xstartcol{\@tryfcolumn\@deferlist \if@fcolmade\else
8526     \begingroup\edef\@tempb{\@deferlist}\gdef\@deferlist{\let\@elt\@scolelt
8527     \@tempb\endgroup}\fi}
8528
8529 \def\@scolelt#1{\def\@currbox{#1}\@addtonextcol}
8530
8531 \def\@startdblcolumn{\global\@colht\textheight
8532     \@tryfcolumn\@dbldeferlist \if@fcolmade\else
8533     \begingroup
8534         \edef\@tempb{\@dbldeferlist}\gdef\@dbldeferlist{\let\@elt\@sdblcolelt
8535         \@tempb\endgroup}\fi}
8536
8537 \def\@sdblcolelt#1{\def\@currbox{#1}\@addtodblcol}
8538
8539 \def\@tryfcolumn #1{\global\@fcolmadefalse \xdef\@trylist{#1}\xdef\@failedlist
8540     }\begingroup \let\@elt\@xtryfc \@trylist \endgroup

```

```

8541 \if@fcolmade \@vtryfc #1\fi}
8542
8543 \def\@vtryfc #1{\global\setbox\@outputbox\vbox{\let\@elt\@wtryfc
8544 \flsucceed \global\setbox\@outputbox\vbox to\colht{\vskip \@fptop
8545 \vskip -\@fpsep \unvbox \@outputbox \vskip \@fpbot}\let\@elt\relax
8546 \xdef #1{\@failedlist\@flfail}\xdef\@freelist{\@freelist\@flsucceed}}
8547
8548 \def\@wtryfc #1{\global\setbox\@outputbox\vbox{\unvbox\@outputbox
8549 \vskip\@fpsep\box #1}}
8550
8551
8552 \def\@xtryfc #1{\@next\@tempa\@trylist{}}\@currtype
8553 \count #1\divide\@currtype\@xxxii \multiply\@currtype\@xxxii
8554 \@bitor \@currtype \@failedlist \@testfp #1\ifdim
8555 \ht #1>\colht \global\@testtrue\fi
8556 \if@test \@cons\@failedlist #1\else \@ytryfc #1\fi}
8557
8558 \def\@ytryfc #1{\begingroup \gdef\@flsucceed{\@elt #1}\gdef\@flfail
8559 {\@tempdima\ht #1\let\@elt\@ztryfc \@trylist \ifdim \@tempdima >\@fpmin
8560 \global\@fcolmadetrue \else \@cons\@failedlist #1\fi
8561 \endgroup \if@fcolmade \let\@elt\@gobble \fi}
8562
8563 \def\@ztryfc #1{\@tempcna\count #1\divide\@tempcna\@xxxii
8564 \multiply\@tempcna\@xxxii \@bitor \@tempcna {\@failedlist
8565 \@flfail}\@testfp #1\@tempdima\@tempdima \advance\@tempdima\ht #1\advance
8566 \@tempdima\@fpsep \ifdim \@tempdima >\colht \global\@testtrue\fi
8567 \if@test \@cons\@flfail #1\else \@cons\@flsucceed #1\@tempdima\@tempdima
8568 \fi}
8569
8570 \def\@testfp #1{\@tempcna\count #1\divide\@tempcna 8\relax
8571 \ifodd\@tempcna \else \global\@testtrue\fi}
8572
8573 \def\@makefcolumn #1{\begingroup \@fpmin\z@ \let\@testfp\@gobble
8574 \@tryfcolumn #1\endgroup}
8575
8576 \def\@addtobot{\@tempcna\count\@currbox\divide\@tempcna4 \ifodd\@tempcna
8577 \ifnum \@botnum >\z@ \ifdim \@botroom >\ht\@currbox
8578 \global\advance\@botnum\m@ne
8579 \global\advance\@colnum\m@ne
8580 \@tempdima -\ht\@currbox
8581 \advance\@tempdima -\ifx\@botlist\@empty \textfloatsep
8582 \else\floatsep\fi
8583 \global\advance\@botroom \@tempdima
8584 \global\advance\@colroom \@tempdima
8585 \@cons\@botlist\@currbox \global\maxdepth\z@
8586 \@inserttrue\fi\fi\fi}
8587
8588 \def\@addtotoporbot{\@tempcna\count\@currbox \divide\@tempcna\tw@
8589 \ifodd\@tempcna \ifnum \@topnum >\z@ \ifdim\@toproom >\ht\@currbox
8590 \@bitor\@currtype{\@midlist\@botlist}\if@test\else
8591 \global\advance\@topnum\m@ne
8592 \global\advance\@colnum\m@ne
8593 \@tempdima-\ht\@currbox
8594 \advance\@tempdima
8595 -\ifx\@toplist\@empty \textfloatsep \else\floatsep\fi
8596 \global\advance\@toproom \@tempdima
8597 \global\advance\@colroom \@tempdima
8598 \@cons\@toplist\@currbox
8599 \@inserttrue
8600 \fi\fi\fi\fi}
8601 \if@insert\else\@addtobot \fi}

```

```

8602
8603 \def\@addtonextcol{\@insertfalse \@textmin \textfraction\@colht
8604   \@tempdima\ht\@currbox
8605   \advance\@tempdima\@textmin\advance\@tempdima\@maxsep
8606   \ifdim\@colroom >\@tempdima
8607     \ifnum\@colnum >\z@
8608       \@currtype\count\@currbox \divide\@currtype\@xxxii
8609       \multiply\@currtype\@xxxii
8610       \@bitor\@currtype\@deferlist
8611       \if@test\else
8612         \@addtotoporbot
8613     \fi\fi\fi
8614   \if@insert\else \@cons\@deferlist\@currbox\fi}
8615
8616 \def\@addtdblcol{\@insertfalse
8617   \@tempcnta\count\@currbox \divide\@tempcnta\tw@
8618   \ifodd\@tempcnta
8619     \ifnum\@dbltopnum >\z@
8620       \ifdim\@dbltoproom >\ht\@currbox
8621         \@currtype\count\@currbox \divide\@currtype\@xxxii
8622         \multiply\@currtype\@xxxii
8623         \@bitor\@currtype\@dbldeferlist
8624       \if@test\else
8625         \global\advance\@dbltopnum\m@ne
8626         \@tempdima -\ht\@currbox
8627         \advance\@tempdima -\ifx\@dbltoplist\@empty
8628           \dbltextfloatsep\else\dblfloatsep\fi
8629         \global\advance\@dbltoproom \@tempdima
8630         \global\advance\@colht \@tempdima
8631         \@cons\@dbltoplist\@currbox
8632       \inserttrue
8633     \fi\fi\fi\fi
8634   \if@insert\else \@cons\@dbldeferlist\@currbox \fi}
8635
8636 % CHANGE TO \@addtocurcol:
8637 % \penalty\z@ changed to \penalty\interlinepenalty so \samepage
8638 % works properly with figure and table environments.
8639 % (Changed 23 Oct 86)
8640 %
8641 \def\@addtocurcol{\@insertfalse \@textmin \textfraction\@colht
8642   \@tempdima\@pageht \advance\@tempdima\@pagedp
8643   \ifdim \@textmin >\@tempdima \@tempdima\@textmin \fi
8644   \advance\@tempdima\ht\@currbox \advance\@tempdima\@maxsep
8645   \ifdim\@colroom >\@tempdima
8646     \ifnum\@colnum >\z@
8647       \@currtype\count\@currbox \divide\@currtype\@xxxii
8648       \multiply\@currtype\@xxxii
8649       \@bitor\@currtype\@deferlist
8650     \if@test\else
8651       \@bitor\@currtype\@botlist
8652     \if@test \@addtobot \else
8653       \ifodd\count\@currbox
8654         \global\advance\@colnum\m@ne
8655         \@cons\@midlist\@currbox
8656         \vskip\intextsep \box\@currbox
8657         \penalty\interlinepenalty \vskip\intextsep
8658         \ifnum\outputpenalty <-\@Mii \vskip -\parskip\fi
8659         \outputpenalty\z@
8660       \inserttrue
8661     \else \@addtotoporbot
8662   \fi\fi\fi\fi\fi

```

```

8663 \if@insert\else\@cons\@deferlist\@currbox\fi}
8664
8665 \def\@addmarginpar{\@next\@marbox\@currlist{\@cons\@freelist\@marbox
8666 \@cons\@freelist\@currbox}\@latexbug\@tempcnta\@ne
8667 \if@twocolumn
8668 \if@firstcolumn \@tempcnta\m@ne \fi
8669 \else
8670 \if@mparswitch
8671 \ifodd\c@page \else\@tempcnta\m@ne \fi
8672 \fi
8673 \if@reversemargin \@tempcnta -\@tempcnta \fi
8674 \fi
8675 \ifnum\@tempcnta <\z@ \global\setbox\@marbox\box\@currbox \fi
8676 \@tempdima\@mparbottom \advance\@tempdima -\@pageht
8677 \advance\@tempdima\ht\@marbox \ifdim\@tempdima >\z@
8678 \@warning{Marginpar on page \thepage\space moved}\else\@tempdima\z@ \fi
8679 \global\@mparbottom\@pageht \global\advance\@mparbottom\@tempdima
8680 \global\advance\@mparbottom\dp\@marbox
8681 \global\advance\@mparbottom\marginparpush
8682 \advance\@tempdima -\ht\@marbox
8683 \global\ht\@marbox\z@ \global\dp\@marbox\z@
8684 \vskip -\@pagedp \vskip\@tempdima\nointerlineskip
8685 \hbox to\columnwidth
8686 {\ifnum \@tempcnta >\z@
8687 \hskip\columnwidth \hskip\marginparsep
8688 \else \hskip -\marginparsep \hskip -\marginparwidth \fi
8689 \box\@marbox \hss}\nobreak %% RmS 91/06/21 \nobreak added
8690 \vskip -\@tempdima
8691 \nointerlineskip
8692 \hbox{\vrule \@height\z@ \@width\z@ \@depth\@pagedp}}
8693
8694 \message{debugging}
8695 % *****
8696 % * DEBUGGING AND TEST INITIALIZATIONS *
8697 % *****
8698 %
8699 % DEBUGGING
8700 \def\showoverfull{\tracingonline=1}
8701 \tracingstats1 % SHOWS HOW MUCH STUFF TeX HAS USED
8702 \def\showoutput{\tracingonline1\tracingoutput1
8703 \showboxbreadth99999\showboxdepth99999\errorstopmode}
8704 \def\makeatletter{\catcode'\@=11\relax}
8705 \def\makeatother{\catcode'\@=12\relax}
8706
8707 \newcount\@lowpenalty
8708 \newcount\@medpenalty
8709 \newcount\@highpenalty
8710
8711 % LIST
8712
8713 % ENUMERATION
8714
8715 % ITEMIZE
8716
8717 % ARRAY AND TABULAR
8718
8719 % THE PICTURE ENVIRONMENT
8720
8721 \unitlength = 1pt
8722 \fboxsep = 3pt
8723 \fboxrule = .4pt

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8724
8725 %% FOOTNOTES
8726
8727 %\def\footnoterule{} % INITIALIZED BY PLAIN
8728 %\skip\footins{} % INITIALIZED BY PLAIN
8729 %\interfootnotelinepenalty % INITIALIZED BY PLAIN
8730
8731 \@maxdepth = \maxdepth
8732
8733 % \vsize initialized because a \clearpage with \vsize < \topskip
8734 % causes trouble.
8735 % \@colroom and \@colht also initialized because \vsize may be
8736 % set to them if a \clearpage is done before the \begin{document}
8737
8738 \vsize = 1000pt
8739 \@colroom = \vsize
8740 \@colht = \vsize
8741
8742 \endinput

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4037,	4038,	4520,	8455,	8475,	8483,	3150,	3151,	3155,
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144,	1365,	1786,	8503,	8507,	8513,	3248,	3589,	3613,
5073,	5134,	5169,	8514,	8519,	8544,	3629,	3635,	3636,
<code>\verb</code>	83,	172,	8545,	8549,	8656,	3668,	3692,	4022,
3169,	3170,	3224,	8657,	8658,	8684,	4024,	4044,	4046,
3228						4068,	4073,	4354,
<code>\verbatim</code>	172,	1367,	<code>\vspace</code>	100,	146,	1374,	1948,	
<code>\vfil</code>	1368,	5566,	1989,	2064,	2125,	4369,	4375,	4380,
7268,	7578,	7685,	2138,	2139,	2140,	4416,	4576,	4577,
7790,	8346,	8428,	<code>\vsplit</code>	1375,	8410	4581,	4586,	4592,
<code>\vfuzz</code>	1369,	7221,	<code>\vss</code>	1376,	3933,	3934	4596,	4789,
7224			<code>\vtop</code>	1377,	3817,	4874,	4879,	4897,
<code>\vline</code>	96,	145,	4005,	4036,	4518,	5005,	5011,	5017,
4453,	4889		4579,	4915,	6799,	5018,	5022,	5215,
<code>\vrule</code>	1371,	2196,				5216,	5219,	5221,
3964,						5222,	5225,	5249,
3975,	3977,	3991,	W			5251,	5254,	5259,
3993,	4075,	4545,	<code>\wd</code>	1378,	3560,	5262,	5263,	5267,
4573,	4596,	4870,	3675,	4354,	4386,	5268,	5271,	5274,
4889,	5117,	5250,	4396,	4410,	5227,	5281,	5284,	5289,
5306,	5309,	5334,	5228,	5234,	5236,	5299,	5304,	5306,
5342,	5371,	5379,	5238,	5241,	5245,	5307,	5309,	5310,
5414,	5421,	5436,	5246,	5276,	5489,	5313,	5316,	5405,
5443,	5566,	5685,	5507,	5656,	5892,	5406,	5410,	5422,
7509,	8214,	8439,	<code>\write</code>	5,	1379,	5424,	5430,	5444,
<code>\vsize</code>	1372,	2390,	1493,	1597,	2424,	5447,	5652,	5658,
2486,	7725,	7839,	2439,	2453,	2456,	5677,	5705,	5715,
8367,	8377,	8733,	2460,	2496,	2528,	6077,	6086,	6103,
8735,	8738,	8739,	2533,	2538,	2539,	6116,	6127,	6283,
8740			2541,	2790,	2872,	6668,	6678,	6681,
<code>\vskip</code>	1373,		2894,	6233,	6248,	6682,	6708,	6709,
2064,	2090,	2092,	6255,	6355,	6369,	6816,	6818,	6831,
2093,	2095,	2096,	6441,	6448,	6465,	6836,	6837,	7017,
2104,	2109,	2114,	6478,	6481,	6489,	7214,	7269,	8235,
2121,	2127,	2130,	6569,	7793,	7794,	8328,	8381,	8393,
2132,	2136,	2149,	<code>\writes</code>	1380,	7653	8398,	8405,	8410,
2151,	3086,	3118,				8432,	8466,	8473,
3119,	3120,	3121,	X			8481,	8573,	8577,
3139,	3205,	3482,	<code>\xdef</code>	1381,	1603,	2344,	8585,	8589,
3483,	3519,	3520,	5840,	5846,	5914,	8619,	8637,	8646,
3653,	3654,	3962,	6996,	7002,	7007,	8659,	8675,	8677,
3965,	3976,	3992,	7022,	7027,	7035,	8678,	8683,	8686,
4053,	4055,	4200,	7040,	7144,	8412,	8692		
4202,	4209,	4360,	8421,	8452,	8499,	<code>\z@skip</code>	2197,	2201
4376,	4458,	4547,	8504,	8515,	8539,	8546		
4598,	4886,	4901,						
4919,	5045,	5384,						
5388,	5393,	5397,						