

# The revtex4 document class

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This file embodies the implementation of the APS RevTeX 4 document class for electronic submissions to journals.

The distribution point for this work is <http://publish.aps.org/revtex4/>, which contains fully unpacked, prebuilt runtime files and documentation.

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# 1 Using RevTeX

The file `README` has retrieval and installation information.

User documentation is presented separately in `revguide.tex`.

The file `template.aps` is a boilerplate file.

## 2 Overview

RevTeX is a L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> document class, somewhat like a hybrid of the standard L<sup>A</sup>T<sub>E</sub>X book and article classes.

Certain packages are (should be) loaded by this class in any case: amssymb, amsmath, bm, natbib.

Certain packages are automatically loaded by this class when a corresponding class option has been invoked:

RevTeX option	package
twocolumn	multicol
hyperref	hyperref
amsmath	amsmath
amssymb	amssymb
aps	overcite

Certain other packages are to be loaded by the document through explicit use of \usepackage. Some mentioned in the user documentation are graphicx, longtable, and bm.

This document class implements the substyle: a set of mutually exclusive class options that, in this case, allow the document class to address multiple societies. It also implements a sub-substyle, giving the journal of the given society. The only society currently implemented is aps, however, code is in place for another society, the osa.

FIXME: should always load the graphicx package.

QUERY: since amsmath and amssymb extend syntax, why not load them in any case?

QUERY: if you say \documentclass[prb,osa]{revtex4}, then the value of \@society will be wrong, or? Fixed.

Certain events optionally occur at \AtEndOfClass time:

1. Read in packages hyperref, multicol, amsmath, amssymb.
2. Read in journal substyle .rtx file.
3. Read in type size .rtx file.

FIXME: per SPQR, hyperref to load last of all.

Certain events are optionally scheduled for \AtBeginDocument time:

1. Setting default values for the Booleans and for other procedures used in formatting.
2. In response to class options options, adjusting parameters and procedures used in formatting.
3. Implementing the eqsecnum option, if required.
4. Setting the state engine for data commands.
5. Memorizing procedures for later use.
6. Setting type size and area, for use by later calculations.

Certain events are scheduled for `\AtEndDocument` time:

1. Print out the migrated floats or the end notes, if needed.
2. Close out the page grid.
3. Label the last page of the document
4. (natbib) prepare to read in the `.aux` file.

The first two of these are executed by `\class@enddocumenthook`, which is itself installed via `\AtEndDocument`.

### 3 Writing journal-specific extensions to RevTeX

With this version of RevTeX, we introduce a somewhat different scheme for adapting RevTeX to the needs of a specific journal.

To create a journal substyle, you create new class options in RevTeX for the society, say `osa`, and any of that society's journals, one of which is, say, `josaa`, using the code for the APS as a guide. In particular, each of your new options should separately define `\@society` and `\@journal`. That for the former will be the same for all options relating to a particular society.

Then, for the society, you create a corresponding `.rtx` file, in our case `osa.rtx`. Within that file, you override procedures and parameter assignments as you see fit. Ideally they will be generally applicable to all of that society's journals (see the file `aps.rtx` for a realization of this scheme). Also within that file, you include a section of code for each journal, that for `josaa` looks like:

```
% \@ifx{\@journal\journal@josaa}{%  
% <code specific to the josaa>  
% }{}%  
%
```

Thus far, the scheme is similar to that used in RevTeX 3.1. However, the new scheme does differ from the old in that the `.rtx` file should define no syntactical extensions to RevTeX.

### 4 The revtex4 Document Class

```
1 %<*class>  
2 \def\class@name{revtex4}%
```

#### 4.1 Computability Processing

Three cases are possible:

1. `\documentstyle{revtex}` run under L<sup>A</sup>T<sub>E</sub>X 2.09. Input the original RevTeX 3.0 style file.

2. `\documentstyle{revtex4}` run under  $\text{\LaTeX 2}_{\epsilon}$ . Make a small fudge required for table support on all but the first releases of  $\text{\LaTeX 2}_{\epsilon}$ , and then act as above, skipping the rest of this class file. This is exactly the behavior of the `revtex.cls` distributed with  $\text{RevTeX 3.0}$ .
3. `\documentclass{revtex4}` run under  $\text{\LaTeX 2}_{\epsilon}$ . This file is executed in full, giving  $\text{RevTeX 4.0}$  behavior.

```

3 \if@compatibility
4   \ifx\every@math@size\@undefined
5   \else
6     \let\old@expast\@expast
7     \def\@expast#1{\old@expast{#1}\let\@tempa\reserved@a}
8   \fi
9   \input{revtex.sty}
10  \expandafter\endinput
11 \fi

```

## 4.2 Errors and warnings

```

\REVTEX@err A couple of shorthands for Class messages.
\REVTEX@warn
12 \def\REVTEX@err#1{\ClassError{\class@name}{#1}\@eha}%
13 \def\REVTEX@warn#1{\ClassWarningNoLine{\class@name}{#1}}%
14 \def\REVTEX@info#1{\ClassInfo{\class@name}{#1}}%
15 \def\obsolete@command#1{%
16   \REVTEX@warn@end{Command \string#1\space is obsolete.^^JPlease remove from your do
17   \global\let#1\@empty
18   #1%
19 }%
20 \def\replace@command#1#2{%
21   \REVTEX@warn@end{Command \string#1\space is obsolete;^^JUse \string#2\space instea
22   \global\let#1#2%
23   #1%
24 }%
25 \def\REVTEX@warn@end#1{\AtEndDocument{\REVTEX@warn{#1}}}%

```

## 5 Extensions to the $\text{\LaTeX}$ Kernel

For better or worse, I am gradually introducing some portions of the `ltxkrnext` package (<ftp://ftp.teleport.com/users/ogawa/macros/latex/contrib/supported/ltxkrnext/>).

Also, any portions of  $\text{RevTeX}$  that I consider to be kernel extensions, I am putting here.

### 5.1 New Tools

```

\halign@
26 \def\halign@{\halign to}%

```

`\f@ur` Analogous to `\@ne`, `\tw@`, and `\thr@@`.

```
27 \chardef\f@ur=4\relax
```

`\let@environment` The directive `\let@environment` takes care of a common programming idiom whereby one environment is made a synonym for another.

```
28 \def\let@environment#1#2{%
29   \expandafter\let
30   \csname#1\expandafter\endcsname\csname#2\endcsname
31   \expandafter\let
32   \csname end#1\expandafter\endcsname\csname end#2\endcsname
33 }%
```

`\tracingplain` The command `\tracingplain` causes  $\text{\TeX}$ 's tracing parameters to return to the values set by default. This command is sometimes useful when you have said `\tracingall` somewhere and want to restore. The `\traceoutput` command causes `\tracingoutput` diagnostics upon `\shipout`.

```
34 \newcommand\tracingplain{%
35   \tracingonline\z@\tracingcommands\z@\tracingstats\z@
36   \tracingpages\z@\tracingoutput\z@\tracinglostchars\@ne
37   \tracingmacros\z@\tracingparagraphs\z@\tracingrestores\z@
38   \showboxbreadth5\showboxdepth3\relax %\errorstopmode
39 }%
40 \newcommand\traceoutput{%
41   \appdef\@resetactivechars{\showoutput}%
42 }%
```

## 5.2 Boolean Control

We introduce just enough of the Boolean calculus for  $\text{\TeX}$ . Alan Jeffrey was the pioneer here, with an article in TUGboat (Vol. 11, No. 2, page 237). This implementation owes a debt to William Baxter ([web@superscript.com](mailto:web@superscript.com)). See articles by Baxter and Ogawa in the proceedings of the 1994 TUG meeting.

`\prepdef` Provide the capability of performing head- and tail patches. The procedure `\prepdef` prepends to the given macro the tokens specified in its second argument. Likewise for `\appdef`, except that it appends. Note that the first 10 toks registers are utility registers, and we simply make a control sequence name, `\toks@ii`, for one of them.

```
43 \def\prepdef#1#2{%
44   \@ifxundefined#1{\toks@{}}{\toks@\expandafter{#1}}%
45   \toks@ii{#2}%
46   \edef#1{\the\toks@ii\the\toks@}%
47 }%
48 \def\appdef#1#2{%
49   \@ifxundefined#1{\toks@{}}{\toks@\expandafter{#1}}%
50   \toks@ii{#2}%
51   \edef#1{\the\toks@\the\toks@ii}%
52 }%
53 \def\gappdef#1#2{%
```



```

54 \@ifxundefined#1{\toks@{}}{\toks@\expandafter{#1}}%
55 \toks@ii{#2}%
56 \global\edef#1{\the\toks@\the\toks@ii}%
57}%
58\def\appdef@val#1#2{%
59 \appdef#1{#2}%
60}%
61\def\appdef@e#1#2{%
62 \expandafter\appdef
63 \expandafter#1%
64 \expandafter{#2}%
65}%
66\def\appdef@eval#1#2{%
67 \expandafter\appdef@val
68 \expandafter#1%
69 \expandafter{#2}%
70}%
71\toksdef\toks@ii=\tw@

```

\@ifxundefined Certain utility procedures use \@ifxundefined, which is defined here in terms of  
 \@ifnotrelax \@ifx. Others use \@ifnotrelax, namely when the control sequence name is man-  
 \@argswap ufactured by the use of \csname.  
 \@argswap@val

The procedures \@argswapand \@argswap@valare used to facilitate control of expansion.

```

72\long\def\@ifxundefined#1{\@ifx{\undefined#1}}%
73\long\def\@ifnotrelax#1#2#3{\@ifx{\relax#1}{#3}{#2}}%
74\long\def\@argswap#1#2{#2#1}%
75\long\def\@argswap@val#1#2{#2{#1}}%
76\def\@ifxundefined@cs#1{\expandafter\@ifx\expandafter{\csname#1\endcsname\relax}}%

```

\@boolean In order to define \@ifx, we first must create the “defining word” (term taken from our  
 \@boole@def Forth vocabulary) \@boole@def, which employs \@boolean to do its job.

```

77\def\@boolean#1#2{%
78 \long\def#1{%
79   #2% \if<something>
80   \expandafter\boolean@true
81   \else
82   \expandafter\boolean@false
83   \fi
84 }%
85}%
86\def\@boole@def#1#\@boolean{#1}% Implicit #2

```

\@booleantrue The procedures \@booleantrue and \@booleanfalse are assignment operators  
 \@booleanfalse for Boolean flags.

```

87\def\@booleantrue#1{\let#1\boolean@true}%
88\def\@booleanfalse#1{\let#1\boolean@false}%

```

\@ifx We can now invoke the defining word to create the procedures \@ifx and friends.

```

\@ifx@empty
\@ifempty
\@ifnum
\@ifodd
\@ifdim
\@ifvoid
\@ifhmode
\@ifvmode

```

```

89 \@boole@def\@ifx#1{\ifx#1}%
90 \@boole@def\@ifx@empty#1{\ifx\@empty#1}%
91 \@boole@def\@ifempty#1{\if!#1!}%
92 \@boole@def\@ifsw#1{\csname if#1\endcsname}%
93 \@boole@def\@ifnum#1{\ifnum#1}%
94 \@boole@def\@ifodd#1{\ifodd#1}%
95 \@boole@def\@ifdim#1{\ifdim#1}%
96 \@boole@def\@ifvoid#1{\ifvoid#1}%
97 \@boole@def\@ifhmode{\ifhmode}%
98 \@boole@def\@ifvmode{\ifvmode}%

```

`\boolean@true` `\boolean@false` Note that when a Boolean operator expands, it employs two macros that act as selectors, defined here.

```

99 \long\def\boolean@true#1#2{#1}%
100 \long\def\boolean@false#1#2{#2}%

```

### 5.3 Begin Document Structure

The standard  $\text{\LaTeX}$  mechanism `\AtBeginDocument` is inadequate because the `\vsize` is bound much too early. We supply here a mechanism whereby decisions about the page layout can be deferred until `\AtBeginDocument` time.

The problem we are working around is that the `\AtBeginDocument` hook in `\document` appears long after the calculation of `\vsize` and `\hsize`, that is,  $\text{\LaTeX}$  provides no mechanism for deferring the decision about the page grid until `\AtBeginDocument` time. We fix things by prepending a hook at the very beginning of `\document`.

The price we pay for this facility is to depend on the stability of this part of  $\text{\LaTeX}$ 's kernel code (the first token of `\document`), which could change, you see. But considering that  $\text{\LaTeX}$  is at this point essentially stagnant again, we risk it.

`\document` We begin by installing hooks into `\document` that we will manage ourselves. First we do as `\document` does: end the group begun by `\begin`. Last, we conclude our shenanigans by absorbing the first token of the expansion of `\document`, which we assume to be `\endgroup`.

```

101 \prepdef\document{%
102 \endgroup
103 \set@typesize@hook
104 \normalsize
105 \set@pica@hook
106 \boolean@true{ }%
107 }%

```

`\set@typesize@hook` `\set@pica@hook` The macros `\set@typesize@hook` and `\set@pica@hook` provide everything we need. To use, simply `\appdef` your tokens to the appropriate hook.

```

108 \def\set@typesize@hook{ }%
109 \def\set@pica@hook{ }%

```

## 5.4 Display Math

`\eqnarray@broken` Team L<sup>A</sup>T<sub>E</sub>X will never repair Leslie's broken definition of `eqnarray`. Let us be bold...

`\eqnarray@flegn@fixed`

```

110 \def\eqnarray@broken{%
111   \stepcounter{equation}%
112   \def\@currentlabel{\p@equation\theequation}%
113   \global\@eqnswtrue
114   \math
115   \global\@eqcnt\z@
116   \tabskip\@centering
117   \let\\\@eqnocr
118   $$\everycr{}\halign to\displaywidth\bgroup
119     \hskip\@centering$\displaystyle\tabskip\z@skip{##}$\@eqnse
120     &\global\@eqcnt\@ne\hskip \tw@\arraycolsep \hfil{##}$\hfil
121     &\global\@eqcnt\tw@ \hskip \tw@\arraycolsep
122     $\displaystyle{##}$\hfil\tabskip\@centering
123     &\global\@eqcnt\thr@@ \hb@xt@\z@\bgroup\hss##\egroup
124     \tabskip\z@skip
125   \cr
126 }
127 \long\def\eqnarray@flegn@fixed{%
128   \stepcounter{equation}\def\@currentlabel{\p@equation\theequation}%
129   \global\@eqnswtrue\math\global\@eqcnt\z@
130   \tabskip\mathindent
131   \let\=\@eqnocr
132   \setlength\abovedisplayskip{\topsep}%
133   \ifvmode\addtolength\abovedisplayskip{\partopsep}\fi
134   \addtolength\abovedisplayskip{\parskip}%
135   \setlength\belowdisplayskip{\abovedisplayskip}%
136   \setlength\belowdisplayshortskip{\abovedisplayskip}%
137   \setlength\abovedisplayshortskip{\abovedisplayskip}%
138   $$%
139   \everycr{}%
140   \halign to\linewidth\bgroup
141     \hskip\@centering$\displaystyle\tabskip\z@skip{##}$\@eqnse
142     &\global\@eqcnt\@ne
143     \hskip\tw@\eqncolsep
144     \hfil$ {{}} ## {{}} $\hfil
145     &\global\@eqcnt\tw@
146     \hskip\tw@\eqncolsep
147     $\displaystyle{##}$\hfil\tabskip\@centering
148     &\global\@eqcnt\thr@@\hb@xt@\z@\bgroup\hss##\egroup
149     \tabskip\z@skip
150   \cr
151 }%
152 \ifx{\eqnarray\eqnarray@broken}{%
153   \expandafter\PackageInfo\expandafter{\class@name}%
154   {Repairing broken {eqnarray} definition}%
155   \let\eqnarray\eqnarray@flegn@fixed
156   \newlength\eqncolsep

```

```

157 \setlength\eqncolsep\z@
158 \let\eqnarray@broken\relax
159 \let\eqnarray@fleqn@fixed\relax
160 }{}%
161 \def\mathindent{\@centering}%
162 \def\set@eqnarray@skips{}%

```

## 5.5 Floats

### 5.5.1 Usage notes

We extend the  $\LaTeX$  kernel for three purposes:

1. When the `\footnote` command is used within the scope of a float, we do as `minipage` does.
2. We provide a mechanism to write floats out to an external stream for temporary storage (deferred floats).
3. We provide mechanism for placing a float here invariably, that is, floats are un-floated. This mechanism is used to read the external stream mentioned above.

To use these mechanisms, the document class should define a float, say, `figure` as per usual, and in addition:

1. Optionally define an alternative, say `figure@write` as follows:

```

%\newenvironment{figure@write}{%
% \write@float{figure}%
%}{%
% \endwrite@float
%}%
%
```

That is, the alternative environment executes `\write@float` instead of `\@float`. Note that this step is not needed if the float environment is defined in the simple way of `classes.dtx`. However, an environment like `longtable` will require it.

2. Install into `\AtBeginDocument` a call to `\do@if@floats`, with the float name and an appropriate file extension as its arguments.

```

%\AtBeginDocument{\do@if@floats{figure}{.fgx}}%
%
```

3. Optionally define a text entity `\figuresname` that will be the text of the head that is set over the deferred floats. If not defined, there will be no head.
4. Optionally define a user-level command to allow the document to determine where the figures are printed out (default is to print at end of document). E.g.,

```
%\newcommand\printfigures{\print@float{figure}}%
%
```

5. Install into `\AtEndDocument` a call to `\printfigures`, or, if the latter is not defined, as follows:

```
%\AtEndDocument{\print@float{figure}}%
%
```

Note that installing this command into `\AtBeginDocument` is best done earlier than calls that assume the last page of the document is at hand.

### 5.5.2 Footnotes within floats, unfloating floats, float font

`\caption` DPC: Er a bit of a hack, but seems best way of supporting normal  $\text{\LaTeX}$  syntax at this point: If a caption is used below a table, then put out the footnotes before the caption.

```
163 \AtBeginDocument{%
164   \prepdef\caption{\minipagefootnotes}%
165 }%
```

`\minipagefootnotes` Procedure to spew the footnotes accumulated within a minipage environment.

```
166 \def\minipagefootnotes{%
167   \par
168   \ifvoid\@mpfootins\else
169 %     \unskip
170 %     \vskip\skip\@mpfootins
171   \unvbox\@mpfootins
172   \fi}
```

`\floats@sw` The Boolean `\floats@sw` signifies that floats are to be floated; if false, that floats are to be deferred to the end of the document. Note that the state of this Boolean is to be changed by the document class in response to user-selected options. Here we display model code that assigns a default value at `\AtBeginDocument` time.

```
%\AtBeginDocument{%
% \ifxundefined\floats@sw{\@booleantrue\floats@sw}{}%
%}%
%
```

`\@xfloat` The float start-code is redefined to set up footnotes in the style of minipage. Also, the  
`\@mpmakefntext` `\floats@sw` Boolean informs us that floats are to be all placed here. Note that, to protect against the Boolean being undefined at this late hour, we default it globally to true.

DPC: setting `\if@twocolumn` flag just to prompt the float not to float. (probably should add new explicit flag)

```
173 \let\REVTEX@xfloat\@xfloat
174 \def\@xfloat#1[#2]{%
175   \par
```

```

176 \let\footnote\REVTEX@footnote
177 \def\@mpfn{mpfootnote}%
178 \def\thempfn{\thempfootnote}%
179 \c@mpfootnote\z@
180 \let\@footnotetext\@mpfootnotetext
181 \let\@makefnmark\@mpmakefnmark
182 \@ifxundefined\floats@sw{\global\@booleantrue\floats@sw}{}%
183 \floats@sw{%
184 \REVTEX@xfloat#1[#2]%
185 }{%
186 \def\@capttype{#1}%
187 \addvspace\intextsep
188 \vbox\bgroup
189 \def\end@float{%
190 \minipagefootnotes
191 \par\vskip\z@skip %% \par\vskip\z@ added 15 Dec 87
192 \egroup
193 \par
194 \addvspace\intextsep
195 }%
196 }%
197 }%
198 \def\@mpmakefnmark#1{%
199 \parindent=1em
200 \noindent
201 \hb@xt@1em{\hss\@makefnmark}%
202 #1%
203 }%

```

`\end@float` If you get to the end of the float and still have pending footnotes, put them out now.

```
204 \prepdef\end@float{\minipagefootnotes}%
```

### 5.5.3 Writing floats out to a file

`\do@if@floats` The procedure `\do@if@floats` should be executed at `\AtBeginDocument` time, and arranges to write out the floats of the given class to a temporary file, to be read back later (deferred floats), given that `\floats@sw` is false. Note that, to protect against the Boolean being undefined at this late hour, we default it globally to true.

```

205 \def\do@if@floats#1#2{%
206 \@ifxundefined\floats@sw{\global\@booleantrue\floats@sw}{}%
207 \floats@sw}{}%

```

Open the stream to save out the document's floats of this class.

```

208 \expandafter\newwrite
209 \csname#1write\endcsname
210 \expandafter\def
211 \csname#1@stream\endcsname{\jobname#2}%
212 \expandafter\immediate
213 \expandafter\openout

```

```

214             \csname#1write\endcsname
215             \csname#1@stream\endcsname\relax

```

Swap environments. If the class writer has defined, e.g., `figure@write`, then we use this as the procedure to execute for writing the float out to the external stream. Otherwise, the replacement of `\@float` by `\write@float` should do the right thing for float environments defined in the simple way of `classes.dtx`.

```

216 \ifxundefined\REVTEX@float{%
217   \let\REVTEX@float\@float
218   \let\REVTEX@dblfloat\@dblfloat
219   \let\@float\write@float
220   \let\@dblfloat\write@floats
221 }{}%
222 \let@environment{#1@float}{#1}%
223 \let@environment{#1@floats}{#1*}%
224 \ifxundefined@cs{#1write}{}{}%
225   \let@environment{#1}{#1write}%
226 }%
227 }%
228 }%

```

`\print@float` The procedure `\print@float` prints out the deferred floats.

```

229 \def\print@float#1{%
230   \ifxundefined@cs{#1write}{}{}%
231   \begingroup
232 %   \c@secnumdepth-\maxdimen
233   \ifxundefined@cs{#1sname}{}{}%
234     \expandafter\section
235     \expandafter*%
236     \expandafter{%
237       \csname#1sname\endcsname
238     }%
239   }%
240   \raggedbottom
241   \let\@float\REVTEX@float
242   \let\@dblfloat\REVTEX@dblfloat
243   \let@environment{#1}{#1@float}%
244   \let@environment{#1*}{#1@floats}%
245   \expandafter\immediate
246   \expandafter\closeout
247     \csname#1write\endcsname
248   \input{\csname#1@stream\endcsname}%
249   \endgroup
250   \expandafter\let\csname#1write\endcsname\relax
251 }%
252 }%

```

`\write@float` Handles the case where the name of the float is the same as that of the stream. Note  
`\write@floats` that `longtable` does *not* fit this case. Note also: `\write@float` is *not* a user-level  
`\write@@float` environment therefore it is properly not defined with `\newenvironment`.

```

253 \def\write@float#1{\write@@float{#1}{#1}}%
254 \def\endwrite@float{\@Esphack}%
255 \def\write@floats#1{\write@@float{#1*}{#1}}%
256 \def\endwrite@floats{\@Esphack}%

```

\write@@float

```

257 \def\write@@float#1#2{%
258   \ifhmode
259     \@bsphack
260   \fi
261   \chardef\@tempc\csname#2write\endcsname
262   \toks@{\begin{#1}}%
263   \def\@tempb{#1}%
264   \expandafter\let\csname end#1\endcsname\endwrite@float
265   \catcode'\^M\active
266   \@makeother\{\@makeother\}\@makeother\%
267   \write@floatline
268 }%

```

\write@floatline    The procedure \write@floatline only parses, and passes its result to \@write@floatline,  
 \@write@floatline    which writes the line to output, then tests the line for the \end{<float>} tokens with  
 \float@end@tag    aid of the \float@end@tag procedure.

```

269 \begingroup
270 \catcode'\[\the\catcode'\{\catcode'\]\the\catcode'\}\@makeother\{\@makeother\}%
271 \gdef\float@end@tag#1\end{#2}#3@nul[%
272   \def\@tempa[#2]%
273   \ifx[\@tempa\@tempb][\end{#2}][\write@floatline]%
274 ]%
275 \obeylines%
276 \gdef\write@floatline#1^M[%
277   \begingroup%
278   \newlinechar'\^M%
279   \toks@\expandafter[\the\toks@#1]\immediate\write\@tempc[\the\toks@]%
280   \endgroup%
281   \toks@[]%
282   \float@end@tag#1\end{}\@nul%
283 ]%
284 \endgroup

```

## 5.6 Counters

The following definitions override those of the  $\text{\LaTeX}$  kernel, providing for a greater range of inputs.

```

285 \def\@alph#1{\ifcase#1\or a\or b\or c\or d\else\@ialph{#1}\fi}
286 \def\@ialph#1{\ifcase#1\or \or \or \or \or e\or f\or g\or h\or i\or j\or
287   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
288   y\or z\or aa\or bb\or cc\or dd\or ee\or ff\or gg\or hh\or ii\or jj\or
289   kk\or ll\or mm\or nn\or oo\or pp\or qq\or rr\or ss\or tt\or uu\or
290   vv\or ww\or xx\or yy\or zz\else\@ctrerr\fi}

```



```

291 \def\@fnsymbol#1{\ensuremath{\ifcase#1\or *\or \dagger\or \ddagger\or
292 \mathchar "278\or **\or \dagger\dagger
293 \or \ddagger\ddagger \or \mathsection \mathsection\or
294 *{ }*\or\dagger\dagger\dagger\or\ddagger\ddagger\ddagger\or
295 \mathsection \mathsection \mathsection
296 \else\@ctrerr\fi}}

```

## 5.7 Customization of Sections

Patch the standard L<sup>A</sup>T<sub>E</sub>X sectioning procedure to:

- Allow a sectioning command to trigger the title page, or more generally to recognize that it is the first object in the document, so we headpatch `\@startsection`.
- Allow a tail command in #6 to uppercase the title, so we retain DPC's braces.
- Allow each type of sectioning command to format its number differently, so we generalize `\@secntformat`.
- Allow each type of sectioning command to format its argument differently, so we generalize `\@hangfrom`.
- Allow the starred form of the command to mark (the running head) and make an entry in the TOC, so we put `\@ssect` on the same footing as `\@sect`.

Note that the tokens passed to the TOC now are *not* the optional argument of the command, but the required. This means that the user can no longer use the former to put variant content in to the TOC as the Manual says.

Instead, the optional argument is used to put an alternative title into the running headers, a better choice.

`\@startsection` Patch a head hook into the basic sectioning command. Treat `\@sect` and `\@ssect` on an equal footing: now their pattern parts are identical.

```

297 \def\@startsection#1#2#3#4#5#6{%
298 \startsection@hook
299 \if@noskipsec \leavevmode \fi
300 \par
301 \@tempskipa #4\relax
302 \@afterindenttrue
303 \ifdim \@tempskipa <\z@
304 \@tempskipa -\@tempskipa \@afterindentfalse
305 \fi
306 \if@nobreak
307 \everypar{}%
308 \else
309 \addpenalty\@secpenalty\addvspace\@tempskipa
310 \fi
311 \ifstar
312 {\@dblarg{\@ssect{#1}{#2}{#3}{#4}{#5}{#6}}}%
313 {\@dblarg{\@sect {#1}{#2}{#3}{#4}{#5}{#6}}}%

```

```

314 }%
315 \def\@startsection@hook{}%

\@sect When defining \@svsec, do not expand \@secntformat. Put brace characters back
       where they were before David Carlisle got at them (i.e., as if \@hangfrom had two
       arguments). Protect the mark mechanism from an undefined meaning. Pass #8 to the
       TOC instead of #7. Remove \relax from the replacement part of \@svsec.
       The procedure \@hangfrom and \@runin@to can be used to process the argu-
       ment of the head. The head can define, e.g., \@hangfrom@section, to do its own
       processing.
316 \REVTeX@info
317 {Repairing broken definition of \string\@sect.}%
318 \def\@sect#1#2#3#4#5#6[#7]#8{%
319   \@ifnum{#2>\c@secnumdepth}{%
320     \let\@svsec\@empty
321   }{%
322     \refstepcounter{#1}%
323     \protected@edef\@svsec{{#1}}%
324     \@ifundefined{@#1cntformat}{%
325       \prepdef\@svsec\@secntformat
326     }{%
327       \expandafter\prepdef
328       \expandafter\@svsec
329       \csname @#1cntformat\endcsname
330     }%
331   }%
332   \@tempskipa #5\relax
333   \@ifdim{\@tempskipa>\z@}{%
334     \begingroup
335       \interlinepenalty \@M
336       #6{%
337         \@ifundefined{@hangfrom@#1}{\@hangfrom}{\csname @hangfrom@#1\endcsname}%
338         {\hskip#3\relax\@svsec}{#8}%
339       }%
340       \@@par
341     \endgroup
342     \@ifundefined{#1mark}{\@gobble}{\csname #1mark\endcsname}{#7}%
343     \addcontentsline{toc}{#1}{%
344       \ifnum #2>\c@secnumdepth \else
345         \protect\numberline{\csname the#1\endcsname}%
346       \fi
347       #8}%
348   }{%
349     \def\@svsechd{%
350       #6{%
351         \@ifundefined{@runin@to@#1}{\@runin@to}{\csname @runin@to@#1\endcsname}%
352         {\hskip#3\relax\@svsec}{#8}%
353       }%
354       \@ifundefined{#1mark}{\@gobble}{\csname #1mark\endcsname}{#7}%

```

```

355     \addcontentsline{toc}{#1}{%
356       \ifnum #2>\c@secnumdepth \else
357         \protect\numberline{\csname the#1\endcsname}%
358       \fi
359       #8}%
360   }%
361 }%
362 \@xsect{#5}%
363 }%
364 \def\@runin@to#1#2{#1#2}%

```

\@ssect Put brace characters back where they were before David Carlisle got at them (as if \@hangfrom has two arguments). Possibly set a mark. Make a TOC entry.

```

365 \REVTEX@info
366 {Repairing broken definition of \string\@ssect.}%
367 \def\@ssect#1#2#3#4#5#6[#7]#8{%
368   \@tempskipa #5\relax
369   \@ifdim{\@tempskipa>\z@}{%
370     \begingroup
371       \interlinepenalty \@M
372       #6{%
373         \@ifundefined{@hangfroms@#1}{\@hangfrom}{\csname @hangfroms@#1\endcsname}%
374         {\hskip#3\relax}{#8}%
375       }%
376       \@@par
377     \endgroup
378     \@ifundefined{#1smark}{\@gobble}{\csname #1smark\endcsname}{#7}%
379     \addcontentsline{toc}{#1}{#8}%
380   }{%
381     \def\@svsechd{%
382       #6{%
383         \@ifundefined{@runin@tos@#1}{\@runin@to}{\csname @runin@tos@#1\endcsname}%
384         {\hskip#3\relax}{#8}%
385       }%
386       \@ifundefined{#1smark}{\@gobble}{\csname #1smark\endcsname}{#7}%
387       \addcontentsline{toc}{#1}{#8}%
388     }%
389   }%
390   \@xsect{#5}%
391 }%

```

\sec@upcase Upper case for sections (optional upper case items). These are created so that some headings can be toggled between mixed case and upper case readily. Headings that might be changed can be wrapped in the style file in \sec@upcase{<text>} constructs; the expansion of \sec@upcase is controlled here. It is \relax by default (mixed case heads), and can easily be changed to \uppercase if desired. If mixed-case headings are wanted by the editor, authors *must* supply mixed case text, although this is what authors should be doing anyway. (Mixed can be converted to upper, but the reverse transformation cannot be automated.)

The following setting gives the L<sup>A</sup>T<sub>E</sub>X default.

```
392 \def\sec@upcase#1{\relax{#1}}%
```

## 5.8 Patch the `tabular` and `array` Environments

`\AtBeginDocument` We headpatch the begin processing and tailpatch the end processing of the `tabular` and `array` environments. A document class can define these hooks as needed.

We assume that the pattern part of `\@array` remains unchanged from that of the L<sup>A</sup>T<sub>E</sub>X kernel. This is true if the `array` package is loaded. However, our patches will not necessarily be effective for other packages that replace the L<sup>A</sup>T<sub>E</sub>X `array` and `tabular` environments.

```
393 \AtBeginDocument{%
394 % \toks@\expandafter{\@array}%
395 % \edef\@array@junk[####1]####2{%
396 % \the\toks@
397 % \noexpand\@array@sw
398 % \noexpand\array@hook
399 % \noexpand\tabular@hook
400 % }%
401 \prepdef\endtabular{\endtabular@hook}%
402 \prepdef\endarray{\endarray@hook}%
403 \providecommand\array@hook{}%
404 \@ifxundefined\endarray@hook{\let\endarray@hook\@empty}{}%
405 \providecommand\tabular@hook{}%
406 \@ifxundefined\endtabular@hook{\let\endtabular@hook\@empty}{}%
407 \@ifpackageloaded{array}{%
408 \let\@array@sw\@array@sw@array
409 }{%
410 \let\@array@sw\@array@sw@LaTeX
411 }%
412 }%
413 \def\@array@sw@LaTeX{\@ifx{\@tabularcr}}%
414 \def\@array@sw@array{\@ifx{\dollarbegin\begin\group}}%
```

`\@tabular` Install, effectively, a head patch to `\tabular`.

```
415 \prepdef\@tabular{\tabular@font}%
```

## 5.9 Syntax

`\@gobble@opt@one` The `\@gobble@opt@one` command eats up an optional argument and one required argument.

```
416 \newcommand*\@gobble@opt@one[2]{}%
```

## 5.10 Auto-indented Contents

Facility to automatically determine the proper indentation of the TOC entries.

Note: `hyperref` compatibility demands respecting that `\contentslinenow` has a 4th argument. So, instead of trying to override the meaning of `\contentsline`, we use the aux file to remember max values from one run to the next.

`\@starttoc` Install hooks at beginning and end of the TOC processing.

```
417 \def\@starttoc#1{%
418   \begingroup
419     \toc@pre
420     \makeatletter
421     \@input{\jobname.#1}%
422     \if@filesw
423       \expandafter\newwrite\csname tf@#1\endcsname
424       \immediate\openout \csname tf@#1\endcsname \jobname.#1\relax
425     \fi
426     \@nobreakfalse
427     \toc@post
428   \endgroup
429 }%
430 \def\toc@pre{}%
431 \def\toc@post{}%
```

`\toc@@font` Interface for setting the formatting characteristics of this part of the TOC.

Note: `\toc@@font` is the common font for all auto-sizing toc commands, although this, too, could become a dispatcher.

```
432 \def\toc@@font{}%{\footnotesize\rmfamily}%
433 \def\@dotsep{\z@}{5.5pt}%
```

`\l@section` Interface for determining which TOC elements are automatically indented.

All of the `\l@...` commands simply go through the bottleproc `\l@sections`. The calling convention is to pass the name of self and the name of parent. If you want to exclude any of these from the indentation scheme, simply leave the `\l@...` command undefined.

Note that the parent of “section” is nil, so we have to define a stub.

```
%\def\l@section{%
% \l@sections{}{section}% Implicit #3#4
%}%
%\def\tocleft@{\z@}%
%\def\l@subsection{%
% \l@sections{section}{subsection}% Implicit #3#4
%}%
%\def\l@subsubsection{%
% \l@sections{subsection}{subsubsection}% Implicit #3#4
%}%
%\def\l@paragraph{%
% \l@sections{subsubsection}{paragraph}% Implicit #3#4
%}%
%\def\l@subparagraph#1#2{%
% \l@sections{paragraph}{subparagraph}% Implicit #3#4
```

```
%}%
%
```

Glom some \dimen registers.

```
434 \let\tocdim@section \leftmargini
435 \let\tocdim@subsection \leftmarginii
436 \let\tocdim@subsubsection \leftmarginiii
437 \let\tocdim@paragraph \leftmarginiv
438 \let\tocdim@appendix \leftmarginv
439 \let\tocdim@pagenum \leftmarginvi
```

\toc@pre@auto We patch \@starttoc to: 1) before TOC processing, initialize the max registers and  
\toc@post@auto set the needed dimensions from the values stored in the auxiliary file, and 2) after TOC  
processing, store out those max register values into the auxiliary file.

Note that the font is set here: all other TOC entries must override these font settings.

To activate this override of the standard L<sup>A</sup>T<sub>E</sub>X processing, the substyle does:

\let\toc@pre\toc@pre@auto and \let\toc@post\toc@post@auto.

```
440 \def\toc@pre@auto{%
441   \toc@@font
442   \@tempdima\z@
443   \toc@setindent\@tempdima{section}%
444   \toc@setindent\@tempdima{subsection}%
445   \toc@setindent\@tempdima{subsubsection}%
446   \toc@setindent\@tempdima{paragraph}%
447   \toc@letdimen{appendix}%
448   \toc@letdimen{pagenum}%
449 }%
450 \def\toc@post@auto{%
451   \if@filesw
452     \begingroup
453       \toc@writedimen{section}%
454       \toc@writedimen{subsection}%
455       \toc@writedimen{subsubsection}%
456       \toc@writedimen{paragraph}%
457       \toc@writedimen{appendix}%
458       \toc@writedimen{pagenum}%
459     \endgroup
460   \fi
461 }%
```

\toc@setindent

```
462 \def\toc@setindent#1#2{%
463   \csname tocdim@#2\endcsname\z@
464   \@ifundefined{tocmax@#2}{\@namedef{tocmax@#2}{\z@}}{}%
465   \advance#1\@nameuse{tocmax@#2}\relax
466   \expandafter\edef\csname toclef@#2\endcsname{\the#1}%
467 }%
```

\toc@letdimen

```

468 \def\toc@letdimen#1{%
469 \csname tocdim@#1\endcsname\z@
470 \@ifundefined{tocmax@#1}{\@namedef{tocmax@#1}{\z@}}{}%
471 \expandafter\let\csname tocleft@#1\expandafter\endcsname\csname tocmax@#1\endcsname
472 }%

```

\toc@writedimen

```

473 \def\toc@writedimen#1{%
474 \immediate\write\@auxout{%
475 \gdef\expandafter\string\csname tocmax@#1\endcsname{%
476 \expandafter\the\csname tocdim@#1\endcsname
477 }%
478 }%
479 }%

```

\l@@sections The procedure for formatting the indented TOC entries. We use control sequence names such as \tocmax@section and \tocleft@section, the former being written to the auxiliary file and the latter only defined for the duration of the TOC processing.

Note that the assignment of \box\z@ must endure over the invocation of #3.

```

480 \def\l@@sections#1#2#3#4{%
481 % #1 - superior section
482 % #2 - this section
483 % #3 - content, including possible \numberline
484 % #4 - page number
485 \expandafter\let\expandafter\dimen@temp\csname tocdim@#2\endcsname
486 \setbox\z@\hbox{\ignorespaces#4}\ifdim\tocdim@pagenum<\wd\z@\tocdim@pagenum\wd\z@
487 \begingroup
488 \everypar{}%
489 \leftskip\csname tocleft@#2\endcsname\relax
490 \parindent-\leftskip\advance\parindent\csname tocleft@#1\endcsname\relax
491 \rightskip\tocleft@pagenum plus 1fil\relax
492 \skip@parfillskip\parfillskip\z@
493 \let\numberline\numberline@@sections
494 \ignorespaces#3\unskip\nobreak\hskip\skip@
495 \hb@xt@\rightskip{\hfil\unhbox\z@}\hskip-\rightskip\hskip\z@skip
496 \par
497 \aftergroup\dimen@temp
498 \expandafter
499 \endgroup\the\dimen@temp\relax
500 }%

```

\numberline@@sections The bottleproc for all \numberline processing in indented TOC entries. The first argument is self.

```

501 \def\numberline@@sections#1{%
502 \leavevmode\hb@xt@-\parindent{%
503 \aftergroup\dimen@temp
504 \hfil
505 \setbox\z@\hbox{#1.\kern\@dotsep}\dimen@wd\z@
506 \unhbox\z@

```

```

507 \@@ifdim{\dimen@<\dimen@temp}{\dimen@\dimen@temp}{}%
508 \expandafter
509 }\the\dimen@\relax
510 \ignorespaces
511 }%

```

## 6 Options

### 6.1 Define Booleans Used in Options

The following Booleans are used within the document class to allow the document or the substyle to make selections of formatting. Because an explicit document class option always overrides a substyle, any substyle wishing to assign a value to a flag must first test the flag to confirm that it is still undefined. This further means that the default value of the flag must be assigned late, at the end of `\AtBeginDocument` time, and that the flag may be queried no earlier than that time.

`\twocolumn@sw` The boolean `\twocolumn@sw` signifies that we are to use a two-column grid, the  
`\multicol@sw` boolean `\multicol@sw` that we are to use the `multicol` package for this purpose.

```

512 \AtBeginDocument{%
513 \@@ifxundefined\twocolumn@sw{\@booleanfalse\twocolumn@sw}{}%
514 \@@ifxundefined\multicol@sw{\@booleanfalse\multicol@sw}{}%
515 }%

```

`\footinbib@sw` The boolean `\footinbib@sw` signifies that footnotes are to be set in the bibliography, as endnotes.

```

516 \AtBeginDocument{%
517 \@@ifxundefined\footinbib@sw{\@booleanfalse\footinbib@sw}{}%
518 }%

```

`\preprintsty@sw` The boolean `\preprintsty@sw` signifies that the document is to be formatted in preprint style.

```

519 \AtBeginDocument{%
520 \@@ifxundefined\preprintsty@sw{\@booleanfalse\preprintsty@sw}{}%
521 }%

```

`\galley@sw` The boolean `\galley@sw` signifies that the document is to be formatted in galley style. Asserting both `\galley@sw` and `\preprintsty@sw` may produce strange formatting results, but it is not illegal. However, it *is* illegal to assert galley and any twocolumn option.

```

522 \AtBeginDocument{%
523 \@@ifxundefined\galley@sw{\@booleanfalse\galley@sw}{}%
524 }%

```

`\groupauthors@sw` The flag `\groupauthors@sw` signifies that authors are to be grouped. This affects the meaning of `\@author@present` and `\@tempaffil`.



`\runinaddress@sw` The flag `\runinaddress@sw` signifies that author addresses are to be run in.

`\@affils@sw` If `\@affils@sw` is false, an address is never recognised as “new” and is therefore always entered into the affiliation list, stopping groups of authors at the same address being amalgamated into the same list: the address will be printed the same number of times it is entered.

`\showPACS@sw` If `\showPACS@sw` is true, print the PACS information in the title block, otherwise not.

```

525 \AtBeginDocument{%
526 \@ifxundefined\showPACS@sw{\@booleanfalse\showPACS@sw}{}%
527}%

```

`\floats@sw` The Boolean `\floats@sw` signifies that floats are to be floated; if false, that floats are to be deferred to the end of the document. By default, the former. Note that the state of this Boolean is to be changed by the document class in response to user-selected options. The default is established here.

`\twoside@sw` The flag `\twoside@sw` signifies that the document is to be formatted for duplex printing. At `\AtBeginDocument` time, we must align the value of the kernel `\newif` switch `\if@twoside` to that of `\twoside@sw`.

```

528 \AtBeginDocument{%
529 \@ifxundefined\twoside@sw{\@booleanfalse\twoside@sw}{}%
530 \twoside@sw{\@twosidettrue}{\@twosidefalse}%
531}%

```

`\draft@sw` The flag `\draft@sw` signifies that the document is to be formatted in draft mode. Certain packages may pay attention to the class option `draft` that sets this Boolean.

```

532 \AtBeginDocument{%
533 \@ifxundefined\draft@sw{\@booleanfalse\draft@sw}{}%
534 \draft@sw{\overfullrule 5\p@}{\overfullrule\z@}%
535}%

```

`\tightenlines@sw` The boolean `\tightenlines@sw` signifies that the leading is to be made standard amount. If false, it means that the leading is to be set extra open. Has no effect on 10pt size option.

```

536 \AtBeginDocument{%
537 \@ifxundefined\tightenlines@sw{\@booleanfalse\tightenlines@sw}{}%
538}%

```

`\lengthcheck@sw` The flag `\lengthcheck@sw` signifies that the length checking is in effect. It is up to the individual journal substyle to alter its formatting accordingly.

```

539 \AtBeginDocument{%
540 \@ifxundefined\lengthcheck@sw{\@booleanfalse\lengthcheck@sw}{}%
541}%

```

`\eqsecnum@sw` The flag `\eqsecnum@sw` signifies that equations are to be numbered with the section, e.g., “Eq. (2.13)”. This flag is neither set nor queried.

```

542 \AtBeginDocument{%

```

```

543 \ifxundefined\eqsecnum@sw{\@booleanfalse\eqsecnum@sw}{}%
544 \eqsecnum@sw{%
545   \@addtoreset{equation}{section}%
546   \def\theequation@prefix{\thesection.}%
547   {}%
548 }%

```

`\byrevtex@sw` The flag `\byrevtex@sw` signifies that the document should bear an imprint to the effect that it was formatted by this document class.

```

549 \AtBeginDocument{%
550 \ifxundefined\byrevtex@sw{\@booleanfalse\byrevtex@sw}{}%
551 }%

```

## 6.2 Declare Options

### 6.2.1 Preprint Style

```

552 \DeclareOption{preprint}{%
553   \@booleantrue\preprintsty@sw
554   \def\@pointsize{12}%
555 }%
556 \DeclareOption{manuscript}{%
557   \REVTeX@warn{Document class option manuscript is obsolete; use preprint instead}%
558   \ExecuteOptions{preprint}%
559 }%

```

### 6.2.2 Showing PACS

```

560 \DeclareOption{showpacs}{%
561   \@booleantrue\showPACS@sw
562 }%
563 \DeclareOption{noshowpacs}{%
564   \@booleanfalse\showPACS@sw
565 }%

```

### 6.2.3 Hypertext Option

DPC: For Hyperpreprint, we want to load `hyperref`, but stop it making special kludges for `revtex3` which don't apply here. (Once `RevTeX 4` is released, `hyperref` can be updated to spot the difference between `revtex3` and 4, but this will not do any harm, even then.)  
 FIXME: `hyperref` should load last of all packages.

```

566 \DeclareOption{hyperref}{%
567   \AtEndOfClass{%
568     \let\REVTeX@tempa\@clsextension
569     \let\@clsextension\@empty
570     \RequirePackage{hyperref}%
571     \let\@clsextension\REVTeX@tempa
572   }%

```

If you have a hyper-foo enabled browser you may prefer this format which does not print the URL for the home page, but just makes the name a link, but by default print it so it works on paper.

```
573 \def\@pointsize{10}%
574 }%
```

#### 6.2.4 Type Size

Use \@pointsize=10 rather than \@ptsize=0 to allow easy extensions to 9pt or whatever. Note: the three alternatives are mutually exclusive. Furthermore if \@pointsize is still undefined at \@AtEndOfClass time, then the substyle can conclude that the user accepts the default.

```
575 \DeclareOption{10pt}{\def\@pointsize{10}}
576 \DeclareOption{11pt}{\def\@pointsize{11}}
577 \DeclareOption{12pt}{\def\@pointsize{12}}
```

#### 6.2.5 Media Size

```
578 \DeclareOption{a4paper}
579   {\setlength\paperheight {297mm}%
580    \setlength\paperwidth  {210mm}}
581 \DeclareOption{a5paper}
582   {\setlength\paperheight {210mm}%
583    \setlength\paperwidth  {148mm}}
584 \DeclareOption{b5paper}
585   {\setlength\paperheight {250mm}%
586    \setlength\paperwidth  {176mm}}
587 \DeclareOption{letterpaper}
588   {\setlength\paperheight {11in}%
589    \setlength\paperwidth  {8.5in}}
590 \DeclareOption{legalpaper}
591   {\setlength\paperheight {14in}%
592    \setlength\paperwidth  {8.5in}}
593 \DeclareOption{executivepaper}
594   {\setlength\paperheight {10.5in}%
595    \setlength\paperwidth  {7.25in}}
596 \DeclareOption{landscape}
597   {\setlength\@tempdima {\paperheight}%
598    \setlength\paperheight {\paperwidth}%
599    \setlength\paperwidth {\@tempdima}}
```

#### 6.2.6 Bibnotes

The default for \author@note (email, homepage) is a \footnote, the alternative, selected by this option, is a bibnote.

```
600 \DeclareOption{bibnotes}{\def\author@note{\rtx@bibnote}}%
601 \DeclareOption{nobibnotes}{\def\author@note{\footnote}}%
602 \AtBeginDocument{\@ifxundefined\author@note{\def\author@note{\footnote}}{}}%
```

### 6.2.7 Footinbib

```
603 \DeclareOption{footinbib}{\@booleantrue\footinbib@sw}
604 \DeclareOption{nofootinbib}{\@booleanfalse\footinbib@sw}
```

### 6.2.8 superbib

The document may invoke superscript bibliography style. If not, the journal substyle may make a selection. If neither, the class itself selects a default. This is really a quite deep nesting of defaults.

```
605 \DeclareOption{superbib}{%
606 \def\place@bibnumber{\place@bibnumber@sup}%
607 }%
```

### 6.2.9 Simplex/Duplex Pages

The complementary options `twoside` and `oneside` assert formatting for duplex or simplex printing, respectively. At the same time, we arrange for the selection of the page grid with respect to the marginal column: Because `\if@reversemargin` remains default (false), if duplex printing, this column will always be on the (right), if simplex printing, it will always be on the (outside). QUERY: correct choice?

```
608 \DeclareOption{twoside}{\@booleantrue\twoside@sw \mparswitchfalse}
609 \DeclareOption{oneside}{\@booleanfalse\twoside@sw \mparswitchtrue}
```

### 6.2.10 Two-Column Page Grid

Two-column formatting uses the `multicol` package, licensed from Frank Mittelbach.

`\twocolumn@sw` The flag `\twocolumn@sw` signifies that the document is to be formatted in the two-column page grid.

If no options relating to page grid are invoked by `\AtBeginDocument` time, we set default values. Up to that point, the class can check if `\twocolumn@sw` is `\undefined` to see if any related options have been invoked.

At `\AtBeginDocument` time, we must align the value of the kernel `\newif switch \if@twocolumn` to that of `\twocolumn@sw`.

At `\AtEndDocument` time, a hook is installed that, say, could return us to one-column page grid. This hook is installed as late as possible (i.e., after items like `\printtables`).

```
610 \AtBeginDocument{%
611 \ifxundefined\twocolumn@sw{%
612 \@booleanfalse\twocolumn@sw
613 }{}%
614 \twocolumn@sw{\@twocolumntrue}{\@twocolumnfalse}%
615 }%
616 \AtEndDocument{%
617 \class@enddocumenthook
618 }%
619 \AtEndOfClass{%
620 \appdef\class@enddocumenthook{%
```

```

621 \close@column
622 }%
623 \AtBeginDocument{%
624 \ifxundefined\close@column{%
625 \let\close@column\close@column@default
626 }{}%
627 }%
628 }%

```

`twocolumn` sets up `\maketitle` to start two columns using the `multicol` package. At the end of the document the `multicol` environment ends. (The fudge with `\hfuzz` just stops a spurious warning about overfull box in the output routine, which appears just to be an artifact of ending the environment in the middle of the end code for document.

```

629 \DeclareOption{twocolumn}{%
630 \@booleantrue\twocolumn@sw
631 \@booleantrue\multicol@sw
632 }%
633 \DeclareOption{twocolumngrid}{%
634 \@booleantrue\twocolumn@sw
635 \@booleanfalse\multicol@sw
636 }%

```

`onecolumn` specifies one-column page grid.

```

637 \DeclareOption{onecolumn}{%
638 \@booleanfalse\twocolumn@sw
639 }%

```

`galley` emulates setting the galley of a two-column journal. **FIXME:** this option should effectively set `\preprintsty@sw` false. **NOTE:** it makes no sense to assert both `galley` and `twocolumn`.

```

640 \DeclareOption{galley}{%
641 \ExecuteOptions{onecolumn}%
642 \@booleantrue\galley@sw
643 \appdef\set@pica@hook{%
644 \advance\textwidth-\columnsep
645 \textwidth.5\textwidth
646 }%
647 }%

```

### 6.2.11 `tightenlines`

This class option specifies that standard leading is to be used to set the type. If lacking, the leading will be loose.

```

648 \DeclareOption{tightenlines}{\@booleantrue\tightenlines@sw}

```

### 6.2.12 lengthcheck

This class option specifies that the formatted document should approach as closely as possible the formatting of an actual journal article to facilitate the author's performance of a length check.

```
649 \DeclareOption{lengthcheck}{\@booleantrue\lengthcheck@sw}
```

### 6.2.13 Draft and Final

```
650 \DeclareOption{draft}{%
651 \@booleantrue\draft@sw
652 }%
653 \DeclareOption{final}{%
654 \@booleanfalse\draft@sw
655 }%
```

### 6.2.14 eqsecnum

The eqsecnum class option signifies that equations are to be numbered within sections.

```
656 \DeclareOption{eqsecnum}{\@booleantrue\eqsecnum@sw}
```

### 6.2.15 secnumarabic

The secnumarabic class option signifies that sectioning commands are to be numbered arabic.

```
657 \DeclareOption{secnumarabic}{\@booleantrue\secnumarabic@sw}
```

The code that polls the Boolean \secnumarabic@sw appears in Section 21.2.

FIXME: model fleqn after amsfonts. I no longer understand why I said this.

```
658 \DeclareOption{fleqn}{\input{fleqn.clo}}
```

### 6.2.16 floats/endfloats

These options control, via the Boolean \floats@sw, whether floats are to be migrated to the end of the document.

```
659 \DeclareOption{floats}{\@booleantrue\floats@sw}
660 \DeclareOption{endfloats}{\@booleanfalse\floats@sw}
661 \AtBeginDocument{%
662 \@ifxundefined\floats@sw{\@booleantrue\floats@sw}{}%
663 }%
```

### 6.2.17 titlepage/notitlepage

These options control, via \titlepage@sw, whether the title block is to be set on a separate page.

\titlepage@sw The flag \titlepage@sw signifies that a forced page break is to follow the title page: the article title appears on a page by itself.

The Boolean `\titlepage@sw` is in an odd situation: its value is set by one or more substyles, contingent upon the value of another Boolean. Therefore that code must be invoked at `\AtBeginDocument` time. Therefore we must assign the default value at the very end of `\AtBeginDocument` processing: we use `\defaults@hook`. Luckily, this Boolean does not need to be queried at `\AtBeginDocument` time, or we'd be in dire straights.

```
664 \DeclareOption{titlepage}{\@booleantrue\titlepage@sw}
665 \DeclareOption{notitlepage}{\@booleanfalse\titlepage@sw}
666 \appdef\defaults@hook{%
667   \ifxundefined\titlepage@sw{\@booleanfalse\titlepage@sw}{}%
668 }%
```

### 6.2.18 Substyle and Sub-substyle

If the society has already been assigned, notify user that `\@society` is being overridden.

```
669 \def\change@society#1{%
670   \def\@tempa{#1}%
671   \ifxundefined\@society{}{%
672     \@ifx\@tempa\@society{}{%
673       \REVTeX@warn{Conflicting society \@tempa<>\@society.}%
674     }%
675   }%
676   \let\@society\@tempa
677 }%
678 \DeclareOption{aps}{\change@society{aps}\def\@journal{}}%
679 \DeclareOption{pra}{\change@society{aps}\def\@journal{pra}}%
680 \DeclareOption{prb}{\change@society{aps}\def\@journal{prb}}%
681 \DeclareOption{prc}{\change@society{aps}\def\@journal{prc}}%
682 \DeclareOption{prd}{\change@society{aps}\def\@journal{prd}}%
683 \DeclareOption{pre}{\change@society{aps}\def\@journal{pre}}%
684 \DeclareOption{prl}{\change@society{aps}\def\@journal{prl}}%
685 \DeclareOption{prstab}{\change@society{aps}\def\@journal{prstab}}%
686 \DeclareOption{rmp}{\change@society{aps}\def\@journal{rmp}}%
```

NOTE: `revguide.tex` does not mention any `\@journal` options besides `prb`.

**amsfonts** The class option `amsfonts` has the same effect as if the document preamble contained a `\usepackage{amsfonts}` statement.

```
687 \DeclareOption{amsfonts}{%
688   \def\REVTeX@amsfonts{\RequirePackage{amsfonts}}%
689 }%
690 \DeclareOption{noamsfonts}{%
691   \let\REVTeX@amsfonts\@empty
692 }%
693 \AtEndOfClass{\ifxundefined\REVTeX@amsfonts{}{\REVTeX@amsfonts}}%
```

**amssymb** The class option `amssymb` has the same effect as if the document preamble contained a `\usepackage{amssymb}` statement.

```
694 \DeclareOption{amssymb}{%
```

```

695 \def\REVTEX@amssymb{\RequirePackage{amssymb}}}%
696 }%
697 \DeclareOption{noamssymb}{%
698 \let\REVTEX@amssymb\@empty
699 }%
700 \AtEndOfClass{\@ifxundefined\REVTEX@amssymb{\{\REVTEX@amssymb\}}}%

```

## 6.2.19 Presenting Authors and Their Affiliations

The `runinaddress` option is the only one that sets `\runinaddress@sw` to true.

The `unsortedaddress` option is the only one that sets `\@affils@sw` to false.

If we take the `groupedaddress` option as the default, then we can look upon the `superscriptaddress` option as simply turning `\groupauthors@sw` to false.

`groupedaddress`, the default, groups authors above a common address. In order to assert the default and still provide for proper precedence for document-supplied options, we carry out our action at `\AtBeginDocument` time, and only if none of the related class options were invoked.

```

701 \DeclareOption{groupedaddress}{\clo@groupedaddress}%
702 \def\clo@groupedaddress{%
703 \@booleantrue\groupauthors@sw
704 \@booleantrue\@affils@sw
705 \@booleanfalse\runinaddress@sw
706 }%
707 \AtBeginDocument{%
708 \@ifxundefined\groupauthors@sw{\clo@groupedaddress}{}%
709 }%

```

`unsortedaddress` is similar to `groupedaddress`, but turns off `\@affils@sw`, with the result that each address that is entered will be printed.

```

710 \DeclareOption{unsortedaddress}{\clo@unsortedaddress}%
711 \def\clo@unsortedaddress{%
712 \@booleantrue\groupauthors@sw
713 \@booleanfalse\@affils@sw
714 \@booleanfalse\runinaddress@sw
715 }%

```

`runinaddress` is similar to `groupedaddress`, with the addition of the Boolean `\runinaddress@sw`, which causes the authors to be formatted in a paragraph instead of on separate lines.

```

716 \DeclareOption{runinaddress}{\clo@runinaddress}%
717 \def\clo@runinaddress{%
718 \@booleantrue\groupauthors@sw
719 \@booleantrue\@affils@sw
720 \@booleantrue\runinaddress@sw
721 }%

```

`superscriptaddress` presents author affiliations as superscripts. Authors with like affiliations share the same superscript.

```

722 \DeclareOption{superscriptaddress}{\clo@superscriptaddress}%
723 \def\clo@superscriptaddress{%

```



```

724 \@booleanfalse\groupauthors@sw
725 \@booleantrue\@affils@sw
726 \@booleanfalse\runinaddress@sw
727 }%

```

### 6.2.20 Typeset by RevTeX

The class option `byrevtex` signifies that you want the “Typeset by RevTeX” byline to appear on your formatted output. By default, no such byline appears.

```

728 \DeclareOption{byrevtex}{\@booleantrue\byrevtex@sw}%

```

## 6.3 Default Option

The default handling for a document class option is to treat it as the name of a society and hunt for a corresponding `.rtx` file to read in. This behavior is much like the L<sup>A</sup>T<sub>E</sub>X 2.09 handling, where one looked for a `.sty` file, except that in this case, we must catch the case where multiple unknown options are declared.

```

729 \DeclareOption*{%
730   \IfFileExists{\CurrentOption\REVTEX@society@ext}{%
731     \expandafter\change@society\expandafter{\CurrentOption}%
732   }{%
733     \OptionNotUsed
734   }%
735 }%
736 \def\REVTEX@society@ext{.rtx}%
737 \AtEndOfClass{%
738   \@ifxundefined\@society{%
739     \REVTEX@warn{No Society specified, using generic APS style}%
740     \def\@society{aps}\def\@journal{}%
741   }{%
742     \expandafter\input\expandafter{\@society\REVTEX@society@ext}%
743   }%

```

## 6.4 Class-Asserted Options

Here we establish the default document class options. Those of the document itself will override these.

```

744 \ExecuteOptions{10pt}

```

## 6.5 Execute Options

The document class options are processed in the order they are declared in this document class file.

Precedence is established in the following way:

First, the single `.rtx` file is read in. It may set values to any of the Booleans that represent class options, but it may do so only if that Boolean is undefined, signifying that

its corresponding document class options were absent from the document's option list. In this way correct precedence of class options is maintained.

Second, the type size option is acted upon. Type size code should not require altering the values of any of the Booleans carrying class options.

Next, at `\AtEndOfClass` time, certain packages are read in.

Finally, at `\AtBeginDocument` time, the state of the Booleans determines how the formatting will go.

```
745 \ProcessOptions\relax
```

## 7 Procedures Dependent Upon Options

```
\ps@headings
\ps@myheadings 746 \def\ps@headings@twoside{%
747   \let\@mkboth\markboth
748   \let\@oddfoot\@empty
749   \let\@evenfoot\@empty
750   \def\@evenhead{\thepage\hfil \slshape \leftmark}%
751   \def\@oddhead{{\slshape \rightmark}\hfil \thepage}%
752   \def\sectionmark##1{%
753     \markboth{%
754       \MakeTextUppercase{%
755         \@ifnum{\c@secnumdepth >\z@}{\thesection\hskip 1em\relax}}{%
756         ##1%
757       }%
758     }{}%
759   }%
760   \def\subsectionmark##1{%
761     \markright {%
762       \@ifnum{\c@secnumdepth >\@ne}{\thesubsection\hskip 1em\relax}}{%
763       ##1%
764     }%
765   }%
766 }%
767 \def\ps@headings@oneside{%
768   \let\@mkboth\markboth
769   \let\@oddfoot\@empty
770   \let\@evenfoot\@empty
771   \def\@oddhead{{\slshape \rightmark}\hfil \thepage}%
772   \def\sectionmark##1{%
773     \markright {%
774       \MakeTextUppercase{%
775         \@ifnum{\c@secnumdepth >\z@}{\thesection\hskip 1em\relax}}{%
776         ##1%
777       }%
778     }%
779   }%
780 }%
```

```

781 \AtBeginDocument{%
782   \twoside@sw{%
783     \let\ps@headings\ps@headings@twoside
784   }{%
785     \let\ps@headings\ps@headings@oneside
786   }%
787 }%

788 \def\ps@myheadings{%
789   \let\mkboth\@gobbletwo
790   \def\@oddhead{\slshape\rightmark}\hfil \thepage}%
791   \let\@oddfoot\@empty
792   \def\@evenhead{\thepage\hfil\slshape\leftmark}%
793   \let\@evenfoot\@empty
794   \let\sectionmark\@gobble
795   \let\subsectionmark\@gobble
796 }%

797 \def\ps@article{%
798   \def\@evenhead{\thepage\hfil{\leftmark}}}%
799   \def\@oddhead{\rightmark}\hfil \thepage}%
800   \def\@oddfoot{\byrevtex@sw{\hfil Typeset by \revtex\hfil}}}%
801   \let\@evenfoot\@oddfoot
802   \let\mkboth\@gobbletwo
803   \let\sectionmark\@gobble
804   \let\subsectionmark\@gobble
805 }%

```

`\lastpage@putlabel` Support the default meaning of `\@endpage`. Name of this macro (and the `\label` key) taken from CTAN:/macros/latex/contrib/other/lastpage with code optimised slightly.

```

806 \def\lastpage@putlabel{%
807   \if@filesw
808     \begingroup
809       \advance\c@page\m@ne
810       \immediate\write\@auxout{\string\newlabel{LastPage}{\thepage}}}%
811   \endgroup
812 \fi
813 }%

```

Install a late hook into `\AtEndDocument` that labels the last page of the document. This is done just before the `.aux` file is closed, and does not require a `\shipout`, because it writes directly to the `.aux` file. Note that we invoke `\clearpage`: this means that no more typesetting should be done past this point. Check: are there any more things installed via `\AtEndDocument`?

```

814 \AtEndDocument{%
815   \clearpage\lastpage@putlabel
816 }%

```

## 8 Required Packages

CTAN:macros/latex/contrib/other/misc/url.sty  
817 \RequirePackage{url}%

## 9 Society- and Journal-Specific Code

\@journal Journal test helper, used as

```
%\ifx{\@journal\journal@pra}{%
% <journal-specific setup>
%\fi
%
```

Journal code might like to further specify (if as yet undefined) or distinguish on the following Booleans.

Note: the journal substyle code should only alter the value of one of these Booleans if the Boolean is \undefined. This convention is what makes the document’s options take precedence over the values set by the journal.

FIXME: make this table an exhaustive listing of all the parameters set by the class options.

\@pointsize	(101112), depending on the type size
\footinbib@sw	true if footnotes are to be formatted in the bibliography
\preprintsty@sw	true for preprint and hyperpreprint
\eqsecnum@sw	true means that equations are numbered within sections
\secnumarabic@sw	true means the sections are to be numbered arabic
\groupauthors@sw	true means authors listed separately for each address
\showPACS@sw	true means to produce the PACS as part of the title block
\@affils@sw	true means each affiliation is printed, for each author
\runinaddress@sw	true means author addresses are printed run-in
\draft@sw	true implies that PACS will be printed
\tightenlines@sw	true if preprint single spaced
\lengthcheck@sw	true if length checking is in effect
\byrevtex@sw	true means to announce “typeset by RevTeX”
\titlepage@sw	true for title is to be set on a separate page
\twocolumn@sw	true if two-column page grid
\twoside@sw	true means to format pages for duplex printing
\floats@sw	false means floats are migrated to end of document
\REVTEX@amsfonts	if \@empty, means that amsfonts will <i>not</i> be loaded
\REVTEX@amssymb	if \@empty, means that amssymb will <i>not</i> be loaded
\author@note	if \undefined, means that the default (\footnote) will be used
\place@bibnumber	if \undefined, means that the default (inline) will be used

Note: if \twocolumn@sw and \preprintsty@sw are both false, then ‘galley’ style is in effect. The galley option invokes onecolumn, but does not affect the \preprintsty@sw.

Note: `\paperwidth` and `\paperheight` are not integrated into this scheme, and should be selected by the document alone.

## 10 Front Matter

### 10.1 The title command

`\title` The author uses `\title` to specify the title, as in the AMS classes, `\title` has an optional argument specifying a short form for use in running heads.

```

818 \renewcommand\title{\@dblarg\REVTEX@title}%
819 \def\REVTEX@title[#1]#2{%
820   \def\@title{#2}%
821   \def\@shorttitle{#1}%
822 }%
```

`\@title` The arguments to `\title` are saved in these internal macros, which are set up to produce a warning if `\title` has not been used before `\maketitle`.

```

823 \def\@title{\REVTEX@warn{No title}}%
824 \def\@shorttitle{ }%
```

### 10.2 The author command and related commands

`\c@affil` A counter to store the affiliation numbers used for the superscript marks. This command defines `\theaffil`.

```
825 \newcounter{affil}
```

`\author` Each author is given in a *separate* `\author` command. This is similar to the AMS classes, but the AMS also try to support the `article` class `\and` command for putting multiple authors in one `\author` command. `\and` is not supported in this class.

This procedure moves the previous author to the list for the current address (`\move@author`) and starts a new author name with a flag value indicating that an `\author` with no affiliation has been specified (a following `\affiliation` command will reset this, i.e., `\@author@sw`).

```

826 \renewcommand\author[1]{%
827   \@author@sw{%
828     \@addaffils
829   }{}%
830   \move@author
831   \def\@author{{}{}{#1}{}{}}%
832   \let\thanks\thanks@author
833 }%
```

`\move@author` Move the most recent author to the list of current authors. If we recently did a `\@author@init`, this is a no-op. If we recently encountered a `\collaboration`, we preface the author with the `\@collaboration@opr` intercollated operator, otherwise we apply `\@author@opr`.

```

834 \def\move@author{%
835   \@author@sw}{%
836   \collaboration@sw{%
837     \@booleanfalse\collaboration@sw
838     \expandafter\appdef
839     \expandafter\@authors@curr
840     \expandafter{%
841       \expandafter \@collaboration@opr
842       \@author
843     }%
844   }{%
845     \expandafter\appdef
846     \expandafter\@authors@curr
847     \expandafter{%
848       \expandafter \@author@opr
849       \@author
850     }%
851   }%
852 }%
853 }%

```

`\collaboration` Specify the collaboration (given after a group of authors).

This procedure does exactly what `\author` does, and sets a flag signifying that the `\collaboration` command was given.

```

854 \@booleanfalse\collaboration@sw
855 \def\collaboration#1{%
856   \groupauthors@sw{%
857     \REVTeX@warn{%
858       \string\collaboration\space not allowed with groupaddress option.
859       Use superscriptaddress instead
860     }%
861   }{%
862     \@booleantrue\collaboration@sw
863   }%
864   \author{#1}%
865 }%
866 \def\@collaboration@opr#1#2#3#4{%
867   \par
868   {%
869     \let\@affilID@temp\@empty
870     \@author@opr{#1}{#2}{(\ignorespaces#3\unskip)}{#4}%
871   }%
872   \par
873 }%
874 \def\@collaboration@count{%
875   \appdef@eval\@tempa{\the\@tempcnta}%
876   \@tempcnta\z@
877   \@gobblefour
878 }%

```

```

879 \def\@collaboration@present#1#2#3#4{%
880 \par
881 \@author@opr{#1}{#2}{(\ignorespaces#3\unskip)}{#4}\par
882 \smallskip
883 \reset@authorcount
884 }%

\@author We define a flag value for \@author(private), a procedure for setting \@author
to the flag value (\@author@init), and a Boolean to test against the flag value
(\@author@sw).

885 \def\@author@cleared{{}{}}{}{}{}{}%
886 \def\@author@init{\let\@author\@author@cleared\let\thanks\thanks@warning}%
887 \def\@author@sw{\@ifx{\@author\@author@cleared}}%
888 \AtBeginDocument{%
889 \@author@init
890 }%

We define procedures for adding tokens to \@author and a procedure to do sanity
checking just before the title block is formatted.

891 \def\@author@join@i#1#2#3#4#5{%
892 \def\@author{{\@join{\@separator}}{#1}{#5}}{#2}{#3}{#4}}%
893 }%
894 \def\@author@join@ii#1#2#3#4#5{%
895 \def\@author{{#1}{\@join{\@separator}}{#2}{#5}}{#3}{#4}}%
896 }%
897 \def\@author@join@iii#1#2#3#4#5{%
898 \def\@author{{#1}{#2}{\@join{\@separator}}{#3}{#5}}{#4}}%
899 }%
900 \def\@author@join@iv#1#2#3#4#5{%
901 \def\@author{{#1}{#2}{#3}{\@join{\@separator}}{#4}{#5}}}%
902 }%
903 \def\@author@finish{%
904 \@author@sw{}{%
905 \move@author
906 \REVTEX@warn{No affiliation specified for \@author}%
907 }%
908 \@addaffils
909 }%

\@join The procedure \@join inserts a separator between two tokens, or, if the first token is nil,
elides both that token and the separator.

910 \def\@join#1#2#3{%
911 \@ifempty{#2}{#3}{#2#1#3}%
912 }%
913 \def\@separator{;\space}%

\surname No-op to allow better post-processing of the file.
\firstname 914 \let\surname\@firstofone
915 \let\firstname\@firstofone

```

`\@authors@curr` The control sequence name `\@authors@curr` accretes author entries (with `\@author@opr` as the intercollated operator) and collaboration entries (with `\@collaboration@opr` as the intercollated operator). Ultimately, its contents are appended to `\@authors`. It must be initialized to `\@empty`.

```
916 \let \@authors@curr \@empty
```

`\and` The original L<sup>A</sup>T<sub>E</sub>X idea of using one `\author` command to capture all authors and their address just doesn't work with multiple authors possibly sharing addresses, so in this class disable `\and`.

```
917 \renewcommand \and {\REVTeX@err{\protect \and \space is not supported}}
```

`\affiliation` After each group of authors with the same address, give that address in `\affiliation`. If later in the list you have an author with the address of an earlier author, repeat the `\affiliation` command, the system will detect the similarity and only print the affiliation once, but reuse the superscript marker.

```
918 \def \cat@comma@active {\catcode '\, \active}%
919 {\cat@comma@active \gdef, {\active@comma}}%
920 \def \active@comma {,\penalty-400\relax}%
921 \newcommand* \affiliation [1] [] {\begingroup \cat@comma@active \@affiliation {#1}}%
922 \def \@affiliation #1#2 {%
923   \endgroup
924   \move@author \@author@init
```

Set the `\temp@sw` to true, then execute the affiliation list (`\@affil@list`) with the intercollated operator set to `\@affil@match`. If the current affiliation has been seen before, `\temp@sw` will be set to true, `\tempc` will be set to the existing affiliation number, and `\tempd` will be set to the affiliation's footnote. The Boolean `\@affils@sw` being false prevents this test from ever returning a positive result.

```
925   \@booleanfalse \temp@sw
926   \let \@tempd \@empty
927   \@affils@sw {%
928     \def \@tempa {#2} \let \@affil@opr \@affil@match \@affil@list
929   } {} \temp@sw
```

True clause: This affiliation has been seen before. Check its footnote.

```
930   {%
931     \def \@tempa {#1}%
932     \@ifx {\@tempd \@tempa} {} {%
933       \REVTeX@warn {%
934         New footnote specified for \string \affiliation {#2}.
935         Please put it on the *first* instance thereof.
936       }%
937     }%
938   }%
```

False clause: This is a new address: increment the counter to get a unique ID for the new affiliation and append the new number, address, and footnote to the list `\@affil@list`.

```
939   {%
940     \stepcounter {affil}%
```



```

941 \edef\@tempc{\theaffil}%
942 \appdef \@affil@list{\@affil@opr}%
943 \appdef@eval\@affil@list\@tempc
944 \appdef \@affil@list{\{#1\}\{#2\}}%
945 }%

```

Append the ID of the affiliation to the affiliation group of the current author list.

```

946 \appdef@eval\@affilID@curr\@tempc
947 }%

```

`\noaffiliation` User-level command signifying that the current list of authors has *no* affiliation.

```

948 \newcommand\noaffiliation{%
949 \move@author\@author@init
950 \edef\@affilID@curr{\@affilID@curr}%
951 }%

```

`\@authors` The `\@authors` macro accretes authors (using `\@author@opr` as the intercollated operator), affiliations (using `\@affilID@opr` as the intercollated operator), and collaborations (using `\@collaboration@opr` as the intercollated operator).

DPC: It starts with `\relax` for the affiliation processing, and then `\@gobbletwo` which will eat the `\@andorcomma`, before the first name, so the first name does not get a comma before it.

```

952 \let\@authors\@empty

```

`\@addaffils` Append `\@authors@curr` and `\@affilID@curr` to `\@authors` and `\affils@list`, respectively.

```

953 \def\@addaffils{%

```

First, append current affiliation group (expansion of `\@affilID@curr`) to the author list (`\@authors`), using `\@affilID@opr` as the intercollated operator; also append the current authors (`\@authors@curr`).

```

954 \appdef \@authors{\@affilID@opr}%
955 \appdef@eval\@authors{\@affilID@curr}%
956 \appdef@e \@authors{\@authors@curr}%

```

Next, append the current affiliation group to `\affils@list`, (if it is not already there) using `\affils@opr` as the intercollated operator.

```

957 \@booleanfalse\temp@sw
958 \let\affils@opr\affils@match\affils@list
959 \temp@sw{\}%
960 \appdef \affils@list{\affils@opr}%
961 \appdef@eval\affils@list{\@affilID@curr}%
962 }%

```

Finally, null out the temp registers.

```

963 \let\@authors@curr\@empty
964 \let\@affilID@curr\@empty
965 }%

```

`\affils@list` The macro `\affils@list` accretes `\@affilID@curr`, with `\affils@opr` as the intercollated operator. It must be empty at the beginning of the document.

```
966 \let\affils@list\@empty
```

`\@affil@list` The macro `\@affil@list` accretes the list of affiliations with `\@affil@opr` as the intercollated operator. It must be empty at the beginning of the document.

Each `\affiliation` command in the document contributes to this list, as long as the argument of that instance of the command is “new”.

Each entry in this list consists of the `\@affil@opr` operator followed by three brace-delimited tokens, representing, in order:

1. the affiliation’s unique ID, a number increasing monotonically for each new entry,
2. the optional argument of the `\affiliation` command, the footnote to the affiliation, and
3. the text of the affiliation.

At various junctures in the code, the control sequence name `\@affil@opr` assumes the meaning of `\@affil@footnote`, `\@affil@match`, `\@affil@group`, or `\@affil@marked`, and the list `\@affil@list` is expanded.

```
967 \let\@affil@list\@empty
```

`\@affilID@curr` The macro `\@affilID@curr` accretes affiliation IDs into an affiliation group. It must be empty at the beginning of the document.

```
968 \let\@affilID@curr\@empty
```

`\@affil@match` The definition for the `\@affil@list` intercollated operator when adding a new affiliation: seeks a match with any earlier affiliation. When the affiliation list is executed, this procedure tests each entry against the ‘new’ affiliation (which has been stored in `\@tempa`).

Uses `\temp@sw`, `\@tempc`, and `\@tempd` to communicate back: if it returns `\temp@sw` true, a match was found, then `\@tempc` will be the first attribute of the matching entry and `\@tempd` will be the second attribute of the matching entry.

```
969 \def\@affil@match#1#2#3{%
970   \def\@tempb{#3}%
971   \ifx{\@tempa\@tempb}{%
972     \@booleantrue\temp@sw
973     \def\@tempd{#2}%
974     \def\@tempc{#1}%
975   }{}%
976 }%
```

`\@tempaffil@script` Give a superscript marker to the address, and junk the text argument (#2).

```
977 \def\@tempaffil@script#1#2{%
978   ,\,#1%
979 }%
```

`\@tempaffil@group` Execute if we are grouping authors above ‘main addresses’. Put temp address in a footnote, with explanatory text. Note: this procedure uses `\@tempb` and `\@tempc` to communicate to `\@affil@opr`.

```

980 \def\@tempaffil@group#1#2{%
981   \def\@tempc{#1}%
982   \def\@tempb{#2}%
983   \begingroup
984   \let\@affil@opr\@affil@footnote\@affil@list
985   \endgroup
986 }%

```

`\@affil@footnote` The local definition of `\@affil@opr` when `\@affil@list` is executed by `\@tempaffil@group`. If a match is found to `\@tempc`, then footnotes are formatted with the relevant content.

```

987 \def\@affil@footnote#1#2#3{%
988   \def\@tempa{#1}%
989   \ifx{\@tempa\@tempc}{%
990     \comma@space
991     \footnote{\@tempb#3}%
992     \footnote{#2}%
993   }{}%
994 }%

```

`\@affil@group` The local definition of `\@affil@opr` when the list `\@affil@list` is executed by `\do@affil@fromgroup`: Print the address if its number matches `\count@`.

```

995 \def\@affil@group#1#2#3{%
996   \@ifnum{\count@=#1\relax}{%
997     #3%
998     \@ifempty{#2}{}{\footnote{#2}}%
999     \after@address
1000    \advance\@tempcnta\m@ne
1001   }{}%
1002 }%

```

`\email` Just tacks the email address on to the current author.

```

1003 \newcommand*\email[2][Electronic address: ]{%
1004   \expandafter\@author@join@ii\@author{#1\href{mailto:#2}{#2}}%
1005 }%

```

`\homepage` Just tacks the URL on to the current author. Note: group opened in `\homepage` is closed in `\@homepage`.

```

1006 \newcommand*\homepage{%
1007   \begingroup
1008   \@makeother\~%
1009   \@makeother\%%
1010   \@homepage
1011 }%
1012 \newcommand*\@homepage[2][URL:~]{%
1013   \endgroup
1014   \expandafter\@author@join@ii\@author{#1\url{#2}}%

```

1015 }%

\url  
\href 1016 \AtBeginDocument{%  
1017 \providecommand\url{\texttt}%  
1018 \providecommand\href[2]{\url{#2}}%  
1019 }%

\thanks The \thanks command is only valid when appearing between an \author command  
\thanks@warning and preceding the following \affiliation command. That is, it must be subsidiary  
\thanks@author to

1020 \def\thanks@warning{%  
1021 \REVTeX@warn{\string\thanks\space is valid only following \string\author.^JPlease  
1022 \@gobble  
1023 }%  
1024 \let\thanks\thanks@warning

The operative version of \thanks appends an item to author's second argument.

1025 \def\thanks@author{%  
1026 \expandafter\@author@join@ii\@author  
1027 }%

\altaffiliation Implemented more or less like \thanks but shares the affiliation counter. Optional  
argument may be used to give explanatory text eg 'currently staying at' This will be  
placed before the address, if used in a footnote.

1028 \newcommand\*\altaffiliation[2][]{%  
1029 \expandafter\@author@join@ii\@author{#1#2}%  
1030 }%

\listand Might need extending with penalties etc.

1031 \def\@listand{\@ifnum{\@tempcnta=\tw@}{\andname}{ }\space}%

\@listcomma This definition, with \@ne puts a comma before and. UK English (at least) would nor-  
mally use \tw@ here which would then use the more consistent convention of using  
comma or and but not both.

1032 \def\@listcomma{\@ifnum{\@tempcnta>\@ne}{,}{ }}%

\@author@present@group Basic author-setting wrapper for \@author@opr. Depends on class option.

If grouping authors, not much to do except count down the list calling the \doauthor  
hook on each author.

1033 \def\@author@present@group#1#2#3#4{%  
1034 \gdef\comma@space{\gdef\comma@space{\textsuperscript{,\,}}}%  
1035 \doauthor{#1}{#2}{#3}{#4}%  
1036 \advance\@tempcnta\m@ne  
1037 }%

\@author@present@script In the superscript address case, need to add commas between groups of address numbers,  
which are passed in the macro \@affilID@temp in the form {3}{4}{7} if this set  
of authors is related to addresses, 3, 4 and 7.

```

1038 \def\@author@present@script#1#2#3#4{%
1039   \gdef\comma@space{\textsuperscript{,\,}}%
1040   \doauthor{#1}{#2}{#3}{%
1041     \textsuperscript{\expandafter\@affilcomma\@affilID@temp\relax\relax}%
1042     #4%
1043   }%
1044   \advance\@tempcnta\m@ne
1045 }%
1046 \def\@affilcomma#1#2{%
1047   #1%
1048   \@ifx{\relax#2}{\,%
1049     ,\,\@affilcomma
1050   }%
1051   #2%
1052 }%

```

\@author@present@count This version of \@author@opr counts the number of authors it processes.

```

1053 \def\@doauthor@count{\advance\@tempcnta\@ne\@gobblefour}%

```

\doauthor Main control over how authors are typeset.

#1 is never loaded  
 #2 is loaded by \email, \homepage, or \thanks  
 #3 is loaded by \author  
 #4 Superscript marks for address, and any extra marks from \@thanks etc. and is never loaded.

First, the author name is formatted, followed by a comma, then come any marks relating to affiliation, then come the homepage URL and email address, if any, with appropriate punctuation.

```

1054 \def\doauthor#1#2#3#4{%
1055   \ignorespaces#3\unskip\@listcomma
1056   \@ifx{\@affilID@temp\@empty}{\,%
1057     \@ifempty{#1#2}{\,%
1058       \@ifx{\@affilID@temp\@empty}{\comma@space}%
1059       \author@note{%
1060         % \ttfamily
1061         #1%
1062         \@ifempty{#1}{\@ifempty{#2}{\,%
1063           #2%
1064         }%
1065       }%
1066       \space\@listand
1067 }%#4

```

\@affilID@opr DPC: The number(s) associated to the affiliation address(es).

\@affilID@temp The control sequence name \@affilID@opr is placed in the author list (\@authors) every time a new affiliation is encountered, with that affiliation as its argument.

\@affilID@def Alternative procedures are assigned to this control sequence name, and the author list is executed, to either count the number of authors at a given address (\@affilID@count) or to present the given authors (\@affilID@match).

The default procedure is to simply define \@affilID@temp to the given value (\@affilID@def).

Note that \@affilID@temp is used to communicate between \doauthor and instances of \@affilID@opr within the author list.

```

1068 \def\@affilID@def#1{%
1069   \def\@affilID@temp{#1}%
1070 }%
1071 \let\@affilID@temp\@empty
1072 \let\@affilID@opr\@affilID@def
1073 %
1074 \def\@affilID@count#1{%
1075   \def\@tempb{#1}%
1076   \@ifx{\@tempa\@tempb}{%
1077     \let\@author@opr\@doauthor@count
1078   }{%
1079     \let\@author@opr\@gobblefour
1080   }%
1081 }%
1082 \def\@affilID@match#1{%
1083   \def\@tempb{#1}%
1084   \@ifx{\@tempa\@tempb}{%
1085     \let\@author@opr\@author@present
1086   }{%
1087     \let\@author@opr\@gobblefour
1088   }%
1089 }%

```

\@thanks Society-specific options may change this. \comma@space is a separator between adjacent footnotes.

```

1090 \def\@thanks{\comma@space\footnote}

```

\@affil@marked Alias \@affil@opr: The affiliations are being formatted in the case where authors are not being grouped: just make a list out of the affiliations with the numbers printed. Society-specific code can change the formatting by overriding the definition of \frontmatter@affiliationfont. **FIXME:** s/b separate hook. Instead, it is conflated with the hook to be used when printing affiliations

```

1091 \def\@affil@marked#1#2#3{%
1092   \par
1093   \begingroup
1094     \frontmatter@affiliationfont
1095     \textsuperscript{\normalfont#1}%
1096     #3\par
1097   \endgroup
1098 }%

```

\affils@match Alias \affils@opr, this procedure is used to probe the list of affiliation groups and set a Boolean if a match is found to \@affilID@curr.

```

1099 \def\affils@match#1{%

```

```

1100 \def\@tempa{#1}%
1101 \@ifx{\@affilID@curr\@tempa}{%
1102     \@booleantrue\temp@sw
1103 }{}%
1104 }%

```

`\do@affil@fromgroup` Executes iteratively: selects the next address ID to print, and then re-execute the list of addresses to print the text of that address.

Note: thus we create an  $n^2$  computing process. FIXME: can use hashing instead, you know.

```

1105 \def\do@affil@fromgroup#1#2{%
1106     \@ifx{\relax#2}{}%
1107     \count@#2\relax
1108     #1\do@affil@fromgroup#1%
1109 }%
1110 }%

```

### 10.3 The keywords command

`\keywords` Usual game, save text in a macro for processing by `\maketitle`.  
`\@keywords` 1111 `\def\keywords#1{%`  
 1112 `\gdef\@keywords{#1}}`  
 1113 `\def\@keywords{ }`

### 10.4 The \date command and related commands

`\date` Use the `\date` command to specify the document date, the `\received` command to  
`\received` specify the date received, `\revised` for date revised, `\accepted` for date accepted,  
`\revised` and `\published` for date published. Normally only `\date` to be used by author, the  
`\accepted` remainder used only by editors.  
`\published` DPC: As for `\keywords`, but this time don't flag a warning if there is no revision  
`\@date` date specified.  
`\@received` In each case the user-level command defines the value of a macro which buffers the  
`\@revised` data entered by the user. For instance, `\received` causes `\@received` to acquire  
`\@accepted` a value. The optional argument allows the user to override the text that will be typeset  
`\@published` along with the date; the default value of that text is itself a localized macro.

```

1114 \renewcommand*\date[2][\Dated@name]{\def\@date{#1#2}}%
1115 \def\@date{}%
1116 \newcommand*\received[2][\Received@name]{\def\@received{#1#2}}%
1117 \def\@received{}%
1118 \newcommand*\revised[2][\Revised@name]{\def\@revised{#1#2}}%
1119 \def\@revised{}%
1120 \newcommand*\accepted[2][\Accepted@name]{\def\@accepted{#1#2}}%
1121 \def\@accepted{}%
1122 \newcommand*\published[2][\Published@name]{\def\@published{#1#2}}%
1123 \def\@published{}%

```

## 10.5 The pacs command

PACS, the Physics and Astronomy Classification Scheme.

```
\pacs As for \keywords
\@pacs 1124 \def\pacs#1{%
1125 \REVTeX@aftermaketitle{\pacs}%
1126 \gdef\@pacs{#1}%
1127 }%
1128 \def\@pacs{}{\REVTeX@warn{No PACS numbers}}%
```

## 10.6 The \preprint command

```
1129 \def\preprint#1{\gappdef\@preprint{\preprint{#1}}}%
1130 \let\@preprint\@empty
```

## 10.7 draft

DPC: Name clash with draft option. L<sup>A</sup>T<sub>E</sub>X doesn't care, but it confuses me.

This command is a 3.1 relic, now removed.

```
1131 %\newcommand\draft{\@booleantrue\draft@sw}%
```

## 10.8 The abstract environment

\absbox

```
1132 \newbox\absbox
```

abstract Abstract, as in AMS classes, must be specified *before* \maketitle. It just saves everything up in \absbox.

```
1133 % \changes{v4.e}{1998/01/31}
1134 % {hookify}
1135 % Note that the specifics of how the abstract is to be
1136 % formatted are set by \cmd\frontmatter@abstractwidth,
1137 % \cmd\frontmatter@abstractheading, and \cmd\frontmatter@abstractfont.
1138 %
1139 \newenvironment{abstract}{%
1140 \REVTeX@aftermaketitle{\begin{abstract}}%
1141 \lrbox\absbox
1142 \minipage{\frontmatter@abstractwidth}%
1143 \frontmatter@abstractheading
1144 \frontmatter@abstractfont
1145 }{%
1146 \endminipage
1147 \endlrbox
1148 }%
```

\frontmatter@abstractheading The default abstract head; journals will override this procedure.

```
1149 \def\frontmatter@abstractheading{%
1150 \begin{center}\large\abstractname\end{center}%
```



```

1151 \vspace{-1pc}%
1152 }%

\frontmatter@abstractfont The default type specification for the body of the abstract. Journals will override this
setting.
1153 \def\frontmatter@abstractfont{ }%

\frontmatter@abstractwidth The default setting is the full text width; journals can override this setting.
1154 \def\frontmatter@abstractwidth{\textwidth}

frontmatter@abstract@produce This procedure determines how the abstract is incorporated into the title block. We split
this out in anticipation of the need to lift the limitation that the abstract not break over
pages.
1155 \def\frontmatter@abstract@produce{%
1156 \addvspace\frontmatter@preabstractspace
1157 \leavevmode\box\absbox\par
1158 \addvspace\frontmatter@postabstractspace
1159 }%

frontmatter@preabstractspace Space above and space below abstract in title block
frontmatter@postabstractspace 1160 \def\frontmatter@preabstractspace{.5\baselineskip}
1161 \def\frontmatter@postabstractspace{.5\baselineskip}

```

## 10.9 Formatting the title block

```

titlepage This is LATEX 2ε's article class version, with modifications.
1162 \newenvironment{titlepage}{%
1163 \let\wastwocol@sw\twocolumn@sw
1164 \wastwocol@sw{\onecolumn}{\newpage}%
1165 \thispagestyle{titlepage}%
1166 \setcounter{page}\@ne
1167 }{%
1168 \wastwocol@sw{\twocolumn}{\newpage}%
1169 \twoside@sw{}{%
1170 \setcounter{page}\@ne
1171 }%
1172 }%

\maketitle Put it all together to format the title block.
Note: using \@tempcnta and \@tempa to communicate between procedures.
1173 \def\maketitle{%
1174 % \say\@authors
1175 \@author@finish
1176 \title@column\titleblock@produce
1177 \suppressfloats[t]%

Now save some memory.
1178 \let\and\relax

```

```

1179 \let\affiliation\@gobble@opt@one
1180 % \let\address\affiliation
1181 \let\author\@gobble
1182 \@author@init
1183 \let\@authors\@empty
1184 \let\@authors@curr\@empty
1185 \let\@affil@list\@empty
1186 \let\keywords\@gobble
1187 \let\@keywords\@empty
1188 \let\email\@gobble
1189 \let\@address\@empty
1190 \let\maketitle\relax
1191 \let\thanks\@gobble
1192 \titlepage@sw{%
1193     \clearpage
1194 }{}%
1195 }%

```

`\titleblock@produce` This procedure produces the title block.

It effectively executes inside a group (because we cannot rely on multicols to do this for us) and always returns us to vertical mode.

```

1196 \def\titleblock@produce{%
1197 \begingroup

Special footnote version [of footnotes] for \thanks, copied from article class
\maketitle.

1198 \groupauthors@sw{%
1199 \let\@author@present\@author@present@group
1200 \let\frontmatter@author@produce\frontmatter@author@produce@group
1201 \let\@tempaffil\@tempaffil@group
1202 }{%
1203 \let\@author@present\@author@present@script
1204 \let\frontmatter@author@produce\frontmatter@author@produce@script
1205 \let\@tempaffil\@tempaffil@script
1206 }%
1207 \let\footnote\REVTEX@footnote
1208 \let\thefootnote\frontmatter@thefootnote
1209 % \let\makefntext\frontmatter@makefntext
1210 \global\c@footnote\@ne % FIXME: what if the title had a footnote?
1211 \let\@makefnmark\frontmatter@makefnmark
1212 \frontmatter@setup
1213 \thispagestyle{titlepage}\label{FirstPage}%

```

Produce the title:

```
1214 \frontmatter@title@produce
```

Produce the author list:

```
1215 \frontmatter@author@produce
```

Produce the dates:

```
1216 \frontmatter@RRAPformat{%

```

```

1217 \expandafter\produce@RRAP\expandafter{\@date}%
1218 \expandafter\produce@RRAP\expandafter{\@received}%
1219 \expandafter\produce@RRAP\expandafter{\@revised}%
1220 \expandafter\produce@RRAP\expandafter{\@accepted}%
1221 \expandafter\produce@RRAP\expandafter{\@published}%
1222 }%

```

Produce the abstract, PACS, and keywords, and end any paragraph.

```

1223 \frontmatter@abstract@produce
1224 \@pacs@produce\@pacs
1225 \@keywords@produce\@keywords
1226 \par
1227 \addvspace\frontmatter@finalspace
1228 \par
1229 \endgroup
1230 }%

```

`\frontmatter@title@produce` The default formatting procedure for the article title. This procedure should take care of the vertical space below the title.

Journals will override this procedure.

```

1231 \def\frontmatter@title@produce{%
1232 \begingroup\@title\par\endgroup
1233 \addvspace{\baselineskip}%
1234 }%

```

`\frontmatter@author@produce@group` `\frontmatter@author@produce@group` is an alias for `\frontmatter@author@produce`, the procedure that formats the author/affiliation list.

In this case, the authors are being grouped above their shared addresses.

This procedure must ensure that any paragraph that it starts gets ended finally.

```

1235 \def\frontmatter@author@produce@group{%
1236 \begingroup
1237 \frontmatter@authorformat
1238 \let\@collaboration@opr\@gobblefour
1239 \let\affils@opr\affils@present\affils@list
1240 \par
1241 \endgroup
1242 }%

```

`\frontmatter@author@produce@script` `\frontmatter@author@produce@script` is an alias for `\frontmatter@author@produce`, the procedure that formats the author/affiliation list.

In this case, the authors affiliations are being superscripted; the authors are not being grouped above their shared addresses.

This procedure must ensure that any paragraph that it starts gets ended finally.

```

1243 \def\frontmatter@author@produce@script{%
1244 \begingroup
1245 \frontmatter@authorformat

```

When `\@authors` is executed, `\@tempcnt` counts the number of authors in each collaboration, and `\@tempa` stores a list of number of authors in each collaboration.

```

1246 \let\@tempa\@empty
1247 \@tempcnta\z@
1248 \let\@affilID@opr\@gobble
1249 \let\@author@opr\@doauthor@count
1250 \let\@collaboration@opr\@collaboration@count
1251 \@authors

```

We have now processed the last batch of authors, but there might not be a \collaboration at the very end: we emulate what would have happened if there were.

```

1252 \appdef@eval\@tempa{\the\@tempcnta}%
1253 \reset@authorcount

```

Execute \@doauthors, presenting the authors and their affiliations. Upon completion, there will be two spaces following the last letter because of \listand processing; remove them.

```

1254 \let\@affilID@opr\@affilID@def
1255 \let\@author@opr\@author@present
1256 \let\@collaboration@opr\@collaboration@present
1257 \@authors\unskip\unskip
1258 \par
1259 \frontmatter@above@affiliation
1260 \let\@affil@opr\@affil@marked\@affil@list
1261 \par
1262 \endgroup
1263 }%

```

\affils@present Alias of \affils@opr, process each element in the affiliation list, presenting all authors with this affiliation.

```

1264 \def\affils@present#1{%

```

Count (using \@tempcnta) the authors in the author list whose affiliation is #1. Note that \@tempa is used as a storage register for the argument of the procedure, for purposes of comparison using \ifx.

QUERY: does the value of \@tempa and \@affilID@opr need to persist?

QUERY: what value does \@author@opr have at this point? ANSWER: the \@affilID@count procedure assigns a meaning to \@author@opr dynamically.

QUERY: what value does \@collaboration@opr have at this point? ANSWER: it has been directly defined: the default.

```

1265 \def\@tempa{#1}%
1266 \let\@affilID@opr\@affilID@count
1267 \begingroup
1268 \@tempcnta\z@
1269 \@authors

```

If no authors at this address, skip it.

```

1270 \@ifnum{\@tempcnta=\z@}{\}%

```

DPC: If we have a list of length two, need to locally zap a comma in case we are following the American custom of using ‘, and’ except for lists of length two.

```

1271 \begingroup

```

```

1272 \ifnum{\@tempcnta=\tw@}{%
1273 \let\@listcomma\relax
1274 }{%

```

Run through the author list, presenting (with \@author@present) those authors whose affiliation matched the given one.

```

1275 \let\@affilID@opr\@affilID@match\@authors
1276 \endgroup
1277 \beginingroup
1278 \par
1279 \frontmatter@above@affiliation
1280 \frontmatter@affiliationfont
1281 \let\\frontmatter@addressnewline
1282 \runinaddress@sw{%
1283 \@tempcnta\z@
1284 \@tfor\@tempa:=#1\do{\advance\@tempcnta\@ne}%
1285 \ifnum{\@tempcnta=\tw@}{%
1286 \let\@listcomma\relax
1287 }{%
1288 \def\after@address{\@listcomma\ \@listand}%
1289 }{%
1290 \tightenlines@sw{}{%
1291 \parskip\z@ %space between affilations in grouped mode
1292 }%
1293 \let\after@address\par
1294 }%
1295 \let\@affil@opr\@affil@group
1296 \do@affil@fromgroup\@affil@list#1\relax
1297 \endgroup

```

End of branch handling authors.

```

1298 }%
1299 \par
1300 \endgroup
1301 \smallskip
1302 }%

```

\reset@authorcount Pull off the author count for this collaboration, and truncate the list of counts. For a list of length two, suppress comma addition. Note: this procedure communicates through \@tempcnta and \@tempa.

```

1303 \def\reset@authorcount{%
1304 \expandafter\@reset@ac\@tempa0\@reset@ac
1305 \ifnum{\@tempcnta=\tw@}{%
1306 \let\@listcomma\relax
1307 }{%
1308 \def\@listcomma{\ifnum{\@tempcnta>\@ne}{,}{}}%
1309 }%
1310 }%

```

```

1311 \def\@reset@ac#1#2\@reset@ac{%
1312   \@tempcnta#1%
1313   \def\@tempa{#2}%
1314 }%

\@pacs@produce   PACS, keywords and dates.
1315 \def\@pacs@produce#1{%
1316   \showPACS@sw{\parbox[t]{\frontmatter@abstractwidth}{\@pacs@name#1}}}%
1317 }%

\@keywords@produce
1318 \def\@keywords@produce#1{%
1319   % #1\par % FIXME: keywords squelched
1320 }%

\frontmatter@thefootnote
1321 \def\frontmatter@thefootnote{\@fnsymbol\c@footnote}%

\frontmatter@makefnmark   The default procedure for setting the footnote mark within the frontmatter. Journals will
                           override this procedure.
1322 \def\frontmatter@makefnmark{\@textsuperscript{\normalfont\@thefnmark}}%

\frontmatter@makefntext   This procedure is used when setting footnotes within the title block.
1323 \long\def\frontmatter@makefntext#1{%
1324   \parindent 1em
1325   \noindent
1326   \@textsuperscript{\normalfont\@thefnmark}#1%
1327 }%

\frontmatter@setup   The default type specification for the title page. Journals will override this definition.
1328 \def\frontmatter@setup{ }%

\frontmatter@RRAPformat   The procedure \frontmatter@RRAPformat is the formatting procedure for the “Re-
                           \punct@RRAP      ceived, Revised, etc.” block on the title page. The macro \punct@RRAP produces the
                           \produce@RRAP    punctuation between the entries. Journals will override these two definitions.
                           The procedure \produce@RRAP is fairly general.
1329 \def\frontmatter@RRAPformat#1{\begingroup#1\par\endgroup}%
1330 \def\punct@RRAP{ ; }%
1331 \def\produce@RRAP#1{%
1332   \@ifempty{#1}{ }{%
1333     \@ifvmode{\leavevmode}{\unskip\punct@RRAP\ignorespaces}%
1334     #1%
1335   }%
1336 }%

\frontmatter@authorformat   The default type specification for the author list. Journals will override this definition.
1337 \def\frontmatter@authorformat{ }%

```

frontmatter@above@affiliation The default amount of space above affiliation. Journals will override this definition.

```
1338 \def\frontmatter@above@affiliation{ }%
```

frontmatter@affiliationfont The default type specification for the affiliation. Journals will override this definition.

```
1339 \def\frontmatter@affiliationfont{ }%
```

\frontmatter@finalspace

```
1340 \def\frontmatter@finalspace{2\baselineskip}
```

\frontmatter@addressnewline The definition of \ for address handling. Default puts all the ‘lines’ on a run-in line, separated by comma and space. DPC: was space between lines of addresss.

```
1341 \def\frontmatter@addressnewline{%
1342   \@ifhmode{\skip@\lastskip\unskip\unpenalty\break\hskip\skip@}{ }%
1343   % was: \vskip-.5ex
1344 }%
```

\REVTEX@aftermaketitle Error-checking code.

```
1345 \def\REVTEX@aftermaketitle#1{%
1346   \@ifx{\maketitle\relax}{ }%
1347   \REVTEX@err{\protect#1 must be used before \protect\maketitle}%
1348   }{ }%
1349 }%
```

\ps@titlepage Default page style for title page. Journals will override this procedure.

```
1350 \def\ps@titlepage{\ps@empty}%
```

FIXME: there is a limitation to the default meaning of \@startpage, the label “FirstPage” is only defined if the document has a \maketitle command.

```
1351 \def\volumeyear#1{\gdef\@volumeyear{#1}}%
1352 \def\@volumeyear{ }%
1353 \def\volumenumber#1{\gdef\@volumenumber{#1}}%
1354 \def\@volumenumber{ }%
1355 \def\issuenummer#1{\gdef\@issuenummer{#1}}%
1356 \def\@issuenummer{ }%
1357 \def\eid#1{\gdef\@eid{#1}}%
1358 \def\@eid{ }%
1359 %
1360 \def\startpage#1{\gdef\@startpage{#1}\c@page#1\relax}%
1361 \def\@startpage{\pageref{FirstPage}}%
1362 \def\endpage#1{\gdef\@endpage{#1}}%
1363 \def\@endpage{\pageref{LastPage}}%
```

## 10.10 Printing out the “list-of” elements

FIXME: The \appendix@toc procedure should change the meaning of \l@section so that the \sections can be appropriately formatted, reflecting their status as appendices.

```

1364 \def\print@toc#1{%
1365   \begingroup
1366   % \c@secnumdepth-\maxdimen
1367   \expandafter\section
1368   \expandafter*%
1369   \expandafter{%
1370           \csname#1name\endcsname
1371           }%
1372   \let\appendix\appendix@toc
1373   \@starttoc{#1}%
1374   \endgroup
1375 }%
1376 \def\appendix@toc{%

```

## 11 Body

### 11.1 counters

The following definitions are probably identical to those in `classes.dtx`

```

1377 \def\labelenumi{\theenumi.}
1378 \def\theenumi{\arabic{enumi}}
1379 \def\labelenumii{(\theenumii)}
1380 \def\theenumii{\alph{enumii}}
1381 \def\p@enumii{\theenumi}
1382 \def\labelenumiii{\theenumiii.}
1383 \def\theenumiii{\roman{enumiii}}
1384 \def\p@enumiii{\theenumi(\theenumii)}
1385 \def\labelenumiv{\theenumiv.}
1386 \def\theenumiv{\Alph{enumiv}}
1387 \def\p@enumiv{\p@enumiii\theenumiii}
1388 \def\labelitemi{\textbullet}
1389 \def\labelitemii{\normalfont\series\textendash}
1390 \def\labelitemiii{\textasteriskcentered}
1391 \def\labelitemiv{\textperiodcentered}
1392 \pagenumbering{arabic}

```

### 11.2 float parameters

from the old `aps.sty`. (same as article I think)

```

1393 \setcounter{topnumber}{2}
1394 \def\topfraction{.7}
1395 \setcounter{bottomnumber}{1}
1396 \def\bottomfraction{.3}
1397 \setcounter{totalnumber}{3}
1398 \def\textfraction{.2}
1399 \def\floatpagefraction{.5}

```



```

1400 \setcounter{dbltopnumber}{2}
1401 \def\dbltopfraction{.7}
1402 \def\dblfloatpagefraction{.5}

```

## 11.3 List Environments

```

1403 \newenvironment{verse}{%
1404   \let\=\@centercr
1405   \list{}{%
1406     \itemsep\z@ \itemindent -1.5em\listparindent \itemindent
1407     \rightmargin\leftmargin\advance\leftmargin 1.5em}\item[]%
1408 }{%
1409 \endlist
1410 }%

1411 \newenvironment{quotation}{%
1412   \list{}{%
1413     \listparindent 1.5em
1414     \itemindent\listparindent
1415     \rightmargin\leftmargin \parsep \z@ \@plus\p@}\item[]%
1416 }{%
1417 \endlist
1418 }%

1419 \newenvironment{quote}{%
1420   \list{}{%
1421     \rightmargin\leftmargin}\item[]%
1422 }{%
1423 \endlist
1424 }%

1425 \def\descriptionlabel#1{%
1426   \hspace\labelsep \normalfont\bfseries #1%
1427 }%

1428 \newenvironment{description}{%
1429   \list{}{%
1430     \labelwidth\z@ \itemindent-\leftmargin
1431     \let\makelabel\descriptionlabel
1432   }%
1433 }{%
1434 \endlist
1435 }%

```

## 11.4 Sectioning Commands

### 11.4.1 Counters and Their Productions

```

1436 \newcounter{part}
1437 \newcounter{section}
1438 \newcounter{subsection}[section]
1439 \newcounter{subsubsection}[subsection]
1440 \newcounter{paragraph}[subsubsection]

```

```

1441 \newcounter{subparagraph}[paragraph]
1442 \def\thepart      {\Roman{part}} %
1443 \def\thesection    {\Roman{section}}
1444 \def\p@section      {}
1445 \def\thesubsection {\Alph{subsection}}
1446 \def\p@subsection  {\thesection\,,}
1447 \def\thesubsubsection {\arabic{subsubsection}}
1448 \def\p@subsubsection {\thesection\,,\thesubsection\,,}
1449 \def\theparagraph   {\alph{paragraph}}
1450 \def\thesubparagraph {\theparagraph.\arabic{subparagraph}}

```

### 11.4.2 The Acknowledgments Environment

This user-level command produces a head introducing the acknowledgments, and acts as a wrapper for the text. In this implementation, it is an unnumbered section, but appears within the toc.

```

1451 \newenvironment{acknowledgments}{%
1452 \section*{\acknowledgmentsname}%
1453 }{%
1454 \par
1455 }%

```

### 11.4.3 Part Opener

section setup copied verbatim from revtex3 aps/osa. Does not explicitly depend on point-size options.

```

1456 \def\part{\par
1457 \addvspace{4ex}
1458 \@afterindentfalse
1459 \secdef\@part\@spart}

1460 \def\@part[#1]#2{%
1461 \@ifnum{\c@secnumdepth >\m@ne}{%
1462 \refstepcounter{part}
1463 \addcontentsline{toc}{part}{\thepart\hspace{1em}#1}%
1464 }{%
1465 \addcontentsline{toc}{part}{#1}%
1466 }%
1467 \begingroup
1468 \parindent \z@ \raggedright
1469 \interlinepenalty\@M
1470 \@ifnum{\c@secnumdepth >\m@ne}{%
1471 \Large \bf \partname~\thepart%
1472 \par\nobreak
1473 }{}%
1474 \huge \bf
1475 #2%
1476 \markboth{}{}\par
1477 \endgroup
1478 \nobreak

```

```

1479 \vskip 3ex
1480 \@afterheading
1481 }%

1482 \def\@spart#1{{\parindent \z@ \raggedright
1483 \interlinepenalty\@M
1484 \huge \bf
1485 #1\par}
1486 \nobreak
1487 \vskip 3ex
1488 \@afterheading}

```

#### 11.4.4 Stacked Heads

```

1489 \def\section{%
1490 \@startsection
1491 {section}%
1492 {1}%
1493 {\z@}%
1494 {0.8cm \@pluslex \@minus .2ex}%
1495 {0.5cm \@pluslex \@minus .2ex}%
1496 {%
1497 \normalfont\small\bfseries
1498 \centering
1499 \MakeTextUppercase
1500 }%
1501 }%
1502 \def\@sectioncntformat#1{\csname the#1\endcsname.\quad}%

1503 \def\subsection{%
1504 \@startsection
1505 {subsection}%
1506 {2}%
1507 {\z@}%
1508 {.8cm \@pluslex \@minus .2ex}%
1509 {.5cm \@pluslex \@minus .2ex}%
1510 {\normalfont\small\bfseries\centering}}

1511 \def\subsubsection{%
1512 \@startsection
1513 {subsubsection}%
1514 {3}%
1515 {\z@}%
1516 {.8cm \@pluslex \@minus .2ex}%
1517 {.5cm \@pluslex \@minus .2ex}%
1518 {\normalfont\small\itshape\centering}}

```

#### 11.4.5 Runin Heads

```

1519 \def\paragraph{%
1520 \@startsection
1521 {paragraph}%

```

```

1522     {4}%
1523     {\parindent}%
1524     {\z@}%
1525     {-1em}%
1526     {\normalfont\normalsize\itshape}%
1527 }%

1528 \def\subparagraph{%
1529   \@startsection
1530     {subparagraph}%
1531     {5}%
1532     {\parindent}%
1533     {3.25ex \@plus1ex \@minus .2ex}%
1534     {-1em}%
1535     {\normalfont\normalsize\bseries}%
1536 }%

```

## 11.5 Math

`\theequation` We change the production of the equation counter so that we can accomodate the `eqsecnum` option.

```

1537 \def\theequation{%
1538   \theequation@prefix\arabic{equation}%
1539 }%
1540 \def\theequation@prefix{}%

```

## 11.6 Type Size-Dependent Settings

Note that many parameters, as well as the meaning of `\normalsize`, are deferred until `\AtEndOfClass` time. Therefore, code elsewhere in this class *should not* assume these things' values have been set!

```

1541 \AtEndOfClass{%
1542   \expandafter\input\expandafter{\@pointsize pt\REVTEX@society@ext}%
1543 }%

```

## 11.7 All Point Sizes

```

1544 \setcounter{secnumdepth}{4}

1545 \lineskip 1pt
1546 \normallineskip 1pt
1547 \def\baselinestretch{1}%

1548 \@lowpenalty 51
1549 \@medpenalty 151
1550 \@highpenalty 301

1551 \@beginparpenalty -\@lowpenalty
1552 \@endparpenalty -\@lowpenalty
1553 \@itempenalty -\@lowpenalty

1554 \arraycolsep 3pt

```

```

1555 \tabcolsep 2pt
1556 \arrayrulewidth .4pt
1557 \doublerulesep 2pt

1558 \skip\@mpfootins = \skip\footins

1559 \fboxsep = 3.0pt
1560 \fboxrule = 0.4pt

```

## 11.8 Figures

`figure` We define the figure environment. Later, we will horse around with its meaning in order to accomodate `\floats@sw`.

```

1561 \newenvironment{figure}
1562     {\@float{figure}}
1563     {\end@float}
1564 \newenvironment{figure*}
1565     {\@dblfloat{figure}}
1566     {\end@dblfloat}

```

`\makecaption` More or less the standard caption code, from article class.

```

1567 \newlength\abovecaptionskip
1568 \newlength\belowcaptionskip
1569 \setlength\abovecaptionskip{10\p@}
1570 \setlength\belowcaptionskip{0\p@}

1571 \long\def\@makecaption#1#2{%
1572     \vskip\abovecaptionskip
1573     \sbox\@tempboxa{#1: #2}%
1574     \@ifdim{\wd\@tempboxa >\hsize}{%
1575         #1: #2\par
1576     }{%
1577         \global \@minipagefalse
1578         \hb@xt@\hsize{\unhbox\@tempboxa\hfil}%
1579     }%
1580     \vskip\belowcaptionskip
1581 }%

```

`\thefigure` The figure counter and float placement defaults.

```

1582 \newcounter{figure}
1583 \renewcommand \thefigure {\@arabic\c@figure}

1584 \def\fps@figure{tbp}
1585 \def\ftype@figure{1}
1586 \def\ext@figure{lof}
1587 \def\fnum@figure{\figurename~\thefigure}

```

### 11.8.1 Deferring figure Floats

We install a hook at `\AtBeginDocument` time which determines if figures will float or will be deferred until `\printfigures` time.

```

1588 \AtBeginDocument{\do@if@floats{figure}{.fgx}}%
1589 \appdef\class@enddocumenthook{%
1590 \printfigures
1591 }%

```

`\printfigures` The user-level command `\printfigures` determines where the figures are to appear in a document in which `\floats@sw` is false. If the user invokes the `nofloats` and fails to insert a `\printfigures` command, the figures will be printed at the end of the document. If the command is given, but floats are not being deferred, it amounts to a no-op.

```

1592 \newcommand\printfigures{\print@float{figure}}%

```

## 11.9 Tables

DPC: More or less taken from `revtex2 aps.sty`, but using `dcolum` for decimal alignment.

`table` We define the `table` environment. Later, we will horse around with its meaning in order to accomodate `\floats@sw`.

```

1593 \newenvironment{table}
1594     {\@float{table}}
1595     {\end@float}
1596 \newenvironment{table*}
1597     {\@dblfloat{table}}
1598     {\end@dblfloat}

```

`\thetable` Table counter and default float placement declarations.

```

1599 \newcounter{table}
1600 \renewcommand\thetable{\@Roman\c@table}

1601 \def\fps@table{tbp}
1602 \def\ftype@table{2}
1603 \def\ext@table{lot}
1604 \def\fnm@table{\tablename~\thetable}

```

`\tabular@font` Assign a meaning to the hook installed into float processing.

`\squeezetable` By default floats are `\small`. The `\squeezetable` declaration makes them smaller (`\scriptsize`). In general you can locally redefine `\tabular@font` to be whatever you like. (DPC: `\Huge\color{magenta}...?`)

```

1605 \def\tabular@font{\small}%
1606 \def\squeezetable{\def\tabular@font{\scriptsize}}%

```

### 11.9.1 Deferring table Floats

We install a hook at `\AtBeginDocument` time which determines if tables will float or will be deferred until `\printtables` time.

We also deal with the possibility of `longtable` environments.

```

1607 \AtBeginDocument{%

```

```

1608 \floats@sw{}{%
1609 \let@environment{longtable@float}{longtable}%
1610 \let@environment{longtable}{longtable@write}%
1611 }%
1612 \do@if@floats{table}{.tbx}%
1613 }%
1614 \appdef\class@enddocumenthook{%
1615 \printtables
1616 }%
1617 \newenvironment{longtable@write}{%
1618 \write@@float{longtable}{table}%
1619 }{%
1620 \endwrite@float
1621 }%

```

`\printtables` The user-level command `\printtables` determines where the tables are to appear in a document in which `\floats@sw` is false. If the user invokes the `nofloats` and fails to insert a `\printtables` command, the tables will be printed at the end of the document. If the command is given, but floats are not being deferred, it amounts to a no-op.

```

1622 \newcommand\printtables{%
1623 \let@environment{longtable}{longtable@float}%
1624 \print@float{table}%
1625 }%

```

## 12 Tabular

Every tabular has a double (Scotch) rule above and below. The column specifier “d” is implemented using the `dcolum` package, if available. **FIXME:** always load `dcolum`!

```

\tabular@hook
\endtabular@hook
1626 \def\tabular@hook{%
1627 \def\endtabular@hook{%
1628 %\RequirePackage{dcolum}%
1629 \AtBeginDocument{%
1630 \@ifpackageloaded{dcolum}{%
1631 \newcolumntype{d}{D{.}{.}{-1}}%
1632 }{}%
1633 }%
1634 \def\toprule{\hline\hline}%
1635 \def\colrule{\hline}%
1636 \def\botrule{\hline\hline}%

```

## 13 Footnote Text

```

\@makefntext
1637 \newcommand\@makefntext[1]{%
1638 \def\baselinestretch{1}%

```

```

1639 \reset@font\footnotesize
1640 \parindent 1em%
1641 \noindent
1642 \hb@xt@1.8em{\hss\@makefnmark}%
1643 #1\par
1644 }%

```

## 13.1 Citations, Bibliography, Endnotes

### 13.1.1 Bibliography

Load Patrick Daly's natbib package, `ftp://ctan.tug.org/macros/latex/contrib/supported/natbib`

Note that natbib assumes that it loads over a document class, such as the article class, that has already defined thebibliography and \@listi.

Note also that natbib also installs a command \NAT@set@cites into \AtBeginDocument which presumes that the proper \bibpunct command has been issued.

```

1645 \newenvironment{thebibliography}{}{}%
1646 \let\@listi\@empty
1647 \RequirePackage{natbib}%
1648 \let\NAT@thebibliography\thebibliography
1649 \let\NAT@endthebibliography\endthebibliography

```

\bibliographystyle We arrange for the selection of bibliography style to occur either due to the document's explicit \bibliographystyle statement or via the journal substyle.

Note that RevT<sub>E</sub>X is now incompatible with any package that patches \bibliographystyle, except for those (like natbib) that load before here.

```

1650 \let\LATEX@bibliographystyle\bibliographystyle
1651 \def\bibliographystyle{\def\@bibstyle}%

```

\bibsection We define the sectioning command to use when starting the bibliography and gently coax natbib into using the formatting procedures that *we* want to use.

\@bibsetup This way of setting up thebibliography automatically sets the label width based on the largest number used within the bibliography. This scheme will not work properly using the Harvard style of bib entry, though.

\bibfont In \bibfont is the class's default \place@bibnumber. If neither the document nor the journal substyle has made a selection at that late moment, the following selection will prevail and avoid this procedure being undefined.

```

1652 \def\bibsection{\section*{\refname}}%
1653 \def\REV@bibsetup#1{\NAT@bibsetup{\ref{LastBibItem}}}%
1654 \let\bibpreamble\@empty
1655 \def\bibfont{%
1656   \bibsep\z@\relax
1657   \let\NAT@bibsetup\@bibsetup
1658   \let\@bibsetup\REV@bibsetup
1659   \@ifxundefined\place@bibnumber{%
1660     \let\@biblabel\place@bibnumber@inl
1661   }%

```



```

1662 \let\@biblabel\place@bibnumber
1663 }%
1664 \def\newblock{\ }%
1665 }%

```

`\NAT@onlinecite` We anticipate using numerical citations. If superscript citations are used, we nonetheless need a way to use numerical citations as required by the author. These should be accessible via the `\citet` command.

Nonetheless we remember how to do a numerical citation even when the superscript citation has been selected.

Can you say “inelegant hack”? I knew you could!

```

1666 \let\NAT@citeyear\citeyear
1667 \def\NAT@onlinecite#1{%
1668 \begingroup
1669 \let\@cite\NAT@citenum
1670 \let\NAT@mbox\mbox
1671 \let\citeyear\NAT@citeyear
1672 \def\NAT@space{ }%
1673 \cite{#1}%
1674 \endgroup
1675 }%

```

`\onlinecite` We assign default meaning to two citation commands; `\onlinecite` is used when a citation should appear on the baseline (as opposed to superscripted), and `\textcite` is used for a textual citation (`\cite` gives a parenthetical citation.)

`\textcite`

```

1676 \AtBeginDocument{%
1677 \@ifxundefined\onlinecite{\def\onlinecite{\citealp}}}%
1678 \@ifxundefined\textcite{\def\textcite{\citet}}}%
1679 }%

```

`thebibliography` We put a tail patch into `\thebibliography` and a headpatch into `\endthebibliography`.

```

1680 \renewenvironment{thebibliography}[1]{%
1681 \NAT@thebibliography{#1}%
1682 \@bibnotes
1683 }{%
1684 \@endnotesinbib
1685 \edef\@currentlabel{\arabic{NAT@ctr}}%
1686 \label{LastBibItem}%
1687 \NAT@endthebibliography
1688 }%

```

`\place@bibnumber@sup` Two procedures to select from: produce the `\bibitem` device.

```

1689 %\let\@openbib@code\empty
1690 \def\place@bibnumber@sup#1{\textsuperscript{#1}}%
1691 \def\place@bibnumber@inl#1{[#1]}%

```

### 13.1.2 `\endnotes` and `\rtx@bibnotes`

FIXME: check hyperref compatibility!

`\rtx@bibnote` A version of footnote that appears at the start of the bibliography, most likely used as `\frontmatter@footnote`.

Note: this procedure accumulates material in a macro, taxing T<sub>E</sub>X's mem.

```

1692 \def\rtx@bibnote#1{%
1693   \stepcounter\@mpfn
1694   \protected@xdef\@thefnmark{\thempfn}%
1695   \protected@xdef\@@thefnmark{\textsuperscript{\normalfont\thempfn}}%
1696   \@footnotemark
1697   \expandafter\g@addto@macro
1698   \expandafter\@bibnotes
1699   \expandafter{%
1700   \expandafter \item
1701   \expandafter [\@@thefnmark]#1\par
1702           }%
1703 }%
1704 \let\@bibnotes\@empty

```

`\endnote` A version of footnote that appears at the end of the document. Actually it just appears where `\printendnotes` appears.

```

1705 \def\endnote{%
1706   \@ifnextchar[ {%
1707     \@xendnote
1708   }{%
1709     \stepcounter{footnote}%
1710     \protected@xdef\@thefnmark{\thefootnote}%
1711     \@footnotemark
1712     \@endnotetext
1713   }%
1714 }%

```

`\@xendnote`

```

1715 \def\@xendnote[#1]{%
1716   \begingroup
1717     \c@footnote#1\relax
1718     \unrestored@protected@xdef\@thefnmark{\thefootnote}%
1719   \endgroup
1720   \@footnotemark
1721   \@endnotetext
1722 }%

```

`\REVTEXT@endnote@ext`

```

1723 \def\REVTEXT@endnote@ext{.end}%

```

`\@endnotetext` The commands `\label`, `\index`, and `\glossary`, which are robustified for `\markright` and `\addcontentsline`, are likewise robustified here.

```

1724 \long\def\@endnotetext#1{%
1725   \@ifx{\@endnoteout\@undefined}{%
1726     \newwrite\@endnoteout

```

```

1727 \gdef\endnote@stream{\jobname\REVTeX@endnote@ext}%
1728 \immediate\openout\@endnoteout\endnote@stream\relax
1729 }{}%
1730 \begingroup
1731 \let\label\relax \let\index\relax \let\glossary\relax
1732 \let\cite\relax \let\ref\relax \let\pageref\relax
1733 \let\\\relax
1734 \let\protect\noexpand
1735 \newlinechar'\^M%
1736 % \newlinechar'\ %
1737 \immediate\write\@endnoteout{\noexpand\REVdoendnote{\@thefnmark}{#1}}%
1738 \endgroup
1739 }%

\endnotetext

1740 \def\endnotetext{%
1741 \ifnextchar[ {%
1742 \@xendnotenext
1743 }{%
1744 \protected@xdef\@thefnmark{\thefootnote}\@endnotetext
1745 }%
1746 }%

\@xendnotenext

1747 \def\@xendnotenext[#1]{%
1748 \begingroup
1749 \c@footnote#1\relax
1750 \unrestored@protected@xdef\@thefnmark{\thefootnote}%
1751 \endgroup
1752 \@endnotetext
1753 }%

\printendnotes

1754 \def\printendnotes{%
1755 \@ifx{\@endnoteout\@undefined}{ }{%
1756 \begingroup
1757 \c@secnumdepth-\maxdimen
1758 \section{%
1759 \notesname
1760 }%
1761 \immediate\closeout\@endnoteout
1762 \global\let\@endnoteout\@undefined
1763 \begin{enumerate}%
1764 \makeatletter
1765 \input{\endnote@stream}%
1766 \end{enumerate}%
1767 \endgroup
1768 }%
1769 }%

```

```

1770 \appdef\class@enddocumenthook{%
1771 \printendnotes
1772 }%

```

`\REVfirstnote` In RevTeX, we have permanently altered the way that the footnote counter gets reset at the beginning of the document.

`\set@firstnote`

If footnotes appear in the bibliography, we initialise the footnote counter to number of cites (found last time) via `\set@firstnote`.

```

1773 \chardef\REVfirstnote\z@
1774 \AtBeginDocument{%
1775 \global\c@footnote\REVfirstnote
1776 \appdef\maketitle{\global\c@footnote\REVfirstnote}%
1777 }%
1778 \def\set@firstnote#1{%
1779 \@ifnum{\REVfirstnote=#1\relax}{}{%
1780 \REVTeX@warn@end{Endnote numbers changed: rerun LaTeX}%
1781 }%
1782 \immediate\write\@mainaux{%
1783 \global\chardef\string\REVfirstnote#1\relax
1784 }%
1785 }%

```

`\@endnotesinbib`

We define a function `\@endnotesinbib`, and a variant `\@endnotesinbibliography`.

`\@endnotesinbibliography`

The former is invoked at the start of the end processing for `\end{thebibliography}`; the latter is a synonym.

The procedure typesets the footnotes that are to appear in the bibliography; the default is to simply arrange for the footnote counter to be reset at the start of the document.

The switchover to setting footnotes in the bibliography is done via `\AtBeginDocument` code that changes the meaning of `\footnote` and that substitutes the synonym for `\@endnotesinbib`.

Note that this code make the assumption that the counter used in `thebibliography` is `\c@NAT@ctr`.

```

1786 \def\@endnotesinbib{%
1787 \set@firstnote\z@
1788 }%
1789 \def\@endnotesinbibliography{%
1790 \expandafter\set@firstnote\expandafter{\the\c@NAT@ctr}%
1791 \@ifx{\@endnoteout\@undefined}{}{%
1792 \immediate\closeout\@endnoteout
1793 \global\let\@endnoteout\@undefined
1794 \makeatletter
1795 \input{\endnote@stream}%
1796 }%
1797 }%
1798 \AtBeginDocument{%
1799 \let\REVTeX@footnote\footnote
1800 \footinbib@sw{%
1801 \let\footnote\endnote

```

```

1802 \let\printendnotes\relax
1803 \let\@endnotesinbib\@endnotesinbibliography
1804 }{}%
1805 }%

\REVdoendnote
1806 \def\REVdoendnote#1#2{\bibitem{endnote#1}#2}

\@bibnotes
1807 \let\@bibnotes\@empty

14 Initial setup

Note that this code is executed at \AtBeginDocument time in order to handle a particular timing problem. Please do not move this code any earlier!

1808 \AtBeginDocument{%
1809 \ps@article
1810 \pagenumbering{arabic}%
1811 \normalsize
1812 \tabbingsep \labelsep
1813 \leftmargin\leftmarginI
1814 \labelwidth\leftmargin\advance\labelwidth-\labelsep
1815 \let\@listi\@listI
1816 \@listi
1817 \@ifxundefined\REVTEX@settypespec{\REVTEX@settypespec}%
1818 \twoside@sw{}{%
1819 \raggedbottom
1820 }%

    FIXME: Always sloppy??

1821 \multicol@sw{}{%
1822 \twocolumn@sw{%
1823 \twocolumn
1824 \sloppy
1825 \raggedbottom
1826 }{%
1827 \onecolumn
1828 \sloppy
1829 \raggedbottom
1830 }%
1831 }%
1832 }%

```

## 15 \appendix

```

1833 %\newif\ifappendixon

```

Note that, within appendices, equations are numbered within sections (appendices).

```

1834 \def\appendix{%
1835   \par
1836 % \appendixontrue
1837   \setcounter{section}\z@
1838   \setcounter{subsection}\z@
1839   \setcounter{subsubsection}\z@
1840   \def\thesection{\Alph{section}}%
1841   \def\thesubsection{\arabic{subsection}}%
1842   \def\thesubsubsection{\alph{subsubsection}}%
1843   \@addtoreset{equation}{section}%
1844   \def\theequation@prefix{\thesection}%
1845   \addtocontents{toc}{\protect\appendix}%
1846 }%

```

## 16 Changing the page grid

### 16.1 Grid Changes with `multicol`

```

\title@column@multicol
\close@column@multicol

```

We're changing the page grid with the `multicol` package: set a flag value to help us out when the document has a `widetext` environment.

Implementation note :the optional argument of `\multicols` apparently does not execute inside a group, as does that of the `\twocolumn` command. However, the `\multicols` procedure itself opens a group which is then closed by `\endmulticols`. QUERY: What gets restored when the group closes?

```

1847 \def\title@column@multicol#1{%
1848   \@twocolumntrue
1849   \let\@currenvir@save\@currenvir
1850   \def\@currenvir{multicols}%
1851   \multicols{2}[\#1]\relax
1852 }%
1853 \def\close@column@multicol{%
1854   \endmulticols
1855   \let\@currenvir\@currenvir@save
1856   \hfuzz\maxdimen
1857 }%

```

```
widetext@multicol
```

DPC: This version of `widetext` is for the two-column page grid. In the open code, we simply switch to a one-column grid; in the close code, we resume the interrupted two-column grid. Need to play around with `\@currenvir`, an internal of `\begin`, as this is an 'inverse' environment.

```

1858 \newenvironment{widetext@multicol}{%
1859   \endgroup
1860   \def\@tempa{multicols}%
1861   \@ifx{\@currenvir\@tempa}{%
1862     \csname end\@currenvir\endcsname
1863   }{%
1864     \REVTeX@err{%
1865       widetext environment must not be inside any environment: \@currenvir

```

```

1866     }%
1867     \def\endwidetext{\begingroup\def\@currenvir{widetext}}%
1868   }%
1869 }{%
1870   \multicols{2}\relax
1871   \begingroup
1872   \def\@currenvir{widetext}%
1873   \@endpetrue
1874 }%

```

## 16.2 Avoiding Grid Changes

In preprint styles, “wide text” is a no-op, and the title page processing involves no grid change.

```

\title@column@default
\close@column@default 1875 \def\title@column@default#1{#1}%
1876 \def\close@column@default{}%

```

## 16.3 Galley Style: Margin Changes

A variant of preprint processing. Emulate journal appearance somewhat.

widetext@galley DPC: We’re in galley style so do a lob sided display environment.

QUERY: How can we be sure that we are in galley style? ANSWER: as noted elsewhere, require both \twocolumn@sw and \preprintsty@sw to be false.

```

1877 \def@galley@outdent{\rightmargin-\columnwidth\advance\rightmargin-\columnsep}%
1878 \let\widetext@outdent\@empty
1879 \newenvironment{widetext@galley}{%
1880   \list{}{%
1881     \listparindent \parindent
1882     \itemindent \parindent
1883     \leftmargin \z@
1884     \parsep \z@\@plus\p@
1885     \widetext@outdent
1886     \relax
1887   }%
1888   \item\relax
1889 }{
1890   \endlist
1891 }%

```

## 16.4 Grid Changing Via L<sup>A</sup>T<sub>E</sub>X

In case twocolumngrid has been invoked, switch column grid using the column grid-changing commands. Supply stub definitions of those commands here.

`\title@column@grid` Standard L<sup>A</sup>T<sub>E</sub>X is entirely adequate to the task of dealing with the title block, because it  
`\close@column@grid` always starts at the top of a new page. At the end of the document, the columns will *not*  
be balanced. FIXME: balance them!

```
1892 \def\title@column@grid#1{%
1893   \@twocolumntrue
1894   \twocolumn[#1]%
1895 }%
1896 \def\close@column@grid{%
1897   \onecolumn
1898 }%
```

`widetext@grid` We will not get the behavior we want with standard L<sup>A</sup>T<sub>E</sub>X because it always forces a  
pagebreak when changing the grid. This needs fixed, of course.

```
1899 \newenvironment{widetext@grid}{%
1900   \par\ignorespaces\twocolumn@grid
1901 }{%
1902   \par\onecolumn@grid\global\@ignoretrue
1903   \@endpetrue
1904 }%
1905 \def\twocolumn@grid{\twocolumn\relax}%
1906 \def\onecolumn@grid{\onecolumn}%

```

Read in the `multicol` package if need be.

```
1907 \AtEndOfClass{%
1908   \@ifxundefined\twocolumn@sw{}{%
1909     \twocolumn@sw{%
1910       \multicol@sw{%
1911         \let\REVTEX@tempa\@classoptionslist
1912         \let\@classoptionslist\empty
1913         \RequirePackage{multicol}%
1914         \let\@classoptionslist\REVTEX@tempa
1915       }{}%
1916     }{}%
1917   }%
1918 }%
```

Decide, finally, how the page grid is to be manipulated.

```
1919 \AtBeginDocument{%
1920   \twocolumn@sw{%
1921     \multicol@sw{%

```

Change the page grid with `multicol` package.

```
1922   \let@environment{widetext}{widetext@multicol}%
1923   \let\title@column\title@column@multicol
1924   \let\close@column\close@column@multicol
1925 }{%

```

Change the page grid with standard L<sup>A</sup>T<sub>E</sub>X.

```
1926   \let@environment{widetext}{widetext@grid}%
1927   \let\title@column\title@column@grid

```



```

1928 \let\close@column\close@column@grid
1929 }%
1930 }{%
1931 \let@environment{widetext}{widetext@galley}%
1932 \preprintsty@sw{%
    Change the page grid not at all.
1933 }{%
    If we are galley style, change the page margin only.
1934 \galley@sw{%
1935 \let\widetext@outdent\galley@outdent
1936 }{%
1937 }%
1938 }%
1939 }%
1940 }%

```

`\title@column` Provide a default meaning for `\title@column` in case it was never defined.

```

1941 \AtBeginDocument{%
1942 \@ifxundefined\title@column{%
1943 \let\title@column\title@column@default
1944 }{%
1945 }%

```

## 17 Old font commands

```

1946 \DeclareOldFontCommand{\rm}{\normalfont\rmfamily}{\mathrm}
1947 \DeclareOldFontCommand{\sf}{\normalfont\sffamily}{\mathsf}
1948 \DeclareOldFontCommand{\tt}{\normalfont\ttfamily}{\mathtt}
1949 \DeclareOldFontCommand{\bf}{\normalfont\bfseries}{\mathbf}
1950 \DeclareOldFontCommand{\it}{\normalfont\itshape}{\mathit}
1951 \DeclareOldFontCommand{\sl}{\normalfont\slshape}{\@nomath\sl}
1952 \DeclareOldFontCommand{\sc}{\normalfont\scshape}{\@nomath\sc}
1953 \DeclareRobustCommand*\cal{\@fontswitch\relax\mathcal}
1954 \DeclareRobustCommand*\mit{\@fontswitch\relax\mathnormal}

```

## 18 English-Language Texts

As this class is just for English language journals, we could hardwire these texts, but to make it easier to use this as a basis for the code for similar journal styles, separate out all the fixed text strings into the conventional macros of the form `\...name`

Some of these might need changing in the society-specific code.

`\today` Procedure `\today` is used in the article class, but not in this document class.

```

1955 \def\today{\ifcase\month\or
1956 January\or February\or March\or April\or May\or June\or
1957 July\or August\or September\or October\or November\or December\fi
1958 \space\number\day, \number\year}

```

`\notesname` Text entity `\notesname` is used in `\printendnotes`.  
1959 `\def\notesname{Notes}`

`\partname` Text entity `\partname` is used in `\@part`.  
1960 `\def\partname{Part}`

`\tocname` Text entity `\tocname` is used in `\tableofcontents`, as defined in the standard L<sup>A</sup>T<sub>E</sub>X book class.  
1961 `\def\tocname{Contents}`

`\lofname` Text entity `\lofname` is used in `\listoffigures`, as defined in the standard L<sup>A</sup>T<sub>E</sub>X book class.  
1962 `\def\lofname{List of Figures}`

`\lotname` Text entity `\lotname` is used in `\listoftables`, as defined in the standard L<sup>A</sup>T<sub>E</sub>X book class.  
1963 `\def\lotname{List of Tables}`

`\refname` Text entity `\refname` is used in the bibliography.  
1964 `\def\refname{References}`

`\indexname` Text entity `\indexname` is used in the index, as defined in the standard L<sup>A</sup>T<sub>E</sub>X book class.  
1965 `\def\indexname{Index}`

`\figurename` Text entity `\figurename` is used in figure, `\figuresname` in `\printfigures`.  
1966 `\def\figurename{FIG.}`  
1967 `\def\figuresname{Figures}%`

`\tablename` Text entity `\tablename` is used in table, `\tablesname` in `\printtables`.  
1968 `\def\tablename{TABLE}`  
1969 `\def\tablesname{Tables}%`

`\abstractname` Text entity `\abstractname` is used in abstract.  
1970 `\def\abstractname{Abstract}`

`\appendixesname` Text entity `\appendixesname` is used in TOC.  
`\appendixname` 1971 `\def\appendixesname{Appendixes}%`  
1972 `\def\appendixname{Appendix}%`

`\acknowledgmentsname` Text entity `\acknowledgmentsname` is used in acknowledgments.  
1973 `\def\acknowledgmentsname{Acknowledgments}`

`\journalname` This should be set by the society journal options, eg ‘pra’.  
1974 `\def\journalname{??}`

`\copyrightname` Default layout does not assign copyright, but a journal that wants to might use this.  
1975 `\def\copyrightname{??}`

`\andname` The text string “and” for use in author lists.  
1976 `\def\andname{and}`

`\@pacs@name` The text string prepended to PACS numbers.  
1977 `\def\@pacs@name{PACS numbers: }%`

`\ppname` The text string “pp” for use in page ranges.  
1978 `\def\ppname{pp}`

`\numbername` The text string “number” for use in article reference.  
1979 `\def\numbername{number}`

`\volumename` The text string “volume” for use in article reference.  
1980 `\def\volumename{volume}`

`\Dated@name` These texts are used in the `\date`, et al. commands.  
1981 `\def\Dated@name{dated: }%`  
1982 `\def\Received@name{received }%`  
1983 `\def\Revised@name{revised }%`  
1984 `\def\Accepted@name{accepted }%`  
1985 `\def\Published@name{published }%`

## 19 Uppercase

A better definition is available in `textcase.sty` on ctan (skips mathematics).

```
1986 \AtBeginDocument{%
1987   \providecommand\MakeTextUppercase{\MakeUppercase}%
1988 }%
```

## 20 Legacy Commands

Some commands left over from version 3.1. Some definitions can be overridden in the document preamble or in included packages.

```
1989 \def\address{\replace@command\address\affiliation}%
1990 \def\altaddress{\replace@command\altaddress\altaffiliation}%
1991 \newenvironment{references}{%
1992   \REVTeX@warn@end{The references environment is not supported; use thebibliography .
1993   \gdef\references{\thebibliography{}}\references
1994 }{%
1995   \endthebibliography
1996 }%
1997 \def\draft{%
1998   \REVTeX@warn@end{Command \string\draft\space is obsolete; ^^JInvoke option draft in
1999   \@booleantrue\draft@sw
2000 }%
2001 \def\tighten{%
```

```

2002 \REVTEX@warn@end{Command \string\tighten\space is obsolete;^^JInvoke option tighten
2003 \@booleantrue\tightenlines@sw
2004 }%
2005 \def\tableline{%
2006 \noalign{%
2007 \REVTEX@warn@end{Command \string\tableline\space is obsolete;^^JUse \string\colru
2008 \global\let\tableline\colrule
2009 }%
2010 \tableline
2011 }%
2012 \def\case{\replace@command\case\frac}%
2013 \def\slantfrac{\replace@command\slantfrac\frac}%
2014 \def\tablenote{\replace@command\tablenote\footnote}%
2015 \def\tablenotemark{\replace@command\tablenotemark\footnotemark}%
2016 \def\tablenotetext{\replace@command\tablenotetext\footnotetext}%
2017 % Lose the following definition:
2018 \DeclareRobustCommand\REV@text[1]{%
2019 \relax
2020 \ifmmode
2021 \mathchoice
2022 {\hbox{\everymath{\displaystyle }#1}}}%
2023 {\hbox{\everymath{\textstyle }#1}}}%
2024 {\hbox{\everymath{\scriptstyle }\let\f@size\sf@size\selectfont#1}}}%
2025 {\hbox{\everymath{\scriptscriptstyle }\let\f@size\ssf@size\selectfont#1}}}%
2026 \glb@settings
2027 \else
2028 \mbox{#1}%
2029 \fi
2030 }%
2031 % Lose the following definition:
2032 \DeclareRobustCommand\REV@bbox[1]{%
2033 \relax
2034 \ifmmode
2035 \mathchoice
2036 {\hbox{\everymath{\displaystyle }\boldmath$#1$}}}%
2037 {\hbox{\everymath{\textstyle }\boldmath$#1$}}}%
2038 {\hbox{\everymath{\scriptstyle }\boldmath$#1$}}}%
2039 {\hbox{\everymath{\scriptscriptstyle }\boldmath$#1$}}}%
2040 \glb@settings
2041 \else
2042 \mbox{#1}%
2043 \fi
2044 }%
2045 \DeclareRobustCommand\REV@bm[1]{%
2046 \REVTEX@warn@end{To use \string\bm, please load the bm package!}%
2047 \global\let\bm\relax
2048 }%
2049 \def\FL{\obsolete@command\FL}%
2050 \def\FR{\obsolete@command\FR}%
2051 \def\narrowtext{\obsolete@command\narrowtext}%

```

```

2052 \def\mediumtext{\obsolete@command\mediumtext}%
2053 \newenvironment{quasitable}{%
2054 \let@environment{tabular}{longtable}%
2055 }{%
2056 }%
2057 \AtBeginDocument{%
2058 \@ifxundefined\text{\let\text\REV@text}{}%
2059 \@ifxundefined\bm{\let\bm\REV@bm}{}%
2060 \providecommand\bibinfo[2]{#2}%
2061 \providecommand\epprint[1]{#1}%
2062 \providecommand\url[1]{#1}%
2063 }%

\bbbox
2064 \def\bbbox#1{%
2065 \REVTEX@warn@end{\string\bbbox\space is obsolete,^^Jload the bm package and use \st
2066 \global\let\bbbox\relax
2067 }%

\mathletters
2068 \newenvironment{mathletters}{%
2069 \REVTEX@warn@end{Environment {mathletters} is obsolete;^^Jload the amsmath package
2070 \global\let\mathletters\@empty
2071 }{%
2072 }%

\eqnum
2073 \def\eqnum#1{%
2074 \REVTEX@warn@end{\string\eqnum\space is obsolete, load the amsmath package and use
2075 \global\let\eqnum\@gobble
2076 }%

We read in the symbol definitions.
2077 \RequirePackage{revsymb}%

```

## 21 Endgame for the Document Class

This section contains definitions related to the end-of-class processing: we want to control exactly what happens next.

We provide for a “job macro package” that can override definitions made by the class or any other packages it loads. We act on the value of `\secnumarabic@sw`; this code is a model for dealing with the job macro package. We also install a the very last procedures into `\AtEndOfClass`, ones that need to tail on to any processing performed either by the class, by any of its included packages, or by the job macro package and any packages it may have loaded.

## 21.1 Job Macro Package

You can create a “job macro package” for your document that will be read in automatically every time your document is processed. Thus, if your job is a file called `myarticle.tex`, then the file `myarticle.rty` will be read in just the same as if you had placed a `\usepackage{myarticle.rty}` statement immediately following your `\documentclass` statement.

Within your `.rty` file, you can define and use control sequence names that use the `@` character and you can override any of the definitions or assignments made by the RevTeX document class or the selected journal substyle. That is, you have the power to really mess things up badly.

If you choose to have a job macro package, you are well advised to read the L<sup>A</sup>T<sub>E</sub>X guide to document classes, `revtex4.dtxclsguide.tex` or read up on the subject in a book like the L<sup>A</sup>T<sub>E</sub>X Companion.

The file `revtex4.dtxtemplate.rty` contains a template for creating your own job macro package.

```
2078 \AtEndOfClass{\InputIfFileExists{\jobname.rty}{}}%
```

## 21.2 \secnumarabic@sw

`\secnumarabic@sw` The flag `\secnumarabic@sw` signifies that sectioning commands are to be numbered arabic. The effect of this command should override any settings made by the journal substyle or by the job macro package. However, it should be lower in precedence to definitions appearing in the document preamble. Therefore, we install its code into `\AtEndOfClass`, but do it *after* the corresponding code for the journal substyle and the job macro package.

Note: `\thesection` must *not* be redefined, say, at `\AtBeginDocument` time by some delayed code.

```
2079 \AtEndOfClass{%
2080   \@ifxundefined\secnumarabic@sw{\@booleanfalse\secnumarabic@sw}{}%
2081   \secnumarabic@sw{%
2082     \def\thesection      {\arabic{section}}%
2083     \def\thesubsection   {\thesection.\arabic{subsection}}%
2084     \def\thesubsubsection {\thesubsection.\arabic{subsubsection}}%
2085   }{}%
2086 }%
```

## 21.3 Define the Bibliography Style

This portion of the code for this class file *must* appear at the very end, after the journal substyle has set the default value of `\@bibstyle`.

```
\@bibstyle
2087 \AtEndOfClass{%
2088   \AtBeginDocument{%
2089     \@ifxundefined\@bibstyle{}{}%
2090     \expandafter\LaTeX@bibliographystyle\expandafter{\@bibstyle}%

```

```

2091 }%
2092 }%
2093 }%

```

## 21.4 Hook for default values of Booleans

This portion of the code for this class file *must* appear at the very end.

`\defaults@hook` The procedure `\defaults@hook` should hereby be the very last to be installed into `\AtBeginDocument`. We provide it with a default in case it has not been used up til now.

```

2094 \AtEndOfClass{%
2095 \AtBeginDocument{%
2096 \defaults@hook
2097 }%
2098 }%
2099 \@ifundefined\defaults@hook{\let\defaults@hook\@empty}{}%

```

End of the class file.

```

2100 %</class>

```

## 22 Symbols: the revsymp module

```

2101 %<*revsymp>

```

`\lambdabar`

```

2102 \DeclareRobustCommand\lambdabar{%
2103 \bgroup
2104 \def\@tempa{%
2105 \hbox{%
2106 \raise.73\ht\z@
2107 \hb@xt@\z@{%
2108 \kern.25\wd\z@
2109 \vrule \@width.5\wd\z@\@height.1\p@\@depth.1\p@
2110 \hss
2111 }%
2112 \box\z@
2113 }%
2114 }%
2115 \mathchoice
2116 {\setbox\z@\hbox{$\displaystyle \lambda$}\@tempa}%
2117 {\setbox\z@\hbox{$\textstyle \lambda$}\@tempa}%
2118 {\setbox\z@\hbox{$\scriptstyle \lambda$}\@tempa}%
2119 {\setbox\z@\hbox{$\scriptscriptstyle \lambda$}\@tempa}%
2120 \egroup
2121 }%

```

`\openone` DPC: Really should use a font that includes this glyph. Unfortunately not in AMS ones, but is in `bbold`, `cmbb`. (I think, must check), `FIXME`: check for `bbold`.

```

2122 \DeclareRobustCommand\openone{\leavevmode\hbox{\small1\normalsize\kern-.33em1}}%
\corresponds
2123 \DeclareRobustCommand\corresponds{{\lower.2ex\hbox{=}}{\kern-.75em^{\triangle}}}

\succsim These version 3.1 commands are always supplied, but the definitions in amssymb are
\precsim preferred.
\lessim 2124 \DeclareRobustCommand\altsuccsim{\succ\kern-.9em_\sim\kern.3em}%
\gtrsim 2125 \DeclareRobustCommand\altprecsim{\prec\kern-1em_\sim\kern.3em}%
\alt 2126 \let\REV@succsim\altsuccsim
\agt 2127 \let\REV@precsim\altprecsim
2128 \DeclareRobustCommand\REV@lessim{\mathrel{\mathpalette\vereq{<}}}%
2129 \DeclareRobustCommand\REV@gtrsim{\mathrel{\mathpalette\vereq{>}}}%
2130 \DeclareRobustCommand\alt{\lessim}
2131 \DeclareRobustCommand\agt{\gtrsim}
2132 \def\vereq#1#2{%
2133 \lower3\p@\vbox{%
2134 \baselineskip1.5\p@
2135 \lineskip1.5\p@
2136 \ialign{$\m@th#1\hfill##\hfil$\crrc#2\crrc\sim\crrc}%
2137 }%
2138 }%

\tensor
\overstar 2139 \DeclareRobustCommand\tensor[1]{\@ontopof{#1}{\leftrightharpoonup}{1.15}\mathord{\box2}}
\overdots 2140 \DeclareRobustCommand\overstar[1]{\@ontopof{#1}{\ast}{1.15}\mathord{\box2}}
\overcirc 2141 \DeclareRobustCommand\overdots[1]{\@ontopof{#1}{\cdots}{1.0}\mathord{\box2}}
\loarrow 2142 \DeclareRobustCommand\overcirc[1]{\@ontopof{#1}{\circ}{1.2}\mathord{\box2}}
\roarrow 2143 \DeclareRobustCommand\loarrow[1]{\@ontopof{#1}{\leftarrow}{1.15}\mathord{\box2}}
2144 \DeclareRobustCommand\roarrow[1]{\@ontopof{#1}{\rightarrow}{1.15}\mathord{\box2}}

\@ontopof
2145 \def\@ontopof#1#2#3{%
2146 {%
2147 \mathchoice
2148 {\@ontopof{#1}{#2}{#3}\displaystyle \scriptstyle}%
2149 {\@ontopof{#1}{#2}{#3}\textstyle \scriptstyle}%
2150 {\@ontopof{#1}{#2}{#3}\scriptstyle \scriptscriptstyle}%
2151 {\@ontopof{#1}{#2}{#3}\scriptscriptstyle\scriptscriptstyle}%
2152 }%
2153 }%

@@ontopof Same as RevTeX3, more or less.
2154 \def@@ontopof#1#2#3#4#5{%
2155 \setbox\z@\hbox{$#4#1$}%
2156 \setbox\f@ur\hbox{$#5#2$}%
2157 \setbox\tw@\null\ht\tw@\ht\z@ \dp\tw@\dp\z@
2158 \@ifdim\wd\z@>\wd\f@ur{%
2159 \setbox\f@ur\hb@xt@\wd\z@{\hss\box\f@ur\hss}%

```



```

2160     \mathord{\rlap{\raise#3\ht\z@\box\four}\box\z@}%
2161   }{%
2162     \setbox\four\hbext@.9\wd\four{\hss\box\four\hss}%
2163     \setbox\z@\hbext@\wd\four{\hss$#4\relax#1$\hss}%
2164     \mathord{\rlap{\copy\z@}\raise#3\ht\z@\box\four}%
2165   }%
2166 }%

```

`\frak` Deal with legacy `\frak`: if `amsfonts` not loaded, defined in such a way as to ask for that package. Also, says to use `\mathfrak` instead.

```

2167 \DeclareRobustCommand\frak{%
2168   \REVSymbWarn{%
2169     Command \string\frak\space unsupported:^^J%
2170     please use \string\mathfrak\space instead.%
2171   }%
2172   \global\let\frak\mathfrak
2173   \frak
2174 }%
2175 \DeclareRobustCommand\REV@mathfrak{%
2176   \REVSymbWarn{%
2177     Command \string\mathfrak\space undefined:^^J%
2178     please specify the amsfonts or amssymb option!%
2179   }%
2180   \global\let\mathfrak\@firstofone
2181   \mathfrak
2182 }%

```

`\Bbb` Deal with legacy `\Bbb`: if `amsfonts` not loaded, defined in such a way as to ask for that package. Also, says to use `\mathbb` instead.

```

2183 \DeclareRobustCommand\Bbb{%
2184   \REVSymbWarn{%
2185     Command \string\Bbb\space unsupported:^^J%
2186     please use \string\mathbb\space instead.%
2187   }%
2188   \global\let\Bbb\mathbb
2189   \Bbb
2190 }%
2191 \DeclareRobustCommand\REV@mathfrak{%
2192   \REVSymbWarn{%
2193     Command \string\mathbb\space undefined:^^J%
2194     please specify the amsfonts or amssymb option!%
2195   }%
2196   \global\let\mathbb\@firstofone
2197   \mathbb
2198 }%

```

`\Bigglb` Deal with legacy bold delimiters. Each of the following takes an implicit argument consisting of the delimiter to be made big and bold. **FIXME:** `\DeclareBoldMathCommand` is not the right tool!

```

2199 \def\Bigg\lb{\REV@boldopen \Bigg}%
2200 \def\Big\lb {\REV@boldopen \Big }%
2201 \def\bigg\lb{\REV@boldopen \bigg}%
2202 \def\big\lb {\REV@boldopen \big }%
2203 \def\Biggrb{\REV@boldclose\Bigg}%
2204 \def\Bigrb {\REV@boldclose\Big }%
2205 \def\biggrb{\REV@boldclose\bigg}%
2206 \def\bigrb {\REV@boldclose\big }%
2207 \def\REV@pmb#1{%
2208   \hbox{%
2209     \setbox\z@=\hbox{#1}%
2210     \kern-.02em\copy\z@\kern-\wd\z@
2211     \kern .04em\copy\z@\kern-\wd\z@
2212     \kern-.02em
2213     \raise.04em\copy\z@
2214   }%
2215 }%
2216 \def\REV@boldopen #1#2{\mathopen {\REV@pmb{ $1#2$ }}}%
2217 \def\REV@boldclose#1#2{\mathclose{\REV@pmb{ $1#2$ }}}%

```

\AtBeginDocument Package dependencies are taken care of \AtBeginDocument time.

```

2218 \def\REVSymb@warn#1{\PackageWarningNoLine{revsymb}{#1}}%
2219 \AtBeginDocument{%
2220   \@ifxundefined\succsim{\let\succsim\altsuccsim}{}%
2221   \@ifxundefined\precsim{\let\precsim\altprecsim}{}%
2222   \@ifxundefined\lessim{\let\lessim\REV@lessim}{}%
2223   \@ifxundefined\gtrsim {\let\gtrsim \REV@gtrsim }{%
2224   \@ifxundefined\mathfrak{\let\mathfrak\REV@mathfrak}{}%
2225   \@ifxundefined\mathbb{\let\mathbb\REV@mathbb}{}%
2226 }%
2227 %</revsymb>

```

## 23 The 10pt class option: the 10pt module

The file 10pt.rtx is read in by the revtex4 document class if \@pointsize has the value 10.

```

2228 %<*10pt>
2229 \def\normalsize{%
2230   \@setfontsize\normalsize\@xpt{11.5}%
2231   \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2232   \belowdisplayskip \abovedisplayskip
2233   \abovedisplayshortskip \abovedisplayskip
2234   \belowdisplayshortskip \abovedisplayskip
2235   \let\@listi\@listI
2236 }%
2237 \def\small{%

```

```

2238 \@setfontsize\small\@ixpt{11}%
2239 \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@
2240 \belowdisplayskip \abovedisplayskip
2241 \abovedisplayshortskip \z@ \@plus2\p@
2242 \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2243 \def\@listi{%
2244     \leftmargin\leftmargini
2245     \topsep 4\p@ \@plus2\p@ \@minus2\p@
2246     \parsep 2\p@ \@plus\p@ \@minus\p@
2247     \itemsep \parsep
2248 }%
2249 }%

2250 \def\footnotesize{%
2251     \@setfontsize\footnotesize\@viipt{9.5pt}%
2252     \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
2253     \belowdisplayskip \abovedisplayskip
2254     \abovedisplayshortskip \z@ \@plus\p@
2255     \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
2256     \def\@listi{%
2257         \leftmargin\leftmargini
2258         \topsep 3\p@ \@plus\p@ \@minus\p@
2259         \parsep 2\p@ \@plus\p@ \@minus\p@
2260         \itemsep \parsep
2261     }%
2262 }%

2263 \def\scriptsize{%
2264     \@setfontsize\scriptsize\@viipt\@viipt
2265 }%

2266 \def\tiny{%
2267     \@setfontsize\tiny\@vpt\@vpt
2268 }%

2269 \def\large{%
2270     \@setfontsize\large\@xiipt{14pt}%
2271 }%

2272 \def\Large{%
2273     \@setfontsize\Large\@xivpt{18pt}%
2274 }%

2275 \def\LARGE{%
2276     \@setfontsize\LARGE\@xviipt{22pt}%
2277 }%

2278 \def\huge{%
2279     \@setfontsize\huge\@xxpt{25pt}%
2280 }%

2281 \def\Huge{%
2282     \@setfontsize\Huge\@xxvpt{30pt}%
2283 }%

2284 \AtBeginDocument{%
2285     \twoside@sw{%
2286         \oddsidemargin -.4in

```

```

2287     \evensidemargin -.1in
2288     \marginparwidth 107pt
2289 }{%
2290     \oddsidemargin -.25in
2291     \evensidemargin -.25in
2292     \marginparwidth 30pt
2293 }%
2294 }%

2295 \marginparsep 6pt

2296 \topmargin -61pt

2297 \headheight 25pt
2298 \headsep 16pt

2299 \topskip 10pt

2300 \footskip 30pt

2301 \appdef\set@pica@hook{%
2302 \textheight = 57\baselineskip
2303 \advance\textheight by \topskip
2304 }%

2305 \textwidth42.5pc

2306 \columnsep 1.5pc
2307 \columnseprule 0pt

2308 \footnotesep 1pt
2309 \skip\footins 39pt plus 4pt minus 2pt
2310 \def\footnoterule{\kern-19pt\hrule width.5in\kern18.6pt}%

2311 \floatsep 12pt plus 2pt minus 2pt
2312 \textfloatsep 20pt plus 2pt minus 4pt
2313 \intextsep 12pt plus 2pt minus 2pt

2314 \dblfloatsep 12pt plus 2pt minus 2pt
2315 \dbltextfloatsep 20pt plus 2pt minus 4pt

2316 \@fptop 0pt plus 1fil
2317 \@fpsep 8pt plus 2fil
2318 \@fpbot 0pt plus 1fil
2319 \@dblftop 0pt plus 1fil
2320 \@dblfpsep 8pt plus 2fil
2321 \@dblfpbot 0pt plus 1fil

2322 \marginparpush 5pt

2323 \parskip 0pt plus 1pt
2324 \parindent 10pt
2325 \emergencystretch8\p@

2326 \partopsep 2pt plus 1pt minus 1pt

2327 \leftmargini 25pt
2328 \leftmarginii 22pt
2329 \leftmarginiii 18.7pt

```

```

2330 \leftmarginiv 17pt
2331 \leftmarginv 10pt
2332 \leftmarginvi 10pt

2333 \def\@listI{%
2334   \leftmargin\leftmargini
2335   \parsep 4\p@ plus2\p@ minus\p@
2336   \topsep 8\p@ plus2\p@ minus4\p@
2337   \itemsep 4\p@ plus2\p@ minus\p@
2338 }%

2339 \labelsep 4pt

2340 \def\@listii{%
2341   \leftmargin\leftmarginii
2342   \labelwidth\leftmarginii
2343   \advance\labelwidth-\labelsep
2344   \topsep 4\p@ plus2\p@ minus\p@
2345   \parsep 2\p@ plus\p@ minus\p@
2346   \itemsep \parsep
2347 }%

2348 \def\@listiii{%
2349   \leftmargin\leftmarginiii
2350   \labelwidth\leftmarginiii
2351   \advance\labelwidth-\labelsep
2352   \topsep 2\p@ plus\p@ minus\p@
2353   \parsep \z@
2354   \partopsep \p@ plus\z@ minus\p@
2355   \itemsep \topsep
2356 }%

2357 \def\@listiv{%
2358   \leftmargin\leftmarginiv
2359   \labelwidth\leftmarginiv
2360   \advance\labelwidth-\labelsep
2361 }%

2362 \def\@listv{%
2363   \leftmargin\leftmarginv
2364   \labelwidth\leftmarginv
2365   \advance\labelwidth-\labelsep
2366 }%

2367 \def\@listvi{%
2368   \leftmargin\leftmarginvi
2369   \labelwidth\leftmarginvi
2370   \advance\labelwidth-\labelsep
2371 }%

2372 %</10pt>

```

## 24 The 11pt class option: the 11pt module

The file 11pt.rtx is read in by the revtex4 document class if \@pointsizes has the value 11.

```
2373 %<*11pt>
2374 \def\normalsize{%
2375     \@setfontsize\normalsize\@xipt{13.6}%
2376     \abovedisplayskip 11\p@ \@plus3\p@ \@minus6\p@
2377     \belowdisplayskip \abovedisplayskip
2378     \abovedisplayshortskip \abovedisplayskip
2379     \belowdisplayshortskip \abovedisplayskip
2380     \let\@listi\@listI
2381 }%
2382 \def\small{%
2383     \@setfontsize\small\@xpt\@xipt
2384     \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2385     \abovedisplayshortskip \z@ \@plus3\p@
2386     \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
2387     \def\@listi{\leftmargin\leftmarginI
2388                 \topsep 6\p@ \@plus2\p@ \@minus2\p@
2389                 \parsep 3\p@ \@plus2\p@ \@minus\p@
2390                 \itemsep \parsep
2391     }%
2392     \belowdisplayskip \abovedisplayskip
2393 }%
2394 \def\footnotesize{%
2395     \@setfontsize\footnotesize\@ixpt{11}%
2396     \abovedisplayskip 8\p@ \@plus2\p@ \@minus4\p@
2397     \abovedisplayshortskip \z@ \@plus\p@
2398     \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2399     \def\@listi{\leftmargin\leftmarginI
2400                 \topsep 4\p@ \@plus2\p@ \@minus2\p@
2401                 \parsep 2\p@ \@plus\p@ \@minus\p@
2402                 \itemsep \parsep
2403     }%
2404     \belowdisplayskip \abovedisplayskip
2405 }%
2406 \def\scriptsize{%
2407     \@setfontsize\scriptsize\@viipt{9.5}%
2408 }%
2409 \def\tiny{%
2410     \@setfontsize\tiny\@vipt\@viipt
2411 }%
2412 \def\large{%
2413     \@setfontsize\large\@xiipt{14}%
2414 }%
2415 \def\Large{%
2416     \@setfontsize\Large\@xivpt{18}%
```

```

2417 }%
2418 \def\LARGE{%
2419   \@setfontsize\LARGE\@xvipt{22}%
2420 }%
2421 \def\huge{%
2422   \@setfontsize\huge\@xxpt{25pt}%
2423 }%
2424 \def\Huge{%
2425   \@setfontsize\Huge\@xxvpt{30pt}%
2426 }%
2427 %</11pt>

```

## 25 The 12pt class option: the 12pt module

The file 12pt.rtx is read in by the revtex4 document class if \@pointsizes has the value 12.

```

2428 %<*12pt>
2429 \def\normalsize{%
2430   \@setfontsize\normalsize\@xipt{14pt}%
2431   \abovedisplayskip 12\p@ \@plus3\p@ \@minus7\p@
2432   \belowdisplayskip \abovedisplayskip
2433   \abovedisplayshortskip \z@ plus3\p@
2434   \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2435   \let\@listi\@listI
2436 }%
2437 \def\small{%
2438   \@setfontsize\small\@xipt{14.5pt}%
2439   \abovedisplayskip 811\p@ \@plus3\p@ \@minus6\p@
2440   \belowdisplayskip \abovedisplayskip
2441   \abovedisplayshortskip \z@ \@plus3\p@
2442   \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2443   \def\@listi{%
2444     \leftmargin\leftmarginI
2445     \topsep 9\p@ \@plus3\p@ \@minus5\p@
2446     \parsep 4.5\p@ \@plus2\p@ \@minus\p@
2447     \itemsep \parsep
2448   }%
2449 }%

```

Same baselineskip as \small ?

```

2450 \def\footnotesize{%
2451   \@setfontsize\footnotesize\@xpt{14.5pt}%
2452   \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2453   \belowdisplayskip \abovedisplayskip
2454   \abovedisplayshortskip \z@ \@plus3\p@
2455   \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
2456   \def\@listi{%

```

```

2457 \leftmargin\leftmargini
2458 \topsep 6\p@ \@plus2\p@ \@minus2\p@
2459 \parsep 3\p@ \@plus2\p@ \@minus\p@
2460 \itemsep \parsep
2461 }%
2462 }%

2463 \def\scriptsize{%
2464 \setfontsize\scriptsize\viipt{9.5pt}%
2465 }%
2466 \def\tiny{%
2467 \setfontsize\tiny\vpt{7pt}%
2468 }%
2469 \def\large{%
2470 \setfontsize\large\xivpt{18pt}%
2471 }%
2472 \def\Large{%
2473 \setfontsize\Large\xviipt{22pt}%
2474 }%
2475 \def\LARGE{%
2476 \setfontsize\LARGE\xxpt{25pt}%
2477 }%
2478 \def\huge{%
2479 \setfontsize\huge\xxv{30pt}%
2480 }%
2481 \let\Huge=\huge
2482 %</12pt>

```

## 26 Page parameters

This code is common to both 11pt and 12pt.

```

2483 %<*11pt|12pt>

2484 \AtBeginDocument{%
2485 \twoside@sw{%
2486 \oddsidemargin .25in
2487 \evensidemargin -.25in
2488 \marginparwidth 60pt
2489 }{%
2490 \oddsidemargin 0pt
2491 \evensidemargin 0pt
2492 \marginparwidth 44pt
2493 }%
2494 }%

2495 \marginparsep 10pt

2496 \topmargin -37pt

2497 \headheight 12pt
2498 \headsep 25pt

```



```

2499 \topskip 10pt
2500 \footskip 30pt
2501 \appdef\set@pica@hook{%
2502 \@ifxundefined\tightenlines@sw{\@booleanfalse\tightenlines@sw}{}%
2503 \tightenlines@sw{%
2504 \textheight = 44\baselineskip
2505 }{%
2506 \linespread{1.655}\normalfont
2507 \textheight = 27\baselineskip
2508 }%
2509 \advance\textheight by \topskip
2510 }%
2511 \textwidth 468pt
2512 \columnsep 10pt
2513 \columnseprule 0pt
2514 \footnotesep 1pt
2515 \skip\footins 25.25pt plus 4pt minus 2pt
2516 \def\footnoterule{\kern-5.25pt\hrule width.5in\kern4.85pt}
2517 \floatsep 14pt plus 2pt minus 4pt
2518 \textfloatsep 20pt plus 2pt minus 4pt
2519 \intextsep 14pt plus 4pt minus 4pt
2520 \dblfloatsep 14pt plus 2pt minus 4pt
2521 \dbltextfloatsep 20pt plus 2pt minus 4pt
2522 \@fptop 0pt plus 1fil
2523 \@fpsep 10pt plus 2fil
2524 \@fpbot 0pt plus 1fil
2525 \@dblftop 0pt plus 1fil
2526 \@dblfpsep 10pt plus 2fil%
2527 \@dblfpbot 0pt plus 1fil
2528 \marginparpush 7pt
2529 \parskip 0pt plus 1pt
2530 \parindent 15pt
2531 \emergencystretch8\p@
2532 \partopsep 3pt plus 2pt minus 2pt
2533 \leftmargini 30pt
2534 \leftmarginii 26pt
2535 \leftmarginiii 22pt
2536 \leftmarginiv 20pt
2537 \leftmarginv 12pt
2538 \leftmarginvi 12pt
2539 \def\@listI{\leftmargin\leftmargini \parsep 5\p@ plus2.5\p@ minus\p@
2540 \topsep 10\p@ plus4\p@ minus6\p@
2541 \itemsep 5\p@ plus2.5\p@ minus\p@
2542 }%

```

```

2543 \labelsep 6pt
2544 \def\@listii{\leftmargin\leftmarginii
2545 \labelwidth\leftmarginii\advance\labelwidth-\labelsep
2546 \topsep 5\p@ plus2.5\p@ minus\p@
2547 \parsep 2.5\p@ plus\p@ minus\p@
2548 \itemsep \parsep
2549 }%
2550 \def\@listiii{\leftmargin\leftmarginiii
2551 \labelwidth\leftmarginiii\advance\labelwidth-\labelsep
2552 \topsep 2.5\p@ plus\p@ minus\p@
2553 \parsep \z@ \partopsep \p@ plus\z@ minus\p@
2554 \itemsep \topsep
2555 }%
2556 \def\@listiv{\leftmargin\leftmarginiv
2557 \labelwidth\leftmarginiv\advance\labelwidth-\labelsep
2558 }%
2559 \def\@listv{\leftmargin\leftmarginv
2560 \labelwidth\leftmarginv\advance\labelwidth-\labelsep
2561 }%
2562 \def\@listvi{\leftmargin\leftmarginvi
2563 \labelwidth\leftmarginvi\advance\labelwidth-\labelsep
2564 }%
2565 %</11pt|12pt>

```

## 27 The aps class option: the aps module

The file `aps.rtx` is read in by the `revtex4` document class if `\@society` has the value `aps`.

Here, code specific to APS journals is separated out from the `RevTeX` document class. (Other societies can customize `RevTeX` by supplying their own `.rtx` file.)

We first give some text entities (amounting to journal abbreviations), then some APS-specific initialisations, then code for particular APS journals. In the latter case, the choice is keyed off the macro `\@journal`.

Note on `\AtEndOfClass`: this file, like all journal substyles, is read in at `\AtEndOfClass` time, so you should not predicate your code in this way. It would be an improvement in `LATEX` to `\let\AtEndOfClass` to something like `\@firstofone`. This change would be effected in `\@onefilewithoptions`.

```

2566 %<*aps>

```

### 27.1 Defend Against Forseeable Errors

Protect this file from being read in by anything but `RevTeX`.

```

2567 \ifx\undefined\REVTEX@society@ext
2568 \def\@tempa{%

```

```

2569 \endinput
2570 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2571 }%
2572 \expandafter\else
2573 \def\@tempa{}%
2574 \expandafter\fi\@tempa

```

## 27.2 Abbreviations

The following macros constitute typing shortcuts for certain journal names.

```

2575 \def\ao{Appl.\ Opt.\ }
2576 \def\ap{Appl.\ Phys.\ }
2577 \def\apl{Appl.\ Phys.\ Lett.\ }
2578 \def\apj{Astrophys.\ J.\ }
2579 \def\bell{Bell Syst.\ Tech.\ J.\ }
2580 \def\jqe{IEEE J.\ Quantum Electron.\ }
2581 \def\assp{IEEE Trans.\ Acoust.\ Speech Signal Process.\ }
2582 \def\aprop{IEEE Trans.\ Antennas Propag.\ }
2583 \def\mtt{IEEE Trans.\ Microwave Theory Tech.\ }
2584 \def\iovs{Invest.\ Ophthalmol.\ Vis.\ Sci.\ }
2585 \def\jcp{J.\ Chem.\ Phys.\ }
2586 \def\jmo{J.\ Mod.\ Opt.\ }
2587 \def\josa{J.\ Opt.\ Soc.\ Am.\ }
2588 \def\josaa{J.\ Opt.\ Soc.\ Am.\ A }
2589 \def\josab{J.\ Opt.\ Soc.\ Am.\ B }
2590 \def\jpp{J.\ Phys.\ (Paris) }
2591 \def\nat{Nature (London) }
2592 \def\oc{Opt.\ Commun.\ }
2593 \def\ol{Opt.\ Lett.\ }
2594 \def\pl{Phys.\ Lett.\ }
2595 \def\pra{Phys.\ Rev.\ A }
2596 \def\prb{Phys.\ Rev.\ B }
2597 \def\prc{Phys.\ Rev.\ C }
2598 \def\prd{Phys.\ Rev.\ D }
2599 \def\pre{Phys.\ Rev.\ E }
2600 \def\prl{Phys.\ Rev.\ Lett.\ }
2601 \def\rmp{Rev.\ Mod.\ Phys.\ }
2602 \def\pspie{Proc.\ Soc.\ Photo-Opt.\ Instrum.\ Eng.\ }
2603 \def\sjqe{Sov.\ J.\ Quantum Electron.\ }
2604 \def\vr{Vision Res.\ }

```

## 27.3 APS Setup

Here we define the default procedures for APS journals. Individual APS journals may override these definitions.

### 27.3.1 Title block

The specifics of the title block. Apply to all APS journals; individual journals may override these settings.

`\titlepage`

```
2605 \renewenvironment{titlepage}{%
2606   \let\wastwocol@sw\twocolumn@sw
2607   \wastwocol@sw{\onecolumn}{\newpage}%
2608   \thispagestyle{titlepage}%
2609   \c@page\z@% article sets this to one not zero???
2610 }{%
2611   \wastwocol@sw{\twocolumn}{\newpage}%
2612 }%
2613 \def\ps@titlepage{\ps@empty}%
```

`\frontmatter@abstractheading` APS Journals all set the abstract head the same way, with no head. However, if the user has specified the preprint class option, then the abstract will have a head.

```
2614 \def\frontmatter@abstractheading{%
2615   \preprintsty@sw{%
2616     \begin{center}\large\abstractname\end{center}%
2617     \vspace{-1pc}%
2618   }{}%
2619 }%
```

`\frontmatter@abstractwidth` All APS journals set the abstract to the same relative width.

```
2620 \def\frontmatter@abstractwidth{.75\textwidth}
```

`\frontmatter@abstractfont` All APS journals set the abstract body the same way.

```
2621 \def\frontmatter@abstractfont{\small}%
```

`\footinbib@sw` All APS journals except RMP invoke the footinbib option.

```
2622 \@ifxundefined\footinbib@sw{\@booleantrue\footinbib@sw}{}%
```

All APS journal preprints use separate titlepage and full-width abstract.

Note that we defer polling the `\preprintsty@sw` Boolean until `\AtBeginDocument` time, because the document preamble may legitimately change the state of that variable.

```
2623 \AtBeginDocument{%
2624   \preprintsty@sw{%
2625     \@ifxundefined\titlepage@sw{\@booleantrue\titlepage@sw}{}%
2626     \def\frontmatter@abstractwidth{\textwidth}%
2627     \def\frontmatter@affiliationfont{\it}%
2628   }{}%
2629 }%
```

`\frontmatter@authorformat` All APS journals set the author list the same.

```
2630 \def\frontmatter@authorformat{%
2631   \skip@%flushglue
2632   \@flushglue\z@ plus.3\hsize\relax
```

```

2633 \centering
2634 \baselineskip3ex
2635 \parskip\z@skip
2636 \@flushglue\skip@
2637 }%

\frontmatter@above@affiliation The default amount of space above affiliation. Journals will override this definition.
2638 \def\frontmatter@above@affiliation{\smallskip}%

\frontmatter@affiliationfont All APS journals set the affiliation the same.
2639 \def\frontmatter@affiliationfont{\small\it}%

Set up the default APS style for title block authors and affiliations.
2640 \@ifxundefined\groupauthors@sw{%
2641 \clo@groupedaddress
2642 }{}%

\frontmatter@setup All APS journals set the title page the same.
2643 \def\frontmatter@setup{\normalfont\centering}%

\frontmatter@title@produce All APS journals set the article title the same.
2644 \def\frontmatter@title@produce{%
2645 \begingroup\large\bfseries\@title\par\endgroup
2646 \addvspace{2\baselineskip}%
2647 }%

\frontmatter@makefnmark All APS journals share this procedure for setting the titlepage footnote text.
2648 \def\frontmatter@makefnmark{\@textsuperscript{\normalfont\@thefnmark}}%

\frontmatter@RRAPformat All APS journals use the same format for the “Received, Revised, etc.” block on the title
page.
2649 \def\frontmatter@RRAPformat#1{%
2650 \begingroup
2651 \centering\parskip.5ex\relax
2652 \everypar{\hbox\bgroup(\@gobble@leavemode@uppercase}%
2653 \def\par{\@ifvmode{}{\unskip)\egroup\@par}}%
2654 #1\par
2655 \endgroup
2656 }%
2657 \def\punct@RRAP{;\egroup\hbox\bgroup}%
2658 \def\@gobble@leavemode@uppercase#1#2{\expandafter\MakeTextUppercase}%

\ps@titlepage Title page style. Currently empty except for preprint header, which consists of all the
\preprint arguments, stacked flush right at the right margin.
2659 \def\ps@titlepage{%
2660 \def\@oddhead{%
2661 \hfill
2662 \produce@preprints\@preprint

```

```

2663 }%
2664 \let\@evenhead\@oddhead
2665 \def\@oddfoot{\hfil\preprintsty@sw{\thepage}{}}\hfil}%
2666 \let\@evenfoot\@empty
2667 }%
2668 \def\produce@preprints#1{%
2669 \preprintsty@sw{%
2670 \vtop to \z@{%
2671 \def\baselinestretch{1}%
2672 \small
2673 \let\preprint\preprint@cr
2674 \halign{\hfil##\cr#1\cr}\cr}%
2675 \par
2676 \vss
2677 }%
2678 }{}%
2679 }%
2680 \def\preprint@cr#1{#1\cr}%

Invoke bibnote option, if it has not yet been set.
2681 \@ifxundefined\author@note{\def\author@note{\rtx@bibnote}}{}%

```

### 27.3.2 Table of Contents

The toc will itself make an entry in the toc, but we temporarily turn off toc formatting for the duration.

```

2682 \def\@pnumwidth{1.55em}
2683 \def\@tocmarg {2.55em}
2684 \def\@dotsep{4.5}
2685 \setcounter{tocdepth}{3}

2686 \def\tableofcontents{%
2687 \addtocontents{toc}{\string\tocdepth@munge}%
2688 \print@toc{toc}%
2689 \addtocontents{toc}{\string\tocdepth@restore}%
2690 }%

2691 \def\tocdepth@munge{%
2692 \let\l@section@saved\l@section
2693 \let\l@section\@gobble@tw@
2694 }%
2695 \def\@gobble@tw@#1#2{}%

2696 \def\tocdepth@restore{%
2697 \let\l@section\l@section@saved
2698 }%

2699 \def\l@part#1#2{\addpenalty{\@secpenalty}%
2700 \addvspace{2.25em plus\p@}%
2701 \begingroup
2702 \@tempdima 3em %

```

```

2703 \parindent \z@ \rightskip \@pnumwidth %
2704 \parfillskip -\@pnumwidth
2705 {\large \bf %
2706 \leavevmode %
2707 #1\hfil \hb@xt@\@pnumwidth{\hss #2}}\par
2708 \nobreak %
2709 \endgroup
2710 }%

2711 \def\l@section#1#2{%
2712 \addpenalty{\@secpenalty}%
2713 \addvspace{1.0em plus\p@}%
2714 \@tempdima 3.0em %
2715 \begingroup
2716 \parindent \z@ \rightskip \@pnumwidth
2717 \parfillskip -\@pnumwidth
2718 \bf %
2719 \leavevmode %
2720 \advance\leftskip\@tempdima %
2721 \hskip -\leftskip %
2722 #1\nobreak\hfil \nobreak\hb@xt@\@pnumwidth{\hss #2}\par
2723 \endgroup
2724 }%

2725 \def\l@subsection{\@dottedtocline{2}{3.0em}{2.0em}}
2726 \def\l@subsubsection{\@dottedtocline{3}{5.0em}{1.5em}}
2727 \def\l@paragraph{\@dottedtocline{4}{6.5em}{1.5em}}
2728 \def\l@subparagraph{\@dottedtocline{5}{8.0em}{1.5em}}

2729 \def\listoffigures{\print@toc{lof}}%
2730 \def\l@figure{\@dottedtocline{1}{1.5em}{2.3em}}

2731 \def\listoftables{\print@toc{lot}}%
2732 \let\l@table\l@figure

```

### 27.3.3 Appendix

```

\appendix
\@hangfrom@appendix 2733 \appdef\appendix{%
\@hangfroms@appendix 2734 \let\@hangfrom@section\@hangfrom@appendix
\@appendixcntformat 2735 \let\@hangfroms@section\@hangfroms@appendix
2736 \let\@sectioncntformat\@appendixcntformat
2737 }%
2738 \def\@hangfrom@appendix#1#2{%
2739 #1\@ifempty{#2}{}{\: \quad#2}%
2740 }%
2741 \def\@hangfroms@appendix#1#2{%
2742 #1\appendixname\@ifempty{#2}{}{\: \quad#2}%
2743 }%
2744 \def\@appendixcntformat#1{\appendixname\ \cename the#1\endcsname}%

```

### 27.3.4 Bibliography

Customize RevTeX for the journal substyle; this task requires three components: the BIBTEX `apsrev.bst` style file, customizing code for `natbib`, and customizations of the `thebibliography` environment.

`\@bibstyle` Define the argument of the `\bibliographystyle` command (if the document does not do so). The user must have installed a `.bst` file of the corresponding name. This file will then be used by BIBTEX when compiling the document's `.bbl` file.

The default bibliography style for the APS journal substyles, `apsrev.bst`, was originally called `revtex.bst`, but that name is much too generic and should be given to a `.bst` file that applies generally to any RevTeX journal substyle, an impossibility.

To generate `apsrev.bst`, use `custom-bib` version 3.89d1 or later. Run the `.bst` generator, `makebst.tex`, and accept all defaults, with the following exceptions:

1. ORDERING OF REFERENCES: c: seq-no (references in order of Citation);
2. AUTHOR NAMES: i: nm-init (Initials + surname);
3. NUMBER OF AUTHORS: l: max 12, min 12 (there will be three prompts total);
4. TYPEFACE FOR AUTHORS IN LIST OF REFERENCES: u: User defined author font;
5. FONT FOR FIRST NAMES: u: First names in user defined font;
6. EDITOR NAMES IN INCOLLECTION ETC: a: Editors incollection like authors;
7. DATE FORMAT: p: yr-par (Date in parentheses);
8. SUPPRESS MONTH: x: Date is year only;
9. TITLE OF ARTICLE: i: tit-it (Title italic)
10. ARTICLE TITLE PRESENT: x: jtit-x (No article title);
11. JOURNAL TITLE FONT: r: jtlt-rm (Journal title normal);
12. TECHNICAL REPORT TITLE: b: trtit-b (Tech. report title like books);
13. JOURNAL VOLUME: b: vol-bf (Volume bold);
14. VOLUME PUNCTUATION: c: volp-com (Volume with comma);
15. PAGE NUMBERS: f: jpg-1 (Only start page number);
16. JOURNAL NAME PUNCTUATION: x: jnm-x (Space after journal);
17. PUBLISHER IN PARENTHESES: d: pub-date (Publisher and date in parentheses);
18. PUBLISHER POSITION: p: pre-pub (Publisher before chapter, pages);
19. URL ADDRESS: n: URL as note;



20. EDITOR IN COLLECTIONS: b: Booktitle, edited by ...;
21. PUNCTUATION BETWEEN SECTIONS (BLOCKS): c: blk-com (Comma between blocks);
22. ABBREVIATE WORD 'PAGES': a: pp ('Page' abbreviated);
23. ABBREVIATE WORD 'EDITORS': a: ed ('Editor' abbreviated);
24. OTHER ABBREVIATIONS: a: abr (Abbreviations);
25. ABBREVIATION FOR 'EDITION': a: ednx ('Edition' abbreviated as 'ed');
26. EDITION NUMBERS: n: ord (Numerical editions);
27. STORED JOURNAL NAMES: a: jabr (Abbreviated journal names);
28. FONT OF 'ET AL': i: etal-it (Italic et al);
29. NEW FONT SELECTION SCHEME: n: nfss (NFSS);
30. ADDITIONAL REVTeX DATA FIELDS: y: revdata (additional data fields);
31. REFERENCE COMPONENT TAGS: y: reference component tags;

A file `apsrev.dbj` file equivalent to the following should result:

```
% \input docstrip
% \preamble
% -----
% *** REVTeX-compatible apsrev.bst ***
% \endpreamble
% \postamble
% End of customized bst file
% \endpostamble
% \keepsilent
% \askforoverwritefalse
% \def\MBopts{\from{merlin.mbs}}%
%   seq-no%: Citation order ((unsorted, like unsrt.bst))
%   ,nm-init,ed-au%: Initials + surname ((J. F. Smith))
%   ,nmlm%: Limited authors ((et al replaces missing names))
%   ,x10,x2%: Maximum of 12 authors
%   ,m10,m2%: Minimum of 12 authors
%   ,nmft,nmft-def%: User defined author font ((\bibnamefont))
%   ,fnm-def%: First names in user defined font ((\bibfnamefont))
%   ,nmfted%: Editors incollection like authors (font)
%   ,yr-par%: Date in parentheses (as (May 1993))
%   ,xmth%: Date is year only ()
%   ,tit-it%: Title italic ((\em))
%   ,jtitt-x%: No article title ()
%   ,jtttl-rm%: Journal title normal (font)
%   ,trtit-b%: Tech. report title like books ()
```

```
%
,vol-bf%: Volume bold (as {\bf vol}(num))
%
,volp-com%: Volume with comma (as vol(num), ppp)
%
,jpg-1%: Only start page number ()
%
,jnm-x%: Space after journal (name)
%
,pub-date%: Publisher and date in parentheses ((Oxford, 1994))
%
,pre-pub%: Publisher before chapter, pages ()
%
,isbn%: Include ISBN (for books, booklets, etc.)
%
,issn%: Include ISSN (for periodicals)
%
,url,url-nt%: URL as note ()
%
,edby%: Booktitle, edited by .. ((where .. is names))
%
,blk-com%: Comma between blocks ()
%
,pp%: 'Page' abbreviated (as p. or pp.)
%
,ed%: 'Editor' abbreviated (as ed. or eds.)
%
,abr%: Abbreviations (of such words)
%
,ednx%: 'Edition' abbreviated as 'ed' ()
%
,ord%: Numerical editions (as 1st, 2nd, 3rd, etc)
%
,jabr%: Abbreviated journal names ()
%
,etal-it%: Italic et al ()
%
,nfss%: NFSS (use \textbf, \emph, not \bf, \em)
%
,revdata%: additional data fields (Include collaboration, eid, eprint, numpages, a
%
,bibinfo%: reference component tags (Apply tags like \bibinfo to the content of \
%
}}
% \generate{\file{\jobname.bst}{\MBopts}}
% \endbatchfile
%
```

```
% FUNCTION {banner.log} {"REVTex-compatible apsrev.bst 9812" warning$}
%
```

We ensure that the journal substyle has the first word in the matter by installing the (default) APS code later on (see Section 27.5).

Set up for numerical citations. We also nip inside natbib and set up for sort&compression.

```

2745 \@ifpackageloaded{natbib}{%
2746   \bibpunct{[}{]}{,}{n}{}{,}%
2747   \def\NAT@sort{2}%
2748 }{}%

```

In `\bibfont` is the class's default `\place@bibnumber`. If neither the document nor the journal substyle has made a selection at that late moment, the following selection will prevail and avoid this procedure being undefined.

A journal substyle may override these settings.

```

2749 \def\bibsection{\section*{\refname}}%
2750 \def\REV@bibsetup#1{\NAT@bibsetup{\ref{LastBibItem}}}%
2751 \let\bibpreamble@empty
2752 \def\bibfont{%
2753   \bibsep\z@\relax
2754   \let\NAT@bibsetup\@bibsetup
2755   \let\@bibsetup\REV@bibsetup
2756   \@ifxundefined\place@bibnumber{%
2757     \let\@biblabel\place@bibnumber@inl
2758   }{%
2759     \let\@biblabel\place@bibnumber
2760   }%
2761   \def\newblock{\ }%
2762 }%
```

### 27.3.5 Index

FIXME: the following call to `\twocolumn` appears wrong if we were in two-column grid.

```

2763 \newenvironment{theindex}{%
2764   \let\wastwocol@sw\twocolumn@sw
2765   \columnseprule \z@
2766   \columnsep 35\p@
2767   \c@secnumdepth-\maxdimen
2768   \twocolumn[%
2769     \section{%
2770       \indexname
2771     }%
2772   ]%
2773   \thispagestyle{plain}%
2774   \parindent\z@
2775   \parskip\z@ plus.3\p@\relax
2776   \let\item\@idxitem
2777 }{%
2778   \wastwocol@sw{\clearpage}{\onecolumn}%
2779 }%
2780 %
2781 \def\@idxitem{\par\hangindent 40\p@}
2782 %
2783 \def\subitem{\par\hangindent 40\p@ \hspace*{20\p@}}
2784 %
2785 \def\subsubitem{\par\hangindent 40\p@ \hspace*{30\p@}}
2786 %
2787 \def\indexspace{\par \vskip 10\p@ plus5\p@ minus3\p@\relax}
```

## 27.4 Journal-Specific Code

For APS journals, we supply code specific to PRA, PRB, PRC, PRD, PRE, PRL, and RMP. At present, they are identical, with the exception of PRB's code for superscript citations.

```
2788 \def\journal@pra{pra}%
2789 \def\journal@prb{prb}%
2790 \def\journal@prc{prc}%
2791 \def\journal@prd{prd}%
2792 \def\journal@pre{pre}%
2793 \def\journal@prl{prl}%
2794 \def\journal@prstab{prstab}%
2795 \def\journal@rmp{rmp}%
```

Note: the convention in this document class is that the substyle must not override any explicit class options declared by the document. This means that the various Booleans of Section 6 may be assigned here only if they are still undefined at this point.

For most all of the APS journals, the journal-dependent code is relatively meager and is therefore embedded in this file. However, the RMP code is sufficiently extensive that splitting it out into a separate file is more convenient.

### 27.4.1 pra

```
2796 \@ifx{\@journal\journal@pra}{%
```

End of pra code.

```
2797 }{ }%
```

### 27.4.2 prb

```
2798 \@ifx{\@journal\journal@prb}{%
```

PRB requires superscript citations. We use Patrick Daly's natbib package, and hyperref and other packages are already set up to cope with this.

\bibpunct Set up for numerical citations. We also nip inside natbib and set up for sort&compression.

```
2799 \bibpunct{}{}{,}{s}{}{\textsuperscript{,}}%
2800 \def\NAT@sort{2}%
2801 \def\onlinecite#1{\begingroup\let\@cite\NAT@citenum\citealp{#1}\endgroup}%
```

Invoke superbib option if the document has made no selection of its own.

```
2802 \AtBeginDocument{%
2803 \ifxundefined\place@bibnumber{%
2804 \def\place@bibnumber{\place@bibnumber@sup}%
2805 }{ }%
2806 }%
```

End of prb code.

```
2807 }{ }%
```

### 27.4.3 prc

```
2808 \@ifx{\@journal\journal@prc}{%
```

End of prc code.

```
2809 }{}%
```

### 27.4.4 prd

```
2810 \@ifx{\@journal\journal@prd}{%
```

End of prd code.

```
2811 }{}%
```

### 27.4.5 pre

```
2812 \@ifx{\@journal\journal@pre}{%
```

End of prd code.

```
2813 }{}%
```

### 27.4.6 prl

```
2814 \@ifx{\@journal\journal@prl}{%
```

Implement length checking. Use the mathtime package, plus whatever other processing is required to make the formatted output be true to the metrics of the journal.

Note that we execute \RequirePackage at \AtBeginDocument time; this timing can be problematic for some packages: they are not used to being read in so late.

```
2815 \AtBeginDocument{%
2816   \lengthcheck@sw{%
2817     \Requirepackage{mathtime}%
2818   }{}%
2819 }%
```

Note: we defer this code until after type size file is read in.

```
2820 \appdef\set@typesize@hook{%
2821   \@ifnum{\@pointsize=10\relax}{%
2822     \def\normalsize{%
2823       \@setfontsize\normalsize\@xpt\@xipt
2824       \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2825       \belowdisplayskip \abovedisplayskip
2826       \abovedisplayshortskip \abovedisplayskip
2827       \belowdisplayshortskip \abovedisplayskip
2828       \let\@listi\@listI
2829     }%
2830   }{}%
2831 }%
2832 \appdef\set@pica@hook{%
2833   \@ifnum{\@pointsize=10\relax}{%
2834     \textheight = 55\baselineskip
2835     \advance\textheight by \topskip
2836   }{}%
2837 }%
```

End of prl code.

```
2838 }{}%
```

#### 27.4.7 prstab

```
2839 \ifx{\@journal\journal@prstab}{%
```

End of prstab code.

```
2840 }{}%
```

#### 27.4.8 rmp

Read in the code from a file.

```
2841 \ifx{\@journal\journal@rmp}{\input{\@journal\REVTeX@society@ext}}{}%
```

### 27.5 Establish APS Defaults

`\place@bibnumber` We install code that will select the presentation for `\bibitems` and govern the `BIBTEX` processing. If the user has not selected any related option and if the journal substyle also has not, then the `aps` option chooses these defaults.

```
2842 \AtBeginDocument{%
2843   \ifxundefined\place@bibnumber{%
2844     \def\place@bibnumber{\place@bibnumber@inl}%
2845   }{}%
2846   \ifxundefined\@bibstyle{%
2847     \def\@bibstyle{apspra}%
2848   }{}%
2849 }%
```

```
2850 %</aps>
```

## 28 The rmp journal substyle: the rmp module

The file `rmp.rtx` is read in by the `revtex4` document class if `\@society` has the value `aps` and `\@journal` has the value `rmp`.

It is read at the end of the `revtex4.dtxaps.rtx`, so all definitions and assignments in that file are operative unless overridden here.

```
2851 %<*rmp>
```

Protect this file from being read in by anything but `RevTEX`.

```
2852 \ifx\undefined\REVTeX@society@ext
2853   \def\@tempa{%
2854     \endinput
2855     \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2856   }%
2857   \expandafter\else
2858   \def\@tempa{}%
2859   \expandafter\fi\@tempa
```

Protect this file from being read in as a society instead of a journal. In such a case, `\@journal` will be `\@empty`.

```
2860 \@ifx@empty\@journal{%
2861 \REVTeX@warn{I have to read in the aps substyle first!}%
2862 \endinput
2863 \def\@society{aps}\def\@journal{rmp}%
2864 \expandafter\input\expandafter{\@society\REVTeX@society@ext}%
2865 }{}%
```

## 28.1 Frontmatter

`\frontmatter@setup`

```
2866 \def\frontmatter@setup{\normalfont\raggedright\sffamily}%
```

`\frontmatter@title@produce`

```
2867 \def\frontmatter@title@produce{%
2868 \begingroup\Large\bfseries\@title\par\endgroup
2869 \addvspace{8pt}%
2870 }%
```

`\frontmatter@authorformat`

Set the rag to a milder value, because we want to do true ragged right typesetting, as opposed to the L<sup>A</sup>T<sub>E</sub>X default, which gives very poor results.

```
2871 \def\frontmatter@authorformat{%
2872 \preprintsty@sw{\vskip0.5pc\relax}{}%
2873 \@tempskipa\@flushglue
2874 \@flushglue\z@ plus50\p@\relax
2875 \raggedright\advance\leftskip.5in\relax
2876 \@flushglue\@tempskipa
2877 \parskip\z@skip
2878 }%
```

`frontmatter@affiliationfont`

```
2879 \def\frontmatter@affiliationfont{\small\slshape\selectfont}%
```

Set up the default RMP style for title block authors and affiliations. This command should effectively override the effect of the corresponding command in the parent sub-style.

```
2880 \@ifxundefined\groupauthors@sw{%
2881 \clo@groupedaddress
2882 }{}%
```

`\frontmatter@RRAPformat`

Note: in RMP, if we are not in preprint mode, the date will not be produced.

```
2883 \def\frontmatter@RRAPformat#1{%
2884 \begingroup
2885 \small
2886 \raggedright\advance\leftskip.5in\relax
2887 \parskip.5ex\relax
2888 \everypar{\hbox\bgroup(\@gobble@leavemode@uppercase}%
```

```

2889 \def\par{\@ifvmode{ }\unskip)\egroup\@par}}%
2890 \preprintsty@sw{ }\let\@date\@empty}%
2891 #1\par
2892 \endgroup
2893 }%

Frontmatter@abstractheading The default abstract head; journals will override this procedure.
2894 \def\frontmatter@abstractheading{%
2895 \preprintsty@sw{%
2896 \begingroup
2897 \centering\large\abstractname\par
2898 \endgroup
2899 \vspace{.5pc}%
2900 }{ }%
2901 }%

\frontmatter@abstractfont
2902 \def\frontmatter@abstractfont{%
2903 \footnotesize
2904 \hsize\columnwidth
2905 \leftskip=0.5in
2906 \rightskip=\leftskip
2907 \parindent\z@
2908 %\hsize5.5in
2909 }%

Frontmatter@preabstractspace Space above and space below abstract in title block
Frontmatter@postabstractspace 2910 \def\frontmatter@preabstractspace{2.5pc}
2911 \def\frontmatter@postabstractspace{2.0pc}

```

Not done: PACS.

## 28.2 General Text

If not in preprint mode, set the type size to 10/12 point.

```

2912 \appdef\set@typesize@hook{%
2913 \@ifxundefined\preprintsty@sw{ }{%
2914 \preprintsty@sw{ }{%
2915 \def\normalsize{%
2916 \@setsize\normalsize{12pt}\xpt\xpt
2917 \abovedisplayskip 10\p@ plus2\p@ minus5\p@
2918 \belowdisplayskip \abovedisplayskip
2919 \abovedisplayshortskip \abovedisplayskip
2920 \belowdisplayshortskip \abovedisplayskip
2921 \let\@listi\@listI
2922 }%
2923 }%
2924 }%
2925 }%

```



Footnote mods:

```
2926 \footnotesep 9.25pt
2927 \skip\footins 36pt plus 4pt minus 2pt
2928 \def\footnoterule{\kern-13pt\hrule width.5in\kern15.6pt}%
```

## 28.3 Sectioning

```
2929 \def\thepart{\Roman{part}} %
2930 \def\thesection{\Roman{section}}
2931 \def\p@section{}
2932 \def\thesubsection{\Alph{subsection}}
2933 \def\p@subsection{\thesection.}
2934 \def\thesubsubsection{\arabic{subsubsection}}
2935 \def\p@subsubsection{\thesection.\thesubsection.}
2936 \def\p@paragraph{\thesection.\thesubsection.\thesubsubsection.}
2937 \def\theparagraph{\alph{paragraph}}
2938 \def\thesubparagraph{\theparagraph.\arabic{subparagraph}}

2939 \def\section{%
2940   \@startsection{section}{1}{\z@}{0.8cm pluslex minus.2ex}{0.4cm pluslex minus.2ex}
2941   {%
2942     \small\sffamily\bfseries\selectfont
2943     \raggedright
2944     \parindent\z@
2945     \MakeTextUppercase % Implicit #1
2946   }%
2947 }%
2948 \def\subsection{%
2949   \@startsection{subsection}{2}{\z@}{0.8cm pluslex minus.2ex}{0.4cm pluslex minus.2ex}
2950   {%
2951     \small\sffamily\bfseries
2952     \raggedright
2953     \parindent\z@
2954   }%
2955 }%
2956 \def\subsubsection{%
2957   \@startsection{subsubsection}{3}{\z@}{.8cm pluslex minus.2ex}{0.4cm pluslex minus.2ex}
2958   {%
2959     \small\sffamily\selectfont
2960     \raggedright
2961     \parindent\z@
2962   }%
2963 }%
2964 \def\paragraph{%
2965   \@startsection{paragraph}{4}{\z@}{.8cm pluslex minus.2ex}{0.4cm pluslex minus.2ex}
2966   {%
2967     \small\slshape\selectfont
2968     \raggedright
2969     \parindent\z@
2970   }%
}
```

```

2971 }%
2972 \def\subparagraph{%
2973   \@startsection{subparagraph}{4}{\parindent}{3.25ex plus1ex minus.2ex}{-1em}%
2974   {\normalsize\bfseries\selectfont}%
2975 }%
2976 \def\@secntformat#1{\csname the#1\endcsname.\ }%
2977 %
2978 \setcounter{tocdepth}{4}% FIXME: has no effect

\appendix
\@hangfrom@appendix 2979 \appdef\appendix{%
\@hangfroms@appendix 2980 \let\@hangfrom@section\@hangfrom@appendix
\@appendixcntformat 2981 \let\@hangfroms@section\@hangfroms@appendix
2982 \let\@sectioncntformat\@appendixcntformat
2983 }%
2984 \def\@hangfrom@appendix#1#2{%
2985   #1\@ifempty{#2}{}{: \ #2}%
2986 }%
2987 \def\@hangfroms@appendix#1#2{%
2988   #1\appendixname\@ifempty{#2}{}{: \ #2}%
2989 }%
2990 \def\@appendixcntformat#1{\appendixname\ \csname the#1\endcsname}%

```

## 28.4 Figure and Table Caption Formatting

```

\@makecaption
2991 \setlength\belowcaptionskip{2\p@}
2992 \long\def\@makecaption#1#2{%
2993   \vskip\abovecaptionskip
2994   \vbox{%
2995     \small\rmfamily
2996     % \hsize\@capwidth
2997     \noindent
2998     #1\nobreak\hskip.5em plus.2em\ignorespaces#2\par
2999   }%
3000   \vskip\belowcaptionskip
3001 }%

```

## 28.5 Citations and Bibliography

Customize RevTeX for the journal substyle; this task requires three components: a BibTeX .bst style file, customizing code for natbib, and customizations of the thebibliography environment.

`\@bibstyle` Define the argument of the `\bibliographystyle` command (if the document does not do so).

The user must have installed a .bst file of the corresponding name. This file will then be used by BibTeX when compiling the document's .bbl file.

To generate `apsrmp.bst`, use `custom-bib` version 3.89d1 or later. Run the `.bst` generator, `makebst.tex`, with the following options:

1. ORDERING OF REFERENCES: \*: (Alphabetical);
2. AUTHOR NAMES: i: nm-init (Initials + surname);
3. NUMBER OF AUTHORS: l: max 10, min 11;
4. DATE FORMAT: p: yr-par (Date in parentheses);
5. TITLE OF ARTICLE: i: tit-it (Title italic)
6. ARTICLE TITLE PRESENT: x: jtit-x (No article title);
7. JOURNAL TITLE FONT: r: jtlt-rm (Journal title normal);
8. TECHNICAL REPORT TITLE: b: trtit-b (Tech. report title like books);
9. JOURNAL VOLUME: b: vol-bf (Volume bold);
10. VOLUME PUNCTUATION: c: volp-com (Volume with comma);
11. PAGE NUMBERS: f: jpg-1 (Only start page number);
12. JOURNAL NAME PUNCTUATION: x: jnm-x (Space after journal);
13. PUBLISHER IN PARENTHESES: d: pub-date (Publisher and date in parentheses);
14. PUBLISHER POSITION: p: pre-pub (Publisher before chapter, pages);
15. ISBN NUMBER: \*: isbn (Include ISBN);
16. PUNCTUATION BETWEEN SECTIONS (BLOCKS): c: blk-com (Comma between blocks);
17. ABBREVIATE WORD 'PAGES': a: pp ('Page' abbreviated);
18. ABBREVIATE WORD 'EDITORS': a: ed ('Editor' abbreviated);
19. OTHER ABBREVIATIONS: a: abr (Abbreviations);
20. ABBREVIATION FOR 'EDITION': a: ednx ('Edition' abbreviated as 'ed');
21. EDITION NUMBERS: n: ord (Numerical editions);
22. STORED JOURNAL NAMES: a: jabr (Abbreviated journal names);
23. FONT OF 'ET AL': i: etal-it (Italic et al);
24. NEW FONT SELECTION SCHEME: n: nfss (NFSS);
25. ADDITIONAL REVTeX DATA FIELDS: y: revdata (additional data fields);
26. REFERENCE COMPONENT TAGS: r: bibinfo (reference component tags);

A file `apsrmp.dbj` file equivalent to the following should result:

```
% \input docstrip
% \preamble
% -----
% *** REVTeX-compatible apsrmp.bst ***
% \endpreamble
% \postamble
% End of customized bst file
% \endpostamble
% \keepsilent
% \askforoverwritefalse
% \def\MBopts{\from{merlin.mbs}{%
%   ay%:      Author-year (with some non-standard interface)
%   ,nat%:    Natbib (for use with natbib.sty v5.3)
%   ,vonx%:   Sort without von part ((de la Maire after Mahone))
%   ,nm-rev1%: Only first name reversed, initials ((AGU style: Smith, J. F., H.~K.~J.))
%   ,nmlm%:   Limited authors ((et al replaces missing names))
%   ,x10,x2%: Maximum of 12 authors
%   ,m10,m2%: Minimum of 12 authors
%   ,nmft,nmft-def%: User defined author font ((\bibnamefont))
%   ,fnm-def%:  First names in user defined font ((\bibnamefont))
%   ,nmfted%:   Editors incollection like authors (font)
%   ,nmand-rm%: 'And' in normal font ((JONES and JAMES))
%   ,lab,lab-def%: User defined citation font ((\citenamefont))
%   ,keyxyr%:   Year blank when KEY replaces missing author ((for natbib 7.0))
%   ,dt-beg%:   Date after authors ()
%   ,xmth%:     Date is year only ()
%   ,yr-com%:   Date preceded by comma (as ', 1993')
%   ,note-yr%:  Year text full (as 1990--1993 or 'in press')
%   ,jtit-x%:   No article title ()
%   ,jttil-rm%: Journal title normal (font)
%   ,trtit-b%:  Tech. report title like books ()
%   ,vol-bf%:   Volume bold (as {\bf vol}(num))
%   ,volp-com%: Volume with comma (as vol(num), ppp)
%   ,jpg-1%:    Only start page number ()
%   ,pp-last%:  Pages at end (but before any notes)
%   ,num-xser%: Allows number without series (and suppresses word "number")
%   ,jnm-x%:    Space after journal (name)
%   ,pub-par%:  Publisher in parentheses ()
%   ,pre-pub%:  Publisher before chapter, pages ()
%   ,isbn%:     Include ISBN (for books, booklets, etc.)
%   ,issn%:     Include ISSN (for periodicals)
%   ,url,url-blk%: Include URL (as regular item block)
%   ,edpar%:    'Name (editor),' (in parentheses, after name, comma after)
%   ,edby%:     Booktitle, edited by .. ((where .. is names))
%   ,blk-com%:  Comma between blocks ()
%   ,ijn1%:     Add 'in' before journal name (in style for incollection)
%   ,pp%:       'Page' abbreviated (as p. or pp.)
%   ,ed%:       'Editor' abbreviated (as ed. or eds.)
```

```

% ,xedn%:      Editions as in database (saving much processing memory)
% ,jabr%:      Abbreviated journal names ()
% ,etal-it%:   Italic et al ()
% ,nfss%:      NFSS (use \textbf, \emph, not \bf, \em)
% ,revdata%:   additional data fields (Include collaboration, eid, eprint, numpages,
% ,bibinfo%:   reference component tags (Apply tags like \bibinfo to the content of
% }}
% \generate{\file{\jobname.bst}{\MBopts}}
% \endbatchfile
%

3002 \AtBeginDocument{%
3003 \ifxundefined\@bibstyle{%
3004 \def\@bibstyle{apsrmp}%
3005 }{}%
3006 }%

\bibpunct The following commands effectively establish the style in which \cite commands are
formatted. You can think of them as the second needed component for the bibliography.
Set up for numerical citations. We also nip inside natbib and set up for
sort&compression.

3007 \ifpackage{natbib}{%
3008 \bibpunct{({}{)}{,}{a}}{,}%
3009 \def\NAT@sort{0}%
3010 }{}%

\bibsection We define the sectioning command to use when starting the bibliography.
\@bibsetup In \bibfont is the journal substyle's definition of \@biblabel.
\bibfont 3011 \def\bibsection{\section*{\refname}}%
\@biblabel 3012 \let\bibpreamble\@empty
\@bibsetup@rmp 3013 \def\bibfont{%
3014 \bibsep\z@\relax
3015 \let\@bibsetup\@bibsetup@rmp
3016 \let\@biblabel\@gobble
3017 \def\newblock{\ }%
3018 }%
3019 \def\@bibsetup@rmp#1{%
3020 \leftmargin10\p@
3021 \labelwidth\z@
3022 \labelsep\z@
3023 \itemindent-\leftmargin
3024 \parsep\z@
3025 \topsep\z@
3026 \itemsep\z@
3027 }%

\footinbib@sw Footnotes in bibliography are inconsistent with author-year references, and are particu-
larly nast under natbib: the package will automatically change to numbered references
if any \bibitem commands lack the optional argument. Also, all APS journals except

```

RMP invoke the `footinbib` option. Therefore, we must uninvoke it now, even if invoked by the document.

```

3028 \@ifxundefined\footinbib@sw{\}%
3029 \footinbib@sw{\}%
3030 \REVTeX@warn{\%
3031   Footnotes in bibliography are incompatible with RMP.^J%
3032   Undoing the footinbib option.
3033 }%
3034 }{\}%
3035 }%
3036 \@booleanfalse\footinbib@sw

```

## 28.6 Table of Contents

We set up for auto-sizing of certain TOC elements.

To do this, we override certain definitions for the default TOC font (`\toc@@font`) and spacing (`\dotsep`), and define formatting for the needed elements (`\l@...`). Finally, we activate the autosizing by assigning `\toc@pre` and `\toc@post`.

`\toc@@font` Set the formatting characteristics of the auto-indenting part of the TOC.

```

3037 \def\toc@@font{\%
3038 \footnotesize\rmfamily
3039 \def\{\space\ignorespaces}%
3040 }%
3041 \def\dotsep{5.5pt}%

```

`\l@section` Determine which TOC elements are automatically indented.

```

3042 \def\l@section{\%
3043 \l@sections{\section}% Implicit #3#4
3044 }%
3045 \def\tocleft@{\z@}%
3046 \def\l@subsection{\%
3047 \l@sections{section}{subsection}% Implicit #3#4
3048 }%
3049 \def\l@subsubsection#1#2{\}%
3050 \def\l@paragraph#1#2{\}%
3051 \def\l@subparagraph#1#2{\}%

```

Activate the TOC processing.

```

3052 \let\toc@pre\toc@pre@auto
3053 \let\toc@post\toc@post@auto
3054 %</rmp>

```

Here ends the programmer's documentation.

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		\@endnotesinbibliography



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