

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

REVT_EX is a L^AT_EX 2_ε document class, somewhat like a hybrid of the standard L^AT_EX `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:

REVT _E X option	package
<code>twocolumn</code>	<code>multicol</code>
<code>hyperref</code>	<code>hyperref</code>
<code>amsmath</code>	<code>amsmath</code>
<code>amssymb</code>	<code>amssymb</code>
<code>aps</code>	<code>overcite</code>

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-pre>
2 \def\class@name{revtex4}%
```

4.1 Compatability Processing

If the document has `\documentstyle{revtex4}`, then, instead of attempting to run in compatability mode, just complain and exit.

```

3 \if@compatibility
4 \edef\reserved@a{\errhelp{%
5   Change your \string\documentstyle\space statement to
6   \string\documentclass\space and rerun.
7 }}\reserved@a
8 \errmessage{You cannot run REVTeX 4 in compatability mode}%
9 \expandafter\@end
10 \fi

```

4.2 Errors and warnings

`\REVTeX@err` A couple of shorthands for Class messages.

`\REVTeX@warn`

```

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15   \REVTeX@warn@end{Command \string#1\space is obsolete.^^JPlease remove from your do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20   \REVTeX@warn@end{Command \string#1\space is obsolete;^^JUse \string#2\space instea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

```

5 Extensions to the L^AT_EX 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 REV_TE_X that I consider to be kernel extensions, I am putting here.

5.1 New Tools

`\halign@`

```
25 \def\halign@{\halign to}%
```

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

```
26 \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.

```
27 \def\let@environment#1#2{%
28   \expandafter\let

```

```

29 \csname#1\expandafter\endcsname\csname#2\endcsname
30 \expandafter\let
31 \csname end#1\expandafter\endcsname\csname end#2\endcsname
32 }%

```

`\tracingplain` The command `\tracingplain` causes \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`.

```

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

```

`\say` The commands `\say` and `\saythe` cause diagnostic messages in the \TeX log that give the value of a control sequence name or a register respectively.

```

42 \newcommand\say[1]{\typeout{<\noexpand#1=\meaning#1>}}%
43 \newcommand\saythe[1]{\typeout{<\noexpand#1=\the#1>}}%

```

5.2 Boolean Control

We introduce just enough of the Boolean calculus for \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). 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.

```

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

```

```

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

```

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

\@ifnotrelax
\@argswap
\@argswap@val The procedures \@argswap and \@argswap@val are used to facilitate control of expansion.

```

73 \long\def\@ifxundefined#1{\@ifx{\undefined#1}}%
74 \long\def\@ifnotrelax#1#2#3{\@ifx{\relax#1}{#3}{#2}}%
75 \long\def\@argswap#1#2{#2#1}%
76 \long\def\@argswap@val#1#2{#2{#1}}%
77 \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 Forth vocabulary) \@boole@def, which employs \@boolean to do its job.

```

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

```

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

```

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

```

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

```

\@ifx@empty 90 \@boole@def\@ifx#1{\ifx#1}%
\@ifempty
\@ifcat
\@ifdim
\@ifeof
\@ifhbox
\@ifhmode
\@ifinner
\@ifmmode
\@ifnum
\@ifodd
\@ifshbr

```

```

91 \@boole@def\@ifx@empty#1{\ifx\@empty#1}%
92 \@boole@def\@ifempty#1{\if!#1!}%
93 \@boole@def\@ifsw#1{\csname if#1\endcsname}%
94 \@boole@def\@ifdim#1{\ifdim#1}%
95 \@boole@def\@ifeof#1{\ifeof#1}%
96 \@boole@def\@ifhbox#1{\ifhbox#1}%
97 \@boole@def\@ifhmode{\ifhmode}%
98 \@boole@def\@ifinner{\ifinner}%
99 \@boole@def\@ifmmode{\ifmmode}%
100 \@boole@def\@ifnum#1{\ifnum#1}%
101 \@boole@def\@ifodd#1{\ifodd#1}%
102 \@boole@def\@ifvbox#1{\ifvbox#1}%
103 \@boole@def\@ifvmode{\ifvmode}%
104 \@boole@def\@ifvoid#1{\ifvoid#1}%

```

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

```

105 \long\def\boolean@true#1#2{#1}%
106 \long\def\boolean@false#1#2{#2}%

```

`\loopuntil` `\loopwhile` Loop control using the Boolean idiom. Superior to `\loop... \repeat` because these can be nested. The tail of the argument must have a Boolean predicate.

```

107 \long\def\loopuntil#1{#1}{\loopuntil{#1}}%
108 \long\def\loopwhile#1{#1{\loopwhile{#1}}}%

```

5.3 Begin Document Structure

The standard \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, \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 \LaTeX 's kernel code (the first token of `\document`), which could change, you see. But considering that \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`.

```

109 \prepdef\document{%
110 \endgroup
111 \set@typesize@hook
112 \normalsize

```

```

113 \set@pica@hook
114 \boolean@true{ }%
115 }%

```

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

```

116 \def\set@typesize@hook{ }%
117 \def\set@pica@hook{ }%

```

5.4 Display Math

`\eqnarray@broken` Team L^AT_EX will never repair Leslie's broken definition of `eqnarray`. Let us be bold. . . .

```

\eqnarray@flegn@fixed
118 \def\eqnarray@broken{%
119   \stepcounter{equation}%
120   \def\@currentlabel{\p@equation\theequation}%
121   \global\@eqnswtrue
122   \m@th
123   \global\@eqcnt\z@
124   \tabskip\@centering
125   \let\@eqncr
126   $$\everycr{\halign to\displaywidth\bgroup
127     \hskip\@centering$\displaystyle\tabskip\z@skip{##}$\@eqnse1
128     &\global\@eqcnt\@ne\hskip \tw@\arraycolsep \hfil${##}$\hfil
129     &\global\@eqcnt\tw@ \hskip \tw@\arraycolsep
130     $\displaystyle{##}$\hfil\tabskip\@centering
131     &\global\@eqcnt\thr@@ \hb@xt@\z@\bgroup\hss##\egroup
132     \tabskip\z@skip
133     \cr
134 }
135 \long\def\eqnarray@flegn@fixed{%
136 \stepcounter{equation}\def\@currentlabel{\p@equation\theequation}%
137 \global\@eqnswtrue\m@th\global\@eqcnt\z@
138 \tabskip\mathindent
139 \let\@=\@eqncr
140 \setlength\abovedisplayskip{\topsep}%
141 \ifvmode\addtolength\abovedisplayskip{\partopsep}\fi
142 \addtolength\abovedisplayskip{\parskip}%
143 \setlength\belowdisplayskip{\abovedisplayskip}%
144 \setlength\belowdisplayshortskip{\abovedisplayskip}%
145 \setlength\abovedisplayshortskip{\abovedisplayskip}%
146 $$%
147 \everycr{ }%
148 \halign@\linewidth\bgroup
149 \hskip\@centering$\displaystyle\tabskip\z@skip{##}$\@eqnse1
150 &\global\@eqcnt\@ne
151 \hskip\tw@\eqncolsep
152 \hfil${{}##{}}$\hfil
153 &\global\@eqcnt\tw@
154 \hskip\tw@\eqncolsep

```

```

155   $\displaystyle{##}$\hfil\tabskip\@centering
156   &\global\@eqcnt\thr@\hb@xt@\z@\bgroup\hss##\egroup
157   \tabskip\z@skip
158   \cr
159 }%
160 \@ifx{\eqnarray\eqnarray@broken}{%
161   \expandafter\PackageInfo\expandafter{\class@name}%
162   {Repairing broken {eqnarray} definition}%
163   \let\eqnarray\eqnarray@fleqn@fixed
164   \newlength\eqncolsep
165   \setlength\eqncolsep\z@
166   \let\eqnarray@broken\relax
167   \let\eqnarray@fleqn@fixed\relax
168 }{}%
169 \def\mathindent{\@centering}%
170 \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 \LaTeX syntax at this point: If a caption is used below a table, then put out the footnotes before the caption.

```
171 \AtBeginDocument{%
172 \prepdef\caption{\minipagefootnotes}%
173 }%
```

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

```
174 \def\minipagefootnotes{%
175 \par
176 \ifvoid\@mpfootins\else
177 % \unskip
178 % \vskip\skip\@mpfootins
179 \unvbox\@mpfootins
180 \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 `\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)

```

181 \let\REVTEX@xfloat\@xfloat
182 \def\@xfloat#1[#2]{%
183   \let\footnote\REVTEX@footnote
184   \def\@mpfn{mpfootnote}%
185   \def\thempfn{\thempfootnote}%
186   \c@mpfootnote\z@
187   \let\@footnotetext\@mpfootnotetext
188   \let\@makefnmark\@mpmakefnmark
189   \@ifxundefined\floats@sw{\global\@booleantrue\floats@sw}{}%
190   \floats@sw{%
191     \REVTEX@xfloat#1[#2]%
192   }{%
193     \def\@capttype{#1}%
194     \begin@float@pagebreak
195     \vbox\bgroup
196       \def\end@float{%
197         \minipagefootnotes
198         \par\vskip\z@skip      %% \par\vskip\z@ added 15 Dec 87
199         \egroup
200         \par
201         \end@float@pagebreak
202       }%
203     }%
204   }%
205 \def\begin@float@pagebreak{\par\addvspace\intextsep}%
206 \def\end@float@pagebreak{\par\addvspace\intextsep}%
207 \def\@mpmakefnmark#1{%
208   \parindent=1em
209   \noindent
210   \hb@xt@1em{\hss\@makefnmark}%
211   #1%
212 }%

```

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

```

213 \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.

```

214 \def\do@if@floats#1#2{%
215 \@ifxundefined\floats@sw{\global\@booleantrue\floats@sw}{}%
216 \floats@sw}{}%

```

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

```

217 \expandafter\newwrite
218 \csname#1write\endcsname
219 \expandafter\def
220 \csname#1@stream\endcsname{\jobname#2}%
221 \expandafter\immediate
222 \expandafter\openout
223 \csname#1write\endcsname
224 \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`.

```

225 \@ifxundefined\REVTEX@float{%
226 \let\REVTEX@float\@float
227 \let\REVTEX@dblfloat\@dblfloat
228 \let\@float\write@float
229 \let\@dblfloat\write@floats
230 }{}%
231 \let@environment{#1@float}{#1}%
232 \let@environment{#1@floats}{#1*}%
233 \@ifxundefined@cs{#1@write}{}%
234 \let@environment{#1}{#1@write}%
235 }%
236 }%
237 }%

```

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

```

238 \def\triggerpar{\leavevmode\@par}%
239 \def\oneapage{\def\begin@float@pagebreak{\newpage}\def\end@float@pagebreak{\newpage}
240 \def\print@float#1#2{%
241 \@ifxundefined@cs{#1write}{}%
242 \beginngroup
243 #2%
244 \raggedbottom
245 \let\@float\REVTEX@float
246 \let\@dblfloat\REVTEX@dblfloat
247 \let\trigger@float@par\triggerpar
248 \expandafter\prepdef\csname#1@float\endcsname{\trigger@float@par}%
249 \expandafter\prepdef\csname#1@floats\endcsname{\trigger@float@par}%
250 \let@environment{#1}{#1@float}%
251 \let@environment{#1*}{#1@floats}%
252 \expandafter\immediate
253 \expandafter\closeout
254 \csname#1write\endcsname

```

```

255 \everypar{%
256 \global\let\trigger@float@par\relax
257 \global\everypar{}\setbox\z@\lastbox
258 \@ifxundefined@cs{#1sname}{}{%
259 \begin@float@pagebreak
260 \expandafter\section
261 \expandafter*%
262 \expandafter{%
263 \csname#1sname\endcsname
264 }%
265 }%
266 }%
267 \input{\csname#1@stream\endcsname}%
268 \endgroup
269 \expandafter\let\csname#1write\endcsname\relax
270 }%
271 }%

```

`\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`.

```

272 \def\write@float#1{\write@@float{#1}{#1}}%
273 \def\endwrite@float{\@Esphack}%
274 \def\write@floats#1{\write@@float{#1*}{#1}}%
275 \def\endwrite@floats{\@Esphack}%

```

`\write@@float`

```

276 \def\write@@float#1#2{%
277 \ifhmode
278 \@bsphack
279 \fi
280 \chardef\@tempc\csname#2write\endcsname
281 \toks@\begin{#1}}%
282 \def\@tempb{#1}%
283 \expandafter\let\csname end#1\endcsname\endwrite@float
284 \catcode'\^M\active
285 \@makeother\{\@makeother\}\@makeother\%
286 \write@floatline
287 }%

```

`\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.

```

288 \begingroup
289 \catcode'\[\the\catcode'\{\catcode'\}\the\catcode'\}\@makeother\{\@makeother\}%
290 \gdef\float@end@tag#1\end{#2}#3\nul[%
291 \def\@tempa[#2]%
292 \@ifx[\@tempa\@tempb][\end{#2}][\write@floatline]%
293 ]%

```

```

294 \obeylines%
295 \gdef\write@floatline#1^^M[%
296 \begingroup%
297 \newlinechar^^M%
298 \toks@\expandafter[\the\toks@#1]\immediate\write\@tempc[\the\toks@]%
299 \endgroup%
300 \toks@[ ]%
301 \float@end@tag#1\end{ }\@nul%
302 ]%
303 \endgroup

```

5.6 Counters

The following definitions override those of the L^AT_EX kernel, providing for a greater range of inputs.

```

304 \def\@alph#1{\ifcase#1\or a\or b\or c\or d\else\@ialph{#1}\fi}
305 \def\@ialph#1{\ifcase#1\or \or \or \or \or e\or f\or g\or h\or i\or j\or
306 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
307 y\or z\or aa\or bb\or cc\or dd\or ee\or ff\or gg\or hh\or ii\or jj\or
308 kk\or ll\or mm\or nn\or oo\or pp\or qq\or rr\or ss\or tt\or uu\or
309 vv\or ww\or xx\or yy\or zz\else\@ctrerr\fi}
310 \def\@fnsymbol#1{\ensuremath{\ifcase#1\or *\or \dagger\or \ddagger\or
311 \mathchar "278\or **\or \dagger\dagger
312 \or \ddagger\ddagger \or \mathsection \mathsection\or
313 *{*}* \or \dagger\dagger\dagger\or \ddagger\ddagger\ddagger\or
314 \mathsection \mathsection \mathsection
315 \else\@ctrerr\fi}}

```

5.7 Customization of Sections

Patch the standard L^AT_EX 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.

```

316 \def\@startsection#1#2#3#4#5#6{%
317   \@startsection@hook
318   \if@noskipsec \leavevmode \fi
319   \par
320   \@tempskipa #4\relax
321   \@afterindenttrue
322   \ifdim \@tempskipa <\z@
323     \@tempskipa -\@tempskipa \@afterindentfalse
324   \fi
325   \if@nobreak
326     \everypar{}%
327   \else
328     \addpenalty\@secpenalty\advspace\@tempskipa
329   \fi
330   \@ifstar
331     {\@dblarg{\RTX@ssect{#1}{#2}{#3}{#4}{#5}{#6}}}%
332     {\@dblarg{\@sect {#1}{#2}{#3}{#4}{#5}{#6}}}%
333 }%
334 \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 argument of the head. The head can define, e.g., `\@hangfrom@section`, to do its own processing.

```

335 \REVTEX@info
336 {Repairing broken definition of \string\@sect.}%
337 \def\@sect#1#2#3#4#5#6[#7]#8{%
338   \ifnum{#2}>\c@secnumdepth}{%
339     \let\@svsec\@empty
340   }{%
341     \refstepcounter{#1}%
342     \protected@edef\@svsec{{#1}}%
343     \@ifundefined{@#1cntformat}{%
344       \prepdef\@svsec\@secntformat
345     }{%
346       \expandafter\prepdef
347       \expandafter\@svsec
348       \csname @#1cntformat\endcsname
349     }%
350   }%
351   \@tempskipa #5\relax
```

```

352 \@ifdim{\@tempskipa>\z@}{%
353   \begingroup
354     \interlinepenalty \@M
355     #6{%
356       \@ifundefined{@hangfrom@#1}{\@hangfrom}{\csname @hangfrom@#1\endcsname}%
357       {\hskip#3\relax\@svsec}{#8}%
358     }%
359   \@par
360   \endgroup
361   \@ifundefined{#1mark}{\@gobble}{\csname #1mark\endcsname}{#7}%
362   \addcontentsline{toc}{#1}{%
363     \ifnum #2>\c@secnumdepth \else
364       \protect\numberline{\csname the#1\endcsname}%
365     \fi
366     #8}%
367 }{%
368   \def\@svsechd{%
369     #6{%
370       \@ifundefined{@runin@to@#1}{\@runin@to}{\csname @runin@to@#1\endcsname}%
371       {\hskip#3\relax\@svsec}{#8}%
372     }%
373     \@ifundefined{#1mark}{\@gobble}{\csname #1mark\endcsname}{#7}%
374     \addcontentsline{toc}{#1}{%
375       \ifnum #2>\c@secnumdepth \else
376         \protect\numberline{\csname the#1\endcsname}%
377       \fi
378       #8}%
379   }%
380 }%
381 \@xsect{#5}%
382 }%
383 \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.

Note that, for compatibility with the `hyperref` package, we need to provide the interface required by that package (actually required by `pdfmark.def` and `nameref.sty`), namely the definition of `\@currentlabelname`, the insertion of the procedure `\Sectionformat`, and the call to `\phantomsection`. We also have to sidestep the patch to `\@ssect` in that same file, therefore we use a different control sequence name in the call from `\@startsection`.

```

384 \def\RTX@ssect#1#2#3#4#5#6[#7]#8{%
385   \def\@currentlabelname{#8}%
386   \@tempskipa #5\relax
387   \@ifdim{\@tempskipa>\z@}{%
388     \begingroup
389       \interlinepenalty \@M
390       #6{%
391         \@ifundefined{@hangfroms@#1}{\@hangfrom}{\csname @hangfroms@#1\endcsname}%

```

```

392     {\hskip#3\relax}{\Sectionformat{#8}{#1}}%
393     }%
394     \@@par
395     \endgroup
396     \@ifundefined{#1smark}{\@gobble}{\csname #1smark\endcsname}{#7}%
397     \addcontentsline{toc}{#1}{#8}%
398     }{%
399     \def\@svsechd{%
400     #6{%
401     \@ifundefined{@runin@tos@#1}{\@runin@to}{\csname @runin@tos@#1\endcsname}%
402     {\hskip#3\relax}{\Sectionformat{#8}{#1}}%
403     }%
404     \@ifundefined{#1smark}{\@gobble}{\csname #1smark\endcsname}{#7}%
405     \addcontentsline{toc}{#1}{#8}%
406     }%
407     }%
408     \@xsect{#5}%
409     \phantomsection
410 }%
411 \AtBeginDocument{%
412 \@ifx{\phantomsection\@undefined}{\let\phantomsection\@empty}{}%
413 \@ifx{\Sectionformat\@undefined}{\let\Sectionformat\@firstoftwo}{}%
414 }%

```

`\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^AT_EX default.

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

5.8 Patch the `tabular` and `array` Environments

`\endtabular` 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^AT_EX 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^AT_EX `array` and `tabular` environments.

```

416 \AtBeginDocument{%
417 % \toks@\expandafter{\@array}%
418 % \edef\@array@junk[####1]####2{%
419 % \the\toks@
420 % \noexpand\@array@sw

```

```

421 % \noexpand\array@hook
422 % \noexpand\tabular@hook
423 % }%
424 \prepdef\endtabular{\endtabular@hook}%
425 \prepdef\endarray{\endarray@hook}%
426 \providecommand\array@hook{}%
427 \@ifundefined\endarray@hook{\let\endarray@hook\@empty}{}%
428 \providecommand\tabular@hook{}%
429 \@ifundefined\endtabular@hook{\let\endtabular@hook\@empty}{}%
430 \@ifpackageloaded{array}{%
431   \let\@array@sw\@array@sw@array
432 }{}%
433 \let\@array@sw\@array@sw@LaTeX
434 }%
435 }%
436 \def\@array@sw@LaTeX{\@ifx{\@tabularcr}}%
437 \def\@array@sw@array{\@ifx{\dollarbegin\beginngroup}}%

```

`\@tabular` Install, effectively, a head patch to `\tabular`. In order to avoid interference from, e.g., the `array` package, we must perform this patch only *after* packages load.

```

438 \AtBeginDocument{%
439 \prepdef\@tabular{\tabular@font}%
440 }%

```

5.9 Syntax

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

```

441 \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.

```

442 \def\@starttoc#1{%
443   \beginngroup
444     \toc@pre
445     \makeatletter
446     \@input{\jobname.#1}%
447     \if@filesw
448       \expandafter\newwrite\csname tf@#1\endcsname
449       \immediate\openout \csname tf@#1\endcsname \jobname.#1\relax
450     \fi
451     \@nobreakfalse

```

```

452 \toc@post
453 \endgroup
454 }%
455 \def\toc@pre{}%
456 \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.

```

457 \def\toc@@font{}%{\footnotesize\rmfamily}%
458 \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.

```

459 \let\tocdim@section \leftmargini
460 \let\tocdim@subsection \leftmarginii
461 \let\tocdim@subsubsection \leftmarginiii
462 \let\tocdim@paragraph \leftmarginiv
463 \let\tocdim@appendix \leftmarginv
464 \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^AT_EX processing, the substyle does:
`\let\toc@pre\toc@pre@auto` and `\let\toc@post\toc@post@auto`.

```

465 \def\toc@pre@auto{%
466   \toc@@font
467   \@tempdima\z@
468   \toc@setindent\@tempdima{section}%
469   \toc@setindent\@tempdima{subsection}%
470   \toc@setindent\@tempdima{subsubsection}%
471   \toc@setindent\@tempdima{paragraph}%
472   \toc@letdimen{appendix}%
473   \toc@letdimen{pagenum}%
474 }%
475 \def\toc@post@auto{%
476   \if@filesw
477   \begingroup
478     \toc@writedimen{section}%
479     \toc@writedimen{subsection}%
480     \toc@writedimen{subsubsection}%
481     \toc@writedimen{paragraph}%
482     \toc@writedimen{appendix}%
483     \toc@writedimen{pagenum}%
484   \endgroup
485   \fi
486 }%

\toc@setindent

487 \def\toc@setindent#1#2{%
488   \csname tocdim@#2\endcsname\z@
489   \@ifundefined{tocmax@#2}{\@namedef{tocmax@#2}{\z@}}{}%
490   \advance#1\@nameuse{tocmax@#2}\relax
491   \expandafter\edef\csname tocleft@#2\endcsname{\the#1}%
492 }%

\toc@letdimen

493 \def\toc@letdimen#1{%
494   \csname tocdim@#1\endcsname\z@
495   \@ifundefined{tocmax@#1}{\@namedef{tocmax@#1}{\z@}}{}%
496   \expandafter\let\csname tocleft@#1\expandafter\endcsname\csname tocmax@#1\endcsname
497 }%

\toc@writedimen

498 \def\toc@writedimen#1{%
499   \immediate\write\@auxout{%
500     \gdef\expandafter\string\csname tocmax@#1\endcsname{%
501       \expandafter\the\csname tocdim@#1\endcsname
502     }%
503   }%
504 }%

```

`\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.

```

505 \def\l@@sections#1#2#3#4{%
506 % #1 - superior section
507 % #2 - this section
508 % #3 - content, including possible \numberline
509 % #4 - page number
510 \expandafter\let\expandafter\dimen@temp\csname tocdim@#2\endcsname
511 \setbox\z@\hbox{\ignorespaces#4}\ifdim\tocdim@pagenum<\wd\z@\tocdim@pagenum\wd\z@\
512 \begingroup
513 \everypar{}%
514 \leftskip\csname tocleft@#2\endcsname\relax
515 \parindent-\leftskip\advance\parindent\csname tocleft@#1\endcsname\relax
516 \rightskip\tocleft@pagenum plus 1fil\relax
517 \skip@\parfillskip\parfillskip\z@
518 \let\numberline\numberline@@sections
519 \ignorespaces#3\unskip\nobreak\hskip\skip@
520 \hb@xt@\rightskip{\hfil\unhbox\z@}\hskip-\rightskip\hskip\z@skip
521 \par
522 \aftergroup\dimen@temp
523 \expandafter
524 \endgroup\the\dimen@temp\relax
525 }%

```

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

```

526 \def\numberline@@sections#1{%
527 \leavevmode\hb@xt@-\parindent{%
528 \aftergroup\dimen@temp
529 \hfil
530 \setbox\z@\hbox{#1.\kern\@dotsep}\dimen@\wd\z@
531 \unhbox\z@
532 \@ifdim{\dimen@<\dimen@temp}{\dimen@\dimen@temp}{}%
533 \expandafter
534 }\the\dimen@\relax
535 \ignorespaces
536 }%

```

5.11 Page Grid package

We register that the kernel extensions are loaded:

```

537 \expandafter\def\csname ver@ltxkrnext.sty\endcsname{1999/06/08 0.0a2 latex kernel p

```

And we load the page grid package:

```

538 %</class-pre>
539 %\RequirePackage{ltxgrid}%
540 %<*class-pst>

```

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.

```
541 \AtBeginDocument{%
542   \@ifxundefined\twocolumn@sw{\@booleanfalse\twocolumn@sw}{}%
543   \@ifxundefined\multicol@sw{\@booleanfalse\multicol@sw}{}%
544 }%
```

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

```
545 \AtBeginDocument{%
546   \@ifxundefined\footinbib@sw{\@booleanfalse\footinbib@sw}{}%
547 }%
```

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

```
548 \AtBeginDocument{%
549   \@ifxundefined\preprintsty@sw{\@booleanfalse\preprintsty@sw}{}%
550 }%
```

`\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.

```
551 \AtBeginDocument{%
552   \@ifxundefined\galley@sw{\@booleanfalse\galley@sw}{}%
553 }%
```

`\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.

```
554 \AtBeginDocument{%
555 \@ifxundefined\showPACS@sw{\@booleanfalse\showPACS@sw}{}%
556 }%
```

`\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.

`\floatp@sw` The Boolean `\floatp@sw` signifies that endfloats are to be set one per page; if false, that endfloats are to be set with multiple floats per page permitted. By default, the latter. 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`.

```
557 \AtBeginDocument{%
558 \@ifxundefined\twoside@sw{\@booleanfalse\twoside@sw}{}%
559 \twoside@sw{\@twosidetrue}{\@twosidefalse}%
560 }%
```

`\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.

```
561 \AtBeginDocument{%
562 \@ifxundefined\draft@sw{\@booleanfalse\draft@sw}{}%
563 \draft@sw{\overfullrule 5\p@}{\overfullrule\z@}%
564 }%
```

`\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.

```
565 \AtBeginDocument{%
566 \@ifxundefined\tightenlines@sw{\@booleanfalse\tightenlines@sw}{}%
567 }%
```

`\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.

```
568 \AtBeginDocument{%
569 \@ifxundefined\lengthcheck@sw{\@booleanfalse\lengthcheck@sw}{}%
570 }%
```

`\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.

```
571 \AtBeginDocument{%
572 \@ifxundefined\eqsecnum@sw{\@booleanfalse\eqsecnum@sw}{}%
573 \eqsecnum@sw{%
```

```

574 \@addtoreset{equation}{section}%
575 \def\theequation@prefix{\thesection.}%
576 }{}%
577 }%

```

`\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.

```

578 \AtBeginDocument{%
579 \@ifxundefined\byrevtex@sw{\@booleanfalse\byrevtex@sw}{}%
580 }%

```

6.2 Declare Options

6.2.1 Checkin: for Editorial Use

A document class option declaring that the document is being processed by the editorial staff.

This option should:

- put date in footer along with folio
- Have the effect of selecting the `preprint` class option.
- Have the effect of selecting the `showpacs` class option.

```

581 \DeclareOption{checkin}{%
582 \@booleantrue\dateinRH@sw
583 \@booleantrue\preprintsty@sw
584 \def\@pointsize{12}%
585 \@booleantrue\showPACS@sw
586 }%
587 \@booleanfalse\dateinRH@sw
588 \def\checkindate{\dateinRH@sw{\tiny(\today)}}{}%

```

6.2.2 Preprint Style

```

589 \DeclareOption{preprint}{%
590 \@booleantrue\preprintsty@sw
591 \def\@pointsize{12}%
592 }%
593 \DeclareOption{manuscript}{%
594 \REVTeX@warn{Document class option manuscript is obsolete; use preprint instead}%
595 \ExecuteOptions{preprint}%
596 }%

```

6.2.3 Showing PACS

```

597 \DeclareOption{showpacs}{%
598 \@booleantrue\showPACS@sw
599 }%
600 \DeclareOption{noshowpacs}{%

```

```
601 \@booleanfalse\showPACS@sw
602 }%
```

6.2.4 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.

```
603 \DeclareOption{hyperref}{%
604   \AtEndOfClass{%
605     \let\REVTEX@tempa\@clsextension
606     \let\@clsextension\@empty
607     \RequirePackage{hyperref}%
608     \let\@clsextension\REVTEX@tempa
609   }%
```

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.

```
610 \def\@pointsize{10}%
611 }%
```

6.2.5 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.

```
612 \DeclareOption{10pt}{\def\@pointsize{10}}
613 \DeclareOption{11pt}{\def\@pointsize{11}}
614 \DeclareOption{12pt}{\def\@pointsize{12}}
```

6.2.6 Media Size

```
615 \DeclareOption{a4paper}
616   {\setlength\paperheight {297mm}%
617    \setlength\paperwidth  {210mm}}
618 \DeclareOption{a5paper}
619   {\setlength\paperheight {210mm}%
620    \setlength\paperwidth  {148mm}}
621 \DeclareOption{b5paper}
622   {\setlength\paperheight {250mm}%
623    \setlength\paperwidth  {176mm}}
624 \DeclareOption{letterpaper}
625   {\setlength\paperheight {11in}%
626    \setlength\paperwidth  {8.5in}}
627 \DeclareOption{legalpaper}
628   {\setlength\paperheight {14in}%
```

```

629 \setlength\paperwidth {8.5in}
630 \DeclareOption{executivepaper}
631   {\setlength\paperheight {10.5in}%
632    \setlength\paperwidth {7.25in}}
633 \DeclareOption{landscape}
634   {\setlength\@tempdima {\paperheight}%
635    \setlength\paperheight {\paperwidth}%
636    \setlength\paperwidth {\@tempdima}}

```

6.2.7 Bibnotes

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

```

637 \DeclareOption{bibnotes}{\def\author@note{\rtx@bibnote}}%
638 \DeclareOption{nobibnotes}{\def\author@note{\footnote}}%
639 \AtBeginDocument{\ifxundefined\author@note{\def\author@note{\footnote}}{}}%

```

6.2.8 Footinbib

```

640 \DeclareOption{footinbib}{\@booleantrue\footinbib@sw}
641 \DeclareOption{nofootinbib}{\@booleanfalse\footinbib@sw}

```

6.2.9 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.

```

642 \DeclareOption{superbib}{%
643 \def\place@bibnumber{\place@bibnumber@sup}%
644 }%

```

6.2.10 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?

```

645 \DeclareOption{twoside}{\@booleantrue\twoside@sw \mparswitchfalse}
646 \DeclareOption{oneside}{\@booleanfalse\twoside@sw \mparswitchtrue}

```

6.2.11 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 `\AtBeginDcoument` 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`).

```

647 \AtBeginDocument{%
648   \@ifxundefined\twocolumn@sw{%
649     \@booleanfalse\twocolumn@sw
650   }{}%
651   \twocolumn@sw{\@twocolumntrue}{\@twocolumnfalse}%
652 }%
653 \AtEndDocument{%
654   \class@enddocumenthook
655 }%
656 \AtEndOfClass{%
657   \appdef\class@enddocumenthook{%
658     \close@column
659   }%
660   \AtBeginDocument{%
661     \@ifxundefined\close@column{%
662       \let\close@column\close@column@default
663     }{}%
664   }%
665 }%

```

The `twocolumn` class option employs the standard mechanism for changing the column grid: the `ltxgrid` package.

The undocumented class option `multicolumn` sets up `\maketitle` to start two columns using the `multicol` package. At the end of the document the `multicol` environment ends. (DPC: 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.)

```

666 \DeclareOption{multicolumn}{%
667   \@booleantrue\twocolumn@sw
668   \@booleantrue\multicol@sw
669 }%
670 \DeclareOption{twocolumn}{%
671   \@booleantrue\twocolumn@sw
672   \@booleanfalse\multicol@sw
673 }%

```

`onecolumn` specifies one-column page grid.

```

674 \DeclareOption{onecolumn}{%
675   \@booleanfalse\twocolumn@sw
676 }%

```

`galley` emulates setting the galleys 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`.

```

677 \DeclareOption{galley}{%
678   \ExecuteOptions{onecolumn}%
679   \@booleantrue\galley@sw
680   \appdef\set@pica@hook{%
681     \advance\textwidth-\columnsep
682     \textwidth.5\textwidth
683   }%
684 }%

```

6.2.12 tightenlines

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

```

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

```

6.2.13 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.

```

686 \DeclareOption{lengthcheck}{\@booleantrue\lengthcheck@sw}

```

6.2.14 Draft and Final

```

687 \DeclareOption{draft}{%
688   \@booleantrue\draft@sw
689 }%
690 \DeclareOption{final}{%
691   \@booleanfalse\draft@sw
692 }%

```

6.2.15 eqsecnum

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

```

693 \DeclareOption{eqsecnum}{\@booleantrue\eqsecnum@sw}

```

6.2.16 secnumarabic

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

```

694 \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.

```

695 \DeclareOption{fleqn}{\input{fleqn.clo}}

```

6.2.17 floats/endfloats

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

```
696 \DeclareOption{floats}{\@booleantrue\floats@sw\@booleanfalse\floatp@sw}
697 \DeclareOption{endfloats}{\@booleanfalse\floats@sw\@booleanfalse\floatp@sw}
698 \DeclareOption{endfloats*}{\@booleanfalse\floats@sw\@booleantrue\floatp@sw}
699 \AtBeginDocument{%
700   \@ifundefined\floats@sw{\@booleantrue\floats@sw}{}%
701   \@ifundefined\floatp@sw{\@booleantrue\floatp@sw}{}%
702 }%
```

6.2.18 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.

```
703 \DeclareOption{titlepage}{\@booleantrue\titlepage@sw}
704 \DeclareOption{notitlepage}{\@booleanfalse\titlepage@sw}
705 \appdef\defaults@hook{%
706   \@ifundefined\titlepage@sw{\@booleanfalse\titlepage@sw}{}%
707 }%
```

6.2.19 Substyle and Sub-substyle

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

```
708 \def\change@society#1{%
709   \def\@tempa{#1}%
710   \@ifundefined\@society{}{%
711     \@ifx{\@tempa\@society}{}%
712     \REVTeX@warn{Conflicting society \@tempa<>\@society.}%
713   }%
714 }%
715 \let\@society\@tempa
716 }%
717 \DeclareOption{aps}{\change@society{aps}\def\@journal{}}%
718 \DeclareOption{pra}{\change@society{aps}\def\@journal{pra}}%
719 \DeclareOption{prb}{\change@society{aps}\def\@journal{prb}}%
720 \DeclareOption{prc}{\change@society{aps}\def\@journal{prc}}%
721 \DeclareOption{prd}{\change@society{aps}\def\@journal{prd}}%
```

```

722 \DeclareOption{pre}{\change@society{aps}\def\@journal{pre}}%
723 \DeclareOption{prl}{\change@society{aps}\def\@journal{prl}}%
724 \DeclareOption{prstab}{\change@society{aps}\def\@journal{prstab}}%
725 \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.

```

726 \DeclareOption{amsfonts}{%
727   \def\REVTEX@amsfonts{\RequirePackage{amsfonts}}%
728 }%
729 \DeclareOption{noamsfonts}{%
730   \let\REVTEX@amsfonts\@empty
731 }%
732 \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.

```

733 \DeclareOption{amssymb}{%
734   \def\REVTEX@amssymb{\RequirePackage{amssymb}}%
735 }%
736 \DeclareOption{noamssymb}{%
737   \let\REVTEX@amssymb\@empty
738 }%
739 \AtEndOfClass{\@ifxundefined\REVTEX@amssymb{\REVTEX@amssymb}}%

```

6.2.20 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.

```

740 \DeclareOption{groupedaddress}{\clo@groupedaddress}%
741 \def\clo@groupedaddress{%
742   \@booleantrue\groupauthors@sw
743   \@booleantrue\@affils@sw
744   \@booleanfalse\runinaddress@sw
745 }%
746 \AtBeginDocument{%
747   \@ifxundefined\groupauthors@sw{\clo@groupedaddress}}%
748 }%

```

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

```

749 \DeclareOption{unsortedaddress}{\clo@unsortedaddress}%
750 \def\clo@unsortedaddress{%
751   \@booleantrue\groupauthors@sw
752   \@booleanfalse\@affils@sw
753   \@booleanfalse\runinaddress@sw
754 }%

```

`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.

```

755 \DeclareOption{runinaddress}{\clo@runinaddress}%
756 \def\clo@runinaddress{%
757   \@booleantrue\groupauthors@sw
758   \@booleantrue\@affils@sw
759   \@booleantrue\runinaddress@sw
760 }%

```

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

```

761 \DeclareOption{superscriptaddress}{\clo@superscriptaddress}%
762 \def\clo@superscriptaddress{%
763   \@booleanfalse\groupauthors@sw
764   \@booleantrue\@affils@sw
765   \@booleanfalse\runinaddress@sw
766 }%

```

6.2.21 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.

```

767 \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^AT_EX 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.

```

768 \DeclareOption*{%
769   \IfFileExists{\CurrentOption\REVTEX@society@ext}{%
770     \expandafter\change@society\expandafter{\CurrentOption}%
771   }{%
772     \OptionNotUsed
773   }%
774 }%
775 \def\REVTEX@society@ext{.rtx}%
776 \AtEndOfClass{%
777   \@ifxundefined\@society{%
778     \REVTEX@warn{No Society specified, using generic APS style}%

```

```

779 \def\@society{aps}\def\@journal{}%
780 }{}%
781 \expandafter\input\expandafter{\@society\REVTEX@society@ext}%
782 }%

```

6.4 Class-Asserted Options

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

```
783 \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.

```
784 \ProcessOptions\relax
```

7 Procedures Dependent Upon Options

```

\ps@headings
\ps@myheadings
785 \def\ps@headings@twoside{%
786   \let\@mkboth\markboth
787   \let\@oddfoot\@empty
788   \let\@evenfoot\@empty
789   \def\@evenhead{\thepage\quad\checkindate\hfil \slshape \leftmark}%
790   \def\@oddhead{\slshape \rightmark}\hfil\checkindate\quad\thepage}%
791   \def\sectionmark##1{%
792     \markboth{%
793       \MakeTextUppercase{%
794         \@ifnum{\c@secnumdepth >\z@}{\thesection\hskip 1em\relax}}{%
795         ##1%
796       }%
797     }{}%
798   }%
799   \def\subsectionmark##1{%
800     \markright {%

```

```

801     \@ifnum{\c@secnumdepth >\@ne}{\thesubsection\hskip 1em\relax}{}%
802     ##1%
803   }%
804 }%
805 }%
806 \def\ps@headings@oneside{%
807   \let\mkboth\markboth
808   \let\@oddfoot\@empty
809   \let\@evenfoot\@empty
810   \def\@oddhead{\slshape \rightmark}\hfil\checkindate\quad\thepage}%
811   \def\sectionmark##1{%
812     \markright {%
813       \MakeTextUppercase{%
814         \@ifnum{\c@secnumdepth >\z@}{\thesection\hskip 1em\relax}{}%
815         ##1%
816       }%
817     }%
818   }%
819 }%
820 \AtBeginDocument{%
821   \twoside@sw{%
822     \let\ps@headings\ps@headings@twoside
823   }{%
824     \let\ps@headings\ps@headings@oneside
825   }%
826 }%

827 \def\ps@myheadings{%
828   \let\mkboth@gobbletwo
829   \def\@oddhead{\slshape\rightmark}\hfil\checkindate\quad\thepage}%
830   \let\@oddfoot\@empty
831   \def\@evenhead{\thepage\quad\checkindate\hfil\slshape\leftmark}%
832   \let\@evenfoot\@empty
833   \let\sectionmark@gobble
834   \let\subsectionmark@gobble
835 }%

836 \def\ps@article{%
837   \def\@evenhead{\thepage\quad\checkindate\hfil{\leftmark}}%
838   \def\@oddhead{\rightmark}\hfil\checkindate\quad\thepage}%
839   \def\@oddfoot{}%
840   \let\@evenfoot\@oddfoot
841   \let\mkboth@gobbletwo
842   \let\sectionmark@gobble
843   \let\subsectionmark@gobble
844 }%

```

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

```
845 \def\lastpage@putlabel{%
```

```

846 \if@filesw
847 \begingroup
848   \advance\c@page\m@ne
849   \immediate\write\@auxout{\string\newlabel{LastPage}{\the\c@page}}%
850 \endgroup
851 \fi
852 }%

```

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`?

```

853 \AtEndDocument{%
854   \clearpage\lastpage@putlabel
855 }%

```

8 Required Packages

[CTAN:macros/latex/contrib/other/misc/url.sty](#)

```

856 \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.

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

```

\REVTEX@title
857 \renewcommand\title{\@dblarg\REVTEX@title}%
858 \def\REVTEX@title[#1]#2{%
859   \def\@title{#2}%
860   \def\@shorttitle{#1}%
861 }%
```

`\@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`.

```

\@shorttitle
862 \def\@title{\REVTEX@warn{No title}}%
863 \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`.
- ```
864 \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`).
- ```
865 \renewcommand\author[1]{%
866   \@author@sw{%
867     \addaffils
868   }{}%
869   \move@author
870   \def\@author{{}{\#1}}{}%
871   \let\thanks\thanks@author
872 }%
```
- `\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`.
- ```
873 \def\move@author{%
874 \@author@sw{}{}%
875 \@collaboration@sw{%
876 \@booleanfalse\collaboration@sw
877 \expandafter\appdef
878 \expandafter\@authors@curr
879 \expandafter{%
880 \expandafter \@collaboration@opr
881 \@author
882 }%
883 }{}%
884 \expandafter\appdef
885 \expandafter\@authors@curr
886 \expandafter{%
887 \expandafter \@author@opr
888 \@author
889 }%
890 }%
891 }%
892 }%
```
- `\collaboration` Specify the collaboration (given after a group of authors).



```

933 \def\@author@join@ii#1#2#3#4#5{%
934 \def\@author{#1}{\@join{\@separator}{#2}{#5}}{#3}{#4}}%
935 }%
936 \def\@author@join@iii#1#2#3#4#5{%
937 \def\@author{#1}{#2}{\@join{\@separator}{#3}{#5}}{#4}}%
938 }%
939 \def\@author@join@iv#1#2#3#4#5{%
940 \def\@author{#1}{#2}{#3}{\@join{\@separator}{#4}{#5}}}%
941 }%
942 \def\@author@finish{%
943 \@author@sw}{}%
944 \move@author
945 \begin@group
946 \let\href\@secondoftwo
947 \REVTeX@warn{No affiliation specified for \@author}%
948 \end@group
949 }%
950 \@addaffils
951 }%

```

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

```

952 \def\@join#1#2#3{%
953 \@ifempty{#2}{#3}{#2#1#3}}%
954 }%
955 \def\@separator{; \space}%

```

`\surname` No-op to allow better post-processing of the file.  
`\firstname` 956 `\let\surname\@firstofone`  
 957 `\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`.

```
958 \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`.

```
959 \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.

```

960 \def\cat@comma@active{\catcode\,\active}%
961 {\cat@comma@active\gdef,{\active@comma}}%

```

```

962 \def\active@comma{,\penalty-400\relax}%
963 \newcommand*\affiliation[1][]{\begingroup\cat@comma@active\@affiliation{#1}}%
964 \def\@affiliation#1#2{%
965 \endgroup
966 \move@author\@author@init

```

Set the `\temp@sw` to true, then execute the affiliation list (`\@affil@list`) with the intercolated 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.

```

967 \@booleanfalse\temp@sw
968 \let\@tempd\@empty
969 \@affils@sw{%
970 \def\@tempa{#2}\let\@affil@opr\@affil@match\@affil@list
971 }}\temp@sw

```

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

```

972 {%
973 \def\@tempa{#1}%
974 \@ifx{\@tempd\@tempa}{}{%
975 \REVTeX@warn{%
976 New footnote specified for \string\affiliation{#2}.
977 Please put it on the first instance thereof.
978 }%
979 }%
980 }%

```

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`.

```

981 {%
982 \stepcounter{affil}%
983 \edef\@tempc{\theaffil}%
984 \appdef\@affil@list{\@affil@opr}%
985 \appdef@eval\@affil@list\@tempc
986 \appdef\@affil@list{{#1}{#2}}%
987 }%

```

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

```

988 \appdef@eval\@affilID@curr\@tempc
989 }%

```

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

```

990 \newcommand\noaffiliation{%
991 \move@author\@author@init
992 \edef\@affilID@curr{\@affilID@curr}%
993 }%

```

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

```
994 \let\@authors\@empty
```

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

```
995 \def\@addaffils{%
```

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

```
996 \appdef \@authors{\@affilID@opr}%
```

```
997 \appdef@eval\@authors{\@affilID@curr}%
```

```
998 \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 intercolated operator.

```
999 \@booleanfalse\temp@sw
```

```
1000 \let\affils@opr\affils@match\affils@list
```

```
1001 \temp@sw{}{ }%
```

```
1002 \appdef \affils@list{\affils@opr}%
```

```
1003 \appdef@eval\affils@list{\@affilID@curr}%
```

```
1004 }%
```

Finally, null out the temp registers.

```
1005 \let\@authors@curr\@empty
```

```
1006 \let\@affilID@curr\@empty
```

```
1007 }%
```

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

```
1008 \let\affils@list\@empty
```

`\@affil@list` The macro `\@affil@list` accretes the list of affiliations with `\@affil@opr` as the intercolated 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.

```
1009 \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.

```
1010 \let\@affilID@curr\@empty
```

`\@affil@match` The definition for the `\@affil@list` intercolated 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.

```
1011 \def\@affil@match#1#2#3{%
1012 \def\@tempb{#3}%
1013 \@ifx{\@tempa\@tempb}{%
1014 \@booleantrue\temp@sw
1015 \def\@tempd{#2}%
1016 \def\@tempc{#1}%
1017 }{}%
1018 }%
```

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

```
1019 \def\@tempaffil@script#1#2{%
1020 ,\,#1%
1021 }%
```

`\@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`.

```
1022 \def\@tempaffil@group#1#2{%
1023 \def\@tempc{#1}%
1024 \def\@tempb{#2}%
1025 \beginingroup
1026 \let\@affil@opr\@affil@footnote\@affil@list
1027 \endgroup
1028 }%
```

`\@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.

```
1029 \def\@affil@footnote#1#2#3{%
1030 \def\@tempa{#1}%
1031 \@ifx{\@tempa\@tempc}{%
1032 \comma@space
1033 \footnote{\@tempb#3}%
1034 }{}%
```

```

1034 \footnote{#2}%
1035 }{}%
1036 }%

\@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@.
1037 \def\@affil@group#1#2#3{%
1038 \@ifnum{\count@=#1\relax}{%
1039 #3%
1040 \@ifempty{#2}{}{\footnote{#2}}%
1041 \after@address
1042 \advance\@tempcnta\m@ne
1043 }{}%
1044 }%

\email Just tacks the email address on to the current author.
1045 \newcommand*\email[2][Electronic address:]{%
1046 \expandafter\@author@join@ii\@author{#1\href{mailto:#2}{#2}}%
1047 }%

\homepage Just tacks the URL on to the current author. Note: group opened in \homepage is closed
in \@homepage.
1048 \newcommand\homepage{%
1049 \begin@group
1050 \@makeother\~%
1051 \@makeother\%%
1052 \@homepage
1053 }%
1054 \newcommand*\@homepage[2][URL:~]{%
1055 \end@group
1056 \expandafter\@author@join@ii\@author{#1\url{#2}}%
1057 }%

\url
\href 1058 \AtBeginDocument{%
1059 \providecommand\url{\texttt}%
1060 \providecommand\href[2]{\url{#2}}%
1061 }%

\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
1062 \def\thanks@warning{%
1063 \REVTEX@warn{\string\thanks\space is valid only following \string\author.^JPlease
1064 \@gobble
1065 }%
1066 \let\thanks\thanks@warning

```

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

```
1067 \def\thanks@author{%
1068 \expandafter\@author@join@ii\@author
1069 }%
```

`\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.

```
1070 \newcommand*\altaffiliation[2][]{%
1071 \expandafter\@author@join@ii\@author{#1#2}%
1072 }%
```

`\listand` Might need extending with penalties etc.

```
1073 \def\@listand{\@ifnum{\@tempcnta=\tw@}{\andname}{ }\space}%
```

`\@listcomma` This definition, with `\@ne` puts a comma before and. UK English (at least) would normally use `\tw@` here which would then use the more consistent convention of using comma or and but not both.

```
1074 \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.

```
1075 \def\@author@present@group#1#2#3#4{%
1076 \gdef\comma@space{\gdef\comma@space{,\,}}%
1077 \doauthor{#1}{#2}{#3}{#4}%
1078 \advance\@tempcnta\m@ne
1079 }%
```

`\@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.

```
1080 \def\@author@present@script#1#2#3#4{%
1081 \gdef\comma@space{,\,}%
1082 \doauthor{#1}{#2}{#3}{%
1083 \expandafter\@affilcomma\@affilID@temp\relax\relax%
1084 #4%
1085 }%
1086 \advance\@tempcnta\m@ne
1087 }%
1088 \def\@affilcomma#1#2{%
1089 #1%
1090 \ifx{\relax#2}{ }{%
1091 ,\,\@affilcomma
1092 }%
1093 #2%
1094 }%
```

`\@author@present@count` This version of `\@author@opr` counts the number of authors it processes.  
 1095 `\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.

```
1096 \def\doauthor#1#2#3#4{%
1097 \ignorespaces#3\unskip\@listcomma
1098 \@ifx{\@affilID@temp\@empty}{}{#4}%
1099 \@ifempty{#1#2}{}{%
1100 \@ifx{\@affilID@temp\@empty}{}{\comma@space}%
1101 \author@note{%
1102 % \ttfamily
1103 #1%
1104 \@ifempty{#1}{}{\@ifempty{#2}{}{, }}%
1105 #2%
1106 }%
1107 }%
1108 \space\@listand
1109 }%#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.

```
1110 \def\@affilID@def#1{%
1111 \def\@affilID@temp{#1}%
1112 }%
1113 \let\@affilID@temp\@empty
1114 \let\@affilID@opr\@affilID@def
1115 %
1116 \def\@affilID@count#1{%
1117 \def\@tempb{#1}%
1118 \@ifx{\@tempa\@tempb}{}%
1119 \let\@author@opr\@doauthor@count
1120 }{%
```

```

1121 \let\@author@opr\@gobblefour
1122 }%
1123 }%
1124 \def\@affilID@match#1{%
1125 \def\@tempb{#1}%
1126 \@ifx{\@tempa\@tempb}{%
1127 \let\@author@opr\@author@present
1128 }{%
1129 \let\@author@opr\@gobblefour
1130 }%
1131 }%

```

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

```

1132 \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

```

1133 \def\@affil@marked#1#2#3{%
1134 \par
1135 \beginingroup
1136 \frontmatter@affiliationfont
1137 \normalfont#1%
1138 #3\par
1139 \endgroup
1140 }%

```

\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.

```

1141 \def\affils@match#1{%
1142 \def\@tempa{#1}%
1143 \@ifx{\@affilID@curr\@tempa}{%
1144 \@booleantrue\temp@sw
1145 }{}%
1146 }%

```

\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.

```

1147 \def\do@affil@fromgroup#1#2{%
1148 \@ifx{\relax#2}{}%
1149 \count#2\relax
1150 #1\do@affil@fromgroup#1%
1151 }%
1152 }%

```

### 10.3 The keywords command

`\keywords` Usual game, save text in a macro for processing by `\maketitle`.  
`@keywords` 1153 `\def\keywords#1{%`  
1154 `\gdef\@keywords{#1}}`  
1155 `\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.

```
1156 \newcommand*\date[2][\Dated@name]{\def\@date{#1#2}}%
1157 \def\@date{}%
1158 \newcommand*\received[2][\Received@name]{\def\@received{#1#2}}%
1159 \def\@received{}%
1160 \newcommand*\revised[2][\Revised@name]{\def\@revised{#1#2}}%
1161 \def\@revised{}%
1162 \newcommand*\accepted[2][\Accepted@name]{\def\@accepted{#1#2}}%
1163 \def\@accepted{}%
1164 \newcommand*\published[2][\Published@name]{\def\@published{#1#2}}%
1165 \def\@published{}%
```

### 10.5 The pacs command

PACS, the Physics and Astronomy Classification Scheme.

`\pacs` As for `\keywords`  
`@pacs` 1166 `\def\pacs#1{%`  
1167 `\REVTEX@aftermaketitle{\pacs}%`  
1168 `\gdef\@pacs{#1}%`  
1169 `}%`  
1170 `\def\@pacs{}%\REVTEX@warn{No PACS numbers}}%`

### 10.6 The `\preprint` command

```
1171 \def\preprint#1{\gappdef\@preprint{\preprint{#1}}}%
1172 \let\@preprint\@empty
```

### 10.7 draft

DPC: Name clash with draft option.  $\LaTeX$  doesn't care, but it confuses me.

This command is a 3.1 relic, now removed.

```
1173 %\newcommand\draft{\@booleantrue\draft@sw}%
```

## 10.8 The abstract environment

`\absbox`

```
1174 \newbox\absbox
```

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

```
1175 % \changes{v4.e}{1998/01/31}
```

```
1176 % {hookify}
```

```
1177 % Note that the specifics of how the abstract is to be
```

```
1178 % formatted are set by \cmd\frontmatter@abstractwidth,
```

```
1179 % \cmd\frontmatter@abstractheading, and \cmd\frontmatter@abstractfont.
```

```
1180 %
```

```
1181 \newenvironment{abstract}{%
```

```
1182 \REVTeX@aftermaketitle{\begin{abstract}}%
```

```
1183 \lrbox\absbox
```

```
1184 \minipage{\frontmatter@abstractwidth}%
```

```
1185 \frontmatter@abstractheading
```

```
1186 \frontmatter@abstractfont
```

```
1187 }%
```

```
1188 \endminipage
```

```
1189 \endlrbox
```

```
1190 }%
```

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

```
1191 \def\frontmatter@abstractheading{%
```

```
1192 \begin{center}\large\abstractname\end{center}%
```

```
1193 \vspace{-1pc}%
```

```
1194 }%
```

`\frontmatter@abstractfont` The default type specification for the body of the abstract. Journals will override this setting.

```
1195 \def\frontmatter@abstractfont{ }%
```

`\frontmatter@abstractwidth` The default setting is the full text width; journals can override this setting.

```
1196 \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.

```
1197 \def\frontmatter@abstract@produce{%
```

```
1198 \addvspace\frontmatter@preabstractspace
```

```
1199 \leavevmode\box\absbox\par
```

```
1200 \addvspace\frontmatter@postabstractspace
```

```
1201 }%
```

```

frontmatter@preabstractspace Space above and space below abstract in title block
frontmatter@postabstractspace 1202 \def\frontmatter@preabstractspace{.5\baselineskip}
1203 \def\frontmatter@postabstractspace{.5\baselineskip}

```

## 10.9 Formatting the title block

`titlepage` This is L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>'s article class version, with modifications.

```

1204 \newenvironment{titlepage}{%
1205 \let\wastwocol@sw\twocolumn@sw
1206 \wastwocol@sw{\onecolumngrid}{\newpage}%
1207 \thispagestyle{titlepage}%
1208 \setcounter{page}\@ne
1209 }{%
1210 \wastwocol@sw{\twocolumngrid}{\newpage}%
1211 \twoside@sw{}{%
1212 \setcounter{page}\@ne
1213 }%
1214 }%

```

`\maketitle` Put it all together to format the title block.

Note: using `\@tempcnta` and `\@tempa` to communicate between procedures.

```

1215 \def\maketitle{%
1216 % \say\@authors
1217 \@author@finish
1218 \title@column\titleblock@produce
1219 \suppressfloats[t]%

```

Now save some memory.

```

1220 \let\and\relax
1221 \let\affiliation\@gobble@opt@one
1222 % \let\address\affiliation
1223 \let\author\@gobble
1224 \@author@init
1225 \let\@authors\@empty
1226 \let\@authors@curr\@empty
1227 \let\@affil@list\@empty
1228 \let\keywords\@gobble
1229 \let\@keywords\@empty
1230 \let\email\@gobble
1231 \let\@address\@empty
1232 \let\maketitle\relax
1233 \let\thanks\@gobble
1234 \titlepage@sw{%
1235 \@ifnum{\column@count=\tw@}{}{%
1236 \clearpage
1237 }%
1238 }{}%
1239 }%

```

```

\titleblock@produce This procedure produces the title block.
 It effectively executes inside a group (because we cannot rely on multicol to do
 this for us) and always returns us to vertical mode. This guard may be removed once we
 are shut of multicol.
1240 \def\titleblock@produce{%
1241 \beginingroup
 Special footnote version [of footnotes] for \thanks, copied from article class
 \maketitle.
1242 \groupauthors@sw{%
1243 \let\@author@present\@author@present@group
1244 \let\frontmatter@author@produce\frontmatter@author@produce@group
1245 \let\@tempaffil\@tempaffil@group
1246 }{%
1247 \let\@author@present\@author@present@script
1248 \let\frontmatter@author@produce\frontmatter@author@produce@script
1249 \let\@tempaffil\@tempaffil@script
1250 }%
1251 \let\footnote\REVTEX@footnote
1252 \let\thefootnote\frontmatter@thefootnote
1253 % \let\@makefnmark\frontmatter@makefnmark
1254 \global\c@footnote\@ne % FIXME: what if the title had a footnote?
1255 \let\@makefnmark\frontmatter@makefnmark
1256 \frontmatter@setup
1257 \thispagestyle{titlepage}\label{FirstPage}%
 Produce the title:
1258 \frontmatter@title@produce
 Produce the author list:
1259 \frontmatter@author@produce
 Produce the dates:
1260 \frontmatter@RRAPformat{%
1261 \expandafter\produce@RRAP\expandafter{\@date}%
1262 \expandafter\produce@RRAP\expandafter{\@received}%
1263 \expandafter\produce@RRAP\expandafter{\@revised}%
1264 \expandafter\produce@RRAP\expandafter{\@accepted}%
1265 \expandafter\produce@RRAP\expandafter{\@published}%
1266 }%
 Produce the abstract, PACS, and keywords, and end any paragraph.
1267 \frontmatter@abstract@produce
1268 \@pacs@produce\@pacs
1269 \@keywords@produce\@keywords
1270 \par
1271 \addvspace\frontmatter@finalspace
1272 \par
1273 \endgroup
1274 }%

```

`\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.

```

1275 \def\frontmatter@title@produce{%
1276 \begingroup\@title\par\endgroup
1277 \addvspace{\baselineskip}%
1278 }%
```

`\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.

```

1279 \def\frontmatter@author@produce@group{%
1280 \begingroup
1281 \frontmatter@authorformat
1282 \let\@collaboration@opr\@gobblefour
1283 \let\affils@opr\affils@present\affils@list
1284 \par
1285 \endgroup
1286 }%
```

`\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.

```

1287 \def\frontmatter@author@produce@script{%
1288 \begingroup
1289 \frontmatter@authorformat
```

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

```

1290 \let\@tempa\@empty
1291 \@tempcnta\z@
1292 \let\@affilID@opr\@gobble
1293 \let\@author@opr\@doauthor@count
1294 \let\@collaboration@opr\@collaboration@count
1295 \@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.

```

1296 \appdef@eval\@tempa{\the\@tempcnta}%
1297 \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.

```

1298 \let\@affilID@opr\@affilID@def
1299 \let\@author@opr\@author@present
```

```

1300 \let\@collaboration@opr\@collaboration@present
1301 \@authors\unskip\unskip
1302 \par
1303 \frontmatter@above@affiliation
1304 \let\@affil@opr\@affil@marked\@affil@list
1305 \par
1306 \endgroup
1307 }%

```

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

```

1308 \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.

```

1309 \def\@tempa{#1}%
1310 \let\@affilID@opr\@affilID@count
1311 \begingroup
1312 \@tempcnta\z@
1313 \@authors

```

If no authors at this address, skip it.

```

1314 \@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.

```

1315 \begingroup
1316 \@ifnum{\@tempcnta=\tw@}{}%
1317 \let\@listcomma\relax
1318 }{}%

```

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

```

1319 \let\@affilID@opr\@affilID@match\@authors
1320 \endgroup

1321 \begingroup
1322 \par
1323 \frontmatter@above@affiliation
1324 \frontmatter@affiliationfont
1325 \let\\frontmatter@addressnewline
1326 \runinaddress@sw{%
1327 \@tempcnta\z@
1328 \@tfor\@tempa:=#1\do{\advance\@tempcnta\@ne}%
1329 \@ifnum{\@tempcnta=\tw@}{}%

```

```

1330 \let\@listcomma\relax
1331 }{}%
1332 \def\after@address{\@listcomma\ \@listand}%
1333 }{%
1334 \tightenlines@sw{}{%
1335 \parskip\z@ %space between affiliations in grouped mode
1336 }%
1337 \let\after@address\par
1338 }%
1339 \let\@affil@opr\@affil@group
1340 \do@affil@fromgroup\@affil@list#1\relax
1341 \endgroup

```

End of branch handling authors.

```

1342 }%
1343 \par
1344 \endgroup
1345 \smallskip
1346 }%

```

`\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`.

```

1347 \def\reset@authorcount{%
1348 \expandafter\@reset@ac\@tempa0\@reset@ac
1349 \@ifnum{\@tempcnta=\tw@}{%
1350 \let\@listcomma\relax
1351 }{%
1352 \def\@listcomma{\@ifnum{\@tempcnta>\@ne}{,}{}}%
1353 }%
1354 }%
1355 \def\@reset@ac#1#2\@reset@ac{%
1356 \@tempcnta#1%
1357 \def\@tempa{#2}%
1358 }%

```

`\@pacs@produce` PACS, keywords and dates.

```

1359 \def\@pacs@produce#1{%
1360 \showPACS@sw{\parbox[t]{\frontmatter@abstractwidth}{\@pacs@name#1}}{}%
1361 }%

```

`\@keywords@produce`

```

1362 \def\@keywords@produce#1{%
1363 % #1\par % FIXME: keywords squelched
1364 }%

```

`\frontmatter@thefootnote`

```

1365 \def\frontmatter@thefootnote{\@fnsymbol\c@footnote}%

```

`\frontmatter@makefnmark` The default procedure for setting the footnote mark within the frontmatter. Journals will override this procedure.

```
1366 \def\frontmatter@makefnmark{\@textsuperscript{\normalfont\@thefnmark}}%
```

`\frontmatter@makefntext` This procedure is used when setting footnotes within the title block.

```
1367 \long\def\frontmatter@makefntext#1{%
1368 \parindent 1em
1369 \noindent
1370 \@textsuperscript{\normalfont\@thefnmark}#1%
1371 }%
```

`\frontmatter@setup` The default type specification for the title page. Journals will override this definition.

```
1372 \def\frontmatter@setup{ }%
```

`\frontmatter@RRAPformat` The procedure `\frontmatter@RRAPformat` is the formatting procedure for the “Received, Revised, etc.” block on the title page. The macro `\punct@RRAP` produces the punctuation between the entries. Journals will override these two definitions.

`\produce@RRAP` The procedure `\produce@RRAP` is fairly general.

```
1373 \def\frontmatter@RRAPformat#1{\begingroup#1\par\endgroup}%
1374 \def\punct@RRAP{ ; }%
1375 \def\produce@RRAP#1{%
1376 \@ifempty{#1}{}{}%
1377 \@ifvmode{\leavevmode}{\unskip\punct@RRAP\ignorespaces}%
1378 #1%
1379 }%
1380 }%
```

`\frontmatter@authorformat` The default type specification for the author list. Journals will override this definition.

```
1381 \def\frontmatter@authorformat{ }%
```

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

```
1382 \def\frontmatter@above@affiliation{ }%
```

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

```
1383 \def\frontmatter@affiliationfont{ }%
```

`\frontmatter@finalspace`

```
1384 \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.

```
1385 \def\frontmatter@addressnewline{%
1386 \@ifhmode{\skip@\lastskip\unskip\unpenalty\break\hskip\skip@}{}%
1387 % was: \vskip-.5ex
1388 }%
```

`\REVTEX@aftermaketitle` Error-checking code.

```
1389 \def\REVTEX@aftermaketitle#1{%
1390 \@ifx{\maketitle\relax}{%
1391 \REVTEX@err{\protect#1 must be used before \protect\maketitle}%
1392 }{}%
1393 }%
```

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

```
1394 \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.

```
1395 \def\volumeyear#1{\gdef\@volumeyear{#1}}%
1396 \def\@volumeyear{}%
1397 \def\volumenumber#1{\gdef\@volumenumber{#1}}%
1398 \def\@volumenumber{}%
1399 \def\issuenumder#1{\gdef\@issuenumder{#1}}%
1400 \def\@issuenumder{}%
1401 \def\eid#1{\gdef\@eid{#1}}%
1402 \def\@eid{}%
1403 %
1404 \def\startpage#1{\gdef\@startpage{#1}\c@page#1\relax}%
1405 \def\@startpage{\pageref{FirstPage}}%
1406 \def\endpage#1{\gdef\@endpage{#1}}%
1407 \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.

```
1408 \def\print@toc#1{%
1409 \begingroup
1410 % \c@secnumdepth-\maxdimen
1411 \expandafter\section
1412 \expandafter*%
1413 \expandafter{%
1414 \csname#1name\endcsname
1415 }%
1416 \let\appendix\appendix@toc
1417 \@starttoc{#1}%
1418 \endgroup
1419 }%
1420 \def\appendix@toc{}%
```

## 11 Body

### 11.1 counters

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

```
1421 \def\labelenumi{\theenumi.}
1422 \def\theenumi{\arabic{enumi}}

1423 \def\labelenumii{(\theenumii)}
1424 \def\theenumii{\alph{enumii}}
1425 \def\p@enumii{\theenumi}

1426 \def\labelenumiii{\theenumiii.}
1427 \def\theenumiii{\roman{enumiii}}
1428 \def\p@enumiii{\theenumi(\theenumii)}

1429 \def\labelenumiv{\theenumiv.}
1430 \def\theenumiv{\Alph{enumiv}}
1431 \def\p@enumiv{\p@enumiii\theenumiii}

1432 \def\labelitemi{\textbullet}
1433 \def\labelitemii{\normalfont\series\textendash}
1434 \def\labelitemiii{\textasteriskcentered}
1435 \def\labelitemiv{\textperiodcentered}

1436 \pagenumbering{arabic}
```

### 11.2 float parameters

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

```
1437 \setcounter{topnumber}{2}
1438 \def\topfraction{.7}
1439 \setcounter{bottomnumber}{1}
1440 \def\bottomfraction{.3}
1441 \setcounter{totalnumber}{3}
1442 \def\textfraction{.2}
1443 \def\floatpagefraction{.5}
1444 \setcounter{dbltopnumber}{2}
1445 \def\dbltopfraction{.7}
1446 \def\dblfloatpagefraction{.5}
```

### 11.3 List Environments

```
1447 \newenvironment{verse}{%
1448 \let\=\@centercr
1449 \list{}{%
1450 \itemsep\z@ \itemindent -1.5em\listparindent \itemindent
1451 \rightmargin\leftmargin\advance\leftmargin 1.5em}\item[]%
1452 }{%
1453 \endlist
1454 }%
```

```

1455 \newenvironment{quotation}{%
1456 \list{}{%
1457 \listparindent 1.5em
1458 \itemindent\listparindent
1459 \rightmargin\leftmargin \parsep \z@ \@plus\p@}\item[]%
1460 }{%
1461 \endlist
1462 }%

1463 \newenvironment{quote}{%
1464 \list{}{%
1465 \rightmargin\leftmargin}\item[]%
1466 }{%
1467 \endlist
1468 }%

1469 \def\descriptionlabel#1{%
1470 \hspace\labelsep \normalfont\bfseries #1%
1471 }%

1472 \newenvironment{description}{%
1473 \list{}{%
1474 \labelwidth\z@ \itemindent-\leftmargin
1475 \let\makelabel\descriptionlabel
1476 }%
1477 }{%
1478 \endlist
1479 }%

```

## 11.4 Sectioning Commands

### 11.4.1 Counters and Their Productions

```

1480 \newcounter{part}
1481 \newcounter{section}
1482 \newcounter{subsection}[section]
1483 \newcounter{subsubsection}[subsection]
1484 \newcounter{paragraph}[subsubsection]
1485 \newcounter{subparagraph}[paragraph]

1486 \def\thepart {\Roman{part}} %
1487 \def\thesection {\Roman{section}}
1488 \def\p@section {}
1489 \def\thesubsection {\Alph{subsection}}
1490 \def\p@subsection {\thesection\,}
1491 \def\thesubsubsubsection {\arabic{subsubsection}}
1492 \def\p@subsubsection {\thesection\,\thesubsection\,}
1493 \def\theparagraph {\alph{paragraph}}
1494 \def\thesubparagraph {\theparagraph.\arabic{subparagraph}}

```

### 11.4.2 The Acknowledgments Environment

This user-level markup 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.

For compatiability's sake, we implement it under the alternative spelling `acknowledgements`.

No! Belay that.

```
1495 \newenvironment{acknowledgments}{%
1496 \section*{\acknowledgmentsname}%
1497 }{%
1498 \par
1499 }%
1500 %\newenvironment{acknowledgements}{\acknowledgments}{\endacknowledgments}%
```

### 11.4.3 Part Opener

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

```
1501 \def\part{\par
1502 \addvspace{4ex}
1503 \@afterindentfalse
1504 \secdef\@part\@spart}
1505 \def\@part[#1]#2{%
1506 \@ifnum{\c@secnumdepth >\m@ne}{%
1507 \refstepcounter{part}
1508 \addcontentsline{toc}{part}{\thepart\hspace{1em}#1}%
1509 }{%
1510 \addcontentsline{toc}{part}{#1}%
1511 }%
1512 \begingroup
1513 \parindent \z@ \raggedright
1514 \interlinepenalty\@M
1515 \@ifnum{\c@secnumdepth >\m@ne}{%
1516 \Large \bf \partname~\thepart%
1517 \par\nobreak
1518 }{%
1519 \huge \bf
1520 #2%
1521 \markboth{}{\}\par
1522 \endgroup
1523 \nobreak
1524 \vskip 3ex
1525 \@afterheading
1526 }%
1527 \def\@spart#1{{\parindent \z@ \raggedright
1528 \interlinepenalty\@M
1529 \huge \bf
1530 #1\par}
1531 \nobreak
1532 \vskip 3ex
1533 \@afterheading}
```

#### 11.4.4 Stacked Heads

```
1534 \def\section{%
1535 \@startsection
1536 {section}%
1537 {1}%
1538 {\z@}%
1539 {0.8cm \@pluslex \@minus .2ex}%
1540 {0.5cm \@pluslex \@minus .2ex}%
1541 {%
1542 \normalfont\small\bfseries
1543 \centering
1544 \MakeTextUppercase
1545 }%
1546 }%
1547 \def\@sectioncntformat#1{\csname the#1\endcsname.\quad}%

1548 \def\subsection{%
1549 \@startsection
1550 {subsection}%
1551 {2}%
1552 {\z@}%
1553 {.8cm \@pluslex \@minus .2ex}%
1554 {.5cm \@pluslex \@minus .2ex}%
1555 {\normalfont\small\bfseries\centering}}

1556 \def\subsubsection{%
1557 \@startsection
1558 {subsubsection}%
1559 {3}%
1560 {\z@}%
1561 {.8cm \@pluslex \@minus .2ex}%
1562 {.5cm \@pluslex \@minus .2ex}%
1563 {\normalfont\small\itshape\centering}}
```

#### 11.4.5 Runin Heads

```
1564 \def\paragraph{%
1565 \@startsection
1566 {paragraph}%
1567 {4}%
1568 {\parindent}%
1569 {\z@}%
1570 {-1em}%
1571 {\normalfont\normalsize\itshape}%
1572 }%

1573 \def\subparagraph{%
1574 \@startsection
1575 {subparagraph}%
1576 {5}%
1577 {\parindent}%
1578 {3.25ex \@pluslex \@minus .2ex}%
```

```

1579 {-1em}%
1580 {\normalfont\normalsize\bseries}%
1581 }%

```

## 11.5 Math

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

```

1582 \def\theequation{%
1583 \theequation@prefix\arabic{equation}%
1584 }%
1585 \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!

```

1586 \AtEndOfClass{%
1587 \expandafter\input\expandafter{\@pointsize pt\REVTEX@society@ext}%
1588 }%

```

## 11.7 All Point Sizes

```

1589 \setcounter{secnumdepth}{4}

1590 \lineskip 1pt
1591 \normallineskip 1pt
1592 \def\baselinestretch{1}%

1593 \@lowpenalty 51
1594 \@medpenalty 151
1595 \@highpenalty 301

1596 \@beginparpenalty -\@lowpenalty
1597 \@endparpenalty -\@lowpenalty
1598 \@itempenalty -\@lowpenalty

1599 \arraycolsep 3pt
1600 \tabcolsep 2pt
1601 \arrayrulewidth .4pt
1602 \doublerulesep 2pt

1603 \skip\@mpfootins = \skip\footins

1604 \fboxsep = 3.0pt
1605 \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`.

```

1606 \newenvironment{figure}

```

```

1607 {\@float{figure}}
1608 {\end@float}
1609 \newenvironment{figure*}
1610 {\@dblfloat{figure}}
1611 {\end@dblfloat}

```

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

```

1612 \newlength\abovecaptionskip
1613 \newlength\belowcaptionskip
1614 \setlength\abovecaptionskip{10\p@}
1615 \setlength\belowcaptionskip{0\p@}

1616 \long\def\@makecaption#1#2{%
1617 \vskip\abovecaptionskip
1618 \sbox\@tempboxa{#1: #2}%
1619 \@ifdim{\wd\@tempboxa >\hsize}{%
1620 \begingroup
1621 \let\footnote\@footnotemark@gobble
1622 #1: #2\par
1623 \endgroup
1624 }{%
1625 \global \@minipagefalse
1626 \hb@xt@\hsize{\unhbox\@tempboxa\hfil}%
1627 }%
1628 \vskip\belowcaptionskip
1629 }%
1630 \def\@footnotemark@gobble{%
1631 \@footnotemark
1632 \@ifnextchar[{\@gobble@opt@i}{\@gobble}%
1633 }%
1634 \def\@gobble@opt@i[#1]#2{ }%

```

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

```

1635 \newcounter{figure}
1636 \renewcommand \thefigure {\@arabic\c@figure}

1637 \def\fps@figure{tbp}
1638 \def\ftype@figure{1}
1639 \def\ext@figure{lof}
1640 \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.

```

1641 \AtBeginDocument{\do@if@floats{figure}{.fgx}}%
1642 \appdef\class@enddocumenthook{%
1643 \printfigures\relax
1644 }%

```

`\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.

```

1645 \newcommand\printfigures{%
1646 \@ifstar{\boolean@true}{\floatp@sw{\boolean@true}{\boolean@false}}%
1647 {%
1648 \print@float{figure}{\oneapage}%
1649 }{%
1650 \print@float{figure}{}%
1651 }%
1652 }%

```

## 11.9 Tables

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

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

```

1653 \newenvironment{table}
1654 {\@float{table}}
1655 {\end@float}
1656 \newenvironment{table*}
1657 {\@dblfloat{table}}
1658 {\end@dblfloat}

```

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

```

1659 \newcounter{table}
1660 \renewcommand\thetable{\@Roman\c@table}

1661 \def\fps@table{tbp}
1662 \def\ftype@table{2}
1663 \def\ext@table{lot}
1664 \def\fnum@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}...?`)

```

1665 \def\tabular@font{\small}%
1666 \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.

```

1667 \AtBeginDocument{%
1668 \floats@sw{}{%
1669 \let@environment{longtable@float}{longtable}%
1670 \let@environment{longtable}{longtable@write}%
1671 }%
1672 \do@if@floats{table}{.tbx}%
1673 }%
1674 \appdef\class@enddocumenthook{%
1675 \printtables\relax
1676 }%
1677 \newenvironment{longtable@write}{%
1678 \write@@float{longtable}{table}%
1679 }{%
1680 \endwrite@float
1681 }%

```

`\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.

```

1682 \newcommand\printtables{%
1683 \let@environment{longtable}{longtable@float}%
1684 \@ifstar{\boolean@true}{\floatp@sw{\boolean@true}{\boolean@false}}%
1685 {%
1686 \print@float{table}{\oneapage}%
1687 }{%
1688 \print@float{table}{}%
1689 }%
1690 }%

```

## 12 Tabular

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

```

\tabular@hook
\endtabular@hook
1691 \def\tabular@hook{%
1692 \def\endtabular@hook{}%
1693 %\RequirePackage{dcolumn}%
1694 \AtBeginDocument{%
1695 \@ifpackageloaded{dcolumn}{%
1696 \newcolumntype{d}{D{.}{.}{-1}}%
1697 }{}%
1698 }%
1699 \def\toprule{\hline\hline}%
1700 \def\colrule{\hline}%
1701 \def\botrule{\hline\hline}%

```

## 13 Footnote Text

`\@makefntext`

```
1702 \newcommand\@makefntext[1]{%
1703 \def\baselinestretch{1}%
1704 \reset@font\footnotesize
1705 \parindent 1em%
1706 \noindent
1707 \hb@xt@1.8em{\hss\@makefnmark}%
1708 #1\par
1709 }%
```

### 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.

```
1710 \newenvironment{thebibliography}{}{}%
1711 \let\@listi\@empty
1712 \RequirePackage{natbib}[1999/05/28 7.0]%
1713 \let\NAT@thebibliography\thebibliography
1714 \let\NAT@endthebibliography\endthebibliography
```

`\NAT@citesuper`

We redefine `natbib`'s procedure `\NAT@citesuper`, which is executed when setting a superscript citation. The `\hspace` is removed: in any case, it should really be `\hspace*`, to prevent an unwanted pagebreak.

```
1715 \renewcommand\NAT@citesuper[3]{%
1716 \ifNAT@swa
1717 \leavevmode
1718 \unskip
1719 % \hspace{1\p@}%
1720 #1%
1721 \if*#3*\else\ (#3)\fi
1722 \else
1723 #1%
1724 \fi
1725 \endgroup
1726 }%
```

`\@make@citemark`

We define a procedure that will set a footnote mark the same way that a citation is set. If footnotes are put in the bibliography with `\footinbib@sw`, then the corresponding mark should look the same as the result of a `\cite`. This is how we do it.

```
1727 \def\@make@citemark{\begingroup\NAT@swatrue\@cite{\@thefnmark}}{}{}%
```

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

```

1728 \let\LATEX@bibliographystyle\bibliographystyle
1729 \def\bibliographystyle{\def\bibstyle}%

```

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

`\bibfont` This way of setting up the bibliography 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.

`\@biblabel` 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.

```

1730 \def\bibsection{\section*{\refname}}%
1731 \def\REV@bibsetup#1{\NAT@bibsetup{\ref{LastBibItem}}}%
1732 \let\bibpreamble\empty
1733 \def\bibfont{%
1734 \bibsep\z@\relax
1735 \let\NAT@bibsetup\@bibsetup
1736 \let\@bibsetup\REV@bibsetup
1737 \@ifxundefined\place@bibnumber{%
1738 \let\@biblabel\place@bibnumber@inl
1739 }{%
1740 \let\@biblabel\place@bibnumber
1741 }%
1742 \def\newblock{\ }%
1743 }%

```

`\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!

```

1744 \let\NAT@citeyear\citeyear
1745 \def\NAT@onlinecite#1{%
1746 \begingroup
1747 \let\@cite\NAT@citenum
1748 \let\NAT@mbox\mbox
1749 \let\citeyear\NAT@citeyear
1750 \def\NAT@space{ }%
1751 \cite{#1}%
1752 \endgroup
1753 }%

```

`\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.)

```
1754 \AtBeginDocument{%
1755 \@ifxundefined\onlinecite{\def\onlinecite{\citealp}}{}}%
1756 \@ifxundefined\textcite{\def\textcite{\citet}}{}}%
1757 }%
```

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

```
1758 \renewenvironment{thebibliography}[1]{%
1759 \NAT@thebibliography{#1}%
1760 \@bibnotes
1761 }{%
1762 \@endnotesinbib
1763 \edef\@currentlabel{\arabic{NAT@ctr}}%
1764 \label{LastBibItem}%
1765 \NAT@endthebibliography
1766 }%
```

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

```
1767 %\let\@openbib@code\@empty
1768 \def\place@bibnumber@sup#1{#1}%
1769 \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  $\TeX$ 's mem.

```
1770 \def\rtx@bibnote#1{%
1771 \stepcounter\@mpfn
1772 \protected@xdef\@thefnmark{\thempfn}%
1773 \protected@xdef\@@thefnmark{\normalfont\thempfn}%
1774 \@footnotemark
1775 \expandafter\g@addto@macro
1776 \expandafter\@bibnotes
1777 \expandafter{%
1778 \expandafter \item
1779 \expandafter [\@@thefnmark]#1\par
1780 }%
1781 }%
1782 \let\@bibnotes\@empty
```

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

```
1783 \def\endnote{%
```

```

1784 \@ifnextchar[{%
1785 \@xendnote
1786 } {%
1787 \stepcounter{footnote}%
1788 \protected@xdef\@thefnmark{\thefootnote}%
1789 \@footnotemark
1790 \@endnotetext
1791 }%
1792 }%

```

\@xendnote

```

1793 \def\@xendnote[#1] {%
1794 \begingroup
1795 \c@footnote#1\relax
1796 \unrestored@protected@xdef\@thefnmark{\thefootnote}%
1797 \endgroup
1798 \@footnotemark
1799 \@endnotetext
1800 }%

```

\REVTEX@endnote@ext

```

1801 \def\REVTEX@endnote@ext{.end}%

```

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

```

1802 \long\def\@endnotetext#1 {%
1803 \@ifx{\@endnoteout\@undefined} {%
1804 \newwrite\@endnoteout
1805 \gdef\endnote@stream{\jobname\REVTEX@endnote@ext}%
1806 \immediate\openout\@endnoteout\endnote@stream\relax
1807 } {%
1808 \begingroup
1809 \let\label\relax \let\index\relax \let\glossary\relax
1810 \let\cite\relax \let\ref\relax \let\pageref\relax
1811 \let\\\relax
1812 \let\protect\noexpand
1813 \newlinechar'\^M%
1814 % \newlinechar'\ %
1815 \immediate\write\@endnoteout{\noexpand\REVdoendnote{\@thefnmark}{#1}}%
1816 \endgroup
1817 }%

```

\endnotetext

```

1818 \def\endnotetext {%
1819 \@ifnextchar[{%
1820 \@xendnotenext
1821 } {%
1822 \protected@xdef\@thefnmark{\thefootnote}\@endnotetext
1823 }%
1824 }%

```

\@xendnotenext

```
1825 \def\@xendnotenext[#1]{%
1826 \begingroup
1827 \c@footnote#1\relax
1828 \unrestored@protected@xdef\@thefnmark{\thefootnote}%
1829 \endgroup
1830 \@endnotetext
1831 }%
```

\printendnotes

```
1832 \def\printendnotes{%
1833 \ifx{\@endnoteout\@undefined}{ }{%
1834 \begingroup
1835 \c@secnumdepth-\maxdimen
1836 \section{%
1837 \notesname
1838 }%
1839 \immediate\closeout\@endnoteout
1840 \global\let\@endnoteout\@undefined
1841 \begin{enumerate}%
1842 \makeatletter
1843 \input{\endnote@stream}%
1844 \end{enumerate}%
1845 \endgroup
1846 }%
1847 }%
1848 \appdef\class@enddocumenthook{%
1849 \printendnotes
1850 }%
```

\REVfirstnote In REV<sub>T</sub>E<sub>X</sub>, we have permanently altered the way that the footnote counter gets reset at  
\set@firstnote the beginning of the document.

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

```
1851 \chardef\REVfirstnote\z@
1852 \AtBeginDocument{%
1853 \global\c@footnote\REVfirstnote
1854 \appdef\maketitle{\global\c@footnote\REVfirstnote}%
1855 }%
1856 \def\set@firstnote#1{%
1857 \@ifnum{\REVfirstnote=#1\relax}{ }{%
1858 \REVTEX@warn@end{Endnote numbers changed: rerun LaTeX}%
1859 }%
1860 \immediate\write\@mainaux{%
1861 \global\chardef\string\REVfirstnote#1\relax
1862 }%
1863 }%
```

\@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`.

```

1864 \def\@endnotesinbib{%
1865 \set@firstnote\z@
1866 }%
1867 \def\@endnotesinbibliography{%
1868 \expandafter\set@firstnote\expandafter{\the\c@NAT@ctr}%
1869 \@ifx{\@endnoteout\@undefined}{\}%
1870 \immediate\closeout\@endnoteout
1871 \global\let\@endnoteout\@undefined
1872 \makeatletter
1873 \input{\endnote@stream}%
1874 }%
1875 }%
1876 \AtBeginDocument{%
1877 \let\REVTEX@footnote\footnote
1878 \footinbib@sw{%
1879 \let\footnote\endnote
1880 \let\printendnotes\relax
1881 \let\@endnotesinbib\@endnotesinbibliography
1882 \let\@makefnmark\@make@citemark
1883 }{\}%
1884 }%

```

`\REVdoendnote`

```

1885 \def\REVdoendnote#1#2{\bibitem{endnote#1}#2}

```

`\@bibnotes`

```

1886 \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!

```

1887 \AtBeginDocument{%
1888 \ps@article
1889 \pagenumbering{arabic}%
1890 \normalsize
1891 \tabbingsep \labelsep

```

```

1892 \leftmargin\leftmargini
1893 \labelwidth\leftmargin\advance\labelwidth-\labelsep
1894 \let\@listi\@listI
1895 \@listi
1896 \@ifxundefined\REVTEX@settypespec{\REVTEX@settypespec}%
1897 \twoside@sw}{}%
1898 \raggedbottom
1899 }%
 FIXME: Always sloppy??
1900 \multicol@sw}{}%
1901 \twocolumn@sw{%
1902 \twocolumngrid
1903 \sloppy
1904 \raggedbottom
1905 }{%
1906 \onecolumngrid
1907 \sloppy
1908 \raggedbottom
1909 }%
1910 }%
1911 }%

```

## 15 \appendix

```
1912 %\newif\ifappendixon
```

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

```

1913 \def\appendix{%
1914 \par
1915 % \appendixontrue
1916 \setcounter{section}\z@
1917 \setcounter{subsection}\z@
1918 \setcounter{subsubsection}\z@
1919 \def\thesection{\Alph{section}}%
1920 \def\thesubsection{\arabic{subsection}}%
1921 \def\thesubsubsection{\alph{subsubsection}}%
1922 \@addtoreset{equation}{section}%
1923 \def\theequation@prefix{\thesection}%
1924 \addtocontents{toc}{\protect\appendix}%
1925 }%

```

## 16 Changing the page grid

### 16.1 Grid Changes with multicol

```
\title@column@multicol We're changing the page grid with the multicol package: set a flag value to help us
\close@column@multicol 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?

```

1926 \def\title@column@multicol#1{%
1927 \@twocolumntrue
1928 \let\@current@save\@current
1929 \def\@current{multicols}%
1930 \multicols{2}[\#1]\relax
1931 }%
1932 \def\close@column@multicol{%
1933 \endmulticols
1934 \let\@current\@current@save
1935 \hfuzz\maxdimen
1936 }%

```

`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 `\@current`, an internal of `\begin`, as this is an ‘inverse’ environment.

```

1937 \newenvironment{widetext@multicol}{%
1938 \endgroup
1939 \def\@tempa{multicols}%
1940 \@ifx{\@current\@tempa}{%
1941 \csname end\@current\endcsname
1942 }{%
1943 \REVTEX@err{%
1944 widetext environment must not be inside any environment: \@current
1945 }%
1946 \def\endwidetext{\begingroup\def\@current{widetext}}%
1947 }%
1948 }{%
1949 \multicols{2}\relax
1950 \begingroup
1951 \def\@current{widetext}%
1952 \@endpetrue
1953 }%

```

## 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 1954 \def\title@column@default#1{\#1}%
1955 \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 else-
 where, require both \twocolumn@sw and \preprintsty@sw to be false.
1956 \def\galley@outdent{\rightmargin-\columnwidth\advance\rightmargin-\columnsep}%
1957 \let\widetext@outdent\@empty
1958 \newenvironment{widetext@galley}{%
1959 \list{}{%
1960 \listparindent \parindent
1961 \itemindent \parindent
1962 \leftmargin \z@
1963 \parsep \z@\@plus\p@
1964 \widetext@outdent
1965 \relax
1966 }%
1967 \item\relax
1968 }{
1969 \endlist
1970 }%
```

### 16.4 Grid Changing Via ltxgrid

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 The title block always starts at the top of a new page.
\close@column@grid 1971 \def\title@column@grid#1{%
1972 \onecolumngrid
1973 \beginngroup#1\endgroup
1974 \@twocolumntrue
1975 \twocolumngrid
1976 }%
1977 \def\close@column@grid{%
1978 \onecolumngrid
1979 }%
```

widetext@grid We slip into the one-column page grid within the scope of this environment.

```
1980 \newenvironment{widetext@grid}{%
1981 \par\ignorespaces\onecolumngrid
1982 }{%
1983 \par\twocolumngrid\global\@ignoretrue
1984 \@endpetrue
1985 }%
```

Read in the multicol package if need be.

```
1986 \AtEndOfClass{%
```

```

1987 \@ifxundefined\twocolumn@sw{ }{ }%
1988 \twocolumn@sw{%
1989 \multicol@sw{%
1990 \let\REVTEX@tempa\@classoptionslist
1991 \let\@classoptionslist\@empty
1992 \RequirePackage{multicol}%
1993 \let\@classoptionslist\REVTEX@tempa
1994 }{ }%
1995 }{ }%
1996 }%
1997 }%

```

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

```

1998 \AtBeginDocument{%
1999 \twocolumn@sw{%
2000 \multicol@sw{%

```

Change the page grid with multicol package.

```

2001 \let@environment{widetext}{widetext@multicol}%
2002 \let\title@column\title@column@multicol
2003 \let\close@column\close@column@multicol
2004 }{ }%

```

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

```

2005 \let@environment{widetext}{widetext@grid}%
2006 \let\title@column\title@column@grid
2007 \let\close@column\close@column@grid
2008 }%
2009 }{ }%
2010 \let@environment{widetext}{widetext@galley}%
2011 \preprintsty@sw{%

```

Change the page grid not at all.

```

2012 }{ }%

```

If we are galley style, change the page margin only.

```

2013 \galley@sw{%
2014 \let\widetext@outdent\galley@outdent
2015 }{ }%
2016 }%
2017 }%
2018 }%
2019 }%

```

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

```

2020 \AtBeginDocument{%
2021 \@ifxundefined\title@column{%
2022 \let\title@column\title@column@default
2023 }{ }%
2024 }%

```

## 17 Old font commands

```
2025 \DeclareOldFontCommand{\rm}{\normalfont\rmfamily}{\mathrm}
2026 \DeclareOldFontCommand{\sf}{\normalfont\sffamily}{\mathsf}
2027 \DeclareOldFontCommand{\tt}{\normalfont\ttfamily}{\mathtt}
2028 \DeclareOldFontCommand{\bf}{\normalfont\bfseries}{\mathbf}
2029 \DeclareOldFontCommand{\it}{\normalfont\itshape}{\mathit}
2030 \DeclareOldFontCommand{\sl}{\normalfont\slshape}{\@nomath\sl}
2031 \DeclareOldFontCommand{\sc}{\normalfont\scshape}{\@nomath\sc}
2032 \DeclareRobustCommand*\cal{\@fontswitch\relax\mathcal}
2033 \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.
2034 \def\today{\ifcase\month\or
2035 January\or February\or March\or April\or May\or June\or
2036 July\or August\or September\or October\or November\or December\fi
2037 \space\number\day, \number\year}

\notesname Text entity \notesname is used in \printendnotes.
2038 \def\notesname{Notes}

\partname Text entity \partname is used in \@part.
2039 \def\partname{Part}

\tocname Text entity \tocname is used in \tableofcontents, as defined in the standard
LATEX book class.
2040 \def\tocname{Contents}

\lofname Text entity \lofname is used in \listoffigures, as defined in the standard LATEX
book class.
2041 \def\lofname{List of Figures}

\lotname Text entity \lotname is used in \listoftables, as defined in the standard LATEX
book class.
2042 \def\lotname{List of Tables}

\refname Text entity \refname is used in thebibliography.
2043 \def\refname{References}

\indexname Text entity \indexname is used in theindex, as defined in the standard LATEX book
class.
2044 \def\indexname{Index}
```

`\figurename` Text entity `\figurename` is used in figure, `\figuresname` in `\printfigures`.  
2045 `\def\figurename{FIG.}`  
2046 `\def\figuresname{Figures}`%

`\tablename` Text entity `\tablename` is used in table, `\tablesname` in `\printtables`.  
2047 `\def\tablename{TABLE}`  
2048 `\def\tablesname{Tables}`%

`\abstractname` Text entity `\abstractname` is used in abstract.  
2049 `\def\abstractname{Abstract}`

`\appendixesname` Text entity `\appendixesname` is used in TOC.  
`\appendixname` 2050 `\def\appendixesname{Appendixes}`%  
2051 `\def\appendixname{Appendix}`%

`\acknowledgmentsname` Text entity `\acknowledgmentsname` is used in acknowledgments.  
2052 `\def\acknowledgmentsname{Acknowledgments}`

`\journalname` This should be set by the society journal options, eg ‘pra’.  
2053 `\def\journalname{??}`

`\copyrightname` Default layout does not assign copyright, but a journal that wants to might use this.  
2054 `\def\copyrightname{??}`

`\andname` The text string “and” for use in author lists.  
2055 `\def\andname{and}`

`\@pacs@name` The text string prepended to PACS numbers.  
2056 `\def\@pacs@name{PACS numbers: }`%

`\ppname` The text string “pp” for use in page ranges.  
2057 `\def\ppname{pp}`

`\numbername` The text string “number” for use in article reference.  
2058 `\def\numbername{number}`

`\volumename` The text string “volume” for use in article reference.  
2059 `\def\volumename{volume}`

`\Dated@name` These texts are used in the `\date`, et al. commands.  
`\Received@name` 2060 `\def\Dated@name{dated: }`%  
`\Revised@name` 2061 `\def\Received@name{received }`%  
`\Accepted@name` 2062 `\def\Revised@name{revised }`%  
`\Published@name` 2063 `\def\Accepted@name{accepted }`%  
2064 `\def\Published@name{published }`%

## 19 Uppercase

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

```
2065 \AtBeginDocument{%
2066 \providecommand\MakeTextUppercase{\MakeUppercase}%
2067 }%
```

## 20 Legacy Commands

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

```
2068 \def\address{\replace@command\address\affiliation}%
2069 \def\altaddress{\replace@command\altaddress\altaffiliation}%
2070 \newenvironment{references}{%
2071 \REVTEX@warn@end{The references environment is not supported; use thebibliography}
2072 \gdef\references{\thebibliography{}}\references
2073 }{%
2074 \endthebibliography
2075 }%
2076 \def\draft{%
2077 \REVTEX@warn@end{Command \string\draft\space is obsolete;^^JInvoke option draft in
2078 \@booleantrue\draft@sw
2079 }%
2080 \def\tighten{%
2081 \REVTEX@warn@end{Command \string\tighten\space is obsolete;^^JInvoke option tighten
2082 \@booleantrue\tightenlines@sw
2083 }%
2084 \def\tableline{%
2085 \noalign{%
2086 \REVTEX@warn@end{Command \string\tableline\space is obsolete;^^JUse \string\colru
2087 \global\let\tableline\colrule
2088 }%
2089 \tableline
2090 }%
2091 \def\case{\replace@command\case\frac}%
2092 \def\slantfrac{\replace@command\slantfrac\frac}%
2093 \def\tablenote{\replace@command\tablenote\footnote}%
2094 \def\tablenotemark{\replace@command\tablenotemark\footnotemark}%
2095 \def\tablenotetext{\replace@command\tablenotetext\footnotetext}%
2096 % Lose the following definition:
2097 \DeclareRobustCommand\REV@text[1]{%
2098 \relax
2099 \ifmmode
2100 \mathchoice
2101 {\hbox{\{\everymath{\displaystyle #1}\}}}%
2102 {\hbox{\{\everymath{\textstyle #1}\}}}%
2103 {\hbox{\{\everymath{\scriptstyle #1}\}\let\f@size\sf@size\selectfont#1}}}%
2104 {\hbox{\{\everymath{\scriptscriptstyle #1}\}\let\f@size\ssf@size\selectfont#1}}}%

```

```

2105 \glb@settings
2106 \else
2107 \mbox{#1}%
2108 \fi
2109 }%
2110 % Lose the following definition:
2111 \DeclareRobustCommand\REV@bbox[1]{%
2112 \relax
2113 \ifmmode
2114 \mathchoice
2115 {\hbox{\everymath{\displaystyle}\boldmath$#1$}}%
2116 {\hbox{\everymath{\textstyle}\boldmath$#1$}}%
2117 {\hbox{\everymath{\scriptstyle}\boldmath$#1$}}%
2118 {\hbox{\everymath{\scriptscriptstyle}\boldmath$#1$}}%
2119 \glb@settings
2120 \else
2121 \mbox{#1}%
2122 \fi
2123 }%
2124 \DeclareRobustCommand\REV@bm[1]{%
2125 \REVTEX@warn@end{To use \string\bm, please load the bm package!}%
2126 \global\let\bm\relax
2127 }%
2128 \def\FL{\obsolete@command\FL}%
2129 \def\FR{\obsolete@command\FR}%
2130 \def\narrowtext{\obsolete@command\narrowtext}%
2131 \def\mediumtext{\obsolete@command\mediumtext}%
2132 \newenvironment{quasitable}{%
2133 \let@environment{tabular}{longtable}%
2134 }{%
2135 }%
2136 \AtBeginDocument{%
2137 \@ifxundefined\text{\let\text\REV@text}{}%
2138 \@ifxundefined\bm{\let\bm\REV@bm}{}%
2139 \providecommand\bibinfo[2]{#2}%
2140 \providecommand\epprint[1]{#1}%
2141 \providecommand\url[1]{#1}%
2142 }%

```

\bbox

```

2143 \def\bbox#1{%
2144 \REVTEX@warn@end{\string\bbox\space is obsolete,^^Jload the bm package and use \st
2145 \global\let\bbox\relax
2146 }%

```

\mathletters

```

2147 \newenvironment{mathletters}{%
2148 \REVTEX@warn@end{Environment {mathletters} is obsolete;^^Jload the amsmath package
2149 \global\let\mathletters\@empty
2150 }{%

```

```

2151 }%

\eqnum
2152 \def\eqnum#1{%
2153 \REVTeX@warn@end{\string\eqnum\space is obsolete, load the amsmath package and use
2154 \global\let\eqnum\@gobble
2155 }%

```

We read in the symbol definitions.

```
2156 \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 REV $\TeX$  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  $\LaTeX$  guide to document classes, `revtex4.dtxclsguide.tex` or read up on the subject in a book like the  $\LaTeX$  Companion.

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

```
2157 \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.

```

2158 \AtEndOfClass{%
2159 \@ifxundefined\secnumarabic@sw{\@booleanfalse\secnumarabic@sw}{}%
2160 \secnumarabic@sw{%
2161 \def\p@section {}%
2162 \def\thesection {\arabic{section}}%
2163 \def\p@subsection {}%
2164 \def\thesubsection {\thesection.\arabic{subsection}}%
2165 \def\p@subsubsection {}%
2166 \def\thesubsubsection {\thesubsection.\arabic{subsubsection}}%
2167 }{}%
2168 }%

```

### 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
2169 \AtEndOfClass{%
2170 \AtBeginDocument{%
2171 \@ifxundefined\@bibstyle{}{}%
2172 \expandafter\LET\@bibliographystyle\expandafter{\@bibstyle}%
2173 }%
2174 }%
2175 }%

```

### 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.

```

2176 \AtEndOfClass{%
2177 \AtBeginDocument{%
2178 \defaults@hook
2179 }%
2180 }%
2181 \@ifxundefined\defaults@hook{\let\defaults@hook\@empty}{}%

```

End of the class file.

```

2182 %</class-pst>

```

## 22 Symbols: the revsymb module

```

2183 %<*revsymb>

\lambdabar
2184 \DeclareRobustCommand\lambdabar{%
2185 \bgroup
2186 \def\@tempa{%
2187 \hbox{%
2188 \raise.73\ht\z@
2189 \hb@xt@\z@{%
2190 \kern.25\wd\z@
2191 \vrule \@width.5\wd\z@\@height.1\p@\@depth.1\p@
2192 \hss
2193 }%
2194 \box\z@
2195 }%
2196 }%
2197 \mathchoice
2198 {\setbox\z@\hbox{\$displaystyle \lambda$}\@tempa}%
2199 {\setbox\z@\hbox{\$textstyle \lambda$}\@tempa}%
2200 {\setbox\z@\hbox{\$scriptstyle \lambda$}\@tempa}%
2201 {\setbox\z@\hbox{\$scriptscriptstyle\lambda$}\@tempa}%
2202 \egroup
2203 }%

\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.
2204 \DeclareRobustCommand\openone{\leavevmode\hbox{\small1\normalize\kern-.33em1}}%

\corresponds
2205 \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 2206 \DeclareRobustCommand\altsuccsim{\succ\kern-.9em_\sim\kern.3em}%
\gtrsim 2207 \DeclareRobustCommand\altprecsim{\prec\kern-1em_\sim\kern.3em}%
\alt 2208 \let\REV@succsim\altsuccsim
\agt 2209 \let\REV@precsim\altprecsim
2210 \DeclareRobustCommand\REV@lessim{\mathrel{\mathpalette\vereq{<}}}%
2211 \DeclareRobustCommand\REV@gtrsim{\mathrel{\mathpalette\vereq{>}}}%
2212 \DeclareRobustCommand\alt{\lessim}
2213 \DeclareRobustCommand\agt{\gtrsim}
2214 \def\vereq#1#2{%
2215 \lower3\p@\vbox{%
2216 \baselineskip1.5\p@
2217 \lineskip1.5\p@
2218 \ialign{\$m\th#1\hfill#\hfil$\crcr#2\crcr\sim\crcr}%
2219 }%
2220 }%

```

```

\tensor
\overstar 2221 \DeclareRobustCommand\tensor[1]{\@ontopof{#1}{\leftrightharpoonup}{1.15}\mathord{\box2}}
\overdots 2222 \DeclareRobustCommand\overstar[1]{\@ontopof{#1}{\ast}{1.15}\mathord{\box2}}
\overcirc 2223 \DeclareRobustCommand\overdots[1]{\@ontopof{#1}{\cdots}{1.0}\mathord{\box2}}
\loarrow 2224 \DeclareRobustCommand\overcirc[1]{\@ontopof{#1}{\circ}{1.2}\mathord{\box2}}
\roarrow 2225 \DeclareRobustCommand\loarrow[1]{\@ontopof{#1}{\leftarrow}{1.15}\mathord{\box2}}
 2226 \DeclareRobustCommand\roarrow[1]{\@ontopof{#1}{\rightarrow}{1.15}\mathord{\box2}}

\@ontopof
2227 \def\@ontopof#1#2#3{%
2228 {%
2229 \mathchoice
2230 {\@ontopof{#1}{#2}{#3}\displaystyle \scriptstyle }%
2231 {\@ontopof{#1}{#2}{#3}\textstyle \scriptstyle }%
2232 {\@ontopof{#1}{#2}{#3}\scriptstyle \scriptscriptstyle}%
2233 {\@ontopof{#1}{#2}{#3}\scriptscriptstyle\scriptscriptstyle}%
2234 }%
2235 }%

@@ontopof Same as REVTeX3, more or less.
2236 \def@@ontopof#1#2#3#4#5{%
2237 \setbox\z@\hbox{#4#1$}%
2238 \setbox\f@ur\hbox{#5#2$}%
2239 \setbox\tw@\null\ht\tw@\ht\z@ \dp\tw@\dp\z@
2240 \@ifdim{\wd\z@>\wd\f@ur}{%
2241 \setbox\f@ur\hb@xt@\wd\z@{\hss\box\f@ur\hss}%
2242 \mathord{\rlap{\raise#3\ht\z@\box\f@ur}\box\z@}%
2243 }{%
2244 \setbox\f@ur\hb@xt@.9\wd\f@ur{\hss\box\f@ur\hss}%
2245 \setbox\z@\hb@xt@\wd\f@ur{\hss$#4\relax#1$\hss}%
2246 \mathord{\rlap{\copy\z@}\raise#3\ht\z@\box\f@ur}%
2247 }%
2248 }%

\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.
2249 \DeclareRobustCommand\frak{%
2250 \REVSymb@warn{%
2251 Command \string\frak\space unsupported:^^J%
2252 please use \string\mathfrak\space instead.%
2253 }%
2254 \global\let\frak\mathfrak
2255 \frak
2256 }%
2257 \DeclareRobustCommand\REV@mathfrak{%
2258 \REVSymb@warn{%
2259 Command \string\mathfrak\space undefined:^^J%
2260 please specify the amsfonts or amssymb option!%
2261 }%

```

```

2262 \global\let\mathfrak\@firstofone
2263 \mathfrak
2264 }%

```

`\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.

```

2265 \DeclareRobustCommand\Bbb{%
2266 \REVSymb@warn{%
2267 Command \string\Bbb\space unsupported:^^J%
2268 please use \string\mathbb\space instead.%
2269 }%
2270 \global\let\Bbb\mathbb
2271 \Bbb
2272 }%
2273 \DeclareRobustCommand\REV@mathfrak{%
2274 \REVSymb@warn{%
2275 Command \string\mathbb\space undefined:^^J%
2276 please specify the amsfonts or amssymb option!%
2277 }%
2278 \global\let\mathbb\@firstofone
2279 \mathbb
2280 }%

```

`\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!

```

2281 \def\Bigglb{\REV@boldopen \Bigg}%
2282 \def\Biglb {\REV@boldopen \Big }%
2283 \def\bigglb{\REV@boldopen \bigg}%
2284 \def\biglb {\REV@boldopen \big }%
2285 \def\Biggrb{\REV@boldclose\Bigg}%
2286 \def\Bigrb {\REV@boldclose\Big }%
2287 \def\biggrb{\REV@boldclose\bigg}%
2288 \def\bigrb {\REV@boldclose\big }%
2289 \def\REV@pmb#1{%
2290 \hbox{%
2291 \setbox\z@=\hbox{#1}%
2292 \kern-.02em\copy\z@\kern-\wd\z@
2293 \kern .04em\copy\z@\kern-\wd\z@
2294 \kern-.02em
2295 \raise.04em\copy\z@
2296 }%
2297 }%
2298 \def\REV@boldopen #1#2{\mathopen {\REV@pmb{ $#1#2$}}}%
2299 \def\REV@boldclose#1#2{\mathclose{\REV@pmb{ $#1#2$}}}%

```

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

```

2300 \def\REVSymb@warn#1{\PackageWarningNoLine{revsymb}{#1}}%
2301 \AtBeginDocument{%

```

```

2302 \@ifxundefined\succsim{\let\succsim\altsuccsim}{}%
2303 \@ifxundefined\precsim{\let\precsim\altprecsim}{}%
2304 \@ifxundefined\lessim{\let\lessim\REV@lessim}{}%
2305 \@ifxundefined\gtrsim {\let\gtrsim \REV@gtrsim }{}%
2306 \@ifxundefined\mathfrak{\let\mathfrak\REV@mathfrak}{}%
2307 \@ifxundefined\mathbb{\let\mathbb\REV@mathbb}{}%
2308 }%

```

```
2309 %</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.

```
2310 %<*10pt>
```

```

2311 \def\normalsize{%
2312 \@setfontsize\normalsize\@xpt{11.5}%
2313 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2314 \belowdisplayskip \abovedisplayskip
2315 \abovedisplayshortskip \abovedisplayskip
2316 \belowdisplayshortskip \abovedisplayskip
2317 \let\@listi\@listI
2318 }%
2319 \def\small{%
2320 \@setfontsize\small\@ixpt{11}%
2321 \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@
2322 \belowdisplayskip \abovedisplayskip
2323 \abovedisplayshortskip \z@ \@plus2\p@
2324 \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2325 \def\@listi{%
2326 \leftmargin\leftmarginI
2327 \topsep 4\p@ \@plus2\p@ \@minus2\p@
2328 \parsep 2\p@ \@plus\p@ \@minus\p@
2329 \itemsep \parsep
2330 }%
2331 }%
2332 \def\footnotesize{%
2333 \@setfontsize\footnotesize\@viipt{9.5pt}%
2334 \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
2335 \belowdisplayskip \abovedisplayskip
2336 \abovedisplayshortskip \z@ \@plus\p@
2337 \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
2338 \def\@listi{%
2339 \leftmargin\leftmarginI
2340 \topsep 3\p@ \@plus\p@ \@minus\p@
2341 \parsep 2\p@ \@plus\p@ \@minus\p@
2342 \itemsep \parsep

```

```

2343 }%
2344 }%

2345 \def\scriptsize{%
2346 \@setfontsize\scriptsize\@viipt\@viiipt
2347 }%
2348 \def\tiny{%
2349 \@setfontsize\tiny\@vpt\@vipt
2350 }%
2351 \def\large{%
2352 \@setfontsize\large\@xiipt{14pt}%
2353 }%
2354 \def\Large{%
2355 \@setfontsize\Large\@xivpt{18pt}%
2356 }%
2357 \def\LARGE{%
2358 \@setfontsize\LARGE\@xviipt{22pt}%
2359 }%
2360 \def\huge{%
2361 \@setfontsize\huge\@xxpt{25pt}%
2362 }%
2363 \def\Huge{%
2364 \@setfontsize\Huge\@xxvpt{30pt}%
2365 }%

2366 \AtBeginDocument{%
2367 \twoside@sw{%
2368 \oddsidemargin -.4in
2369 \evensidemargin -.1in
2370 \marginparwidth 107pt
2371 }{%
2372 \oddsidemargin -.25in
2373 \evensidemargin -.25in
2374 \marginparwidth 30pt
2375 }%
2376 }%

2377 \marginparsep 6pt

2378 \topmargin -61pt

2379 \headheight 25pt
2380 \headsep 16pt

2381 \topskip 10pt

2382 \footskip 30pt

2383 \appdef\set@pica@hook{%
2384 \textheight = 57\baselineskip
2385 \advance\textheight by \topskip
2386 }%

2387 \textwidth42.5pc

```

```

2388 \columnsep 1.5pc
2389 \columnseprule 0pt

2390 \footnotesep 1pt
2391 \skip\footins 39pt plus 4pt minus 2pt
2392 \def\footnoterule{\kern-19pt\hrule width.5in\kern18.6pt}%

2393 \floatsep 12pt plus 2pt minus 2pt
2394 \textfloatsep 20pt plus 2pt minus 4pt
2395 \intextsep 12pt plus 2pt minus 2pt

2396 \dblfloatsep 12pt plus 2pt minus 2pt
2397 \dbltextfloatsep 20pt plus 2pt minus 4pt

2398 \@fptop 0pt plus 1fil
2399 \@fpsep 8pt plus 2fil
2400 \@fpbot 0pt plus 1fil
2401 \@dblftop 0pt plus 1fil
2402 \@dblfpsep 8pt plus 2fil
2403 \@dblfpbot 0pt plus 1fil

2404 \marginparpush 5pt

2405 \parskip 0pt plus 1pt
2406 \parindent 10pt
2407 \emergencystretch8\p@

2408 \partopsep 2pt plus 1pt minus 1pt

2409 \leftmargini 25pt
2410 \leftmarginii 22pt
2411 \leftmarginiii 18.7pt
2412 \leftmarginiv 17pt
2413 \leftmarginv 10pt
2414 \leftmarginvi 10pt

2415 \def\@listI{%
2416 \leftmargin\leftmargini
2417 \parsep 4\p@ plus2\p@ minus\p@
2418 \topsep 8\p@ plus2\p@ minus4\p@
2419 \itemsep 4\p@ plus2\p@ minus\p@
2420 }%

2421 \labelsep 4pt

2422 \def\@listii{%
2423 \leftmargin\leftmarginii
2424 \labelwidth\leftmarginii
2425 \advance\labelwidth-\labelsep
2426 \topsep 4\p@ plus2\p@ minus\p@
2427 \parsep 2\p@ plus\p@ minus\p@
2428 \itemsep \parsep
2429 }%

2430 \def\@listiii{%
2431 \leftmargin\leftmarginiii
2432 \labelwidth\leftmarginiii

```

```

2433 \advance\labelwidth-\labelsep
2434 \topsep 2\p@ plus\p@ minus\p@
2435 \parsep \z@
2436 \partopsep \p@ plus\z@ minus\p@
2437 \itemsep \topsep
2438 }%

2439 \def\@listiv{%
2440 \leftmargin\leftmarginiv
2441 \labelwidth\leftmarginiv
2442 \advance\labelwidth-\labelsep
2443 }%

2444 \def\@listv{%
2445 \leftmargin\leftmarginv
2446 \labelwidth\leftmarginv
2447 \advance\labelwidth-\labelsep
2448 }%

2449 \def\@listvi{%
2450 \leftmargin\leftmarginvi
2451 \labelwidth\leftmarginvi
2452 \advance\labelwidth-\labelsep
2453 }%

2454 %</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.

```

2455 %<*11pt>

2456 \def\normalsize{%
2457 \setfontsize\normalsize\@xipt{13.6}%
2458 \abovedisplayskip 11\p@ \@plus3\p@ \@minus6\p@
2459 \belowdisplayskip \abovedisplayskip
2460 \abovedisplayshortskip \abovedisplayskip
2461 \belowdisplayshortskip \abovedisplayskip
2462 \let\@listi\@listI
2463 }%

2464 \def\small{%
2465 \setfontsize\small\@xpt\@xipt
2466 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2467 \abovedisplayshortskip \z@ \@plus3\p@
2468 \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
2469 \def\@listi{\leftmargin\leftmargini
2470 \topsep 6\p@ \@plus2\p@ \@minus2\p@
2471 \parsep 3\p@ \@plus2\p@ \@minus\p@
2472 \itemsep \parsep
2473 }%

```

```

2474 \belowdisplayskip \abovedisplayskip
2475 }%

2476 \def\footnotesize{%
2477 \setfontsize\footnotesize\@ixpt{11}%
2478 \abovedisplayskip 8\p@ \@plus2\p@ \@minus4\p@
2479 \abovedisplayshortskip \z@ \@plus\p@
2480 \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2481 \def\@listi{\leftmargin\leftmargini
2482 \topsep 4\p@ \@plus2\p@ \@minus2\p@
2483 \parsep 2\p@ \@plus\p@ \@minus\p@
2484 \itemsep \parsep
2485 }%
2486 \belowdisplayskip \abovedisplayskip
2487 }%

2488 \def\scriptsize{%
2489 \setfontsize\scriptsize\@viiipt{9.5}%
2490 }%
2491 \def\tiny{%
2492 \setfontsize\tiny\@vipt\@vipt
2493 }%
2494 \def\large{%
2495 \setfontsize\large\@xiipt{14}%
2496 }%
2497 \def\Large{%
2498 \setfontsize\Large\@xivpt{18}%
2499 }%
2500 \def\LARGE{%
2501 \setfontsize\LARGE\@xviipt{22}%
2502 }%
2503 \def\huge{%
2504 \setfontsize\huge\@xxpt{25pt}%
2505 }%
2506 \def\Huge{%
2507 \setfontsize\Huge\@xxvpt{30pt}%
2508 }%
2509 %</11pt>

```

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

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

```

2510 %<*12pt>

2511 \def\normalsize{%
2512 \setfontsize\normalsize\@xiipt{14pt}%
2513 \abovedisplayskip 12\p@ \@plus3\p@ \@minus7\p@
2514 \belowdisplayskip \abovedisplayskip

```

```

2515 \abovedisplayshortskip \z@ plus3\p@
2516 \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2517 \let\@listi\@listI
2518 }%

2519 \def\small{%
2520 \@setfontsize\small\@xipt{14.5pt}%
2521 \abovedisplayskip 811\p@ \@plus3\p@ \@minus6\p@
2522 \belowdisplayskip \abovedisplayskip
2523 \abovedisplayshortskip \z@ \@plus3\p@
2524 \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2525 \def\@listi{%
2526 \leftmargin\leftmarginI
2527 \topsep 9\p@ \@plus3\p@ \@minus5\p@
2528 \parsep 4.5\p@ \@plus2\p@ \@minus\p@
2529 \itemsep \parsep
2530 }%
2531 }%

Same baselineskip as \small ?

2532 \def\footnotesize{%
2533 \@setfontsize\footnotesize\@xpt{14.5pt}%
2534 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2535 \belowdisplayskip \abovedisplayskip
2536 \abovedisplayshortskip \z@ \@plus3\p@
2537 \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
2538 \def\@listi{%
2539 \leftmargin\leftmarginI
2540 \topsep 6\p@ \@plus2\p@ \@minus2\p@
2541 \parsep 3\p@ \@plus2\p@ \@minus\p@
2542 \itemsep \parsep
2543 }%
2544 }%

2545 \def\scriptsize{%
2546 \@setfontsize\scriptsize\@viipt{9.5pt}%
2547 }%

2548 \def\tiny{%
2549 \@setfontsize\tiny\@vpt{7pt}%
2550 }%

2551 \def\large{%
2552 \@setfontsize\large\@xivpt{18pt}%
2553 }%

2554 \def\Large{%
2555 \@setfontsize\Large\@xxvpt{22pt}%
2556 }%

2557 \def\LARGE{%
2558 \@setfontsize\LARGE\@xxpt{25pt}%
2559 }%

2560 \def\huge{%
2561 \@setfontsize\huge\@xxv{30pt}%

```

```

2562 }%
2563 \let\Huge=\huge
2564 %</12pt>

```

## 26 Page parameters

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

```

2565 %<*11pt|12pt>
2566 \AtBeginDocument{%
2567 \twoside@sw{%
2568 \oddsidemargin .25in
2569 \evensidemargin -.25in
2570 \marginparwidth 60pt
2571 }{%
2572 \oddsidemargin 0pt
2573 \evensidemargin 0pt
2574 \marginparwidth 44pt
2575 }%
2576 }%

2577 \marginparsep 10pt

2578 \topmargin -37pt

2579 \headheight 12pt
2580 \headsep 25pt

2581 \topskip 10pt

2582 \footskip 30pt

2583 \appdef\set@pica@hook{%
2584 \@ifundefined\tightenlines@sw{\@booleanfalse\tightenlines@sw}{}%
2585 \tightenlines@sw{%
2586 \textheight = 44\baselineskip
2587 }{%
2588 \linespread{1.655}\normalfont
2589 \textheight = 27\baselineskip
2590 }%
2591 \advance\textheight by \topskip
2592 }%

2593 \textwidth 468pt

2594 \columnsep 10pt
2595 \columnseprule 0pt

2596 \footnotesep 1pt
2597 \skip\footins 25.25pt plus 4pt minus 2pt
2598 \def\footnoterule{\kern-5.25pt\hrule width.5in\kern4.85pt}

2599 \floatsep 14pt plus 2pt minus 4pt
2600 \textfloatsep 20pt plus 2pt minus 4pt
2601 \intextsep 14pt plus 4pt minus 4pt

```

```

2602\dblfloatsep 14pt plus 2pt minus 4pt
2603\dbltextfloatsep 20pt plus 2pt minus 4pt

2604\@fptop 0pt plus 1fil
2605\@fpsep 10pt plus 2fil
2606\@fpbot 0pt plus 1fil
2607\@dblfpsep 0pt plus 1fil
2608\@dblfpsep 10pt plus 2fil%
2609\@dblfpbot 0pt plus 1fil

2610\marginparpush 7pt

2611\parskip 0pt plus 1pt
2612\parindent 15pt
2613\emergencystretch8\p@
2614\partopsep 3pt plus 2pt minus 2pt

2615\leftmargini 30pt
2616\leftmarginii 26pt
2617\leftmarginiii 22pt
2618\leftmarginiv 20pt
2619\leftmarginv 12pt
2620\leftmarginvi 12pt

2621\def\@listI{\leftmargin\leftmargini \parsep 5\p@ plus2.5\p@ minus\p@
2622 \topsep 10\p@ plus4\p@ minus6\p@
2623 \itemsep 5\p@ plus2.5\p@ minus\p@
2624 }%

2625\labelsep 6pt

2626\def\@listii{\leftmargin\leftmarginii
2627 \labelwidth\leftmarginii\advance\labelwidth-\labelsep
2628 \topsep 5\p@ plus2.5\p@ minus\p@
2629 \parsep 2.5\p@ plus\p@ minus\p@
2630 \itemsep \parsep
2631 }%

2632\def\@listiii{\leftmargin\leftmarginiii
2633 \labelwidth\leftmarginiii\advance\labelwidth-\labelsep
2634 \topsep 2.5\p@ plus\p@ minus\p@
2635 \parsep \z@ \partopsep \p@ plus\z@ minus\p@
2636 \itemsep \topsep
2637 }%

2638\def\@listiv{\leftmargin\leftmarginiv
2639 \labelwidth\leftmarginiv\advance\labelwidth-\labelsep
2640 }%

2641\def\@listv{\leftmargin\leftmarginv
2642 \labelwidth\leftmarginv\advance\labelwidth-\labelsep
2643 }%

2644\def\@listvi{\leftmargin\leftmarginvi
2645 \labelwidth\leftmarginvi\advance\labelwidth-\labelsep
2646 }%

2647 %</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`.

```
2648 %<*aps>
```

### 27.1 Defend Against Forseeable Errors

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

```
2649 \ifx\undefined\REVTEX@society@ext
2650 \def\@tempa{%
2651 \endinput
2652 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2653 }%
2654 \expandafter\else
2655 \def\@tempa{}%
2656 \expandafter\fi\@tempa
```

### 27.2 Abbreviations

The following macros constitute typing shortcuts for certain journal names.

```
2657 \def\ao{Appl.\ Opt.\ }
2658 \def\ap{Appl.\ Phys.\ }
2659 \def\apl{Appl.\ Phys.\ Lett.\ }
2660 \def\apj{Astrophys.\ J.\ }
2661 \def\bell{Bell Syst.\ Tech.\ J.\ }
2662 \def\jqe{IEEE J.\ Quantum Electron.\ }
2663 \def\assp{IEEE Trans.\ Acoust.\ Speech Signal Process.\ }
2664 \def\aprop{IEEE Trans.\ Antennas Propag.\ }
2665 \def\mtt{IEEE Trans.\ Microwave Theory Tech.\ }
2666 \def\iovs{Invest.\ Ophthalmol.\ Vis.\ Sci.\ }
2667 \def\jcp{J.\ Chem.\ Phys.\ }
2668 \def\jmo{J.\ Mod.\ Opt.\ }
2669 \def\josa{J.\ Opt.\ Soc.\ Am.\ }
2670 \def\josaa{J.\ Opt.\ Soc.\ Am.\ A }
2671 \def\josab{J.\ Opt.\ Soc.\ Am.\ B }
2672 \def\jpp{J.\ Phys.\ (Paris) }
2673 \def\nat{Nature (London) }
```

```

2674 \def\oc{Opt.\ Commun.\ }
2675 \def\ol{Opt.\ Lett.\ }
2676 \def\pl{Phys.\ Lett.\ }
2677 \def\pra{Phys.\ Rev.\ A }
2678 \def\prb{Phys.\ Rev.\ B }
2679 \def\prc{Phys.\ Rev.\ C }
2680 \def\prd{Phys.\ Rev.\ D }
2681 \def\pre{Phys.\ Rev.\ E }
2682 \def\prl{Phys.\ Rev.\ Lett.\ }
2683 \def\rmp{Rev.\ Mod.\ Phys.\ }
2684 \def\pspie{Proc.\ Soc.\ Photo-Opt.\ Instrum.\ Eng.\ }
2685 \def\sjqe{Sov.\ J.\ Quantum Electron.\ }
2686 \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`

```

2687 \renewenvironment{titlepage}{%
2688 \let\wastwocol@sw\twocolumn@sw
2689 \onecolumngrid
2690 \newpage
2691 \thispagestyle{titlepage}%
2692 \c@page\z@% article sets this to one not zero???
2693 }{%
2694 \wastwocol@sw{\twocolumngrid}{\newpage}%
2695 }%

```

`\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.

```

2696 \def\frontmatter@abstractheading{%
2697 \preprintsty@sw{%
2698 \begin{center}\large\abstractname\end{center}%
2699 \vspace{-1pc}%
2700 }{}%
2701 }%

```

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

```

2702 \def\frontmatter@abstractwidth{.75\textwidth}

```

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

```

2703 \def\frontmatter@abstractfont{%
2704 \small
2705 \parskip3\p@\relax
2706 }%

```

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

```

2707 \@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.

```

2708 \AtBeginDocument{%
2709 \preprintsty@sw{%
2710 \@ifxundefined\titlepage@sw{\@booleantrue\titlepage@sw}{}%
2711 \def\frontmatter@abstractwidth{\textwidth}%
2712 \def\frontmatter@affiliationfont{\it}%
2713 }{}%
2714 }%

```

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

```

2715 \def\frontmatter@authorformat{%
2716 \skip@\@flushglue
2717 \@flushglue\z@ plus.3\hsize\relax
2718 \centering
2719 \baselineskip3ex
2720 \parskip\z@skip
2721 \@flushglue\skip@
2722 }%

```

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

```

2723 \def\frontmatter@above@affiliation{\smallskip}%

```

`\frontmatter@affiliationfont` All APS journals set the affiliation the same.

```

2724 \def\frontmatter@affiliationfont{\small\it}%

```

Set up the default APS style for title block authors and affiliations.

```

2725 \@ifxundefined\groupauthors@sw{%
2726 \clo@groupedaddress
2727 }{}%

```

`\frontmatter@setup` All APS journals set the title page the same.

```

2728 \def\frontmatter@setup{\normalfont\centering}%

```

`\frontmatter@title@produce` All APS journals set the article title the same.

```

2729 \def\frontmatter@title@produce{%
2730 \begingroup\large\bfseries\@title\par\endgroup
2731 \addvspace{2\baselineskip}%
2732 }%

```

```

\frontmatter@makefnmark All APS journals share this procedure for setting the titlepage footnote text.
2733 \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.
2734 \def\frontmatter@RRAPformat#1{%
2735 \begingroup
2736 \centering\parskip.5ex\relax
2737 \everypar{\hbox\bgroup(\@gobble@leavemode@uppercase}%
2738 \def\par{\@ifvmode{\@unskip}\egroup\@par}}%
2739 #1\par
2740 \endgroup
2741 }%
2742 \def\punct@RRAP{;\egroup\ \hbox\bgroup}%
2743 \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.
2744 \def\ps@titlepage{%
2745 \def\@oddhead{%
2746 \hfill
2747 \produce@preprints\@preprint
2748 }%
2749 \let\@evenhead\@oddhead
2750 \def\@oddfoot{%
2751 \hfil
2752 \byrevtex\quad
2753 \preprintsty@sw{\thepage}}%
2754 \quad\checkindate
2755 \hfil
2756 }%
2757 \let\@evenfoot\@oddfoot
2758 }%
2759 \def\byrevtex{\byrevtex@sw{Typeset by REV\TeX}}%

\produce@preprints
2760 \def\produce@preprints#1{%
2761 \preprintsty@sw{%
2762 \vtop to \z@{%
2763 \def\baselinestretch{1}%
2764 \small
2765 \let\preprint\preprint@count
2766 \count@\z@#1\@ifnum{\count@>\tw@}{%
2767 \hbox{%
2768 \let\preprint\preprint@hlist
2769 #1\setbox\z@\lastbox
2770 }%
2771 }{%
2772 \let\preprint\preprint@cr

```

```

2773 \halign{\hfil##\cr#1\cr}\cr}\%
2774 \par
2775 \vss
2776 }%
2777 }%
2778 }{}%
2779 }%
2780 \def\preprint@cr#1{#1\cr}\%
2781 \def\preprint@count#1{\advance\count@one}\%
2782 \def\preprint@hlist#1{#1\hbox{, }}%

```

Invoke bibnote option, if it has not yet been set.

```

2783 \@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.

```

2784 \def\@pnumwidth{1.55em}
2785 \def\@tocrmarg {2.55em}
2786 \def\@dotsep{4.5}
2787 \setcounter{tocdepth}{3}
2788 \def\tableofcontents{%
2789 \addtocontents{toc}{\string\tocdepth@munge}%
2790 \print@toc{toc}%
2791 \addtocontents{toc}{\string\tocdepth@restore}%
2792 }%
2793 \def\tocdepth@munge{%
2794 \let\l@section@saved\l@section
2795 \let\l@section@gobble@tw@
2796 }%
2797 \def@gobble@tw@#1#2{}%
2798 \def\tocdepth@restore{%
2799 \let\l@section\l@section@saved
2800 }%
2801 \def\l@part#1#2{\addpenalty{\@secpenalty}%
2802 \addvspace{2.25em plus\p@}%
2803 \begingroup
2804 \@tempdima 3em %
2805 \parindent \z@ \rightskip \@pnumwidth %
2806 \parfillskip -\@pnumwidth
2807 {\large \bf %
2808 \leavevmode %
2809 #1\hfil \hb@xt@\@pnumwidth{\hss #2}}\par
2810 \nobreak %
2811 \endgroup
2812 }%

```

```

2813 \def\l@section#1#2{%
2814 \addpenalty{\@secpenalty}%
2815 \addvspace{1.0em plus\p@}%
2816 \@tempdima 3.0em %
2817 \begingroup
2818 \parindent \z@ \rightskip \@pnumwidth
2819 \parfillskip -\@pnumwidth
2820 \bf %
2821 \leavevmode %
2822 \advance\leftskip\@tempdima %
2823 \hskip -\leftskip %
2824 #1\nobreak\hfil \nobreak\hb@xt@\@pnumwidth{\hss #2}\par
2825 \endgroup
2826 }%

2827 \def\l@subsection{\@dottedtocline{2}{3.0em}{2.0em}}
2828 \def\l@subsubsection{\@dottedtocline{3}{5.0em}{1.5em}}
2829 \def\l@paragraph{\@dottedtocline{4}{6.5em}{1.5em}}
2830 \def\l@subparagraph{\@dottedtocline{5}{8.0em}{1.5em}}

2831 \def\listoffigures{\print@toc{lof}}%
2832 \def\l@figure{\@dottedtocline{1}{1.5em}{2.3em}}

2833 \def\listoftables{\print@toc{lot}}%
2834 \let\l@table\l@figure

```

### 27.3.3 Appendix

```

\appendix
\@hangfrom@appendix 2835 \appdef\appendix{%
\@hangfroms@appendix 2836 \let\@hangfrom@section\@hangfrom@appendix
\@appendixcntformat 2837 \let\@hangfroms@section\@hangfroms@appendix
2838 \let\@sectioncntformat\@appendixcntformat
2839 }%
2840 \def\@hangfrom@appendix#1#2{%
2841 #1\@ifempty{#2}{}{\quad#2}%
2842 }%
2843 \def\@hangfroms@appendix#1#2{%
2844 #2%
2845 }%
2846 \def\@appendixcntformat#1{\appendixname\ \csname the#1\endcsname}%

```

### 27.3.4 Bibliography

Customize REV<sub>T</sub>E<sub>X</sub> for the journal substyle; this task requires three components: the BIB<sub>T</sub>E<sub>X</sub> `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 BIB<sub>T</sub>E<sub>X</sub> 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 REV<sub>T</sub>E<sub>X</sub> journal substyle, an impossibility.

To generate `apsrev.bst`, use `custom-bib` version 4.0b2 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,ed-au (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: nmft,nmft-def (User defined author font);
5. FONT FOR FIRST NAMES: u: fnm-def (First names in user defined font);
6. EDITOR NAMES IN INCOLLECTION ETC: a: nmfted (Editors incollection like authors);
7. DATE FORMAT: p: yr-par (Date in parentheses);
8. SUPPRESS MONTH: x: xmth (Date is year only);
9. TITLE OF ARTICLE: i: tit-it (Title italic)
10. ARTICLE TITLE PRESENT: x: jtitt-x (No article title);
11. JOURNAL NAME FONT: r: jtitt-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 PARENTHESSES: d: pub-date (Publisher and date in parentheses);
18. PUBLISHER POSITION: p: pre-pub (Publisher before chapter, pages);
19. ISBN NUMBER: isbn: (Include ISBN for books, booklets)
20. ISSN NUMBER: issn: (Include ISSN for periodicals)
21. EDITOR IN COLLECTIONS: b: edby (Booktitle, edited by ...);
22. PUNCTUATION BETWEEN SECTIONS (BLOCKS): c: blk-com (Comma between blocks);
23. ABBREVIATE WORD 'PAGES': a: pp ('Page' abbreviated);

24. ABBREVIATE WORD 'EDITORS': a: ed ('Editor' abbreviated);
25. OTHER ABBREVIATIONS: a: abr (Abbreviations);
26. ABBREVIATION FOR 'EDITION': a: ednx ('Edition' abbreviated as 'ed');
27. EDITION NUMBERS: n: ord (Numerical editions);
28. STORED JOURNAL NAMES: a: jabr (Abbreviated journal names);
29. FONT OF 'ET AL': i: etal-it (Italic et al);
30. ADDITIONAL REVTeX DATA FIELDS: r: revdata, eprint, url, url-blk (Include REVTeX data fields collaboration, eid, eprint, numpages, url)
31. NEW FONT SELECTION SCHEME: n: nfss (NFSS);
32. ADDITIONAL REVTeX DATA FIELDS: y: revdata (additional data fields);
33. REFERENCE COMPONENT TAGS: y: reference component tags;
34. URL ADDRESS: n: URL as note;

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)
% ,jtit-x%: No article title
% ,jttl-rm%: Journal name 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
% ,edby%: In 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
% ,revdata,eprint,url,url-blk%: Include REVTeX data fields collaboration, eid, eprint
% ,url,url-nt%: URL as note
% ,bibinfo%: Reference component tags like \bibinfo in the content of \bibitem
% ,nfss%: NFSS use \textbf, \emph, not \bf, \em
% }}
% \generate{\file{\jobname.bst}{\MBopts}}
% \endbatchfile
%

```

To get a banner in the .blg file, patch by hand into apsrev.bst:

```

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

```

and invoke banner.log from within begin.bib

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).

`\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.

The journal substyles can override these choices.

```

2847 \@ifpackageloaded{natbib}{%
2848 \bibpunct{[]{}{}{,}{n}{}{,}}%
2849 \def\NAT@sort{2}%
2850 }{}%

```

`\bibsection` We define the sectioning command to use when starting the bibliography and gently coax `\@bibsetup` natbib into using the formatting procedures appropriate to the APS.

`\bibfont` This way of setting up the bibliography automatically sets the label width based on the largest number used within the bibliography.

`\@biblabel` 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.

```
2851 \def\bibsection{\section*{\refname}}%
2852 \def\REV@bibsetup#1{\NAT@bibsetup{\ref{LastBibItem}}}%
2853 \let\bibpreamble\@empty
2854 \def\bibfont{%
2855 \bibsep\z@\relax
2856 \let\NAT@bibsetup\@bibsetup
2857 \let\@bibsetup\REV@bibsetup
2858 \@ifxundefined\place@bibnumber{%
2859 \let\@biblabel\place@bibnumber@inl
2860 }{%
2861 \let\@biblabel\place@bibnumber
2862 }%
2863 \def\newblock{\ }%
2864 }%
```

### 27.3.5 Index

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

```
2865 \newenvironment{theindex}{%
2866 \let\wastwocol@sw\twocolumn@sw
2867 \columnseprule \z@
2868 \columnsep 35\p@
2869 \c@secnumdepth-\maxdimen
2870 \onecolumngrid
2871 \section{\indexname}%
2872 \thispagestyle{plain}%
2873 \parindent\z@
2874 \parskip\z@ plus.3\p@\relax
2875 \let\item\@idxitem
2876 \wastwocol@sw{\twocolumngrid}}{%
2877 }{%
2878 \onecolumngrid
2879 }%
2880 %
2881 \def\@idxitem{\par\hangindent 40\p@}
2882 %
2883 \def\subitem{\par\hangindent 40\p@ \hspace*{20\p@}}
2884 %
2885 \def\subsubitem{\par\hangindent 40\p@ \hspace*{30\p@}}
2886 %
2887 \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.

```
2888 \def\journal@pra{pra}%
2889 \def\journal@prb{prb}%
2890 \def\journal@prc{prc}%
2891 \def\journal@prd{prd}%
2892 \def\journal@pre{pre}%
2893 \def\journal@prl{prl}%
2894 \def\journal@prstab{prstab}%
2895 \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

```
2896 \@ifx{\@journal\journal@pra}{%
 End of pra code.
2897 }{}%
```

#### 27.4.2 prb

```
2898 \@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.

```
2899 \bibpunct{}{}{,}{s}{}{,}%
2900 \def\NAT@sort{2}%
2901 \def\onlinecite#1{\begingroup\let\@cite\NAT@citenum\citealp{#1}\endgroup}%
```

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

```
2902 \AtBeginDocument{%
2903 \@ifxundefined\place@bibnumber{%
2904 \def\place@bibnumber{\place@bibnumber@sup}%
2905 }{}%
2906 }%
```

End of prb code.

```
2907 }{}%
```

#### 27.4.3 prc

```
2908 \@ifx{\@journal\journal@prc}{%
```

End of prc code.

```
2909 }{}%
```

#### 27.4.4 prd

```
2910 \@ifx{\@journal\journal@prd}{%
```

End of prd code.

```
2911 }{}%
```

#### 27.4.5 pre

```
2912 \@ifx{\@journal\journal@pre}{%
```

End of prd code.

```
2913 }{}%
```

#### 27.4.6 prl

```
2914 \@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.

```
2915 \AtBeginDocument{%
2916 \lengthcheck@sw{%
2917 \Requirepackage{mathtime}%
2918 }{}%
2919 }%
```

A PRL does not have numbered sections.

```
2920 \c@secnumdepth=-\maxdimen
```

Note: we defer this code until after type size file is read in.

```
2921 \appdef\set@typesize@hook{%
2922 \@ifnum{\@pointsize=10\relax}{%
2923 \def\normalsize{%
2924 \@setfontsize\normalsize\@xpt\@xipt
2925 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2926 \belowdisplayskip \abovedisplayskip
2927 \abovedisplayshortskip \abovedisplayskip
2928 \belowdisplayshortskip \abovedisplayskip
2929 \let\@listi\@listI
2930 }%
2931 }{}%
2932 }%
2933 \appdef\set@pica@hook{%
2934 \@ifnum{\@pointsize=10\relax}{%
2935 \textheight = 55\baselineskip
2936 \advance\textheight by \topskip
2937 }{}%
2938 }%
```

End of prl code.

```
2939 }{}%
```

#### 27.4.7 prstab

```
2940 \@ifx{\@journal\journal@prstab}{%
```

```
 End of prstab code.
```

```
2941 }{}%
```

### 27.4.8 rmp

Read in the code from a file.

```
2942 \@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`  
`\@bibstyle` 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.

```
2943 \AtBeginDocument{%
2944 \@ifxundefined\place@bibnumber{%
2945 \def\place@bibnumber{\place@bibnumber@inl}%
2946 }{}%
2947 \@ifxundefined\@bibstyle{%
2948 \def\@bibstyle{apsrev}%
2949 }{}%
2950 }%
2951 %</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.

```
2952 %<*rmp>
```

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

```
2953 \ifx\undefined\REVTeX@society@ext
2954 \def\@tempa{%
2955 \endinput
2956 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2957 }%
2958 \expandafter\else
2959 \def\@tempa{}%
2960 \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`.

```
2961 \@ifx@empty\@journal{%
2962 \REVTeX@warn{I have to read in the aps substyle first!}%
2963 \endinput
```

```

2964 \def\@society{aps}\def\@journal{rmp}%
2965 \expandafter\input\expandafter{\@society\REVTEX@society@ext}%
2966 }{}%

```

## 28.1 Frontmatter

`\frontmatter@setup`

```

2967 \def\frontmatter@setup{\normalfont\raggedright\sffamily}%

```

`\frontmatter@title@produce`

```

2968 \def\frontmatter@title@produce{%
2969 \begingroup\Large\bfseries\@title\par\endgroup
2970 \addvspace{8pt}%
2971 }%

```

`\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.

```

2972 \def\frontmatter@authorformat{%
2973 \preprintsty@sw{\vskip0.5pc\relax}{}%
2974 \@tempskipa\@flushglue
2975 \@flushglue\z@ plus50\p@\relax
2976 \raggedright\advance\leftskip.5in\relax
2977 \@flushglue\@tempskipa
2978 \parskip\z@skip
2979 }%

```

`frontmatter@affiliationfont`

```

2980 \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.

```

2981 \@ifxundefined\groupauthors@sw{%
2982 \clo@groupedaddress
2983 }{}%

```

`\frontmatter@RRAPformat`

Note: in RMP, if we are not in preprint mode, the date will not be produced.

```

2984 \def\frontmatter@RRAPformat#1{%
2985 \begingroup
2986 \small
2987 \raggedright\advance\leftskip.5in\relax
2988 \parskip.5ex\relax
2989 \everypar{\hbox\bgroup(\@gobble@leavemode@uppercase}%
2990 \def\par{\@ifvmode{}{\unskip}\egroup\@par}}%
2991 \preprintsty@sw{\let\@date\@empty}%
2992 #1\par
2993 \endgroup
2994 }%

```

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

```
2995 \def\frontmatter@abstractheading{%
2996 \preprintsty@sw{%
2997 \begingroup
2998 \centering\large\abstractname\par
2999 \endgroup
3000 \vspace{.5pc}%
3001 }{}%
3002 }%
```

\frontmatter@abstractfont

```
3003 \def\frontmatter@abstractfont{%
3004 \footnotesize
3005 \hsize\columnwidth
3006 \leftskip=0.5in
3007 \rightskip=\leftskip
3008 \parindent\z@
3009 %\hsize5.5in
3010 }%
```

frontmatter@preabstractspace Space above and space below abstract in title block

```
frontmatter@postabstractspace 3011 \def\frontmatter@preabstractspace{2.5pc}
3012 \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.

```
3013 \appdef\set@typesize@hook{%
3014 \@ifxundefined\preprintsty@sw{}{}%
3015 \preprintsty@sw{}{}%
3016 \def\normalsize{%
3017 \@setsize\normalsize{12pt}\xpt\xpt
3018 \abovedisplayskip 10\p@ plus2\p@ minus5\p@
3019 \belowdisplayskip \abovedisplayskip
3020 \abovedisplayshortskip \abovedisplayskip
3021 \belowdisplayshortskip \abovedisplayskip
3022 \let\@listi\@listI
3023 }%
3024 }%
3025 }%
3026 }%
```

Footnote mods:

```
3027 \footnotesep 9.25pt
3028 \skip\footins 36pt plus 4pt minus 2pt
3029 \def\footnoterule{\kern-13pt\hrule width.5in\kern15.6pt}%
```

## 28.3 Sectioning

```
3030 \def\thepart{\Roman{part}} %
3031 \def\thesection{\Roman{section}}
3032 \def\p@section{}
3033 \def\thesubsection{\Alph{subsection}}
3034 \def\p@subsection{\thesection.}
3035 \def\thesubsubsection{\arabic{subsubsection}}
3036 \def\p@subsubsection{\thesection.\thesubsection.}
3037 \def\p@paragraph{\thesection.\thesubsection.\thesubsubsection.}
3038 \def\theparagraph{\alph{paragraph}}
3039 \def\thesubparagraph{\theparagraph.\arabic{subparagraph}}

3040 \def\section{%
3041 \@startsection{section}{1}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm plus1ex minus.2ex}
3042 {%
3043 \small\sffamily\bfseries\selectfont
3044 \raggedright
3045 \parindent\z@
3046 \MakeTextUppercase % Implicit #1
3047 }%
3048 }%
3049 \def\subsection{%
3050 \@startsection{subsection}{2}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm plus1ex minus.2ex}
3051 {%
3052 \small\sffamily\bfseries
3053 \raggedright
3054 \parindent\z@
3055 }%
3056 }%
3057 \def\subsubsection{%
3058 \@startsection{subsubsection}{3}{\z@}{.8cm plus1ex minus.2ex}{0.4cm plus1ex minus.2ex}
3059 {%
3060 \small\sffamily\selectfont
3061 \raggedright
3062 \parindent\z@
3063 }%
3064 }%
3065 \def\paragraph{%
3066 \@startsection{paragraph}{4}{\z@}{.8cm plus1ex minus.2ex}{0.4cm plus1ex minus.2ex}
3067 {%
3068 \small\slshape\selectfont
3069 \raggedright
3070 \parindent\z@
3071 }%
3072 }%
3073 \def\subparagraph{%
3074 \@startsection{subparagraph}{4}{\parindent}{3.25ex plus1ex minus.2ex}{-1em}%
3075 {\normalsize\bfseries\selectfont}%
3076 }%
3077 \def\@secntformat#1{\cename the#1\endcename.\ }%
```

```

3078 %
3079 \setcounter{tocdepth}{4}% FIXME: has no effect

\appendix
\@hangfrom@appendix 3080 \appdef\appendix{%
\@hangfroms@appendix 3081 \let\@hangfrom@section\@hangfrom@appendix
\@appendixcntformat 3082 \let\@hangfroms@section\@hangfroms@appendix
3083 \let\@sectioncntformat\@appendixcntformat
3084 }%
3085 \def\@hangfrom@appendix#1#2{%
3086 #1\@ifempty{#2}{}{:\ #2}%
3087 }%
3088 \def\@hangfroms@appendix#1#2{%
3089 #1\appendixname\@ifempty{#2}{}{:\ #2}%
3090 }%
3091 \def\@appendixcntformat#1{\appendixname\ \cscname the#1\endcscname}%

```

## 28.4 Figure and Table Caption Formatting

```

\@makecaption
3092 \setlength\belowcaptionskip{2\p@}
3093 \long\def\@makecaption#1#2{%
3094 \vskip\abovecaptionskip
3095 \vbox{%
3096 \small\rmfamily
3097 % \hspace\@capwidth
3098 \noindent
3099 #1\nobreak\hspace.5em plus.2em\ignorespaces#2\par
3100 }%
3101 \vskip\belowcaptionskip
3102 }%

```

## 28.5 Citations and Bibliography

Customize REV<sub>T</sub>E<sub>X</sub> for the journal substyle; this task requires three components: a BIB<sub>T</sub>E<sub>X</sub> .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 BIB<sub>T</sub>E<sub>X</sub> 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. STYLE OF CITATIONS: a: ay( Author-year with some non-standard interface)
2. AUTHOR-YEAR SUPPORT SYSTEM: nat: (Natbib for use with natbib v5.3 or later)

3. ORDERING OF REFERENCES: \*: (Alphabetical);
4. ORDER ON VON PART: x: vonx (Sort without von part—de la Maire after Mahone)
5. AUTHOR NAMES: a: nm-rev1 (Only first name reversed, initials—AGU style: Smith, J. F., H. K. Jones)
6. POSITION OF JUNIOR: jnrlst (Junior comes last as Smith, John, Jr.)
7. NUMBER OF AUTHORS: l: max 12, min 12 (three prompts in all);
8. TYPEFACE FOR AUTHORS IN LIST OF REFERENCES: u: nmft, nmft-def (User defined author font—\bibnamefont)
9. FONT FOR FIRST NAMES: u: fnm-def (First names in user defined font—\bibfnamefont)
10. EDITOR NAMES IN INCOLLECTION ETC: a: nmfted (Editors incollection like authors font)
11. FONT FOR 'AND' IN LIST: r: nmand-rm ('And' in normal font—JONES and JAMES)
12. FONT OF CITATION LABELS IN TEXT: u: lab, lab-def (User-defined citation font—\citenamefont)
13. LABEL WHEN AUTHORS MISSING: keyxyr (Year blank when KEY replaces missing author—for natbib 7.0)
14. DATE POSITION: b: dt-beg (Date after authors)
15. SUPPRESS MONTH: xmth (Date is year only)
16. DATE FORMAT: yr-com (Date preceded by comma as ', 1993')
17. TRUNCATE YEAR: note-yr (Year text full as 1990–1993 or 'in press')
18. ARTICLE TITLE PRESENT: x: jtix (No article title);
19. JOURNAL TITLE FONT: r: jttrm (Journal title normal);
20. TECHNICAL REPORT TITLE: b: trtit-b (Tech. report title like books);
21. JOURNAL VOLUME: b: vol-bf (Volume bold);
22. VOLUME PUNCTUATION: c: volp-com (Volume with comma);
23. PAGE NUMBERS: f: jpg-1 (Only start page number);
24. POSITION OF PAGES: e: pp-last (Pages at end, but before any notes)
25. NUMBER AND SERIES FOR COLLECTIONS: num-xser (Allows number without series and suppresses word "number")

26. JOURNAL NAME PUNCTUATION: x: jnm-x (Space after journal);
27. PUBLISHER IN PARENTHESES: p: pub-par (Publisher in parentheses)
28. PUBLISHER POSITION: p: pre-pub (Publisher before chapter, pages);
29. ISBN NUMBER: \*: isbn (Include ISBN);
30. ISSN NUMBER: \*: isbn (Include ISSN for periodicals);
31. 'EDITOR' AFTER NAMES: a: edpar ('Name (editor),' in parentheses, after name, comma after)
32. EDITOR IN COLLECTIONS: b: edby (In booktitle, edited by...—where ... is names)
33. PUNCTUATION BETWEEN SECTIONS (BLOCKS): c: blk-com (Comma between blocks);
34. 'IN' WITH JOURNAL NAMES: i: injnl (Add 'in' before journal name in style for incollection)
35. ABBREVIATE WORD 'PAGES': a: pp ('Page' abbreviated);
36. ABBREVIATE WORD 'EDITORS': a: ed ('Editor' abbreviated);
37. ABBREVIATION FOR 'EDITION': a: ednx ('Edition' abbreviated as 'ed');
38. EDITION NUMBERS: xedn (Editions as in database saving much processing memory)
39. STORED JOURNAL NAMES: a: jabr (Abbreviated journal names);
40. FONT OF 'ET AL': i: etal-it (Italic et al);
41. ADDITIONAL REVTeX DATA FIELDS: r: revdata, eprint, url, url-blk (Include REVTeX data fields)
42. NEW FONT SELECTION SCHEME: n: nfss (NFSS);
43. ADDITIONAL REVTeX DATA FIELDS: y: revdata (additional data fields);
44. 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 v5.3 or later
% ,vonx%: Sort without von part (de la Maire after Mahone)
% ,nm-rev1%: Only first name reversed, initials (AGU style: Smith, J. F., H. K. Jones)
% ,jnrlst%: Junior comes last as Smith, John, Jr.
% ,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
% ,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'
% ,jtitt-x%: No article title
% ,jtitt-rm%: Journal name 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
% ,edpar%: 'Name (editor),' in parentheses, after name, comma after
% ,edby%: In booktitle, edited by .. (where .. is names)
% ,blk-com%: Comma between blocks
% ,injnl%: 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
% ,revdata,eprint,url,url-blk%: Include REVTeX data fields collaboration, eid, eprint
% ,bibinfo%: Reference component tags like \bibinfo in the content of \bibitem
% ,nfss%: NFSS use \textbf, \emph, not \bf, \em
% }}
% \generate{\file{\jobname.bst}{\MBopts}}
% \endbatchfile

```

```

%
3103 \AtBeginDocument{%
3104 \ifxundefined\@bibstyle{%
3105 \def\@bibstyle{apsrmp}%
3106 }{}%
3107 }%

\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.
3108 \ifpackageloaded{natbib}{%
3109 \bibpunct{({})}{,}{a}{}{,}%
3110 \def\NAT@sort{0}%
3111 }{}%

\bibsection We define the sectioning command to use when starting the bibliography.
\@bibsetup In \bibfont is the journal substyle's definition of \@biblabel.
\bibfont 3112 \def\bibsection{\section*{\refname}}%
\@biblabel 3113 \let\bibpreamble\@empty
\@bibsetup@rmp 3114 \def\bibfont{%
3115 \bibsep\z@\relax
3116 \let\@bibsetup\@bibsetup@rmp
3117 \let\@biblabel\@gobble
3118 \def\newblock{\ }%
3119 }%
3120 \def\@bibsetup@rmp#1{%
3121 \leftmargin10\p@
3122 \labelwidth\z@
3123 \labelsep\z@
3124 \itemindent-\leftmargin
3125 \parsep\z@
3126 \topsep\z@
3127 \itemsep\z@
3128 }%

\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 in-
voked by the document.
3129 \ifxundefined\footinbib@sw{}{}%
3130 \footinbib@sw{%
3131 \REVTEX@warn{%
3132 Footnotes in bibliography are incompatible with RMP.^J%
3133 Undoing the footinbib option.
3134 }%
3135 }{}%

```

```
3136 }%
3137 \@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.

```
3138 \def\toc@@font{%
3139 \footnotesize\rmfamily
3140 \def\{\space\ignorespaces}%
3141 }%
3142 \def\@dotsep{5.5pt}%
```

`\l@section` Determine which TOC elements are automatically indented.

```
3143 \def\l@section{%
3144 \l@sections{}{section}% Implicit #3#4
3145 }%
3146 \def\tocleft@{\z@}%
3147 \def\l@subsection{%
3148 \l@sections{section}{subsection}% Implicit #3#4
3149 }%
3150 \def\l@subsubsection#1#2{}%
3151 \def\l@paragraph#1#2{}%
3152 \def\l@subparagraph#1#2{}%
```

Activate the TOC processing.

```
3153 \let\toc@pre\toc@pre@auto
3154 \let\toc@post\toc@post@auto
3155 %</rmp>
```

Here ends the programmer's documentation.

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