

keytheorems package

version 0.0.8δ

github.com/mbertucci47/keytheorems

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Abstract

An experimental `expl3`-implementation of a key-value interface to `amsthm`, implementing most of the functionality provided by `thmtools`. Likely contains many bugs; use at your own risk!

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1 Dependencies

Without using the `tcolorbox`^{P.6} or `tcolorbox-no-titlebar`^{P.7} options, the package loads the `aliascnt`, `amsthm`, `refcount`, and `translations` packages.

2 Global Options

`\keytheoremset{<options>}`

Every key in this section can be given as a package option with `\usepackage[<options>]{keytheorems}` or in `\keytheoremset{<options>}`, with the exception that `continues-code`^{P.2} can only be used in the latter.

`overload` (initially unset)

Redefines `\newtheorem` to internally use the `keytheorems` machinery. The syntax remains the same.

`thmtools-compat` (initially unset)

For compatibility with `thmtools` syntax. Currently defines the following commands:

thmtools command	keytheorems replacement
<code>\declaretheorem</code>	<code>\newkeytheorem</code>
<code>\declaretheoremstyle</code>	<code>\newkeytheoremstyle</code> ^{→ P. 7}
<code>\listoftheorems</code>	<code>\listofkeytheorems</code> ^{→ P. 9}
<code>\addtotheoremheadhook</code>	
<code>\addtotheoremheadhook</code>	
<code>\addtotheoremfoothook</code>	<code>\addtotheoremhook</code> ^{→ P. 11}
<code>\addtotheoremfoothook</code>	
<code>restatable</code> environment	<code>store</code> ^{→ P. 3} key

Also defined are the `shaded` and `thmbox` keys, implemented internally with `tcolorbox` rather than the `shadethm` and `thmbox` packages, respectively.

`store-all` (initially unset)

Tells `keytheorems` to grab the body of each theorem so it can later be printed with the `print-body`^{→ P. 10} option of `\listofkeytheorems`^{→ P. 9}. Note that this means a theorem body *cannot* contain verbatim material.

`restate-counters`={⟨*comma-list of counters*⟩} (initially {`equation`})

Additional counters whose values are preserved when a theorem is restated. This key does not reset the list, so you don't need to include `equation` in ⟨*comma-list*⟩.

`continues-code`=⟨*code with #1*⟩ (initially `\GetTranslation{keythms_continues}\pageref{#1}`)

The code used to typeset the note produced by the `continues`^{→ P. 3} key. If English or an unknown language is used, defaults to `continuing from p.\, \pageref{#1}`. Currently (likely inaccurate!) translations exist for French, German, and Spanish.

`qed-symbol`=⟨*symbol*⟩ (initially `\openbox`)

Redefines `\qedsymbol` to be ⟨*symbol*⟩.

`auto-translate`=`true`|`false` (default `true`, initially `true`)

If `false`, `keytheorems` does not automatically translate the title text for `\listofkeytheorems`^{→ P. 9} and the note produced by the `continues`^{→ P. 3} key. These texts can be manually customized with the `title`^{→ P. 10} and `continues-code` keys, respectively.

3 Defining Theorems

`\newkeytheorem`{⟨*env name*⟩}[⟨*options*⟩]

Defines a theorem environment ⟨*env name*⟩ which itself takes a few options (see subsection 3.1). You can also declare multiple theorems at once by replacing ⟨*env name*⟩ with a comma-list of names, e.g. `\newkeytheorem{theorem, lemma, proposition}[⟨options⟩]`.

By default, the theorem's printed name is a title-cased ⟨*env name*⟩. This can be changed with the `name`^{→ P. 4} key. All ⟨*options*⟩ are described in subsections 3.2 and 3.3.

```
% preamble
\newkeytheorem{theorem}

% document
\begin{theorem}
Some text
\end{theorem}
```

Theorem 1. *Some text*

3.1 Keys available to theorem environments

As in `amsthm`, theorems can take an optional argument that contains a note or heading.

```
\begin{theorem}[some heading]
Some text
\end{theorem}
```

Theorem 2 (some heading). *Some text*

Alternatively, the optional argument may contain any of the following keys.

`note=<text>` (initially unset)

Alias `name`. This is the key-value equivalent of the optional argument described above. This syntax, however, allows the argument to contain other keys.

```
\begin{theorem}[some heading]
Some text
\end{theorem}
\begin{theorem}[note=another heading]
Some more text
\end{theorem}
```

Theorem 3 (some heading). *Some text*

Theorem 4 (another heading). *Some more text*

`short-note=<text>` (initially unset)

Alias `short-name`. This replaces the value of `note` when displayed in `\listofkeytheorems`^{P.9}.

`label=<label name>` (initially unset)

This is the key-value equivalent of `\begin{theorem} \label{<label name>}`.

```
\begin{theorem}[label=foo]
Some text
\end{theorem}
\ref{foo}
```

Theorem 5. *Some text*

5

`continues*=<label name>` (initially unset)

Pick up a theorem where you left off. The theorem number remains the same. The printed text can be customized with the `continues-code`^{P.2} option. The starred version also copies the theorem note, if it exists.

```
\begin{theorem}[continues=foo]
\dots and some more text.
\end{theorem}
```

Theorem 5 (continuing from p. 3). ... *and some more text.*

`store=<tag>` (initially unset)

Alias `restate`. Stores the the theorem to be restated at any point in the document with `\getkeytheorem`^{P.8}.

```
\begin{theorem}[store=blub]
A theorem worth restating.
\end{theorem}
More brilliant mathematics.
\getkeytheorem{blub}
```

Theorem 6. *A theorem worth restating.*

More brilliant mathematics.

Theorem 6. *A theorem worth restating.*

A theorem given this key *cannot* contain verbatim material or other unexpected catcodes, such as a `tikz-cd` diagram. The latter issue can be averted with the `ampersand-replacement` key.

```

% preamble
\usepackage{tikz}
\usetikzlibrary{cd}

% document
\begin{lemma}[store=diagram]
Some commutative diagram:
\[\begin{tikzcd}[ampersand
\rightarrow replacement=\&
X\times_S Y \ar[r] \ar[d] \& X \ar[d]
\rightarrow \& \\
Y \ar[r] \& S
\end{tikzcd}\]
\end{lemma}
\dots
\getkeytheorem{diagram}

```

Lemma 7. *Some commutative diagram:*

$$\begin{array}{ccc}
 X \times_S Y & \longrightarrow & X \\
 \downarrow & & \downarrow \\
 Y & \longrightarrow & S
 \end{array}$$

...

Lemma 7. *Some commutative diagram:*

$$\begin{array}{ccc}
 X \times_S Y & \longrightarrow & X \\
 \downarrow & & \downarrow \\
 Y & \longrightarrow & S
 \end{array}$$

`listhack=true|false`

(initially false)

Meant only to be used with the `break`^{P.8} style key for a theorem starting with a list. Compare:

```

% preamble
\newkeytheoremstyle{breaksty}{break}
\newkeytheorem{observation}[style=breaksty]

% document
\begin{observation}
\begin{enumerate}
\item First item
\end{enumerate}
\end{observation}

\begin{observation}[listhack=true]
\begin{enumerate}
\item First item
\end{enumerate}
\end{observation}

```

Observation 1. *1. First item*

Observation 2.

1. First item

Note that the value `true` must be explicitly set so that `listhack` is not interpreted as the note text.

`seq=<name>`

(initially unset)

Adds the theorem to a custom sequence `<name>` that can then be listed with `\listofkeytheorems[seq=<name>]`. See `seq`^{P.10} for more details.

3.2 Keys inherited from thmtools

These are the `[<options>]` available to `\newkeytheorem`. Except for `name` and `style`^{P.5}, each key below can also be used in `\newkeytheoremstyle`^{P.7}. For more description, see the `thmtools` package.

`name=<display name>`

(initially title-cased `<env name>`)

Aliases `title` and `heading`.

```

% preamble
\newkeytheorem{mythm}[name=Some Name]

% document
\begin{mythm}
Some text
\end{mythm}

```

Some Name 1. *Some text*

`numbered=true|false|unless-unique` (default `true`, initially `true`)

For compatibility with `thmtools`, also accepts the values `yes`, `no`, and `unless unique`.

```
% preamble
\newkeytheorem{theorem}[
  name=Theorem, numbered=false
]

% document
\begin{theorem*}
An unnumbered theorem.
\end{theorem*}
```

Theorem. *An unnumbered theorem.*

`parent=<counter>` (initially unset)

Aliases `numberwithin` and `within`.

```
% preamble
\newkeytheorem{conjecture}[parent=section]

% document
\begin{conjecture}
The first number is the section.
\end{conjecture}
```

Conjecture 3.1. *The first number is the section.*

`sibling=<counter>` (initially unset)

Aliases `numberlike` and `sharenumber`.

```
% preamble
\newkeytheorem{lemma}[sibling=theorem]

% document
\begin{lemma}
This shares its counter with
\texttt{theorem}.
\end{lemma}
```

Lemma 8. *This shares its counter with theorem.*

`style=<style name>` (initially unset)

Accepts any `<style name>` defined by `\newkeytheoremstyle`^{P.7}, as well as any of the predefined `amsthm` styles: `plain`, `definition`, and `remark`.

```
% preamble
\newkeytheorem{remark}[style=remark]

% document
\begin{remark}
Some text
\end{remark}
```

Remark 1. Some text

`preheadhook=<code>` (initially unset)

`postheadhook=<code>` (initially unset)

`prefoothook=<code>` (initially unset)

`postfoothook=<code>` (initially unset)

Details in section 7.

```

% preamble
\newkeytheorem{test}[
  preheadhook=PREHEAD,
  postheadhook=POSTHEAD,
  prefoothook=PREFOOT,
  postfoothook=POSTFOOT
]

% document
\begin{test}
Some text
\end{test}

```

PREHEAD

Test 1. *POSTHEAD*Some text *PREFOOT*

POSTFOOT

refname= \langle ref name \rangle or $\{\langle$ singular name \rangle, \langle plural name $\rangle\}$ (initially \langle display name \rangle)

If a single string, then the name used by `hyperref`'s `\autoref` and `cleveref`'s `\cref`. If two strings separated by a comma, then the second string is the plural form used by `\cref`.

Refname= \langle ref name \rangle or $\{\langle$ singular name \rangle, \langle plural name $\rangle\}$ (initially \langle display name \rangle)

Same as **refname** but for `\Autoref` and `\Cref`. Note that `\Autoref` is defined by `keytheorems`, but requires `hyperref` to work.

```

% preamble
\newkeytheorem{prop}[
  name=Proposition,
  refname={proposition,propositions},
  Refname={Proposition,Propositions}
]

% document
\begin{prop}[label=abc]
Some text
\end{prop}
\begin{prop}[label=def]
Some more text
\end{prop}
\begin{theorem}
Consider \cref{abc,def}.
\Autoref{abc} \dots
\end{theorem}

```

Proposition 1. *Some text*

Proposition 2. *Some more text*

Theorem 9. *Consider propositions 1 and 2. Proposition 1 ...*

qed= \langle symbol \rangle (default `\openbox`, initially unset)

Adds \langle symbol \rangle to the end of the theorem body. If no value is given, the symbol \square is used.

```

% preamble
\newkeytheorem{example}[qed]
\newkeytheorem{solution}[qed=$\clubsuit$]

% document
\begin{example}
Some text
\end{example}
\begin{solution}
Some more text
\end{solution}

```

Example 1. *Some text*

\square

Solution 1. *Some more text*

\clubsuit

3.3 Keys added by `keytheorems`

tcolorbox= $\{\langle$ tcolorbox options $\rangle\}$ (initially unset)

This key specifies that the theorem be placed inside a `tcolorbox` environment with \langle options \rangle . The theorem head is typeset as a `tcolorbox` title; to avoid this see `tcolorbox-no-titlebar`^{P.7}.

```

% preamble
\tcbset{
  defstyle/.style={
    arc=0mm,
    colback=blue!5!white,
    colframe=blue!75!black
  },
}
\newkeytheorem{corollary}[tcolorbox]
\newkeytheorem{definition}[
  style=definition,
  tcolorbox={defstyle}
]

% document
\begin{corollary}
Some text
\end{corollary}
\begin{definition}
Some more text
\end{definition}

```

Corollary 1.

Some text

Definition 1.

Some more text

`tcolorbox-no-titlebar={\langle tcolorbox options \rangle}`

(initially unset)

Same usage as `tcolorbox`^{P.6} but the theorem head is typeset as usual, not as a `tcolorbox` title.

```

% preamble
\newkeytheorem{boxcor}[
  tcolorbox-no-titlebar={
    colback=red!10
  },
  name=Corollary,sibling=corollary
]

% document
\begin{boxcor}
Some text
\end{boxcor}

```

Corollary 2. *Some text*

4 Theorem Styles

`\newkeytheoremstyle{\langle name \rangle}{\langle options \rangle}`

This is `keytheorems`' version of `thmtools`' `\declaretheoremstyle[\langle options \rangle]{\langle name \rangle}`. Since it makes little sense to define a style with no keys, we've made the `\langle options \rangle` argument mandatory. Note that unlike `amsthm`'s `\newtheoremstyle`, this command will error if a style has already been defined. To overwrite an existing style, there is the analogous `\renewkeytheoremstyle`. For completeness, there is also `\declarekeytheoremstyle` and `\providekeytheoremstyle`.



For the AMS classes `amsart`, `amsbook`, and `amsproc`, as well as the `amsart`-based `acmart`, the initial key values are slightly different than what's below in order to match those class's defaults.

4.1 Keys inherited from `thmtools`

The following keys have the same meaning and syntax as the corresponding `thmtools` keys. In addition to the list below, most of the keys available to `\newkeytheorem`^{P.2} can be used in `\newkeytheoremstyle`.

`spaceabove=\langle length \rangle` (initially `\topsep`)

`spacebelow=\langle length \rangle` (initially `\topsep`)

`bodyfont`= $\langle font\ declarations \rangle$ (initially `\itshape`)

`headindent`= $\langle length \rangle$ (initially 0pt)

`headfont`= $\langle font\ declarations \rangle$ (initially `\bfseries`)

`headpunct`= $\langle code \rangle$ (initially `\{.\}`)

`postheadspace`= $\langle length \rangle$ (initially 5pt plus 1pt minus 1pt)
Do not use this with the `break` key.

`break` (initially unset)
Do not use this with the `postheadspace` key.

`notefont`= $\langle font\ declarations \rangle$ (initially `\fontseries\mddefault\upshape`)

`notebraces`= $\{\langle left\ brace \rangle\}\{\langle right\ brace \rangle\}$ (initially `\{()\}`)

`headstyle`=`margin`|`swapnumber`| $\langle code\ using\ \backslash NAME, \backslash NUMBER, and \backslash NOTE \rangle$
Alias `headstyle`. Within $\langle code \rangle$, the commands `\NAME`, `\NUMBER`, and `\NOTE` correspond to the formatted parts of the theorem head.

4.2 Keys added by keytheorems

`inherit-style`= $\langle style\ name \rangle$ (initially unset)
Inherit the keys of any style declared with `\newkeytheoremstyle`^{P.7}. Additionally, the three styles predefined by `amsthm` are possible values: `plain`, `definition`, and `remark`.

5 Restating Theorems

When a theorem is given the `store`^{P.3} key, the contents of the theorem are saved and written to a `.thlist` file. At the start of the next run, this file is input at the beginning of the document and allows you to retrieve the stored theorems at any point, before or after the original theorem.

`\getkeytheorem`[$\langle property \rangle$]{ $\langle tag \rangle$ }

Retrieves the theorem given the key `store`= $\langle tag \rangle$. An optional $\langle property \rangle$ can be given to retrieve only the corresponding part of the theorem. Currently only the property `body` is implemented, which retrieves the (unformatted) body of the theorem.

```
\getkeytheorem{mytag}
```

```
\begin{example}[store=mytag]
```

```
Fascinating example.
```

```
\end{example}
```

```
\getkeytheorem[body]{mytag}
```

Example 2. *Fascinating example.* ☐

Example 2. *Fascinating example.* ☐

Fascinating example.

`\IfRestatingTF`{ $\langle true\ code \rangle$ }{ $\langle false\ code \rangle$ }

Executes $\langle true\ code \rangle$ if being retrieved with `\getkeytheorem` and $\langle false\ code \rangle$ if in the original theorem.

```
\begin{example}[store=hmm]
```

```
I am the
```

```
\IfRestatingTF{restated}{original}
```

```
example!
```

```
\end{example}
```

```
\getkeytheorem{hmm}
```

Example 3. *I am the original example!* ☐

Example 3. *I am the restated example!* ☐

6 Listing Theorems

`\listofkeytheorems[<options>]`

`\keytheoremset{<options>}`

	List of Theorems
<code>\listofkeytheorems</code>	1 Theorem 2
	2 Theorem (some heading) 2
	3 Theorem (some heading) 3
	4 Theorem (another heading) . . 3
	5 Theorem 3
	5 Theorem (continuing from p. 3) 3
	6 Theorem 3
	7 Lemma 3
	1 Observation 4
	2 Observation 4
	1 Some Name 4
	Theorem 4
	3.1 Conjecture 5
	8 Lemma 5
	1 Remark 5
	1 Test 5
	1 Proposition 6
	2 Proposition 6
	9 Theorem 6
	1 Example 6
	1 Solution 6
	1 Corollary 6
	1 Definition 6
	2 Corollary 7
	2 Example 8
	3 Example 8

6.1 Keys inherited from thmtools

`numwidth=<length>` (initially 2.3em)

`ignore={<comma-list of env names>}` (initially unset)

`show={<comma-list of env names>}` (initially all theorems)

`onlynamed={<comma-list of env names>}` (initially unset)

`ignoreall` (initially unset)

<pre> \listofkeytheorems[ignoreall,show=theorem] \listofkeytheorems[ignoreall, show=conjecture, title=List of Conjectures] </pre>	<div> <div>List of Theorems</div> <div> <div>1</div> <div>Theorem</div> <div>2</div> </div> <div>2</div> <div>Theorem (some heading) . . .</div> <div>2</div> <div>3</div> <div>Theorem (some heading) . . .</div> <div>3</div> <div>4</div> <div>Theorem (another heading) .</div> <div>3</div> <div>5</div> <div>Theorem</div> <div>3</div> <div>5</div> <div>Theorem (continuing from</div> <div>p. 3)</div> <div>3</div> <div>6</div> <div>Theorem</div> <div>3</div> <div>9</div> <div>Theorem</div> <div>6</div> </div> <div> <div>List of Conjectures</div> <div> <div>3.1</div> <div>Conjecture</div> <div>5</div> </div> </div>
---	--

`showall` (initially set)

`title=<text>` (initially `\GetTranslation{keythms_listof_title}`)
 Defaults to “List of Theorems” if English or an unknown language is used. Currently French, German, and Spanish have (likely inaccurate!) translations. A translation can be added with a GitHub pull request or manually with `\DeclareTranslation{<lang>}{keythms_listof_title}{<text>}`.

`swapnumber=true|false` (initially false)

6.2 Keys added by keytheorems

`onlynumbered={<comma-list of env names>}` (initially unset)

Similar to `onlynamed`^{→P.9}, but lists only those theorems which are numbered. This is useful if you’d like to exclude things like unnumbered definitions and remarks from the list of theorems.

`seq=<name>` (initially unset)

Used to list only the theorems added to the custom sequence `<name>` with the `seq`^{→P.4} theorem key. This is the only way to fully customize which theorems appear in the list of theorems.

`title-code=<code with #1>` (initially `\section*{#1}`)

If `\chapter` is defined, then initially this is instead `\chapter*{#1}`.

`no-title` (initially unset)

Suppresses the title of the list of theorems. Useful for custom ordering of the list.

<pre> \keytheoremset{ignoreall} \listofkeytheorems[show=example] \listofkeytheorems[show=solution,no-title] </pre>	<div> <div>List of Theorems</div> <div> <div>1</div> <div>Example</div> <div>6</div> </div> <div>2</div> <div>Example</div> <div>8</div> <div>3</div> <div>Example</div> <div>8</div> <div>1</div> <div>Solution</div> <div>6</div> </div>
--	--

`note-code=<code with #1>` (initially `{ (#1) }`)

Formats the optional note in the list of theorems.

`print-body` (initially unset)

Instead of listing the theorem headings, the theorems are restated with their body text. Not very useful without the `store-all`^{→P.2} load-time option.

`no-continues=true|false` (initially false)

Suppresses the printing of theorems given the `continues`^{→P.3} key in the list of theorems.

`no-chapter-skip=true|false` (initially `false`)

By default a small vertical space is inserted between each chapter’s chunk of theorems. Setting this key to `true` removes this space.

`chapter-skip-length=<dimension>` (initially 10pt)

Controls the amount of space inserted between chunks.

6.3 Adding code to list of theorems

There are analogous commands to `\addcontentsline` and `\addtocontents` for adding entries or arbitrary code to the list of theorems.



You *must* use these commands rather than the aforementioned because the `.thlist` file is also used to define restated theorems and cannot contain unexpected code.

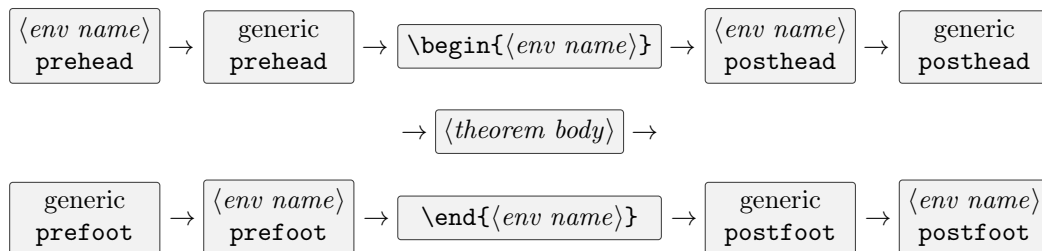
`\addtheoremcontentsline{<level>}{<text>}`

`\addtotheoremcontents{<code>}`

7 Theorem Hooks

`\addtotheoremhook[<env name>]{<hook name>}{<code>}`

`<hook name>` can be `prehead`, `posthead`, `prefoot`, `postfoot`, or `restated`. If no `<env name>` is given, the `<code>` is added to the “generic” hook, i.e. applied to all theorems. As in `thmtools`, the order of hooks is as follows:



The `restated` hook is applied at the start of theorems retrieved with `\getkeytheorem`, before the `prehead` hook. This can be useful for disabling commands such as `\footnote` in the restated theorems, e.g.

```

\addtotheoremhook{restated}{%
  \renewcommand\footnote[2][]{}%
}

```

By default, `keytheorems` disables the `\label` and `\RecordProperties` commands in restated theorems.

In `thmtools`, the `prefoot` and `postfoot` hooks always prepend code, i.e. the code

```

\addtotheoremhook{postfoot}{A}
\addtotheoremhook{postfoot}{B}

```

results in BA after the theorem. With `keytheorems`, code is added in the order declared, meaning

```

\addtotheoremhook{postfoot}{A}
\addtotheoremhook{postfoot}{B}

```

results in AB after the theorem. This is the behavior of the \LaTeX kernel hooks that `keytheorems` uses under the hood.

Right now, code added using the hook keys `preheadhook`^{P.5}, etc. is outermost, meaning executed first in `prehead` and `posthead` and last in `prefoot` and `postfoot`. This may change if I think of good reasons to do so...

8 Implementation

```

1  \NeedsTeXFormat{LaTeX2e}[2024/06/01]
2  \ProvidesExplPackage{keytheorems}{2024-06-07}{0.0.8delta}{l3keys interface to amsthm}
3
4  %% TESTING
5  % \debug_on:n { all }
6  %% END TESTING
7
8  \RequirePackage{aliascnt} % for sibling theorems
9  \RequirePackage{amsthm}
10 % ~ ams classes have way of ignoring this so don't need to check if they're loaded
11 \RequirePackage{refcount} % for \getrefnumber
12 \RequirePackage{translations} % for translating "List of Theorems"
13
14 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
15 %% Error Messages %%
16 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
17
18 \msg_new:nnn { keytheorems } { thmtools-before }
19 {
20     keytheorems~is~not~compatible~with~thmtools.~
21     Try~replacing~\protect\usepackage{thmtools}~with~
22     \protect\usepackage[thmtools-compat]{keytheorems}.
23 }
24 \msg_new:nnn { keytheorems } { thmtools-after }
25 {
26     keytheorems~is~not~compatible~with~thmtools.~
27     This~will~not~work~as~you~think!~
28     Try~replacing~\protect\usepackage{thmtools}~with~
29     \protect\usepackage[thmtools-compat]{keytheorems}.
30 }
31 \msg_new:nnn { keytheorems } { no-stored-theorem }
32 {
33     No~stored~theorem~'#1'~found!~
34     Try~compiling~again.~If~that~doesn't~work,~
35     check~the~spelling~of~'#1'.
36 }
37 \msg_new:nnn { keytheorems } { undefined-thm-hook }
38 {
39     No~theorem~hook~'#1'.~Check~the~spelling.~
40     Should~be~one~of~'prehead',~'posthead',~'prefoot',~'postfoot',~or~'restated'.
41 }
42 \msg_new:nnn { keytheorems } { no-Autorefname }
43 {
44     No~Autorefname~for~'#1'.
45 }
46 \msg_new:nnn { keytheorems } { thmstyle-undefined }
47 {
48     Theorem~style~'#1'~undefined.~
49     Use~\protect\newkeytheoremstyle\space instead.
50 }
51 \msg_new:nnn { keytheorems } { thmstyle-defined }
52 {
53     Theorem~style~'#1'~already~defined.~
54     Use~\protect\renewkeytheoremstyle\space instead.
55 }
56

```

```

57 % Error if thmtools loaded since compilation hangs.
58 % If thmtools loaded after, produce warning.
59 \IfPackageLoadedTF { thmtools }
60 {
61     \msg_fatal:nn { keytheorems } { thmtools-before }
62 }
63 {
64     \hook_gput_code:nnn { package/thmtools/before } { . }
65     {
66         \msg_warning:nn { keytheorems } { thmtools-after }
67     }
68 }
69
70 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
71 %%% Declare Variables %%%
72 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
73
74 \tl_new:N \l__keythms_tmpa_tl
75
76 \bool_new:N \g__keythms_listof_writefile_bool
77 \bool_gset_false:N \g__keythms_listof_writefile_bool
78 \bool_new:N \l__keythms_thm_numbered_bool
79 \bool_new:N \l__keythms_thm_unlessunique_bool
80 \bool_new:N \l__keythms_thmuse_listhack_bool
81 \bool_new:N \l__keythms_thmuse_restating_bool
82 \clist_new:N \g__keythms_restatecounters_clist
83 \clist_new:N \l__keythms_thmstyle_savedkeys_clist
84 \iow_new:N \g__keythms_listof_stream
85 \prop_new:N \g__keythms_thmnames_prop
86 \prop_new:N \g__keythms_thmuse_othercounters_prop
87 \prop_new:N \l__keythms_restate_counters_prop
88 \tl_new:N \l__keythms_thm_currentthmstyle_tl
89 \tl_new:N \l__keythms_thm_defaultkeys_tl
90 \tl_new:N \l__keythms_thm_envname_tl
91 \tl_new:N \l__keythms_thmstyle_defaultkeys_tl
92 \tl_new:N \l__keythms_thmstyle_lnotebrace_tl
93 \tl_new:N \l__keythms_thmstyle_rnotebrace_tl
94 \tl_new:N \l__keythms_thmuse_envname_tl
95 \tl_new:N \g__keythms_thmuse_temprestatedata_tl
96
97 \newcounter{keythms_restate_dummyctr}
98 \cs_gset:Npn \theHkeythms_restate_dummyctr
99 { restate.\arabic{keythms_restate_dummyctr} }
100 \cs_gset:Npn \thekeythms_restate_dummyctr { }
101 \newcounter{keythms_continues_dummyctr}
102 \cs_gset:Npn \theHkeythms_continues_dummyctr
103 { continues.\arabic{keythms_continues_dummyctr} }
104 \cs_gset:Npn \thekeythms_continues_dummyctr { }
105 \newcounter{keythms_unnumbered_dummyctr}
106 \cs_gset:Npn \theHkeythms_unnumbered_dummyctr
107 { unnumbered.\arabic{keythms_unnumbered_dummyctr} }
108 \cs_gset:Npn \thekeythms_unnumbered_dummyctr { }
109
110 \cs_generate_variant:Nn \hook_gput_code:nnn { nnV }
111 \cs_generate_variant:Nn \keys_precompile:nnN { nv, nVc }
112
113 % for detecting AMS classes
114 \prg_new_conditional:Npnn \keythms_if_amsclass: { T, TF }

```

```

115 {
116   \IfClassLoadedTF { amsart } { \prg_return_true: }
117   {
118     \IfClassLoadedTF { amsbook } { \prg_return_true: }
119     {
120       \IfClassLoadedTF { amsproc } { \prg_return_true: }
121       { \prg_return_false: }
122     }
123   }
124 }
125
126 %%%%%%%%%%%
127 %% Styles %%
128 %%%%%%%%%%%
129
130 % \_keythms_thmstyle_setbraces:nn { <left brace> } { <right brace> }
131 \cs_new_protected:Npn \_keythms_thmstyle_setbraces:nn #1#2
132 {
133   \tl_set:Nn \l__keythms_thmstyle_lnotebrace_tl { #1 }
134   \tl_set:Nn \l__keythms_thmstyle_rnotebrace_tl { #2 }
135 }
136 \cs_new:Npn \keythms_thmstyle_savethmkey_reqval:n #1
137 {
138   \clist_put_right:No \l__keythms_thmstyle_savedkeys_clist
139   { \l_keys_key_str = { #1 } }
140 }
141 \cs_new:Npn \keythms_thmstyle_savethmkey_optval:n #1
142 {
143   \tl_if_empty:NTF \l_keys_value_tl
144   {
145     \clist_put_right:No \l__keythms_thmstyle_savedkeys_clist
146     { \l_keys_key_str }
147   }
148   {
149     \clist_put_right:No \l__keythms_thmstyle_savedkeys_clist
150     { \l_keys_key_str = { #1 } }
151   }
152 }
153
154 \keys_define:nn { keytheorems/thmstyle }
155 {
156   spaceabove .tl_set:N = \l__keythms_thmstyle_spaceabove_tl,
157   spacebelow .tl_set:N = \l__keythms_thmstyle_spacebelow_tl,
158   bodyfont .tl_set:N = \l__keythms_thmstyle_bodyfont_tl,
159   headindent .tl_set:N = \l__keythms_thmstyle_headindent_tl,
160   headfont .tl_set:N = \l__keythms_thmstyle_headfont_tl,
161   headpunct .tl_set:N = \l__keythms_thmstyle_headpunct_tl,
162   postheadspace .tl_set:N = \l__keythms_thmstyle_postheadspace_tl,
163   break .meta:n = { postheadspace = \newline }, % add error if postheadspace set
164   break .value_forbidden:n = true,
165   notefont .tl_set:N = \l__keythms_thmstyle_notefont_tl,
166   notebraces .code:n = \exp_after:wN \_keythms_thmstyle_setbraces:nn #1,
167   headstyle .choice:,
168   headstyle / margin .code:n =
169   {
170     \cs_set:Nn \keythms_thmstyle_headcmd:nnn
171     { \makebox[Opt][r]{\NUMBER\ }\NAME\NOTE }
172   },

```

```

173 headstyle / swapnumber .code:n =
174 {
175     \cs_set:Nn \keythms_thmstyle_headcmd:nnn { \NUMBER\ \NAME\NOTE }
176 },
177 headstyle / unknown .cs_set:Np = \keythms_thmstyle_headcmd:nnn #1#2#3,
178 headformat .meta:n = { headstyle = #1 },
179 inherit-style .choice:,
180 inherit-style / plain .meta:n = {},
181 inherit-style / definition .meta:n = { bodyfont = \normalfont },
182 inherit-style / remark .meta:n =
183 {
184     headfont = \itshape,
185     bodyfont = \normalfont,
186     spaceabove = 0.5\topsep,
187     spacebelow = 0.5\topsep,
188 },
189 % thm keys that are saved for later
190 numbered .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
191 parent .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
192 numberwithin .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
193 within .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
194 sibling .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
195 numberlike .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
196 sharenumber .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
197 preheadhook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
198 postheadhook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
199 prefoothook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
200 postfoothook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
201 qed .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
202 tcolorbox .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
203 tcolorbox-no-titlebar .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
204 }
205
206 \cs_new_protected:Nn \keythms_thmstyle_thmname:n { \thmname{#1} }
207 \cs_new_protected:Nn \keythms_thmstyle_thmnumber:n { \thmnumber{#1} }
208 \cs_new_protected:Nn \keythms_thmstyle_thmnote:n { \thmnote{#1} }
209
210 %% NOTE: if these are used, user is in charge of spacing with \NAME and \NUMBER
211 %% QUESTION: should these be moved into def of \newkeytheoremstyle?
212 \cs_new:Npn \NAME { \keythms_thmstyle_thmname:n { ##1 } }
213 \cs_new:Npn \NUMBER
214 {
215     \keythms_thmstyle_thmnumber:n { \textup { ##2 } }
216 }
217 \cs_new:Npn \NOTE
218 {
219     \keythms_thmstyle_thmnote:n
220     { ~ \group_begin: % group so notefont doesn't affect headpunct
221       \exp_not:V \l__keythms_thmstyle_notefont_tl
222       \l__keythms_thmstyle_lnotebrace_tl ##3 \l__keythms_thmstyle_rnotebrace_tl
223       \group_end:
224     }
225 }
226
227 \cs_new:Npn \keythms_thmstyle_headcmd_default:nnn #1#2#3
228 {
229     \keythms_thmstyle_thmname:n { #1 }
230     \keythms_thmstyle_thmnumber:n

```

```

231     { \tl_if_empty:nF { #1 } { ~ } \exp_not:N \textup { #2 } }
232     % ~ this \tl_if_empty has no effect...
233     \keythms_thmstyle_thmnote:n
234     { ~ \group_begin: % group so notefont doesn't affect headpunct
235       \exp_not:V \l__keythms_thmstyle_notefont_tl
236       \l__keythms_thmstyle_lnotebrace_tl #3 \l__keythms_thmstyle_rnotebrace_tl
237       \group_end:
238     }
239   }
240
241   %%% <SURELY A BETTER WAY>
242   \cs_new_protected:Npn \__keythms_thmstyle_definekeylist:nn #1#2
243   {
244     \clist_const:cn { c__keythms_thmstyle_defaultkeys_ #1 _clist } { #2 }
245   }
246
247   \cs_new_protected:Npn \__keythms_thmstyle_setdefaultkeys:n #1
248   {
249     \keys_precompile:nvN { keytheorems/thmstyle }
250     { c__keythms_thmstyle_defaultkeys_ #1 _clist }
251     \l__keythms_thmstyle_defaultkeys_tl
252   }
253
254   \__keythms_thmstyle_definekeylist:nn { default }
255   {
256     spaceabove    = \topsep,
257     spacebelow    = \topsep,
258     bodyfont      = \itshape,
259     headindent    = 0pt,
260     headfont      = \bfseries,
261     headpunct     = {.),
262     postheadspace = 5pt plus 1pt minus 1pt,
263     notefont      = \fontseries\mddefault\upshape,
264     notebraces    = {({}{)},
265     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
266   }
267   \__keythms_thmstyle_definekeylist:nn { amsart }
268   {
269     spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
270     spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
271     bodyfont      = \itshape,
272     headindent    = 0pt,
273     headfont      = \bfseries,
274     headpunct     = {.),
275     postheadspace = 5pt plus 1pt minus 1pt,
276     notefont      = \fontseries\mddefault\upshape,
277     notebraces    = {({}{)},
278     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
279   }
280   \__keythms_thmstyle_definekeylist:nn { amsproc }
281   {
282     spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
283     spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
284     bodyfont      = \itshape,
285     headindent    = \parindent,
286     headfont      = \scshape,
287     headpunct     = {.),
288     postheadspace = 5pt plus 1pt minus 1pt,

```



```

289     notefont      = \fontseries\mddefault\upshape,
290     notebraces    = {\}\},
291     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
292 }
293 \__keythms_thmstyle_definekeylist:nn { amsbook }
294 {
295     spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
296     spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
297     bodyfont      = \itshape,
298     headindent    = \parindent,
299     headfont      = \scshape,
300     headpunct     = {\.},
301     postheadspace = 5pt plus 1pt minus 1pt,
302     notefont      = \fontseries\mddefault\upshape,
303     notebraces    = {\}\},
304     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
305 }
306 \__keythms_thmstyle_definekeylist:nn { acmart }
307 {
308     spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
309     spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
310     bodyfont      = \@acmplainbodyfont,
311     headindent    = \@acmplainindent,
312     headfont      = \@acmplainheadfont,
313     headpunct     = {\.},
314     postheadspace = .5em,
315     notefont      = \@acmplainnotefont,
316     notebraces    = {\}\},
317     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
318 }
319
320 \IfClassLoadedTF { amsart }
321 {
322     \IfClassLoadedTF { acmart } % acmart loads amsart
323     {
324         \__keythms_thmstyle_setdefaultkeys:n { acmart }
325     }
326     {
327         \__keythms_thmstyle_setdefaultkeys:n { amsart }
328         \keys_define:nn { keytheorems/thmstyle }
329         {
330             inherit-style / remark .meta:n =
331             {
332                 headfont = \itshape,
333                 bodyfont = \normalfont,
334             }
335         }
336     }
337 }
338 {
339     \IfClassLoadedTF { amsbook }
340     {
341         \__keythms_thmstyle_setdefaultkeys:n { amsbook }
342         \keys_define:nn { keytheorems/thmstyle }
343         {
344             inherit-style / remark .meta:n =
345             {
346                 bodyfont = \normalfont,

```

```

347         },
348     }
349 }
350 {
351     \IfClassLoadedTF { amsproc }
352     {
353         \__keythms_thmstyle_setdefaultkeys:n { amsproc }
354         \keys_define:nn { keytheorems/thmstyle }
355         {
356             inherit-style / remark .meta:n =
357             {
358                 bodyfont = \normalfont,
359             },
360         }
361     }
362     { \__keythms_thmstyle_setdefaultkeys:n { default } }
363 }
364 }
365 %%% </SURELY A BETTER WAY>
366
367 \NewDocumentCommand \newkeytheoremstyle { m m }
368 {
369     \cs_if_free:cTF { th@ #1 }
370     { \keythms_thmstyle_declarestyle:nn { #1 } { #2 } }
371     { \msg_error:nnn { keytheorems } { thmstyle-defined } { #1 } }
372 }
373 \NewDocumentCommand \renewkeytheoremstyle { m m }
374 {
375     \cs_if_free:cTF { th@ #1 }
376     { \msg_error:nnn { keytheorems } { thmstyle-undefined } { #1 } }
377     { \keythms_thmstyle_declarestyle:nn { #1 } { #2 } }
378 }
379 \NewDocumentCommand \providekeytheoremstyle { m m }
380 {
381     \cs_if_free:cT { th@ #1 }
382     { \keythms_thmstyle_declarestyle:nn { #1 } { #2 } }
383 }
384 \NewDocumentCommand \declarekeytheoremstyle { m m }
385 {
386     \keythms_thmstyle_declarestyle:nn { #1 } { #2 }
387 }
388
389 \@onlypreamble \newkeytheoremstyle
390 \@onlypreamble \renewkeytheoremstyle
391 \@onlypreamble \providekeytheoremstyle
392 \@onlypreamble \declarekeytheoremstyle
393
394 \cs_new_eq:NN \keythms_thmstyle_new:nnnnnnnn \newtheoremstyle
395 \cs_generate_variant:Nn \keythms_thmstyle_new:nnnnnnnn { nVVVVVVVe }
396
397 \cs_new_protected:Npn \keythms_thmstyle_declarestyle:nn #1#2
398 {
399     \clist_clear:N \l__keythms_thmstyle_savedkeys_clist
400     \tl_use:N \l__keythms_thmstyle_defaultkeys_tl
401     \keys_set:nn { keytheorems/thmstyle } { #2 }
402     \keythms_thmstyle_new:nVVVVVVVe { #1 }
403     \l__keythms_thmstyle_spaceabove_tl
404     \l__keythms_thmstyle_spacebelow_tl

```

```

405 \l__keythms_thmstyle_bodyfont_tl
406 \l__keythms_thmstyle_headindent_tl
407 \l__keythms_thmstyle_headfont_tl
408 \l__keythms_thmstyle_headpunct_tl
409 \l__keythms_thmstyle_postheadspace_tl
410 { \text_expand:n { \keythms_thmstyle_headcmd:nnn{##1}{##2}{##3} } }
411 % Define new inherit-style key
412 \keys_define:nn { keytheorems/thmstyle }
413 { inherit-style / #1 .meta:n = { #2 } }
414 \tl_if_exist:cF { l__keythms_thmstyle_ #1 _savedkeys_tl }
415 { \tl_new:c { l__keythms_thmstyle_ #1 _savedkeys_tl } }
416 \keys_precompile:nVc { keytheorems/thm }
417 \l__keythms_thmstyle_savedkeys_clist
418 { l__keythms_thmstyle_ #1 _savedkeys_tl }
419 }
420
421 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
422 %%% Defining Theorems %%%
423 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
424
425 % FIX: reimplement these without \NewDocumentCommand and \SplitArgument
426
427 % \keythms_thm_setrefnames:n { <envname> } { <refname> or <sing,plural> }
428 \NewDocumentCommand \keythms_thm_setrefnames:nn
429 { m >\SplitArgument{1}{,}} m }
430 { \__keythms_thm_setrefnames_aux:nnn{#1}#2 }
431 \cs_new_protected:Npn \__keythms_thm_setrefnames_aux:nnn #1#2#3
432 {
433   \cs_set:cpn { #1 autorefname } { #2 }
434   \IfPackageLoadedT { cleveref }
435   {
436     \tl_if_novalue:nTF { #3 }
437     { \crefname{#1}{#2}{\textbf{??~(pl.~#2)}} }
438     { \crefname{#1}{#2}{#3} }
439   }
440 }
441 \cs_generate_variant:Nn \keythms_thm_setrefnames:nn { nV }
442
443 % \keythms_thm_setRefnames:n { <envname> } { <refname> or <sing,plural> }
444 \NewDocumentCommand \keythms_thm_setRefnames:nn
445 { m >\SplitArgument{1}{,}} m }
446 { \__keythms_thm_setRefnames_aux:nnn{#1}#2 }
447 \cs_new_protected:Npn \__keythms_thm_setRefnames_aux:nnn #1#2#3
448 {
449   \cs_set:cpn { #1 Autorefname } { #2 }
450   \IfPackageLoadedT { cleveref }
451   {
452     \tl_if_novalue:nTF { #3 }
453     { \Crefname{#1}{#2}{\textbf{??~(pl.~#2)}} }
454     { \Crefname{#1}{#2}{#3} }
455   }
456 }
457 \cs_generate_variant:Nn \keythms_thm_setRefnames:nn { nV }
458
459 \keys_define:nn { keytheorems/thm }
460 {
461   name .tl_set:N = \l__keythms_thm_name_tl,
462   title .meta:n = { name = #1 },

```

```

463 heading .meta:n = { name = #1 },
464 refname .tl_set:N = \l__keythms_thm_refname_tl,
465 Refname .tl_set:N = \l__keythms_thm_Refname_tl,
466 numbered .choice:,
467 numbered / true .code:n = \bool_set_true:N \l__keythms_thm_numbered_bool,
468 numbered / false .code:n = \bool_set_false:N \l__keythms_thm_numbered_bool,
469 numbered / yes .meta:n = { numbered = true },
470 numbered / no .meta:n = { numbered = false },
471 numbered / unless-unique .code:n =
472 {
473 \bool_set_true:N \l__keythms_thm_unlessunique_bool
474 },
475 numbered / unless-unique .meta:n = { numbered = unless-unique },
476 numbered .default:n = true,
477 parent .tl_set:N = \l__keythms_thm_parent_tl,
478 numberwithin .meta:n = { parent = #1 },
479 within .meta:n = { parent = #1 },
480 sibling .tl_set:N = \l__keythms_thm_sibling_tl,
481 numberlike .meta:n = { sibling = #1 },
482 sharenumber .meta:n = { sibling = #1 },
483 style .tl_set:N = \l__keythms_thm_style_tl,
484 style .groups:n = { style-comes-first },
485 preheadhook .tl_set:N = \l__keythms_thm_preheadhook_tl,
486 postheadhook .tl_set:N = \l__keythms_thm_postheadhook_tl,
487 prefoothook .tl_set:N = \l__keythms_thm_prefoothook_tl,
488 postfoothook .tl_set:N = \l__keythms_thm_postfoothook_tl,
489 qed .tl_set:N = \l__keythms_thm_qed_tl,
490 qed .default:n = \c_novaluel_tl,
491 % ~ distinguish between 'qed' and 'qed={}'
492 tcolorbox .tl_set:N = \l__keythms_thm_tcbkeys_tl,
493 tcolorbox .default:n = {},
494 tcolorbox-no-titlebar .meta:n =
495 {
496 tcolorbox={
497 notitle,
498 before~upper={
499 \group_begin:
500 \__keythms_thm_tcbxtemphead:
501 \group_end:
502 },
503 #1
504 }
505 },
506 tcolorbox-no-titlebar .default:n = {},
507 }
508
509 % what below is unnecessary? I really don't understand this code.
510 \cs_new:Npn \__keythms_thm_storedeferredthmhead:n #1
511 {
512 \if@inlabel \indent \par \fi % eject a section head if one is pending
513 \if@nobreak
514 \adjust@parskip@nobreak
515 \else
516 \addpenalty\@beginparpenalty
517 \addvspace\@topsep
518 \addvspace{-\parskip}
519 \fi
520 % \global\@inlabeltrue % MY COMMENT: if this is uncommented then spacing after sections is wrong

```

```

521     \everypar\@everypar
522     \cs_set:Npn \__keythms_thm_tcbxtemphead: { \normalfont #1 }
523     \ignorespaces
524 }
525
526 \keys_precompile:nnN { keytheorems/thm }
527 {
528     name          = \q_no_value,
529     refname       = \q_no_value,
530     Refname       = \q_no_value,
531     numbered      = true,
532     parent        = {},
533     sibling        = {},
534     style         = {},
535     preheadhook   = {},
536     postheadhook  = {},
537     prefoothook   = {},
538     postfoothook  = {},
539     qed           = \q_no_value,
540     tcolorbox     = \q_no_value,
541 }
542 \l__keythms_thm_defaultkeys_tl
543
544 \cs_new_protected:Npn \__keythms_thm_makethmhooks:n #1
545 {
546     \hook_new:n { keytheorems/#1/prehead }
547     \hook_new:n { keytheorems/#1/posthead }
548     \hook_new_reversed:n { keytheorems/#1/prefoot }
549     \hook_new_reversed:n { keytheorems/#1/postfoot }
550     \hook_new:n { keytheorems/#1/restated }
551 }
552
553 % Make generic theorem hooks
554 \__keythms_thm_makethmhooks:n { allthms }
555
556 % \newkeytheorem{<name>}{<keys>}
557 \NewDocumentCommand \newkeytheorem { m O{} }
558 {
559     \clist_map_inline:nn { #1 } % define multiple theorems at once
560     { \keythms_thm_newkeythm:nn { ##1 } { #2 } }
561 }
562
563 \@onlypreamble \newkeytheorem
564
565 % to prevent error when plain, remark, or definition style used
566 \tl_new:N \l__keythms_thmstyle_plain_savedkeys_tl
567 \tl_new:N \l__keythms_thmstyle_remark_savedkeys_tl
568 \tl_new:N \l__keythms_thmstyle_definition_savedkeys_tl
569
570 % \keythms_thm_newkeythm:nn { <envname> } { <keys> }
571 \cs_new_protected:Npn \keythms_thm_newkeythm:nn #1#2
572 {
573     % Store envname
574     \tl_set:Nn \l__keythms_thm_envname_tl { #1 }
575     % Make unless-unique false by default (can't precompile this)
576     \bool_set_false:N \l__keythms_thm_unlessunique_bool
577     % Set default keys
578     \tl_use:N \l__keythms_thm_defaultkeys_tl

```

```

579 % First set style so we can pick up additional thm keys, then overwrite if necessary
580 \keys_set:groups:nnn { keytheorems/thm } { style-comes-first } { #2 }
581 \tl_if_empty:NF \l__keythms_thm_style_tl
582 {
583   % Store theorem style
584   \tl_set:Ne \l__keythms_thm_currentthmstyle_tl { \the\thm@style }
585   % Temporarily set theorem style
586   \__keythms_theoremstyle:n { \l__keythms_thm_style_tl }
587   % If thm keys given in style, call now (possibly overwritten in next step)
588   % but don't error if user uses a style defined with just \newtheoremstyle
589   \tl_if_exist:cT { l__keythms_thmstyle_ \l__keythms_thm_style_tl _savedkeys_tl }
590   { \tl_use:c { l__keythms_thmstyle_ \l__keythms_thm_style_tl _savedkeys_tl } }
591 }
592 % Set env-specific keys
593 \keys_set:nn { keytheorems/thm } { #2 }
594 % Set up env-specific hooks
595 \__keythms_thm_makethmhooks:n { #1 }
596 % Add to env-specific hooks (use label so code given in keys is outermost)
597 % NOTE: faster to check if empty than add empty code to hook
598 \tl_if_empty:NF \l__keythms_thm_preheadhook_tl
599 {
600   \hook_gput_code:nnV { keytheorems/#1/prehead }
601   { keythms_hook_keys } \l__keythms_thm_preheadhook_tl
602 }
603 \tl_if_empty:NF \l__keythms_thm_postheadhook_tl
604 {
605   \hook_gput_code:nnV { keytheorems/#1/posthead }
606   { keythms_hook_keys } \l__keythms_thm_postheadhook_tl
607 }
608 \tl_if_empty:NF \l__keythms_thm_prefoothook_tl
609 {
610   \hook_gput_code:nnV { keytheorems/#1/prefoot }
611   { keythms_hook_keys } \l__keythms_thm_prefoothook_tl
612 }
613 \tl_if_empty:NF \l__keythms_thm_postfoothook_tl
614 {
615   \hook_gput_code:nnV { keytheorems/#1/postfoot }
616   { keythms_hook_keys } \l__keythms_thm_postfoothook_tl
617 }
618 % Set name if none given
619 \quark_if_no_value:NT \l__keythms_thm_name_tl % use quark so name={} is valid
620 {
621   % use e so \text_titlecase called only once per theorem definition,
622   % not each time the theorem is used
623   \tl_set:Ne \l__keythms_thm_name_tl
624   { \text_titlecase_first:n { #1 } }
625 }
626 % associate formatted name with envname in prop list
627 \prop_gput:NnV \g__keythms_thmnames_prop { #1 } \l__keythms_thm_name_tl
628 % Call correct \newtheorem variant
629 \bool_if:NTF \l__keythms_thm_unlessunique_bool
630 {
631   % [unq] is required since aux is read at begindocument
632   % (technically right before) which is after theorem is defined
633   \RequirePackage[unq]{unique}
634   \tl_if_empty:NTF \l__keythms_thm_parent_tl
635   {
636     \hook_gput_code:nnn { keytheorems/#1/prehead }

```

```

637     { keythms_hook_keys } { \setuniqmark { #1 } }
638 \ifuniq{ #1 }
639   { \bool_set_false:N \l__keythms_thm_numbered_bool }
640   { \bool_set_true:N \l__keythms_thm_numbered_bool }
641 \bool_if:NTF \l__keythms_thm_numbered_bool
642   {
643     \tl_if_empty:NTF \l__keythms_thm_sibling_tl
644     {
645       \__keythms_thm_new:nV { #1 } \l__keythms_thm_name_tl
646     }
647     {
648       \exp_args:NnV \newaliascnt { #1 } \l__keythms_thm_sibling_tl
649       \__keythms_thm_new_sibling:nVn { #1 }
650       \l__keythms_thm_name_tl { #1 }
651       \aliascntresetthe { #1 }
652     }
653   }
654   {
655     \__keythms_thm_new_nonnumber:nV { #1 } \l__keythms_thm_name_tl
656     \hook_gput_code:nnn { keytheorems/#1/prehead } { keythms_hook_keys }
657     {
658       \keythms_if_restating:F
659       { \refstepcounter{ keythms_unnumbered_dummyctr } }
660     }
661   }
662 }
663 {
664   \__keythms_thm_new_uuwithparent:nVV { #1 }
665   \l__keythms_thm_name_tl \l__keythms_thm_parent_tl
666 }
667 }
668 {
669 \bool_if:NTF \l__keythms_thm_numbered_bool
670   {
671     \tl_if_empty:NTF \l__keythms_thm_parent_tl
672     {
673       \tl_if_empty:NTF \l__keythms_thm_sibling_tl
674       {
675         \__keythms_thm_new:nV { #1 } \l__keythms_thm_name_tl
676       }
677       {
678         \exp_args:NnV \newaliascnt { #1 } \l__keythms_thm_sibling_tl
679         \__keythms_thm_new_sibling:nVn { #1 }
680         \l__keythms_thm_name_tl { #1 }
681         \aliascntresetthe { #1 }
682       }
683     }
684     {
685       \__keythms_thm_new_parent:nVV { #1 }
686       \l__keythms_thm_name_tl \l__keythms_thm_parent_tl
687     }
688   }
689   {
690     \__keythms_thm_new_nonnumber:nV { #1 } \l__keythms_thm_name_tl
691     \hook_gput_code:nnn { keytheorems/#1/prehead } { keythms_hook_keys }
692     {
693       \keythms_if_restating:F
694       { \refstepcounter{ keythms_unnumbered_dummyctr } }

```

```

695     }
696   }
697 }
698 % Store theorem def and redefine it with keys
699 \keythms_keyify_theorem:n { #1 }
700 % define \<env>autorefname and \<env>Autorefname, might be redefined next
701 \exp_args:NnV \cs_set:cpn { #1 autorefname } \l__keythms_thm_name_tl
702 \exp_args:NnV \cs_set:cpn { #1 Autorefname } \l__keythms_thm_name_tl
703 % Set ref names
704 \quark_if_no_value:NF \l__keythms_thm_refname_tl
705   { \keythms_thm_setrefnames:nV { #1 } \l__keythms_thm_refname_tl }
706 \quark_if_no_value:NF \l__keythms_thm_Refname_tl
707   { \keythms_thm_setRefnames:nV { #1 } \l__keythms_thm_Refname_tl }
708 % Set up qed if needed
709 \quark_if_no_value:NF \l__keythms_thm_qed_tl
710   {
711     \exp_args:Nno \__keythms_thm_qedcode:nn { #1 } { \l__keythms_thm_qed_tl }
712   }
713 % Set up tcolorbox if needed
714 \quark_if_no_value:NF \l__keythms_thm_tcbkeys_tl
715   {
716     \exp_args:Nno \__keythms_thm_tcbboxcode:nn { #1 }
717       { \l__keythms_thm_tcbkeys_tl }
718   }
719 % Set default list-of display command
720 \__keythms_listof_show_aux:n { #1 }
721 % Set theorem style back to original state if needed
722 \tl_if_empty:NF \l__keythms_thm_style_tl
723   {
724     \__keythms_theoremstyle:V \l__keythms_thm_currentthmstyle_tl
725   }
726 }
727
728 \cs_new_protected:Npn \__keythms_thm_tcbboxcode:nn #1#2
729 {
730   \RequirePackage{tcolorbox}
731   \hook_gput_code:nnn { keytheorems/#1/prehead }
732     { keythms_tcbbox }
733   {
734     \cs_set_eq:NN \deferred@thm@head \__keythms_thm_storedeferredthmhead:n
735     \cs_set_eq:NN \Hy@theorem@makelinktarget \use_none:n
736     % ^ don't like playing with hyperref internals... but don't see around
737     %   it because hyperref tries to add to para hook which doesn't work
738     %   when title set up the way we do it
739     \cs_set:Npn \thm@space@setup { \thm@preskip=Opt \thm@postskip=Opt }
740     % ^ to match tcolorbox defaults; shouldn't interfere with user styles
741   }
742   \hook_gset_rule:nnnn { keytheorems/#1/posthead }
743     { keythms_tcbbox } { before } { keythms_hook_keys }
744   \hook_gset_rule:nnnn { keytheorems/#1/prefoot }
745     { keythms_tcbbox } { after } { keythms_hook_keys }
746   \hook_gset_rule:nnnn { keytheorems/#1/prefoot }
747     { keythms_tcbbox } { after } { keythms_qed }
748   \bool_if:NTF \l__keythms_thm_numbered_bool
749     {
750       \hook_gput_code:nnn { begindocument } { . }
751       {
752         \IfPackageLoadedTF{cleveref}

```



```

753 { % hyperref doesn't patch \@thm if cleveref loaded
754   \hook_gput_code:nnn { keytheorems/#1/posthead }
755   { keythms_tcbox }
756   {
757     \begin{tcolorbox}[
758       savedelimiter=#1,
759       title={ \_\_keythms_thm_tcboxtemphead: },
760       #2]
761   }
762 }
763 {
764   \hook_gput_code:nnn { keytheorems/#1/posthead }
765   { keythms_tcbox }
766   {
767     \begin{tcolorbox}[
768       savedelimiter=#1,
769       title={ \_\_keythms_thm_tcboxtemphead: },
770       phantom={ \MakeLinkTarget*{\@currentHref} }, % fix hyperlinking
771       #2]
772   }
773 }
774 }
775 }
776 {
777   \hook_gput_code:nnn { keytheorems/#1/posthead }
778   { keythms_tcbox }
779   {
780     \begin{tcolorbox}[
781       savedelimiter=#1,
782       title={ \_\_keythms_thm_tcboxtemphead: },
783       #2]
784   }
785 }
786 \hook_gput_code:nnn { keytheorems/#1/prefoot }
787 { keythms_tcbox } { \end{tcolorbox} }
788 }
789 \cs_new_protected:Npn \_\_keythms_thm_qedcode:nn #1#2
790 {
791   \hook_gput_code:nnn { keytheorems/#1/posthead }
792   { keythms_qed }
793   {
794     \exp_args:No \tl_if_novalue:nF { #2 } { \protected@edef\qedsymbol{#2} }
795     \pushQED{\qed}
796   }
797   \hook_gput_code:nnn { keytheorems/#1/prefoot }
798   { keythms_qed }
799   {
800     \exp_args:No \tl_if_novalue:nF { #2 } { \protected@edef\qedsymbol{#2} }
801     \popQED
802   }
803 }
804
805 \cs_new_eq:NN \_\_keythms_theoremstyle:n \theoremstyle
806 \cs_generate_variant:Nn \_\_keythms_theoremstyle:n { V }
807
808 % \newtheorem variants
809 \cs_new_eq:NN \_\_keythms_thm_new:nn \newtheorem
810 \cs_generate_variant:Nn \_\_keythms_thm_new:nn { nV }

```

```

811
812 \cs_new_protected:Npn \__keythms_thm_new_nonnumber:nn #1#2
813   { \__keythms_thm_new:nn*{#1}{#2} }
814 \cs_generate_variant:Nn \__keythms_thm_new_nonnumber:nn { nV }
815
816 \cs_new_protected:Npn \__keythms_thm_new_parent:nnn #1#2#3
817   { \__keythms_thm_new:nn{#1}{#2}[#3] }
818 \cs_generate_variant:Nn \__keythms_thm_new_parent:nnn { nVV }
819
820 \cs_new_protected:Npn \__keythms_thm_new_sibling:nnn #1#2#3
821   { \__keythms_thm_new:nn{#1}[#3]{#2} }
822 \cs_generate_variant:Nn \__keythms_thm_new_sibling:nnn { nV }
823
824 \cs_new_protected:Npn \__keythms_thm_new_uuwithparent:nnn #1#2#3
825   {
826     \cs_undefine:c { keythms_orig_nonnumber_#1 } % for renew, declare
827     \__keythms_thm_new_nonnumber:nn { keythms_orig_nonnumber_#1 } { #2 }
828     \__keythms_thm_new_parent:nnn { #1 } { #2 } { #3 }
829     \DeclareEnvironmentCopy { keythms_orig_withparent_#1 } { #1 }
830     \renewenvironment { #1 } % opt arg is implicit
831       {
832         \setuniqmark{ #1. \use:c {the #3} }
833         \ifuniq{ #1. \use:c {the #3} }
834           {
835             \keythms_if_restating:F
836             { \refstepcounter{ keythms_unnumbered_dummyctr } }
837             \begin{keythms_orig_nonnumber_#1}
838           }
839           {
840             \begin{keythms_orig_withparent_#1}
841           }
842         }
843       {
844         \ifuniq{ #1. \use:c {the #3} }
845           { \end{keythms_orig_nonnumber_#1} }
846           { \end{keythms_orig_withparent_#1} }
847       }
848   }
849 \cs_generate_variant:Nn \__keythms_thm_new_uuwithparent:nnn { nVV }
850
851 % for getting notes with continues*, use nameref if available, otherwise ltproperties
852 \hook_gput_code:nnn { begindocument } { . }
853 {
854   \IfPackageLoadedTF { nameref }
855   {
856     \cs_new:Npn \__keythms_thmuse_recordnote: { } % nameref takes care of this
857     \cs_new:Npn \__keythms_getrecordednote:n #1
858       {
859         \getrefbykeydefault{ #1 }{ name }{ }
860       }
861   }
862   { % needs https://github.com/latex3/latex2e/issues/1200 fixed
863     \property_new:nnnn { keytheorems/recordednote } { now } { }
864     { \l__keythms_thmuse_note_tl }
865     \cs_new:Npn \__keythms_getrecordednote:n #1
866       {
867         \property_ref:nn { keythms_recordednote_#1 }
868         { keytheorems/recordednote }

```

```

869     }
870     \cs_new:Npn \__keythms_thmuse_recordnote:
871     {
872         \tl_if_empty:NF \l__keythms_thmuse_note_tl
873         {
874             \RecordProperties
875             { keythms_recordednote_\l__keythms_thmuse_label_tl }
876             { keytheorems/recordednote }
877         }
878     }
879 }
880 }
881
882 \keys_define:nn { keytheorems/thmuse }
883 {
884     label      .tl_set:N = \l__keythms_thmuse_label_tl,
885     note       .tl_set:N = \l__keythms_thmuse_note_tl,
886     name       .meta:n   = { note = #1 },
887     % ^ for compatibility. "name" is ambiguous and doesn't match amsthm language
888     short-note .code:n   = {}, % these do nothing at point of use
889     short-name .code:n   = {}, % ^ worthwhile compatibility?
890     continues  .tl_set:N = \l__keythms_thmuse_contlabel_tl,
891     continues* .code:n   =
892     {
893         \keys_set:nn { keytheorems/thmuse } { continues = #1 }
894         \protected@edef \l__keythms_tmpa_tl { \__keythms_getrecordednote:n{#1} }
895         \tl_if_empty:NF \l__keythms_tmpa_tl
896         {
897             \keys_set:nn { keytheorems/thmuse }
898             { note = \l__keythms_tmpa_tl }
899         }
900     },
901     store      .tl_set:N = \l__keythms_thmuse_store_tl,
902     %store      .default:n = \q_no_value, % ={name} causes issues
903     restate    .meta:n   = { store = #1 },
904     % ^ thmtools compatibility
905     listhack    .choice:, % need equals sign
906     listhack / true .code:n = \bool_set_true:N \l__keythms_thmuse_listhack_bool,
907     listhack / false .code:n = \bool_set_false:N \l__keythms_thmuse_listhack_bool,
908     listhack    .initial:n = false,
909     seq        .code:n   = {},
910 }
911
912 \cs_new_protected:Npn \keythms_keyify_theorem:n #1
913 { % #1 = theorem name
914     \DeclareEnvironmentCopy { keythms_orig_#1 } { #1 }
915     \DeclareDocumentEnvironment { keythms_grab_#1 } { m O{} +b }
916     { % ##1 = keys, ##2 = note, ##3 = theorem body
917         \__keythms_thm_prehead_code:n { #1 }
918         \begin{keythms_orig_#1}[{##2}]
919         \clist_map_inline:Nn \g__keythms_restatecounters_clist
920         {
921             \prop_gput:Nne \g__keythms_thmuse_othercounters_prop { ####1 }
922             { \the\value{####1} }
923         }
924         \__keythms_thm_posthead_code:n { #1 }
925         % below needs to come after posthead so that correct \@currentHref
926         % is stored for tcolorbox theorems

```

```

927   \_keythms_thm_addcontentsdata:nnnn { #1 }
928   { \prop_to_keyval:N \g__keythms_thmuse_othercounters_prop }
929   { ##1 } { ##3 }
930   \_keythms_thm_tempstorerebasedata:nnn { #1 } { ##1 } { ##3 }
931   ##3
932   \_keythms_thm_prefoot_code:n { #1 }
933   \end{keythms_orig_#1}
934   \_keythms_thm_postfoot_code:n { #1 }
935 }
936 {}
937 % NOTE: have to do a lot of shenanigans to make sure the begin/end of grabbed
938 %       theorem env captures only the body and no package code.
939 %       This is the price of on-the-fly redefining the env to grab body
940 \RenewDocumentEnvironment { #1 } { = {note} 0{} }
941 {
942   \keys_set:nn { keytheorems/thmuse } { ##1 }
943   \tl_if_empty:NF \l__keythms_thmuse_store_tl
944   {
945     \bool_gset_true:N \g__keythms_listof_writefile_bool
946     \cs_set_eq:NN \_keythms_withhooks_begin:nn \_keythms_grab_begin:nn
947     \cs_set_eq:NN \_keythms_withhooks_begin:nnn \_keythms_grab_begin:nnn
948     \cs_set_eq:NN \_keythms_withhooks_begin:nnV \_keythms_grab_begin:nnV
949     \cs_set_eq:NN \_keythms_withhooks_end:n \_keythms_grab_end:n
950   }
951   \_keythms_thm_prehead_continues_code:n { #1 }
952   \tl_if_empty:NTF \l__keythms_thmuse_note_tl
953   { \_keythms_withhooks_begin:nn { #1 } { ##1 } }
954   {
955     \_keythms_withhooks_begin:nnV { #1 } { ##1 }
956     \l__keythms_thmuse_note_tl
957   }
958 }
959 {
960   \_keythms_withhooks_end:n { #1 }
961   \tl_if_empty:NF \l__keythms_thmuse_store_tl
962   {
963     \cs_if_exist:cF
964     { __keythms_getthm_ \l__keythms_thmuse_store_tl _theorem }
965     {
966       \cs_new:cpe
967       { __keythms_getthm_ \l__keythms_thmuse_store_tl _theorem }
968       {
969         \exp_not:N \_keythms_getthm_theorem:nnnnn
970         \exp_not:o { \g__keythms_thmuse_temprestatedata_tl }
971       }
972       \cs_new:cpe
973       { __keythms_getthm_ \l__keythms_thmuse_store_tl _body }
974       {
975         \exp_not:N \_keythms_getthm_body:nn
976         \exp_args:No \exp_not:o
977         {
978           \exp_after:wN \_keythms_use_iii_v_braced:nnnnn
979           \g__keythms_thmuse_temprestatedata_tl
980         }
981       }
982     }
983   }
984 }

```

```

985 }
986 \cs_new:Npn \__keythms_use_iii_v_braced:nnnnn #1#2#3#4#5 { {#3}-{#5} }
987
988 \cs_new_protected:Npn \__keythms_withhooks_begin:nn #1#2
989 { % #1 = theorem name, #2 = keys
990   \__keythms_thm_prehead_code:n { #1 }
991   \begin{keythms_orig_#1}
992   \__keythms_thm_posthead_code:n { #1 }
993   \__keythms_thm_addcontentsdata:nnnn { #1 } { } { #2 } { }
994   \ignorespaces % I hope this is alright
995 }
996 \cs_new_protected:Npn \__keythms_withhooks_begin:nnn #1#2#3
997 { % #1 = theorem name, #2 = keys, #3 = note
998   \__keythms_thm_prehead_code:n { #1 }
999   \begin{keythms_orig_#1}[{#3}]
1000   \__keythms_thm_posthead_code:n { #1 }
1001   \__keythms_thm_addcontentsdata:nnnn { #1 } { } { #2 } { }
1002   \ignorespaces % I hope this is alright
1003 }
1004 \cs_generate_variant:Nn \__keythms_withhooks_begin:nnn { nnV }
1005 \cs_new_protected:Npn \__keythms_withhooks_end:n #1
1006 {
1007   \__keythms_thm_prefoot_code:n { #1 }
1008   \end{keythms_orig_#1}
1009   \__keythms_thm_postfoot_code:n { #1 }
1010 }
1011 \cs_new_protected:Npn \__keythms_grab_begin:nn #1#2
1012 { % #1 = theorem name, #2 = keys
1013   \begin{keythms_grab_#1}{#2}
1014 }
1015 \cs_new_protected:Npn \__keythms_grab_begin:nnn #1#2#3
1016 { % #1 = theorem name, #2 = keys, #3 = note
1017   \begin{keythms_grab_#1}{#2}[{#3}]
1018 }
1019 \cs_generate_variant:Nn \__keythms_grab_begin:nnn { nnV }
1020 \cs_new_protected:Npn \__keythms_grab_end:n #1 { \end{keythms_grab_#1} }
1021
1022 \cs_new_protected:Npn \__keythms_orig_begin:n #1 { \begin{keythms_orig_#1} }
1023 \cs_new_protected:Npn \__keythms_orig_begin:nn #1#2
1024 { \begin{keythms_orig_#1}[{#2}] }
1025 \cs_generate_variant:Nn \__keythms_orig_begin:nn { nV }
1026 \cs_new_protected:Npn \__keythms_orig_end:n #1 { \end{keythms_orig_#1} }
1027
1028 \cs_new:Npn \__keythms_thm_prehead_code:n #1
1029 { % #1 = theorem name
1030   \tl_set:Nn \l__keythms_thmuse_envname_tl { #1 }
1031   \hook_use:n { keytheorems/#1/prehead }
1032   \hook_use:n { keytheorems/allthms/prehead }
1033 }
1034 %% this below has to be separate from prehead_code above since we need to add
1035 %% continues-code to note before retrieving it in \__keythms_withhooks_begin:nnV
1036 \cs_new:Npn \__keythms_thm_prehead_continues_code:n #1
1037 { % #1 = theorem name
1038   \tl_if_empty:NF \l__keythms_thmuse_contlabel_tl
1039   {
1040     \tl_if_empty:NF \l__keythms_thmuse_note_tl
1041     { \tl_put_right:Nn \l__keythms_thmuse_note_tl { , ~ } }
1042     \tl_put_right:Ne \l__keythms_thmuse_note_tl

```

```

1043         { \__keythms_thmuse_continues:V \l__keythms_thmuse_contlabel_tl }
1044 \cs_set:cpn { the #1 }
1045 {
1046     \getrefnumber { \l__keythms_thmuse_contlabel_tl }
1047 }
1048 \cs_set_eq:cn { c@ #1 } \c@keythms_continues_dummyctr
1049 \cs_set_eq:cn { theH #1 } \theHkeythms_continues_dummyctr
1050 %\cs_set_eq:NN \setunigmark \use_none:n % not the right fix
1051 }
1052 }
1053 \cs_new:Npn \__keythms_thm_posthead_code:n #1
1054 { % #1 = theorem name
1055     \hook_use:n { keytheorems/#1/posthead }
1056     \hook_use:n { keytheorems/allthms/posthead }
1057     \tl_if_empty:NF \l__keythms_thmuse_label_tl
1058     {
1059         \label{ \l__keythms_thmuse_label_tl }
1060         \__keythms_thmuse_recordnote:
1061     }
1062     \bool_if:NT \l__keythms_thmuse_listhack_bool
1063     { % straight from thm-amsthm.sty
1064         \leavevmode
1065         \vspace{-\baselineskip}%
1066         \par
1067         \everypar{\setbox\z@\lastbox\everypar{}}%
1068     }
1069 }
1070 \cs_new:Npn \__keythms_thm_prefoot_code:n #1
1071 { % #1 = theorem name
1072     \hook_use:n { keytheorems/allthms/prefoot }
1073     \hook_use:n { keytheorems/#1/prefoot }
1074 }
1075 \cs_new:Npn \__keythms_thm_postfoot_code:n #1
1076 { % #1 = theorem name
1077     \hook_use:n { keytheorems/allthms/postfoot }
1078     \hook_use:n { keytheorems/#1/postfoot }
1079 }
1080 \cs_new:Npn \__keythms_thm_addcontentsdata:nnnn #1#2#3#4
1081 { % #1 = theorem name, #2 = stored counters, #3 = keys, #4 = body
1082     \keythms_listof_chaptervspacethack:
1083     \iow_shipout:Ne \@auxout
1084     {
1085         \exp_not:N \@writefile { thlist }
1086         {
1087             \KeyThmsSavedTheorem{ #1 }
1088             { \@currentlabel }
1089             { \@currentHref }
1090             { \thepage }
1091             { #2 }
1092             { \exp_not:n { #3 } } % do we want any expansion here, perhaps
1093             { \exp_not:n { #4 } } % with \text_expand:n ?
1094         }
1095     }
1096 }
1097 \cs_new:Npn \__keythms_thm_tempstorerebasedata:nnn #1#2#3
1098 { % #1 = theorem name, #2 = keys, #3 = body
1099     \tl_gset:Ne \g__keythms_thmuse_temprebasedata_tl % needs to be global to get out of env
1100     {

```

```

1101     { #1 }
1102     { \@currentlabel }
1103     { \prop_to_keyval:N \g__keythms_thmuse_othercounters_prop }
1104     { \exp_not:n { #2 } } % do we want any expansion here, perhaps
1105     { \exp_not:n { #3 } } % with \text_expand:n ?
1106   }
1107 }
1108
1109 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1110 %% Retrieving Theorem Data %%
1111 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1112
1113 \cs_new_protected:Npn \KeyThmsSavedTheorem #1#2#3#4#5#6#7 % 7th arg is body
1114   { \use:c { __keythms_thmitem_#1:nnnnnn } {#2}{#3}{#4}{#5}{#6}{#7} }
1115
1116 \keys_define:nn { keytheorems/storeatbegin }
1117   {
1118     store .tl_set:N = \l__keythms_storeatbegin_store_tl,
1119     restate .meta:n = { store=#1 },
1120     unknown .code:n = { } % do nothing with unknown keys
1121   }
1122
1123 \cs_new_protected:Npn \KeyThmsContentsLine #1 { #1 }
1124 \NewDocumentCommand \addtheoremcontentsline { m m }
1125   {
1126     \addtocontents { thlist }
1127     {
1128       \KeyThmsContentsLine
1129       { % copied from def of \addcontentsline
1130         \protect\contentsline{#1}{#2}{\thepage}{ }
1131         \protected@file@percent
1132       }
1133     }
1134   }
1135 \NewDocumentCommand \addtotheoremcontents { m }
1136   {
1137     \addtocontents { thlist }
1138     {
1139       \KeyThmsContentsLine { #1 }
1140     }
1141   }
1142
1143 \hook_gput_code:nnn { begindocument } { { . } }
1144   {
1145     \group_begin:
1146     \cs_set_eq:NN \KeyThmsContentsLine \use_none:n
1147     \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1148     \cs_set_protected:Npn \KeyThmsSavedTheorem #1#2#3#4#5#6#7
1149       {
1150         \group_begin:
1151         \keys_set:nn { keytheorems/storeatbegin } { #6 }
1152         \tl_if_empty:NF \l__keythms_storeatbegin_store_tl
1153         {
1154           \cs_new:cpn
1155             { __keythms_getthm_ \l__keythms_storeatbegin_store_tl _theorem }
1156             {
1157               \__keythms_getthm_theorem:nnnnn
1158                 {#1}{#2}{#5}{#6}{#7}

```

```

1159         }
1160         \cs_new:cpn
1161         { __keythms_getthm_ \l__keythms_storeatbegin_store_tl _body }
1162         {
1163             \__keythms_getthm_body:nn {#5}{#7}
1164         }
1165     }
1166     \group_end:
1167 }
1168 \file_if_exist_input:n { \c_sys_jobname_str.thlist }
1169 \group_end:
1170 }
1171
1172 \prg_new_conditional:Npnn \keythms_if_restating: { T, F, TF }
1173 {
1174     \bool_if:NTF \l__keythms_thmuse_restating_bool
1175     { \prg_return_true: }
1176     { \prg_return_false: }
1177 }
1178 \NewDocumentCommand \IfRestatingTF { } { \keythms_if_restating:TF }
1179
1180 \cs_new_protected:Npn \__keythms_getthm_theorem:nnnnn #1#2#3#4#5
1181 { % #1 = name, #2 = number, #3 = restate counters, #4 = keys, #5 = theorem body
1182     \group_begin:
1183     \bool_set_true:N \l__keythms_thmuse_restating_bool
1184     \prop_set_from_keyval:Nn \l__keythms_restate_counters_prop { #3 }
1185     \prop_map_inline:Nn \l__keythms_restate_counters_prop
1186     {
1187         \tl_set:ce { l_keythms_restate_current_##1_tl } { \the\value{##1} }
1188         \setcounter { ##1 } { ##2 }
1189         % ^ FIX: what if eq's numbered by section, theorem, etc.? The
1190         %       thmtools code is opaque.... Or maybe should be up to the
1191         %       user to say "restate-counters={section,chapter,...}".
1192         \cs_set:cpn { theH ##1 } { \use:c { the ##1 } . \theHkeythms_restate_dummyctr }
1193     }
1194     \tl_if_empty:nTF { #2 }
1195     { \refstepcounter{keythms_restate_dummyctr} } % for unnumbered theorems
1196     {
1197         \cs_set:cpn { the #1 } { #2 }
1198         \cs_set_eq:cN { c@ #1 } \c@keythms_restate_dummyctr
1199         \cs_set_eq:cN { theH #1 } \theHkeythms_restate_dummyctr
1200         % ^ why are the last two line here? We shouldn't be referencing
1201         %   restated theorems. Think it's a remnant of thmtools
1202         % WRONG: needed to make numbering correct after restated theorem.
1203         % not sure about theH. <- this is needed to prevent duplicate anchors
1204     }
1205     \renewcommand\label[2][]{ } % disable \label (opt arg in case cleveref loaded)
1206     \cs_set_eq:NN \ltx@label \use_none:n % disable \ltx@label
1207     \cs_set_eq:NN \property_record:nn \use_none:nn % disable \RecordProperties
1208     \cs_set_eq:NN \setuniqmark \use_none:n % work with numbered=unless-unique
1209     % QUESTION: also disable \hyper@@anchor? \MakeLinkTarget?
1210     \keys_set:nn { keytheorems/thmuse } { #4 }
1211     \hook_use:n { keytheorems/#1/restated }
1212     \hook_use:n { keytheorems/allthms/restated }
1213     \__keythms_thm_prehead_continues_code:n { #1 }
1214     \__keythms_thm_prehead_code:n { #1 }
1215     \tl_if_empty:NTF \l__keythms_thmuse_note_tl
1216     { \__keythms_orig_begin:n { #1 } }

```



```

1217     { \_keythms_orig_begin:nV { #1 } \l__keythms_thmuse_note_tl }
1218     \_keythms_thm_posthead_code:n { #1 }
1219     #5
1220     \_keythms_thm_prefoot_code:n { #1 }
1221     \_keythms_orig_end:n { #1 }
1222     \_keythms_thm_postfoot_code:n { #1 }
1223     \prop_map_inline:Nn \l__keythms_restate_counters_prop
1224     {
1225         \exp_args:Nnc \setcounter { ##1 }
1226         { l_keythms_restate_current_##1_tl }
1227     }
1228     \group_end:
1229 }
1230
1231 \cs_new_protected:Npn \_keythms_getthm_body:nn #1#2
1232 { % #1 = restate counters, #2 = theorem body
1233     \group_begin:
1234     \bool_set_true:N \l__keythms_thmuse_restating_bool
1235     \prop_set_from_keyval:Nn \l__keythms_restate_counters_prop { #1 }
1236     \prop_map_inline:Nn \l__keythms_restate_counters_prop
1237     {
1238         \tl_set:ce { l_keythms_restate_current_##1_tl } { \the\value{##1} }
1239         \setcounter { ##1 } { ##2 }
1240         % ^ FIX: what if eq's numbered by section, theorem, etc.? The
1241         %       thmtools code is opaque.... Or maybe should be up to the
1242         %       user to say "restate-counters={section,chapter,...}".
1243         \cs_set:cpn { theH ##1 } { \use:c { the ##1 } . \theHkeythms_restate_dummyctr }
1244     }
1245     \refstepcounter{keythms_restate_dummyctr}
1246     \renewcommand\label[2] [] {} % disable \label (opt arg in case cleveref loaded)
1247     \cs_set_eq:NN \ltx@label \use_none:n % disable \ltx@label
1248     \cs_set_eq:NN \property_record:nn \use_none:nn % disable \RecordProperties
1249     \hook_use:n { keytheorems/#1/restated }
1250     \hook_use:n { keytheorems/allthms/restated }
1251     #2
1252     \prop_map_inline:Nn \l__keythms_restate_counters_prop
1253     {
1254         \exp_args:Nnc \setcounter { ##1 }
1255         { l_keythms_restate_current_##1_tl }
1256     }
1257     \group_end:
1258 }
1259
1260 % \getkeytheorem[<property>]{<tag>}
1261 \NewDocumentCommand \getkeytheorem { o m }
1262 {
1263     \cs_if_exist:cTF { __keythms_getthm_#2_theorem }
1264     {
1265         \IfNoValueTF { #1 }
1266         { \use:c { __keythms_getthm_#2_theorem } }
1267         { \use:c { __keythms_getthm_#2_#1 } }
1268     }
1269     {
1270         \textbf{??}
1271         \msg_warning:nnn { keytheorems } { no-stored-theorem } { #2 }
1272     }
1273 }
1274

```

```

1275 %%%%%%%%%%%
1276 %%% Theorem Hooks %%%
1277 %%%%%%%%%%%
1278
1279 %%% \addtotheoremhook[<envname>]{<hook>}{<code>}
1280 \NewDocumentCommand \addtotheoremhook { o m +m }
1281 {
1282   \__hook_if_declared:nTF { keytheorems/allthms/#2 }
1283   {
1284     \IfNoValueTF { #1 }
1285     { \hook_gput_code:nnn { keytheorems/allthms/#2 } { . } { #3 } }
1286     { \hook_gput_code:nnn { keytheorems/#1/#2 } { . } { #3 } }
1287   }
1288   {
1289     \msg_error:nnn { keytheorems } { undefined-thm-hook } { #2 }
1290   }
1291 }
1292
1293 % NOTE: I think it's OK we use the internal \__hook_if_declared:nTF above
1294 %       since we don't need to worry about the user creating new theorem hooks
1295 %       so, as we're only checking the existence of hooks created by us, it's OK.
1296
1297 %%%%%%%%%%%
1298 %%% List of Theorems %%%
1299 %%%%%%%%%%%
1300
1301 \keys_define:nn { keytheorems/listof }
1302 {
1303   numwidth .dim_set:N = \l__keythms_listof_numwidth_dim,
1304   numwidth .initial:n = 2.3em,
1305   ignore .code:n =
1306   {
1307     \hook_gput_code:nnn { begindocument/before } { keytheorems }
1308     { \keythms_listof_ignore:n { #1 } }
1309   },
1310   show .code:n =
1311   {
1312     \hook_gput_code:nnn { begindocument/before } { keytheorems }
1313     { \keythms_listof_show:n { #1 } }
1314   },
1315   onlynamed .code:n =
1316   {
1317     \hook_gput_code:nnn { begindocument/before } { keytheorems }
1318     { \keythms_listof_onlynamed:n { #1 } }
1319   },
1320   onlynamed .default:n = \q_no_value,
1321   onlynumbered .code:n =
1322   {
1323     \hook_gput_code:nnn { begindocument/before } { keytheorems }
1324     { \keythms_listof_onlynumbered:n { #1 } }
1325   },
1326   onlynumbered .default:n = \q_no_value,
1327   ignoreall .code:n =
1328   {
1329     \hook_gput_code:nnn { begindocument/before } { keytheorems } % in case called before theorem
1330     {
1331       \prop_map_inline:Nn \g__keythms_thmnames_prop
1332       { \__keythms_listof_ignore_aux:n { ##1 } }

```

```

1333     }
1334 },
1335 showall .code:n =
1336 {
1337     \hook_gput_code:nnn { begindocument/before } { keytheorems } % in case called before theorem
1338     {
1339         \prop_map_inline:Nn \g__keythms_thmnames_prop
1340         { \__keythms_listof_show_aux:n { ##1 } }
1341     }
1342 },
1343 title .tl_set:N = \l__keythms_listof_title_tl,
1344 title .initial:n = \GetTranslation{keythms_listof_title},
1345 swapnumber .bool_set:N = \l__keythms_listof_swapnumber_bool,
1346 swapnumber .initial:n = false,
1347 title-code .cs_set:Np = \__keythms_listof_titlecmd:n #1,
1348 no-title .bool_set:N = \l__keythms_listof_notitle_bool,
1349 no-title .initial:n = false,
1350 print-body .code:n =
1351 {
1352     \cs_set:Nn \keythms_listof_listcmd:nnnnnnn
1353     {
1354         \tl_if_empty:nF { ##7 }
1355         {
1356             \__keythms_getthm_theorem:nnnnn
1357             {##1}{##2}{##5}{##6}{##7}
1358         }
1359     }
1360     \cs_set_eq:NN \KeyThmsContentsLine \use_none:n
1361     % ^ I assume we want this?
1362     \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1363 },
1364 note-code .cs_set:Np = \__keythms_listof_notecmd:n #1,
1365 note-code .initial:n = { ~ (#1) },
1366 no-continues .bool_set:N = \l__keythms_listof_nocont_bool,
1367 no-continues .initial:n = false,
1368 no-chapter-skip .bool_set:N = \l__keythms_listof_nochapskip_bool,
1369 no-chapter-skip .initial:n = false,
1370 chapter-skip-length .dim_set:N = \keythms@listof@chaptervspace@dim,
1371 chapter-skip-length .initial:n = 10pt,
1372 }
1373
1374 \hook_gput_code:nnn { begindocument } { . } % redefine these keys at begindocument
1375 {
1376     \keys_define:nn { keytheorems/listof }
1377     {
1378         ignore .code:n = \keythms_listof_ignore:n { #1 },
1379         show .code:n = \keythms_listof_show:n { #1 },
1380         onlynamed .code:n = \keythms_listof_onlynamed:n { #1 },
1381         onlynamed .default:n = \q_no_value,
1382         onlynumbered .code:n = \keythms_listof_onlynumbered:n { #1 },
1383         onlynumbered .default:n = \q_no_value,
1384         ignoreall .code:n =
1385         {
1386             \prop_map_inline:Nn \g__keythms_thmnames_prop
1387             { \__keythms_listof_ignore_aux:n { ##1 } }
1388         },
1389         showall .code:n =
1390         {

```

```

1391         \prop_map_inline:Nn \g__keythms_thmnames_prop
1392         { \__keythms_listof_show_aux:n { ##1 } }
1393     },
1394     seq      .code:n = \keythms_listof_showseq:n { #1 },
1395 }
1396 }
1397
1398 \NewDocumentCommand \keytheoremset { m }
1399 {
1400     \keys_set:nn { keytheorems/listof } { #1 }
1401 }
1402
1403 \cs_new_protected:Npn \keythms_listof_ignore:n #1
1404 {
1405     \clist_map_inline:nn { #1 } { \__keythms_listof_ignore_aux:n { ##1 } }
1406 }
1407 \cs_new_protected:Npn \__keythms_listof_ignore_aux:n #1
1408 {
1409     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1410     { }
1411 }
1412
1413 \cs_new_protected:Npn \keythms_listof_show:n #1
1414 {
1415     \clist_map_inline:nn { #1 } { \__keythms_listof_show_aux:n { ##1 } }
1416 }
1417 \cs_new_protected:Npn \__keythms_listof_show_aux:n #1
1418 {
1419     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1420     {
1421         \__keythms_listof_listcmd_setup:nn { ##5 }
1422         {
1423             \keythms_listof_listcmd:nnnnnnn
1424             {#1}{##1}{##2}{##3}{##4}{##5}{##6}
1425         }
1426     }
1427 }
1428
1429 \cs_new_protected:Npn \keythms_listof_onlynamed:n #1
1430 {
1431     \quark_if_no_value:nTF { #1 }
1432     {
1433         \prop_map_inline:Nn \g__keythms_thmnames_prop
1434         { \__keythms_listof_onlynamed_aux:n { ##1 } }
1435     }
1436     {
1437         \clist_map_inline:nn { #1 }
1438         { \__keythms_listof_onlynamed_aux:n { ##1 } }
1439     }
1440 }
1441 \cs_new_protected:Npn \__keythms_listof_onlynamed_aux:n #1
1442 {
1443     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1444     {
1445         \__keythms_listof_listcmd_setup:nn { ##5 }
1446         {
1447             \tl_if_empty:NF \l__keythms_listof_heading_note_tl
1448             {

```

```

1449         \keythms_listof_listcmd:nnnnnnn
1450         {#1}{##1}{##2}{##3}{##4}{##5}{##6}
1451     }
1452 }
1453 }
1454 }
1455
1456 \cs_new_protected:Npn \keythms_listof_onlynumbered:n #1
1457 {
1458     \quark_if_no_value:nTF { #1 }
1459     {
1460         \prop_map_inline:Nn \g__keythms_thmnames_prop
1461         { \__keythms_listof_onlynumbered_aux:n { ##1 } }
1462     }
1463     {
1464         \clist_map_inline:nn { #1 }
1465         { \__keythms_listof_onlynumbered_aux:n { ##1 } }
1466     }
1467 }
1468 \cs_new_protected:Npn \__keythms_listof_onlynumbered_aux:n #1
1469 {
1470     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1471     {
1472         \__keythms_listof_listcmd_setup:nn { ##5 }
1473         {
1474             \tl_if_empty:nF { ##1 }
1475             {
1476                 \keythms_listof_listcmd:nnnnnnn
1477                 {#1}{##1}{##2}{##3}{##4}{##5}{##6}
1478             }
1479         }
1480     }
1481 }
1482
1483 \cs_new_protected:Npn \keythms_listof_showseq:n #1
1484 {
1485     \prop_map_inline:Nn \g__keythms_thmnames_prop
1486     { \__keythms_listof_showseq_aux:nn { #1 } { ##1 } }
1487 }
1488 \cs_new_protected:Npn \__keythms_listof_showseq_aux:nn #1#2
1489 { % #1 = seq name, #2 = theorem name
1490     \cs_set_protected:cpn { __keythms_thmitem_#2:nnnnnn } ##1##2##3##4##5##6
1491     {
1492         \__keythms_listof_listcmd_setup:nn { ##5 }
1493         {
1494             \tl_if_eq:NnT \l__keythms_listofheading_seq_tl { #1 }
1495             {
1496                 \keythms_listof_listcmd:nnnnnnn
1497                 {#2}{##1}{##2}{##3}{##4}{##5}{##6}
1498             }
1499         }
1500     }
1501 }
1502
1503 % Seems unnecessary to repeat all this for reading the keyvals from seq.
1504 % In thmtools they just hook the "thmitem" definition into the theorem declaration.
1505 %% NOTE ON ABOVE: this gives more flexibility to define different kinds of lists.
1506 %% See acro.sty for template idea.

```

```

1507 \keys_define:nn { keytheorems/listofheading }
1508 {
1509     note      .tl_set:N = \l__keythms_listofheading_note_tl,
1510     name      .meta:n   = { note = #1 },
1511     short-note .tl_set:N = \l__keythms_listofheading_shortnote_tl,
1512     short-name .meta:n   = { short-note = #1 },
1513     continues .tl_set:N = \l__keythms_listofheading_contlabel_tl,
1514     continues* .code:n   =
1515     {
1516         \keys_set:nn { keytheorems/listofheading } { continues = #1 }
1517         \protected@edef \l__keythms_tmpa_tl { \__keythms_getrecordednote:n{#1} }
1518         \tl_if_empty:NF \l__keythms_tmpa_tl
1519         {
1520             \keys_set:nn { keytheorems/listofheading }
1521             { note = \l__keythms_tmpa_tl }
1522         }
1523     },
1524     seq      .tl_set:N = \l__keythms_listofheading_seq_tl,
1525     unknown .code:n = { } % do nothing with unknown keys
1526     % ~ this is OK because we have total control over possible keys; if invalid
1527     % key is given to theorem then an error will be raised there
1528 }
1529
1530 \cs_new:Npn \__keythms_listof_printheadng:
1531 {
1532     \tl_if_empty:NTF \l__keythms_listofheading_shortnote_tl
1533     {
1534         \tl_if_empty:NF \l__keythms_listofheading_note_tl
1535         { \__keythms_listof_notecmd:n { \l__keythms_listofheading_note_tl } }
1536     }
1537     {
1538         \__keythms_listof_notecmd:n { \l__keythms_listofheading_shortnote_tl }
1539     }
1540 }
1541
1542 \cs_new:Npn \__keythms_listof_default_listcmd:nnnnnnn #1#2#3#4#5#6#7
1543 {
1544     \contentsline{ #1 }
1545     {
1546         \bool_if:NTF \l__keythms_listof_swapnumber_bool
1547         {
1548             \prop_item:Nn \g__keythms_thmnames_prop { #1 } ~ #2
1549         }
1550         {
1551             \numberline{ #2 }
1552             \prop_item:Nn \g__keythms_thmnames_prop { #1 }
1553         }
1554         \__keythms_listof_printheadng:
1555     }
1556     { #4 }{ #3 }
1557 }
1558
1559 % NOTE: We still need to do this setup for [print-body] so that onlynamed works
1560 \cs_new:Npn \__keythms_listof_listcmd_setup:nn #1#2
1561 { % #1 = keys, #2 = list command
1562     \group_begin:
1563     \keys_set:nn { keytheorems/listofheading } { #1 }
1564     \tl_if_empty:NTF \l__keythms_listofheading_contlabel_tl

```

```

1565     { #2 }
1566     {
1567         \bool_if:NF \l__keythms_listof_nocont_bool
1568         {
1569             \tl_if_empty:NF \l__keythms_listofheading_note_tl
1570             {
1571                 \tl_put_right:Nn \l__keythms_listofheading_note_tl { , ~ }
1572             }
1573             \tl_put_right:Nn \l__keythms_listofheading_note_tl
1574             {
1575                 \__keythms_thmuse_continues:V \l__keythms_listofheading_contlabel_tl
1576             }
1577             #2
1578         }
1579     }
1580     \group_end:
1581 }
1582
1583 % set default listcmd
1584 \cs_new_eq:NN \keythms_listof_listcmd:nnnnnnn
1585     \__keythms_listof_default_listcmd:nnnnnnn
1586
1587 \cs_if_exist:NTF \chapter
1588     { \cs_set:Npn \__keythms_listof_titlecmd:n #1 { \chapter*{#1} } }
1589     { \cs_set:Npn \__keythms_listof_titlecmd:n #1 { \section*{#1} } }
1590
1591 \hook_gput_code:nnn { begindocument } { . }
1592 { % try to detect ams classes
1593     \keythms_if_amsclass:TF
1594     {
1595         \prop_map_inline:Nn \g__keythms_thmnames_prop
1596         {
1597             \cs_set:cpn { l@ #1 }
1598             {
1599                 \@tocline{ 0 }{ 3pt plus 2pt }{ 0pt }
1600                 { \l__keythms_listof_numwidth_dim }{ }
1601             }
1602         }
1603     }
1604     {
1605         \prop_map_inline:Nn \g__keythms_thmnames_prop
1606         {
1607             \cs_set:cpn { l@ #1 }
1608             {
1609                 \@dottedtocline{ 1 }{ 1.5em }
1610                 { \l__keythms_listof_numwidth_dim }
1611             }
1612         }
1613     }
1614 }
1615
1616 \keythms_if_amsclass:TF
1617 {
1618     \keys_define:nn { keytheorems/listof } % adjust to class
1619     {
1620         numwidth .initial:n = 1.5pc,
1621     }
1622     \NewDocumentCommand \listofkeytheorems { 0{} }

```

```

1623 { % title command not customizable here
1624 \bool_gset_true:N \g__keythms_listof_writefile_bool
1625 \group_begin:
1626 \keys_set:nn { keytheorems/listof } { #1 }
1627 \bool_if:NT \l__keythms_listof_nochapskip_bool
1628 {
1629 \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1630 }
1631 \legacy_if_set_false:n { @filesw }
1632 \bool_if:NTF \l__keythms_listof_notitle_bool
1633 {
1634 \starttoc{ thlist }{ }
1635 }
1636 { % ams classes don't expand title enough
1637 \protected@edef \l__keythms_tmpa_tl { \l__keythms_listof_title_tl }
1638 \starttoc{ thlist }{ \l__keythms_tmpa_tl }
1639 }
1640 \group_end:
1641 }
1642 }
1643 {
1644 \NewDocumentCommand \listofkeytheorems { 0{ } }
1645 {
1646 \bool_gset_true:N \g__keythms_listof_writefile_bool
1647 \group_begin:
1648 \keys_set:nn { keytheorems/listof } { #1 }
1649 \bool_if:NT \l__keythms_listof_nochapskip_bool
1650 {
1651 \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1652 }
1653 \bool_if:NF \l__keythms_listof_notitle_bool
1654 {
1655 \__keythms_listof_titlecmd:n { \l__keythms_listof_title_tl }
1656 \mkboth % QUESTION: should this go in titlecmd ?
1657 { \MakeUppercase \l__keythms_listof_title_tl }
1658 { \MakeUppercase \l__keythms_listof_title_tl }
1659 }
1660 \legacy_if_set_false:n { @filesw }
1661 \starttoc{ thlist }
1662 \group_end:
1663 }
1664 }
1665 % ^ unlike thmtools we don't use the class's style of \listoffigures because
1666 % we want control over title-code, no-title, etc. But this means we have to guess
1667 % things like marks, sectioning command, etc.
1668
1669 \hook_gput_code:nnn { enddocument } { . }
1670 {
1671 \bool_if:NTF \g__keythms_listof_writefile_bool
1672 {
1673 \legacy_if:nT { @filesw }
1674 {
1675 \iow_new:N \tf@thlist
1676 \iow_open:Nn \tf@thlist { \c_sys_jobname_str.thlist }
1677 }
1678 }
1679 { % if .thlist file left over from previous run but not needed, clear it
1680 \file_if_exist:nT { \c_sys_jobname_str.thlist }

```



```

1681         {
1682             \iow_open:Nn \g_tmpa_iow { \c_sys_jobname_str.thlist }
1683             \iow_close:N \g_tmpa_iow
1684         }
1685     }
1686 }
1687
1688 % chapterospacehack (code translated from thmtools)
1689 \cs_new_eq:NN \KeyThmsAddvspace \addvspace
1690 \int_new:N \g_keythms_listof_prevchapter_int
1691 \int_gset:Nn \g_keythms_listof_prevchapter_int { 1 }
1692 % ^ if this is zero, bad things happen if title-code is changed; anyways don't
1693 % need addvspace at top
1694 \cs_new:Npn \keythms_listof_chapterospacehack: { }
1695 \cs_if_exist:cT { c@chapter }
1696 {
1697     \cs_if_eq:NNF \c@chapter \relax
1698     {
1699         \cs_set:Npn \keythms_listof_chapterospacehack:
1700         {
1701             \int_compare:nNnF { \value{chapter} } = { \g_keythms_listof_prevchapter_int }
1702             {
1703                 \addtocontents{ thlist }
1704                 {
1705                     \protect\KeyThmsAddvspace
1706                     { \keythms@listof@chapterospace@dim }
1707                 }
1708                 \int_gset:Nn \g_keythms_listof_prevchapter_int { \value{chapter} }
1709             }
1710         }
1711     }
1712 }
1713
1714 %%%%%%%%%%%%%%%
1715 %%% \Autoref %%%
1716 %%%%%%%%%%%%%%%
1717
1718 \ProvideDocumentCommand { \Autoref } { s m }
1719 {
1720     \group_begin:
1721     \cs_set_eq:NN \HyRef@testreftype \__keythms_Autoref_testreftype:w
1722     \IfBooleanTF { #1 } { \autoref*{#2} } { \autoref{#2} }
1723     \group_end:
1724 }
1725
1726 \cs_new:Npn \__keythms_Autoref_testreftype:w #1.#2\
1727 {
1728     \cs_if_exist:cTF { #1 Autorefname }
1729     {
1730         \cs_set:Npe \HyRef@currentHtag
1731         {
1732             \exp_not:N \use:c { #1 Autorefname }
1733             \exp_not:N \c_space_token
1734         }
1735     }
1736     { \msg_warning:nnn { keytheorems } { no-Autorefname } { #1 } }
1737 }
1738

```

```

1739 %%%%%%%%%%%%%%%
1740 %%% Global Keys %%%
1741 %%%%%%%%%%%%%%%
1742
1743 \keys_define:nn { keytheorems }
1744 {
1745   restate-counters .code:n =
1746   {
1747     \clist_map_inline:nn { #1 }
1748     { \tl_new:c { l_keythms_restate_current_##1_tl } }
1749     \clist_gput_right:Nn \g__keythms_restatecounters_clist { #1 }
1750   },
1751   restate-counters .initial:n = equation,
1752   continues-code .cs_set:Np = \__keythms_thmuse_continues:n #1,
1753   continues-code .initial:n =
1754   { % not sure how best to handle this translation
1755     \GetTranslation{keythms_continues}\pageref{#1}
1756   },
1757   qed-symbol .cs_set_protected:Np = \qedsymbol,
1758   overload .code:n = \__keythms_overload_code:,
1759   overload .value_forbidden:n = true,
1760   overload .usage:n = preamble,
1761   thmtools-compat .code:n = \__keythms_thmtoolscompat_code:,
1762   thmtools-compat .value_forbidden:n = true,
1763   thmtools-compat .usage:n = preamble,
1764   store-all .code:n = \__keythms_storeall_code:,
1765   store-all .value_forbidden:n = true,
1766   store-all .usage:n = preamble,
1767   auto-translate .bool_gset:N = \g__keythms_autotranslate_bool,
1768   auto-translate .initial:n = true,
1769 }
1770
1771 \cs_generate_variant:Nn \__keythms_thmuse_continues:n { V }
1772
1773 % \keytheoremset{<options>}
1774 \NewDocumentCommand \keytheoremset { m }
1775 {
1776   \keys_set:nn { keytheorems } { #1 }
1777 }
1778
1779 \cs_new_protected:Npn \__keythms_overload_code:
1780 {
1781   \RenewDocumentCommand { \newtheorem } { smomo }
1782   {
1783     \IfBooleanTF { ##1 }
1784     { \keythms_thm_newkeythm:nn { ##2 } { name=##4, numbered=no } }
1785     {
1786       \IfNoValueTF { ##3 }
1787       {
1788         \IfNoValueTF { ##5 }
1789         { \keythms_thm_newkeythm:nn { ##2 } { name=##4 } }
1790         { \keythms_thm_newkeythm:nn { ##2 } { name=##4, parent=##5 } }
1791       }
1792       { \keythms_thm_newkeythm:nn { ##2 } { name=##4, sibling=##3 } }
1793     }
1794   }
1795 }
1796

```

```

1797 \cs_new_protected:Npn \__keythms_thmtoolscompat_code:
1798 {
1799   \ProvideDocumentCommand { \declaretheoremstyle } { 0{} m }
1800   {
1801     \declarekeytheoremstyle { ##2 } { ##1 }
1802   }
1803   \ProvideDocumentCommand { \declaretheorem } { 0{} m }
1804   {
1805     \newkeytheorem { ##2 } [ ##1 ]
1806   }
1807   \ProvideDocumentEnvironment { restatable } { 0{} m m }
1808   {
1809     \begin{##2}[##1,store=##3]
1810   }
1811   {
1812     \end{##2}
1813     \cs_new:cpn { ##3 }
1814       { % make \foo and \foo* identical
1815         \peek_meaning_remove:NTF *
1816         { \use:c { __keythms_getthm_ ##3 _theorem } }
1817         { \use:c { __keythms_getthm_ ##3 _theorem } }
1818       }
1819   }
1820   \ProvideDocumentCommand { \listoftheorems } { } { \listofkeytheorems }
1821   \ProvideDocumentCommand { \addtotheorempreheadhook } { o m }
1822   {
1823     \IfNoValueTF { ##1 }
1824       { \addtotheoremhooke { prehead } { ##2 } }
1825       { \addtotheoremhooke [ ##1 ] { prehead } { ##2 } }
1826   }
1827   \ProvideDocumentCommand { \addtotheorempostheadhook } { o m }
1828   {
1829     \IfNoValueTF { ##1 }
1830       { \addtotheoremhooke { posthead } { ##2 } }
1831       { \addtotheoremhooke [ ##1 ] { posthead } { ##2 } }
1832   }
1833   \ProvideDocumentCommand { \addtotheoremprefoothook } { o m }
1834   {
1835     \IfNoValueTF { ##1 }
1836       { \addtotheoremhooke { prefoot } { ##2 } }
1837       { \addtotheoremhooke [ ##1 ] { prefoot } { ##2 } }
1838   }
1839   \ProvideDocumentCommand { \addtotheorempostfoothook } { o m }
1840   {
1841     \IfNoValueTF { ##1 }
1842       { \addtotheoremhooke { postfoot } { ##2 } }
1843       { \addtotheoremhooke [ ##1 ] { postfoot } { ##2 } }
1844   }
1845   \clist_new:N \l__keythms_tcbshaded_keys_clist
1846   \clist_new:N \l__keythms_tcbthmbox_keys_clist
1847   \keys_define:nn { keytheorems/thm/shaded }
1848   {
1849     textwidth .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { width=##1 },
1850     bgcolor .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { colback=##1 },
1851     rulewidth .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { boxrule=##1 },
1852     rulecolor .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { colframe=##1 },
1853     margin .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { boxsep=##1 },
1854     padding .meta:n = { margin=##1 },

```

```

1855     leftmargin .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { left~skip=##1 }
1856     rightmargin .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { right~skip=##1 }
1857 }
1858 \keys_define:nn { keytheorems/thm/thmbox }
1859 {
1860     L .code:n =
1861     {
1862         \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1863         { keythms_tcbthmbox_L }
1864     },
1865     M .code:n =
1866     {
1867         \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1868         { keythms_tcbthmbox_M }
1869     },
1870     S .code:n =
1871     {
1872         \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1873         { keythms_tcbthmbox_S }
1874     },
1875     underline .choice:,
1876     underline / true .code:n = {},
1877     underline / false .code:n =
1878     {
1879         \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1880         { boxed~title~style={bottomrule=0pt} }
1881     },
1882     underline .default:n = true,
1883     nounderline .meta:n = { underline=false },
1884     cut .choice:,
1885     cut / true .code:n = {},
1886     cut / false .code:n =
1887     {
1888         \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist { unbreakable }
1889     },
1890     cut .default:n = true,
1891     nocut .meta:n = { cut=false },
1892     thickness .code:n = % could also add keys to clist with changed dims; which is better?
1893     {
1894         \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1895         { keythms_tcbbox }
1896         { \dim_set:Nn \l__keythms_tcbthmbox_thickness_dim { ##1 } }
1897     },
1898     leftmargin .code:n =
1899     {
1900         \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1901         { keythms_tcbbox }
1902         { \dim_set:Nn \l__keythms_tcbthmbox_leftmargin_dim { ##1 } }
1903     },
1904     rightmargin .code:n =
1905     {
1906         \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1907         { keythms_tcbbox }
1908         { \dim_set:Nn \l__keythms_tcbthmbox_rightmargin_dim { ##1 } }
1909     },
1910     hskip .code:n =
1911     {
1912         \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }

```

```

1913         { keythms_tcbox }
1914         { \dim_set:Nn \l_keythms_tcbthmbox_hskip_dim { ##1 } }
1915     },
1916     vskip .code:n =
1917     {
1918         \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1919         { keythms_tcbox }
1920         { \dim_set:Nn \l_keythms_tcbthmbox_vskip_dim { ##1 } }
1921     },
1922 }
1923 \dim_new:N \l_keythms_tcbthmbox_thickness_dim
1924 \dim_set:Nn \l_keythms_tcbthmbox_thickness_dim { 0.6pt }
1925 \dim_new:N \l_keythms_tcbthmbox_leftmargin_dim
1926 \dim_set:Nn \l_keythms_tcbthmbox_leftmargin_dim { 0.7\parindent } % use \parindent? thmbox does
1927 \dim_new:N \l_keythms_tcbthmbox_rightmargin_dim
1928 \dim_set:Nn \l_keythms_tcbthmbox_rightmargin_dim { Opt }
1929 \dim_new:N \l_keythms_tcbthmbox_hskip_dim
1930 \dim_set:Nn \l_keythms_tcbthmbox_hskip_dim { 0.2em }
1931 \dim_new:N \l_keythms_tcbthmbox_vskip_dim
1932 \dim_set:Nn \l_keythms_tcbthmbox_vskip_dim { 0.2em }
1933 \msg_new:nnn { keytheorems } { mdfamed-undefined }
1934 {
1935     keytheorems~does~not~define~the~'mdfamed'~key.~
1936     Consider~using~the~'tcolorbox'~key~instead.
1937 }
1938 \keys_define:nn { keytheorems/thm }
1939 {
1940     shaded .code:n =
1941     {
1942         \clist_clear:N \l__keythms_tcbshaded_keys_clist
1943         \keys_set:nn { keytheorems/thm/shaded } { ##1 }
1944         % FIX: surely a better way to do this
1945         \RequirePackage{tcolorbox}
1946         \pgfkeysifdefined{/tcb/keythms_tcbshaded_default/.@cmd} % even worth it?
1947         {}
1948         {
1949             \tcbset % wish I could do this outside of key but can't assume tcb loaded
1950             {
1951                 keythms_tcbshaded_default/.style=
1952                 {
1953                     sharp~corners = all,
1954                     boxrule = Opt,
1955                     left = Opt, right = Opt,
1956                     top = Opt, bottom = Opt,
1957                     parbox = false,
1958                 }
1959             }
1960         }
1961         \keys_set:ne { keytheorems/thm }
1962         {
1963             tcolorbox-no-titlebar =
1964             {
1965                 keythms_tcbshaded_default,
1966                 \l__keythms_tcbshaded_keys_clist
1967             }
1968         }
1969     },
1970     thmbox .code:n = % adapted from https://tex.stackexchange.com/a/236230/208544

```

```

1971 {
1972   \clist_clear:N \l__keythms_tcbthmbox_keys_clist
1973   \keys_set:nn { keytheorems/thm/thmbox } { ##1 }
1974   % FIX: surely a better way to do this
1975   \RequirePackage{tcolorbox}
1976   \tcbuselibrary{skins,breakable}
1977   \pgfkeysifdefined{/tcb/keythms_tcbthmbox_default/.@cmd} % even worth it?
1978   {}
1979   {
1980     \tcbset{
1981       keythms_tcbthmbox_default/.style={
1982         enhanced,
1983         breakable,
1984         sharp~corners=all,
1985         right=\l_keythms_tcbthmbox_hskip_dim,
1986         left=\l_keythms_tcbthmbox_hskip_dim,
1987         top=\l_keythms_tcbthmbox_vskip_dim,
1988         bottom=\l_keythms_tcbthmbox_vskip_dim,
1989         coltitle=black,
1990         frame~engine=empty,
1991         interior~titled~engine=empty,
1992         interior~engine=empty,
1993         extras~broken={
1994           frame~engine=empty,
1995           interior~titled~engine=empty,
1996           interior~engine=empty
1997         },
1998         parbox=false,
1999         % even though frame isn't drawn, makes spacing correct
2000         boxrule=0.5\l_keythms_tcbthmbox_thickness_dim,
2001         attach~boxed~title~to~top~left={
2002           xshift=-\l_keythms_tcbthmbox_leftmargin_dim,
2003         },
2004         boxed~title~style={
2005           empty,
2006           size=minimal,
2007           bottom=0.7ex,
2008           top=0ex,
2009           % ditto
2010           bottomrule=0.5\l_keythms_tcbthmbox_thickness_dim,
2011         },
2012         left~skip=\l_keythms_tcbthmbox_leftmargin_dim,
2013         right~skip=\l_keythms_tcbthmbox_rightmargin_dim,
2014         overlay~unbroken={
2015           \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2016             (title.south~west)
2017             --
2018             (title.south~east);
2019           \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2020             (frame.north~west)
2021             |-
2022             ([xshift=10mm]frame.south~west);
2023         },
2024         overlay~first={
2025           \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2026             (title.south~west)
2027             --
2028             (title.south~east);

```

```

2029         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2030             (frame.north~west)
2031             --
2032             (frame.south~west);
2033     },
2034     overlay~middle={
2035         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2036             (frame.north~west)
2037             --
2038             (frame.south~west);
2039     },
2040     overlay~last={
2041         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2042             (frame.north~west)
2043             |-
2044             ([xshift=10mm]frame.south~west);
2045     }
2046 },
2047 keythms_tcbthmbox_L/.style={
2048     overlay~unbroken={
2049         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2050             (title.south~west)
2051             --
2052             (title.south~east);
2053         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2054             (frame.north~west)
2055             |-
2056             (frame.south~east)
2057             -|
2058             (frame.north~east);
2059     },
2060     overlay~first={
2061         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2062             (title.south~west)
2063             --
2064             (title.south~east);
2065         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2066             (frame.north~west)
2067             --
2068             (frame.south~west);
2069         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2070             (frame.north~east)
2071             --
2072             (frame.south~east);
2073     },
2074     overlay~middle={
2075         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2076             (frame.north~west)
2077             --
2078             (frame.south~west);
2079         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2080             (frame.north~east)
2081             --
2082             (frame.south~east);
2083     },
2084     overlay~last={
2085         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2086             (frame.north~west)

```

```

2087         |-
2088         (frame.south~east)
2089         -|
2090         (frame.north~east);
2091     }
2092 },
2093 keythms_tcbthmbox_M/.style={},
2094 keythms_tcbthmbox_S/.style={ % first and middle same as M
2095     overlay~unbroken={
2096         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2097             (title.south~west)
2098             --
2099             (title.south~east);
2100         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2101             (frame.north~west)
2102             --
2103             (frame.south~west);
2104     },
2105     overlay~last={
2106         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2107             (frame.north~west)
2108             --
2109             (frame.south~west);
2110     }
2111 },
2112 }
2113 }
2114 \keys_set:ne { keytheorems/thm }
2115 {
2116     tcolorbox =
2117     {
2118         keythms_tcbthmbox_default,
2119         \l__keythms_tcbthmbox_keys_clist
2120     }
2121 }
2122 },
2123 thmbox .default:n = M,
2124 mdframed .code:n = \msg_error:nn { keytheorems } { mdframed-undefined },
2125 }
2126 }
2127
2128 \cs_new_protected:Npn \__keythms_storeall_code:
2129 {
2130     \cs_set_eq:NN \__keythms_withhooks_begin:nn \__keythms_grab_begin:nn
2131     \cs_set_eq:NN \__keythms_withhooks_begin:nnn \__keythms_grab_begin:nnn
2132     \cs_set_eq:NN \__keythms_withhooks_begin:nnV \__keythms_grab_begin:nnV
2133     \cs_set_eq:NN \__keythms_withhooks_end:n \__keythms_grab_end:n
2134 }
2135
2136 \hook_gput_code:nnn { begindocument/before } { . }
2137 { % use 'provide' in case user defines their own translation in preamble
2138     \ProvideTranslationFallback { keythms_listof_title } { List~of~Theorems }
2139     \ProvideTranslationFallback { keythms_continues } { continuing~from~p.\, }
2140     \bool_if:NT \g__keythms_autotranslate_bool
2141     {
2142         \ProvideTranslation { English } { keythms_listof_title } { List~of~Theorems }
2143         \ProvideTranslation { English } { keythms_continues } { continuing~from~p.\, }
2144         % from DeepL; I don't know these languages!

```



```

2145     \ProvideTranslation { French } { keythms_listof_title } { Liste~des~théorèmes }
2146     \ProvideTranslation { French } { keythms_continues } { suite~de~la~p.\, }
2147     \ProvideTranslation { German } { keythms_listof_title } { Liste~der~Theoreme }
2148     \ProvideTranslation { German } { keythms_continues } { weiter~von~Seite~ }
2149     \ProvideTranslation { Spanish } { keythms_listof_title } { Lista~de~teoremas }
2150     \ProvideTranslation { Spanish } { keythms_continues } { continúa~de~la~p.\, }
2151   }
2152 }
2153
2154 \ProcessKeyOptions[keytheorems]
2155
2156 \file_input_stop:

```

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