

# L<sup>A</sup>T<sub>E</sub>X Class for the *Association for Computing Machinery*\*

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## Abstract

This package provides a class for typesetting publications of the Association for Computing Machinery.

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## 1 Introduction

The Association for Computing Machinery<sup>1</sup> is the world’s largest educational and scientific computing society, which delivers resources that advance computing as a science and a profession. It was one of the early adopters of  $\TeX$  for its typesetting.

It provided several different classes for a number of journals and conference proceedings. Unfortunately during the years since these classes were written, the code was patched many times, and supporting different versions of the classes became difficult.

This package provides the uniform interface for all ACM publications. It is intended to replace all the different classes and packages and provide an up-to-date  $\LaTeX$  package.

This package uses only free  $\TeX$  packages and fonts included in  $\TeX$ Live, Mik $\TeX$  and other popular  $\TeX$  distributions. It is intended to be published in these distributions itself, which minimizes users’ efforts in the installation and support of this package.

I am grateful to Michael D. Adams, Leif Andersen, Lawrence Christopher Angrave, Dirk Beyer, Andrew Black, Joachim Breitner, Yegor Bugayenko, Benjamin Byholm, John Collins, Roberto Di Cosmo, Nils Anders Danielsson, Michael Ekstrand, Matthew Fluet, Paolo G. Giarrusso, Ben Greenman, Enrico Gregorio, Jamie Davis, Ulrike Fischer, Jason Hemann, Peter Kemp, Luis Leiva, Ben Liblit, Rholais Lii, LianTze Lim, Kuldeep S. Meel, Kai Mindermann, Frank Mittelbach, Serguei Mokhov, Ross Moore, John Owens, Joel Nider, Scott Pakin, Tobias Pape, Henning Pohl, Philip Quinn, Mathias Rav, Andreas Reichinger, Matteo Riondato, Craig Rodkin, Bernard Rous, Feras Saad, Kerry A. Seitz, Jr., David Shamma, Gabriel Scherer, Kartik Singhal, Christoph Sommer, Stephen Spencer, Shin Hwei Tan, Daniel Thomas, Shari Trewin, Zack Weinberg, John Wickerson and many others for their invaluable help.

The development version of the package is available at <https://github.com/borisveytsman/acmart>.

## 2 User’s guide

This class uses many commands and customization options, so it might appear intimidating for a casual user. Do not panic! Many of these commands and options can be safely left with their default values or the values recommended by your conference or journal editors. If you have problems or questions, do not hesitate to ask me directly or the community at <https://github.com/borisveytsman/acmart>, <https://tex.stackexchange.com> or the closest  $\TeX$  Users Group. The world-wide  $\TeX$  Users Group is at <https://tug.org/>; please consider joining us if you use  $\TeX$  regularly.

### 2.1 Installation

Most probably, you already have this package installed in your favorite  $\TeX$  distribution; if not, you may want to upgrade. You may need to upgrade it anyway since this package uses a number of relatively recent packages, especially the ones related to fonts.

The latest released version of this package can be found on CTAN: <https://www.ctan.org/pkg/acmart>. The development version can be found on GitHub: <https://github.com/borisveytsman/acmart>. At this address you can file a bug report—or even contribute your own enhancement by making a pull request.

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<sup>1</sup><http://www.acm.org/>

Please note that the version on Github is a development (or experimental) version: please download it for testing new features. The production version is the one on CTAN and ACM sites.

Most users should not attempt to install this package themselves but should rather rely on their  $\TeX$  distributions to provide it. If you decide to install the package yourself, follow the standard rules:

1. Run `latex acmart.ins`. This will produce the file `acmart.cls`
2. Put the files `acmart.cls`, `acm-jdslogo.png`, and `ACM-Reference-Format.bst` in places where  $\TeX$  can find them (see [1] or the documentation for your  $\TeX$  system).
3. Update the database of file names. Again, see [1] or the documentation for your  $\TeX$  system for the system-specific details.
4. The file `acmart.pdf` provides the documentation for the package. (This is probably the file you are reading now.)

As an alternative to items 2 and 3 you can just put the files in the working directory where your `.tex` file is.

This class uses a number of other packages. They are included in all major  $\TeX$  distributions ( $\TeX$ Live, Mac $\TeX$ , Mik $\TeX$ ) of 2015 and later, so you probably have them installed. Just in case here is the list of these packages:

- *amscs*, <http://www.ctan.org/pkg/amscs>
- *amsfonts*, <http://www.ctan.org/pkg/amsfonts>
- *amsmath*, <http://www.ctan.org/pkg/amsmath>
- *binhex*, <http://www.ctan.org/pkg/binhex>
- *balance*, <http://www.ctan.org/pkg/balance>
- *booktabs*, <http://www.ctan.org/pkg/booktabs>
- *caption*, <http://www.ctan.org/pkg/caption>
- *comment*, <http://www.ctan.org/pkg/comment>
- *cm-super*, <http://www.ctan.org/pkg/cm-super>
- *cmap*, <http://www.ctan.org/pkg/cmap>
- *doclicense*, <http://www.ctan.org/pkg/doclicense>
- *draftwatermark*, <http://www.ctan.org/pkg/draftwatermark>
- *environ*, <http://www.ctan.org/pkg/environ>
- *etoolbox*, <http://www.ctan.org/pkg/etoolbox>
- *fancyhdr*, <http://www.ctan.org/pkg/fancyhdr>
- *float*, <http://www.ctan.org/pkg/float>
- *fontaxes*, <http://www.ctan.org/pkg/fontaxes>

- *geometry*, <http://www.ctan.org/pkg/geometry>
- *graphics*, <http://www.ctan.org/pkg/graphics>
- *hyperref*, <http://www.ctan.org/pkg/hyperref>
- *hyperxmp*, <http://www.ctan.org/pkg/hyperxmp>
- *iftex*, <http://www.ctan.org/pkg/iftex>
- *inconsolata*, <http://www.ctan.org/pkg/inconsolata>
- *libertine*, <http://www.ctan.org/pkg/libertine>
- *manyfoot*, <http://www.ctan.org/pkg/manyfoot>
- *microtype*, <http://www.ctan.org/pkg/microtype>
- *mmap*, <http://www.ctan.org/pkg/mmap>
- *ms*, <http://www.ctan.org/pkg/ms>
- *mweights*, <http://www.ctan.org/pkg/mweights>
- *natbib*, <http://www.ctan.org/pkg/natbib>
- *nccfoots*, <http://www.ctan.org/pkg/nccfoots>
- *newtx*, <http://www.ctan.org/pkg/newtx>
- *oberdiek*, <http://www.ctan.org/pkg/oberdiek>
- *pdftex-def*, <http://www.ctan.org/pkg/pdftex-def>
- *refcount*, <http://www.ctan.org/pkg/refcount>
- *setspace*, <http://www.ctan.org/pkg/setspace>
- *textcase*, <http://www.ctan.org/pkg/textcase>
- *totpages*, <http://www.ctan.org/pkg/totpages>
- *trimspaces*, <http://www.ctan.org/pkg/trimspaces>
- *upquote*, <http://www.ctan.org/pkg/upquote>
- *url*, <http://www.ctan.org/pkg/url>
- *xcolor*, <http://www.ctan.org/pkg/xcolor>
- *xkeyval*, <http://www.ctan.org/pkg/xkeyval>
- *xstring*, <http://www.ctan.org/pkg/xstring>

## 2.2 Invocation and options

To use this class, put in the preamble of your document

```
\documentclass[<options>]{acmart}
```

There are several options corresponding to the type of the document and its general appearance. They are described below. Generally speaking, the options have key=value forms, for example,

```
\documentclass[format=acmsmall, screen=true, review=false]{acmart}
```

The option `format` describes the format of the output. There are several possible values for this option, for example,

```
\documentclass[format=acmtog]{acmart}
```

Actually the words `format=` can be omitted, e.g.,

```
\documentclass[acmtog, review=false]{acmart}
```

The possible formats are listed in Table 1. Note that formats starting with `acm` are intended for journals, transactions, and course materials, while formats starting with `sig` are intended for proceedings published as books.

Sometimes conference proceedings are published as a special issue (or issues) of an ACM journal. In this case, you should use the journal format. The templates `sample-acmsmall-conf.tex` and `sample-acmtog-conf.tex` show how to enter conference information. Note that you need to comment out `\acmJournal{...}` line for such papers to get the conference information in the footers and headers.

Starting in 2020, ACM retired formats `sigchi` and `sigchi-a`. SIGCHI conferences now use `sigconf` format for their publications. If a file uses `sigchi` format, a warning is issued, and the format is automatically switched to `sigconf`. Format `sigchi-a` can be used for non-ACM documents only (see Section 2.23). The format `acmcp` is used for ACM cover pages discussed in Section 2.5.

There are several Boolean options that can take `true` or `false` values. They are listed in Table 2. The words `=true` can be omitted when setting a Boolean option, so instead of `screen=true` one can write just `screen`, for example,

```
\documentclass[acmsmall, screen, review]{acmart}
```

The option `review` is useful when combined with the `manuscript` format option. It provides a version suitable for reviewers and copy editors.

Two samples in the `samples` directory, `manuscript` and `acmsmall-submission`, show manuscripts formatted for submission to ACM.

The default for the option `screen` depends on the publication. At present it is `false` for all publications *but* PACM, since PACM is now electronic-only. Thus PACM titles (see Table 5) set this option to `true`. In the future this option may involve additional features suitable for on-screen versions of articles.

The option `natbib` is used when the corresponding BibTeX style is based on `natbib`. In most cases you do not need to set it. See Section 2.14.

Table 1: The possible values for the format option

Value	Meaning
manuscript	A manuscript. This is the default.
acmsmall	Small single-column format. Used for ACMJCSS, CIE, CSUR, DLT, FAC, GAMES, JACM, JATS, JDIQ, JDS, JEA, JERIC, JETC, JRC, PACM-CGIT, PACMHCI, PACMMOD, PACMNET, PACMPL, PACMSE, POMACS, TAAS, TACCESS, TACO, TALG, TALLIP (formerly TALIP), TCPS, TDS, TEAC, TECS, TELO, THRI, THS, TIOT, TISSEC, TIST, TKDD, TMIS, TOCE, TOCHI, TOCL, TOCS, TOCT, TODAES, TODS, TOIS, TOIT, TOMACS, TOMM (formerly TOMCCAP), TOMPECS, TOMS, TOPC, TOPLAS, TOPML, TOPS, TORS TOS, TOSEM, TOSN, TQC, TRET, TSAS, TSC, TSLP, and TWEB, including special issues.
acmlarge	Large single-column format. Used for DTRAP, HEALTH, IMWUT, JOCCH, and TAP, including special issues.
acmtog	Large double-column format. Used for TOG, including annual conference Technical Papers.
sigconf	Proceedings format for most ACM conferences (with the exception of SIGPLAN) and all ICPS volumes.
sigplan	Proceedings format for SIGPLAN conferences.
acmengage	ACM EngageCSEdu Course materials.
acmcp	ACM cover page.

The option `anonymous` is used for anonymous review processes and causes all author information to be obscured.

The option `timestamp` is used to include a time stamp in the footer of each page. When preparing a document, this can help avoid confusing different revisions. The footer also includes the page range of the document. This helps detect missing pages in hard copies.

The option `authordraft` is intended for author’s drafts that are not intended for distribution. It typesets a copyright block to give the author an idea of its size and the overall size of the paper but overprints it with the phrase “Unpublished working draft. Not for distribution”, which is also used as a watermark. This option sets `timestamp` and `review` to `true`, but these can be overridden by setting these options to `false` *after* setting `authordraft` to `true`.

The option `balance` determines whether the last page in the two column mode has balanced columns. By default it is `true`; however, it may lead to problems for some documents. Set it to `false` if you encounter compilation errors. Note that for one page documents `\balance` command might cause problems. An alternative is the (experimental) option `pbalance`, which uses the new package `pbalance` for this end.

The option `urlbreakonhyphens` determines whether URLs can be split between lines after hyphens. By default it is `true`. Set it to `false` to disallow these breaks.

The option `language` is used to define the languages for the multi-language papers. It is discussed in Section 2.6.

Table 2: Boolean options

Option	Default	Meaning
review	false	A review version: lines are numbered and hyperlinks are colored
screen	see text	A screen version: hyperlinks are colored
natbib	true	Whether to use the natbib package (see Section 2.14)
anonymous	false	Whether to make author(s) anonymous
authorversion	false	Whether to generate a special version for the authors' personal use or posting (see Section 2.3)
nonacm	false	Use the class typesetting options for a non-ACM document, which will not include the conference/journal header and footers. Currently such documents allow only a Creative Commons license.
timestamp	false	Whether to put a time stamp in the footer of each page
authordraft	false	Whether author's-draft mode is enabled
acmthm	true	Whether to define theorem-like environments, see Section 2.10
balance	true	Whether to balance the last page in two column mode
pbalance	false	Whether to balance the last page in two column mode using pbalance package
urlbreakonhyphens	true	Whether to break urls on hyphens



## 2.3 Top matter

A number of commands set up *top matter* or (in computer science jargon) *metadata* for an article. They establish the publication name, article title, authors, DOI and other data. Some of these commands, like `\title` and `\author`, should be put by the authors. Others, like `\acmVolume` and `\acmDOI`—by the editors. Below we describe these commands and mention who should issue them. These macros should be used *before* the `\maketitle` command. Note that in previous versions of ACM classes some of these commands should be used before `\maketitle`, and some after it. Now they all must be used before `\maketitle`.

This class internally loads the `amsart` class, so many top-matter commands are inherited from `amsart` [2].

`\acmJournal` The macro `\acmJournal{\shortName}` sets the name of the journal or transaction for journals and transactions. The argument is the short name of the publication in *uppercase*, for example,

```
\acmJournal{TOMS}
```

The currently recognized journals are listed in Table 5. Note that conference proceedings published in *book* form do not set this macro.

`\acmConference` The macro `\acmConference[\short name][\name][\date][\venue]` is used for conference proceedings published in the book form. The arguments are the following:

**short name:** the abbreviated name of the conference (optional).

**name:** the name of the conference.

**date:** the date(s) of the conference.

**venue:** the place of the conference.

Examples:

```
\acmConference[TD'15]{Technical Data Conference}{November
12--16}{Dallas, TX, USA}
\acmConference[SA'15 Art Papers]{November 02--06, 2015}{Kobe, Japan}
```

`\acmBooktitle` By default we assume that conference proceedings are published in the book named *Proceedings of CONFERENCE*, where CONFERENCE is the name of the conference inferred from the command `\acmConference` above. However, sometimes the book title is different. The command `\acmBooktitle` can be used to set this title, for example,

```
\acmBooktitle{Companion to the first International Conference on the
Art, Science and Engineering of Programming (Programming '17)}
```

An ACM paper should have either `\acmJournal` or `\acmConference` command. If it has both (or more) commands, the last one takes precedence. Note that if you have the command `\acmConference` in a journal format like `acmsmall`, the class will use conference format for `bibstrip` and reference citation formatting. In the samples directory there is a file `sample-acmsmall-conf.tex` with the example of this usage.

An ACM Engage material should *not* use `\acmJournal` or `\acmConference` command. It may use `\acmBooktitle` to override the default *ACM EngageCSEdu*. It should use `\acmYear` to set the date of the material.

`\editor` In most cases, conference proceedings are edited. You can use the command `\editor{<editor>}` to set the editor of the volume. This command can be repeated, for example,

```
\editor{Jennifer B. Sartor}
\editor{Theo D'Hondt}
\editor{Wolfgang De Meuter}
```

`\title` The command `\title`, as in the `amsart` class, has two arguments: one optional, and one mandatory:

```
\title[<ShortTitle>]{<FullTitle>}
```

The mandatory argument is the full title of the article. The optional argument, if present, defines the shorter version of the title for running heads. If the optional argument is absent, the full title is used instead.

It is expected that this command is inserted by the author of the manuscript.

`\subtitle` Besides title, ACM classes allow a subtitle, set with the `\subtitle{<subtitle>}` macro.

The commands for specifying authors are highly structured. The reason is they serve double duty: the authors' information is typeset in the manuscript *and* is used by the metadata extraction tools for indexing and cataloguing. Therefore it is very important to follow the guidelines exactly.

`\author` The basic commands are `\author`, `\orcid` (for the researchers registered with ORCID, <http://www.orcid.org/>), `\affiliation` and `\email`. In the simplest case, you

`\affiliation` enter them in this order:

```
\email
\author{...}
\orcid{...}
\affiliation{...}
\email{...}
```

Do *not* use the  $\LaTeX$  `\and` macro or commas, or `\\` between the authors! Each author deserves his or her own `\author` command. An attempt to list several authors or their e-mails in one command leads to a warning or an error. This is not a bug, but the expected behavior.

Note that some formats do not typeset e-mails or ORCID identifiers. Do not worry: the metadata tools will get them.

ACM strongly encourages that you include ORCIDs for all authors before compiling or submitting for review and/or production processing.

If you do not have an ORCID, you may get one for free by registering at <http://www.orcid.org/>.

Sometimes an author has several affiliations. In this case, the `\affiliation` command should be repeated:

```
\author{...}
\orcid{...}
\affiliation{...}
\affiliation{...}
\email{...}
```

Similarly you can repeat the `\email` command.

You may have several authors with the same affiliation, different affiliations, or overlapping affiliations (author  $A_1$  is affiliated with institutions  $I_1$  and  $I_2$ , while author  $A_2$  is affiliated with  $I_2$  only, author  $A_3$  is affiliated with  $I_1$  and  $I_3$ , etc.). The recommended solution is to put the `\affiliation` commands after each author, possibly repeating them:

```
\author{...}
\orcid{...}
\affiliation{...}
\affiliation{...}
\email{...}
\author{...}
\orcid{...}
\affiliation{...}
\email{...}
\author{...}
\orcid{...}
\affiliation{...}
\affiliation{...}
\email{...}
```

In some cases, when several authors share the same affiliation, you can try to save space using the format

```
\author{...}
\email{...}
\author{...}
\email{...}
\affiliation{...}
```

However, this format is not generally recommended.

`\additionalaffiliation` In some cases, too many affiliations can take too much space. The command `\additionalaffiliation{<affiliation>}` creates a footnote after an author's name with the words "Also with {<affiliation>}". You should use this command only as a last resort. An example of usage is:

```
\author{G. Tobin}
\author{Ben Trovato}
\additionalaffiliation{%
  \institution{The Th{\o}rv{\a}ld Group}
  \city{Hekla}
  \country{Iceland}}
\affiliation{%
  \institution{Institute for Clarity in Documentation}
  \city{Dublin}
  \state{Ohio}}
```

Here Trovato and Tobin share their affiliation with the Institute for Clarity in Documentation, but only Ben Trovato is affiliated with The Th{\o}rv{\a}ld Group.

`\position` The `\affiliation` and `\additionalaffiliation` commands are further structured  
`\institution` to interact with the metadata extraction tools. Inside these commands you should use  
`\department`  
`\city`  
`\state`  
`\country`

the `\position`, `\institution`, `\department`, `\city`, `\state`, and `\country` macros to indicate the corresponding parts of the affiliation. Note that in some cases (for example, journals) these parts are not printed in the resulting copy, but they *are* necessary since they are used by the XML metadata extraction programs. Do *not* put commas or `\\` between the elements of `\affiliation`. They will be provided automatically.

The fields `\institution`, `\city` and `\country` are mandatory. If they are not provided, an error or a warning is issued. Currently the absence of `\country` produces an error; ACM may change this in the future.

Starting 2024, ACM no longer collects or print postal addresses of the authors. Thus the commands `\streetaddress` and `\postcode`, present in the previous versions of the class, now produce a warning.

An example of the author block:

```
\author{A. U. Thor}
\orcid{1234-4564-1234-4565}
\affiliation{%
  \institution{University of New South Wales}
  \department{School of Biomedical Engineering}
  \city{Sidney}
  \state{NSW}
  \country{Australia}}
\email{author@nsw.au.edu}
\author{A. N. Other}
\affiliation{%
  \institution{University of New South Wales}
  \city{Sidney}
  \state{NSW}
  \country{Australia}}
\author{C. O. Respondent}
\orcid{1234-4565-4564-1234}
\affiliation{%
  \institution{University of Pennsylvania}
  \city{Philadelphia}
  \state{PA}
  \country{USA}}
\affiliation{%
  \institution{University of New South Wales}
  \city{Sidney}
  \state{NSW}
  \country{Australia}}
```

Note that the old ACM conference formats did not allow more than six authors and required some effort from authors to achieve alignment. The new format is much better in this.

Sometimes an author works in several departments within the same institution. There could be two situations: the departments are independent, or one department is within another. In the first case, just repeat the command `\department` several times. To handle the second case the command has an optional numerical parameter. The departments with higher numbers are higher in the organizational chart. Compare

```
\affiliation{%
  \department[0]{Department of Lunar Studies} % 0 is the default
```

```

\department[1]{John Doe Institute} % higher than 0
\institution{University of San Serriffe}
\country{San Serriffe}

```

and

```

\affiliation{%
\department{Department of Lunar Studies} % Not in the John Doe Institute!
\department{John Doe Institute}
\institution{University of San Serriffe}
\country{San Serriffe}
}

```

`\thanks` Like `amsart` (and unlike standard  $\LaTeX$ ), we allow `\thanks` only *outside* of the commands `\title` and `\author`. This command is obsolete and should *not* be used in most cases. Do not list your acknowledgments or grant sponsors here. Put this information in the `acks` environment (see Section 2.13).

`\authorsaddresses` In some formats, addresses are printed as a footnote on the first page. By default  $\LaTeX$  typesets them itself using the information you give it. However, you can override its choice using the command `\authorsaddresses{<contact addresses>}`, for example,

```

\authorsaddresses{%
Authors' addresses: G.~Zhou, Computer Science Department, College of
William and Mary, 104 Jameson Rd, Williamsburg, PA 23185, US;
V.~B'eranger, Inria Paris-Rocquencourt, Rocquencourt, France;
A.~Patel, Rajiv Gandhi University, Rono-Hills, Doimukh, Arunachal
Pradesh, India; H.~Chan, Tsinghua University, 30 Shuangqing Rd,
Haidian Qu, Beijing Shi, China; T.~Yan, Eaton Innovation Center,
Prague, Czech Republic; T.~He, C.~Huang, J.~A.~Stankovic University
of Virginia, School of Engineering Charlottesville, VA 22903, USA;
T. F. Abdelzaher, (Current address) NASA Ames Research Center,
Moffett Field, California 94035.}

```

You can *suppress* printing authors' addresses by setting them to an empty string: `\authorsaddresses{}`. Please note that authors' addresses are mandatory for journal articles.

`\titlenote` While the command `\thanks` generates a note without a footnote mark, sometimes  
`\subtitlenote` the authors might need notes more tightly connected to the title, subtitle or author. The  
`\authornote` commands `\titlenote`, `\subtitlenote` and `\authornote` that follow the corresponding commands (`\title`, `\subtitle` and `\author`) generate such notes. For example,

```

\title{This is a title}
\titlenote{This is a titlenote}
\author{A. U. Thor}
\authornote{This is an authornote}

```

Please never use a `\footnote` inside an `\author` or `\title` command since this confuses the metadata extraction software. (Actually these commands now produce errors.)

`\authornotemark` Sometimes one may need to have the same footnote connected to several authors. The command `\authornotemark[<number>]` adds just the footnote mark, for example,

```

\author{A. U. Thor}

```

```

\authornote{Both authors contributed equally to the paper}
...
\author{A. N. Other}
\authornotemark[1]

```

The correct numbering of these marks is the responsibility of the user.

```

\acmVolume    The macros \acmVolume, \acmNumber, \acmArticle, \acmYear and \acmMonth are
\acmNumber    inserted by the editor and set the journal volume, issue, article number, year and month
\acmArticle    correspondingly. The arguments of all these commands, including \acmMonth, is numer-
\acmYear       ical. For example,
\acmMonth
\acmVolume{9}
\acmNumber{4}
\acmArticle{39}
\acmYear{2010}
\acmMonth{3}

```

Note that `\acmArticle` is used not only for journals but also for some conference proceedings.

```

\acmArticleSeq    The articles in the same issue of a journal have a sequence number. By default it is
                  the same as the article number, but the command \acmArticleSeq{<n>} can be used to
                  change it:

```

```

\acmArticle{39} % The sequence number will be 39 by default
\acmArticleSeq{5} % We redefine it to 5

```

```

\acmSubmissionID    If your paper got a Submission ID from the Conference Management System, put it
                    here:

```

```

\acmSubmissionID{123-A56-BU3}

```

```

\acmISBN    Book-like volumes have ISBN numbers attached to them. The macro \acmISBN{<ISBN>}
            sets it. Normally it is set by the typesetter, for example,

```

```

\acmISBN{978-1-4503-3916-2}

```

Setting it to the empty string, as `\acmISBN{}`, suppresses printing the ISBN.

```

\acmDOI    The macro \acmDOI{<DOI>} sets the DOI of the article, for example,

```

```

\acmDOI{10.1145/9999997.9999999}

```

It is normally set by the typesetter. Setting it to the empty string, as `\acmDOI{}`, suppresses the DOI.

```

\acmBadge    Some conference articles get special distinctions, for example, the artifact evaluation
            for PPOPP 2016 (see http://ctuning.org/ae/ppopp2016.html). These articles display
            special badges supplied by the conference organizers. This class provides command to
            add these badges: \acmBadge[<url>]{<graphics>}. The arguments have the following
            meaning: [<url>], if provided, sets the link to the badge authority in the screen version,
            while {<graphics>} sets the graphics file with the badge image. The file must be a cropped

```

square, which is scaled to a standard size in the output. For example, if the badge image is `ae-logo.pdf`, the command is

```
\acmBadgeR[http://ctuning.org/ae/ppopp2016.html]{ae-logo}
```

The command can be repeated, if a paper has several badges.

`\startPage` The macro `\startPage{<page>}` sets the first page of the article in a journal or book. It is used by the typesetter.

`\terms` The command `\keywords{<keyword, keyword,...>}` sets keywords for the article.

`\keywords` They must be separated by commas, for example,

```
\keywords{wireless sensor networks, media access control,  
multi-channel, radio interference, time synchronization}
```

`CCSXML (env)` ACM publications are classified according to the ACM Computing Classification Scheme (CCS). CCS codes are used both in the typeset version of the publications *and* in the metadata in various databases. Therefore you need to provide both  $\TeX$  commands and XML metadata with the paper.

The tool at <http://dl.acm.org/ccs.cfm> can be used to generate CCS codes. After you select the topics, click on “Generate CCS codes” to get results like the following:

```
\begin{CCSXML}  
<ccs2012>  
  <concept>  
    <concept_id>10010520.10010553.10010562</concept_id>  
    <concept_desc>Computer systems organization~Embedded systems</concept_desc>  
    <concept_significance>500</concept_significance>  
  </concept>  
  <concept>  
    <concept_id>10010520.10010575.10010755</concept_id>  
    <concept_desc>Computer systems organization~Redundancy</concept_desc>  
    <concept_significance>300</concept_significance>  
  </concept>  
  <concept>  
    <concept_id>10010520.10010553.10010554</concept_id>  
    <concept_desc>Computer systems organization~Robotics</concept_desc>  
    <concept_significance>100</concept_significance>  
  </concept>  
  <concept>  
    <concept_id>10003033.10003083.10003095</concept_id>  
    <concept_desc>Networks~Network reliability</concept_desc>  
    <concept_significance>100</concept_significance>  
  </concept>  
</ccs2012>  
\end{CCSXML}
```

```
\ccsdesc[500]{Computer systems organization~Embedded systems}  
\ccsdesc[300]{Computer systems organization~Redundancy}  
\ccsdesc{Computer systems organization~Robotics}  
\ccsdesc[100]{Networks~Network reliability}
```

You just need to copy this code and paste it in your paper anywhere before `\maketitle`.

CCS Concepts and user-defined keywords are required for all articles over two pages in length, and are optional for one- and two-page articles (or abstracts).

`\setcopyright` There are several possibilities for the copyright of the papers published by the ACM: the authors may license the paper to the ACM, some or all authors might be employees of the US or Canadian governments, etc. Accordingly the command `\setcopyright{...}` is introduced. Its argument is the copyright status of the paper, for example, `\setcopyright{acmcopyright}`. The possible values for this command are listed in Table 3. This command must be placed in the preamble, before `\begin{document}`. Additional information about ACM copyright rules is discussed in Section 2.18.

`\setcctype` If Creative Commons license is used, the package by default chooses CC-BY 4.0 Attribution 4.0 International license. You can override this choice by the command `\setcctype[<version>]{<type>}`, where [*<version>*] can be either 3.0 or 4.0 (4.0 by default), and {*<type>*} can be one of zero, by, by-sa, by-nd, by-nc, by-nc-sa, by-nc-nd (see <https://creativecommons.org/licenses/> for the explanation). This command should be used in the preamble only.

Material published under Creative Commons license should include the corresponding icon. A modern T<sub>E</sub>X distribution includes these icons in the package *doclicense*. In case your distribution does not have them, ACM provides a file `cciicons.zip` with these icons. Just unzip it in the same directory where your document is.

The ACM submission software should generate the right command for you to paste into your file.

`\copyrightyear` Each copyright statement must have the year of copyright. By default it is the same as `\acmYear`, but you can override this using the macro `\copyrightyear`, e.g.,

```
\acmYear{2016}
\copyrightyear{2015}
```

There is a special case for a personal copy that the authors may be allowed to generate for their use or a posting on a personal site (check the instructions for the specific journal or conference for the details). The document option `authorversion=true` produces a special form of the copyright statement for this case. Note that you still need the `\setcopyright` command and (optionally) `\copyrightyear` command to tell T<sub>E</sub>X about the copyright owner and year. Also, you should be aware that due to the different sizes of the permission blocks for the printed version and authors' version, the page breaks might be different between them.

`abstract (env.)` The environment `abstract` must *precede* the `\maketitle` command. Again, this is different from the standard L<sup>A</sup>T<sub>E</sub>X. Putting `abstract` after `\maketitle` will trigger an error.

`teaserfigure (env.)` A special kind of figure is used for many two-column conference proceedings. This figure is placed just after the authors but before the main text. The environment `teaserfigure` is used for these figures. This environment must be used *before* `\maketitle`, for example,

```
\begin{teaserfigure}
  \includegraphics[width=\textwidth]{sampleteaser}
  \caption{This is a teaser}
  \label{fig:teaser}
\end{teaserfigure}
```



Table 3: Parameters for the `\setcopyright` command

Parameter	Meaning
<code>none</code>	The copyright and permission information is not typeset. (This is the option for some ACM conferences.)
<code>acmlicensed</code>	The authors retain the copyright but license the publication rights to ACM.
<code>rightsretained</code>	The authors retain the copyright and publication rights to themselves or somebody else.
<code>usgov</code>	All the authors are employees of the US government.
<code>usgovmixed</code>	Some authors are employees of the US government.
<code>cagov</code>	All the authors are employees of the Canadian government.
<code>cagovmixed</code>	Some authors are employees of the Canadian government.
<code>licensedusgovmixed</code>	Some authors are employees of the US government, and the publication rights are licensed to ACM.
<code>licensedcagov</code>	All the authors are employees of the Canadian government, and the publication rights are licensed to ACM.
<code>licensedcagovmixed</code>	Some authors are employees of the Canadian government, and the publication rights are licensed to ACM.
<code>othergov</code>	Authors are employees of a government other than the US or Canada.
<code>licensedothergov</code>	Authors are employees of a government other than the US or Canada, and the publication rights are licensed to ACM.
<code>iw3c2w3</code>	Special statement for conferences organized by IW3C2.
<code>iw3c2w3g</code>	Special statement for conferences organized by IW3C2, when some authors are approved Google employees.
<code>cc</code>	Creative Commons license. If this key is set, <i>doclicense</i> images are used to typeset the license. See also <code>\setcctype</code> command. Note that at present this license can be used only either for <code>acmengage</code> format, or for <code>nonacm</code> publications, or for the authors that meet any of the following requirements: (a) part of the ACM Open Program; (b) publishing in a Gold Open Access publication; (c) paying the Open Access APC; (d) part of the Google publishing agreement.
<code>acmcopyright</code>	The authors transfer the copyright to the ACM. This choice is no longer available for the non-commissioned authors and will trigger a warning.

Table 4: Settings for the `\settopmatter` command

Parameter	Values	Meaning
<code>printccs</code>	true/false	Whether to print CCS categories
<code>printacmref</code>	true/false	Whether to print the ACM bibliographic entry
<code>printfolios</code>	true/false	Whether to print page numbers (folios)
<code>authorsperrow</code>	numeric	Number of authors per row for the title page in conference proceedings formats

`\settopmatter` Some information in the top matter is printed for certain journals or proceedings and suppressed for others. You can override these defaults using the command `\settopmatter{<settings>}`. The settings and their meanings are listed in Table 4. For example,

```
\settopmatter{printacmref=false, printccs=true, printfolios=true}
```

The parameter `authorsperrow` requires some explanation. In conference proceedings authors' information is typeset in boxes, several boxes per row (see `sample-sigconf.pdf`, `sample-sigplan.pdf`, etc.). The number of boxes per row is determined automatically. If you want to override this, you can do it using this parameter, for example,

```
\settopmatter{authorsperrow=4}
```

However, in most cases you should *not* do this and should use the default settings. Setting `authorsperrow` to 0 will revert it to the default settings.

The parameter `printacmref` specifies whether to print the ACM bibliographic entry (default), or not. Note that this entry is required for all articles over one page in length, and is optional for one-page articles (abstracts).

`\received` The command `\received[<stage>]{<date>}` sets the history of the publication. The `[<stage>]` argument is optional; the default is Received for the first date and revised for the subsequent ones. For example,

```
\received{20 February 2007}
\received[revised]{12 March 2009}
\received[accepted]{5 June 2009}
```

`\maketitle` The macro `\maketitle` must be the last command in the top-matter group. That is it must follow the commands defined in this section.

`\shortauthors` *After* the command `\maketitle`, the macro `\shortauthors` stores the names of the authors for the running head. You can redefine it if the list of author's name is too long, e.g.,

```
\maketitle
\renewcommand{\shortauthors}{Zhou et al.}
```

## 2.4 Top matter of ACM Engage materials

ACM Engage materials resemble conference proceedings, but have some special features. First, as a rule, they are released under a Creative Commons license. By default CC-BY is used. However, if you want to use another variant of CC license, use

`\setcctype` command, for example, `\setcctype{by-nc}`. Second, abstract is called *synopsis*. Third, there are special top matter items used for the materials, such as *Course*, *Resource Type*, *Programming Language*, *CS Topics*.

`\setengagemetadata` These items are set with the command `\setengagemetadata{<name>}{<value>}`, for example,

```
\setengagemetadata{Course}{CS1}
\setengagemetadata{Programming Language}{Python}
\setengagemetadata{Knowledge Unit}{Programming Concepts}
\setengagemetadata{CS Topics}{Functions, Data Types, Expressions,
Mathematical Reasoning}
```

Note that the type of Creative Commons license, if such license is used, is automatically added to the metadata.

## 2.5 ACM cover page

ACM cover pages are forms of extended abstracts that are added to journals at the late stage. Authors prepare them as separate .tex files using acmcp format. At present only JDS uses them, but in the future this may change.

There are several top matter commands specific for this format.

`\acmArticleType` There are five article types accepted by JDS: *Research* (the default), *Review*, *Discussion*, *Invited*, and *Position*. The command `\acmArticleType{<type>}` sets the article type, for example

```
\acmArticleType{Review}
```

`\acmCodeLink` The commands `\acmCodeDataLink{<link>}` and `\acmDataLink{<link>}` set the links  
`\acmDataLink` to the data and code accompanying the paper, for example,

```
\acmCodeLink{https://github.com/repository/code}
\acmDataLink{https://datadryad.org/stash/dataset/doi:DOI}
```

You may repeat these commands if you have several repositories.

`\acmContributions` The command `\acmContributions{<contributions>}` sets the contributions of the authors, for example,

```
\acmContributions{AW designed the study, CD performed it, all
authors contributed to the writing.}
```

ACM cover page should have the following obligatory sections:

- Problem statement,
- Methods,
- Results,
- Significance.

Sometimes the addresses extracted from the authors' data are too long to fit on the page. In this case the command `\authorsaddresses` can be use to override them, for example,

```
\authorsaddresses{Corresponding author: Ben Trovato,
\href{mailto:trovato@corporation.com}{trovato@corporation.com};
Institute for Clarity in Documentation, P.O. Box 1212, Dublin,
Ohio, USA, 43017-6221}
```

The design of the cover page may require additional runs of latex to make the elements of the page align.

## 2.6 Internationalization

ACM accepts publications in languages other than English, as well as papers in English with translations of titles, subtitles, keywords and abstracts into other languages. Papers in languages other than English usually have titles, subtitles (if applicable), keywords and abstracts in English. Note that CCS concepts are always typeset in English.

To submit these papers you need to set the option `language` in the `\documentclass` command. This option can be repeated, for example,

```
\documentclass[sigconf, language=french, language=english]{acmart}
```

The last language in the list is the main language of the paper, i.e. the one for the main title, abstract, body, etc. The other languages are *secondary*, and used for translated titles, keywords, abstracts. Thus the paper above is written in English, and has a secondary abstract and a secondary title in French. On the other hand, a paper in French with secondary titles and abstracts in English and German should use, for example

```
\documentclass[sigconf,
language=german,
language=english,
language=french]{acmart}
```

This key can use any language defined in *babel* package [3] (currently the package is tested with English, French, German and Spanish languages; other languages may require a translation of `\keywordsname` macro). Actually *acmart* loads *babel* internally, so you can use the facilities provided by this package.

If this key is set, you have access to several additional top matter commands.

`\translatedtitle`     The commands `\translatedtitle{<language>}title`, `\translatedsubtitle{<language>}subtitle`  
`\translatedsubtitle` and `\translatedkeywordslanguagekeywords` are used to set title, subtitle and key-  
`\translatedkeywords` words in the secondary language. For example, a paper in English with French title and abstract may set

```
\title{A note on computational complexity}
\translatedtitle{french}{Remarque sur la complexit'e de calcul}
```

while a paper in French should set

```
\title{Remarque sur la complexit'e de calcul}
\translatedtitle{english}{A note on computational complexity}
```

`translatedabstract (env)` Similarly, `translatedabstract` environment has a mandatory language argument, for example,

```
\begin{translatedabstract}{english}
  This is the English version of the abstract
\end{translatedabstract}
```

You can repeat these commands if a paper has more than one secondary language.

Use the standard commands (`\title`, `\subtitle`, `\keywords`, `abstract`) for the main language of the paper.

## 2.7 Algorithms

There are now several good packages for typesetting algorithms [4, 5, 6], and the authors are free to choose their favorite one.

## 2.8 Figures and tables

The new ACM styles use the standard L<sup>A</sup>T<sub>E</sub>X interface for figures and tables. There are some important items to be aware of, however.

1. The captions for figures must be entered *after* the figure bodies and for tables *before* the table bodies.
2. The ACM uses the standard types for figures and tables and adds several new ones. In total there are the following types:
  - figure, table:** a standard figure or table taking a full text width in one-column formats and one column width in two-column formats.
  - figure\***, **table\*** in two-column formats, a special figure or table taking a full text width.
  - teaserfigure:** a special figure before `\maketitle`.
3. Accordingly, when scaling images, one should use the following sizes:
  - (a) For `teaserfigure`, `figure` in one-column mode or `figure*` in two-column mode, use `\textwidth`. In one-column mode, you can also use `\columnwidth`, which coincides with `\textwidth` in this case.
  - (b) For `figure` in two-column mode, use `\columnwidth`.

It is strongly recommended to use the package `booktabs` [7] and follow its main principles of typography with respect to tables:

1. Never, ever use vertical rules.
2. Never use double rules.

It is also a good idea not to overuse horizontal rules.

For table *footnotes* you have several options described in the TeX FAQ [1]. The simplest one is to use a `\minipage` environment:

```
\begin{table}
\caption{Simulation Configuration}
```

```

\label{tab:conf}
\begin{minipage}{\columnwidth}
\begin{center}
\begin{tabular}{ll}
\toprule
TERRAIN\footnote{This is a table footnote. This is a
  table footnote. This is a table footnote.} &
(200\,m\$\times\$200\,m) Square\\
Node Number & 289\\
Node Placement & Uniform\\
Application & Many-to-Many/Gossip CBR Streams\\
Payload Size & 32 bytes\\
Routing Layer & GF\\
MAC Layer & CSMA/MMSN\\
Radio Layer & RADIO-ACCNOISE\\
Radio Bandwidth & 250Kbps\\
Radio Range & 20m--45m\\
\bottomrule
\end{tabular}
\end{center}
\bigskip
\footnotesize\emph{Source:} This is a table
sourcernote. This is a table sourcernote. This is a table
sourcernote.

\emph{Note:} This is a table footnote.
\end{minipage}
\end{table}

```

Tables and figures are by default centered. However, in some cases (for example, when you use several subimages per figure) you may need to override this. A good way to do so is to put the contents into a `\minipage` of the width `\columnwidth`.

## 2.9 Descriptions of images

`\Description` Some readers of ACM publications might be visually challenged. These readers might use a voice-over software to read aloud the papers. It is important to provide them a description of each image used in the paper.

The command `\Description[short description][long description]` should be placed inside every figure, `teaserfigure` or `marginfigure` environment to provide a description of the image(s) used in the figure. Unlike `\caption`, which is used alongside the image, `\Description` is intended to be used instead of the image, for example,

```

\begin{figure}
\centering
\includegraphics{voltage}
\Description{A bell-like histogram centered at $0.5\sim V$ with most
measurements between $0.2\sim V$ and $0.8\sim V$}
\caption{Histogram of the measurements of voltage}
\label{fig:voltage}
\end{figure}

```

At present the lack of descriptions generates a warning at compilation.

## 2.10 Theorems

The ACM classes define two theorem styles and several pre-defined theorem environments:

**acmplain:** this is the style used for theorem, conjecture, proposition, lemma and corollary, and

**acmdefinition:** this is the style used for example and definition.

These environments are defined by default. In the unusual circumstance that a user does not wish to have these environments defined, the option `acmthm=false` in the preamble will suppress them.

Sometimes authors want to define new theorem-like constructs that use theorem counters. These constructs must be defined either after `\begin{document}`, or delayed using `\AtEndPreamble` macro, for example,

```
\AtEndPreamble{%
  \theoremstyle{acmdefinition}
  \newtheorem{remark}[theorem]{Remark}}
```

## 2.11 Online-only and offline-only material

`printonly` (*env.*) Some supplementary material in ACM publications is put online but not in the printed `screenonly` (*env.*) version. The text inside the environment `screenonly` will be typeset only when the option `screen` (see Section 2.2) is set to true. Conversely, the text inside the environment `printonly` is typeset only when this option is set to false. For example,

```
\section{Supplementary materials}

\begin{printonly}
  Supplementary materials are available in the online version of this paper.
\end{printonly}

\begin{screenonly}
  (The actual supplementary materials.)
\end{screenonly}
```

We use the `comment` package for typesetting this code, so `\begin` and `\end` should start on a line of their own with no leading or trailing spaces.

## 2.12 Note about anonymous mode

`anonsuppress` (*env.*) When the option `anonymous` is selected,  $\TeX$  suppresses author information (including the number of authors) for an anonymous review. However, sometimes the information identifying the authors may be present in the body of the paper. For example,

```
\begin{anonsuppress}
  This is the continuation of the previous work by the author
  \cite{prev1, prev2}.
\end{anonsuppress}
```

As for the `printonly` and `screenonly` environments, `\begin{anonsuppress}` and `\end{anonsuppress}` should start on a line of their own with no leading or trailing spaces.

`\anon` To suppress short snippets of information, use the command `\anon[substitute]{suppressed-text}`. By default [*substitute*] is the word ANONYMOUS. Examples:

```
This work was performed at \anon{NSA}.
This work was performed at \anon[No Such Agency]{NSA}.
```

## 2.13 Acknowledgments

The traditional “Acknowledgments” section is conventionally used to thank persons and granting agencies for their help and support. However, there are several important considerations about this section.

First, in anonymous mode this section must be omitted: it gives too much information to reviewers. Second, data about grants is extracted and stored separately by the postprocessing software. ACM classes provide facilities for both these tasks.

`acks (env)` The environment `acks` starts an unnumbered section “Acknowledgments” unless the anonymous mode is chosen. Put all thanks inside this environment.

As for the `printonly` and `screenonly` environments, `\begin{acks}` and `\end{acks}` should start on a line of their own with no leading or trailing spaces.

`\grantsponsor` All financial support *must* be listed using the commands `\grantsponsor` and `\grantnum`. These commands tell the postprocessing software about the granting organization and grant. The format of these commands is the following:

```
\grantsponsor{sponsorID}{name}{url}
\grantnum[url]{sponsorID}{number}.
```

Here `{sponsorID}` is the unique ID used to match grants to sponsors, `{name}` is the name of the sponsor, `{url}` is its URL, and `{number}` is the grant number. The `{sponsorID}` of the `\grantnum` command must correspond to the `{sponsorID}` of a `\grantsponsor` command. Some awards have their own web pages, which you can include using the optional argument of the `\grantnum` command.

At present `{sponsorID}` is chosen by the authors and can be an arbitrary key in the same way the label of a `\cite` is arbitrarily chosen. There might be a change to this policy if the ACM decides to create a global database of sponsoring organizations.

Example:

```
\begin{acks}
The authors would like to thank Dr. Yuhua Li for providing the
matlab code of the \textit{BEPS} method.
```

```
The authors would also like to thank the anonymous referees for
their valuable comments and helpful suggestions. This work is
supported by the \grantsponsor{GS501100001809}{National Natural
Science Foundation of
China}{https://doi.org/10.13039/501100001809} under Grant
No.: ~\grantnum{GS501100001809}{61273304}
and ~\grantnum[http://www.nnsf.cn/youngscientists]{GS501100001809}{Young
Scientists' Support Program}.
\end{acks}
```



## 2.14 Bibliography

The ACM lets you use either Bib $\TeX$  or Bib $\LaTeX$  to process your references: they require slightly different setup of your  $\LaTeX$  file, as detailed in the following subsections.

### 2.14.1 Processing using Bib $\TeX$

This uses the `natbib` package for formatting references and the Bib $\TeX$  style file `ACM-Reference-Format.bst` for Bib $\TeX$  processing. You can disable loading of `natbib` using the option `natbib=false` in `\documentclass`. However, it is not recommended, as well as the use of Bib $\TeX$  styles other than `ACM-Reference-Format.bst`, and may delay the processing of the manuscript.

`\citestyle` If you use `natbib`, you can select one of two predefined citation styles using the command `\citestyle`: the author-year format `acmauthoryear` or the numeric format `acmnumeric`. For example,

```
\citestyle{acmauthoryear}
```

Note that numeric citations are the default mode for most formats.

`\setcitestyle` You can further customize `natbib` using the `\setcitestyle` command, for example,

```
\setcitestyle{numbers,sort&compress}
```

One of the more common versions is

```
\setcitestyle{nosort}
```

It is useful if you do not like the way `natbib` sorts citation lists.

If you use `natbib`, then commands like `\citep` and `\citeauthor` are automatically supported. The command `\shortcite` is the same as `\cite` in numerical mode and cites the year in author-date mode.

Note that before version 1.48 the command `\citeyear` put the year in parentheses. In version 1.48 and later it produces just the year; the command `\citeyearpar` can be used to emulate its old behavior.

There are several customized Bib $\TeX$  entry types and fields in the ACM style file `ACM-Reference-Format.bst` that you may want to be aware of.

The style supports the fields `doi` and `url`, for example,

```
doi = "10.1145/1188913.1188915",
url = "http://ccrma.stanford.edu/~jos/bayes/bayes.pdf",
```

Normally the printing of URL is suppressed if DOI is present. However, there is a special field `distinctURL`. If it is present and is not zero, URL is printed even if DOI is present.

The style supports the arXiv-recommended fields `eprint` and (optionally) `primaryclass`, for example,

```
eprint = "960935712",
primaryclass = "cs",
```

See the examples at <https://arxiv.org/help/hypertex/bibstyles>.

There are several special entry types. Types `online` and `game` are used for Web pages and games, for example,

```
@online{Thornburg01,
  author = "Harry Thornburg",
  year = "2001",
  title = "Introduction to Bayesian Statistics",
  url = "http://ccrma.stanford.edu/~jos/bayes/bayes.html",
  month = mar,
  lastaccessed = "March 2, 2005",
}
```

Entry types `artifactsoftware`, `artifactdataset` (with synonyms `software` and `dataset`) can be used to cite software artifacts and datasets, for example,

```
@ArtifactSoftware{R,
  title = {R: A Language and Environment for Statistical Computing},
  author = {{R Core Team}},
  organization = {R Foundation for Statistical Computing},
  address = {Vienna, Austria},
  year = {2019},
  url = {https://www.R-project.org/},
}
@ArtifactDataset{UMassCitations,
  author = {Sam Anzaroot and Andrew McCallum},
  title = {{UMass} Citation Field Extraction Dataset},
  year = 2013,
  url =
    {http://www.iesl.cs.umass.edu/data/data-umasscitationfield},
  lastaccessed = {May 27, 2019}
}
```

For these entry types you can use the `lastaccessed` field to add the access date for the URL.

There are two ways to enter video or audio sources in the bibliography corresponding to two different possibilities. For standalone sources available online, you can use an `online` entry and set its `howpublished` field. For example,

```
@online{Obama08,
  author = "Barack Obama",
  year = "2008",
  title = "A more perfect union",
  howpublished = "Video",
  day = "5",
  url = "http://video.google.com/videoplay?docid=6528042696351994555",
  month = mar,
  lastaccessed = "March 21, 2008",
}
```

For sources available as attachments to conference proceedings and similar documents, you can use the usual `inproceedings` entry type and set its `howpublished` field:

```
@Inproceedings{Novak03,
```

```

author =      "Dave Novak",
title =       "Solder man",
booktitle =   "ACM SIGGRAPH 2003 Video Review on Animation theater Program",
year =        "2003",
publisher =   "ACM Press",
address =     "New York, NY",
pages =       "4",
month =       "March 21, 2008",
doi =         "10.9999/woot07-S422",
howpublished = "Video",
}

```

Sometimes you need to cite a complete issue of a journal. The periodical entry type is intended for this:

```

@periodical{JCohen96,
key =         "Cohen",
editor =      "Jacques Cohen",
title =       "Special issue: Digital Libraries",
journal =     "Communications of the {ACM}",
volume =     "39",
number =     "11",
month =      nov,
year =       "1996",
}

```

If you do not know the year of publication, the style will add “[n. d.]” (for “no date”) to the entry.

If you do not know the author (this is often the case for online entries), use the key field to add a key for sorting and citations, for example,

```

@online{TUGInstmem,
key =         {TUG},
year =        2017,
title =       "Institutional members of the {\TeX} Users Group",
url =         "http://wwtug.org/instmem.html",
lastaccessed = "May 27, 2017",
}

```

A note about sorting. The current ACM bibliography styles always sort the entries according to authors names and publication year. There is a controversy about sorting names with “von” or “van” part: should Ludwig van Beethoven be sorted under “V” or under “B”? The American practice is to use “van” in sorting, i.e. to file van Beethoven under “V”. However, some authorities recommend to sort Dutch persons according to their last names (see e.g. <https://www.ifla.org/files/assets/cataloguing/pubs/names-of-persons.1996.pdf>). While I do not want to take a part in this dispute, I would like to point to the old “noopsort” trick by Oren Patashnik. Add to the .bib file the line

```

@PREAMBLE{"\providecommand{\noopsort}[1]{}"}

```

and then encode the author as

```
author = {Ludwig {\noopsort{Beethoven}}van Beethoven},
```

This will make the author to be sorted as “Beethoven” rather than “van Beethoven”.

The current bst style defines a number of macros for common journal names. In particular, all journals listed in Table 5 are included, so you can use strings like `journal = taccess` for *ACM Transactions on Accessible Computing*.

### 2.14.2 Processing using Bib<sub>La</sub>T<sub>E</sub>X

You will find in this package two sets of style files for Bib<sub>La</sub>T<sub>E</sub>X, `acmnumeric` and `acmauthoryear`, that mimic the behaviour of the `ACM-Reference-Format.bst` Bib<sub>T</sub>E<sub>X</sub> style. They provide you access to all the power of Bib<sub>La</sub>T<sub>E</sub>X and already include support for advanced citation of software artefact from the `biblatex-software` package, also separately available on CTAN. Look at the `biblatex-software` documentation to learn more about what it offers.

There are a few key differences in how the <sub>La</sub>T<sub>E</sub>X sources are set up when using Bib<sub>La</sub>T<sub>E</sub>X instead of Bib<sub>T</sub>E<sub>X</sub>, that we summarize briefly here (please refer to the official Bib<sub>La</sub>T<sub>E</sub>X documentation for more details).

In the preamble of your document you need to load the Bib<sub>La</sub>T<sub>E</sub>X package and select the appropriate bibliography style, as follows

```
\RequirePackage[
  datamodel=acmdatamodel,
  style=acmnumeric, % use style=acmauthoryear for publications that require it
]{biblatex}
```

Also in the preamble, you need to declare the bibliography sources files using the `\addbibresource` directive (one `\addbibresource` command per source file), e.g.:

```
\addbibresource{software.bib}
\addbibresource{sample-base.bib}
```

At the end of the document, where you want the bibliography to appear, you need to place the command `\printbibliography`.

Look at the `sample-*-biblatex.tex` files that can be found in the `samples` directory after running `make` for templates showcasing these Bib<sub>La</sub>T<sub>E</sub>X styles.

## 2.15 Colors

While printed ACM publications are usually black and white, screen mode allows the use of colors. The ACM classes pre-define several colors according to [8]: `ACMBlue`, `ACMYellow`, `ACMOrange`, `ACMRed`, `ACMLightBlue`, `ACMGreen`, `ACMPurple` and `ACMDarkBlue`. You can use them in color assignments.

The ACM provides the following recommendation on color use.

The most accessible approach would be to ensure that your article is still readable when printed in greyscale. The most notable reasons for this are:

1. The most common type of inherited Color Vision Deficiency (CVD) is red-green (in which similar-brightness colors that differ only in their amounts of red or green are often confused), and it affects up to 8% of males and 0.5% of females of Northern European descent.
2. The most common type of acquired Color Vision Deficiency (CVD) is blue-yellow (including mild cases for many older adults).
3. Most printing is in black and white.
4. Situational impairments (e.g., bright sunlight shining on a mobile screen) tend to reduce the entire color gamut, reducing color discriminability.

**Note:** It is *not* safe to encode information using only variations in color (i.e., only differences in hue and/or saturation) as there is bound to be someone affected!

To ensure that you are using the most accessible colors, the ACM recommends that you choose sets of colors to help ensure suitable variations in when printed in greyscale by using either of the following tools:

1. ColourBrewer: <http://colorbrewer2.org/>
2. ACE: The Accessible Colour Evaluator: <http://daprlab.com/ace/> for designing WCAG 2.0 compliant palettes.

### 2.15.1 Manual bibliography

Some people create bibliographies manually, writing down `\bibitem` commands explicitly. This approach is *not* recommended for ACM styles. The reason is, ACM submissions, besides being typeset, are also processed by special programs that extract metadata and references. Bibliographies created automatically with ACM styles contain customized macros for these programs, for example,

```
\bibitem[Ablamowicz and Fauser(2007)]%
  {Ablamowicz07}
\bibfield{author}{\bibinfo{person}{Rafal Ablamowicz} {and}
  \bibinfo{person}{Bertfried Fauser}.} \bibinfo{year}{2007}\natexlab{}
\newblock \bibinfo{booktitle}{\emph{CLIFFORD: a Maple 11 Package for Clifford
  Algebra Computations, version 11}}.
\newblock
\urldef\tempurl%
\url{http://math.tntech.edu/rafal/cliff11/index.html}
\showURL{%
Retrieved February 28, 2008 from \tempurl}
```

Manual bibliographies without these macros may slow down the publication process, and thus are not recommended for ACM submissions.

## 2.16 Other notable packages and typographic remarks

Several other packages are recommended for specialized tasks.

The package `subcaption` [9] is recommended for complex figures with several subplots or subfigures that require separate subcaptioning. The packages `nomenc1` [10] and

glossaries [11] can be used for the automatic creation of the lists of symbols and concepts used.

By default `acmart` prevents all widows and orphans (i.e., lonely lines at the beginning or end of the page) and hyphenation at the end of the page. This is done by the rather strict settings

```
\widowpenalty=10000
\clubpenalty=10000
\brokenpenalty=10000
```

However, this may lead to frustrating results when the authors must obey a page limit. Setting these penalties to smaller values may help if you absolutely need to.

Another problem might be the too strict line breaking rules. Again, a strategically placed `\sloppy` command or putting the problematic paragraph inside `sloppypar` environment might help—but beware, the results might be, well, sloppy.

Note that the uppercasing in section titles is done using the `textcase` package [12], so the command `\NoCaseChange` inside the title may help to prevent extraneous uppercasing.

## 2.17 Counting words

Some ACM conferences use word count limits for papers. The calculation of word number for a paper with math, tables and figures is not a trivial task. Currently the authoritative word count is done by translating the PDF to text and using `wc -w` on the output. Authors can use the package `texcount` (used by Overleaf) to get an estimate of the word count. To facilitate this one adds to the beginning of the package metacomments

```
%TC:macro \cite [option:text,text]
%TC:macro \citep [option:text,text]
%TC:macro \citet [option:text,text]
%TC:envir table 0 1
%TC:envir table* 0 1
%TC:envir tabular [ignore] word
%TC:envir displaymath 0 word
%TC:envir math 0 word
%TC:envir comment 0 0
```

and uses `\begin{math}... \end{math}` instead of dollar signs for math. Note that the count is in any case approximate, and the final decision of editors is based on PDF count.

The script `texcount` provides a report of word count in the document.

## 2.18 Creative Commons licenses for ACM publications

At present ACM does not allow the authors to typeset Creative Commons license for most ACM publications. These licenses can be used under an agreement with the ACM publishing office. In this case they are inserted by ACM itself.

The exceptions are ACM Engage format, which allows Creative Commons license, and conferences organized and copyrighted by IW3C2. In these cases the authors should use correspondingly `\setcopyright{cc}`, `\setcopyright{iw3c2w3}`, or `\setcopyright{iw3c2w3g}` (the latter should be used by Google employees).

Yet another case is the typesetting of non-ACM materials, when the option `nonacm` is used. This case is somewhat opposite, because for this case *only* Creative Common licenses are supported.

The command `\setcopyright{cc}` produces an error unless the format is `acmengage` or `nonacm` option is selected. On the other hand, if the option `nonacm` is selected, any argument of `\setcopyright` other than `cc` is treated as `none`.

## 2.19 Disabled or forbidden commands

The goal of `acmart` package is to provide a uniform look and feel for ACM publications. Accordingly, a number of commands is forbidden or disabled in `acmart`.

You may *not* put several authors or several e-mails into a `\author` or `\email` command. This may lead to errors or warning.

You cannot change `\baselinestretch` in your document: this produces an error.

You should not abuse the command `\vspace`: this command may disturb the typesetting of ACM papers.

You should not load `amssymb` package since the package `acmart` defines the corresponding symbols itself.

## 2.20 Notes for wizards

Sometimes you need to change the behavior of `acmart`. The usual way to do this is to redefine commands in the preamble. However, these definitions are executed *after* `acmart` is loaded and certain decisions are made. This presents a number of problems.

For example, one may want to use the `titletoc` package with `acmart`. This package should be loaded before `hyperref`. However, since `acmart` loads `hyperref` itself, the line `\usepackage{titletoc}` in the preamble will lead to grief (see <http://tex.stackexchange.com/questions/357265/using-titletoc-with-acm-acmart-style>).

Another example is passing options to a package. Suppose you want to use the `dvipsnames` option of the `xcolor` package. Normally you cannot do this because `acmart` loads this package itself without options.

The file `acmart-preload-hook.tex` can be used to solve these problems. If this file exists, it will be processed before any other package. You can use this file to load packages or pass options to them. For example, if you put in this file

```
\let\LoadClassOrig\LoadClass
\renewcommand\LoadClass[2][\LoadClassOrig[#1]{#2}%
\usepackage{titletoc}
```

then `titletoc` will be loaded before `hyperref`. If you put in this file

```
\PassOptionsToPackage{dvipsnames}{xcolor}
```

you will pass `dvipsnames` to `xcolor`.

**Important note.** This hook makes it too easy to create a manuscript that is not acceptable by the ACM. It is even easier to create a file that cannot be compiled. So please do not use it *unless you know what you are doing*. And if you use it, *do not ask for support*. If you decide to use this hook, you are on your own.

`\AtBeginMaketitle` Another hook is `\AtBeginMaketitle`. The commands in this hook are executed before `\maketitle`.

## 2.21 Currently supported publications

Table 5: ACM publications and arguments of the `\acmJournal` command

Abbreviation	Publication
ACMJCSS	ACM Journal on Computing and Sustainable Societies
CIE	ACM Computers in Entertainment
CSUR	ACM Computing Surveys
DLT	Distributed Ledger Technologies: Research and Practice
DGOV	Digital Government: Research and Practice
DTRAP	Digital Threats: Research and Practice
FAC	Formal Aspects of Computing
GAMES	ACM Games: Research and Practice
HEALTH	ACM Transactions on Computing for Healthcare
IMWUT	PACM on Interactive, Mobile, Wearable and Ubiquitous Technologies
JACM	Journal of the ACM
JATS	ACM Journal on Autonomous Transportation Systems
JDIQ	ACM Journal of Data and Information Quality
JDS	ACM/IMS Journal of Data Science
JEA	ACM Journal of Experimental Algorithmics
JERIC	ACM Journal of Educational Resources in Computing
JETC	ACM Journal on Emerging Technologies in Computing Systems
JOCCH	ACM Journal on Computing and Cultural Heritage
JRC	ACM Journal on Responsible Computing
PACMCGIT	Proceedings of the ACM on Computer Graphics and Interactive Techniques
PACMHCI	PACM on Human-Computer Interaction
PACMOD	PACM on Management of Data
PACMNET	PACM on Networking
PACMPL	PACM on Programming Languages
PACMSE	PACM on Software Engineering
POMACS	PACM on Measurement and Analysis of Computing Systems
TAAS	ACM Transactions on Autonomous and Adaptive Systems
TACCESS	ACM Transactions on Accessible Computing
TACO	ACM Transactions on Architecture and Code Optimization
TALG	ACM Transactions on Algorithms
TALLIP	ACM Transactions on Asian and Low-Resource Language Information Processing
TAP	ACM Transactions on Applied Perception
TCPS	ACM Transactions on Cyber-Physical Systems
TDS	ACM/IMS Transactions on Data Science
TEAC	ACM Transactions on Economics and Computation
TECS	ACM Transactions on Embedded Computing Systems
TELO	ACM Transactions on Evolutionary Learning and Optimization
THRI	ACM Transactions on Human-Robot Interaction
TIIS	ACM Transactions on Interactive Intelligent Systems
TIOT	ACM Transactions on Internet of Things
TISSEC	ACM Transactions on Information and System Security



Table 5: ACM publications and arguments of the `\acmJournal` command (continued)

Abbreviation	Publication
TIIST	ACM Transactions on Intelligent Systems and Technology
TKDD	ACM Transactions on Knowledge Discovery from Data
TMIS	ACM Transactions on Management Information Systems
TOCE	ACM Transactions on Computing Education
TOCHI	ACM Transactions on Computer-Human Interaction
TOCL	ACM Transactions on Computational Logic
TOCS	ACM Transactions on Computer Systems
TOCT	ACM Transactions on Computation Theory
TODAES	ACM Transactions on Design Automation of Electronic Systems
TODS	ACM Transactions on Database Systems
TOG	ACM Transactions on Graphics
TOIS	ACM Transactions on Information Systems
TOIT	ACM Transactions on Internet Technology
TOMACS	ACM Transactions on Modeling and Computer Simulation
TOMM	ACM Transactions on Multimedia Computing, Communications and Applications
TOMPECS	ACM Transactions on Modeling and Performance Evaluation of Computing Systems
TOMS	ACM Transactions on Mathematical Software
TOPC	ACM Transactions on Parallel Computing
TOPLAS	ACM Transactions on Programming Languages and Systems
TOPML	ACM Transactions on Probabilistic Machine Learning
TOPS	ACM Transactions on Privacy and Security
TORS	ACM Transactions on Recommender Systems
TOS	ACM Transactions on Storage
TOSEM	ACM Transactions on Software Engineering and Methodology
TOSN	ACM Transactions on Sensor Networks
TQC	ACM Transactions on Quantum Computing
TRETS	ACM Transactions on Reconfigurable Technology and Systems
TSAS	ACM Transactions on Spatial Algorithms and Systems
TSC	ACM Transactions on Social Computing
TSLP	ACM Transactions on Speech and Language Processing
TWEB	ACM Transactions on the Web

Besides the publications listed in Table 5, there is a special “publication” type FACMP, a forthcoming ACM publication, reserved for new journals which are not assigned an ISSN yet.

## 2.22 Samples

There are several samples of `acmart` documents, that can serve as templates for the authors. Among them `sample-sig...` are templates for conference papers, while `sample-acm...` are templates for journal articles and special materials.

Here is the list of the samples:

**sample-manuscript:** A proceedings paper in the manuscript format.

- sample-acmsmall:** A journal paper in the acmsmall format.
- sample-acmsmall-biblatex:** A journal paper using experimental *biblatex* bibliography processing.
- sample-acmlarge:** A journal paper in the acmlarge format.
- sample-acmtog:** A journal paper in the acmtog format.
- sample-sigconf:** A proceedings paper in the standard sigconf format.
- sample-sigconf-biblatex:** A proceedings paper in the sigconf format using experimental *biblatex* bibliography processing.
- sample-sigconf-authordraft:** A proceedings paper in the sigconf format with the authordraft option selected.
- sample-sigconf-i13n:** A proceedings paper in the sigconf format with multilanguage titles and abstract.
- sample-sigconf-xelatex:** A proceedings paper in the sigconf format, Xe $\LaTeX$  version.
- sample-sigconf-lualatex:** A proceedings paper in the sigconf format, Lua $\LaTeX$  version.
- sample-sigplan:** A proceedings paper in the sigplan format.
- sample-acmsmall-conf:** A proceedings paper in the acmsmall format for the publication in a journal using this option.
- sample-acmtog-conf:** A proceedings paper in the acmtog format for the publication in a journal using this option.
- sample-acmcp:** A sample of ACM Cover Page used by JDS.
- sample-acmengage:** A sample of ACM Engage publication.

### 2.23 A note about sigchi-a format

Starting in Spring 2020 ACM retired SIGCHI Extended Abstract format (sigchi-a). ACM will not, under any circumstances, accept documents in this format for publication and will not offer technical support to the authors who use this template.

You may use this format in the nonacm mode only, as in

```
\documentclass[sigchi-a, nonacm]{acmart}
```

sidebar (*env.*)  
 marginfigure (*env.*)  
 margintable (*env.*)
 
 This format has large margin uses for special figures and tables. This package provides three environments for this with optional captions:

**sidebar:** textual information in the margin,

**marginfigure:** a figure in the margin,

**margintable:** a table in the margin.

The environments `figure` and `table` produce figures and tables with the width of the text column. The environments `figure*` and `table*` produce “wide” figures and tables, which take a large part of the margin.

The horizontal sizes of figures are:

1. `figure: \columnwidth`,
2. `marginfigure: \marginparwidth`,
3. `figure*: \fulltextwidth`.

## 3 Implementation

### 3.1 Identification

We start with a declaration of who we are. Most .dtx files put driver code in a separate .drv driver file. We roll this code into the main file and use the pseudo-guard <gobble> for it.

```
1 <class>\NeedsTeXFormat{LaTeX2e}
2 <*gobble>
3 \ProvidesFile{acmart.dtx}
4 </gobble>
5 <class>\ProvidesClass{acmart}
6 [2024/04/13 v2.06 Typesetting articles for the Association for Computing Machinery]
```

And the driver code:

```
7 <*gobble>
8 \documentclass{ltxdoc}
9 \usepackage{array,booktabs,amsmath,graphicx,fancyvrb,tabularx, longtable}
10 \usepackage[tt=false, type1=true]{libertine}
11 \usepackage[varqu]{zi4}
12 \usepackage[libertine]{newtxmath}
13 \usepackage[tableposition=top]{caption}
14 \usepackage{hypdoc}
15 \PageIndex
16 \CodelineIndex
17 \RecordChanges
18 \EnableCrossrefs
19 \begin{document}
20   \DocInput{acmart.dtx}
21 \end{document}
22 </gobble>
23 <*class>
24 \def\@classname{acmart}
```

### 3.2 Preload hook

We preload acmart-preload-hook:

```
25 \InputIfFileExists{acmart-preload-hook.tex}{%
26   \ClassWarning{\@classname}{%
27     I am loading acmart-preload-hook.tex. You are fully responsible
28     for any problems from now on.}}{}
```

### 3.3 Options

We need xkeyval since some of our options may have values:

```
29 \RequirePackage{xkeyval}
   We use xstring to check whether user input is valid
30 \RequirePackage{xstring}
   We need iftex to check the engine
31 \RequirePackage{iftex}
```

format The possible formats

```
32 \define@choicekey*+{acmart.cls}{format}[\ACM@format\ACM@format@nr]{%
33 manuscript, acmsmall, acmlarge, acmtog, sigconf, siggraph,
34 sigplan, sigchi, sigchi-a, acmengage, acmcp}[manuscript]{}{%
35 \ClassError{\@classname}{The option format must be manuscript,
36 acmsmall, acmlarge, acmtog, sigconf, siggraph,
37 sigplan, sigchi or sigchi-a}}
38 \def\@DeclareACMFormat#1{\DeclareOptionX{#1}{\setkeys{acmart.cls}{format=#1}}}
39 \@DeclareACMFormat{manuscript}
40 \@DeclareACMFormat{acmsmall}
41 \@DeclareACMFormat{acmlarge}
42 \@DeclareACMFormat{acmtog}
43 \@DeclareACMFormat{sigconf}
44 \@DeclareACMFormat{siggraph}
45 \@DeclareACMFormat{sigplan}
46 \@DeclareACMFormat{sigchi}
47 \@DeclareACMFormat{sigchi-a}
48 \@DeclareACMFormat{acmengage}
49 \@DeclareACMFormat{acmcp}
50 \ExecuteOptionsX{format}
```

\if@ACM@screen Whether we use screen mode

```
51 \define@boolkey+{acmart.cls}[@ACM@]{screen}[true]{%
52 \if@ACM@screen
53 \PackageInfo{\@classname}{Using screen mode}%
54 \else
55 \PackageInfo{\@classname}{Not using screen mode}%
56 \fi}{\PackageError{\@classname}{The option screen can be either true or
57 false}}
58 \ExecuteOptionsX{screen=false}
```

\if@ACM@urlbreakonhyphens

```
59 \define@boolkey+{acmart.cls}[@ACM@]{urlbreakonhyphens}[true]{%
60 \if@ACM@urlbreakonhyphens
61 \PackageInfo{\@classname}{Using breaking urls on hyphens}%
62 \else
63 \PackageInfo{\@classname}{Not breaking urls on hyphens}%
64 \fi}{\PackageError{\@classname}{The option urlbreakonhyphens can be either true or
65 false}}
66 \ExecuteOptionsX{urlbreakonhyphens=true}
```

\if@ACM@acmthm Whether we define theorem-like environments.

```
67 \define@boolkey+{acmart.cls}[@ACM@]{acmthm}[true]{%
68 \if@ACM@acmthm
69 \PackageInfo{\@classname}{Requiring acmthm}%
70 \else
71 \PackageInfo{\@classname}{Suppressing acmthm}%
72 \fi}{\PackageError{\@classname}{The option acmthm can be either true or
73 false}}
74 \ExecuteOptionsX{acmthm=true}
```

\if@ACM@review Whether we use review mode

```
75 \define@boolkey+{acmart.cls}[@ACM@]{review}[true]{%
```

```

76 \if@ACM@review
77   \PackageInfo{\@classname}{Using review mode}%
78   \AtBeginDocument{\@ACM@printfoliostrue}%
79 \else
80   \PackageInfo{\@classname}{Not using review mode}%
81 \fi}{\PackageError{\@classname}{The option review can be either true or
82   false}}
83 \ExecuteOptionsX{review=false}

```

`\if@ACM@authorversion` Whether we use author's-version mode

```

84 \define@boolkey+{acmart.cls}[@ACM@]{authorversion}[true]{%
85   \if@ACM@authorversion
86     \PackageInfo{\@classname}{Using authorversion mode}%
87   \else
88     \PackageInfo{\@classname}{Not using authorversion mode}%
89 \fi}{\PackageError{\@classname}{The option authorversion can be either true or
90   false}}
91 \ExecuteOptionsX{authorversion=false}

```

`\if@ACM@nonacm` Special option for non-ACM publications using the ACM typesetting options.

```

92 \define@boolkey+{acmart.cls}[@ACM@]{nonacm}[true]{%
93   \if@ACM@nonacm
94     \PackageInfo{\@classname}{Using nonacm mode}%
95     \AtBeginDocument{\@ACM@printacmreffalse}%
96     % in 'nonacm' mode we disable the "ACM Reference Format"
97     % printing by default, but this can be re-enabled by the
98     % user using \settopmatter{printacmref=true}
99   \else
100     \PackageInfo{\@classname}{Not using nonacm mode}%
101 \fi}{\PackageError{\@classname}{The option nonacm can be either true or
102   false}}
103 \ExecuteOptionsX{nonacm=false}

```

`\if@ACM@balance` Whether to balance the last page

```

104 \define@boolkey+{acmart.cls}[@ACM@]{balance}[true]{}%
105 \PackageError{\@classname}{The option balance can be either true or
106   false}}
107 \ExecuteOptionsX{balance}

```

`\if@ACM@pbalance` Whether to balance the last page

```

108 \define@boolkey+{acmart.cls}[@ACM@]{pbalance}[true]{}%
109 \PackageError{\@classname}{The option pbalance can be either true or
110   false}}
111 \ExecuteOptionsX{pbalance=false}

```

`\if@ACM@natbib@override` This macro is no longer used.

`\if@ACM@natbib` Whether we use natbib mode

```

112 \define@boolkey+{acmart.cls}[@ACM@]{natbib}[true]{%
113   \if@ACM@natbib
114     \PackageInfo{\@classname}{Explicitly selecting natbib mode}%
115   \else
116     \PackageInfo{\@classname}{Explicitly deselecting natbib mode}%
117 \fi}{\PackageError{\@classname}{The option natbib can be either true or

```

```

118     false}}
119 \ExecuteOptionsX{natbib=true}

\if@ACM@anonymous Whether we use anonymous mode
120 \define@boolkey+{acmart.cls}[@ACM@]{anonymous}[true]{%
121   \if@ACM@anonymous
122     \PackageInfo{\@classname}{Using anonymous mode}%
123   \else
124     \PackageInfo{\@classname}{Not using anonymous mode}%
125   \fi}{\PackageError{\@classname}{The option anonymous can be either true or
126     false}}
127 \ExecuteOptionsX{anonymous=false}

\if@ACM@timestamp Whether we use timestamp mode
128 \define@boolkey+{acmart.cls}[@ACM@]{timestamp}[true]{%
129   \if@ACM@timestamp
130     \PackageInfo{\@classname}{Using timestamp mode}%
131   \else
132     \PackageInfo{\@classname}{Not using timestamp mode}%
133   \fi}{\PackageError{\@classname}{The option timestamp can be either true or
134     false}}
135 \ExecuteOptionsX{timestamp=false}

\if@ACM@authordraft Whether we use author-draft mode
136 \define@boolkey+{acmart.cls}[@ACM@]{authordraft}[true]{%
137   \if@ACM@authordraft
138     \PackageInfo{\@classname}{Using authordraft mode}%
139     \@ACM@timestamptrue
140     \@ACM@reviewtrue
141   \else
142     \PackageInfo{\@classname}{Not using authordraft mode}%
143   \fi}{\PackageError{\@classname}{The option authordraft can be either true or
144     false}}
145 \ExecuteOptionsX{authordraft=false}

\ACM@fontsize The font size to pass to the base class
146 % \changes{v1.87}{2022/08/27}{Added fontsize 8pt}
147 \def\ACM@fontsize{}
148 \DeclareOptionX{8pt}{\edef\ACM@fontsize{\CurrentOption}}
149 \DeclareOptionX{9pt}{\edef\ACM@fontsize{\CurrentOption}}
150 \DeclareOptionX{10pt}{\edef\ACM@fontsize{\CurrentOption}}
151 \DeclareOptionX{11pt}{\edef\ACM@fontsize{\CurrentOption}}
152 \DeclareOptionX{12pt}{\edef\ACM@fontsize{\CurrentOption}}

\ACM@languages The languages of the document
153 \def\ACM@languages{}
154 \DeclareOptionX{language}{%
155   \ifx\ACM@languages\@empty
156     \gdef\ACM@languages{english}\fi
157   \g@addto@macro\ACM@languages{, #1}}

158 \DeclareOptionX{draft}{\PassOptionsToClass{\CurrentOption}{amsart}}
159 \DeclareOptionX{*}{\PassOptionsToClass{\CurrentOption}{amsart}}
160 \ProcessOptionsX
161 \ClassInfo{\@classname}{Using format \ACM@format, number \ACM@format@nr}

```

### 3.4 Setting switches

`\if@ACM@manuscript` Whether we use manuscript mode

```
162 \newif\if@ACM@manuscript
```

`\if@ACM@journal` There are two kinds of publications: journals and books

```
163 \newif\if@ACM@journal
```

`\if@ACM@journal@bibstrip` Sometimes ACM wants a journal-like publication to have conference information in the bibstrip and vice versa, so we have an additional switch.

```
164 \newif\if@ACM@journal@bibstrip
```

`\if@ACM@journal@bibstrip@or@tog` ACM TOG sometimes uses journal-like bibstrip even for conference proceedings, so we need to set it separately

```
165 \newif\if@ACM@journal@bibstrip@or@tog
```

`\if@ACM@sigchiamode` The formatting of SIGCHI extended abstracts is quite unusual. We have a special switch for them.

```
166 \newif\if@ACM@sigchiamode
```

`\if@ACM@engage` ACM Engage course materials have special formatting

```
167 \newif\if@ACM@engage
```

```
168 \@ACM@engagefalse
```

`\if@ACM@acmcp` ACM cover page formatting

```
169 \newif\if@ACM@acmcp
```

```
170 \@ACM@acmcpfalse
```

#### Setting up switches

```
171 \ifnum\ACM@format@nr=5\relax % siggraph
```

```
172 \ClassWarning{\@classname}{%
```

```
173 The format siggraph is now obsolete.\MessageBreak
```

```
174 I am switching to sigconf.}
```

```
175 \setkeys{acmart.cls}{format=sigconf}
```

```
176 \fi
```

```
177 \ifnum\ACM@format@nr=7\relax % sigchi
```

```
178 \ClassWarning{\@classname}{%
```

```
179 The format sigchi is now obsolete.\MessageBreak
```

```
180 I am switching to sigconf.}
```

```
181 \setkeys{acmart.cls}{format=sigconf}
```

```
182 \fi
```

```
183 \ifnum\ACM@format@nr=8\relax % sigchi
```

```
184 \ClassWarning{\@classname}{%
```

```
185 ACM SIGCHI has retired the SIGCHI-A template\MessageBreak
```

```
186 effective immediately. ACM is keeping this template\MessageBreak
```

```
187 option available to authors who are working on legacy\MessageBreak
```

```
188 documents only. ACM will not, under any circumstances,\MessageBreak
```

```
189 accept documents in this format for publication and\MessageBreak
```

```
190 will not offer technical support to the authors who use\MessageBreak
```

```
191 this template.\MessageBreak
```

```
192 ACM SIGCHI is directing Conference leaders and\MessageBreak
```

```
193 authors to publish their articles using the SIGCONF\MessageBreak
```

```
194 template call.}
```



```

195 \fi
196 \ifnum\ACM@format@nr=0\relax
197   \@ACM@manuscripttrue
198 \else
199   \@ACM@manuscriptfalse
200 \fi
201 \@ACM@sigchiamodef=false
202 \ifcase\ACM@format@nr
203 \relax % manuscript
204   \@ACM@journaltrue
205 \or % acmsmall
206   \@ACM@journaltrue
207 \or % acmlarge
208   \@ACM@journaltrue
209 \or % acmtog
210   \@ACM@journaltrue
211   \@ACM@journal@bibstrip@or@togtrue
212 \or % sigconf
213   \@ACM@journalfalse
214 \or % siggraph
215   \@ACM@journalfalse
216 \or % sigplan
217   \@ACM@journalfalse
218 \or % sigchi
219   \@ACM@journalfalse
220 \or % sigchi-a
221   \@ACM@journalfalse
222   \@ACM@sigchiamodetrue
223 \or % acmengage
224   \@ACM@journalfalse
225   \@ACM@engagetrue
226 \or % acmcp
227   \@ACM@journaltrue
228   \@ACM@acmcptrue
229   \@AtBeginDocument{\@ACM@printacmreffalse}%
230 \fi
231 \if@ACM@journal
232   \@ACM@journal@bibstriptrue
233   \@ACM@journal@bibstrip@or@togtrue
234 \else
235   \@ACM@journal@bibstripfalse
236 \fi

```

### 3.5 Loading the base class and package

At this point we either have `\ACM@fontsize` or use defaults

```

237 \ifx\ACM@fontsize\@empty
238   \ifcase\ACM@format@nr
239   \relax % manuscript
240     \def\ACM@fontsize{9pt}%
241   \or % acmsmall
242     \def\ACM@fontsize{10pt}%
243   \or % acmlarge
244     \def\ACM@fontsize{10pt}%

```

```

245 \or % acmtog
246   \def\ACM@fontsize{9pt}%
247 \or % sigconf
248   \def\ACM@fontsize{9pt}%
249 \or % siggraph
250   \def\ACM@fontsize{9pt}%
251 \or % sigplan
252   \def\ACM@fontsize{10pt}%
253 \or % sigchi
254   \def\ACM@fontsize{9pt}%
255 \or % sigchi-a
256   \def\ACM@fontsize{10pt}%
257 \or % acmengage
258   \def\ACM@fontsize{10pt}%
259 \or % acmcp
260   \def\ACM@fontsize{9pt}%
261 \fi
262 \fi
263 \ClassInfo{\@classname}{Using fontsize \ACM@fontsize}
264 \LoadClass[\ACM@fontsize, reqno]{amsart}
265 \RequirePackage{microtype}
    We need etoolbox for delayed code
266 \RequirePackage{etoolbox}
    Booktabs is now the default
267 \RequirePackage{booktabs}
    We need totpages to calculate the number of pages and refcount to use that number
268 \RequirePackage{refcount}
269 \RequirePackage{totpages}
    The \collect@body macro in amsmath is defined using \def. We load environ to
    access the \long version of this command
270 \RequirePackage{environ}
    We use setspace for double spacing
271 \if@ACM@manuscript
272 \RequirePackage{setspace}
273 \onehalfspacing
274 \fi
    We need textcase for better upcasing
275 \RequirePackage{textcase}

276 \if@ACM@acmcp
277 \RequirePackage{framed}
278 \RequirePackage{zref-savepos, zref-user}
279 \fi

\ACM@acmcp@delta We need to store the dimen to store the insert length of amcp box
280 \newdimen\ACM@acmcp@delta
281 \ACM@acmcp@delta=0pt\relax

```

### 3.6 Citations

We patch `\setcitestyle` to allow, for example, `\setcitestyle{sort}` and `\setcitestyle{nosort}`. We patch `\citestyle` to warn about undefined citation styles.

```
282 \if@ACM@natbib
283 \RequirePackage{natbib}
284 \renewcommand{\bibsection}{%
285   \section*{\refname}%
286   \phantomsection\addcontentsline{toc}{section}{\refname}%
287 }
288 \renewcommand{\bibfont}{\bibliofont}
289 \renewcommand\setcitestyle[1]{
290   \@for\@tempa:=#1\do
291   {\def\@tempb{round}\ifx\@tempa\@tempb
292     \renewcommand\NAT@open{()\renewcommand\NAT@close{}}\fi
293   \def\@tempb{square}\ifx\@tempa\@tempb
294     \renewcommand\NAT@open{[]\renewcommand\NAT@close{[]}\fi
295   \def\@tempb{angle}\ifx\@tempa\@tempb
296     \renewcommand\NAT@open{<}\renewcommand\NAT@close{>}\fi
297   \def\@tempb{curly}\ifx\@tempa\@tempb
298     \renewcommand\NAT@open{\{}\renewcommand\NAT@close{\}}\fi
299   \def\@tempb{semicolon}\ifx\@tempa\@tempb
300     \renewcommand\NAT@sep{;}\fi
301   \def\@tempb{colon}\ifx\@tempa\@tempb
302     \renewcommand\NAT@sep{:}\fi
303   \def\@tempb{comma}\ifx\@tempa\@tempb
304     \renewcommand\NAT@sep{,}\fi
305   \def\@tempb{authoryear}\ifx\@tempa\@tempb
306     \NAT@numbersfalse\fi
307   \def\@tempb{numbers}\ifx\@tempa\@tempb
308     \NAT@numberstrue\NAT@superfalse\fi
309   \def\@tempb{super}\ifx\@tempa\@tempb
310     \NAT@numberstrue\NAT@supertrue\fi
311   \def\@tempb{nobibstyle}\ifx\@tempa\@tempb
312     \let\bibstyle=\@gobble\fi
313   \def\@tempb{bibstyle}\ifx\@tempa\@tempb
314     \let\bibstyle=\@citestyle\fi
315   \def\@tempb{sort}\ifx\@tempa\@tempb
316     \def\NAT@sort{\@ne}\fi
317   \def\@tempb{nosort}\ifx\@tempa\@tempb
318     \def\NAT@sort{\z@}\fi
319   \def\@tempb{compress}\ifx\@tempa\@tempb
320     \def\NAT@cmprs{\@ne}\fi
321   \def\@tempb{nocompress}\ifx\@tempa\@tempb
322     \def\NAT@cmprs{\z@}\fi
323   \def\@tempb{sort&compress}\ifx\@tempa\@tempb
324     \def\NAT@sort{\@ne}\def\NAT@cmprs{\@ne}\fi
325   \def\@tempb{mcite}\ifx\@tempa\@tempb
326     \let\NAT@merge\@ne\fi
327   \def\@tempb{merge}\ifx\@tempa\@tempb
328     \@ifnum{\NAT@merge<\tw@}{\let\NAT@merge\tw@}{}\fi
329   \def\@tempb{elide}\ifx\@tempa\@tempb
330     \@ifnum{\NAT@merge<\thr@}{\let\NAT@merge\thr@}{}\fi
331   \def\@tempb{longnamesfirst}\ifx\@tempa\@tempb
```

```

332 \NAT@longnamestrue\fi
333 \def\@tempb{nonamebreak}\ifx\@tempa\@tempb
334 \def\NAT@nmfmt#1{\mbox{\NAT@up#1}}\fi
335 \expandafter\NAT@find@eq\@tempa=\relax\@nil
336 \if\@tempc\relax\else
337 \expandafter\NAT@rem@eq\@tempc
338 \def\@tempb{open}\ifx\@tempa\@tempb
339 \xdef\NAT@open{\@tempc}\fi
340 \def\@tempb{close}\ifx\@tempa\@tempb
341 \xdef\NAT@close{\@tempc}\fi
342 \def\@tempb{aysep}\ifx\@tempa\@tempb
343 \xdef\NAT@aysep{\@tempc}\fi
344 \def\@tempb{yysep}\ifx\@tempa\@tempb
345 \xdef\NAT@yrsep{\@tempc}\fi
346 \def\@tempb{notesep}\ifx\@tempa\@tempb
347 \xdef\NAT@cmt{\@tempc}\fi
348 \def\@tempb{citesep}\ifx\@tempa\@tempb
349 \xdef\NAT@sep{\@tempc}\fi
350 \fi
351 }%
352 \NAT@setcites
353 }
354 \renewcommand\citestyle[1]{%
355 \ifcsname bibstyle@#1\endcsname%
356 \csname bibstyle@#1\endcsname\let\bibstyle\@gobble%
357 \else%
358 \@latex@error{Undefined ‘#1’ citestyle}%
359 \fi
360 }%
361 \fi

```

`\bibstyle@acmauthoryear` The default author-year format:

```

362 \newcommand{\bibstyle@acmauthoryear}{%
363 \setcitestyle{%
364 authoryear,%
365 open={[]},close={]},citesep={;},%
366 aysep={},yysep={,},%
367 notesep={, }}

```

`\bibstyle@acmnumeric` The default numeric format:

```

368 \newcommand{\bibstyle@acmnumeric}{%
369 \setcitestyle{%
370 numbers,sort&compress,%
371 open={[]},close={]},citesep={,},%
372 notesep={, }}

```

The default is numeric:

```

373 \if@ACM@natbib
374 \citestyle{acmnumeric}
375 \fi

```

### 3.7 Internationalization

```

376 \if@ACM@journal

```

```

377 \renewcommand\keywordsname{Additional Key Words and Phrases}%
378 \else
379 \renewcommand\keywordsname{Keywords}%
380 \fi
381 \if@ACM@engage
382 \renewcommand\abstractname{Synopsis}%
383 \fi
384 \ifx\ACM@languages\@empty
385 \else
386 \RequirePackage[\ACM@languages]{babel}%
387 \addto\captionsenglish{%
388 \if@ACM@journal
389 \renewcommand\keywordsname{Additional Key Words and Phrases}%
390 \else
391 \renewcommand\keywordsname{Keywords}%
392 \fi
393 \renewcommand\acksname{Acknowledgements}%
394 \if@ACM@engage
395 \renewcommand\abstractname{Synopsis}%
396 \fi
397 }%
398 \addto\captionsfrench{%
399 \if@ACM@journal
400 \renewcommand\keywordsname{Mots Clés et Phrases Supplémentaires}%
401 \else
402 \renewcommand\keywordsname{Mots clés}%
403 \fi
404 \renewcommand\acksname{Remerciements}%
405 }%
406 \addto\captionsgerman{%
407 \if@ACM@journal
408 \renewcommand\keywordsname{Zusätzliche Schlagwörter und Phrasen}%
409 \else
410 \renewcommand\keywordsname{Schlagwörter}%
411 \fi
412 \renewcommand\acksname{Danksagungen}%
413 }%
414 \addto\captionsspanish{%
415 \if@ACM@journal
416 \renewcommand\keywordsname{Palabras y Frases Claves Adicionales}%
417 \else
418 \renewcommand\keywordsname{Palabras claves}%
419 \fi
420 \renewcommand\acksname{Expresiones de gratitud}%
421 }%
422 \fi

```

\ACM@lang@check Some commands should not be used if the document is monlingual

```

423 \newcommand\ACM@lang@check[1]{%
424 \ifx\ACM@languages\@empty\relax
425 \ClassError{\@classname}{%
426 Command \string#1 \MessageBreak is used in monlingual document}{%
427 You used a command (\string#1) \MessageBreak
428 that does not have a meaning \MessageBreak

```

```

429 unless are languages are defined. \MessageBreak
430 Please choose the languages in \string\documentclass
431 \MessageBreak
432 (e.g. \string\documentclass[languages={french, english}]{acmart}),
433 \MessageBreak
434 or delete the command.}%
435 \fi}

```

`\@translatedtitle`

```
436 \def\@translatedtitle{}
```

`\translatedtitle` The title of the paper in a different language

```
437 \newcommand\translatedtitle[2]{\ACM@lang@check{\translatedtitle}%
438 \g@addto@macro\@translatedtitle{\par\foreignlanguage{#1}{#2}}}
```

`\@translatedsubtitle`

```
439 \def\@translatedsubtitle{}
```

`\translatedsubtitle` The subtitle of the paper in a different language

```
440 \newcommand\translatedsubtitle[2]{\ACM@lang@check{\translatedsubtitle}%
441 \g@addto@macro\@translatedsubtitle{\par\foreignlanguage{#1}{#2}}}
```

`\@translatedkeywords`

```
442 \def\@translatedkeywords{}
```

`\translatedkeywords` Add keywords to the paper in the language specified

```
443 \newcommand\translatedkeywords[2]{\ACM@lang@check{\translatedkeywords}%
444 \g@addto@macro\@translatedkeywords{\mktranslatedkeywords{#1}{#2}}}
```

`\@translatedabstracts` The container for translated abstracts.

```
445 \def\@translatedabstracts{}
```

`translatedabstract` We save translated abstracts into `\@translatedabstracts`

```
446 \newenvironment{translatedabstract}[1]{\Collect@Body
447 \@savetranslatedabstract\mktranslatedabstract{#1}}{}
```

`\@savetranslatedabstract` And saving the abstract

```
448 \long\def\@savetranslatedabstract#1{\if@ACM@maketitle@typeset
449 \ClassError{\@classname}{Abstract must be defined before maketitle
450 command. Please move it!}\fi
451 \ACM@lang@check{translatedabstract}%
452 \g@addto@macro\@translatedabstracts{\bgroup#1\egroup}}
```

### 3.8 Sectioning

`\@startsection` Before we call `hyperref`, we redefine `\startsection` commands to their  $\LaTeX$  defaults since the `amsart` ones are too AMS-specific. We need to do this early since we want `hyperref` to have a chance to redefine them again:

```

453 \def\@startsection#1#2#3#4#5#6{%
454 \if@noskipsec \leavevmode \fi
455 \par
456 \@tempskipa #4\relax

```

```

457 \@afterindenttrue
458 \ifdim \@tempskipa <\z@
459   \@tempskipa -\@tempskipa \@afterindentfalse
460 \fi
461 \if@nobreak
462   \everypar{}%
463 \else
464   \addpenalty\@secpenalty\advspace\@tempskipa
465 \fi
466 \@ifstar
467   {\@ssect{#3}{#4}{#5}{#6}}%
468   {\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}
469 \def\@sect#1#2#3#4#5#6[#7]#8{%
470 \edef\@toclevel{\ifnum#2=\@m 0\else\number#2\fi}%
471 \ifnum #2>\c@secnumdepth
472   \let\@svsec\@empty
473 \else
474   \refstepcounter{#1}%
475   \protected@edef\@svsec{\@secntformat{#1}\relax}%
476 \fi
477 \@tempskipa #5\relax
478 \ifdim \@tempskipa>\z@
479   \begingroup
480     #6{%
481       \@hangfrom{\hskip #3\relax\@svsec}%
482       \interlinepenalty \@M #8\@par}%
483   \endgroup
484   \csname #1mark\endcsname{#7}%
485   \ifnum #2>\c@secnumdepth \else
486     \@tochangmeasure{\csname the#1\endcsname}%
487   \fi
488   \addcontentsline{toc}{#1}{%
489     \ifnum #2>\c@secnumdepth \else
490       \protect\numberline{\csname the#1\endcsname}%
491     \fi
492     #7}%
493 \else
494   \def\@svsechd{%
495     #6{\hskip #3\relax
496       \@svsec #8}%
497     \csname #1mark\endcsname{#7}%
498     \ifnum #2>\c@secnumdepth \else
499       \@tochangmeasure{\csname the#1\endcsname\space}%
500     \fi
501     \addcontentsline{toc}{#1}{%
502       \ifnum #2>\c@secnumdepth \else
503         \protect\numberline{\csname the#1\endcsname}%
504       \fi
505       #7}}%
506 \fi
507 \@xsect{#5}}
508 \def\@xsect#1{%
509   \@tempskipa #1\relax
510   \ifdim \@tempskipa>\z@

```

```

511 \par \nobreak
512 \vskip \@tempskipa
513 \@afterheading
514 \else
515 \@nobreakfalse
516 \global\@noskipsectrue
517 \everypar{%
518 \if@noskipsec
519 \global\@noskipsecfalse
520 {\setbox\z@\lastbox}%
521 \clubpenalty\@M
522 \begingroup \svsechd \endgroup
523 \unskip
524 \@tempskipa #1\relax
525 \hskip -\@tempskipa
526 \else
527 \clubpenalty \@clubpenalty
528 \everypar{}}%
529 \fi}%
530 \fi
531 \ignorespaces}
532 \def\@secntformat#1{\csname the#1\endcsname\quad}
533 \def\@ssect#1#2#3#4#5{%
534 \@tempskipa #3\relax
535 \ifdim \@tempskipa>\z@
536 \begingroup
537 #4{%
538 \@hangfrom{\hskip #1}%
539 \interlinepenalty \@M #5\@par}%
540 \endgroup
541 \else
542 \def\@svsechd{#4{\hskip #1\relax #5}}%
543 \fi
544 \@xsect{#3}}

```

\@startsection The amsart package redefines \@startsection. Here we redefine it again to make the table of contents work.

```

545 \def\@starttoc#1#2{\begingroup\makeatletter
546 \setTrue{#1}%
547 \par\removelastskip\vskip\z@skip
548 \@startsection{section}\@M\z@{\linespacing\@plus\linespacing}%
549 {.5\linespacing}{\centering\contentsnamefont}{#2}%
550 \@input{\jobname.#1}%
551 \if@filesw
552 \xp\newwrite\csname tf@#1\endcsname
553 \immediate\xp\openout\csname tf@#1\endcsname \jobname.#1\relax
554 \fi
555 \global\@nobreakfalse \endgroup
556 \addvspace{32\p@\@plus14\p@}%
557 }

```

\l@subsection Section spacing is more generous than for amsart

```

558 \def\l@section{\@tocline{1}{0pt}{1pc}{2pc}{}}

```



```
\l@section The spacing in amsart is too large
559 \def\l@section{\@tocline{2}{0pt}{1pc}{3pc}{}}
```

```
\l@subsubsection The spacing in amsart is too large
560 \def\l@subsubsection{\@tocline{3}{0pt}{1pc}{5pc}{}}
```

We need to define footnote-related stuff before the call to hyperref (Ross Moore)

```
\@makefnmark We do not use indentation for footnotes
561 \def\@makefnmark{\noindent\@makefnmark}
```

```
\@footnotetext In sigchi-a mode our footnotes are in the margin!
562 \if@ACM@sigchiamode
563 \long\def\@footnotetext#1{\marginpar{%
564   \reset@font\small
565   \interlinepenalty\interfootnotelinepenalty
566   \protected@edef\@currentlabel{%
567     \csname p@footnote\endcsname\@thefnmark
568   }}%
569   \color@begingroup
570   \@makefnmark#1
571   \rule{\z@}{\footnotesep}\ignorespaces#1\@finalstrut\strutbox}%
572   \color@endgroup}}%
573 \fi
```

```
\@mpfootnotetext We want the footnotes in minipages centered:
574 \long\def\@mpfootnotetext#1{%
575   \global\setbox\@mpfootins\vbox{%
576     \unvbox\@mpfootins
577     \reset@font\footnotesize
578     \hsize\columnwidth
579     \@parboxrestore
580     \protected@edef\@currentlabel
581       {\csname p@mpfootnote\endcsname\@thefnmark}%
582     \color@begingroup\centering
583     \@makefnmark#1
584     \rule{\z@}{\footnotesep}\ignorespaces#1\@finalstrut\strutbox}%
585     \color@endgroup}}
```

```
\@makefnmark AMS classes use a buggy definition of \makefnmark. We revert to the standard one.
586 \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}
```

### 3.9 Hyperxmp and hyperref

Adding hyperref

```
587 \let\@footnotemark@nolink\@footnotemark
588 \let\@footnotetext@nolink\@footnotetext
589 \RequirePackage[bookmarksnumbered,unicode]{hyperref}
590 \RequirePackage{hyperxmp}
591 \pdfstringdefDisableCommands{%
592   \def\addtocounter#1#2{}%
593   \def\unskip{}%
594   \def\textbullet{- }%
```

```

595 \def\textrightarrow{ -> }%
596 \def\footnotemark{}%
597 }
598 \urlstyle{rm}
599 \ifcase\ACM@format@nr
600 \relax % manuscript
601 \or % acmsmall
602 \or % acmlarge
603 \or % acmtog
604 \or % sigconf
605 \or % siggraph
606 \or % sigplan
607 \urlstyle{sf}
608 \or % sigchi
609 \or % sigchi-a
610 \urlstyle{sf}
611 \or % acmengage
612 \or % acmcp
613 \fi
614 \AtEndPreamble{%
615 \if@ACM@urlbreakonhyphens
616 \def\do@url@hyp{\do\~}%
617 \fi
618 \if@ACM@screen
619 \hypersetup{colorlinks,
620 linkcolor=ACMPurple,
621 citecolor=ACMPurple,
622 urlcolor=ACMDarkBlue,
623 filecolor=ACMDarkBlue}
624 \else
625 \hypersetup{hidelinks}
626 \fi
627 \hypersetup{pdflang={en},
628 pdfdisplaydoctitle}}
    Bibliography mangling.
629 \if@ACM@natbib
630 \let\citeN\cite
631 \let\cite\citep
632 \let\citeANP\citeauthor
633 \let\citeNN\citeyearpar
634 \let\citeyearNP\citeyear
635 \let\citeNP\citealt
636 \DeclareRobustCommand\citeA
637 {\begin@group\NAT@swafalse
638 \let\NAT@ctype\@ne\NAT@partrue\NAT@fullfalse\NAT@open\NAT@citetp}%
639 \providecommand\newblock{}%
640 \else
641 \AtBeginDocument{%
642 \let\shortcite\cite%
643 \providecommand\citename[1]{#1}}
644 \fi
645 \newcommand\shortcite[2][]{%
646 \ifNAT@numbers\cite[#1]{#2}\else\citeyearpar[#1]{#2}\fi}

```

`\bibliographystyle` The `amsart` package redefines `\bibliographystyle` since it prefers the AMS bibliography style. We turn it back to the  $\LaTeX$  definition:

```
647 \def\bibliographystyle#1{%
648   \ifx\@begindocumenthook\undefined\else
649     \expandafter\AtBeginDocument
650     \fi
651     {\if@filesw
652       \immediate\write\@auxout{\string\bibstyle{#1}}%
653       \fi}}
```

### 3.10 Other packages

Graphics and color.

```
654 \RequirePackage{graphicx}
655 \RequirePackage[prologue]{xcolor}
```

We define ACM colors according to [8]:

```
656 \definecolor[named]{ACMBlue}{cmyk}{1,0.1,0,0.1}
657 \definecolor[named]{ACMYellow}{cmyk}{0,0.16,1,0}
658 \definecolor[named]{ACMOrange}{cmyk}{0,0.42,1,0.01}
659 \definecolor[named]{ACMRed}{cmyk}{0,0.90,0.86,0}
660 \definecolor[named]{ACMLightBlue}{cmyk}{0.49,0.01,0,0}
661 \definecolor[named]{ACMGreen}{cmyk}{0.20,0,1,0.19}
662 \definecolor[named]{ACMPurple}{cmyk}{0.55,1,0,0.15}
663 \definecolor[named]{ACMDarkBlue}{cmyk}{1,0.58,0,0.21}
```

Author-draft mode or sigchi-a mode

```
664 \if@ACM@authordraft
665   \RequirePackage{draftwatermark}
666   \SetWatermarkFontSize{0.5in}
667   \SetWatermarkColor[gray]{.9}
668   \SetWatermarkText{\parbox{12em}{\centering
669     Unpublished working draft. \\
670     Not for distribution.}}
671 \else
672   \if@ACM@sigchiamode
673     \if@ACM@nonacm\else
674       \RequirePackage{draftwatermark}
675       \SetWatermarkFontSize{0.5in}
676       \SetWatermarkColor[gray]{.9}
677       \SetWatermarkText{\parbox{12em}{\centering
678         Legacy document. \\
679         Not for publication in an ACM venue}}
680     \fi
681   \fi
682 \fi
```

### 3.11 Paper size and paragraphing

We use `geometry` for dimensions. Note that the present margins do not depend on the font size option—we might need to change this. See <https://github.com/borisveytsman/acmart/issues/5#issuecomment-272881329>.

```
683 \RequirePackage{geometry}
```

```

684 \ifcase\ACM@format@nr
685 \relax % manuscript
686   \geometry{letterpaper,head=13pt,
687     marginparwidth=6pc,heightrounded}%
688 \or % acmsmall
689   \geometry{twoside=true,
690     includeheadfoot, head=13pt, foot=2pc,
691     paperwidth=6.75in, paperheight=10in,
692     top=58pt, bottom=44pt, inner=46pt, outer=46pt,
693     marginparwidth=2pc,heightrounded
694   }%
695 \or % acmlarge
696   \geometry{twoside=true, head=13pt, foot=2pc,
697     paperwidth=8.5in, paperheight=11in,
698     includeheadfoot,
699     top=78pt, bottom=114pt, inner=81pt, outer=81pt,
700     marginparwidth=4pc,heightrounded
701   }%
702 \or % acmtog
703   \geometry{twoside=true, head=13pt, foot=2pc,
704     paperwidth=8.5in, paperheight=11in,
705     includeheadfoot, columnsep=24pt,
706     top=52pt, bottom=75pt, inner=52pt, outer=52pt,
707     marginparwidth=2pc,heightrounded
708   }%
709 \or % sigconf
710   \geometry{twoside=true, head=13pt,
711     paperwidth=8.5in, paperheight=11in,
712     includeheadfoot, columnsep=2pc,
713     top=57pt, bottom=73pt, inner=54pt, outer=54pt,
714     marginparwidth=2pc,heightrounded
715   }%
716 \or % siggraph
717   \geometry{twoside=true, head=13pt,
718     paperwidth=8.5in, paperheight=11in,
719     includeheadfoot, columnsep=2pc,
720     top=57pt, bottom=73pt, inner=54pt, outer=54pt,
721     marginparwidth=2pc,heightrounded
722   }%
723 \or % sigplan
724   \geometry{twoside=true, head=13pt,
725     paperwidth=8.5in, paperheight=11in,
726     includeheadfoot=false, columnsep=2pc,
727     top=1in, bottom=1in, inner=0.75in, outer=0.75in,
728     marginparwidth=2pc,heightrounded
729   }%
730 \or % sigchi
731   \geometry{twoside=true, head=13pt,
732     paperwidth=8.5in, paperheight=11in,
733     includeheadfoot, columnsep=2pc,
734     top=66pt, bottom=73pt, inner=54pt, outer=54pt,
735     marginparwidth=2pc,heightrounded
736   }%
737 \or % sigchi-a

```

```

738 \geometry{twoside=false, head=13pt,
739   paperwidth=11in, paperheight=8.5in,
740   includeheadfoot, marginparsep=72pt,
741   marginparwidth=170pt, columnsep=20pt,
742   top=72pt, bottom=72pt, left=314pt, right=72pt
743   }%
744   \@mparswitchfalse
745   \reversemarginpar
746 \or % acmengage
747 \geometry{twoside=true, head=13pt,
748   paperwidth=8.5in, paperheight=11in,
749   includeheadfoot, columnsep=2pc,
750   top=57pt, bottom=73pt, inner=54pt, outer=54pt,
751   marginparwidth=2pc,heightrounded
752   }%
753 \or % acmcp
754 \geometry{twoside=true,
755   includeheadfoot, head=13pt, foot=2pc,
756   paperwidth=6.75in, paperheight=10in,
757   top=58pt, bottom=44pt, inner=46pt, outer=46pt,
758   marginparwidth=2pc,heightrounded
759   }%
760 \fi

```

#### `\parindent` Paragraphing

```

\parskip 761 \setlength\parindent{10\p@}
762 \setlength\parskip{\z@}
763 \ifcase\ACM@format@nr
764 \relax % manuscript
765 \or % acmsmall
766 \or % acmlarge
767 \or % acmtog
768 \setlength\parindent{9\p@}%
769 \or % sigconf
770 \or % siggraph
771 \or % sigplan
772 \or % sigchi
773 \or % sigchi-a
774 \or % acmengage
775 \or % acmcp
776 \fi

```

`\normalparindent` The `amsart` package defines the `\normalparindent` length and initializes it to 12pt (the value of `\parindent` in `amsart`). It is later used to set the `\listparindent` length in the quotation environment and the `\parindent` length in the `\@footnotetext` command. We set `\normalparindent` to the value of `\parindent` as selected by `acmart` for consistent paragraph indents.

```
777 \setlength\normalparindent{\parindent}
```

Footnotes require some consideration. We have several layers of footnotes: front-matter footnotes, “regular” footnotes and the special insert for the `bibstrip`. In the old ACM classes, the `bibstrip` was a `\@float`. The problem with floats is that they tend to, well, float—and we want the guarantee they stay.

We use `manyfoot` for layered footnotes instead.

copyrightpermissionfootnoterule This is the footnote rule that separates the bibstrip from the rest of the paper. It is a full width rule.

```
778 \def\copyrightpermissionfootnoterule{\kern-3\p@
779 \hrule \@width \columnwidth \kern 2.6\p@}

780 \RequirePackage{manyfoot}
781 \SelectFootnoteRule[2]{copyrightpermission}
782 \DeclareNewFootnote{authorsaddresses}
783 \SelectFootnoteRule[2]{copyrightpermission}
784 \DeclareNewFootnote{copyrightpermission}
```

\footnoterule Tschichold's rules:

```
785 \def\footnoterule{\kern-3\p@
786 \hrule \@width 4pc \kern 2.6\p@}
```

\endminipage We do not use footnote rules in minipages

```
787 \def\endminipage{%
788 \par
789 \unskip
790 \ifvoid\@mpfootins\else
791 \vskip\skip\@mpfootins
792 \normalcolor
793 \unvbox\@mpfootins
794 \fi
795 \@minipagefalse
796 \color@endgroup
797 \egroup
798 \expandafter\@iiparbox\@mpargs{\unvbox\@tempboxa}}
```

\@textbottom Add some stretch according to David Carlisle's advice at <http://tex.stackexchange.com/a/62318/5522>

```
799 \def\@textbottom{\vskip \z@ \@plus 1pt}
800 \let\@texttop\relax
```

In two-column layouts, force both columns to be the same height by inserting extra internal vertical space to fill out the page.

```
801 \ifcase\ACM@format@nr
802 \relax % manuscript
803 \or % acmsmall
804 \or % acmlarge
805 \or % acmtog
806 \flushbottom
807 \or % sigconf
808 \flushbottom
809 \or % siggraph
810 \flushbottom
811 \or % sigplan
812 \flushbottom
813 \or % sigchi
814 \flushbottom
815 \or % sigchi-a
816 \or % acmengage
817 \flushbottom
```

```

818 \or % acmcp
819 \flushbottom
820 \fi

```

### 3.12 Fonts

Somehow PDF $\TeX$  and Xe $\TeX$  require different incantations to make a PDF compliant with the current Acrobat bugs. Xpdf is much better.

The code below is by Ross Moore.

```

821 \ifPDFTeX
822 \input{glyphtounicode}
823 \pdfglyphtounicode{f_f}{FB00}
824 \pdfglyphtounicode{f_f_i}{FB03}
825 \pdfglyphtounicode{f_f_l}{FB04}
826 \pdfglyphtounicode{f_i}{FB01}
827 \pdfglyphtounicode{t_t}{0074 0074}
828 \pdfglyphtounicode{f_t}{0066 0074}
829 \pdfglyphtounicode{T_h}{0054 0068}
830 \pdfgentounicode=1
831 \RequirePackage{cmap}
832 \fi

```

`\if@ACM@newfonts` Whether we load the new fonts

```

833 \newif\if@ACM@newfonts
834 \@ACM@newfontstrue
835 \IfFileExists{libertine.sty}{\ClassWarning{\@classname}{You do not
836   have the libertine package installed. Please upgrade your
837   TeX}\@ACM@newfontsfalse}
838 \IfFileExists{zi4.sty}{\ClassWarning{\@classname}{You do not
839   have the inconsolata (zi4.sty) package installed. Please upgrade your
840   TeX}\@ACM@newfontsfalse}
841 \IfFileExists{newtxmath.sty}{\ClassWarning{\@classname}{You do not
842   have the newtxmath package installed. Please upgrade your
843   TeX}\@ACM@newfontsfalse}

```

We use Libertine throughout.

```

844 \if@ACM@newfonts
845 \RequirePackage[T1]{fontenc}
846 % Note that the order in which packages are loaded matters,
847 % and the correct order depends on the LaTeX engine used.
848 % See https://github.com/borisveytsman/acmart/issues/402
849 % and https://github.com/borisveytsman/acmart/issues/410
850 \ifxetex
851 \RequirePackage[libertine]{newtxmath}
852 \RequirePackage[tt=false]{libertine}
853 \setmonofont[StylisticSet=3]{inconsolata}
854 \else
855 \ifluatex
856 \RequirePackage[libertine]{newtxmath}
857 \RequirePackage[tt=false]{libertine}
858 \setmonofont[StylisticSet=3]{inconsolata}
859 \else
860 \RequirePackage[tt=false, type1=true]{libertine}

```

```

861     \RequirePackage[varqu]{zi4}
862     \RequirePackage[libertine]{newtxmath}
863     \fi
864 \fi
865 \fi

```

`\liningnums` Libertine defines `\liningnums`, which makes `fontspec` unhappy. While we do not use `fontspec`, some users do.

```

866 \let\liningnums\undefined
867 \AtEndPreamble{%
868   \DeclareTextFontCommand{\liningnums}{\libertineLF}}

```

The SIGCHI extended abstracts are sans serif:

```

869 \if@ACM@sigchiamode
870   \renewcommand{\familydefault}{\sfdefault}
871 \fi

```

### 3.13 Image descriptions

`\if@Description@present` A local switch: whether there is a description in the given figure

```

872 \newif\if@Description@present
873 \@Description@presenttrue

```

`\if@undescribed@images` A global switch whether some images were *not* described

```

874 \newif\if@undescribed@images
875 \@undescribed@imagesfalse

```

`\Description` The `Description` macro right now just sets switches

```

876 \newcommand\Description[2][\global\@Description@presenttrue\ignorespaces}

```

The global warning

```

877 \AtEndDocument{\if@undescribed@images
878   \ClassWarningNoLine{\@classname}{Some images may lack descriptions}\fi}

```

Hooks for figures and tables. We also patch `algorithm` and `algorithm*` in case somebody uses them.

```

879 \AtBeginEnvironment{figure}{\@Description@presentfalse
880   \let\@vspace\@vspace@orig
881   \let\@vspacer\@vspacer@orig}
882 \AtBeginEnvironment{figure*}{\@Description@presentfalse
883   \let\@vspace\@vspace@orig
884   \let\@vspacer\@vspacer@orig}
885 \AtEndEnvironment{figure}{\if@Description@present\else
886   \global\@undescribed@imagestrue
887   \ClassWarning{\@classname}{A possible image without description}\fi}
888 \AtEndEnvironment{figure*}{\if@Description@present\else
889   \global\@undescribed@imagestrue
890   \ClassWarning{\@classname}{A possible image without description}\fi}
891 \AtBeginEnvironment{table}{\let\@vspace\@vspace@orig
892   \let\@vspacer\@vspacer@orig}
893 \AtBeginEnvironment{table*}{\let\@vspace\@vspace@orig
894   \let\@vspacer\@vspacer@orig}
895 \AtBeginEnvironment{algorithm}{\let\@vspace\@vspace@orig

```



```

896 \let\@vspacer\@vspacer@orig}
897 \AtBeginEnvironment{algorithm*}{\let\@vspace\@vspace@orig
898 \let\@vspacer\@vspacer@orig}
899 \AtBeginEnvironment{lstlisting}{\let\@vspace\@vspace@orig
900 \let\@vspacer\@vspacer@orig}
901 \AtBeginEnvironment{lstlisting*}{\let\@vspace\@vspace@orig
902 \let\@vspacer\@vspacer@orig}
903 \AtBeginEnvironment{minted}{\let\@vspace\@vspace@orig
904 \let\@vspacer\@vspacer@orig}
905 \AtBeginEnvironment{minted*}{\let\@vspace\@vspace@orig
906 \let\@vspacer\@vspacer@orig}
907 \AtBeginEnvironment{listing}{\let\@vspace\@vspace@orig
908 \let\@vspacer\@vspacer@orig}
909 \AtBeginEnvironment{listing*}{\let\@vspace\@vspace@orig
910 \let\@vspacer\@vspacer@orig}
911

```

### 3.14 Floats

We use the caption package

```

912 \RequirePackage{caption, float}
913 \captionsetup[table]{position=top}
914 \if@ACM@journal
915 \captionsetup{labelfont={sf, small},
916 textfont={sf, small}, margin=\z@}
917 \captionsetup[figure]{name={Fig.}}
918 \else
919 \captionsetup{labelfont={bf},
920 textfont={bf}, labelsep=colon, margin=\z@}
921 \ifcase\ACM@format@nr
922 \relax % manuscript
923 \or % acmsmall
924 \or % acmlarge
925 \or % acmtog
926 \or % sigconf
927 \or % siggraph
928 \captionsetup{textfont={it}}
929 \or % sigplan
930 \captionsetup{labelfont={bf},
931 textfont={normalfont}, labelsep=period, margin=\z@}
932 \or % sigchi
933 \captionsetup[figure]{labelfont={bf, small},
934 textfont={bf, small}}
935 \captionsetup[table]{labelfont={bf, small},
936 textfont={bf, small}}
937 \or % sigchi-a
938 \captionsetup[figure]{labelfont={bf, small},
939 textfont={bf, small}}
940 \captionsetup[table]{labelfont={bf, small},
941 textfont={bf, small}}
942 \or % acmengage
943 \or % acmcp
944 \fi
945 \fi

```

```

sidebar The sidebar environment:
946 \newfloat{sidebar}{}{sbar}
947 \floatname{sidebar}{Sidebar}
948 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}

\@sidebar The processing of the saved text
949 \long\def\@sidebar#1{\bgroup\let\@vspace\@vspace@orig
950 \let\@vspacer\@vspacer@orig\captionsetup{type=sidebar}%
951 \marginpar{\small#1}\egroup}

marginfigure The marginfigure environment:
952 \newenvironment{marginfigure}{\Collect@Body\@marginfigure}{}

\@marginfigure The processing of the saved text
953 \long\def\@marginfigure#1{\bgroup
954 \let\@vspace\@vspace@orig
955 \let\@vspacer\@vspacer@orig
956 \captionsetup{type=figure}%
957 \marginpar{\@Description@presentfalse\centering
958 \small#1\if@Description@present\else
959 \global\@undescribed@imagestrue
960 \ClassWarning{\@classname}{A possible image without description}
961 \fi}%
962 \egroup}

margintable The margintable environment:
963 \newenvironment{margintable}{\Collect@Body\@margintable}{}

\@margintable The processing of the saved text
964 \long\def\@margintable#1{\bgroup\let\@vspace\@vspace@orig
965 \let\@vspacer\@vspacer@orig\captionsetup{type=table}%
966 \marginpar{\centering\small#1}\egroup}

SIGCHI extended abstracts provide an interesting possibility to push into the margin.
Here we use figure* and table* for this.

\fulltextwidth We define the width of the boxes as
967 \newdimen\fulltextwidth
968 \fulltextwidth=\dimexpr(\textwidth+\marginparwidth+\marginparsep)

\@dblfloat We redefine the double-float command. First, we make the size bigger. Second, our
default position is going to be tp (to give marginalia a chance)
969 \if@ACM@sigchiamode
970 \def\@dblfloat{\bgroup\let\@vspace\@vspace@orig
971 \let\@vspacer\@vspacer@orig\columnwidth=\fulltextwidth
972 \let\@endfloatbox\@endwidefloatbox
973 \def\@fpsadddfault{\def\@fps{tp}}%
974 \@float}
975 \fi

\end@dblfloat And the end. Just adding a \bgroup.
976 \if@ACM@sigchiamode
977 \def\end@dblfloat{%
978 \end@float\egroup}
979 \fi

```

`\@endwidefloatbox` This is the end of a wide box—we basically move everything to the left

```
980 \def\@endwidefloatbox{%
981   \par\vskip\z@skip
982   \@minipagefalse
983   \outer@nobreak
984   \egroup
985   \color@endbox
986   \global\setbox\@currbox=\vbox{\moveleft
987     \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
988   \wd\@currbox=\textwidth
989 }
```

### 3.15 Lists

```
990 \ifcase\ACM@format@nr
991 \relax % manuscript
992 \or % acsmall
993 \or % acmlarge
994 \or % acmtog
995 \or % sigconf
996 \or % siggraph
997 \or % sigplan
998 \def\labelenumi{\theenumi.}
999 \def\labelenumii{\theenumii.}
1000 \def\labelenumiii{\theenumiii.}
1001 \def\labelenumiv{\theenumiv.}
1002 \or % sigchi
1003 \or % sigchi-a
1004 \or % acmengage
1005 \or % acmcp
1006 \fi
```

The AMS uses generous margins for lists. Note that `amsart` defines `\leftmargin` values for list levels at the beginning of the document, so we must redefine them in the same manner. Also, note that `amsart` redefines the `enumerate` and `itemize` environments with a `\makelabel` command that uses `\llap`, so the `\labelwidth` value is (effectively) irrelevant; nonetheless, we follow `amsart` and set `\labelwidth` to `\leftmargin` minus `\labelsep`.

```
1007 \newdimen\@ACM@labelwidth
1008 \AtBeginDocument{%
1009   \setlength\labelsep{4pt}
1010   \setlength{\@ACM@labelwidth}{6.5pt}
1011
1012   %% First-level list: when beginning after the first line of an
1013   %% indented paragraph or ending before an indented paragraph, labels
1014   %% should not hang to the left of the preceding/following text.
1015   \setlength\leftmargini{\z@}
1016   \addtolength\leftmargini{\parindent}
1017   \addtolength\leftmargini{2\labelsep}
1018   \addtolength\leftmargini{\@ACM@labelwidth}
1019
1020   %% Second-level and higher lists.
1021   \setlength\leftmarginii{\z@}
1022   \addtolength\leftmarginii{0.5\labelsep}
```

```

1023 \addtolength\leftmarginii{\@ACM@labelwidth}
1024 \setlength\leftmarginiii{\leftmarginii}
1025 \setlength\leftmarginiv{\leftmarginiii}
1026 \setlength\leftmarginv{\leftmarginiv}
1027 \setlength\leftmarginvi{\leftmarginv}
1028 \@listi}
1029 \newskip\listisep
1030 \listisep\smallskipamount
1031 \def\@listI{\leftmargin\leftmargini
1032 \labelwidth\leftmargini \advance\labelwidth-\labelsep
1033 \listparindent\z@
1034 \topsep\listisep}
1035 \let\@listi\@listI
1036 \def\@listii{\leftmargin\leftmarginii
1037 \labelwidth\leftmarginii \advance\labelwidth-\labelsep
1038 \topsep\z@skip}
1039 \def\@listiii{\leftmargin\leftmarginiii
1040 \labelwidth\leftmarginiii \advance\labelwidth-\labelsep}
1041 \def\@listiv{\leftmargin\leftmarginiv
1042 \labelwidth\leftmarginiv \advance\labelwidth-\labelsep}
1043 \def\@listv{\leftmargin\leftmarginv
1044 \labelwidth\leftmarginv \advance\labelwidth-\labelsep}
1045 \def\@listvi{\leftmargin\leftmarginvi
1046 \labelwidth\leftmarginvi \advance\labelwidth-\labelsep}
\descriptionlabel We do not use a colon by default like amsart does:
1047 \renewcommand{\descriptionlabel}[1]{\upshape\bfseries #1}

\description Make the description environment indentation consistent with that of the itemize
and enumerate environments.
1048 \renewenvironment{description}{\list{}}{%
1049 \labelwidth\@ACM@labelwidth
1050 \let\makelabel\descriptionlabel}%
1051 }{
1052 \endlist
1053 }
1054 \let\enddescription=\endlist % for efficiency

```

### 3.16 Top-matter data

`\if@ACM@maketitle@typeset` The switch to check whether `\maketitle` is already typeset. It is initially false, and setting top matter when it is true is wrong.

```

1055 \newif\if@ACM@maketitle@typeset
1056 \@ACM@maketitle@typesetfalse

```

We use the `xkeyval` interface to define journal titles and the relevant information

```

1057 \define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
1058 ACMJCSS,%
1059 CIE,%
1060 CSUR,%
1061 DGOV,%
1062 DLT,%
1063 DTRAP,%
1064 FAC,%

```

1065 GAMES,%  
1066 HEALTH,%  
1067 IMWUT,%  
1068 JACM,%  
1069 JATS,%  
1070 JDIQ,%  
1071 JDS,%  
1072 JEA,%  
1073 JERIC,%  
1074 JETC,%  
1075 JOCCH,%  
1076 JRC,%  
1077 PACMCGIT,%  
1078 PACMHCI,%  
1079 PACMMOD,%  
1080 PACMNET,%  
1081 PACMPL,%  
1082 PACMSE,%  
1083 POMACS,%  
1084 TAAS,%  
1085 TACCESS,%  
1086 TACO,%  
1087 TALG,%  
1088 TALLIP,%  
1089 TAP,%  
1090 TCPS,%  
1091 TDS,%  
1092 TEAC,%  
1093 TECS,%  
1094 TELO,%  
1095 THRI,%  
1096 TIIS,%  
1097 TIOT,%  
1098 TISSEC,%  
1099 TIST,%  
1100 TKDD,%  
1101 TMIS,%  
1102 TOCE,%  
1103 TOCHI,%  
1104 TOCL,%  
1105 TOCS,%  
1106 TOCT,%  
1107 TODAES,%  
1108 TODS,%  
1109 TOG,%  
1110 TOIS,%  
1111 TOIT,%  
1112 TOMACS,%  
1113 TOMM,%  
1114 TOMPECS,%  
1115 TOMS,%  
1116 TOPC,%  
1117 TOPLAS,%  
1118 TOPML,%

```

1119 TOPS,%
1120 TORS,%
1121 TOS,%
1122 TOSEM,%
1123 TOSN,%
1124 TQC,%
1125 TRETTS,%
1126 TSAS,%
1127 TSC,%
1128 TSLP,%
1129 TWEB,%
1130 FACMP%
1131 }{%
1132 \ifcase\@journalCode@nr
1133 \relax % ACMJCSS
1134 \def\@journalName{ACM Journal on Computing and Sustainable Societies}%
1135 \def\@journalNameShort{ACM J. Comput. Sustain. Soc.}%
1136 \def\@permissionCodeOne{2834-5533}%
1137 \def\@permissionCodeTwo{2834-5533}%
1138 \or % CIE
1139 \def\@journalName{ACM Computers in Entertainment}%
1140 \def\@journalNameShort{ACM Comput. Entertain.}%
1141 \def\@permissionCodeOne{1544-3574}%
1142 \or % CSUR
1143 \def\@journalName{ACM Computing Surveys}%
1144 \def\@journalNameShort{ACM Comput. Surv.}%
1145 \def\@permissionCodeOne{0360-0300}%
1146 \def\@permissionCodeTwo{1557-7341}%
1147 \or % DGOV
1148 \def\@journalName{Digital Government: Research and Practice}%
1149 \def\@journalNameShort{Digit. Gov. Res. Pract.}%
1150 \def\@permissionCodeOne{2639-0175}%
1151 \def\@permissionCodeTwo{2639-0175}%
1152 \or % DLT
1153 \def\@journalName{Distributed Ledger Technologies: Research and Practice}%
1154 \def\@journalNameShort{Distrib. Ledger Technol.}%
1155 \def\@permissionCodeOne{2769-6472}%
1156 \def\@permissionCodeTwo{2769-6480}%
1157 \or % DTRAP
1158 \def\@journalName{Digital Threats: Research and Practice}%
1159 \def\@journalNameShort{Digit. Threat. Res. Pract.}%
1160 \def\@permissionCodeOne{2576-5337}%
1161 \def\@permissionCodeTwo{2576-5337}%
1162 \or % FAC
1163 \def\@journalName{Formal Aspects of Computing}%
1164 \def\@journalNameShort{Form. Asp. Comput.}%
1165 \def\@permissionCodeOne{0934-5043}%
1166 \def\@permissionCodeTwo{1433-299X}%
1167 \or % GAMES
1168 \def\@journalName{ACM Games: Research and Practice}%
1169 \def\@journalNameShort{ACM Games}%
1170 \def\@permissionCodeOne{2832-5516}%
1171 \def\@permissionCodeTwo{2832-5516}%
1172 \or % HEALTH

```

```

1173 \def\@journalName{ACM Transactions on Computing for Healthcare}%
1174 \def\@journalNameShort{ACM Trans. Comput. Healthcare}%
1175 \def\@permissionCodeOne{2637-8051}%
1176 \def\@permissionCodeTwo{2637-8051}%
1177 \or % IMWUT
1178 \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
1179     Wearable and Ubiquitous Technologies}%
1180 \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
1181 \def\@permissionCodeOne{2474-9567}%
1182 \def\@permissionCodeTwo{2474-9567}%
1183 \@ACM@screentruer
1184 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1185 \or % JACM
1186 \def\@journalName{Journal of the ACM}%
1187 \def\@journalNameShort{J. ACM}%
1188 \def\@permissionCodeOne{0004-5411}%
1189 \def\@permissionCodeTwo{1557-735X}%
1190 \or % JATS
1191 \def\@journalName{Journal on Autonomous Transportation Systems}%
1192 \def\@journalNameShort{ACM J. Auton. Transport. Syst.}%
1193 \def\@permissionCodeOne{2833-0528}%
1194 \def\@permissionCodeTwo{2833-0528}%
1195 \or % JDIQ
1196 \def\@journalName{ACM Journal of Data and Information Quality}%
1197 \def\@journalNameShort{ACM J. Data Inform. Quality}%
1198 \def\@permissionCodeOne{1936-1955}%
1199 \def\@permissionCodeTwo{1936-1963}%
1200 \or % JDS
1201 \def\@journalName{ACM/IMS Journal of Data Science}%
1202 \def\@journalNameShort{ACM/IMS J. Data Sci.}%
1203 \def\@permissionCodeOne{2831-3194}%
1204 \def\@permissionCodeTwo{2831-3194}%
1205 \or % JEA
1206 \def\@journalName{ACM Journal of Experimental Algorithmics}%
1207 \def\@journalNameShort{ACM J. Exp. Algor.}%
1208 \def\@permissionCodeOne{1084-6654}%
1209 \def\@permissionCodeTwo{1084-6654}%
1210 \or % JERIC
1211 \def\@journalName{ACM Journal of Educational Resources in Computing}%
1212 \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
1213 \def\@permissionCodeOne{1073-0516}%
1214 \or % JETC
1215 \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
1216 \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
1217 \def\@permissionCodeOne{1550-4832}%
1218 \def\@permissionCodeTwo{1550-4840}%
1219 \or % JOCCH
1220 \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
1221 \def\@journalNameShort{ACM J. Comput. Cult. Herit.}%
1222 \def\@permissionCodeOne{1556-4673}%
1223 \def\@permissionCodeTwo{1556-4711}%
1224 \or % JRC
1225 \def\@journalName{ACM Journal on Responsible Computing}%
1226 \def\@journalNameShort{ACM J. Responsib. Comput.}%

```

```

1227 \def\@permissionCodeOne{2832-0565}%
1228 \def\@permissionCodeTwo{2832-0565}%
1229 \or % PACMCGIT
1230 \def\@journalName{Proceedings of the ACM on Computer Graphics and Interactive Techniques}%
1231 \def\@journalNameShort{Proc. ACM Comput. Graph. Interact. Tech.}%
1232 \def\@permissionCodeOne{2577-6193}%
1233 \def\@permissionCodeTwo{2577-6193}%
1234 \@ACM@screentruer
1235 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1236 \or % PACMHCI
1237 \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
1238 \def\@journalNameShort{Proc. ACM Hum.-Comput. Interact.}%
1239 \def\@permissionCodeOne{2573-0142}%
1240 \def\@permissionCodeTwo{2573-0142}%
1241 \@ACM@screentruer
1242 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1243 \or % PACMMOD
1244 \def\@journalName{Proceedings of the ACM on Management of Data}%
1245 \def\@journalNameShort{Proc. ACM Manag. Data}%
1246 \def\@permissionCodeOne{2836-6573}%
1247 \def\@permissionCodeTwo{2836-6573}%
1248 \or % PACMNET
1249 \def\@journalName{Proceedings of the ACM on Networkng}%
1250 \def\@journalNameShort{Proc. ACM Netw.}%
1251 \def\@permissionCodeOne{2834-5509}%
1252 \def\@permissionCodeTwo{2834-5509}%
1253 \or % PACMPL
1254 \def\@journalName{Proceedings of the ACM on Programming Languages}%
1255 \def\@journalNameShort{Proc. ACM Program. Lang.}%
1256 \def\@permissionCodeOne{2475-1421}%
1257 \def\@permissionCodeTwo{2475-1421}%
1258 \@ACM@screentruer
1259 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1260 \or % PACMSE
1261 \def\@journalName{Proceedings of the ACM on Software Engineering}%
1262 \def\@journalNameShort{Proc. ACM Softw. Eng.}%
1263 \def\@permissionCodeOne{2994-970X}%
1264 \def\@permissionCodeTwo{2994-970X}%
1265 \@ACM@screentruer
1266 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1267 \or % POMACS
1268 \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
1269 \def\@journalNameShort{Proc. ACM Meas. Anal. Comput. Syst.}%
1270 \def\@permissionCodeOne{2476-1249}%
1271 \def\@permissionCodeTwo{2476-1249}%
1272 \@ACM@screentruer
1273 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1274 \or % TAAS
1275 \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
1276 \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
1277 \def\@permissionCodeOne{1556-4665}%
1278 \def\@permissionCodeTwo{1556-4703}%
1279 \or % TACCESS
1280 \def\@journalName{ACM Transactions on Accessible Computing}%

```



1281 \def\@journalNameShort{ACM Trans. Access. Comput.}%  
1282 \def\@permissionCodeOne{1936-7228}%  
1283 \def\@permissionCodeTwo{1936-7236}%  
1284 \or % TACO  
1285 \def\@journalName{ACM Transactions on Architecture and Code Optimization}%  
1286 \def\@journalNameShort{ACM Trans. Arch. Code Optim.}%  
1287 \def\@permissionCodeOne{1544-3566}%  
1288 \def\@permissionCodeTwo{1544-3973}%  
1289 \or % TALG  
1290 \def\@journalName{ACM Transactions on Algorithms}%  
1291 \def\@journalNameShort{ACM Trans. Algor.}%  
1292 \def\@permissionCodeOne{1549-6325}%  
1293 \def\@permissionCodeTwo{1549-6333}%  
1294 \or % TALLIP  
1295 \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%  
1296 \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%  
1297 \def\@permissionCodeOne{2375-4699}%  
1298 \def\@permissionCodeTwo{2375-4702}%  
1299 \or % TAP  
1300 \def\@journalName{ACM Transactions on Applied Perception}%  
1301 \def\@journalNameShort{ACM Trans. Appl. Percept.}%  
1302 \def\@permissionCodeOne{1544-3558}%  
1303 \def\@permissionCodeTwo{1544-3965}%  
1304 \or % TCPS  
1305 \def\@journalName{ACM Transactions on Cyber-Physical Systems}%  
1306 \def\@journalNameShort{ACM Trans. Cyber-Phys. Syst.}%  
1307 \def\@permissionCodeOne{2378-962X}%  
1308 \def\@permissionCodeTwo{2378-9638}%  
1309 \or % TDS  
1310 \def\@journalName{ACM/IMS Transactions on Data Science}%  
1311 \def\@journalNameShort{ACM/IMS Trans. Data Sci.}%  
1312 \def\@permissionCodeOne{2577-3224}%  
1313 \or % TEAC  
1314 \def\@journalName{ACM Transactions on Economics and Computation}%  
1315 \def\@journalNameShort{ACM Trans. Econ. Comput.}%  
1316 \def\@permissionCodeOne{2167-8375}%  
1317 \def\@permissionCodeTwo{2167-8383}%  
1318 \or % TECS  
1319 \def\@journalName{ACM Transactions on Embedded Computing Systems}%  
1320 \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%  
1321 \def\@permissionCodeOne{1539-9087}%  
1322 \def\@permissionCodeTwo{1558-3465}%  
1323 \or % TELO  
1324 \def\@journalName{ACM Transactions on Evolutionary Learning and Optimization}%  
1325 \def\@journalNameShort{ACM Trans. Evol. Learn. Optim.}%  
1326 \def\@permissionCodeOne{2688-3007}%  
1327 \def\@permissionCodeTwo{2345-6789}%  
1328 \or % THRI  
1329 \def\@journalName{ACM Transactions on Human-Robot Interaction}%  
1330 \def\@journalNameShort{ACM Trans. Hum.-Robot Interact.}%  
1331 \def\@permissionCodeOne{2573-9522}%  
1332 \def\@permissionCodeTwo{2573-9522}%  
1333 \or % TIIS  
1334 \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%

1335 \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%  
1336 \def\@permissionCodeOne{2160-6455}%  
1337 \def\@permissionCodeTwo{2160-6463}%  
1338 \or % TIOT  
1339 \def\@journalName{ACM Transactions on Internet of Things}%  
1340 \def\@journalNameShort{ACM Trans. Internet Things}%  
1341 \def\@permissionCodeOne{2577-6207}%  
1342 \def\@permissionCodeTwo{2577-6207}%  
1343 \or % TISSEC  
1344 \def\@journalName{ACM Transactions on Information and System Security}%  
1345 \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%  
1346 \def\@permissionCodeOne{1094-9224}%  
1347 \or % TIST  
1348 \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%  
1349 \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%  
1350 \def\@permissionCodeOne{2157-6904}%  
1351 \def\@permissionCodeTwo{2157-6912}%  
1352 \or % TKDD  
1353 \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%  
1354 \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%  
1355 \def\@permissionCodeOne{1556-4681}%  
1356 \def\@permissionCodeTwo{1556-472X}%  
1357 \or % TMIS  
1358 \def\@journalName{ACM Transactions on Management Information Systems}%  
1359 \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%  
1360 \def\@permissionCodeOne{2158-656X}%  
1361 \def\@permissionCodeTwo{2158-6578}%  
1362 \or % TOCE  
1363 \def\@journalName{ACM Transactions on Computing Education}%  
1364 \def\@journalNameShort{ACM Trans. Comput. Educ.}%  
1365 \def\@permissionCodeOne{1946-6226}%  
1366 \def\@permissionCodeTwo{1946-6226}%  
1367 \or % TOCHI  
1368 \def\@journalName{ACM Transactions on Computer-Human Interaction}%  
1369 \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%  
1370 \def\@permissionCodeOne{1073-0516}%  
1371 \def\@permissionCodeTwo{1557-7325}%  
1372 \or % TOCL  
1373 \def\@journalName{ACM Transactions on Computational Logic}%  
1374 \def\@journalNameShort{ACM Trans. Comput. Logic}%  
1375 \def\@permissionCodeOne{1529-3785}%  
1376 \def\@permissionCodeTwo{1557-945X}%  
1377 \or % TOCS  
1378 \def\@journalName{ACM Transactions on Computer Systems}%  
1379 \def\@journalNameShort{ACM Trans. Comput. Syst.}%  
1380 \def\@permissionCodeOne{0734-2071}%  
1381 \def\@permissionCodeTwo{1557-7333}%  
1382 \or % TOCT  
1383 \def\@journalName{ACM Transactions on Computation Theory}%  
1384 \def\@journalNameShort{ACM Trans. Comput. Theory}%  
1385 \def\@permissionCodeOne{1942-3454}%  
1386 \def\@permissionCodeTwo{1942-3462}%  
1387 \or % TODAES  
1388 \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%

```

1389 \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
1390 \def\@permissionCodeOne{1084-4309}%
1391 \def\@permissionCodeTwo{1557-7309}%
1392 \or % TODS
1393 \def\@journalName{ACM Transactions on Database Systems}%
1394 \def\@journalNameShort{ACM Trans. Datab. Syst.}%
1395 \def\@permissionCodeOne{0362-5915}%
1396 \def\@permissionCodeTwo{1557-4644}%
1397 \or % TOG
1398 \def\@journalName{ACM Transactions on Graphics}%
1399 \def\@journalNameShort{ACM Trans. Graph.}%
1400 \def\@permissionCodeOne{0730-0301}%
1401 \def\@permissionCodeTwo{1557-7368}%
1402 \or % TOIS
1403 \def\@journalName{ACM Transactions on Information Systems}%
1404 \def\@journalNameShort{ACM Trans. Inf. Syst.}%
1405 \def\@permissionCodeOne{1046-8188}%
1406 \def\@permissionCodeTwo{1558-2868}%
1407 \or % TOIT
1408 \def\@journalName{ACM Transactions on Internet Technology}%
1409 \def\@journalNameShort{ACM Trans. Internet Technol.}%
1410 \def\@permissionCodeOne{1533-5399}%
1411 \def\@permissionCodeTwo{1557-6051}%
1412 \or % TOMACS
1413 \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
1414 \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
1415 \def\@permissionCodeOne{1049-3301}%
1416 \def\@permissionCodeTwo{1558-1195}%
1417 \or % TOMM
1418 \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
1419 \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
1420 \def\@permissionCodeOne{1551-6857}%
1421 \def\@permissionCodeTwo{1551-6865}%
1422 \or % TOMPECS
1423 \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
1424 \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
1425 \def\@permissionCodeOne{2376-3639}%
1426 \def\@permissionCodeTwo{2376-3647}%
1427 \or % TOMS
1428 \def\@journalName{ACM Transactions on Mathematical Software}%
1429 \def\@journalNameShort{ACM Trans. Math. Softw.}%
1430 \def\@permissionCodeOne{0098-3500}%
1431 \def\@permissionCodeTwo{1557-7295}%
1432 \or % TOPC
1433 \def\@journalName{ACM Transactions on Parallel Computing}%
1434 \def\@journalNameShort{ACM Trans. Parallel Comput.}%
1435 \def\@permissionCodeOne{2329-4949}%
1436 \def\@permissionCodeTwo{2329-4957}%
1437 \or % TOPLAS
1438 \def\@journalName{ACM Transactions on Programming Languages and Systems}%
1439 \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
1440 \def\@permissionCodeOne{0164-0925}%
1441 \def\@permissionCodeTwo{1558-4593}%
1442 \or % TOPML

```

```

1443 \def\@journalName{ACM Transactions on Probabilistic Machine Learning}%
1444 \def\@journalNameShort{ACM Trans. Probab. Mach. Learn.}%
1445 \def\@permissionCodeOne{2836-8924}%
1446 \def\@permissionCodeTwo{2836-8924}%
1447 \or % TOPS
1448 \def\@journalName{ACM Transactions on Privacy and Security}%
1449 \def\@journalNameShort{ACM Trans. Priv. Sec.}%
1450 \def\@permissionCodeOne{2471-2566}%
1451 \def\@permissionCodeTwo{2471-2574}%
1452 \or % TORS
1453 \def\@journalName{ACM Transactions on Recommender Systems}%
1454 \def\@journalNameShort{ACM Trans. Recomm. Syst.}%
1455 \def\@permissionCodeOne{2770-6699}%
1456 \def\@permissionCodeTwo{2770-6699}%
1457 \or % TOS
1458 \def\@journalName{ACM Transactions on Storage}%
1459 \def\@journalNameShort{ACM Trans. Storage}%
1460 \def\@permissionCodeOne{1553-3077}%
1461 \def\@permissionCodeTwo{1553-3093}%
1462 \or % TOSEM
1463 \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
1464 \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
1465 \def\@permissionCodeOne{1049-331X}%
1466 \def\@permissionCodeTwo{1557-7392}%
1467 \or % TOSN
1468 \def\@journalName{ACM Transactions on Sensor Networks}%
1469 \def\@journalNameShort{ACM Trans. Sensor Netw.}%
1470 \def\@permissionCodeOne{1550-4859}%
1471 \def\@permissionCodeTwo{1550-4867}%
1472 \or % TQC
1473 \def\@journalName{ACM Transactions on Quantum Computing}%
1474 \def\@journalNameShort{ACM Trans. Quantum Comput.}%
1475 \def\@permissionCodeOne{2643-6817}%
1476 \def\@permissionCodeTwo{2643-6817}%
1477 \or % TRETTS
1478 \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
1479 \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
1480 \def\@permissionCodeOne{1936-7406}%
1481 \def\@permissionCodeTwo{1936-7414}%
1482 \or % TSAS
1483 \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
1484 \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
1485 \def\@permissionCodeOne{2374-0353}%
1486 \def\@permissionCodeTwo{2374-0361}%
1487 \or % TSC
1488 \def\@journalName{ACM Transactions on Social Computing}%
1489 \def\@journalNameShort{ACM Trans. Soc. Comput.}%
1490 \def\@permissionCodeOne{2469-7818}%
1491 \def\@permissionCodeTwo{2469-7826}%
1492 \or % TSLP
1493 \def\@journalName{ACM Transactions on Speech and Language Processing}%
1494 \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
1495 \def\@permissionCodeOne{1550-4875}%
1496 \def\@permissionCodeTwo{2329-9304}%

```

```

1497 \or % TWEB
1498 \def\@journalName{ACM Transactions on the Web}%
1499 \def\@journalNameShort{ACM Trans. Web}%
1500 \def\@permissionCodeOne{1559-1131}%
1501 \def\@permissionCodeTwo{1559-114X}%
1502 \else % FACMP, a dummy journal
1503 \def\@journalName{ACM Just Accepted}%
1504 \def\@journalNameShort{ACM Accepted}%
1505 \def\@permissionCodeOne{XXXX-XXXX}%
1506 \fi
1507 \ClassInfo{\@classname}{Using journal code \@journalCode}%
1508 }{%
1509 \ClassError{\@classname}{Incorrect journal #1}%
1510 }%

```

**\acmJournal** And the syntactic sugar around it

```

1511 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}%
1512 \global\@ACM@journal@bibstriptrue
1513 \global\@ACM@journal@bibstrip@or@togtrue}

```

The defaults:

```

1514 \def\@journalCode@nr{0}
1515 \def\@journalName{}%
1516 \def\@journalNameShort{\@journalName}%
1517 \def\@permissionCodeOne{XXXX-XXXX}%
1518 \def\@permissionCodeTwo{\@permissionCodeOne}%

```

**\acmConference** This is the conference command

```

1519 \newcommand\acmConference[4][[]]{%
1520 \gdef\acmConference@shortname{#1}%
1521 \gdef\acmConference@name{#2}%
1522 \gdef\acmConference@date{#3}%
1523 \gdef\acmConference@venue{#4}%
1524 \ifx\acmConference@shortname\@empty
1525 \gdef\acmConference@shortname{#2}%
1526 \fi
1527 \global\@ACM@journal@bibstripfalse
1528 \ifx\@acmBooktitle\@empty\relax
1529 \acmBooktitle{Proceedings of \acmConference@name
1530 \ifx\acmConference@name\acmConference@shortname\else
1531 \ (\acmConference@shortname)\fi}%
1532 \fi
1533 }
1534 \if@ACM@journal\else
1535 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
1536 DC, USA}%
1537 \fi

```

**\acmBooktitle** The book title of the conference:

```

\@acmBooktitle 1538 \def\acmBooktitle#1{\gdef\@acmBooktitle{#1}}
1539 \acmBooktitle{}

```

**\@editorsAbbrev** How to abbreviate editors

```

1540 \def\@editorsAbbrev{(Ed.)}

```

```

\@acmEditors The list of editors
1541 \def\@acmEditors{}

\editor Add a new editor to the list
1542 \def\editor#1{\ifx\@acmEditors\@empty
1543   \gdef\@acmEditors{#1}%
1544   \else
1545     \gdef\@editorsAbbrev{(Eds.)}%
1546     \g@addto@macro\@acmEditors{\and#1}%
1547   \fi}

\subtitle The subtitle macro
1548 \def\subtitle#1{\def\@subtitle{#1}}
1549 \subtitle{}

\num@authorgroups The total number of “groups”. Each group is several authors with the same affiliations(s)
1550 \newcount\num@authorgroups
1551 \num@authorgroups=0\relax

\num@authors The total number of authors
1552 \newcount\num@authors
1553 \num@authors=0\relax

\if@insideauthorgroup Whether we are continuing an author group
1554 \newif\if@insideauthorgroup
1555 \@insideauthorgroupfalse

\author Adding an author to the list of authors and addresses.
    Note that we want to typeset the link to the author’s orcid if known. The problem
    is, we know the orcid only after the author is entered. The trick is based on the idea
    that \csname . . . \endcsname is \relax unless defined. Therefore we typeset authors by
    the special macro \csname typeset@author\the\num@authors\endcsname, which is
    defined by \orcid command.
1556 \renewcommand\author[2][{}]{%
1557   \IfSubStr{\detokenize{#2}}{,}{\ClassWarning{\@classname}{Do not put several
1558     authors in the same \string\author\space macro!}}}%
1559   \global\advance\num@authors by 1\relax
1560   \if@insideauthorgroup\else
1561     \global\advance\num@authorgroups by 1\relax
1562     \global\@insideauthorgrouptrue
1563   \fi
1564   \ifx\addresses\@empty
1565     \if@ACM@anonymous
1566       \gdef\addresses{\@author{Anonymous Author(s)}%
1567         \ifx\@acmSubmissionID\@empty\else\Submission Id:
1568           \@acmSubmissionID\fi}}%
1569       \gdef\authors{Anonymous Author(s)}%
1570     \else
1571       \expandafter\gdef\expandafter\addresses\expandafter{%
1572         \expandafter\@author\expandafter{%
1573           \csname typeset@author\the\num@authors\endcsname{#2}}}%
1574       \gdef\authors{#2}%
1575     \fi

```

```

1576 \else
1577   \if@ACM@anonymous\else
1578   \expandafter\g@addto@macro\expandafter\addresses\expandafter{%
1579     \expandafter\and\expandafter\@author\expandafter{%
1580       \csname typeset@author\the\num@authors\endcsname{#2}}}%
1581   \g@addto@macro\authors{\and#2}%
1582   \fi
1583 \fi
1584 \if@ACM@anonymous
1585   \ifx\shortauthors\@empty
1586     \gdef\shortauthors{Anon.
1587       \ifx\@acmSubmissionID\@empty\else Submission Id:
1588       \@acmSubmissionID\fi}%
1589   \fi
1590 \else
1591   \def\@tempa{#1}%
1592   \ifx\@tempa\@empty
1593     \ifx\shortauthors\@empty
1594       \gdef\shortauthors{#2}%
1595     \else
1596       \g@addto@macro\shortauthors{\and#2}%
1597     \fi
1598   \else
1599     \ifx\shortauthors\@empty
1600       \gdef\shortauthors{#1}%
1601     \else
1602       \g@addto@macro\shortauthors{\and#1}%
1603     \fi
1604   \fi
1605 \fi}

```

`\affiliation` The macro `\affiliation` mimics `\address` from `amsart`. Note that it has an optional argument, which we use differently from `amsart`.

```

1606 \newcommand{\affiliation}[2][{}]{%
1607   \global\@insideauthorgroupfalse
1608   \if@ACM@anonymous\else
1609     \g@addto@macro\addresses{\affiliation{#1}{#2}}%
1610   \fi}

```

`\ACM@affiliation@obeypunctuation` Whether to use the author's punctuation (false by default, which adds American-style address punctuation)

```

1611 \define@boolkey+{@ACM@affiliation@}{@ACM@affiliation@}{obeypunctuation}%
1612 [true]{\ClassError{\@classname}{The option obeypunctuation can be either true or false}}

```

`\additionalaffiliation` Additional affiliations go to footnotes

```

1613 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}

```

`\@additionalaffiliation` Process `\additionalaffiliation` inside `\authornote`

```

1614 \def\@additionalaffiliation#1{\bgroup
1615   \def\position##1{\ignorespaces}%
1616   \def\institution##1{##1\ignorespaces}%
1617   \def\department{\@ifnextchar[{\@department}{\@department[]}}%
1618   \def\@department[##1]##2{\unskip, ##2\ignorespaces}%

```

```

1619 \let\city\position
1620 \let\state\position
1621 \let\country\position
1622 Also with #1\unskip.\egroup}

```

`\email` The macro `\email` mimics `\email` from `amsart`. Again, it has an optional argument that we do not currently need but keep for possible future use.

```

1623 \renewcommand{\email}[2][]{%
1624 \IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several
1625 addresses in the same \string\email\space macro!}}{%
1626 \if@ACM@anonymous\else
1627 \g@addto@macro\addresses{\email{#1}{#2}}%
1628 \fi}

```

`\orcid` We redefine the command to typeset the current author

```

1629 \def\orcid#1{\unskip\ignorespaces%
1630 \IfBeginWith{#1}{http}{%
1631 \expandafter\gdef\csname
1632 typeset@author\the\num@authors\endcsname##1{%
1633 \href{#1}{##1}}}%
1634 \expandafter\gdef\csname
1635 typeset@author\the\num@authors\endcsname##1{%
1636 \href{https://orcid.org/#1}{##1}}}

```

`\authorsaddresses` Setting up authors' addresses

```

1637 \def\authorsaddresses#1{\def\@authorsaddresses{#1}}
1638 \authorsaddresses{\@mkauthorsaddresses}

```

`\@mktranslatedkeywords` We have two argument: the language to typeset keywords and the keywords.

```

1639 \newcommand\@mktranslatedkeywords[2]{\bgroup
1640 \selectlanguage{#1}%
1641 {\@specialsection{keywordsname}%
1642 \noindent#2\par}\egroup}

```

`\@titlenotes` The title notes

```

1643 \def\@titlenotes{}

```

`\titlenote` Adding a note to the title

```

1644 \def\titlenote#1{%
1645 \g@addto@macro\@title{\footnotemark}%
1646 \if@ACM@anonymous
1647 \g@addto@macro\@titlenotes{%
1648 \stepcounter{footnote}\footnotetext{Title note}}%
1649 \else
1650 \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
1651 \fi}

```

`\@subtitlenotes` The subtitle notes

```

1652 \def\@subtitlenotes{}

```

`\subtitlenote` Adding a note to the subtitle

```

1653 \def\subtitlenote#1{%
1654 \g@addto@macro\@subtitle{\footnotemark}%

```



```

1655 \if@ACM@anonymous
1656   \g@addto@macro\@subtitlenotes{%
1657     \stepcounter{footnote}\footnotetext{Subtitle note}}%
1658 \else
1659   \g@addto@macro\@subtitlenotes{%
1660     \stepcounter{footnote}\footnotetext{#1}}%
1661 \fi}

\@authornotes The author notes
1662 \def\@authornotes{}

\authornote Adding a note to the author
1663 \def\authornote#1{%
1664   \if@ACM@anonymous\else
1665     \g@addto@macro\addresses{\@authornotemark}%
1666     \g@addto@macro\@authornotes{%
1667       \stepcounter{footnote}\footnotetext{#1}}%
1668   \fi}

\authornotemark Adding a footnote mark to the authors
1669 \newcommand\authornotemark[1][\relax]{%
1670   \ifx#1\relax\relax\relax
1671   \g@addto@macro\addresses{\@authornotemark}%
1672   \else
1673   \g@addto@macro\addresses{\@authornotemark{#1}}%
1674   \fi}

\acmVolume The current volume
1675 \def\acmVolume#1{\def\@acmVolume{#1}}
1676 \acmVolume{1}

\acmNumber The current number
1677 \def\acmNumber#1{\def\@acmNumber{#1}}
1678 \acmNumber{1}

\acmArticle The current article
1679 \def\acmArticle#1{\def\@acmArticle{#1}}
1680 \acmArticle{}

\acmArticleSeq The sequence number
1681 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
1682 \acmArticleSeq{\@acmArticle}

\acmYear The current year
1683 \def\acmYear#1{\def\@acmYear{#1}}
1684 \acmYear{\the\year}

\acmMonth The current month
1685 \def\acmMonth#1{\def\@acmMonth{#1}}
1686 \acmMonth{\the\month}

```

`\acmPubDate` The publication date  
1687 `\def\acmPubDate{\ifcase\acmMonth\or`  
1688 `January\or February\or March\or April\or May\or June\or`  
1689 `July\or August\or September\or October\or November\or`  
1690 `December\fi}\acmYear}`

`\acmPrice` The price—obsolete  
1691 `\def\acmPrice#1{\ClassWarning{\@classname}{The macro \string\acmPrice`  
1692 `is obsolete. ACM no longer prints the price in bibstrip.}}`

`\acmSubmissionID` The submission ID  
1693 `\def\acmSubmissionID#1{\def\acmSubmissionID{#1}}`  
1694 `\acmSubmissionID{}`

`\acmISBN` The book ISBN  
1695 `\def\acmISBN#1{\def\acmISBN{#1}}`  
1696 `\acmISBN{978-x-xxxx-xxxx-x/YY/MM}`

`\acmDOI` The paper DOI  
1697 `\def\acmDOI#1{\def\acmDOI{#1}}`  
1698 `\acmDOI{10.1145/nnnnnnn.nnnnnnn}`

`\if@ACM@badge`

`\@ACM@badge@width` The width of the badge  
1699 `\newlength\@ACM@badge@width`  
1700 `\setlength\@ACM@badge@width{3pc}`

`\@ACM@title@width` The width of the title  
1701 `\newlength\@ACM@title@width`

`\@ACM@badge@skip` The spacing between badges  
1702 `\newlength\@ACM@badge@skip`  
1703 `\setlength\@ACM@badge@skip{1pt}`

`\acmBadgeR`  
1704 `\def\acmBadgeR{}`

`\acmBadgeL`  
1705 `\def\acmBadgeL{}`

`\acmBadgeR` Setting the right badge  
1706 `\newcommand\acmBadgeR[2][]{%`  
1707 `\ifx\acmBadgeR\empty`  
1708 `\gdef\acmBadgeR{%`  
1709 `\smash{%`  
1710 `\raisebox{0.5\height}{%`  
1711 `\href{#1}{\includegraphics[width=\@ACM@badge@width]{#2}}}}%`  
1712 `\else`  
1713 `\g@addto@macro{\acmBadgeR}{%`  
1714 `\hspace{\@ACM@badge@skip}%`  
1715 `\smash{%`  
1716 `\raisebox{0.5\height}{%`  
1717 `\href{#1}{\includegraphics[width=\@ACM@badge@width]{#2}}}}%`  
1718 `\fi}`

`\acmBadgeL` Setting the left badge

```
1719 \newcommand\acmBadgeL[2][]{%
1720   \ifx\@acmBadgeL\@empty
1721     \gdef\@acmBadgeL{%
1722       \smash{%
1723         \raisebox{0.5\height}{%
1724           \href{#1}{\includegraphics[width=\@ACM@badge@width]{#2}}}}}%
1725   \else
1726     \g@addto@macro{\@acmBadgeL}{%
1727       \hspace{\@ACM@badge@skip}%
1728       \smash{%
1729         \raisebox{0.5\height}{%
1730           \href{#1}{\includegraphics[width=\@ACM@badge@width]{#2}}}}}%
1731   \fi}
```

`\acmBadge` Just a syntax sugar for `\acmBadgeR`

```
1732 \let\acmBadge=\acmBadgeR
```

`\startPage` The start page of the paper

```
1733 \def\startPage#1{\def\@startPage{#1}}
1734 \startPage{}
```

`\terms` Terms are obsolete. We use CCS now.

```
1735 \def\terms#1{\ClassWarning{\@classname}{The command \string\terms{} is
1736   obsolete. I am going to ignore it}}
```

`\keywords` Keywords are mostly obsolete. We use CCS now. Still it makes sense to keep them for compatibility.

```
1737 \def\keywords#1{\def\@keywords{#1}}
1738 \let\@keywords\@empty

1739 \AtEndDocument{\if@ACM@nonacm\else\ifx\@keywords\@empty
1740   \ifnum\getrefnumber{TotPages}>2\relax
1741     \ClassWarningNoLine{\@classname}{ACM keywords are mandatory
1742       for papers over two pages}%
1743   \fi\fi\fi}
```

`abstract` The `amsart` package puts `abstract` in a box. Since we do not know whether we will use two-column mode, we prefer to save the text

```
1744 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}
```

`\@saveabstract` And saving the abstract

```
1745 \long\def\@saveabstract#1{\if@ACM@maketitle@typeset
1746   \ClassError{\@classname}{Abstract must be defined before maketitle
1747     command. Please move it!}\fi
1748   \long\gdef\@abstract{#1}}
1749 \@saveabstract{}
```

`\@empty` The long version of `\@empty` (to compare with `\@abstract`)

```
1750 \long\def\@empty{}
```

`\if@ACM@printccs` Whether to print CCS

```
1751 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
1752   \if@ACM@printccs
1753     \ClassInfo{\@classname}{Printing CCS}%
1754   \else
1755     \ClassInfo{\@classname}{Suppressing CCS}%
1756 \fi}{\ClassError{\@classname}{The option printccs can be either true or false}}
```

`\if@ACM@printacmref` Whether to print the ACM bibstrip

```
1757 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
1758   \if@ACM@printacmref
1759     \ClassInfo{\@classname}{Printing bibformat}%
1760   \else
1761     \ClassInfo{\@classname}{Suppressing bibformat}%
1762 \fi}{\ClassError{\@classname}{The option printacmref can be either true or false}}

1763 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@printacmref\else
1764   \ifnum\getrefnumber{TotPages}>1\relax
1765   \ClassWarningNoLine{\@classname}{%
1766     ACM reference format is mandatory \MessageBreak
1767     for papers over one page. \MessageBreak
1768     Please add printacmref=true to the \MessageBreak
1769     \string\settopmatter\space command.}%
1770   \fi\fi\fi}
```

`\if@ACM@printfolios` Whether to print folios

```
1771 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
1772   \if@ACM@printfolios
1773     \ClassInfo{\@classname}{Printing folios}%
1774   \else
1775     \ClassInfo{\@classname}{Suppressing folios}%
1776 \fi}{\ClassError{\@classname}{The option printfolios can be either true or false}}
```

`@ACM@authorsperrow` The number of authors per row. 0 means use the default algorithm.

```
1777 \define@cmdkey{@ACM@topmatter@}[@ACM@]{authorsperrow}[0]{%
1778   \IfInteger{#1}{\ClassInfo{\@classname}{Setting authorsperrow to
1779     #1}}{\ClassWarning{\@classname}{The parameter authorsperrow must be
1780     numerical. Ignoring the input #1}}\gdef\@ACM@authorsperrow{0}}
```

`\settopmatter` The usual syntactic sugar

```
1781 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}
```

Now the settings

```
1782 \settopmatter{printccs=true, printacmref=true}
1783 \if@ACM@manuscript
1784   \settopmatter{printfolios=true}
1785 \else
1786   \if@ACM@journal
1787     \settopmatter{printfolios=true}
1788   \else
1789     \settopmatter{printfolios=false}
1790   \fi
1791 \fi
1792 \settopmatter{authorsperrow=0}
```

`\@received` The container for the paper history

```
1793 \def\@received{}
```

`\received` The `\received` command

```
1794 \newcommand\received[2][\def\@tempa{#1}%
1795 \ifx\@tempa\@empty
1796 \ifx\@received\@empty
1797 \gdef\@received{Received #2}%
1798 \else
1799 \g@addto@macro{\@received}{; revised #2}%
1800 \fi
1801 \else
1802 \ifx\@received\@empty
1803 \gdef\@received{#1 #2}%
1804 \else
1805 \g@addto@macro{\@received}{; #1 #2}%
1806 \fi
1807 \fi}
1808 \AtEndDocument{%
1809 \ifx\@received\@empty\else
1810 \par\bigskip\noindent\small\normalfont\@received\par
1811 \fi}
```

`\acmArticleType` Article type. We set up the color.

```
1812 \define@choicekey+{ACM}{articletype}[\ACM@ArticleType\ACM@ArticleType@nr]{%
1813 Research,Review,Discussion,Invited,Position}[Review]{%
1814 \ifcase\ACM@ArticleType@nr
1815 \relax % Research
1816 \colorlet{@ACM@Article@color}{ACMBlue}%
1817 \or % Review
1818 \colorlet{@ACM@Article@color}{ACMOrange}%
1819 \or % Discussion
1820 \colorlet{@ACM@Article@color}{ACMGreen}%
1821 \or % Invited
1822 \colorlet{@ACM@Article@color}{ACMPurple}%
1823 \or % Position
1824 \colorlet{@ACM@Article@color}{ACMRed}%
1825 \fi
1826 }{%
1827 \ClassError{\@classname}{Article Type must be Research, Review, \MessageBreak
1828 Discussion, Invited, or Position}}
1829 \def\acmArticleType#1{\setkeys{ACM}{articletype=#1}}
1830 \if@ACM@acmcp
1831 \acmArticleType{Research}%
1832 \fi
1833
```

`\@ACM@color@frame` The colored frame for the acmcp

```
1834 \newenvironment{@ACM@color@frame}{%
1835 \def\FrameCommand{\hspace*{-6.5pc}}%
1836 \colorbox{@ACM@Article@color!10!white}}%
1837 \MakeFramed {\advance\hspace
1838 -6.5pc\relax\FrameRestore}}{\zsaveposy{@ACM@acmcpframe@y}}%
1839 \endMakeFramed}
```

`\acmCodeDataLink` The code link

```

1840 \def\acmCodeLink#1{%
1841   \ifx\@acmCodeDataLink\@empty
1842     \gdef\@acmCodeDataLink{\url{#1}}%
1843   \else
1844     \g@addto@macro{\@acmCodeDataLink}{\ \url{#1}}%
1845   \fi}
1846 \def\@acmCodeDataLink{}

```

`\acmContributions` The authors' contribution statement

```

1847 \def\acmContributions#1{\gdef\@acmContributions{#1}}
1848 \acmContributions{}

```

`\acmDataLink` The code link

```

1849 \let\acmDataLink\acmCodeLink

```

### 3.17 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```

1850 \RequirePackage{comment}
1851 \excludecomment{CCSXML}

```

`\@concepts` This is the storage macro and counter for concepts

```

1852 \let\@concepts\@empty
1853 \newcounter{@concepts}

```

`\ccsdesc` The first argument is the significance, the second is the concept(s)

```

1854 \newcommand\ccsdesc[2][100]{%
1855   \ccsdesc@parse#1~#2~\ccsdesc@parse@end}

```

`\ccsdesc@parse` The parser of the expression Significance~General~Specific (we need `textcomp` for `\textrightarrow`). Note that Specific can be empty!

```

1856 \def\textrightarrow{\rightarrow}
1857 \def\ccsdesc@parse#1~#2~#3~{%
1858   \stepcounter{@concepts}%
1859   \expandafter\ifx\csname CCS@General@#2\endcsname\relax
1860     \expandafter\gdef\csname CCS@General@#2\endcsname{\textbullet\
1861       \textbf{#2}}%
1862     \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{;}%
1863     \expandafter\gdef\csname CCS@Specific@#2\endcsname{}%
1864     \g@addto@macro{\@concepts}{\csname CCS@General@#2\endcsname
1865       \csname CCS@Punctuation@#2\endcsname
1866       \csname CCS@Specific@#2\endcsname}%
1867   \fi
1868   \ifx#3\relax\relax\else
1869     \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{
1870       \textrightarrow\ }%
1871     \expandafter\g@addto@macro\expandafter{\csname CCS@Specific@#2\endcsname}{%
1872       \addtocounter{@concepts}{-1}%
1873       \ifnum#1>499\textbf{#3}\else
1874       \ifnum#1>299\textit{#3}\else
1875       #3\fi\fi\ifnum\value{@concepts}=0.\else; \fi}%
1876   \fi
1877 \ccsdesc@parse@finish}

```

```

1878 \AtEndDocument{\if@ACM@nonacm\else\ifx\@concepts\@empty\relax
1879 \ifnum\getrefnumber{TotPages}>2\relax
1880 \ClassWarningNoLine{\@classname}{CCS concepts are mandatory
1881   for papers over two pages}%
1882 \fi\fi\fi}

```

```

\ccdesc@parse@finish Gobble everything to \ccdesc@parse@end
1883 \def\ccdesc@parse@finish#1\ccdesc@parse@end{}

```

### 3.18 Copyright system

This is from acmcopyright.sty

```

\if@printcopyright Whether to print a copyright symbol
1884 \newif\if@printcopyright
1885 \@printcopyrighttrue

```

```

\if@printpermission Whether to print the permission block
1886 \newif\if@printpermission
1887 \@printpermissiontrue

```

```

\if@acmowned Whether the ACM owns the rights to the paper
1888 \newif\if@acmowned
1889 \@acmownedtrue

```

Keys:

```

1890 \define@choicekey*{ACM@}{acmcopyrightmode}[%
1891 \acm@copyrightinput\acm@copyrightmode]{none,%
1892   acmcopyright,acmlicensed,rightsretained,%
1893   usgov,usgovmixed,cagov,cagovmixed,licensedusgovmixed,%
1894   licensedcagov,licensedcagovmixed,othergov,licensedothergov,%
1895   iw3c2w3,iw3c2w3g,cc}{%
1896 \@printpermissiontrue
1897 \@printcopyrighttrue
1898 \@acmownedtrue
1899 \ifnum\acm@copyrightmode=0\relax % none
1900 \@printpermissionfalse
1901 \@printcopyrightfalse
1902 \@acmownedfalse
1903 \fi
1904 \ifnum\acm@copyrightmode=2\relax % acmlicensed
1905 \@acmownedfalse
1906 \fi
1907 \ifnum\acm@copyrightmode=3\relax % rightsretained
1908 \@acmownedfalse
1909 \fi
1910 \ifnum\acm@copyrightmode=4\relax % usgov
1911 \@printpermissiontrue
1912 \@printcopyrightfalse
1913 \@acmownedfalse
1914 \fi
1915 \ifnum\acm@copyrightmode=6\relax % cagov
1916 \@acmownedfalse

```

```

1917 \fi
1918 \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1919 \@acmownedfalse
1920 \fi
1921 \ifnum\acm@copyrightmode=9\relax % licensedcagov
1922 \@acmownedfalse
1923 \fi
1924 \ifnum\acm@copyrightmode=10\relax % licensedcagovmixed
1925 \@acmownedfalse
1926 \fi
1927 \ifnum\acm@copyrightmode=11\relax % othergov
1928 \@acmownedtrue
1929 \fi
1930 \ifnum\acm@copyrightmode=12\relax % licensedothergov
1931 \@acmownedfalse
1932 \fi
1933 \ifnum\acm@copyrightmode=13\relax % iw3c2w3
1934 \@acmownedfalse
1935 \fi
1936 \ifnum\acm@copyrightmode=14\relax % iw3c2w3g
1937 \@acmownedfalse
1938 \fi
1939 \ifnum\acm@copyrightmode=15\relax % cc
1940 \@acmownedfalse
1941 \fi}

```

`\setcopyright` This is the syntactic sugar around setting keys.

```

1942 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
1943 \setcopyright{acmlicensed}

```

`\setcctype` The type of Creative Commons license used

```

1944 \newcommand\setcctype[2][4.0]{%
1945 \def\ACM@cc@version{#1}%
1946 \def\ACM@cc@type{#2}}
1947 \setcctype{by}

```

`\@copyrightowner` Here is the owner of the copyright

```

1948 \def\@copyrightowner{%
1949 \ifcase\acm@copyrightmode\relax % none
1950 \or % acmcopyright
1951 ACM\@.
1952 \or % acmlicensed
1953 Copyright held by the owner/author(s). Publication rights licensed to
1954 ACM\@.
1955 \or % rightsretained
1956 Copyright held by the owner/author(s).
1957 \or % usgov
1958 \or % usgovmixed
1959 Copyright held by the owner/author(s).
1960 \or % cagov
1961 Copyright Crown in Right of Canada.
1962 \or %cagovmixed
1963 Copyright held by the owner/author(s).
1964 \or %licensedusgovmixed

```



```

1965 Copyright held by the owner/author(s). Publication rights licensed to
1966 ACM\@.
1967 \or % licensedcagov
1968 Copyright held by the owner/author(s).
1969 \or %licensedcagovmixed
1970 Copyright held by the owner/author(s). Publication rights licensed to
1971 ACM\@.
1972 \or % othergov
1973 Copyright held by the owner/author(s).
1974 \or % licensedothergov
1975 Copyright held by the owner/author(s). Publication rights licensed to
1976 ACM\@.
1977 \or % ic2w3www
1978 IW3C2 (International World Wide Web Conference Committee), published
1979 under Creative Commons CC-BY~4.0 License.
1980 \or % ic2w3wwwgoogle
1981 IW3C2 (International World Wide Web Conference Committee), published
1982 under Creative Commons CC-BY-NC-ND~4.0 License.
1983 \or % cc
1984 Copyright held by the owner/author(s).
1985 \fi}

```

`\@formatdoi` Print a clickable DOI

```

1986 \def\@formatdoi#1{\url{https://doi.org/#1}}

```

`\@ACM@copyright@check@cc` At present cC licenses can be used only for acmengage format or for non-acm stuff. This macro checks whether the CC license is applicable and generates an error if not.

```

1987 \def\@ACM@copyright@check@cc{%
1988   \if@ACM@nonacm
1989     \ClassInfo{\@classname}{Using CC license with a non-acm
1990       material}%
1991   \else
1992     \if@ACM@engage
1993       \ClassInfo{\@classname}{Using CC license with ACM Engage
1994         material}%
1995     \else
1996       \ClassWarning{\@classname}{%
1997         Sorry, Creative Commons licenses are\MessageBreak
1998         currently not used with ACM publications\MessageBreak
1999         typeset by the authors}{Please use nonacm
2000         option or ACM Engage class to enable CC licenses}%
2001     \fi
2002   \fi}

```

`\@copyrightpermission` The canned permission block.

```

2003 \def\@copyrightpermission{%
2004   \ifcase\acm@copyrightmode\relax % none
2005   \or % acmcopyright
2006   Permission to make digital or hard copies of all or part of this
2007   work for personal or classroom use is granted without fee provided
2008   that copies are not made or distributed for profit or commercial
2009   advantage and that copies bear this notice and the full citation on
2010   the first page. Copyrights for components of this work owned by
2011   others than ACM must be honored. Abstracting with credit is

```

2012 permitted. To copy otherwise, or republish, to post on servers or  
2013 to redistribute to lists, requires prior specific permission  
2014 and\hspace\*{.5pt}/or  
2015 a fee. Request permissions from permissions@acm.org.  
2016 \or % acmlicensed  
2017 Permission to make digital or hard copies of all or part of this  
2018 work for personal or classroom use is granted without fee provided  
2019 that copies are not made or distributed for profit or commercial  
2020 advantage and that copies bear this notice and the full citation on  
2021 the first page. Copyrights for components of this work owned by  
2022 others than the author(s) must be honored. Abstracting with credit  
2023 is permitted. To copy otherwise, or republish, to post on servers  
2024 or to redistribute to lists, requires prior specific permission  
2025 and\hspace\*{.5pt}/or a fee. Request permissions from  
2026 permissions@acm.org.  
2027 \or % rightsretained  
2028 Permission to make digital or hard copies of all or part of this  
2029 work for personal or classroom use is granted without fee provided  
2030 that copies are not made or distributed for profit or commercial  
2031 advantage and that copies bear this notice and the full citation on  
2032 the first page. Copyrights for third-party components of this work  
2033 must be honored. For all other uses, contact the  
2034 owner\hspace\*{.5pt}/author(s).  
2035 \or % usgov  
2036 This paper is authored by an employee(s) of the United States  
2037 Government and is in the public domain. Non-exclusive copying or  
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2039 given and the authors and agency are clearly identified as its  
2040 source. All others Request permissions from  
2041 owner\hspace\*{.5pt}/author(s).  
2042 \or % usgovmixed  
2043 ACM acknowledges that this contribution was authored or co-authored  
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2045 government. As such, the United States government retains a  
2046 nonexclusive, royalty-free right to publish or reproduce this  
2047 article, or to allow others to do so, for government purposes  
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2119 \or % iw3c2w3

```

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2128 disseminate the work on their personal and corporate Web sites with
2129 the appropriate attribution.
2130 \or % CC
2131 \@ACM@copyright@check@cc
2132 \IfEq{\ACM@cc@type}{zero}{%
2133 \def\ACM@CC@Url{https://creativecommons.org/publicdomain/zero/1.0/legalcode}}{%
2134 \edef\ACM@CC@Url{https://creativecommons.org/licenses/\ACM@cc@type/\ACM@cc@version/legalcode}}%
2135 \href{\ACM@CC@Url}{\includegraphics[height=5ex]{doclicense-CC-\ACM@cc@type-88x31}}\
2136 \href{\ACM@CC@Url}{%
2137 This work is licensed under a Creative Commons
2138 \IfEq{\ACM@cc@type}{zero}{CC0 1.0 Universal}{%
2139 \IfEq{\ACM@cc@type}{by}{Attribution}{}%
2140 \IfEq{\ACM@cc@type}{by-sa}{Attribution-ShareAlike}{}%
2141 \IfEq{\ACM@cc@type}{by-nd}{Attribution-NoDerivatives}{}%
2142 \IfEq{\ACM@cc@type}{by-nc}{Attribution-NonCommercial}{}%
2143 \IfEq{\ACM@cc@type}{by-nc-sa}{Attribution-NonCommercial-ShareAlike}{}%
2144 \IfEq{\ACM@cc@type}{by-nc-nd}{Attribution-NonCommercial-NoDerivatives}{}%
2145 ~\IfEq{\ACM@cc@version}{4.0}{4.0 International}{3.0 Unported}%
2146 }
2147 License.}%
2148 \fi}

```

`\copyrightyear` By default, the copyright year is the same as `\acmYear`, but one can override this:

```

2149 \def\copyrightyear#1{\def\@copyrightyear{#1}}
2150 \copyrightyear{\@acmYear}

```

`\@teaserfigures` The teaser figures container

```

2151 \def\@teaserfigures{}

```

`teaserfigure` The teaser figure

```

2152 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}

```

`\@saveteaser` Saving the teaser

```

2153 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}

```

`\thanks` We redefine `amsart \thanks` so the anonymous key works

```

2154 \renewcommand{\thanks}[1]{%
2155 \ifnotempty{#1}{%
2156 \if@ACM@anonymous
2157 \g@addto@macro\thankses{\thanks{A note}}%
2158 \else
2159 \g@addto@macro\thankses{\thanks{#1}}%
2160 \fi}}

```

`\anon` We provide `\anon` command, which obscures parts of the text if the package option `anonymous` is set

```

2161 \newcommand{\anon}[2][ANONYMIZED]{%
2162   \if@ACM@anonymous%
2163     {\color{ACMOrange}#1}%
2164   \else%
2165     #2%
2166   \fi}

```

### 3.19 Maketitle hook

The current  $\LaTeX$  provides a nice lthooks mechanism. However, since it is relatively new, we will use oldfashioned approach—at least for now.

```

\@beginmaketitlehook The hook
2167 \ifx\@beginmaketitlehook\undefined
2168   \let\@beginmaketitlehook\empty
2169 \fi

\AtBeginMaketitle Adding to the hook
2170 \def\AtBeginMaketitle{\g@addto@macro\@beginmaketitlehook}

```

### 3.20 ACM Engage top matter

```

\@acmengagemetadate The special metadata for ACM engage course materials
2171 \def\@acmengagemetadate{}

\setengagemetadate Adding topic to engage metadata
2172 \def\setengagemetadate#1#2{%
2173   \g@addto@macro{\@acmengagemetadate}{%
2174     \@setengagemetadate{#1}{#2}}}

```

### 3.21 Typesetting top matter

```

\mktitle@bx Some of our formats use a two-column design. Some use a one-column design. In all
cases we use a wide title. Thus we typeset the top matter in a special box to be used in
the construction \@twocolumn[<box>].
2175 \newbox\mktitle@bx

```

```

\maketitle The (in)famous \maketitle. Note that in sigchi-a mode, authors are not in the title
box.

```

Another note: there is a subtle difference between author notes, title notes and thanks. The latter two refer to the paper itself and therefore belong to the copyright/permission block. By the way, this was the default behavior of the old ACM classes.

```

2176 \def\maketitle{\@beginmaketitlehook
2177   \@ACM@maketitle@typesettrue
2178   \if@ACM@anonymous
2179     % Anonymize omission of \author-s
2180     \ifnum\num@authorgroups=0\author{ }\fi
2181   \fi
2182   \begingroup
2183     \let\@vspace\@vspace@orig
2184     \let\@vspacer\@vspacer@orig
2185     \let\@footnotemark\@footnotemark@nolink

```

```

2186 \let\@footnotetext\@footnotetext@nolink
2187 \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
2188 \hspace=\textwidth
2189 \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
2190 \mktitle\if@ACM@sigchiamode\else\mkauthors\fi\mkteasers
2191 \@printtopmatter
2192 \if@ACM@sigchiamode\mkauthors\fi
2193 \setcounter{footnote}{0}%
2194 \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
2195 \@titlenotes
2196 \@subtitlenotes
2197 \@authornotes
2198 \let\@makefnmark\relax
2199 \let\@thefnmark\relax
2200 \let\@makefnmark\relax
2201 \ifx\@empty\thankses\else
2202   \footnotetextauthorsaddresses{%
2203     \def\par{\let\par\@par}\parindent\z@\@setthanks}%
2204 \fi
2205 \if@ACM@acmcp\else
2206   \ifx\@empty\@authorsaddresses\else
2207     \if@ACM@anonymous\else
2208       \if@ACM@journal@bibstrip@or@tog
2209         \footnotetextauthorsaddresses{%
2210           \def\par{\let\par\@par}\parindent\z@\@setauthorsaddresses}%
2211       \fi
2212     \fi
2213   \fi
2214 \fi
2215 \if@ACM@nonacm
2216   \ifnum\acm@copyrightmode=15\relax % cc
2217     \footnotetextcopyrightpermission{\@copyrightpermission}%
2218   \fi
2219 \else
2220   \if@ACM@acmcp\else
2221     \footnotetextcopyrightpermission{%
2222       \if@ACM@authordraft
2223         \raisebox{-2ex}{\z@\z@\makebox[0pt][l]{\large\bfseries
2224           Unpublished working draft. Not for distribution.}}%
2225         \color[gray]{0.9}%
2226       \fi
2227       \parindent\z@\parskip0.1\baselineskip
2228       \if@ACM@authorversion\else
2229         \if@printpermission\@copyrightpermission\par\fi
2230       \fi
2231       \if@ACM@manuscript\else
2232         \if@ACM@journal@bibstrip\else % Print the conference information
2233           \if@ACM@engage
2234             {\itshape \@acmBooktitle, \@acmYear.}\par
2235           \else
2236             {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
2237           \fi
2238         \fi
2239       \fi

```

```

2240 \if@printcopyright
2241 \copyright\ \@copyrightyear\ \@copyrightowner\
2242 \else
2243 \@copyrightyear.\
2244 \fi
2245 \if@ACM@manuscript
2246 Manuscript submitted to ACM\
2247 \else
2248 \if@ACM@authorversion
2249 This is the author's version of the work. It is posted here for
2250 your personal use. Not for redistribution. The definitive Version
2251 of Record was published in
2252 \if@ACM@journal@bibstrip
2253 \emph{\@journalName}%
2254 \else
2255 \emph{\@acmBooktitle}%
2256 \fi
2257 \ifx\@acmDOI\@empty
2258 .
2259 \else
2260 , \@formatdoi{\@acmDOI}.
2261 \fi\
2262 \else
2263 \if@ACM@nonacm\else
2264 \if@ACM@journal@bibstrip
2265 ACM~\@permissionCodeTwo/\@acmYear/\@acmMonth-ART\@acmArticle\
2266 \@formatdoi{\@acmDOI}%
2267 \else % Conference
2268 \ifx\@acmISBN\@empty\else ACM~ISBN~\@acmISBN\\\fi
2269 \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi%
2270 \fi
2271 \fi
2272 \fi
2273 \fi}%
2274 \fi
2275 \fi
2276 \endgroup
2277 \if@ACM@engage\@typesetengagemetadata\fi
2278 \setcounter{footnote}{0}%
2279 \@mkabstract
2280 \ifx\@translatedabstracts\@empty\else
2281 \@translatedabstracts\fi
2282 \if@ACM@printccs
2283 \ifx\@concepts\@empty\else\bgroup
2284 {\@specialsection{CCS Concepts}%
2285 \noindent\@concepts\par}\egroup
2286 \fi
2287 \fi
2288 \if@ACM@acmcp\else
2289 \ifx\@keywords\@empty\else\bgroup
2290 {\@specialsection{\keywordsname}%
2291 \noindent\@keywords\par}\egroup
2292 \fi
2293 \ifx\@translatedkeywords\@empty\else

```

```

2294     \@translatedkeywords
2295     \fi
2296 \fi
2297 \let\metadata@authors=\authors
2298 \xandlist{, }{, }{\metadata@authors
2299 \def\@ACM@checkaffil{}%
2300 \hypersetup{%
2301   pdfauthor={\metadata@authors},
2302   pdftitle={\@title},
2303   pdfsubject={\@concepts},
2304   pdfkeywords={\@keywords},
2305   pdfcreator={LaTeX with acmart
2306     \csname ver@acmart.cls\endcsname\space
2307     and hyperref
2308     \csname ver@hyperref.sty\endcsname}}%
2309 \andify\authors
2310 \andify\shortauthors
2311 \global\let\authors=\authors
2312 \global\let\shortauthors=\shortauthors
2313 \if@ACM@printacmref
2314   \mkbibcitation
2315 \fi
2316 \global\@topnum\z@ % this prevents floats from falling
2317                   % at the top of page 1
2318 \global\@botnum\z@ % we do not want them to be on the bottom either
2319 \@printendtopmatter
2320 \@afterindentfalse
2321 \@afterheading
2322 \if@ACM@acmcp
2323   \set@ACM@acmcpbox
2324   \AtEndDocument{\end@ACM@color@frame}%
2325   \@ACM@color@frame
2326 \fi
2327 }

```

\set@ACM@acmcpbox Setting infobox for acmcp

```

2328 \newbox\@ACM@acmcpbox
2329 \def\set@ACM@acmcpbox{%
2330   \bgroup
2331   \hsize=5pc
2332   \global\setbox\@ACM@acmcpbox=\vbox{%
2333     \setlength{\parindent}{\z@}%
2334     {\includegraphics[width=\hsize]{acm-jdslogo}\par}%
2335     \scriptsize
2336     \ifnum\getrefnumber{TotPages}>1\else
2337       \zrefused{@ACM@acmcpbox@y}%
2338       \zrefused{@ACM@acmcpframe@y}%
2339       \@tempdima=\dimexpr\zposy{@ACM@acmcpbox@y}sp -
2340       \zposy{@ACM@acmcpframe@y}sp+0.3\FrameSep+
2341       \@ACM@acmcp@delta\relax
2342       \ifdim\@tempdima>0pt\relax
2343         \vspace*{\@tempdima}%
2344         \protected@write\@auxout{%
2345           {\string\global\@ACM@acmcp@delta=\the\@tempdima\relax}%

```



```

2346     \fi
2347     \fi
2348     \ifx\@acmCodeDataLink\@empty\else\bigskip
2349     Code and data links:\\ \@acmCodeDataLink\par\bigskip
2350     \fi
2351     \ifx\@keywords\@empty\else\bigskip
2352     Keywords: \@keywords\par
2353     \fi
2354     \ifx\@acmContributions\@empty\else\bigskip
2355     \@acmContributions\par
2356     \fi
2357     \ifx\@empty\@authorsaddresses\else\bigskip\setauthorsaddresses\fi
2358     \zsaveposy{@ACM@acmcpbox@y}%
2359   }
2360 \egroup}

```

`\@specialsection` This macro starts sections for proceedings and uses `\small` for journals

```

2361 \def\@specialsection#1{%
2362   \let\@vspace\@vspace@orig
2363   \let\@vspacer\@vspacer@orig
2364   \ifcase\ACM@format@nr
2365   \relax % manuscript
2366     \par\medskip\small\noindent#1: %
2367   \or % acmsmall
2368     \par\medskip\small\noindent#1: %
2369   \or % acmlarge
2370     \par\medskip\small\noindent#1: %
2371   \or % acmtog
2372     \par\medskip\small\noindent#1: %
2373   \or % sigconf
2374     \section*{#1}%
2375   \or % siggraph
2376     \section*{#1}%
2377   \or % sigplan
2378     \noindentparagraph*{#1:~}%
2379   \or % sigchi
2380     \section*{#1}%
2381   \or % sigchi-a
2382     \section*{#1}%
2383   \or % acmengage
2384     \section*{#1}%
2385   \or % acmcp
2386     \section*{#1}%
2387   \fi
2388   \let\@vspace\@vspace@acm
2389   \let\@vspacer\@vspacer@acm
2390 }

```

`\@printtopmatter` The printing of top matter starts a new page and uses the given title box.

Note that if there are too many authors, `\mktitle@bx` might overflow the page. Therefore we start with checking this and if this happens, we split the box and print it page by page.

```

2391 \def\@printtopmatter{%
2392   \ifx\@startPage\@empty

```

```

2393     \gdef\@startPage{1}%
2394 \else
2395     \setcounter{page}{\@startPage}%
2396 \fi
2397 \@tempdima=\ht\mktitle@bx
2398 \advance\@tempdima by \dp\mktitle@bx
2399 \ifdim\@tempdima>0.9\textheight
2400     \loop
2401         \setbox\@tempboxa=\vsplit \mktitle@bx to 0.9\textheight
2402         \thispagestyle{firstpagestyle}%
2403         \noindent\unvbox\@tempboxa
2404         \clearpage
2405         \@tempdima=\ht\mktitle@bx
2406         \advance\@tempdima by \dp\mktitle@bx
2407         \ifdim\@tempdima>0.9\textheight\repeat
2408 \fi
2409 \thispagestyle{firstpagestyle}%
2410 \noindent
2411 \ifcase\ACM@format@nr
2412 \relax % manuscript
2413     \box\mktitle@bx\par
2414 \or % acmsmall
2415     \box\mktitle@bx\par
2416 \or % acmlarge
2417     \box\mktitle@bx\par
2418 \or % acmtog
2419     \twocolumn[\box\mktitle@bx]%
2420 \or % sigconf
2421     \twocolumn[\box\mktitle@bx]%
2422 \or % siggraph
2423     \twocolumn[\box\mktitle@bx]%
2424 \or % sigplan
2425     \twocolumn[\box\mktitle@bx]%
2426 \or % sigchi
2427     \twocolumn[\box\mktitle@bx]%
2428 \or % sigchi-a
2429     \par\box\mktitle@bx\par\bigskip
2430 \or % acmengage
2431     \twocolumn[\box\mktitle@bx]%
2432 \or % acmcp
2433     \box\mktitle@bx\par
2434 \fi
2435 }

```

`\@mktitle` The title of the article

```

2436 \def\@mktitle{%
2437 \ifcase\ACM@format@nr
2438 \relax % manuscript
2439     \@mktitle@i
2440 \or % acmsmall
2441     \@mktitle@i
2442 \or % acmlarge
2443     \@mktitle@i
2444 \or % acmtog

```

```

2445 \mktitle@i
2446 \or % sigconf
2447 \mktitle@iii
2448 \or % siggraph
2449 \mktitle@iii
2450 \or % sigplan
2451 \mktitle@iii
2452 \or % sigchi
2453 \mktitle@iii
2454 \or % sigchi-a
2455 \mktitle@iv
2456 \or % acmengage
2457 \mktitle@iii
2458 \or % acmcp
2459 \mktitle@i
2460 \fi
2461 }

```

`\@titlefont` The font to typeset the title

```

2462 \def\@titlefont{%
2463 \ifcase\ACM@format@nr
2464 \relax % manuscript
2465 \LARGE\sffamily\bfseries
2466 \or % acmsmall
2467 \LARGE\sffamily\bfseries
2468 \or % acmlarge
2469 \LARGE\sffamily\bfseries
2470 \or % acmtog
2471 \Huge\sffamily
2472 \or % sigconf
2473 \Huge\sffamily\bfseries
2474 \or % siggraph
2475 \Huge\sffamily\bfseries
2476 \or % sigplan
2477 \Huge\bfseries
2478 \or % sigchi
2479 \Huge\sffamily\bfseries
2480 \or % sigchi-a
2481 \Huge\bfseries
2482 \or % acmengage
2483 \Huge\sffamily\bfseries
2484 \or % acmcp
2485 \LARGE\sffamily\bfseries
2486 \fi}

```

`\@subtitlefont` The font to typeset the subtitle

```

2487 \def\@subtitlefont{\normalsize
2488 \ifcase\ACM@format@nr
2489 \relax % manuscript
2490 \mdseries
2491 \or % acmsmall
2492 \mdseries
2493 \or % acmlarge
2494 \mdseries

```

```

2495 \or % acmtog
2496 \LARGE
2497 \or % sigconf
2498 \LARGE\mdseries
2499 \or % siggraph
2500 \LARGE\mdseries
2501 \or % sigplan
2502 \LARGE\mdseries
2503 \or % sigchi
2504 \LARGE\mdseries
2505 \or % sigchi-a
2506 \mdseries
2507 \or % acmengage
2508 \LARGE\mdseries
2509 \or % acmcp
2510 \mdseries
2511 \fi}

```

`\@mkttitle@i` The version of `\mkttitle` for most journals

```

2512 \def\@mkttitle@i{\hsize=\textwidth
2513 \if@ACM@acmcp
2514 \advance\hsize by -6pc%
2515 \fi
2516 \@ACM@title@width=\hsize
2517 \setbox\mkttitle@bx=\vbox{\noindent\@titlefont
2518 \parbox[t]{\@ACM@title@width}{\raggedright
2519 \@titlefont\noindent
2520 \@title\@translatedtitle%
2521 \ifx\@subtitle\@empty\else
2522 \par\noindent{\@subtitlefont\@subtitle\@translatedsubtitle}%
2523 \fi}%
2524 \par\bigskip}}%

```

`\@mkttitle@ii` The version of `\mkttitle` for TOG. Since v1.06, this is subsumed by the `\mkttitle@i` macro

`\@mkttitle@iii` The version of `\@mkttitle` for SIG proceedings.

```

2525 \def\@mkttitle@iii{\hsize=\textwidth
2526 \setbox\mkttitle@bx=\vbox{\@titlefont\centering
2527 \@ACM@title@width=\hsize
2528 \parbox[t]{\@ACM@title@width}{\centering\@titlefont
2529 \@title\@translatedtitle%
2530 \ifx\@subtitle\@empty\else
2531 \par\noindent{\@subtitlefont\@subtitle\@translatedsubtitle}
2532 \fi
2533 }%
2534 \par\bigskip}}%

```

`\@mkttitle@iv` The version of `\@mkttitle` for sigchi-a

```

2535 \def\@mkttitle@iv{\hsize=\textwidth
2536 \setbox\mkttitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
2537 \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
2538 \noindent\@title\@translatedtitle%
2539 \ifx\@subtitle\@empty\else

```

```

2540     \par\noindent\@subtitlefont\@subtitle\@translatedsubtitle%
2541     \fi
2542     \par\bigskip}}%

```

\@ACM@addtoaddress This macro adds an item to the address using the following rules:

1. If we start a paragraph, add the item
2. Otherwise, add a comma and the item
3. However, the comma is deleted if it is at the end of a line. We use the magic \cleaders trick for this.

```

2543 \newbox\@ACM@commabox
2544 \def\@ACM@addtoaddress#1{%
2545   \ifvmode\else
2546     \if@ACM@affiliation@obexpunctuation\else
2547     \setbox\@ACM@commabox=\hbox{, }%
2548     \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
2549   \fi\fi
2550   #1}

```

```

\institution Theoretically we can define the macros for \affiliation inside the \@mkauthors-style
\position commands. However, this would lead to a strange error if an author uses them outside
\department \affiliation. Of course we can make them produce an error message, but...
\streetaddress 2551 \def\streetaddress#1{\ClassWarning{\@classname}{ACM no longer collects
\city 2552 authors' postal addresses. I am ignoring your street
\state 2553 address}\unskip\ignorespaces}
\postcode 2554 \def\postcode#1{\ClassWarning{\@classname}{ACM no longer collects
\country 2555 authors' postal addresses. I am ignoring your postal
2556 code}\unskip\ignorespaces}
2557 \if@ACM@journal
2558 \def\position#1{\unskip\ignorespaces}
2559 \def\institution#1{\global\@ACM@instpresenttrue
2560 \unskip~#1\ignorespaces}
2561 \def\city#1{\global\@ACM@citypresenttrue\unskip\ignorespaces}
2562 \def\state#1{\unskip\ignorespaces}
2563 \newcommand\department[2][0]{\unskip\ignorespaces}
2564 \def\country#1{\StrDel{#1}{ }[\@tempa]%
2565 \ifx\@tempa@empty\else
2566 \global\@ACM@countrypresenttrue\fi
2567 \if@ACM@affiliation@obexpunctuation\else, \fi#1\ignorespaces}
2568 \else
2569 \def\position#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
2570 \def\institution#1{\global\@ACM@instpresenttrue
2571 \if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
2572 \newcommand\department[2][0]{\if@ACM@affiliation@obexpunctuation
2573 #2\else#2\par\fi}%
2574 \def\city#1{\global\@ACM@citypresenttrue\@ACM@addtoaddress{#1}}%
2575 \let\state\@ACM@addtoaddress
2576 \def\country#1{\global\@ACM@countrypresenttrue\@ACM@addtoaddress{#1}}%
2577 \fi

```

\@mkauthors Typesetting the authors

```

2578 \def\@mkauthors{\begingroup

```

```

2579 \hspace=\textwidth
2580 \ifcase\ACM@format@nr
2581 \relax % manuscript
2582 \mkauthors@i
2583 \or % acmsmall
2584 \mkauthors@i
2585 \or % acmlarge
2586 \mkauthors@i
2587 \or % acmtog
2588 \mkauthors@i
2589 \or % sigconf
2590 \mkauthors@iii
2591 \or % siggraph
2592 \mkauthors@iii
2593 \or % sigplan
2594 \mkauthors@iii
2595 \or % sigchi
2596 \mkauthors@iii
2597 \or % sigchi-a
2598 \mkauthors@iv
2599 \or % acmengage
2600 \mkauthors@iii
2601 \or % acmcp
2602 \mkauthors@i
2603 \fi
2604 \endgroup
2605 }

```

\@authorfont Somehow different conferences use different fonts for author names. Why?

```

2606 \def\@authorfont{\Large\sffamily}

```

\@affiliationfont Font for affiliations

```

2607 \def\@affiliationfont{\normalsize\normalfont}

```

Adjusting fonts for different formats

```

2608 \ifcase\ACM@format@nr
2609 \relax % manuscript
2610 \or % acmsmall
2611 \def\@authorfont{\large\sffamily}
2612 \def\@affiliationfont{\small\normalfont}
2613 \or % acmlarge
2614 \or % acmtog
2615 \def\@authorfont{\LARGE\sffamily}
2616 \def\@affiliationfont{\large}
2617 \or % sigconf
2618 \def\@authorfont{\LARGE}
2619 \def\@affiliationfont{\large}
2620 \or % siggraph
2621 \def\@authorfont{\normalsize\normalfont}
2622 \def\@affiliationfont{\normalsize\normalfont}
2623 \or % sigplan
2624 \def\@authorfont{\Large\normalfont}
2625 \def\@affiliationfont{\normalsize\normalfont}
2626 \or % sigchi

```

```

2627 \def\@authorfont{\bfseries}
2628 \def\@affiliationfont{\mdseries}
2629 \or % sigchi-a
2630 \def\@authorfont{\bfseries}
2631 \def\@affiliationfont{\mdseries}
2632 \or % acmengage
2633 \def\@authorfont{\LARGE}
2634 \def\@affiliationfont{\large}
2635 \or % acmcp
2636 \def\@authorfont{\large\sffamily}
2637 \def\@affiliationfont{\small\normalfont}
2638 \fi

```

\@typeset@author@line At this point we have \@currentauthors and \@currentaffiliations. We typeset them in the journal style

```

2639 \def\@typeset@author@line{%
2640 \andify\@currentauthors\par\noindent
2641 \@currentauthors\def\@currentauthors{}%
2642 \ifx\@currentaffiliations\@empty\else
2643 \andify\@currentaffiliations
2644 \unskip, {\@currentaffiliations}\par
2645 \fi
2646 \def\@currentaffiliations{}}

```

\if@ACM@instpresent Whether the given affiliation has institution

```

2647 \newif\if@ACM@instpresent
2648 \@ACM@instpresenttrue

```

\if@ACM@citypresent Whether the given affiliation has city

```

2649 \newif\if@ACM@citypresent
2650 \@ACM@citypresenttrue

```

\if@ACM@countrypresent Whether the given affiliation has country

```

2651 \newif\if@ACM@countrypresent
2652 \@ACM@countrypresenttrue

```

\@ACM@resetaffil Reset affiliation flags

```

2653 \def\@ACM@resetaffil{%
2654 \global\@ACM@instpresentfalse
2655 \global\@ACM@citypresentfalse
2656 \global\@ACM@countrypresentfalse
2657 }

```

\@ACM@checkaffil Check affiliation flags

```

2658 \def\@ACM@checkaffil{%
2659 \if@ACM@instpresent\else
2660 \ClassWarningNoLine{\@classname}{No institution present for an affiliation}%
2661 \fi
2662 \if@ACM@citypresent\else
2663 \ClassWarningNoLine{\@classname}{No city present for an affiliation}%
2664 \fi
2665 \if@ACM@countrypresent\else
2666 \ClassError{\@classname}{No country present for an affiliation}{ACM

```

```

2667     requires each author to indicate their country using country macro.}%
2668 \fi
2669 }

```

`\mkauthors@i` This version is used in most journal formats. Note that `\and` between authors with the same affiliation becomes `_and_`:

```

2670 \def\mkauthors@i{%
2671   \def\@currentauthors{}%
2672   \def\@currentaffiliations{}%
2673   \global\let\and\@typeset@author@line
2674   \def\@author##1{%
2675     \ifx\@currentauthors\@empty
2676       \gdef\@currentauthors{\@authorfont\MakeTextUppercase{##1}}%
2677     \else
2678       \g@addto@macro{\@currentauthors}{\and\MakeTextUppercase{##1}}%
2679     \fi
2680     \gdef\and{}%
2681   \def\email##1##2{%
2682     \def\@tempa{##2}\ifx\@tempa\@empty\else
2683       \ifx\@currentaffiliations\@empty
2684         \gdef\@currentaffiliations{%
2685           \setkeys{@ACM@affiliation}{obeypunctuation=false}%
2686           \setkeys{@ACM@affiliation}{##1}%
2687           \@ACM@resetaffil
2688           \@affiliationfont##2\@ACM@checkaffil}%
2689         \else
2690           \g@addto@macro{\@currentaffiliations}{\and
2691             \setkeys{@ACM@affiliation}{obeypunctuation=false}%
2692             \setkeys{@ACM@affiliation}{##1}\@ACM@resetaffil
2693             ##2\@ACM@checkaffil}%
2694           \fi
2695         \fi
2696       \global\let\and\@typeset@author@line}%
2697   \if@ACM@acmcp
2698     \advance\hsize by -6pc%
2699   \fi
2700   \global\setbox\mktitle@bx=\vbox{\noindent\unvbox\mktitle@bx\par\medskip
2701     \noindent\addresses\@typeset@author@line
2702     \par\medskip}%
2703   \par\medskip}%
2704 }

```

`\mkauthors@ii` The `\mkauthors@ii` command was the version used in acmtog. It is no longer necessary.

`\author@bx` The box to put an individual author in

```
2705 \newbox\author@bx
```

`\author@bx@wd` The width of the author box

```
2706 \newdimen\author@bx@wd
```

`\author@bx@sep` The separation between author boxes

```
2707 \newskip\author@bx@sep
2708 \author@bx@sep=1pc\relax
```



`\typeset@author@bx` Typesetting the box with authors. Note that in `sigchi-a` the box is not centered.

```
2709 \def\typeset@author@bx{\bgroup\hsize=\author@bx@wd
2710 \def\and{\par}\normalbaselines
2711 \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
2712 \@authorfont\@currentauthors\par\@affiliationfont
2713 \@currentaffiliation}\egroup
2714 \box\author@bx\hspace{\author@bx@sep}%
2715 \gdef\@currentauthors{}%
2716 \gdef\@currentaffiliation{}}
```

`\mkauthors@iii` The `sigconf` version. Here we use a centered design with each author in a separate box.

```
2717 \def\mkauthors@iii{%
```

First, we need to determine the design of the author strip. The boxes are separated by `\author@bx@sep` plus two `\author@bx@sep` margins. This means that each box must be of width  $(\text{textwidth} - \text{author@bx@sep})/N - \text{author@bx@sep}$ , where  $N$  is the number of boxes per row.

```
2718 \author@bx@wd=\textwidth\relax
2719 \advance\author@bx@wd by -\author@bx@sep\relax
2720 \ifnum\@ACM@authorsperrow>0\relax
2721 \divide\author@bx@wd by \@ACM@authorsperrow\relax
2722 \else
2723 \ifcase\@num@authorgroups
2724 \relax % 0?
2725 \or % 1=one author per row
2726 \or % 2=two authors per row
2727 \divide\author@bx@wd by \@num@authorgroups\relax
2728 \or % 3=three authors per row
2729 \divide\author@bx@wd by \@num@authorgroups\relax
2730 \or % 4=two authors per row (!)
2731 \divide\author@bx@wd by 2\relax
2732 \else % three authors per row
2733 \divide\author@bx@wd by 3\relax
2734 \fi
2735 \fi
2736 \advance\author@bx@wd by -\author@bx@sep\relax
```

Now, parsing of `\addresses`:

```
2737 \gdef\@currentauthors{}%
2738 \gdef\@currentaffiliation{}%
2739 \def\@author##1{\ifx\@currentauthors\@empty
2740 \gdef\@currentauthors{\par##1}%
2741 \else
2742 \g@addto@macro\@currentauthors{\par##1}%
2743 \fi
2744 \gdef\and{}}%
2745 \def\email##1##2{\ifx\@currentaffiliation\@empty
2746 \gdef\@currentaffiliation{\bgroup
2747 \mathchardef\UrbreakPenalty=10000\nolinkurl{##2}\egroup}%
2748 \else
2749 \g@addto@macro\@currentaffiliation{\par\bgroup
2750 \mathchardef\UrbreakPenalty=10000\nolinkurl{##2}\egroup}%
2751 \fi}%
2752 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
```

```

2753 \gdef\@currentaffiliation{%
2754 \setkeys{@ACM@affiliation@}{obypunctuation=false}%
2755 \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2756 ##2\@ACM@checkaffil}%
2757 \else
2758 \g@addto@macro\@currentaffiliation{\par
2759 \setkeys{@ACM@affiliation@}{obypunctuation=false}%
2760 \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2761 ##2\@ACM@checkaffil}%
2762 \fi
2763 \global\let\and\@typeset@author@bx
2764 }%

```

Actual typesetting is done by the `\and` macro:

```

2765 \hsize=\textwidth
2766 \global\setbox\mkttitle@bx=\vbox{\noindent
2767 \unvbox\mkttitle@bx\par\medskip\leavevmode
2768 \lineskip=1pc\relax\centering\hspace*{-1em}%
2769 \addresses\let\and\@typeset@author@bx\and\par\bigskip}}

```

`\@mkauthors@iv` The sigchi-a version. We put authors in the main text with no more than 2 authors per line, unless overridden.

```

2770 \def\@mkauthors@iv{%

```

First, we need to determine the design of the author strip. The boxes are separated by `\author@bx@sep` plus two `\author@bx@sep` margins. This means that each box must be of width  $(\text{\textwidth} - \text{\author@bx@sep})/N - \text{\author@bx@sep}$ , where  $N$  is the number of boxes per row.

```

2771 \author@bx@wd=\columnwidth\relax
2772 \advance\author@bx@wd by -\author@bx@sep\relax
2773 \ifnum\@ACM@authorsperrow>0\relax
2774 \divide\author@bx@wd by \@ACM@authorsperrow\relax
2775 \else
2776 \ifcase\@num@authorgroups
2777 \relax % 0?
2778 \or % 1=one author per row
2779 \else % 2=two authors per row
2780 \divide\author@bx@wd by 2\relax
2781 \fi
2782 \fi
2783 \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of `\addresses`:

```

2784 \gdef\@currentauthors{}%
2785 \gdef\@currentaffiliation{}%
2786 \def\@author##1{\ifx\@currentauthors\@empty
2787 \gdef\@currentauthors{\par##1}%
2788 \else
2789 \g@addto@macro\@currentauthors{\par##1}%
2790 \fi
2791 \gdef\and{}}%
2792 \def\email##1##2{\ifx\@currentaffiliation\@empty
2793 \gdef\@currentaffiliation{\nolinkurl{##2}}%
2794 \else
2795 \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%

```

```

2796 \fi}%
2797 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2798 \gdef\@currentaffiliation{%
2799 \setkeys{@ACM@affiliation}{obeypunctuation=false}%
2800 \setkeys{@ACM@affiliation}{##1}\@ACM@resetaffil
2801 ##2\@ACM@checkaffil}%
2802 \else
2803 \g@addto@macro\@currentaffiliation{\par
2804 \setkeys{@ACM@affiliation}{obeypunctuation=false}%
2805 \setkeys{@ACM@affiliation}{##1}\@ACM@resetaffil
2806 ##2\@ACM@checkaffil}%
2807 \fi
2808 \global\let\and\@typeset@author@bx}%
2809 %

```

Actual typesetting is done by the \and macro

```

2810 \bgroup\hsize=\columnwidth
2811 \par\raggedright\leftskip=\z@
2812 \lineskip=1pc\noindent
2813 \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}

```

\@mkauthorsaddresses Typesetting authors' addresses in the footnote style

```

2814 \def\@mkauthorsaddresses{%
2815 \ifnum\@num@authors>1\relax
2816 Authors' \else Author's \fi
2817 Contact Information:
2818 \bgroup
2819 \def\streetaddress##1{\ClassWarning{\@classname}{ACM no longer collects
2820 authors' postal addresses. I am ignoring your street
2821 address}\unskip\ignorespaces}%
2822 \def\postcode##1{\ClassWarning{\@classname}{ACM no longer collects
2823 authors' postal addresses. I am ignoring your postal
2824 code}\unskip\ignorespaces}%
2825 \def\position##1{\unskip\ignorespaces}%
2826 \gdef\@ACM@institution@separator{, }%
2827 \def\institution##1{\unskip\@ACM@institution@separator ##1\gdef\@ACM@institution@separator{ and }}
2828 \def\city##1{\unskip, ##1}%
2829 \def\state##1{\unskip, ##1}%
2830 \renewcommand\department[2][0]{\unskip\@addpunct, ##2}%
2831 \def\country##1{\unskip, ##1}%
2832 \def\and{\unskip; \gdef\@ACM@institution@separator{, }}%
2833 \def\@author##1{##1}%
2834 \def\email##1##2{\unskip, \nolinkurl{##2}}%
2835 \addresses
2836 \egroup}

2837 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@journal
2838 \ifx\@authorsaddresses\@empty
2839 \ClassWarningNoLine{\@classname}{Authors'
2840 addresses are mandatory for ACM journals}%
2841 \fi\fi\fi}

```

\@setaddresses This is an amsart macro that we do not need.

```

2842 \def\@setaddresses{}

```

`\@authornotemark` Adding a footnote mark to authors. This version adds a “normal” footnote mark.  
2843 `\def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark\relax}}`

`\@@authornotemark` Adding a footnote mark to authors with a given number  
2844 `\def\@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}`

`\@mkteasers` Typesetting the teasers

```
2845 \def\@mkteasers{%
2846   \ifx\@teaserfigures\empty\else
2847     \def\@teaser##1{\par\bigskip\bgroup
2848       \captionsetup{type=figure}##1\egroup\par}
2849     \global\setbox\mktitle@bx=\vbox{\noindent\unvbox\mktitle@bx\par
2850       \noindent\@Description@presentfalse
2851       \@teaserfigures\par\if@Description@present\else
2852         \global\@undescr@imagestrue
2853         \ClassWarning{\@classname}{A possible image without
2854           description}\fi
2855       \medskip}%
2856   \fi}
```

`\@mkabstract` Typesetting the abstract

```
2857 \def\@mkabstract{\bgroup
2858   \ifx\@abstract\empty\else
2859     {\phantomsection\addcontentsline{toc}{section}{\abstractname}%
2860     \if@ACM@journal
2861       \everypar{\setbox\z@\lastbox\everypar{}}\small
2862     \else
2863       \section*{\abstractname}%
2864     \fi
2865     \ignorespaces\@abstract\par}%
2866   \fi\egroup}
```

`\@mktranslatedabstract` Typesetting a translated abstract

```
2867 \def\@mktranslatedabstract#1{\selectlanguage{#1}%
2868   \if@ACM@journal
2869     \everypar{\setbox\z@\lastbox\everypar{}}\small
2870   \else
2871     \section*{\abstractname}%
2872   \fi
2873   \ignorespaces}
```

`\@mkbibcitation` Print the bibcitation format

```
2874 \def\@mkbibcitation{\bgroup
2875   \let\@vspace\@vspace@orig
2876   \let\@vspacer\@vspacer@orig
2877   \def\@pages@word{\ifnum\getrefnumber{TotPages}=1\relax page\else pages\fi}%
2878   \def\footnotemark{}%
2879   \def\@unskip{\ignorespaces}%
2880   \def\footnote{\ClassError{\@classname}{Please do not use footnotes
2881     inside a \string\title{} or \string\author{} command! Use
2882     \string\titlenote{} or \string\authornote{} instead!}}%
2883   \def\@article@string{\ifx\@acmArticle\empty{\ } \else,
2884     Article~\@acmArticle\ \fi}%
```

```

2885 \par\medskip\small\noindent{\bfseries ACM Reference Format:}\par\nobreak
2886 \noindent\bgroup
2887 \def\{\unskip}, \ignorespaces}\authors\egroup. \@acmYear. \@title
2888 \ifx\@subtitle\@empty. \else: \@subtitle. \fi
2889 \if@ACM@nonacm\else
2890 % The 'nonacm' option disables 'printacmref' by default,
2891 % and the present \@mkbibcitation definition is never used
2892 % in this case. The conditional remains useful if the user
2893 % explicitly sets \settopmatter{printacmref=true}.
2894 \if@ACM@journal@bibstrip
2895 \textit{\@journalNameShort}
2896 \@acmVolume, \@acmNumber \@article@string (\@acmPubDate),
2897 \ref{TotPages}~\@pages@word.
2898 \else
2899 In \textit{\@acmBooktitle}%
2900 \ifx\@acmEditors\@empty\textit{.}\else
2901 \andify\@acmEditors\textit{, }\@acmEditors~\@editorsAbbrev.%
2902 \fi\
2903 ACM, New York, NY, USA%
2904 \@article@string\unskip, \ref{TotPages}~\@pages@word.
2905 \fi
2906 \fi
2907 \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
2908 \par\egroup}

```

\@printendtopmatter End the top matter

```

2909 \def\@printendtopmatter{%
2910 \let\@vspace\@vspace@orig
2911 \let\@vspacer\@vspacer@orig
2912 \par\bigskip
2913 \let\@vspace\@vspace@acm
2914 \let\@vspacer\@vspacer@acm
2915 }

```

\@setthanks We redefine \@setthanks using \@long

```

2916 \def\@setthanks{\@long\def\thanks##1{\par##1\@addpunct.}\thankses}

```

\@setauthorsaddresses

```

2917 \def\@setauthorsaddresses{\@authorsaddresses\unskip\@addpunct.}

```

\@typesetengagemetadata Typesetting special metadata for ACM Engage

```

2918 \def\@typesetengagemetadata{%
2919 \def\@setengagemetadata##1##2{\par\noindent\textbf{##1} ##2\par}%
2920 \@acmengagemetadata}

```

### 3.22 Headers and Footers

We use fancyhdr for our headers and footers:

```

2921 \RequirePackage{fancyhdr}

```

\ACM@restore@pagestyle The following code by Ross Moore protects against changes by the totpages package:

```

2922 \let\ACM@ps@plain\ps@plain
2923 \let\ACM@ps@myheadings\ps@myheadings

```

```

2924 \let\ACM@ps@headings\ps@headings
2925 \def\ACM@restore@pagestyle{%
2926   \let\ps@plain\ACM@ps@plain
2927   \let\ps@myheadings\ACM@ps@myheadings
2928   \let\ps@headings\ACM@ps@headings}
2929 \AtBeginDocument{\ACM@restore@pagestyle}

```

\ACM@linecount@bx This is the box displayed in review mode

```

2930 \if@ACM@review
2931   \newsavebox{\ACM@linecount@bx}
2932   \newlength\ACM@linecount@bxht
2933   \newcount\ACM@linecount
2934   \ACM@linecount\@ne\relax
2935   \def\ACM@mk@linecount{%
2936     \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{\normalfont
2937       \normalsize
2938       \setlength{\ACM@linecount@bxht}{0pt}%
2939       \loop{\color{red}\scriptsize\the\ACM@linecount}}\
2940       \global\advance\ACM@linecount by \@ne
2941       \addtolength{\ACM@linecount@bxht}{\baselineskip}%
2942       \ifdim\ACM@linecount@bxht<\textheight\repeat
2943       {\color{red}\scriptsize\the\ACM@linecount}\hfill
2944       \global\advance\ACM@linecount by \@ne}}
2945 \fi

```

\ACM@linecountL How to display the box on the left

```

2946 \def\ACM@linecountL{%
2947   \if@ACM@review
2948     \ACM@mk@linecount
2949     \begin{picture}(\z@,\z@)%
2950       \put(-26,-22){\usebox{\ACM@linecount@bx}}%
2951     \end{picture}%
2952 \fi}

```

\ACM@linecountR How to display the box on the right. In one column formats we do not step the numbers.

```

2953 \def\ACM@linecountR{%
2954   \if@ACM@review
2955     \ifcase\ACM@format@nr
2956       \relax % manuscript
2957         \relax
2958         \or % acmsmall
2959           \relax
2960         \or % acmlarge
2961           \relax
2962         \or % acmtog
2963           \ACM@mk@linecount
2964         \or % sigconf
2965           \ACM@mk@linecount
2966         \or % siggraph
2967           \ACM@mk@linecount
2968         \or % sigplan
2969           \ACM@mk@linecount
2970         \or % sigchi
2971           \ACM@mk@linecount

```

```

2972 \or % sigchi-a
2973 \ACM@mk@linecount
2974 \or % acmengage
2975 \ACM@mk@linecount
2976 \or % acmcp
2977 \relax
2978 \fi
2979 \begin{picture}(0,0)%
2980 \put(20,-22){\usebox{\ACM@linecount@bx}}%
2981 \end{picture}%
2982 \fi}

```

`\ACM@timestamp` The timestamp system

```

2983 \if@ACM@timestamp
2984 % Subtracting 30 from \time gives us the effect of rounding down despite
2985 % \numexpr rounding to nearest
2986 \newcounter{ACM@time@hours}
2987 \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
2988 \newcounter{ACM@time@minutes}
2989 \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
2990 \newcommand\ACM@timestamp{%
2991 \footnotesize%
2992 \ifx\@acmSubmissionID\@empty\relax\else
2993 Submission ID: \@acmSubmissionID.{ }%
2994 \fi
2995 \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
2996 \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{. }%
2997 Page \thepage\ of \@startPage--\pageref*{TotPages}.%
2998 }
2999 \fi

```

`\@shortauthors` Even if the author redefined `\shortauthors`, we do not print it in the headers when in anonymous mode:

```

3000 \def\@shortauthors{%
3001 \if@ACM@anonymous
3002 Anon.
3003 \ifx\@acmSubmissionID\@empty\else Submission Id: \@acmSubmissionID\fi
3004 \else\shortauthors\fi}

```

`\@headfootfont` The font to typeset header and footer text.

```

3005 \def\@headfootfont{\sffamily\footnotesize}

```

`standardpagestyle` The page style for all pages but the first one      The page style for all pages but the first one

```

3006 \AtBeginDocument{%
3007 \fancypagestyle{standardpagestyle}{%
3008 \fancyhf{}%
3009 \renewcommand{\headrulewidth}{\z@}%
3010 \renewcommand{\footrulewidth}{\z@}%
3011 \def\@acmArticlePage{%
3012 \ifx\@acmArticle\empty%
3013 \if@ACM@printfolios\thepage\fi%
3014 \else%

```

```

3015     \@acmArticle\if@ACM@printfolios:\thepage\fi%
3016     \fi%
3017 }%
3018 \if@ACM@journal@bibstrip@or@tog
3019     \ifcase\ACM@format@nr
3020     \relax % manuscript
3021     \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
3022     \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
3023     \fancyhead[RE]{\@shortauthors}%
3024     \fancyhead[LO]{\ACM@linecountL\shorttitle}%
3025     \if@ACM@nonacm\else%
3026     \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}
3027     \fi%
3028 \or % acmsmall
3029     \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticlePage}%
3030     \fancyhead[RO]{\@headfootfont\@acmArticlePage}%
3031     \fancyhead[RE]{\@headfootfont\@shortauthors}%
3032     \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
3033     \if@ACM@nonacm\else%
3034     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
3035     \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
3036     \fi
3037 \or % acmlarge
3038     \fancyhead[LE]{\ACM@linecountL\@headfootfont
3039     \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
3040     \fancyhead[LO]{\ACM@linecountL}%
3041     \fancyhead[RO]{\@headfootfont
3042     \shorttitle\quad\textbullet\quad\@acmArticlePage}%
3043     \if@ACM@nonacm\else%
3044     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
3045     \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
3046     \fi
3047 \or % acmtog
3048     \fancyhead[LE]{\ACM@linecountL\@headfootfont
3049     \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
3050     \fancyhead[LO]{\ACM@linecountL}%
3051     \fancyhead[RE]{\ACM@linecountR}%
3052     \fancyhead[RO]{\@headfootfont
3053     \shorttitle\quad\textbullet\quad\@acmArticlePage\ACM@linecountR}%
3054     \if@ACM@nonacm\else
3055     \if@ACM@journal@bibstrip
3056     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort,
3057     Vol. \@acmVolume, No.\@acmNumber, Article \@acmArticle.
3058     Publication date: \@acmPubDate.}%
3059     \else
3060     \fancyfoot[RO,LE]{\footnotesize \acmConference@shortname,
3061     \acmConference@date, \acmConference@venue.}%
3062     \fi
3063     \fi
3064 \else % Proceedings
3065     \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
3066     \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
3067     \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
3068     \if@ACM@nonacm

```



```

3069     \fancyhead[LE]{\ACM@linecountL}%
3070     \fancyhead[RO]{\ACM@linecountR}%
3071 \else%
3072     \if@ACM@engage
3073     \fancyhead[LE]{\ACM@linecountL\@headfootfont\footnotesize
3074         EngageCSEdu. \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi}%
3075     \fancyhead[RO]{\@headfootfont
3076         EngageCSEdu. \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
3077         \ACM@linecountR}%
3078 \else
3079     \fancyhead[LE]{\ACM@linecountL\@headfootfont\footnotesize
3080         \acmConference@shortname,
3081         \acmConference@date, \acmConference@venue}%
3082     \fancyhead[RO]{\@headfootfont
3083         \acmConference@shortname,
3084         \acmConference@date, \acmConference@venue\ACM@linecountR}%
3085     \fi
3086 \fi
3087 \fi
3088 \else % Proceedings
3089     \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
3090     \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
3091     \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
3092     \if@ACM@nonacm
3093     \fancyhead[LE]{\ACM@linecountL}%
3094     \fancyhead[RO]{\ACM@linecountR}%
3095 \else%
3096     \if@ACM@engage
3097     \fancyhead[LE]{\ACM@linecountL\@headfootfont
3098         EngageCSEdu. \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi}%
3099     \fancyhead[RO]{\@headfootfont
3100         EngageCSEdu. \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
3101         \ACM@linecountR}%
3102 \else
3103     \fancyhead[LE]{\ACM@linecountL\@headfootfont
3104         \acmConference@shortname,
3105         \acmConference@date, \acmConference@venue}%
3106     \fancyhead[RO]{\@headfootfont
3107         \acmConference@shortname,
3108         \acmConference@date, \acmConference@venue\ACM@linecountR}%
3109     \fi
3110 \fi
3111 \fi
3112 \if@ACM@sigchiamode
3113     \fancyheadoffset[L]{\dimexpr(\marginparsep+\marginparwidth)}%
3114 \fi
3115 \if@ACM@timestamp
3116     \fancyfoot[LO,RE]{\ACM@timestamp}
3117 \fi
3118 \if@ACM@acmcp
3119 \renewcommand{\footrulewidth}{0.1\p@}%
3120 \fancyheadoffset[L]{46pt}%
3121 \fancyhead[L]{\makebox[\z@][l]{%
3122     \raisebox{-\dimexpr(0.2\textheight*(\ACM@ArticleType@nr-2))}{%

```

```

3123     \rotatebox{90}{\colorbox{@ACM@Article@color}{\color{white}%
3124     \strut\ACM@ArticleType~Article}}}%
3125     \ACM@linecountL}%
3126 \fancyhead[R]{\makebox[\z@][r]{\box\@ACM@acmcpbox}}%
3127 \fancyfoot[L,C]{}%
3128 \fancyfoot[R]{\footnotesize
3129     \@journalName, Volume~\@acmVolume, Issue~\@acmNumber,
3130     \ifx\@acmArticle\empty\else Article~\@acmArticle\fi\space
3131     (\@acmPubDate)\ifx\@acmDOI\empty\else\\@formatdoi{\@acmDOI}\fi}
3132 \fi
3133 }%
3134 \pagestyle{standardpagestyle}
3135 }

```

\@folio@wd Folio blob width, height, offsets and max number

\@folio@ht

\@folio@w@pset The macro to typeset the folio blob.

\@folio@max  
firstpagestyle

The page style for the first page only.

```

3136 \AtBeginDocument{%
3137 \fancypagestyle{firstpagestyle}{%
3138     \fancyhf{}%
3139     \renewcommand{\headrulewidth}{\z@}%
3140     \renewcommand{\footrulewidth}{\z@}%
3141     \if@ACM@journal@bibstrip@or@tog
3142         \ifcase\ACM@format@nr
3143             \relax % manuscript
3144             \fancyhead[L]{\ACM@linecountL\@acmBadgeL}%
3145             \fancyhead[R]{\@acmBadgeR}%
3146             \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
3147             \if@ACM@nonacm\else%
3148                 \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
3149             \fi%
3150         \or % acmsmall
3151             \if@ACM@nonacm\else%
3152                 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
3153                     \@acmNumber, Article \@acmArticle. Publication date:
3154                     \@acmPubDate.}%
3155             \fi%
3156             \fancyhead[LE]{\ACM@linecountL\@acmBadgeL}%
3157             \fancyhead[LO]{\ACM@linecountL\@acmBadgeL}%
3158             \fancyhead[RO]{\@acmBadgeR}%
3159             \fancyhead[RE]{\@acmBadgeR}%
3160         \or % acmlarge
3161             \if@ACM@nonacm\else%
3162                 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
3163                     \@acmNumber, Article \@acmArticle. Publication date:
3164                     \@acmPubDate.}%
3165             \fi%
3166             \fancyhead[RO]{\@acmBadgeR}%
3167             \fancyhead[RE]{\@acmBadgeR}%
3168             \fancyhead[LE]{\ACM@linecountL\@acmBadgeL}%
3169             \fancyhead[LO]{\ACM@linecountL\@acmBadgeL}%
3170         \or % acmtog

```

```

3171 \if@ACM@nonacm\else%
3172 \if@ACM@journal@bibstrip
3173 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort,
3174 Vol. \@acmVolume, No.\@acmNumber, Article \@acmArticle.
3175 Publication date: \@acmPubDate.}%
3176 \else
3177 \fancyfoot[RO,LE]{\footnotesize \acmConference@shortname,
3178 \acmConference@date, \acmConference@venue.}%
3179 \fi
3180 \fi%
3181 \fancyhead[L]{\ACM@linecountL\@acmBadgeL}%
3182 \fancyhead[R]{\@acmBadgeR\ACM@linecountR}%
3183 \else % Conference proceedings
3184 \fancyhead[L]{\ACM@linecountL\@acmBadgeL}%
3185 \fancyhead[R]{\@acmBadgeR\ACM@linecountR}%
3186 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
3187 \fi
3188 \else
3189 \fancyhead[L]{\ACM@linecountL\@acmBadgeL}%
3190 \fancyhead[R]{\@acmBadgeR\ACM@linecountR}%
3191 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
3192 \fi
3193 \if@ACM@timestamp
3194 \ifnum\ACM@format@nr=0\relax % Manuscript
3195 \fancyfoot[LO,RE]{\ACM@timestamp\quad
3196 \if@ACM@nonacm\else
3197 \footnotesize Manuscript submitted to ACM
3198 \fi}
3199 \else
3200 \fancyfoot[LO,RE]{\ACM@timestamp}
3201 \fi
3202 \fi
3203 \if@ACM@acmcp
3204 \renewcommand{\footrulewidth}{0.1\p@}%
3205 \fancyheadoffset[L]{46pt}%
3206 \fancyhead[L]{\makebox[\z@][l]{%
3207 \raisebox{-\dimexpr(0.2\textheight*(\ACM@ArticleType@nr-2))}{%
3208 \rotatebox{90}{\colorbox{@ACM@Article@color}{\color{white}%
3209 \strut\ACM@ArticleType~Article}}}}%
3210 \ACM@linecountL\@acmBadgeL}%
3211 \fancyhead[R]{\@acmBadgeR\makebox[\z@][r]{\box\@ACM@acmcpbox}}%
3212 \fancyfoot[L,C]{}%
3213 \fancyfoot[R]{\footnotesize
3214 \@journalName, Volume\@acmVolume, Issue\@acmNumber,
3215 \ifx\@acmArticle@empty\else Article\@acmArticle\fi\space
3216 (\@acmPubDate)\ifx\@acmDOI@empty\else\\@formatdoi{\@acmDOI}\fi}
3217 \fi
3218 }}

```

### 3.23 Sectioning

\ACM@NRadjust Ross Moore's macro.

Initially \ACM@sect@format@ just passes through its #1 argument un-

changed. When a sectioning macro such as `\section` occurs, the `\ACM@NRadjust` redefines `\ACM@sect@format@` to expand into the styling commands; e.g., `\@secfont`. Then `\Sectionformat` is temporarily redefined to produce `\realSectionformat{\ACM@sect@format{#1}}{#2}`, which ultimately becomes `\Sectionformat{\@secfont{#1}}{#2}`. This is done to allow `\Sectionformat` to be variable, as may be needed in particular circumstances. Its current expansion is saved as `\realSectionformat` which is used with the modified 1st argument, then `\Sectionformat` is reverted to its former expansion.

To style the section-number, the line `#1{}` is used at the end of `\ACM@NRadjust`. This imposes style-changing commands for fonts and sizes, but any `\MakeUppercase` acts on just the `{}`. It's a bit hacky, by essentially assuming that only numbers occur here, not letters to be case-changed. (This should be acceptable in a class-file, as it ought to be possible to change the case elsewhere, if that was ever desired.) Also, it can result in `\@adddotafter` being called too soon, so a slight adjustment is made, via `\ACM@adddotafter`, which now tests whether its argument is empty. But the coding has to allow for other packages to have also patched `\@adddotafter`.

```

3219 \def\ACM@NRadjust#1{%
3220 \begingroup
3221 \expandafter\ifx\csname Sectionformat\endcsname\relax
3222 % do nothing when \Sectionformat is unknown
3223 \def\next{\endgroup #1}%
3224 \else
3225 \def\next{\endgroup
3226 \let\realSectionformat\Sectionformat
3227 \def\ACM@sect@format@{#1}%
3228 \let\Sectionformat\ACM@NR@adjustedSectionformat
3229 %% next lines added 2018-06-17 to ensure section number is styled
3230 \let\real@adddotafter\@adddotafter
3231 \let\@adddotafter\ACM@adddotafter
3232 #1{ }% imposes the styles, but nullifies \MakeUppercase
3233 \let\@adddotafter\real@adddotafter
3234 }%
3235 \fi \next
3236 }

```

`\ACM@NR@adjustedSectionformat`

```

3237 \def\ACM@NR@adjustedSectionformat#1#2{%
3238 \realSectionformat{\ACM@sect@format{#1}}{#2}%
3239 \let\Sectionformat\realSectionformat}
3240 \DeclareRobustCommand{\ACM@sect@format@}{\ACM@sect@format@}
3241 \def\ACM@sect@format@null#1{#1}
3242 \let\ACM@sect@format@\ACM@sect@format@null
3243 \AtBeginDocument{%
3244 \expandafter\ifx\csname LTX@adddotafter\endcsname\relax
3245 \let\LTX@adddotafter\@adddotafter
3246 \fi
3247 }

```

`\ACM@adddotafter`

```

3248 \def\ACM@adddotafter#1{\ifx\relax#1\relax\else\LTX@adddotafter{#1}\fi}

```

Sectioning is different for different levels

```

3249 \renewcommand\section{\@startsection{section}{1}{\z@}%
3250 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
3251 {.25\baselineskip}%
3252 {\ACM@NRadjust\@secfont}}
3253 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
3254 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
3255 {.25\baselineskip}%
3256 {\ACM@NRadjust\@subsecfont}}
3257 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
3258 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
3259 {-3.5\p@}%
3260 {\ACM@NRadjust{\@subsubsecfont\@adddotafter}}}}
3261 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
3262 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
3263 {-3.5\p@}%
3264 {\ACM@NRadjust{\@parfont\@adddotafter}}}}
3265 \newcommand\noindentparagraph{\@startsection{paragraph}{4}{\z@}%
3266 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
3267 {-3.5\p@}%
3268 {\ACM@NRadjust{\@parfont}}}}
3269
3270 \renewcommand\part{\@startsection{part}{9}{\z@}%
3271 {-10\p@ \@plus -4\p@ \@minus -2\p@}%
3272 {4\p@}%
3273 {\ACM@NRadjust\@parfont}}

```

`\section@raggedright` Special version of `\raggedright` compatible with `\MakeUppercase`

```

3274 \def\section@raggedright{\@rightskip\@flushglue
3275 \rightskip\@rightskip
3276 \leftskip\z@skip
3277 \parindent\z@}

```

`\@secfont` Fonts for sections etc. are different for different formats.

```

\@subsecfont 3278 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
\@subsubsecfont 3279 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
\@parfont 3280 \def\@subsubsecfont{\sffamily\itshape}
3281 \def\@parfont{\itshape}
3282 \setcounter{secnumdepth}{3}
3283 \ifcase\ACM@format@nr
3284 \relax % manuscript
3285 \or % acmsmall
3286 \or % acmlarge
3287 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
3288 \def\@subsecfont{\sffamily\large\section@raggedright}
3289 \or % acmtog
3290 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
3291 \def\@subsecfont{\sffamily\large\section@raggedright}
3292 \or % sigconf
3293 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
3294 \def\@subsecfont{\bfseries\Large\section@raggedright}
3295 \or % siggraph
3296 \def\@secfont{\sffamily\bfseries\Large\section@raggedright\MakeTextUppercase}
3297 \def\@subsecfont{\sffamily\bfseries\Large\section@raggedright}

```

```

3298 \or % sigplan
3299 \def\@secfont{\bfseries\Large\section@raggedright}
3300 \def\@subsecfont{\bfseries\section@raggedright}
3301 \def\@subsubsecfont{\bfseries\section@raggedright}
3302 \def\@parfont{\bfseries\itshape}
3303 \def\@subparfont{\itshape}
3304 \or % sigchi
3305 \setcounter{secnumdepth}{1}
3306 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
3307 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
3308 \or % sigchi-a
3309 \setcounter{secnumdepth}{0}
3310 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
3311 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
3312 \or % acmengage
3313 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
3314 \def\@subsecfont{\bfseries\Large\section@raggedright}
3315 \or %acmcp
3316 \fi

```

`\@adddotafter` Add punctuation after a sectioning command

```
3317 \def\@adddotafter#1{#1\@addpunct{.}}
```

`\@addspaceafter` Add space after a sectioning command

```
3318 \def\@addspaceafter#1{#1\@addpunct{\enspace}}
```

```
3319 \if@ACM@acmcp
```

```
3320 \setcounter{secnumdepth}{-1}%
```

```
3321 \fi
```

### 3.24 TOC lists

`\@dotsep` Related to the `\tableofcontents` are all the horizontal fillers. Base  $\LaTeX$  defines `\@dottedtocline`, which we should not disable. Yet, this command expects `\@dotsep` to be defined but leaves this to the class implementation. Since `amsart` does not provide this, we copy the standard variant from `article` here.

```
3322 \providecommand*\@dotsep{4.5}
```

### 3.25 Theorems

`\@acmplainbodyfont` The font to typeset the body of the `acmplain` theorem style.

```
3323 \def\@acmplainbodyfont{\itshape}
```

`\@acmplainindent` The amount to indent the `acmplain` theorem style.

```
3324 \def\@acmplainindent{\parindent}
```

`\@acmplainheadfont` The font to typeset the head of the `acmplain` theorem style.

```
3325 \def\@acmplainheadfont{\scshape}
```

`\@acmplainnotefont` The font to typeset the note of the `acmplain` theorem style.

```
3326 \def\@acmplainnotefont{\@empty}
```

Customization of the acmplain theorem style:

```
3327 \ifcase\ACM@format@nr
3328 \relax % manuscript
3329 \or % acmsmall
3330 \or % acmlarge
3331 \or % acmtog
3332 \or % sigconf
3333 \or % siggraph
3334 \or % sigplan
3335 \def\@acmplainbodyfont{\itshape}
3336 \def\@acmplainindent{\z@}
3337 \def\@acmplainheadfont{\bfseries}
3338 \def\@acmplainnotefont{\normalfont}
3339 \or % sigchi
3340 \or % sigchi-a
3341 \or % acmengage
3342 \or % acmcp
3343 \fi
```

acmplain The acmplain theorem style

```
3344 \newtheoremstyle{acmplain}%
3345 { .5\baselineskip \@plus .2\baselineskip
3346   \@minus .2\baselineskip }% space above
3347 { .5\baselineskip \@plus .2\baselineskip
3348   \@minus .2\baselineskip }% space below
3349 {\@acmplainbodyfont}% body font
3350 {\@acmplainindent}% indent amount
3351 {\@acmplainheadfont}% head font
3352 { . }% punctuation after head
3353 { .5em }% spacing after head
3354 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont(#3)}}}% head spec
```

\@acmdefinitionbodyfont The font to typeset the body of the acmdefinition theorem style.

```
3355 \def\@acmdefinitionbodyfont{\normalfont}
```

\@acmdefinitionindent The amount to indent the acmdefinition theorem style.

```
3356 \def\@acmdefinitionindent{\parindent}
```

\@acmdefinitionheadfont The font to typeset the head of the acmdefinition theorem style.

```
3357 \def\@acmdefinitionheadfont{\itshape}
```

\@acmdefinitionnotefont The font to typeset the note of the acmdefinition theorem style.

```
3358 \def\@acmdefinitionnotefont{\@empty}
```

Customization of the acmdefinition theorem style:

```
3359 \ifcase\ACM@format@nr
3360 \relax % manuscript
3361 \or % acmsmall
3362 \or % acmlarge
3363 \or % acmtog
3364 \or % sigconf
3365 \or % siggraph
3366 \or % sigplan
```

```

3367 \def\acmdefinitionbodyfont{\normalfont}
3368 \def\acmdefinitionindent{\z@}
3369 \def\acmdefinitionheadfont{\bfseries}
3370 \def\acmdefinitionnotefont{\normalfont}
3371 \or % sigchi
3372 \or % sigchi-a
3373 \or % acmengage
3374 \or % acmcp
3375 \fi

```

acmdefinition The acmdefinition theorem style

```

3376 \newtheoremstyle{acmdefinition}%
3377   {.5\baselineskip\@plus.2\baselineskip
3378     \@minus.2\baselineskip}% space above
3379   {.5\baselineskip\@plus.2\baselineskip
3380     \@minus.2\baselineskip}% space below
3381   {\@acmdefinitionbodyfont}% body font
3382   {\@acmdefinitionindent}% indent amount
3383   {\@acmdefinitionheadfont}% head font
3384   {.% punctuation after head
3385   {.5em}% spacing after head
3386   {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmdefinitionnotefont(#3)}}}% head spec

```

Make acmplain the default theorem style.

```

3387 \theoremstyle{acmplain}

```

Delay defining the theorem environments until after other packages have been loaded. In particular, the `cleveref` package must be loaded before the theorem environments are defined in order to show the correct environment name (see <https://github.com/borisveytsman/acmart/issues/138>). The `acmthm` option is used to suppress the definition of any theorem environments. Also, to avoid obscure errors arising from these environment definitions conflicting with environments defined by the user or by user-loaded packages, we only define environments that have not yet been defined.

```

3388 \AtEndPreamble{%
3389   \if@ACM@acmthm
3390   \theoremstyle{acmplain}
3391   \@ifundefined{theorem}{%
3392     \newtheorem{theorem}{Theorem}[section]
3393   }{}
3394   \@ifundefined{conjecture}{%
3395     \newtheorem{conjecture}[theorem]{Conjecture}
3396   }{}
3397   \@ifundefined{proposition}{%
3398     \newtheorem{proposition}[theorem]{Proposition}
3399   }{}
3400   \@ifundefined{lemma}{%
3401     \newtheorem{lemma}[theorem]{Lemma}
3402   }{}
3403   \@ifundefined{corollary}{%
3404     \newtheorem{corollary}[theorem]{Corollary}
3405   }{}
3406   \theoremstyle{acmdefinition}
3407   \@ifundefined{example}{%

```



```

3408 \newtheorem{example}[theorem]{Example}
3409 }{}
3410 \@ifundefined{definition}{%
3411 \newtheorem{definition}[theorem]{Definition}
3412 }{}
3413 \fi
3414 \theoremstyle{acmplain}
3415 }

```

`\@proofnamefont` The font to typeset the proof name.

```
3416 \def\@proofnamefont{\scshape}
```

`\@proofindent` Whether or not to indent proofs.

```
3417 \def\@proofindent{\indent}
```

Customization of the proof environment.

```

3418 \ifcase\ACM@format@nr
3419 \relax % manuscript
3420 \or % acmsmall
3421 \or % acmlarge
3422 \or % acmtog
3423 \or % sigconf
3424 \or % siggraph
3425 \or % sigplan
3426 \def\@proofnamefont{\itshape}
3427 \def\@proofindent{\noindent}
3428 \or % sigchi
3429 \or % sigchi-a
3430 \or % acmengage
3431 \or % acmcp
3432 \fi

```

`proof` We want some customization of the proof environment.

```

3433 \renewenvironment{proof}[1][\proofname]{\par
3434 \pushQED{\qed}%
3435 \normalfont \topsep6\p@\@plus6\p@\relax
3436 \trivlist
3437 \item[\@proofindent\hskip\labelsep
3438 \@proofnamefont #1\@addpunct{.}]\ignorespaces
3439 }{}%
3440 \popQED\endtrivlist\endpfalse
3441 }

```

### 3.26 Balancing columns

We need balancing only if the user did not disable it, and we use a two column format. Note that `pbalance` uses a different mechanism.

```

3442 \AtEndPreamble{%
3443 \if@ACM@pbalance
3444 \global\@ACM@balancefalse
3445 \ifcase\ACM@format@nr
3446 \relax % manuscript
3447 \or % acmsmall

```

```

3448     \or % acmlarge
3449     \or % acmtog
3450     \RequirePackage{pbalance}%
3451     \or % sigconf
3452     \RequirePackage{pbalance}%
3453     \or % siggraph
3454     \RequirePackage{pbalance}%
3455     \or % sigplan
3456     \RequirePackage{pbalance}%
3457     \or % sigchi
3458     \RequirePackage{pbalance}%
3459     \or % sigchi-a
3460     \or % acmengage
3461     \RequirePackage{pbalance}%
3462     \or % acmcp
3463     \fi
3464 \fi
3465 \if@ACM@balance
3466     \ifcase\ACM@format@nr
3467     \relax % manuscript
3468         \global\@ACM@balancefalse
3469     \or % acmsmall
3470         \global\@ACM@balancefalse
3471     \or % acmlarge
3472         \global\@ACM@balancefalse
3473     \or % acmtog
3474         \RequirePackage{balance}%
3475     \or % sigconf
3476         \RequirePackage{balance}%
3477     \or % siggraph
3478         \RequirePackage{balance}%
3479     \or % sigplan
3480         \RequirePackage{balance}%
3481     \or % sigchi
3482         \RequirePackage{balance}%
3483     \or % sigchi-a
3484         \global\@ACM@balancefalse
3485     \or % acmengage
3486         \RequirePackage{balance}%
3487     \or % acmcp
3488         \global\@ACM@balancefalse
3489     \fi
3490 \fi
3491 }
3492 \AtEndDocument{%
3493     \if@ACM@balance
3494     \if@twocolumn
3495     \balance
3496     \fi\fi}

```

### 3.27 Acknowledgments

\acksname

```
3497 \newcommand\acksname{Acknowledgments}
```

`\acks` This is a comment-like structure

```
3498 \specialcomment{acks}{%
3499   \begingroup
3500   \section*{\acksname}
3501   \phantomsection\addcontentsline{toc}{section}{\acksname}
3502 }{%
3503   \endgroup
3504 }
```

`\grantsponsor` We just typeset the name of the sponsor

```
3505 \def\grantsponsor#1#2#3{#2}
```

`\grantnum`

```
3506 \newcommand\grantnum[3][]{#3%
3507   \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}
```

### 3.28 Conditional typesetting

We use the `comment` package for conditional typesetting:

```
3508 \AtEndPreamble{%
3509   \if@ACM@screen
3510     \includecomment{screenonly}
3511     \excludecomment{printonly}
3512   \else
3513     \excludecomment{screenonly}
3514     \includecomment{printonly}
3515   \fi
3516   \if@ACM@anonymous
3517     \excludecomment{anonsuppress}
3518     \excludecomment{acks}
3519   \else
3520     \includecomment{anonsuppress}
3521   \fi}
```

### 3.29 Additional bibliography commands

`\showeprint` The command `\showeprint` has two arguments: the (optional) prefix and the eprint number. Right now the only prefix we understand is the (lowercase) word ‘arxiv’.

```
3522 \newcommand\showeprint[2][arxiv]{%
3523   \def\@tempa{#1}%
3524   \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
3525   \def\@tempb{arxiv}%
3526   \ifx\@tempa\@tempb\relax
3527     arXiv:\href{https://arxiv.org/abs/#2}{#2}%
3528   \else
3529     \def\@tempb{arXiv}%
3530     \ifx\@tempa\@tempb\relax
3531       arXiv:\href{https://arxiv.org/abs/#2}{#2}%
3532     \else
3533       #1:#2%
3534     \fi
3535   \fi}
```

### 3.30 Index

`\theindex` Standard amsart uses plain page style in index pages. This clashes with line numbering for review option, so we redefine it.

```
3536 \def\theindex{\@restonecoltrue\if@twocolumn\@restonecolfalse\fi
3537 \columnseprule\z@ \columnsep 35\p@
3538 \@indextitlestyle
3539 \let\item\idxitem
3540 \parindent\z@ \parskip\z@\@plus.3\p@\relax
3541 \raggedright
3542 \hyphenpenalty\@M
3543 \footnotesize}
```

### 3.31 End of Class

`\vspace` We do not disable `\vspace`, but add warning to it

```
3544 \let\@vspace@orig=\@vspace
3545 \let\@vspacer@orig=\@vspacer
3546 \apptocmd{\@vspace}{\ClassWarning{\@classname}{\string\vspace\space should
3547 only be used to provide space above/below surrounding
3548 objects}}{}}
3549 \apptocmd{\@vspacer}{\ClassWarning{\@classname}{\string\vspace\space should
3550 only be used to provide space above/below surrounding
3551 objects}}{}}
3552 \let\@vspace@acm=\@vspace
3553 \let\@vspacer@acm=\@vspacer
```

`\ACM@origbaselinestretch` We produce an error if the user tries to change `\baselinestretch`

```
3554 \let\ACM@origbaselinestretch\baselinestretch
3555 \AtEndDocument{\ifx\baselinestretch\ACM@origbaselinestretch\else
3556 \ClassError{\@classname}{An attempt to redefine
3557 \string\baselinestretch\space detected. Please do not do this for
3558 ACM submissions!}\fi}

3559 \normalsize\normalfont\frenchspacing
3560 </class>
```

## References

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## Change History

1.48	General: Added prologue option to xcolor . . . . .	51	\ccsdesc@parse: Added warning for missing concepts . . . . .	79
	Bib code cleanup (Zack Weinberg)	36	\if@ACM@printacmref: Added warning for longer papers . . . . .	76
	Documentation update (siggraph)	36	\keywords: Added warning for missing keywords . . . . .	75
1.49	General: New journal: DTRAP . . . . .	36	1.69	\vspace: Added the changed command to avoid grouping . . . . .
1.53	General: New journals: PACMCGIT, TIOT, TDSCI . . . . .	36	1.70	General: Name change for TDS . . . . .
	Rearranged docs . . . . .	36	1.71	General: Bibliography change: volume for @inproceedings is now in brackets together with series . . . . .
1.54	General: Moved footnote stuff before hyperref call (Ross Moore) . . . . .	36		LuaTeX now uses the OTF versions of fonts . . . . .
1.56	General: Documented \Description	36		Retired sigchi and sigchi-a . . . . .
1.57	General: Booktabs package is now the default . . . . .	36	1.75	General: Documentation update . . . . .
1.58	General: Changes in samples (Enrico Gregorio) . . . . .	36	1.78	General: Documentation update: Word count . . . . .
	New journal: HEALTH. TDS is renamed to TDSCI . . . . .	36	1.79	General: Updated indormation for TAP, TCPS, TEAC . . . . .
1.60	General: New option: urlbreakonhyphens . . . . .	36	1.80	General: Added DLT and FAC . . . . .
	\if@ACM@urlbreakonhyphens: introduced macro . . . . .	37	1.82	General: Updated abbreviations and codes for several journals . . . . .
1.62	General: New journal: TELO . . . . .	36	1.84	General: New journals: JDS, GAMES . . . . .
1.63	General: New journal: FACMP . . . . .	36	1.85	General: Added CC licenses . . . . .
	New journal: TQUANT . . . . .	36		Added: acmengage . . . . .
1.63a	General: Move: TQUANT to TQC . . . . .	36		New journal: JRC . . . . .
1.64	General: Putting abstract after \maketitle now causes an error . . . . .	36		\@mkauthors: Added: acmengage . . . . .
1.65	General: New journal: DGOV . . . . .	36		\@mktitle: Added: acmengage . . . . .
1.66	General: ACM reference format is now mandatory for papers over one page; CCS concepts and keywords are now mandatory for papers over two pages . . . . .	36		\@parfont: Added: acmengage . . . . .
	Authors' addresses are mandatory for journal articles . . . . .	36		\@printtopmatter: Added: acmengage . . . . .
	\@mkauthorsaddresses: Added warning for missing addresses . . . . .	99		\@specialsection: Added: acmengage . . . . .
				\@subtitlefont: Added: acmengage . . . . .
				\@titlefont: Added: acmengage . . . . .
				\ACM@linecountR: Added: acmengage . . . . .
				format: New format: acmengage . . . . .
				\parskip: Added: acmengage . . . . .

1.87	General: New journals: ACMJCSS, JATS, TORS . . . . .	60	<a href="https://github.com/borisveytsman/acmart/issues/12">//github.com/borisveytsman/ acmart/issues/12</a> ) . . . . .	36
	format: New format: acmcp . . . . .	37	Documentation changes (closes <a href="https://github.com/borisveytsman/acmart/issues/13">https: //github.com/borisveytsman/ acmart/issues/13</a> ) . . . . .	36
1.88	General: Added ISSN for ACMJCSS . . . . .	60	v1.03	
	Added ISSN for GAMES . . . . .	60	General: Added anonsuppress environment . . . . .	36
	Added PACMNET . . . . .	60	Added authorversion option (closes <a href="https://github.com/borisveytsman/acmart/issues/9">https: //github.com/borisveytsman/ acmart/issues/9</a> ) . . . . .	36
1.89	General: Added PACMMOD . . . . .	60	<a href="https://github.com/borisveytsman/acmart/issues/9">https: //github.com/borisveytsman/ acmart/issues/9</a> ) . . . . .	36
	Added TOPML . . . . .	60	<a href="https://github.com/borisveytsman/acmart/issues/9">https: //github.com/borisveytsman/ acmart/issues/9</a> ) . . . . .	36
	<code>\@printtopmatter</code> : Moved badges to top header . . . . .	89	<code>\@formatdoi</code> : Added macro . . . . .	81
1.90	General: Added TOPML eISSN . . . . .	60	<code>\if@ACM@authorversion</code> : Added macro . . . . .	38
1.90a	General: Changes in the sample keywords and concepts . . . . .	36	<code>\maketitle</code> : Added special case of authorversion . . . . .	85
1.92	General: Documentation update: use of ‘anonymous’ throughout . . . . .	36	v1.04	
	Moved hyperxmp again due to kernel update . . . . .	49	General: Updated bibliography for siggraph . . . . .	36
2.04	General: Deleted loading ifdraft due to the new release of hyperxmp . . . . .	49	<code>\acmArticleSeq</code> : Name change by Matthew Fluet . . . . .	73
	Explicitly load ifdraft since hyperxmp tries to load it inside a group . . . . .	49	<code>\acmDOI</code> : Name change by Matthew Fluet . . . . .	74
2.05	General: New data for TELO . . . . .	60	<code>\acmISBN</code> : Name change by Matthew Fluet . . . . .	74
2.06	General: Added eISSN for a number of journals . . . . .	60	v1.05	
v1.00	General: First released version . . . . .	36	General: Added processing doi numbers for acmsiggraph and doi numbers for sigproc.bib . . . . .	36
v1.01	General: Changed hyperref colors in screen mode (closes <a href="https://github.com/borisveytsman/acmart/issues/1">https: //github.com/borisveytsman/ acmart/issues/1</a> ) . . . . .	36	Patched <code>\setcitestyle</code> command; closes <a href="https://github.com/borisveytsman/acmart/issues/19">https: //github.com/borisveytsman/ acmart/issues/19</a> ) . . . . .	36
	Defined ACM colors . . . . .	36	v1.06	
	Explicitly put draft option (closes <a href="https://github.com/borisveytsman/acmart/issues/4">https: //github.com/borisveytsman/ acmart/issues/4</a> ) . . . . .	39	<code>\@ACM@badge@skip</code> : Added macro . . . . .	74
	Set headheight to 1pc for all formats (closes <a href="https://github.com/borisveytsman/acmart/issues/5">https: //github.com/borisveytsman/ acmart/issues/5</a> ) . . . . .	36	<code>\@ACM@badge@width</code> : Added macro . . . . .	74
v1.02	General: Added TOPS and TSC (closes <a href="https://github.com/borisveytsman/acmart/issues/5">https: //github.com/borisveytsman/ acmart/issues/5</a> ) . . . . .	36	<code>\@ACM@title@width</code> : Added macro . . . . .	74
			<code>\@mktitle@i</code> : Added processing badges . . . . .	92
			Made generic . . . . .	92
			<code>\@mktitle@ii</code> : Now this macro is obsolete . . . . .	92
			<code>\@mktitle@iii</code> : Added processing badges . . . . .	92
			Made more generic . . . . .	92
			<code>\@mktitle@iv</code> : Made more generic . . . . .	92
			<code>\@printtopmatter</code> : Added processing badges . . . . .	89
			<code>\@subtitlefont</code> : Added macro . . . . .	91
			<code>\@titlefont</code> : Added macro . . . . .	91
			<code>\acmBadgeL</code> : Added macro . . . . .	75
			<code>\acmBadgeR</code> : Added macro . . . . .	74

	\if@ACM@badge: Added macro . . . . .	74	\@mpfootnotetext: Made minipage footnotes centered . . . . .	49
v1.07	\maketitle: Corrected a bug with abstract footnotes . . . . .	85	\bibliographystyle: Redefined macro . . . . .	50
	Corrected a bug with permssion and footnotes order . . . . .	85	\bibstyle@acmauthoryear: Added macro . . . . .	44
v1.08	General: SIGPLAN reformatting by Matthew Fluet . . . . .	36	\bibstyle@acmnumeric: Added macro . . . . .	44
	Typos corrected (Tobias Pape) . . . .	36	\if@ACM@printfolios: Added macro	76
v1.09	General: Revert SIGPLAN caption rules . . . . .	36	standardpagestyle: Added headers for sigs . . . . .	103
			Expanded headers for sigchi-a . . . .	103
v1.10	General: Changes of 'licensedothergov' wording . . . . .	79	Suppressed folios if sig . . . . .	103
	\maketitle: Corrected a bug with doi in manuscript and author vertesion, <a href="https://github.com/borisveytsman/acmart/issues/36">https: //github.com/borisveytsman/ acmart/issues/36</a> . . . . .	85	v1.14	General: \citestyle updates (Matthew Fluet) . . . . .
	standardpagestyle: Reversed folios location . . . . .	103		Patched \citestyle . . . . .
v1.11	General: Customization of ACM theorem styles and proof environment by Matthew Fluet . . . .	36	\bibstyle@acmauthoryear: Moved def of \bibstyle@acmauthoryear before use . . . . .	44
v1.12	General: Added graceful behavior when libertine fonts are absent . . . .	55	\bibstyle@acmnumeric: Moved def of \bibstyle@numeric before use . . . .	44
	Documentation updates . . . . .	36	v1.15	\@ACM@addtoaddress: Added macro
	\@marginfigure: Now centering by default . . . . .	58		\@mkauthors@iii: New authors system . . . . .
	\@marginfigure: Now centering by default . . . . .	58		\@shortauthors: Introduced macro . . . .
	\@parfont: Moved to \section@raggedright . . . . .	109		\@typeset@author@bx: Moved to separate macro . . . . .
	\copyrightpermissionfootnoterule: Added macro . . . . .	54		\acks: Added macro . . . . .
	\descriptionlabel: Redefined . . . . .	60		\affiliation: Added code for author groups . . . . .
	\footnoterule: Made shorter . . . . .	54		\author: Added code for author groups . . . . .
	\if@ACM@natbib@override: Added macro . . . . .	38		\city: Added macro . . . . .
	\if@ACM@newfonts: Added macro . . . .	55		\country: Added macro . . . . .
	\maketitle: Moved thankses to copyrightpermission box . . . . .	85		\department: Added macro . . . . .
	\section@raggedright: Introduced macro . . . . .	109		\grantnum: Added macro . . . . .
v1.13	General: Font adjustments for acmsmall . . . . .	94		\grantsponsor: Added macro . . . . .
	Increased font size for ACM Large	41		\if@insideauthorgroup: Introduced macro . . . . .
	Print bibliographic information by default for the proceedings . . . . .	76		\institution: Added macro . . . . .
				\num@authorgroups: Renamed . . . . .
				\orcid: Introduced macro . . . . .
				\position: Added macro . . . . .
				\postcode: Added macro . . . . .
				\state: Added macro . . . . .
				\streetaddress: Added macro . . . . .
				standardpagestyle: Better handling of anonymous mode . . . . .
			v1.16	General: Formatting header/footer (Matthew Fluet) . . . . .
				\@headfootfont: Added macro . . . . .



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General: Slightly decreased margins	v1.23	General: Add PACMPL journal option 36
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\@makefnmark: Redefined . . . . . 49	v1.24	General: Add IMWUT journal option 60
\@mkauthors: TOG now uses the same	v1.25	General: Updated PACMPL . . . . . 60
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Changed format for sigs . . . . . 100		to Stephen Spencer) . . . . . 36
\acmArticle: The default is now	v1.27	\if@ACM@printccs: Typo corrected . 76
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\acmMonth: The default must be	v1.28	General: Corrected option natbib
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\acmNumber: The default is now		Got rid of warnings in pdf keywords 49
numerical . . . . . 73		\ccsdesc@parse: Change from \to to
\acmVolume: The default is now		\texttrightarrow (Matteo
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\acmYear: The default is now	v1.29	
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\grantnum: Added url . . . . . 115		indentation (John Wickerson) . . 100
\grantsponsor: Renamed . . . . . 115		\ccsdesc@parse: Add spacing after
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standardpagestyle: Added paper		bold/italic (John Wickerson) . . . . 78
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General: Natbib is now the default for	v1.30	
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\@mkauthors@i: Now we andify		Bibtex style now recognizes https://
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\@typeset@author@line: Added		Switched to T1: looks like libertine
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General: Include 'Abstract',		\department: Added optional
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\acks: Include 'Acknowledgements' in		\tochangmeasure . . . . . 46
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v1.33		<code>standardpagestyle</code> : Added right linecount for two-column formats	103
General: Added acmart-preload-hook . . . . .	36	Added timestamp (Michael D. Adams) . . . . .	103
Added cmap and glyphtounicode . . . . .	55	v1.34	
BibTeX comma before articleno bug corrected . . . . .	36	<code>\@mkbibcitation</code> : Deleted DOI from doi numbers . . . . .	100
BibTeX crossref bug corrected . . . . .	36	<code>\ACM@linecount@bx</code> : Rulers now are continuous . . . . .	102
BibTeX numpages bug corrected . . . . .	36	<code>\ACM@linecountL</code> : Rulers now are continuous . . . . .	102
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<code>\@mkauthors@i</code> : Added obeypunctuation code . . . . .	96	The <code>\terms</code> command is now obsolete . . . . .	85
<code>\@mkauthors@iii</code> : Added obeypunctuation code . . . . .	97	<code>\terms</code> : The <code>\terms</code> command now just produces a warning . . . . .	75
<code>\@mkauthors@iv</code> : Added obeypunctuation code . . . . .	98	v1.35	
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