

# 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  $\text{\TeX}$  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  $\text{\LaTeX}$  package.

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

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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  $\text{\TeX}$  Users Group. The world-wide  $\text{\TeX}$  Users Group is at <https://tug.org/>; please consider joining us if you use  $\text{\TeX}$  regularly.

### 2.1 Installation

Most probably, you already have this package installed in your favorite  $\text{\TeX}$  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  $\text{\TeX}$  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` and `ACM-Reference-Format.bst` in places where  $\text{\TeX}$  can find them (see [1] or the documentation for your  $\text{\TeX}$  system).
3. Update the database of file names. Again, see [1] or the documentation for your  $\text{\TeX}$  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  $\text{\TeX}$  distributions ( $\text{\TeX}$ Live, Mac $\text{\TeX}$ , Mik $\text{\TeX}$ ) 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>
- *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>

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 CIE, CSUR, DLT, FAC, JACM, JDIQ, JEA, JERIC, JETC, PACMCGIT, PACMHCI, PACMPL, TAAS, TACCESS, TACO, TALG, TALLIP (formerly TALIP), TCPS, TDS, TEAC, TECS, TELO, THRI, TIIS, TIOT, TISSEC, TIST, TKDD, TMIS, TOCE, TOCHI, TOCL, TOCS, TOCT, TODAES, TODS, TOIS, TOIT, TOMACS, TOMM (formerly TOMCCAP), TOMPECS, TOMS, TOPC, TOPLAS, TOPS, TOS, TOSEM, TOSN, TQC, TRETS, TSAS, TSC, TSLP and TWEB, including special issues.
acmlarge	Large single-column format. Used for DTRAP, HEALTH, IMWUT, JOCCH, POMACS 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 exceptions listed below) and all ICPS volumes.
sigplan	Proceedings format for SIGPLAN conferences.

## 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 and transactions, while formats starting with `sig` are intended for proceedings published as books.

Note that sometimes conference proceedings are published as a special issue (or issues) of an ACM journal. In this case, you should use the journal format for a conference paper. Please contact your conference committee if in doubt.

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 2.18).

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 2.11.

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.

## 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].

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 2.11)
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 or permission statements
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 2.7
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



`\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.

`\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 enter them in this order:

`\orcid`

`\affiliation`

`\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.

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}
  \streetaddress{1 Th{\o}rv{\a}ld Circle}
  \city{Hekla}
  \country{Iceland}}
\affiliation{%
  \institution{Institute for Clarity in Documentation}
  \streetaddress{P.O. Box 1212}
  \city{Dublin}
  \state{Ohio}
  \postcode{43017-6221}}

```

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 to interact with the metadata extraction tools. Inside these commands you should use the `\position`, `\institution`, `\department`, `\city`, `\streetaddress`, `\state`, `\postcode` 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.

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}
\streetaddress{Samuels Building (F25), Kensington Campus}
\city{Sidney}
\state{NSW}
\postcode{2052}
\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 insitution. 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}}

```

The command `\affiliation` formats its output according to American conventions. This might be wrong for some cases. Consider, for example, a German address. In Ger-

many, the postcode is put before the city and is not separated by a comma. We can handle this order using

```
\affiliation{%
  \institution{Fluginstitut}
  \streetaddress{Sonnenallee 17}
  \postcode{123456}
  \city{Helm}
  \country{Germany}}
```

However, the comma after the postcode is unfortunate: the address will be typeset (in some formats) as

```
Fluginstitut
Sonnenallee 17
123456, Helm, Germany
```

To overcome this problem, the command `\affiliation` has an optional parameter `obeypunctuation`, which can be `false` (the default) or `true`. If this parameter is `true`, `\affiliation` obeys the author's command. Thus

```
\affiliation[obeypunctuation=true]{%
  \institution{Fluginstitut}\\
  \streetaddress{Sonnenallee 17}\\
  \postcode{123456}
  \city{Helm},
  \country{Germany}}
```

will be typeset as

```
Fluginstitut
Sonnenallee 17
123456 Helm, Germany
```

Note that you should *not* use this option for journals.

It is expected that these commands are inserted by the author of the manuscript.

`\thanks` Like `amsart` (and unlike standard  $\text{\LaTeX}$ ), 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 2.10).

`\authorsaddresses` In some formats, addresses are printed as a footnote on the first page. By default  $\text{\LaTeX}$  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 numerical. For example,

```
\acmYear
\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*. It is used to vertically position the black blob on the first page of some formats. 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
```

	Setting this number to zero suppresses the blob.
<code>\acmSubmissionID</code>	<p>If your paper got a Submission ID from the Conference Management System, put it here:</p> <pre>\acmSubmissionID{123-A56-BU3}</pre>
<code>\acmPrice</code>	<p>The macro <code>\acmPrice{&lt;price&gt;}</code> sets the price for the article, for example,</p> <pre>\acmPrice{25.00}</pre> <p>Note that you do not need to put the dollar sign here, just the amount. By default the price is \$15.00, unless the copyright is set to <code>usgov</code>, <code>rightsretained</code>, <code>iw3c2w3</code>, or <code>iw3c2w3g</code>, when it is suppressed. Note that to override the defaults you need to set the price <i>after</i> the <code>\setcopyright</code> command. Also, the command <code>\acmPrice{}</code> suppresses the printing of the price.</p>
<code>\acmISBN</code>	<p>Book-like volumes have ISBN numbers attached to them. The macro <code>\acmISBN{&lt;ISBN&gt;}</code> sets it. Normally it is set by the typesetter, for example,</p> <pre>\acmISBN{978-1-4503-3916-2}</pre> <p>Setting it to the empty string, as <code>\acmISBN{}</code>, suppresses printing the ISBN.</p>
<code>\acmDOI</code>	<p>The macro <code>\acmDOI{&lt;DOI&gt;}</code> sets the DOI of the article, for example,</p> <pre>\acmDOI{10.1145/9999997.9999999}</pre> <p>It is normally set by the typesetter. Setting it to the empty string, as <code>\acmDOI{}</code>, suppresses the DOI.</p>
<code>\acmBadgeR</code> <code>\acmBadgeL</code>	<p>Some conference articles get special distinctions, for example, the artifact evaluation for PPOPP 2016 (see <a href="http://ctuning.org/ae/ppopp2016.html">http://ctuning.org/ae/ppopp2016.html</a>). These articles display special badges supplied by the conference organizers. This class provides commands to add these badges: <code>\acmBadgeR[&lt;url&gt;]{&lt;graphics&gt;}</code> and <code>\acmBadgeL[&lt;url&gt;]{&lt;graphics&gt;}</code>. The first command puts the badge to the right of the title, and the second one—to the left. The arguments have the following meaning: <code>[&lt;url&gt;]</code>, if provided, sets the link to the badge authority in the screen version, while <code>{&lt;graphics&gt;}</code> 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 <code>ae-logo.pdf</code>, the command is</p> <pre>\acmBadgeR[http://ctuning.org/ae/ppopp2016.html]{ae-logo}</pre>
<code>\startPage</code>	<p>The macro <code>\startPage{&lt;page&gt;}</code> sets the first page of the article in a journal or book. It is used by the typesetter.</p>
<code>\terms</code> <code>\keywords</code>	<p>The command <code>\keywords{&lt;keyword, keyword,...&gt;}</code> sets keywords for the article. They must be separated by commas, for example,</p> <pre>\keywords{wireless sensor networks, media access control, multi-channel, radio interference, time synchronization}</pre>

CCSXML      ACM publications are classified according to the ACM Computing Classification  
\ccsdesc    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  
 $\backslash$ 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 transfer the rights to the ACM, license them to the ACM, some or all  
authors might be employees of the US or Canadian governments, etc. Accordingly the  
command  $\backslash$ setcopyright{...} is introduced. Its argument is the copyright status of  
the paper, for example,  $\backslash$ setcopyright{acmcopyright}. The possible values for this  
command are listed in Table 3. This command must be placed in the preamble, before  
 $\backslash$ begin{document}.

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  $\backslash$ acmYear, but you can override this using the macro  $\backslash$ copyrightyear, e.g.,



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>acmcopyright</code>	The authors transfer the copyright to the ACM (the “traditional” choice).
<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.

```
\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  $\text{\TeX}$  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` The environment `abstract` must *precede* the `\maketitle` command. Again, this is different from the standard  $\text{\LaTeX}$ . Putting `abstract` after `\maketitle` will trigger an error.

`teaserfigure` 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}
```

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

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

`\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 Algorithms

There are now several good packages for typesetting algorithms [3, 4, 5], and the authors are free to choose their favorite one.

## 2.5 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` [6] 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
sourcenote. This is a table sourcenote. This is a table
sourcenote.

\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`.

## 2.6 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  $0.5\text{~V}$  with most
    measurements between  $0.2\text{~V}$  and  $0.8\text{~V}$ }
  \caption{Histogram of the measurements of voltage}
  \label{fig:voltage}
\end{figure}

```

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

## 2.7 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}}

```

## 2.8 Online-only and offline-only material

`printonly` Some supplementary material in ACM publications is put online but not in the printed  
`screenonly` 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.

## 2.9 Note about anonymous mode

`anonsuppress` When the option `anonymous` is selected,  $\TeX$  suppresses author information (including the number of authors) for a blind 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}.
```

## 2.10 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` 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}

## 2.11 Bibliography

The ACM uses the natbib package for formatting references and the BibTeX style file ACM-Reference-Format.bst for BibTeX 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 BibTeX 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 BibTeX 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*.

## 2.12 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 [7]: 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.

## 2.13 Other notable packages and typographic remarks

Several other packages are recommended for specialized tasks.

The package `subcaption` [8] is recommended for complex figures with several subplots or subfigures that require separate subcaptioning. The packages `nomencl` [9] and `glossaries` [10] 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 [11], so the command `\NoCaseChange` inside the title may help to prevent extraneous uppercasing.

## 2.14 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.

## 2.15 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 type-setting of ACM papers.

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

## 2.16 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`, for example,

```
\AtBeginMaketitle{\acmPrice{125.00}}
```

## 2.17 Currently supported publications

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

Abbreviation	Publication
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
HEALTH	ACM Transactions on Computing for Healthcare
IMWUT	PACM on Interactive, Mobile, Wearable and Ubiquitous Technologies
JACM	Journal of the ACM
JDIQ	ACM Journal of Data and Information Quality
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
PACMCGIT	Proceedings of the ACM on Computer Graphics and Interactive Techniques
PACMHCI	PACM on Human-Computer Interaction
PACMPL	PACM on Programming Languages
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
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
TIST	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

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

Abbreviation	Publication
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
TOPS	ACM Transactions on Privacy and Security
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.

## 2.18 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  
marginfigure  
margintable

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 [2022/02/05 v1.82 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}[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 \ExecuteOptionsX{format}

```

\if@ACM@screen Whether we use screen mode

```

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

```

\if@ACM@urlbreakonhyphens

```

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

```

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

```

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

```

\if@ACM@review Whether we use review mode

```

73 \define@boolkey+{acmart.cls}[@ACM@]{review}[true]{%
74 \if@ACM@review
75 \PackageInfo{\@classname}{Using review mode}%

```

```

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

\if@ACM@authorversion Whether we use author's-version mode
82 \define@boolkey+{acmart.cls}{@ACM@}{authorversion}[true]{%
83   \if@ACM@authorversion
84     \PackageInfo{\@classname}{Using authorversion mode}%
85   \else
86     \PackageInfo{\@classname}{Not using authorversion mode}%
87   \fi}{\PackageError{\@classname}{The option authorversion can be either true or
88     false}}
89 \ExecuteOptionsX{authorversion=false}

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

\if@ACM@balance Whether to balance the last page
102 \define@boolkey+{acmart.cls}{@ACM@}{balance}[true]{}%
103 \PackageError{\@classname}{The option balance can be either true or
104   false}}
105 \ExecuteOptionsX{balance}

\if@ACM@pbalance Whether to balance the last page
106 \define@boolkey+{acmart.cls}{@ACM@}{pbalance}[true]{}%
107 \PackageError{\@classname}{The option pbalance can be either true or
108   false}}
109 \ExecuteOptionsX{pbalance=false}

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

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

```

```

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

```

```

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

```

```

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

```

```

\ACM@fontsize The font size to pass to the base class
144 \def\ACM@fontsize{}
145 \DeclareOptionX{9pt}{\edef\ACM@fontsize{\CurrentOption}}
146 \DeclareOptionX{10pt}{\edef\ACM@fontsize{\CurrentOption}}
147 \DeclareOptionX{11pt}{\edef\ACM@fontsize{\CurrentOption}}
148 \DeclareOptionX{12pt}{\edef\ACM@fontsize{\CurrentOption}}

149 \DeclareOptionX{draft}{\PassOptionsToClass{\CurrentOption}{amsart}}
150 \DeclareOptionX{*}{\PassOptionsToClass{\CurrentOption}{amsart}}
151 \ProcessOptionsX
152 \ClassInfo{\@classname}{Using format \ACM@format, number \ACM@format@nr}

```

### 3.4 Setting switches

```

\if@ACM@manuscript Whether we use manuscript mode
153 \newif\if@ACM@manuscript

```

```

\if@ACM@journal There are two kinds of publications: journals and books
154 \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.

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

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

```
156 \newif\if@ACM@sigchiamode
```

#### Setting up switches

```
157 \ifnum\ACM@format@nr=5\relax % siggraph
158 \ClassWarning{\@classname}{%
159   The format siggraph is now obsolete.\MessageBreak
160   I am switching to sigconf.}
161 \setkeys{acmart.cls}{format=sigconf}
162 \fi
163 \ifnum\ACM@format@nr=7\relax % sigchi
164 \ClassWarning{\@classname}{%
165   The format sigchi is now obsolete.\MessageBreak
166   I am switching to sigconf.}
167 \setkeys{acmart.cls}{format=sigconf}
168 \fi
169 \ifnum\ACM@format@nr=8\relax % sigchi
170 \ClassWarning{\@classname}{%
171   ACM SIGCHI has retired the SIGCHI-A template\MessageBreak
172   effective immediately. ACM is keeping this template\MessageBreak
173   option available to authors who are working on legacy\MessageBreak
174   documents only. ACM will not, under any circumstances,\MessageBreak
175   accept documents in this format for publication and\MessageBreak
176   will not offer technical support to the authors who use\MessageBreak
177   this template.\MessageBreak
178   ACM SIGCHI is directing Conference leaders and\MessageBreak
179   authors to publish their articles using the SIGCONF\MessageBreak
180   template call.}
181 \fi
182 \ifnum\ACM@format@nr=0\relax
183 \if@ACM@manuscripttrue
184 \else
185 \if@ACM@manuscriptfalse
186 \fi
187 \if@ACM@sigchiamodefalse
188 \ifcase\ACM@format@nr
189 \relax % manuscript
190 \if@ACM@journaltrue
191 \or % acmsmall
192 \if@ACM@journaltrue
193 \or % acmlarge
194 \if@ACM@journaltrue
195 \or % acmtog
196 \if@ACM@journaltrue
197 \or % sigconf
198 \if@ACM@journalfalse
199 \or % siggraph
200 \if@ACM@journalfalse
201 \or % sigplan
```

```

202 \ACM@journalfalse
203 \or % sigchi
204 \ACM@journalfalse
205 \or % sigchi-a
206 \ACM@journalfalse
207 \ACM@sigchiamodetrue
208 \fi
209 \if@ACM@journal
210 \ACM@journal@bibstriptrue
211 \else
212 \ACM@journal@bibstripfalse
213 \fi

```

### 3.5 Loading the base class and package

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

```

214 \ifx\ACM@fontsize\empty
215 \ifcase\ACM@format@nr
216 \relax % manuscript
217 \def\ACM@fontsize{9pt}%
218 \or % acmsmall
219 \def\ACM@fontsize{10pt}%
220 \or % acmlarge
221 \def\ACM@fontsize{10pt}%
222 \or % acmtog
223 \def\ACM@fontsize{9pt}%
224 \or % sigconf
225 \def\ACM@fontsize{9pt}%
226 \or % siggraph
227 \def\ACM@fontsize{9pt}%
228 \or % sigplan
229 \def\ACM@fontsize{10pt}%
230 \or % sigchi
231 \def\ACM@fontsize{9pt}%
232 \or % sigchi-a
233 \def\ACM@fontsize{10pt}%
234 \fi
235 \fi
236 \ClassInfo{\@classname}{Using fontsize \ACM@fontsize}
237 \LoadClass[\ACM@fontsize, reqno]{amsart}
238 \RequirePackage{microtype}

```

We need etoolbox for delayed code

```
239 \RequirePackage{etoolbox}
```

Booktabs is now the default

```
240 \RequirePackage{booktabs}
```

We need totpages to calculate the number of pages and refcount to use that number

```

241 \RequirePackage{refcount}
242 \RequirePackage{totpages}

```

The \collect@body macro in amsmath is defined using \def. We load environ to access the \long version of this command

```

243 \RequirePackage{environ}

    We use setspace for double spacing
244 \if@ACM@manuscript
245 \RequirePackage{setspace}
246 \onehalfspacing
247 \fi

    We need textcase for better upcasing
248 \RequirePackage{textcase}

```

### 3.6 Citations

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

```

249 \if@ACM@natbib
250   \RequirePackage{natbib}
251   \renewcommand{\bibsection}{%
252     \section*{\refname}%
253     \phantomsection\addcontentsline{toc}{section}{\refname}%
254   }
255   \renewcommand{\bibfont}{\bibliofont}
256   \renewcommand{\setcitestyle}[1]{
257     \@for\@tempa:=#1\do
258     {\def\@tempb{round}\ifx\@tempa\@tempb
259       \renewcommand\NAT@open{()\renewcommand\NAT@close{}}\fi
260       \def\@tempb{square}\ifx\@tempa\@tempb
261         \renewcommand\NAT@open{[]\renewcommand\NAT@close{[]}\fi
262       \def\@tempb{angle}\ifx\@tempa\@tempb
263         \renewcommand\NAT@open{$<$}\renewcommand\NAT@close{$>$}\fi
264       \def\@tempb{curly}\ifx\@tempa\@tempb
265         \renewcommand\NAT@open{\{}\renewcommand\NAT@close{\}}\fi
266       \def\@tempb{semicolon}\ifx\@tempa\@tempb
267         \renewcommand\NAT@sep{;}\fi
268       \def\@tempb{colon}\ifx\@tempa\@tempb
269         \renewcommand\NAT@sep{;}\fi
270       \def\@tempb{comma}\ifx\@tempa\@tempb
271         \renewcommand\NAT@sep{,}\fi
272       \def\@tempb{authoryear}\ifx\@tempa\@tempb
273         \NAT@numbersfalse\fi
274       \def\@tempb{numbers}\ifx\@tempa\@tempb
275         \NAT@numberstrue\NAT@superfalse\fi
276       \def\@tempb{super}\ifx\@tempa\@tempb
277         \NAT@numberstrue\NAT@supertrue\fi
278       \def\@tempb{nobibstyle}\ifx\@tempa\@tempb
279         \let\bibstyle=\@gobble\fi
280       \def\@tempb{bibstyle}\ifx\@tempa\@tempb
281         \let\bibstyle=\@citestyle\fi
282       \def\@tempb{sort}\ifx\@tempa\@tempb
283         \def\NAT@sort{\@ne}\fi
284       \def\@tempb{nosort}\ifx\@tempa\@tempb
285         \def\NAT@sort{\z@}\fi
286       \def\@tempb{compress}\ifx\@tempa\@tempb
287         \def\NAT@cmprs{\@ne}\fi

```

```

288 \def\@tempb{nocompress}\ifx\@tempa\@tempb
289 \def\NAT@cmprs{\z@}\fi
290 \def\@tempb{sort&compress}\ifx\@tempa\@tempb
291 \def\NAT@sort{\@ne}\def\NAT@cmprs{\@ne}\fi
292 \def\@tempb{mcite}\ifx\@tempa\@tempb
293 \let\NAT@merge\@ne\fi
294 \def\@tempb{merge}\ifx\@tempa\@tempb
295 \@ifnum{\NAT@merge<\tw@}\let\NAT@merge\tw@}\fi
296 \def\@tempb{elide}\ifx\@tempa\@tempb
297 \@ifnum{\NAT@merge<\thr@}\let\NAT@merge\thr@}\fi
298 \def\@tempb{longnamesfirst}\ifx\@tempa\@tempb
299 \NAT@longnamestrue\fi
300 \def\@tempb{nonamebreak}\ifx\@tempa\@tempb
301 \def\NAT@nmfmt#1{\mbox{\NAT@up#1}}\fi
302 \expandafter\NAT@find@eq\@tempa=\relax\@nil
303 \if\@tempc\relax\else
304 \expandafter\NAT@rem@eq\@tempc
305 \def\@tempb{open}\ifx\@tempa\@tempb
306 \xdef\NAT@open{\@tempc}\fi
307 \def\@tempb{close}\ifx\@tempa\@tempb
308 \xdef\NAT@close{\@tempc}\fi
309 \def\@tempb{aysep}\ifx\@tempa\@tempb
310 \xdef\NAT@aysep{\@tempc}\fi
311 \def\@tempb{yysep}\ifx\@tempa\@tempb
312 \xdef\NAT@yrsep{\@tempc}\fi
313 \def\@tempb{notesep}\ifx\@tempa\@tempb
314 \xdef\NAT@cmt{\@tempc}\fi
315 \def\@tempb{citesep}\ifx\@tempa\@tempb
316 \xdef\NAT@sep{\@tempc}\fi
317 \fi
318 }%
319 \NAT@setcites
320 }
321 \renewcommand\citestyle[1]{%
322 \ifcsname bibstyle@#1\endcsname%
323 \csname bibstyle@#1\endcsname\let\bibstyle\@gobble%
324 \else%
325 \@latex@error{Undefined ‘#1’ citestyle}%
326 \fi
327 }%
328 \fi

```

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

```

329 \newcommand{\bibstyle@acmauthoryear}{%
330 \setcitestyle{%
331 authoryear,%
332 open={[]},close={[]},citesep={;},%
333 aysep={},yysep={},,%
334 notesep={, }}

```

`\bibstyle@acmnumeric` The default numeric format:

```

335 \newcommand{\bibstyle@acmnumeric}{%
336 \setcitestyle{%
337 numbers,sort&compress,%

```

```

338   open={[,close={}],citesep={,},%
339   notesep={, }}

```

The default is numeric:

```

340 \if@ACM@natbib
341 \citestyle{acmnumeric}
342 \fi

```

`\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:

```

343 \def\startsection#1#2#3#4#5#6{%
344   \if@noskipsec \leavevmode \fi
345   \par
346   \@tempskipa #4\relax
347   \@afterindenttrue
348   \ifdim \@tempskipa <\z@
349     \@tempskipa -\@tempskipa \@afterindentfalse
350   \fi
351   \if@nobreak
352     \everypar{}%
353   \else
354     \addpenalty\@secpenalty\addvspace\@tempskipa
355   \fi
356   \ifstar
357     {\@ssect{#3}{#4}{#5}{#6}}%
358     {\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}
359 \def\@sect#1#2#3#4#5#6[#7]#8{%
360   \edef\@toclevel{\ifnum#2=\@m 0\else\number#2\fi}%
361   \ifnum #2>\c@secnumdepth
362     \let\@svsec\@empty
363   \else
364     \refstepcounter{#1}%
365     \protected@edef\@svsec{\@secntformat{#1}\relax}%
366   \fi
367   \@tempskipa #5\relax
368   \ifdim \@tempskipa>\z@
369     \begingroup
370       #6{%
371         \@hangfrom{\hskip #3\relax\@svsec}%
372         \interlinepenalty \@M #8\@par}%
373     \endgroup
374     \csname #1mark\endcsname{#7}%
375     \ifnum #2>\c@secnumdepth \else
376       \@tochangmeasure{\csname the#1\endcsname}%
377     \fi
378     \addcontentsline{toc}{#1}{%
379       \ifnum #2>\c@secnumdepth \else
380         \protect\numberline{\csname the#1\endcsname}%
381       \fi
382       #7}%
383   \else
384     \def\@svsechd{%
385       #6{\hskip #3\relax

```



```

386 \svsec #8}%
387 \csname #1mark\endcsname{#7}%
388 \ifnum #2>\c@secnumdepth \else
389 \tochangmeasure{\csname the#1\endcsname\space}%
390 \fi
391 \addcontentsline{toc}{#1}{%
392 \ifnum #2>\c@secnumdepth \else
393 \protect\numberline{\csname the#1\endcsname}%
394 \fi
395 #7}}%
396 \fi
397 \xsect{#5}}
398 \def\xsect#1{%
399 \@tempskipa #1\relax
400 \ifdim \@tempskipa>\z@
401 \par \nobreak
402 \vskip \@tempskipa
403 \afterheading
404 \else
405 \@nobreakfalse
406 \global\@noskipsectrue
407 \everypar{%
408 \if@noskipsec
409 \global\@noskipsecfalse
410 {\setbox\z@\lastbox}%
411 \clubpenalty\@M
412 \begingroup \svsechd \endgroup
413 \unskip
414 \@tempskipa #1\relax
415 \hskip -\@tempskipa
416 \else
417 \clubpenalty \@clubpenalty
418 \everypar{}}%
419 \fi}%
420 \fi
421 \ignorespaces}
422 \def\@seccntformat#1{\csname the#1\endcsname\quad}
423 \def\@ssect#1#2#3#4#5{%
424 \@tempskipa #3\relax
425 \ifdim \@tempskipa>\z@
426 \begingroup
427 #4{%
428 \@hangfrom{\hskip #1}%
429 \interlinepenalty \@M #5\@par}%
430 \endgroup
431 \else
432 \def\svsechd{#4{\hskip #1\relax #5}}%
433 \fi
434 \xsect{#3}}

```

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

```

435 \def\starttoc#1#2{\begingroup\makeatletter
436 \setTrue{#1}%

```

```

437 \par\removelastskip\vskip\z@skip
438 \@startsection{section}\@M\z@{\linespacing\@plus\linespacing}%
439   {.5\linespacing}{\centering\contentsnamefont}{#2}%
440 \@input{\jobname.#1}%
441 \if@files
442   \exp\newwrite\csname tf@#1\endcsname
443   \immediate\exp\openout\csname tf@#1\endcsname \jobname.#1\relax
444 \fi
445 \global\@nobeckfalse \endgroup
446 \addvspace{32\p@\@plus14\p@}%
447 }

\l@section Section spacing is more generous than for amsart
448 \def\l@section{\@tocline{1}{0pt}{1pc}{2pc}{}}

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

\l@subsubsection The spacing in amsart is too large
450 \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
451 \def\@makefnmark{\noindent\@makefnmark}

\@footnotetext In sigchi-a mode our footnotes are in the margin!
452 \if@ACM@sigchiamode
453 \long\def\@footnotetext#1{\marginpar{%
454   \reset@font\small
455   \interlinepenalty\interfootnotelinepenalty
456   \protected@edef\@currentlabel{%
457     \csname p@footnote\endcsname\@thefnmark
458   }%
459   \color@begingroup
460     \@makefnmark{%
461       \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
462   \color@endgroup}}%
463 \fi

\@mpfootnotetext We want the footnotes in minipages centered:
464 \long\def\@mpfootnotetext#1{%
465   \global\setbox\@mpfootins\vbox{%
466     \unvbox\@mpfootins
467     \reset@font\footnotesize
468     \hsize\columnwidth
469     \@parboxrestore
470     \protected@edef\@currentlabel
471       {\csname p@mpfootnote\endcsname\@thefnmark}%
472     \color@begingroup\centering
473       \@makefnmark{%
474         \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
475     \color@endgroup}}

```

`\@makefnmark` AMS classes use a buggy definition of `\makefnmark`. We revert to the standard one.

```
476 \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}
```

Adding hyperxmp

```
477 \RequirePackage{hyperxmp}
```

And now, hyperref

```
478 \let\@footnotemark@nolink\@footnotemark
```

```
479 \let\@footnotetext@nolink\@footnotetext
```

```
480 \RequirePackage[bookmarksnumbered,unicode]{hyperref}
```

```
481 \pdfstringdefDisableCommands{%
```

```
482   \def\addtocounter#1#2{%
```

```
483     \def\unskip{ }%
```

```
484     \def\textbullet{- }%
```

```
485     \def\textrightarrow{-> }%
```

```
486     \def\footnotemark{ }%
```

```
487 }
```

```
488 \urlstyle{rm}
```

```
489 \ifcase\ACM@format@nr
```

```
490 \relax % manuscript
```

```
491 \or % acmsmall
```

```
492 \or % acmlarge
```

```
493 \or % acmtog
```

```
494 \or % sigconf
```

```
495 \or % siggraph
```

```
496 \or % sigplan
```

```
497   \urlstyle{sf}
```

```
498 \or % sigchi
```

```
499 \or % sigchi-a
```

```
500   \urlstyle{sf}
```

```
501 \fi
```

```
502 \AtEndPreamble{%
```

```
503   \if@ACM@urlbreakonhyphens
```

```
504     \def\do@url@hyp{\do{-}}%
```

```
505   \fi
```

```
506   \if@ACM@screen
```

```
507     \hypersetup{colorlinks,
```

```
508       linkcolor=ACMPurple,
```

```
509       citecolor=ACMPurple,
```

```
510       urlcolor=ACMDarkBlue,
```

```
511       filecolor=ACMDarkBlue}
```

```
512   \else
```

```
513     \hypersetup{hidelinks}
```

```
514   \fi
```

```
515   \hypersetup{pdflang={en},
```

```
516     pdfdisplaydoctitle}}
```

Bibliography mangling.

```
517 \if@ACM@natbib
```

```
518   \let\citeN\cite
```

```
519   \let\cite\citep
```

```
520   \let\citeANP\citeauthor
```

```
521   \let\citeNN\citeyearpar
```

```
522   \let\citeyearNP\citeyear
```

```
523   \let\citeNP\citealt
```

```

524 \DeclareRobustCommand\citeA
525   {\begingroup\NAT@swafalse
526     \let\NAT@ctype\@ne\NAT@partrue\NAT@fullfalse\NAT@open\NAT@citetp}%
527   \providecommand\newblock{}%
528 \else
529   \AtBeginDocument{%
530     \let\shortcite\cite%
531     \providecommand\citename[1]{#1}}
532 \fi
533 \newcommand\shortcite[2][]{%
534   \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  $\text{\LaTeX}$  definition:

```

535 \def\bibliographystyle#1{%
536   \ifx\@begindocumenthook\@undefined\else
537     \expandafter\AtBeginDocument
538   \fi
539   {\if@filesw
540     \immediate\write\@auxout{\string\bibstyle{#1}}%
541   \fi}}

```

Graphics and color.

```

542 \RequirePackage{graphicx}
543 \RequirePackage[prologue]{xcolor}

```

We define ACM colors according to [7]:

```

544 \definecolor[named]{ACMBlue}{cmyk}{1,0.1,0,0.1}
545 \definecolor[named]{ACMYellow}{cmyk}{0,0.16,1,0}
546 \definecolor[named]{ACMOrange}{cmyk}{0,0.42,1,0.01}
547 \definecolor[named]{ACMRed}{cmyk}{0,0.90,0.86,0}
548 \definecolor[named]{ACMLightBlue}{cmyk}{0.49,0.01,0,0}
549 \definecolor[named]{ACMGreen}{cmyk}{0.20,0,1,0.19}
550 \definecolor[named]{ACMPurple}{cmyk}{0.55,1,0,0.15}
551 \definecolor[named]{ACMDarkBlue}{cmyk}{1,0.58,0,0.21}

```

Author-draft mode or sigchi-a mode

```

552 \if@ACM@authordraft
553   \RequirePackage{draftwatermark}
554   \SetWatermarkFontSize{0.5in}
555   \SetWatermarkColor[gray]{.9}
556   \SetWatermarkText{\parbox{12em}{\centering
557     Unpublished working draft.\
558     Not for distribution.}}
559 \else
560   \if@ACM@sigchiamode
561     \if@ACM@nonacm\else
562       \RequirePackage{draftwatermark}
563       \SetWatermarkFontSize{0.5in}
564       \SetWatermarkColor[gray]{.9}
565       \SetWatermarkText{\parbox{12em}{\centering
566         Legacy document. \
567         Not for publication in an ACM venue}}
568     \fi
569   \fi

```

570 \fi

### 3.7 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>.

```
571 \RequirePackage{geometry}
572 \ifcase\ACM@format@nr
573 \relax % manuscript
574   \geometry{letterpaper,head=13pt,
575     marginparwidth=6pc,heightrounded}%
576 \or % acmsmall
577   \geometry{twoside=true,
578     includeheadfoot, head=13pt, foot=2pc,
579     paperwidth=6.75in, paperheight=10in,
580     top=58pt, bottom=44pt, inner=46pt, outer=46pt,
581     marginparwidth=2pc,heightrounded
582   }%
583 \or % acmlarge
584   \geometry{twoside=true, head=13pt, foot=2pc,
585     paperwidth=8.5in, paperheight=11in,
586     includeheadfoot,
587     top=78pt, bottom=114pt, inner=81pt, outer=81pt,
588     marginparwidth=4pc,heightrounded
589   }%
590 \or % acmtog
591   \geometry{twoside=true, head=13pt, foot=2pc,
592     paperwidth=8.5in, paperheight=11in,
593     includeheadfoot, columnsep=24pt,
594     top=52pt, bottom=75pt, inner=52pt, outer=52pt,
595     marginparwidth=2pc,heightrounded
596   }%
597 \or % sigconf
598   \geometry{twoside=true, head=13pt,
599     paperwidth=8.5in, paperheight=11in,
600     includeheadfoot, columnsep=2pc,
601     top=57pt, bottom=73pt, inner=54pt, outer=54pt,
602     marginparwidth=2pc,heightrounded
603   }%
604 \or % siggraph
605   \geometry{twoside=true, head=13pt,
606     paperwidth=8.5in, paperheight=11in,
607     includeheadfoot, columnsep=2pc,
608     top=57pt, bottom=73pt, inner=54pt, outer=54pt,
609     marginparwidth=2pc,heightrounded
610   }%
611 \or % sigplan
612   \geometry{twoside=true, head=13pt,
613     paperwidth=8.5in, paperheight=11in,
614     includeheadfoot=false, columnsep=2pc,
615     top=1in, bottom=1in, inner=0.75in, outer=0.75in,
616     marginparwidth=2pc,heightrounded
```

```

617     }%
618 \or % sigchi
619   \geometry{twoside=true, head=13pt,
620     paperwidth=8.5in, paperheight=11in,
621     includeheadfoot, columnsep=2pc,
622     top=66pt, bottom=73pt, inner=54pt, outer=54pt,
623     marginparwidth=2pc, heightrounded
624   }%
625 \or % sigchi-a
626   \geometry{twoside=false, head=13pt,
627     paperwidth=11in, paperheight=8.5in,
628     includeheadfoot, marginparsep=72pt,
629     marginparwidth=170pt, columnsep=20pt,
630     top=72pt, bottom=72pt, left=314pt, right=72pt
631   }%
632   \mparswitchfalse
633   \reversemarginpar
634 \fi

\parindent Paragraph
\parskip
635 \setlength\parindent{10\p@}
636 \setlength\parskip{\z@}
637 \ifcase\ACM@format@nr
638 \relax % manuscript
639 \or % acmsmall
640 \or % acmlarge
641 \or % acmtog
642   \setlength\parindent{9\p@}%
643 \or % sigconf
644 \or % siggraph
645 \or % sigplan
646 \or % sigchi
647 \or % sigchi-a
648 \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 com-
mand. We set \normalparindent to the value of \parindent as selected by acmart for
consistent paragraph indents.
649 \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.
650 \def\copyrightpermissionfootnoterule{\kern-3\p@
651   \hrule \@width \columnwidth \kern 2.6\p@}

```

```

652 \RequirePackage{manyfoot}
653 \SelectFootnoteRule[2]{copyrightpermission}
654 \DeclareNewFootnote{authorsaddresses}
655 \SelectFootnoteRule[2]{copyrightpermission}
656 \DeclareNewFootnote{copyrightpermission}

\footnoterule Tschichold's rules:
657 \def\footnoterule{\kern-3\p@
658   \hrule \@width 4pc \kern 2.6\p@}

\endminipage We do not use footnote rules in minipages
659 \def\endminipage{%
660   \par
661   \unskip
662   \ifvoid\@mpfootins\else
663     \vskip\skip\@mpfootins
664     \normalcolor
665     \unvbox\@mpfootins
666   \fi
667   \@minipagefalse
668   \color@endgroup
669   \egroup
670   \expandafter\@iiiparbox\@mpargs{\unvbox\@tempboxa}}

\@textbottom Add some stretch according to David Carlisle's advice at http://tex.stackexchange.com/a/62318/5522
671 \def\@textbottom{\vskip \z@ \@plus 1pt}
672 \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.
673 \ifcase\ACM@format@nr
674 \relax % manuscript
675 \or % acmsmall
676 \or % acmlarge
677 \or % acmtog
678   \flushbottom
679 \or % sigconf
680   \flushbottom
681 \or % siggraph
682   \flushbottom
683 \or % sigplan
684   \flushbottom
685 \or % sigchi
686   \flushbottom
687 \or % sigchi-a
688 \fi

```

### 3.8 Fonts

Somehow PDF<sub>TeX</sub> and Xe<sub>TeX</sub> require different incantations to make a PDF compliant with the current Acrobat bugs. Xpdf is much better.

The code below is by Ross Moore.

```

689 \ifPDFTeX
690 \input{glyphtounicode}
691 \pdfglyphtounicode{f_f}{FB00}
692 \pdfglyphtounicode{f_f_i}{FB03}
693 \pdfglyphtounicode{f_f_l}{FB04}
694 \pdfglyphtounicode{f_i}{FB01}
695 \pdfglyphtounicode{t_t}{0074 0074}
696 \pdfglyphtounicode{f_t}{0066 0074}
697 \pdfglyphtounicode{T_h}{0054 0068}
698 \pdfgentounicode=1
699 \RequirePackage{cmap}
700 \fi

```

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

```

701 \newif\if@ACM@newfonts
702 \@ACM@newfontstrue
703 \IfFileExists{libertine.sty}{\ClassWarning{\@classname}{You do not
704   have the libertine package installed. Please upgrade your
705   TeX}\@ACM@newfontsfalse}
706 \IfFileExists{zi4.sty}{\ClassWarning{\@classname}{You do not
707   have the inconsolata (zi4.sty) package installed. Please upgrade your
708   TeX}\@ACM@newfontsfalse}
709 \IfFileExists{newtxmath.sty}{\ClassWarning{\@classname}{You do not
710   have the newtxmath package installed. Please upgrade your
711   TeX}\@ACM@newfontsfalse}

```

We use Libertine throughout.

```

712 \if@ACM@newfonts
713   \RequirePackage[T1]{fontenc}
714   % Note that the order in which packages are loaded matters,
715   % and the correct order depends on the LaTeX engine used.
716   % See https://github.com/borisveytsman/acmart/issues/402
717   % and https://github.com/borisveytsman/acmart/issues/410
718   \ifxetex
719     \RequirePackage[libertine]{newtxmath}
720     \RequirePackage[tt=false]{libertine}
721     \setmonofont[StylisticSet=3]{inconsolata}
722   \else
723     \ifluatex
724       \RequirePackage[libertine]{newtxmath}
725       \RequirePackage[tt=false]{libertine}
726       \setmonofont[StylisticSet=3]{inconsolata}
727     \else
728       \RequirePackage[tt=false, type1=true]{libertine}
729       \RequirePackage[varqu]{zi4}
730       \RequirePackage[libertine]{newtxmath}
731     \fi
732   \fi
733 \fi

```

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

```

734 \let\liningnums\undefined
735 \AtEndPreamble{%

```



```
736 \DeclareTextFontCommand{\liningnums}{\libertineLF}}
```

The SIGCHI extended abstracts are sans serif:

```
737 \if@ACM@sigchiamode
738 \renewcommand{\familydefault}{\sfdefault}
739 \fi
```

### 3.9 Image descriptions

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

```
740 \newif\if@Description@present
741 \@Description@presenttrue
```

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

```
742 \newif\if@undescribed@images
743 \@undescribed@imagesfalse
```

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

```
744 \newcommand\Description[2][\global\@Description@presenttrue\ignorespaces]
```

The global warning

```
745 \AtEndDocument{\if@undescribed@images
746 \ClassWarningNoLine{\@classname}{Some images may lack descriptions}\fi}
```

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

```
747 \AtBeginEnvironment{figure}{\@Description@presentfalse
748 \let\@vspace\@vspace@orig
749 \let\@vspacer\@vspacer@orig}
750 \AtBeginEnvironment{figure*}{\@Description@presentfalse
751 \let\@vspace\@vspace@orig
752 \let\@vspacer\@vspacer@orig}
753 \AtEndEnvironment{figure}{\if@Description@present\else
754 \global\@undescribed@imagestrue
755 \ClassWarning{\@classname}{A possible image without description}\fi}
756 \AtEndEnvironment{figure*}{\if@Description@present\else
757 \global\@undescribed@imagestrue
758 \ClassWarning{\@classname}{A possible image without description}\fi}
759 \AtBeginEnvironment{table}{\let\@vspace\@vspace@orig
760 \let\@vspacer\@vspacer@orig}
761 \AtBeginEnvironment{table*}{\let\@vspace\@vspace@orig
762 \let\@vspacer\@vspacer@orig}
763 \AtBeginEnvironment{algorithm}{\let\@vspace\@vspace@orig
764 \let\@vspacer\@vspacer@orig}
765 \AtBeginEnvironment{algorithm*}{\let\@vspace\@vspace@orig
766 \let\@vspacer\@vspacer@orig}
767 \AtBeginEnvironment{lstlisting}{\let\@vspace\@vspace@orig
768 \let\@vspacer\@vspacer@orig}
769 \AtBeginEnvironment{lstlisting*}{\let\@vspace\@vspace@orig
770 \let\@vspacer\@vspacer@orig}
771 \AtBeginEnvironment{minted}{\let\@vspace\@vspace@orig
772 \let\@vspacer\@vspacer@orig}
773 \AtBeginEnvironment{minted*}{\let\@vspace\@vspace@orig
```

```

774 \let\@vspacer\@vspacer@orig}
775 \AtBeginEnvironment{listing}{\let\@vspace\@vspace@orig
776 \let\@vspacer\@vspacer@orig}
777 \AtBeginEnvironment{listing*}{\let\@vspace\@vspace@orig
778 \let\@vspacer\@vspacer@orig}
779

```

### 3.10 Floats

We use the caption package

```

780 \RequirePackage{caption, float}
781 \captionsetup[table]{position=top}
782 \if@ACM@journal
783 \captionsetup{labelfont={sf, small},
784 textfont={sf, small}, margin=\z@}
785 \captionsetup[figure]{name={Fig.}}
786 \else
787 \captionsetup{labelfont={bf},
788 textfont={bf}, labelsep=colon, margin=\z@}
789 \ifcase\ACM@format@nr
790 \relax % manuscript
791 \or % acmsmall
792 \or % acmlarge
793 \or % acmtog
794 \or % sigconf
795 \or % siggraph
796 \captionsetup{textfont={it}}
797 \or % sigplan
798 \captionsetup{labelfont={bf},
799 textfont={normalfont}, labelsep=period, margin=\z@}
800 \or % sigchi
801 \captionsetup[figure]{labelfont={bf, small},
802 textfont={bf, small}}
803 \captionsetup[table]{labelfont={bf, small},
804 textfont={bf, small}}
805 \or % sigchi-a
806 \captionsetup[figure]{labelfont={bf, small},
807 textfont={bf, small}}
808 \captionsetup[table]{labelfont={bf, small},
809 textfont={bf, small}}
810 \fi
811 \fi

```

sidebar The sidebar environment:

```

812 \newfloat{sidebar}{}{sbar}
813 \floatname{sidebar}{Sidebar}
814 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}

```

\@sidebar The processing of the saved text

```

815 \long\def\@sidebar#1{\bgroup\let\@vspace\@vspace@orig
816 \let\@vspacer\@vspacer@orig\captionsetup{type=sidebar}%
817 \marginpar{\small#1}\egroup}

```

marginfigure The marginfigure environment:

```
818 \newenvironment{marginfigure}{\Collect@Body\@marginfigure}{}
```

\@marginfigure The processing of the saved text

```
819 \long\def\@marginfigure#1{\bgroup
820   \let\@vspace\@vspace@orig
821   \let\@vspacer\@vspacer@orig
822   \captionsetup{type=figure}%
823   \marginpar{\@Description@presentfalse\centering
824     \small#1\if@Description@present\else
825       \global\@undescribed@imagestrue
826       \ClassWarning{\@classname}{A possible image without description}
827     \fi}%
828   \egroup}
```

margintable The margintable environment:

```
829 \newenvironment{margintable}{\Collect@Body\@margintable}{}
```

\@margintable The processing of the saved text

```
830 \long\def\@margintable#1{\bgroup\let\@vspace\@vspace@orig
831   \let\@vspacer\@vspacer@orig\captionsetup{type=table}%
832   \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

```
833 \newdimen\fulltextwidth
834 \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)

```
835 \if@ACM@sigchiamode
836 \def\@dblfloat{\bgroup\let\@vspace\@vspace@orig
837   \let\@vspacer\@vspacer@orig\columnwidth=\fulltextwidth
838   \let\@endfloatbox\@endwidefloatbox
839   \def\@fpsadddefault{\def\@fps{tp}}%
840   \@float}
841 \fi
```

\end@dblfloat And the end. Just adding a \bgroup.

```
842 \if@ACM@sigchiamode
843 \def\end@dblfloat{%
844   \end@float\egroup}
845 \fi
```

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

```
846 \def\@endwidefloatbox{%
847   \par\vskip\z@skip
848   \@minipagefalse
849   \outer@nobreak
850   \egroup
851   \color@endbox}
```

```

852 \global\setbox\@currbox=\vbox{\moveleft
853   \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
854   \wd\@currbox=\textwidth
855 }

```

### 3.11 Lists

```

856 \ifcase\ACM@format@nr
857 \relax % manuscript
858 \or % acmsmall
859 \or % acmlarge
860 \or % acmtog
861 \or % sigconf
862 \or % siggraph
863 \or % sigplan
864 \def\labelenumi{\theenumi.}
865 \def\labelenumii{\theenumii.}
866 \def\labelenumiii{\theenumiii.}
867 \def\labelenumiv{\theenumiv.}
868 \or % sigchi
869 \or % sigchi-a
870 \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`.

```

871 \newdimen\@ACM@labelwidth
872 \AtBeginDocument{%
873   \setlength\labelsep{4pt}
874   \setlength{\@ACM@labelwidth}{6.5pt}
875
876   %% First-level list: when beginning after the first line of an
877   %% indented paragraph or ending before an indented paragraph, labels
878   %% should not hang to the left of the preceding/following text.
879   \setlength\leftmargini{\z@}
880   \addtolength\leftmargini{\parindent}
881   \addtolength\leftmargini{2\labelsep}
882   \addtolength\leftmargini{\@ACM@labelwidth}
883
884   %% Second-level and higher lists.
885   \setlength\leftmarginii{\z@}
886   \addtolength\leftmarginii{0.5\labelsep}
887   \addtolength\leftmarginii{\@ACM@labelwidth}
888   \setlength\leftmarginiii{\leftmarginii}
889   \setlength\leftmarginiv{\leftmarginiii}
890   \setlength\leftmarginv{\leftmarginiv}
891   \setlength\leftmarginvi{\leftmarginv}
892   \@listi}
893 \newskip\listisep
894 \listisep\smallskipamount
895 \def\@listI{\leftmargin\leftmargini

```

```

896 \labelwidth\leftmargini \advance\labelwidth-\labelsep
897 \listparindent\z@
898 \topsep\listisep}
899 \let\@listi\@listI
900 \def\@listii{\leftmargin\leftmarginii
901 \labelwidth\leftmarginii \advance\labelwidth-\labelsep
902 \topsep\z@skip}
903 \def\@listiii{\leftmargin\leftmarginiii
904 \labelwidth\leftmarginiii \advance\labelwidth-\labelsep}
905 \def\@listiv{\leftmargin\leftmarginiv
906 \labelwidth\leftmarginiv \advance\labelwidth-\labelsep}
907 \def\@listv{\leftmargin\leftmarginv
908 \labelwidth\leftmarginv \advance\labelwidth-\labelsep}
909 \def\@listvi{\leftmargin\leftmarginvi
910 \labelwidth\leftmarginvi \advance\labelwidth-\labelsep}
\descriptionlabel We do not use a colon by default like amsart does:
911 \renewcommand{\descriptionlabel}[1]{\upshape\bfseries #1}

\description Make the description environment indentation consistent with that of the itemize
and enumerate environments.
912 \renewenvironment{description}{\list{}}{%
913 \labelwidth\@ACM@labelwidth
914 \let\makelabel\descriptionlabel}%
915 }{
916 \endlist
917 }
918 \let\enddescription=\endlist % for efficiency

```

### 3.12 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.

```

919 \newif\if@ACM@maketitle@typeset
920 \@ACM@maketitle@typesetfalse

```

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

```

921 \define@choicekey*+{ACM}{acmJournal}{\@journalCode\@journalCode@nr}{%
922 CIE,%
923 CSUR,%
924 DGOV,%
925 DLT,%
926 DTRAP,%
927 FAC,%
928 HEALTH,%
929 IMWUT,%
930 JACM,%
931 JDIQ,%
932 JEA,%
933 JERIC,%
934 JETC,%
935 JOCCH,%
936 PACMCGIT,%
937 PACMHCI,%

```

```

938 PACMPL,%
939 POMACS,%
940 TAAS,%
941 TACCESS,%
942 TACO,%
943 TALG,%
944 TALLIP,%
945 TAP,%
946 TCPS,%
947 TDS,%
948 TEAC,%
949 TECS,%
950 TELO,%
951 THRI,%
952 TIIS,%
953 TIOT,%
954 TISSEC,%
955 TIST,%
956 TKDD,%
957 TMIS,%
958 TOCE,%
959 TOCHI,%
960 TOCL,%
961 TOCS,%
962 TOCT,%
963 TODAES,%
964 TODS,%
965 TOG,%
966 TOIS,%
967 TOIT,%
968 TOMACS,%
969 TOMM,%
970 TOMPECS,%
971 TOMS,%
972 TOPC,%
973 TOPS,%
974 TOPLAS,%
975 TOS,%
976 TOSEM,%
977 TOSN,%
978 TQC,%
979 TRETs,%
980 TSAS,%
981 TSC,%
982 TSLP,%
983 TWEB,%
984 FACMP%
985 }{%
986 \ifcase \@journalCode@nr
987 \relax % CIE
988 \def \@journalName{ACM Computers in Entertainment}%
989 \def \@journalNameShort{ACM Comput. Entertain.}%
990 \def \@permissionCodeOne{1544-3574}%
991 \or % CSUR

```

```

992 \def\@journalName{ACM Computing Surveys}%
993 \def\@journalNameShort{ACM Comput. Surv.}%
994 \def\@permissionCodeOne{0360-0300}%
995 \or % DGOV
996 \def\@journalName{Digital Government: Research and Practice}%
997 \def\@journalNameShort{Digit. Gov. Res. Pract.}%
998 \def\@permissionCodeOne{2639-0175}%
999 \or % DLT
1000 \def\@journalName{Distributed Ledger Technologies: Research and Practice}%
1001 \def\@journalNameShort{Distrib. Ledger Technol.}%
1002 \def\@permissionCodeOne{2769-6472}%
1003 \or % DTRAP
1004 \def\@journalName{Digital Threats: Research and Practice}%
1005 \def\@journalNameShort{Digit. Threat. Res. Pract.}%
1006 \def\@permissionCodeOne{2576-5337}%
1007 \or % FAC
1008 \def\@journalName{Formal Aspects of Computing}%
1009 \def\@journalNameShort{Form. Asp. Comput.}%
1010 \def\@permissionCodeOne{0934-5043}%
1011 \def\@permissionCodeTwo{1433-299X}%
1012 \or % HEALTH
1013 \def\@journalName{ACM Transactions on Computing for Healthcare}%
1014 \def\@journalNameShort{ACM Trans. Comput. Healthcare}%
1015 \def\@permissionCodeOne{2637-8051}%
1016 \or % IMWUT
1017 \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
1018     Wearable and Ubiquitous Technologies}%
1019 \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
1020 \def\@permissionCodeOne{2474-9567}%
1021 \@ACM@screentruer
1022 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1023 \or % JACM
1024 \def\@journalName{Journal of the ACM}%
1025 \def\@journalNameShort{J. ACM}%
1026 \def\@permissionCodeOne{0004-5411}%
1027 \or % JDIQ
1028 \def\@journalName{ACM Journal of Data and Information Quality}%
1029 \def\@journalNameShort{ACM J. Data Inform. Quality}%
1030 \def\@permissionCodeOne{1936-1955}%
1031 \or % JEA
1032 \def\@journalName{ACM Journal of Experimental Algorithmics}%
1033 \def\@journalNameShort{ACM J. Exp. Algor.}%
1034 \def\@permissionCodeOne{1084-6654}%
1035 \or % JERIC
1036 \def\@journalName{ACM Journal of Educational Resources in Computing}%
1037 \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
1038 \def\@permissionCodeOne{1073-0516}%
1039 \or % JETC
1040 \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
1041 \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
1042 \def\@permissionCodeOne{1550-4832}%
1043 \or % JOCCH
1044 \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
1045 \def\@journalNameShort{ACM J. Comput. Cult. Herit.}%

```

```

1046 \or % PACMCGIT
1047 \def\@journalName{Proceedings of the ACM on Computer Graphics and Interactive Techniques}%
1048 \def\@journalNameShort{Proc. ACM Comput. Graph. Interact. Tech.}%
1049 \def\@permissionCodeOne{2577-6193}%
1050 \@ACM@screentruer
1051 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1052 \or % PACMHCI
1053 \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
1054 \def\@journalNameShort{Proc. ACM Hum.-Comput. Interact.}%
1055 \def\@permissionCodeOne{2573-0142}%
1056 \@ACM@screentruer
1057 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1058 \or % PACMPL
1059 \def\@journalName{Proceedings of the ACM on Programming Languages}%
1060 \def\@journalNameShort{Proc. ACM Program. Lang.}%
1061 \def\@permissionCodeOne{2475-1421}%
1062 \@ACM@screentruer
1063 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1064 \or % POMACS
1065 \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
1066 \def\@journalNameShort{Proc. ACM Meas. Anal. Comput. Syst.}%
1067 \def\@permissionCodeOne{2476-1249}%
1068 \@ACM@screentruer
1069 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1070 \or % TAAS
1071 \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
1072 \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
1073 \def\@permissionCodeOne{1556-4665}%
1074 \or % TACCESS
1075 \def\@journalName{ACM Transactions on Accessible Computing}%
1076 \def\@journalNameShort{ACM Trans. Access. Comput.}%
1077 \def\@permissionCodeOne{1936-7228}%
1078 \or % TACO
1079 \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
1080 \def\@journalNameShort{ACM Trans. Arch. Code Optim.}%
1081 \def\@permissionCodeOne{1544-3566}%
1082 \def\@permissionCodeTwo{1544-3973}%
1083 \or % TALG
1084 \def\@journalName{ACM Transactions on Algorithms}%
1085 \def\@journalNameShort{ACM Trans. Algor.}%
1086 \def\@permissionCodeOne{1549-6325}%
1087 \or % TALLIP
1088 \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
1089 \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
1090 \def\@permissionCodeOne{2375-4699}%
1091 \or % TAP
1092 \def\@journalName{ACM Transactions on Applied Perception}%
1093 \def\@journalNameShort{ACM Trans. Appl. Percept.}%
1094 \def\@permissionCodeOne{1544-3558}%
1095 \or % TCPS
1096 \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
1097 \def\@journalNameShort{ACM Trans. Cyber-Phys. Syst.}%
1098 \def\@permissionCodeOne{2378-962X}%
1099 \or % TDS

```



```

1100 \def\@journalName{ACM/IMS Transactions on Data Science}%
1101 \def\@journalNameShort{ACM/IMS Trans. Data Sci.}%
1102 \def\@permissionCodeOne{2577-3224}%
1103 \or % TEAC
1104 \def\@journalName{ACM Transactions on Economics and Computation}%
1105 \def\@journalNameShort{ACM Trans. Econ. Comput.}%
1106 \def\@permissionCodeOne{2167-8375}%
1107 \or % TECS
1108 \def\@journalName{ACM Transactions on Embedded Computing Systems}%
1109 \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
1110 \def\@permissionCodeOne{1539-9087}%
1111 \or % TELO
1112 \def\@journalName{ACM Transactions on Evolutionary Learning}%
1113 \def\@journalNameShort{ACM Trans. Evol. Learn.}%
1114 \def\@permissionCodeOne{2688-3007}%
1115 \or % THRI
1116 \def\@journalName{ACM Transactions on Human-Robot Interaction}%
1117 \def\@journalNameShort{ACM Trans. Hum.-Robot Interact.}%
1118 \def\@permissionCodeOne{2573-9522}%
1119 \or % TIIS
1120 \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
1121 \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
1122 \def\@permissionCodeOne{2160-6455}%
1123 \or % TIOT
1124 \def\@journalName{ACM Transactions on Internet of Things}%
1125 \def\@journalNameShort{ACM Trans. Internet Things}%
1126 \def\@permissionCodeOne{2577-6207}%
1127 \or % TISSEC
1128 \def\@journalName{ACM Transactions on Information and System Security}%
1129 \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
1130 \def\@permissionCodeOne{1094-9224}%
1131 \or % TIIST
1132 \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
1133 \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
1134 \def\@permissionCodeOne{2157-6904}%
1135 \or % TKDD
1136 \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
1137 \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
1138 \def\@permissionCodeOne{1556-4681}%
1139 \or % TMIS
1140 \def\@journalName{ACM Transactions on Management Information Systems}%
1141 \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
1142 \def\@permissionCodeOne{2158-656X}%
1143 \or % TOCE
1144 \def\@journalName{ACM Transactions on Computing Education}%
1145 \def\@journalNameShort{ACM Trans. Comput. Educ.}%
1146 \def\@permissionCodeOne{1946-6226}%
1147 \or % TOCHI
1148 \def\@journalName{ACM Transactions on Computer-Human Interaction}%
1149 \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
1150 \def\@permissionCodeOne{1073-0516}%
1151 \or % TOCL
1152 \def\@journalName{ACM Transactions on Computational Logic}%
1153 \def\@journalNameShort{ACM Trans. Comput. Logic}%

```

```

1154 \def\@permissionCodeOne{1529-3785}%
1155 \or % TOCS
1156 \def\@journalName{ACM Transactions on Computer Systems}%
1157 \def\@journalNameShort{ACM Trans. Comput. Syst.}%
1158 \def\@permissionCodeOne{0734-2071}%
1159 \or % TOCT
1160 \def\@journalName{ACM Transactions on Computation Theory}%
1161 \def\@journalNameShort{ACM Trans. Comput. Theory}%
1162 \def\@permissionCodeOne{1942-3454}%
1163 \or % TODAES
1164 \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
1165 \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
1166 \def\@permissionCodeOne{1084-4309}%
1167 \or % TODS
1168 \def\@journalName{ACM Transactions on Database Systems}%
1169 \def\@journalNameShort{ACM Trans. Datab. Syst.}%
1170 \def\@permissionCodeOne{0362-5915}%
1171 \or % TOG
1172 \def\@journalName{ACM Transactions on Graphics}%
1173 \def\@journalNameShort{ACM Trans. Graph.}%
1174 \def\@permissionCodeOne{0730-0301}%
1175 \or % TOIS
1176 \def\@journalName{ACM Transactions on Information Systems}%
1177 \def\@journalNameShort{ACM Trans. Inf. Syst.}%
1178 \def\@permissionCodeOne{1046-8188}%
1179 \or % TOIT
1180 \def\@journalName{ACM Transactions on Internet Technology}%
1181 \def\@journalNameShort{ACM Trans. Internet Technol.}%
1182 \def\@permissionCodeOne{1533-5399}%
1183 \or % TOMACS
1184 \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
1185 \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
1186 \def\@permissionCodeOne{1049-3301}%
1187 \def\@permissionCodeTwo{1558-1195}%
1188 \or % TOMM
1189 \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
1190 \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
1191 \def\@permissionCodeOne{1551-6857}%
1192 \def\@permissionCodeTwo{0100}%
1193 \or % TOMPECS
1194 \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
1195 \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
1196 \def\@permissionCodeOne{2376-3639}%
1197 \or % TOMS
1198 \def\@journalName{ACM Transactions on Mathematical Software}%
1199 \def\@journalNameShort{ACM Trans. Math. Softw.}%
1200 \def\@permissionCodeOne{0098-3500}%
1201 \or % TOPC
1202 \def\@journalName{ACM Transactions on Parallel Computing}%
1203 \def\@journalNameShort{ACM Trans. Parallel Comput.}%
1204 \def\@permissionCodeOne{1539-9087}%
1205 \or % TOPS
1206 \def\@journalName{ACM Transactions on Privacy and Security}%
1207 \def\@journalNameShort{ACM Trans. Priv. Sec.}%

```

```

1208 \def\@permissionCodeOne{2471-2566}%
1209 \or % TOPLAS
1210 \def\@journalName{ACM Transactions on Programming Languages and Systems}%
1211 \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
1212 \def\@permissionCodeOne{0164-0925}%
1213 \or % TOS
1214 \def\@journalName{ACM Transactions on Storage}%
1215 \def\@journalNameShort{ACM Trans. Storage}%
1216 \def\@permissionCodeOne{1553-3077}%
1217 \or % TOSEM
1218 \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
1219 \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
1220 \def\@permissionCodeOne{1049-331X}%
1221 \or % TOSN
1222 \def\@journalName{ACM Transactions on Sensor Networks}%
1223 \def\@journalNameShort{ACM Trans. Sensor Netw.}%
1224 \def\@permissionCodeOne{1550-4859}%
1225 \or % TQC
1226 \def\@journalName{ACM Transactions on Quantum Computing}%
1227 \def\@journalNameShort{ACM Trans. Quantum Comput.}%
1228 \def\@permissionCodeOne{2643-6817}%
1229 \or % TRETS
1230 \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
1231 \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
1232 \def\@permissionCodeOne{1936-7406}%
1233 \or % TSAS
1234 \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
1235 \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
1236 \def\@permissionCodeOne{2374-0353}%
1237 \or % TSC
1238 \def\@journalName{ACM Transactions on Social Computing}%
1239 \def\@journalNameShort{ACM Trans. Soc. Comput.}%
1240 \def\@permissionCodeOne{2469-7818}%
1241 \or % TSLP
1242 \def\@journalName{ACM Transactions on Speech and Language Processing}%
1243 \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
1244 \def\@permissionCodeOne{1550-4875}%
1245 \or % TWEB
1246 \def\@journalName{ACM Transactions on the Web}%
1247 \def\@journalNameShort{ACM Trans. Web}%
1248 \def\@permissionCodeOne{1559-1131}%
1249 \else % FACMP, a dummy journal
1250 \def\@journalName{Forthcoming ACM Publication}%
1251 \def\@journalNameShort{ACM Forthcoming}%
1252 \def\@permissionCodeOne{XXXX-XXXX}%
1253 \fi
1254 \ClassInfo{\@classname}{Using journal code \@journalCode}%
1255 }{%
1256 \ClassError{\@classname}{Incorrect journal #1}%
1257 }%

```

\acmJournal And the syntactic sugar around it

```

1258 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}%
1259 \global\@ACM@journal@bibstriptrue}

```

The defaults:

```
1260 \def\@journalCode@nr{0}
1261 \def\@journalName{}%
1262 \def\@journalNameShort{\@journalName}%
1263 \def\@permissionCodeOne{XXXX-XXXX}%
1264 \def\@permissionCodeTwo{}%
```

`\acmConference` This is the conference command

```
1265 \newcommand\acmConference[4][{}%
1266   \gdef\acmConference@shortname{#1}%
1267   \gdef\acmConference@name{#2}%
1268   \gdef\acmConference@date{#3}%
1269   \gdef\acmConference@venue{#4}%
1270   \ifx\acmConference@shortname\@empty
1271     \gdef\acmConference@shortname{#2}%
1272   \fi
1273   \global\@ACM@journal@bibstripfalse
1274 }
1275 \if@ACM@journal\else
1276 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
1277   DC, USA}%
1278 \fi
```

`\acmBooktitle` The book title of the conference:

```
\acmBooktitle 1279 \def\acmBooktitle#1{\gdef\@acmBooktitle{#1}}
1280 \acmBooktitle{}
1281 \ifx\acmConference@name\@undefined\else
1282 \acmBooktitle{Proceedings of \acmConference@name
1283   \ifx\acmConference@name\acmConference@shortname\else
1284     \ (\acmConference@shortname)\fi}
1285 \fi
```

`\@editorsAbbrev` How to abbreviate editors

```
1286 \def\@editorsAbbrev{(Ed.)}
```

`\@acmEditors` The list of editors

```
1287 \def\@acmEditors{}
```

`\editor` Add a new editor to the list

```
1288 \def\editor#1{\ifx\@acmEditors\@empty
1289   \gdef\@acmEditors{#1}%
1290 \else
1291   \gdef\@editorsAbbrev{(Eds.)}%
1292   \g@addto@macro\@acmEditors{\and#1}%
1293 \fi}
```

`\subtitle` The subtitle macro

```
1294 \def\subtitle#1{\def\@subtitle{#1}}
1295 \subtitle{}
```

`\num@authorgroups` The total number of “groups”. Each group is several authors with the same affiliations(s)

```
1296 \newcount\num@authorgroups
1297 \num@authorgroups=0\relax
```

```

\num@authors The total number of authors
1298 \newcount\num@authors
1299 \num@authors=0\relax

\if@insideauthorgroup Whether we are continuing an author group
1300 \newif\if@insideauthorgroup
1301 \@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.
1302 \renewcommand\author[2][{}%
1303 \IfSubStr{\detokenize{#2}}{,}{\ClassWarning{\@classname}{Do not put several
1304     authors in the same \string\author\space macro!}}}%
1305 \global\advance\num@authors by 1\relax
1306 \if@insideauthorgroup\else
1307     \global\advance\num@authorgroups by 1\relax
1308     \global\@insideauthorgrouptrue
1309 \fi
1310 \ifx\addresses\@empty
1311     \if@ACM@anonymous
1312         \gdef\addresses{\@author{Anonymous Author(s)}%
1313             \ifx\@acmSubmissionID\@empty\else\Submission Id:
1314                 \@acmSubmissionID\fi}%
1315         \gdef\authors{Anonymous Author(s)}%
1316     \else
1317         \expandafter\gdef\expandafter\addresses\expandafter{%
1318             \expandafter\@author\expandafter{%
1319                 \csname typeset@author\the\num@authors\endcsname{#2}}}%
1320         \gdef\authors{#2}%
1321     \fi
1322 \else
1323     \if@ACM@anonymous\else
1324         \expandafter\g@addto@macro\expandafter\addresses\expandafter{%
1325             \expandafter\and\expandafter\@author\expandafter{%
1326                 \csname typeset@author\the\num@authors\endcsname{#2}}}%
1327         \g@addto@macro\authors{\and#2}%
1328     \fi
1329 \fi
1330 \if@ACM@anonymous
1331     \ifx\shortauthors\@empty
1332         \gdef\shortauthors{Anon.
1333             \ifx\@acmSubmissionID\@empty\else Submission Id:
1334                 \@acmSubmissionID\fi}%
1335     \fi
1336 \else
1337     \def\@tempa{#1}%
1338     \ifx\@tempa\@empty
1339         \ifx\shortauthors\@empty
1340             \gdef\shortauthors{#2}%

```

```

1341     \else
1342       \g@addto@macro\shortauthors{\and#2}%
1343     \fi
1344   \else
1345     \ifx\shortauthors\@empty
1346       \gdef\shortauthors{#1}%
1347     \else
1348       \g@addto@macro\shortauthors{\and#1}%
1349     \fi
1350   \fi
1351 \fi}

```

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

```

1352 \newcommand{\affiliation}[2][{}]{%
1353   \global\@insideauthorgroupfalse
1354   \if@ACM@anonymous\else
1355     \g@addto@macro\addresses{\affiliation{#1}{#2}}%
1356   \fi}

```

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

```

1357 \define@boolkey+{@ACM@affiliation@}[@ACM@affiliation@]{obeypunctuation}%
1358 [true]{\ClassError{\@classname}{The option obeypunctuation can be either true or false}}

```

`\additionalaffiliation` Additional affiliations go to footnotes

```

1359 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}

```

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

```

1360 \def\@additionalaffiliation#1{\bgroup
1361   \def\position##1{\ignorespaces}%
1362   \def\institution##1{##1\ignorespaces}%
1363   \def\department{\@ifnextchar[{\@department}{\@department[]}}%
1364   \def\@department[##1]##2{\unskip, ##2\ignorespaces}%
1365   \let\streetaddress\position
1366   \let\city\position
1367   \let\state\position
1368   \let\postcode\position
1369   \let\country\position
1370   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.

```

1371 \renewcommand{\email}[2][{}]{%
1372   \IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several
1373     addresses in the same \string\email\space macro!}}{}%
1374   \if@ACM@anonymous\else
1375     \g@addto@macro\addresses{\email{#1}{#2}}%
1376   \fi}

```

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

```

1377 \def\orcid#1{\unskip\ignorespaces%
1378   \IfBeginWith{#1}{http}{%

```

```

1379 \expandafter\gdef\csname
1380     typeset@author\the\num@authors\endcsname##1{%
1381         \href{#1}{##1}}}%
1382 \expandafter\gdef\csname
1383     typeset@author\the\num@authors\endcsname##1{%
1384         \href{https://orcid.org/#1}{##1}}}%

\authorsaddresses Setting up authors' addresses
1385 \def\authorsaddresses#1{\def\@authorsaddresses{#1}}
1386 \authorsaddresses{\mkauthorsaddresses}

\@titlenotes The title notes
1387 \def\@titlenotes{}

\titlenote Adding a note to the title
1388 \def\titlenote#1{%
1389     \g@addto@macro\@title{\footnotemark}%
1390     \if@ACM@anonymous
1391         \g@addto@macro\@titlenotes{%
1392             \stepcounter{footnote}\footnotetext{Title note}}%
1393     \else
1394         \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
1395     \fi}

\@subtitlenotes The subtitle notes
1396 \def\@subtitlenotes{}

\subtitlenote Adding a note to the subtitle
1397 \def\subtitlenote#1{%
1398     \g@addto@macro\@subtitle{\footnotemark}%
1399     \if@ACM@anonymous
1400         \g@addto@macro\@subtitlenotes{%
1401             \stepcounter{footnote}\footnotetext{Subtitle note}}%
1402     \else
1403         \g@addto@macro\@subtitlenotes{%
1404             \stepcounter{footnote}\footnotetext{#1}}%
1405     \fi}

\@authornotes The author notes
1406 \def\@authornotes{}

\authornote Adding a note to the author
1407 \def\authornote#1{%
1408     \if@ACM@anonymous\else
1409         \g@addto@macro\addresses{\@authornotemark}%
1410         \g@addto@macro\@authornotes{%
1411             \stepcounter{footnote}\footnotetext{#1}}%
1412     \fi}

\authornotemark Adding a footnote mark to the authors
1413 \newcommand\authornotemark[1][\relax]{%
1414     \ifx#1\relax\relax\relax
1415     \g@addto@macro\addresses{\@authornotemark}%

```

```

1416 \else
1417 \g@addto@macro\addresses{\@@authornotemark{#1}}%
1418 \fi}

\acmVolume The current volume
1419 \def\acmVolume#1{\def\@acmVolume{#1}}
1420 \acmVolume{1}

\acmNumber The current number
1421 \def\acmNumber#1{\def\@acmNumber{#1}}
1422 \acmNumber{1}

\acmArticle The current article
1423 \def\acmArticle#1{\def\@acmArticle{#1}}
1424 \acmArticle{}

\acmArticleSeq The sequence number
1425 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
1426 \acmArticleSeq{\@acmArticle}

\acmYear The current year
1427 \def\acmYear#1{\def\@acmYear{#1}}
1428 \acmYear{\the\year}

\acmMonth The current month
1429 \def\acmMonth#1{\def\@acmMonth{#1}}
1430 \acmMonth{\the\month}

\@acmPubDate The publication date
1431 \def\@acmPubDate{\ifcase\@acmMonth\or
1432 January\or February\or March\or April\or May\or June\or
1433 July\or August\or September\or October\or November\or
1434 December\fi~\@acmYear}

\acmPrice The price
1435 \def\acmPrice#1{\def\@acmPrice{#1}}
1436 \acmPrice{15.00}

\acmSubmissionID The submission ID
1437 \def\acmSubmissionID#1{\def\@acmSubmissionID{#1}}
1438 \acmSubmissionID{}

\acmISBN The book ISBN
1439 \def\acmISBN#1{\def\@acmISBN{#1}}
1440 \acmISBN{978-x-xxxx-xxxx-x/YY/MM}

\acmDOI The paper DOI
1441 \def\acmDOI#1{\def\@acmDOI{#1}}
1442 \acmDOI{10.1145/nnnnnnn.nnnnnnn}

\if@ACM@badge Whether to print a badge. Note that either a left or right badge triggers it:
1443 \newif\if@ACM@badge
1444 \@ACM@badgefalse

```



`\@ACM@badge@width` The width of the badge  
1445 `\newlength\@ACM@badge@width`  
1446 `\setlength\@ACM@badge@width{5pc}`

`\@ACM@title@width` The width of the badge  
1447 `\newlength\@ACM@title@width`

`\@ACM@badge@skip` The space between the badge and the title  
1448 `\newlength\@ACM@badge@skip`  
1449 `\setlength\@ACM@badge@skip{1pc}`

`\acmBadgeR` Setting the right badge  
1450 `\newcommand\acmBadgeR[2][\@ACM@badgetrue`  
1451 `\def\@acmBadgeR@url{#1}%`  
1452 `\def\@acmBadgeR@image{#2}}`  
1453 `\def\@acmBadgeR@url{}`  
1454 `\def\@acmBadgeR@image{}`

`\acmBadgeL` Setting the left badge  
1455 `\newcommand\acmBadgeL[2][\@ACM@badgetrue`  
1456 `\def\@acmBadgeL@url{#1}%`  
1457 `\def\@acmBadgeL@image{#2}}`  
1458 `\def\@acmBadgeL@url{}`  
1459 `\def\@acmBadgeL@image{}`

`\startPage` The start page of the paper  
1460 `\def\startPage#1{\def\@startPage{#1}}`  
1461 `\startPage{}`

`\terms` Terms are obsolete. We use CCS now.  
1462 `\def\terms#1{\ClassWarning{\@classname}{The command \string\terms{} is`  
1463 `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.  
1464 `\def\keywords#1{\def\@keywords{#1}}`  
1465 `\let\@keywords\@empty`  
1466 `\AtEndDocument{\if@ACM@nonacm\else\ifx\@keywords\@empty`  
1467 `\ifnum\getrefnumber{TotPages}>2\relax`  
1468 `\ClassWarningNoLine{\@classname}{ACM keywords are mandatory`  
1469 `for papers over two pages}%`  
1470 `\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  
1471 `\renewenvironment{abstract}{\Collect@Body\@saveabstract}{}`

`\@saveabstract` And saving the abstract  
1472 `\long\def\@saveabstract#1{\if@ACM@maketitle@typeset`  
1473 `\ClassError{\@classname}{Abstract must be defined before maketitle`  
1474 `command. Please move it!}\fi`  
1475 `\long\gdef\@abstract{#1}}`  
1476 `\@saveabstract{}`

```

\@empty The long version of \@empty (to compare with \@abstract)
1477 \long\def\@empty{}

\if@ACM@printccs Whether to print CCS
1478 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
1479   \if@ACM@printccs
1480     \ClassInfo{\@classname}{Printing CCS}%
1481   \else
1482     \ClassInfo{\@classname}{Suppressing CCS}%
1483   \fi}{\ClassError{\@classname}{The option printccs can be either true or false}}

\if@ACM@printacmref Whether to print the ACM bibstrip
1484 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
1485   \if@ACM@printacmref
1486     \ClassInfo{\@classname}{Printing bibformat}%
1487   \else
1488     \ClassInfo{\@classname}{Suppressing bibformat}%
1489   \fi}{\ClassError{\@classname}{The option printacmref can be either true or false}}

1490 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@printacmref\else
1491   \ifnum\getrefnumber{TotPages}>1\relax
1492     \ClassWarningNoLine{\@classname}{%
1493       ACM reference format is mandatory \MessageBreak
1494       for papers over one page. \MessageBreak
1495       Please add printacmref=true to the \MessageBreak
1496       \string\settopmatter\space command.}%
1497   \fi\fi\fi}

\if@ACM@printfolios Whether to print folios
1498 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
1499   \if@ACM@printfolios
1500     \ClassInfo{\@classname}{Printing folios}%
1501   \else
1502     \ClassInfo{\@classname}{Suppressing folios}%
1503   \fi}{\ClassError{\@classname}{The option printfolios can be either true or false}}

\@ACM@authorssperrow The number of authors per row. 0 means use the default algorithm.
1504 \define@cmdkey{@ACM@topmatter@}[@ACM@]{authorssperrow}[0]{%
1505   \IfInteger{#1}{\ClassInfo{\@classname}{Setting authorssperrow to
1506     #1}}{\ClassWarning{\@classname}{The parameter authorssperrow must be
1507     numerical. Ignoring the input #1}}\gdef\@ACM@authorssperrow{0}}

\settopmatter The usual syntactic sugar
1508 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}

Now the settings
1509 \settopmatter{printccs=true, printacmref=true}
1510 \if@ACM@manuscript
1511   \settopmatter{printfolios=true}
1512 \else
1513   \if@ACM@journal
1514     \settopmatter{printfolios=true}
1515   \else

```

```

1516 \settopmatter{printfolios=false}
1517 \fi
1518 \fi
1519 \settopmatter{authorsperrow=0}

\@received The container for the paper history
1520 \def\@received{}

\received The \received command
1521 \newcommand\received[2][\def\@tempa{#1}%
1522 \ifx\@tempa\@empty
1523 \ifx\@received\@empty
1524 \gdef\@received{Received #2}%
1525 \else
1526 \g@addto@macro{\@received}{; revised #2}%
1527 \fi
1528 \else
1529 \ifx\@received\@empty
1530 \gdef\@received{#1 #2}%
1531 \else
1532 \g@addto@macro{\@received}{; #1 #2}%
1533 \fi
1534 \fi}
1535 \AtEndDocument{%
1536 \ifx\@received\@empty\else
1537 \par\bigskip\noindent\small\normalfont\@received\par
1538 \fi}

```

### 3.13 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```

1539 \RequirePackage{comment}
1540 \excludecomment{CCSXML}

\@concepts This is the storage macro and counter for concepts
1541 \let\@concepts\@empty
1542 \newcounter{@concepts}

\ccsdesc The first argument is the significance, the second is the concept(s)
1543 \newcommand\ccsdesc[2][100]{%
1544 \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!
1545 \def\textrightarrow{\rightarrow}
1546 \def\ccsdesc@parse#1~#2~#3~{%
1547 \stepcounter{@concepts}%
1548 \expandafter\ifx\csname CCS@General@#2\endcsname\relax
1549 \expandafter\gdef\csname CCS@General@#2\endcsname{\textbullet\
1550 \textbf{#2}}%
1551 \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{; }%
1552 \expandafter\gdef\csname CCS@Specific@#2\endcsname{}%
1553 \g@addto@macro{\@concepts}{\csname CCS@General@#2\endcsname

```

```

1554 \csname CCS@Punctuation@#2\endcsname
1555 \csname CCS@Specific@#2\endcsname}%
1556 \fi
1557 \ifx#3\relax\relax\else
1558 \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{
1559 \textrightarrow\ }%
1560 \expandafter\g@addto@macro\expandafter{\csname CCS@Specific@#2\endcsname}{%
1561 \addtocounter{@concepts}{-1}%
1562 \ifnum#1>499\textbf{#3}\else
1563 \ifnum#1>299\textit{#3}\else
1564 #3\fi\fi\ifnum\value{@concepts}=0.\else; \fi}%
1565 \fi
1566 \ccsdesc@parse@finish}

1567 \AtEndDocument{\if@ACM@nonacm\else\ifx\@concepts\empty\relax
1568 \ifnum\getrefnumber{TotPages}>2\relax
1569 \ClassWarningNoLine{\@classname}{CCS concepts are mandatory
1570 for papers over two pages}%
1571 \fi\fi\fi}

```

```

\ccdesc@parse@finish Gobble everything to \ccsdesc@parse@end
1572 \def\ccsdesc@parse@finish#1\ccsdesc@parse@end{}

```

### 3.14 Copyright system

This is from acmcopyright.sty

```

\if@printcopyright Whether to print a copyright symbol
1573 \newif\if@printcopyright
1574 \@printcopyrighttrue

\if@printpermission Whether to print the permission block
1575 \newif\if@printpermission
1576 \@printpermissiontrue

\if@acmowned Whether the ACM owns the rights to the paper
1577 \newif\if@acmowned
1578 \@acmownedtrue

```

Keys:

```

1579 \define@choicekey*{ACM@}{acmcopyrightmode}[%
1580 \acm@copyrightinput\acm@copyrightmode]{none,%
1581 acmcopyright,acmlicensed,rightsretained,%
1582 usgov,usgovmixed,cagov,cagovmixed,licensedusgovmixed,%
1583 licensedcagov,licensedcagovmixed,othergov,licensedothergov,%
1584 iw3c2w3,iw3c2w3g}{%
1585 \@printpermissiontrue
1586 \@printcopyrighttrue
1587 \@acmownedtrue
1588 \ifnum\acm@copyrightmode=0\relax % none
1589 \@printpermissionfalse
1590 \@printcopyrightfalse
1591 \@acmownedfalse

```

```

1592 \fi
1593 \ifnum\acm@copyrightmode=2\relax % acmlicensed
1594 \@acmownedfalse
1595 \fi
1596 \ifnum\acm@copyrightmode=3\relax % rightsretained
1597 \@acmownedfalse
1598 \AtBeginDocument{\acmPrice{}}%
1599 \fi
1600 \ifnum\acm@copyrightmode=4\relax % usgov
1601 \@printpermissiontrue
1602 \@printcopyrightfalse
1603 \@acmownedfalse
1604 \AtBeginDocument{\acmPrice{}}%
1605 \fi
1606 \ifnum\acm@copyrightmode=6\relax % cagov
1607 \@acmownedfalse
1608 \fi
1609 \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1610 \@acmownedfalse
1611 \fi
1612 \ifnum\acm@copyrightmode=9\relax % licensedcagov
1613 \@acmownedfalse
1614 \fi
1615 \ifnum\acm@copyrightmode=10\relax % licensedcagovmixed
1616 \@acmownedfalse
1617 \fi
1618 \ifnum\acm@copyrightmode=11\relax % othergov
1619 \@acmownedtrue
1620 \fi
1621 \ifnum\acm@copyrightmode=12\relax % licensedothergov
1622 \@acmownedfalse
1623 \fi
1624 \ifnum\acm@copyrightmode=13\relax % iw3c2w3
1625 \@acmownedfalse
1626 \AtBeginDocument{\acmPrice{}}%
1627 \fi
1628 \ifnum\acm@copyrightmode=14\relax % iw3c2w3g
1629 \@acmownedfalse
1630 \AtBeginDocument{\acmPrice{}}%
1631 \fi}

```

\setcopyright This is the syntactic sugar around setting keys.

```

1632 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
1633 \setcopyright{acmcopyright}

```

\@copyrightowner Here is the owner of the copyright

```

1634 \def\@copyrightowner{%
1635 \ifcase\acm@copyrightmode\relax % none
1636 \or % acmcopyright
1637 Association for Computing Machinery.
1638 \or % acmlicensed
1639 Copyright held by the owner/author(s). Publication rights licensed to
1640 ACM\@.
1641 \or % rightsretained

```

1642 Copyright held by the owner/author(s).  
 1643 \or % usgov  
 1644 \or % usgovmixed  
 1645 Association for Computing Machinery.  
 1646 \or % cagov  
 1647 Crown in Right of Canada.  
 1648 \or %cagovmixed  
 1649 Association for Computing Machinery.  
 1650 \or %licensedusgovmixed  
 1651 Copyright held by the owner/author(s). Publication rights licensed to  
 1652 ACM\@.  
 1653 \or % licensedcagov  
 1654 Crown in Right of Canada. Publication rights licensed to  
 1655 ACM\@.  
 1656 \or %licensedcagovmixed  
 1657 Copyright held by the owner/author(s). Publication rights licensed to  
 1658 ACM\@.  
 1659 \or % othergov  
 1660 Association for Computing Machinery.  
 1661 \or % licensedothergov  
 1662 Copyright held by the owner/author(s). Publication rights licensed to  
 1663 ACM\@.  
 1664 \or % ic2w3www  
 1665 IW3C2 (International World Wide Web Conference Committee), published  
 1666 under Creative Commons CC-BY~4.0 License.  
 1667 \or % ic2w3wwwgoogle  
 1668 IW3C2 (International World Wide Web Conference Committee), published  
 1669 under Creative Commons CC-BY-NC-ND~4.0 License.  
 1670 \fi}

\@formatdoi Print a clickable DOI

1671 \def\@formatdoi#1{\url{https://doi.org/#1}}

\@copyrightpermission The canned permission block.

1672 \def\@copyrightpermission{%  
 1673 \ifcase\acm@copyrightmode\relax % none  
 1674 \or % acmcopyright  
 1675 Permission to make digital or hard copies of all or part of this  
 1676 work for personal or classroom use is granted without fee provided  
 1677 that copies are not made or distributed for profit or commercial  
 1678 advantage and that copies bear this notice and the full citation on  
 1679 the first page. Copyrights for components of this work owned by  
 1680 others than ACM must be honored. Abstracting with credit is  
 1681 permitted. To copy otherwise, or republish, to post on servers or to  
 1682 redistribute to lists, requires prior specific permission  
 1683 and\hspace\*{.5pt}/or a fee. Request permissions from  
 1684 permissions@acm.org.  
 1685 \or % acmlicensed  
 1686 Permission to make digital or hard copies of all or part of this  
 1687 work for personal or classroom use is granted without fee provided  
 1688 that copies are not made or distributed for profit or commercial  
 1689 advantage and that copies bear this notice and the full citation on  
 1690 the first page. Copyrights for components of this work owned by  
 1691 others than the author(s) must be honored. Abstracting with credit

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 1693 or to redistribute to lists, requires prior specific permission  
 1694 and\hspace\*{.5pt}/or a fee. Request permissions from  
 1695 permissions@acm.org.  
 1696 \or % rightsretained  
 1697 Permission to make digital or hard copies of part or all of this work  
 1698 for personal or classroom use is granted without fee provided that  
 1699 copies are not made or distributed for profit or commercial advantage  
 1700 and that copies bear this notice and the full citation on the first  
 1701 page. Copyrights for third-party components of this work must be  
 1702 honored. For all other uses, contact the  
 1703 owner\hspace\*{.5pt}/author(s).  
 1704 \or % usgov  
 1705 This paper is authored by an employee(s) of the United States  
 1706 Government and is in the public domain. Non-exclusive copying or  
 1707 redistribution is allowed, provided that the article citation is  
 1708 given and the authors and agency are clearly identified as its  
 1709 source.  
 1710 \or % usgovmixed  
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 1712 by an employee, contractor, or affiliate of the United States  
 1713 government. As such, the United States government retains a  
 1714 nonexclusive, royalty-free right to publish or reproduce this  
 1715 article, or to allow others to do so, for government purposes only.  
 1716 \or % cagov  
 1717 This article was authored by employees of the Government of Canada.  
 1718 As such, the Canadian government retains all interest in the  
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 1721 others to do so, provided that clear attribution is given both to  
 1722 the authors and the Canadian government agency employing them.  
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 1724 use is granted. Copies must bear this notice and the full citation  
 1725 on the first page. Copyrights for components of this work owned by  
 1726 others than the Canadian Government must be honored. To copy  
 1727 otherwise, distribute, republish, or post, requires prior specific  
 1728 permission and\hspace\*{.5pt}/or a fee. Request permissions from  
 1729 permissions@acm.org.  
 1730 \or % cagovmixed  
 1731 ACM acknowledges that this contribution was co-authored by an  
 1732 affiliate of the national government of Canada. As such, the Crown  
 1733 in Right of Canada retains an equal interest in the copyright.  
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 1739 To copy otherwise, distribute, republish, or post, requires prior  
 1740 specific permission and\hspace\*{.5pt}/or a fee. Request permissions  
 1741 from permissions@acm.org.  
 1742 \or % licensedusgovmixed  
 1743 Publication rights licensed to ACM\@. ACM acknowledges that this  
 1744 contribution was authored or co-authored by an employee, contractor  
 1745 or affiliate of the United States government. As such, the

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 1747 reproduce this article, or to allow others to do so, for Government  
 1748 purposes only.  
 1749 \or % licensedcagov  
 1750 This article was authored by employees of the Government of Canada.  
 1751 As such, the Canadian government retains all interest in the  
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 1753 royalty-free right to publish or reproduce this article, or to allow  
 1754 others to do so, provided that clear attribution is given both to  
 1755 the authors and the Canadian government agency employing them.  
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 1757 use is granted. Copies must bear this notice and the full citation  
 1758 on the first page. Copyrights for components of this work owned by  
 1759 others than the Canadian Government must be honored. To copy  
 1760 otherwise, distribute, republish, or post, requires prior specific  
 1761 permission and\hspace\*{.5pt}/or a fee. Request permissions from  
 1762 permissions@acm.org.  
 1763 \or % licensedcagovmixed  
 1764 Publication rights licensed to ACM\@. ACM acknowledges that this  
 1765 contribution was authored or co-authored by an employee, contractor  
 1766 or affiliate of the national government of Canada. As such, the  
 1767 Government retains a nonexclusive, royalty-free right to publish or  
 1768 reproduce this article, or to allow others to do so, for Government  
 1769 purposes only.  
 1770 \or % othergov  
 1771 ACM acknowledges that this contribution was authored or co-authored  
 1772 by an employee, contractor or affiliate of a national government. As  
 1773 such, the Government retains a nonexclusive, royalty-free right to  
 1774 publish or reproduce this article, or to allow others to do so, for  
 1775 Government purposes only.  
 1776 \or % licensedothergov  
 1777 Publication rights licensed to ACM\@. ACM acknowledges that this  
 1778 contribution was authored or co-authored by an employee, contractor  
 1779 or affiliate of a national government. As such, the Government  
 1780 retains a nonexclusive, royalty-free right to publish or reproduce  
 1781 this article, or to allow others to do so, for Government purposes  
 1782 only.  
 1783 \or % iw3c2w3  
 1784 This paper is published under the Creative Commons Attribution~4.0  
 1785 International (CC-BY~4.0) license. Authors reserve their rights to  
 1786 disseminate the work on their personal and corporate Web sites with  
 1787 the appropriate attribution.  
 1788 \or % iw3c2w3g  
 1789 This paper is published under the Creative Commons  
 1790 Attribution-NonCommercial-NoDerivs~4.0 International  
 1791 (CC-BY-NC-ND~4.0) license. Authors reserve their rights to  
 1792 disseminate the work on their personal and corporate Web sites with  
 1793 the appropriate attribution.  
 1794 \fi}

\copyrightyear By default, the copyright year is the same as \acmYear, but one can override this:  
 1795 \def\copyrightyear#1{\def\@copyrightyear{#1}}  
 1796 \copyrightyear{\@acmYear}



`\@teaserfigures` The teaser figures container  
1797 `\def\@teaserfigures{}`

`teaserfigure` The teaser figure  
1798 `\newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}`

`\@saveteaser` Saving the teaser  
1799 `\long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}`

`\thanks` We redefine `amsart \thanks` so the anonymous key works  
1800 `\renewcommand{\thanks}[1]{%`  
1801 `\@ifnotempty{#1}{%`  
1802 `\if@ACM@anonymous`  
1803 `\g@addto@macro\thankses{\thanks{A note}}%`  
1804 `\else`  
1805 `\g@addto@macro\thankses{\thanks{#1}}%`  
1806 `\fi}}`

`\anon` We provide `\anon` command, which blinds parts of the text if the package option `anonymous` is set  
1807 `\newcommand{\anon}[2][ANONYMIZED]{%`  
1808 `\if@ACM@anonymous%`  
1809 `{\color{ACMOrange}#1}%`  
1810 `\else%`  
1811 `#2%`  
1812 `\fi}`

### 3.15 Maketitle hook

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

`\@beginmaketitlehook` The hook  
1813 `\ifx\@beginmaketitlehook\@undefined`  
1814 `\let\@beginmaketitlehook\@empty`  
1815 `\fi`

`\AtBeginMaketitle` Adding to the hook  
1816 `\def\AtBeginMaketitle{\g@addto@macro\@beginmaketitlehook}`

### 3.16 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⟩]`.  
1817 `\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.

```

1818 \def\maketitle{\@beginmaketitlehook
1819 \@ACM@maketitle@typesettrue
1820 \if@ACM@anonymous
1821 % Anonymize omission of \author-s
1822 \ifnum\num@authorgroups=0\author{}\fi
1823 \fi
1824 \beginngroup
1825 \let\@vspace\@vspace@orig
1826 \let\@vspacer\@vspacer@orig
1827 \let\@footnotemark\@footnotemark@nolink
1828 \let\@footnotetext\@footnotetext@nolink
1829 \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1830 \hsize=\textwidth
1831 \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1832 \mktitle\if@ACM@sigchiamode\else\mkauthors\fi\mkteasers
1833 \@printtopmatter
1834 \if@ACM@sigchiamode\mkauthors\fi
1835 \setcounter{footnote}{0}%
1836 \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1837 \@titlenotes
1838 \@subtitlenotes
1839 \@authornotes
1840 \let\@makefnmark\relax
1841 \let\@thefnmark\relax
1842 \let\@makefntext\noindent
1843 \ifx\@empty\thankses\else
1844 \footnotetextauthorsaddresses{%
1845 \def\par{\let\par\@par}\parindent\z@\@setthanks}%
1846 \fi
1847 \ifx\@empty\authorsaddresses\else
1848 \if@ACM@anonymous\else
1849 \if@ACM@journal@bibstrip
1850 \footnotetextauthorsaddresses{%
1851 \def\par{\let\par\@par}\parindent\z@\@setauthorsaddresses}%
1852 \fi
1853 \fi
1854 \fi
1855 \if@ACM@nonacm\else\footnotetextcopyrightpermission{%
1856 \if@ACM@authordraft
1857 \raisebox{-2ex}[\z@][\z@]{\makebox[0pt][l]{\large\bfseries
1858 Unpublished working draft. Not for distribution.}}%
1859 \color[gray]{0.9}%
1860 \fi
1861 \parindent\z@\parskip0.1\baselineskip
1862 \if@ACM@authorversion\else
1863 \if@printpermission\@copyrightpermission\par\fi
1864 \fi
1865 \if@ACM@manuscript\else
1866 \if@ACM@journal@bibstrip\else % Print the conference information
1867 {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
1868 \fi
1869 \fi
1870 \if@printcopyright
1871 \copyright\ \@copyrightyear\ \@copyrightowner\

```

```

1872 \else
1873 \@copyrightyear.\
1874 \fi
1875 \if@ACM@manuscript
1876 Manuscript submitted to ACM\
1877 \else
1878 \if@ACM@authorversion
1879 This is the author's version of the work. It is posted here for
1880 your personal use. Not for redistribution. The definitive Version
1881 of Record was published in
1882 \if@ACM@journal@bibstrip
1883 \emph{\@journalName}%
1884 \else
1885 \emph{\@acmBooktitle}%
1886 \fi
1887 \ifx\@acmDOI\@empty
1888 .
1889 \else
1890 , \@formatdoi{\@acmDOI}.
1891 \fi\
1892 \else
1893 \if@ACM@nonacm\else
1894 \if@ACM@journal@bibstrip
1895 \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1896 \ifx\@acmPrice\@empty\else\ $\@acmPrice\fi\
1897 \@formatdoi{\@acmDOI}%
1898 \else % Conference
1899 \ifx\@acmISBN\@empty\else ACM~ISBN~\@acmISBN
1900 \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\fi
1901 \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi%
1902 \fi
1903 \fi
1904 \fi
1905 \fi}
1906 \fi
1907 \endgroup
1908 \setcounter{footnote}{0}%
1909 \@mkabstract
1910 \if@ACM@printccs
1911 \ifx\@concepts\@empty\else\bgroup
1912 {\@specialsection{CCS Concepts}}%
1913 \noindent\@concepts\par\egroup
1914 \fi
1915 \fi
1916 \ifx\@keywords\@empty\else\bgroup
1917 {\if@ACM@journal
1918 \@specialsection{Additional Key Words and Phrases}}%
1919 \else
1920 \@specialsection{Keywords}}%
1921 \fi
1922 \noindent\@keywords\par\egroup
1923 \fi
1924 \let\metadata@authors=\authors
1925 \xandlist{, }, }, }\metadata@authors

```

```

1926 \def\@ACM@checkaffil{%
1927 \hypersetup{%
1928   pdfauthor={\metadata@authors},
1929   pdftitle={\@title},
1930   pdfsubject={\@concepts},
1931   pdfkeywords={\@keywords},
1932   pdfcreator={LaTeX with acmart
1933     \csname ver@acmart.cls\endcsname\space
1934     and hyperref
1935     \csname ver@hyperref.sty\endcsname}}%
1936 \andify\authors
1937 \andify\shortauthors
1938 \global\let\authors=\authors
1939 \global\let\shortauthors=\shortauthors
1940 \if@ACM@printacmref
1941   \mkbibcitation
1942 \fi
1943 \global\@topnum\z@ % this prevents floats from falling
1944                   % at the top of page 1
1945 \global\@botnum\z@ % we do not want them to be on the bottom either
1946 \@printendtopmatter
1947 \@afterindentfalse
1948 \@afterheading
1949 }

```

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

```

1950 \def\@specialsection#1{%
1951   \let\@vspace\@vspace@orig
1952   \let\@vspacer\@vspacer@orig
1953   \ifcase\ACM@format@nr
1954     \relax % manuscript
1955     \par\medskip\small\noindent#1: %
1956     \or % acmsmall
1957     \par\medskip\small\noindent#1: %
1958     \or % acmlarge
1959     \par\medskip\small\noindent#1: %
1960     \or % acmtog
1961     \par\medskip\small\noindent#1: %
1962     \or % sigconf
1963     \section*{#1}%
1964     \or % siggraph
1965     \section*{#1}%
1966     \or % sigplan
1967     \noindentparagraph*{#1:~}%
1968     \or % sigchi
1969     \section*{#1}%
1970     \or % sigchi-a
1971     \section*{#1}%
1972     \fi
1973   \let\@vspace\@vspace@acm
1974   \let\@vspacer\@vspacer@acm
1975 }

```

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

for sigchi-a we print badges here rather than in \mktitle since we want them in the margins.

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.

```

1976 \def\@printtopmatter{%
1977   \ifx\@startPage\empty
1978     \gdef\@startPage{1}%
1979   \else
1980     \setcounter{page}{\@startPage}%
1981   \fi
1982   \@tempdima=\ht\mktitle@bx
1983   \advance\@tempdima by \dp\mktitle@bx
1984   \ifdim\@tempdima>0.9\textheight
1985     \loop
1986       \setbox\@tempboxa=\vsplit \mktitle@bx to 0.9\textheight
1987       \thispagestyle{firstpagestyle}%
1988       \noindent\unvbox\@tempboxa
1989       \clearpage
1990       \@tempdima=\ht\mktitle@bx
1991       \advance\@tempdima by \dp\mktitle@bx
1992       \ifdim\@tempdima>0.9\textheight\repeat
1993   \fi
1994   \thispagestyle{firstpagestyle}%
1995   \noindent
1996   \ifcase\ACM@format@nr
1997   \relax % manuscript
1998     \box\mktitle@bx\par
1999   \or % acmsmall
2000     \box\mktitle@bx\par
2001   \or % acmlarge
2002     \box\mktitle@bx\par
2003   \or % acmtog
2004     \twocolumn[\box\mktitle@bx]%
2005   \or % sigconf
2006     \twocolumn[\box\mktitle@bx]%
2007   \or % siggraph
2008     \twocolumn[\box\mktitle@bx]%
2009   \or % sigplan
2010     \twocolumn[\box\mktitle@bx]%
2011   \or % sigchi
2012     \twocolumn[\box\mktitle@bx]%
2013   \or % sigchi-a
2014     \par\box\mktitle@bx\par\bigskip
2015     \if@ACM@badge
2016       \marginpar{\noindent
2017         \ifx\@acmBadgeL@image\empty\else
2018           \href{\@acmBadgeL@url}{%
2019             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
2020           \hskip\@ACM@badge@skip
2021         \fi
2022         \ifx\@acmBadgeR@image\empty\else
2023           \href{\@acmBadgeR@url}{%

```

```

2024             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
2025             \fi}%
2026         \fi
2027     \fi
2028 }

\@mktitle The title of the article
2029 \def\@mktitle{%
2030     \ifcase\ACM@format@nr
2031     \relax % manuscript
2032         \@mktitle@i
2033     \or % acmsmall
2034         \@mktitle@i
2035     \or % acmlarge
2036         \@mktitle@i
2037     \or % acmtog
2038         \@mktitle@i
2039     \or % sigconf
2040         \@mktitle@iii
2041     \or % siggraph
2042         \@mktitle@iii
2043     \or % sigplan
2044         \@mktitle@iii
2045     \or % sigchi
2046         \@mktitle@iii
2047     \or % sigchi-a
2048         \@mktitle@iv
2049     \fi
2050 }

\@titlefont The font to typeset the title
2051 \def\@titlefont{%
2052     \ifcase\ACM@format@nr
2053     \relax % manuscript
2054         \LARGE\sffamily\bfseries
2055     \or % acmsmall
2056         \LARGE\sffamily\bfseries
2057     \or % acmlarge
2058         \LARGE\sffamily\bfseries
2059     \or % acmtog
2060         \Huge\sffamily
2061     \or % sigconf
2062         \Huge\sffamily\bfseries
2063     \or % siggraph
2064         \Huge\sffamily\bfseries
2065     \or % sigplan
2066         \Huge\bfseries
2067     \or % sigchi
2068         \Huge\sffamily\bfseries
2069     \or % sigchi-a
2070         \Huge\bfseries
2071     \fi}

\@subtitlefont The font to typeset the subtitle

```

```

2072 \def\@subtitlefont{\normalsize
2073 \ifcase\ACM@format@nr
2074 \relax % manuscript
2075 \mdseries
2076 \or % acmsmall
2077 \mdseries
2078 \or % acmlarge
2079 \mdseries
2080 \or % acmtog
2081 \LARGE
2082 \or % sigconf
2083 \LARGE\mdseries
2084 \or % siggraph
2085 \LARGE\mdseries
2086 \or % sigplan
2087 \LARGE\mdseries
2088 \or % sigchi
2089 \LARGE\mdseries
2090 \or % sigchi-a
2091 \mdseries
2092 \fi}

```

\@mktitle@i The version of \mktitle for most journals

```

2093 \def\@mktitle@i{\hsize=\textwidth
2094 \@ACM@title@width=\hsize
2095 \ifx\@acmBadgeL@image\@empty\else
2096 \advance\@ACM@title@width by -\@ACM@badge@width
2097 \advance\@ACM@title@width by -\@ACM@badge@skip
2098 \fi
2099 \ifx\@acmBadgeR@image\@empty\else
2100 \advance\@ACM@title@width by -\@ACM@badge@width
2101 \advance\@ACM@title@width by -\@ACM@badge@skip
2102 \fi
2103 \setbox\mktitle@bx=\vbox{\noindent\@titlefont
2104 \ifx\@acmBadgeL@image\@empty\else
2105 \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
2106 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
2107 \hskip\@ACM@badge@skip
2108 \fi
2109 \parbox[t]{\@ACM@title@width}{\raggedright
2110 \@titlefont\noindent
2111 \@title
2112 \ifx\@subtitle\@empty\else
2113 \par\noindent{\@subtitlefont\@subtitle}
2114 \fi}%
2115 \ifx\@acmBadgeR@image\@empty\else
2116 \hskip\@ACM@badge@skip
2117 \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
2118 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
2119 \fi
2120 \par\bigskip}}%

```

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

`\@mktitle@iii` The version of `\@mktitle` for SIG proceedings. Note that since the title is centered, we leave space for the left badge even if only the right badge is defined.

```

2121 \def\@mktitle@iii{\hsize=\textwidth
2122   \setbox\mktitle@bx=\vbox{\@titlefont\centering
2123     \@ACM@title@width=\hsize
2124     \if@ACM@badge
2125       \advance\@ACM@title@width by -2\@ACM@badge@width
2126       \advance\@ACM@title@width by -2\@ACM@badge@skip
2127       \parbox[b]{\@ACM@badge@width}{\strut
2128         \ifx\@acmBadgeL@image\@empty\else
2129           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
2130             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
2131         \fi}%
2132       \hskip\@ACM@badge@skip
2133     \fi
2134     \parbox[t]{\@ACM@title@width}{\centering\@titlefont
2135       \@title
2136       \ifx\@subtitle\@empty\else
2137         \par\noindent{\@subtitlefont\@subtitle}
2138       \fi
2139     }%
2140     \if@ACM@badge
2141       \hskip\@ACM@badge@skip
2142       \parbox[b]{\@ACM@badge@width}{\strut
2143         \ifx\@acmBadgeR@image\@empty\else
2144           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
2145             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
2146         \fi}%
2147     \fi
2148     \par\bigskip}}%

```

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

```

2149 \def\@mktitle@iv{\hsize=\textwidth
2150   \setbox\mktitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
2151     \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
2152     \noindent\@title
2153     \ifx\@subtitle\@empty\else
2154       \par\noindent\@subtitlefont\@subtitle
2155     \fi
2156     \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.

```

2157 \newbox\@ACM@commabox
2158 \def\@ACM@addtoaddress#1{%
2159   \ifvmode\else
2160     \if@ACM@affiliation@obeypunctuation\else
2161       \setbox\@ACM@commabox=\hbox{, }%

```



```

2162 \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
2163 \fi\fi
2164 #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 2165 \def\streetaddress#1{\unskip\ignorespaces}
\city 2166 \def\postcode#1{\unskip\ignorespaces}
\state 2167 \if@ACM@journal
\postcode 2168 \def\position#1{\unskip\ignorespaces}
\country 2169 \def\institution#1{\global\@ACM@instpresenttrue
2170 \unskip~#1\ignorespaces}
2171 \def\city#1{\global\@ACM@citypresenttrue\unskip\ignorespaces}
2172 \def\state#1{\unskip\ignorespaces}
2173 \newcommand\department[2][0]{\unskip\ignorespaces}
2174 \def\country#1{\global\@ACM@countrypresenttrue
2175 \if@ACM@affiliation@obeypunctuation\else, \fi#1\ignorespaces}
2176 \else
2177 \def\position#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
2178 \def\institution#1{\global\@ACM@instpresenttrue
2179 \if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
2180 \newcommand\department[2][0]{\if@ACM@affiliation@obeypunctuation
2181 #2\else#2\par\fi}%
2182 % \def\streetaddress#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
2183 \def\city#1{\global\@ACM@citypresenttrue\@ACM@addtoaddress{#1}}%
2184 \let\state\@ACM@addtoaddress
2185 % \def\postcode#1{\if@ACM@affiliation@obeypunctuation#1\else\unskip\space#1\fi}%
2186 \def\country#1{\global\@ACM@countrypresenttrue\@ACM@addtoaddress{#1}}%
2187 \fi

\@mkauthors Typesetting the authors
2188 \def\@mkauthors{\begingroup
2189 \hsize=\textwidth
2190 \ifcase\ACM@format@nr
2191 \relax % manuscript
2192 \@mkauthors@i
2193 \or % acmsmall
2194 \@mkauthors@i
2195 \or % acmlarge
2196 \@mkauthors@i
2197 \or % acmtog
2198 \@mkauthors@i
2199 \or % sigconf
2200 \@mkauthors@iii
2201 \or % siggraph
2202 \@mkauthors@iii
2203 \or % sigplan
2204 \@mkauthors@iii
2205 \or % sigchi
2206 \@mkauthors@iii
2207 \or % sigchi-a
2208 \@mkauthors@iv
2209 \fi

```

```

2210 \endgroup
2211 }

\@authorfont Somehow different conferences use different fonts for author names. Why?
2212 \def\@authorfont{\Large\sffamily}

\@affiliationfont Font for affiliations
2213 \def\@affiliationfont{\normalsize\normalfont}

Adjusting fonts for different formats
2214 \ifcase\ACM@format@nr
2215 \relax % manuscript
2216 \or % acmsmall
2217 \def\@authorfont{\large\sffamily}
2218 \def\@affiliationfont{\small\normalfont}
2219 \or % acmlarge
2220 \or % acmtog
2221 \def\@authorfont{\LARGE\sffamily}
2222 \def\@affiliationfont{\large}
2223 \or % sigconf
2224 \def\@authorfont{\LARGE}
2225 \def\@affiliationfont{\large}
2226 \or % siggraph
2227 \def\@authorfont{\normalsize\normalfont}
2228 \def\@affiliationfont{\normalsize\normalfont}
2229 \or % sigplan
2230 \def\@authorfont{\Large\normalfont}
2231 \def\@affiliationfont{\normalsize\normalfont}
2232 \or % sigchi
2233 \def\@authorfont{\bfseries}
2234 \def\@affiliationfont{\mdseries}
2235 \or % sigchi-a
2236 \def\@authorfont{\bfseries}
2237 \def\@affiliationfont{\mdseries}
2238 \fi

\@typeset@author@line At this point we have \@currentauthors and \@currentaffiliations. We typeset
them in the journal style
2239 \def\@typeset@author@line{%
2240 \andify\@currentauthors\par\noindent
2241 \@currentauthors\def\@currentauthors{}%
2242 \ifx\@currentaffiliations\@empty\else
2243 \andify\@currentaffiliations
2244 \unskip, {\@currentaffiliations}\par
2245 \fi
2246 \def\@currentaffiliations{}}

\if@ACM@instpresent Whether the given affiliation has institution
2247 \newif\if@ACM@instpresent
2248 \@ACM@instpresenttrue

\if@ACM@citypresent Whether the given affiliation has city
2249 \newif\if@ACM@citypresent
2250 \@ACM@citypresenttrue

```

```

\if@ACM@countrypresent Whether the given affiliation has country
2251 \newif\if@ACM@countrypresent
2252 \@ACM@countrypresenttrue

\@ACM@resetaffil Reset affiliation flags
2253 \def\@ACM@resetaffil{%
2254   \global\@ACM@instpresentfalse
2255   \global\@ACM@citypresentfalse
2256   \global\@ACM@countrypresentfalse
2257 }

\@ACM@checkaffil Check affiliation flags
2258 \def\@ACM@checkaffil{%
2259   \if@ACM@instpresent\else
2260     \ClassWarningNoLine{\@classname}{No institution present for an affiliation}%
2261     \fi
2262     \if@ACM@citypresent\else
2263       \ClassWarningNoLine{\@classname}{No city present for an affiliation}%
2264       \fi
2265     \if@ACM@countrypresent\else
2266       \ClassError{\@classname}{No country present for an affiliation}{ACM
2267         requires each author to indicate their country using country macro.}%
2268       \fi
2269 }

\@mkauthors@i This version is used in most journal formats. Note that \and between authors with the
same affiliation becomes _and_:
2270 \def\@mkauthors@i{%
2271   \def\@currentauthors{}%
2272   \def\@currentaffiliations{}%
2273   \global\let\and\@typeset@author@line
2274   \def\@author##1{%
2275     \ifx\@currentauthors\@empty
2276       \gdef\@currentauthors{\@authorfont\MakeTextUppercase{##1}}%
2277     \else
2278       \g@addto@macro{\@currentauthors}{\and\MakeTextUppercase{##1}}%
2279     \fi
2280     \gdef\and{}}%
2281   \def\email##1##2{%
2282     \def\affiliation##1##2{%
2283       \def\@tempa{##2}\ifx\@tempa\@empty\else
2284         \ifx\@currentaffiliations\@empty
2285           \gdef\@currentaffiliations{%
2286             \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2287             \setkeys{@ACM@affiliation@}{##1}%
2288             \@ACM@resetaffil
2289             \@affiliationfont##2\@ACM@checkaffil}%
2290           \else
2291             \g@addto@macro{\@currentaffiliations}{\and
2292               \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2293               \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2294               ##2\@ACM@checkaffil}%
2295             \fi

```

```

2296 \fi
2297 \global\let\and\@typeset@author@line}%
2298 \global\setbox\mktitle@bx=\vbox{\noindent\unvbox\mktitle@bx\par\medskip
2299 \noindent\addresses\@typeset@author@line
2300 \par\medskip}%
2301 }

```

`\@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  
2302 `\newbox\author@bx`

`\author@bx@wd` The width of the author box  
2303 `\newdimen\author@bx@wd`

`\author@bx@sep` The separation between author boxes  
2304 `\newskip\author@bx@sep`  
2305 `\author@bx@sep=1pc\relax`

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

```

2306 \def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd
2307 \def\and{\par}\normalbaselines
2308 \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
2309 \@authorfont\@currentauthors\par\@affiliationfont
2310 \@currentaffiliation}\egroup
2311 \box\author@bx\hspace{\author@bx@sep}%
2312 \gdef\@currentauthors{}}%
2313 \gdef\@currentaffiliation{}}

```

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

```

2314 \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.

```

2315 \author@bx@wd=\textwidth\relax
2316 \advance\author@bx@wd by -\author@bx@sep\relax
2317 \ifnum\@ACM@authorsperrrow>0\relax
2318 \divide\author@bx@wd by \@ACM@authorsperrrow\relax
2319 \else
2320 \ifcase\@num@authorgroups
2321 \relax % 0?
2322 \or % 1=one author per row
2323 \or % 2=two authors per row
2324 \divide\author@bx@wd by \@num@authorgroups\relax
2325 \or % 3=three authors per row
2326 \divide\author@bx@wd by \@num@authorgroups\relax
2327 \or % 4=two authors per row (!)
2328 \divide\author@bx@wd by 2\relax
2329 \else % three authors per row
2330 \divide\author@bx@wd by 3\relax
2331 \fi

```

```

2332 \fi
2333 \advance\author@bx@wd by -\author@bx@sep\relax
Now, parsing of \addresses:
2334 \gdef\@currentauthors{}%
2335 \gdef\@currentaffiliation{}%
2336 \def\@author##1{\ifx\@currentauthors\@empty
2337 \gdef\@currentauthors{\par##1}%
2338 \else
2339 \g@addto@macro\@currentauthors{\par##1}%
2340 \fi
2341 \gdef\and{}}%
2342 \def\email##1##2{\ifx\@currentaffiliation\@empty
2343 \gdef\@currentaffiliation{\bgroup
2344 \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2345 \else
2346 \g@addto@macro\@currentaffiliation{\par\bgroup
2347 \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2348 \fi}%
2349 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2350 \gdef\@currentaffiliation{%
2351 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2352 \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2353 ##2\@ACM@checkaffil}%
2354 \else
2355 \g@addto@macro\@currentaffiliation{\par
2356 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2357 \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2358 ##2\@ACM@checkaffil}%
2359 \fi
2360 \global\let\and\@typeset@author@bx
2361 }%

```

Actual typesetting is done by the \and macro:

```

2362 \hsize=\textwidth
2363 \global\setbox\mktitle@bx=\vbox{\noindent
2364 \unvbox\mktitle@bx\par\medskip\leavevmode
2365 \lineskip=1pc\relax\centering\hspace*{-1em}%
2366 \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.

```

2367 \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.

```

2368 \author@bx@wd=\columnwidth\relax
2369 \advance\author@bx@wd by -\author@bx@sep\relax
2370 \ifnum\@ACM@authorsperrrow>0\relax
2371 \divide\author@bx@wd by \@ACM@authorsperrrow\relax
2372 \else
2373 \ifcase\@num@authorgroups
2374 \relax % 0?

```

```

2375 \or % 1=one author per row
2376 \else % 2=two authors per row
2377 \divide\author@bx@wd by 2\relax
2378 \fi
2379 \fi
2380 \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of \addresses:

```

2381 \gdef\@currentauthors{}%
2382 \gdef\@currentaffiliation{}%
2383 \def\@author##1{\ifx\@currentauthors\@empty
2384 \gdef\@currentauthors{\par##1}%
2385 \else
2386 \g@addto@macro\@currentauthors{\par##1}%
2387 \fi
2388 \gdef\and{}}%
2389 \def\@email##1##2{\ifx\@currentaffiliation\@empty
2390 \gdef\@currentaffiliation{\nolinkurl{##2}}%
2391 \else
2392 \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
2393 \fi}%
2394 \def\@affiliation##1##2{\ifx\@currentaffiliation\@empty
2395 \gdef\@currentaffiliation{%
2396 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2397 \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2398 ##2\@ACM@checkaffil}%
2399 \else
2400 \g@addto@macro\@currentaffiliation{\par
2401 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2402 \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2403 ##2\@ACM@checkaffil}%
2404 \fi
2405 \global\let\and\@typeset@author@bx}%
2406 %

```

Actual typesetting is done by the \and macro

```

2407 \bgroup\hsize=\columnwidth
2408 \par\raggedright\leftskip=\z@
2409 \lineskip=1pc\noindent
2410 \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}

```

\@mkauthorsaddresses Typesetting authors' addresses in the footnote style

```

2411 \def\@mkauthorsaddresses{%
2412 \ifnum\@num@authors>1\relax
2413 Authors' \else Author's \fi
2414 \ifnum\@num@authorgroups>1\relax
2415 addresses: \else address: \fi
2416 \bgroup
2417 \def\streetaddress##1{\unskip, ##1}%
2418 \def\postcode##1{\unskip, ##1}%
2419 \def\position##1{\unskip\ignorespaces}%
2420 \gdef\@ACM@institution@separator{,}%
2421 \def\institution##1{\unskip\@ACM@institution@separator ##1\gdef\@ACM@institution@separator{ and }}
2422 \def\city##1{\unskip, ##1}%
2423 \def\state##1{\unskip, ##1}%

```

```

2424 \renewcommand\department[2][0]{\unskip\@addpunct, ##2}%
2425 \def\country##1{\unskip, ##1}%
2426 \def\and{\unskip; \gdef\@ACM@institution@separator{, }}%
2427 \def\@author##1{##1}%
2428 \def\email##1##2{\unskip, \nolinkurl{##2}}%
2429 \addresses
2430 \egroup}

2431 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@journal
2432 \ifx\@authorsaddresses\@empty
2433 \ClassWarningNoLine{\@classname}{Authors'
2434 addresses are mandatory for ACM journals}%
2435 \fi\fi\fi}

\@setaddresses This is an amsart macro that we do not need.
2436 \def\@setaddresses{}

\@authornotemark Adding a footnote mark to authors. This version adds a “normal” footnote mark.
2437 \def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark\relax}}

\@@authornotemark Adding a footnote mark to authors with a given number
2438 \def\@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}

\@mkteasers Typesetting the teasers
2439 \def\@mkteasers{%
2440 \ifx\@teaserfigures\@empty\else
2441 \def\@teaser##1{\par\bigskip\bgroup
2442 \captionsetup{type=figure}##1\egroup\par}
2443 \global\setbox\mktitle@bx=\vbox{\noindent\unvbox\mktitle@bx\par
2444 \noindent\@Description@presentfalse
2445 \@teaserfigures\par\if@Description@present\else
2446 \global\@undescrbed@imagestrue
2447 \ClassWarning{\@classname}{A possible image without
2448 description}\fi
2449 \medskip}%
2450 \fi}

\@mkabstract Typesetting the abstract
2451 \def\@mkabstract{\bgroup
2452 \ifx\@abstract\@empty\else
2453 {\phantomsection\addcontentsline{toc}{section}{Abstract}%
2454 \if@ACM@journal
2455 \everypar{\setbox\z@=\lastbox\everypar{}}\small
2456 \else
2457 \section*{\abstractname}%
2458 \fi
2459 \ignorespaces\@abstract\par}%
2460 \fi\egroup}

\@mkbibcitation Print the bibcitation format
2461 \def\@mkbibcitation{\bgroup
2462 \let\@vspace\@vspace@orig
2463 \let\@vspacer\@vspacer@orig
2464 \def\@pages@word{\ifnum\getrefnumber{TotPages}=1\relax page\else pages\fi}%

```

```

2465 \def\footnotemark{}%
2466 \def\{\unskip{} \ignorespaces}%
2467 \def\footnote{\ClassError{\@classname}{Please do not use footnotes
2468     inside a \string\title{} or \string\author{} command! Use
2469     \string\titlenote{} or \string\authornote{} instead!}}%
2470 \def\@article@string{\ifx\@acmArticle\@empty{\ } \else,
2471     Article~\@acmArticle\ } \fi}%
2472 \par\medskip\small\noindent{\bfseries ACM Reference Format:}\par\nobreak
2473 \noindent\bgroup
2474     \def\{\unskip{}, \ignorespaces}\authors\egroup. \@acmYear. \@title
2475 \ifx\@subtitle\@empty. \else: \@subtitle. \fi
2476 \if@ACM@nonacm\else
2477     % The 'nonacm' option disables 'printacmref' by default,
2478     % and the present \@mkbibcitation definition is never used
2479     % in this case. The conditional remains useful if the user
2480     % explicitly sets \settopmatter{printacmref=true}.
2481     \if@ACM@journal@bibstrip
2482         \textit{\@journalNameShort}
2483         \@acmVolume, \@acmNumber \@article@string (\@acmPubDate),
2484         \ref{TotPages}~\@pages@word.
2485     \else
2486         In \textit{\@acmBooktitle}%
2487         \ifx\@acmEditors\@empty\textit{.}\else
2488             \andify\@acmEditors\textit{, }\@acmEditors~\@editorsAbbrev.%
2489             \fi\
2490         ACM, New York, NY, USA%
2491         \@article@string\unskip, \ref{TotPages}~\@pages@word.
2492     \fi
2493 \fi
2494 \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
2495 \par\egroup}

```

\@printendtopmatter End the top matter

```

2496 \def\@printendtopmatter{%
2497     \let\@vspace\@vspace@orig
2498     \let\@vspacer\@vspacer@orig
2499     \par\bigskip
2500     \let\@vspace\@vspace@acm
2501     \let\@vspacer\@vspacer@acm
2502 }

```

\@setthanks We redefine \setthanks using \long

```

2503 \def\@setthanks{\long\def\thanks##1{\par##1\@addpunct.}\thankses}

```

\@setauthorsaddresses

```

2504 \def\@setauthorsaddresses{\@authorsaddresses\unskip\@addpunct.}

```

### 3.17 Headers and Footers

We use fancyhdr for our headers and footers:

```

2505 \RequirePackage{fancyhdr}

```

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



```

2506 \let\ACM@ps@plain\ps@plain
2507 \let\ACM@ps@myheadings\ps@myheadings
2508 \let\ACM@ps@headings\ps@headings
2509 \def\ACM@restore@pagestyle{%
2510   \let\ps@plain\ACM@ps@plain
2511   \let\ps@myheadings\ACM@ps@myheadings
2512   \let\ps@headings\ACM@ps@headings}
2513 \AtBeginDocument{\ACM@restore@pagestyle}

```

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

```

2514 \if@ACM@review
2515   \newsavebox{\ACM@linecount@bx}
2516   \newlength\ACM@linecount@bxht
2517   \newcount\ACM@linecount
2518   \ACM@linecount\@ne\relax
2519   \def\ACM@mk@linecount{%
2520     \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{\normalfont
2521       \normalsize
2522       \setlength{\ACM@linecount@bxht}{0pt}%
2523       \loop{\color{red}\scriptsize\the\ACM@linecount}\\
2524       \global\advance\ACM@linecount by \@ne
2525       \addtolength{\ACM@linecount@bxht}{\baselineskip}%
2526       \ifdim\ACM@linecount@bxht<\textheight\repeat
2527       {\color{red}\scriptsize\the\ACM@linecount}\hfill
2528       \global\advance\ACM@linecount by \@ne}}
2529   \fi

```

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

```

2530 \def\ACM@linecountL{%
2531   \if@ACM@review
2532     \ACM@mk@linecount
2533     \begin{picture}(0,0)%
2534       \put(-26,-22){\usebox{\ACM@linecount@bx}}%
2535     \end{picture}%
2536   \fi}

```

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

```

2537 \def\ACM@linecountR{%
2538   \if@ACM@review
2539     \ifcase\ACM@format@nr
2540       \relax % manuscript
2541       \relax
2542       \or % acmsmall
2543       \relax
2544       \or % acmlarge
2545       \relax
2546       \or % acmtog
2547       \ACM@mk@linecount
2548       \or % sigconf
2549       \ACM@mk@linecount
2550       \or % siggraph
2551       \ACM@mk@linecount
2552       \or % sigplan
2553       \ACM@mk@linecount

```

```

2554 \or % sigchi
2555 \ACM@mk@linecount
2556 \or % sigchi-a
2557 \ACM@mk@linecount
2558 \fi
2559 \begin{picture}(0,0)%
2560 \put(20,-22){\usebox{\ACM@linecount@bx}}%
2561 \end{picture}%
2562 \fi}

```

`\ACM@timestamp` The timestamp system

```

2563 \if@ACM@timestamp
2564 % Subtracting 30 from \time gives us the effect of rounding down despite
2565 % \numexpr rounding to nearest
2566 \newcounter{ACM@time@hours}
2567 \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
2568 \newcounter{ACM@time@minutes}
2569 \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
2570 \newcommand\ACM@timestamp{%
2571 \footnotesize%
2572 \ifx\@acmSubmissionID\@empty\relax\else
2573 Submission ID: \@acmSubmissionID.{ }%
2574 \fi
2575 \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
2576 \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{. }%
2577 Page \thepage of \@startPage--\pageref*{TotPages}.%
2578 }
2579 \fi

```

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

```

2580 \def\@shortauthors{%
2581 \if@ACM@anonymous
2582 Anon.
2583 \ifx\@acmSubmissionID\@empty\else Submission Id: \@acmSubmissionID\fi
2584 \else\shortauthors\fi}

```

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

```

2585 \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

```

2586 \AtBeginDocument{%
2587 \fancypagestyle{standardpagestyle}{%
2588 \fancyhf{}%
2589 \renewcommand{\headrulewidth}{\z@}%
2590 \renewcommand{\footrulewidth}{\z@}%
2591 \def\@acmArticlePage{%
2592 \ifx\@acmArticle\empty%
2593 \if@ACM@printfolios\thepage\fi%
2594 \else%
2595 \@acmArticle\if@ACM@printfolios:\thepage\fi%
2596 \fi%

```

```

2597 }%
2598 \if@ACM@journal@bibstrip
2599 \ifcase\ACM@format@nr
2600 \relax % manuscript
2601 \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
2602 \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
2603 \fancyhead[RE]{\@shortauthors}%
2604 \fancyhead[LO]{\ACM@linecountL\shorttitle}%
2605 \if@ACM@nonacm\else%
2606 \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}
2607 \fi%
2608 \or % acmsmall
2609 \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticlePage}%
2610 \fancyhead[RO]{\@headfootfont\@acmArticlePage}%
2611 \fancyhead[RE]{\@headfootfont\@shortauthors}%
2612 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2613 \if@ACM@nonacm\else%
2614 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2615 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2616 \fi
2617 \or % acmlarge
2618 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2619 \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2620 \fancyhead[LO]{\ACM@linecountL}%
2621 \fancyhead[RO]{\@headfootfont
2622 \shorttitle\quad\textbullet\quad\@acmArticlePage}%
2623 \if@ACM@nonacm\else%
2624 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2625 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2626 \fi
2627 \or % acmtog
2628 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2629 \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2630 \fancyhead[LO]{\ACM@linecountL}%
2631 \fancyhead[RE]{\ACM@linecountR}%
2632 \fancyhead[RO]{\@headfootfont
2633 \shorttitle\quad\textbullet\quad\@acmArticlePage\ACM@linecountR}%
2634 \if@ACM@nonacm\else%
2635 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2636 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2637 \fi
2638 \else % Proceedings
2639 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2640 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2641 \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2642 \if@ACM@nonacm
2643 \fancyhead[LE]{\ACM@linecountL}%
2644 \fancyhead[RO]{\ACM@linecountR}%
2645 \else%
2646 \fancyhead[LE]{\ACM@linecountL\@headfootfont\footnotesize
2647 \acmConference@shortname,
2648 \acmConference@date, \acmConference@venue}%
2649 \fancyhead[RO]{\@headfootfont
2650 \acmConference@shortname,

```

```

2651         \acmConference@date, \acmConference@venue\ACM@linecountR}%
2652     \fi
2653 \fi
2654 \else % Proceedings
2655     \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2656     \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2657     \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2658     \if@ACM@nonacm
2659         \fancyhead[LE]{\ACM@linecountL}%
2660         \fancyhead[RO]{\ACM@linecountR}%
2661     \else%
2662         \fancyhead[LE]{\ACM@linecountL\@headfootfont
2663             \acmConference@shortname,
2664             \acmConference@date, \acmConference@venue}%
2665         \fancyhead[RO]{\@headfootfont
2666             \acmConference@shortname,
2667             \acmConference@date, \acmConference@venue\ACM@linecountR}%
2668     \fi
2669 \fi
2670 \if@ACM@sigchiamode
2671     \fancyheadoffset[L]{\dimexpr\marginparsep+\marginparwidth}%
2672 \fi
2673 \if@ACM@timestamp
2674     \fancyfoot[LO,RE]{\ACM@timestamp}
2675 \fi
2676 }%
2677 \pagestyle{standardpagestyle}
2678 }

\@folio@wd Folio blob width, height, offsets and max number
\@folio@ht
\@folio@voffset
\@folio@max
2679 \newdimen\@folio@wd
2680 \@folio@wd=\z@
2681 \newdimen\@folio@ht
2682 \@folio@ht=\z@
2683 \newdimen\@folio@voffset
2684 \@folio@voffset=\z@
2685 \def\@folio@max{1}
2686 \ifcase\ACM@format@nr
2687 \relax % manuscript
2688 \or % acmsmall
2689     \@folio@wd=45.75pt\relax
2690     \@folio@ht=1.25in\relax
2691     \@folio@voffset=.2in\relax
2692     \def\@folio@max{8}
2693 \or % acmlarge
2694     \@folio@wd=43.25pt\relax
2695     \@folio@ht=79pt\relax
2696     \@folio@voffset=.55in\relax
2697     \def\@folio@max{10}
2698 \fi

\@folioblob The macro to typeset the folio blob.
2699 \def\@folioblob{\@tempcnta=0\@acmArticleSeq\relax
2700     \ifnum\@tempcnta=0\relax\else

```

First, we calculate \@acmArticleSeq modulo \@folio@max

```

2701 \loop
2702   \ifnum\@tempcnta>\@folio@max\relax
2703     \advance\@tempcnta by - \@folio@max
2704   \repeat

2705   \advance\@tempcnta by -1\relax
2706   \@tempdima=\@folio@ht\relax
2707   \multiply\@tempdima by \the\@tempcnta\relax
2708   \advance\@tempdima by -\@folio@voffset\relax
2709   \begin{picture}(0,0)
2710     \makebox[\z@]{\raisebox{-\@tempdima}{%
2711       \rlap{%
2712         \raisebox{-0.45\@folio@ht}{\z@}{\z@}{%
2713           \rule{\@folio@wd}{\@folio@ht}}}%
2714       \parbox{\@folio@wd}{%
2715         \centering
2716         \textcolor{white}{\LARGE\sffamily\bfseries\@acmArticle}}}}
2717   \end{picture}\fi}
2718

```

firstpagestyle The page style for the first page only.

```

2719 \AtBeginDocument{%
2720 \fancypagestyle{firstpagestyle}{%
2721   \fancyhf{}%
2722   \renewcommand{\headrulewidth}{\z@}%
2723   \renewcommand{\footrulewidth}{\z@}%
2724   \if@ACM@journal@bibstrip
2725     \ifcase\ACM@format@nr
2726     \relax % manuscript
2727     \fancyhead[L]{\ACM@linecountL}%
2728     \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
2729     \if@ACM@nonacm\else%
2730     \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
2731     \fi%
2732   \or % acmsmall
2733     \if@ACM@nonacm\else%
2734     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2735       \@acmNumber, Article \@acmArticle. Publication date:
2736       \@acmPubDate.}%
2737     \fi%
2738     \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2739     \fancyhead[LO]{\ACM@linecountL}%
2740     \fancyhead[RO]{\@folioblob}%
2741     \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
2742   \or % acmlarge
2743     \if@ACM@nonacm\else%
2744     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2745       \@acmNumber, Article \@acmArticle. Publication date:
2746       \@acmPubDate.}%
2747     \fi%
2748     \fancyhead[RO]{\@folioblob}%
2749     \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2750     \fancyhead[LO]{\ACM@linecountL}%

```

```

2751 \fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2752 \or % acmtog
2753 \if@ACM@nonacm\else%
2754 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2755 \@acmNumber, Article \@acmArticle. Publication date:
2756 \@acmPubDate.}%
2757 \fi%
2758 \fancyhead[L]{\ACM@linecountL}%
2759 \fancyhead[R]{\ACM@linecountR}%
2760 \else % Conference proceedings
2761 \fancyhead[L]{\ACM@linecountL}%
2762 \fancyhead[R]{\ACM@linecountR}%
2763 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2764 \fi
2765 \else
2766 \fancyhead[L]{\ACM@linecountL}%
2767 \fancyhead[R]{\ACM@linecountR}%
2768 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2769 \fi
2770 \if@ACM@timestamp
2771 \ifnum\ACM@format@nr=0\relax % Manuscript
2772 \fancyfoot[LO,RE]{\ACM@timestamp\quad
2773 \if@ACM@nonacm\else
2774 \footnotesize Manuscript submitted to ACM
2775 \fi}
2776 \else
2777 \fancyfoot[LO,RE]{\ACM@timestamp}
2778 \fi
2779 \fi
2780 }}

```

### 3.18 Sectioning

\ACM@NAdjust Ross Moore's macro.

Initially \ACM@sect@format@ just passes through its #1 argument unchanged. When a sectioning macro such as \section occurs, the \ACM@NAdjust 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@NAdjust. 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.

```

2781 \def\ACM@NRadjust#1{%
2782   \begingroup
2783   \expandafter\ifx\csname Sectionformat\endcsname\relax
2784     % do nothing when \Sectionformat is unknown
2785     \def\next{\endgroup #1}%
2786   \else
2787     \def\next{\endgroup
2788       \let\realSectionformat\Sectionformat
2789       \def\ACM@sect@format@{#1}%
2790       \let\Sectionformat\ACM@NR@adjustedSectionformat
2791       %% next lines added 2018-06-17 to ensure section number is styled
2792       \let\real@adddotafter\@adddotafter
2793       \let\@adddotafter\ACM@adddotafter
2794       #1}% imposes the styles, but nullifies \MakeUppercase
2795       \let\@adddotafter\real@adddotafter
2796     }%
2797   \fi \next
2798 }

```

\ACM@NR@adjustedSectionformat

```

2799 \def\ACM@NR@adjustedSectionformat#1#2{%
2800   \realSectionformat{\ACM@sect@format{#1}}{#2}%
2801   \let\Sectionformat\realSectionformat}
2802 \DeclareRobustCommand{\ACM@sect@format@}{\ACM@sect@format@}
2803 \def\ACM@sect@format@null#1{#1}
2804 \let\ACM@sect@format@null\ACM@sect@format@null
2805 \AtBeginDocument{%
2806   \expandafter\ifx\csname LTX@adddotafter\endcsname\relax
2807     \let\LTX@adddotafter\@adddotafter
2808   \fi
2809 }

```

\ACM@adddotafter

```

2810 \def\ACM@adddotafter#1{\ifx\relax#1\relax\else\LTX@adddotafter{#1}\fi}

```

Sectioning is different for different levels

```

2811 \renewcommand\section{\@startsection{section}{1}{\z@}%
2812   {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2813   {.25\baselineskip}%
2814   {\ACM@NRadjust\@secfont}}
2815 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2816   {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2817   {.25\baselineskip}%
2818   {\ACM@NRadjust\@subsecfont}}
2819 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2820   {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2821   {-3.5\p@}%
2822   {\ACM@NRadjust\@subsubsecfont\@adddotafter}}
2823 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
2824   {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2825   {-3.5\p@}%
2826   {\ACM@NRadjust\@parfont\@adddotafter}}
2827 \newcommand\noindentparagraph{\@startsection{paragraph}{4}{\z@}%
2828   {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%

```

```

2829 {-3.5\p@}%
2830 {\ACM@NRadjust{\@parfont}}}}
2831
2832 \renewcommand\part{\@startsection{part}{9}{\z@}%
2833 {-10\p@ \@plus -4\p@ \@minus -2\p@}%
2834 {4\p@}%
2835 {\ACM@NRadjust\@parfont}}

```

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

```

2836 \def\section@raggedright{\@rightskip\@flushglue
2837 \rightskip\@rightskip
2838 \leftskip\z@skip
2839 \parindent\z@}

```

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

```

\@subsecfont 2840 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
\@subsubsecfont 2841 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
\@parfont 2842 \def\@subsubsecfont{\sffamily\itshape}
2843 \def\@parfont{\itshape}
2844 \setcounter{secnumdepth}{3}
2845 \ifcase\ACM@format@nr
2846 \relax % manuscript
2847 \or % acmsmall
2848 \or % acmlarge
2849 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2850 \def\@subsecfont{\sffamily\large\section@raggedright}
2851 \or % acmtog
2852 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2853 \def\@subsecfont{\sffamily\large\section@raggedright}
2854 \or % sigconf
2855 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
2856 \def\@subsecfont{\bfseries\Large\section@raggedright}
2857 \or % siggraph
2858 \def\@secfont{\sffamily\bfseries\Large\section@raggedright\MakeTextUppercase}
2859 \def\@subsecfont{\sffamily\bfseries\Large\section@raggedright}
2860 \or % sigplan
2861 \def\@secfont{\bfseries\Large\section@raggedright}
2862 \def\@subsecfont{\bfseries\section@raggedright}
2863 \def\@subsubsecfont{\bfseries\section@raggedright}
2864 \def\@parfont{\bfseries\itshape}
2865 \def\@subparfont{\itshape}
2866 \or % sigchi
2867 \setcounter{secnumdepth}{1}
2868 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2869 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2870 \or % sigchi-a
2871 \setcounter{secnumdepth}{0}
2872 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2873 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2874 \fi

```

`\@adddotafter` Add punctuation after a sectioning command

```

2875 \def\@adddotafter#1{#1\@addpunct{.}}

```



`\@addspaceafter` Add space after a sectioning command  
2876 `\def\@addspaceafter#1{#1\@addpunct{\enspace}}`

### 3.19 TOC lists

`\@dotsep` Related to the `\tableofcontents` are all the horizontal fillers. Base  $\text{\LaTeX}$  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.  
2877 `\providecommand*\@dotsep{4.5}`

### 3.20 Theorems

`\@acmplainbodyfont` The font to typeset the body of the `acmplain` theorem style.  
2878 `\def\@acmplainbodyfont{\itshape}`

`\@acmplainindent` The amount to indent the `acmplain` theorem style.  
2879 `\def\@acmplainindent{\parindent}`

`\@acmplainheadfont` The font to typeset the head of the `acmplain` theorem style.  
2880 `\def\@acmplainheadfont{\scshape}`

`\@acmplainnotefont` The font to typeset the note of the `acmplain` theorem style.  
2881 `\def\@acmplainnotefont{\@empty}`

Customization of the `acmplain` theorem style:

```
2882 \ifcase\ACM@format@nr
2883 \relax % manuscript
2884 \or % acmsmall
2885 \or % acmlarge
2886 \or % acmtog
2887 \or % sigconf
2888 \or % siggraph
2889 \or % sigplan
2890 \def\@acmplainbodyfont{\itshape}
2891 \def\@acmplainindent{\z@}
2892 \def\@acmplainheadfont{\bfseries}
2893 \def\@acmplainnotefont{\normalfont}
2894 \or % sigchi
2895 \or % sigchi-a
2896 \fi
```

`acmplain` The `acmplain` theorem style

```
2897 \newtheoremstyle{acmplain}%
2898 { .5\baselineskip\@plus.2\baselineskip
2899 \@minus.2\baselineskip}% space above
2900 { .5\baselineskip\@plus.2\baselineskip
2901 \@minus.2\baselineskip}% space below
2902 {\@acmplainbodyfont}% body font
2903 {\@acmplainindent}% indent amount
2904 {\@acmplainheadfont}% head font
2905 { .}% punctuation after head
```

```

2906 { .5em}% spacing after head
2907 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont(#3)}}}% head spec

```

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

```

2908 \def\@acmdefinitionbodyfont{\normalfont}

```

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

```

2909 \def\@acmdefinitionindent{\parindent}

```

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

```

2910 \def\@acmdefinitionheadfont{\itshape}

```

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

```

2911 \def\@acmdefinitionnotefont{\@empty}

```

Customization of the acmdefinition theorem style:

```

2912 \ifcase\ACM@format@nr
2913 \relax % manuscript
2914 \or % acmsmall
2915 \or % acmlarge
2916 \or % acmtog
2917 \or % sigconf
2918 \or % siggraph
2919 \or % sigplan
2920 \def\@acmdefinitionbodyfont{\normalfont}
2921 \def\@acmdefinitionindent{\z@}
2922 \def\@acmdefinitionheadfont{\bfseries}
2923 \def\@acmdefinitionnotefont{\normalfont}
2924 \or % sigchi
2925 \or % sigchi-a
2926 \fi

```

`acmdefinition` The acmdefinition theorem style

```

2927 \newtheoremstyle{acmdefinition}%
2928 { .5\baselineskip\@plus.2\baselineskip
2929 \@minus.2\baselineskip}% space above
2930 { .5\baselineskip\@plus.2\baselineskip
2931 \@minus.2\baselineskip}% space below
2932 {\@acmdefinitionbodyfont}% body font
2933 {\@acmdefinitionindent}% indent amount
2934 {\@acmdefinitionheadfont}% head font
2935 { .}% punctuation after head
2936 { .5em}% spacing after head
2937 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmdefinitionnotefont(#3)}}}% head spec

```

Make acmplain the default theorem style.

```

2938 \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.

```

2939 \AtEndPreamble{%
2940   \if@ACM@acmthm
2941   \theoremstyle{acmplain}
2942   \@ifundefined{theorem}{%
2943     \newtheorem{theorem}{Theorem}[section]
2944   }{}
2945   \@ifundefined{conjecture}{%
2946     \newtheorem{conjecture}[theorem]{Conjecture}
2947   }{}
2948   \@ifundefined{proposition}{%
2949     \newtheorem{proposition}[theorem]{Proposition}
2950   }{}
2951   \@ifundefined{lemma}{%
2952     \newtheorem{lemma}[theorem]{Lemma}
2953   }{}
2954   \@ifundefined{corollary}{%
2955     \newtheorem{corollary}[theorem]{Corollary}
2956   }{}
2957   \theoremstyle{acmdefinition}
2958   \@ifundefined{example}{%
2959     \newtheorem{example}[theorem]{Example}
2960   }{}
2961   \@ifundefined{definition}{%
2962     \newtheorem{definition}[theorem]{Definition}
2963   }{}
2964   \fi
2965   \theoremstyle{acmplain}
2966 }
```

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

```
2967 \def\@proofnamefont{\scshape}
```

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

```
2968 \def\@proofindent{\indent}
```

Customization of the proof environment.

```

2969 \ifcase\ACM@format@nr
2970 \relax % manuscript
2971 \or % acmsmall
2972 \or % acmlarge
2973 \or % acmtog
2974 \or % sigconf
2975 \or % siggraph
2976 \or % sigplan
2977   \def\@proofnamefont{\itshape}
2978   \def\@proofindent{\noindent}
2979 \or % sigchi
2980 \or % sigchi-a
2981 \fi
```

proof We want some customization of the proof environment.

```

2982 \renewenvironment{proof}[1][\proofname]{\par
2983   \pushQED{\qed}%
2984   \normalfont \topsep6\p@\plus6\p@\relax
2985   \trivlist
2986   \item[\@proofindent\hskip\labelsep
2987         {\@proofnamefont #1\@addpunct{.}}]\ignorespaces
2988 }{%
2989   \popQED\endtrivlist\endpfalse
2990 }

```

### 3.21 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.

```

2991 \AtEndPreamble{%
2992   \if@ACM@pbalance
2993     \global\@ACM@balancefalse
2994     \ifcase\ACM@format@nr
2995       \relax % manuscript
2996       \or % acmsmall
2997       \or % acmlarge
2998       \or % acmtog
2999         \RequirePackage{pbalance}%
3000       \or % sigconf
3001         \RequirePackage{pbalance}%
3002       \or % siggraph
3003         \RequirePackage{pbalance}%
3004       \or % sigplan
3005         \RequirePackage{pbalance}%
3006       \or % sigchi
3007         \RequirePackage{pbalance}%
3008       \or % sigchi-a
3009     \fi
3010   \fi
3011   \if@ACM@balance
3012     \ifcase\ACM@format@nr
3013       \relax % manuscript
3014       \global\@ACM@balancefalse
3015       \or % acmsmall
3016       \global\@ACM@balancefalse
3017       \or % acmlarge
3018       \global\@ACM@balancefalse
3019       \or % acmtog
3020         \RequirePackage{balance}%
3021       \or % sigconf
3022         \RequirePackage{balance}%
3023       \or % siggraph
3024         \RequirePackage{balance}%
3025       \or % sigplan
3026         \RequirePackage{balance}%
3027       \or % sigchi
3028         \RequirePackage{balance}%

```

```

3029      \or % sigchi-a
3030      \global\@ACM@balancefalse
3031    \fi
3032  \fi
3033 }
3034 \AtEndDocument{%
3035   \if@ACM@balance
3036   \if@twocolumn
3037   \balance
3038   \fi\fi}

```

### 3.22 Acknowledgments

```

\acksname
3039 \newcommand\acksname{Acknowledgments}

\acks This is a comment-like structure
3040 \specialcomment{acks}{%
3041   \begingroup
3042   \section*{\acksname}
3043   \phantomsection\addcontentsline{toc}{section}{\acksname}
3044 }{%
3045   \endgroup
3046 }

\grantsponsor We just typeset the name of the sponsor
3047 \def\grantsponsor#1#2#3{#2}

\grantnum
3048 \newcommand\grantnum[3][{}]{#3%
3049   \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}

```

### 3.23 Conditional typesetting

We use the comment package for conditional typesetting:

```

3050 \AtEndPreamble{%
3051   \if@ACM@screen
3052   \includecomment{screenonly}
3053   \excludecomment{printonly}
3054   \else
3055   \excludecomment{screenonly}
3056   \includecomment{printonly}
3057   \fi
3058   \if@ACM@anonymous
3059   \excludecomment{anonsuppress}
3060   \excludecomment{acks}
3061   \else
3062   \includecomment{anonsuppress}
3063   \fi}

```

### 3.24 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’.

```

3064 \newcommand\showeprint[2][arxiv]{%
3065   \def\@tempa{#1}%
3066   \ifx\@tempa\empty\def\@tempa{arxiv}\fi
3067   \def\@tempb{arxiv}%
3068   \ifx\@tempa\@tempb\relax
3069     arXiv:\href{https://arxiv.org/abs/#2}{#2}%
3070   \else
3071     \def\@tempb{arXiv}%
3072     \ifx\@tempa\@tempb\relax
3073       arXiv:\href{https://arxiv.org/abs/#2}{#2}%
3074     \else
3075       #1:#2%
3076   \fi
3077 \fi}

```

### 3.25 Index

`\theindex` Standard amsart uses plain page style in index pages. This clashes with line numbering for review option, so we redefine it.

```

3078 \def\theindex{\@restonecoltrue\if@twocolumn\@restonecolfalse\fi
3079   \columnseprule\z@ \columnsep 35\p@
3080   \@indextitlestyle
3081   \let\item\@idxitem
3082   \parindent\z@ \parskip\z@\@plus.3\p@\relax
3083   \raggedright
3084   \hyphenpenalty\@M
3085   \footnotesize}

```

### 3.26 End of Class

`\vspace` We do not disable `\vspace`, but add warning to it

```

3086 \let\@vspace@orig=\@vspace
3087 \let\@vspacer@orig=\@vspacer
3088 \apptocmd{\@vspace}{\ClassWarning{\@classname}{\string\vspace\space should
3089   only be used to provide space above/below surrounding
3090   objects}}{}{}
3091 \apptocmd{\@vspacer}{\ClassWarning{\@classname}{\string\vspace\space should
3092   only be used to provide space above/below surrounding
3093   objects}}{}{}
3094 \let\@vspace@acm=\@vspace
3095 \let\@vspacer@acm=\@vspacer

```

`\ACM@origbaselinestretch` We produce an error if the user tries to change `\baselinestretch`

```

3096 \let\ACM@origbaselinestretch\baselinestretch
3097 \AtEndDocument{\ifx\baselinestretch\ACM@origbaselinestretch\else
3098   \ClassError{\@classname}{An attempt to redefine
3099     \string\baselinestretch\space detected. Please do not do this for
3100     ACM submissions!}\fi}

```

3101 \normalsize\normalfont\frenchspacing  
3102 </class>

## References

- [1] UK T<sub>E</sub>X Users Group. UK list of T<sub>E</sub>X frequently asked questions. <https://texfaq.org>, 2019.
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- [11] David Carlisle. *The textcase package*, October 2004. <http://www.ctan.org/pkg/textcase>.



## Change History

1.48	General: Added prologue option to xcolor . . . . .	44	General: ACM reference format is now mandatory for papers over one page; CCS concepts and keywords are now mandatory for papers over two pages . . . . .	32
	Bib code cleanup (Zack Weinberg)	32	Authors' addresses are mandatory for journal articles . . . . .	32
	Documentation update (siggraph)	32		
1.49	General: New journal: DTRAP . . . . .	32		
1.53	General: New journals: PACMCGIT, TIOT, TDSCI . . . . .	32	1.69	\vspace: Added the changed command to avoid grouping . . .
	Rearranged docs . . . . .	32	1.70	General: Name change for TDS . . . . .
1.54	General: Moved footnote stuff before hyperref call (Ross Moore) . . . . .	32	1.71	General: Bibliography change: volume for @inproceedings is now in brackets together with series . . .
1.56	General: Documented \Description	32		LuaTeX now uses the OTF versions of fonts . . . . .
1.57	General: Booktabs package is now the default . . . . .	32		Retired sigchi and sigchi-a . . . . .
1.58	General: Changes in samples (Enrico Gregorio) . . . . .	32	1.75	General: Documentation update . . .
	New journal: HEALTH. TDS is renamed to TDSCI . . . . .	32	1.78	General: Documentation update: Word count . . . . .
1.60	\if@ACM@urlbreakonhyphens: introduced macro . . . . .	33	1.79	General: Updated indormation for TAP, TCPS, TEAC . . . . .
	General: New option: urlbreakonhyphens . . . . .	32	1.80	General: Added DLT and FAC . . . . .
1.62	General: New journal: TELO . . . . .	32	1.82	General: Updated abbreviations and codes for several journals . . . . .
1.63	General: New journal: FACMP . . . . .	32		
	New journal: TQUANT . . . . .	32	v1.00	General: First released version . . . . .
1.63a	General: Move: TQUANT to TQC . . .	32	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> ) . . . . .
1.64	General: Putting abstract after \maketitle now causes an error . .	32		Defined ACM colors . . . . .
1.65	General: New journal: DGOV . . . . .	32		Explicitly put draft option (closes <a href="https://github.com/borisveytsman/acmart/issues/4">https://github.com/borisveytsman/acmart/issues/4</a> ) . . . . .
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