Instructions for using the GT macro packages

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Abstract

These are instructions for using the macro packages `gtmacros.tex` and `gtmacs.tex`. These packages are recommended for use by authors submitting articles to *Geometry & Topology* and *Algebraic & Geometric Topology*. They are intended to be used with plain `tex`. The only difference between the two is that the AMS fonts are not defined in `gtmacs.tex`. Thus you should use `gtmacs.tex` if your system does not have the AMS fonts installed.

If you prefer to use `latex` then use the *Geometry & Topology* documentclass file `gtart.cls` and read the corresponding instructions [7].

AMS Classification 00-01, 00-02; 68-00, 68-01

Keywords Format, macro package, *Geometry & Topology*, *Algebraic & Geometric Topology*, submission

For convenience of authors who prefer using plain `tex`, we have provided a collection of macros which will typeset a document in our recommended format. There are two versions of this package: `gtmacros.tex` which is the full version and `gtmacs.tex` which is a cut-down version. The only difference between the two is that the AMS fonts are not defined in `gtmacs.tex`. Thus you should use `gtmacs.tex` if your system does not have the AMS fonts installed. These macro packages provide the same utility (for writing journal articles) as given by `latex` (or ams–`latex` in the case of the full package).

The macro packages are written to be read (as ASCII files) and you will find that each macro is described in such a way as to make it clear how to use it (or to modify it to achieve different results). You are welcome to adapt the macro files in any way which suits you; however if you do modify either file then *please change its name*. If you use the modified file to format an article for submission to *Geometry & Topology* or *Algebraic & Geometric Topology*, then please paste the modified file into your main TeX file. *Do not submit it as a separate file.* Make a "comment" explaining what modifications you have made.

This file is the `tex` version of the macro instructions, and is itself a demonstration of the macros.

1 Fonts

The main font size is 11pt (in fact 10pt at `\magstephalf` ie 10.95pt) and the gtmacros define two control sequences `\small` and `\large` (based on Knuth's size-changing macros [4, page 414]) which have the effect of reducing (resp. enlarging) all fonts including mathematical ones. `\small` reduces the point size to 10pt approx and `\large` enlarges it to 14.4pt. `\large` should be used only for section headings and there is a macro which does this automatically for you (see the next section). `\small` should be used for subsidiary material, appendices, footnotes and such like (the footnote macro, see below, also does this automatically).

To set a piece of text `\small` you type `\small` at the beginning and enclose the whole thing in braces `{ ... }` to prevent the `\small` affecting the rest of the text. For example if you type:

```
{\small This is a {\sl demonstration} of the "\small" macro.
$H_2SO_4$ to you {\it professor}, and $\int\pi$ to your dear
{\bf wife}.}
```

The result is:

This is a *demonstration* of the `\small` macro. H_2SO_4 to you *professor*, and $\int \pi$ to your dear **wife**.[1]

You can use the usual switches `\bf`, `\it`, `\sl` to switch on bold, italic or slanted type inside `\small` text, with the correct size result (as demonstrated above).

The way the size-changing macros work is explained in detail via comments in the file `gtmacros.tex` if you wish to read them.

Using the AMS fonts

The rest of this section applies only to the full macro package `gtmacros.tex`. To switch to the AMS symbol-a font use the control sequence `\msa`. Similarly use `\msb` and `\frak` to switch to the AMS symbol-b font and the Euler-Fraktal font respectively. The switches `\Bbb` and `\goth` are alternatives for `\msb` and `\frak` respectively (`\Bbb` is for *Blackboard-bold*). All switches work like the switches `\bf`, `\tt` etc (ie they need to be enclosed in `{,}`'s), except `\Bbb` which, as in `amstex`, just affects only the next character. Eg you can use macros like the following

```
\def\N{{\frak N}}
\def\re{\Bbb R}
\def\doublecup{{\msa \char'144}}
```

[1] This strange sentence comes from Flanders and Swan [3].

to access the characters from the three AMS fonts. The results are as follows:
`\N` : $\mathfrak{N}$, `\re` : $\mathbb{R}$, `\doublecup` : $\Cup$.

More generally you can make `\mathchardef`'s which will define characters which behave as relations, delimiters etc in mathematical formulæ and you will find some examples in `gtmacros.tex`. For convenience we have appended font tables for the three families.

There is also a lazy way of accessing the AMS symbols, provided you take the trouble to learn the AMS names for them. We have provided a file `amsnames.tex` which you can copy. Then if you type `\input amsnames` directly after `\input gtmacros` you can call all the AMS symbols by using the same names as in `amstex`. The symbols will then behave exactly as in `amstex`. For example `$\maltese$` defines the symbol $\maltese$.

The size-changing commands `\small` and `\large` change the size of the AMS fonts to the correct sizes (as demonstrated here—this subsection is set `\small`).

2 Style Macros

There are several interconnected macros which set the house style. The `\section` macro sets the section heading bold `\large` and numbered automatically. Eg the heading above was typed `\section{Style Macros}`. The macro `\ppar` makes a slightly larger than usual paragraph break. Use it for minor changes of topics etc. The `\sh` macro is for subheadings. For example:

Examples

Which was typed `\sh{Examples}`. There are macros for results, definitions etc. The standard macro is the `\proc ... \endproc` macro which sets theorems etc with automatic numbers. For example to get the statements:

Theorem 2.1 *Every lemon is yellow.*

Corollary 2.2 *Yellow fruit tastes bitter.*

You type:

```
\proc{Theorem}Every lemon is yellow.\endproc.
\proc{Corollary}Yellow fruit tastes bitter.\endproc
```

The macro `\prf ... \endprf` is for proofs with appropriate spacing and with the proof terminated with a small square at the right margin. To get the small square on its own, type `\qed`.

Examples:

```
\proc{Theorem}There are infinitely many odd prime numbers
of the general form $4t+1$. \qed\endproc
```

```
\proc{Lemma}No even number $>2$ is prime.\endproc
\prf By definition if $r$ is even then $r=2q$ say.  But if
$r>2$ then $q>1$ hence $r=2q$ is not prime. \endprf
```

Results:

Theorem 2.3 *There are infinitely many odd prime numbers of the general form* $4t+1$. □

Lemma 2.4 *No even number* >2 *is prime.*

Proof By definition if r is even then $r = 2q$ say. But if $r > 2$ then $q > 1$ hence $r = 2q$ is not prime. □

The macro `\proclaim` has exactly the same effect as the `\proc` macro except that the number is omitted. For example:

Conjecture *Some oranges are yellow.*

which was typed:

```
\proclaim{Conjecture}Some oranges are yellow.\endproc
```

and there is a variant `\rk ... \endrk` for remarks etc which omits the number and does not switch on slanted type. For example:

Definition A **lemon** is a pale yellow oval citrus fruit with acid pulp.

Remark Some lemons are thick-skinned.

which were typed

```
\rk{Definition}A {\bf lemon} is a pale yellow oval citrus fruit
with acid pulp.\endrk
\rk{Remark}Some lemons are thick-skinned.\endrk
```

If you wish to number a definition or remark then use `\proc` but switch off slanted type immediately. Eg:

Definition 2.5 By **yellow** we mean Britsh Standard colour BS3320.

Typed:

```
\proc{Definition}\rm By {\bf yellow} we mean Britsh Standard
colour BS3320.\endproc
```

There is also a variant of the `\prf` macro which gives the same layout but with alternative name.

For example:

Proof of main theorem There are several steps which we omit. □

which was typed:

```
\proof{Proof of main theorem}There are several steps which we
omit.\endprf
```

And finally there is a `\label` macro for numbering equations etc, which produces the correct number in sequence:

For example:

$$6x = 7 \qquad \mathbf{2.6}$$

hence

$$x = \frac{7}{6} \qquad \mathbf{2.7}$$

which was typed:

```
For example:
$$6x=7\eqno{\bf\label}$$
hence
$$x={7\over6}\eqno{\bf\label}$$.
```

3 References

The GT macro packages provide a full (and extendable) set of macros for dealing with (external) references and cross-references. There are two basic commands `\key{..}` and `\ref{..}`. You type `\key{`*string*`}` at the start of each reference in the list of external references, or after any of the macros which provide an automatic number. Here *string* is some sequence of symbols which reminds you of the paper, result, equation etc you wish to refer to. Then you type `\ref{`*string*`}` to print that theorem number, reference number etc.

For example:

7 Example section head : results

Main Theorem 7.1 *Oranges are citrus fruit.*

It follows from theorem 7.1 that oranges have a high acid content. Now consider:

$$\int_{-\infty}^{+\infty} g(t)dt \qquad \mathbf{7.2}$$

then applying equation 7.2 to the acidity calculation ...

In section 7 we stated ...

This was typed:

```
For example:
\section{Example section head : results}\key{sec-results}
\proc{Main Theorem}\key{Main-Th}Oranges are citrus fruit.
\endproc
It follows from theorem \ref{Main-Th} that oranges have a high
acid content.  Now consider:
$$\int_{-\infty}^{+\infty}g(t)dt\eqno{\bf\label}\key{Int-Eq}$$
then applying equation \ref{Int-Eq} to the acidity calculation
\dots\par
In section \ref{sec-results} we stated \dots
```

For external references you type your list of references in the form `\reflist ... \endreflist` where `...` is the list of references in alphabetical order and in the form

`\key{`*string*`}` reference

Eg:

`\reflist`

...more references ...

```
\key{Kn-84}  {\bf D Knuth}, {\it The TeXbook}, Addison--Wesley
(1984)
```

...more references ...

`\endreflist`

Note that references must be separated by a blank line or `\par`. You then type `\references` where you want the references to be printed (normally near the end of the paper). To refer to Knuth type for example `see Knuth [\ref{Kn-84}, page 320]` which gives the result: see Knuth [4, page 320].

The `\key` and `\ref` macros work in the same way with all the macros which provide automatic numbering: `\section` `\proc` `\label` `\fnote` `\figure` `\caption` `\figurelabel` (the last four will be described in section 5). Moreover if you define your own macros which provide automatic numbering, then it is easy to extend the macros to work with your numbering macro (see the example of `\equationnumber` given below). Each of these macros primes the `\nextkey` macro to be the number just used and the `\key` macro transfers this number to your string. Thus you can type `\key{..}` at any time after one numbering macro before the next one.

The macros can be used in two modes. In *standard* mode they work only for backwards references. In other words you cannot use a particular key *before* the `\key{..}` command which defines it. Thus you need to type your list of external references near the beginning of your file. (They don't get printed there, they get printed where you type `\references`.)

In *forward* mode you *can* use a key before it is defined. To switch on forward mode type the command `\useforwardrefs` near the beginning of your file (after `\input gtmacros` or `gtmacs`). Forward mode uses an auxiliary `.ref` file and has the same disadvantage as `latex` namely that you have to `tex` your file twice (once to write the `.ref` file and once to read it) and if you make any changes which affect reference numbers then you again need to `tex` twice to get the references correct. In forward mode you can type your list of external references at any point in the file, in particular you can type them where they would normally be typed. In this case, if you type the list (using the same format as given above) between the commands `\biblio` and `\endbiblio` then you do not need to type `\references` to get them printed (if you do type `\references` they'll get printed twice).

Extending the macros to work with new numbers

Extending the macros is very straightforward and best explained by example.

Suppose that you wish to use a separate counter for equations and to use `\key`'s and `\ref`'s with equation numbers. Suppose that you want to be able to type `\auteqno` in a displayed equation in order to get the correct equation number inside round brackets. Here is the code to do all that:

```
\newcount\equationnumber
\equationnumber=1
\def\auteqno{\eqno{(\number\equationnumber)}%
```

```
\xdef\nextkey{\number\equationnumber}%
\global\advance\equationnumber by 1}
```

Taking this in order: The first line of code sets up the new counter for equation numbers and the second line initialises it to 1. The final three lines are the `\auteqno` macro. `\auteqno` is defined in the third line to be plain `tex`'s `\eqno` with the equationumber in round brackets and the next line is the magic line which defines the `\nextkey` to be that number (thus the next time you type `\key{..}` you will be defining a key for this equation number); finally in the last line the equationnumber is moved up one to be ready for the next numbered equation. Here is a test of this new macro:

Consider the equation

$$\int_0^1 f(x)t^2 = \pi \tag{1}$$

and the secondary calculation

$$g(x) = \sum_{n=0}^{\infty} t^{-n} \tag{2}$$

then applying equation (2) with t a solution to equation (1) ...

This was typed:

```
Consider the equation
$$\int_0^1f(x)t^2=\pi\auteqno\key{int-eq}$$
and the secondary calculation
$$g(x)=\sum_{n=0}^{\infty}t^{-n}\auteqno\key{sum-eq}$$
then applying equation (\ref{sum-eq}) with $t$ a solution
to equation (\ref{int-eq}) \dots
```

Notes

(i) There is one very important thing to note about these macros. The `\key{..}` macro sets up a new control sequence, namely the string that you use. For example `\key{IntEq}` would set up a new control sequence `\IntEq` which expands to the number you are providing a key for. Thus it is important to choose your keys carefully so that they don't redefine important control sequences that you want to use! If you use characters that do not normally appear in control sequences such as `-` or `:` then you cannot run into problems. However you may wish to use letter-only keys because then you can refer to the number by typing eg `\IntEq` which is shorter than `\ref{IntEq}`. Very few control sequences in plain `tex` contain capital letters[2] so if wish to save typing by using letter-only keys then, if you use one or more capital letters in your *key*'s, you can easily avoid trouble. However also note that, if you are using forward mode, then typing `\IntEq` *before* `\key{IntEq}` (which defines the new control sequence) will cause a `tex` error the first time the file is `tex`'ed. Typing `\ref{IntEq}` will just give you a polite warning!

(ii) Although (in standard mode) the list of references is typed at the beginning of the text, to be printed at the end, all the formatting instructions are typed with the list. Thus, if you get an overful `\hbox` when `tex` processes the list on say page 35 of your article, you nevertheless correct it (for example by inserting an optional hyphen)[3] at the beginning of your file.

4 The title page or header material

Geometry & Topology has a standard format for title pages which displays the following items of information supplied by the author(s):

- Title of paper
- Author(s)
- Author(s) addresses (including email and URL if provided)
- Abstract of paper
- AMS classification numbers (primary and secondary) and keywords

In addition the journal adds the following information to this page at publication:

- Volume number, year and page numbers of the published paper
- Dates of receipt, revision (or acceptance if the paper was not revised) and publication
- The names of the three academic editors who have proposed and seconded the paper

Algebraic & Geometric Topology article style has a shorter header containing just the title, authors names, abstract (set small), AMS classification numbers and

[2] There are the uppercase Greek letters(`\Alpha`...`\Omega`), a few arrows (`\Leftarrow` etc), a few that start `\Big` (`\Biggl` for example), and then only `\A`, `\AA`, `\AE`, `\H`, `\O`, `\OE`, `\P`, `\Re`, `\Relbar`, `\S`, `\TeX`, and `\Vert`.

[3] There is an example in this file. An optional hyphen was needed in reference [5].

keywords. The journal adds publication date and page range at publication. Authors addresses and the received date are given at the end of the article.

If you are using the macros to format an article for submission to either journal, then please type the title page information in a standard format (see the example below). This will enable the journal to produce the final title page with just a minimal amount of editing to your `tex` file and thus speed up the publication of your paper.

To encourage you to do this we have provided a macro `\maketitlepage` which turns this standard information into a basic title page layout. There is a similar macro `\makeagtttitle` which produces a short header in *Algebraic & Geometric Topology* style. There is also an alternative `\makeshorttitle` alias `\maketitle` which produces a conventional short header with addresses. You can also force `tex` to use *Geometry & Topology* or *Algebraic & Geometric Topology* style for the header material and also to produce running heads and feet similar to those which appear on the published article. This allows you to check the final appearance of your article. To do this type `\gtart` or `\agtart` near the start of the file (after `\input gtmacros`). Header information can be suplied in a number of equivalent ways. Here is a complete sample:

```
\title{A short spoof paper\\with a two-line title}
\authors{Albert Einstein\\Leonardo da Vinci}

\address{IAS, Princeton}
\secondaddress{Renaissance\\Venice}
\email{ae@ias.princeton.edu\\ldv@ren.ven.hist}

\abstract

This is a short spoof paper typed on the template
{\tt gtlatex.tem} purely in order to illustrate its use.
As this is a rather short summary, here is some nonsense to
spin it out.

We prove that colours come in fifteen primary hyperbands; each
hyperband being supported by a James product [\James] and
controlled by a colour changing macro [\ref{Kn-84}].

\endabstract

\primaryclass{00-01, 00-02}
```

```
\secondaryclass{68-00, 68-01}
\keywords{Spoof, template, colour, hyperband, James product}

\maketitlepage %%% for GT articles
\makeagttitle  %%% for AGT articles
```

You can see the result by looking at the title page of [1] which is one of our sample files.

We now examine this sample in detail. First a general point; the control sequence `\\` is used as standard "separator" — to separate lines in `\title` and `\address`, and to separate multiple authors, email addresses and URL's (see below). Turning now to the items in order. The title has an an optional "short" form `\shorttitle` to be used for running heads. If this is not given, then the full title is used instead. For example:

```
\title{A short spoof paper\\with a two-line title}
\shorttitle{A short spoof paper}
```

The authors and addresses can be supplied singly or combined and in any order. Thus the following produces exactly the same effect:

```
\author{Albert Einstein}
\address{IAS, Princeton}
\email{ae@ias.princeton.edu

\secondauthor{Leonardo da Vinci}
\secondaddress{Renaissance\\Venice}
\secondemail{ldv@ren.ven.hist}
```

Web addresses (URL's) can also be given:

```
\url{http://www.ias.edu/~al\\http://www.ven.hist/~lvd}
```

and there are a variety of aliases. Eg `\author`, `\authors`, `\secondauthor` are all aliases thus

```
\secondauthor{Leonardo da Vinci}\author{Albert Einstein}
```

produces exactly the same result as

```
\authors{Leonardo da Vinci\\Albert Einstein}
```

with Leonardo first ! Similarly `\addresses` and `\address` are aliases, as are `\emails`, `\email`, `\emailaddr` and `\emailaddress` and `\url`, `\urls`, `\urladdr` and `\urladdress`. However `\secondaddress`, `\secondemail` and `\secondurl` behave slightly differently. In each case they produce the word "and" to separate the adresses. They are specifically intended for when there are precisely two authors (as in the example above). If there are three or more authors then either supply the information in one set or in three similar sets. Thus:

```
\authors{John Major\\Margaret Thatcher\\Harold Wilson}
\addresses{First\\Address\smallskip Second\\Address etc}
\emails{jm@11.downing.st\\mt@11.downing.st\\hw@11.downing.st}
```

or

```
\author{John Major}\address{First\\Address}\email{jm@11.d.s}
\author{M Thatcher}\address{First\\Address}\email{mt@11.d.s}
\author{H Wilson}\address{First\\Address}\email{hw@11.d.s}
```

Important note `\secondaddress`, `\secondemail` and `\secondurl` must not be used *except* as the final (usually the second) address etc. The macros will generate some very odd looking `tex` errors if you ignore this advice!

The author and address layout works well for one or two authors and (if addresses are short) for three authors. After that you will probably need to take some control "by hand". For example here is an excerpt from the title page information for a five-author paper:

```
\title{Ordering the braid groups}
\authors{Roger Fenn, Michael T~Greene, Dale Rolfsen\\
Colin Rourke, Bert Wiest}
\shortauthors{Fenn, Greene, Rolfsen, Rourke and Wiest}

\address{%
\rm Email:\stdspace \tt R.A.Fenn@sussex.ac.uk\ \
Michael.Greene@uk.radan.com\\rolfsen@math.ubc.ca\ \
cpr@maths.warwick.ac.uk\\ bertold@maths.warwick.ac.uk}
```

Here the five authors are displayed on two lines and only email addresses are given on the title page, with formatting controlled by hand. You can see the result at [2].

The abstract must be given between the control sequences `\abstract` and `\endabstract` as in the above example and finally AMS classification numbers (both primary and secondary) and keywords should be given. For compatibility with AMS style, `\subjclass` is an alias for `\primaryclass`.

Notes (1) The header material should contain acknowledgments, thanks or dedications. These items should be collected and placed somewhere suitable in the main body of the paper, eg at the end of the introduction or at the end of the paper.

(2) If you use multiple `\address` declarations then the addresses must contain only text and no control sequences other than `\\` or primitive commands. Thus if you want to format the addresses yourself, then make one single address including commands to specify your layout (as in the five-author example above). A similar remark applies to `\email` and `\url` declarations. Again you will get some very odd looking `tex` errors if you ignore this advice!

(3) To print author addresses (at the end of the paper for the *Algebraic & Geometric Topology* style) use the command `\Addresses`.

(4) There is a variant of the `\maketitlepage` and `\makeagttitle` macros, namely `\makeshorttitle` alias `\maketitle`. This does not typeset the heading material on a separate page, but sets it as a conventional head with the abstract set small. If you are using these macros for typesetting an article not necessarily intended for *Geometry & Topology* then you will probably prefer to use this variant which produces a more conventional preprint. This style was used for this set of instructions.

5 Miscellaneous macros

Finally there are a few macros for miscellaneous purposes.

Itemised lists

There is a macro for itemised lists which works exactly as in plain `tex`. For example the list which ended section 3 was typed:

```
\items
\item{(i)}
There is one very important thing to note about these macros.
...
a polite warning!

\item{(ii)}Although (in standard mode) the list of references is
...
at the beginning of your file.
\enditems
```

The control sequence `\itemb` produces a bulleted item. For example the list which appeared near the beginning section 4 was typed:

```
\items\itemb  Title of paper
\itemb Author(s)
\itemb Author(s) addresses (including email and URL if provided)
\itemb Abstract of paper
\itemb AMS classification numbers (primary and secondary) and
keywords
\enditems
```

Footnotes

The footnote macro is `\fnote` and sets the footnote `\small` and automatically numbered.[4] To use the macro just type `\fnote{` *footnote text* `}` where you want the footnote to apply. You can use the `\key` and `\ref` macros with the `\fnote` macro in exactly the same way as with other numbering macros (see section 3). For example the footnote on this page was typed:

```
...
automatically numbered.\fnote{Footnote numbers are sequential
through the paper. Up to 99 footnotes can be used before the
numbers start overflowing into the left margin.}\key{fnote:nos}
To use the ...
```

Quotations

The macros `\quote ... \endquote` are for quotations, which are typeset with an inset (on both sides) and in italic type, for example:

> *"Whereas in the old days," said I, "it was very hard to live without strife and robbery. That's what you mean, isn't it, by giving me the negative side of your conditions?"*
>
> *"Yes," he said, "it was so hard, that those who habitually acted fairly to their neighbours were celebrated as saints and heroes, and were looked up to with the greatest reverence."*
>
> *"While they were alive?" said I.*
>
> *"No," said he, "after they were dead."*[23]

[4] Footnote numbers are sequential through the paper. Up to 99 footnotes can be used before the numbers start overflowing into the left margin.

[23] William Morris [5]. Note that the footnote number has been artificially increased to illustrate how two digit footnote numbers are typeset by the `\fnote` macro.

This was typed:

```
\quote
\noindent\llap{``}Whereas in the old days,'' said I, ``it was
.....
\noindent\llap{``}No,'' said he, ``after they were
dead.''\fnote{William Morris ..... macro.}
\endquote
```

Figures

There are some macros for handling figures, which provide for automatic numbering and work with the `\key` and `\ref` macros. The basic macro is the `\figure ... \endfigure` macro which centres the figure, uses `tex`'s `\midinsert` macro to allow it to "float" to a suitable place if necessary and adds an automatically numbered label after it. If you have a caption, then type `\caption{`*caption text*`}` somewhere between `\figure` and `\endfigure`. The macro will then add the caption to the figure label. The `\key` macro can be used to set a key for the figure number at any point after `\figure` and before the next numbering macro. Here are a couple of examples using text to simulate figures:

A FIGURE

Figure 1

Figure 1 has no caption.

ANOTHER FIGURE

Figure 2: another figure

By contrast figure 2 has a caption.

Which was typed:

```
\figure A FIGURE
\key{fig-test1}
\endfigure

Figure \ref{fig-test1} has no caption.

\figure ANOTHER FIGURE
\caption{another figure}
```

```
\key{fig-test2}
\endfigure

By contrast figure \ref{fig-test2} has a caption.
```

If you want an unnumbered or uncentred figure, then use `tex`'s raw `\midinsert` macro thus:

`\midinsert` *Figure instructions* `\endinsert`

You can add a (numbered) caption in the same style as with the `\figure` macro by typing `\caption{`*caption text*`}` in the appropriate place (with a `\key`, if needed, afterwards) and finally if you want a figure label with a figure number but without a caption outside of the `\figure ... \endfigure` macro then type `\figurelabel` again with optional `\key` afterwards.

Thus typing:

```
\midinsert
\centerline{A FIGURE}
\vglue 6pt\figurelabel
\key{fig-test1}
\endinsert

Figure \ref{fig-test1} has no caption.

\midinsert
\centerline{ANOTHER FIGURE}
\vglue 6pt\caption{another figure}
\key{fig-test2}
\endinsert

By contrast figure \ref{fig-test2} has a caption.
```

produces exactly the same result as the example above.

The sample file [6] is all about graphics and inserts and you will find many examples of the use of these macros there, see in particular the `.tex` source file.

Some abbreviations

`\co` is an abbreviation for `\colon\thinspace`. It is for typesetting functions. For example $f : X \to Y$ (typed `$f:X\to Y$`) has the *wrong* spacing around the colon, whereas $f\colon X \to Y$ (typed `$f\co X\to Y$`) is correct.

`\nl` (newline) gives a forced line break and `\np` (newpage) a forced page break; `\cl` is an abbreviation for `\centerline`.

Finally `\gt` is an abbreviation for *Geometry & Topology*, ie it gives the journal title set in preferred style.

Verbatim macro

No macro package would be complete without a version of Knuth's verbatim macro [4, pages 420–1]. The GT version uses the double quote `"` as switch character since `tex` files do not normally need to contain the character `"`. There is a safety mechanism built into this macro. Normally the macro is "switched off" (or more precisely a "safety-catch" is on) and typing `"` produces exactly the same result as typing `''`. However if the macro is "on" then `"` switches verbatim on and off; and then everything between consecutive pairs of `"`'s is printed verbatim in the typewriter font `cmtt`.

The main switches (for the safety catch) are `\verb` and `\brev`. `\verb` switches the macro on and `\brev` switches the macro off (the default). Thus to use the macro, type `\verb` somewhere convenient before use and the use `"` to switch verbatim on and off. Be careful not to use `"` for any other purpose. There is no need to switch the macro off again unless you need to use `"` for some other purpose (eg making `\mathchardef`'s).[24] Whether the macro is on or off you can always use the control sequence `\dq` (double quote) for `"` (even in `\mathchardef`'s) and the control sequence `\ttq` is an abbreviation for `{\tt\dq}`. Thus `"\ttq"` will produce `"` (in `cmtt`) *inside* a verbatim quote.

References

[1] **Albert Einstein**, **Leonardo da Vinci**, *A short spoof paper*, `gt/info/samples/spoof.ps` and `spoof.tex`

[2] **R Fenn**, **M T Greene**, **D Rolfsen**, **C Rourke**, **B Wiest**, *Ordering the braid groups*, preprint, `http://www.maths.warwick.ac.uk/ cpr/braidor,ps`

[3] **Michael Flanders**, **Donald Swan**, *At the Drop of another hat*, Band 6: First and second law, Parlophone, PCS 3052 (1964)

[4] **Donald Knuth**, *The TeXbook*, Addison–Wesley (1984)

[5] **William Morris**, *News from nowhere*, Three works by William Morris, Lawrence and Wishart (1968)

[6] **Colin Rourke**, *Further topics for authors*, `gt/info/samples/topics.ps` and `topics.tex`

[7] **Colin Rourke**, *Instructions for using* `gtart.cls`, `gt/info/macros/gtartins.tex`

[24] Note to users of the full macro package: the macro *must be off* before inputting `amsnames.tex`.

Appendix: font tables for the AMS fonts

Euler-Fraktal font

	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*
'000	𝔡	𝔡	𝔣	𝔣	𝔤	𝔨	𝔱	𝔲
'010								
'020			‘	’				
'030								
'040		!					&	'
'050	(	)	*	+	,	−	.	/
'060	0	1	2	3	4	5	6	7
'070	8	9	:	;		=		?
'100		𝔄	𝔅	ℭ	𝔇	𝔈	𝔉	𝔊
'110	ℌ	ℑ	𝔍	𝔎	𝔏	𝔐	𝔑	𝔒
'120	𝔓	𝔔	ℜ	𝔖	𝔗	𝔘	𝔙	𝔚
'130	𝔛	𝔜	ℨ	[		]	^	
'140		𝔞	𝔟	𝔠	𝔡	𝔢	𝔣	𝔤
'150	𝔥	𝔦	𝔧	𝔨	𝔩	𝔪	𝔫	𝔬
'160	𝔭	𝔮	𝔯	𝔰	𝔱	𝔲	𝔳	𝔴
'170	𝔵	𝔶	𝔷			"		ı

AMS symbol-a font

	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*
'000	⊡	⊞	⊠	□	■	·	◊	♦
'010	↻	↺	⇌	⇋	⊟	⊩	⊪	⊨
'020	↠	↞	⇇	⇉	⇈	⇊	↾	⇂
'030	↿	⇃	↣	↢	⇆	⇄	↰	↱
'040	⇝	↭	↫	↬	≗	≿	≳	⪆
'050	⊸	∴	∵	≑	≜	≾	≲	⪅
'060	⪕	⪖	⋞	⋟	≼	≦	⩽	≶
'070	‵	-	≓	≒	≽	≧	⩾	≷
'100	⊏	⊐	⊳	⊲	⊵	⊴	★	≬
'110	▼	▶	◀	→	←	△	▲	▽
'120	≖	⋚	⋛	⪋	⪌	¥	⇛	⇚
'130	✓	⊻	⊼	⩞	∠	∡	∢	∝
'140	⌣	⌢	⋐	⋑	⋓	⋒	⋏	⋎
'150	⋋	⋌	⫅	⫆	≏	≎	⋘	⋙
'160	⌜	⌝	®	Ⓢ	⋔	∔	∽	⋍
'170	⌞	⌟	✠	∁	⊺	⊚	⊛	⊝

AMS symbol-b font

	0	*1*	*2*	*3*	*4*	*5*	*6*	*7*
'000	$\lvertneqq$	$\gvertneqq$	$\nleq$	$\ngeq$	$\nless$	$\ngtr$	$\nprec$	$\nsucc$
'010	$\lneqq$	$\gneqq$	$\nleqslant$	$\ngeqslant$	$\lneq$	$\gneq$	$\npreceq$	$\nsucceq$
'020	$\precnsim$	$\succnsim$	$\lnsim$	$\gnsim$	$\nleqq$	$\ngeqq$	$\precneqq$	$\succneqq$
'030	$\precnapprox$	$\succnapprox$	$\lnapprox$	$\gnapprox$	$\nsim$	$\ncong$	$\diagup$	$\diagdown$
'040	$\varsubsetneq$	$\varsupsetneq$	$\nsubseteqq$	$\nsupseteqq$	$\subsetneqq$	$\supsetneqq$	$\varsubsetneqq$	$\varsupsetneqq$
'050	$\subsetneq$	$\supsetneq$	$\nsubseteq$	$\nsupseteq$	$\nparallel$	$\nmid$	$\nshortmid$	$\nshortparallel$
'060	$\nvdash$	$\nVdash$	$\nvDash$	$\nVDash$	$\ntrianglerighteq$	$\ntrianglelefteq$	$\ntriangleleft$	$\ntriangleright$
'070	$\nleftarrow$	$\nrightarrow$	$\nLeftarrow$	$\nRightarrow$	$\nLeftrightarrow$	$\nleftrightarrow$	$\divideontimes$	$\varnothing$
'100	$\nexists$	$\mathbb{A}$	$\mathbb{B}$	$\mathbb{C}$	$\mathbb{D}$	$\mathbb{E}$	$\mathbb{F}$	$\mathbb{G}$
'110	$\mathbb{H}$	$\mathbb{I}$	$\mathbb{J}$	$\mathbb{K}$	$\mathbb{L}$	$\mathbb{M}$	$\mathbb{N}$	$\mathbb{O}$
'120	$\mathbb{P}$	$\mathbb{Q}$	$\mathbb{R}$	$\mathbb{S}$	$\mathbb{T}$	$\mathbb{U}$	$\mathbb{V}$	$\mathbb{W}$
'130	$\mathbb{X}$	$\mathbb{Y}$	$\mathbb{Z}$	$\widehat{\quad}$	$\widehat{\qquad}$	$\widetilde{\quad}$	$\widetilde{\qquad}$	
'140	$\Finv$	$\Game$					$\mho$	$\eth$
'150	$\eqsim$	$\beth$	$\gimel$	$\daleth$	$\lessdot$	$\gtrdot$	$\ltimes$	$\rtimes$
'160	$\shortmid$	$\shortparallel$	$\smallsetminus$	$\thicksim$	$\thickapprox$	$\approxeq$	$\succapprox$	$\precapprox$
'170	$\curvearrowleft$	$\curvearrowright$	$\digamma$	$\varkappa$	$\Bbbk$	$\hslash$	$\hbar$	$\backepsilon$

Note that the tables use *octal* numbers which are appropriate for `\char` definitions. To make `\mathchardef`'s you must translate the octal number into a two digit *hexadecimal* number : this is easy. The first hex digit (`0` ... `7`) changes for every two rows on the table, eg rows *'160* and *'170* both have first hex digit `7`, and the second digit is the column with 8 added for even rows. Eg `\char'115` in octal is `\char"4D` in hex.