Fácil TEX

by

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Plates

Introduction

Even though this macro package contains every standard feature one expects to find in a set of macros, it is not intended to be a discrete "hack collection." It does contain some sophisticated routines at that; but the main goal was rather to assemble an accesible, integrated, and flexible package.

These macros attempt to provide handy features for the casual user, but they also attempt to provide the less-than-casual user with primitives and parameters that simplify the (re)writing of even the most complicated routines (output, v.g.). Most other petty objects, like the controversial § sign, or the fonts, can be taken care of with a simple redefinition. Macros are ready to be used; there exist default initializations for everything—which also happen to be the ones I prefer, in spite of the fact that there will always be someone out there who will utterly dislike my favorite macros. So go ahead and redefine whatever you wish; just first give a try to the "standard" layouts.

Running TEX

All macros are compatible with any version of TEX, except for the existence of fonts in a given device. However, since 42 fonts are loaded, it is better to use a preloaded version.

The only routine that requires a simple, short extension to TEX is the indexing routine. This will be discussed later on.

As for control sequences, practically everything the manual describes will work using this macros. Only \hsize and \vsize have other names (see Chapter 1). A few other things are different, but chances are you'll never discover them, and I won't even bother to mention them (one of them is \lg; why not use the traditional \log or \ln?). An effort was also made to avoid using special SAIL characters for control sequences, thereby simplifying the transportability and use of the macros in other machines.

Knowing TEX

Even the most erratic user cannot get away without reading at the very least the first few chapters of the TEX manual,[1] but he/she can safely speed-up at most "dangerous bend" signs without peril. The chapter on "Recovery from Errors" is also strongly recommended.

On the other hand, this manual is not meant to be read-through beyond chapter 2. It is much better to start with the "templates" provided in Chapter 1, and to proceed to type until something special is desired.

Common Errors

► The quotes are not " as in a typewriter, but `` to open, and '' to close.

► Most TEX control sequences that expect a <dimension> or <glue> specification are typed in the form \vskip 5pt plus 1pt. On the other hand, most macros defined here take their arguments between braces: \zkip{5pt}. If either one is typed as the other, you are likely to get a message "Illegal unit of measure."

► When defining your own macros or when invoking macros, do not insert too many spaces. For instance, \table{5pt}⊔{Una tablita} would be interpreted by TEX as if the second argument of \table was a space! Similarly, don't end an input line between arguments.

► "TEX capacity exceeded." Unless you are doing something truly complicated, like having 100 index entries in a multicolumn page, you should first doubt your parentheses, $ and $$. You may also be trying to invoke a macro with 10 or 12 paragraphs of text (split it), or you may be forgetting the last \cr in an alignment.

Most (decent) text editors provide mechanisms to match parentheses. To detect unmatched $, try inserting $\;$ in several places; TEX will balk at the \; if an unmatched $ exists.

That error can also occur if you have hundreds of control sequences, and you'll then have to make some of them local. See next Chapter.

As a last possibility, you may truly be exceeding TEX capacity; and as the manual points out, this is a sorry situation. But before you commit violent actions, try the selective macro loading explained in the next chapter.

► "You cannot do that in xxx mode." You may be attempting to do something weird like invoking a certain macro inside another; e. g. \chapterbegin{text\footnote...}. Or, again, something may be wrong with braces or $.

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May, 1981.

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[1] *TEX and Metafont — New directions in Typesetting,* by D. E. Knuth. Digital Press, 1979.

Templates for Common Applications

This is a short chapter. It merely attempts to provide "templates" for typical applications that can just be copied into a given manuscript. For more involved applications, you'll have to read more carefully the ensuing chapters. Templates for letters appear minutely described in Chapter 4.

It is strongly recommended that you first try out one of these "normal" types of output; then proceed (if need be) to modify the things you dislike.

Organizing a Manuscript

In general, the following seems to be a good arrangement for longer manuscripts; one constructs a file containing four parts:

1	`\input <macro files>`
2	Your own macros or initializations

3	`\input <file 1>`
	`\input <file 2>`
	...
	Or text here

4	`\indexgenerate...`
	`\tableofcontents...`
	`\tableofplates...`
	`\bye`

Figure 1. Manuscript Organization

1. Here input one or more sets of macros, always starting with KERMAC, and followed by TMRMAC, PAPMAC, MATMAC, TEXMAC, as required by your application. In most cases macros *need not* be copied (they are in a system area), even if you want to modify a few things.

2. This portion may include your own initializations (`\parindent`, e.g.) or redefinition of parameters in the macros. If this is often done in the same way, most of these things could be stored in a file MYMAC containing both **1, 2**.

3. Next come the various sections that form your manuscript: chapters, sections, etc. In this manual, for instance, there were several such files for the text of each of the longer chapters 1–5, and two others for the commands to list the macro files and the appendix. The advantage of this is that it permits selective printing of portions, by replacing "\input <file n>" by "%input <file n>." You can then also type {\input <file n>} to make *local* the macros appearing (and relevant only) in file *n*, thus avoiding exceeding TEX's capacity.

4. This is just the postamble, and all those instructions are optional.

Simplest Document

This may not use headings, sections or any such sophistications. For that, you'll probably need only:

```
\input kermac
\input matmac          % optional

        Text here

\bye
```

This will work just as if you had input BASIC.tex.

Paper-type Document

There are several possible formats,

```
\input kermac
\input matmac          % optional
\input papmac

% Special Initializations go here

\titlepage
\ctrcol{\bigfnt The paper's Name     \cr\zkip{10pt}     % Vertical skip
        \rm      The Authors' Name(s)\cr\zkip{1.5truein}
        \bigfnt Abstract             \cr\zkip{20pt}}

    Abstract's Text

\endpage

\sectionbegin{Introduction}

    Paper's Text here

\bye
```

The "special initializations" may include choosing the page style (see Chapter 4), defining dimensions, margins, etc (see Chapter 1), and, possibly, *followed* by desired heading handling. All these things are optional, and you should first try the defaults provided.

Assuming only sections (\sectionbegin) —and, possibly, subsections (\subsectionbegin)— are used, by default headings on odd pages will appear empty. There are three obvious ways to remedy this:

▸ To set section name on even-page headings and subsection name on odd-pages (or section names in every heading if no sub-sections are used), type:

\secsubsecstyle.

▸ Section name on odd-page headings and a fixed text (e.g. the author's and/or paper's name) on even-pages, type:

\fixedheadings{Text}{}.

▸ Similarly, for a given Text-1 on even headings and a Text-2 on odd headings,

\fixedheadings{Text-1}{Text-2}.

Technical Reports, Theses, Books

The organization for these could be practically the same as in the preceding case, except (perhaps) having the title page on a separate page, followed by:

```
\appchapterbegin{Abstract}

    Abstract's Text

\appchapterbegin{Introduction}

    Introduction's Text

\chapter{1}            % Or desired initial chapter number.

    Text: Chapters, Sections, etc.

\tableofcontents{2}    % Optional
\bye
```

One can use chapters, sections, and subsections, or merely sections and subsections, by declaring \secsubsecstyle if so desired.[1]

This manual itself used the chapter-section format (default), with the effect you can perceive on headings, headlines, and table of contents.

Selective Macro Loading. Saving TeX Memory.

You may now proceed to the next chapter. This section is about mechanisms to save the day when your manuscript has grown too big or complex for TeX to handle.

When loading all main sets KERMAC, MATMAC and PAPMAC, chances are (unless you happen to be writting this manual) that you are filling your valuable working space with countless features you never use. If this causes TeX to run out of memory, you may try the "selective loading" options. In general, inputting those sets can be in the form:

---

[1] This format was used by Arthur Samuel in his *Short Waits*, Stanford University, Computer Science Dept.

```
ker-option \input kermac
pap-option \input papmac
mat-option \input matmac
```

1. The ker-option is of the form \setcount0 a. When KERMAC is input, certain portions of its code may be read as comments (and hence certain macros will no exist!) according to the following code:

   - $a = 0$ (default) loads everything:

   - $a = 1$ minus spanish and french accents,

   - $a = 2$ minus Mickey Mouse macros (pretzels, braces, big parentheses, ellipses); only \boxit and \ldots are left,

   - $a = 3$ (or bigger) minus NoFill macros.

   This is a one-time option. KERMAC cannot be loaded twice in a MS.

2. The mat-option is of the form \def\matmac{abcde}, where a, b, c, d, e are digits with the folowing meaning:

   - $a = 0, 1, 2$ selects between the English (default), Spanish, or French (resp.) keywords. Even if only the first are loaded, accents may still be used (say for quotations) if loaded in KERMAC.

   - $b = 1$ loads (default) automatically numbered equations and theorems. Only \QED and \Pf are left otherwise.

   - $c = 1$ loads the more specialized macros \chop, \charfn, \bracedef, \array, and arrows. This is the default.

   - d, e are reserved for future use.

   The default is thus 01100. Do not enter less than five digits; $00000 \neq 0$. Note MATMAC could be input twice, with different load options, in case of crisis.

3. PAPMAC has more loading options: \def\papmac{abcdefghi} with the following meaning:

   - $a = 0, 1, 2$ selects between the English, Spanish or French keywords. As in the case of MATMAC, accents will still work if loaded appropiately in KERMAC.

   - $b = 1$ to load the chapter macros; any other value omits them. This is useful if you are using \secsubsecstyle, for instance.

   - $c = 0, 1, 2, 3$ states the level of sectioning desired. Thus, $c = 0$ will omit sections, subsections and subsubsections; $c = 1$ will load only section macros, $c = 2$ sections and subsections, and $c = 3$ all these. Default is 3.

   - $d = 1$ loads all page styles (default). Any other value will only leave the default page style \oddevennumbering used in this very chapter.

   - $e = 1$ loads (default) the index-generation macros. Other values leave only the index-declaring macros, so a MS will run unchanged if the \indexgenerate statement is deleted.

   - $f = 1$ loads (default) the \sidenote and \annotate macros.

   - g controls loading of figures and tables (and table of plates), and of the table-of-contents generation. The value $g = 0$ (default) loads all these; $g = 1$ omits figures and tables as well as the table of plates, and $g = 2$ will also omit the table of contents.

   - h, i are reserved for future use.

   Summing up, the default is 013111000.

Chapter 2

Basic Macros (KERMAC)

This is the kernel of the macro package; any other set of macros depends on this one. The reading of this chapter is also needed to understand and use what follows.

§2.1 Fonts, Special Characters, Spacing

The special characters %, {, }, \$, @, #, ↓, ↑ discussed in the TEX manual are used and work as described there. On non-SAIL machines, however, the alignment tab @ is replaced by &, and the subscripts are set by means of _ (underline). Character VT (ASCII '13, or ↑K) is considered a space. Nevertheless observe that any such codes can be altered *after* inputting the macro sets.

There are 42 fonts assigned in the macros, a sample of which appears in Appendix S. They can be used by typing \:A, as explained in the manual, but it is better to use the specially-defined control sequences; it is easier to remember the mnemonic \biggfnt than \:A.

Some fonts are best handled in terms of the "families" \tenpoint (the one you are now reading), \ninepoint and \eightpoint. These make \baselineskip adjustments suitable for the height of the family you choose. Each family also includes \rm (roman), \it (*italics*), \sl (*slanted*), \bf (**bold-face**), \tt (typewriter), \caps (CAPS AND SMALL CAPS), and \sy (∫†]⌊▽[∫). So, as soon as you type \eightpoint, \rm will mean eight-point roman.

Changing a font family can be made local to a group (see Chapter 5 in the TEX manual). You can also make *local* changes of the *current* spacing, valid inside a group, or until the \baselineskip is reassigned. This paragraph was preceded by the instruction \spacing{1.6}, which increased the spacing by 60%. To return to normal spacing, the paragraph was merely followed by the instruction \tenpoint.

Now, since the special characters cannot be typed as such, special control sequences exist in case you ever need them. These are: \\, \%, \#, \\$, \&, \vbar (|), and \@. Last two are not special, but you'll get strange characters if you merely type those characters in the middle of the text.

A collection of big parentheses is also provided, valid in Math Mode. Namely, \biglp, \bigglp, \biggglp, \bigggrp, \biggrp and \bigrp:

((()))

§2.2 Special Words, Languages

All special words, such as "Contents" (\Contents), "Plates" (\Plates), etc. used in any macros are handled by means of control sequences to facilitate their redefinition. This is initially done by macro \english, which is the default language. The obvious application of that is the ability to translate the macros to other languages, of which two are provided: \espanol, \francais.

So, if we had used the load-time option for french keywords, explained in the introduction, this chapter would have been labeled "Chapitre 2." Another effect of language switching is an increase the hyphenation penalty. In Spanish at least, some words turn out to be correctly hyphenated by TeX, but additional care should be given at proof-reading time. Hyphenation penalties can be controlled by reassigning \hyph. Language changes can be made local to enable accent setting.

2.2.1 Español

A pesar de que TeX provee todos los acentos imaginables, su uso es en general demasiado complicado. Ya es suficientemente difícil acordarse de acentuar las palabras para, además, tener que escribir horrores como "as\'\i\ ser\'a ma\s nana" para obtener "así será mañana."

La instrucción \espanol simplifica el uso de acentos utilizando, en cambio, los caracteres ", ¯. Así, las palabras anteriores se escriben simplemente as"i ser"a ma¯nana, como en una máquina de escribir convencional. Para poner diéresis hay que escribir g\umlaut uerita (güerita), que es terrible, pero hay poquísimas palabras en español que lo requieren.

Todos los acentos son desconectados dentro del modo "NoFill" descrito más adelante.

2.2.2 Français

TeX contient tous les accents dont on a besoin pour écrire des textes en Français. Mais pour simplifier son usage, on peut utiliser l'instruction \francais qui définit quelques symboles spéciaux. Par exemple, on obtient

> —Inès se met à chanter...
> *Le bourreau s'est levé tôt*
> *C'est qu'il avait du boulot*
> *Faut qu'il coupe des Généraux*
> *Des Évêques, des Amiraux*
> *Dans la rue des Blancs-Manteaux*

en écrivant In'es...met ʻa...s'est lev"e t¯ot...C'est qu'il...G"en"eraux...Des "Ev¯eques..., etc. (Ne confondez pas l'apostrophe avec l'accent aigu). Pour les autres symboles grammaticaux, on écrit: Haïr (Ha\+ir), Noël (No\+el), Ça va (\CCD a va), ça ira (\ccd a ira). Enfin, il y a aussi des « guillemets » spéciaux. (\<guillemets\>\ ).[1] Il faudra apprendre par cœur toutes les conventions (c\oe ur).

Remarquez qu'aucun des accents n'est permis dans « NoFill » (que l'on verra après).

§2.3 Tutti Frutti: Glue, Boxes, Alignment

Justification　To place objects (boxes or lines) flushed left, centered, or flushed right, you can use macros \ljustline,[2] \ctrline or \rjustline respectively. All these construct a box of the same width as the page. An example appears at the end of this section.

---

[1]Pour obtenir les guillemets "normaux", utilisez \char'134 et \char'42. N'utilisez jamais ʻ ` !

[2]Boxes are always flushed left in a vertical list, so \ljustline is spurious except when a box of width $=$ size is desired.

Spacing   If you know what a \quad is, you may be happy to use \hquad (half quad) and \qquad (double quad). There also exist \xskip, \xxskip, \yskip and \yyskip described in the TEX manual. Whenever you want space at the top of the page, TEX will heartlessly kill it, so you have to add an invisible object between the top and the glue. As said in the TEX manual, \null will do, but you can simply type \topspace 3in.

Glue   There are several glue-producing macros: \lft, \ctr, \rt, \tp, \mid, \btm that are used to justify inside a box. An example of \ctr appears at the end of this section.[3] When forming a vlist of boxes, \epoxy will make them stick together without space.

Alignment   You can type a sequence of \ctrline and \vskip to center and space several lines, or you can use \ctrcol as follows:

```
\ctrcol{El Hacedor\cr\zkip{15pt}
          por   \cr\zkip{15pt}
       Jorge Luis Borges}
```

which is slightly more readable. Here \cr means end of line, \zkip means vertical skip (and should always follow a \cr). In the same way you can use \lftcol and \rtcol. You may change fonts inside the lines, as illustrated in Chapter 1. Some very general alignment macros are described in the next chapters (see \array, \cage).

To underline or to overline, type \undertext {To...} (resp. \overtext). To type things like 3rd type 3\th{rd}. Also in KERMAC are contained the ellipses (three dots)... but do not forget to enclose them between $.

Finally, there are some "Mickey Mouse" macros for glamorous effects:
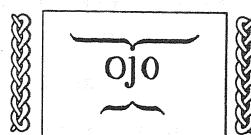
which was obtained by typing

```
{\def\boxitsep{10pt}\ctrline{\pretzelit{ \boxit{\hbox to 50pt{\upbrace}
                    \hbox to 50pt{\biggfnt\ctr{ojo}}
                    \hbox to 50pt{\ctr{\hbox to 25pt{\dnbrace}}}} }} }
```

All of these, \boxit, \pretzelit, \dnbrace, \upbrace, appear in the TEX manual. By redefining \boxitsep you can change the size of the frame in \boxit (it is defined by default to be 3pt).

§2.4 Paragraphing, Verses

Typing a paragraph simply makes it look as the one you are reading now: with a crown indentation given by \parindent, and a distance between paragraphs defined by \parskip. In this paragraph, those dimensions were chosen to be 15pt and .075in plus 1pt respectively.

Note, however, this paragraph has no crown indentation. The easiest way to do that is by typing \noindent just before the paragraph.

If in the middle of a paragraph you decide you want to cut a line short as the previous one, type \linebreak, or \lbrk as this one.
The difference between those two is evidenced: the latter won't try to stretch lines to the right margin.

---

[3]You may want to know that \tp can be used to lower the baseline of a box; e.g., \vbox{\tp{\hbox{y}}} is not the same as \hbox{y}.

Care must be taken, when appending a box in vertical mode, following a paragraph, to insert some space (TₑX will eat it). Of course you can be as arbitrary as you wish, but to insert the box with exactly the normal interparagraph spacing, there is \paraskip, which should preced the box. See? No \paraskip was typed. This is \ctrline{See...}

For adornments, there are a number of macros to handle paragraphs.

First, the macros that display a paragraph in two given levels: \displaypar, \displaypar, which get indented by 80% and 60% (resp.) of the horizontal dimension (TₑX's \hsize); you type \displaypar{First...}.

And this is the second level (.6). These two have an important feature, that they produce a box, and hence are unbreakable. This may be desirable in certain circumstances, but...

...if you wanted to display a sequence of paragraphs, or a long one, then the previous ones will not be very suitable.

The two paragraphs you are now reading were preceded by \ctrpars {.75} (again, a percentage of the horizontal size), and *followed* by \endpars. These are not boxes, but rather paragraphs (lists of boxes, the lines), and hence breakable. Note also these have \parindent, in contrast with the boxed ones.

Next, there are macros for indenting on the left by increasing amounts; this one, by 1/4in, was simply preceded by the control sequence \indentqin.

Note also all these are subject to the standard crown indentation, which can be removed using \noindent before the indent instruction. The name of this one, indenting 1/2in, is \indenthin.

Finally, to indent by one inch, \indentin.

Or, to indent by a random amount, \indentpar{2truein}{-30pt}, which also inserted a negative —30pt at the beginning of the paragraph.

\hangobj Another common application is that of hanging an object out of a paragraph. This paragraph was preceded by the instruction \hangobj{\\hangobj }, and followed by the lines in the paragraph. If the object is made to have fixed width (for instance \hbox to 60pt{obj}), the paragraphs would appear aligned.

1. For the most common application, numbered paragraphs, there exists a collection of special macros. This one was preceded by the instruction \enumerate {1}.

    This is not quite the same as \hangobj, because \enumerate will keep track of the indented amount. So, you can type a second paragraph, like this one, preserving indentation. This paragraph was preceded by the instruction \hangnxtpar.

2. Now, of course, nobody would type only a paragraph with a "1"; to continue numbering, preced the paragraph with the control sequence \enumrnext.

ix. Actually, the parameter of \enumerate can be any integer or single letter. This paragraph was preceded by \enumerate{-9}. Both macros \hangnxtpar and \enumrnext work in any case. The format of the hanging symbol (here in bold-face, followed by a quad space), can be easily altered by redefining macro \enumrfmt. This can be made to have fixed width to yield homogeneous indentation (see macro \ref).

▸ And then, there are marked paragraphs. These go preceded by the instruction \itemize, and will also remember the level of indentation.

That is, \hangnxtpar can be used for an ensuing paragraph like this one.

- The format of itemized paragraphs is \itemzfmt, which can be redefined to be your favorite mark; e.g., \def\itemzfmt{$\bullet$\hquad}. And there is also this margin parameter, \hangparind, which is initially set to be zero pt. In the preceding paragraphs, it was set to be 40pt. This will affect \enumerate, \itemize and any other macros defined in terms of \hangpar (cf. \ref)...

As well as the secondary ones.

    A. It is also possible to combine \displaypar and one of the enumerate macros. This is valid also for \itemize, \hangobj and \hangpar. Just put each par inside a display macro. Parameter \hangparind will also affect this.

Finally, we show how to handle sub-numbered paragraphs, using a stack-handling capability of \hangpar that will work regardless of the size of the hanging object (this is not quite apparent in the following examples). First, it has to be enabled; type: \hanginit, and start...[4]

  A. This is the first par   `\enumerate{A}`
       It works as before. Note \hangparind.

    1. 2nd par   `\enumerate{1}`
       It gets indented by previous amount.

      iii. 3rd par   `\enumerate{-3}`
         Get the idea?

        4th par   `\hangnxtpar`
         Now back one level:

        5th par (level of "1")   `\hangpop\hangnxtpar`
        \hangpop does it. Try another one.

    2. 6th par   `\hangpop\enumerate{2}`
       Sorry about that; there's no symbol stack.

    3. 7th par   `\enumrnext`
       But numbering can continue once reassigned.

  B. 8th par   `\hangpop\hangpop\enumerate{B}`
     Back one more and then in again:

    ▸ 9th par   `\itemize`
       Works also with marked pars.

    10th par   `\hangnxtpar`
       With correct indentation.

    ▸ 11th par   `\itemznext`
       If you had merely typed \itemize, this would be more indented.

  C. 12th par   `\hangpop\hangpop\enumerate{C}`
     End test.

To disable the nesting option, simply set \def\hangstack{F}.

It is really simpler than it looks. Basically you have to type *two* \hangpop to get back to old level, as happened in paragraphs 8 and 12. The exception occurred in paragraphs 5 and 6, where the stack was rather at the same level of indentation. So, rule is: pop twice unless previous paragraph was a \hangnxtpar, in which case you only pop once.

---

[4]The right column shows the instructions used to preced the paragraphs on the left.

N ow comes a fancy one. This kind of paragraph, adequate to start a Bible or a Fairy Tale, started with the instruction \capitalpar2N\hskip-4pt{}ow comes.... The "2" states the number of lines in which to fit the given letter. The only other possible value is 3.[5] Pity, but capital paragraphs look somewhat ugly when double spacing is used.

The same macro can also be used to construct the "dangerous bend" paragraphs appearing in the TEX manual. Merely type \capitalpar2{\danger}, followed by the text in the paragraph, where the definition of character \danger is left as an exercise for the reader. For similar uses, the format of the capital letter can be redefined (say, if a Gothic Letter is desired); one simply has to redefine the control sequence \capitalfmt.

Macros for verses come in two flavours: \verse, that merely contructs a centered box,

Qu'il vienne, qu'il vienne
Le temps dont on s'eprenne

and \dverse (shown) that works like a math display (it interrupts the paragraph, displays the verse, and continues the paragraph). Both accept alignment arguments (see \ctrcol).

§2.5 NoFill Modes

Since TEX has this compulsion of justifying every line it can lay its hands on, special macros need be defined to typeset text like that in a computer program. There are three basic macros that produce so-called NoFill output. All these produce paragraphs, and so can be subject to any of the macros explained in the previous section, with the exception of \displaypar. All of them also produce blank lines for each empty line found in the input.

The simplest one is called \rraggedd. It simply breaks at each CR (chcode'15) sensed in the input, and sets a very ragged paragraph. It is used as follows:

```
{\noindent\bf\rraggedd\1
if ScanString("ifdef") then\=\# This belongs to the \\x case in TEXEXT;
        begin
            do GetTok until CurCmd $\not=$ Spacer; BackInput;
            GetTok; if Def1:=HashEntry < 0 then
    ifdefErr:BackError("You can only use \\ifdef with control sequences");
            Def1 := Link(Link(Field(Link,EqTb[HashEntry])));
            GetNCTok; GetTok; if Def2:=HashEntry < 0 then go to ifdefErr;
            Def2 := Link(Link(Field(Link,EqTb[HashEntry])));
            ScanCond(IfEqDef(Def1,Def2));
        end else}
```

And produces, in current font,

if ScanString("ifdef") then   #This belongs to the \x case in TEXEXT;
  begin
  do GetTok until CurCmd $\neq$ Spacer; BackInput;
  GetTok; if Def1:=HashEntry < 0 then
  ifdefErr:BackError("You can only use \ifdef with control sequences");
  Def1 := Link(Link(Field(Link,EqTb[HashEntry])));
  GetNCTok; GetTok; if Def2:=HashEntry < 0 then go to ifdefErr;
  Def2 := Link(Link(Field(Link,EqTb[HashEntry])));
  ScanCond(IfEqDef(Def1,Def2));
  end else

---

[5]Which requires a larger font than that shown.

It killed all but one space at the beginning of lines. Note the use of \1 at the end of a line to discard the following CR (and thus avoid extra blank lines), and note \noindent was used to avoid crown-indentation. Also observe usage of \= to flush right the rest of a line. Macro \nojust has a similar effect (the syntax is the same), except it produces:

```
if ScanString("ifdef") then                          # This belongs to the \x case in TEXEXT;
        begin
            do GetTok until CurCmd ≠ Spacer; BackInput;
            GetTok; if Def1:=HashEntry < 0 then
    ifdefErr:BackError("You can only use \ifdef with control sequences");
            Def1 := Link(Link(Field(Link,EqTb[HashEntry])));
            GetNCTok; GetTok; if Def2:=HashEntry < 0 then go to ifdefErr;
            Def2 := Link(Link(Field(Link,EqTb[HashEntry])));
            ScanCond(IfEqDef(Def1,Def2));
        end else
```

which resembles better the given input. Note in both examples that both the \= and the $\not=$ were evaluated by TEX. This may be a bad inconvenience when the text contains excess of special characters.[6] But, on the other hand, it allows introducing formulas within non-justified text. For a more complete character set, you can use \typnoi, which sets the text in a "typewriter font"; viz,

```
{\typnoi\1
integer procedure ifeqdef (integer d1;integer d2)  # adapted from dumptokens;
begin  integer t,cmd1,cmd2,char1,char2;          # (see also \\let);
    while d1 and d2 do
 . . . . .
 . . . . .
    end; \nofbreak\1
    return (d1=d2);
end; \par}
```

```
integer procedure ifeqdef(integer d1;integer d2)  # adapted from dumptokens;
begin  integer t,cmd1,cmd2,char1,char2;          # (see also \let);
    while d1 and d2 do
    begin
        t:=info(d1); cmd1:=field(cmd,t); char1:=field(char,t);
        t:=info(d2); cmd2:=field(cmd,t); char2:=field(char,t);
        if cmd1 xor cmd2 then return(false);
        case cmd1 of
        begin
        [0] if equ(idname(char1),idname(char2)) then else return(false);
        [macprm] [spacer][endv] if cmd1 neq cmd2 then return(false);
        else if char1 neq char2 then return(false)
        end;
        d1:=link(d1); d2:=link(d2);
    end;
    return (d1=d2);
end;
```

All characters are disconnected from their usual TEX meaning (thus, typing a % would have made it appear): note for instance the appearance of #. Only \, {, } retain their meaning and that is why we had to type \\ to get \. For literal text imbedded in horizontal mode, one can also type {\typewrite <your text>} (But keep in mind this is not the same as {\tt <your text>}; latter merely changes font, but \typewrite effectively disconnects TEX.) The font used is \ttwr, \ninepoint by default.

---

[6]For instance, typing @ will yield Ø, since TEX uses a special code different from standard ASCII, so you have to use control sequences for almost every special character. See also TEXMAC in Chapter 4 for ASCII text listing macros.

When a long text is being typewritten, it is best to point out the best places to break, and this can be done by means of macro \nofbreak; see above example, and also notice usage of \1 to avoid spurious blank lines.

TABs (chcode'11) are not allowed by default, but if you are careful enough to set them only at the beginning of lines then each TAB is equivalent to eight spaces, and you can make any of the above macros recognize this by redefining \def\tabeffect{\⊔......\⊔}.

Finally, if you are wondering whether you can type (or define) things like \ctrline{\typewrite text}, the answer is no, because TEX will hastily grab the text, consider CR to be spaces and start justifying. So, the correct way to do such things is:

```
\def\code{\nojust\save0\gbox{4in}}
\def\endc{\par\ctrline{\box0}}
{\code{\1
A bunch
of lines}\endc}
```

where you choose the desired width, or place the box at your favorite spot in the page (or \boxit or whatever you prefer). You can also use \typewrite or \rraggedd in place of \nojust.

If your device has a font GRFX, you can then set graphs using NoFill mode. The syntax is almost the same, except for the \par at the end (it is crucial except when setting the graph inside \gbox):

```
{\grfx\1
```
$\leftarrow\alpha\alpha\alpha\alpha\alpha\alpha\beta\alpha\alpha\alpha\alpha\alpha\alpha\rightarrow$

a boxiix

$\%\alpha\alpha\alpha\alpha\alpha\alpha\alpha\alpha\alpha\alpha\alpha\alpha\$\par}$

To use other fonts in NoFill mode, see code for the above macros in terms of macro \nofill.

§2.6 Page Styles, Numbering, Titlepages, etc.

In the fashion KERMAC is initialized, you'll see a page format similar to that in BASIC.tex. There are, however, some parameters you may combine to obtain a different effect.

First, pages have either \romannumbering or \arabicnumbering; these appear at the bottom of pages in italic 10pt font (cf. \botfnt). It is set by typing \romannumbering{1}. There are also \titlepage and \normalpage, which control the setting of numbers: titlepages are not numbered, but normal pages are.[7]

Next, pages are meant to be used on \oneside or on \bothsides (for printing). This affects only the margins.[8]

There is a choice of another "page style" in KERMAC: \fullpages. It omits numbering, and allows use of the whole declared vertical dimension (see next section). In this style title pages are the same as normal pages. To go back to the normal page style (numbers at the bottom), you type \noheading.

To end a page, type \endpage (which does a \vfill\eject) and to end the execution of TEX, type \bye.

The \magnify option will expand pages photographically, except any dimensions given in true units. Fonts are also expanded, if the correct magnification is available in the output device.

---

[7]This also affects headings in PAPMAC.

[8]But has some other effects in the headings and headlines set by PAPMAC — see Chapter 3.

§2.7 Page Dimensions, Margins

Page dimensions are set by \sethsize, \setvsize. **You should not use** \hsize, \vsize described in the manual. Page dimensions should be specified in "true" dimensions: any valid TeX unit preceded by true.

To declare margins, use \setmargin {x}{y}{z}{w}, where all these are also true dimensions:

▸ When \oneside, left margin will be $= x$ on every page (and y is ignored).

▸ When \bothsides, left margin will be $= x$ on *odd* numbered pages, and $= y$ on *even* pages.[9]

▸ Top margins will be z on \titlepages and w on \normalpages

Example:[10]

```
\sethsize{6.25truein}
\setvsize{9.125truein}
\setmargin{1.25truein}{1truein}{1.125truein}{.9375truein}
```

As a matter of fact, neither page dimensions, nor margins "need" be specified in true units, so that dimensions could also be magnified. Use this feature at your own risk.

---

[9] Given x, h (i.e., \sethsize{h}), to get the left margin in even pages equal to the right margin on odd pages, let $y =$ < sheet width > $- h - x$.

[10] When installing the macros for a new device, if margins do not come out as described, macro \assmpage (defined by \setmargin) needs to be adjusted to the desired device. \assmpage shifts to "zero" by the left and top margins produced by TeX using BASIC.tex. Mind the fact that some spoolers also modify the margins.

Chapter 3

Macros for Papers, Reports, Books (PAPMAC)

Les soleils couchants
Revêtent les champs,
Les canaux, la ville entière.
D'hyacinthe et d'or;
Le monde s'endort
Dans une chaude lumière.

C. Baudelaire,
L'Invitation au Voyage

—Je ... Je pense qu'à la longue on doit s'habituer aux meubles.
J. P. Sartre, *Huis Clos I*

While KERMAC provides general-use facilities, this set is designed for more structured documents. There are instructions to handle "headings" (also called running heads – the text that goes on the very top of each page), and "headlines" (the text that announces the beginning of a major division in the document), to produce a table of contents, and to generate an index of key-words.

As soon as this set is input, the page style gets assigned to be \oddevennumbering and \bothsides. Please refer to the section "Global Initializations" of PAPMAC in Appendix M for details.

§3.1 Chapters, Sections

To declare a chapter, type:

> \chapterbegin{Miscellanea}

or:

> \chapterbegin{Macros for Papers, Reports,\cr\zkip{4pt} Books (PAPMAC)}

This takes care of the headline on top of this page (see next section for explanation of that strange \cr), of the heading appearing on next page, and of the table of contents entry. Declaring a chapter is a major event; it has other effects:

- Start on a fresh page
- Set headings on even pages
- Reset section numbering to 1
- Reset theorem number to 1
- Reset footnote numbering to 1.

Note section numbers, as well as the other items[1] in this list, depend on the chapter number. The chapter number itself is assigned by \chapter, and increased in each newly declared chapter. Thus, in particular, the first section declared by \sectionbegin is "3.1" (as this one).

Sections have the following effects:

- Skip and set a headline (left justified)
- Set headings on odd pages
- Make table of contents entry
- Reset subsection numbering to 1.

There are still \subsectionbegin (see next subsection) and \subsubsectionbegin. These do not[2] have any effect on the running heads; they merely put a headline and appear listed in the table of contents. Of course, \subsectionbegin resets subsubsection numbering to 1.

Chapter numbers, assigned by \chapter{7}, can be positive, negative (roman numerals), or letters (lower or upper case); one can declare \chapter{A} or \chapter{-7}. In the latter case, one gets chapters "vii, viii, ix" in lower case; but this can be altered by declaring:

\def\chapnumcase#1{\uppercase #1}

One can also start at \chapter{0}, and everything will work as described above. However, *provided* \chapterbegin is never used, as in the case of a paper that has only sections (and subsections), the numbering of sections, theorems, figures, etc. will be $1, 2, \ldots$ and not $0.1, 0.2, \ldots$ See also \secsubsecstyle.

Finally, the page skip can be altered in various ways. For instance, to skip to next odd page, generating a blank page if need be, do:

\def\chapskippage{\endpage\ddvnmsel{\titlepage\hmode\endpage}{}}

(use \endsheet in multi-column format).[3]

3.1.1 Appendices and Abbreviations

Chapters, sections, subsections, etc. have brothers called \appchapterbegin, \appsectionbegin, \appsubsectionbegin, \appsubsubsectionbegin that forget all about automatic numbering, and only set the given title. Several such titles can be found in the table of contents of this manual; for instance "Appendix M..." was obtained by typing \appchapterbegin{Appendix M...}. The idea is to allow chapters or sections for Notes, Exercises, Introductions, that need not have a number.

The appended chapters reset \chapter{0}, with the effects described in previous subsection.

A minor disaster will occur by typing \chapterbegin{A veeery long title...}; overfull boxes may occur in every heading. To avoid this, there are also the cousins \chapterbeginb, \sectionbeginb, and \subsectionbeginb *and* corresponding appendices that accept abbreviations. All these eight accept two parameters, the first one to be used in the headlines and in the table of contents, and the second in the headings only.

3.1.2 Altering the Formats

The formats used in headlines and headings for chapters, sections, etc. can be usually easily altered by merely redefining several parameters: \Chapter (= "Chapter"), \Section (= §), or the first line

---

[1] With the exception of footnotes.

[2] However, see \secsubsecstyle

[3] To save paper, replace the first argument of \ddvnmsel by \advnce0\advnce6.

in chapter headlines, which is handled by \chapfmt, and then shipped to the \headline routine (see next section). \chapfmt can be either \ddvnchapfmt (the default, "Chapter n"; like in this chapter), or \ctrchapfmt (a big numeral like that in Chapter 4), or anything else. Examples:

```
\def\Section{}          % gets rid of funny section sign
\def\Plates{Figures and Tables}
\let\chapfmt=\ctrchapfmt
```

Section, subsection and subsubsection formats include some parameters not handled by \headline routine; namely, \tit (font used for section headlines), \sectionskip and \posthdrskip (space before and after a headline). These have special penalties to avoid leaving a headline alone at the end of a page.

If more elaborate changes are desired, the "b" (e.g. \chapterbeginb) macros have to be redefined in terms of the "declare" macros. This is not difficult if one merely imitates the default formats. For example, to make subsection headlines be centered and in slanted type (default is roman, left justified for both sub- and subsubsections), one sets (first four lines show old code):

```
\def\subsectionbeginb#1#2{\addq1{\varssec}
        \subsectiondeclare{\tenpoint\hangobj{\bf\subsecnum\hquad}\rm #1}{\¬
                \subsecnum\hquad #1}{\subsecnum\hquad #2}}
\def\appsubsectionbeginb#1#2{\subsectiondeclare{\tenpoint\noindent #1}{#1}{#2}}


\def\subsectionbeginb#1#2{\addq1{\varssec}
        \subsectiondeclare{\tenpoint\ctrline{\sl\subsecnum\hquad #1}}{\¬
                \subsecnum\hquad #1}{\subsecnum\hquad #2}}
\def\appsubsectionbeginb#1#2{\subsectiondeclare{\tenpoint\sl\ctrline{#1}}{#1}{#2}}
```

Note that \ctrline was used. To allow longer titles \ctrcol or \displaypar would be better, since these allow several lines. Primitives \chapnum, \sectionnum, \subsecnum, and \subsubsecnum are assigned automatically and can be used freely inside the "declare" arguments. See also \consnum.

§3.2 Headlines, Quotes

Macro \headline takes care of major headlines and is called by other macros like \chapterbegin. By default, \headline = \ddvnheadline, is a macro that justifies to the right on odd-numbered pages and to the left on even-numbered pages, assuming \bothsides. It justifies to the right on every page when \oneside is used. Another possible variety is \ctrheadline (used in Chapter 4). That is, one can redefine dummy macro \headline, or use one of the two provided: \let\headline=\ctrheadline.

Its argument is an alignment argument, and hence accepts objects such as \cr (that causes a line-break), \zkip (vertical skip), \noalign, etc. Refer to the example of \chapterbegin given in previous section. The text is set in \Tit type (default is \Tit = \biggfnt).

The spacing before and after a headline is \hdltopskip and \hdlbtmskip respectively. These can be redefined to be any dimension acceptable by TeX, but mind the fact that the headline macro will set \titlepage, and so the top margin (see \setmargin) may play undesired tricks.

Quotes, like those appearing at the beginning of this chapter, are set by macros \chapquotep (with a paragraph argument) and \chapquotev (verse argument) immediately following the chapter declaration:

```
{\eightpoint\it
\def\\{\qquad}\francais
\chapquotev{\\Les soleils couchants\cr
        \\Rev\A etent les champs,\cr
        Les canaux, la ville enti'ere.\cr
        \\D'hyacinthe et d'or;\cr
        \\Le monde s'endort\cr
        Dans une chaude lumi'ere.\cr\zkip{3pt}
        \\\\\\rm C. Baudelaire,\cr
        \\\L'Invitation au Voyage}

\chapquotep{---Je $\ldots$ Je pense qu''a la longue on doit s'habituer aux meubles.\lbrk
        \null\hfil{\rm J. P. Sartre}, Huis Clos I\linebreak}}
```

Note that justification takes place exactly contrary to the headline. The horizontal size of the paragraph format is defined by parameter \chapquotepsize. To obtain centered quotes, one may use \displaypar or \verse described in Chapter 2.

§3.3 Page Styles

In addition to the two simple styles \noheading and \fullpages defined in KERMAC, PAPMAC includes four more elaborate ones: \oddevennumbering (like in this chapter), \bottomnumbering (like in Chapter 4), \ctrnumheading (like in Appendix M), and \topboxes (like in Appendix V). See also \secsubsecstyle. Styles may be swapped anytime in the manuscript.

Any page style will work properly with any declared page dimensions, margins, number of columns, magnification, or printing use (\bothsides, \oneside). When in \oddevennumbering, page numbers will always appear on the right hand side if \oneside is used.

None of these styles will produce headings on a \titlepage, only on \normalpage (remember \headline declares \titlepage). In a normal page, numbering may be either \romannumbering or \arabicnumbering without any change, but in a title page numbering will appear *at the bottom* only in roman pages (see \numonlyrmn, \cbotnum). Compare the titlepage at the beginning of this chapter with the title page in the table of contents.

To change or define a new page style, see Chapter 5.

§3.4 Headings

This section may be somewhat complicated; it explains all about headings, even in weird situations. Pray, don't you need to read only the next two paragraphs? (Try Chapter 1 for "normal" cases first).

Running heads vary depending on the chosen page style. In both styles \oddevennumbering and \topboxes, even-numbered pages have the chapter name and odd-numbered pages the section name. In styles \bottomnumbering and \ctrnumheading[4] chapter names go on the left, and section names on the right.

When \secsubsecstyle is declared *after* the page style, sections will play the role of chapters, and subsections the role of sections. Chapters should not be used, but subsubsections are valid (these will then be like subsections). In brief: raise one level the "category" of all those divisions (and dethrone the highest ranking one). This style is suitable for paper-type documents.

---

[4]Appendix M. is *not* a typical example of this; it utilizes special headings handled by TEXMAC.

Parameters for running heads include: \rhtypeface (\eightpoint by default), \hdrfnt, the font used for titles in the headings, and \topnum, the font used for page numbers in the headings (not the same as \botfnt!).

These are the normal cases. Anomalous situations occur when the first pages of a chapter (resp. section in \secsubsecstyle) do not contain a section (resp. subsection) declaration, and in that case the section (resp. subsection) heading is copied from the chapter (resp. section) heading. This will be acceptable in either of the first two styles but in the other two you'll get a double heading. To fix this one can define

$$\text{\textbackslash def\textbackslash adjchaphd\{\textbackslash gdef\textbackslash rhoddpg\{\}\}}$$

to wipe out the odd (or right) repeated heading. Similarly, in \secsubsecstyle, do:

$$\text{\textbackslash def\textbackslash adjsechd\{\textbackslash gdef\textbackslash rhevenpg\{\}\}}$$

In chapter-section style, if there are chapters but no sections, the chapter name will appear in every heading (as above). If there are sections, but no chapters, the even (or right) heading will appear empty.

In section-subsection style, sections without subsections will have the section name in every page. If there are sub-sections, but no sections, the even (or right) heading will appear empty.

One way to fill (or replace) undesired headings is by means of \fixedheadings; it has two arguments: the first, the desired even (right) heading, and the other the odd (left) heading. Reverse the order if in \secsubsecstyle. However, if any of the given parameters is *empty*, the corresponding heading will still be assigned by the chapter, section, etc. declaration. This should explain the paper templates given in Chapter 1.

If even this long list will not solve your problem, try redefining \headmark as a last resource. It is called by \chapterbegin and \sectionbegin to store the headings for latter use (cf. \normmark) in the output routine. Its two arguments have the same meaning as those in \fixedheadings. For example, to make the headings be reversed, do:

$$\text{\textbackslash let\textbackslash invheadmark=\textbackslash headmark}$$
$$\text{\textbackslash def\textbackslash headmark\#1\#2\{\textbackslash invheadmark\{\#2\}\{\#1\}\}.}$$

Or, for a temporary inversion, you may also try \rhswap. Chapter 5 gives some further details.

§3.5 Footnotes, Comments, Notes, Bibliography

Footnotes come in two varieties: \nfootnote having some text as argument,[5] and \footnote having for first argument a character[∅] and for second the associated text. Footnotes are only valid in horizontal or in vertical mode. Depending on the position of the footnote declaration, the identifying tag may preced a punctuation mark[6], or follow it,[7] or appear on top[8] as you see fit.[9] Since footnote will eat all spaces preceding the declaration, you may need to insert a little space afterwards[10] Some parameters can be changed to taste: \botsep (definition of bar, and space after it), \botskip (space between footnotes), and \footntsize (width of text).

---

[5] This one numbers automatically.

[∅] Which is used as tag. This does not alter automatic numbering.

[6] Ugly, isn't it?

[7] This is a controversial topic

[8] Using \spose{.} instead of "," just before the footnote

[9] Look at this.

[10] Look at this one. Type \spose{.}\nfootnote{Look at...}\quad. The "\spose" may be omitted. Also observe the neat indentation that occurs when the footnote occupies several lines.

If there are footnotes, why not \sidenote's? The note to the right was typed immediately preceding this paragraph; it is not valid to declare sidenotes in the middle of a paragraph (but blank lines; say in the form "\ \linebreak", can be inserted to move it a few lines down). Sidenotes also have several controlling parameters: \sidenotesize (width), \sidenoteskip (the margin between text and sidenote), and are set in font \sidenotefnt (currently \tinyfnt).

Another species of notes is the \annotate kind. These are accumulated, and listed as either an appended section (\seclistnotes), or as an appended chapter (\chaplistnotes). That is, type as many \annotate{text} as you wish, and then at the end of the chapter, type \seclistnotes. The reference will be by page number. These also have controlling parameters: \lntypeface (currently \eightpoint), and \lnpar (the format used to list an annotate entry).

To insert commentaries in the manuscript, there are also \comment 's. These have two parameters; typing \comment{\Max}{I think this should be rewritten} will typeset that commentary between brackets in the form [Max: I think this should be rewritten] *provided* \Max is "Max"; but this comment can be made to disappear by setting \def\Max{}. It is useful to define

```
\def\Max{\comment{\cmax}}
\def\cmax{Max}                  % or \def\cmax{} to delete comments
```

and then merely type \Max{I think...}.

For bibliographic references, there is a simple macro \ref. One types

```
\ref{7}Schmeller, Johann (ed.), \it ``Carmina Burana'' --- Lateinische und deutsche
Lieder und Gedichte. \rm Stuttgart, 1847.

\hangnxtpar Einer Handschrift des XIII Jahrhunderts aus Benedictbeuern auf der K.
Bibliothek zu M\"unchen.
```

to get

[7]   Schmeller, Johann (ed.), *"Carmina Burana" — Lateinische und deutsche Lieder und Gedichte.* Stuttgart, 1847.

Einer Handschrift des XIII Jahrhunderts aus Benedictbeuern auf der K. Bibliothek zu München.

The format of the reference box can be changed: \reffmt, \refsize. You may also try using one of the \enumerate -type macros if you do not care for brackets.

§3.6 Figures and Tables

The TEX manual (p. 108) shows a way to typeset a table. Here is an equivalent, more readable macro (have you tried a 20 by 20 table yet?) yielding the same result:

```
{\jail$$\cage{to 150 pt}{\r\c\r}{\hbar
            \noalign{\hbox to 150pt{\vb \ctr{AT & T Common Stock}\vb}}
            \hbar
            \row \.Year\.\hfill|\.Price\.|\.Dividend\.\endr
            \row 1971|41-54|\$2.60\endr
            @2|41-54|2.70\endr
            \row 3|46-55|2.87\cr
            \row 4|40-53|3.24\hbar
            \row 5|45-52@@3.40\nohbar
            \row 6|51-59|.95\spose{*}\endr
            \noalign{\vskip 3pt
                    \hbox{*(first quarter only)}}}}$$}
```

this code yields[11]

AT & T Common Stock		
Year	Price	Dividend
1971	41-54	$2.60
2	41-54	2.70
3	46-55	2.87
4	40-53	3.24
5	45-52	3.40
6	51-59	.95*

*(first quarter only)

Table 1. Illustration of the use of \jail, \cage

Macro \jail defines the environment within which a \cage can be constructed. Latter has three arguments: a dimension (or empty, use natural size), a preamble, that can make use of the special control sequences \l, \r, \c (left, right, center), and the third a list of rows that can use any of the primitives shown above. Thus, \row and \endr set left and right v-bars on the sides of a row of elements, which are delimited by either "|" or @@ (to omit the vertical ruler). A row can also end in one of the control sequences \cr, \nohbar, or \hbar, or begin with @, with shown effects.

The vertical dimension of rows is controled by means of parameter \cagesize, defined by default to be 2pt. When this is increased, a row ending in \nohbar may look too separated from the next one (cf. Fig. 1 in Chapter 1). To remedy this, \cr or \nohbar may be followed by the special macro \bskip, which will make the two rows be a distance \bskipsize apart (default is 2pt); that is, the normal distance between rows is overridden and \bskipsize is used instead. To separate rows, on the other hand, one may insert empty rows (\row||\nohbar), or an alignment skip: \zkip. For special effects, \vb yields a vertical bar and \hbar a horizontal one.

Finally, to produce asymmetrical tables, you may experiment using \spose or \.\spose{A long line}\. in place of a table entry, or similar combinations. (Recall \spose produces an element of zero-width, so if its real size is wider than the natural size of the column where it appears it will extend beyond that column. Next, justify it to taste using \.).

All of these are local macros, valid only inside the \jail environment. Another example appears in Chapter 5. Macro \ctrline could also have been used to center the table, instead of $$.

These macros will work with any given font (the size of the vertical bar is computed), and the dimension of the vertical skip can be controlled by means of parameter \cagesize.

---

[11] The mistakes are intentional!

Figure 2. A blank \figuref inserted by TEX in next available location.

You may have noticed the caption, as well as the entry in the table of plates. There are two macros that leave a given amount of space and set a caption on bottom: \figure and \table. In previous example we left zero space in order just to set a caption, assign penalties, and to set an entry in the table of plates. Similar to these are \figuref and \tablef, which instead of leaving space where they appear, will seek enough space top of the next possible page; ex: \figuref{1.5in}{A blank \\tt\\figuref...} This will most often happen on top of the page where \figuref appears (with occasionally unpleasant results). To insert a whole page figure, you should leave enough space for the caption to fit in.

Table and figure numbers are global, but can be reset anytime by reassigning variables \vartab and \varfig. The space below the f-figures (resp. tables) is controlled by \topskip.

Finally, captions come in several flavours and can be chosen by redefining the format \ftfmt: \ftctr accepting one line (default), \ftatop accepting several lines in verse (align) format, and \ftatoppar that accepts a paragraph.

§3.7 Table of Contents and Plates

In the first stage, transparent to the user, both tables are constructed using the names declared in \chapterbegin (resp. \figure), etc. and stored in files called TOFC.TEM, TOFP.TEM (no initialization required). Then, at the end of the manuscript, one inserts the instruction \tableofcontents or \tableofplates with its argument being the *roman* page number where the table should appear (e.g. "3" will set it in page "iii"; but "-3" in page "3"). The table of contents is thus generated with the appearance of an appended chapter (not listed in the table, of course!). Refer to Chapter 1 for some hints on manuscript organization.

Character "|" is not allowed in any title that is to appear in either table, but can be set using \vbar.

There are a few parameters to alter: \tofctypeface (\ninepoint by default), \tofcsize, the width of entry lines, and \leadtc, the format of "leaders" (currently we use dots). The format of the table of contents' lines themselves is handled by macros \tofcbox, \tofcline, \tofcgap.

If it is desired to add an entry to one of the tables, one can use macros \addtotofc, \addtotofp. This is useful, for example, when appending title pages generated in special ways (cf. Chapter 5). Also notice the artificially inserted "Plates" entry in the table of contents of this manual.

The table of contents is generated on a separate page, but it can also be imbedded in the text (e.g. as an appended section), although this will require running TEX at least three times: (1) Imbed file TOFC (or TOFP) in the text (as explained below) putting appropriate headlines, spacing, etc. just to have an idea how much space this will take. (2) Run TEX again to obtain correct page numbers and re-imbed file in text. (3) Run final version. The correct way to imbed the strange table of contents lines is as follows:

```
{\tofcpreamble

% optional: \def\constofc#1#2{} \appsectionbegin{\Contents}

    Lines obtained from TOFC.TEM
}
```

(the cryptic \def\constofc... serves to disconnect the table of contents construction: table of contents should not appear listed in itself).

§3.8 Index of KeyWords

The index is similar to the Table of Contents. First, special macros are used to construct a file INDX.TEM which contains the information necessary generate the index itself. This is done using the instruction \indexgenerate, but this stage is not automatic: you have to use first a (lexicographic) sort program outside of TeX.

Index entries have two levels, and are perhaps best described by looking at examples—please refer to the index, and find the entries named "Index" (and variations), which were generated using the following in several places within the manuscript:

```
Level 1:    \index{Index}
            \indexsee{Index}{\tt\\indexgenerate}
            \indexsee{Index}{\tt\\index}
            \indexj{index}{\\tt\\}                    % entry \index
Level 2:    \iindex{Index}{construction of}
```

All these are merely tagged to the position of the page where they appear and leave no visible mark. Macros suffixed "j", \indexj and \iindexj, allow a piece of text to be inserted in front of the first word; thus the entries in the index of this manual could be made to appear in the correct alphabetical order. Macros suffixed "k" (for "keep"), \indexk and \iindexk, have the same tagging effect as their non-k counterparts, but they also insert the key-words in the text; that is, \indexk{nahuatl} is precisely the same as \index{nahuatl}nahuatl.
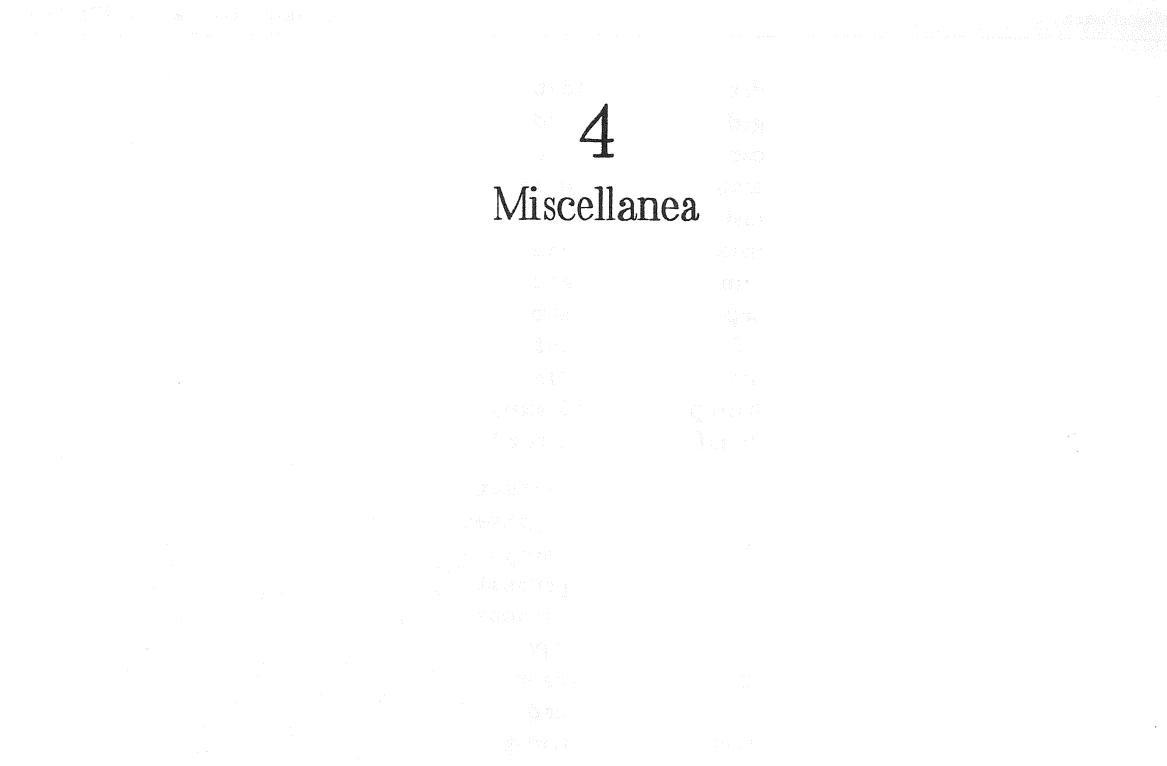
Character "|" is not allowed in any keyword appearing in the index, but can be set using \vbar.

Now, once you have created the file INDX.TEM, you need to do a lexicographic sort of it and put the result in a file called INDEX.TEX (see \loadindx). Then run TeX again, but this time insert the instruction \indexgenerate (see Chapter 1). Macros will take care of the rest.

One parameter that can be changed is the typeface: \indxtypeface, \eightpoint by default.

The sort program (every installation has one) should: (1) compare strings delimited by <cr>, (2) delete repetitions, and (3) not distinguish lower case from upper case. Ask your local wizard.

Note: To make the above work, TeX requires a simple extension to compare two strings. The required procedures appear in Section 2.5 as examples of NoFill mode. They are extremely simple to install.

4

Miscellanea

§4.1 Macros for Math (MATMAC)

Most of these were taken either from BASIC or from the TEX manual, and for that reason, will not be extensively described here. All control sequences in this section are valid only in Math Mode (that is, between $ or $$).

For a very complete set of macros designed specifically for Mathematics, see[1] "$\mathcal{AMS}$ TEX."

4.1.1 Standard Math Stuff

First, there are functions, operators, and transcendental functions.[2]

sin	\sin
cos	\cos
tan	\tan
cot	\cot
sec	\sec
csc	\csc
exp	\exp
log	\log
ln	\ln

---

[1] *The Joy of TEX* by Michael Spivak, published by the American Mathematical Society.

[2] Please notice TEX contains many others already incorporated.

det	\det
gcd	\gcd
osc	\osc
diam	\diam
dist	\dist
max	\max
min	\min
sup	\sup
inf	\inf
lim	\lim
limsup	\limsup
liminf	\liminf
{	\leftset
}	\rightset
∅	\emptyset
⊂	\psubset
⊃	\psupset
≡	\eqv
≢	\neqv
≠	\neq
mod	\modop

Also included are \mod and \choose. For the slightly more complicated ones, there are \lpile, \cpile, \rpile, \chop; and for equations, \eqalign, \eqalignno, and \twoline. The following are used in the manual, but not included in BASIC:

$$\delta_{i,j} = \begin{cases} 1 & \text{if } i = j, \\ 0 & \text{otherwise;} \end{cases}$$

you type:

```
\delta↓{i,j}=\bracedef{1}{\hbox{if }i=j,}{0}{\hbox{otherwise;}}}
```

For characteristic functions: \charfn{S} yields χ_S. Notice the difference using sub-indices: χ_S.

For matrices (compare with manual; here you don't need to set the alignment!):

$$\begin{pmatrix} a_{11} & 7 \\ \exp x^2 & 234 \end{pmatrix}$$

you type, for a 2 by n array, with columns spaced by a \quad:

```
\left(\array{2}{\quad}{a↓{11}@7\cr
              \exp{x↑2}@234}\right)
```

In general, \array has three parameters; the first, the number of columns, the second the intercolumn spacing (e.g. \; or \quad as above), and the third a list of alignment rows. Notice \array does not include the parenthesis. As a matter of fact it is a very versatile macro; for instance, to construct diagrams[3]

---

[3]Algebrists may be somewhat disappointed to learn that there is no reasonable way to typeset a diagram with diagonals, such as the *Zassenhaus Lemma*.

using macros \Harrow, \Varrow:

$$0 \longrightarrow H \xrightarrow{\quad inc \quad} G \longrightarrow G/H \longrightarrow 0$$

$$\Big\downarrow can \qquad \Big\downarrow can \qquad \Big\downarrow id$$

$$0 \longrightarrow H/K \xrightarrow[inc]{} G/K \xrightarrow[can]{} G/H \longrightarrow 0$$

which was done by typing

```
{\def\rarr{\Harrow{30pt}{}{\r}}
$$\array{9}{\;}{
0\;0\rarr{}{}0H0\rarr{inc}{\vbox to 15pt{}}0G0\rarr{}{}0G/H0\rarr{}{}00\cr
00\Varrow{30pt}{}{\d}{\ \quad}{can}00\Varrow{30pt}{}{\d}{\ \quad}{can}00\Varrow{30pt}{}{\d}{\quad}{id}\cr
0\;0\rarr{}{}0H/K0\rarr{}{inc}0G/K0\rarr{}{can}0G/H0\rarr{}{}00}$$}
```

Note both arrow macros have five parameters: the length, the left and right (or top and bottom) arrow characters, which can be omitted, and the last pair any objects that go on the top and bottom (left and right) of the arrow. In the example the vertical arrows used only the objects to the right, but a space was inserted as a left object in order to center the arrows. To avoid the vertical offset of horizontal arrows with respect to the objects, these should be \vcenter'ed.

4.1.2 Theorems, Proofs, Equation Nos.

For automatic numbering, there are \thm, \lem, \cor, \prop, \rem, which come out like:

Lemma 4.1. *If Ω is any set of finite measure and $u \in L^p(\Omega)$ is positive, $p > 0$, then*

$$\int_\Omega u^p = p \int_0^\infty t^{p-1} |\Gamma_t| \, dt \tag{4.1}$$

where $\Gamma_t = \{ x \in \Omega : u(x) \geq t \}$.

Proof: We may assume that $p = 1$, since the general assertion follows by a simple... ∎

Which was obtained by typing `\lem If $\Omega$ is any set... \Pf We may... \QED`. So there are of course also \Pf (also called \proofbegin) and \QED, which have the shown effect.

For other statements use \stmt; e.g. \stmt{Paratheorem} There holds...:

Paratheorem 4.2. *There holds $8i = \infty$, and consequently $\infty i = 8$ also.*

Proof: As we know, $i = e^{\pi i/2}$ is a rotation by 90°. The conclusion then follows by elementary parageometry. The proof of the second statement is left as an exercise. ∎

Do not despair if you dislike your theorems in \it type; merely redefine parameter \stmtfnt.

Note the equation number in lemma above: \neqno. This is used as TEX's \eqno, as the last token in a Math Display Mode list. For numbers on the left, use \nleqno (re: \leqno). Also note how the (automatic) numbering depends only on the chapter number. If you had declared \chapter{0}, the zero-chapter number would have been omitted. Same thing happens in an \appchapterbegin. As observed in Chapter 3, \chapterbegin (and relatives) reset the \stmt numbering to 1 again. Same convention is used for \neqno (resp. \nleqno).

See also the \thbegin-type macros defined in the TEX manual.

Variables \varstmt and \vareqno are used to count statement and equation numbers, and are initialized (\inivar) to be 1. Both can be reset at any time (but do not let \chapterbegin play tricks on you!) to get desired numbering.

§4.2 Letters, Memoranda, Phone Guides (LETMAC)

This is the easiest set to use. You need only know the rudiments of TEX to be able to type your letters. You may also use this set to generate a listing of names and addresses and telephone numbers.

4.2.1 Letters and Memoranda

To get started, all you need do is create a file LETT.TEX containing:

```
\input letmac

\def\sname{Max D\'\i az}
\def\saddr{Mathematics Department\cr Stanford, California 94305}

\let\pname=\sname
\def\pmax{{\penfnt Max }}
\def\paddr{1211 Ramona Street\cr
           Palo Alto California, 94301\cr
           U. S. A.}

% A special letterhead
\def\iimas{\def\jaddr{Apartado Postal 20-726\cr M\'exico 20, D.F.}
           \let\jname=\sname
           \def\ltfnt{\dunhill\baselineskip16pt}
           \gdef\whoswho{Tel. 548-33-60} % (note usage)
           \gdef\jlogo{$\vcenter{\hbox{\bigggfnt IIMAS\hskip8pt}}$}
           \def\lbltop{{\bigggfnt$\vcenter{\hbox{IIMAS}}$\hskip3pt}{\jname}{\jaddr}}
           \job}

% Initialize to taste
\parindent 20pt
```

Then, a typical letter will look like this:

```
\input lett                        % Input previous file
                                   % Language (\espanol,\francais, \english)
\date{December 1\th{st}}           % Letter date

\stanford                          % Style of letter; see also \personal,\smemo

\to{Mr. Hyde\cr 35 Curzon St\cr    % Destinatary
London\cr}

        Letter text goes here...

\sign{\sname}                      % Your signature
\fin                               % End letter and generate addr. labels
```

And to print the letter, you just input (a file containing) the previous instructions. There are a number of things in file LETT above that require explanation.[4] The \iimas macro is special and you may just ignore it.

Stanford Letterhead Parameters

- ► \saddr Defines your address at Stanford. This can be any number of lines (two or three preferred) separated by \cr (which causes a line-break), as shown above. This is used in the letter-head, in the memorandum style, and in the return-address label.

- ► \sname Your name in a formal letter. Used in the return-address label only.

    Example: \def\sname{Lawrence M. Dollar, M. D.}.

- ► \whoswho Defines your honorary titles, position, and/or phone number, or simply omit it if you do not really have anything to put there. May be several lines long. Ex:

    \def\whoswho{Lawrence Manya Dollar III, M. D.\cr Corporate
        Director\cr (999)878-1234 to 7653}

Personal Letterhead Parameters

- ► \paddr As before. Your home address. Used in the letter-head, and in the return-address label.

- ► \pname Your personal name. One line preferred. Used in the return-address label only. Example: \def\pname{Larry Buck}. Note you may include your name in the first line of \paddr, but in that case you should leave \pname empty (default).

That is all LETMAC needs to know (and probably so do you; but read on, there are a number of useful macros). Coming back to the letter template shown before, the various elements are used as follows.

- ► \english First define desired language (remember \espanol, \francais). English is the default, and if this is desired, simply omit this line.

---

[4]Note KERMAC need not be input. LETMAC will input it automatically.

▶ \date This is set in the form \date{February 31} or \date{March 1\th{st}}. Year is added automatically. If the format is not satisfactory, do instead \def\todate{your own format}.

▶ \stanford Or \personal define the letter-head style. See also \smemo.

The order of the last three things needs be preserved.

▶ \to Sets the destinatary. May be several lines long, separated by \cr. For example,

```
\to{Mlle. Niaque Lafolle\cr 35 Rue des Hauts Cieux\cr
     Quartier L\'a B\'as\cr  7500483 Paris, France\cr}
```

(do not forget the \cr at the end). This information is then copied for the address label, and in the footings (only after the first page). For an easier way to set the destinatary, see the next section.

Then the letter itself. beginning with

```
\noindent Ma Niaque, petite,
```

▶ \sign The simplest signature may be \sign{Yo mero}, but several lines may be typed in; for instance,

```
\sign{\hfill Sincerely,\cr\ssqip\signbar\cr
      \hfill Evlin R.}
```

or simply \sign{\ssqip\sqip ME}, and so on. The control sequence \ssqip provides enough space for a common signature (unless you happen to be a banker). The cryptic \hfill inserted in the first example makes the words be centered with respect to the ruler \signbar.

▶ \sqip This is similar to \ssqip, but about half of its dimension. Both may be used inside \saddr, \paddr, \whoswho, \to, \cc or \smemo, provided they follow a \cr.

After the signature you may type various things; for example \cc below, or:

```
\noindent (Enclosure)
\noindent AB/wxy
```

▶ \cc Consists, again, of several lines; type (in one line if you prefer):

```
\cc{cc:@Mr. Alien\cr
    @Dr. Fou\cr
    @Prof. Tic}
```

▶ \fin This is the standard way to end a letter (or \smemo), to generate the address labels. If these are not desired, simply type \endpage (or \bye).

File may end here, or other letters may follow. Copy previous pattern from \to to \fin (if in same language).

A typical memorandum looks like this:

```
% Select language at this point
\date{December 1\th{st}}
\smemo{Juan Charrasqueado}
```

The text

```
\endpage
```

▸ \smemo Does everything for you, except the text. Its parameter may contain several lines, similar to \cc. Ex:

```
\smemo{Charlie\cr Re:@That pending business}
```

or,

```
\smemo{Mr. Janitor\cr
        @Maintenance Dept\cr
     Re:@No soap in the bathroom\cr
     cc:@Worker's Union}
```

That is, each line consists of two items, separated by @. The first, possibly omitted, aligned with the "To:" and "From:", and the second aligned with the Memo's recipient.

4.2.2 Name-and-Address Listings

You may construct a file containing the \to{ ... } instructions, which may then be copied into the letter. However, all those \cr are unsightly. For better results, how about something like:

```
\@Diaz|Max
Mathematics Department
Stanford University
Stanford, CA 94305
%  Home: 123-4567
%  ARPA: MMD \at SAIL,
%     CSD.DIAZ \at SCORE
@
```

which can be inserted just as it is in place of \to{Max Diaz\cr Math...}.

The rules are as follows:

▸ The vertical bar denotes inversion, when appearing in the *first* line. Thus, the letter will be addressed to "Max Diaz". This allows keeping the items in alphabetical order, if so desired, but the bar may be omitted in any of the names (as in the case of a company name).

▸ Any line preceded a per-cent sign will be omitted in this application.

▸ Things to be careful about are: (1) the at-sign to terminate, appearing alone in last line of the group, (2) Use \at to put an at-sign, not \@, (3) do not type % alone in a line; add a blank space or something, and to type a real per-cent sign, use \per.

In addition to the above, you may also generate a neat listing of your telephone directory; you need only insert the following in the first page of the file containing the above groups:

```
\input letmac

\phonebook{T}                 % F omits comments "%"
\deskstyle                    % or \pocketstyle
\def\lefth{Directorio Telefonico}    % Some captions to choose
\def\righth{Max Diaz}


          Names and Addresses go here


\bye
```

4.2.3 Adapting LETMAC

Replacing the Stanford seal in the letterheads is done in a very simple way by invoking macro \job, which contains parameters \jaddr, \jname, \lbltop, and \jlogo. This is done in macro \iimas, where the logo was replaced by "IIMAS".

Similarly, adapting \smemo may just require setting in your LETT.TEX file the following addition:

```
\def\xmemo#1{{\def\saddr{your addr} \def\sname{your name}
            \smemo{#1}}}
```

then using \xmemo instead of original one.

There are some other parameters in this set; the words \To, \From, \Memo, and the date format \date. Most fonts are also handled by means of parameters; for instance, \phdfnt, \fotfnt, \fottypeface. You may also wish to alter the format of address labels (\lblfmt). To design a more elaborate letterhead, see "Page Styles" in Chapter 5.

§4.3 Listing Text Files (TEXMAC)

This set permits listing of almost any text file (or text) in no-fill mode, where all ASCII printing characters appear correctly (as well as some SAIL characters, but do not count on this). The macro listings of Appendix M were generated directly from the macro files using this set.

Files may contain any character, except ∞ (ASCII character '16), which is used as escape character. Form-feeds (FF), Vertical-Tabs (VT), and Line-feeds (LF) are ignored. ALL others are taken literally (including TEX's special characters). TABs are allowed (and will be substituted by exactly eight spaces), but may not always work (they will, when appearing at the beginning of lines, and followed by spaces. Macro files actually are all TABed). The first character in the file should not be a space nor a TAB. The syntax is:

```
{\sic
∞listfile/file/
∞listfile/another file/


            Or put text here


∞endsic}
```

TEXMAC requires previous input of KERMAC and PAPMAC (except when not using \listfile. Various other control sequences exist that allow, for instance, putting headers and sections (again, see Appendix M and the table of contents).

► ∞comm/anything/ ignores anything.

► ∞pagebrk forces a page break.

► ∞tsec/section name/ does a \sectionbegin.

► ∞tssec/subsection name/ performs a \subsectionbegin.

Note all these should appear in the text file in places where they will not harm the contents of the file. In the case of TEX files, it is possible to type %∞pagebrk in the file. For more details, take a look at the source macro files.

§4.4 Times Roman Fonts (TMRMAC)

This is similar to TBASIC.tex. It is probably useless unless those fonts exist in your installation.

TMRMAC is meant to be input any time after input of KERMAC, and will redefine \tenpoint as well as \bigfnt and \biggfnt.

Chapter 5

Page Design

This chapter extends the brief overview given in Chapter 1 about the output routines. We saw there how to specify dimensions, margins, magnification, etc.; here we shall see how to handle multi-column format and how to define or modify page styles. If the latter is your intention, you may be able to proceed to section 5 after leafing briefly over the next four sections, which go into all dark alleys of the output neighborhood.

---

§5.1 MultiColumn Format

This is very simple to use; as soon as one declares \multicolfmt, one declares the number of "columns" desired using \columnsperpage, e.g.

n	h	i	w
2	3	.25	6.25
3	2	.125	6.25
4	1.5	.08333	6.25
7	.85714	.04166	6.25
9	.66666	.03125	6.25

Table 2. Possible column sizes (truein)

That is, the first argument, n, states the number of columns ($1 \leq n \leq 10$); the second the width h of the columns, separated by the intercolumn glue i specified by the third. The fourth is the total width w, where it is required that $w \geq n \times h + (n - 1) \times i$ (equality occurs in all examples given above). Thus, h is TEX's \hsize, while w is the width of headings and other similar things that live outside the columns. After such a declaration, any ensuing input text will be so formatted, preserving any other output declarations such as headings, page style, page dimensions or magnification. Bigger n than 3 is of course not very suitable for text, but can be very useful to typeset tables.

In multicolumn format some things have a different meaning. Macro \endpage only ends a column, but \endsheet a real page (\vfill'ing each column), and \bye then performs the latter. The equivalent of \eject is \ejectsheet (see also macro \completesheet in next section). Finally, note size (h) refers to the width of a column.

As you may have noticed, it is possible to change the number of columns in the middle of a page, but this will be discussed in the next two sections.

If plain, single-column format is desired, it is best to use \singlecolfmt, which makes TEX run considerably faster. However, the output routine for multi-column output allows single-column format with a number of additional features; (see next section). For single column, the instruction \sethsize{x} is converted into a columns-per-page declaration with $n = 1$, $h = w = x$. But h need not equal w; and if it isn't one can create special effects, such as headings extending beyond the page (i. e., column) boundaries. For example:

```
\columnsperpage{1}{6truein}{0pt}{6.25truein}
\def\lftcolskip{.125truein}
```

will cause headings to overhang .125truein on either side. This is basically what is going on in this page (as can be seen in the headings). For special effects, like rules between columns, or boxed pages, see macros `\intercolsep` and `\frameit`.

The original TEX control sequences `\hsize` and `\vsize`, that declare horizontal or vertical dimensions, are redefined by KERMAC, but their original definitions are saved as `\Maxhsize` and `\Maxvsize`. These may need to be used in special cases, but reading of this chapter is recommended before attempting to do so.

§5.2 MultiRow Format; States

Multi column format is practically useless unless there are mechanisms to set headlines on top, middle or bottom of a page. There are some such macros available that work *almost* like TEX's `\topinsert`, `\botinsert`. But to describe them one must first understand some special *states* that occur in the output routines.

When in `\singlecolfmt`, the states are exactly the same as the usual TEX modes: horizontal, vertical, etc. In `\multicolfmt`, states are:

H [Horizontal State]. TEX can be in any mode, but it has not yet completed a column (i.e., a `\page`).

V [Vertical State]. A column has been completed, and TEX is in vertical mode. This state is achieved from state H after a call to `\endpage` or `\eject`; (further ones have no effect).

S [Stable State]. This is when V state occurs in the last column of a page. State S is reached after an `\endsheet` or `\ejectsheet` (and further ones have no effect).

In state S it is valid to invoke `\Topinsert`, `\Midinsert`, or `\Botinsert` which have for argument a `<vlist>` (note capitals). This list is inserted in the appropiate place, and TEX remains in state S. The use of these is to put headlines interwoven in a multi-column page; for example:

```
\endsheet  % or \ejectsheet
           % or \completesheet
\Topinsert{\ctrline{Topmost headline}
           \vskip 1in}
\Botinsert{\vskip 20pt\ctrline{A footline}}
%\columnsperpage... (or use previous value)

   Some text

% Go to state S (see next section)
\Botinsert{\vskip 1in
           \ctrline{Botmost footline}}
\Midinsert{\vskip 30pt
           \rtcol{Mid\cr Headline}
           \vskip 30pt}

   More text

% Go to state S (optional)
\completesheet
```

Successive TopInserts are stacked up (that is, last one goes at the top), while BotInserts are stacked down (last one at bottom). MidInserts are special *top* insertions that go at the bottom of the top stack. Thus, in the example, the MidInsert will appear below the first text, and will be followed by the second text.

An example of such row pasting-up appears at the end of this chapter.

§5.3 Balanced MultiColumn Format

In the example shown in last section, there were some mysterious instructions to force S state. It is obvious that what is needed is a mechanism to effect a TopInsert of whatever is still contained in the *current* page. For example, for the headline at the begining of this chapter the actual instructions were:

```
\balancedmode

\chapterbegin{Page Design}
   This chapter extends the brief...

\balancecols{}
\columnsperpage{2... }
\Midinsert{...         }
```

Not minding the misleading (for this example) names, what the above does is: `\balancemode` says "prepare for a TopInsert," and then macro `\balancecols` performs it; after it TEX is in state S, and hence the MidInsert is then valid (the centered ruler). Of course this could have

been done by typing a TopInsert on top of the two column page, as explained in last section.

Naturally there is nothing to "balance" if you are using only one column. But suppose you are using two columns. Then, at the end of a chapter (look at the end of this one) chances are you'll get a long column extending to the bottom of the page and another short one. One can then invoke macro \balancemode at the beginning of that page, and \balancecols{} at the end. Again, this puts TEX in state S, and hence a MidInsert is possible.

Now, everything is fine as long as you are trying to balance something balanceable. What if it isn't?

Refer to Figure 3. There are nine columns and $509 = 58 \times 9 + 3$ items. Hmm... if the above instructions are inserted as such, the three elements left will go to limbo, and will just be dropped somewhere at the bottom of the page. So what you have to do is tell TEX to allow for a little error; say, by adding one more item to the first eight columns, and leaving the last one with less items; $509 = 57 \times 8 + 53$. Actually you don't even have to count: since the items are set in eight point, just tell TEX to allow an error of 8pt. This is the argument of \balancecols (null in the first example). Finally, you have to tell TEX you don't want any more TopInserts, but real output: \completesheet.

The whole story is then:

```
\columnsperpage{9... }
\titlepage
\Topinsert{\ctrline{Appendix R.}
    \vskip7pt
    \hbox par size{The following... }
    \vskip15pt}
\balancedmode

\eightpoint
\noindent{\rraggedd\
11FTP
6TO10
......
YH
ZERO}

\balancecols{8pt}
\completesheet
```

§5.4 Output Routines

In single column format the \output routine is extremely simple; it saves each \page delivered by TEX in \box5, inserting glue \lftcolskip at the left. \box5 is fetched by macro \assmpage, which selects between \titpage or \nrmpage (both of which must make use of \box5 — see next section), puts the result inside \frameit and then sets up the correct margins, whereby counters 0 and 6 are advanced.

Macro \frameit (dummy by default) can be used to \boxit the page, for instance, but may require different headings to avoid overlapping. This is used in LETMAC; see the definition of macros \pageframe, \phonebook, \deskstyle, and \pocketstyle. The other dummy macro, \intercolsep, can be defined to be a vertical ruler, as ilustrated in this chapter.

In multi-column format, \box5 is eventually handled as described above, except that its construction may take a more tortuous path. What happens is that columns are horizontally appended (with \intercolsep inserted between them) until n are completed, and then whatever was accumulated in \box6 (Top inserts) is put on top, and \box4 (Bot inserts) on bottom.

But the output routine may also be called without any actual output being produced. Such is the case in balanced mode (\blnce = T), when pages are merely appended vertically in \box3, and then eventually fed back to TEX by macro \balancecols. The former switches to "regurgitate mode" (\rgrgtt = T), which instead of outputting a completed \box5, merely performs a TopInsert of it.

§5.5 Page Styles

To define a new page style, one needs to define two vertical lists that are called \titpage and \nrmpage, and that consist of any combination of boxes, vertical glue, and headings or footings (both are also boxes). The output routine will invoke the appropriate vlist depending on whether the constructed page is a \titlepage or a \normalpage. The result is then shipped to the pastup routine described in previous section.

There are two important objects that appear in those vlists; namely, \box5 that contains a completed (possibly multi-column) page, and \normmark that contains headings. The former is constructed internally, and the user need only use it without further worry; but the latter can be designed in any conceivable way. The way it works follows: macros like \chapterdeclare invoke a macro called \headmark that has two parameters (chapter and section name, as explained in chapter 4) the latter produces a box that is \mark'ed (or stored—cf. TEX manual) for latter use, namely when \normmark is invoked. The latter can be defined as \botmark (the default), \topmark, or \firstmark to taste (see the TEX manual for the meaning of these). If, for instance, the top mark is chosen, headings would refer to the first section declared in a given page, and not to the last as it is by default.
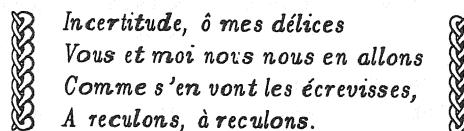
This is a good moment for you to consult Appendix M and see how page styles \topboxes and \noheading make use of the objects so far described. Note for instance how the \headmark macro for \topboxes stores an \if instruction to put a heading appropiate to the parity of the page.

Other things to be found in the title page and normal page lists constructed by the page styles include: \cbotnum, a box of height \btmnrspace containing a centered number, and \numonlyrmn that constructs either such a box or an empty one depending on whether the page has a roman numeral.

Page styles such as \oddevennumbering and \ctrnumheading, which set a ruler beneath the heading titles (as in this chapter), are written in terms of macro \onelineheading, which in turn uses other primitives called \headmarknln, \onelinefmt, and \onelineh. Thus, to remove the ruler, one simply needs redefine the latter (refer to Appendix M), not the whole page style. See also how \ctrnumheading takes advantage of these primitives.

Finally, to complete the (re)definition of a page style, one needs to state how big should pages be (i.e., TEX's \vsize). This is done by means of macro \computevsize that has two arguments; the first a *constant*, \epagesize (the vertical dimension declared by the user), and the second the maximum height of headings, footings, numbers, etc. This is illustrated in style \bottomnumbering, which leaves 3/4in to compensate for the fact that normal pages have both a heading and a bottom number.

Incertitude, ô mes délices
Vous et moi nous nous en allons
Comme s'en vont les écrevisses,
A reculons, à reculons.

Appendix R.

The following DMP files, on the [1, 3] directory, may be run by an R FILNAM<CR> command. If HELP documentation is unavailable, many of these programs are still easy to use as they may contain self documentation or they may request the necessary input data interactively.

11FTP	CHRTST	DSKLOD	FONTCA	LINK	OPASCA	PUB	STORY	VEROLD
6TO10	CINEMA	DSKTIM	FORMAT	LINS	OPUMA	PUB2	SUPDUP	VIDXGQ
A	CKSUM	DTLNET	FRAID	LISP	ORACLE	PUMA	SURVEY	VLISP
A2E	CM11	DTN	FREEFO	LITCRY	P	Q	SW	VM
ACRDEM	CODE	DTYPE	FRWK40	LOA	P2P	RAID	SWR	VM15
ACRONY	COLIST	DVIFTP	FSCALE	LOADAV	PACK	RCV	SYNDMP	VM22
ACRPAP	COMBI	DVIPRE	FSIM	LOADER	PACKMS	RDPY	SYNJOB	VMR
ACRROD	COMBIN	DVIXGP	FSIM2	LOGRUN	PAGE	READCN	SYNTER	VNEW
ACRSIM	COMPLR	E	FTP	LPS	PAL	RECKNU	SYNTH	VPROVE
AD	CONVRT	EC	FUDGE2	LPSYN	PALX	REDUCE	SYSDWN	VTEST
ADAM	COOL	ECL	FUNC	LSPFNT	PAM	RELFLY	TALK	VWOLF
ADH	COPY	EDFONT	FUNC11	LSPMON	PARRY2	REPENT	TAP	WAIT
ADS	CPRINT	EDIT	G	MACLSP	PAS	RESOLV	TAPE	WAVES
ADUDP	CRAM	EFIND	GAL	MACRO	PAS2	RHY	TD	WEAK
ADVENT	CRDIR	EFTP	GEOMED	MACTO6	PASCAL	RLISP	TEC	WHEN
AFPIX	CRE	ELCF	GLOB	MAGGOT	PASOLD	RMS	TECH2	WHERE
AID	CREF	EMACLS	GO	MAIL	PC	ROUTE	TECO	WHO
AKRNIM	CROSS	ENCODE	GOGAME	MAINSA	PCHECK	RPG	TELNET	WILD
AL	CRU1	ENORM	GREEN	MAP	PCP	RSEXEC	TEMPER	WISE
ALIGN	CRU2	ERAID	GRHOCK	MAXTEX	PCPLOT	RSL	TENDMP	WL
AM11	CRYPT	ESPERA	GRNJOB	META	PCREF	RUNOFF	TENGWR	WLA
AMOEBA	CRYPTO	EX	GRUMP	METAFO	PDRILL	RYDER	TEST	WLABS
AMPSCL	CSTART	EXB	HARRY	METER	PEDIT	RYGAME	TEST2	WLNET
ARKTEX	D	EXBFTP	HAUNT	MEXPR	PERUSE	S	TEX	WLUMAP
ARKXGP	DA	EXHALE	HE	MF	PETAL	S1LPT	TEXDOC	WM
ARMDPY	DAEMON	EXL	HEART	MFRPVC	PFORM	SAIL	TFDRD	WO
ATSIGN	DART	EXMRG	HELP	MFRSYN	PICTUR	SAMCMP	TFTOPL	WOMBAT
B	DAZZLE	EXR	HG	MFSYN	PIX	SAMPLA	TFXGEN	X
BASIC	DBCK	EXS	HOST	MICROS	PIXUR	SAVE	TFXPR	XAP
BCOMPL	DCHESS	F	HOSTAB	MIDAS	PK	SAVPP	TIMES	XBIGMF
BIGPIC	DCSTAT	F40	HOSTAT	MITFIX	PLISP	SCIP	TINGLE	XCOMPL
BILLBD	DDFONT	FAIL	HYPNO	MIXAL	PLNR	SCORE	TJ6PUB	XGPDVI
BINCOM	DDHACK	FAILSA	IC	MIXSCR	PLOT	SCRIBE	TJCNV	XGPJOB
BLAISE	DDJOB	FASBOL	IIIGO	MIXSND	PLTOTF	SEGFND	TMPCOR	XGPLOT
BLIS10	DDT	FASM	IIIPOX	MKVID	PLTPRE	SEGMEN	TSNAIL	XGPMF
BLISS	DDTLSP	FASM2	IL	MLISP	PLTVEC	SHIT	TSTJOB	XGPQUE
BLOOP	DDUSE	FCOPY	IMPSTA	MLISP2	PMFW	SHUFFL	TTEX	XGPSYG
BLTST	DDVID	FCROX	INDENT	MLISPC	POINTY	SIMPLE	TTYSET	XGPSYN
BRAVO	DEDIT	FED	INDEX	MMFOL	POLL	SIXTYP	TVFONT	XGPTEX
BRKSND	DF	FILDMP	INFO	MONUSE	POX	SLAC	TXTF80	XGPTYP
BROOM	DFTP	FILE	INHALE	MP	PPK	SLR1	TYPJOB	XGPVID
BUDGET	DIABLO	FILEX	INR	MPV	PPL	SMPLS	U	XIP
BUNDLE	DIAL	FIND	ITSV	MS	PPSAV	SNAIL	UDPUSE	XLATE
BUREAU	DIET	FINDAF	JMCWC1	MSORT	PPSAVE	SOB	UEDDT	XLD
BUZZ	DIGTIZ	FINE	JMGSYN	MTRX	PR	SOLO	UNDOC	XLISP
CAL	DIRED	FINGER	JOTTO	MUS10	PREPOX	SOS	UNPACK	XM
CALLIT	DIZZY	FIRWRK	JUST	MUS11	PRESS	SPASM	UNPOX	XPART
CAM	DLNFTP	FIXIM1	KAFFEE	MUSIC	PRIV	SPECT	UNXGP	XS
CANCEL	DLNSTA	FIXIML	KALAH	MYMF	PRN	SPELL	V	XSV
CANTOR	DM	FLTAPP	KLMUS	NAME	PROFIL	SPIDER	VAR2P	YELLOW
CCLOCK	DMCHK	FMUNGE	KRL	NCOMPL	PROVE	SPINDL	VARIAN	YELO
CHACK	DO	FNTCHR	KWIC	NETWHO	PRUNE	SPOOL	VARL	YH
CHAT	DOCTOR	FOL	L	NEWLCF	PSEG	SQUEEZ	VCGEN	ZERO
CHATER	DPYHAX	FOLISP	LCF	NEWMUS	PTEX	SRCCHK	VCLIP	
CHECKE	DRAW	FOLML	LESCAL	NEWS	PTY	SRCCOM	VCWP	
CHRFNT	DRONE	FOLMRG	LIFE	NMUSIO	PTYJOB	SSORT	VERCH	
CHRMAC	DRW	FONT	LIFXGP	NPOX	PTYOLD	STEREO	VERIFY	

Figure 3. Using Multi-Column Format for Tables

Appendix M. Macro Listings

KERMAC.tex

```
\chcode '45=5    % % ignores rest of line
\chcode '134=0   % \ escape character
\chcode '173=1   % { beginning of group
\chcode '176=2   % } end of group
\chcode '44=3    % $ begins math
\chcode '26=4    % @ alignment tab
\chcode '43=6    % # parameter character
\chcode '136=7   % ↑ superscript escape
\chcode '1=8     % ↓ subscript escape
\chcode '13=10   % VT space-type (⏘ in this listings)

\font L=cmr10 at 30truept  % = cmr30
\font A=cmr18
\font M=peni18 at 18truept
\font B=cmr12
\font C=cmdunh
\font D=cmss12
\font E=cmu10
\font a=cmr10
\font g=cmi10
\font u=cmsy10
\font n=cms10
\font q=cmb10
\font t=cmtt
\font ?=cmti10
\font G=cmcsc
\font b=cmr9
\font h=cmi9
\font i=cmsy9
\font s=cms9
\font k=cmb9
\font y=cmtt9
\font I=cmti9
\font F=cmcsc9
\font m=cmr8
\font r=cmi8
\font o=cmsy8
\font p=cms8
\font e=cmb8
\font H=cmtt8
\font J=cmti8
\font K=cmcsc at 8truept
\font d=cmr7
\font j=cmi7
\font x=cmsy7
\font c=cmr6
\font v=cmi6
\font w=cmsy6
\font f=cmr5
\font l=cmi5
\font z=cmsy5
\font 0=cmathx
\font ;=stan70
%font >=          % reserved for GRFX font
%
```

```
\def\tenpoint{\def\rm{\:a}
        \def\sy{\:u}
        \def\sl{\:n}
        \def\bf{\:q}
        \def\tt{\:t}
        \def\it{\:?}
        \def\caps{\:G}
        \mathrm adf % 10,7,5
        \mathit gjl
        \mathsy urz
        \baselineskip 12pt
        \dispskip 12pt plus 3pt minus 9pt
        \dispaskip 6pt plus 3pt
        \dispbskip 7pt plus 3pt minus 4pt
        \rm}
\def\ninepoint{\def\rm{\:b}
        \def\sy{\:i}
        \def\sl{\:s}
        \def\bf{\:k}
        \def\tt{\:y}
        \def\it{\:I}
        \def\caps{\:F}
        \mathrm bcf % 9,6,5
        \mathit hvl
        \mathsy iwz
        \baselineskip 11pt
        \dispskip 11pt plus 3pt minus 8pt
        \dispaskip 6pt plus 3pt
        \dispbskip 6pt plus 3pt minus 3pt
        \rm}
\def\eightpoint{\def\rm{\:m}
        \def\sy{\:o}
        \def\sl{\:p}
        \def\bf{\:e}
        \def\tt{\:H}
        \def\it{\:J}
        \def\caps{\:m}               % WRONG because CMCSC8 not available.
        \mathrm mcf % 8,6,5
        \mathit rvl
        \mathsy owz
        \baselineskip 10pt
        \dispskip 9pt plus 3pt minus 7pt
        \dispaskip 4pt plus 2pt
        \dispbskip 5pt plus 2pt minus 1pt
        \rm}
\mathex Q

\def\bigggfnt{\:L}
\def\biggfnt{\:A}
\def\penfnt{\:M}
\def\bigfnt{\:B}
\def\dunhill{\:C}
\def\sanss{\:D}
\def\teniu{\:E}
\def\tinyfnt{\:c\baselineskip 7.5pt}
\def\mathfnt{\:0}
\def\stanlogo{\:;}
\def\gfx{\:>}

\def\spacing#1{\save9\vbox{\null\null}\baselineskip #1ht9}
\lineskip 1pt
%
```

42

```
\def\%{\char'45 }
\def\&{\char'46 }
\def\\{\hbox{\sy\char4}}
\def\#{\hbox{\sy\char'161}}
\def\@{\hbox{\sy\char'174}}
\def\${\hbox{\sy\char'177}}
\def\vbar{\hbox{\tt\char'174}}


\def\LIFESAVER#1{\ifdimen\count0pt<#1pt{\gdef\jnk{\chcode'27=5}}
                          \else{\gdef\jnk{\chcode'134=5\chcode'173=5\chcode'27=0}} % ↔
             \jnk}
\def\ENDLIFESAVER{\chcode'134=0\chcode'173=1\chcode'27=5}


%
```

English, Espanol, Francais

```
\def\espanol{}
\def\francais{}
\def\english{\langrestore
        \let\langcoderestore=\¬
        \let\langrestore=\¬
        \def\date##1{\gdef\todate{##1, 1981}}
        \hyph 50}
\def\todate{}


\LIFESAVER1
\def\espanol{\langrestore
        \makeacc{42}{\"}{16} % "=acute
        \chcode '32=13\def\~{\accent'24 } % ~=tilde (never on an "i")
        \def\langcoderestore{\chcode '32=12\chcode '42=12}
        \def\langrestore{\langcoderestore\let\"=\umlaut}
        \def\date##1{\gdef\todate{##1{} de 1981}}
        \hyph 100}
\def\francais{\langrestore
        \makeacc{140}{\`}{15} % `=grave
        \makeacc{32}{\^}{17} % ^=circumflex
        \makeacc{42}{\"}{16} % "=acute
        \makeacc{42}{\+}{23} % \+=trema
        \def\ccd{\c c}
        \def\CCD{\spose{\char'30}C}
        \def\<{\hbox{\:w h\hskip-1pt h\hskip.30em}}
        \def\>{\hbox{\hskip.30em\:w i\hskip-1pt i}}
        \def\langcoderestore{\chcode '32=12\chcode '42=12\chcode'140=12}
        \def\langrestore{\langcoderestore\let\"=\umlaut\let\`=\grave\let\<=\mineur\let\>=\majeur}
        \def\date##1{\gdef\todate{le ##1{} de 1981}}
        \hyph 100}

\def\makeacc#1#2#3{\chcode '#1=13\def#2##1{\if##1i{\accent'#3\i}\else{\accent'#3##1} }}
\let\umlaut=\"
\let\grave=\`
\let\mineur=\<
\let\majeur=\>
↔ENDLIFESAVER

%Internal use:
\def\langrestore{}
%
```

Glue, Boxes, Alignment

```
\def\epoxy{\baselineskip0pt\lineskip0pt}

\def\lft#1{#1\hfill}
\def\ctr#1{\hfill #1\hfill}
\def\rt#1{\hfill #1}
\def\tp#1{#1\vfill}
\def\mid#1{\vfill #1\vfill}
\def\btm#1{\vfill #1}

\def\null{\hbox{}}
\def\spose#1{\hbox to 0pt{#1\hss}}

\def\ljustline#1{\hbox to size{#1\hss}}
\def\ctrline#1{\hbox to size{\hss #1\hss}}
\def\rjustline#1{\hbox to size{\hss #1}}
\def\lftcol#1{\vbox{\halign{\lft{##}\cr #1\cr}}}
\def\ctrcol#1{\ctrline{\vbox{\halign{\ctr{##}\cr #1\cr}}}}
\def\rtcol#1{\rjustline{\vbox{\halign{\rt{##}\cr #1\cr}}}}

\def\hquad{\hskip.5em{}}
\def\qquad{\quad\quad}
\def\xskip{\hskip 7pt plus 3pt minus 4pt}
\def\xxskip{\hskip 14pt plus 6pt minus 8pt}
\def\yskip{\par\penalty-50\vskip 3pt plus 3pt minus 2pt}
\def\yyskip{\par\penalty-100\vskip 6pt plus 6pt minus 4pt}

\def\zkip#1{\noalign{\vskip #1}}

\def\topspace{{\hrule height0pt}\vskip}
%
```

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Underline, Boxit, Brace, th, Ellipsis

```
\def\undertext#1{$\underline{\hbox{#1}}$}
\def\overtext#1{$\overline{\hbox{#1}}$}

\def\boxit#1{\vbox{\hrule
                   \hbox{\vrule\hskip\boxitsep
                         \vbox{\vskip\boxitsep #1\vskip\boxitsep}\¬
                         \hskip\boxitsep\vrule}
                   \hrule}}
\def\boxitsep{3pt}

\def\th#1{{$\top{\hbox{\:m #1}}$}}
\def\ldots{{.\:>.\:>.}}

\LIFESAVER2
\def\bigp#1{\mathopen{\vcenter{\hbox{\mathfnt\char'#1}}}}
\def\biglp{\bigp0}
\def\bigrp{\bigp1}
\def\bigglp{\bigp{22}}
\def\biggrp{\bigp{23}}
\def\biggglp{\bigp{40}}
\def\bigggrp{\bigp{41}}

\def\cdots{{\char'401\:>\char'401\:>\char'401}}
\def\ldotss{{.\:>.\:>.\:>}}
\def\cdotss{\cdots\:>}
\def\ldotsm{{\:>.\:>.\:>.\:>}}
\def\vdots{\vbox{\baselineskip 4pt\vskip 6pt\hbox{.}\hbox{.}\hbox{.}}}

\def\dnbrace{$\char'772$\bracex$\char'775\char'774$\bracex$\char'773$}
\def\upbrace{$\char'774$\bracex$\char'773\char'772$\bracex$\char'775$}
\def\bracex{\leaders\hrule height 1.5pt \hfill}
\def\pretzelit#1{$\left\char'656\vcenter{\hbox{#1}}\right\char'657$}
↔ENDLIFESAVER
%
```

Paragraphing, Verse

```
\parindent 40pt
\parskip .075in plus 1pt

\let\=\hfil
\def\lbrk{\=\linebreak}
\def\paraskip{\par\noindent{\parskip0pt\par}}

\def\displaypar#1{\paraskip
                {\def\noindent{}\save9\hbox to size{}\ctrline{\hbox par .8wd9{#1}}}}
\def\displayypar#1{\paraskip
                {\def\noindent{}\save9\hbox to size{}\ctrline{\hbox par .6wd9{#1}}}}

\def\ctrpars#1{\save9\hbox to size{}\save 8\hbox{\hskip\hpagesize\hskip-#1 wd9}\hmode
             \parshape 1 .5wd8 #1wd9\!}
\def\endpars{\par\parshape 0{}}

\def\indentqin{\hangindent.25truein after 0 }
\def\indenthin{\hangindent.5truein after 0 }
\def\indentin{\hangindent1 truein after 0 }
\def\indentpar#1#2{\noindent\hangindent #1 after 0\hskip #2\!}

\def\enumerate#1{\setcount7 #1\hangpar{\enumrfmt}\advnce7}
\def\enumrnext{\hangpop\hangpar{\enumrfmt}\advnce7}
\def\enumrfmt{\ifdimen \count7pt<64pt{\bf\count7.\quad}\else{\bf\char\count7.\quad}}

\def\itemize{\hangpar{\itemzfmt}}
\def\itemznext{\hangpop\itemize}
\def\itemzfmt{{\mathfnt\char '170}\hquad}

\def\hangpar#1{\if T\hangstack{}\else{\save8\hbox{\hskip\hangparind}}\noindent\hskip 1wd8\¬
             \save9\hbox{#1}\save8\hbox{\unbox8\hskip1wd9}\box9\hangindent1wd8\!}
\def\hangnxtpar{\noindent\hangindent 1wd8 after 0\!}
\def\hanginit{\save8\hbox{\hskip\hangparind}\def\hangstack{T}}
\def\hangpop{\save8\hbox{\unbox8\unskip}}
\def\hangparind{0pt}
\def\hangstack{F}

\def\hangobj #1{\save9\hbox{#1}\noindent\hangindent 1wd9\box9\hskip 0pt\!}

\def\capitalpar#1#2{\save8\hbox{\capitalfmt{#2}}
       \save9\vbox{\if2#1{\hbox{h}\null}\else{\hbox{h}\null\null}}\paraskip
       {\parskip0pt\copy8\dontbrk\vskip-1ht9\hrule height0pt\dontbrk\noindent
       }\hangindent1.3wd8 for #1}
\def\capitalfmt#1{\bigggfnt #1}

\def\verse#1{\ctrline{\lftcol{#1}}}
\def\dverse#1{\paraskip\ctrline{\lftcol{#1}}\noindent}
%
```

Rraggedd, NoJust, TypeWrite, Grfx

```
\LIFESAVER3
\def\rraggedd{\def\1\
{}\def\
{\skip9\linebreak\null}% \CR
\chcode'15=13\hmode}              % cr

\def\nojust{\penalty-1\def\         {\tabeffect}
\def\ {\hquad}\rraggedd          % \SP
\chcode'11=13\chcode'40=13{}}                    % tab, sp

\def\typewrite{\ttwr\nofill}
\def\typnoi{\brkhere\noindent\typewrite}

\def\grfx{\brkhere\noindent\grafix\nofill}
\def\gbox#1#2{\hbox¥par¥#1{#2}}        %VT=¥='13

\def\nofbreak{{\par\brkhere\parskip0pt\noindent}}

\def\tabeffect{{\mathfnt\char'177}}% \TAB (surprise)

%
```

NoFill Macro – Internal Use

```
% Fonts for used in \nofill:
\def\ttwr{\ninepoint\tt}
\def\grafix{\gfx\parskip 0pt\epoxy}

% Produce "nofill" text.  Note result is a paragraph:
\def\nofill{\def\\ {{\char'134}}\def\{{{\char'173}}\def\}{{\char'176}}\def\1\
{}\def\         {\tabeffect}\def\
{\skip9\linebreak\null}% \CR
\chcode'1=12% ↓
\chcode'26=12% ⊖
\chcode'43=12% #
\chcode'44=12% $
\chcode'45=12% %
\chcode'136=12% ↑
\langcoderestore
\chcode'11=13\chcode'15=13\chcode'40=13{}} % tab, cr, sp

\specskip9 0pt plus 100pt
↔ENDLIFESAVER
%
```

Dimensions; Multi-Column

```
\def\sethsize#1{\columnsperpage{1}{#1}{0pt}{#1}}
\def\setvsize#1{\computevsize{#1}{\hdngsize}}

\def\setmargin#1#2#3#4{\gdef\assmpage{\moveleft 1.0625truein
                                \hbox{\ddvnmsel{\hskip #2}{\hskip #1}
                                        \vbox{\vskip-.9375truein
                                                \if T\tpage{\vskip #3}\else{\vskip #4}
                                                \frameit{\if T\tpage{\titpage}\else{\nrmpage}}}}
                                \normalpage}}

\def\magnify#1{\chpar12=#1
                \computevsize{\epagesize}{\hdngsize}
                \columnsperpage{\colsperpg}{\hpagesize}{\intercolglue}{\hsheetsize}}

\def\singlecolfmt{\endsheet
        \gdef\mcol{F}
        \gdef\endsheet{\endpage}
        \output{\epoxy\save5\hbox{\hbox to \lftcolskip{}\page}
                \assmpage\advnce0\ifpos0{\advcount6}\else{\advcount6 by-1}}}

\def\multicolfmt{\endsheet\input mulmac }

\def\columnsperpage#1#2#3#4{\endsheet
        \Maxhsize #2
        \setq\colsperpg{#1}
        \ifnum #1=1{}\else{\if F\mcol{\Error! Declare \multicolfmt}\else{}}
        \setq\hpagesize{#2}
        \setq\intercolglue{#3}
        \setq\hsheetsize{#4}
        \setq\varcoln{\colsperpg}}
%
```

Page Design, Numbering, Use, Styles

```
\def\romannumbering#1{\setcount9 #1\neg9\setcount0\count9\advcount9 by 10100\setcount6\count9}
\def\arabicnumbering#1{\setcount0 #1\setcount9\count0\advcount9 by 10100\setcount6\count9}

\def\oneside{\gdef\ddvnum{F}}
\def\bothsides{\gdef\ddvnum{T}}

\def\endpage{\par\vfill\eject}

\def\bye{\endsheet\end}

\def\titlepage{\gdef\tpage{T}}
\def\normalpage{\gdef\tpage{F}}

\def\noheading{\endsheet
        \computevsize{\epagesize}{\btmnrspace}
        \gdef\nrmpage{\box5\cbotnum}
        \gdef\titpage{\box5}
        \gdef\headmark##1##2{}}

\def\fullpages{\endsheet
        \computevsize{\epagesize}{0pt}
        \gdef\nrmpage{\box5}
        \gdef\titpage{\box5}
        \gdef\headmark##1##2{}}

\def\botfnt{\teniu}


        % Page parameters. Should not be altered
\topbaseline 0pt
\maxdepth 0pt
%
```

Internal Handling of Pages

```
        % #1 = total printing area, #2 = hdng (and footng) space; so, \vsize=#1-#2.
\def\computevsize#1#2{\setq\epagesize{#1}
                     \setq\hdngsize{#2}
                     \save9\vbox{\vskip #1\vskip-#2}
                     \if T\noejc{\gdef\noejc{F}}\else{\eject}
                     \Maxvsize 1ht9}

\def\cbotnum{\vskip 0pt
           \vbox to
           \btmnrspace{\btm{\hbox to
                            \hsheetsize{\ctr{\botfnt
                                            \ifpos0{--\hquad\count0\hquad--}\else{\count0}}}}}}
\def\btmnrspace{.375 truein}

        % Do #1 if \bothsides and even page; do #2 otherwise:
\def\ddvnmsel#1#2{\if T\ddvnum{\ifeven0{#1}\else{#2}}\else{#2}}

\def\lftcolskip{0pt}
\def\frameit#1{\vbox to \epagesize{#1}}

        % Only to initialize properly:
\let\endsheet=\endpage
\def\noejc{F}
\def\hdngsize{0pt}
\setcount80
\def\consnum#1{#1}
%
```

Hacks

```
\chcode'272='3072
\varunit 1 in

\def\trace{\chpar0=}
\def\jpar{\chpar1=}
\def\hyph{\chpar2=}
\def\ragged{\chpar8=}
\def\jjpar{\chpar15=}
\def\loose{\chpar14=}
\def\uchyph{\chpar16=}
\def\macrotrace{\trace'355}
\def\pagetrace{\trace'77700147}
\def\fullpagetrace{\trace'77777747}
\def\normaltrace{\trace'345}

\def\dontbrk{\penalty1000000{}}
\def\brkhere{\penalty-1000{}}

\def\hmode{{${}-$}}         % Enter horizontal mode
\def\¬{}          % Kill spaces (dummy c. s.).

        % Advance #1 +1 if \count#1 nonnegative; else by -1
\def\advnce#1{\neg#1\ifpos#1{\advcount#1}\else{\advcount#1 by -1}\neg#1{}}

        % #1 = num; #2 = \var; to handle pseudo-counters (to spare some \count'ers for luser)
\def\addq#1#2{\setcount9 #2\advcount9 by #1\setq #2{\count9}}
        % #2 = num; #1 = \var
\def\inivar#1#2{\xdef #1{#2}\addq{-1}{#1}}

\def\ifzero#1#2\else#3{\ifpos#1{#3}\else{\neg#1\ifpos#1{\neg#1 #3}\else{\neg#1 #2}}}
\def\neg#1{\setcount#1-\count#1 }
\def\ifnull#1#2\else#3{\def\ifnjnk{#10}\if0\ifnjnk{#2}\else{#3}}
\def\ifnum#1=#2#3\else#4{\ifdimen #1pt=#2pt{#3}\else{#4}}

        % \iterate{stmt}{\var}. See \endsheet.
\def\iterate#1#2{\ifdimen #2pt>0pt{\addq{-1}{#2}#1\iterate{#1}{#2}}\else{}}

        % A few LISP-like macros for a change:
\let\setq=\xdef
        % \eval{arg}
\def\eval#1{\setq\expandit{#1}\expandit}
        % \apply{\function}{args}{\result}. Examples in LETMAC.
\def\apply#1#2#3{\eval{\def\getans##1{\gdef#3{##1#2}}\getans{#1}}}
        % \elt{index}{list}{\ans}. See \LIFESAVER and also MULMAC.
\def\elt#1#2#3{\eval{\gdef\eltindx##1##2##3##4##5##6##7##8##9{###1}}\apply{\eltindx}{#2}{#3}}

\let\Maxhsize=\hsize
\let\Maxvsize=\vsize
\def\hsize{\Error! Use \seth(v)size.}
\let\vsize=\hsize

\def\close#1{\open#1=empty#1.tem }

% Redefine for use in other sets:
\def\LIFESAVER#1#2#3{\elt{#1}{\loadtab}{\jnk}
                  \ifdimen \jnk pt#2#3pt{\gdef\jnk{\chcode'27=5}}
                              \else{\gdef\jnk{\chcode'134=5\chcode'173=5\chcode'27=0}} % ↔
                  \jnk}
\chcode'27=12 % ↔ any char, as should
%
```

Global Initializations

```
\singlecolfmt

\sethsize{6.25truein}
\setvsize{9.125truein}
\setmargin{1.25truein}{1truein}{1.125truein}{.9375truein}

\noheading
\arabicnumbering{1}
\oneside
\normalpage

\english
\tenpoint
\normaltrace

        %Default loading patterns for the other sets:
\def\matmac{01100}
\def\papmac{013111000}
```

LETMAC.tex

```
%
```

Letter-Heads, Sign, Destinatary

```
\input kermac

\let\at=\@
\let\per=\%

\def\stanford{\let\jaddr=\saddr\let\jname=\sname
              \def\ltfnt{\dunhill\baselineskip16pt}
              \def\lbltop{{\hskip-5pt$\vcenter{\vskip18pt
                                              \hbox to 40pt{\stanlogo B}
                                              \vskip18pt}$}{\sname}{\saddr}}
              \def\jlogo{\hskip-60pt$\vcenter{\spose{\stanlogo T}}$\hskip 58pt}
              \job}
\def\personal{\formalstyle\titlepage
        \def\ismemo{F}
        \def\hdid{ }\def\fotfnt{\it}
        \def\lbltop{{}{\pname}{\paddr}}
        {\phdfnt\ctrcol{\paddr}}
        \vskip 40pt
        \rjustline{\teniu\todate\hskip 20pt}
        \vskip .5in}
\def\phdfnt{\eightpoint}

\def\smemo#1{\formalstyle
             \normalpage
             \def\fotfnt{\rm}
             \def\ismemo{T}
             \def\hdid{{\def\cr{ / }\saddr}}
             \ctrline{\undertext{\hbox{\hquad\sanss\Memo\hquad}}}
             \vskip 30pt
             \cc{\To@#1\cr\zkip{1.5pt}\From@\sname\cr\zkip{1.5pt}}
             \vskip 10pt}

\def\to#1{{\def\cr{\alpha}\apply{\getfirst}{#1\alpha\alpha\beta}{\hdid}}
          \save9\vbox{\halign{\lft{##}\cr#1}}
          \if T\ismemo{}
            \else{\save7\vbox{\unbox7\apply{\lblfmt}{\lbltop{\box9}}{\label}\label}}
          \vbox{\halign{\lft{##}\cr#1}}\yyskip\yskip}
\def\@{\par\chcode'15+13\chcode'45=13\def\%##1\
{}\getgente}

\def\sign#1{\par\dontbrk\vskip .3in
            \rjustline{\lftcol{#1}\hskip 120pt\null}}
\def\signbar{\hfill\vbox{\hrule width 80pt}\cr\zkip{4pt}}

\def\cc#1{\halign{\lft{##}@\hquad\lft{##}\cr #1\cr}}

\def\fin{\endpage\if T\ismemo{}\else{\unbox7\endpage\save7\vbox{}}}

\def\sqip{\zkip{15 pt plus 2.5pt}}
\def\ssqip{\zkip{50 pt plus 10 pt}}
%
```

Phone & Addresses Directory

```
\def\deskstyle{\columnsperpage{3}{2truein}{.125truein}{6.375truein}
        \setvsize{9.125truein}
        \def\lftcolskip{.0625truein}
        \def\genteskip{5pt plus 1pt minus 1pt}
        \def\nlfmt{\endpage\topspace.0625truein
                   \hbox{\sanss\ini}\vskip 5pt\hrule width\hpagesize\vskip15pt}}
\def\pocketstyle{\columnsperpage{2}{2.875truein}{.25truein}{7truein}
        \setvsize{6truein}
        \def\lftcolskip{.5truein}
        \def\genteskip{0pt}
        \def\nlfmt{\endpage}}


\def\phonebook#1{\gdef\@{\chcode'15=13\chcode'45=13{}\getpgente}
        \if T#1{\gdef\%##1\
{##1\cr}}\else{\gdef\%##1\
{}}
        \chcode'174=13
        \def\|{, }
        \def\ini{z}
        \let\fottypeface=\teniu\def\fotfnt{}
        \eightpoint
        \parindent0pt
        \fullpages
        \def\intercolsep{\ctr{\vbox to size{\leaders\vrule\vfill}}}
        \let\frameit=\pageframe
        \multicolfmt}
%
```

Internal Handling of Pages

```
\def\job{\formalstyle
        \titlepage
        \gdef\ismemo{F}
        \gdef\fotfnt{\rm}
        \hbox to size{\jlogo$\vcenter{\ltfnt\lftcol{\jaddr}}$
                      \hfill$\vcenter{\eightpoint\lftcol{\whoswho\cr}}$}
        \vskip 40pt\rjustline{\todate\hskip 75pt}\vskip 25pt}

\def\formalstyle{\endsheet
        \arabicnumbering{1}
        \gdef\btmnrspace{1in}
        \gdef\fotfnt{\rm}
        \computevsize{\epagesize}{\btmnrspace}
        \gdef\titpage{\box5}
        \gdef\nrmpage{\box5\btmstrip}
        \gdef\btmstrip{\vbox to
                       \btmnrspace{\vfill\fottypeface\fotfnt
                           \hbox to \hsheetsize{\hdid\hfill\todate\spose{\qquad\count0}}}}}

\def\lblfmt#1#2#3#4{
        \vbox{\boxit{\hbox to \lblwid{#1$\vcenter{\eightpoint\lftcol{#2\cr#3}}$}}
              \vskip.2pt
              \boxit{\hbox to \lblwid{\ctr{\vbox to \lblht{\mid{#4}}}}}}}
\def\lblwid{3.5truein}
\def\lblht{2truein}
\save7\vbox{}

\def\pageframe#1{\vbox{\def\boxitsep{0pt}
                       \boxit{\hbox to \hsheetsize{\vbox to \epagesize{#1}}}
                       \vskip 5pt
                       \vbox to 0pt{\hbox to \hsheetsize{\ctr{\botfnt\count0}}
                                    \vskip 0pt minus 10000000pt}
                       \hbox to \hsheetsize{\tenpoint\quad\lefth\hfill\righth\quad}}}

\def\getfirst#1α#2β{#1}
\def\invert#1|#2|#3β{\! #2  #1}
\def\firstchar#1#2β{#1}

\def\getgente#1\
#2Ω{\apply{\invert}{#1| {}| {}β}{\gente}{\def\
{\cr}\xdef\junkie{#2}}\ to{\gente\cr\junkie}\chcode'15=5\chcode'45=5\let\%=\per\let\
=\¬}

\def\getpgente#1Ω{{\def\
{α}\xdef\gente{#1}\hdln{\gente}}{\def\
{\cr}\xdef\gente{#1}}\ljustline{\lftcol{\cr\gente}}
               \chcode'15=5\chcode'45=5\vskip\genteskip\let\
=\¬}

\def\hdln#1{\apply{\firstchar}{#1β}{\junkie}
        \if \junkie\ini{\null\yskip}\else{\xdef\ini{\junkie}\nlfmt}}
%
```

Global Initializations

```
        \let\xxquote=\def
\let\oeng=\english
\xdef\english{\xxquote\oeng
        \def\Memo{MEMORANDUM}
        \def\To{{\caps To:}}
        \def\From{{\caps From:}}}
\let\oesp=\espanol
\xdef\espanol{\xxquote\oesp
        \def\Memo{MEMORANDUM}
        \def\To{{\caps Para:}}
        \def\From{{\caps De:}}}
\let\ofra=\francais
\xdef\francais{\xxquote\ofra
        \def\Memo{MEMORANDUM}
        \def\To{{\caps Pour:}}
        \def\From{{\caps De:}}}
        \let\xxquote=\¬

\let\fottypeface=\eightpoint
\oneside
\setvsize{9.75truein}
\setmargin{1.25truein}{0truein}{.75truein}{.9375truein}
\english

\def\pname{}
\def\sname{}
\def\lbltop{}
\def\whoswho{}
\def\hdid{}
```

MATMAC.tex

```
\xdef\loadtab{\matmac0000}          % Sel. loading: adjust to 9 digits
%
```

Functions, Operators

```
\def\sup{\mathop{\char s\char u\char p}}
\def\inf{\mathop{\char i\char n\char f}}
\def\max{\mathop{\char m\char a\char x}}
\def\min{\mathop{\char m\char i\char n}}
\def\lim{\mathop{\char l\char i\char m}}
\def\limsup{\mathop{\char l\char i\char m\char s\char u\char p}}
\def\liminf{\mathop{\char l\char i\char m\char i\char n\char f}}
\def\det{\mathop{\char d\char e\char t}}
\def\gcd{\mathop{\char g\char c\char d}}

\def\funct#1{\mathop{#1}\limitswitch}
\def\sin{\funct{\char s\char i\char n}}
\def\cos{\funct{\char c\char o\char s}}
\def\tan{\funct{\char t\char a\char n}}
\def\cot{\funct{\char c\char o\char t}}
\def\sec{\funct{\char s\char e\char c}}
\def\csc{\funct{\char c\char s\char c}}
\def\exp{\funct{\char e\char x\char p}}
\def\log{\funct{\char l\char o\char g}}
\def\ln{\funct{\char l\char n}}
\def\diam{\funct{\char d\char i\char a\char m}}
\def\dist{\funct{\char d\char i\char s\char t}}
\def\osc{\funct{\char o\char s\char c}}

\def\choose{\comb() }

\def\leftset{\mathopen{\{\, }}
\def\rightset{\mathclose{\, \}}}
\def\emptyset{\char '100 }
\def\psubset{\char '432 }
\def\psupset{\char '433 }

\def\modop{\<\,\mathbin{\char m\char o\char d}\<\,}
\def\mod#1{\penalty0\;(\char m\char o\char d\,\,#1)}
\def\eqv{\mathrel\char'421 }
\def\neqv{\mathrel{\not\eqv}}
\def\neq{\mathrel{\not=}}
%
```

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Alignment (for equations), matrices, etc.   MATMAC.tex
                                    58

Alignment (for equations), matrices, etc.

```
\def\lpile#1{\vcenter{\halign{\lft{$## $}\cr #1\cr}}}
\def\cpile#1{\vcenter{\halign{\ctr{$## $}\cr #1\cr}}}
\def\rpile#1{\vcenter{\halign{\rt{$## $}\cr #1\cr}}}

\def\eqalign#1{\baselineskip15pt\lineskip3pt\lineskiplimit3pt
        \vcenter{\halign{\hfill$\dispstyle{##}$&$\dispstyle{\null##}$\hfill\cr#1\cr}}
        \lineskiplimit0pt}
\def\eqalignno#1{\baselineskip15pt\lineskip3pt\lineskiplimit3pt
        \vbox{\tabskip 0pt plus 1000pt minus 1000pt
                \halign to size{\hfill$\dispstyle{##}$\tabskip 0pt
                &$\dispstyle{\null##}$\hfill\tabskip 0 pt plus 1000pt minus 1000pt
                &\hfill$ ##$\tabskip 0pt\cr#1\cr}}
        \lineskiplimit0pt}
\def\twoline#1#2#3{\vbox{\hbox to size{$\quad\dispstyle{#1}$\hfill}\¬
                \vskip#2\hbox to size{\hfill$\dispstyle{#3}\quad$}}}


\LIFESAVER3=1
\def\chop to#1pt#2{\hbox{\lower#1pt\null\vbox{\hbox{\lower100pt\hbox{\raise100pt
                                        \hbox{$\dispstyle{#2}$}}}\vskip-100pt}}}
\def\charfn#1{\raise2pt\hbox{$\chi$}↓{#1}}
\def\bracedef#1#2#3#4{\left\{\vcenter{\halign{\lft{$## $}\qquad0\lft{$##$}\cr
                                        \¬#1&#2\cr#3&#4\cr}}\right.}

\def\array#1#2#3{{\xdef\junkie{}\xdef\tempvr{#1}\addq{-1}{\tempvr}\¬
                \iterate{\xdef\junkie{$\ctr{##}#2$&\junkie}}{\tempvr}\¬
                \def\.{\hskip-10pt plus 100000000pt}\¬
                \vcenter{\halign{\tabskip0pt\junkie$\ctr{##}$\cr #3\cr}}}}


\def\Harrow#1#2#3#4#5{{\def\l{\sy\char'40}\def\r{\sy\char'41}\save9\hbox{#2#3}\¬
        \save9\hbox{\hbox{#2}\hskip-.7pt\raise.525ht9\vbox{\hrule width #1}\hskip-.7pt{}\hbox{#3}}\¬
        \vcenter{\vbox{\hbox to
                        1wd9{\ctr{$\scriptstyle #4$}}\copy9\hbox to 1wd9{\ctr{$\scriptstyle #5$}}}}}}
\def\Varrow#1#2#3#4#5{{\def\u{\sy\char'42}\def\d{\sy\char'43}\save9\vbox{\hbox{#2}\hbox{#3}}\epoxy
        \save9\vbox{\hbox{#2}\moveright.46wd9\hbox{\vrule height #1 depth0pt}\hbox{#3}\vskip0pt}
        \vcenter{\hbox{\vbox to 1ht9{\mid{\hbox{$\scriptstyle #4$}}}\copy9\¬
                \vbox to 1ht9{\mid{\hbox{$\scriptstyle #5$}}}}}}}
↔ENDLIFESAVER
%
```

Theorems, Proofs, Eqnos

```
\def\proofbegin{\rm\par\penalty 25\vskip 6pt plus 12pt minus 4pt\noindent{\sl\Proof\/}:\xskip}
\def\Pf{\proofbegin}

\def\QED{\dontbrk\quad\dontbrk\hbox{\hskip1pt\vrule width4pt height 6pt depth 1.5pt}\par\yyskip}

\LIFESAVER2=1
\def\thm{\stmt{\Theorem}}
\def\lem{\stmt{\Lemma}}
\def\cor{\stmt{\Corollary}}
\def\prop{\stmt{\Proposition}}
\def\rem{\stmt{\Remark}}
\def\stmt#1{\addq1{\varstmt}\yyskip\noindent{\bf#1\ \consnum{\varstmt}.\quad}\stmtfnt}
\def\stmtfnt{\it}

\def\neqno{\addq1{\vareqno}\eqno(\hbox{\rm\consnum{\vareqno}})}
\def\nleqno{\addq1{\vareqno}\leqno(\hbox{\rm\consnum{\vareqno}})}
↔ENDLIFESAVER
%
```

Global Initializations

```
\LIFESAVER1=0
\english
\def\Theorem{Theorem}
\def\Lemma{Lemma}
\def\Corollary{Corollary}
\def\Proposition{Proposition}
\def\Proof{Proof}
\def\Remark{Remark}
↔ENDLIFESAVER

\LIFESAVER1=1
\espanol
\def\Theorem{Teorema}
\def\Lemma{Lema}
\def\Corollary{Corolario}
\def\Proposition{Proposici"on}
\def\Proof{Demostraci"on}
\def\Remark{Nota}
↔ENDLIFESAVER

\LIFESAVER1=2
\francais
\def\Theorem{Theor`eme}
\def\Lemma{Lemme}
\def\Corollary{Corollaire}
\def\Proposition{Proposition}
\def\Proof{D"emonstration}
\def\Remark{Remarque}
↔ENDLIFESAVER

\chcode'27=12 % ↔ any char --- end sel. load

\inivar\varstmt{1}
\inivar\vareqno{1}
```

MULMAC.tex

```
\gdef\computevsize#1#2{\setq\epagesize{#1}
                       \setq\hdngsize{#2}
                       \save9\vbox{\vskip #1\vskip-#2\vskip -1ht6\vskip -1ht4}
                       \if T\noejc{\gdef\noejc{F}}\else{\eject}
                       \Maxvsize 1ht9}
\gdef\endsheet{\endpage
        \ifnum\colsperpg=\varcoln{}
        \else{\inivar\varpag{\varcoln}
             \iterate{\save5
                       \hbox{\box5\hbox to \intercolglue{\intercolsep}\hbox to \hpagesize{}}}{\varpag}
              \setq\varcoln{1}
              \hmode\endpage}}
\gdef\ejectsheet{{\def\endpage{\eject}\endsheet}}
\gdef\completesheet{\null\endsheet}

\gdef\Topinsert#1{\brickset6{#1\box6}}
\gdef\Botinsert#1{\brickset4{\box4 #1}}
\gdef\Midinsert#1{\brickset6{\box6 #1}}
\gdef\brickset#1#2{{\Maxhsize\hsheetsize\save#1\vbox{#2}\hrule height0pt}\Maxhsize\hpagesize
                    \computevsize{\epagesize}{\hdngsize}}}

\gdef\balancedmode{\ejectsheet\gdef\blnce{T}\Maxvsize1000truein\spacing{1}plus.001pt minus .001pt}
\gdef\balancecols#1{{\if T\blnce{}\else{\Error! No balanced mode}
                     \eject\gdef\blnce{F}\gdef\rgrgtt{T}
                     \setcount9 \varcoln\advcount9 by -1
                     \ifnum\count9=0{\gdef\colinv{1}}
                       \else{\elt{\count9
                              }{{.5}{.33333}{.25}{.2}{.16666}{.14285}{.125}{.11111}{.1}}{\colinv}}
                     \ifnull{#1}{\gdef\tempvr{}}\else{\gdef\tempvr{\vskip #1}}
                     \save9\vbox{\vskip\colinv ht3\tempvr}\Maxvsize 1ht9
                     \unbox3\eject}
                     \spacing{1}}

\output{\if T\blnce{\save3\page\save3\vbox{\unbox3\unbox9}}
         \else{\epoxy
              \ifnum\colsperpg=\varcoln{\save5\hbox{\hbox to \lftcolskip{}\page}}
                                  \else{\save5\hbox{\unbox5\hbox
                                                    to \intercolglue{\intercolsep}\page}}
              \addq{-1}{\varcoln}
              \ifnum\varcoln=0{\if T\rgrgtt{\save6\vbox{\box6\box5}\gdef\rgrgtt{F}}
                               \else{\save5\vbox{\box6\box5\box4}\assmpage\advnce0
                                       \ifpos0{\advcount6}\else{\advcount6 by-1}}
                      \gdef\noejc{T}\computevsize{\epagesize}{\hdngsize}
                      \xdef\varcoln{\colsperpg}}
                 \else{}}}

\gdef\mcol{T}
\gdef\rgrgtt{F}
\gdef\blnce{F}
\setq\varcoln{\colsperpg}
\gdef\intercolsep{}
```

PAPMAC.tex

```
\let\loadtab=\papmac          % sel. load table

%
```

Headlines, Chapters, Quotes

```
\def\ddvnheadline#1{\titlepage\topspace\hdltopskip{\Tit\ddvnjust{#1}}\dontbrk\vskip\hdlbtmskip}
\def\ctrheadline#1{\titlepage\topspace\hdltopskip{\Tit\ctrcol{#1}}\dontbrk\vskip\hdlbtmskip}
\def\hdltopskip{.125in}
\def\hdlbtmskip{2in plus 18pt minus 10pt}
\def\Tit{\biggfnt}

\def\chapter#1{\setcount8 #1
        \ifzero8{\gdef\consnum##1{##1}}
           \else{\ifpos8{\gdef\consnum##1{\chapnum.##1}}
                   \else{\gdef\consnum##1{\chapnumcase{\chapnum}.##1}}}}
\LIFESAVER2=1
\def\chapterbegin#1{\chapterbeginb{#1}{#1}}
\def\appchapterbegin#1{\appchapterbeginb{#1}{#1}}
\def\chapterbeginb#1#2{\chapterdeclare{\headline{{\chapfmt}\cr\zkip{10pt}#1}}{\¬
                                        \Chapter\hquad\chapnumcase{\chapnum}\hquad #1}{\¬
                                        \chapnumcase{\chapnum}. #2}
                    \advnce8\chapter{\count8}}
\def\appchapterbeginb#1#2{\chapterdeclare{\headline{#1}}{#1}{#2}\chapter{0}}

\def\chapnumcase#1{#1}
\def\chapskippage{\endpage}
\def\ddvnchapfmt{\teniu\Chapter\hquad\chapnumcase{\chapnum}}
\def\ctrchapfmt{\biggfnt\chapnumcase{\chapnum}}
\let\chapfmt=\ddvnchapfmt
\let\headline=\ddvnheadline

\def\chapquotev#1{\ddvnmsel{\rjustline{\lftcol{#1}}}{\lftcol{#1}}\paraskip}
\def\chapquotep#1{\ddvnmsel{\rjustline{\hbox par \chapquotepsize{#1}}}{\¬
                       \ljustline{\hbox par \chapquotepsize{#1}}}
                \paraskip}
\def\chapquotepsize{9truecm}
%
```

```
%FOR internal use:
        % #1 = headline format, #2 = tofc format, #3 = even rh format. Cf. \chapterbeginb
\def\chapterdeclare#1#2#3{\chapskippage
                \ifdimen \count8pt>64pt{\setq\chapnum{\char\count8}}\else{\setq\chapnum{\count8}}
                \setq\varsec{0}
                \setq\varssec{0}
                \setq\varstmt{0}
                \setq\vareqno{0}
                \setq\varfn{0}
                {#1}
                {\def\cr{ }\def\noalign##1{}
                 \constofc1{#2}{\rhtypeface\xdef\rhevenpg{#3}\xdef\rhoddpg{#3}\adjchaphd}}
                \headmark{\rhevenpg}{\rhoddpg}}
\def\adjchaphd{}
\def\chapnum{0}
↔ENDLIFESAVER
%
```

Sections, SubSections, SubSubSections

```
\def\posthdrskip{\dontbrk\vskip 5pt}
\def\sectionskip{\penalty-50\vskip 24pt plus 12pt minus 6pt}


\LIFESAVER3>0
\def\sectionbegin#1{\sectionbeginb{#1}{#1}}
\def\appsectionbegin#1{\appsectionbeginb{#1}{#1}}
\def\sectionbeginb#1#2{\addq1{\varsec}
        \sectiondeclare{\hangobj{\Section\sectionnum\hquad}\tit#1}{\sectionnum\hquad#1}{\sectionnum.\hquad#2}}
\def\appsectionbeginb#1#2{\sectiondeclare{\noindent\tit #1}{#1}{#2}}

\def\Section{$\section$}
\def\tit{\bigint}


        % #1 = SECTION headline format, #2 = tofc format, #3 = odd rh format
\def\sectiondeclare#1#2#3{\par
        \setq\sectionnum{\consnum{\varsec}}
        \setq\varsec{0}
        \sectionskip
        {\ragged 10000 #1}\constofc2{#2}\par
        {\rhtypeface\xdef\rhoddpg{#3}\adjsechd}
        \headmark{\rhevenpg}{\rhoddpg}
        \posthdrskip}
        % See use of the following in \secsubsecstyle
\def\adjsechd{}
\def\sectionnum{}
←→ENDLIFESAVER


\LIFESAVER3>1
\def\subsectionbegin#1{\subsectionbeginb{#1}{#1}}
\def\appsubsectionbegin#1{\appsubsectionbeginb{#1}{#1}}
\def\subsectionbeginb#1#2{\addq1{\varssec}
        \subsectiondeclare{\tenpoint
                        \hangobj{\bf\subsecnum\hquad}\rm#1}{\subsecnum\hquad#1}{\subsecnum\hquad#2}}
\def\appsubsectionbeginb#1#2{\subsectiondeclare{\tenpoint\noindent #1}{#1}{#2}}


        % #1 = SUB-SECTION headline format, #2 = tofc format, #3 (odd rh for \secsubsecstyle)
\def\subsectiondeclare#1#2#3{\par
        \setq\subsecnum{\consnum{\varsec.\varssec}}
        \setq\varsssec{0}
        \sectionskip
        {\ragged 10000 #1}\constofc3{#2}\par
        \posthdrskip}
\inivar\varsec{1}
\def\subsecnum{}
←→ENDLIFESAVER
%
```

65

```
\LIFESAVER3>2
\def\subsubsectionbegin#1{\addq1{\varsssec}
        \subsubsectiondeclare{\tenpoint\hangobj{\bf\subsubsecnum\hquad}\rm #1}{\subsubsecnum\hquad #1}}
\def\appsubsubsectionbegin#1{\subsubsectiondeclare{\tenpoint\noindent #1}{#1}}


        % #1 = SUB-SUB-SECTION headline format, #2 = tofc format.
\def\subsubsectiondeclare#1#2{\par
        \setq\subsubsecnum{\consnum{\varsec.\varssec.\varsssec}}
        \sectionskip
        {\ragged 10000 #1}\constofc4{#2}\par
        \posthdrskip}
\inivar\varsssec{1}
\def\subsubsecnum{}
↔ENDLIFESAVER
%
```

Page Styles

```
\def\oddevennumbering{\onelineheading
        \gdef\onelinefmt##1##2{\ifeven0{\if T\ddvnum{{\topnum\count0}\hfill ##1}
                                        \else{##1\hfill{\topnum\count0}}}
                            \else{##2\hfill{\topnum\count0}}}}}


\LIFESAVER4=1
\def\ctrnumheading{\onelineheading
        \gdef\onelinh##1{\vbox{\hbox to \hsheetsize{##1}
                                \hbox to \hsheetsize{\leaders\hrule height .2pt\hfill
                                                \ctrnumfmt{\count0}\leaders
                                                \hrule height .2pt\hfill}}}
        \gdef\onelinefmt##1##2{##1\hfill ##2}}
\def\ctrnumfmt#1{\lower3pt\hbox to 25pt{\ctr{\botfnt #1}}}


\def\bottomnumbering{\endsheet
        \computevsize{\epagesize}{.75in}
        \gdef\nrmpage{\normmark\vfill\box5\cbotnum}
        \gdef\titpage{\box5\numonlyrmn}
        \let\headmark=\headmarknln
        \gdef\onelinefmt##1##2{##1\hfill ##2}}


\def\topboxes{\endsheet
        \computevsize{\epagesize}{.5in}
        \gdef\nrmpage{\normmark\vfill\box5}
        \gdef\titpage{\box5\numonlyrmn}
        \gdef\headmark##1##2{{\rhtypeface\mark{\hdrfnt\boxh{##1}{##2}}}}
        \gdef\trule{\vrule height 12.5 pt depth 6.5pt}
        \gdef\boxh##1##2{\vbox{\hrule width \hsheetsize
                                \hbox to \hsheetsize{\trule
                                                \ifeven0{\hbox to 25pt{\ctr{\topnum\count0}}
                                                        \trule\ctr{##1}}
                                                \else{\ctr{##2}\trule
                                                        \hbox to 25pt{\ctr{\topnum\count0}}}
                                                \trule}

                                \hrule}}}
<->ENDLIFESAVER
%
```

Running Heads

```
\def\secsubsecstyle{\chapter{0}
        \let\appchapterbegin=\appsectionbegin
        \gdef\adjsechd{\xdef\rhevenpg{\rhoddpg}}
        \let\junkiesubsec=\subsectiondeclare
        \def\subsectiondeclare##1##2##3{\junkiesubsec{##1}{##2}{##3}
                {\rhtypeface\xdef\rhevenpg{##3}}
                \headmark{\rhoddpg}{\rhevenpg}}}

\def\fixedheadings#1#2{\let\oldheadmark=\headmark
        \ifnull{#1}{\ifnull{#2}{}\else{\gdef\headmark##1##2{\oldheadmark{##1}{#2}}}}
            \else{\ifnull{#2}{\gdef\headmark##1##2{\oldheadmark{#1}{##2}}}
                        \else{\gdef\headmark##1##2{\oldheadmark{#1}{#2}}}}}

\def\rhtypeface{\eightpoint}
\def\hdrfnt{\caps}
\def\topnum{\it}
```

```
%
```

Internal Handling of Page Styles and Headings

```
\def\onelineheading{\endsheet
        \computevsize{\epagesize}{\btmnrspace}
        \gdef\nrmpage{\normmark\vfill\box5}
        \gdef\titpage{\box5\numonlyrmn}
        \gdef\onelinh##1{\vbox{\hbox to \hsheetsize{##1}\vskip 3pt\hrule height.2pt}}
        \let\headmark=\headmarknln}
\def\headmarknln#1#2{{\rhtypeface\mark{\onelinh{\hdrfnt\onelinefmt{#1}{#2}}}}}
\def\rhevenpg{}
\def\rhoddpg{}
```

```
% Above are basic macros to  set running heads.  Note \headmark=\headmarknln,  and
% that \chapterbegin, \sectionbegin, etc.  always call FORMER with  args.
% \rhevenpg, \rhoddpg (unless  \secsubsecstyle); this then \mark's an  underlined
% box (constructed by \onelineh) containing \rhevenpg and \rhoddpg in the  desired
% format \onelinefmt.  This IS  defined by the  chosen page style.   See
% \oddevennumbering and \bottomnumbering for simplest cases.

        % Set bottom number iff roman:
\def\numonlyrmn{\neg0\ifpos0{\neg0\cbotnum}\else{\neg0\vskip\btmnrspace}}
        % To select headline justification
\def\ddvnjust#1{\ddvnmsel{\lftcol{#1}}{\rtcol{#1}}}
        % Set last mark in page
\let\normmark=\botmark
%
```

Footnotes, Bibliography, Annotations, Comments

```
\def \nfootnote#1{\addq1{\varfn}\setfootnote{\varfn}{#1}}
\def \footnote#1#2{\setfootnote{#1}{#2}}
\botsep{\vskip 15pt plus 1pt\hrule width 1.5in\vskip 3pt}
\botskip 3.5pt
\def \footntsize{size}

\def \ref#1{\par\hangpar{\reffmt{#1}}}
\def \reffmt#1{\hbox to \refsize{\lft{[#1]}}}
\def \refsize{35pt}

\def \comment#1#2{\ifnull{#1}{}\else{ [{\bf #1: }#2]\hquad} }

\LIFESAVER6=1
\def \sidenote#1{\paraskip
               {\parskip0pt
                \rjustline{\sidenotefnt
                          \spose{\vbox to 0pt{\hbox par
                                             \sidenotesize{\hangindent\sidenoteskip after 0{}#1}
                                             \vss}}}
               \hrule height0pt\dontbrk\hmode}\!}
\def \sidenotesize{.75truein}
\def \sidenoteskip{.125truein}
\def \sidenotefnt{\tinyfnt}

\def \annotate#1{\openntes{\lntypeface\send2{|lnpar{\count6}#1\par}}}
\def \chaplistnotes{\appchapterbegin{\Notes}
       {\lntypeface\chcode'174=0\close2 \input ntes.tem \endpage}}
\def \seclistnotes{\appsectionbegin{\Notes}
       {\lntypeface\chcode'174=0\close2 \input ntes.tem \endpage}}
\def \lntypeface{\ninepoint}
\def \lnpar#1{\setcount9#1\advcount9by-1 0101\hangobj{\Page\hquad\count9.\hquad}}

       % internal use:
\def\openntes{\open2=ntes.tem \gdef\openntes{}}
↔ENDLIFESAVER


% FOR Internal Use
\def \setfootnote#1#2{\unskip\unskip\unskip
       {\eightpoint
       \botinsert{\hbox par \footntsize{\def\noindent{}\hangobj{\raise .9ex\hbox{#1}}#2}}\¬
       \dontbrk\hskip0pt\raise .9ex\hbox{#1}\penalty -150}}
%
```

Figures and Tables. Table of Plates.

```
\def\jail{\save9\vbox{\vskip\cagesize\hbox{(y}}\save7\vbox{\vskip1dp9\vskip\cagesize}\¬
        \save7\hbox{\vrule height 1ht9 depth 1ht7}\¬
        \def\vb{\copy7}\def\.{\hskip-10pt plus 100000000pt}\¬
        \def\bskip{\noalign{\vskip-\cagesize\vskip-\cagesize\vskip\bskipsize}}\¬
        \def\row{\vb@}\def\endr{@\vb\hbar}\def\nohbar{@\vb\cr}\def\hbar{\cr\noalign{\hrule}}\¬
        \chcode'17 4+13\def\|{@\vb@}\epoxy}
\def\cage#1#2#3{{\def\l{@\lft{####}@####}\def\c{@\ctr{####}@####}\def\r{@\rt{####}@####}\xdef\junkie{#2}}\¬
        \vbox{\tabskip0pt\halign #1{##\tabskip0pt plus 100pt\junkie\tabskip0pt\cr#3}}}
\def\cagesize{2pt}
\def\bskipsize{3pt}


\LIFESAVER7<1
\def\figure#1#2{\figtab{#1}{#2}{\varfig}{\Figure}{\varfig}}
\def\table#1#2{\figtab{#1}{#2}{\vartab}{\Table}{\vartab}}


\def\figuref#1#2{\topinsert{\figure{#1}{#2}}}
\def\tablef#1#2{\topinsert{\table{#1}{#2}}}


        % #1=word, #2=num, #3=caption
\def\ftctr#1#2#3{\ctrcol{\it #1\hquad #2. \rm #3}}
\def\ftatop#1#2#3{\ctrline{\it #1\hquad #2}\vskip 3pt\ctrcol{#3}}
\def\ftatoppar#1#2#3{\ctrline{\it #1\hquad #2}\vskip 3pt{\def\paraskip{}\displaypar{#3}}}
\def\ftfmt{\ftctr}


        % Add entry to table of figures and tables; #1 = one line caption, #2 = NUM as above
\def\addtotofp#1#2{\opentofp{\tofctypeface\send3{|tofpline{#1}{#2}}}}


\def\tableofplates#1{{\appchapterbegin{\Plates}
                    \romannumbering{#1}
                    \tofcpreamble
                    \lineskip3pt plus 1pt
                    \close3
                    \input tofp.tem
                    \endpage}}


        % FOR Internal Use
\def\figtab#1#2#3#4#5{\addq1{#3}\vbox{\vskip #1\vskip 3pt\ftfmt{#4}{#5}{#2}}
                    {\def\cr{ }\def\noalign##1{}\constofp{#4\hquad #5. #2}}}
\def\constofp#1{\addtotofp{#1}{\count6}}
\def\tofpline#1#2{\tofcbox{0pt}{\hangindent3em{}#1}{#2}}
\def\opentofp{\open3=tofp.tem \gdef\opentofp{}}
↔ENDLIFESAVER


\topskip 10pt
%
```

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Internal Handling of T. of C.   PAPMAC.tex
_____ 70 _____

Table of Contents, Table of Plates

```
\def\constofc#1#2{\addtotofc{#1}{#2}{\count6}}
\def\addtotofc#1#2#3{}


↔LIFESAVER7<2
\def\tableofcontents#1{{\def\constofc##1##2{}          % Needed to disconnect tofc!
                      \appchapterbegin{\Contents}
                      \romannumbering{#1}
                      \tofcpreamble
                      \close0
                      \input tofc.tem
                      \endpage}}

        % Add entry to table of contents: #1 (=1,2,3,...) is level of indentation,
        %    #2 = title as it is to appear on t. of c., #3 = page NUM plus 10101
\def\addtotofc#1#2#3{\opentofc{\tofctypeface\send0{|tofcline{#1}{#2}{#3}}}}

\def\tofctypeface{\ninepoint}
\def\tofcsize{size}
\def\leadtc{\hbox to 8pt{.}}
\def\tofcgap{16pt}    %min gap between caption and page no.

%
```

Internal Handling of T. of C.

```
        % Generate table of contents (followed by a bunch of |tofcline...):
\def\tofcpreamble{\tofctypeface
        \spacing{1}plus 1pt minus 1pt
        \ctrline{\hbox to \tofcsize{\hss\Page}}
        \chcode '174=0 }          % | enabled as escape char.
\def\tofcline#1#2#3{
        \if 1#1{\vskip 15pt plus 8pt minus 4pt}\else{\penalty#100}
        \save9\hbox to .25in{}\setcount9 #1\advcount9 by -1
        \tofcbox{\count9wd9}{#2}{#3}
        \if 1#1{\dontbrk\vskip 4pt plus 2pt minus 1pt}\else{}}
\def\tofcbox#1#2#3{\save8\hbox{\hbox to\tofcsize{}\hskip-#1\hskip-\tofcgap\hskip-3em}
        \ctrline{\hbox to\tofcsize{\hbox to#1{}\parfillskip0pt\quad
                                \hbox par 1wd8{#2\leaders\leadtc\hfil}\¬
                                \hskip-8pt\leaders\leadtc\hfil
                                \hbox to 1.5em{\setcount9#3\advcount9 by-10101\rt{\count9}}}}}

        %Initialize file:
\def\opentofc{\open0=tofc.tem \gdef\opentofc{}}
↔ENDLIFESAVER
%
```

Index Entries, IndexGenerate

```
\def\index#1{\indexj{#1}{|¬}}
\def\indexk#1{\index{#1}#1}
\def\indexsee#1#2{\indexsend{#1}{{\it\See} #2}{\count6}{|¬}}
\def\indexj#1#2{\indexsend{#1}{β}{\count6}{#2}}


\def\iindex#1#2{\iindexj{#1}{#2}{|¬}}
\def\iindexk#1#2{\iindex{#1}{#2}#2 #1}
\def\iindexj#1#2#3{\indexsend{#1}{#2}{\count6}{#3}}


\def\indexsend#1#2#3#4{}


\LIFESAVER5=1
\def\indexgenerate{\multicolfmt\balancedmode\appchapterbegin{\Index}\balancecols{}
        {\indexpreamble\inputindx}
        \save7\hbox{\hskip\hpagesize\hskip\hpagesize\hskip.25truein}\sethsize{1wd7}}
\def\inxgap{\par\brkhere\vskip5pt plus 1pt\def\str{axolotl}}
\def\inputindx{\input index.tex }
\def\indextypeface{\eightpoint}
```

%

Internal Handling of Index

```
        % Add index entry. #1=level 1 word, #2 = level 2; #3 = ref. (no. or {} only!)
        %   #4 = junk added in front of #1.  Note order used in sort.
\def\indexsend#1#2#3#4{\openindx{\indextypeface\send1{|inx #1α#4α#2α#3α}}}
        % #1 = page number (arabic by default); if 0, continue numbering
\def\indexpreamble{\save7\hbox{\hskip\hsheetsize\hskip-.25truein}
        \let\junkie=\hsheetsize
        \columnsperpage{2}{.5wd7}{.25truein}{\junkie}
        \parskip0pt\indextypeface
        \chcode'174+0
        \def\str{axolotl}}
        % Grouping routine
\def\ifdef#1=#2#3\else#4{\def\junkie{#2}\x ifdef \junkie=#1{#3}\else{#4}}
\def\inx#1α#2α#3α#4α{\setcount90#4\ifzero9{\setq\pg{}}\else{\advcount9by-10101\setq\pg{\count9}}
        \ifdef\str={#2#1}{\ifdef\strr={#3}{\unskip\unskip\dontbrk, \pg\dontbrk\hskip0pt}
                                \else{\gdef\strr{#3}\par\penalty
                                        50\indentpar{15pt}{-9pt}{\strr}\hquad\pg}}
                \else{\gdef\str{#2#1}\gdef\strr{#3}\par\penalty0\indentpar{9pt}{-9pt}{\str}\hquad
                        \ifdef\strr=β{}\else{\strr\hquad}\pg}}
        % Initialize file:
\def\openindx{\open1=indx.tem \gdef\openindx{}}
↔ENDLIFESAVER
%
```

Global Initializations

```
\LIFESAVER1=0
\english
\def\Chapter{Chapter}
\def\Contents{Contents}
\def\Plates{Plates}
\def\Notes{Notes}
\def\Page{Page}
\def\Figure{Figure}
\def\Table{Table}
\def\See{see}
\def\Index{Index}
↔ENDLIFESAVER


\LIFESAVER1=1
\espanol
\def\Chapter{Cap"itulo}
\def\Contents{Contenido}
\def\Plates{Ilustraciones}
\def\Notes{Notas}
\def\Page{P"agina}
\def\Figure{Figura}
\def\Table{Tabla}
\def\See{ver}
\def\Index{Indice}
↔ENDLIFESAVER


\LIFESAVER1=2
\francais
\def\Chapter{Chapitre}
\def\Contents{Table des Mati`eres}
\def\Plates{Illustrations}
\def\Notes{Notes}
\def\Page{Page}
\def\Figure{Figure}
\def\Table{Table}
\def\See{voir}
\def\Index{Index}
↔ENDLIFESAVER


\inivar\varsec{1}
\inivar\varfn{1}
\inivar\varfig{1}
\inivar\vartab{1}
\chapter{0}


\chpar4=200                    % Widow line penalty


\oddevennumbering
\bothsides
\english


\chcode'27=12 % ↔ any char --- end sel. load
```

TEXMAC.tex

```
%
    To list TEX macros or text files

\def\sic{\parskip0pt
        \def\ttwr{\eightpoint\tt}
        \chcode'34=13\def\<{\hbox{\spose{\char'32}\char'74}}
        \chcode'35=13\def\>{\hbox{\spose{\char'32}\char'76}}
        \chcode'13=13\def\V{\char'11} % VT
        \chcode'2=13\def\α{{\:r\char'13}}
        \chcode'3=13\def\β{{\:r\char'14}}
        \chcode'27=13\def\↔{{\sy\char'44}}
        \chcode'5=13\def\¬{{\sy\char'72}}
        \chcode'173=12  % {
        \chcode'176=12  % }
        \chcode'134=12  % \
        \chcode'16=0    % ω
        \typnoi\specskip88em\def\             {\skip8}\def\
{\par\noindent\null}\chcode'32=13\def\~{\char'24}\chcode1=13\def\↓{\char'175}}

\def\listfile/#1/{\tsec/#1/\inputΨ#1Ψ\noindent}
\def\comm/#1/{}
\def\pagebrk{\endpage\noindent}
\def\tsec/#1/{\hdl{#1}{\rhtypeface\xdef\rhoddpg{#1}\headmark{\rhevenpg}{\rhoddpg}}}
\def\tssec/#1/{\hhdl{#1}{\rhtypeface\xdef\rhevenpg{#1}\headmark{\rhevenpg}{\rhoddpg}}}

\def\endsic{\chcode'176=2\par}


% Internal:
\let\space=\ {}
\def\{\char'25} % This is \∞, but you don't see it!
\def\hdl#1{\endpage{\def\hdlbtmskip{1in}\headline{#1}}\constofc2{#1}}
\def\hhdl#1{\yyskip{\sanss #1}\yskip\constofc3{#1}\par}
```

TMRMAC.tex

```
%
Times Roman Fonts

\magnify{1100}

\font U=timesroman at 12truebp
\font V=timesroman at 18truebp
\font Z=timesroman at 10truebp
\font Y=timesromanb at 10truebp
\font X=timesromani at 10truebp
\font W=timesromanbi at 10truebp

\def\tenpoint{\def\rm{\:Z}
        \def\bf{\:Y}
        \def\it{\:X}
        \def\bi{\:W}
        \def\sy{\:u}
        \def\sl{\:n}
        \def\tt{\:t}
        \def\caps{\:G}
        \mathrm adf % 10,7,5
        \mathit gjl
        \mathsy uxz
        \baselineskip 12pt
        \dispskip 12pt plus 3pt minus 9pt
        \dispaskip 0pt plus 3pt
        \dispbskip 7pt plus 3pt minus 4pt
        \rm}
\def\bigfnt{\:U}
\def\biggfnt{\:V}

\tenpoint
```

Appendix S. Font Samples

None of the codes already assigned can be redefined. You can add new fonts, however, in codes N through Z; see the TeX manual for details.

Font L   cmr30   \biggfnt

La agonía fue larga
y blasfematoria.

Font A   cmr18   \biggfnt

La agonía fue larga
y blasfematoria.

Font M   peni18   \penfnt

*La agoña fue larga
y blasfematoria.*

Font B   cmr12   \bigfnt

La agonía fue larga
y blasfematoria.

Font C   cmdunh   \dunhill

La agonía fue larga
y blasfematoria.

Font D   cmss12   \sanss

La agonía fue larga
y blasfematoria.

Font E   cmu10   \teniu

La agonía fue larga
y blasfematoria.

Font a   cmr10   \tenpoint\rm
Ya con el sol bien alto, se
fueron acercando y lo desarmaron;

Font g   cmi10   \
Ya con el sol bien alto, se
fueron acercando y lo desarmaron;

Font u   cmsy10   \tenpoint\sy

Font n   cms10   \tenpoint\sl
Ya con el sol bien alto, se
fueron acercando y lo desarmaron;

Font q   cmb10   \tenpoint\bf
Ya con el sol bien alto, se
fueron acercando y lo desarmaron;

Font t   cmtt   \tenpoint\tt
`Ya con el sol bien alto, se`
`fueron acercando y lo desarmaron;`

Font ?   cmti10   \tenpoint\it
Ya con el sol bien alto, se
fueron acercando y lo desarmaron;

Font G   cmcsc   \tenpoint\caps
YA CON EL SOL BIEN ALTO, SE
FUERON ACERCANDO Y LO DESARMARON;

Font b   cmr9   \ninepoint\rm
el hombre estaba muerto.
Le notaron ese aire de cachivache que tienen los difuntos.

Font h   cmi9   \
el hombre estaba muerto.
Le notaron ese aire de cachivache que tienen los difuntos.

Font i   cmsy9   \ninepoint\sy
⟩⟦⟨∇⟧⟦∇⟩⟧∫∪⊣⟦⊣ ⟧⊓⟁∇∪∇ʰ
∠⟧ ∆∇∪⊣∇∇∆ ⟧⟧⊣⟩∇⟧ ⊓ ⟧⊣⟧⟨⟩⊑⊣⟧⟨⟧ #⊓⟧ ∪⟩⊣⟧∆⟧∆ ⟦∇∫ ⟧⟩⊓∆∪∇∫ʰ

Font s   cms9   \ninepoint\sl
el hombre estaba muerto.
Le notaron ese aire de cachivache que tienen los difuntos.

Font k   cmb9   \ninepoint\bf
el hombre estaba muerto.
Le notaron ese aire de cachivache que tienen los difuntos.

Font y   cmtt9   \ninepoint\tt
`el hombre estaba muerto.`
`Le notaron ese aire de cachivache que tienen los difuntos.`

Font I   cmti9   \ninepoint\it
el hombre estaba muerto.
Le notaron ese aire de cachivache que tienen los difuntos.

Font F   cmcsc9   \ninepoint\caps
EL HOMBRE ESTABA MUERTO.
LE NOTARON ESE AIRE DE CACHIVACHE QUE TIENEN LOS DIFUNTOS.

Font m   cmr8   \eightpoint\rm

Lo afeitaron, lo envainaron en ropa hecha y lo exhibieron al
espanto y las burlas en la vidriera del mejor almacén.

Font r   cmi8   \

*Lo afeitaron, lo envainaron en ropa hecha y lo exhibieron al
espanto y las burlas en la vidriera del mejor almacén.*

Font o   cmsy8   \eightpoint\sy

⌐▽ ⊣{⌐]⊔⊣▽▽△⇔ ⟦▽ ⌐△ ⊑⊣)△⊣▽▽△ ⌐△ ▽▽√⊣ ⟨⌐]⟨⊣ † ⟦▽ ⌐§⟨⟩⌞)⌐▽▽△ ⊣⟦
⌐⌠√⊣△⊔▽ † ⟦⊣⌠ ⌞∩▽⟦⊣⌠ ⌐△ ⟦⊣ ⊑)⌐▽)⌐▽⊣ ∏⟦ ⟧⟧⌐▽▽ ⊣⟦⟧⊣⌞⌐⌠△⌃

Font p   cms8   \eightpoint\sl

*Lo afeitaron, lo envainaron en ropa hecha y lo exhibieron al
espanto y las burlas en la vidriera del mejor almacén.*

Font e   cmb8   \eightpoint\bf

**Lo afeitaron, lo envainaron en ropa hecha y lo exhibieron al
espanto y las burlas en la vidriera del mejor almacén.**

Font H   cmtt8   \eightpoint\tt

```
Lo afeitaron, lo envainaron en ropa hecha y lo exhibieron al
espanto y las burlas en la vidriera del mejor almacén.
```

Font J   cmti8   \eightpoint\it

*Lo afeitaron, lo envainaron en ropa hecha y lo exhibieron al
espanto y las burlas en la vidriera del mejor almacén.*

Font K   *   \

Does not exist!

Font d   cmr7   \

Hombres a caballo o en tílbury acudieron de leguas a la redonda. El
tercer día lo tuvieron que maquillar. El cuarto día lo enterraron con jubilo.

Font j   cmi7   \

*Hombres a caballo o en tílbury acudieron de leguas a la redonda. El
tercer día lo tuvieron que maquillar. El cuarto día lo enterraron con jubilo.*

Font x   cmsy7   \

Hombres a caballo o en tílbury acudieron de leguas a la redonda. El tercer día lo tuvieron que maquillar. El cuarto día lo enterraron con jubilo.

Font c   cmr6   \tinyfnt

Hombres a caballo o en tílbury acudieron de leguas a la redonda. El
tercer día lo tuvieron que maquillar. El cuarto día lo enterraron con jubilo.

Font v   cmi6   \

*Hombres a caballo o en tílbury acudieron de leguas a la redonda. El
tercer día lo tuvieron que maquillar. El cuarto día lo enterraron con jubilo.*

Font w   cmsy6   \

Hombres a caballo o en tílbury acudieron de leguas a la redonda. El tercer día lo tuvieron que maquillar. El cuarto día lo enterraron con jubilo.

Font f   cmr5   \

Hombres a caballo o en tílbury acudieron de leguas a la redonda. El
tercer día lo tuvieron que maquillar. El cuarto día lo enterraron con jubilo.

Font l   cmi5   \

*Hombres a caballo o en tílbury acudieron de leguas a la redonda. El
tercer día lo tuvieron que maquillar. El cuarto día lo enterraron con jubilo.*

Font z   cmsy5   \

Hombres a caballo o en tílbury acudieron de leguas a la redonda. El tercer día lo tuvieron que maquillar. El cuarto día lo enterraron con jubilo.

Font >   *   \
Does not exist!

Font Ø   cmathx   \mathfnt

Font ;   stan70   \stanlogo

Appendix V. Counters, Boxes, Variables, Files

You should not touch these, unless you know what you're doing. In future uses, we will start taking these in decreasing order; so, if you need a box, start using #0, #1, etc. Special care should be used when attempting to use those variables that are handled in KERMAC, as these will probably interact with many macros in the other sets.

Counters (\count)

0	current page number	KERMAC
6	current page number plus 10101 (for \send)	KERMAC
7	used by \enumerate, \enumelett	KERMAC
8	current chapter number	PAPMAC
9	for temporary computations	KERMAC

Boxes (\box)

3	\multicolfmt.	MULMAC
4	\multicolfmt.	MULMAC
5	\output. DO NOT TOUCH.	KERMAC
6	\multicolfmt.	MULMAC
7	\fin	LETMAC
	\indexgenerate, \jail	PAPMAC
8	\hangpar (\enumerate, \itemize), \capitalpar	KERMAC
9	For temporary computations	KERMAC

Files (\open)

0	\tableofcontents (title = tofc.tem)	PAPMAC
1	\generateindex (title = indx.tem)	PAPMAC
2	\annotate (title = ntes.tem)	PAPMAC
3	\tableofplates (title = tofp.tem)	PAPMAC

Glue (\specskip)

8	\sic	TEXMAC
9	\rraggedd	KERMAC

Global variables

\chapnum	chapter #	PAPMAC
\sectionnum	section #	PAPMAC
\subsecnum	sub-section #	PAPMAC
\subsubsecnum	sub-sub-section #	PAPMAC
\rhevenpg	running head for even pgs	PAPMAC
\rhoddpg	...for odd...	PAPMAC
\colsperpg	\columnsperpage	KERMAC
\intercolglue	\columnsperpage	KERMAC
\hsheetsize	\columnsperpage	KERMAC
\hpagesize	\columnsperpage	KERMAC
\colinv	\columnsperpage	KERMAC
\epagesize	\computevsize	KERMAC
\hdngsize	\computevsize	KERMAC
\hdid	\nrmpage	LETMAC
\junkie	temporal variable	KERMAC
\tempvr	temporal variable	KERMAC
\ifnjnk	\ifnull	KERMAC
\expandit	\eval	KERMAC
\getans	\apply	KERMAC
\eltindx	\elt	KERMAC
\str	\inxit	PAPMAC
\strr	\inxit	PAPMAC
\strrr	\inxit	PAPMAC

Counter variables

\vareqno	equation #	MATMAC
\varfig	figure #	PAPMAC
\varfn	footnote #	PAPMAC
\varsec	sec #	PAPMAC
\varssec	subsec #	PAPMAC
\varsssec	subsubsec #	PAPMAC
\varstmt	statement #	MATMAC
\vartab	table #	PAPMAC
\varpag	endsheet counter	KERMAC
\varcoln	column counter	KERMAC

Boolean variables (T or F)

\tpage	\titlepage	PAPMAC
\ddvnum	\oddevennumbering	KERMAC
\rgrgtt	\multicolfmt	KERMAC
\noejc	\multicolfmt	KERMAC
\ismemo	\smemo	LETMAC

Index of Keywords

Using the macros at Stanford

SAIL:

- ► There is a preloaded version that produces PRESS files (for the DOVER laser printer). It is called MAXTEX.DMP[1,3], and is invoked by typing "r maxtex."

- ► For XGP output (on those black days when the DOVER is out of order), you can use XGPTEX (not preloaded). However, input KERMAX instead of KERMAC. Some fonts are different, though.

- ► The \magnify option may work correctly only using the Dover version. Currently, only the magnification value 1100 (10%) works moderately well, due to lack of magnified fonts in the DOVER printer. The success of \magnify depends on the variety of fonts your document uses (e.g., with \fullpages\tenpoint\rm you have 1100, 1300, 1500, 1700, 2000, 3000; but if you use \caps somewhere, the maximum magnification will be 1100).

- ► In the DOVER printer, the top margin cannot be less than .3125in, or wraparound will occur. Also, horizontal dimensions appear inflated by about 1%.

- ► In the XGP, the top margins should be declared equal for normal and titlepages, or pages will come out in different sizes. The output will look as if a magnification by 30% had been used.

- ► The index macros are available only in the Dover version. Notice you can perform the required sort by using SSORT, with the command index.tex ← indx.tem/U.

SCORE:

- ► The character codes are initialized by default to be & and underline for alignment tab and subscripts. If you wish to use other symbols (e.g., control-V and control-A), merely change the corresponding codes after you input the macros, viz., \chcode'26=4\chcode'1=8.

  Apart from that everything will work as described in the documentation.

- ► The macros are at the present time accesible in the directory <CSD.DIAZ>.

Send a message to MMD@SAIL to be in the mailing list.

Contents — Continued