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7890 48-pt Malvern 55 567890

☐ 1 Conventions used in this handbook

A distinctive font will be used for examples of literal text such as commands to the computer and the contents and names of text files:

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789"#$%&@*+-=,.;:?!
()<>[]{}`´\|/_^~
```

Italic letters are used for the names of some METAFONT variables, for metasyntactic variables, for words mentioned in sentences (such as the word *word* here), and for the titles of books and so on.

Boldface is sometimes used for METAFONT 'sparks'. A bold italic face is used for the first occurence of technical terms.

1·1 Citations and references

Numbers appearing in square brackets (for example, [1]) refer the reader to other sources for more information; they are listed in §12 on page 25.

1·2 Syntax descriptions

Occasional syntax descriptions will be given in the usual extended Backus–Naur Formalism (extended BNF, or EBNF): in other words, an extension of the notation described at the start of Chapter 24 of the *TEXbook* [19], 'Summary of Vertical Mode'. Syntactic entities are written with angle brackets, thusly: ⟨*dimen*⟩. The arrow '→' is read as 'is defined as', and the vertical bar '|' as 'or'. Literal text is enclosed in quotation marks.

Square brackets on the RHS of the arrow enclose optional text. Braces enclose text that may repeated, or rather text which may appear any number of times including zero. There is no conflict with the use of brace tokens in the *TEXbook*: all such tokens will be written in quotation marks in syntax rules ('`{`' and '`}`' rather then { and }), and besides, I will not be referring to brace tokens.

1·3 Composite letters

I will use the phrase ***composite letter*** to refer to letters which, regardless of their meaning in their respective languages, are *written* (not necessarily typeset) as one of the letters *A*–*Z* (called a ***base glyph***) with that addition of some sort ***mark***. Thus composite letters include German umlauts (*ä*, *ö*, *ü*), accented letters in languages like Spanish (*á*, *é*, etc.), and special letters like *å*, *ä* and *ö* in Scandinavian languages.

As well as marks that go above letters, there are some that go below (*ç*, *ą*) and through letters (*ł*, *ø*). Normally it will be useful to distinguish between composite letters with the mark above them and the latter two categories. For example, *Ą* is the same height as the letter *A*, but if the letter *Å* is to have the same height as *A* then the base glyph must be shrunk slightly.

1·4 Hyphens and dashes

To prevent confusion, I shall use the word *dash* to refer only to the en- and em-dash symbols (‘–’ and ‘—’), and I will use the word *hyphen* for hyphens (‘-’).

1·5 Sundry quotation marks

In English printing, the quotation marks are an apostrophe (’) and an inverted comma—with hot metal typesetting this was a literally a comma that had been put in place upside-down. In German, a rather more sensible arrangement is used where two commas start quotations, and two inverted commas close them: „so“. To prevent confusion, I shall consistently refer to the character ‘‘’ as an inverted comma rather than ‘left quote’, because it is not always a *left* quotation mark:

,	comma	„	double comma
‘	inverted comma	“	double inverted comma
’	apostrophe	”	double apostrophe

There is some potential for confusion with regards to the ASCII characters ‘`’and ‘´’, used by TeX to stand for an inverted comma and apostrophe respectively. ASCII was designed with typewriter-like devices in mind, and ´ was intended as a combined neutral single quotation mark, acute accent and apostrophe, which is not quite the same as TeX’s use for it. Traditional UNIX names for these two characters are ***quote*** and ***backquote***.

When I am referring to French guillemets, I shall use ‘left guillemet’ to refer to the one that points to the left («). In French and many other languages, this is used as an opening quotation mark « thus »; in German it is sometimes used as a closing quotation mark »so«.

1·6 How to refer to Malvern fonts

The name ‘Malvern’ is spelled as a normal proper noun (no fancy typography is necessary). In English it is pronounced with the accent on the first syllable, with the *a* pronounced as in either *pal* or *pall* (natives of the town it is named after say ‘*mawl*-vən’, I tend to pronounce it ‘*mal*-vən’). In other languages it may as well be pronounced and declined according to the orthography of the language.

When describing a particular version of Malvern, convention favours an unbreakable space between name and number: Malvern 1·1 is ‘`Malvern~1.1`’ (like Henry VIII, Occam 2, Fortran 9X). The same applies to naming members of the Malvern font family (Malvern 55, Malvern 76) and Malvern font encoding family (Malvern A, Malvern B). In the latter case the letters need not be italicized.

☐ 2 Malvern's font names

2·1 Numeric style codes

The first font family designed as a unit was Univers. The designer, Adrien Frutiger, introduced two-figure codes to describe the different variations, instead of a names like 'bold italic' and 'light condensed'. For example, the 'roman' face is called Univers 55, italic Univers 56, boldface Univers 75 and lightweight condensed italic Univers 38. Frutiger has used his system in all his subsequent font families. Malvern and other new fonts I make use a similar system.

2·2 The style codes used with Malvern

Just as with Frutiger's system, the first digit gives the weight of the font and the second digit gives the width (in the sense of 'compressed' vs. 'expanded'), as in the following table:

	first digit		*second digit*
1	ultra-light (hairline)	1, 2	extra expanded
2	extra-light (thin)		
3	light	3, 4	expanded/extended
4	book (semi-light)		
5	medium	5, 6	normal width
6	demi (semi-bold)		
7	bold	7, 8	condensed/compressed
8	extra-bold		
9	ultra-bold	9, 0	extra compressed

The second digit is even for a slanted face, odd for an upright face—so that the italic version of Malvern 55 is 56, and of 19 is 10. This in theory gives 90 styles. The middle odd-numbered weights (3, 5, and 7) are expected to be the more commonly used ones. Similarly, the three middle widths are expected to be used more often than 1 and 9. The practical upshot of this is (a) they are more likely to be available as PK files and (b) they are more likely to have had their METAFONT programs tested and debugged.

This system of names only allows one slanted form and cannot distinguish 'compressed' from 'condensed'. Normally this fine—before Knuth's Computer Modern came along, it was only heretics with PostScript or phototypesetters without italics available who would resort to obliqued fonts. The METAFONT programs that describe Malvern have the capacity to produce 'vertical italic' and obliqued forms, but these are not part of the standard Malvern pantheon. They are *not* intended to be used in normal bookwork.

2·3 TEX font names

The question now is how to represent these fonts using reasonably portable TEX font names. Recall that only lowercase letters and digits can be used, and that names must be limited to a length that even stupid filesystems like MS-DOS can handle.

I have my own system of external font names of the following form:

⟨*font name*⟩ → ⟨*family*⟩ ⟨*style*⟩ ⟨*encoding*⟩ ⟨*size*⟩.
⟨*family*⟩ → { ⟨*letter*⟩ | ⟨*digit*⟩ } ⟨*letter*⟩.
⟨*style*⟩ → ⟨*digit*⟩ ⟨*digit*⟩.
⟨*encoding*⟩ → ⟨*letter*⟩ [⟨*letter*⟩].

Where a ⟨*size*⟩ is the design size in points, possibly including '`p`' as a decimal point, or '`m`' to indicate millimetres:

⟨*size*⟩ → ⟨*points*⟩ | ⟨*millimetres*⟩.
⟨*points*⟩ → ⟨*digits*⟩ ['`p`' ⟨*digits*⟩].
⟨*millimetres*⟩ → ⟨*digits*⟩ '`m`' [⟨*digits*⟩].
⟨*digits*⟩ → ⟨*digit*⟩ { ⟨*digit*⟩ }.

In the case of Malvern, the ⟨*family*⟩ is `ma`. The ⟨*encoding*⟩ describes the subset of all the Malvern characters that this font contains—for example `s` is the TEX Text character set.

Thus 10-pt Malvern 55 with TEX Text encoding is given the name `ma55s10`, which fits nicely into the eight characters allowed by MS-DOS filenames. More eccentric sizes, like 7·2 pt have names like `ma55s7p2` (eight characters) or `ma55s12p5` (nine characters).

Here's a partial list of encoding codes:

`a`	Malvern A (latin), see §6·2 on page 12
`b`	Malvern B (supplement), see §6·3 on page 14
`c`	Malvern C (Cyrillic), see §6·4 on page 15
`g`	Malvern G (Greek), see §6·5 on page 15
`s`	TEX Text [25]
`az`	TEX Text with old-style numerals
`aa`	TEX Text with small capitals replacing lower case letters
`ab`	TEX Text with old-style numerals and small capitals
`ar`	TEX Extended Text—Latin (Cork) [6]
`as`	Cork with old-style numerals
`at`	Cork with small capitals
`au`	Cork with old-style numerals and small capitals

2·4 Naming Malvern fonts in Karl Berry's system

Karl Berry has described a system for naming fonts newly introduced to the 'TEX world' [2, 3]. A subset of the Karl Berry's syntax for font names is as follows:

⟨*font name*⟩ → '`fmv`' ⟨*style*⟩ ⟨*size*⟩.
⟨*style*⟩ → ⟨*weight*⟩ ⟨*variant*⟩ { ⟨*variant*⟩ } ['`r`' | ⟨*width*⟩]
  | ⟨*weight*⟩ '`r`' ⟨*width*⟩
  | ⟨*weight*⟩.
⟨*weight*⟩ → '`t`' | '`i`' | '`l`' | '`k`' | '`m`' | '`d`' | '`b`' | '`x`' | '`u`' | '`c`'.

⟨*variant*⟩ → ‘`i`’ | ‘`9`’ | ‘`o`’ | ‘`u`’ | ‘`q`’ | ‘`c`’.
⟨*width*⟩ → ‘`x`’ | ‘`c`’.
⟨*size*⟩ → ⟨*digit*⟩ [⟨*digit*⟩].

This definition is incomplete, because the rules governing the order of variant letters and when variant and width letters may be omitted are complicated.

The ⟨*weight*⟩ letters listed above correspond to the first digit's values of 1, ..., 9, 0. A ⟨*variant*⟩ of `i`, `o` or `u` indicates a slanted, obliqued or 'upright italic' style instead of upright; `9` is old-style digits; `c` is caps & small caps; `q` is the Cork encoding (instead of the TEX Text encoding). Fonts with `c` or `q` variants have to be created as virtual fonts, using Alan Jeffrey's `fontinst` package (§10 on page 23). Fonts using TEX Text encoding may be generated directly with METAFONT.

This gives names like '`fmvm12`' for 12-point Malvern 55, '`fmvdic18`' for Malvern 68. Malvern 55 with old-style numerals would be `fmvm9r10`. On the other hand, Malvern 68 with old-style numerals would be '`fmvd9ic10`'—nine characters—and we haven't even specified a base encoding yet.

note *As of October 1994, the font names standard does not allow for combinations for more than two variants (where 'variants' includes encodings and font shape) without breaking the 8-character limit imposed by stupid filesystems like MS-DOS and ISO 9960. The only temporary solution I can offer is to extend the nonstandard '*`ma-`*' naming scheme to include encoding codes for the fonts used by plain LATEX, NFSS and NFSS 2. Therefore '*`fmv-`*' names are not used at present.*

☐ 3 Using Malvern with LATEX 2e[1] or NFSS 2

3·1 Background to LATEX 2e

The release of the so-called New Font Selection Scheme (NFSS) has left the LATEX world in a slightly confused state, with neither plain LATEX nor LATEX augmented with NFSS considered 'standard' anymore. This is partly because LATEX+NFSS is not quite compatible with plain LATEX, so older documents might have to be edited to suit the new system.

LATEX version 3 is intended to put an end to this confusion, but it will be some time before LATEX 3 is generally available. In the meantime a new, 'standard' version has been released, called LATEX 2e. LATEX 2e is backwards-compatible with LATEX-2·09 documents, using a new syntax to access the newer features.

---

1 Note that 'LATEX 2ε' and 'LATEX 2e' are the same thing. The lowered 'ε' is merely an excessively fancy way of saying 'e'.

3·2 NFSS 2

LaTeX 2e includes a new FSS called NFSS 2 which uses font family definition (`fd`) files to tell it how to obtain fonts in a given font family and encoding family. For example, a file describing Cork-encoded Malvern is called '`T1fmv.fd`': *T1* is the NFSS 2 code for the Cork encoding, and *fmv* is Karl Berry's code for Malvern. Once such an `fd` file is installed, to use Malvern fonts in a document you would use something like the following:

```
\fontencoding{T1}
\fontfamily{fmv}
\selectfont
```

This might go in a document preamble, but normally such changes to the overall look of a document belong in a package.

3·3 Malvern in NFSS 2

The Malvern includes a sample set of `tfm`, driver, `vf` and `fd` files so that Malvern should be usable with LaTeX 2e or NFSS 2 without very much effort, both with the TeX Text and Cork encodings (OT1 and T1). This assumes that

- `dvi` previewers and printer drivers that understand virtual fonts are available;
- printer fonts (such as `pk` files) will be generated automatically when needed (for example, by invoking a `MakeTeXPK` script on UNIX-TeX systems).

These files were generated with Alan Jeffrey's `fontinst` package (see §10 on page 23). They do not include support for italic caps-and-small-caps because there is at present no font-shape name for this combination.

☐ 4 Using Malvern with LaTeX 2·09

In LaTeX, It is possible to use a font or two in an ad-hoc fashion using the `\newfont` command:

```
\newfont{twlgr}{ma55g12}
\newcommand{\textgreek}[1]{{\twlgr#1}}
```

Then '`\textgreek{alfa}`' generates 'αλφα'. The problem here is that fonts loaded this way do not change size automatically when commands like `\footnotesize` or `\large` are used; as a result they will not work properly in footnotes or section headings. They also will not work in maths mode.

4·1 Using NFSS

The so-called New Font Selection Scheme (NFSS) is an extension of LaTeX 2·09 to make it easier to switch between fonts [28]. The LaTeX system I have access to does not use NFSS, so I can not test NFSS code and I do not know how much documentation on adding new fonts is supplied with the package. I have included Sebastian Rahtz's **`malvern.sty`** [33], and also style files named **`fmvnfss.sty`** and **`fmv9nfss.sty`**[1] which are modelled on **`malvern.sty`**, but which use the fonts included in the Malvern distribution. They do not have support for the **`\sc`** declaration.

4·2 Making fonts change size without NFSS

To make fonts that change size properly requires a style file that reprograms plain LaTeX's size-changing commands (I shall refer to LaTeX version 2·09 without NFSS as 'plain LaTeX 2·09', and to LaTeX 2·09 with NFSS as LaTeX 2·09 + NFSS'). To do this requires some knowledge of the way plain LaTeX's size-changing and font-changing commands work [27].

The size-changing commands like **`\normalsize`** and **`\footnotesize`** work by calling internal commands **`\`***size***`pt`** and **`\@`***size***`pt`**, where *size* is the type size in points, expressed as roman numerals. For example, in a 10-pt document, **`\normalsize`** invokes **`\xpt`** and **`\@xpt`** in order. The **`\@`***size***`pt`** macros are initially defined to expand to nothing. The **`\`***size***`pt`** macros link font nicknames **`\rm`**, **`\it`** etc. with real fonts like **`\tenrm`** or invocations of **`\@getfont`**. The macro **`\@getfont`** allows some fonts to be loaded on demand rather than preloaded when LaTeX starts up (saving some memory when they are not used). When expanded, **`\@getfont`** appends assignments to **`\@`***size***`pt`** that override the definition in **`\`***size***`pt`**. The practical upshot of this is that **`\@getfont`** is only invoked the first time the font is referred to; subsequent uses of that font use the assignment added to **`\@`***size***`pt`**.

There are two ways to add new fonts to add new fonts to LaTeX's lists. The quick kludge is to let **`\@getfont`** do the work. For example, the following code might go in a **`sty`** file:

```
\@getfont{\prm}{0}{\@xpt}{ma55s10}
\@getfont{\prm}{0}{\@xipt}{ma55s11}
\@getfont{\prm}{0}{\@xiipt}{ma55s12}
\@normalsize
```

This loads the fonts and adds assignments to the **`\@`**-commands so that they are used in 10, 11 and 12-pt text. It also has unwanted side-effects like changing the size and current font, which are cancelled out by the **`\@normalsize`** at the end.

A solution that is more efficient if more than a handful of fonts are being changed is to make a copy of **`lfonts.tex`** and edit it to load Malvern fonts instead of Computer Modern fonts. This approach allows the new fonts to be demand-loaded using **`\@getfont`** and so on. This is used two sample style files included

[1] *Fmv* is Karl Berry's code for Malvern, and *nfss* distinguishes it from the plain LaTeX version and any LaTeX 2e version. The digit '9' is the Berry code for old style figures.

in the distribution, `fmvpltx.sty` and `fmv9pltx.sty`.[1] They do not include support for the caps-and-small-caps declaration `\sc`.

4·3 Which fonts to use with LATEX 2·09

In the Malvern 1·0 documentation I suggested that Malvern fonts with the standardized font names [2, 3] and Cork encoding [6] be used with LATEX, on the grounds that the Cork encoding is due to become the standard for LATEX. Since then the situation has changed a little. The introduction of NFSS 2 means that future versions of LATEX will not be tied down to just one encoding scheme after all. Also, new versions of the font-naming scheme include encoding codes amongst the variant letters, implying that the default is the standard TEX Text encoding.

It follows that the standard names (starting '`fmv-`') should be used with the standard 'TEX Text' encoding when using Malvern fonts with LATEX 2·09, whether with NFSS or not. This way the macros that work with the old encoding (such as `\ae`, `\'`, and the like) will not need to be changed. NFSS 2 will take care of redefining these macros when appropriate.

note *As of October 1994, the font names standard does not allow for combinations for more than two variants (where 'variants' includes encodings and font shape) without breaking the 8-character limit imposed by stupid filesystems like MS-DOS and ISO 9960. The only temporary solution I can offer is to extend the nonstandard '`ma-`' naming scheme to include encoding codes for the fonts used by plain LATEX, NFSS and NFSS 2. Therefore '`fmv-`' names are not used at present.*

☐ 5 Using Malvern with plain TEX: maamac.tex

This section describes a file `maamac.tex` of definitions to customize TEX to work with the Malvern A conventions. It covers roughly the same territory as Chapter 9 of the *TEXbook* [19], and assumes you have already have macros in place to load Malvern fonts with the Malvern A encoding [22, 24]. At a minimum:

```
\input maamac
\font rm=ma55a10 \rm
```

note *The file* `maamac.tex` *('Malvern A macros') was formerly called simply* `malvern.tex`. *The new name is intended to be less ambiguous, while still acceptable to file systems with short file names.*

5·1 Ligatures

The letter ligatures *ff*, *fi*, *fl*, *ffi*, *ffl* and punctuation ligatures '–', '—', '¡', '¿', '“' and '”' work as in Computer Modern. In addition, `fj` produces *fj* and `<<` and `>>` produce the guillemets '«' and '»'. Note

[1] *Fmv* is the code for Malvern in Karl Berry's system, and *pltx* short for 'plain LATEX'.

that you must use '``' to stand for a double-apostrophe—with Computer Modern, some people use '"', which will not work.

5·2 Special letters

In addition to the special letters œ, æ, å, ø, ł, ß, ı and ȷ there are:

`\A`	Ą	`\a`	ą	Polish *a* with ogonek
`\E`	Ę	`\e`	ę	Polish *e* with ogonek
`\TH`	Þ	`\th`	þ	Icelandic thorn
`\DH`	Ð	`\dh`	ð	Icelandic eth
`\NG`	Ŋ	`\ng`	ŋ	Lappish eng
`\vd`	ď	`\vt`	ť	alternatives to *ď*, *ť*
`\vl`	ľ	`\h`	ħ	alternatives to *ľ*, *ĥ*

The commands producing composite letters (`\'e` for *é*, etc.) work as before, except that they use different marks on capital letters: *É* instead of *É*.

5·3 Sundry symbols

The commands `\$`, `\#`, `\%` and `\&` produce '$', '#', '%' and '&' as in plain TEX (`\$` does not produce a pounds sign '£' in italics). In addition, the commands `\P`, `\S`, `\dag` and `\ddag` produce signs ¶, §, †, ‡ that come from the current font rather than the mathematical symbol font.

There are the following additional symbols:

`\pounds`	£	Pounds-sterling sign
`\cents`	¢	Cents sign (alternative to *c*)
`\currency`	¤	Currency sign
`\permille`	‰	Per-mille (per-thousand) sign
`\yen`	¥	Japanese Yen sign
`\florin`	ƒ	Florin sign (alternative to italic *f*)
`\times`	×	multiplication sign
`\minus`	−	minus sign
`\langle`, `\rangle`	〈, 〉	angle brackets
`\{`, `\}`	{, }	braces
`\cdot`	·	raised dot (British decimal point)
`\bullet`	•	a bullet
`\Box`	□	a ballot box
`\degrees`	°	degrees sign
`\Mc`	M$^{\underline{c}}$	'Mac', as in M$^{\underline{c}}$Donald
`\No`	№	'Number' or 'numero'
`\orda`	ª	feminine ordinal numbers
`\ordo`	º	masculine ordinal numbers
`\careof`	℅	indicates indirect address
`\copyright`	©	international sign of copyright
`\registered`	®	registered trade mark sign
`\trademark`	™	trade mark sign

The inclusion of '×', '−', '°', '·' makes it possible to say '−17·6 °C' or '50 mm × 100 mm' without using maths mode (and therefore in the current font). The symbols that are named the same as mathematics symbols in plain TEX use `\ifmmode` so that they can use the plain TEX definition in formulas and the Malvern character in horizontal mode.

5·4 Old-style and ranging numerals

By default, old style numerals are used: 0123456789. These are for use in non-technical text, where old style numerals are usual when using serif fonts. To get ranging numerals 0123456789 use one of:

```
$0123456789$
$\textfont0=\font 0123456789$
\uppercase{0123456789}
\caps{0123456789}
```

The switch to ranging numerals in mathematics mode reflects the assumption that mathematics mode is mainly used in documents with technical content (besides, old style numerals look wrong in anything but the simplest formulas). Normally a given document should not use both styles—which implies that if you are using formulas then all numerals in the manuscript must be encosed in mathematics delimiters.

5·5 Small captials

The following macros do not work in TEX's mouth, meaning that they will not have the intended result when expanded in an `\edef`, for example.

`\sc{ABC\DH}`	ABCĐ	Even small capitals
`\mc{ABC\DH}`	ABCĐ	Medium capitals
`\csc{ABC\DH abc\dh}`	ABCĐABCĐ	Caps and small caps
`\caps{ABC\DH abc\dh}`	ABCĐABCĐ	All-capitals
`\lc{ABC\DH abc\dh}`	abcðabcð	Lower case

For example, I set my postcode with '`\sc{OX1~3QD}`' to get 'OX1 3QD', and I can write 'PostScript' with '`\csc{PostScript}`'. Because the small capital alphabets are included in all styles, we can write '`\csc{\it Fred}`' to get '*Fred*', and even produce the LATEX logo in italics: *LATEX*. Note that these macros work differently from the `\sc` or `\smc` declarations in LATEX and other formats, which switch to `cmcsc10`, a separate caps-and-small-caps font.

The last two transliterate into capitals and lower case—the differences between these macros and the `\uppercase` and `\lowercase` primitives are:

- `\caps` and `\lc` (and all the others) make assignments, and so can not be expanded in TEX's mouth; and
- `\uppercase` and `\lowercase` do not affect letters like Ø and æ when they are produced with control sequences (like `\O` and `\ae`).

The practical upshot is that the primitives are useful when implementing strange macros involving creating control sequence names on the fly etc. and for introducing strange characters into definitions, whereas to produce an all-capitals headline (or whatever), the macros are better.

6 The encoding of Malvern fonts

An ***encoding*** for a computer font is a mapping from a ***character code*** (a nonnegative integer less than 256) to characters in the font. (Encodings are like the 'code pages' defined by ISO standards such as 646 and 8859.) Unlike PostScript, any given TEX/METAFONT font has its encoding hard-wired into it, because characters are always referred to by code.

This section discusses some general aspects of TEX font encodings, and some 'standard' font encodings, before describing the Malvern font encodings. The encoding used is reflected in the external name of the font (see §2·3 on page 4).

6·1 The Malvern font-encoding conventions

The Malvern typeface includes more than 256 characters, so it follows that no one font will contain every Malvern character. Instead I have coding schemes called Malvern A, Malvern B, Malvern C and Malvern G.[1] Malvern A is the simple latin text font; it has the base alphabets (that is, it has *A–Z* and the rest but not *À–Ž*). Malvern C and G are Cyrillic and Greek respectively (Malvern C is stil incomplete). Malvern B is the latin text supplement. (There might also be a Malvern E of composite letter glyphs in the future.)

6·2 Malvern A Encoding

This is the latin text font, containing alphabets, two sets of figures, punctuation marks, various symbols, and some special letters. Although the eventual plan is that language-group specific fonts be created, this encoding has been designed so that it can be used on its own at a pinch. As with the TEX Text encoding, words with composite letters in them will not hyphenate properly, and any composite-letter characters available on the user's keyboard will have to be made to expand to control sequences to generate that character.

As well as the usual (large) capitals and lower case alphabets, Malvern has two more capital alphabets: small capitals and medium capitals. The font is divided into two halves, with the first 128 slots being an extension of a subset of normal ASCII, and the upper 128 characters largely 'shadowing' the lower half. For example,

---

1 The use of 'Malvern' in these names is in order give them a unique name, not to restrict the use of these encodings to Malvern fonts. If the encoding conventions of later versions of Malvern are different for some reason, then the version number can be appended to distinguish the different encodings, giving 'Malvern A 1·0', say.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Þ	Ą	Ŋ	Ł	Đ	Ę	¸	˛	´	`	ˆ	˜	˚	ˇ	˘	˝
1	þ	ą	ŋ	ł	ð	ę	˙	¨	ß	ı	ȷ	ff	fi	fl	ffi	ffl
2	•	!	™	#	$	%	&	’	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	‹	=	›	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	Ø	]	Æ	Œ
6	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	ø	}	æ	œ
8	Þ	Ą	Ŋ	Ł	Đ	Ę	¸	˛	´	`	ˆ	˜	˚	ˇ	˘	˝
9	Þ	Ą	Ŋ	Ł	Đ	Ę	¯	—	ª	º	℅	c̲	ď	ť	ĥ	ľ
A	□	¡	¢	£	¤	‰	×	”	¥	ƒ	†	‡	„	–	·	–
B	0	1	2	3	4	5	6	7	8	9	§	¶	«	—	»	¿
C	°	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
D	P	Q	R	S	T	U	V	W	X	Y	Z	⟨	Ø	⟩	Æ	Œ
E	“	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
F	P	Q	R	S	T	U	V	W	X	Y	Z	©	ø	®	Æ	Œ

Notes:

´006–´017	˝086–˝0F	6–15	marks for l.c. composites
´026–´027	˝16–˝17	22–23	marks for U&lc composites
´060–´071	˝30–˝39	48–57	oldstyle digits
´074, ´076	˝3C, ˝3E	60, 62	single guillemets
´206–´217	˝86–˝8F	134–143	marks for cap. composites
´234	˝9C	156	lower-case *d* with hook (= *ď*)
´235	˝9D	157	lower-case *t* with hook (= *ť*)
´236	˝9E	158	lower-case *h* with circumflex
´237	˝9F	159	lower-case *L* with hook (= *ľ*?)
´240	˝A0	160	ballot box
´244	˝A4	164	ISO-646 currency sign
´251	˝A9	169	‘florin sign’ (variant italic *f*)
´256	˝AE	174	raised dot (British decimal point)
´260–´271	˝B0–˝B9	176–185	ranging figures
´300	˝C0	192	degrees sign
´333, ´335	˝DB, ˝DD	219, 221	angle brackets

Table 1 Malvern A encoding.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	←	→	↑	↓	↔	↕	−	ı								
2			″			∘		′					‚			/
3	0	1	2	3	4	5	6	7	8	9	÷		<		>	
5													\		^	_
6	`		ð̌				ch	ck			ij		ſ		ſſ	ß
7					ə	l	ĭ	ľ	t				|		~	
A	▿				¬	µ										
B	0	1	2	3	4	5	6	7	8	9						

Notes:

´40	˝20	32	blank space
´42	˝22	34	seconds (and ASCII doublequote)
´45	˝25	37	Cork's ring for per mille
´47	˝27	39	minutes (and ASCII quote)
´54	˝2C	44	German single quote
´56	˝2E	46	three-dot ellipsis†
´57	˝2F	47	slash for fractions
´60–´72	˝30–˝3A	48–58	infoerior figures
´60–´72	˝30–˝3A	48–58	inferior figures
´74, ´76	˝3C, ˝3E	60, 62	greater- & less-than signs
´101–´105	˝41–˝45	65–69	Old English caps†
´106–´145	˝46–˝65	70–101	Old English lower case†
´146–´153	˝66–˝6B	102–107	Ligatures *ch*, *ck*, *ct*, *ft*, *ij*, *ll*†
´154–´163	˝6C–˝73	108–115	Long *s* and ligatures
´164	˝74	116	Schwa
´165–´173	˝75–˝7B	117–123	Font-specific variant letters
´134–´137	˝5C–˝5F	92–95	Cork glyphs
´140	˝60	96	reverse tick (ASCII backquote)
´240	˝A0	160	Cork visible space
´241–´246	˝A1–˝A6	161–166	ISO 8859/1 glyphs

Table 2 Malvern B encoding.

small capitals and medium capitals 'shadow' the lower case and large capital alphabets ('a' is character ˝61, and 'A' (small cap.) is ˝61 + ˝80 = ˝E1).

There are two sets of digits: old style (1234567890) are the default; to get ranging digits (1234567890) see § 5·4 on page 11. The usual block of marks (which may be used to make composite letters) is designed to suit the lower case letters, and the shadow set is designed to suit the medium capitals.

6·3 Malvern B Encoding

This font is essentially a collection of random symbols and

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Ђ		Џ		І	Є			ђ		џ		і	є		
1												ё	v			
2	¨	!	”		˘	%	´	’	(	)	*		,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	«	ı	»	?
4		А		Ц	Д	Е	Ф	Г	Х	И		К	Л	М	Н	О
5	П	Ч	Р		Т		В	Щ	Ш	Ы	З	[	“	]	Ь	Ъ
6	‘	а		ц	д	е	ф		х	и	ј		л			о
7	п	ч	р	с	т			щ	ш	ы	з				ь	ъ
8											ї		ў			

Table 3 Malvern C encoding (so far).

alphabetical characters, some of them mathematical. I have not yet settled on a firm design for it—most of it is left as gray areas to be filled in in later versions of Malvern. Also, even in the final form of this font, some areas will be designated as 'font-specific'; other fonts using the Malvern conventions will use them for whatever variant letters and unique characters the designer wishes to include. Superior and inferior—that is, raised and lowered—figures (^{1234567890}/$_{123456789}$) take the place of the old-style and ranging figures. The glyphs required by the Cork encoding, such as this visible space '␣' and ASCII doublequote '"', are also included here.

6·4 Malvern C Encoding

This will be the Cyrillic subset of Malvern, using the same or simlar conventions to the existing `wncy` fonts. As yet, several of these glyphs are missing. (Perversely enough, mainly the ones appearing in the Latin and Greek alphabets, so I can only say 'АНГЛИЧАНИН' by borrowing 'A' and 'H' from Malvern A and 'Γ' from Malvern G!) I'm not really in a good position to produce a good Cyrillic font—I don't have the slightest knowledge of Russian or any other language using the Cyrillic alphabet.

6·5 Malvern G encoding

This is the Greek text font encoding, based largely on the GreekTEX [5] fonts, so that, for example, '`<´a|`' produces an alpha with breathing, accent and iota subscript: 'ᾅ'. The document `magrman.tex` in the Malvern distribution describes the use of this font.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	᾿	–	—	΄			῞	῝	῟	῎	῍	῏	΅	῭	῁	΅
1	ᾳ	ῃ	ῳ	ῥ	ῤ									ά	ά	ὰ
2		!	¨			%		’	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	·	ʽ	=	ʼ	;
4		Α	Β	Ϲ	Δ	Ε	Φ	Γ	Η	Ι	Θ	Κ	Λ	Μ	Ν	Ο
5	Π	Χ	Ρ	Σ	Τ	Υ	Ϝ	Ω	Ξ	Ψ	Ζ	[	φ	]		
6	`	α	β	ϲ	δ	ε	ϕ	γ	η	ι	θ	ϰ	λ	μ	ν	ο
7	π	χ	ρ	ς	τ	υ	ϝ	ω	ξ	ψ	ζ	«	͵	»	ˆ	ς
8	ᾶ	ἁ	ἅ	ἃ	ἇ	ἀ	ἄ	ἂ	ἆ	ᾴ	ᾴ	ᾲ	ᾷ	ᾁ	ᾅ	ᾃ
9	ᾇ	ᾀ	ᾄ	ᾂ	ᾆ	έ	έ	ὲ	ε͂	ἑ	ἕ	ἓ	ἑ͂	ἐ	ἔ	ἒ
A	ἐ͂	ή	ή	ὴ	ῆ	ἡ	ἥ	ἣ	ἧ	ἠ	ἤ	ἢ	ἦ	ῄ	ῄ	ῂ
B	ῇ	ᾑ	ᾕ	ᾓ	ᾗ	ᾐ	ᾔ	ᾒ	ᾖ	ί	ί	ὶ	ῖ	ἱ	ἵ	ἳ
C	ἷ	ἰ	ἴ	ἲ	ἶ	ό	ό	ὸ	ο͂	ὁ	ὅ	ὃ	ὁ͂	ὀ	ὄ	ὂ
D	ὀ͂	ύ	ύ	ὺ	ῦ	ὑ	ὕ	ὓ	ὗ	ὐ	ὔ	ὒ	ὖ	ώ	ώ	ὼ
E	ῶ	ὡ	ὥ	ὣ	ὧ	ὠ	ὤ	ὢ	ὦ	ῴ	ῴ	ῲ	ῷ	ᾡ	ᾥ	ᾣ
F	ᾧ	ᾠ	ᾤ	ᾢ	ᾦ	ϊ	ΐ	ΐ	ῒ	ῗ	ϋ	ΰ	ΰ	ῢ	ῧ	

Table 4 Malvern G encoding.

☐ 7 Composite letters used in some languages

This table lists composite letters listed as being required to typeset several European languages. This list is not particularly canonical—I have merely combined the OUP list [30], the resources of my local library, and *TUGboat* articles [4, 8]. There are probably omissions, especially of composites used in loan-words—and I would appreciate any information which I can include in later revisions.

Czech	á	č Ďď[1]	éě		í	ň	ó	řš Ťť[1]	úů		ý	ž	
Danish	å						ø						æ
Dutch[2]			éë				óö						
English	å[3]	ç	éè[4]ë		ï		ôö[5]						æœ[6]
Esperanto		ĉ		ĝĥ		ĵ		ŝ	ŭ				
Finnish	åä						ö						
French	àâ	ç	éèë		îï		ô		ùûü				
German	ä						ö		ü				ß
Hungarian	á		é		í		óöő		úüű				
Icelandic	á		é		í								þð
Norwegian	å						ø						æ
Polish	ą	ć	ę			łń	ó	ś				źż	
Portuguese	áàâã	ç	éèê		îï		óòôõ		úùü[7]				
Romanian	àâă		è		îĭ			şţ	ù				
Russian[8]			èë		ĭ						ÿ	ž	´ ″
Spanish	á		é		í	ñ	ó		úü				
Swedish	åä						ö						
Turkish	â	ç		ğ	İı[9]î		ö	ş	ü				
Welsh	âá		êë		îï		ôö		û	ŵ	ŷ		

[1] The letters *ď* and *ť* are used as alternatives to placing a ˇ on letters with ascenders. They can also be written ď and ť.

[2] *IJ ij* counts as one letter.

[3] *ångström*.

[4] In poetry, *-èd* is usèd to show a syllable normally mute is to be separately pronounced [11].

[5] American *coöperate* (Br. spelling is *co-operate*), *ångström*.

[6] Using the vowel ligatures *æ* and *œ* in English words with Latin roots is a Victorian affectation—it is usual nowadays to write *aesthetic*, not *æsthetic* [12]. Americans write *esthetic*, of course.

[7] The letter *ü* is used in Brazil but not in Portugal [15].

[8] These are letters used in transliterating Russian and the other languages that use the Cyrillic alphabet (Belorussian etc.) [14].

[9] In Turkish, *I ı* and *İ i* are separate letters. Sometimes *î* or *ī* is used in manuscripts to indicate *ı* [15].

□ 8 Installation summary

8·1 Getting Malvern via FTP

Malvern should be available from CTAN (the Comprehensive TEX Archive Network), in directory `fonts/malvern`.

Where appropriate, Malvern now uses the same naming convention as GNU software, so there should be a bundled distribution called something like

```
Malvern-1.2.tar.gz
```

The file, as the suffix suggests, is a `tar` archive compressed with GNU Zip, and on UNIX systems will likely be unpacked with something like

```
zcat Malvern-1.2.tar.gz |tar xvf -
```

A version which has been 'patched' will have a version ID like '1·2·05', the '05' being the ***patch level***. You apply the patches (with Larry Wall's `patch` program) in order (patch 01 first, then 02, and so on) to the main distribution. Patch files have names like '`malvern-1.2-patch05`'.

There is a document `dvi/install.dvi` included in teh package that contains installation hints.

8·2 Generic driver file

Malvern is unusual amongst METAFONT families in that it is supplied with one *generic driver file* instead of one driver file for each size and style the family comes in.[1] The generic driver file (`ma.mf`) inspects the values of variables like *designsize* and *weight* and gives the ad-hoc parameters appropriate values, before reading the program files. On some UNIX systems a small program called `mff` can be used to generate fonts using this system. Otherwise other measures will have to be taken, described below.

8·3 Malvern encodings

Malvern uses a nonstandard encoding—in fact a family of encodings, for example, Malvern A (latin alphabets) and Malvern G (Greek). To create fonts for use with LATEX 2e and the NFSS 2 font selection macros, use Alan Jeffrey's `fontinst` package [16] (see also §10 on page 23). This generates the `fd` files and virtual fonts so that Malvern fonts may be used in the same way as other LATEX 2e families. (The glyphs needed to make fonts with the Cork (T1) encoding are in Malvern A and Malvern B.) This has already been done for you to make a selection of styles available with both TEX Text and T1 encodings.

8·4 Malvern font names

The Malvern fonts generated with METAFONT will have TEX names of the following form:

`ma`⟨*style*⟩⟨*encoding*⟩⟨*size*⟩

1 The package also includes a selection of driver files.

where the ⟨*style*⟩ is a two digit style code (described below), ⟨*encoding*⟩ is a code identifying a Malvern encoding (such as '`s`' or '`az`'), and ⟨*size*⟩ is the size in points (e.g., '`12`' for 12 pt). Thus `ma55a12` (12-pt Malvern 55, encoding A).

The two-digit style codes are based on Adrian Frutiger's system, devised for the Univers family; see §2·2 on page 4.

The METAFONT programs can also produce fonts in Karl Berry's font naming scheme, with the TEX Text encoding. The names start with '`fmv`'. This is so that these fonts may be used in plain-TEX and LATEX-2·09 documents without too much confusion. The correspondance between Malvern's style digits and weight, variant and expansion letters is given in the tables below. NFSS 2 systems (indeed, any that use non-TEX-text encodings) will have to use virtual fonts.

note '`fmv`-' *names are not used at present; use corresponding* '`ma`-' *names instead. See the note at the end of §2·4 on page 6.*

8·5 Unpacking Malvern

The Malvern distribution includes METAFONT source files, some TEX files such as this documentation, and a few other miscellaneous files.

Source files (`/source`) On most TEX systems, METAFONT fonts end up with their source files stored in METAFONT's input file area. I suggest that Malvern instead be given its own file area. This avoids problems with different font families having files with the same name, and makes it easy to replace all the Malvern files in one go if you upgrade to a newer version of Malvern.

With a new-style directory tree,[1] the `Malvern-1.2` directory may be placed in the '`texmf/fonts/public`' directory, and the directories `source` and `drivers` merged and renamed so that METAFONT can find them.

The files `mff.rc` and `fmv.mff` are input files for `mff` and may be ignored if you are not using `mff` to generate fonts.

Driver files (`/drivers`) These files are not strictly necessary but are included for convenience. They are used when assignments to the generic driver file's parameters on the METAFONT command line is impossible, such as when using the standard `MakeTeXPK` script. A driver file is included for each `tfm` supplied.

TEX input files (`/tex`) These files belong in a system-wide TEX inputs area. The files ending with '`.fd`' are font family definition files, used by NFSS 2 and LATEX 2e.

On new-style directory trees, the best approach is probably to link or rename `texmf/fonts/public/Malvern-1.2/tex` to `texmf/tex/Malvern-1.2`.

[1] At the time of writing, the TEX Directory Standard (TeDiouS) is still in discussion. This is my best guess based on a TEX system I recently had installed.

Documentation files (/doc, /dvi)

Files ending in '.tex' are plain TEX documents, and will not work with LATEX. Compiled (dvi) files are supplied to save the installer having to run TEX. Read install.tex, first. The Greek text encoding is described in magrman.tex.

The *Malvern Handbook*, maman.tex produces cross-references automatically via an aux file, and will need to be run through TEX twice to get the cross-references right. The front matter (preface and table of contents) are printed *last* and should be transferred to the front of the handbook before binding.

note *Please do not install any of the macro files used to typeset the documentation in the system-wide TEX inputs area. They are not supported, not necessarily generally useful, and very nonstandard. Earlier releases of Malvern gave the macro files generic enough names that they might clash with other macro files. They have been renamed to start with 'pdc' in the hope that this will avoid clashes if they are accidentally installed.*

Virtual font files (/vf)

These virtual fonts are generated using Alan Jeffrey's fontinst package [16], and are Malvern fonts with the Cork encoding. With NFSS 2 (or LATEX 2e) they are used by specifying encoding 'T1' and family 'fmv'. See §2·3 on page 5 for a list of encoding codes.

Font metric files (/tfm)

A selection of precompiled font metric files, including those for virtual fonts in /vf and the actual fonts needed to use them, as well as fonts needed to print the documentation in /dvi.

8·6 Using mff to generate Malvern fonts

First, install mff and arrange that METAFONT will be able to find the mf files. Then to create a Malvern font, for example 12-pt Malvern 55 (ma55a12), give the command:

```
mff ma55a12
```

To generate Malvern 55 and 56 at magsteps 0, 1/2 and 1, for 300-dpi and 1000-dpi printers, you would type:

```
mff --magstep=0,h,1 --dpi=300,1000 ma55a10
ma56a10
```

If all goes well, the tfm and pk files generated will be installed in the correct directories automatically.

8·7 Generating Malvern fonts without mff

This section presumes you know how to install a normal METAFONT font.

Create a driver file for each style of Malvern you want to be able to use. It should have the following form:

```
% <name of file> -- generate <size>-pt Malvern <style>
font_size <size> pt#;
encoding = <number>;
weight = <number>; hratio = <number>;
slant = <number>; italicness = <number>;
input ma
```

```
bye.
```

where ⟨*size*⟩ is the design size in points, and the values for the various variables are given below. The ⟨*style*⟩ is the two-digit style code described in §2·2 on page 4.

These driver files should be named after the font they correspond to—for example, '`ma76a12.mf`' to generate Malvern 76. Then they are used as usual with METAFONT:

`mf \mode=luxo; mag=`⟨*number*⟩`; input ma55a12`

where the ⟨*number*⟩ is the magnification wanted, or '`1.0`' for no magnification.

Values for *encoding*

The variable *encoding* specifies the encoding to use—in other words, the subset of Malvern's glyphs to be generated. It should be given one of the following values:

Encoding	*Letter*	*Description*
encoding = 1	`a`	Malvern A (latin alphabets ABCdef.)
encoding = 2	`b`	Malvern B (superscripts, symbols etc.)
encoding = 3	`c`	Malvern C (Cyrillic АДИлзь)
encoding = 5	`e`	Malvern E (composite letters ÅÇD̂éğî)
encoding = 7	`g`	Malvern G (Greek letters ΑΒΓδεζ)
encoding = 19	`s`	TEX text [25]
encoding = 26	`az`	TEX text, old-style numerals

The letter is the letter used in the font name – for example, `ma55s10` for Malvern with the TEX text encoding (*encoding* = 19), and so on.

note *The Malvern programs used to attempt to generate other encoding schemes; with* `fontinst` *this all becomes redundant and those codes are obsolete.*

Values for *weight*

The variable *weight* specifies the weight (boldness) of the font. It has the following values:

Weight	*Style digit*	*NFSS 2 code*	*Berry code*	*Description*
weight = 1/4	1	`ul`	`t`	ultra-light
weight = 1/2	2	`el`	`i`	extra-light
weight = 3/4	3	`l`	`l`	light
weight = 7/8	4	`sl`	`b`	semi-light
weight = 1	5	`m`	`r`	medium
weight = 1·3	6	`sb`	`d`	semi-bold
weight = 1·6	7	`b`	`b`	bold
weight = 2	8	`eb`	`x`	extra-bold
weight = 3	9	`ub`	`u`	ultra-bold

The 'style digit' is the first digit in the two-digit style codes described in §2·2 on page 4. The 'NFSS 2 code' is the first half of a corresponding NFSS 2 'font series' code. The 'Berry code' is the code for this weight in Karl Berry's font naming scheme.

Note that some of the character programs produce ugly results for large values of *weight*.

Values for *hratio*

The variable *hratio* specifies the ratio between horizontal and vertical measurements: in other words, whether the font is compressed or expanded. It may have the following values:

Hratio	*Style digit*	*NFSS 2 code*	*Berry code*	*Description*
hratio = 0·50	9 or 0	`ec`	`o`	extra compressed
hratio = 0·80	7 or 8	`c`	`c`	compressed
hratio = 1·00	5 or 6	`m`	`r`	normal width
hratio = 1·15	3 or 4	`x`	`x`	expanded
hratio = 1·30	1 or 2	`ex`	`w`	extra expanded

The 'style digit' is the second half of the two-digit style codes described in §2·2 on page 4. The 'NFSS 2 code' is the second half of an NFSS 2 'font series' code (for example, bold expanded is $b + x = bx$, compressed is $m + c = c$). The 'Berry code' is for Karl Berry's scheme.

Beware that the character programs do not all produce good results when *hratio* is not 1.

Values for *slant* and *italicness*

These two variables between them specify whether a font is to be produced with italic letterforms or not:

Slant	*Italic?*	*Style digit*	*NFSS 2 code*	*Berry code*	*Description*
slant = 0	*italicness* = 0	odd	`n`	`r`	upright
slant = 1/8	*italicness* = 1	even	`it`	`i`	italic
slant = 0	*italicness* = 1	odd	`ui`	`u`	upright italic (!)
slant = 1/8	*italicness* = 0	even	`sl`	`o`	oblique

The 'NFSS 2 code' is the 'font shape' code. The 'Berry codes' are variant letters for Karl Berry's font naming scheme.

The variable *slant* is common to many METAFONT programs, and causes the glyphs to be obliqued. The *italicness* variable signals that italic letterforms should be used for some letters. It is possible to generate an obliqued font or an 'upright italic' with appropriate settings, but these cannot have '`ma-`' names, because I have not defined style codes for them.

☐ 9 Copying Malvern and reporting bugs

Like TEX and METAFONT themselves, the implementation of Malvern in METAFONT for use with TEX is free software in the sense used by the Free Software Foundation [7]. (The word 'free' is used to mean 'free of restrictions', rather than 'available for free'; free software may be bought and sold on the understanding that the buyer may make copies and distribute them.)

There is a mailing list for discussion of Malvern problems and solutions. Send bug reports, suggestions, and ideas to `malvern@comlab.ox.ac.uk`. To subscribe to the list, mail me at `malvern-request@comlab.ox.ac.uk`.

☐ 10 Fontinst

Alan Jeffrey's **`foninst`** package [16] is a set of TEX macros which allows users to install virtual fonts. It can combine fonts represented by Adobe Font Metric (`afm`) or TEX font metric (`pl`) files into virtual fonts. These virtual fonts can then be used by TEX.

The package

- is written in TEX, for maximum portability (at the cost of speed);
- supports the full Cork encoding;
- allows arbitrary 'fake' glyphs – for example, creating an *ij* ligature by placing *i* next to a *j*;
- allows capital-and-small-capital fonts with letter-spacing and kerning;
- allows kerning information to be copied between glyphs – for example *ij* can be made to kern on the left like *i* and on the right like *j*;
- allows glyphs from several fonts to be combined to make a new one;
- automatically generates a `fd` file for NFSS 2 and LATEX 2e;
- can deal with arbitrary font encodings.

The current version is a beta release. It can be obtained from the Comprehensive TEX Archive Network (CTAN), in directory `fonts/utilities/fontinst`.

By including some Cork-specific glyphs in the Malvern B encoding, I have managed to spin Cork-encoded Malvern fonts (with variant encodings like cap & small caps) from Malvern A and B fonts. The fonts generated have names in Karl Berry's scheme, like '`fmvmq12`'.

11 To-do list

So far both Malvern and this handbook is incomplete—Malvern is a spare-time project and progress has slowed to a crawl over the last few months. For the present, the best strategy seems to be to release a version that can be picked apart by more knowledgable people in order that a later, complete, release be that much better.

Tasks that need attention include:

- Make guillemets space themselves automagically.
- Make head of ¶ solid.
- The kerning table is incomplete—I need to develop a systematic method for thrashing one out in the absence of a decent typesetter or enough specialized knowledge. Donation of a kerning table or clever software for generating same would be appreciated.
- Some composite letters are missing or hastily designed. I need to do more research into other latin-alphabet languages (so that I know how to draw their special letters).
- Find example texts containing some of the more esoteric special letters (such as Ŋ).
- Rethink the proportions of small-capital letters.
- Learn Russian and design a Cyrillic alphabet.
- Script alphabets. (Just an idea.)
- Documentation of the METAFONT code is incomplete—and some of the code might usefully be rationalized.

☐ 12 References

This section includes references not cited in the *Abridged Malvern Handbook*.

The publication *TUGboat*, referred to below, is the journal of the TeX Users Group (TUG), PO Box 9506, Providence, RI 02940–9506, United States of America. Their electronic mail address is `TUG@Math.AMS.com`.

URLs (universal resource locators) describe documents available over Internet. A URL of the form

`file://`⟨*host*⟩`/`⟨*directory*⟩`/`⟨*name*⟩

represents a file called ⟨*name*⟩ in directory ⟨*directory*⟩ on an FTP server called ⟨*host*⟩. CTAN is the Comprehensive TeX Archive, for example

```
file://ftp.tex.ac.uk/tex-archive
gopher://gopher.tex.ac.uk/11/archive/
  Archive%20directory
http://www.tex.ac.uk/tex-archive/
```

and similarly

```
file://ftp.dante.de/tex-archive
file://ftp.shsu.edu/tex-archive
```

and many mirrors.

1 Adobe Systems Incorporated, *PostScript® Language Reference Manual*, 2nd Edition (Addison–Wesley, 1990). The definitive description of the Level-2 PostScript page-decsription language.

2 Karl Berry, ‘Filenames for Fonts’, *TUGboat* 11·4 (1990), pp. 517–520. This describes a system of conventions for assigning TeX external names to fonts.

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4 Janusz S. Bień, ‘On Standards for Computer-Modern Font Extensions’, *TUGboat* 11·2 (1990), pp. 175–183. Ennumerates the special letters used in several languages.

5 K. J. Dryllerakis (`kd@doc.ic.ac.uk`), *Typesetting Greek Texts with GreekTeX*, GreekTeX 3·1 (also known as KD Greek) (CTAN `fonts/greek/kd`).

6 Michael J. Ferguson, ‘Report on Multilingual Activities’, *TUGboat* 11·4 (1990), pp. 514–516. This describes the font encoding that resulted from discussions at the TeX User Group conference in Cork in September 1990.

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8 Yannis Haralambous, 'TEX and Latin-Alphabet Languages', *TUGboat* 10·3 (1989), pp. 342–345. An attempt to devise a system of ligatures to cover all European Latin-alphabet languages. Incorrectly states that no English words use composite letters.

9 Horace Hart, *Hart's Rules for Compositors and Readers at the University Press, Oxford*, 39th Edition (corrected) (Oxford University Press, 1990). A small book describing the house style of the Oxford University Press.

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12 Ibid., p. 62

13 Ibid., p. 102.

14 Ibid., pp. 120–121.

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16 Alan Jeffrey (`alanje@cogs.susc.ac.uk`), *The* `fontinst` *package* (CTAN `fonts/utilities/fontinst`, June 1994). See §10 on page 23.

17 Donald E. Knuth, *The METAFONTbook* (Addison–Wesley, 1986). Also published as Volume C of the Computers and Typesetting Series. The definitive user manual for METAFONT.

18 Ibid., Appendix F.

19 Donald E. Knuth, *The TEXbook* (*n*th printing, Addison–Wesley, 1990). Also published as Volume A of the Computers and Typesetting Series. The definitive user guide to TEX.

20 TEXbook, Chapters 25 and 26. ⟨*character*⟩ is defined at the start of Ch. 26 (Summary of Math Mode), but the concept is used in Ch. 25 (Summary of Horizontal Mode).

21 *TEXbook*, Chapter 9.

22 *TEXbook*, Appendix B, §4

23 *TEXbook*, Appendix D, §1.

24 *TEXbook*, Appendix E.

25 *TEXbook*, Appendix F, Figure 1.

26 Leslie Lamport, *LATEX: A Document Preparation System* (Addison–Wesley, 1986). An introduction and user guide for LATEX.

27 Leslie Lamport et al., `lfonts.tex` (part of the standard LATEX distribution). The only documentation for the standard LATEX font-loading macros.

28 Frank Mittelbach and Rainer Schöpf, 'The New Font Family Selection: User Interface to Standard LaTeX', *TUGboat* 11·2 (1990), pp. 298–. This describes a version of the so-called New Font Selection Scheme (NFSS), used in some LaTeX installations.

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33 Sebastian Rahtz, `malvern.sty` (in directory `/contrib/spqr` of the Malvern 1·2 distribution). Specifies Malvern fonts for LaTeX2·09 with NFSS.

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The abridged MALVERN handbook

P. Damian Cugley

Caveat This documentation is incomplete.

This document describes Malvern 1·2.

TeX was run on this file on 12 Oct. 1994.

☐ Preface

MALVERN IS a sanserif typeface family: a collection of typefaces that have been designed together and are intended to coordinate with each other. ('Sanserif' comes from the French *sans serif* and means that the arms and stems of letters do not have the small finishing strokes called serifs.) This handbook describes an implementation of Malvern created for use with TEX, a fiendish typesetting system devised by Donald E. Knuth. Like Knuth's own Computer Modern family, Malvern is implemented as a set of files which are interpreted by METAFONT, a companion program to TEX which is included in most TEX systems.

This handbook describes my implementation of Malvern and some ways in which Malvern can be used with TEX (both plain TEX and with the LATEX macro package).

The appendix includes a summary of how to install Malvern, some of the code described in previous sections, some tables (useful or otherwise) and a list of books and articles referenced elsewhere.

Damian Cugley, June 1994

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