

The `lucidabr` package*

Sebastian Rahtz, David Carlisle,
T_EX Users Group (lucida@tug.org)

2005/11/29

1 Introduction

This file contains L^AT_EX 2_ε package files needed to use Lucida Bright fonts, and `.fd` files for the fonts as named with the Berry naming scheme. It is accompanied on CTAN by the metric and other support files. The actual outline fonts need to be purchased from the T_EX Users Group (<http://tug.org/lucida>) or another source.

TUG is now the maintainer of this `lucidabr` L^AT_EX support package (many thanks to Morten Høgholm), which is separate from the `lucida` package containing the basic font metric files (many thanks to Walter Schmidt).

The Lucida Bright font families:

Note that the ‘demi bold’ Lucida fonts are classed as ‘b’ (bold) in L^AT_EX. The only ‘bold’ font in the Lucida collection is the bold sans serif font, which is classed as ‘ub’ (ultra bold).

Font File Name		Font Name	L ^A T _E X
Standard	Original		
<code>hlxb8a</code>	<code>lfd</code>	LucidaFax-Demi	<code>hlx/b/n</code>
<code>hlxbi8a</code>	<code>lfdi</code>	LucidaFax-DemiItalic	<code>hlx/b/it</code>
<code>hlxr8a</code>	<code>lfr</code>	LucidaFax	<code>hlx/m/n</code>
<code>hlxri8a</code>	<code>lfi</code>	LucidaFax-Italic	<code>hlx/m/it</code>
<code>hlhb8a</code>	<code>lbd</code>	LucidaBright-Demi	<code>hlh/b/n</code>
<code>hlhbi8a</code>	<code>lbdi</code>	LucidaBright-DemiItalic	<code>hlh/b/it</code>
<code>hlhr8a</code>	<code>lbr</code>	LucidaBright	<code>hlh/m/n</code>
<code>hlhri8a</code>	<code>lbi</code>	LucidaBright-Italic	<code>hlh/m/it</code>
<code>hlhro8a</code>	<code>lbls</code>	LucidaBrightSlanted	<code>hlh/m/sl</code>
<code>hlhrc8a</code>	<code>lbrsc</code>	LucidaBrightSmallcaps	<code>hlh/m/sc</code>
<code>hlhbc8a</code>	<code>lbdsc</code>	LucidaBrightSmallcaps-Demi	<code>hlh/b/sc</code>

*This file has version number v4.3, last revised 2005/11/29.

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Font File Name		Font Name	L ^A T _E X
Standard	Original		
hlsbi8a	lsdi	LucidaSans-DemiItalic	hls/b/it
hlsb8a	lsd	LucidaSans-Demi	hls/b/n
hlsri8a	lsi	LucidaSans-Italic	hls/m/it
hlsr8a	lsr	LucidaSans	hls/m/n
hlsu8a	lsb	LucidaSans-Bold	hls/ub/n
hlsui8a	lsbi	LucidaSans-BoldItalic	hls/ub/it
hlcrf8a	lbl	LucidaBlackletter	hlcf/m/n
hlcw8a	lbh	LucidaHandwriting-Italic	hlcw/m/n
hlce8a	lbc	LucidaCalligraphy-Italic	hlce/m/it
hlcra8a	lbr	LucidaCasual	hlcra/m/n
hlcrc8a	lbki	LucidaCasual-Italic	hlcrc/m/it
hlstr8a	lstr	LucidaSans-Typewriter	hlst/m/n
hlsto8a	lsto	LucidaSans-TypewriterOblique	hlst/m/sl
hlstbo8a	lstbo	LucidaSans-TypewriterBoldOblique	hlst/b/sl
hlstb8a	lstb	LucidaSans-TypewriterBold	hlst/b/n
hlct8a	lbtr	LucidaTypewriter	hlct/m/n
hlctb8a	lbtb	LucidaTypewriterBold	hlct/b/n
hlcto8a	lbto	LucidaTypewriterOblique	hlct/m/sl
hlctbo8a	lbto	LucidaTypewriterBoldOblique	hlct/b/sl
hlcm8a	lbma	LucidaNewMath-Arrows	hlcm/m/n
hlcb8a	lbmad	LucidaNewMath-Arrows-Demi	hlcm/b/n
hlcrv8a	lbme	LucidaNewMath-Extension	hlcv/m/n
hlcry8a	lbms	LucidaNewMath-Symbol	hlcy/m/n
hlcdy8a	lbmsd	LucidaNewMath-Symbol-Demi	hlcy/b/n
hlcrim8a	lbmi	LucidaNewMath-Italic	hlcm/m/itx
hlcrima8a	lbmo	LucidaNewMath-AltItalic	hlcm/m/it
hlcdim8a	lbmdi	LucidaNewMath-DemiItalic	hlcm/b/itx
hlcdima8a	lbmdo	LucidaNewMath-AltDemiItalic	hlcm/b/it
hlcrm8a	lbmr	LucidaNewMath-Roman	hlcm/m/n
hlcdm8a	lbmd	LucidaNewMath-Demibold	hlcm/b/n

2 Packages

2.1 Lucmtime Package

Adobe Times with Lucida Math.

```

1 <*\lucmtime>
2 \def\rmdefault{ptm}
3 \def\sfddefault{cmss}
4 \def\ttdefault{cmtt}

```

```

5 \def\Mathdefault{ptmluc}
6 \DeclareSymbolFont{letters}{OML}{ptmluc}{m}{it}
7 \DeclareSymbolFont{operators}{OT1}{ptm}{m}{n}
8 \SetSymbolFont{letters}{normal}{OML}{ptmluc}{m}{it}
9 \SetSymbolFont{letters}{bold}{OML}{ptmluc}{b}{it}
10 \SetSymbolFont{operators}{bold}{OT1}{ptm}{b}{n}
11 \SetSymbolFont{operators}{normal}{OT1}{ptm}{m}{n}
12 </lucitime>

```

Monotype Times with Lucida Math.

```

13 <*lucmtime>
14 \def\rmdefault{mntx}
15 \def\sffdefault{cmss}
16 \def\ttdefault{cmtt}
17 \def\Mathdefault{mntluc}
18 \DeclareSymbolFont{letters}{OML}{mntluc}{m}{it}
19 \DeclareSymbolFont{operators}{OT1}{mntx}{m}{n}
20 \SetSymbolFont{letters}{normal}{OML}{mntluc}{m}{it}
21 \SetSymbolFont{letters}{bold}{OML}{mntluc}{b}{it}
22 \SetSymbolFont{operators}{bold}{OT1}{mntx}{b}{n}
23 \SetSymbolFont{operators}{normal}{OT1}{mntx}{m}{n}
24 </lucmtime>

```

2.2 Lucmin Package

Adobe Minion with Lucida Math.

```

25 <*lucmin>
26 \def\rmdefault{zmn}
27 \def\sffdefault{zmy}
28 \def\ttdefault{hlct}
29 \renewcommand{\bfdefault}{b}
30 \def\Mathdefault{zmnluc}
31 \DeclareSymbolFont{letters}{OML}{zmnluc}{m}{it}
32 \DeclareSymbolFont{operators}{OT1}{zmn}{m}{n}
33 \SetSymbolFont{letters}{normal}{OML}{zmnluc}{m}{it}
34 \SetSymbolFont{letters}{bold}{OML}{zmnluc}{b}{it}
35 \SetSymbolFont{operators}{bold}{OT1}{zmn}{b}{n}
36 \SetSymbolFont{operators}{normal}{OT1}{zmn}{m}{n}
37 </lucmin>

```

2.3 Lucidbrb and lucidbry Packages

Compatibility with earlier releases.

```

38 <*lucidbrb>
39 \DeclareOption*{\PassOptionsToPackage{\CurrentOption}{lucidabr}}
40 \ProcessOptions
41 \RequirePackage[expert,vargreek]{lucidabr}
42 </lucidbrb>
43 <*lucidbry>

```

```

44 \DeclareOption*{\PassOptionsToPackage{\CurrentOption}{lucidabr}}
45 \ProcessOptions
46 \RequirePackage[LY1]{fontenc}
47 \RequirePackage[expert,vargreek]{lucidabr}
48 </lucidbry>

```

2.4 Lucidbr and lucbmath Packages

Set text and math with Lucida Bright fonts. (Lucbmath package only sets the math fonts.)

```

49 <*lucidabright | lucbmath>
50 \newif\iflucida@expert
51 \DeclareOption{expert}{\lucida@experttrue}
52 \DeclareOption{noexpert}{\lucida@expertfalse}

```

Set up the variant text and math sizes which Y&Y suggest for Lucida. The figures for these two options actually come from Frank Mittelbach (oh great one).

The default is to scale, but two options allow you to revert to normal behaviour, or get even smaller.

```

53 \DeclareOption{ nolucidascale }{%
54   \def\DeclareLucidaFontShape#1#2#3#4#5#6{%
55     \DeclareFontShape{#1}{#2}{#3}{#4}{<->#5}{#6}}
56 \DeclareOption{ lucidascale }{%
57   \def\DeclareLucidaFontShape#1#2#3#4#5#6{%
58     \DeclareFontShape{#1}{#2}{#3}{#4}{%
59       <-5.5>s*[1.04]#5%
60       <5.5-6.5>s*[1.02]#5%
61       <6.5-7.5>s*[.99]#5%
62       <7.5-8.5>s*[.97]#5%
63       <8.5-9.5>s*[.96]#5%
64       <9.5-10.5>s*[.95]#5%
65       <10.5-11.5>s*[.94]#5%
66       <11.5-13>s*[.93]#5%
67       <13-15.5>s*[.92]#5%
68       <15.5-18.5>s*[.91]#5%
69       <18.5-22.5>s*[.9]#5%
70       <22.5->s* [.89]#5%
71     }{#6}}
72 \DeclareOption{ lucidasmallscale }{%
73   \def\DeclareLucidaFontShape#1#2#3#4#5#6{%
74     \DeclareFontShape{#1}{#2}{#3}{#4}{%
75       <-5.5>s*[.98]#5%
76       <5.5-6.5>s*[.96]#5%
77       <6.5-7.5>s*[.94]#5%
78       <7.5-8.5>s*[.92]#5%
79       <8.5-9.5>s*[.91]#5%
80       <9.5-10.5>s*[.9]#5%
81       <10.5-11.5>s*[.89]#5%
82       <11.5-13>s*[.88]#5%

```

```

83 <13-15.5>s* [.87] #5%
84 <15.5-18.5>s* [.86] #5%
85 <18.5-22.5>s* [.85] #5%
86 <22.5->s* [.84] #5%
87 }{#6}}

```

Choose style of letters. Italic3 is not really italic at all, more a roman font with math spacing. Italic2 is not really slanted but a different style of italic, so use an ‘itx’ shape.

```

88 \DeclareOption{mathitalic1}{\def\letters@shape{it}}
89 \DeclareOption{mathitalic2}{\def\letters@shape{itx}}
90 \DeclareOption{mathitalic3}{\def\letters@shape{n}}

```

Choose between slanted and upright lowercase Greek.

```

91 \DeclareOption{slantedgreek}{\def\lccreek@alphabet{letters}}
92 \DeclareOption{uprightgreek}{\def\lccreek@alphabet{mathupright}}

```

Enable use of `\upalpha` and `\varGamma`.

```

93 \DeclareOption{vargreek}{\let\upalpha\relax\let\varGamma\relax}

```

Stop the AMS symbol names being declared.

```

94 \DeclareOption{noamssymbols}{\let\blacksquare\endinput}

```

Set up the text encoding used in the operators font.

```

95 \edef\operator@encoding{\encodingdefault}
96 \DeclareOption{OT1}{\def\operator@encoding{OT1}}
97 \DeclareOption{T1}{\def\operator@encoding{T1}}
98 \DeclareOption{LY1}{\def\operator@encoding{LY1}}

```

Set up the text encodings (not in the lucmath package).

```

99 <*lucidabright>
100 \renewcommand{\rmdefault}{hlh}
101 \renewcommand{\sfdefault}{hls}
102 \renewcommand{\ttdefault}{hlst}
103 \renewcommand{\bfdefault}{b}
104 \DeclareOption{seriftt}{\def\ttdefault{hlct}}
105 \DeclareOption{fax}{\def\rmdefault{hlx}}
106 \DeclareOption{casual}{\def\rmdefault{hlcn}}
107 \DeclareOption{calligraphic}{%
108   \normalfont
109   \DeclareFontShape\encodingdefault\rmdefault{m}{it}%
110     {<->ssub*hlce/m/it}{}}
111 \DeclareOption{handwriting}{%
112   \normalfont
113   \DeclareFontShape\encodingdefault\rmdefault{m}{it}%
114     {<->ssub*hlcw/m/it}{}}
115 \DeclareFontShape\encodingdefault\rmdefault{b}{it}%
116     {<->ssub*hlcw/m/it}{}}

```

The bullet in the lucida text fonts is rather small. Some people may prefer this option, to use a larger one from the math fonts.

```

117 \DeclareOption{altbullet}{%

```

```

118 \normalfont
119 \DeclareTextCommand
120   \textbullet\encodingdefault{\UseTextSymbol{OMS}\textbullet}}
121 </lucidabright>

```

This package makes a lot of redefinitions. The warnings can be rather annoying so some package options control whether the information is printed to the terminal or log file. More control can be obtained by loading the `tracefnt` package.

Just show font errors; Warning and info to the log file. The default for this package.

```

122 \DeclareOption{errorshow}{%
123   \def\@font@info#1{%
124     \GenericInfo{(Font)\@spaces\@spaces\@spaces\space\space}%
125     {LaTeX Font Info: \space\space\space#1}}%
126   \def\@font@warning#1{%
127     \GenericInfo{(Font)\@spaces\@spaces\@spaces\space\space}%
128     {LaTeX Font Warning: #1}}}

```

The normal L^AT_EX default, Font Info to the log file and Font Warning to the terminal.

```

129 \DeclareOption{warningshow}{%
130   \def\@font@info#1{%
131     \GenericInfo{(Font)\@spaces\@spaces\@spaces\space\space}%
132     {LaTeX Font Info: \space\space\space#1}}%
133   \def\@font@warning#1{%
134     \GenericWarning{(Font)\@spaces\@spaces\@spaces\space\space}%
135     {LaTeX Font Warning: #1}}}

```

On some machines writing all the log info may slow things down so extra option not to log font changes at all.

```

136 \DeclareOption{nofontinfo}{%
137   \let\@font@info\@gobble
138   \let\@font@warning\@gobble}
139 \ExecuteOptions{noexpert,lucidascale,slantedgreek,mathitalic1,errorshow}
140 \ProcessOptions
141 </lucidabright | lucbmath>
142 < *lucbmath>

```

New encoding scheme for Math Arrows font

```

143 \DeclareFontEncoding{LMR}{-}{-}
144 \DeclareFontSubstitution{LMR}{h1cm}{m}{n}
145 <!luctim> \DeclareSymbolFont{letters}{OML}{h1cm}{m}{\letters@shape}
146 \iflucida@expert
147 \DeclareSymbolFont{mathupright}{OML}{h1cm}{m}{n}
148 \fi
149 \DeclareSymbolFont{symbols}{OMS}{h1cy}{m}{n}
150 \DeclareSymbolFont{largesymbols}{OMX}{h1cv}{m}{n}

```

The new Expert set for bold math

```

151 \iflucida@expert
152 <!luctim> \SetSymbolFont{letters}{bold}{OML}{h1cm}{b}{\letters@shape}
153 \SetSymbolFont{mathupright}{bold}{OML}{h1cm}{b}{n}
154 \SetSymbolFont{symbols}{bold}{OMS}{h1cy}{b}{n}
155 \fi

156 % \DeclareSymbolFont{italics}{\encodingdefault}{\rmdefault}{m}{it}
157 \DeclareSymbolFont{arrows}{LMR}{h1cm}{m}{n}
158 \iflucida@expert
159 % \DeclareSymbolFont{boldarrows}{LMR}{h1cm}{b}{n}
160 \SetSymbolFont{arrows}{bold}{LMR}{h1cm}{b}{n}
161 \fi
162 </lucbmath>
163 <*\lucbmath>
164 <*\luctim>
165 \DeclareSymbolFont{operators}{\operator@encoding}{\rmdefault}{m}{n}
166 \SetSymbolFont{operators}{bold}{\operator@encoding}{\rmdefault}{b}{n}
167 \SetSymbolFont{operators}{normal}{\operator@encoding}{\rmdefault}{m}{n}

    Explicitly redeclare all the alphabets just in case, but differentiate between
    pure Lucida, and the Times mixture, since those have genuine OT1 mimics.

168 \DeclareMathAlphabet\mathbf{\operator@encoding}{\rmdefault}{b}{n}
169 \DeclareMathAlphabet\mathrm{\operator@encoding}{\rmdefault}{m}{n}
170 \DeclareMathAlphabet\mathsf{\operator@encoding}{\sfdefault}{m}{n}
171 \DeclareMathAlphabet\mathit{\operator@encoding}{\rmdefault}{m}{it}
172 \DeclareMathAlphabet\mathtt{\operator@encoding}{\ttdefault}{m}{n}
173 \DeclareMathAlphabet\mathfrak{\operator@encoding}{hlcf}{m}{n}
174 \SetMathAlphabet{\mathbf}{bold}{\operator@encoding}{\rmdefault}{b}{n}
175 \SetMathAlphabet{\mathsf}{bold}{\operator@encoding}{\sfdefault}{b}{n}
176 \SetMathAlphabet{\mathrm}{bold}{\operator@encoding}{\rmdefault}{b}{n}
177 \SetMathAlphabet{\mathit}{bold}{\operator@encoding}{\rmdefault}{b}{it}
178 \SetMathAlphabet{\mathtt}{bold}{\operator@encoding}{\ttdefault}{b}{n}
179 </!luctim>
180 <*\luctim>
181 \DeclareMathAlphabet{\mathbf}{OT1}{\Mathdefault}{b}{n}
182 \DeclareMathAlphabet{\mathrm}{OT1}{\Mathdefault}{m}{n}
183 \DeclareMathAlphabet{\mathsf}{OT1}{\sfdefault}{m}{n}
184 \DeclareMathAlphabet{\mathit}{OT1}{\Mathdefault}{m}{it}
185 \DeclareMathAlphabet{\mathtt}{OT1}{\ttdefault}{m}{n}
186 \SetMathAlphabet{\mathbf}{bold}{OT1}{\Mathdefault}{b}{n}
187 \SetMathAlphabet{\mathsf}{bold}{OT1}{\sfdefault}{b}{n}
188 \SetMathAlphabet{\mathrm}{bold}{OT1}{\Mathdefault}{b}{n}
189 \SetMathAlphabet{\mathit}{bold}{OT1}{\Mathdefault}{b}{it}
190 \SetMathAlphabet{\mathtt}{bold}{OT1}{\ttdefault}{b}{n}
191 </luctim>
192 \DeclareSymbolFontAlphabet{\mathbb}{arrows}
193 \DeclareSymbolFontAlphabet{\mathscr}{symbols}
194 \iflucida@expert
195 \DeclareSymbolFontAlphabet{\mathup}{mathupright}

```

```

196 \fi
197 \DeclareMathAccent\vec {\mathord}{letters}{126}

```

Symbols taken from the operators font. Need to be careful here as different encodings may have been used.

First check that the AMS have not been redefining `\colon`. If it does not have this original plain T_EX definition, don't redefine it below.

```

198 \let\@tempb\@undefined
199 \DeclareMathSymbol{\@tempb}{\mathpunct}{operators}{58}
200 \def\@tempa{T1}
201 \ifx\operator@encoding\@tempa
202 \DeclareMathSymbol{!}{\mathclose}{operators}{33}
203 \DeclareMathSymbol{:}{\mathrel}{operators}{58}
204 \DeclareMathSymbol{;}{\mathpunct}{operators}{59}
205 \DeclareMathSymbol{?}{\mathclose}{operators}{63}
206 \ifx\colon\@tempb
207 \DeclareMathSymbol{\colon}{\mathpunct}{operators}{58}
208 \fi
209 \DeclareMathAccent{\acute}{\mathalpha}{operators}{1}
210 \DeclareMathAccent{\grave}{\mathalpha}{operators}{0}
211 \DeclareMathAccent{\ddot}{\mathalpha}{operators}{4}
212 \DeclareMathAccent{\tilde}{\mathalpha}{operators}{3}
213 \DeclareMathAccent{\bar}{\mathalpha}{operators}{9}
214 \DeclareMathAccent{\breve}{\mathalpha}{operators}{8}
215 \DeclareMathAccent{\check}{\mathalpha}{operators}{7}
216 \DeclareMathAccent{\hat}{\mathalpha}{operators}{2}
217 \DeclareMathAccent{\dot}{\mathalpha}{operators}{10}
218 \else
219 \def\@tempa{OT1}
220 \ifx\operator@encoding\@tempa
221 \DeclareMathSymbol{!}{\mathclose}{operators}{33}
222 \DeclareMathSymbol{:}{\mathrel}{operators}{58}
223 \DeclareMathSymbol{;}{\mathpunct}{operators}{59}
224 \DeclareMathSymbol{?}{\mathclose}{operators}{63}
225 \ifx\colon\@tempb
226 \DeclareMathSymbol{\colon}{\mathpunct}{operators}{58}
227 \fi
228 \DeclareMathAccent{\acute}{\mathalpha}{operators}{19}
229 \DeclareMathAccent{\grave}{\mathalpha}{operators}{18}
230 \DeclareMathAccent{\ddot}{\mathalpha}{operators}{127}
231 \DeclareMathAccent{\tilde}{\mathalpha}{operators}{126}
232 \DeclareMathAccent{\bar}{\mathalpha}{operators}{22}
233 \DeclareMathAccent{\breve}{\mathalpha}{operators}{21}
234 \DeclareMathAccent{\check}{\mathalpha}{operators}{20}
235 \DeclareMathAccent{\hat}{\mathalpha}{operators}{94}
236 \DeclareMathAccent{\dot}{\mathalpha}{operators}{95}
237 \else
238 \def\@tempa{LY1}
239 \ifx\operator@encoding\@tempa

```



```

240 \DeclareMathSymbol{!}{\mathclose}{operators}{33}
241 \DeclareMathSymbol{:}{\mathrel}{operators}{58}
242 \DeclareMathSymbol{;}{\mathpunct}{operators}{59}
243 \DeclareMathSymbol{?}{\mathclose}{operators}{63}
244 \ifx\colon\@tempb
245     \DeclareMathSymbol{\colon}{\mathpunct}{operators}{58}
246 \fi
247 \DeclareMathAccent{\acute}{\mathalpha}{operators}{19}
248 \DeclareMathAccent{\grave}{\mathalpha}{operators}{18}
249 \DeclareMathAccent{\ddot}{\mathalpha}{operators}{127}
250 \DeclareMathAccent{\tilde}{\mathalpha}{operators}{126}
251 \DeclareMathAccent{\bar}{\mathalpha}{operators}{22}
252 \DeclareMathAccent{\breve}{\mathalpha}{operators}{21}
253 \DeclareMathAccent{\check}{\mathalpha}{operators}{20}
254 \DeclareMathAccent{\hat}{\mathalpha}{operators}{94}
255 \DeclareMathAccent{\vec}{\mathord}{letters}{126}
256 \DeclareMathAccent{\dot}{\mathalpha}{operators}{5}
257 \else
258 \PackageWarningNoLine{LucidaBr}
259 {Unknown Operator Encoding!\MessageBreak
260   Math accents may be wrong: assuming OT1 positions}
261 \fi\fi\fi

```

This section derives mostly from Berthold Horn's files `lcdmacro.tex` and `amssymb1b.tex` ©1991, 1992 Y&Y. All Rights Reserved Original from Version 1.2, 1992 June 14; updated *ad hoc*.

```
262 \ifpackageloaded{amsmath}{%
```

(From M J Downes): it's possible the factors 1.5, 2, 2.5, 3, 3.5 should be adjusted for Lucida fonts. But that has to be determined by looking at printed tests which I cannot do at the moment. [mjd,24-Jun-1993]

```

263 \def\biggg{\bBigg@\thr@@}
264 \def\Biggg{\bBigg@{3.5}}
265 }{%
266 \def\big#1{\hbox{$\left#1\ vbox to8.20\p@{} \right.\n@space$}}
267 \def\Big#1{\hbox{$\left#1\ vbox to10.80\p@{} \right.\n@space$}}
268 \def\bigg#1{\hbox{$\left#1\ vbox to13.42\p@{} \right.\n@space$}}
269 \def\Bigg#1{\hbox{$\left#1\ vbox to16.03\p@{} \right.\n@space$}}
270 \def\biggg#1{\hbox{$\left#1\ vbox to17.72\p@{} \right.\n@space$}}
271 \def\Biggg#1{\hbox{$\left#1\ vbox to21.25\p@{} \right.\n@space$}}
272 \def\n@space{\null\delimiterspace\z@ \m@th}
273 }

```

Define some extra large sizes — always done using extensible parts

```

274 \def\bigggl{\mathopen\biggg}
275 \def\bigggr{\mathclose\biggg}
276 \def\Bigggl{\mathopen\Biggg}
277 \def\Bigggr{\mathclose\Biggg}

```

Following is only really needed if the roman text font is not LucidaBright. Draw the small sizes of '[' and ']' from math italic instead of roman font

```

278 \DeclareMathSymbol{[]}{\mathopen}{letters}{134}
279 \DeclareMathDelimiter{[]}{letters}{134}{largesymbols}{2}
280 \DeclareMathSymbol{[]}{\mathclose}{letters}{135}
281 \DeclareMathDelimiter{[]}{letters}{135}{largesymbols}{3}

Draw the small sizes of ‘(’ and ‘)’ from math italic instead of roman font
282 \DeclareMathSymbol{()}{\mathopen}{letters}{132}
283 \DeclareMathDelimiter{()}{letters}{132}{largesymbols}{0}
284 \DeclareMathSymbol{)}{\mathclose}{letters}{133}
285 \DeclareMathDelimiter{)}{letters}{133}{largesymbols}{1}

Draw ‘=’ and ‘+’ from symbol font instead of roman
286 \DeclareMathSymbol{=}{\mathrel}{symbols}{131}
287 \DeclareMathSymbol{+}{\mathbin}{symbols}{130}

Draw small ‘/’ from math italic instead of roman font
288 \DeclareMathSymbol{/}{\mathord}{letters}{61}
289 \DeclareMathDelimiter{/}{letters}{61}{largesymbols}{14}

Make open face brackets accessible, i.e. [[ and ]]
290 \DeclareMathDelimiter{\lbrack}
291   {\mathopen}{letters}{130}{largesymbols}{130}
292 \DeclareMathDelimiter{\rbrack}
293   {\mathclose}{letters}{131}{largesymbols}{131}

Provide access to surface integral signs (linked from text to display size)
294 \DeclareMathSymbol{\surfintop}{\mathop}{largesymbols}{144}
295 \def\surfint{\surfintop\nolimits}

Make medium size integrals available (NOT linked to display size)
296 \DeclareMathSymbol{\midintop}{\mathop}{largesymbols}{146}
297 \def\midint{\midintop\nolimits}
298 \DeclareMathSymbol{\midointop}{\mathop}{largesymbols}{147}
299 \def\midoint{\midointop\nolimits}
300 \DeclareMathSymbol{\midsurfintop}{\mathop}{largesymbols}{148}
301 \def\midsurfint{\midsurfintop\nolimits}

Extensible integral (use with \bigg, \Bigg, \biggg, \Biggg etc)
302 \DeclareMathDelimiter{\largeint}
303   {\mathop}{largesymbols}{90}{largesymbols}{149}

To close up gaps in special math characters constructed from pieces
304 \def\joinrel{\mathrel{\mkern-4mu}} % \def\joinrel{\mathrel{\mkern-3mu}}

The \mkern-2.5mu undoes the bogus ‘italic correction’ after joiners in LBMA
305 \DeclareMathSymbol{\relbar@}{\mathord}{arrows}{45}
306 \def\relbar{\mathrel{\smash\relbar@}\mathrel{\mkern-2.5mu}}

307 \DeclareMathSymbol{\Relbar@}{\mathrel}{arrows}{61}
308 \def\Relbar{\Relbar@\mathrel{\mkern-2.5mu}}

The \mkern4mu undoes the overhang at the ends of the joiners (and more)
309 \def\longleftarrow{\leftarrow\relbar\mathrel{\mkern4mu}}
310 \def\longrightarrow{\mathrel{\mkern4mu}\relbar\rightarrow}

```

```

311 \def\Longleftarrow{\Leftarrow\Relbar\mathrel{\mkern4mu}}
312 \def\Longrightarrow{\mathrel{\mkern4mu}\Relbar\rightarrow}
    If amsmath is loaded, need to redefine the arrow fill commands as the relative
    spacing around \relbar and \rightarrow is not what the AMS code expects.
313 \AtBeginDocument{%
314   \ifpackageloaded{amsmath}{%
315     \def\rightarrowfill@#1{%
316       \m@th\setboxz@h{#1\relbar$}\ht\z@\z@
317       $#1\mkern4.5mu\mathrel{\copy\z@}%
318       \kern-\wd\z@
319       \cleaders\hbox{#1\mkern-2mu\box\z@\mkern-2mu$}\hfill%
320       \mkern-4.5mu %
321       \rightarrow$}%
322     \def\leftarrowfill@#1{%
323       \m@th\setboxz@h{#1\relbar$}\ht\z@\z@
324       $#1\leftarrow
325       \mkern-4.5mu %
326       \cleaders\hbox{#1\mkern-2mu\copy\z@\mkern-2mu$}\hfill
327       \kern-\wd\z@
328       \mathrel{\box\z@\mkern4.5mu$}
329     \def\leftrightarrowfill@#1{\m@th\setboxz@h{#1\relbar$}\ht\z@\z@
330     $#1\leftarrow
331     \mkern-12mu %
332     \cleaders\hbox{#1\mkern-2mu\box\z@\mkern-2mu$}\hfill
333     \rightarrow$}%
334   {}}

```

Some characters that need construction in CM exist complete in math italic or math symbol font.

```

335 \let\bowtie\undefined
336 \let\models\undefined
337 \let\doteq\undefined
338 \let\cong\undefined
339 \let\angle\undefined
340 \DeclareMathSymbol{\bowtie}{\mathrel}{letters}{246}
341 \DeclareMathSymbol\models{\mathrel}{symbols}{238}
342 \DeclareMathSymbol\doteq{\mathrel}{symbols}{201}
343 \DeclareMathSymbol\cong{\mathrel}{symbols}{155}
344 \DeclareMathSymbol\angle{\mathord}{symbols}{139}

```

These need undefining so that we can redeclare them.

```

345 \let\Box\undefined
346 \let\Diamond\undefined
347 \let\leadsto\undefined
348 \let\neq\undefined
349 \let\hookleftarrow\undefined
350 \let\hookrightarrow\undefined
351 \let\mapsto\undefined
352 \let\notin\undefined
353 \let\rightleftharpoons\undefined

```

Other characters may be found in LucidaNewMath-Arrows (more negated later).

```

354 \DeclareMathSymbol{\neq}{\mathrel}{arrows}{148}
355 \DeclareMathSymbol{\rightleftharpoons}{\mathrel}{arrows}{122}
356 \DeclareMathSymbol{\leftrightharpoons}{\mathrel}{arrows}{121}
357 \DeclareMathSymbol{\hookleftarrow}{\mathrel}{arrows}{60}
358 \DeclareMathSymbol{\hookrightarrow}{\mathrel}{arrows}{62}
359 \DeclareMathSymbol{\mapsto}{\mathrel}{arrows}{44}
360 \def\longmapsto{\mapstochar\longrightarrow}

```

Special L^AT_EX character definitions (originally from L^AT_EX symbol font)

```

361 \let\Join\undefined
362 \let\rhd\undefined
363 \let\lhd\undefined
364 \let\unrhd\undefined
365 \let\unlhd\undefined
366 \DeclareMathSymbol{\Join}{\mathrel}{letters}{246}
367 \DeclareMathSymbol{\rhd}{\mathrel}{letters}{46}
368 \DeclareMathSymbol{\lhd}{\mathrel}{letters}{47}
369 \DeclareMathSymbol{\unlhd}{\mathrel}{symbols}{244}
370 \DeclareMathSymbol{\unrhd}{\mathrel}{symbols}{245}
371 \DeclareMathSymbol{\Box}{\mathord}{arrows}{2}
372 \DeclareMathSymbol{\Diamond}{\mathord}{arrows}{8}
373 \DeclareMathSymbol{\leadsto}{\mathrel}{arrows}{142}
374 \DeclareMathSymbol{\leadsfrom}{\mathrel}{arrows}{141}
375 \def\mathstrut{\vphantom{f}}

```

In n-th root, don't want the 'n' to come too close to the radical

```

376 \def\r@t#1#2{\setbox\z@\hbox{$\m@th#1\sqrt{#2}$}%
377 \dimen@ \ht\z@ \advance\dimen@-\dp\z@
378 \mkern5mu\raise.6\dimen@\copy\rootbox \mkern-7.5mu\box\z@}

```

Here are some extra definitions of mathematical symbols and operators:

```

379 \DeclareMathSymbol{\defineequal}{\mathrel}{symbols}{214}
380 %\let\notleq\nleq
381 %\let\notgeq\ngeq
382 \DeclareMathSymbol{\notequiv}{\mathrel}{arrows}{149}
383 %\let\notprec\nprec
384 %\let\notsucc\nsucc
385 \DeclareMathSymbol{\notapprox}{\mathrel}{arrows}{152}
386 %\let\notpreceq\npreceq
387 %\let\notsucceq\nsucceq
388 \DeclareMathSymbol{\notasymp}{\mathrel}{arrows}{243}
389 \DeclareMathSymbol{\notsubset}{\mathrel}{arrows}{198}
390 \DeclareMathSymbol{\notsupset}{\mathrel}{arrows}{199}
391 \DeclareMathSymbol{\notsim}{\mathrel}{arrows}{150}
392 \DeclareMathSymbol{\notsubsetq}{\mathrel}{arrows}{200}
393 \DeclareMathSymbol{\notsupsetq}{\mathrel}{arrows}{201}
394 \DeclareMathSymbol{\notsimeq}{\mathrel}{arrows}{151}
395 \DeclareMathSymbol{\notsqsubsetq}{\mathrel}{arrows}{212}
396 \DeclareMathSymbol{\notsqsupsetq}{\mathrel}{arrows}{213}
397 \DeclareMathSymbol{\notcong}{\mathrel}{arrows}{153}

```

```

398 \DeclareMathSymbol{\notin}{\mathrel}{arrows}{29}
399 \DeclareMathSymbol{\notni}{\mathrel}{arrows}{31}
400 %\let\notvdash\nvdash
401 %\let\notmodels\nvDash
402 %\let\notparallelparallel
403 %\let\noteq\neq
404 %\let\notless\nless
405 %\let\notgreater\ngtr
406 %\let\notmid\nmid
407 \let\Bbb\mathbb

```

Normal L^AT_EX draws upper case (upright) Greek from cmr10 — when using the Cork encoding, that isn't there.

```
408 \iflucida@expert
```

If we have the LucidaBright Expert set, we'll draw them from the upright math font. That way we can get bold math to work on upright upper case Greek.

Why doesn't this work?

```

\documentclass{article}
\usepackage{lucidabr}
$\mathbf{\Sigma}$
\end{document}

```

The answer lies in the meaning of `\mathbf`; as `fntguide.tex` says, it is for alphabetic switching. The straight lucida style says

```
\DeclareMathSymbol{\Sigma}{\mathalpha}{largesymbols}'326}
```

and the `\mathalpha` signifies that the `\Sigma` can change with the alphabet; so this in fact looks for `\char'326` in the “`mathbf`” alphabet when we ask for that. That is defined with

```
\SetMathAlphabet{\mathbf}{bold}{\operator@encoding}{\rmdefault}{b}{n}
```

ie normal text Lucida bold. It all works in CMR because the text fonts have Greek, which is why the symbols are defined as ; in addition, the alphabets like `\mathbf` *explicitly* ask for OT1:

```
\DeclareMathAlphabet {\mathbf}{OT1}{cmr}{bx}{n}
```

so it works in T1 encoding too.

When we get the symbols from other fonts in Lucida, we should no longer classify the fonts as `\mathalpha`, since the mechanism doesn't function. So we use `\mathord` instead, and you only get bold Greek if you change `\mathversion`. At least it's consistent.

If, however, we are using the Times mixture, we can keep `\mathalpha`, as we have the right font layouts around.

```

409 <*\luctim>
410 \DeclareMathSymbol{\Gamma}{\mathord}{mathupright}{0}
411 \DeclareMathSymbol{\Delta}{\mathord}{mathupright}{1}

```

```

412 \DeclareMathSymbol{\Theta}{\mathord}{mathupright}{2}
413 \DeclareMathSymbol{\Lambda}{\mathord}{mathupright}{3}
414 \DeclareMathSymbol{\Xi}{\mathord}{mathupright}{4}
415 \DeclareMathSymbol{\Pi}{\mathord}{mathupright}{5}
416 \DeclareMathSymbol{\Sigma}{\mathord}{mathupright}{6}
417 \DeclareMathSymbol{\Upsilon}{\mathord}{mathupright}{7}
418 \DeclareMathSymbol{\Phi}{\mathord}{mathupright}{8}
419 \DeclareMathSymbol{\Psi}{\mathord}{mathupright}{9}
420 \DeclareMathSymbol{\Omega}{\mathord}{mathupright}{10}
421 \else
    It's in the extension font (largesymbols)
422 \DeclareMathSymbol{\Gamma}{\mathord}{largesymbols}'320}
423 \DeclareMathSymbol{\Delta}{\mathord}{largesymbols}'321}
424 \DeclareMathSymbol{\Theta}{\mathord}{largesymbols}'322}
425 \DeclareMathSymbol{\Lambda}{\mathord}{largesymbols}'323}
426 \DeclareMathSymbol{\Xi}{\mathord}{largesymbols}'324}
427 \DeclareMathSymbol{\Pi}{\mathord}{largesymbols}'325}
428 \DeclareMathSymbol{\Sigma}{\mathord}{largesymbols}'326}
429 \DeclareMathSymbol{\Upsilon}{\mathord}{largesymbols}'327}
430 \DeclareMathSymbol{\Phi}{\mathord}{largesymbols}'330}
431 \DeclareMathSymbol{\Psi}{\mathord}{largesymbols}'331}
432 \DeclareMathSymbol{\Omega}{\mathord}{largesymbols}'332}
433 \fi
434 </!luctim>
435 <*luctim>
436 \DeclareMathSymbol{\Gamma}{\mathalpha}{mathupright}{0}
437 \DeclareMathSymbol{\Delta}{\mathalpha}{mathupright}{1}
438 \DeclareMathSymbol{\Theta}{\mathalpha}{mathupright}{2}
439 \DeclareMathSymbol{\Lambda}{\mathalpha}{mathupright}{3}
440 \DeclareMathSymbol{\Xi}{\mathalpha}{mathupright}{4}
441 \DeclareMathSymbol{\Pi}{\mathalpha}{mathupright}{5}
442 \DeclareMathSymbol{\Sigma}{\mathalpha}{mathupright}{6}
443 \DeclareMathSymbol{\Upsilon}{\mathalpha}{mathupright}{7}
444 \DeclareMathSymbol{\Phi}{\mathalpha}{mathupright}{8}
445 \DeclareMathSymbol{\Psi}{\mathalpha}{mathupright}{9}
446 \DeclareMathSymbol{\Omega}{\mathalpha}{mathupright}{10}
447 \else
    It's in the extension font (largesymbols)
448 \DeclareMathSymbol{\Gamma}{\mathord}{largesymbols}'320}
449 \DeclareMathSymbol{\Delta}{\mathord}{largesymbols}'321}
450 \DeclareMathSymbol{\Theta}{\mathord}{largesymbols}'322}
451 \DeclareMathSymbol{\Lambda}{\mathord}{largesymbols}'323}
452 \DeclareMathSymbol{\Xi}{\mathord}{largesymbols}'324}
453 \DeclareMathSymbol{\Pi}{\mathord}{largesymbols}'325}
454 \DeclareMathSymbol{\Sigma}{\mathord}{largesymbols}'326}
455 \DeclareMathSymbol{\Upsilon}{\mathord}{largesymbols}'327}
456 \DeclareMathSymbol{\Phi}{\mathord}{largesymbols}'330}
457 \DeclareMathSymbol{\Psi}{\mathord}{largesymbols}'331}
458 \DeclareMathSymbol{\Omega}{\mathord}{largesymbols}'332}

```

```

459 \fi
460 </luctim>
461 \DeclareMathSymbol{\alpha}{\mathord}{\lccreek@alphabet}{11}
462 \DeclareMathSymbol{\beta}{\mathord}{\lccreek@alphabet}{12}
463 \DeclareMathSymbol{\gamma}{\mathord}{\lccreek@alphabet}{13}
464 \DeclareMathSymbol{\delta}{\mathord}{\lccreek@alphabet}{14}
465 \DeclareMathSymbol{\epsilon}{\mathord}{\lccreek@alphabet}{15}
466 \DeclareMathSymbol{\zeta}{\mathord}{\lccreek@alphabet}{16}
467 \DeclareMathSymbol{\eta}{\mathord}{\lccreek@alphabet}{17}
468 \DeclareMathSymbol{\theta}{\mathord}{\lccreek@alphabet}{18}
469 \DeclareMathSymbol{\iota}{\mathord}{\lccreek@alphabet}{19}
470 \DeclareMathSymbol{\kappa}{\mathord}{\lccreek@alphabet}{20}
471 \DeclareMathSymbol{\lambda}{\mathord}{\lccreek@alphabet}{21}
472 \DeclareMathSymbol{\mu}{\mathord}{\lccreek@alphabet}{22}
473 \DeclareMathSymbol{\nu}{\mathord}{\lccreek@alphabet}{23}
474 \DeclareMathSymbol{\xi}{\mathord}{\lccreek@alphabet}{24}
475 \DeclareMathSymbol{\pi}{\mathord}{\lccreek@alphabet}{25}
476 \DeclareMathSymbol{\rho}{\mathord}{\lccreek@alphabet}{26}
477 \DeclareMathSymbol{\sigma}{\mathord}{\lccreek@alphabet}{27}
478 \DeclareMathSymbol{\tau}{\mathord}{\lccreek@alphabet}{28}
479 \DeclareMathSymbol{\upsilon}{\mathord}{\lccreek@alphabet}{29}
480 \DeclareMathSymbol{\phi}{\mathord}{\lccreek@alphabet}{30}
481 \DeclareMathSymbol{\chi}{\mathord}{\lccreek@alphabet}{31}
482 \DeclareMathSymbol{\psi}{\mathord}{\lccreek@alphabet}{32}
483 \DeclareMathSymbol{\omega}{\mathord}{\lccreek@alphabet}{33}
484 \DeclareMathSymbol{\varepsilon}{\mathord}{\lccreek@alphabet}{34}
485 \DeclareMathSymbol{\vartheta}{\mathord}{\lccreek@alphabet}{35}
486 \DeclareMathSymbol{\varpi}{\mathord}{\lccreek@alphabet}{36}
487 \DeclareMathSymbol{\varrho}{\mathord}{\lccreek@alphabet}{37}
488 \DeclareMathSymbol{\varsigma}{\mathord}{\lccreek@alphabet}{38}
489 \DeclareMathSymbol{\varphi}{\mathord}{\lccreek@alphabet}{39}

    ‘Individual’ Upright lowercase Greek (not currently activated).
490 <*upalpha>
491 \ifx\upalpha\relax
492 \DeclareMathSymbol{\upalpha}{\mathord}{mathupright}{11}
493 \DeclareMathSymbol{\upbeta}{\mathord}{mathupright}{12}
494 \DeclareMathSymbol{\upgamma}{\mathord}{mathupright}{13}
495 \DeclareMathSymbol{\updelta}{\mathord}{mathupright}{14}
496 \DeclareMathSymbol{\upepsilon}{\mathord}{mathupright}{15}
497 \DeclareMathSymbol{\upzeta}{\mathord}{mathupright}{16}
498 \DeclareMathSymbol{\upeta}{\mathord}{mathupright}{17}
499 \DeclareMathSymbol{\uptheta}{\mathord}{mathupright}{18}
500 \DeclareMathSymbol{\upiota}{\mathord}{mathupright}{19}
501 \DeclareMathSymbol{\upkappa}{\mathord}{mathupright}{20}
502 \DeclareMathSymbol{\uplambda}{\mathord}{mathupright}{21}
503 \DeclareMathSymbol{\upmu}{\mathord}{mathupright}{22}
504 \DeclareMathSymbol{\upnu}{\mathord}{mathupright}{23}
505 \DeclareMathSymbol{\upxi}{\mathord}{mathupright}{24}
506 \DeclareMathSymbol{\uppi}{\mathord}{mathupright}{25}

```

```

507 \DeclareMathSymbol{\uprho}{\mathord}{mathupright}{26}
508 \DeclareMathSymbol{\upsigma}{\mathord}{mathupright}{27}
509 \DeclareMathSymbol{\uptau}{\mathord}{mathupright}{28}
510 \DeclareMathSymbol{\upupsilon}{\mathord}{mathupright}{29}
511 \DeclareMathSymbol{\upphi}{\mathord}{mathupright}{30}
512 \DeclareMathSymbol{\upchi}{\mathord}{mathupright}{31}
513 \DeclareMathSymbol{\uppsi}{\mathord}{mathupright}{32}
514 \DeclareMathSymbol{\upomega}{\mathord}{mathupright}{33}
515 \DeclareMathSymbol{\upvarepsilon}{\mathord}{mathupright}{34}
516 \fi
517 </upalph>
    Slanted upright Greek.
518 <*varGamma>
519 \ifx\varGamma\relax
520 \DeclareMathSymbol{\varGamma}{\mathord}{letters}{0}
521 \DeclareMathSymbol{\varDelta}{\mathord}{letters}{1}
522 \DeclareMathSymbol{\varTheta}{\mathord}{letters}{2}
523 \DeclareMathSymbol{\varLambda}{\mathord}{letters}{3}
524 \DeclareMathSymbol{\varXi}{\mathord}{letters}{4}
525 \DeclareMathSymbol{\varPi}{\mathord}{letters}{5}
526 \DeclareMathSymbol{\varSigma}{\mathord}{letters}{6}
527 \DeclareMathSymbol{\varUpsilon}{\mathord}{letters}{7}
528 \DeclareMathSymbol{\varPhi}{\mathord}{letters}{8}
529 \DeclareMathSymbol{\varPsi}{\mathord}{letters}{9}
530 \DeclareMathSymbol{\varOmega}{\mathord}{letters}{10}
531 \fi
532 </varGamma>
    Definitions for math symbols and operators (normally found in the AMS symbol
    fonts) using LucidaNewMath fonts MSAM* equivalents:
    Stop here if noamssymbols option given.
533 \ifx\blacksquare\endinput\endinput\fi
534 \DeclareMathSymbol{\boxdot}{\mathbin}{symbols}{237}
535 \DeclareMathSymbol{\boxplus}{\mathbin}{symbols}{234}
536 \DeclareMathSymbol{\boxtimes}{\mathbin}{symbols}{236}
537 \DeclareMathSymbol{\square}{\mathord}{arrows}{2}
538 \DeclareMathSymbol{\blacksquare}{\mathord}{arrows}{3}
539 \DeclareMathSymbol{\centerdot}{\mathbin}{arrows}{225}
540 \DeclareMathSymbol{\lozenge}{\mathord}{arrows}{8}
541 \DeclareMathSymbol{\blacklozenge}{\mathord}{arrows}{9}
542 \DeclareMathSymbol{\circlearrowright}{\mathrel}{arrows}{140}
543 \DeclareMathSymbol{\circlearrowleft}{\mathrel}{arrows}{139}
544 \DeclareMathSymbol{\rightleftharpoons}{\mathrel}{arrows}{122}
545 \DeclareMathSymbol{\leftrightharpoons}{\mathrel}{arrows}{121}
546 \DeclareMathSymbol{\boxminus}{\mathbin}{symbols}{235}
547 \DeclareMathSymbol{\Vdash}{\mathrel}{symbols}{240}
548 \DeclareMathSymbol{\Vvdash}{\mathrel}{letters}{211}
549 \DeclareMathSymbol{\vDash}{\mathrel}{symbols}{238}
550 \DeclareMathSymbol{\twoheadrightarrow}{\mathrel}{arrows}{37}

```



```

551 \DeclareMathSymbol{\twoheadleftarrow}{\mathrel}{arrows}{35}
552 \DeclareMathSymbol{\leftleftarrows}{\mathrel}{arrows}{113}
553 \DeclareMathSymbol{\rightrightarrows}{\mathrel}{arrows}{115}
554 \DeclareMathSymbol{\upuparrows}{\mathrel}{arrows}{114}
555 \DeclareMathSymbol{\downdownarrows}{\mathrel}{arrows}{116}
556 \DeclareMathSymbol{\upharpoonright}{\mathrel}{arrows}{117}
557 \DeclareMathSymbol{\downharpoonright}{\mathrel}{arrows}{119}
558 \DeclareMathSymbol{\upharpoonleft}{\mathrel}{arrows}{118}
559 \DeclareMathSymbol{\downharpoonleft}{\mathrel}{arrows}{120}
560 \DeclareMathSymbol{\rightarrowtail}{\mathrel}{arrows}{41}
561 \DeclareMathSymbol{\leftarrowtail}{\mathrel}{arrows}{40}
562 \DeclareMathSymbol{\leftrightarrows}{\mathrel}{arrows}{110}
563 \DeclareMathSymbol{\rightleftarrows}{\mathrel}{arrows}{109}
564 \DeclareMathSymbol{\Lsh}{\mathrel}{arrows}{123}
565 \DeclareMathSymbol{\Rsh}{\mathrel}{arrows}{125}
566 \DeclareMathSymbol{\rightsquigarrow}{\mathrel}{arrows}{142}
567 \DeclareMathSymbol{\leftsquigarrow}{\mathrel}{arrows}{141}
568 \DeclareMathSymbol{\leftrightsquigarrow}{\mathrel}{arrows}{145}
569 \DeclareMathSymbol{\looparrowleft}{\mathrel}{arrows}{63}
570 \DeclareMathSymbol{\looparrowright}{\mathrel}{arrows}{64}
571 \DeclareMathSymbol{\circeq}{\mathrel}{symbols}{208}
572 \DeclareMathSymbol{\succsim}{\mathrel}{symbols}{225}
573 \DeclareMathSymbol{\gtrsim}{\mathrel}{symbols}{221}
574 \DeclareMathSymbol{\gtrapprox}{\mathrel}{letters}{219}
575 \DeclareMathSymbol{\multimap}{\mathrel}{letters}{199}
576 \DeclareMathSymbol{\image}{\mathrel}{letters}{198}
577 \DeclareMathSymbol{\original}{\mathrel}{letters}{197}
578 \DeclareMathSymbol{\therefore}{\mathrel}{symbols}{144}
579 \DeclareMathSymbol{\because}{\mathrel}{symbols}{145}
580 \DeclareMathSymbol{\doteqdot}{\mathrel}{symbols}{202}
581 \DeclareMathSymbol{\triangleq}{\mathrel}{symbols}{213}
582 \DeclareMathSymbol{\precsim}{\mathrel}{symbols}{224}
583 \DeclareMathSymbol{\lesssim}{\mathrel}{symbols}{220}
584 \DeclareMathSymbol{\lessapprox}{\mathrel}{letters}{218}
585 \DeclareMathSymbol{\eqslantless}{\mathrel}{letters}{226}
586 \DeclareMathSymbol{\eqslantgtr}{\mathrel}{letters}{227}
587 \DeclareMathSymbol{\curlyeqprec}{\mathrel}{letters}{230}
588 \DeclareMathSymbol{\curlyeqsucc}{\mathrel}{letters}{231}
589 \DeclareMathSymbol{\preccurlyeq}{\mathrel}{letters}{228}
590 \DeclareMathSymbol{\leqq}{\mathrel}{symbols}{218}
591 \DeclareMathSymbol{\leqslant}{\mathrel}{letters}{224}
592 \DeclareMathSymbol{\lessgtr}{\mathrel}{symbols}{222}
593 \DeclareMathSymbol{\backprime}{\mathord}{letters}{200}
594 \DeclareMathSymbol{\axisshort}{\mathord}{arrows}{57}
595 \DeclareMathSymbol{\risingdotseq}{\mathrel}{symbols}{204}
596 \DeclareMathSymbol{\fallingdotseq}{\mathrel}{symbols}{203}
597 \DeclareMathSymbol{\succcurlyeq}{\mathrel}{letters}{229}
598 \DeclareMathSymbol{\geqq}{\mathrel}{symbols}{219}
599 \DeclareMathSymbol{\geqslant}{\mathrel}{letters}{225}
600 \DeclareMathSymbol{\gtrless}{\mathrel}{symbols}{223}

```

```

601 \let\sqsubset\undefined
602 \let\sqsupset\undefined
603 \DeclareMathSymbol{\sqsubset}{\mathrel}{symbols}{228}
604 \DeclareMathSymbol{\sqsupset}{\mathrel}{symbols}{229}
605 \DeclareMathSymbol{\vartriangleright}{\mathrel}{letters}{46}
606 \DeclareMathSymbol{\vartriangleleft}{\mathrel}{letters}{47}
607 \DeclareMathSymbol{\trianglerighteq}{\mathrel}{symbols}{245}
608 \DeclareMathSymbol{\trianglelefteq}{\mathrel}{symbols}{244}
609 \DeclareMathSymbol{\bigstar}{\mathord}{arrows}{171}
610 \DeclareMathSymbol{\between}{\mathrel}{letters}{242}
611 \DeclareMathSymbol{\blacktriangledown}{\mathord}{arrows}{7}
612 \DeclareMathSymbol{\blacktriangleright}{\mathrel}{letters}{241}
613 \DeclareMathSymbol{\blacktriangleleft}{\mathrel}{letters}{240}
614 \DeclareMathSymbol{\arrowaxisright}{\mathord}{arrows}{55}
615 \DeclareMathSymbol{\arrowaxisleft}{\mathord}{arrows}{54}
616 \DeclareMathSymbol{\vartriangle}{\mathrel}{arrows}{4}
617 \DeclareMathSymbol{\blacktriangle}{\mathord}{arrows}{5}
618 \DeclareMathSymbol{\triangledown}{\mathord}{arrows}{6}
619 \DeclareMathSymbol{\eqcirc}{\mathrel}{symbols}{207}
620 \DeclareMathSymbol{\lesseqgtr}{\mathrel}{letters}{232}
621 \DeclareMathSymbol{\gtreqless}{\mathrel}{letters}{233}
622 \DeclareMathSymbol{\lesseqqgtr}{\mathrel}{letters}{234}
623 \DeclareMathSymbol{\gtreqqless}{\mathrel}{letters}{235}
624 \DeclareMathSymbol{\Rrightarrow}{\mathrel}{arrows}{108}
625 \DeclareMathSymbol{\Lleftarrow}{\mathrel}{arrows}{106}
626 \DeclareMathSymbol{\veebar}{\mathbin}{letters}{210}
627 \DeclareMathSymbol{\barwedge}{\mathbin}{symbols}{246}
628 \DeclareMathSymbol{\angle}{\mathord}{symbols}{139}
629 \DeclareMathSymbol{\measuredangle}{\mathord}{symbols}{140}
630 \DeclareMathSymbol{\sphericalangle}{\mathord}{symbols}{141}
631 \DeclareMathSymbol{\varpropto}{\mathrel}{symbols}{47} % ?
632 \DeclareMathSymbol{\smallsmile}{\mathrel}{letters}{94} % ?
633 \DeclareMathSymbol{\smallfrown}{\mathrel}{letters}{95} % ?
634 \DeclareMathSymbol{\Subset}{\mathrel}{symbols}{248}
635 \DeclareMathSymbol{\Supset}{\mathrel}{symbols}{249}
636 \DeclareMathSymbol{\Cup}{\mathbin}{symbols}{250}
637 \DeclareMathSymbol{\Cap}{\mathbin}{symbols}{251}
638 \DeclareMathSymbol{\curlywedge}{\mathbin}{symbols}{132}
639 \DeclareMathSymbol{\curlyvee}{\mathbin}{symbols}{133}
640 \DeclareMathSymbol{\leftthreetimes}{\mathbin}{letters}{208}
641 \DeclareMathSymbol{\rightthreetimes}{\mathbin}{letters}{209}
642 \DeclareMathSymbol{\subteqq}{\mathrel}{letters}{238}
643 \DeclareMathSymbol{\supseteqq}{\mathrel}{letters}{239}
644 \DeclareMathSymbol{\bumpeq}{\mathrel}{symbols}{200}
645 \DeclareMathSymbol{\Bumpeq}{\mathrel}{symbols}{199}
646 \DeclareMathSymbol{\lll}{\mathrel}{letters}{222}
647 \DeclareMathSymbol{\ggg}{\mathrel}{letters}{223}
648 \DeclareMathSymbol{\circledS}{\mathord}{letters}{202}
649 \DeclareMathSymbol{\pitchfork}{\mathrel}{letters}{243}
650 \DeclareMathSymbol{\dotplus}{\mathbin}{symbols}{137}

```

```

651 \DeclareMathSymbol{\backsim}{\mathrel}{letters}{248}
652 \DeclareMathSymbol{\backsimeq}{\mathrel}{letters}{249}
653 \DeclareMathSymbol{\complement}{\mathord}{letters}{148}
654 \DeclareMathSymbol{\intercal}{\mathbin}{letters}{217}
655 \DeclareMathSymbol{\circledcirc}{\mathbin}{symbols}{230}
656 \DeclareMathSymbol{\circledast}{\mathbin}{symbols}{231}
657 \DeclareMathSymbol{\circleddash}{\mathbin}{letters}{204}

```

MSBM* equivalents

```

658 \DeclareMathSymbol{\lvertneqq}{\mathrel}{arrows}{222}
659 \DeclareMathSymbol{\gvertneqq}{\mathrel}{arrows}{223}
660 \DeclareMathSymbol{\nleq}{\mathrel}{arrows}{156}
661 \DeclareMathSymbol{\ngeq}{\mathrel}{arrows}{157}
662 \DeclareMathSymbol{\nless}{\mathrel}{arrows}{154}
663 \DeclareMathSymbol{\ngtr}{\mathrel}{arrows}{155}
664 \DeclareMathSymbol{\nprec}{\mathrel}{arrows}{229}
665 \DeclareMathSymbol{\nsucc}{\mathrel}{arrows}{230}
666 \DeclareMathSymbol{\lneqq}{\mathrel}{arrows}{220}
667 \DeclareMathSymbol{\gneqq}{\mathrel}{arrows}{221}
668 \DeclareMathSymbol{\nleqslant}{\mathrel}{arrows}{214}
669 \DeclareMathSymbol{\ngeqslant}{\mathrel}{arrows}{215}
670 \DeclareMathSymbol{\lneq}{\mathrel}{arrows}{218}
671 \DeclareMathSymbol{\gneq}{\mathrel}{arrows}{219}
672 \DeclareMathSymbol{\npreceq}{\mathrel}{arrows}{231}
673 \DeclareMathSymbol{\nsucceq}{\mathrel}{arrows}{232}
674 \DeclareMathSymbol{\precnsim}{\mathrel}{arrows}{235}
675 \DeclareMathSymbol{\succnsim}{\mathrel}{arrows}{236}
676 \DeclareMathSymbol{\lnsim}{\mathrel}{arrows}{224}
677 \DeclareMathSymbol{\gnsim}{\mathrel}{arrows}{226}
678 \DeclareMathSymbol{\lneqq}{\mathrel}{arrows}{216}
679 \DeclareMathSymbol{\ngeqq}{\mathrel}{arrows}{217}
680 \DeclareMathSymbol{\precneqq}{\mathrel}{arrows}{233}
681 \DeclareMathSymbol{\succneqq}{\mathrel}{arrows}{234}
682 \DeclareMathSymbol{\precnapprox}{\mathrel}{arrows}{237}
683 \DeclareMathSymbol{\succnapprox}{\mathrel}{arrows}{238}
684 \DeclareMathSymbol{\lnapprox}{\mathrel}{arrows}{227}
685 \DeclareMathSymbol{\gnapprox}{\mathrel}{arrows}{228}
686 \DeclareMathSymbol{\nsim}{\mathrel}{arrows}{150}
687 \DeclareMathSymbol{\ncong}{\mathrel}{arrows}{153}
688 \DeclareMathSymbol{\diagup}{\mathrel}{arrows}{11}
689 \DeclareMathSymbol{\diagdown}{\mathrel}{arrows}{12}
690 \DeclareMathSymbol{\varsubsetneq}{\mathrel}{arrows}{208}
691 \DeclareMathSymbol{\varsupsetneq}{\mathrel}{arrows}{209}
692 \DeclareMathSymbol{\nsubseteqq}{\mathrel}{arrows}{202}
693 \DeclareMathSymbol{\nsupseteqq}{\mathrel}{arrows}{203}
694 \DeclareMathSymbol{\subsetneqq}{\mathrel}{arrows}{206}
695 \DeclareMathSymbol{\supsetneqq}{\mathrel}{arrows}{207}
696 \DeclareMathSymbol{\varsubsetneqq}{\mathrel}{arrows}{210}
697 \DeclareMathSymbol{\varsupsetneqq}{\mathrel}{arrows}{211}
698 \DeclareMathSymbol{\subsetneq}{\mathrel}{arrows}{204}

```

```

699 \DeclareMathSymbol{\supsetneq}{\mathrel}{arrows}{205}
700 \DeclareMathSymbol{\nsubseteq}{\mathrel}{arrows}{200}
701 \DeclareMathSymbol{\nsubseteq}{\mathrel}{arrows}{201}
702 \DeclareMathSymbol{\nparallel}{\mathrel}{arrows}{247}
703 \DeclareMathSymbol{\nmid}{\mathrel}{arrows}{246}
704 \DeclareMathSymbol{\nshortmid}{\mathrel}{arrows}{244}
705 \DeclareMathSymbol{\nshortparallel}{\mathrel}{arrows}{245}
706 \DeclareMathSymbol{\nvdash}{\mathrel}{arrows}{248}
707 \DeclareMathSymbol{\nVdash}{\mathrel}{arrows}{250}
708 \DeclareMathSymbol{\nvDash}{\mathrel}{arrows}{249}
709 \DeclareMathSymbol{\nVDash}{\mathrel}{arrows}{251}
710 \DeclareMathSymbol{\ntrianglerighteq}{\mathrel}{arrows}{242}
711 \DeclareMathSymbol{\ntrianglelefteq}{\mathrel}{arrows}{241}
712 \DeclareMathSymbol{\ntriangleleft}{\mathrel}{arrows}{239}
713 \DeclareMathSymbol{\ntriangleright}{\mathrel}{arrows}{240}
714 \DeclareMathSymbol{\nleftarrow}{\mathrel}{arrows}{50}
715 \DeclareMathSymbol{\nrightarrow}{\mathrel}{arrows}{51}
716 \DeclareMathSymbol{\nLeftarrow}{\mathrel}{arrows}{102}
717 \DeclareMathSymbol{\nRightarrow}{\mathrel}{arrows}{104}
718 \DeclareMathSymbol{\nLeftrightarrow}{\mathrel}{arrows}{103}
719 \DeclareMathSymbol{\nleftrightharpoonup}{\mathrel}{arrows}{52}
720 \DeclareMathSymbol{\divideontimes}{\mathbin}{letters}{247}
721 \DeclareMathSymbol{\varnothing}{\mathord}{letters}{156}
722 \DeclareMathSymbol{\nexists}{\mathord}{arrows}{32}
723 \DeclareMathSymbol{\Finv}{\mathord}{letters}{144}
724 \DeclareMathSymbol{\Game}{\mathord}{letters}{145}
725 \let\mho\undefined
726 \DeclareMathSymbol{\mho}{\mathord}{letters}{146}
727 \DeclareMathSymbol{\simeq}{\mathrel}{symbols}{39}
728 \DeclareMathSymbol{\eqsim}{\mathrel}{symbols}{153}
729 \DeclareMathSymbol{\beth}{\mathord}{letters}{149}
730 \DeclareMathSymbol{\gimel}{\mathord}{letters}{150}
731 \DeclareMathSymbol{\daleth}{\mathord}{letters}{151}
732 \DeclareMathSymbol{\lessdot}{\mathrel}{letters}{220}
733 \DeclareMathSymbol{\gtrdot}{\mathrel}{letters}{221}
734 \DeclareMathSymbol{\ltimes}{\mathbin}{letters}{206}
735 \DeclareMathSymbol{\rtimes}{\mathbin}{letters}{207}
736 \DeclareMathSymbol{\shortmid}{\mathrel}{letters}{244}
737 \DeclareMathSymbol{\shortparallel}{\mathrel}{letters}{245}
738 \DeclareMathSymbol{\smallsetminus}{\mathbin}{letters}{216} %?
739 \DeclareMathSymbol{\thicksim}{\mathrel}{symbols}{24} %?
740 \DeclareMathSymbol{\thickapprox}{\mathrel}{symbols}{25} %?
741 \DeclareMathSymbol{\approxeq}{\mathrel}{symbols}{157}
742 \DeclareMathSymbol{\succapprox}{\mathrel}{letters}{237}
743 \DeclareMathSymbol{\precapprox}{\mathrel}{letters}{236}
744 \DeclareMathSymbol{\curvearrowleft}{\mathrel}{arrows}{135}
745 \DeclareMathSymbol{\curvearrowright}{\mathrel}{arrows}{136}
746 \DeclareMathSymbol{\digamma}{\mathord}{letters}{70} %?
747 \DeclareMathSymbol{\varkappa}{\mathord}{letters}{155}
748 \DeclareMathSymbol{\Bbbk}{\mathord}{arrows}{107}

```

```

749 \DeclareMathSymbol{\hslash}{\mathord}{letters}{157}
750 \DeclareMathSymbol{\hbar}{\mathord}{arrows}{27}
751 \DeclareMathSymbol{\backepsilon}{\mathrel}{letters}{251} %?
752 \DeclareMathSymbol{\dashrightarrow}{\mathord}{arrows}{58}
753 \DeclareMathSymbol{\dashleftarrow}{\mathord}{arrows}{56}
754 \DeclareMathSymbol{\dashuparrow}{\mathord}{arrows}{57}
755 \DeclareMathSymbol{\dashdownarrow}{\mathord}{arrows}{59}

756 \DeclareMathDelimiter\ulcorner{\mathopen}{arrows}{91}{arrows}{91}
757 \DeclareMathDelimiter\urcorner{\mathclose}{arrows}{92}{arrows}{92}
758 \DeclareMathDelimiter\llcorner{\mathopen}{arrows}{93}{arrows}{93}
759 \DeclareMathDelimiter\lrcorner{\mathclose}{arrows}{94}{arrows}{94}
760 \edef\checkmark{\noexpand\mathhexbox{\hexnumber@\symarrows}AC}
761 \edef\circledR{\noexpand\mathhexbox{\hexnumber@\symletters}C9}
762 \edef\maltese{\noexpand\mathhexbox{\hexnumber@\symletters}CB}

```

Changes to default for `\Leftrightarrow`. I (SPQR) don't like 22C, so:

```

763 \let\Leftrightarrow\undefined
764 \DeclareMathSymbol{\Leftrightarrow}{\mathrel}{arrows}{97}

```

Override AMS logo, just to ensure we don't use any CM fonts! (Not done in this version.)

```

\def\AmS{\protect\AmSfont
  \kern-.1667em\lower.5ex\hbox{M}\kern-.125emS}}
<lucidabright|lucbmath>%\def\AmSfont{\usefont{OMS}{hlcy}{m}{n}}
765 </lucbmath>

```

2.5 Lucfont test file

A test file for the Lucida fonts.

```

766 <*lucfont>
767 \documentclass{article}
768 <T1>\usepackage[T1]{fontenc}
769 <LY1>\usepackage[LY1]{fontenc}
770 \begin{document}
771 \title{All the Lucida text fonts}
772 \author{prepared by Sebastian Rahtz}
773 \date{February 19th 1995}
774 \maketitle
775 \def\test#1#2#3#4#5{%
776 \item[#1/#2/#3]#4 (#5):
777 {\fontfamily{#1}\fontseries{#2}\fontshape{#3}\selectfont
778 Animadversion for a giraffe costs \pounds123. Wa\ss\ ist
779 das f"ur ein Klopff?
780 We are often na{"i}ve vis-\'{a}-vis
781 the d{\ae}monic ph{\oe}nix's official r^{o}le in fluffy souffl\'{e}s}
782 }
783
784 \begin{description}

```

785 \test{hlx}{b}{it}{hlxdi8t}{LucidaFax-DemiItalic}
786 \test{hlx}{b}{n}{hlxd8t}{LucidaFax-Demi}
787 \test{hlx}{m}{it}{hlxrir8t}{LucidaFax-Italic}
788 \test{hlx}{m}{n}{hlxr8t}{LucidaFax}
789
790 \test{hlh}{b}{it}{hlcdib8t}{LucidaBright-DemiItalic}
791 \test{hlh}{b}{n}{hlcdb8t}{LucidaBright-Demi}
792 \test{hlh}{m}{it}{hlcrib8t}{LucidaBright-Italic}
793 \test{hlh}{m}{n}{hlcrb8t}{LucidaBright}
794
795 \test{hlce}{m}{it}{hlcrie8t}{LucidaCalligraphy-Italic}
796
797 \test{hlcf}{m}{n}{hlcrf8t}{LucidaBlackletter}
798
799 \test{hlcn}{m}{it}{hlcrin8t}{LucidaCasual-Italic}
800 \test{hlcn}{m}{n}{hlcrn8t}{LucidaCasual}
801
802 \test{hlst}{b}{n}{hlsbt8t}{LucidaSans-TypewriterBold}
803 \test{hlst}{b}{sl}{hlsbot8t}{LucidaSans-TypewriterBoldOblique}
804
805 \test{hls}{ub}{it}{hlsbi8t}{LucidaSans-BoldItalic}
806 \test{hls}{ub}{n}{hlsb8t}{LucidaSans-Bold}
807 \test{hls}{b}{it}{hlsdi8t}{LucidaSans-DemiItalic}
808 \test{hls}{b}{n}{hlsd8t}{LucidaSans-Demi}
809 \test{hls}{m}{it}{hlsri8t}{LucidaSans-Italic}
810 \test{hls}{m}{n}{hlsr8t}{LucidaSans}
811
812 \test{hlct}{b}{n}{hlcbt8t}{LucidaTypewriterBold}
813 \test{hlct}{b}{sl}{hlcbot8t}{LucidaTypewriterOblique}
814 \test{hlcw}{m}{it}{hlcriw8t}{LucidaHandwriting-Italic}
815
816 \end{description}
817 \end{document}
818 </lucfont>