

Lucida OpenType fonts from TUG

T_EX Users Group
<https://tug.org/lucida>

January 21, 2023

1 Introduction

This document contains examples of the Lucida OpenType fonts available through TUG. They can be used with any OpenType-aware application, including the LuaT_EX and X_YT_EX extensions of T_EX (but not pdfT_EX). A brief overview:

- Math fonts: Lucida Bright Math and Lucida Bright Math Demi, extended OpenType versions of the original Type 1 Lucida math fonts.
- Three text families (regular, italic, bold, bold italic) also coming from the original Type 1 distribution: Lucida Bright, Lucida Sans, and Lucida Sans Typewriter.
- Three specialized fonts from the original Type 1 distribution: Blackletter, Calligraphy, and Handwriting. These are straight conversions of the Type 1 fonts with no additional characters or features.
- Two additional monospaced font families (same four variants): Lucida Grande Mono DK and Lucida Console DK. These have O (oh), and Q glyphs modified to a somewhat squarish shape, and the 0 (zero) glyph open rather than slashed, as preferred by Don Knuth. As usual, Lucida Console has shorter capitals than Grande Mono, among other smaller changes.

Samples of all the fonts follow.

For information on the OpenType features in these fonts, see section 3. If you're using the Lucida OpenType fonts with T_EX, examples and other details are in section 4.

For more information about the Lucida fonts available from TUG, and an order form, please see <https://tug.org/lucida>.

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2 Font samples

The basic text family is LucidaBrightOT, with the usual four variants—regular, italic, bold, and bold italic, all with oldstyle figures; small caps are available in the upright shapes:

For =£45, almost anything can be found floating in fields. LucidaBrightOT
 ;THE DAZED BROWN FOX QUICKLY GAVE 12345-67890
 JUMPS! — ;But aren't Kafka's Schloß and Æsop's Œuvres often
 naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy
 soufflés? SPHINX OF BLACK QUARTZ, JUDGE MY VOW.
 0123456789.

For =£45, almost anything can be found floating in fields. LucidaBrightOT-
Italic
 ;*THE DAZED BROWN FOX QUICKLY GAVE 12345-67890*
JUMPS! — ;But aren't Kafka's Schloß and Æsop's Œuvres often
naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy
soufflés? 0123456789.

For =£45, almost anything can be found floating in fields. LucidaBrightOT-
Demi
 ;**THE DAZED BROWN FOX QUICKLY GAVE 12345-67890**
JUMPS! — ;But aren't Kafka's Schloß and Æsop's Œuvres
often naïve vis-à-vis the dæmonic phœnix's official rôle in
fluffy soufflés? SPHINX OF BLACK QUARTZ, JUDGE MY VOW.
0123456789.

For =£45, almost anything can be found floating in fields. LucidaBrightOT-
DemiItalic
 ;***THE DAZED BROWN FOX QUICKLY GAVE 12345-67890***
JUMPS! — ;But aren't Kafka's Schloß and Æsop's Œuvres
often naïve vis-à-vis the dæmonic phœnix's official rôle in
fluffy soufflés? 0123456789.

2.1 Samples: Lucida Sans OT

The sans serif, LucidaSansOT, is available in the same four variants (no small caps or oldstyle figures):

For =£45, almost anything can be found floating in fields. LucidaSansOT
 ;THE DAZED BROWN FOX QUICKLY GAVE 12345-67890 JUMPS!
 — ;But aren't Kafka's Schloß and Æsop's Œuvres often naïve
 vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

*For =£45, almost anything can be found floating in fields.
 ;THE DAZED BROWN FOX QUICKLY GAVE 12345-67890 JUMPS!
 — ;But aren't Kafka's Schloß and Æsop's Œuvres often naïve
 vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?*

LucidaSansOT-
 Italic

**For =£45, almost anything can be found floating in fields.
 ;THE DAZED BROWN FOX QUICKLY GAVE 12345-67890
 JUMPS! — ;But aren't Kafka's Schloß and Æsop's Œuvres
 often naïve vis-à-vis the dæmonic phœnix's official rôle in
 fluffy soufflés?**

LucidaSansOT-
 Demi

***For =£45, almost anything can be found floating in fields.
 ;THE DAZED BROWN FOX QUICKLY GAVE 12345-67890
 JUMPS! — ;But aren't Kafka's Schloß and Æsop's Œuvres
 often naïve vis-à-vis the dæmonic phœnix's official rôle in
 fluffy soufflés?***

LucidaSansOT-
 DemiItalic

2.2 Samples: Lucida Sans Typewriter OT

The monospaced LucidaSansTypewriterOT family is again available in the usual four variants; no small caps or oldstyle figures.

For =£45, almost anything can be found floating in
 fields. !`THE DAZED BROWN FOX QUICKLY GAVE
 12345--67890 JUMPS! --- ?`But aren't Kafka's
 Schloß and Æsop's Œuvres often naïve vis-à-vis the
 dæmonic phœnix's official rôle in fluffy soufflés?

LucidaSans
 TypewriterOT

*For =£45, almost anything can be found floating in
 fields. !`THE DAZED BROWN FOX QUICKLY GAVE
 12345--67890 JUMPS! --- ?`But aren't Kafka's
 Schloß and Æsop's Œuvres often naïve vis-à-vis the
 dæmonic phœnix's official rôle in fluffy soufflés?*

LucidaSans
 TypewriterOT-
 Oblique

**For =£45, almost anything can be found floating in
 fields. !`THE DAZED BROWN FOX QUICKLY GAVE
 12345--67890 JUMPS! --- ?`But aren't Kafka's
 Schloß and Æsop's Œuvres often naïve vis-à-vis the
 dæmonic phœnix's official rôle in fluffy soufflés?**

LucidaSans
 TypewriterOT-
 Bold

For =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

LucidaSans
TypewriterOT-
BoldOblique

2.3 Samples: Lucida Grande Mono DK

The monospaced LucidaGrandeMonoDK family is available in the usual four variants; no small caps or oldstyle figures.

As mentioned at the beginning, the principal design difference from LucidaSansTypewriter is a squarish style for O (oh), Q, and related characters, and an open, rather than slashed, zero by default. A few other characters differ as well.

In addition, the Grande Mono fonts support the WGL4 (Windows Glyph List) repertoire, thus including Greek and Cyrillic.

For =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

LucidaGrande
MonoDK

For =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

LucidaGrande
MonoDK-Italic

For =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

LucidaGrande
MonoDK-Bold

For =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

LucidaGrande
MonoDK-BoldItalic

2.4 Samples: Lucida Console DK

The monospace LucidaConsoleDK family is available in the usual four variants; no small caps or oldstyle figures.

The Console design has shorter capitals than LucidaGrandeMono, with the same style of O, Q, 0, and related. The Console fonts also support WGL4.

For =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

LucidaConsoleDK

For =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

LucidaConsoleDK-Italic

For =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

LucidaConsoleDK-Bold

For =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

LucidaConsoleDK-BoldItalic

2.5 Samples: Blackletter, Calligraphy, Handwriting

These three specialized text fonts are included: LucidaBlackletterOT, LucidaCalligraphyOT, and LucidaHandwritingOT.

for =£45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phænix's official rôle in fluffy soufflés?

Lucida
BlackletterOT

*For =£45, almost anything can be found floating in fields.
!`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ? `But aren't Kafka's Schloß and
Æsop's Œuvres often naïve vis-à-vis the dæmonic
phœnix's official rôle in fluffy soufflés?*

Lucida
CalligraphyOT

*For =£45, almost anything can be found floating in
fields. !`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ? `But aren't Kafka's Schloß
and Æsop's Œuvres often naïve vis-à-vis the dæmonic
phœnix's official rôle in fluffy soufflés?*

Lucida
HandwritingOT

2.6 Samples: Lucida Bright Math OT

Finally, two OpenType math fonts are provided: `LucidaBrightMathOT` and `LucidaBrightMathOT-Demi`. The `-Demi` variant has bold letters in the normal positions, to be used for typesetting math within bold text, such as section headings. This is distinct from the math characters which are specified as bold in Unicode for specific semantics; those are bold in both math fonts.

$e^{i\pi} + 1 = 0$ LucidaBrightMathOT

$e^{i\pi} + 1 = 0$ LucidaBrightMathOT-Demi

(The above bold math is typeset with `\boldmath $$e...`)

The above are the Lucida OpenType fonts available from TUG. Many more fonts are available from B&H: see <https://lucidafonts.com>.

3 Font features in Lucida OpenType

3.1 General features in Lucida OpenType text fonts

The following are the OpenType features available in (at least some of) the Lucida text fonts:

feature	description	default(*)
<code>dlig</code>	discretionary ligatures (f-ligatures in typewriter font)	off
<code>liga</code>	standard ligatures (f-ligatures in most fonts)	on
<code>onum</code>	old style numbers	off
<code>smcp</code>	small caps	off
<code>zero</code>	slashed zero	off

`loc1` script/language specific (localized) forms on

The `loc1` feature is described in the next section.

(*) Which features are on or off by default is controlled by the application program, not the font. The settings listed here are the most common defaults for OpenType-aware applications.

One more feature, `ss01`, has different meanings in different fonts:

feature	font	description
<code>ss01</code>	Lucida Sans & Typewriter	use dotted zero: 0 vs. default 0.
<code>ss01</code>		use Lucida-standard shapes:
	Lucida Grande Mono	00Q vs. default 00Q;
	Lucida Console	00Q vs. default 00Q.

The following table shows which features are available—not necessarily on by default—in which text fonts. (Math features follow.)

font name	<code>dlig</code>	<code>liga</code>	<code>onum</code>	<code>smcp</code>	<code>zero</code>	<code>ss01</code>
LucidaBrightOT		x	x	x		
LucidaBrightOT-Demi		x	x	x		
LucidaBrightOT-Italic		x	x			
LucidaBrightOT-DemiItalic		x	x			
LucidaSansOT		x			x	x
LucidaSansOT-Demi		x			x	x
LucidaSansOT-Italic		x			x	x
LucidaSansOT-DemiItalic		x			x	x
LucidaSansTypewriterOT	x				x	x
LucidaSansTypewriterOT-Bold	x				x	x
LucidaSansTypewriterOT-Oblique	x				x	x
LucidaSansTypewriterOT-BoldOblique	x				x	x
LucidaGrandeMonoDK	x				x	x
LucidaGrandeMonoDK-Bold	x				x	x
LucidaGrandeMonoDK-Italic	x				x	x
LucidaGrandeMonoDK-BoldItalic	x				x	x
LucidaConsoleDK	x				x	x
LucidaConsoleDK-Bold	x				x	x
LucidaConsoleDK-Italic	x				x	x
LucidaConsoleDK-BoldItalic	x				x	x
LucidaBlackletterOT		x				
LucidaCalligraphyOT		x				
LucidaHandwritingOT		x				

Incidentally, two additional features are present in the fonts: `mark` and `mkmk`. These are related to accent positioning, but at this time they are experimental, not supported, and hence not documented.

3.2 Language-specific features in Lucida OpenType

The Lucida text fonts have two language-specific features:

- with language NLD (Dutch) and when both of the `loc1` and `liga` features are on, `ij` and `IJ` ligatures are activated: `ij IJ`. Available in the four Lucida Bright fonts.
- with language TRK (Turkish) and when both `loc1` and `smcp` are on, the small cap `i` has a dot to differentiate it from dotless `i`: `i İ`. If just `loc1` is on, the ‘`fi`’ and ‘`ffi`’ ligatures are disabled: `fi ffi`. Available in the four Lucida Bright and four Lucida Sans Typewriter fonts.

3.3 Math features in Lucida OpenType

Following are the OpenType features for the math fonts. All math font features work only when the OpenType script `Math` is specified; this is the default in \TeX math mode.

- `ss01` alternate Latin lower case math italic identical to text italic. This option is not recommended as Greek ν (nu) and Latin ν (vee) become too similar; cf. the default vee: ν .
- `ss02` smaller arrows (original Type 1 size): \uparrow vs. default \Uparrow .
- `ss03` smaller operators and geometric shapes (original Type 1 size) Σ vs. default \sum . Works for text size only, not display size.
- `ss04` calligraphic alternative (similar to the Type 1 design) to the math script alphabet: $\mathcal{ABC}xyz$ vs. default $\mathcal{ABC}xyz$. Also available in the bold math font (but no calligraphic lowercase is available there): $\mathbf{\mathcal{ABC}}$ vs. default \mathcal{ABC} .
- `ss05` use a slashed-zero style for the empty set character (U+2205): \emptyset vs. default \varnothing . Also available in the bold math font: $\mathbf{\emptyset}$ vs. default $\mathbf{\varnothing}$.
- `ss08` emphasize right and bottom edges of the d’Alembertian operator (U+29E0, `\laplac`), to follow the design of the Laplace operator (U+2206, `\increment`, Δ); the default design follows the standard, emphasizing the left and upper edges: \square vs. default \square . Also available in the bold math font: $\mathbf{\square}$ vs. default $\mathbf{\square}$.

The Lucida math fonts were originally released (and are still available) in Type 1 format for use with \LaTeX and \TeX . Some design changes have been made in these OpenType versions. For those who want to use the Type 1

designs, the `ss02`, `ss03`, and `ss04` alternatives above are offered; the `ss01` feature also corresponds to an option in the Type 1 support.

Which math features are available in which fonts:

font name	<code>ss01</code>	<code>ss02</code>	<code>ss03</code>	<code>ss04</code>	<code>ss05</code>	<code>ss08</code>
LucidaBrightMathOT	x	x	x	x	x	x
LucidaBrightMathOT-Demi	x			x	x	x

As you might gather from the above descriptions, the bold math font (LucidaBrightMathOT-Demi) has had considerably less development than the regular-weight math font: a smaller character repertoire, fewer features supported, etc.

Finally, for completeness: the regular-weight math font also defines the `dtls` feature (dotless math characters for accents) and both math fonts define `ssty` (script-size versions of primes and related); these are used internally by typesetting programs and generally not set by the user. In addition, the `ss06` and `ss07` features are experimental, and not described here.

4 T_EX and Lucida OpenType

In the T_EX world, OpenType fonts can be found in either of two ways: as files within the usual T_EX trees (examples given here), or as “system fonts” (example given in the `lucidaot-sys-example` document).

To load Lucida OpenType as T_EX files, of course they must first be installed in your T_EX setup; please see the `INSTALL-TeX.txt` file in the Lucida distribution for how to do that.

Lucida OpenType can be used with L^AT_EX, ConT_EXt, or any macro package (or non-T_EX application, for that matter) supporting OpenType text and math typesetting.

4.1 Prerequisite L^AT_EX packages

In L^AT_EX, the Lucida OpenType fonts are used in conjunction with the core packages `fontspec` and `unicode-math`. The former handles text fonts, the latter math. Reading their (extensive) documentation is highly recommended.

You should already have these macro packages installed as part of your T_EX distributions. If either is missing, please look for help with your distribution, or you can install the packages yourself: <https://ctan.org/pkg/fontspec> and <https://ctan.org/pkg/unicode-math> respectively.

4.2 Loading Lucida text fonts in L^AT_EX: `fontspec`

Once the Lucida OpenType fonts and required packages are installed, using them for the main text fonts in a L^AT_EX document requires first loading the `fontspec` package, and then using its `\setmainfont` command. The argument, `LucidaBrightOT.otf`, is specified here with the explicit extension `.otf`; this is what tells the engines to search the T_EX trees (instead of looking it up as a system font).

```
\usepackage{fontspec} % support for OpenType text fonts
\defaultfontfeatures{Scale=.92}
\setmainfont[Ligatures=TeX]{LucidaBrightOT.otf}
```

The `Ligatures=TeX` option makes conventional T_EX input sequences, such as `---`, still work as expected. (This is the default in `fontspec` as of version 2.4.) The scaling brings the visually large Lucida fonts closer to typical design sizes of other typefaces. Of course these settings are completely optional.

You will probably also want to switch the sans and typewriter (monospaced) families to Lucida.

```
\setsansfont[Ligatures=TeX]{LucidaSansOT.otf}
\setmonofont[] {LucidaSansTypewriterOT.otf}
```

With current `fontspec`, the italic, bold, and bold italic variants of each family should be automatically found and used (via the `lucidabrightot.fontspec` and sibling files). In older versions of `fontspec`, when specifying OpenType fonts by filename (though not with system font lookups), it was necessary to explicitly specify the italic, bold, and bold italic file names. It should no longer be necessary, but the fallback code is available in the source of this document (`lucidaot.tex`) in case it's helpful.

4.3 Loading Lucida math fonts in \LaTeX : `unicode-math`

Using Lucida OpenType for typesetting math in \LaTeX requires loading the package `unicode-math` and then calling its `\setmathfont` command. If you want the `\boldmath` command, the font for that also has to be set:

```
\usepackage{unicode-math} % support for OpenType math fonts
\setmathfont{LucidaBrightMathOT.otf}
  [BoldFont=LucidaBrightMathOT-Demi.otf]
```

It is best to load both the `fontspec` and `unicode-math` packages before defining any fonts.

Naturally, you should change any and all options according to your own needs. For a starting point, you can copy the exact commands from this document's source (`lucidaot.tex`) or the companion document that uses system font loading (`lucidaot-sys-example.tex`).

4.4 Basic L^AT_EX example

Given the above preamble, here's a small example of input:

```
\documentclass{article}
% ... preamble from above ...
\begin{document}
Here's some text. And here's some math:
\[ \phi(x)=\int_{-\infty}^x e^{-x^2/2} dx ]
Euro and copyright symbols are available:
\texteuro\ \textcopyright.
\end{document}
```

This results in the following output:

Here's some text. And here's some math:

$$\phi(x) = \int_{-\infty}^x e^{-x^2/2} dx$$

Euro and copyright symbols are available: € ©.

The `fontspec` package can be used to enable and disable the OpenType features listed in section 3. As an example, to enable the `ss04` math feature (alternate calligraphic) the `\setmathfont` call would look like this:

```
\setmathfont[RawFeature={+ss04}]{LucidaBrightMathOT.otf}
```

`fontspec` provides higher-level interfaces to some features, which are greatly preferable when available. For further examples and much more information, please see the `fontspec` documentation.

5 Closing

If you have questions or problems regarding installation or use, please email lucida@tug.org; this is an open and publicly archived list for Lucida discussion; you can subscribe on the web at <https://lists.tug.org/lucida>. On the other hand, questions or problems related to ordering or licensing should go to lucida-admin@tug.org.

Finally, B&H's web site for Lucida is <https://lucidafonts.com>, and TUG's home page for Lucida and T_EX is <https://tug.org/lucida>.