

# **3DLDF 2.0 User Manual**

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3-dimensional drawing with MetaPost output.  
Last updated November 4, 2013

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3DLDF User Manual, edition 2.0.  
The author is Laurence D. Finston.

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# 1 Introduction

This manual documents 3DLDF 2.0. The most important difference between release 2.0 and previous releases is that 3DLDF 2.0 is an *interactive* program, whereas in previous releases, 3DLDF was more like a *library* of C++ functions that users could use in their own programs to make drawings.

Now, 3DLDF implements a *language* similar to the METAFONT language, and in particular the MetaPost language derived from it.

For several years, interactive versions of 3DLDF have been available for downloading from the Savannah website: <https://savannah.gnu.org/projects/3dldf/>. However, 2.0 is the first release that includes this feature.

One result of this is that the old manual for releases through 1.1.5.1 is largely obsolete, as far as the usage of 3DLDF is concerned. The reference sections, documenting the classes, functions, etc., are still usable for those who want to know the details of how the program works, though many descriptions may be out-of-date because of changes made in the meantime. On the other hand, the reference sections are longer needed for just using the program. The old manual is included in the distribution in the directory 3DLDF-2.0/doc/old\_doc/.

The code for *scanning* and *parsing*, i.e., that which implements the *interpreter* that makes the program interactive, is of course not documented in the old manual at all.

To document the new, interactive version of 3DLDF, it would therefore be necessary to write a completely new manual. Unfortunately, it has not been possible for the author to do this, which is the main reason that there has been no new release for so many years. In order not to delay it any longer, he has decided to make a release without rewriting the manual, although this is clearly not ideal.

As a partial substitute, release 2.0 contains the directory 3DLDF-2.0/examples/ with many examples which can be used to learn how to use the 3DLDF language. In addition, the directory 3DLDF-2.0/src/ contains the files `sample.ldf`, `sample0.ldf`, `sample1.ldf` and `sample2.ldf`.

## **2 Installation**

## 3 Invoking

Command-line options:

- `--bison-trace`  
Prints information generated by GNU Bison for tracing which parser rules are reduced and the state of the Bison stack.
- `--multithread-input`  
Enables the use of multiple threads for input.
- `--multithread-output`  
Enables the use of multiple threads for output.
- `--multithread-include`  
Enables the use of multiple threads for input files included in other input files.
- `--silent` Suppresses almost all output to standard output and standard error.
- `--quiet` Suppresses some output to standard output and standard error.
- `--verbose`  
Causes status information to be printed to standard output.
- `--help` Prints a help message and exits.
- `--version`  
Prints version information and exits.

## 4 Getting Started



## 5 Data Types

### 5.1 Numeric types

`numeric`    Integers and floating point numbers.

`boolean`    `true` or `false`

`ulong_long`  
Unsigned long long integers. Corresponds to the C type `unsigned long long int`.

`complex`    Complex number.

`matrix`    Matrix.

### 5.2 Types for drawing and labeling:

`transform`  
Transformation matrix.

`focus`    Focus for the *perspective projection*.

`pen`  
`dash_pattern`  
`color`  
`string`

### 5.3 Shape types

point  
path  
circle  
circle\_slice  
arc  
cone  
conic\_section\_lattice  
cuboid  
cylinder  
ellipse\_slice  
ellipse  
ellipsoid  
glyph  
helix  
hyperbola  
parabola  
paraboloid  
polygon  
polyhedron\_slice  
polyhedron  
rectangle  
reg\_polygon  
sphere  
sphere\_development  
triangle

### 5.4 Combined types

bool\_point

### 5.5 Other types

plane  
nurb  
origami\_figure

### 5.6 Vector types

Vector types (alphabetical):

arc\_vector  
boolean\_vector  
bool\_point\_vector  
circle\_slice\_vector  
circle\_vector  
color\_vector  
complex\_vector  
cone\_vector  
conic\_section\_lattice\_vector  
cuboid\_vector  
cylinder\_vector  
dash\_pattern\_vector  
ellipse\_slice\_vector  
ellipse\_vector  
ellipsoid\_vector  
focus\_vector  
glyph\_vector  
helix\_vector  
hyperbola\_vector  
macro\_vector  
matrix\_vector  
numeric\_vector  
nurb\_vector  
origami\_figure\_vector  
parabola\_vector  
paraboloid\_vector  
path\_vector  
pen\_vector  
picture\_vector  
plane\_vector  
point\_vector  
polygon\_vector  
polyhedron\_slice\_vector  
polyhedron\_vector  
rectangle\_vector  
reg\_polygon\_vector  
sphere\_development\_vector  
sphere\_vector  
string\_vector  
transform\_vector  
triangle\_vector  
ulong\_long\_vector

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