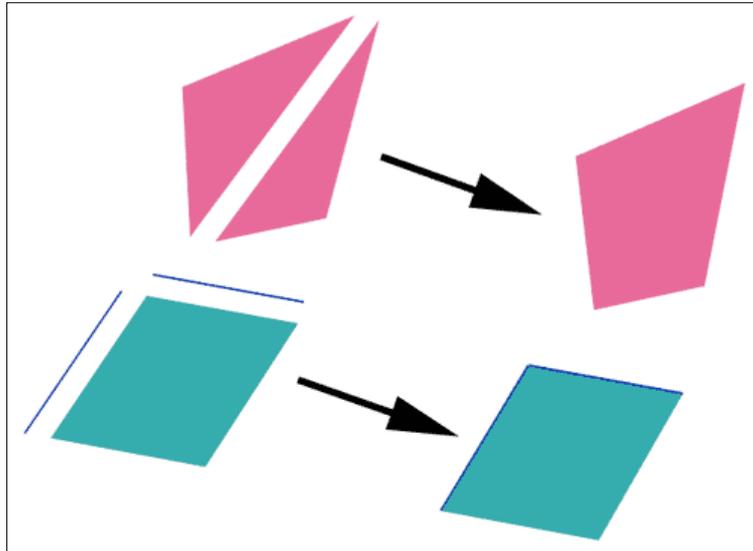


Rectifier, LDraw file optimizer



Rectifier utility scans a LDraw file and performs two kinds of optimization on it:

- Convert adjacent triangles into a quad. This conversion is done only if the resulting quad is convex, flat enough (less than 1° warp) and if the triangles have the same winding and color.
- Convert rhombuses (quads that have parallel opposite sides) bordered by at least one line into a *rect* primitive. Rhombuses must be perfectly flat to allow this conversion.

It is a simple console application, source code is provided below to anyone willing to integrate it in a more palatable interface. You may also use Michael Heidemann [LETGUI](#) front-end (highly recommended!).

Download

[Rectifier package](#), including program for Windows, documentation, source files (Visual C++ 6.0), sample files.

History

- V1.0: Initial release
- V1.1: Corrected a stack size issue that caused crash under Windows 2000.
- V1.2: Rectifier now cares to BFC orientation when replacing quads with *rect* primitives. If no BFC orientation is specified in the input file, CCW is assumed. Also tries to keep simple coefficients in *rect* primitive transformation matrix when possible.
- V1.3: Corrected a bug that caused wrong coefficient in small *rect*
- V1.4: Added -t option allowing to choose the maximum angle formed by two triangles being merged into a quad.

Usage

- Prepare the input LDraw file. **Rectifier** works on any LDraw file, but should be used in the end of authoring process, before submitting parts to tracker.
- Launch a command prompt
- Type the command line: `rectifier [-c] [-q] [-r] [-t <value>] LdrawFileIn LdrawFileOut`. **Rectifier** will create optimized LdrawFileOut. Note that if file LdrawFileOut exists it will be overwritten without warning. -c, -q and -r are optional parameters controlling the behavior of **Rectifier**. These options will be detailed below.

Here is a screen shot of a sample run:

```

ca C:\WINNT\system32\cmd.exe
D:\Mes documents\LDraw tools\Rectifier\Debug>Rectifier 64053.dat 64053r.dat

Ldraw Rectifier v1.0 - by Philo
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Reading Input File...
 492 lines in input file
Substituting quads...
24 triangle(s) and 0 conditional line(s) were replaced with 12 quad(s)
Substituting rect primitives...
69 quad(s) and 180 line(s) were replaced with 69 rect primitive(s)
Writing output file...
Press <Enter> to quit

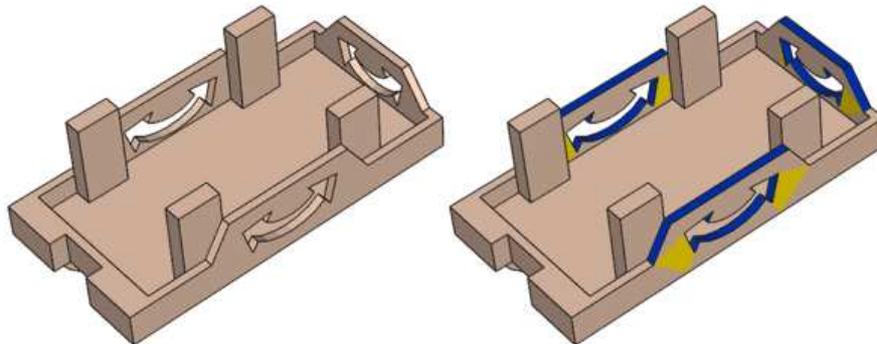
D:\Mes documents\LDraw tools\Rectifier\Debug>

```

How Rectifier works

- Input file is read and parsed. Triangles, quads and lines are stored in an array (limited to 10000 lines, should be more than enough!).
- A first scan is done to locate triangles of the same color that share a common side. For each candidate we check if the formed quad would be convex and planar enough. If a quad is found, it replaces the first triangle and the second is deleted. We then search for a conditional line that would have been set between the two triangles. If one is found it is suppressed.
- We then scan again the array, this time looking for rhombuses. They are identified by their diagonals which must cross in their middle. When a rhombus is found, we look for edge lines bordering the rhombus. According to the configuration of these edge lines, we determine the type of *rect* primitive to use among *rect1*, *rect2p*, *rect2a*, *rect3* and *rect*, as well as its orientation. Center of the rhombus will become center of primitive, while length and orientation of its sides determine the transformation matrix of the primitive. *Rect* primitive will be inserted in file at previous position of the rhombus, lines (incorporated in rect) are deleted.
- **Rectifier** then writes output file, changing only modified or deleted lines.
- Behaviour of **Rectifier** can be controlled with the following command line parameters:
 1. **-c**: Converted triangles are colored in yellow, newly formed *rect* primitives are colored blue. This helps appreciating the work of **Rectifier**.
 2. **-q**: **Rectifier** does not attempt to transform triangles into quads.
 3. **-r**: **Rectifier** does not convert bordered rhombuses into *rect* primitives.
 4. **-t <value>**: defines the maximum angle formed by two triangles to be merged into a quad. Default value is 0.95°, matching the [LDraw recommended value](#).

Example



This file (64053.dat) was processed with **Rectifier**. It located several adjacent triangles (yellow) and combined some quads and lines into *rect* primitives. As a result, the file is shrunk by 24%...

Command line: `rectifier -c 64053.dat 64053r.dat`



[Version Française ici.](#)