3D Lightyear 1.0 Release Notes

Welcome to 3D Lightyear

Get ready! You are about to experience a quantum leap forward in three-dimensional file preparation efficiency and ease of use!

3D Lightyear represents 3D Systems' latest innovation in stereolithography file preparation. Designed to run on Microsoft Windows NT® based workstation computers, **3D Lightyear** works with all of our previously available stereolithography machines (SLAs) as well as our newest, flagship platform, the SLA 7000. **3D Lightyear** builds on the powerful functionality of its predecessor, Maestro, by adding new power and convenience in features such as:

A unified, familiar graphical user interface

3D Lightyear is built using common controls within the Windows user interface. These toolbars, dialogs, pulldown menus, and the extensive on-line help system make **3D Lightyear** highly intuitive, requiring only minimal training to become familiar with the software.

Improved object positioning features

Maestro users have long struggled with clumsy, indirect methods used to translate, rotate and otherwise position parts within the build envelope. *3D Lightyear* brings "drag and drop," "pick and place," and "automatic" part placement, as well as real-time visual rotation, "smart Z", and other often-requested object positioning features and functions to the build file preparation process.

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Up to 150-times faster STL file verification and repair

Historically, bad STL files lead to bad results. But checking them required too much time — more than a high production environment could spare. *3D Lightyear's* STL verification tool runs so fast you'll wonder if it even happened.

Two to Six times improvement in overall performance

With the improved, intuitive user interface, faster STL verification, better support editing, and new improved slicing algorithms, we expect you'll see a marked improvement in part preparation productivity.

Smaller BFF build files that are from one-half to one-tenth the size of Maestro build files

With the complexity of today's part and STL files, the build files have grown increasingly large and more difficult to transfer to the SLA machine. *3D Lightyear* produces significantly smaller BFF files by eliminating all the redundency that exists in the Maestro build file structure.

Improved Support Generation

Some support generation limitations that existed in Maestro, such as; generating curtain and gusset supports in a region that should have only gussets, having supports in the STL file but missing the vectors in the slice file, and preventing the width of a brace from being less than the diameter of the holes in the platform, have been fixed.

...And, much more.

3D Lightyear provides several tools and critical functions for optimizing your models for building on an SLA. You can use it to:

- ✓ Verify the integrity of and make small repairs to your STL files,
- ✓ Orient your models for optimal use of time and space on the Build Platform,



- ✓ Apply part and support build styles and recoating styles to regions of your models to ensure the greatest dimensional accuracy, highest quality surface finish, and/or maximum speed during the build,
- ✓ Create and edit the vents and drains for QuickCast models,
- Create and optimize support structures on your models to ensure the proper support during the build process,
- Customize and save new build and recoat styles used to adjust for minor machine variations, to compensate for specific geometric characteristics in the models, and the like,

and finally ...

✓ Perform the Prepare operation that actually slices your models into the layers that will be "drawn" and "filled" by the SLA laser during the build process and merges the slice data into build files.



IMPORTANT NOTE!



3D Lightyear produces different BFF build files than those produced by Maestro. These newer BFF files can only be used on SLA systems running the corresponding release of SLA control software, **Buildstation 5.0**. They are not compatible with prior versions of Buildstation software. Likewise, Maestroproduced BFF build files can only be used on SLA systems running SLA control software, Buildstation 4.x. They are not compatible with the newer version of SLA control software, **Buildstation 5.0**.

However, the build files used on SLA 250 and SLA 190 systems (.v, .r, .l, .prm) have not changed. Therefore, both *3D Lightyear* and Maestro produce build files compatible with these SLA systems.



Recommended Hardware Platform

The **3D** Lightyear SLA File Preparation software requires a particular type of PC to run efficiently. The following outline summarizes the requirements for a system tested and recommended by 3D Systems' technicians as a good, mid-level platform for running **3D** Lightyear.

- ✓ CPU 450MHz Pentium® II/III (Xeon™ preferred)
- ✓ **System RAM** 256MB ECC SDRAM (minimum)
- Fixed Disk Drive 9GB Ultra2/Wide SCSI (10,000 rpm preferred)
- Video Adapter 3D Graphics Acceleration, Full OpenGL ICD, 8 MB VRAM, PCI Bus (16MB VRAM, Accelerated Graphics Port [AGP] preferred) (See below for tested card configurations.)
- Monitor 17 to 21-inch monitor capable of displaying at lease 65K colors at 1024 X 768 resolution with 75Hz vertical refresh rate
- ✓ CD ROM Drive 24X IDE or SCSI
- Network Interface Card 10/100 10BaseT Ethernet (or combo card if necessary for your installation)
- Operating System Windows NT 4.0 (Service Pack 3 or higher)
- ✓ Other Performance (e.g. 104 key) keyboard, Intellimouse®, 3.5-inch/1.44MB Floppy Drive

To arrive at these specifications, we tested the preparation of a variety of parts of "average" file size and varying degrees of part geometry complexity. While it is **possible** to prepare files on PCs with less memory and a less powerful (slower) processor, we recommend investing a little more in your working environment to save time and aggravation later on. In fact, adding more system memory (RAM), video memory (VRAM), upgrading to more powerful processors, and increasing the available free space on your system's hard disk drive can have significant positive effects on performance and throughput.



Tested Graphics Accelerators

During our beta testing at more than 30 sites, we did not encounter an unresolvable issue with any graphics card that follows our recommended specifications. In those instances where we did experience initial difficulty, in every case either downloading the latest drivers from the manufacturer's web site, or changing the board parameters resolved the difficulty.

Because of this and because it seems there are newer, better graphics cards coming out every month, we hesitate "recommending" a specific card or cards. However, below we provide a list of cards we have used internally in our software development and testing, as well as some of the cards used by the beta sites.

Evans and Sutherland (formerly Accelgraphics) cards as follows:

- ✓ Accel Galaxy AGP 36 Meg
- ✓ Accel Eclipse II AGP 16 Meg
- ✓ Accel Star II AGP 8 Meg

Here we list some of the cards used by our beta sites without problems:

- ✓ Diamond FireGL 4000 PCI
- ✓ Diamond GL 1000 Pro AGP
- ✓ Diamond Permedia 2 AGP
- ✓ Diamond Viper V550 AGP
- ✓ Intergraph 3410T
- ✓ Matrox Millennium II AGP

Overall Operations

Changes from Maestro are many, and most are clearly apparent by examining the user interface. We have included extensive online help and a quick reference card to help make the transition both quick and easy.



Major Program Changes

Below we list several major changes in *3D Lightyear* compared with Maestro, which may not be obvious with a quick glance at the user interface.

Binary Style Files

With **3D** Lightyear, we have changed the style files from text to binary format to prevent direct editing of the files. Direct editing of style files has always been a dangerous practice that allowed the files to be easily corrupted, often resulting in build failure. With **3D** Lightyear, all style file changes are performed through the user interface.

Standard and Advanced User Interface

3D Lightyear provides a wide collection of build and recoat style files for all system/resin combinations sold by 3D Systems. Highly qualified and experienced people develop and extensively test the process parameters in each style file, assuring the user a high rate of build success.

Sometimes, however, minor parameter manipulation may be necessary for a specific combination of part geometry, resin, and build style. We have found over the years that an unlimited ability to manipulate process parameters, especially when applied by a inexperienced user, can lead to build problems.

We want to provide our customers with a system that helps direct success even for novice users, yet provides the flexibility for advanced users to utilize their experience to manipulate parameters in special situations.

With *3D Lightyear*, we have implemented a two-level approach to build parameter manipulation. These levels are called Standard and Advanced.

Description of levels

The Standard level is for users who need to use only the default parameters supplied in the style files, or who make and save only minor parameter modifications to the default styles. The Standard level provides adequate room for parameter manipulation for most customer situations.



The Advanced level is for experienced users who sometimes want to make more than minor changes to the default styles, or to create and save custom Advanced styles for special situations. This level provides much more room for parameter manipulation than the Standard level.

Qualification for Advanced level

Qualification for the Advanced level is by site. To qualify for an Advanced level, the customer must have at least one employee who attended 3D Systems' Advanced Training class, or that has three years of part building experience on SLA systems. 3D Plus also offers special maintenance agreements allowing otherwise non-qualifying sites to obtain the Advanced level license.

Implementation of Advanced level

Information contained in the licensing file on each workstation enables the Advanced level by allowing access to the Advanced style files on that workstation. A supervisor may choose to license experienced users within their facility with Advanced capability, and novice users with Standard capability. Workstations licensed for Standard level are not able to access and use Advanced style files.

What to do if you need a style not provided

If you find that you do not have a style available for your purpose, or that you are not able to manipulate the parameters in an existing style to meet your needs, first check the installation CD-ROM for a "recommended baseline" style that might fill your need. Recommended baseline styles — styles that are not fully tested but can serve as a starting point — are not automatically installed on your workstation, but are available on the installation CD-ROM. If, after checking for a recommended baseline style, you still do not have what you need, please contact the 3D Plus Hotline if within the United States, or your regional support office or hotline if outside the United States. We will make every effort to assess and accommodate your request, if possible. Our goal is to expand our information on process and parameter manipulation so we are able to improve our products.

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Site Licensing

Unlike Maestro, which was licensed per seat, *3D Lightyear* is licensed per site. Once your site obtains the software, you are free to install and license it on as many NT workstations within your organization as you need.

Small Feature Preservation (SFP)

3D Lightyear includes an often asked for feature which we call Small Feature Preservation (SFP). Maestro's linewidth compensation algorithm preserved part accuracy, but often removed small features in doing so. These small features can now be preserved with SFP without the need to turn off linewidth compensation.

Inclusion of QuickCast

The QuickCast build style is included in *3D Lightyear* without extra charge.

Outstanding Issues

The following lists the known issues in this release of **3D Lightyear**, and the work-arounds where available. We are always striving to improve our products. If you find a problem with the software, or have a suggestion for an enhancement, please send an email with your comments or suggestions to *ProductSuggestions@3dsystems.com*.

Tool Tips

When you position the mouse pointer over a parameter value, the "Tool Tips" function displays the default and allowable parameter range. However, when a platform is re-loaded the "Tool Tip" displays the last saved value instead of the correct default value.

<u>Work-around</u>: Note which values you are changing from default and what the default values are for future reference.



Verify Issues

On STLs with very large gaps, Verify will fill the gaps with large triangles instead of numerous small triangles.

<u>Work-around:</u> It is best to go back and modify the CAD file to output an improved STL file.

Small Feature Preservation on SLA 7000 Tooling Style

The SFP function is not effective with the Tooling style on the SLA 7000, especially when High Resolution Spatial Tolerance is also enabled. This can be seen on trailing edges of parts.

Work-around: None identified

Fill Vector Cure Depth

In the Modify Build Styles/Edit Parameters/Fill dialog, the "Up Fill Overcure" and "Down Fill Overcure" values are really "Up Fill Cure Depth" and "Down Fill Cure Depth."

Work-around: None required

Support Argument File (SRG) Mix-up

A platform can have the wrong SRG file attached to it under certain circumstances. The scenario is: open, load, and close a platform; then open, load, and save a platform with a different machine type. If you then open the first platform, the SRG file will be the one specified in the second platform.

Work-around: Use Browse to open the correct SRG file.

Application Error (Dr. Watson) on Part Rotation

In the part selection mode, clicking and holding the left mouse button allows drag and drop part placement of selected parts. Clicking and holding the right mouse button allows interactive part rotation about the select axis. Clicking and holding both the left and right mouse buttons can cause an application error.

Work-around: Use only one mouse button at a time.



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