Tcl3D demos at a glance

Document generated with Tcl 8.5.8 on 2010/12/31 13:50:21

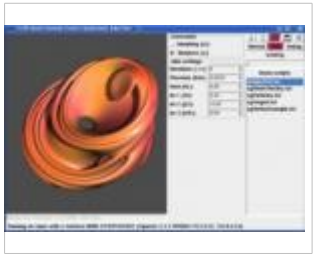
Overview	
Category	Type
LibrarySpecificDemos	tcl3dCg
	tcl3dFTGL
	tcl3dGauges
	tcl3dOde
	tcl3dOgl
	tcl3dOglExt
	tcl3dSDL
	tcl3dTogl
Tcl3DSpecificDemos	rtVis
TutorialsAndBooks	CodeSampler
	GameProgrammer
	NeHe
	Nopper
	RedBook
OpenSceneGraph	CubosLocos
	FopingTutorials
	NPS-Tutorials
	OsgHelp
	QuickStartGuide

Category:	**LibrarySpecificDemos**
Root:	Contents
Types:	tcl3dCg tcl3dFTGL tcl3dGauges tcl3dOde tcl3dOgl tcl3dOglExt tcl3dSDL tcl3dTogl

Type:	**tcl3dCg**
Category:	LibrarySpecificDemos
Root:	Contents

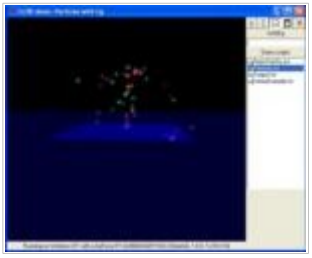
This section contains Cg demo applications from several resources, that have been ported to Tcl3D. The examples cover vertex and fragment shader programming in Cg.
Original sources from different sites. See the documentation for details.

Available demos

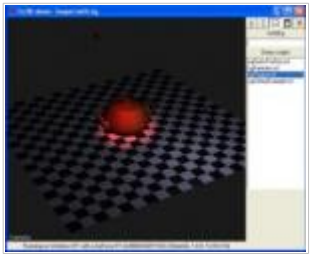


QJuliaGPU

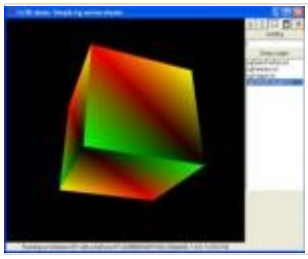
cgFireInTheSky



cgParticles

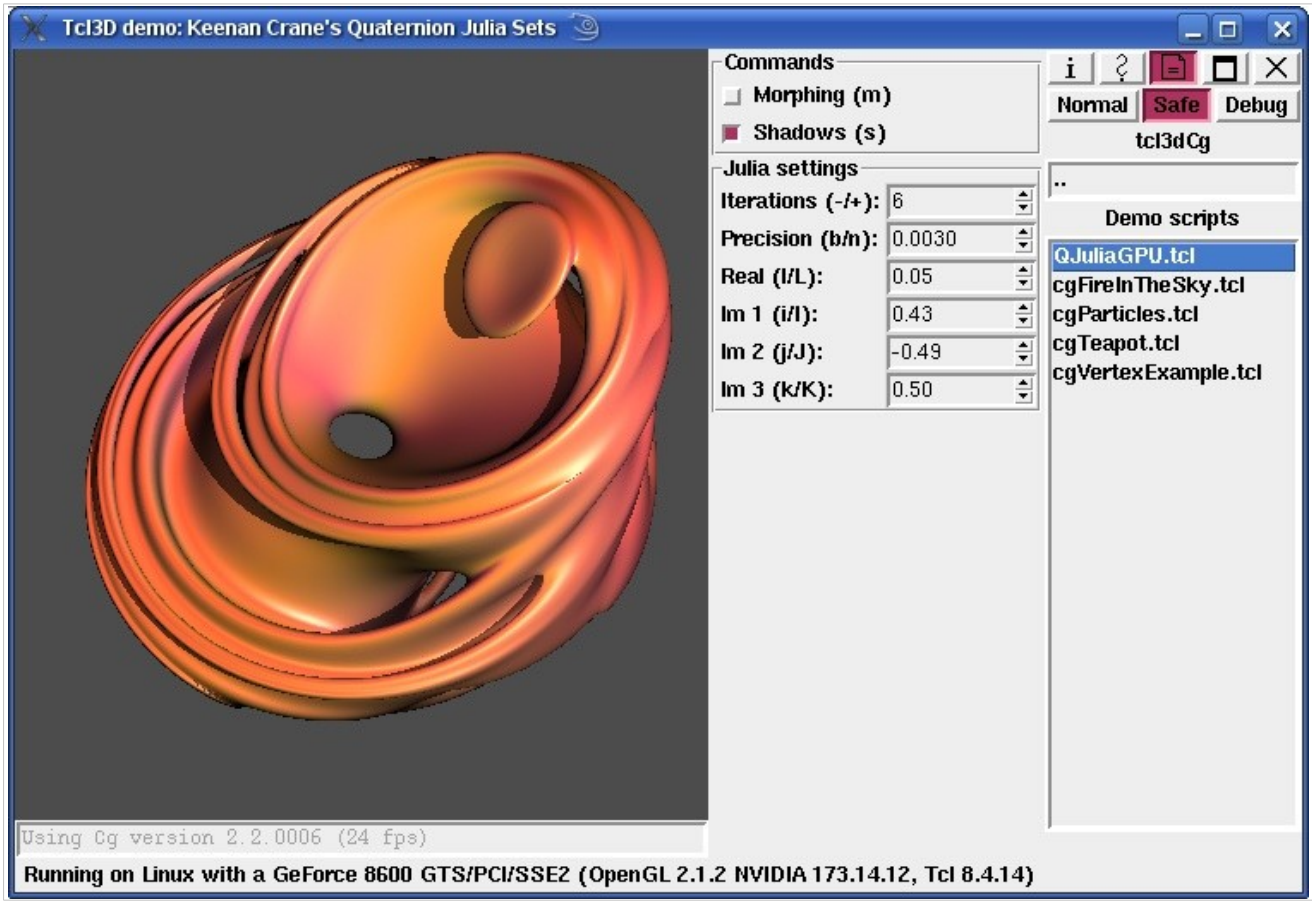


cgTeapot



cgVertexExample

Demo:	**QJuliaGPU**
Type:	tcl3dCg
Category:	LibrarySpecificDemos
Root:	Contents




```
QJuliaGPU -- Keenan Crane (kcrane@uiuc.edu)
4/17/2004

This program ray traces the quaternion Julia set in a fragment shader
using the sphere tracing method.  The program draws a fullscreen quad
where each fragment of the quad specifies a different ray.  These rays
are passed to the fragment shader which iteratively takes conservative
steps along a ray as determined by a distance estimator for the set. The
rays will either stop when close to an isosurface of the distance
function (considered a hit), or leave the bounding sphere of the Julia
set.  If the ray is a hit, shading is performed by approximating the
gradient of the distance function and using this as a surface normal.

A more complete description of the sphere tracing method can be found in
John Hart's paper, "Ray Tracing Deterministic 3-D Fractals"
(http://graphics.cs.uiuc.edu/~jch/papers/rtqjs.pdf).

Controls:

   left mouse button:    rotate view
   middle mouse button:  zoom in/out
   right mouse button:   translate view
   m:                    toggle morph animation
   s:                    toggle shadows on/off
   r:                    reload shaders from disk
   i/I:                  increment/decrement 1st imaginary component of Julia set
constant
   j/J:                  increment/decrement 2nd imaginary component of Julia set
```

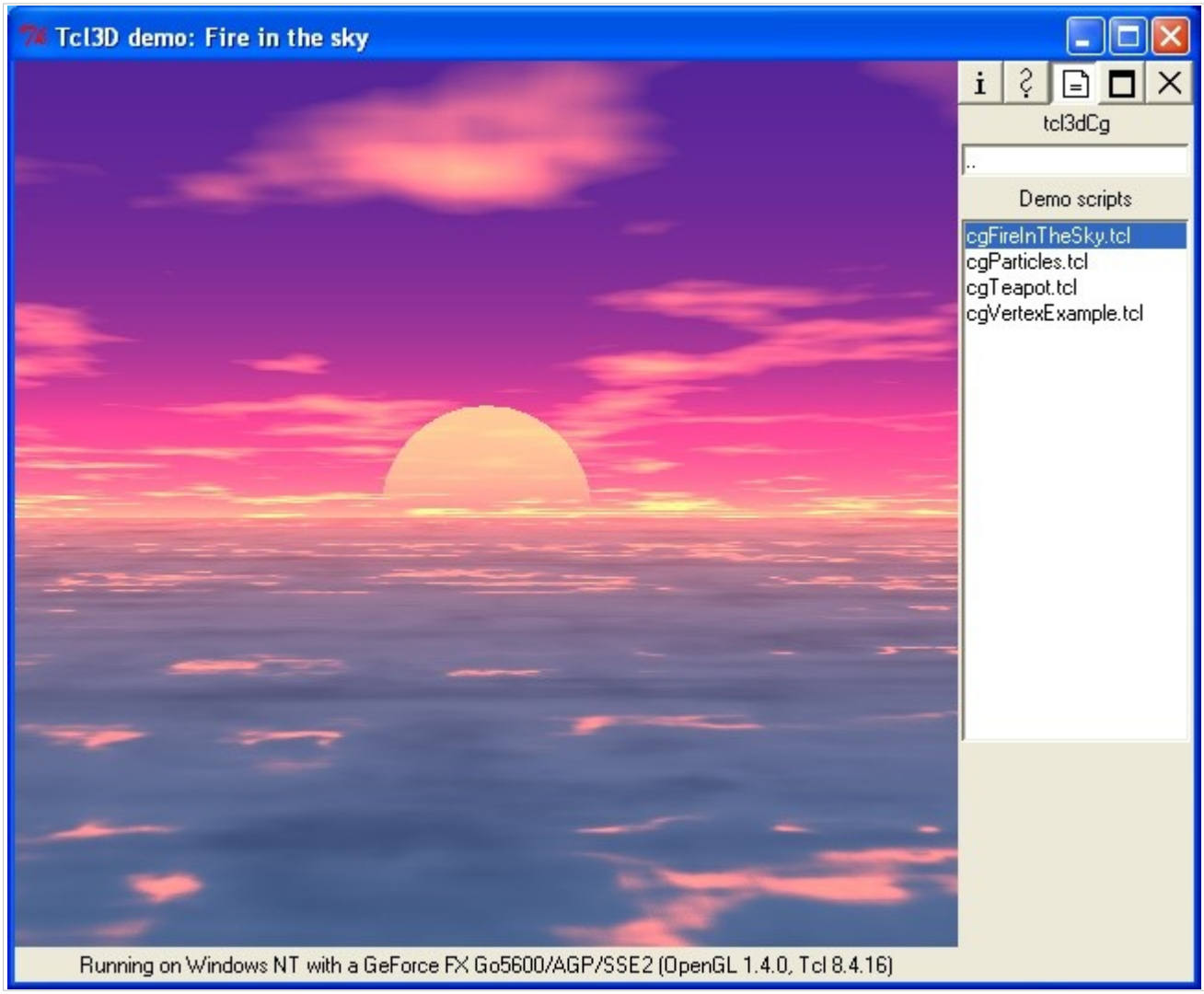
```
constant
    k/K:                  increment/decrement 3rd imaginary component of Julia set
constant
    l/L:                  increment/decrement real component of Julia set constant
    -/+:                   change number of iterations used to test convergence of
a point
    b/n:                  change precision of rendering

 By default the program will shift through a random constants for the
 Julia set within the cube [-1,1]^4.  Increasing the number of iterations
 or the precision will increase the amount of detail seen in the
 rendering.  The former more accurately determines whether a point is
 included in the set, whereas the latter intersects an isosurface of the
 distance function closer to the actual set.  Both of these parameters run
 into precision or computation limits when set too high.


 Original C++ and Cg code by Keenan Crane (kcrane@uiuc.edu)
 See http://www.cs.caltech.edu/~keenan/project_qjulia.html for the original files.

 Modified for Tcl3D by Paul Obermeier 2009/08/29
 See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**cgFireInTheSky**
Type:	tcl3dCg
Category:	LibrarySpecificDemos
Root:	Contents




```
cgFireInTheSky.tcl

Original files from: http://www.shadertech.com/shaders/FireInTheSky-src.zip

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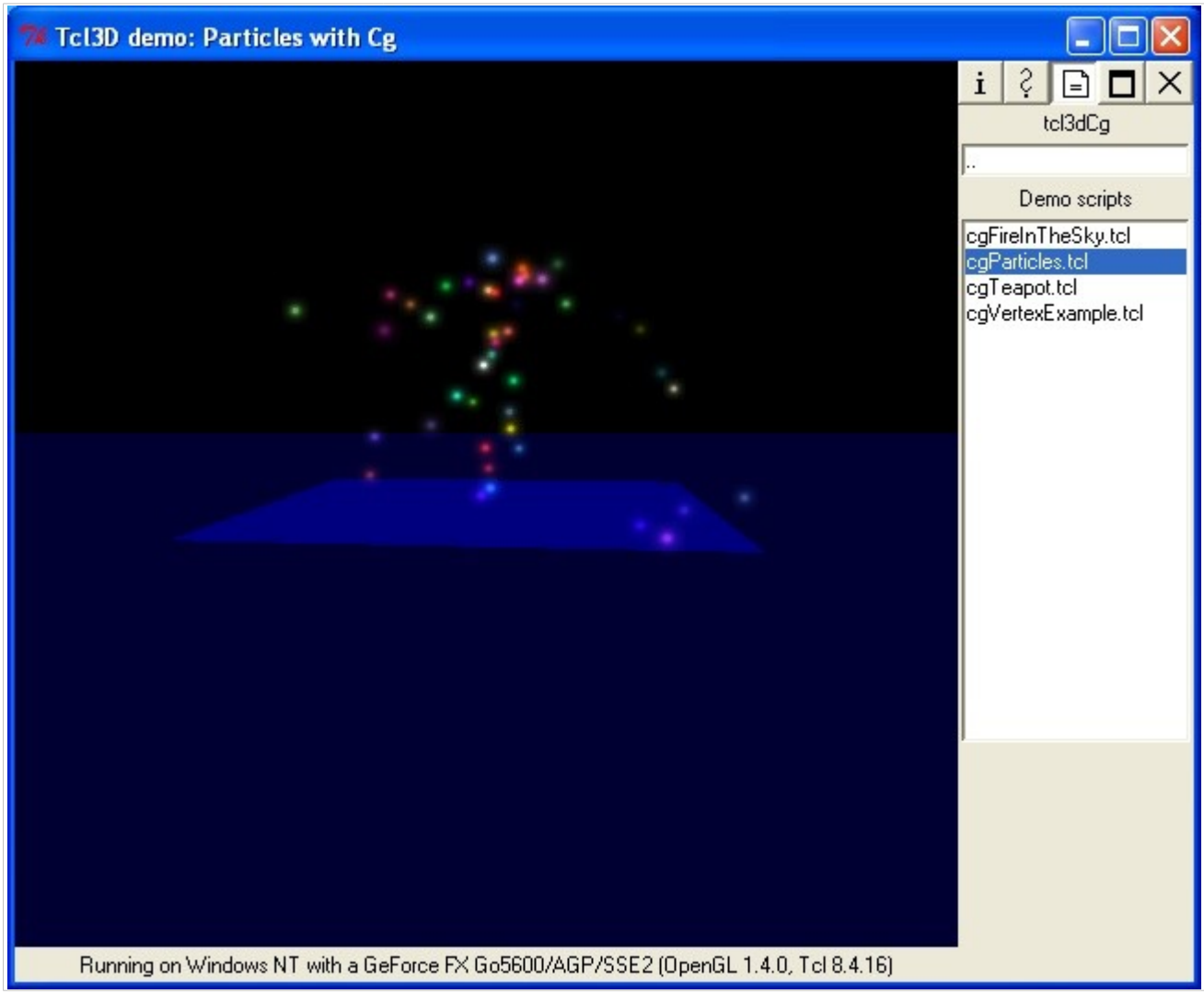
```

```
Modified for Tcl3D by Paul Obermeier 2005/11/07
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**cgParticles**
Type:	tcl3dCg
Category:	LibrarySpecificDemos
Root:	Contents




```
cgParticles.tcl

Particle Effects using CG and OpenGL

Original files from: http://www.shadertech.com/shaders/ParticleSystem-src.zip

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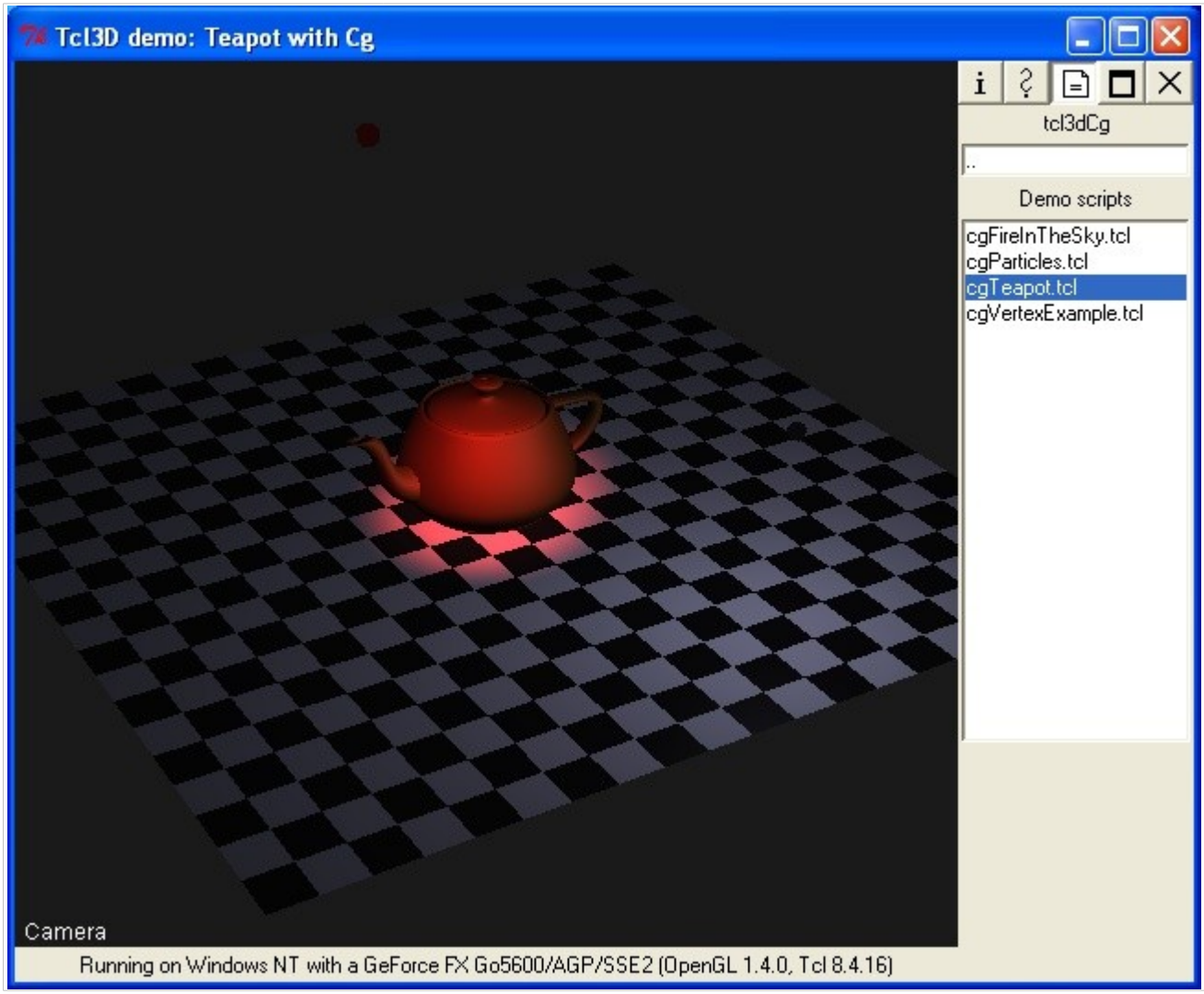
Modified for Tcl3D by Paul Obermeier 2005/11/07
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**cgTeapot**
Type:	tcl3dCg
Category:	LibrarySpecificDemos
Root:	Contents

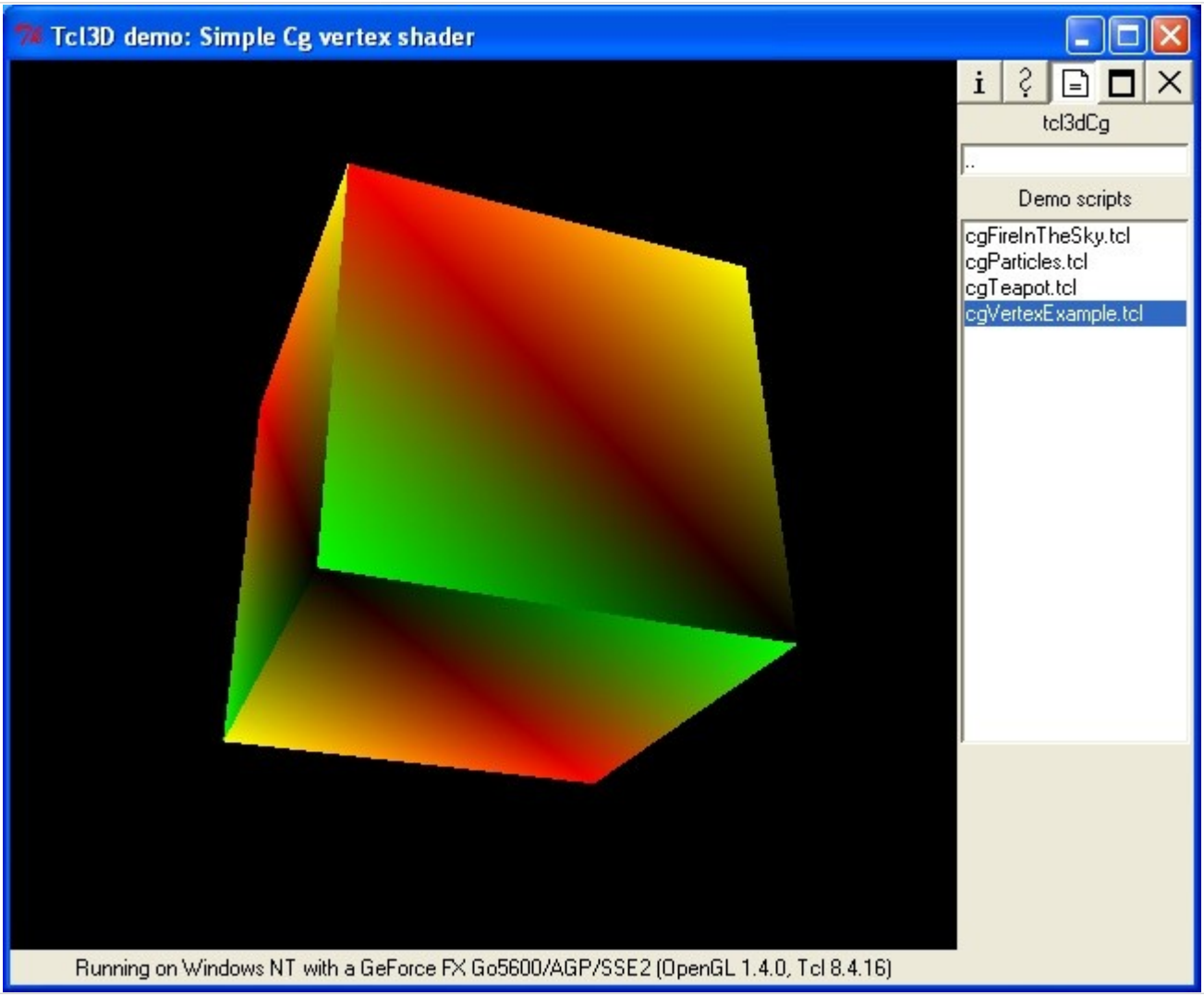



```
cgTeapot.tcl

Original files from: http://developer.nvidia.com/Cg
This is the example called interfaces_ogl as included in the Cg Toolkit.

Modified for Tcl3D by Paul Obermeier 2005/11/07
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**cgVertexExample**
Type:	tcl3dCg
Category:	LibrarySpecificDemos
Root:	Contents




```
cgVertexExample.tcl

Original files from: http://developer.nvidia.com/Cg
This is the example called runtime_ogl as included in the Cg Toolkit.

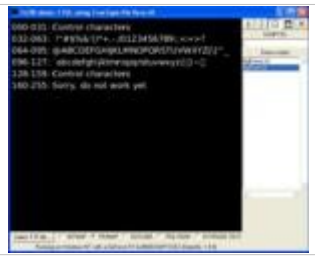
Modified for Tcl3D by Paul Obermeier 2005/11/07
See www.tcl3d.org for the Tcl3D extension.
```

Type:	**tcl3dFTGL**
Category:	LibrarySpecificDemos
Root:	Contents

This section contains FTGL demo applications written in Tcl3D. The examples cover the demo applications distributed with FTGL.

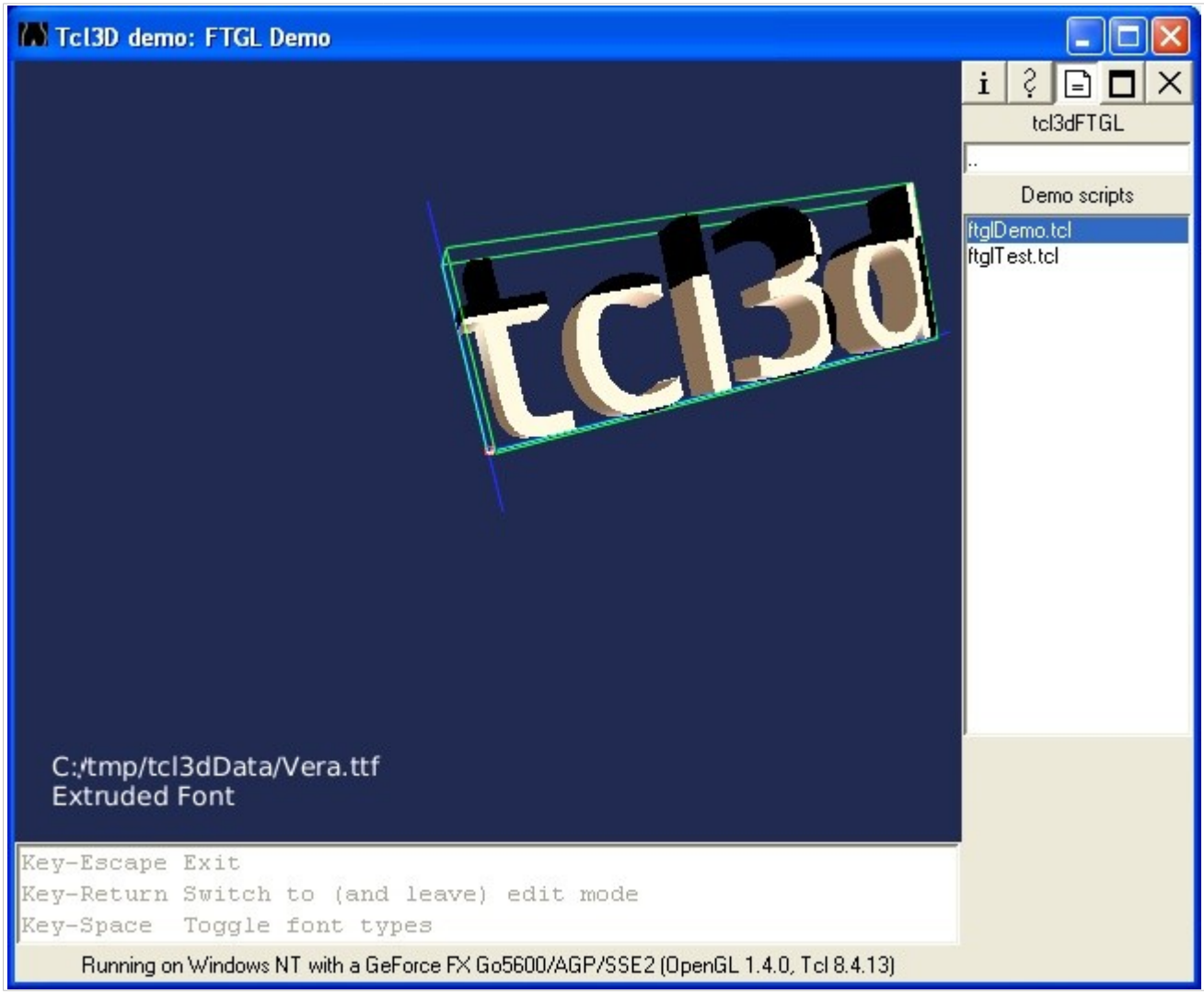
Available demos

ftglDemo



ftglTest

Demo:	**ftglDemo**
Type:	tcl3dFTGL
Category:	LibrarySpecificDemos
Root:	Contents




```
ftglDemo.tcl

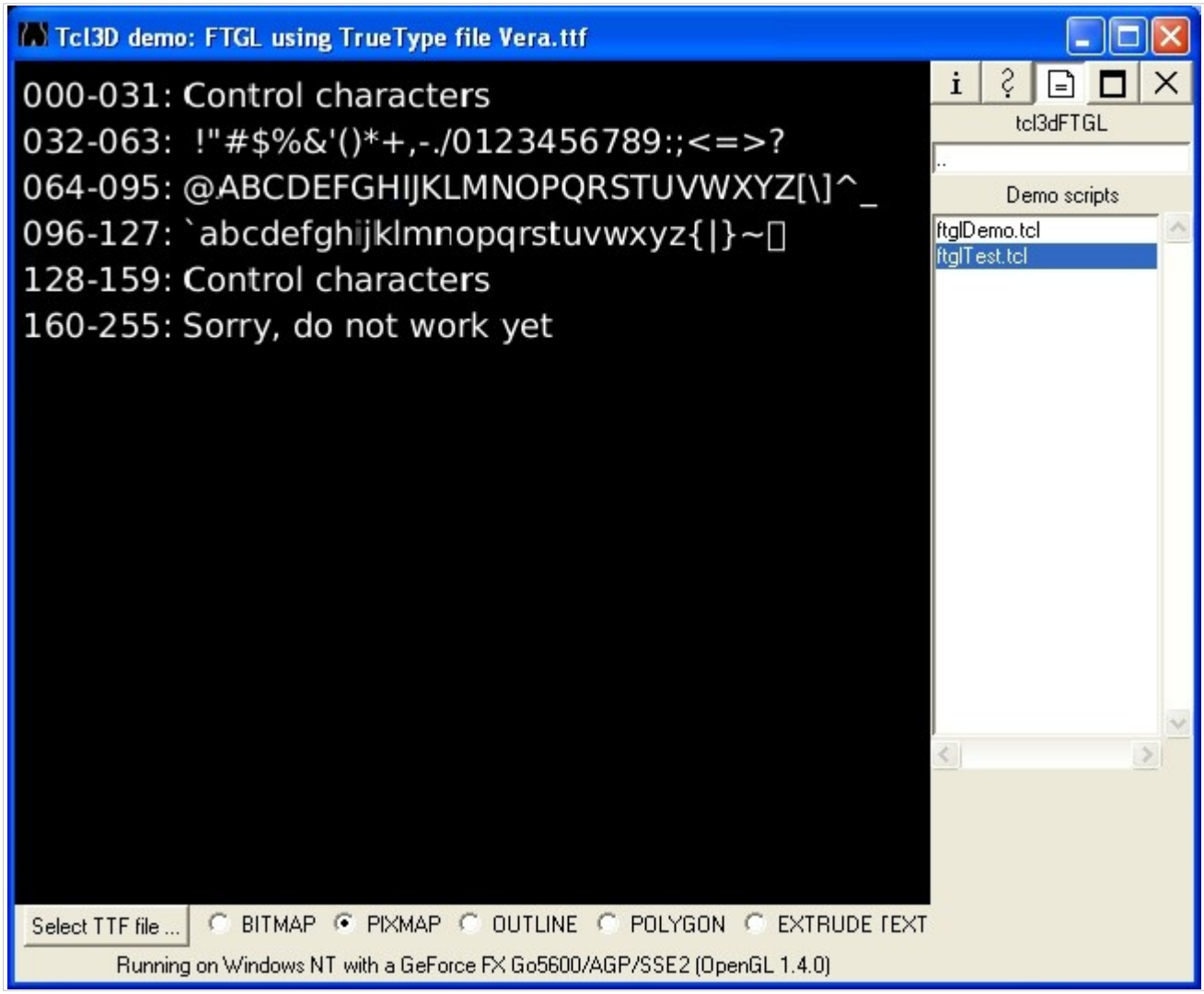
This demo demonstrates the different rendering styles available with FTGL.
Press <n> to change the font rendering style.
Press <enter> to enable edit mode.

Please contact me if you have any suggestions, feature requests, or problems.

Henry Maddocks
henryj@paradise.net.nz
http://homepages.paradise.net.nz/henryj/

Modified for Tcl3D by Paul Obermeier 2006/01/18
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ftglTest**
Type:	tcl3dFTGL
Category:	LibrarySpecificDemos
Root:	Contents




```
ftglTest.tcl

C++ source changed by mrn@paus.ch/ max rheiner
original source: henryj@paradise.net.nz

Modified for Tcl3D by Paul Obermeier 2006/01/18
See www.tcl3d.org for the Tcl3D extension.

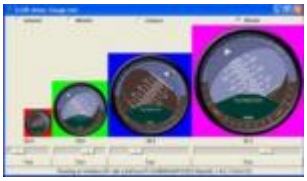
A test program showing the 5 different font rendering types.
```

Type:	**tcl3dGauges**
Category:	LibrarySpecificDemos
Root:	Contents

This section contains demo applications written with Tcl3D extensions packages. The examples cover the tcl3dGauges package, which was supplied by Victor G. Bonilla.

Available demos

gaugedemo



gaugetest

Demo:	**gaugedemo**
Type:	tcl3dGauges
Category:	LibrarySpecificDemos
Root:	Contents


```
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                and redistribution of this file, and for a
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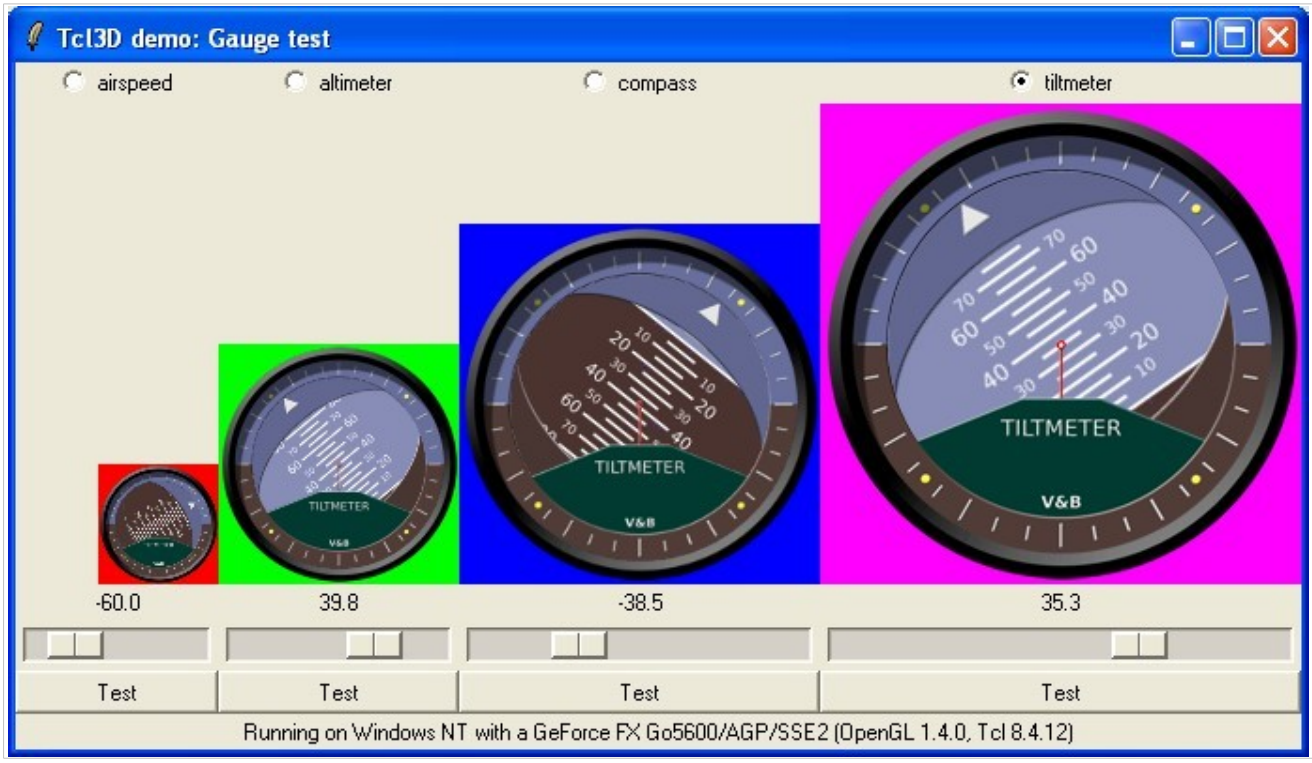
Module:         Tcl3D -> tcl3dGauges
Filename:       gaugedemo.tcl

Author:         Paul Obermeier

Description:    Demo program showing the use of the Tcl3D extension
                package gauge.
```

Demo:	**gaugetest**
Type:	tcl3dGauges
Category:	LibrarySpecificDemos
Root:	Contents




```
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Module:         Tcl3D -> tcl3dGauges
Filename:       gaugetest.tcl

Author:         Paul Obermeier

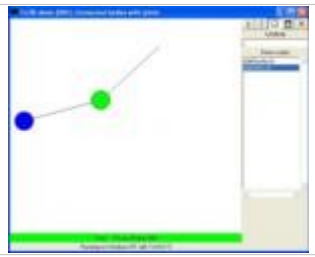
Description:    Test program for the Tcl3D extension package gauge.
                The program allows to show the 4 gauges at different sizes.
```

Type:	**tcl3dOde**
Category:	LibrarySpecificDemos
Root:	Contents

This section contains ODE demo applications written in Tcl3D. The examples cover some demo applications distributed with PyOde.

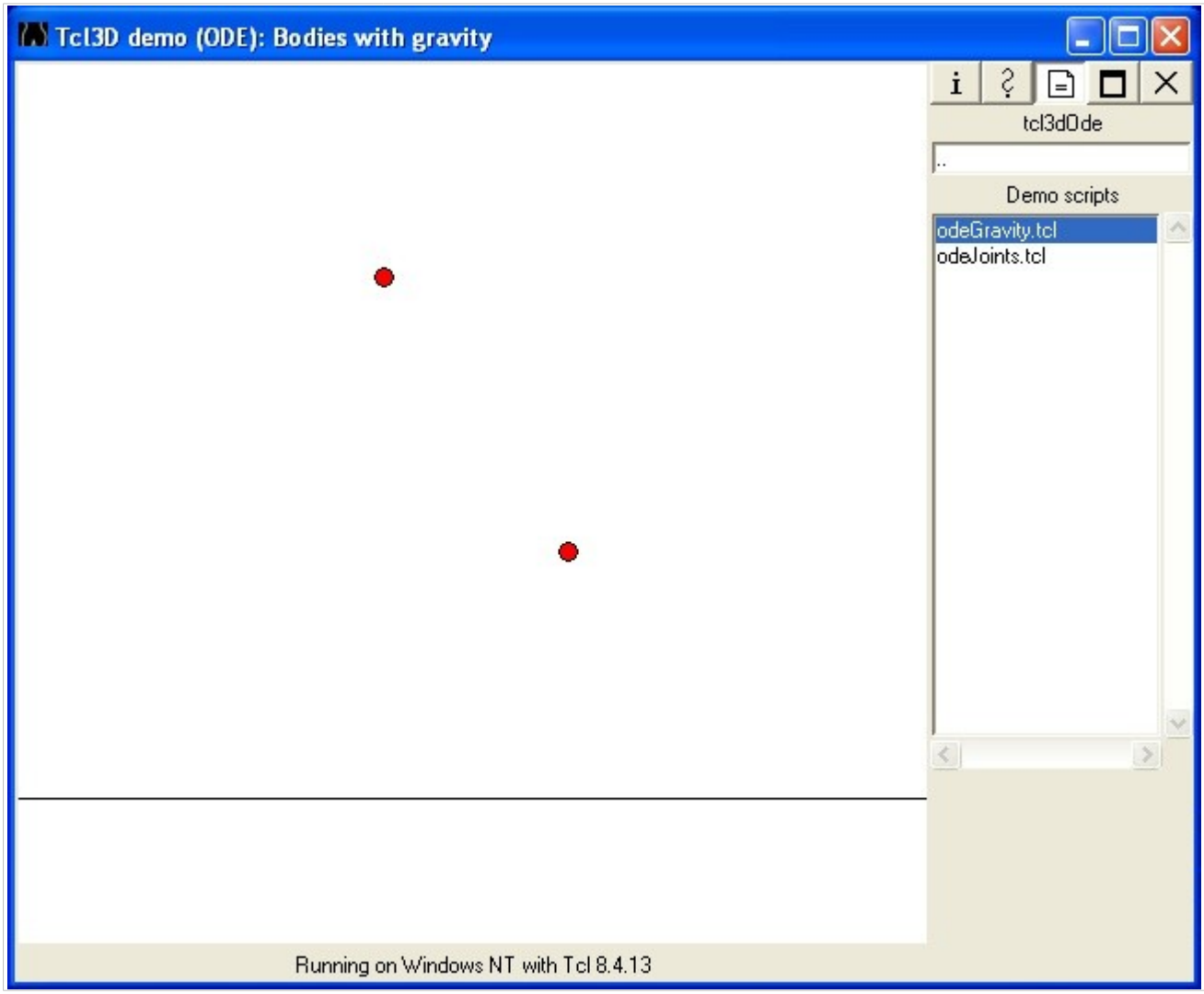
Available demos

odeGravity



odeJoints

Demo:	**odeGravity**
Type:	tcl3dOde
Category:	LibrarySpecificDemos
Root:	Contents




```
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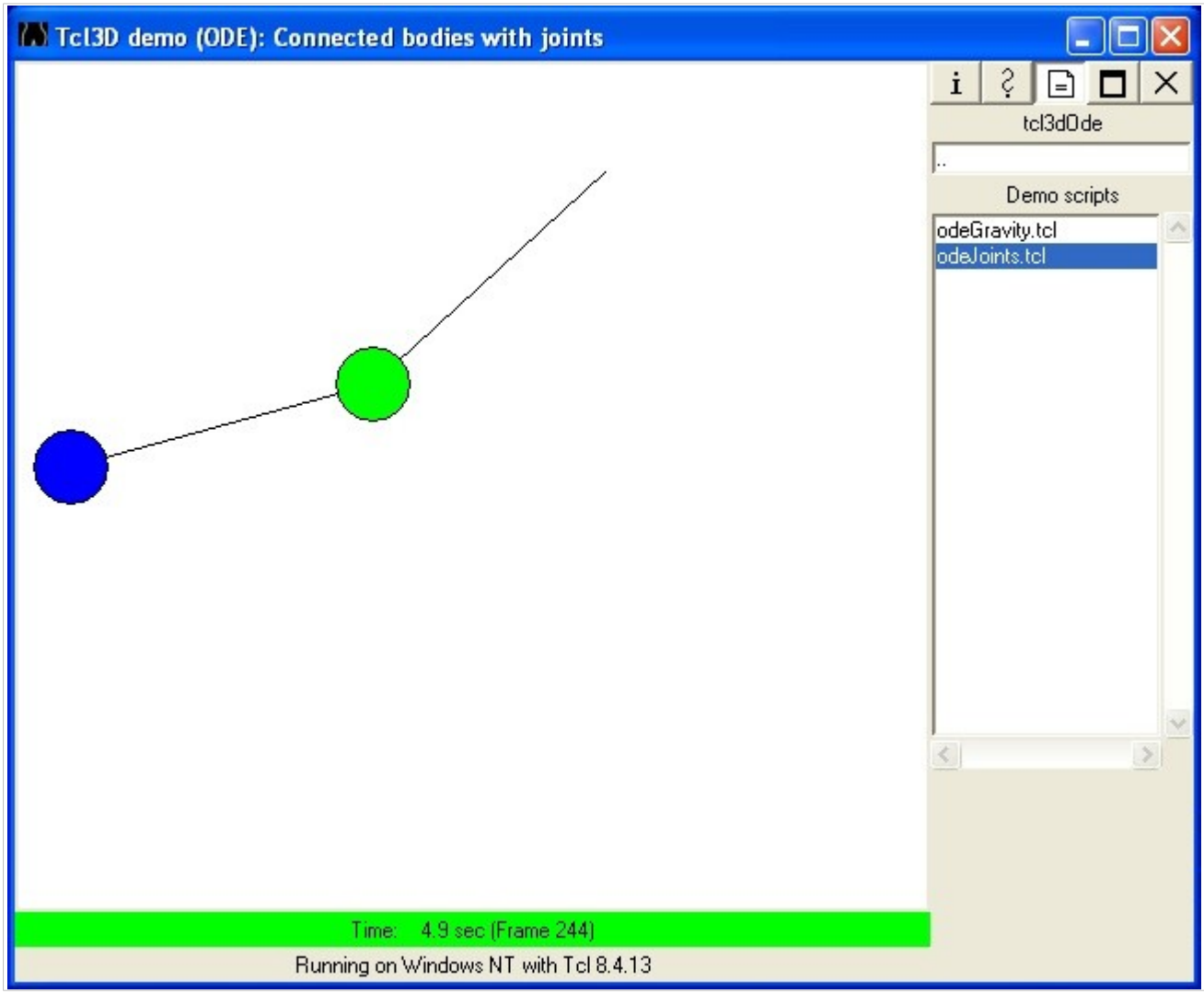
Module:         Tcl3D -> tcl3dOde
Filename:       odeGravity.tcl

Author:         Paul Obermeier

Description:    Tcl3D Ode example: Bodies influenced by gravity.
                Based on PyODE Tutorial 1 By Matthias Baas.
```

Demo:	**odeJoints**
Type:	tcl3dOde
Category:	LibrarySpecificDemos
Root:	Contents




```
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Module:         Tcl3D -> tcl3dOde
Filename:       odeJoints.tcl

Author:         Paul Obermeier

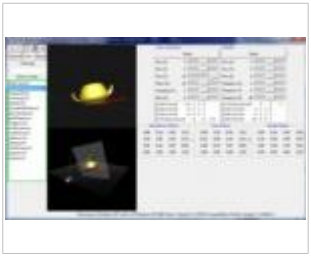
Description:    Tcl3D Ode example: Connected bodies with joints
                Based on PyODE Tutorial 2 By Matthias Baas.
```

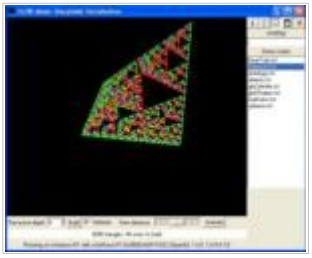
Type:	**tcl3dOgl**
Category:	LibrarySpecificDemos
Root:	Contents

This section contains OpenGL demo applications from several resources, that have been ported to Tcl3D. The examples cover basic OpenGL programming.
Original sources from different sites. See the documentation for details.

Available demos

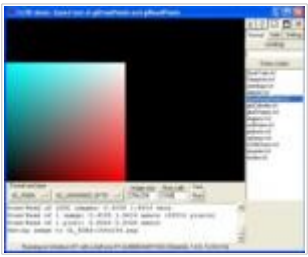

GearTrain


ModelViewMatrix


Sierpinski

animlogo

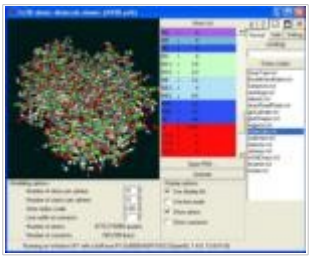

atlantis


drawReadPixels


gluCylinder

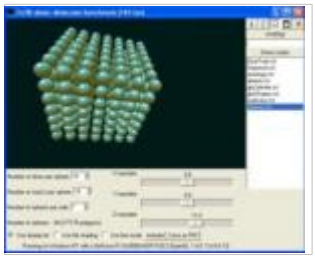

glutShapes


imgproc

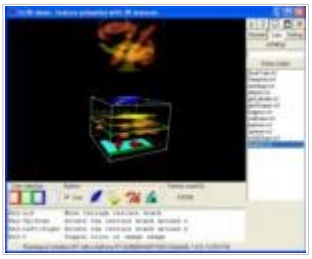

molecules


multiview

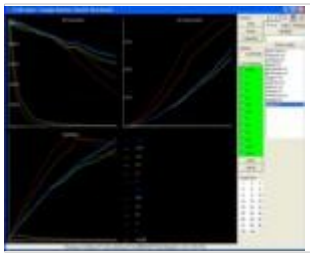

platonic


spheres

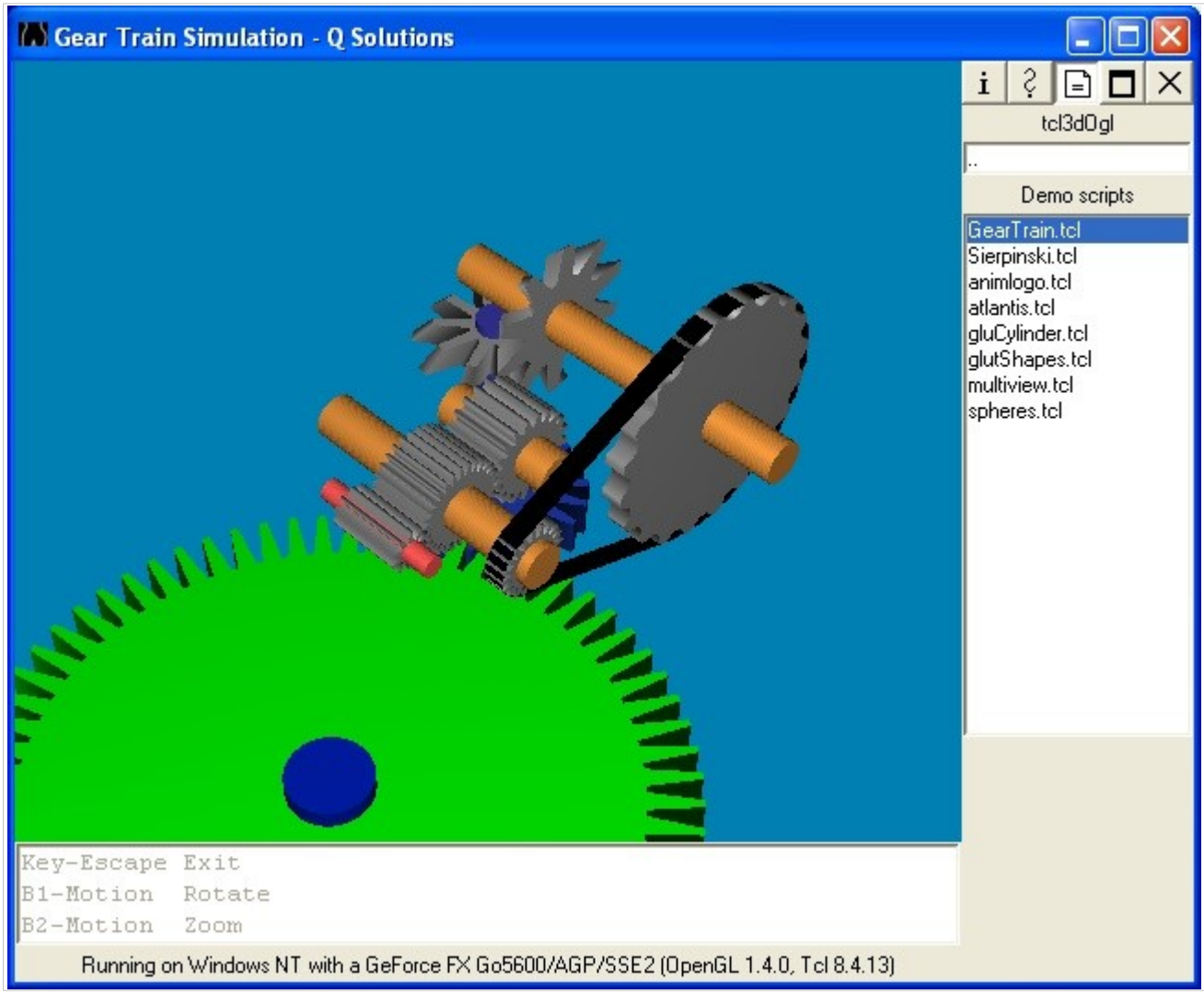

tcl3dChaos


texanim


texgen


trislam

Demo:	**GearTrain**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
GearTrain.tcl

GearTrain Simulator * Version:  1.00

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<skdutta@del3.vsnl.net.in>

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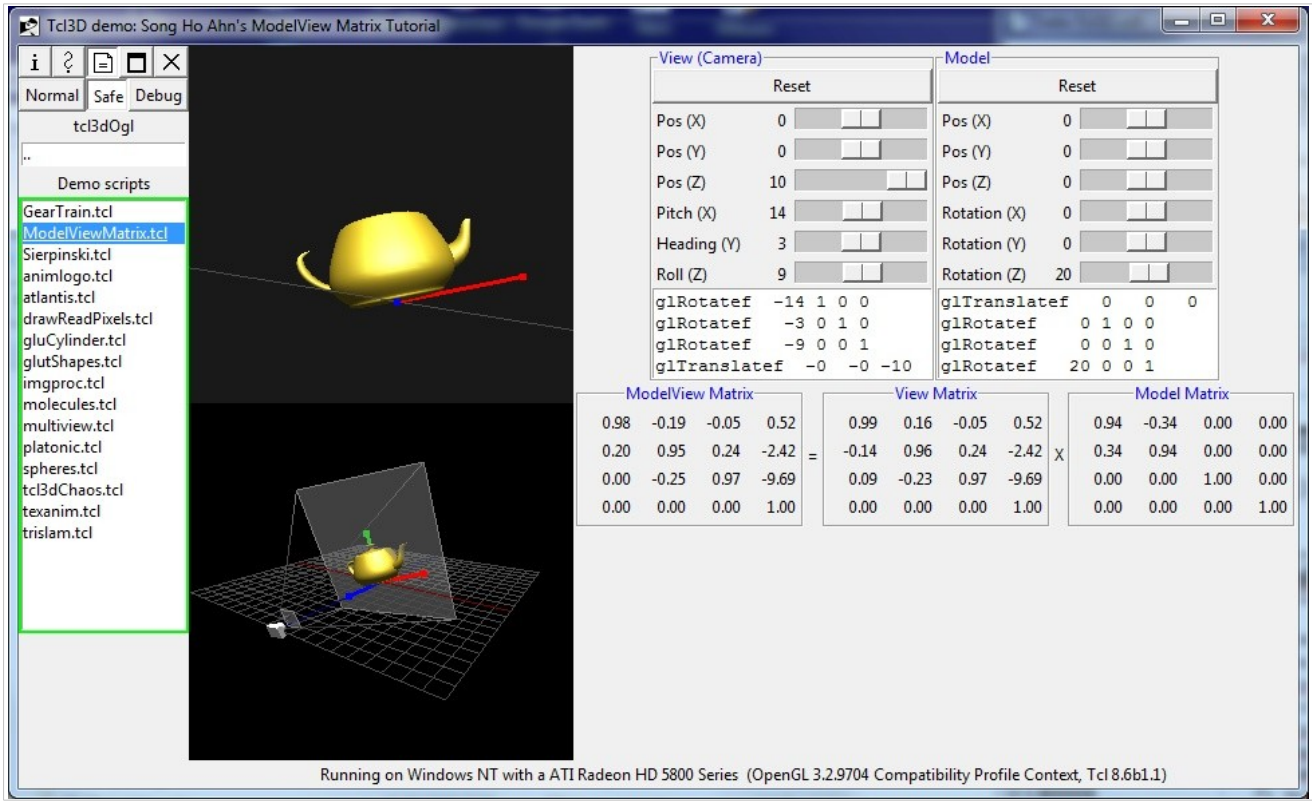
Slightly modified for Tcl3D presentation by Paul Obermeier 2006/08/02
See www.tcl3d.org for the Tcl3D extension.
```

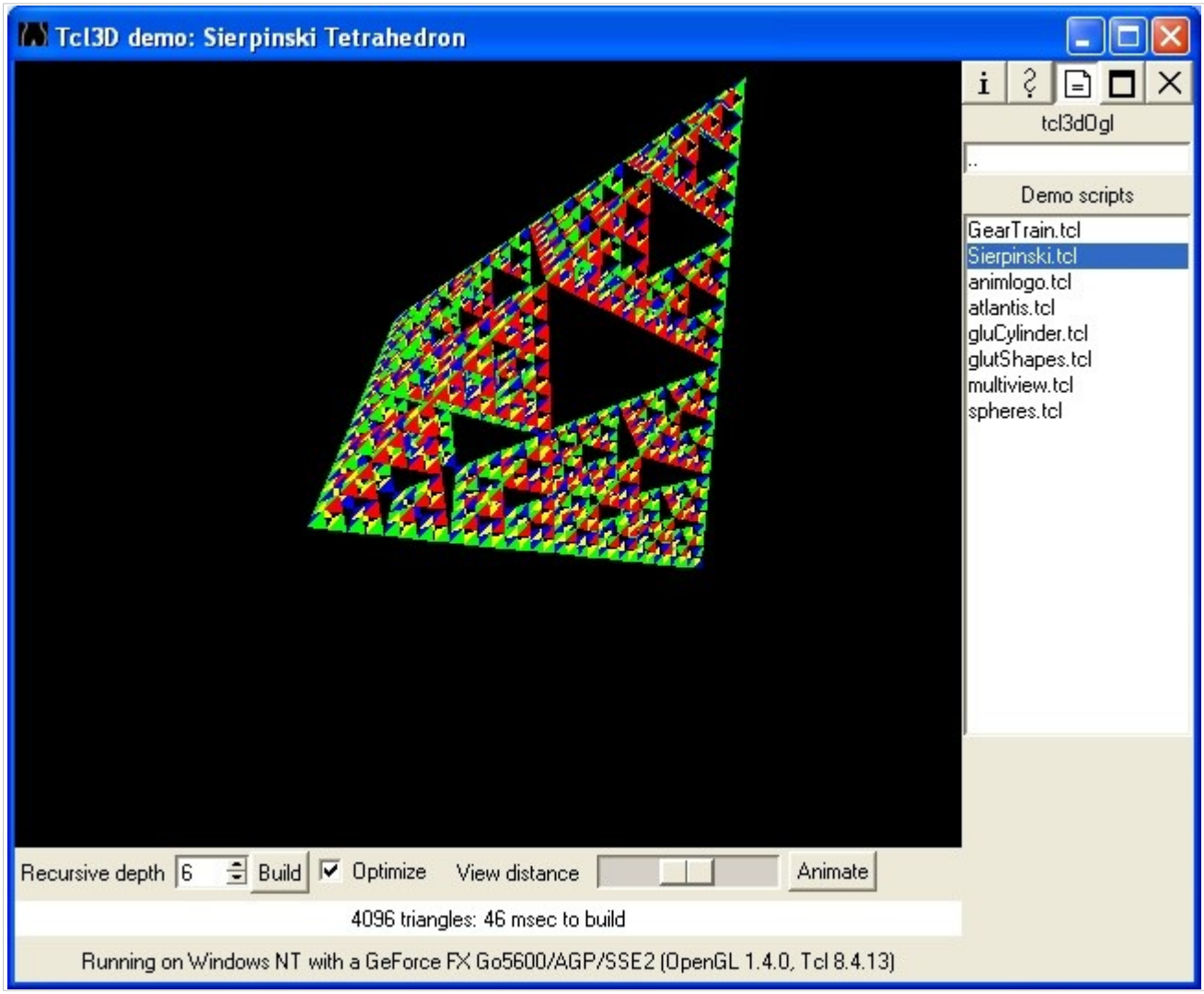
Demo:	**ModelViewMatrix**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
Tutorial OpenGL Transformation
Original C++ code by Song Ho Ahn (song.ahn@gmail.com)
See www.songho.ca/opengl/gl_transform.html for the original files

Modified for Tcl3D by Paul Obermeier 2009/09/13
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Sierpinski**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
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Module:         Tcl3D -> tcl3dOgl
Filename:       Sierpinski.tcl

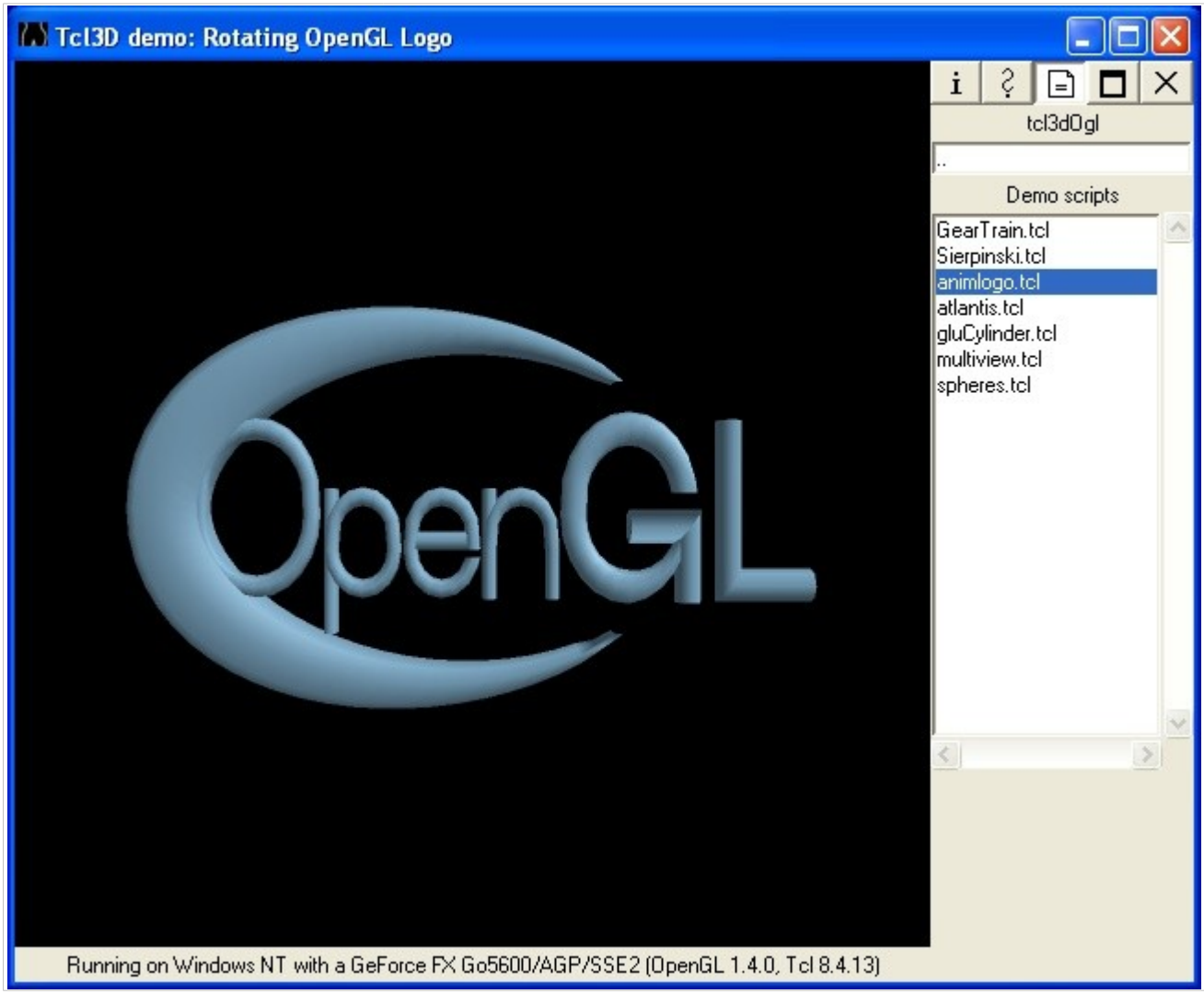
Author:         Paul Obermeier

Description:    Tcl3D demo displaying a 3D Sierpinski Tetrahedron.

                Derived from a demo by Gerard Sookahet (tetra-3dc.tcl),
                which used the 3dcanvas package.
                The original version is at: http://wiki.tcl.tk/11832.

                Incorporates optimization functions by Philip Quaife.
                See the Tcl'ers Wiki http://wiki.tcl.tk/14820 for a
                description of his optimizations.
```

Demo:	**animlogo**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
animlogo.tcl

The animated OpenGL logo

This file is part of the openGL-logo demo.
(c) Henk Kok (kok@wins.uva.nl)

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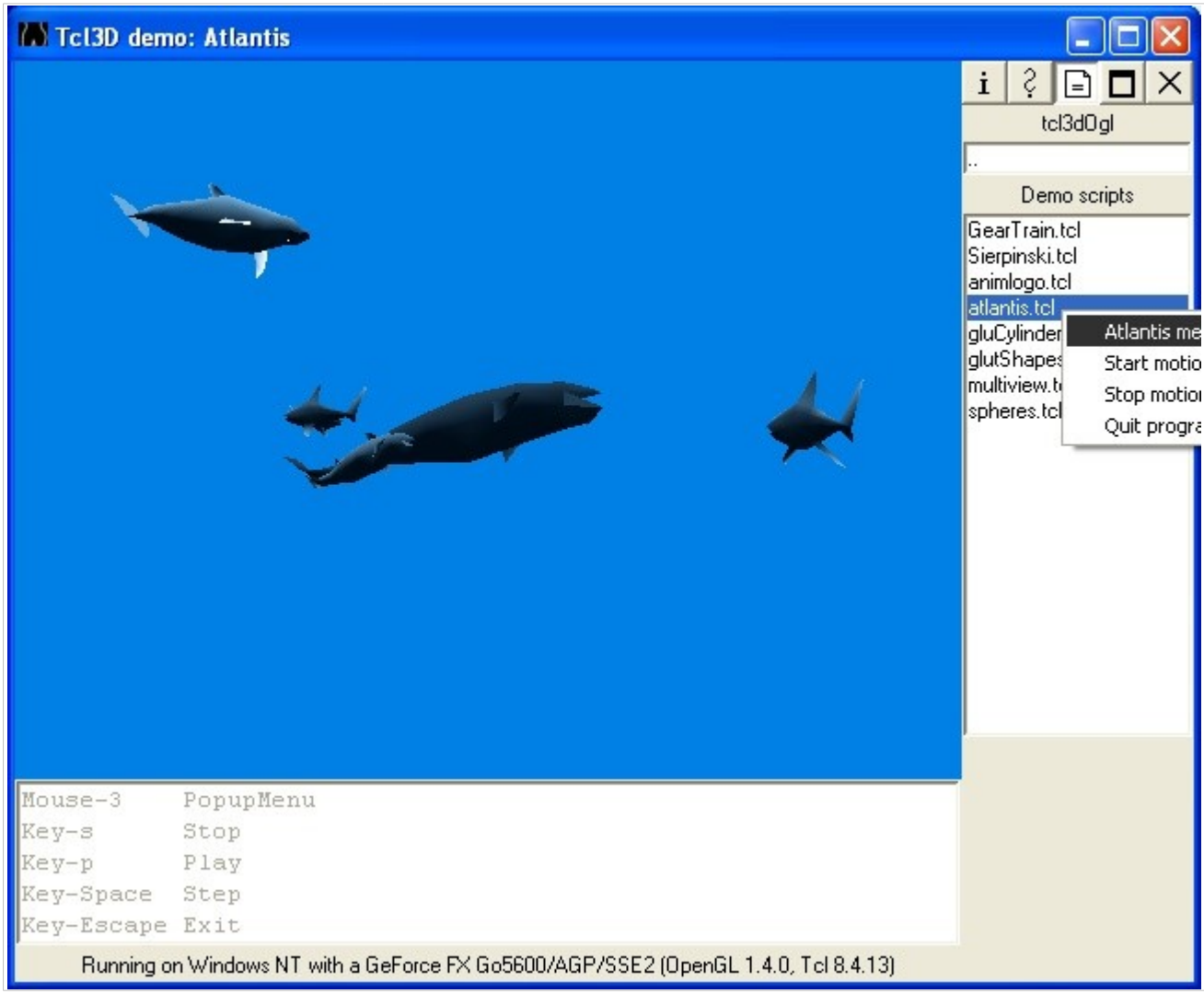
notice and the Dutch variable names :) stay in tact.

Original sources available at:
http://www.opengl.org/resources/code/samples/glut_examples/demos/demos.html

Modified for Tcl3D by Paul Obermeier 2006/08/02
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**atlantis**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
atlantis.tcl

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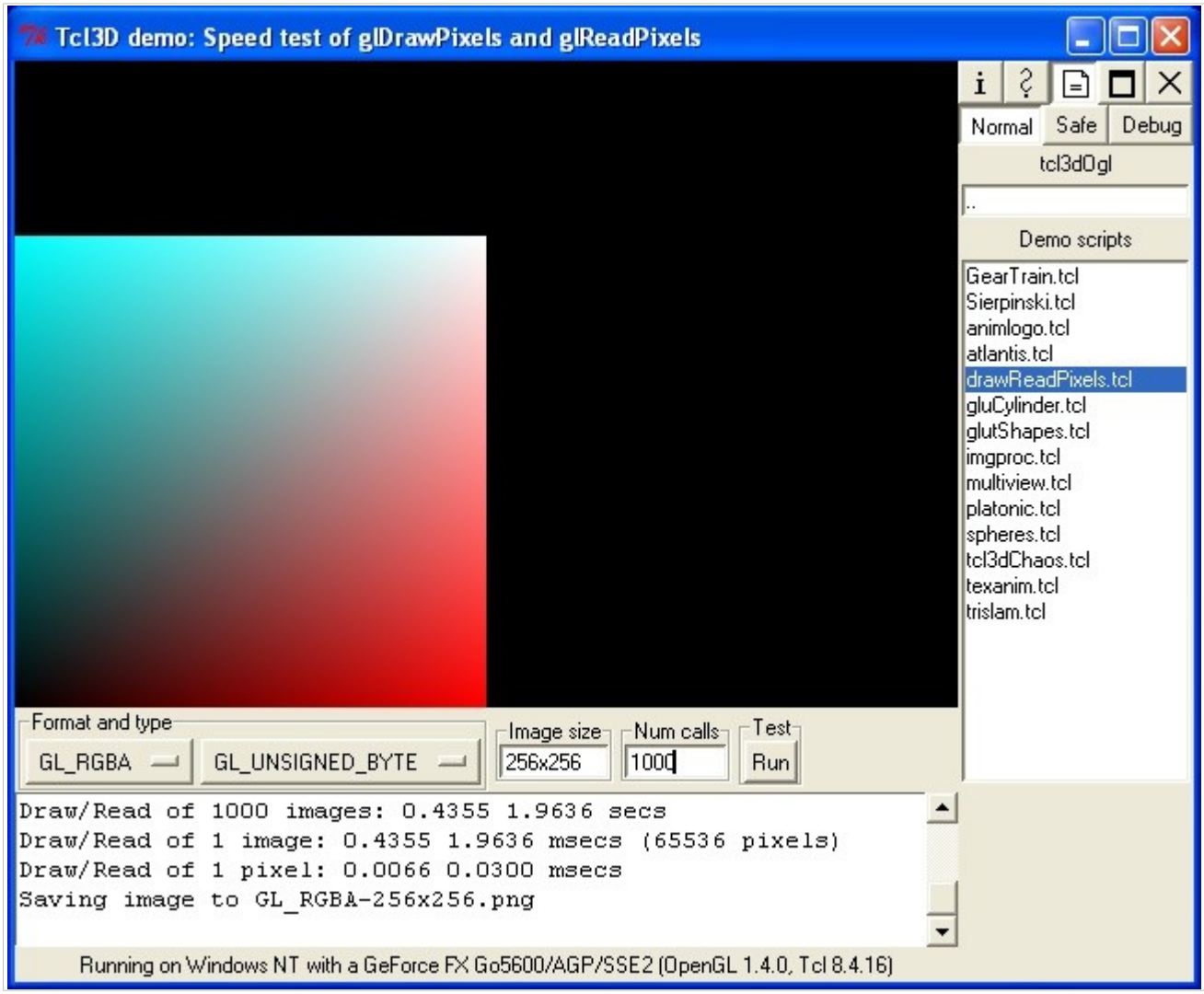
Original sources available at:
http://www.opengl.org/resources/code/samples/glut_examples/demos/demos.html

Modified for Tcl3D by Paul Obermeier 2005/08/14
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**drawReadPixels**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents

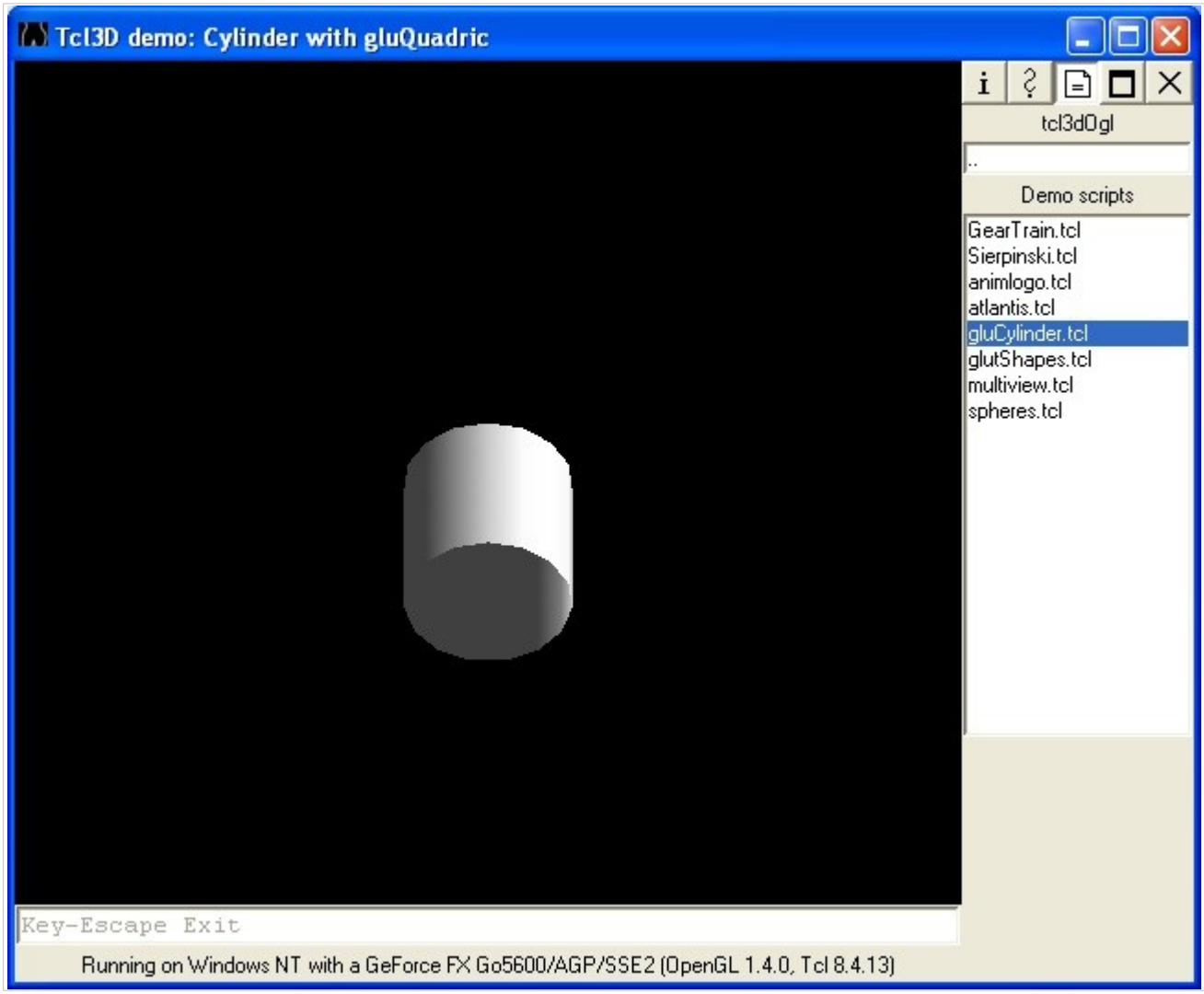



```
testDrawReadPixels.tcl

Tcl3D demo testing the speed of the glDrawPixels and glReadPixels functions.
The program generates a color gradient image of a specified size.
If the image size is greater than 256x256, the color gradient is tiled.
This image is then drawn into the framebuffer with glDrawPixels and read
back with glReadPixels several times.
The time needed for drawing and reading back is reported into a text widget
and onto stdout (for batch processing).
The format and type of the image data can be specified for testing the
differences in speed.
Currently the following formats and types are implemented:
Formats: GL_RGB, GL_BGR, GL_RGBA, GL_BGRA.
Types  : GL_UNSIGNED_BYTE

Author: Paul Obermeier
Date: 2009-07-16
```

Demo:	**gluCylinder**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
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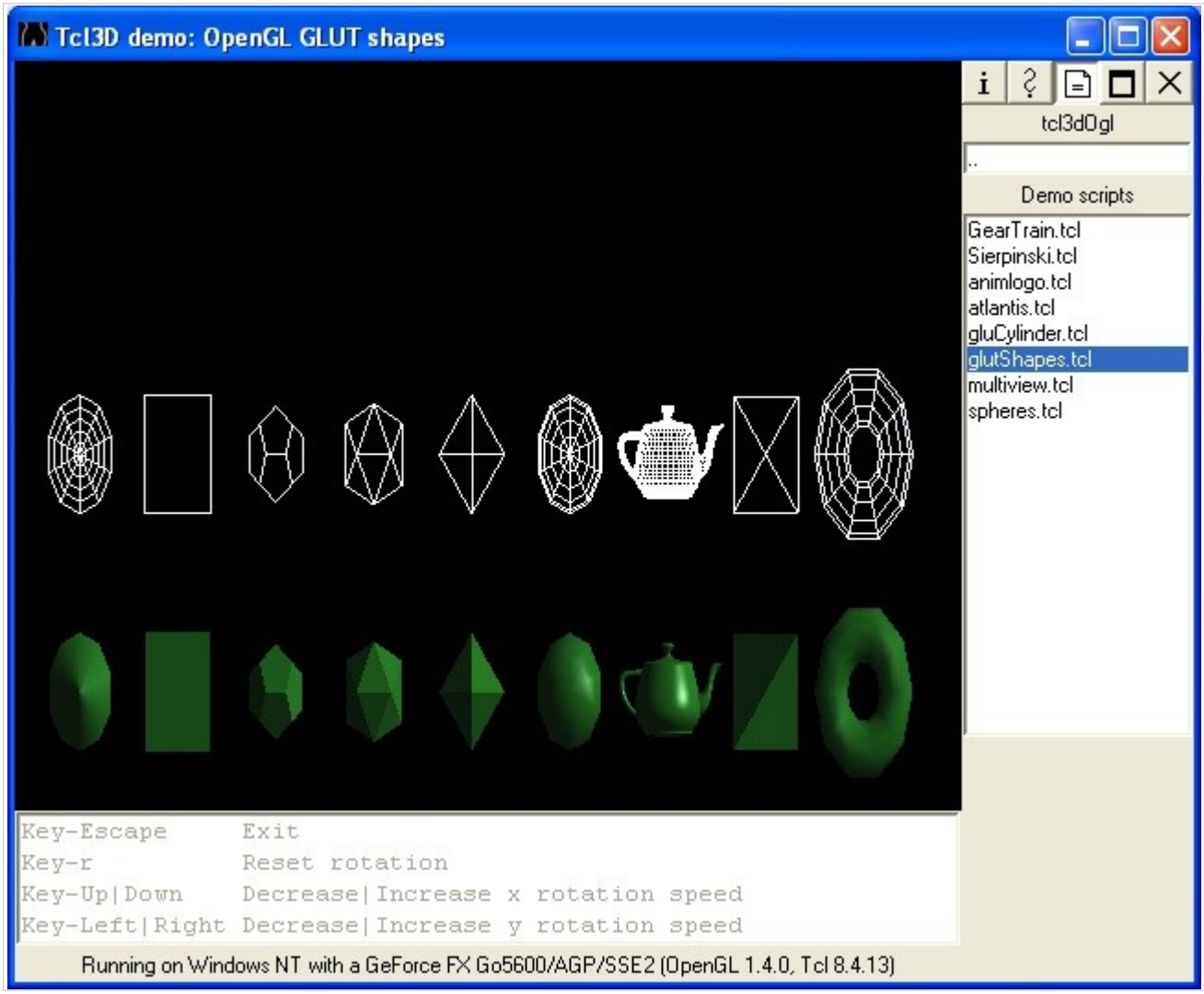
Module:         Tcl3D -> tcl3dOgl
Filename:       gluCylinder.tcl

Author:         Paul Obermeier

Description:    Tcl3D demo showing the use of gluQuadric routines
                to draw a cylinder.
```

Demo:	**glutShapes**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
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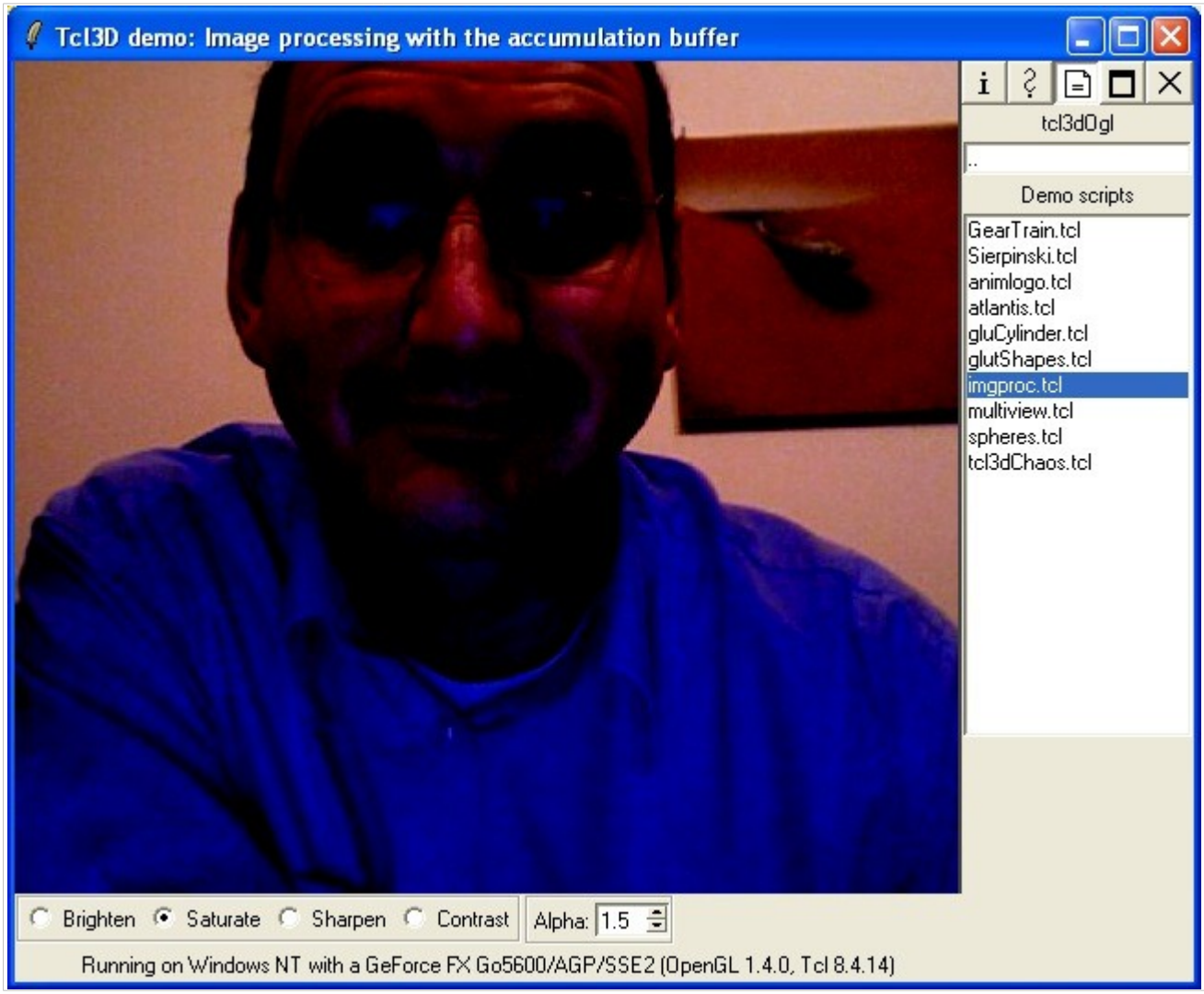
Module:         Tcl3D -> tcl3dOgl
Filename:       glutShapes.tcl

Author:         Paul Obermeier
Date:           2006-12-01

Description:    Tcl3D demo showing all supported GLUT shapes.
```

Demo:	**imgproc**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents



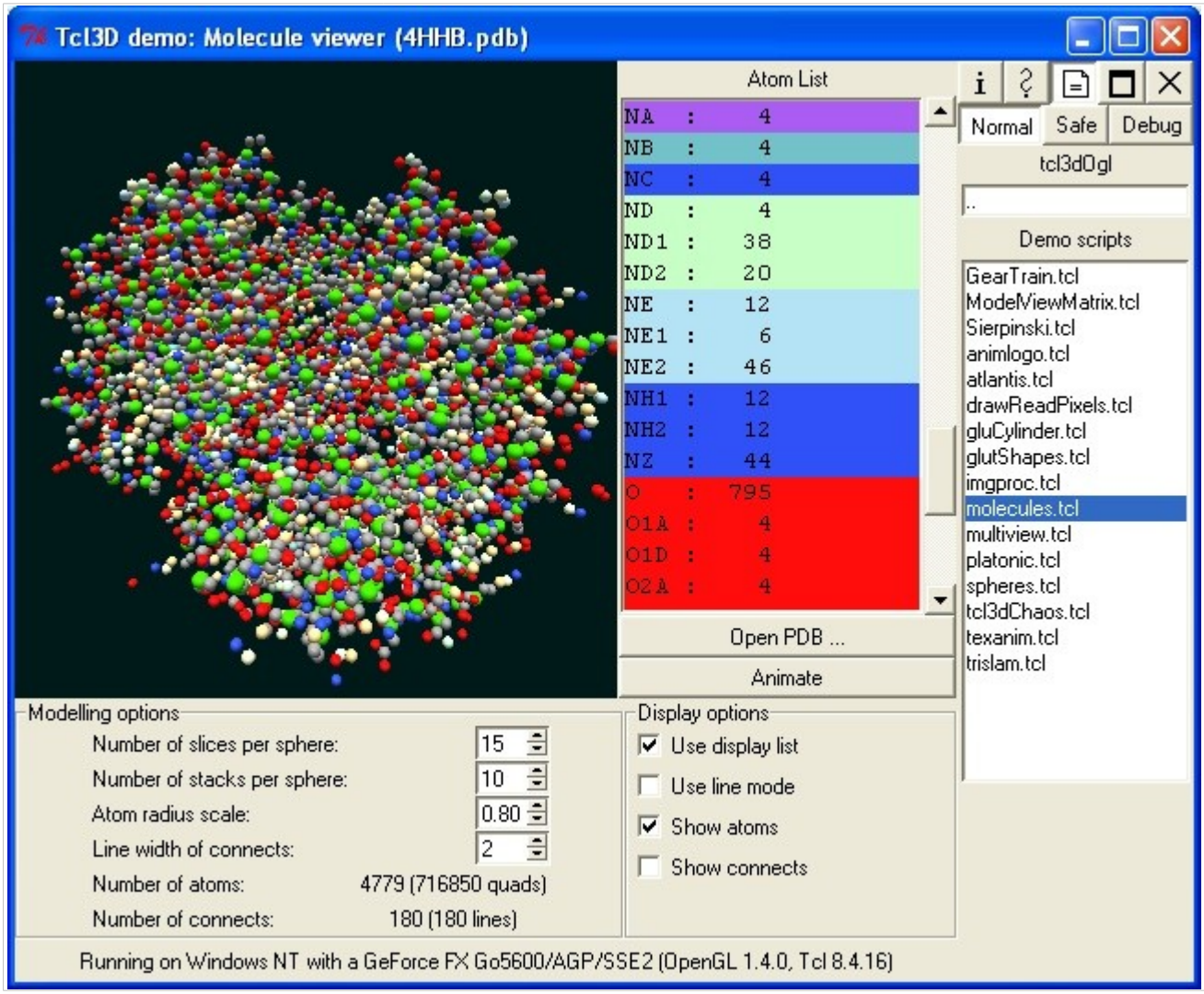

```
imgproc.c - by David Blythe, SGI

Examples of various image processing operations coded as OpenGL
accumulation buffer operations.  This allows extremely fast
image processing on machines with hardware accumulation buffers
(RealityEngine, InfiniteReality, VGX).

This demo is part of the advanced glut demos.
                                                                    See
http://www.opengl.org/resources/code/samples/glut_examples/advanced/advanced.html

Modified for Tcl3D by Paul Obermeier 2007/07/28
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**molecules**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
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Module:       Tcl3D -> tcl3dOgl
Filename:     molecules.tcl

Author:       Paul Obermeier

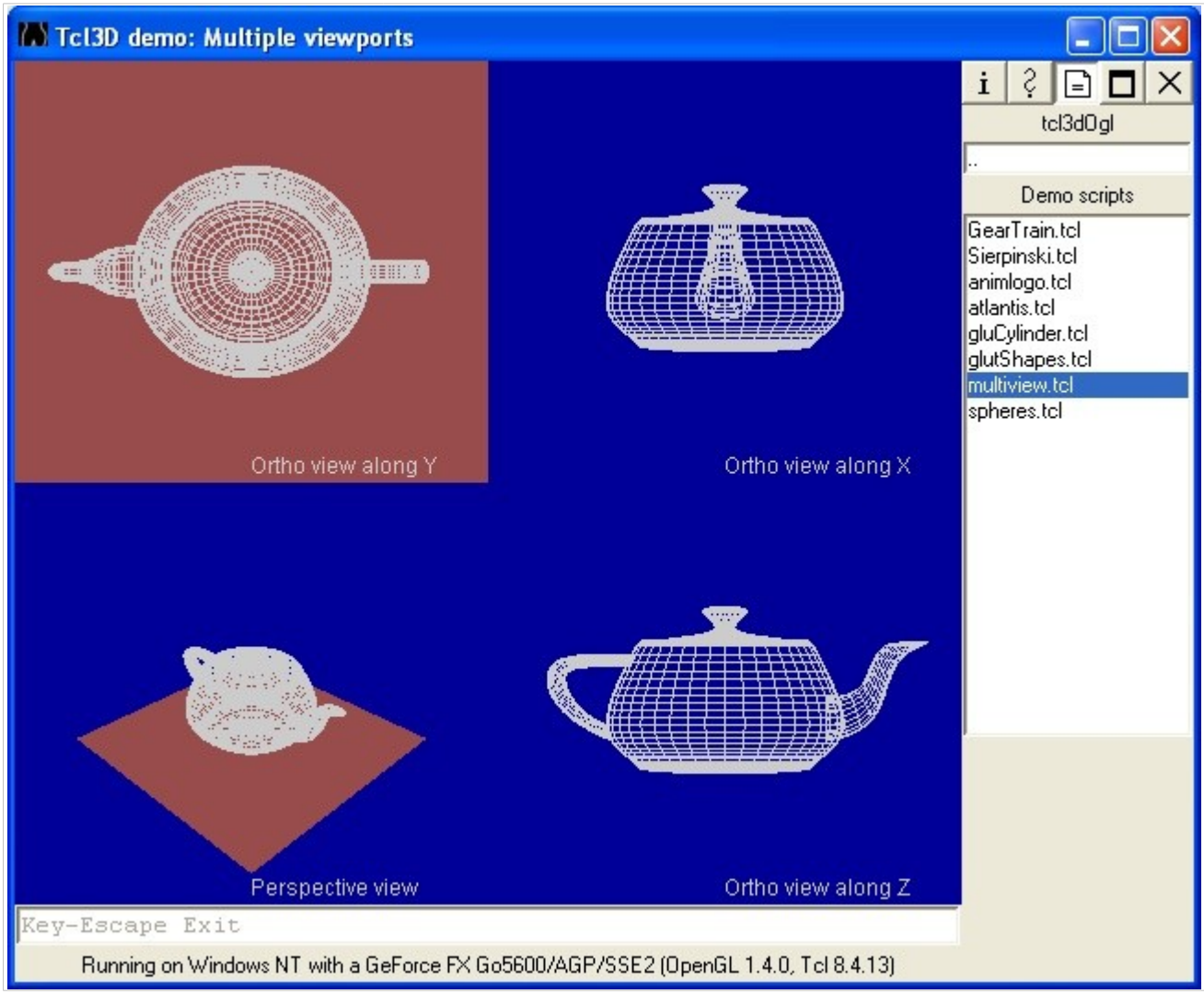
Description:  Tcl3D demo displaying molecules as colored spheres.

              The molecule description is read from a Protein Data Base file.
              See http://www.pdb.org for more information about PDB files.
              This site is also a resource for downloading PDB files.

              Currently supported keywords are ATOM, HETATM and CONECT.
              Feel free to extend and optimize the PDB parser.

              Atom color coding and atom radius are taken from the OpenSource
              molecule viewer QuteMol: http://qutemol.sourceforge.net/
```

Demo:	**multiview**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
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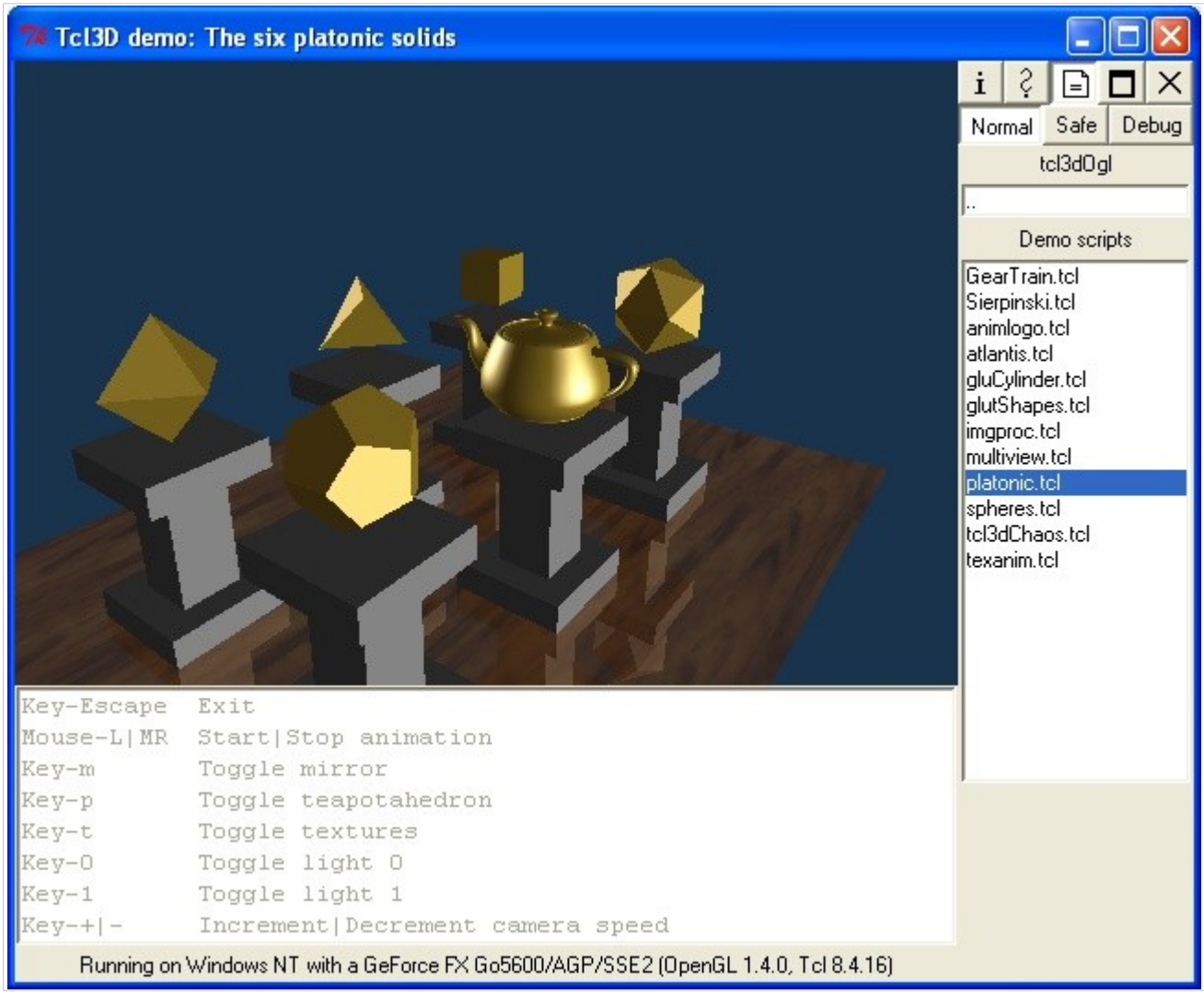
Module:         Tcl3D -> tcl3dOgl
Filename:       multiview.tcl

Author:         Paul Obermeier

Description:    Tcl3D demo showing the famous teapot in 4 different
                viewports on a single togl widget.
```

Demo:	**platonic**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
platonic.c - An OpenGL demonstration that draws the six platonic solids:
             The tetrahedron, the cube, the dodecahedron, the octahedron,
             the icosahedron and the teapotahedron. :-)
             The ray-traced image by Arvo and Kirk on the front cover of
             "An Introduction to Ray Tracing" (A. S. Glassner (ed.),
             Academic Press) inspired me to write this demo.
             A menu with a number of options is tied to the left mouse
             button.

Author:      Gustav Taxen, nv91-gta@nada.kth.se

Notes:       The code is not very pretty, nor is it optimized wrt OpenGL.
             Should add shadows as well, but I'll save that for the next
             version...

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```

```
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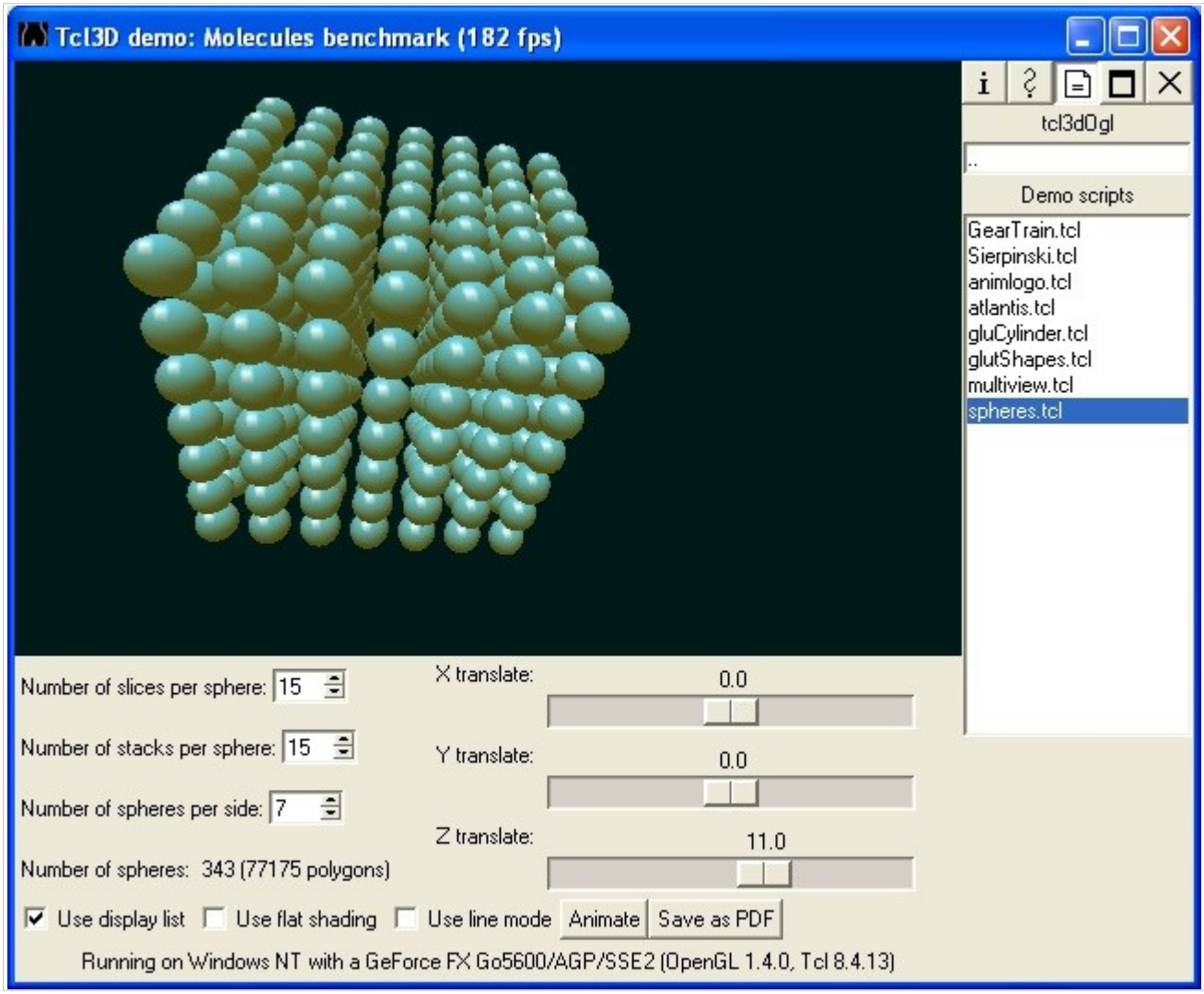
Foundation, 675 Mass Ave, Cambridge, MA 02139, USA.

Original C code taken from:
http://www.student.nada.kth.se/~nv91-gta/OpenGL/projects/platonic/

Modified for Tcl3D by Paul Obermeier 2008/12/21
See www.tcl3d.org for the Tcl3D extension.

See http://design.osu.edu/carlson/history/lesson20.html about the history of
the famous Utah teapot. This page also contains an image of the original
ray-traced scene by Arvo and Kirk.
The image is also on the front page of Glassner's book "An Introduction to
Ray Tracing".
For a mathematical description of the five platonic solids see
http://en.wikipedia.org/wiki/Platonic_solid
```

Demo:	**spheres**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
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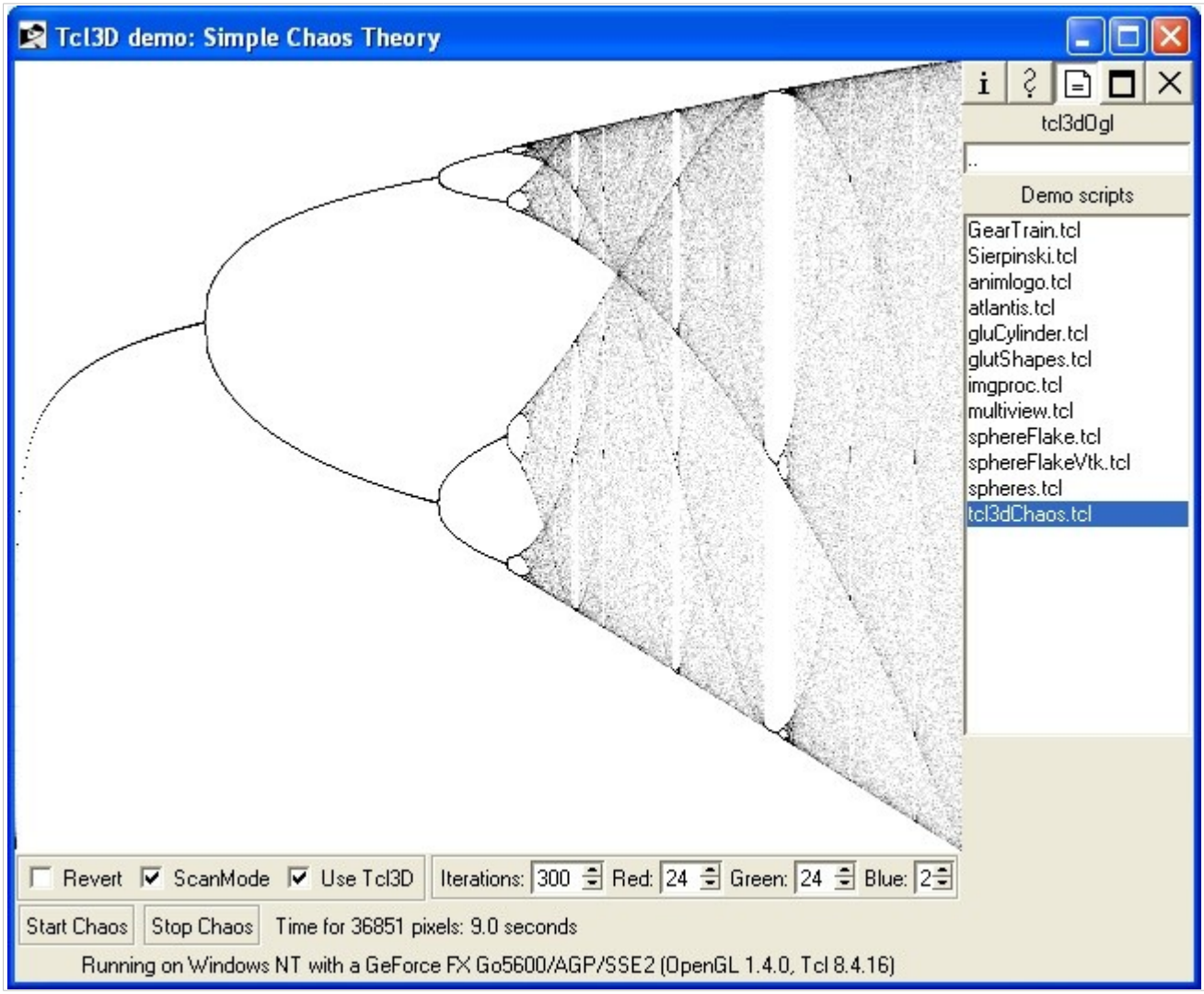
Module:         Tcl3D -> tcl3dOgl
Filename:       spheres.tcl

Author:         Paul Obermeier

Description:    Tcl3D demo displaying spheres in various modes.
```

Demo:	**tcl3dChaos**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
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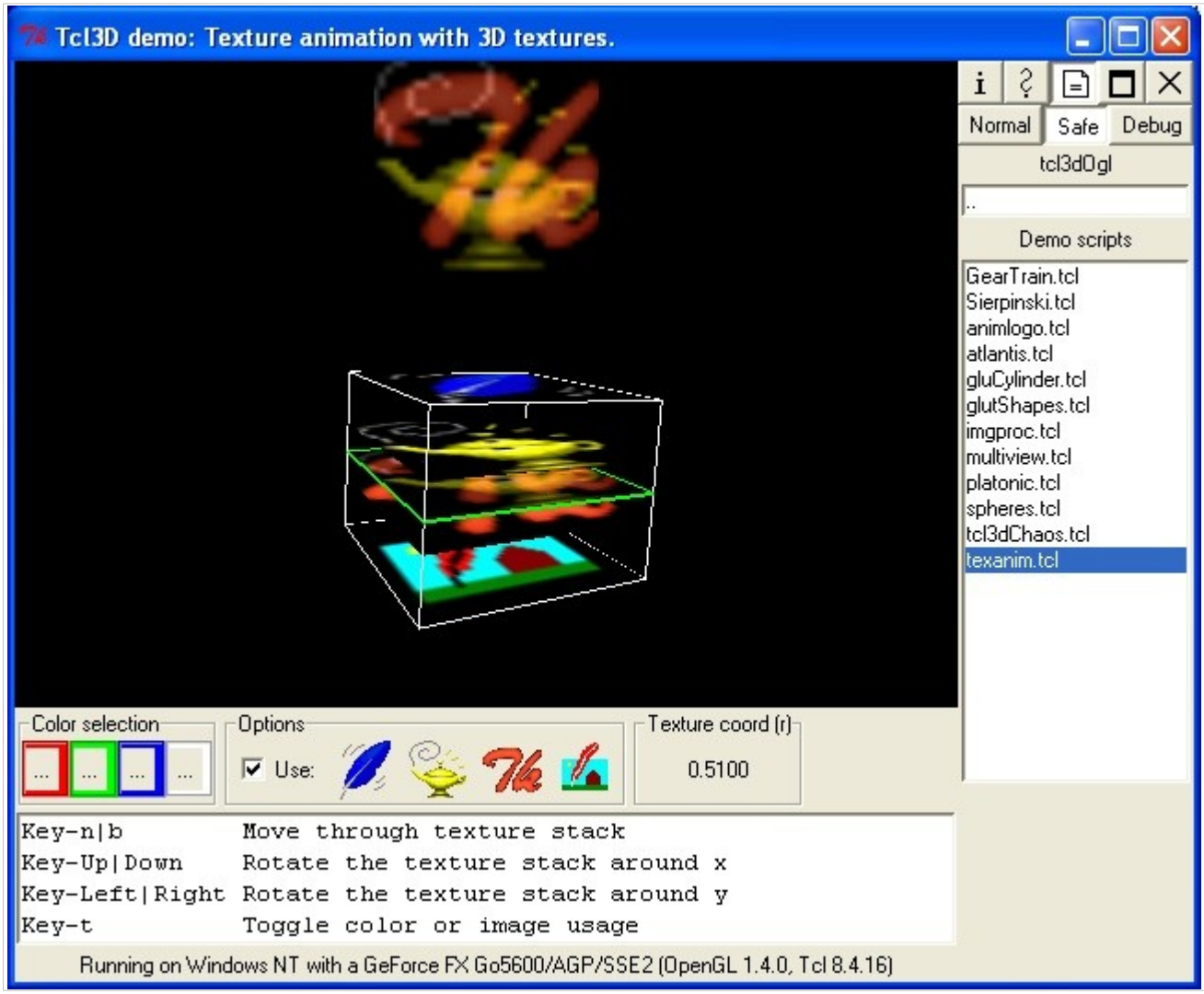
Module:         Tcl3D -> tcl3dOgl
Filename:       tcl3dChaos.tcl

Author:         Paul Obermeier

Description:    Implementation of algorithmn described on Wiki page
                "Simple Chaos Theory with Tcl" (http://wiki.tcl.tk/11887)
                using Tcl3D.
                Interesting values:
                2000   8 10 14   revert
                6300   3  3  3   revert
```

Demo:	**texanim**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents

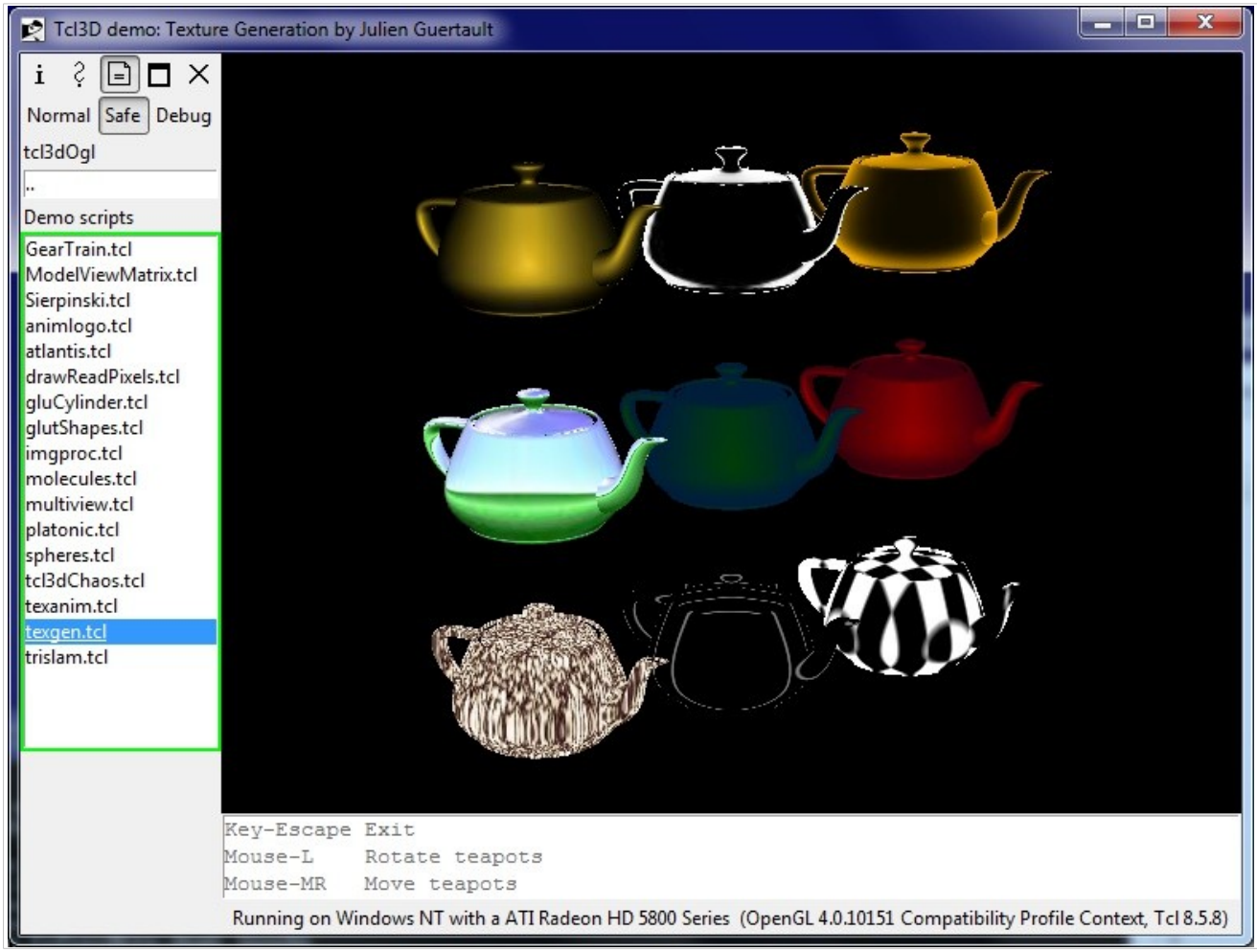



```
texanim.tcl

Tcl3D demo showing the usage of a 3D texture for animation.
In the upper part of the window, a quad is drawn, which shows the
actual texture animation.
In the lower half of the window, the 3D texture is visualized as a
stack of quads. The sampling of the 3D texture is shown by a quad
moving through the texture stack.
Either 4 predefined images can be used as textures or 4 choosable colors.

Author: Paul Obermeier
Date: 2009-01-16
```

Demo:	**texgen**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
Demonstration of texture gen
Copyright (C) 2005 Julien Guertault

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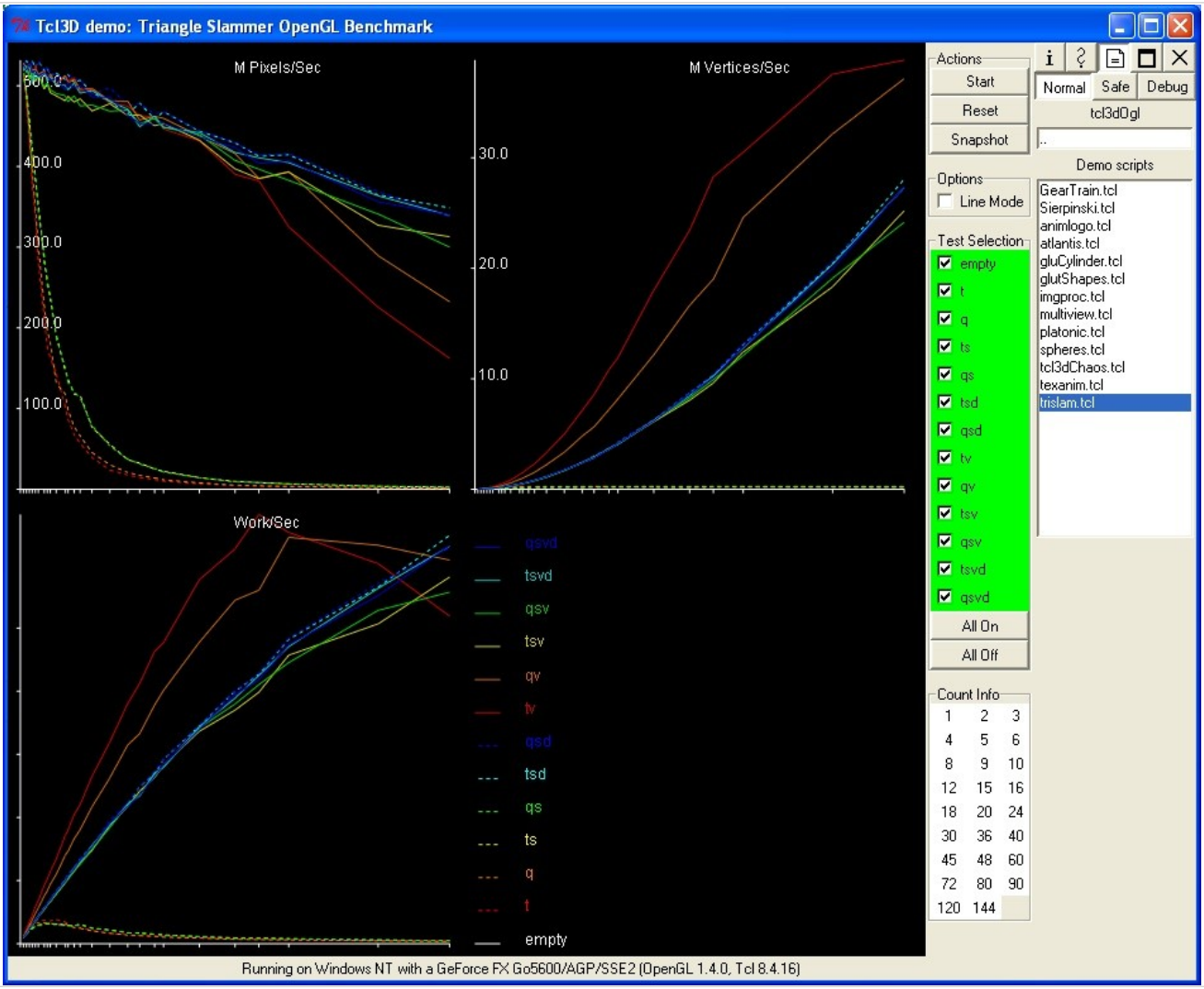
along with this program; if not, write to the Free Software
Foundation, Inc., 59 Temple Place - Suite 330, Boston, MA  02111-1307, USA.

Original sources available at:
http://zavie.free.fr/opengl/#texturegen

Modified for Tcl3D by Paul Obermeier 2010/11/21
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**trislam**
Type:	tcl3dOgl
Category:	LibrarySpecificDemos
Root:	Contents




```
trislam.tcl

Purpose: Determine performance curves for various methods of pushing
         triangles and quads through the OpenGL pipeline

Copyright (c) 2004-2006, Geoff Broadwell; this script is released
as open source and may be distributed and modified under the terms
of either the Artistic License or the GNU General Public License,
in the same manner as Perl itself.  These licenses should have been
distributed to you as part of your Perl distribution, and can be
read using `perldoc perlartistic` and `perldoc perlgpl` respectively.

Rewritten in Python by Bob Free

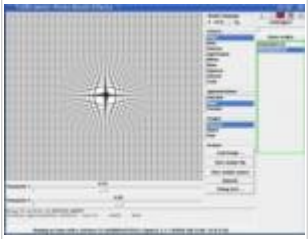
Rewritten and extended for Tcl3D by Paul Obermeier, 2008
```

Type:	**tcl3dOglExt**
Category:	LibrarySpecificDemos
Root:	Contents

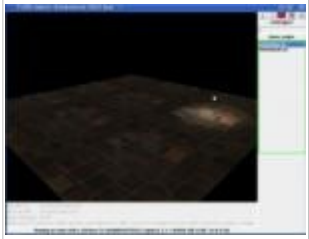
This section contains OpenGL demo applications from several resources, that have been ported to Tcl3D. The examples cover OpenGL extension programming.
Original sources from different sites. See the documentation for details.

Available demos

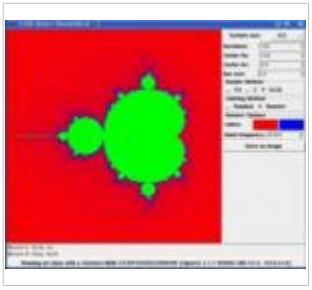
OglBenchFBO



PhotoBooth

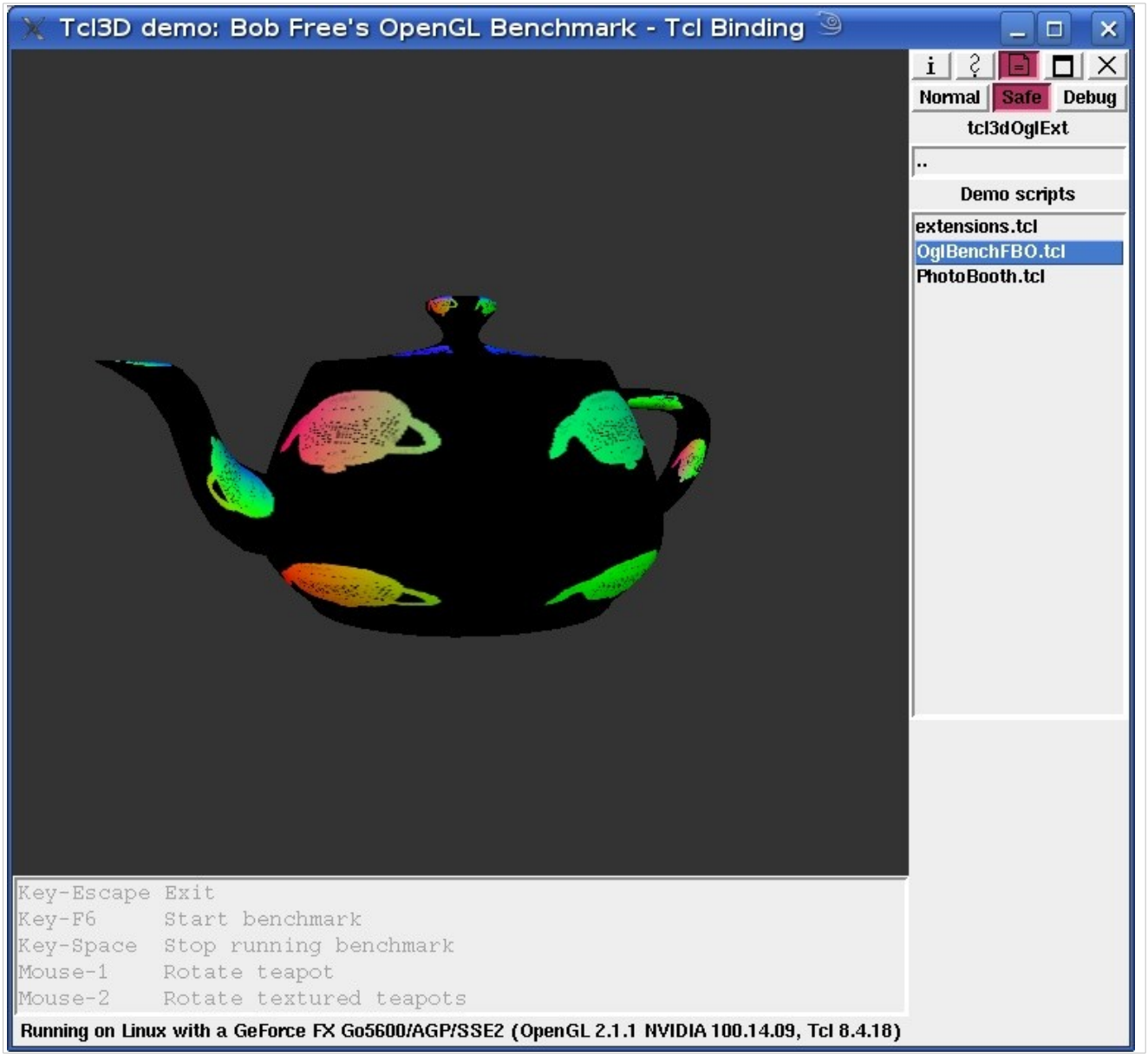


extensions



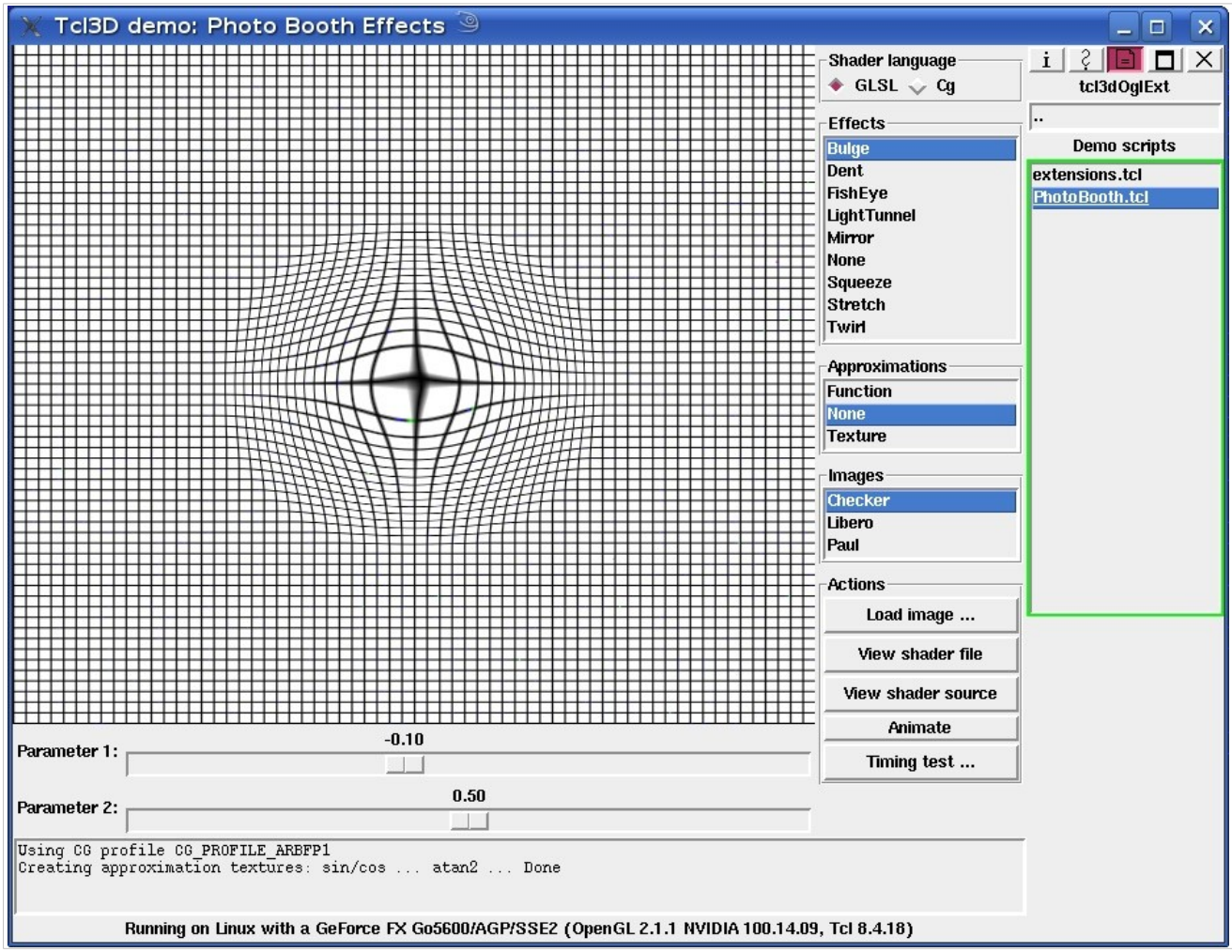
mandelbrot

Demo:	**OglBenchFBO**
Type:	tcl3dOglExt
Category:	LibrarySpecificDemos
Root:	Contents




```
ogl_bench v1.0 - Copyright 2007 - Graphcomp
Bob Free bfree@graphcomp.com
http://graphcomp.com/opengl
```

Demo:	PhotoBooth
Type:	tcl3dOglExt
Category:	LibrarySpecificDemos
Root:	Contents



```
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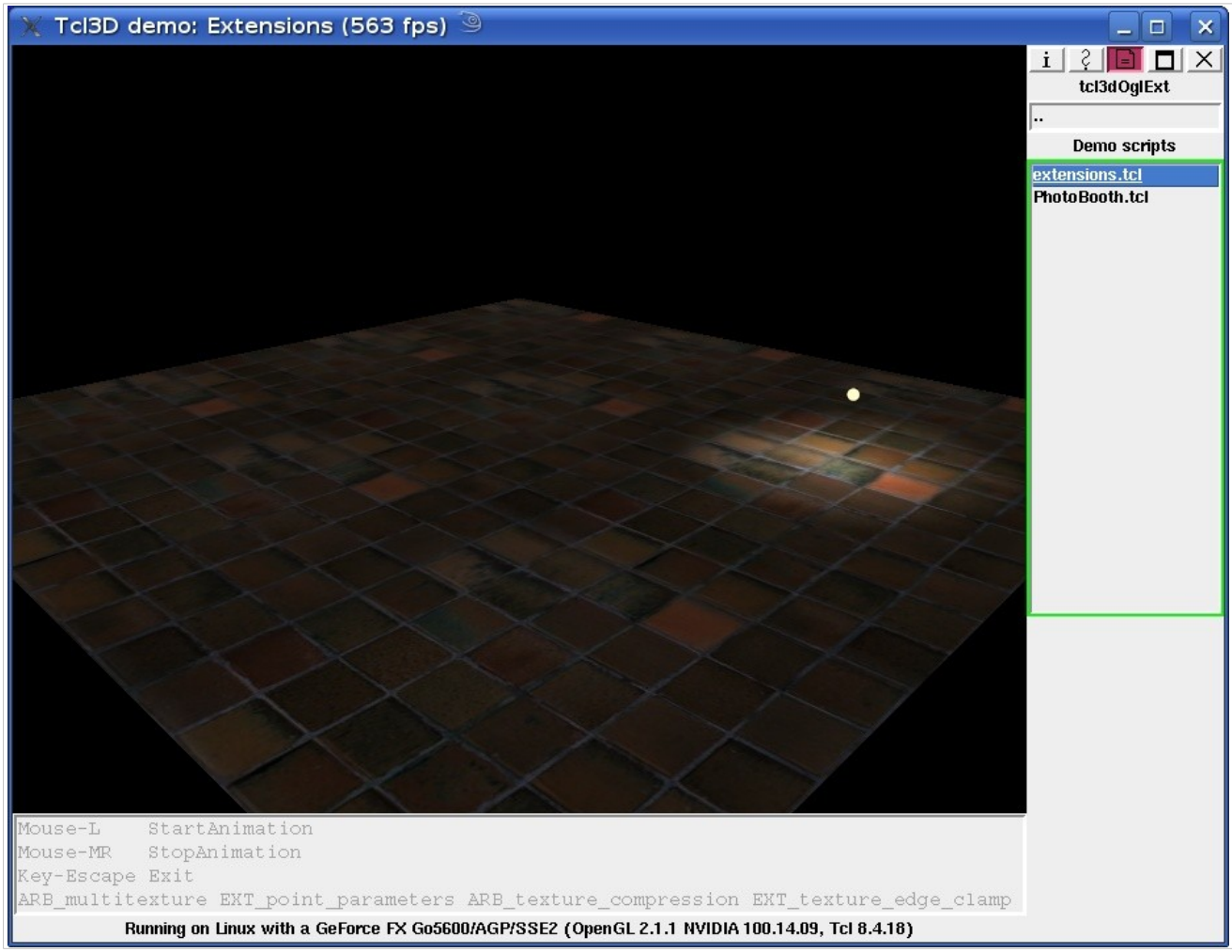
 Modified for Tcl3D by Paul Obermeier 2007/04/14
 See www.tcl3d.org for the Tcl3D extension.

 The demo has been modified to allow up to 2 parameters to be changed
 interactively via a slider.
 The parameter range of the two sliders can be provided as comment lines
 at the top of the shader source files.
 Further enhancements include:
 Loading of image files of any size via the "Load image" button. All image files
  with an extension of .jpg or .tga in the directory of the script are
automatically
 recognized and inserted into the "Images" labelframe.
 Add your own shader without modifying the Tcl script by adding a new file with
extension
 .frag in the directory of the script.

 A description of the effect shaders and the original sources are
 available at http://dem.ocracy.org/libero/photobooth/
```

Demo:	**extensions**
Type:	tcl3dOglExt
Category:	LibrarySpecificDemos
Root:	Contents



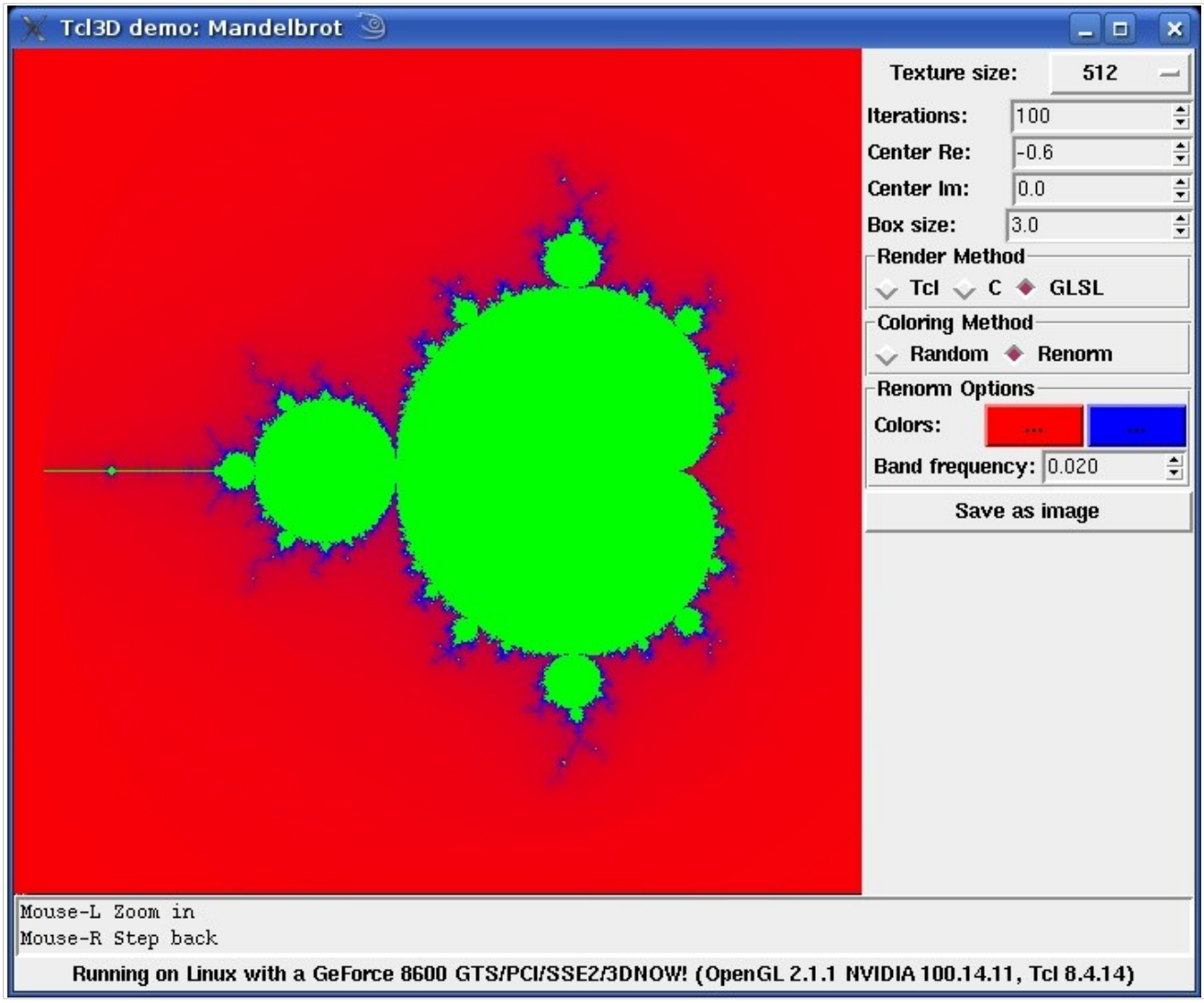

```
extensions.tcl

Program to demonstrate the use of extensions.
Extensions used:
  GL_ARB_multitexture
  GL_EXT_point_parameters
  GL_ARB_texture_compression
  GL_EXT_texture_edge_clamp

Original C++ code by Dave Astle 2/1/2002
                    Original                        files                        from:
http://www.gamedev.net/reference/programming/features/oglext/demo.zip

Modified for Tcl3D by Paul Obermeier 2005/09/05
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**mandelbrot**
Type:	tcl3dOglExt
Category:	LibrarySpecificDemos
Root:	Contents




```
Mandelbrot shader using GPGPU techniques

Author: Gabriel Zachmann, June 2007

The code is derived from ../fbo_demo/saxpy.cpp

The original code can be found at:
http://zach.in.tu-clausthal.de/teaching/cg2_08/downloads/simple_glsl_demos.tar.gz

Modified and extended for Tcl3D by Paul Obermeier 2009/01/04
See www.tcl3d.org for the Tcl3D extension.
```

Type:	**tcl3dSDL**
Category:	LibrarySpecificDemos
Root:	Contents

This section contains SDL demo applications written in Tcl3D. The examples cover joystick and CD programming with the help of the SDL library.

Available demos

cdplayer

joysticktest

Demo:	**cdplayer**
Type:	tcl3dSDL
Category:	LibrarySpecificDemos
Root:	Contents


```
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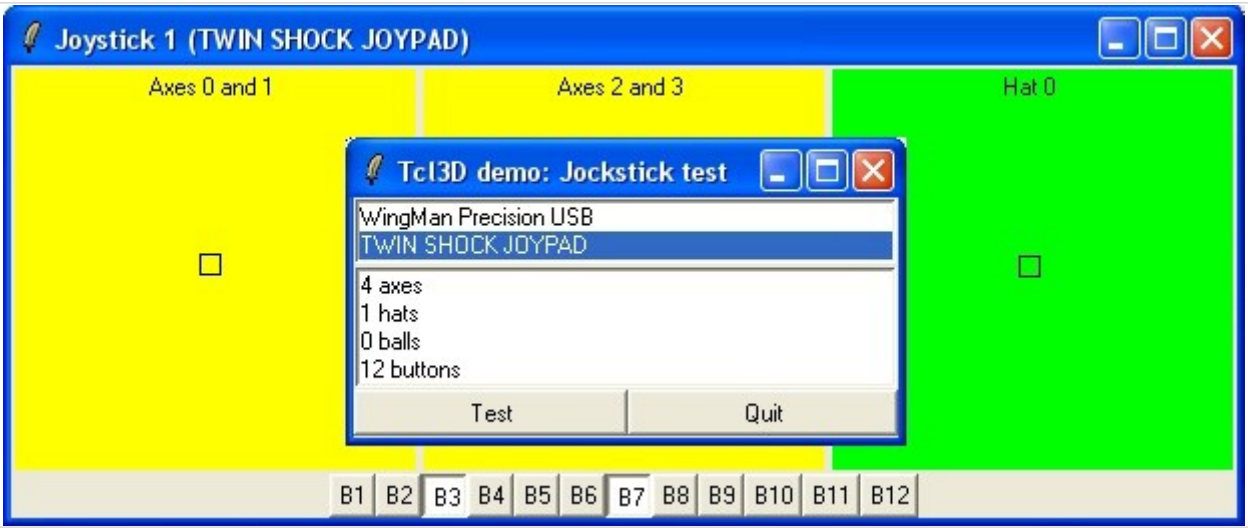
Module:         Tcl3D -> tcl3dSDL
Filename:       cdplayer.tcl

Author:         Paul Obermeier

Description:    Tcl script implementing a simple CD player to test the
                CD related functions (SDL_CD*) of the Tcl3D SDL wrapping.
```

Demo:	**joysticktest**
Type:	tcl3dSDL
Category:	LibrarySpecificDemos
Root:	Contents




```
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Module:         Tcl3D -> tcl3dSDL
Filename:       joysticktest.tcl

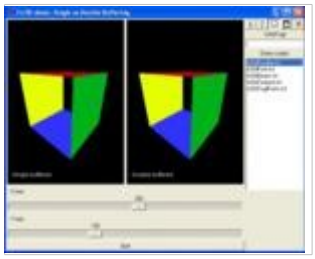
Author:         Paul Obermeier

Description:    Tcl script to test the joystick related functions of
                the Tcl3D SDL wrapping.
```

Type:	**tcl3dTogl**
Category:	LibrarySpecificDemos
Root:	Contents

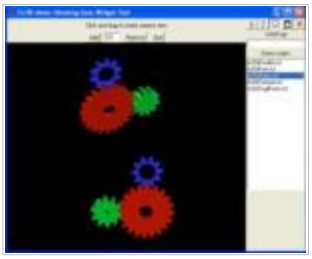
The following demos from the Togl distribution have been ported to Tcl3D.
Original sources available at: http://sourceforge.net/projects/togl/

Available demos



tcl3dDouble

tcl3dFont

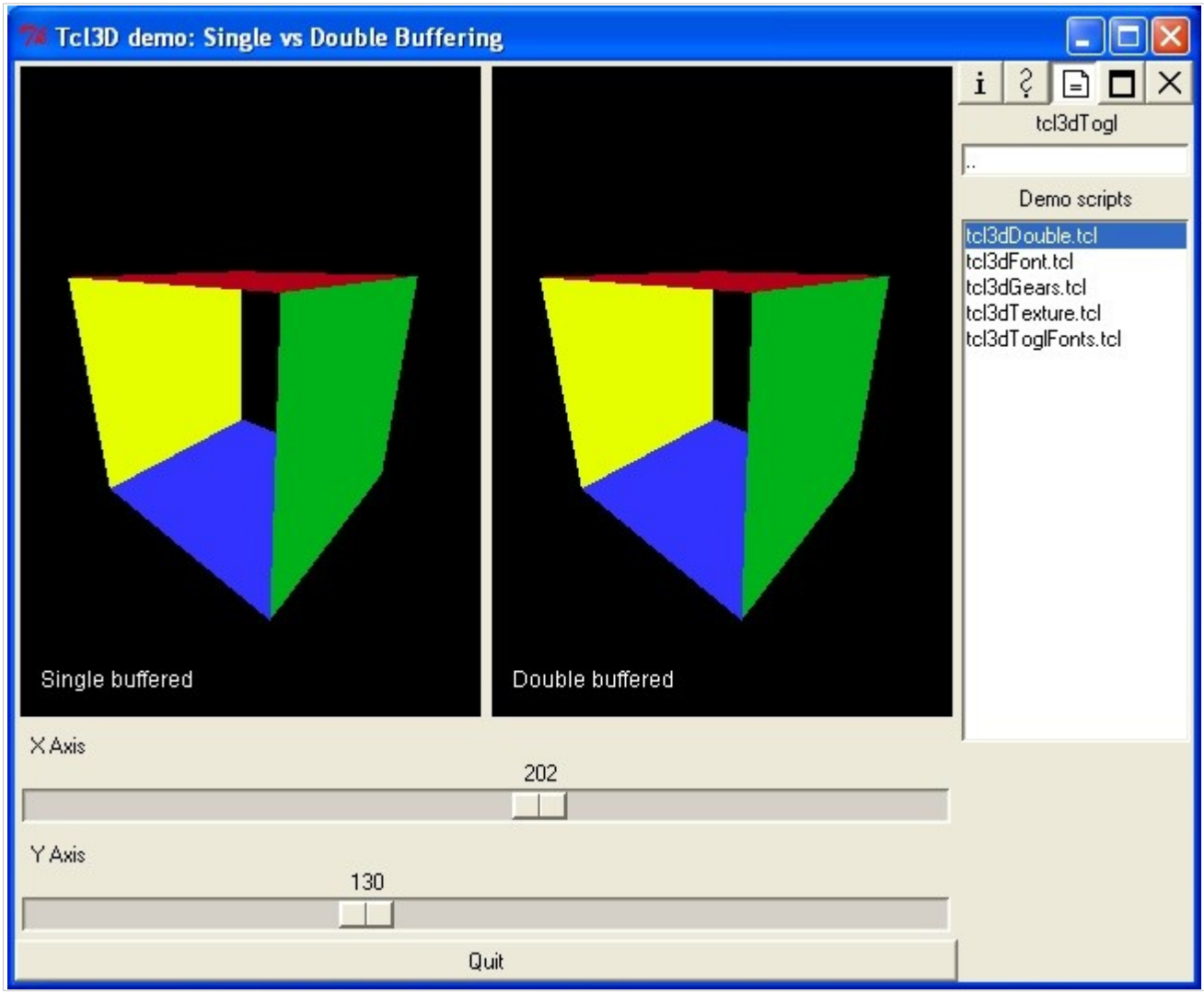


tcl3dGears

tcl3dTexture

tcl3dToglFonts

Demo:	**tcl3dDouble**
Type:	tcl3dTogl
Category:	LibrarySpecificDemos
Root:	Contents




```
tcl3dDouble.tcl

A Tcl3D widget demo with two windows, one single buffered and the
other double buffered.

This is a version of the original Togl double demo written entirely in Tcl
with the help of the Tcl3D package.

Copyright (C) 1996 Brian Paul and Ben Bederson (Original C/Tcl version)
Copyright (C) 2005 Paul Obermeier (Tcl3D version)
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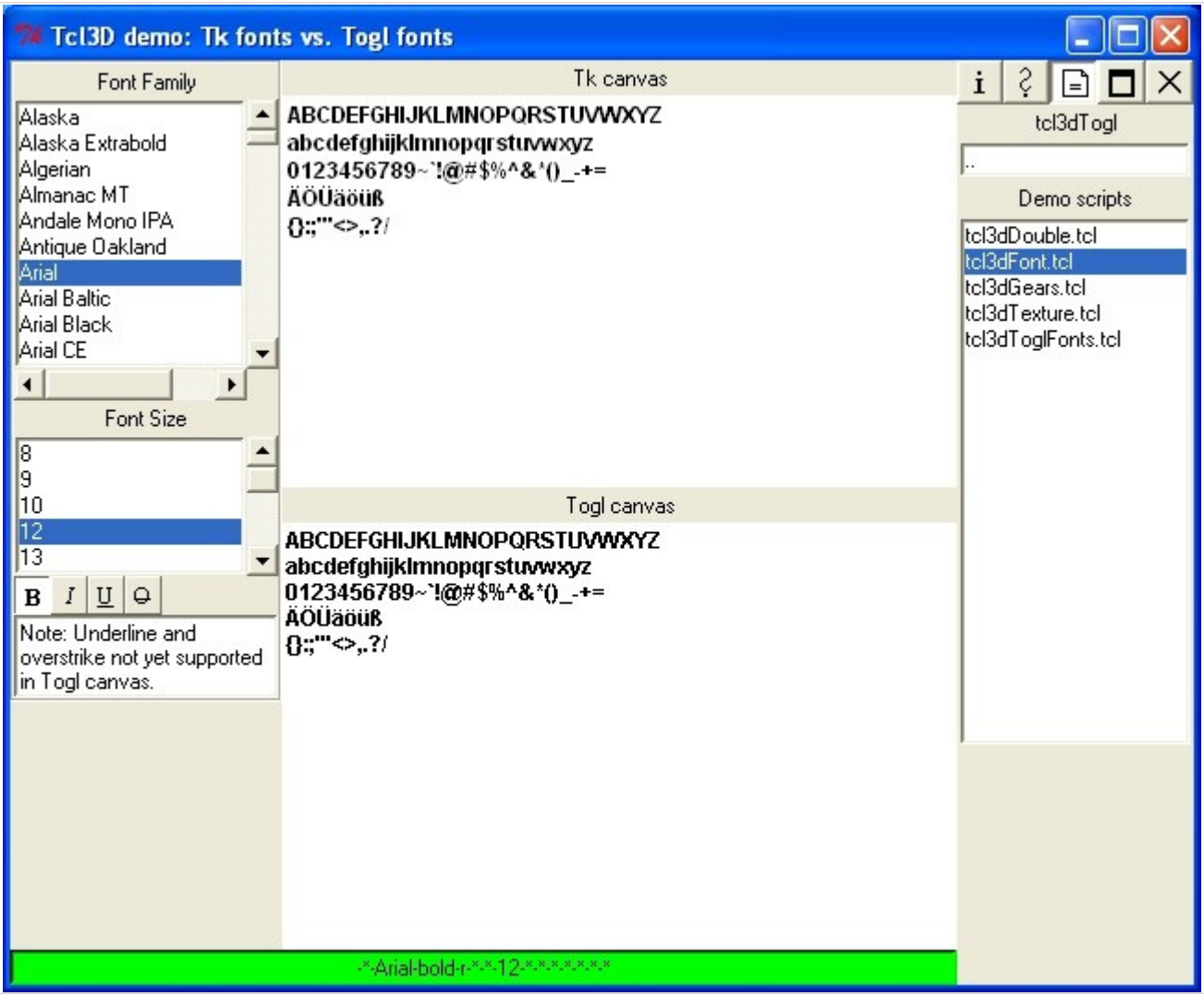
Original sources available at: http://sourceforge.net/projects/togl/
```

Demo:	**tcl3dFont**
Type:	tcl3dTogl
Category:	LibrarySpecificDemos
Root:	Contents




```
Copyright:      2005-2010 Paul Obermeier (obermeier@tcl3d.org)

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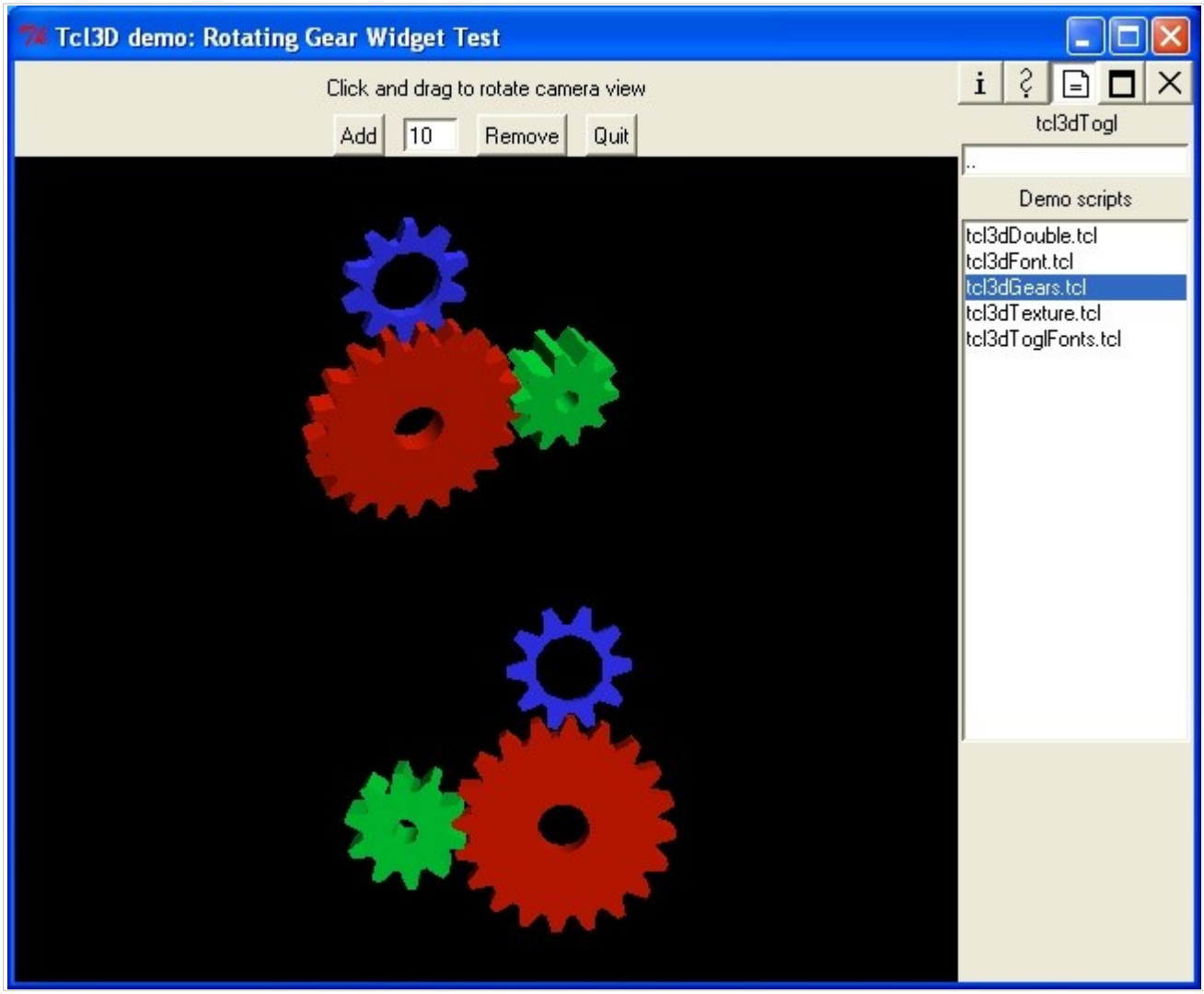
                usage and redistribution of this file, and for a
                DISCLAIMER OF ALL WARRANTIES.

Module:         Tcl3D -> tcl3dTogl
Filename:       tcl3dFont.tcl

Author:         Paul Obermeier

Description:    Tcl script to select a font. The font is displayed in
                a Tk widget as well as in an OpenGL window.
                The font name in XLFD notation is
                shown in a text widget for copy/paste.
                This demo shows the usage of the "loadbitmapfont"
                command built into the Togl widget.
                Note: The Tk font might look nicer, because font
                antialiasing is enabled. On Windows this can be toggled
                in the display property window (Appearance->Effects).
```

Demo:	**tcl3dGears**
Type:	tcl3dTogl
Category:	LibrarySpecificDemos
Root:	Contents




```
tcl3dGears.tcl

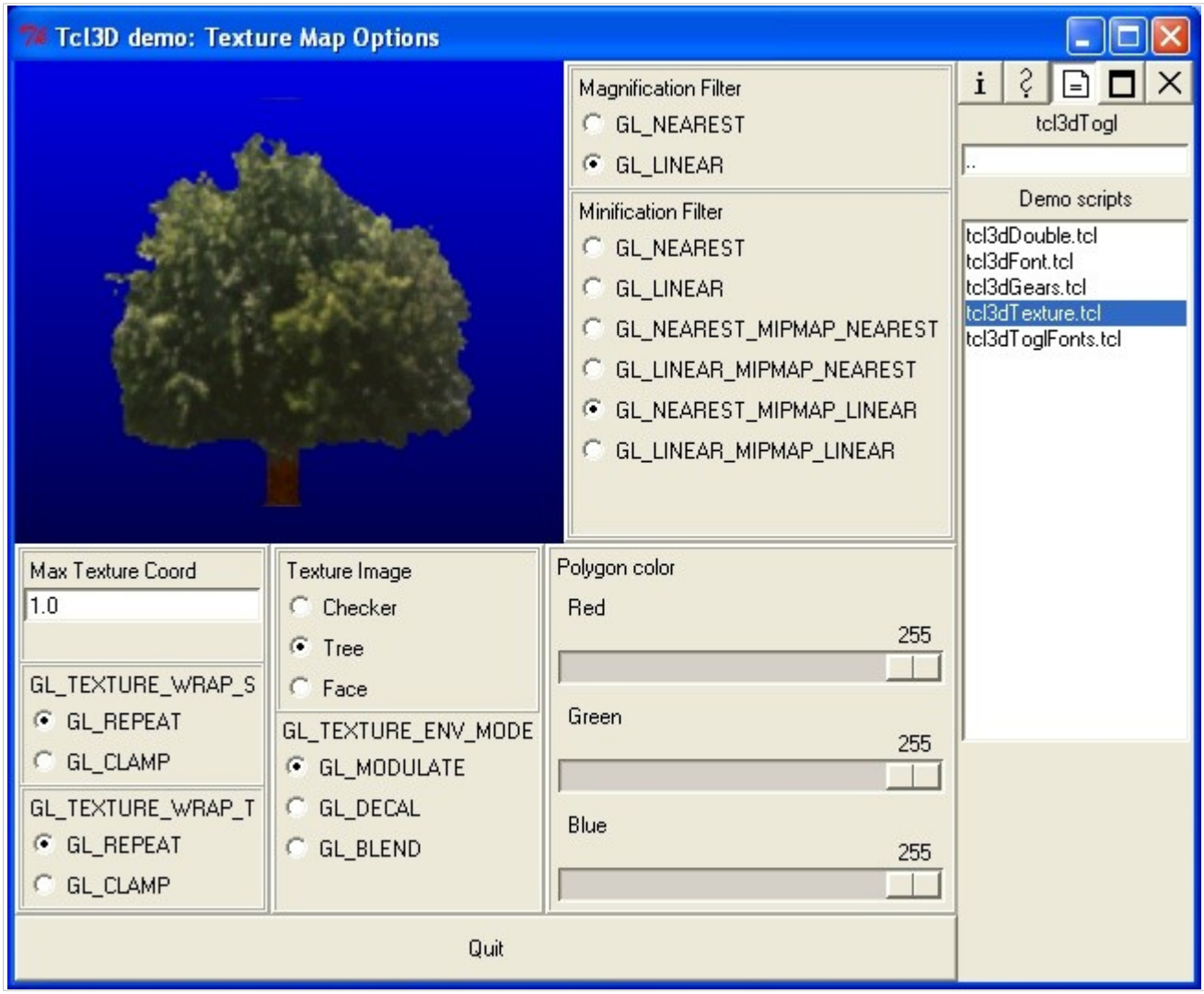
Test Togl using GL Gears Demo

This is a version of the original Togl gears demo written entirely in Tcl
with the help of the Tcl3D package.

Copyright (C) 1997 Philip Quaife (Original C/Tcl version)
Copyright (C) 2005 Paul Obermeier (Tcl3D version)
See the LICENSE file for copyright details.

Original sources available at: http://sourceforge.net/projects/togl/
```

Demo:	**tcl3dTexture**
Type:	tcl3dTogl
Category:	LibrarySpecificDemos
Root:	Contents




```
tcl3dTexture.tcl

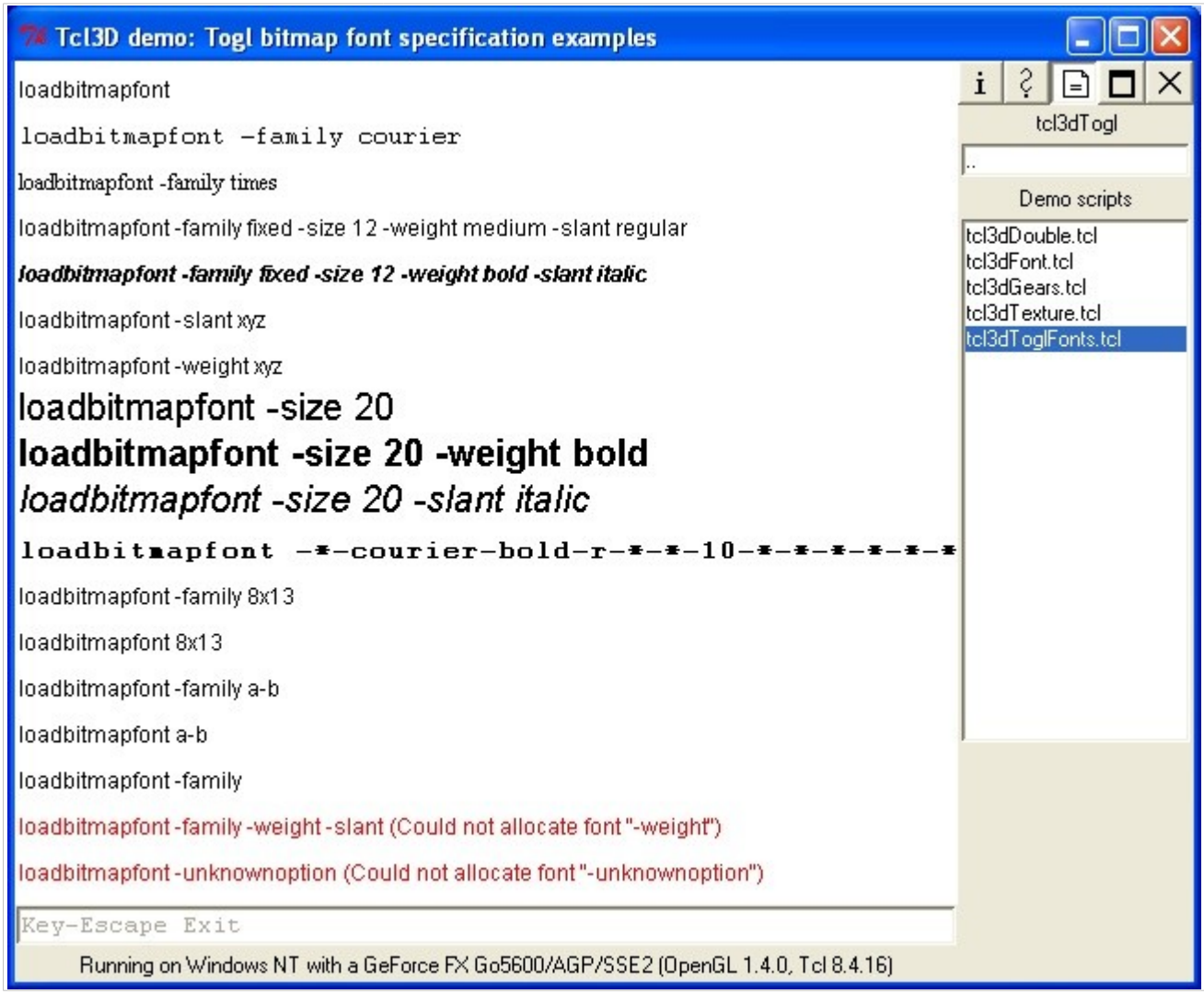
Togl texture map demo

This is a version of the original Togl texture demo written entirely in Tcl
with the help of the Tcl3D package.

Copyright (C) 1996 Brian Paul and Ben Bederson (Original C/Tcl version)
Copyright (C) 2005 Paul Obermeier (Tcl3D version)
See the LICENSE file for copyright details.

Original sources available at: http://sourceforge.net/projects/togl/
```

Demo:	**tcl3dToglFonts**
Type:	tcl3dTogl
Category:	LibrarySpecificDemos
Root:	Contents




```
Copyright:      2006-2010 Paul Obermeier (obermeier@tcl3d.org)

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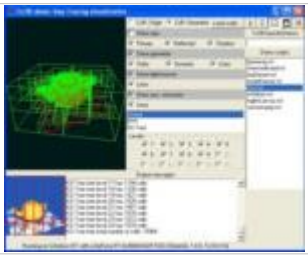
                usage and redistribution of this file, and for a
                DISCLAIMER OF ALL WARRANTIES.

Module:         Tcl3D -> tcl3dTogl
Filename:       tcl3dToglFonts.tcl

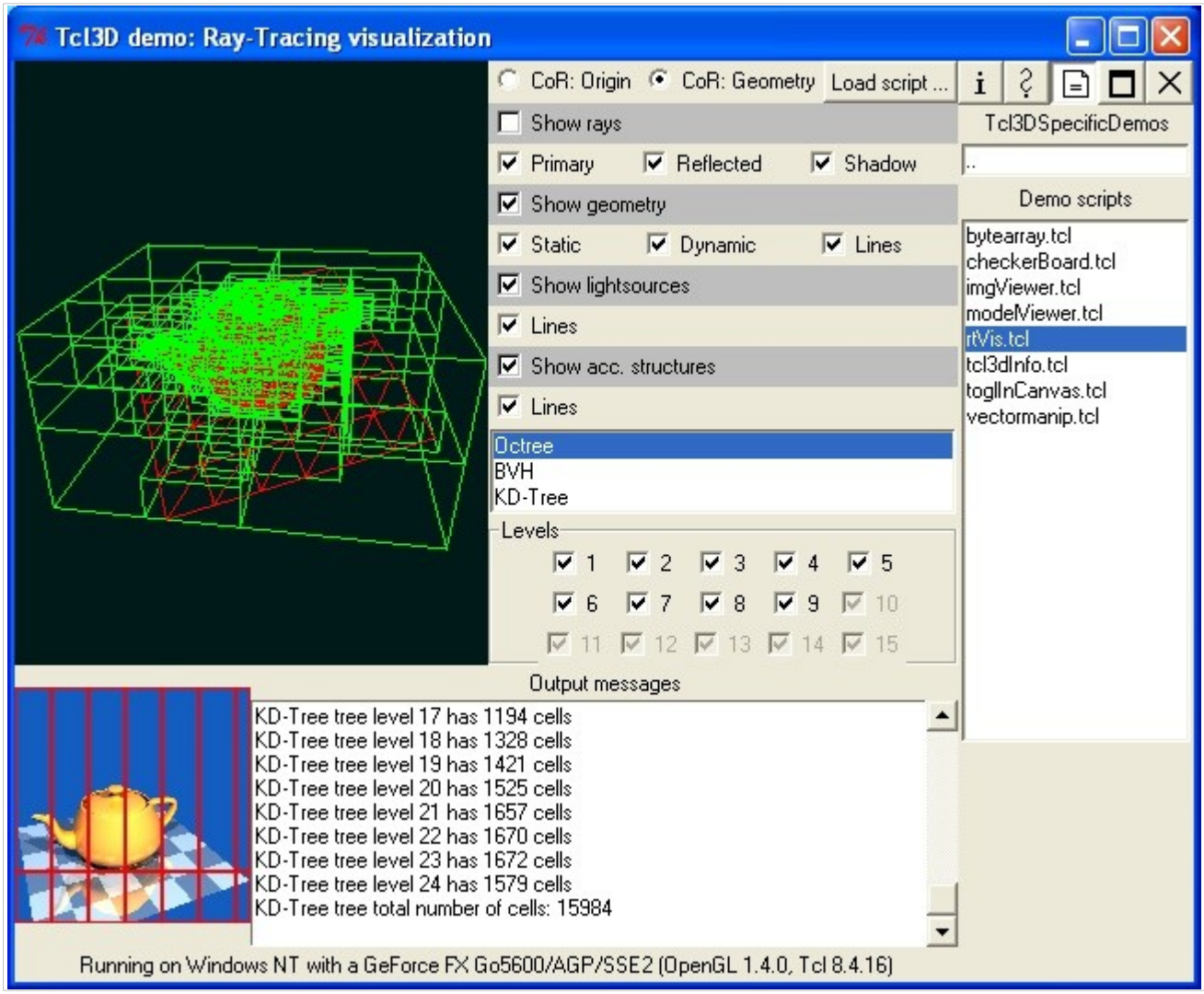
Author:         Paul Obermeier

Description:    Program demonstrating and testing the different
                possibilities of specifing a bitmap font for the
                Togl widget.
```

Category:	**Tcl3DSpecificDemos**
Root:	Contents
Types:	rtVis

Type:	**rtVis**
Category:	Tcl3DSpecificDemos
Root:	Contents
Available demos	
	
rtVis	

Demo:	**rtVis**
Type:	rtVis
Category:	Tcl3DSpecificDemos
Root:	Contents




```
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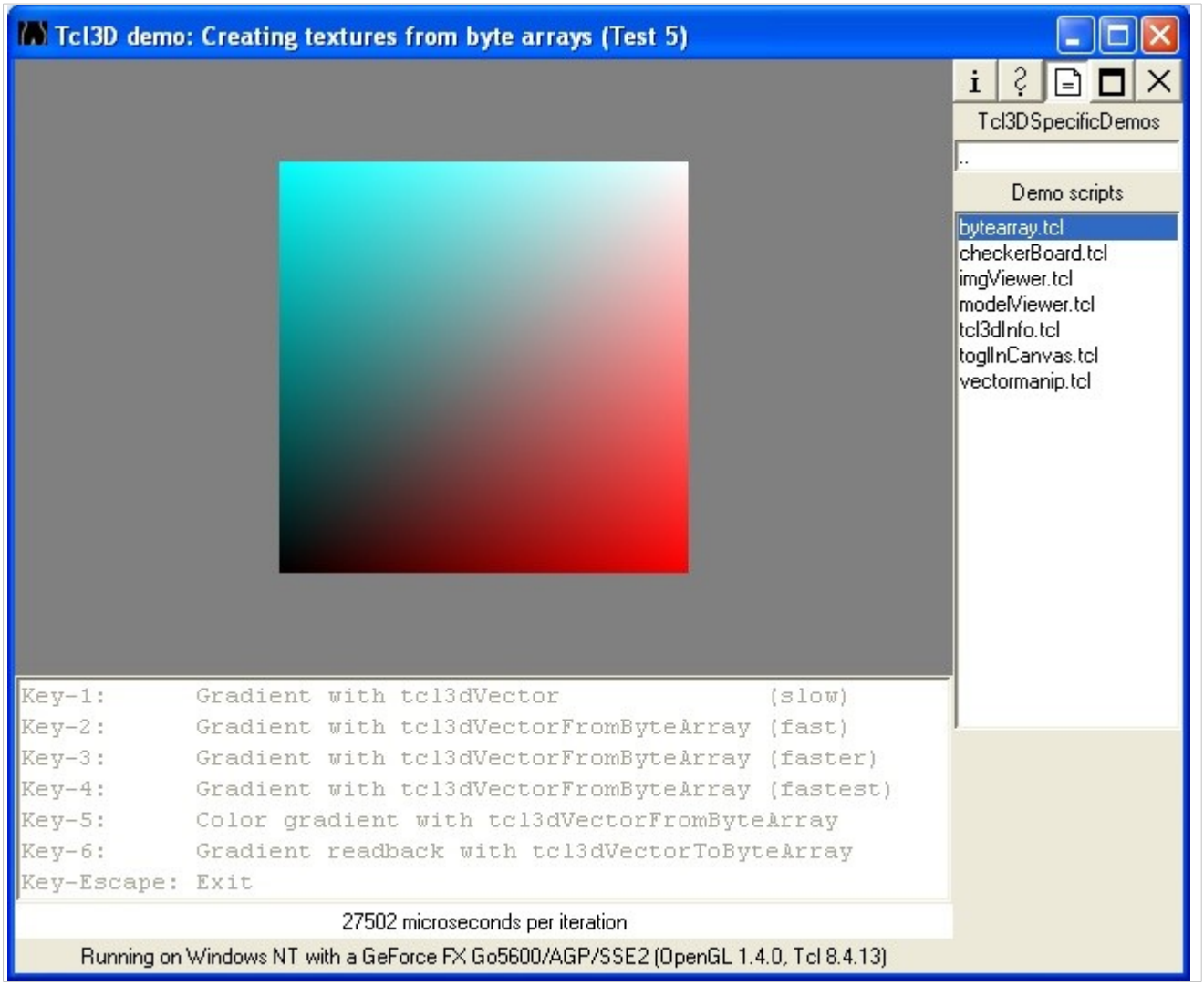
              usage and redistribution of this file, and for a
              DISCLAIMER OF ALL WARRANTIES.

Module:       Tcl3DSpecificDemos
Filename:     rtVis.tcl

Author:       Paul Obermeier

Description:  Ray Tracing visualization program.
              The comments of the rtvis* procedures explain how to
              use the ray-tracing visualization commands.
```

Demo:	**bytearray**
Type:	
Category:	Tcl3DSpecificDemos
Root:	Contents

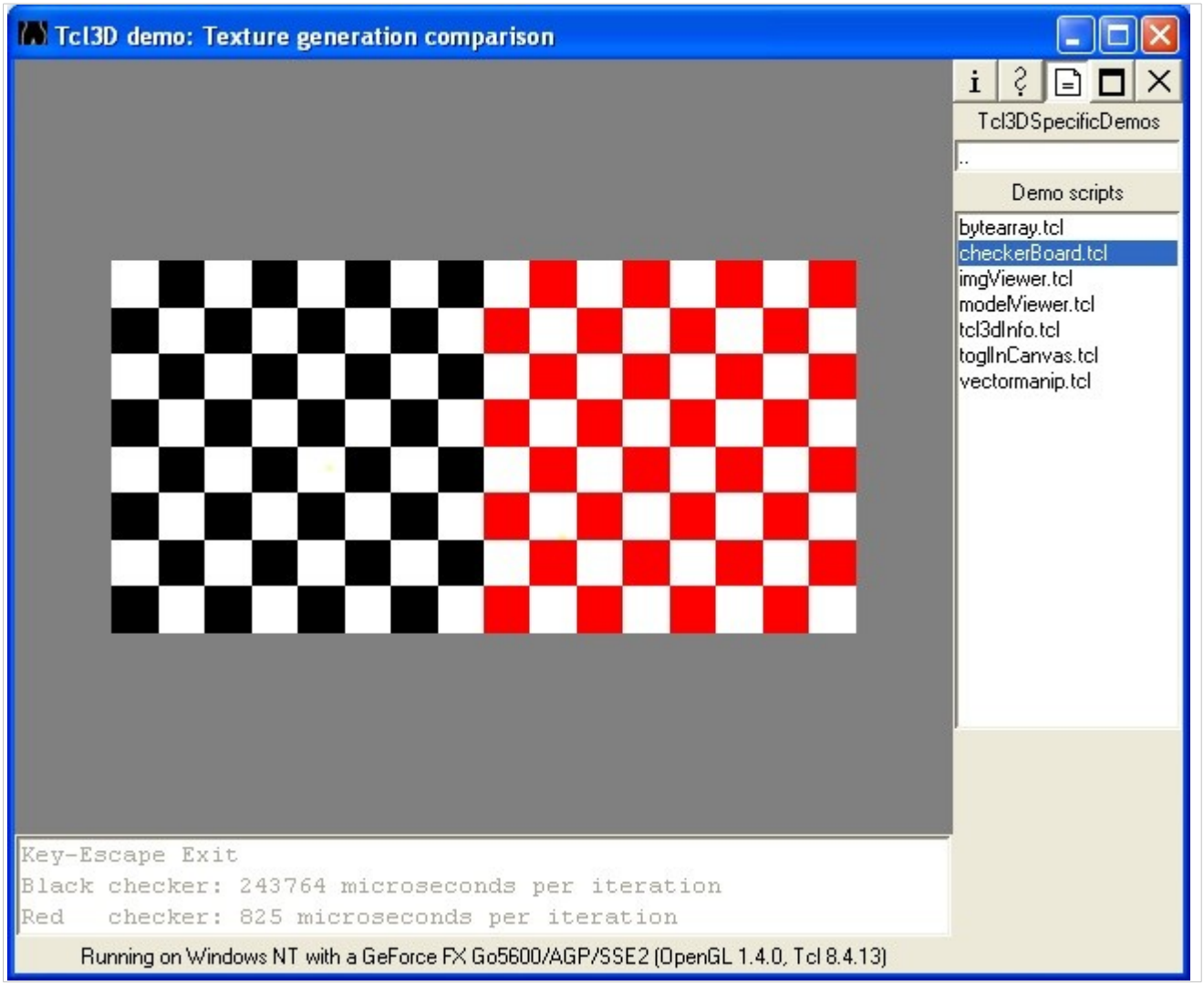



```
bytearray.tcl

Tcl3D demo showing the use of the tcl3dByteArray2Vector function,
introduced in Version 0.3.
The program texture maps an image generated with Tcl onto a quad.

Author: Paul Obermeier
Date: 2006-02-01
```

Demo:	**checkerBoard**
Type:	
Category:	Tcl3DSpecificDemos
Root:	Contents

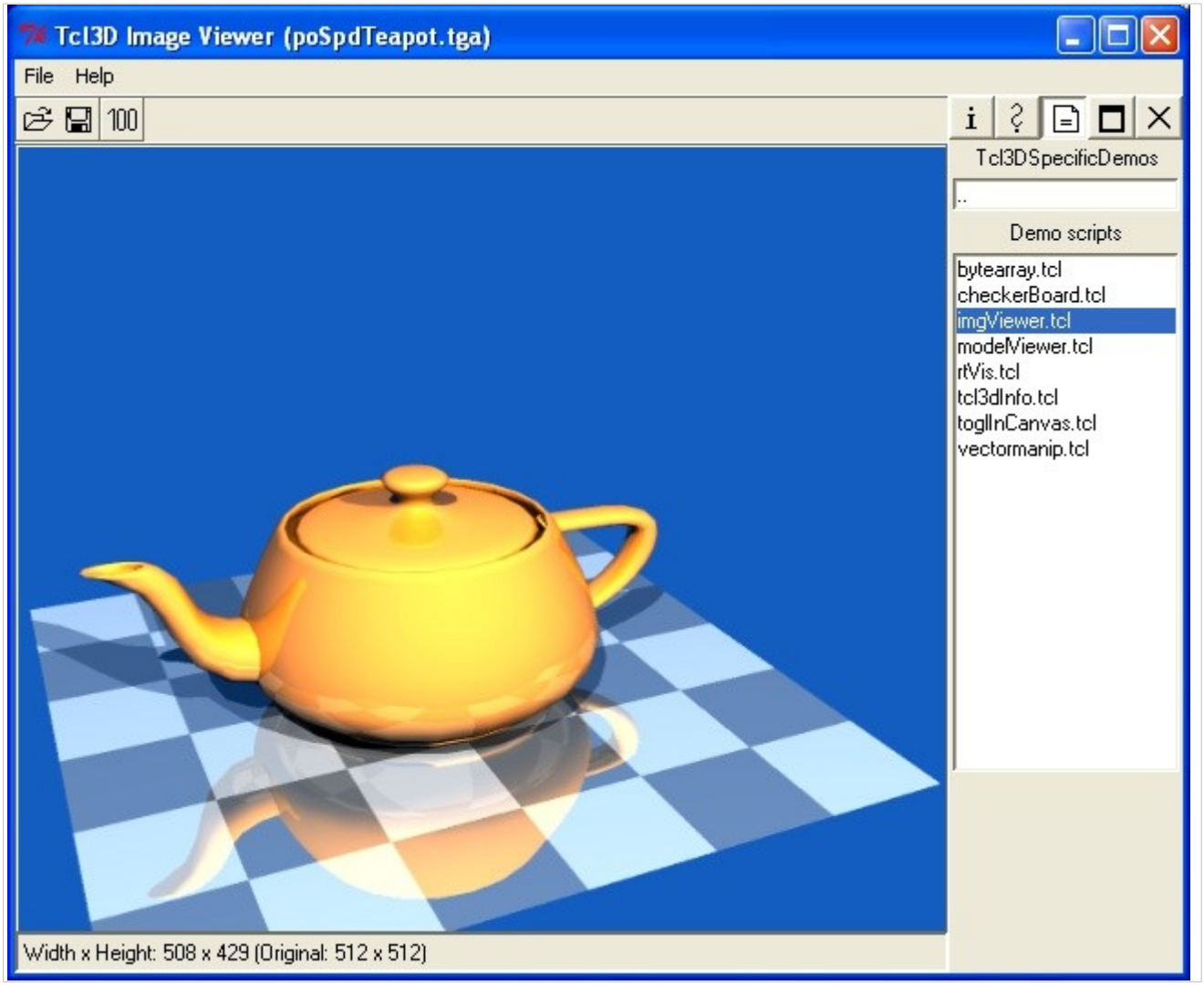



```
checkerBoard.tcl

This program creates a checkerboard image in two ways.
The first texture is created with an algorithm, as used in some of the
RedBook examples (ex. checker.tcl). This algorithm has been converted 1:1
from C to Tcl. Very slow.
The second image is created using the Img extension, which is essentially
faster.

Author: Paul Obermeier
Date: 2006-09-22
```

Demo:	**imgViewer**
Type:	
Category:	Tcl3DSpecificDemos
Root:	Contents




```
Copyright:      2005-2010 Paul Obermeier (obermeier@tcl3d.org)

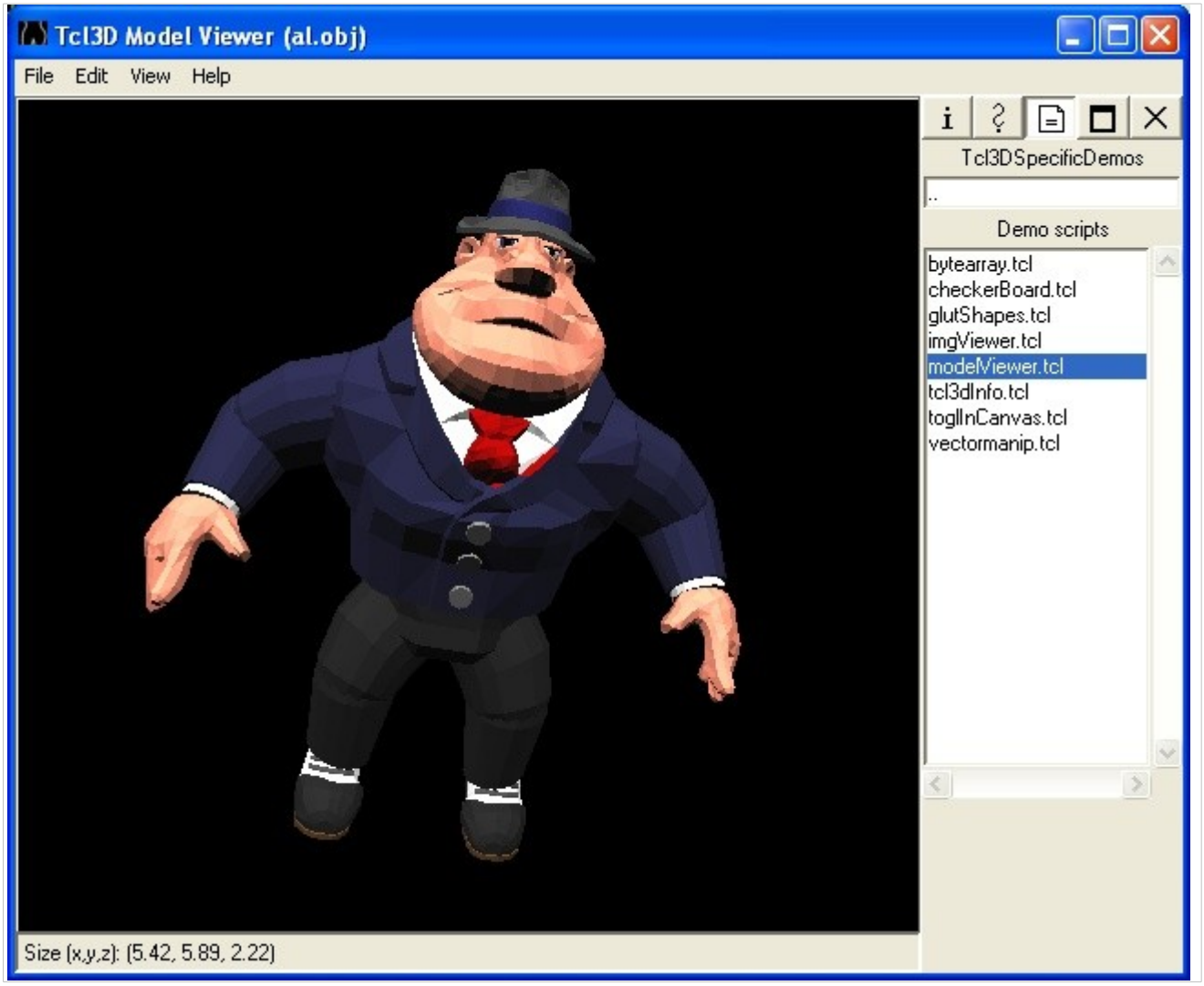
                See the file "Tcl3D_License.txt" for information on
                usage and redistribution of this file, and for a
                DISCLAIMER OF ALL WARRANTIES.

Module:         Tcl3D
Filename:       imgViewer.tcl

Author:         Paul Obermeier

Description:    Tcl program to display images and stretch them in
                realtime with the use of OpenGL textures.
                The images can be read from files in all formats supported by
                the Img extension. The stretched image may also be written
                out to an image file.
```

Demo:	**modelViewer**
Type:	
Category:	Tcl3DSpecificDemos
Root:	Contents




```
Copyright:      2005-2010 Paul Obermeier (obermeier@tcl3d.org)

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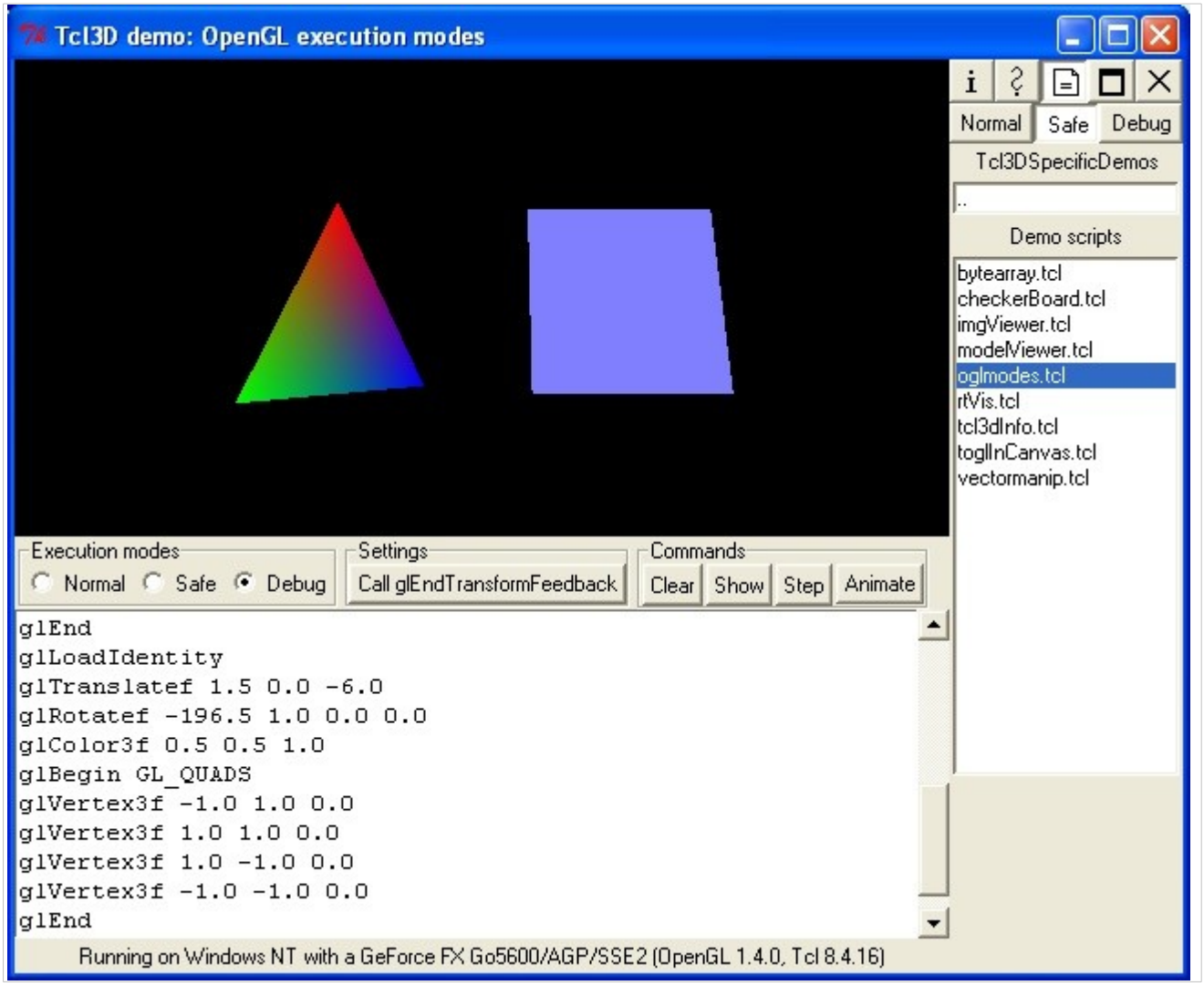
                usage and redistribution of this file, and for a
                DISCLAIMER OF ALL WARRANTIES.

Module:         Tcl3D
Filename:       modelViewer.tcl

Author:         Paul Obermeier

Description:    Tcl program to display 3D model files in all formats supported
                by the Tcl3D extension.
```

Demo:	oglmodes
Type:	
Category:	Tcl3DSpecificDemos
Root:	Contents




```
oglmodes.tcl

Tcl3D demo showing 3 possible modes of OpenGL execution:

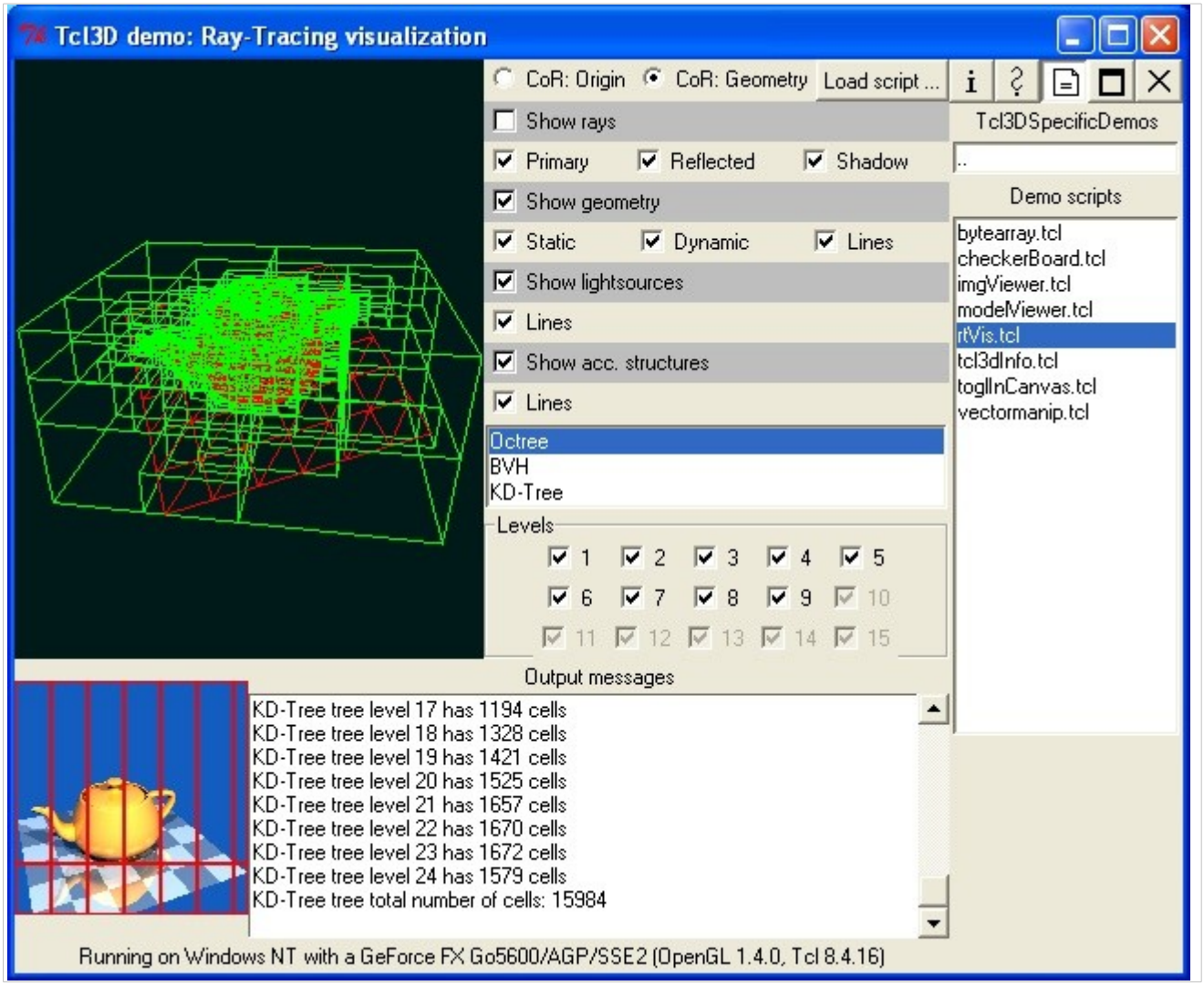
Normal mode: Use the OpenGL functions as wrapped by SWIG.
             This is the fastest mode. If using an
             OpenGL function not available in the used driver
             implementation, this mode will dump core.
Safe mode:   In this mode every OpenGL function is checked for
             availability in the driver before execution.
             If it's not available, a message is printed out.
Debug mode:  This mode checks the availability of an OpenGL function
             like the safe mode, and additionally prints out each
             OpenGL function before execution.

The program allows to insert an unavailable command in the display
callback to see the impact on execution. Currently this command is
set to "glFinishTextureSUNX", which is an old, not widely used extension
and therefore should not be available in most driver implementations
currently in the wild.

Author: Paul Obermeier
```

```
Date: 2009-01-10
```

Demo:	**rtVis**
Type:	
Category:	Tcl3DSpecificDemos
Root:	Contents




```
Copyright:    2008-2010 Paul Obermeier (obermeier@tcl3d.org)

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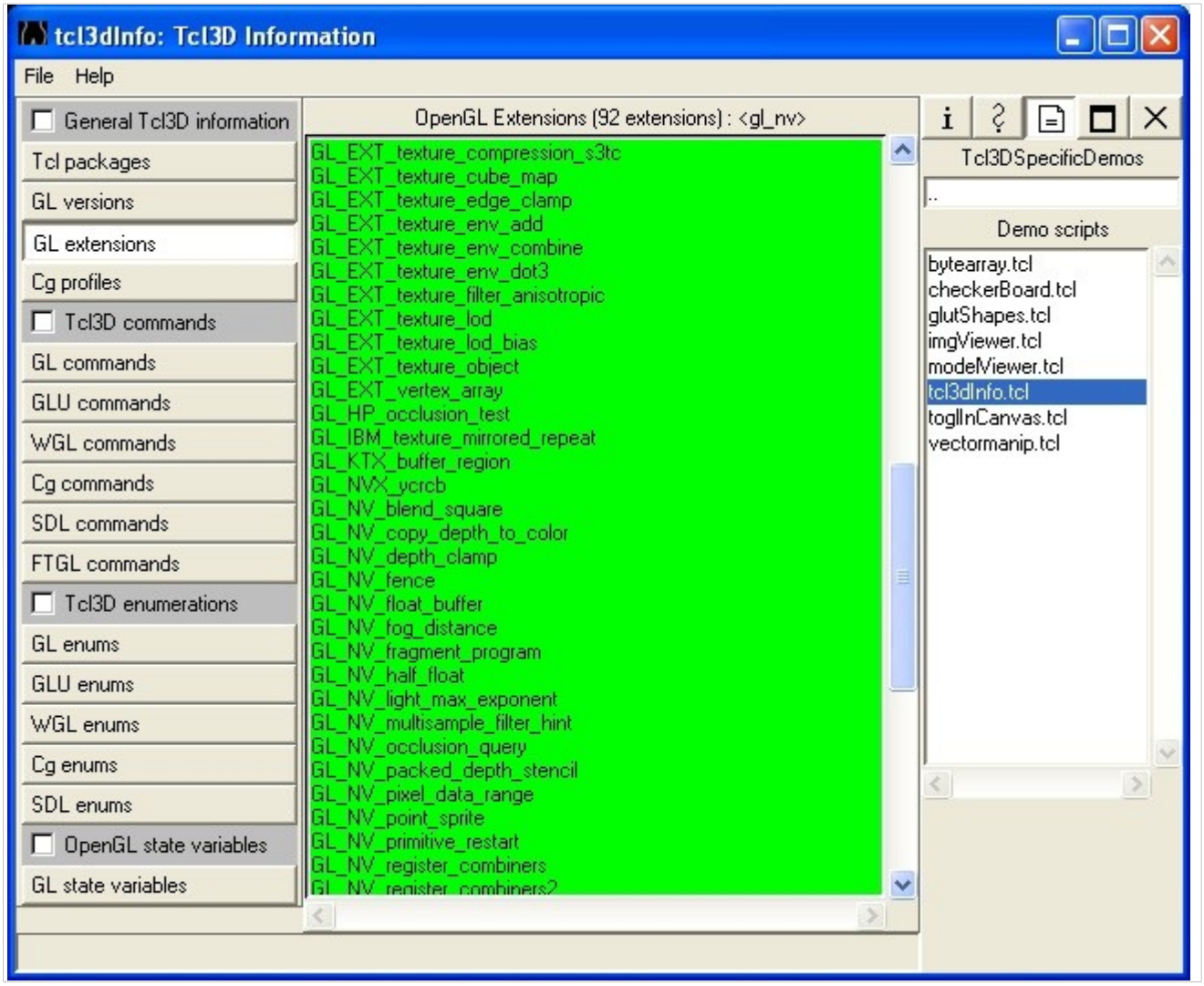
              usage and redistribution of this file, and for a
              DISCLAIMER OF ALL WARRANTIES.

Module:       Tcl3DSpecificDemos
Filename:     rtVis.tcl

Author:       Paul Obermeier

Description:  Ray Tracing visualization program.
              The comments of the rtvis* procedures explain how to
              use the ray-tracing visualization commands.
```

Demo:	**tcl3dInfo**
Type:	
Category:	Tcl3DSpecificDemos
Root:	Contents




```
Copyright:      2005-2010 Paul Obermeier (obermeier@tcl3d.org)

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                usage and redistribution of this file, and for a
                DISCLAIMER OF ALL WARRANTIES.

Module:         Tcl3D
Filename:       tcl3dInfo.tcl

Author:         Paul Obermeier

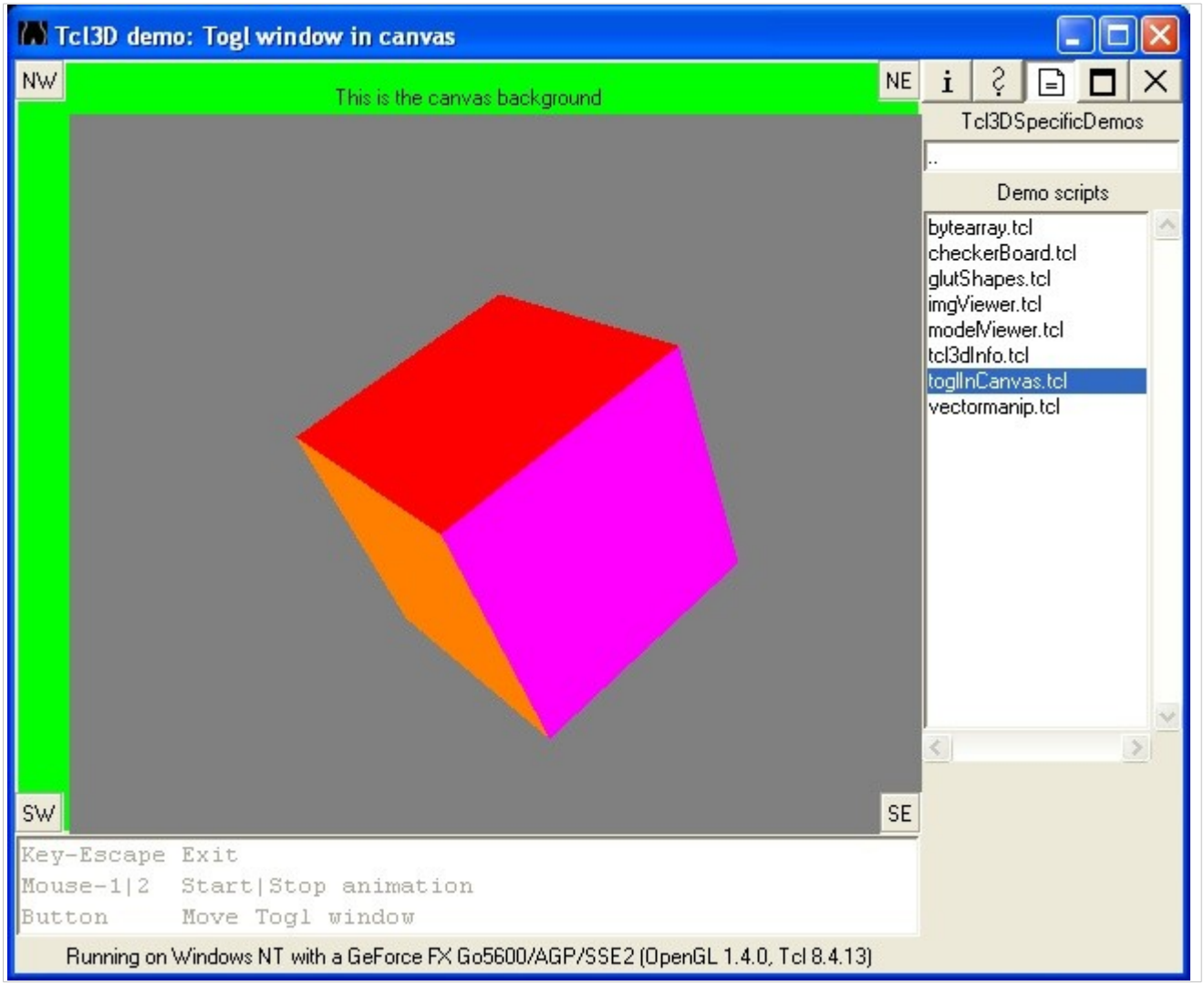
Description:    Tcl script to display OpenGL related information.
                When called without arguments, a window is opened with
                buttons to display OpenGL information for the following
                categories:
                - General information                           (-info)
                - Available OpenGL commands in Tcl              (-cmd)
                - Available OpenGL enumerations in Tcl          (-enum)

                The information texts can also be printed to stdout
                whithout opening a GUI, if calling this Tcl script
                with any of the above listed command line options.
```

```
To display all four categories, the option "-all"
can be used.

Note: To retrieve all necessary information, an OpenGL
      context has to be established. So the batch mode
      needs a DISPLAY, too.
```

Demo:	**toglInCanvas**
Type:	
Category:	Tcl3DSpecificDemos
Root:	Contents

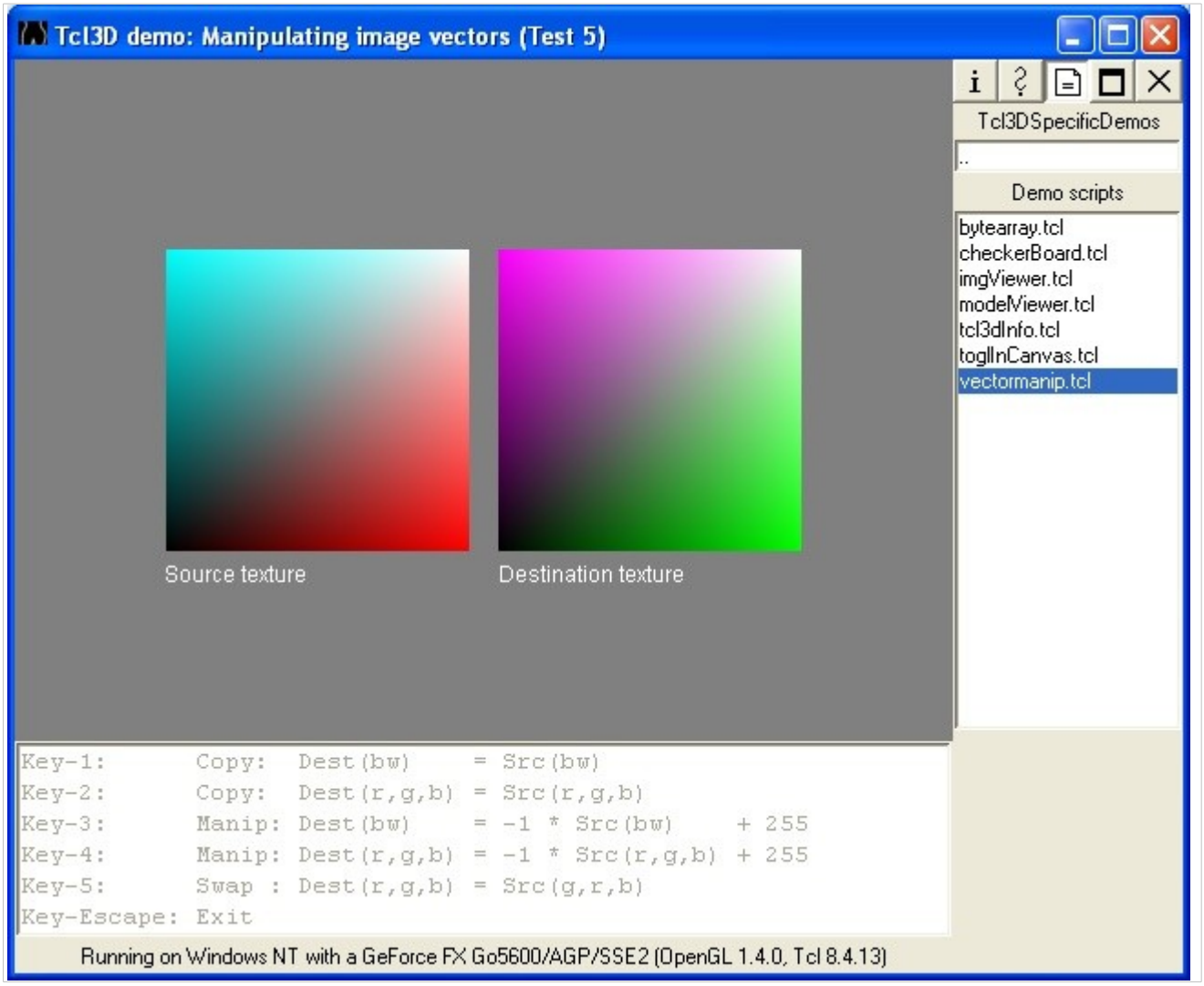



```
toglInCanvas.tcl

Tcl3D demo using a Togl window and some button widgets inserted into a canvas.

Author: Paul Obermeier
Date: 2006-12-08
```

Demo:	**vectormanip**
Type:	
Category:	Tcl3DSpecificDemos
Root:	Contents




```
vectormanip.tcl

Tcl3D demo showing the use of the Vector manipulation functions,
introduced in Version 0.3.2.
The program texture maps an image generated with Tcl (the source) onto the
left quad. The source texture is manipulated with the vector functions
according to the choosen method and mapped onto the right quad.
See functions execMethod? below.

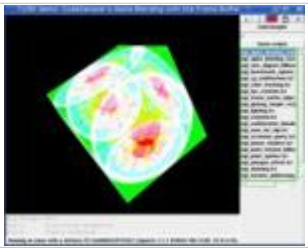
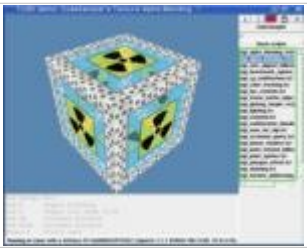
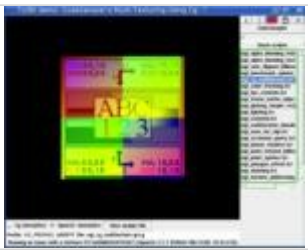
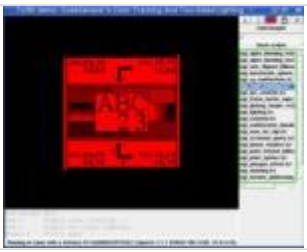
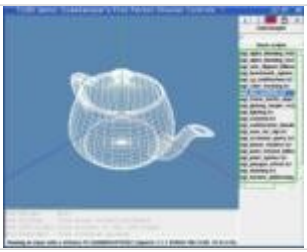
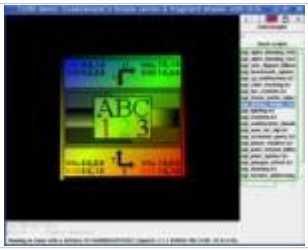
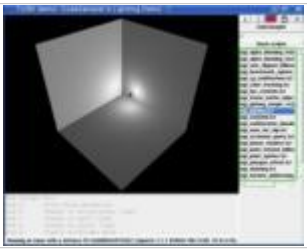
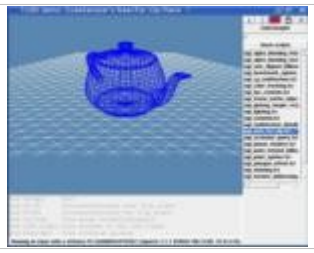
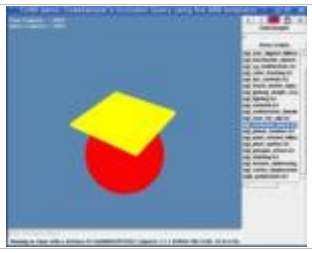
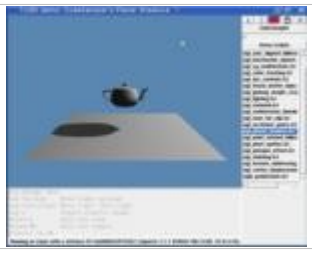
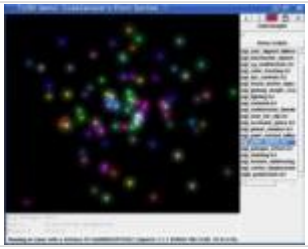
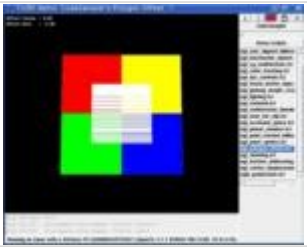
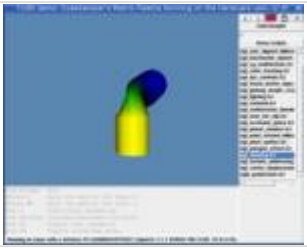
Author: Paul Obermeier
Date: 2006-08-15
```

Category:	**TutorialsAndBooks**
Root:	Contents
Types:	CodeSampler GameProgrammer NeHe Nopper RedBook

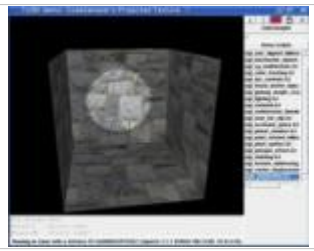
Type:	**CodeSampler**
Category:	TutorialsAndBooks
Root:	Contents

Several demo applications from Kevin Harris' page have been ported to Tcl3D. The examples cover Cg, G
OpenGL extension programming.
Original sources available at: http://www.codesampler.com/oglsrc.htm

Available demos

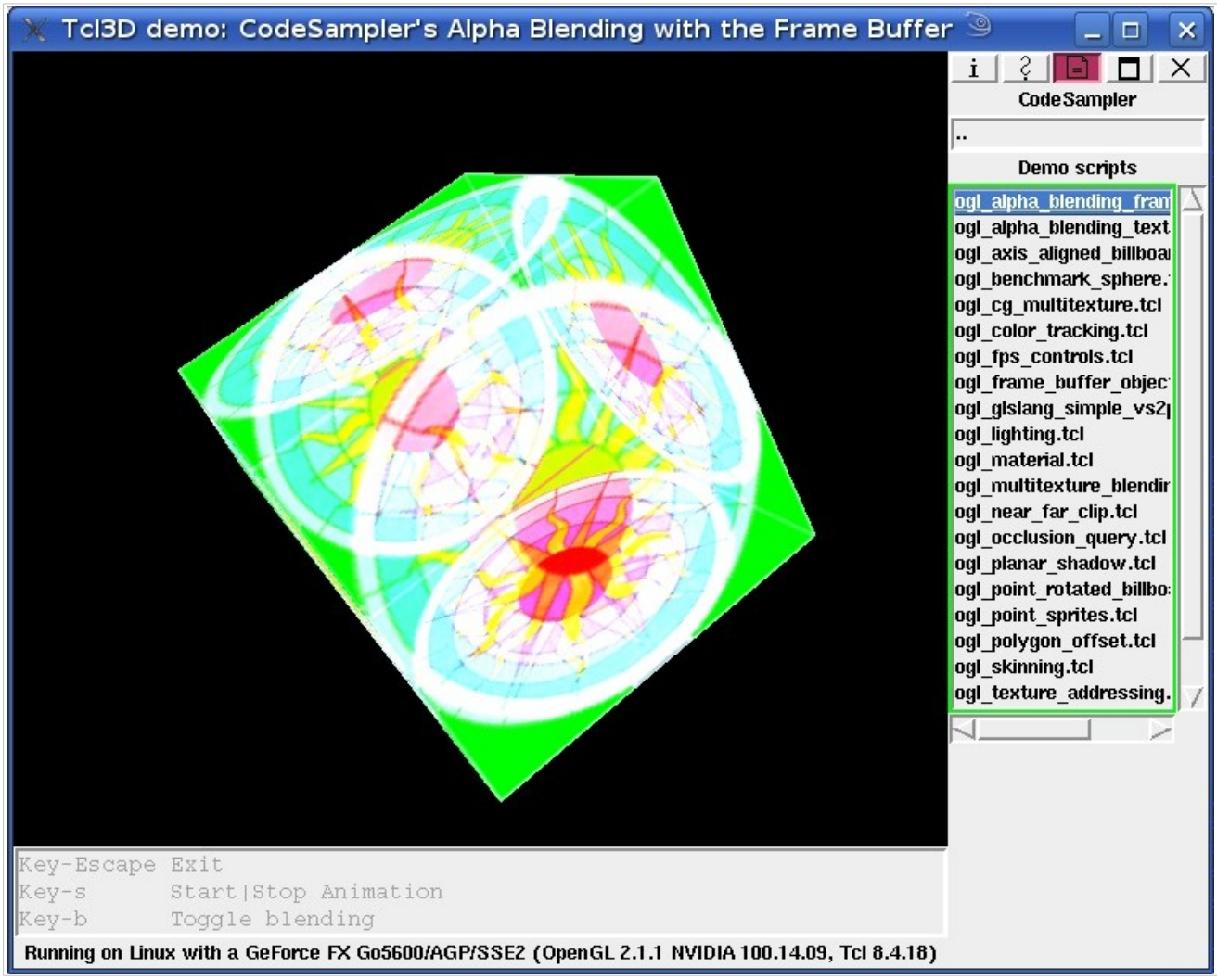
			
ogl_alpha_blending_framebuffer	ogl_alpha_blending_texture	ogl_axis_aligned_billboard	ogl_benchmark_
			
ogl_cg_multitexture	ogl_color_tracking	ogl_fps_controls	ogl_frame_buffer
			
ogl_glslang_simple_vs2ps	ogl_lighting	ogl_material	ogl_multitexture_b
			
ogl_near_far_clip	ogl_occlusion_query	ogl_planar_shadow	ogl_point_rotated_
			
ogl_point_sprites	ogl_polygon_offset	ogl_skinning	ogl_texture_addr

ogl_vertex_displacement



oglu_projtexture

Demo:	**ogl_alpha_blending_framebuffer**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents



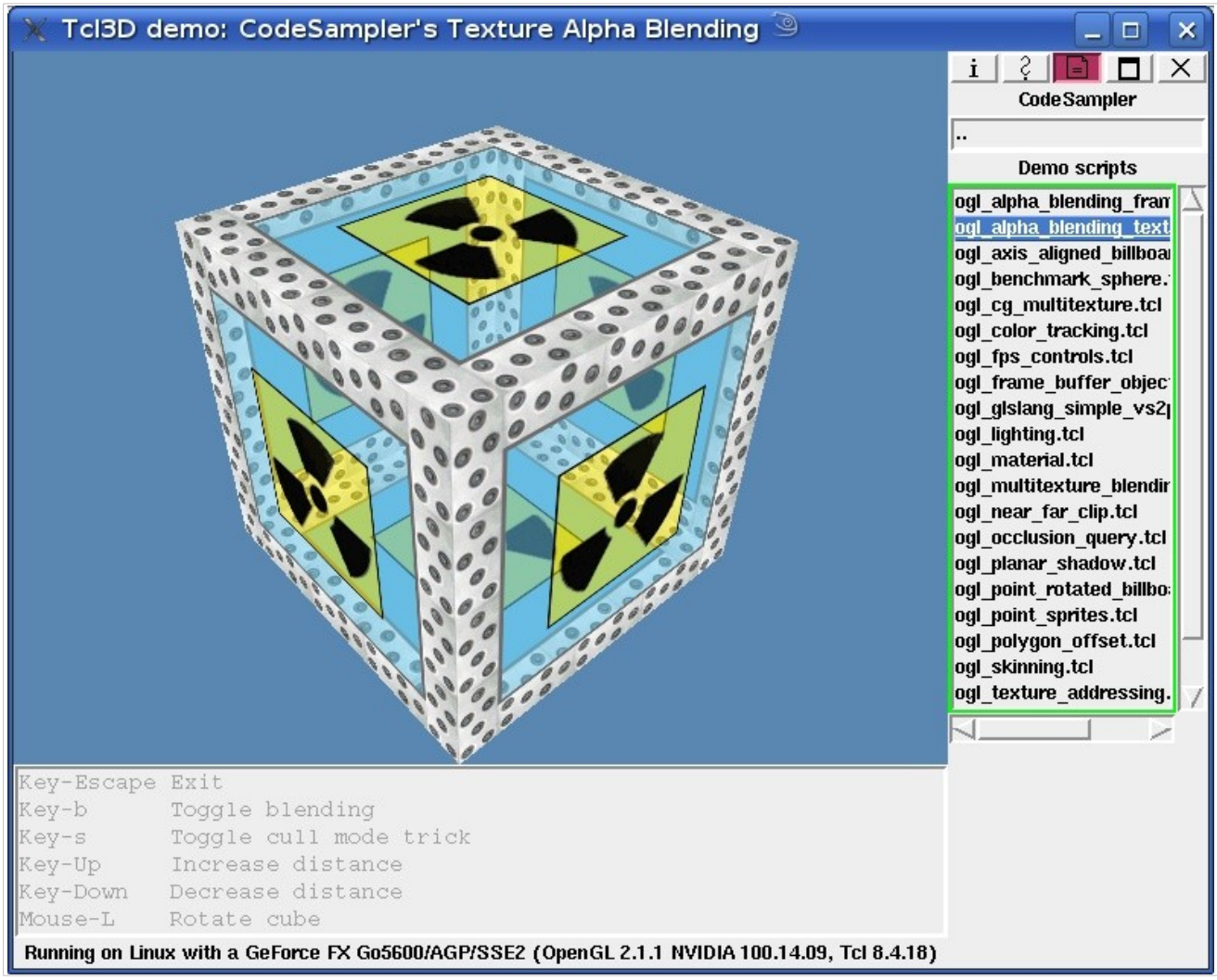

```
--------------------------------------------------------------------------------
          Name: ogl_alpha_blending_framebuffer.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 03/25/05
   Description: This sample demonstrates how to perform alpha-blending in
                the frame-buffer. The sample renders a textured cube which
                is alpha-blended into the frame-buffer in such a way as to
                create a translucent effect.

  Control Keys: b - Toggle blending
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 4: Alpha Blending in the Frame buffer
http://www.codesampler.com/oglsrc/oglsrc_4.htm#ogl_alpha_blending_framebuffer

Modified for Tcl3D by Paul Obermeier 2008/05/01
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_alpha_blending_texture**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents



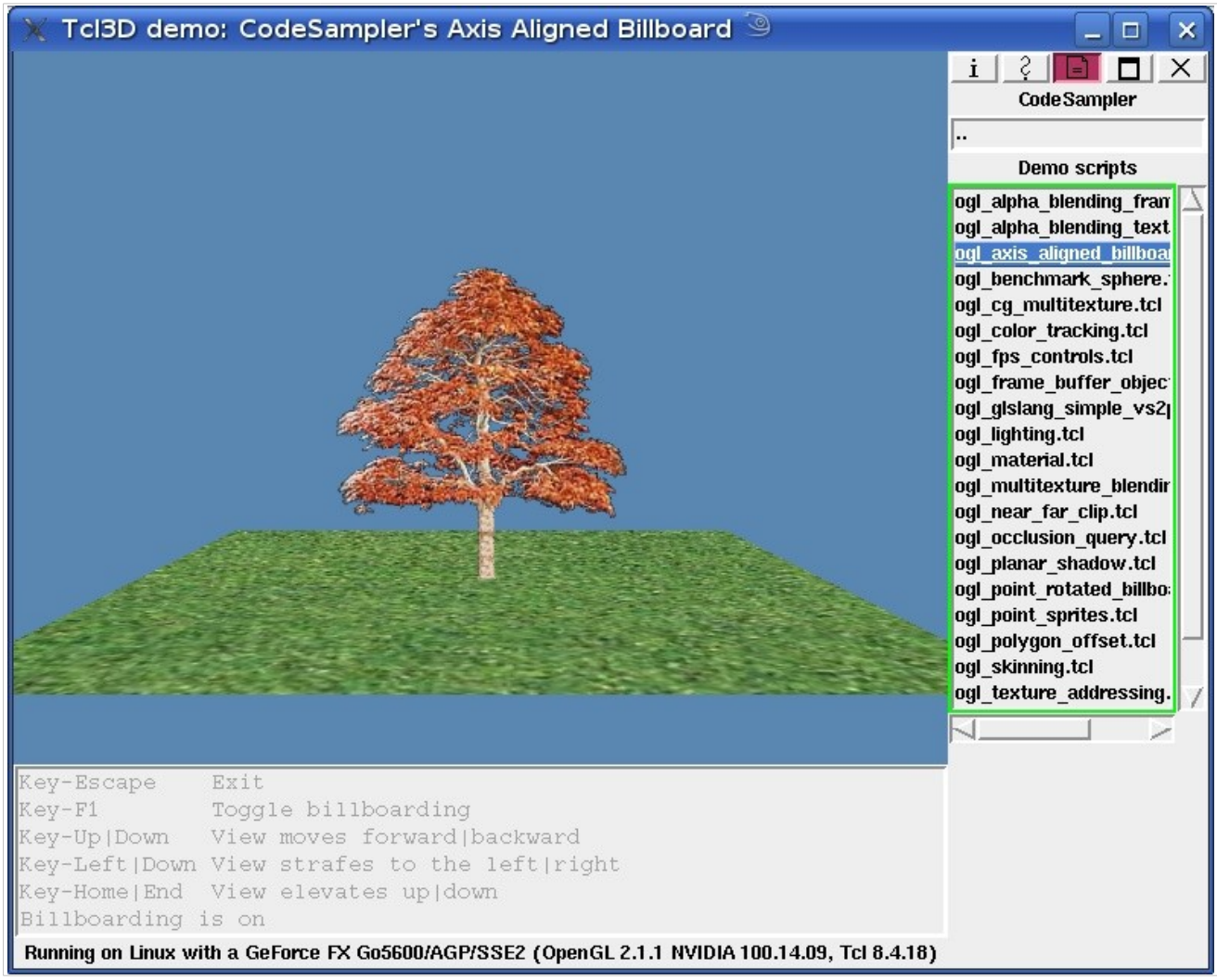

```
--------------------------------------------------------------------------------
          Name: ogl_alpha_blending_texture.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 03/25/05
   Description: This sample demonstrates how to perform alpha blending using
                the alpha channel of a standard .tga texture. For proper
                alpha blending, the sample uses a cull-mode sorting trick
                to ensure the sides of the textured cube get rendered in
                back-to-front order.

  Control Keys: b - Toggle blending
                s - Toggle usage of cull-mode sorting trick
                Up Arrow - Move the test cube closer
                Down Arrow - Move the test cube away
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 3: Alpha Texture Blending
http://www.codesampler.com/oglsrc/oglsrc_3.htm#ogl_alpha_blending_texture

Modified for Tcl3D by Paul Obermeier 2008/05/01
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_axis_aligned_billboard**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents



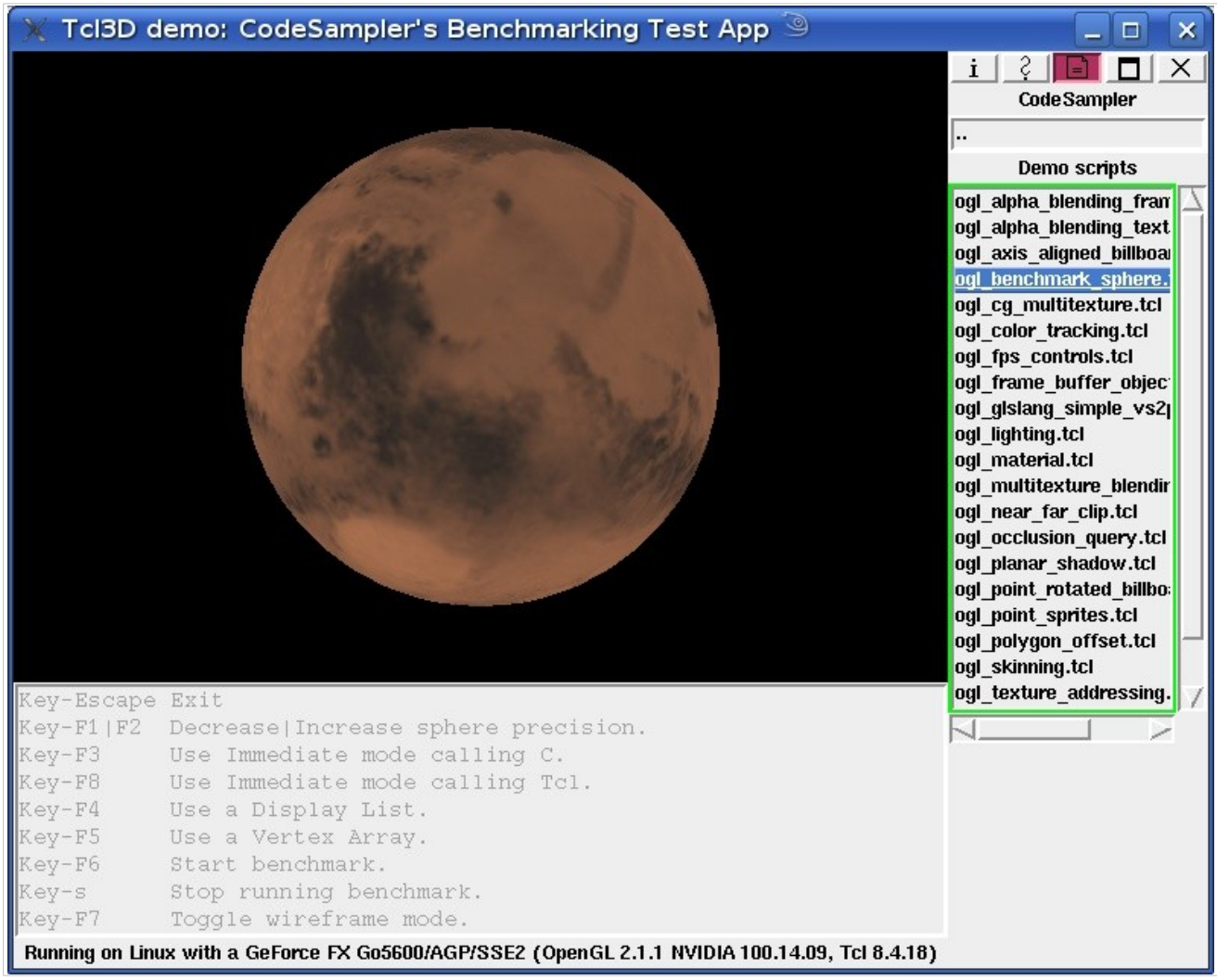

```
--------------------------------------------------------------------------------
          Name: ogl_axis_aligned_billboard.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: An example of axis aligned billboarding.

  Control Keys: F1         - Toggle billboarding
                Up         - View moves forward
                Down       - View moves backward
                Left       - View strafes left
                Right      - View strafes Right
                Left Mouse - Perform looking
                Mouse      - Look about the scene
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 8: Axis-Aligned Billboards

Modified for Tcl3D by Paul Obermeier 2007/03/10
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_benchmark_sphere**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents



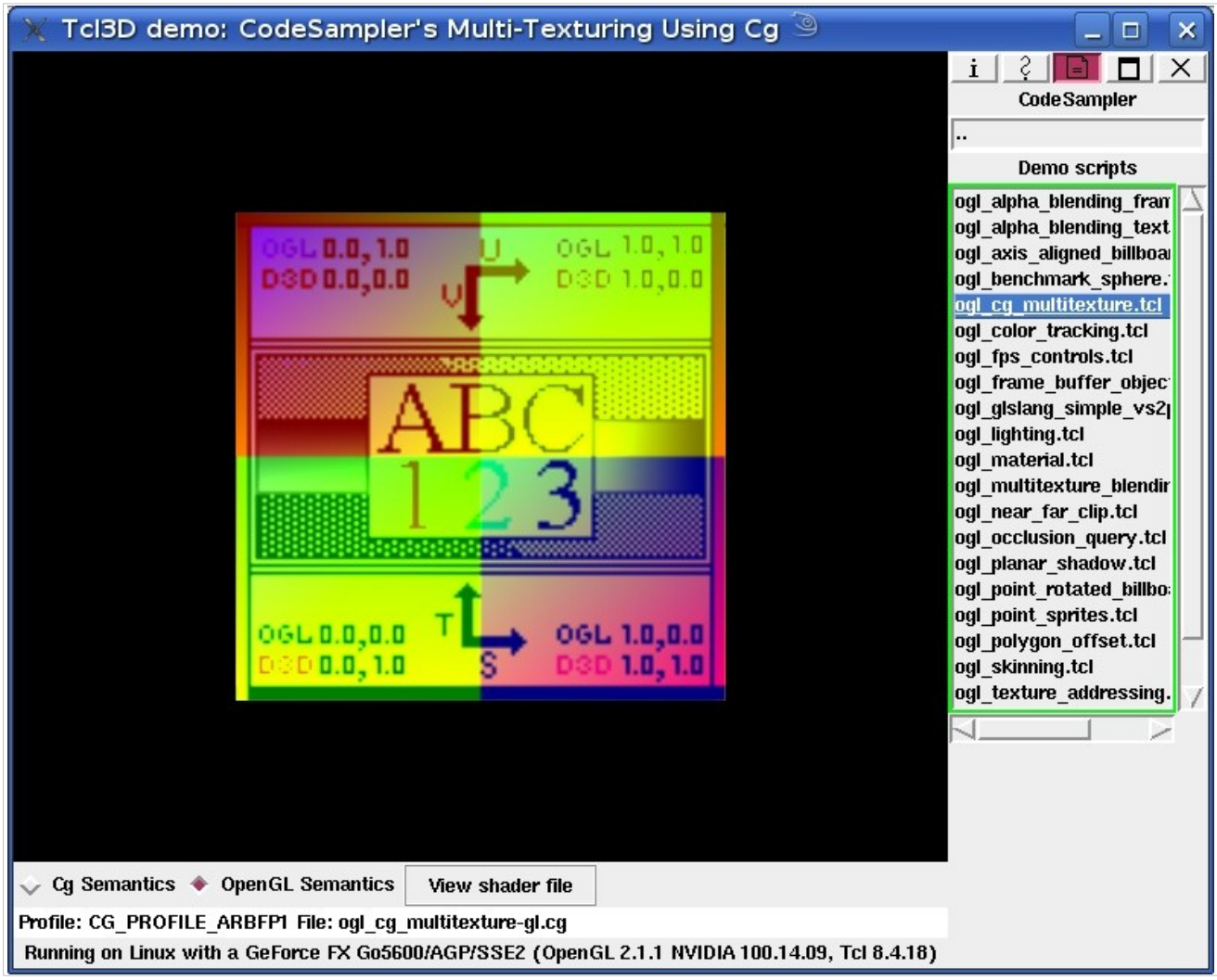

```
--------------------------------------------------------------------------------
          Name: ogl_benchmark_sphere.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 04/21/05
   Description: Renders a textured sphere using either Immediate Mode calls,
                Immediate Mode calls cached in a Display List, or as a
                collection of geometric data stored in an interleaved
                fashion within a Vertex Array.

  Control Keys: Left Mouse Button - Spin the view.
                F1 - Decrease sphere precision.
                F2 - Increase sphere precision.
                F3 - Use Immediate mode
                F4 - Use a Display List
                F5 - Use a Vertex Array
                F6 - Perform Benchmarking
                F7 - Toggle wire-frame mode.
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 9: Benchmarking Test App
```

```
Modified for Tcl3D by Paul Obermeier 2005/11/07
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	ogl_cg_multitexture
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents



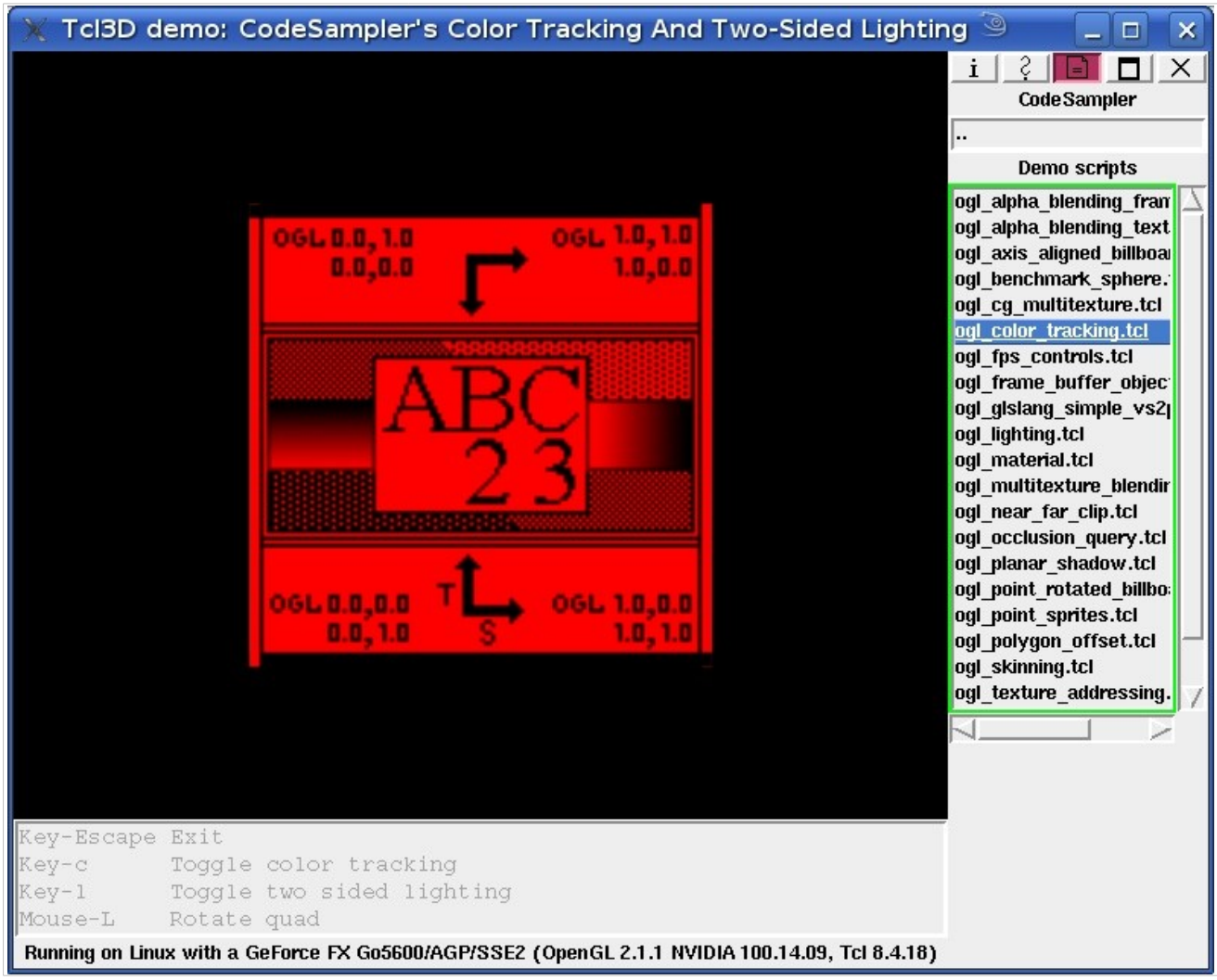

```
--------------------------------------------------------------------------------
          Name: ogl_cg_multitexture.cpp
        Author: Kevin Harris
 Last Modified: 04/26/05
   Description: This sample demonstrates how to blend two textures together
                with Cg using either OpenGL's native multi-texture support
                (using semantics) or by using Cg's special texture functions:
                cgGLSetTextureParameter, cgGLEnableTextureParameter, and
                cgGLDisableTextureParameter.
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 10: Multi-Texturing with Cg

Modified for Tcl3D by Paul Obermeier 2007/05/22
See www.tcl3d.org for the Tcl3D extension.

The original demo has been extended with a little GUI to allow switching
between the two call semantics at runtime.
To visualize, that a different shader program is active,
the OpenGL semantics shader adds only half of the checker image color.
```

Demo:	**ogl_color_tracking**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
--------------------------------------------------------------------------------
          Name: ogl_color_tracking.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 04/28/05
   Description: This sample demonstrates color-tracking and two-sided
                lighting in OpenGL.

                Color tracking allows us to substitute the color of our
                vertices for one or more of the material colors used by
                OpenGL's lighting equation. This feature is typically not
                used much anymore as since modelers today use textures to
                color their geometry - not vertex colors. Of course, this
                technique is alive and kicking in a billion lines of legacy
                code so it's good to understand this technique just in case
                you run across it.

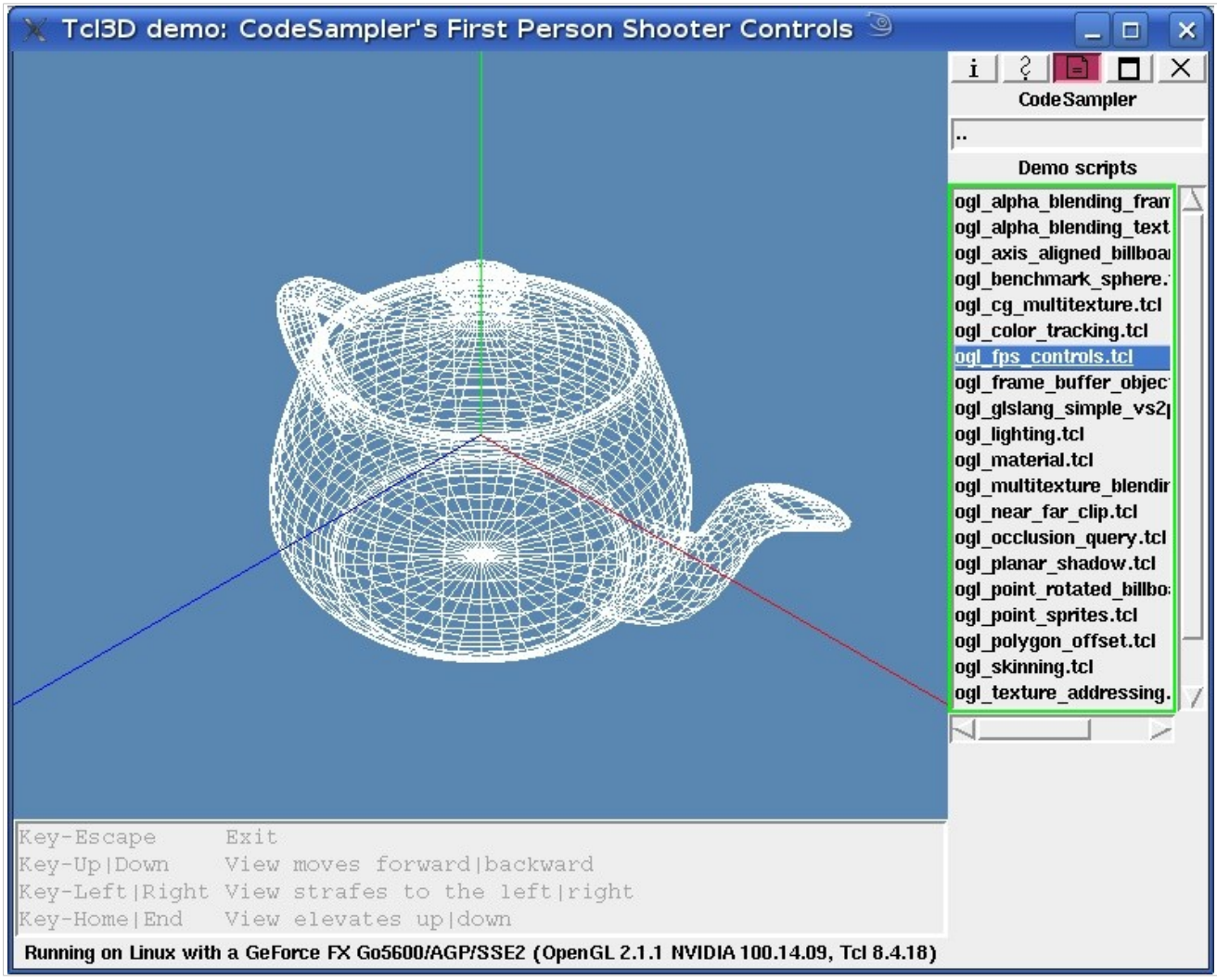
                Two-sided lighting basically means that we want OpenGL to
                light both sides of our geometry instead of just the front
                faces. Again, this feature is typically not used much
                anymore since it's very inefficient to light both sides of
                every triangle but there are some cases where this is
                helpful to know.
```

```
  Control Keys: c - Toggle between a material color or color tracking the
                    vertices
                l - Toggle two-sided lighting
------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 5: Color Tracking and Two-Sided lighting
http://www.codesampler.com/oglsrc/oglsrc_5.htm#ogl_color_tracking

Modified for Tcl3D by Paul Obermeier 2008/05/01
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_fps_controls**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
-------------------------------------------------------------------------------
          Name: ogl_fps_controls.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: This sample demonstrates how to collect user input and
                build a custom view matrix for First Person Shooter style
                controls.

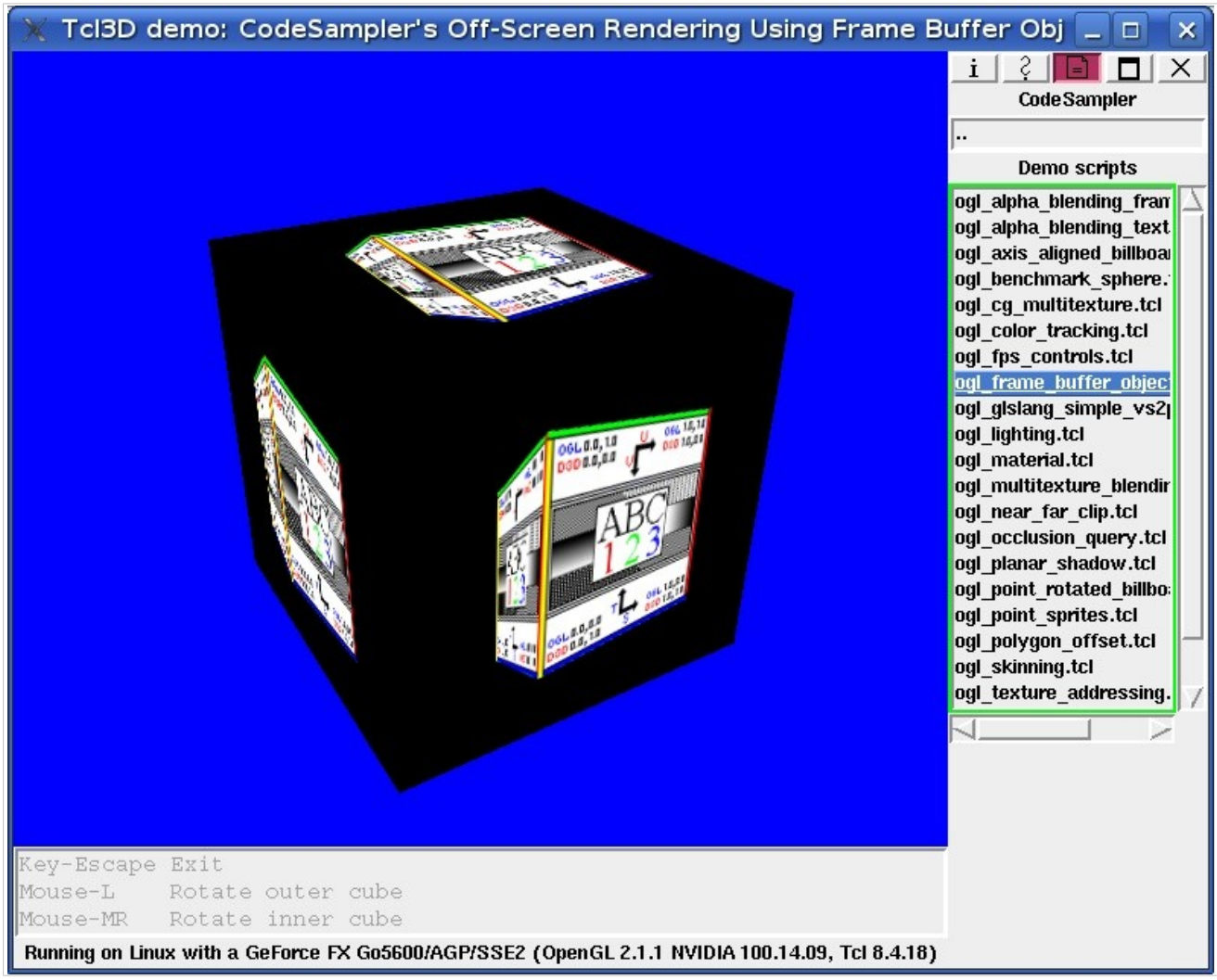
  Control Keys: Up         - View moves forward
                Down       - View moves backward
                Left       - View strafes left
                Right      - View strafes Right
                Left Mouse - Perform looking
                Mouse      - Look about the scene
                Home       - View moves up
                End        - View moves down
-------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 5: First Person Shooter Controls

Modified for Tcl3D by Paul Obermeier 2005/11/05
```

```
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_frame_buffer_object**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
-------------------------------------------------------------------------------
          Name: ogl_frame_buffer_object.cpp
        Author: Kevin Harris  (kevin@codesampler.com)
 Last Modified: 07/06/05
   Description: This sample demonstrates how to create dynamic textures
                through off-screen rendering. The off-screen rendering step
                is accomplished using a frame-buffer and render-buffer
                object, which is created using OpenGL's
                EXT_framebuffer_object extension.

                As a demonstration, a spinning textured cube is rendered
                to a frame-buffer object, which is in turn, used to create a
                dynamic texture. The dynamic texture is then used to texture
                a second spinning cube, which will be rendered to the
                application's window.

  Control Keys: Left Mouse Button  - Spin the large, black cube.
                Right Mouse Button - Spin the textured cube being rendered
                                     into the p-buffer.

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

Note: The EXT_framebuffer_object extension is an excellent replacement for
```

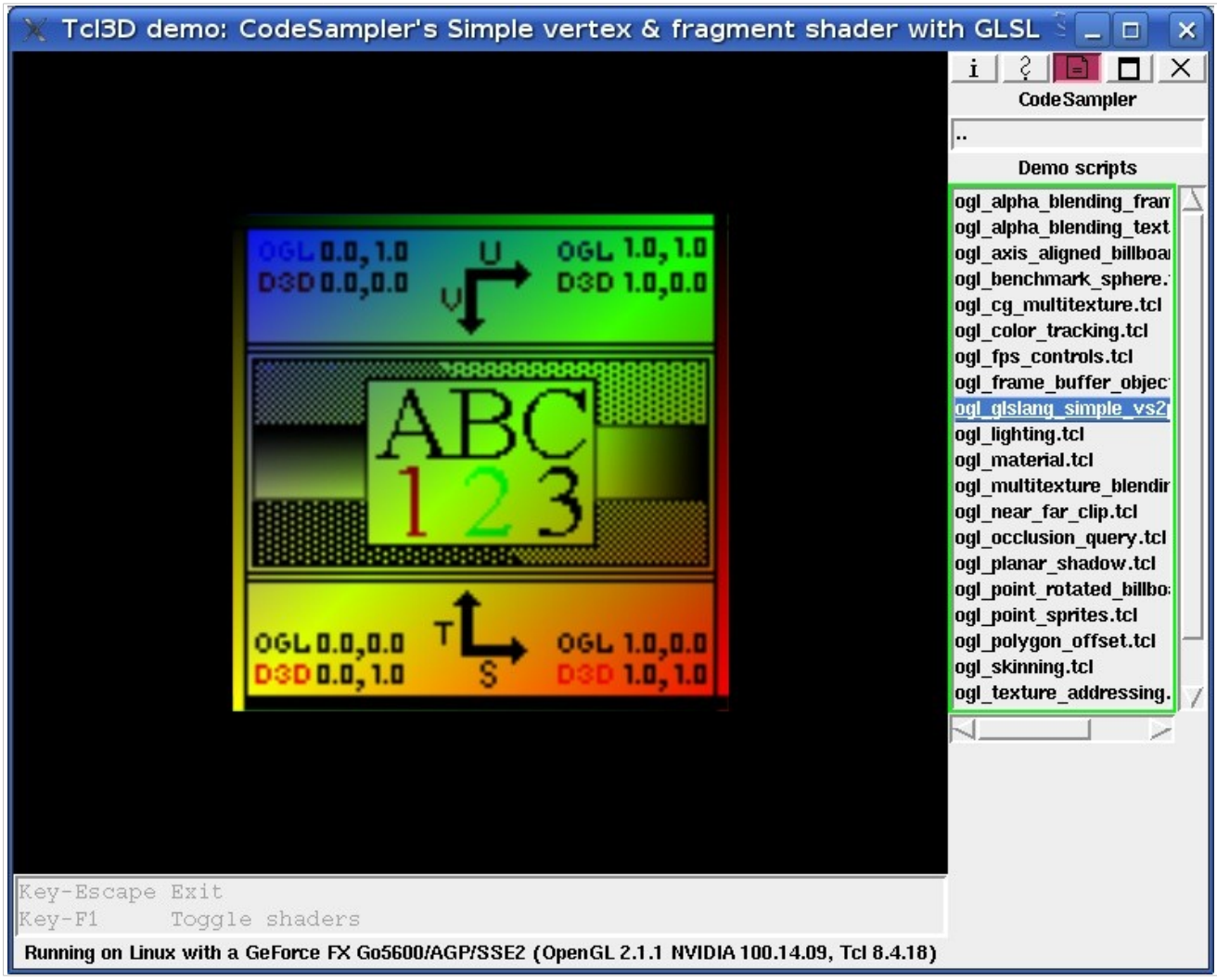
```
      the WGL_ARB_pbuffer and WGL_ARB_render_texture combo which is normally
      used to create dynamic textures. An example of this older technique
      can be found here:

      http://www.codesampler.com/oglsrc/oglsrc_7.htm#ogl_offscreen_rendering
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 14: Off-screen Rendering Using Frame-Buffer Objects

Modified for Tcl3D by Paul Obermeier 2007/02/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_glslang_simple_vs2ps**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
--------------------------------------------------------------------------------
          Name: ogl_glslang_simple_vs2ps.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 04/21/05
   Description: This sample demonstrates how to write vertex and fragment
                shaders using OpenGL's new high-level shading language
                GLslang.

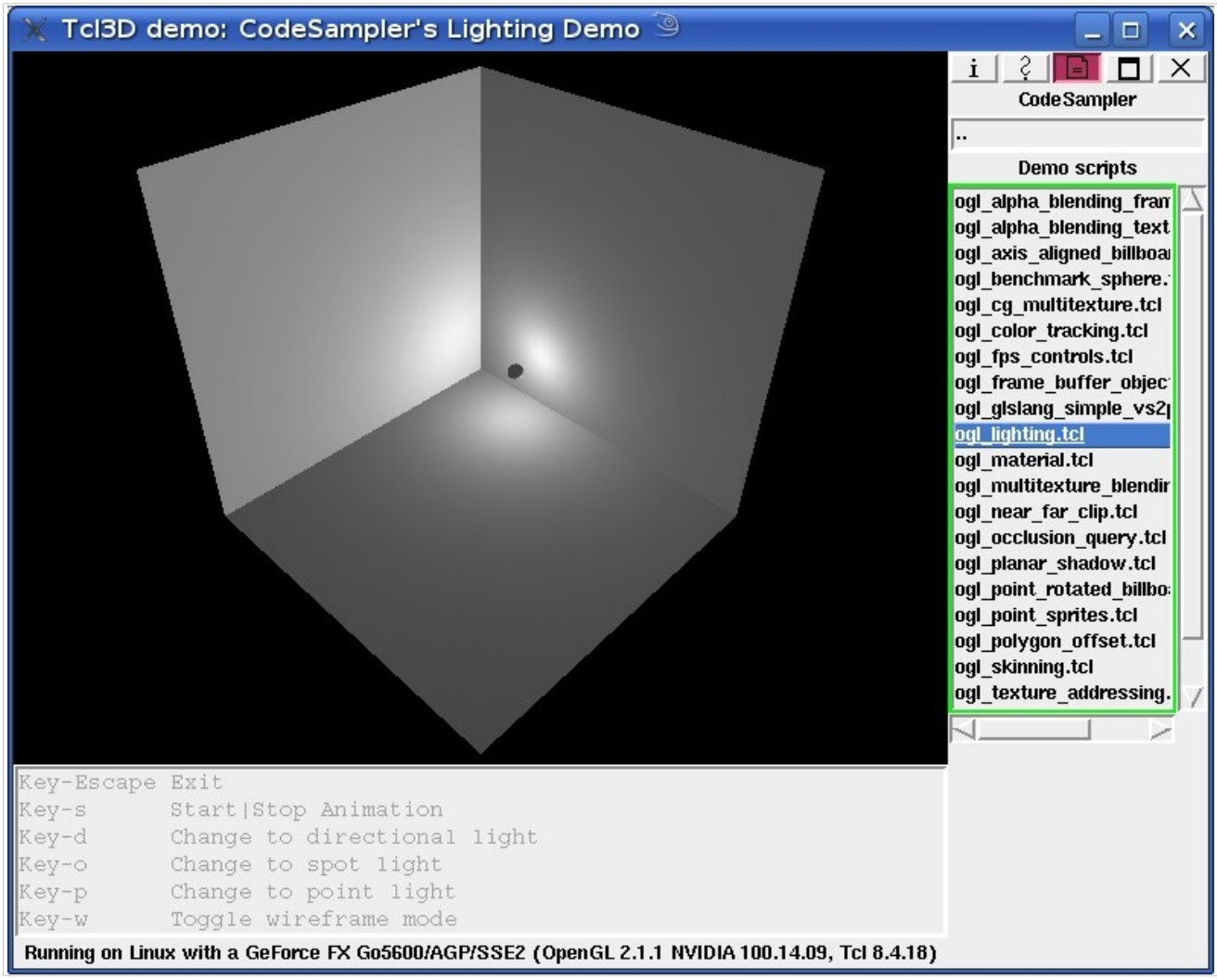
  Control Keys: F1 - Toggle usage of vertex and fragment shaders.

 Note: The fragment shader has been changed slightly from what the
       fixed-function pipeline does by default so you can see a noticeable
       change when toggling the shaders on and off. Instead of modulating
       the vertex color with the texture's texel, the fragment shader adds
       the two together, which causes the fragment shader to produce a
       brighter, washed-out image. This modification can be switched back in
       the fragment shader file.
--------------------------------------------------------------------------------

 Original C++ code by Kevin Harris (kevin@codesampler.com)
 See www.codesampler.com for the original files
 OpenGL samples page 10: Simple Vertex & Fragment Shader (GLslang)
```

```
Modified for Tcl3D by Paul Obermeier 2005/11/05
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_lighting**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents



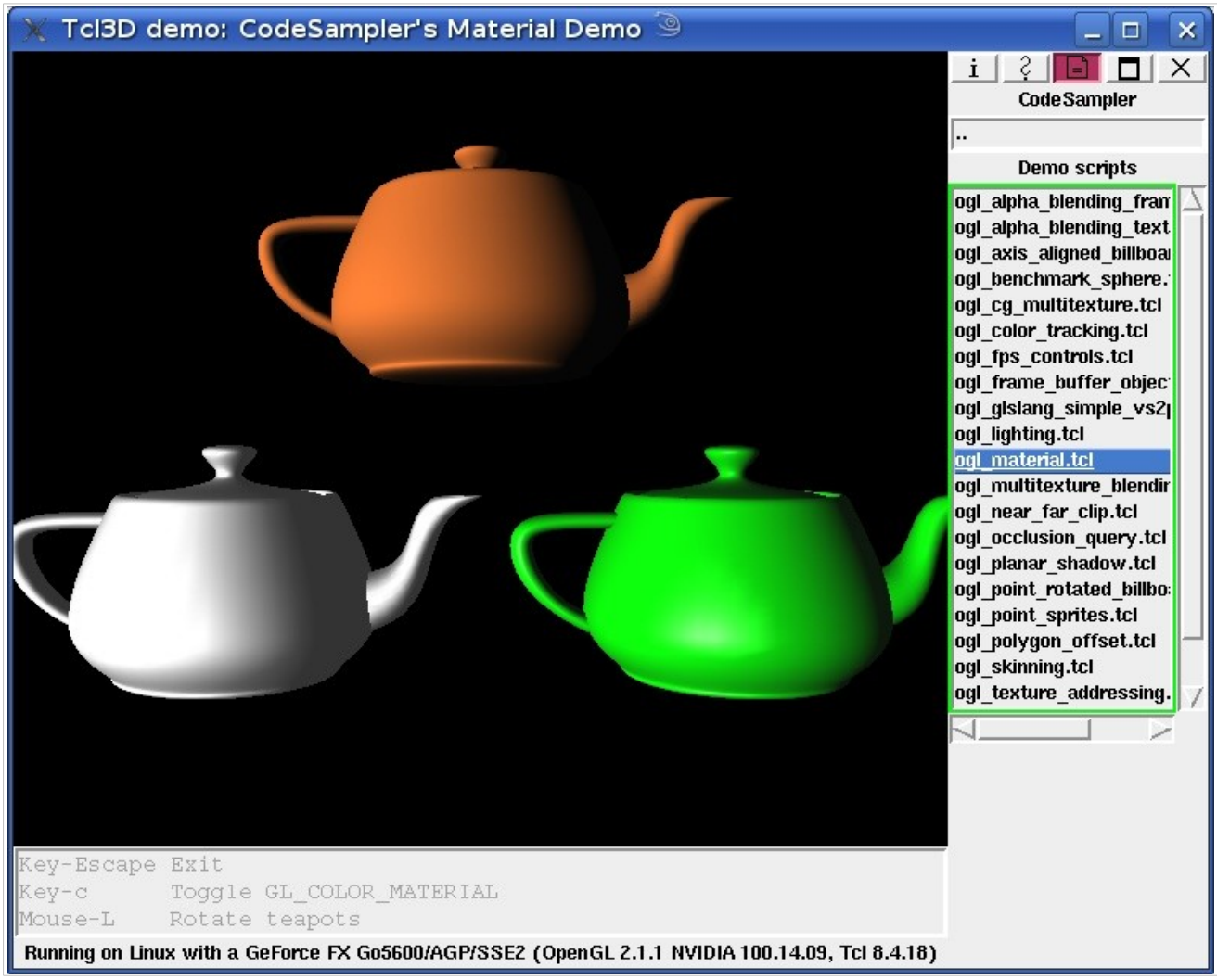

```
-------------------------------------------------------------------------------
          Name: ogl_lighting.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: This sample demonstrates the three basic types of lights
                that are available in OpenGL: directional, spot, and point.

  Control Keys: l - Changes the light's type
                w - Toggles wire frame mode
-------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 5: Lighting
http://www.codesampler.com/oglsrc/oglsrc_5.htm#ogl_lighting

Modified for Tcl3D by Paul Obermeier 2008/05/01
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_material**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents



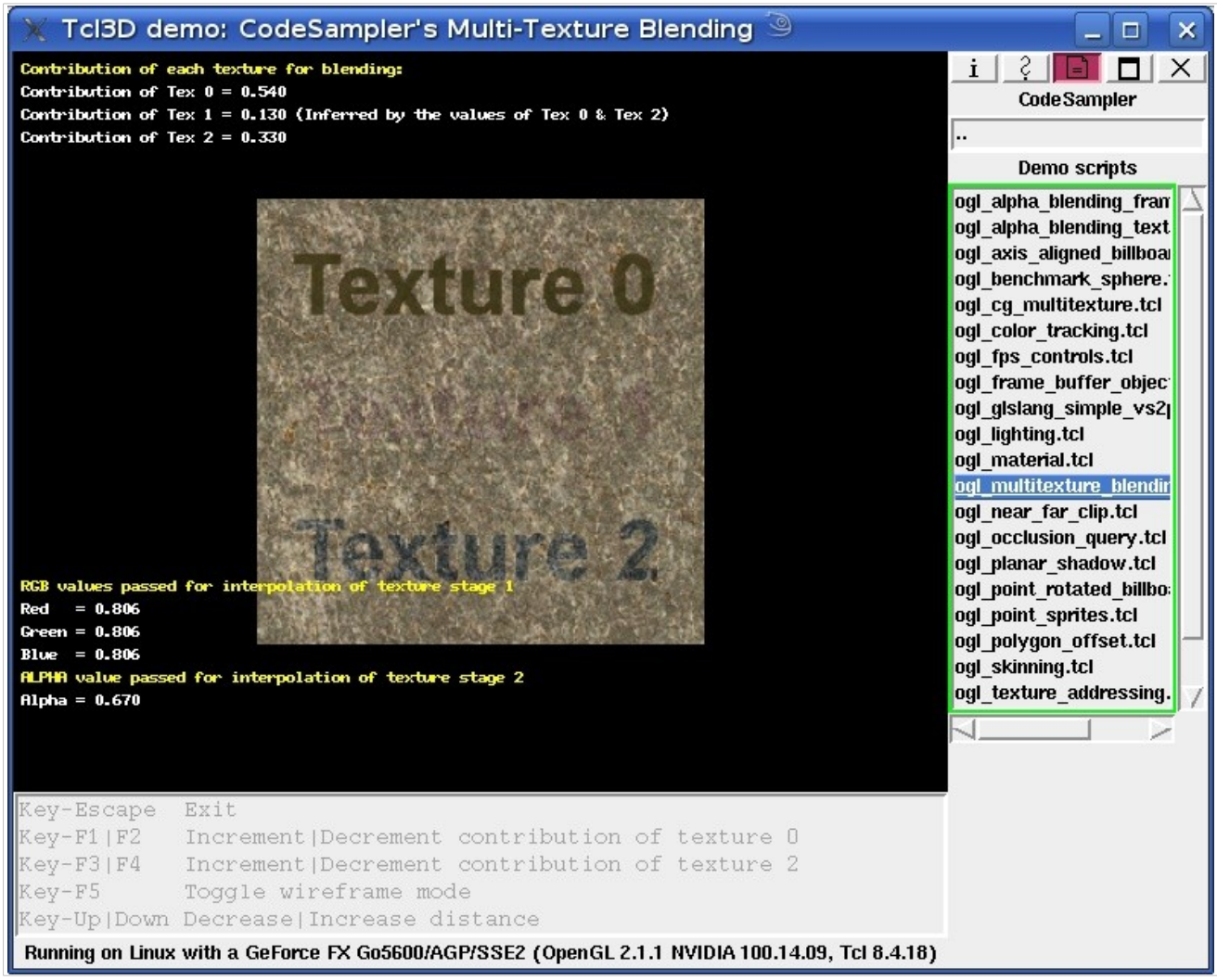

```
--------------------------------------------------------------------------------
          Name: ogl_material.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 04/28/05
   Description: This sample demonstrates how to use materials with lighting
                to produce different surface effects.

  Control Keys: Left Mouse Button - Spin the view
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 5: Materials
http://www.codesampler.com/oglsrc/oglsrc_5.htm#ogl_material

Modified for Tcl3D by Paul Obermeier 2008/04/28
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	ogl_multitexture_blending
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
--------------------------------------------------------------------------------
          Name: ogl_multitexture_blending.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/08/05
   Description: This sample demonstrates how to use the OpenGL extensions
                GL_ARB_multitexture and GL_ARB_texture_env_combine in
                conjunction with specially encoded vertex colors to blend
                three textures together.

                This technique is very popular in terrain rendering engines
                which use it to blend dramatically different textures such
                as rock and grass together with out creating a noticeable
                edge. For example, with three textures consisting of stone,
                grass, and sand you can render a mountain that blends in
                patches of grass and sand at its base.

                Of course, while this technique remains popular as a
                fall-back for older hardware, shaders make this task a lot
                easier and are quickly becoming the preferred method for
                terrain texture blending.

The technique basically consists of the following steps:
```

```
Step 1: Take the desired contribution of the three textures and encode them
        into the vertex's color such that the RGB portion of the color
        controls the interpolation between texture stages 0 and 1, and the
        color's ALPHA controls the interpolation between texture stages
        1 and 2.

Step 2: Use GL_ARB_multitexture to apply three textures simultaneously to
        our geometry.

Step 3: Set the first texture on texture stage 0.

Step 4: During texture stage 1, use GL_INTERPOLATE_ARB to linearly
        interpolate between the output of stage 0 and the texture of stage 1
        with GL_SRC_COLOR (i.e. the RGB part of the color).

Step 4: During texture stage 2, use GL_INTERPOLATE_ARB to linearly
        interpolate between the output of stage 1 and the texture of stage 2
        with GL_SRC_ALPHA (i.e. the ALPHA part of the color).

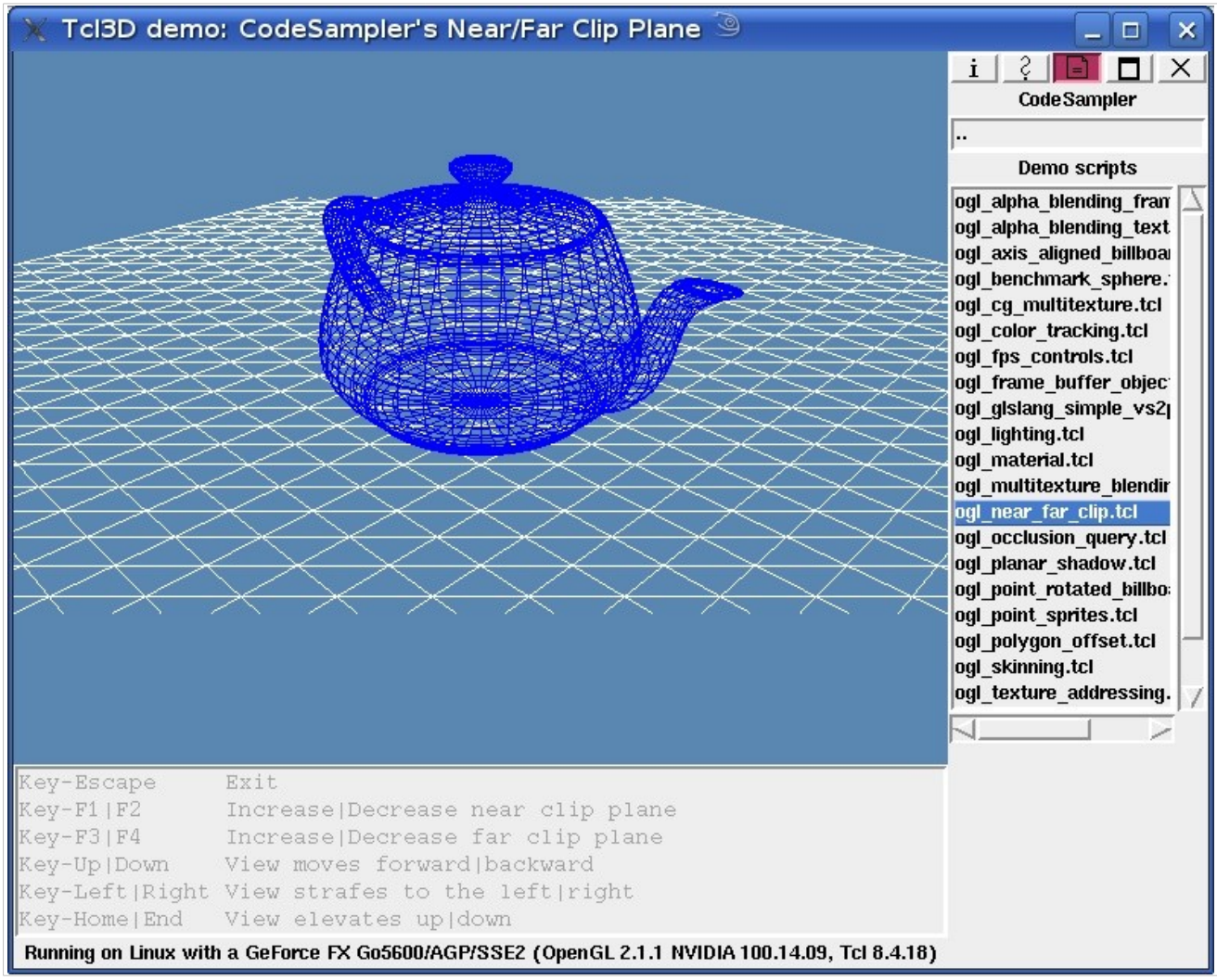
  Control Keys: F1   - Increase contribution of texture 0
                F2   - Decrease contribution of texture 0
                F3   - Increase contribution of texture 2
                F4   - Decrease contribution of texture 2
                F5   - Toggle wire-frame mode.
                Up   - View moves forward
                Down - View moves backward

Note: I tried to create an intuitive way to set the contribution of each
      texture at run-time using the function keys, but this system is still
      a little confusing since I only allow the contribution of texture 0
      and texture 2 to be adjusted. This is due to the fact that the
      equation for encoding the blending info into the vertex color simply
      infers the contribution value of texture 1 based on the values for
      textures 0 and 2. Therefore, the contribution value of texture 1 must
      be indirectly set by adjusting the contributions of textures 0 and 2.
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 4: Multi-Texture Blending

Modified for Tcl3D by Paul Obermeier 2007/03/10
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_near_far_clip**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
-------------------------------------------------------------------------------
          Name: ogl_near_far_clip.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: This sample demonstrates how adjustments to OpenGL's
                near and far clip planes effect the view.

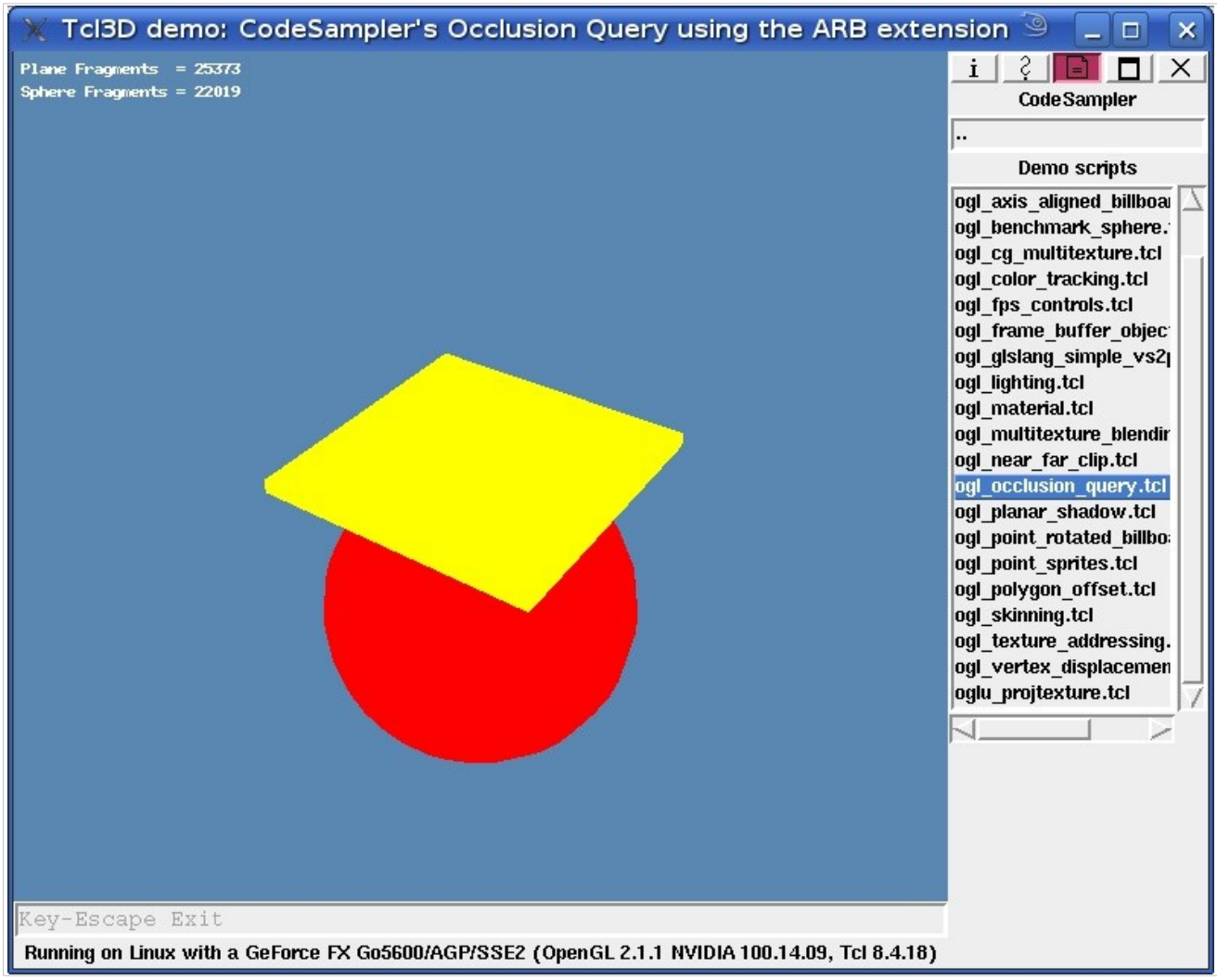
  Control Keys: Up         - View moves forward
                Down       - View moves backward
                Left       - View strafes left
                Right      - View strafes Right
                Left Mouse - Perform looking
                Mouse      - Look about the scene

                F1         - Increase near clip value
                F2         - Decrease near clip value
                F3         - Increase far clip value
                F4         - Decrease far clip value
-------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 2: Near/Far Clipping Plane
```

```
Modified for Tcl3D by Paul Obermeier 2007/03/10
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	ogl_occlusion_query
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
--------------------------------------------------------------------------------
          Name: ogl_occlusion_query_arb.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: This sample demonstrates how to use OpenGL's new extension,
                ARB_occlusion_query and NV_occlusion_query.

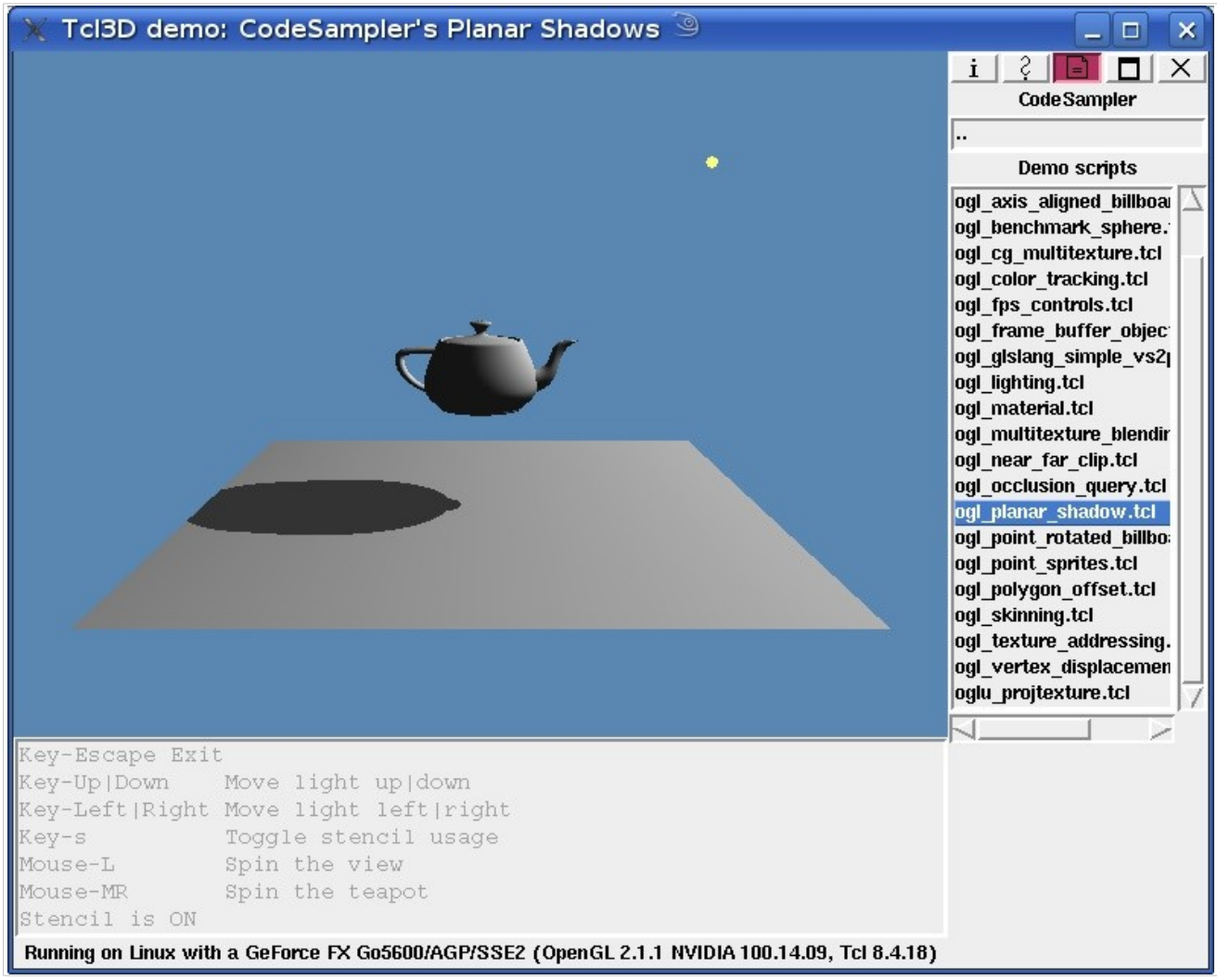
  Control Keys: Left Mouse Button - Spin the view
--------------------------------------------------------------------------------

 Original C++ code by Kevin Harris (kevin@codesampler.com)
 See www.codesampler.com for the original files
 OpenGL samples page 7: Occlusion Query

 Modified for Tcl3D by Paul Obermeier 2007/03/10
 See www.tcl3d.org for the Tcl3D extension.

 This sample integrates ARB_occlusion_query and NV_occlusion_qeury code into one
file.
 If called with no command line arguments, it uses the ARB_occlusion_query
extension.
 Use "nv" as parameter to use the NV_occlusion_query extension.
```

Demo:	**ogl_planar_shadow**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
--------------------------------------------------------------------------------
          Name: ogl_planar_shadow.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: This sample demonstrates how to create planar shadows under
                OpenGL.

                Planar shadows are created by building a special projection
                matrix which flattens an object's geometry into a plane when
                rendered.

                If the plane, which the geometry is flattened into, matches
                up with another planar surface like a floor or a wall, the
                flattened geometry can be made to resemble a shadow on that
                surface.

  Control Keys: Up    - Light moves up
                Down  - Light moves down
                Left  - Light moves left
                Right - Light moves right

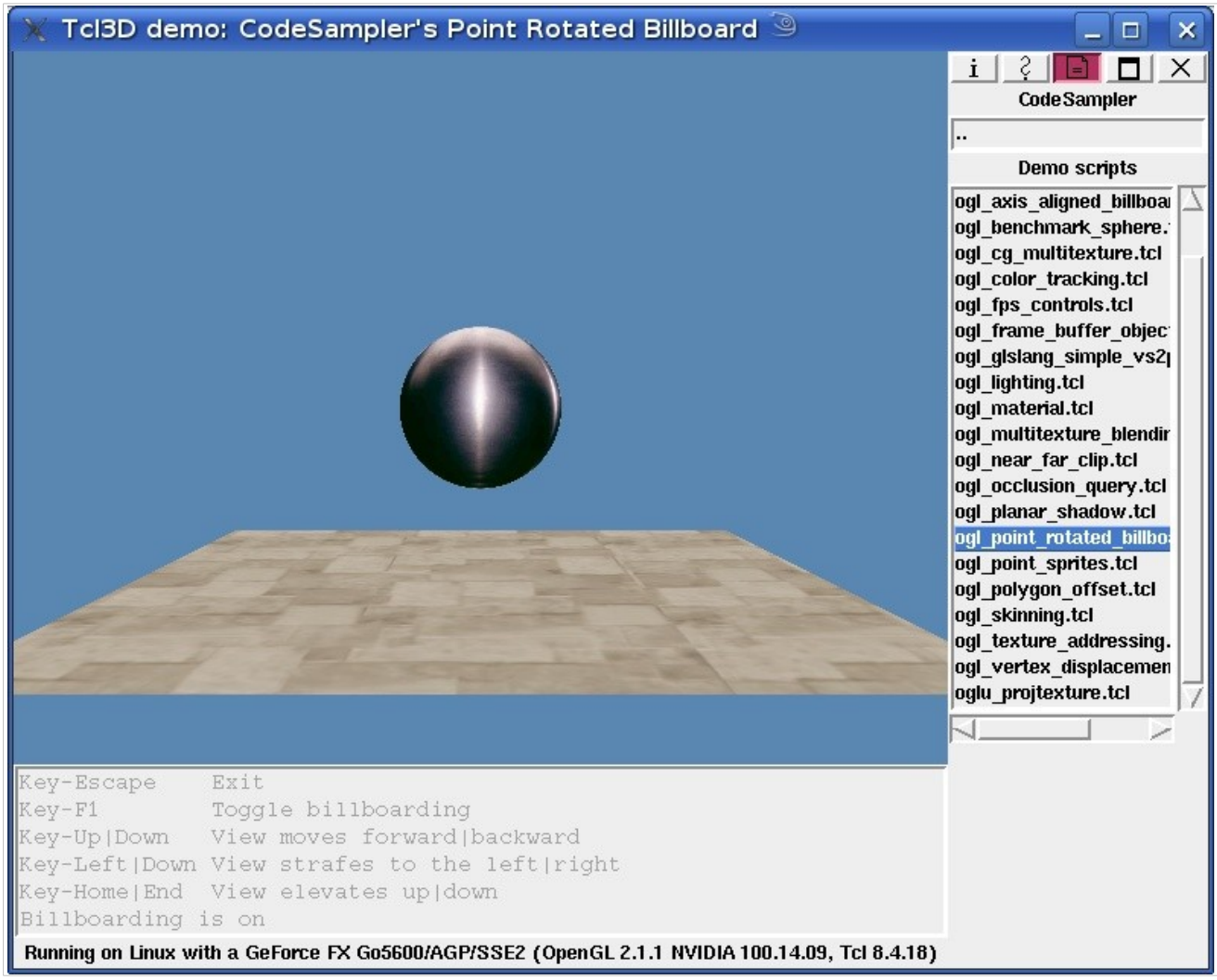
                Left Mouse Button  - Spin the view
                Right Mouse Button - Spin the teapot
```

```
------------------------------------------------------------------------------

 Original C++ code by Kevin Harris (kevin@codesampler.com)
 See www.codesampler.com for the original files
 OpenGL samples page 7: Planar Shadows
 http://www.codesampler.com/oglsrc/oglsrc_7.htm#ogl_planar_shadow

 Modified for Tcl3D by Paul Obermeier 2008/05/02
 See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_point_rotated_billboard**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents



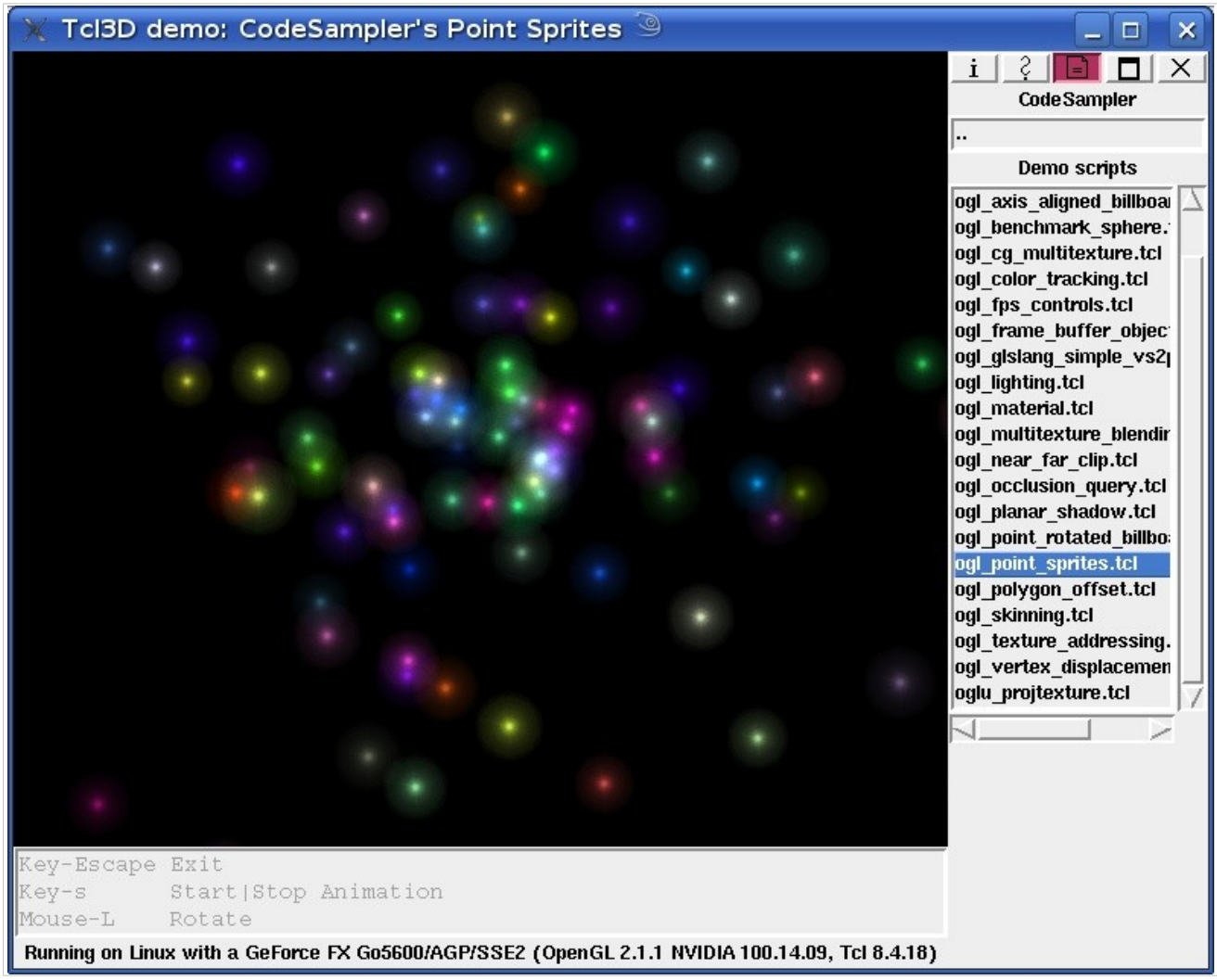

```
------------------------------------------------------------------------------
          Name: ogl_point_rotated_billboard.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: An example of point rotated billboarding.

  Control Keys: F1         - Toggle billboarding
                Up         - View moves forward
                Down       - View moves backward
                Left       - View strafes left
                Right      - View strafes Right
                Left Mouse - Perform looking
                Mouse      - Look about the scene
------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 8: Point-Rotated Billboards

Modified for Tcl3D by Paul Obermeier 2007/03/10
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_point_sprites**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents

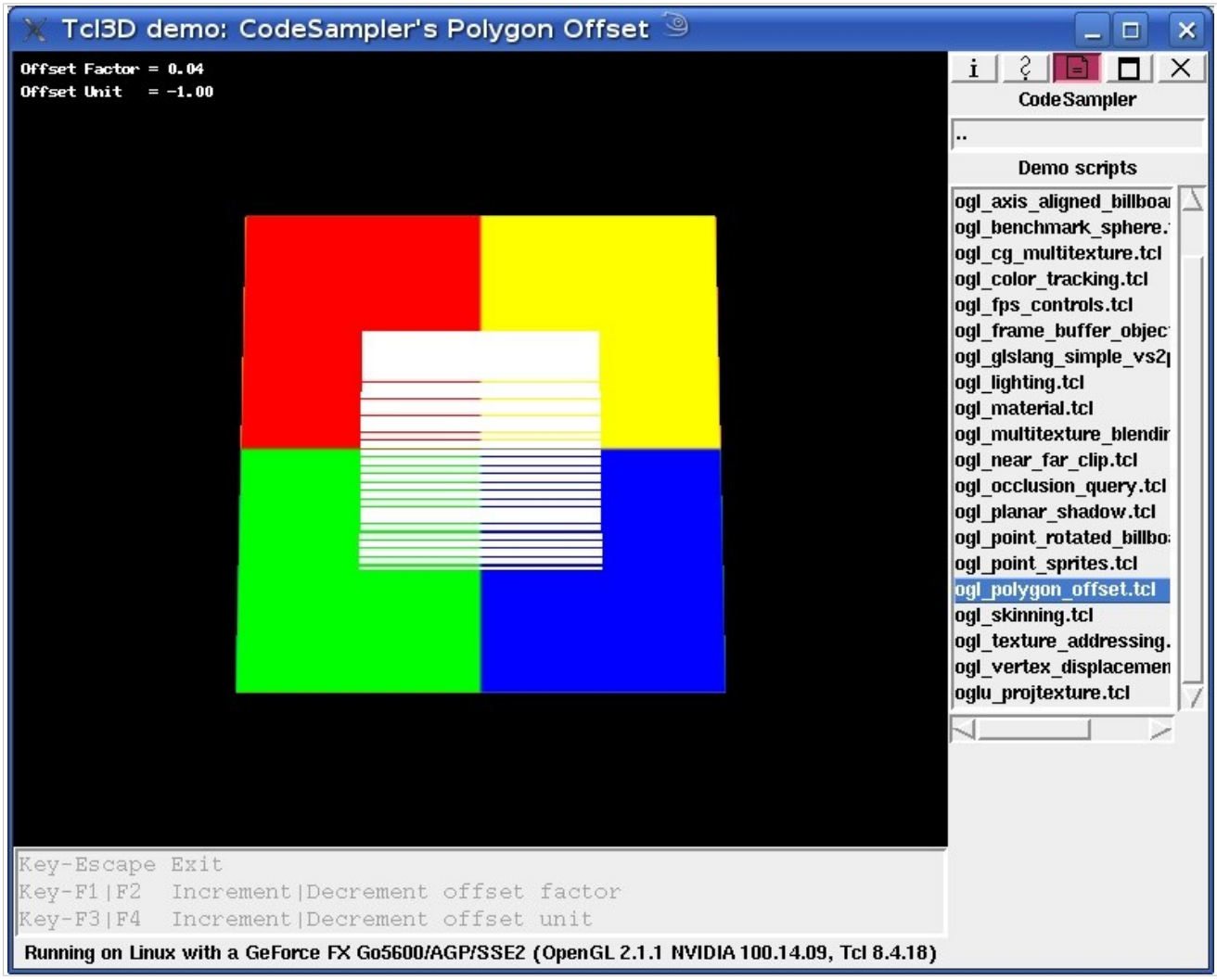



```
--------------------------------------------------------------------------------
          Name: ogl_point_sprites.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: This sample demonstrates how to create point sprites
                using OpenGL's new GL_ARB_point_sprite extension, which
                can be used to create point-rotated billboards on the GPU.
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 6: Point Sprites

Modified for Tcl3D by Paul Obermeier 2005/11/08
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_polygon_offset**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
--------------------------------------------------------------------------------
          Name: ogl_polygon_offset.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: This sample demonstrates how to eliminate z-fighting when
                rendering polygons directly on top of other polygons.

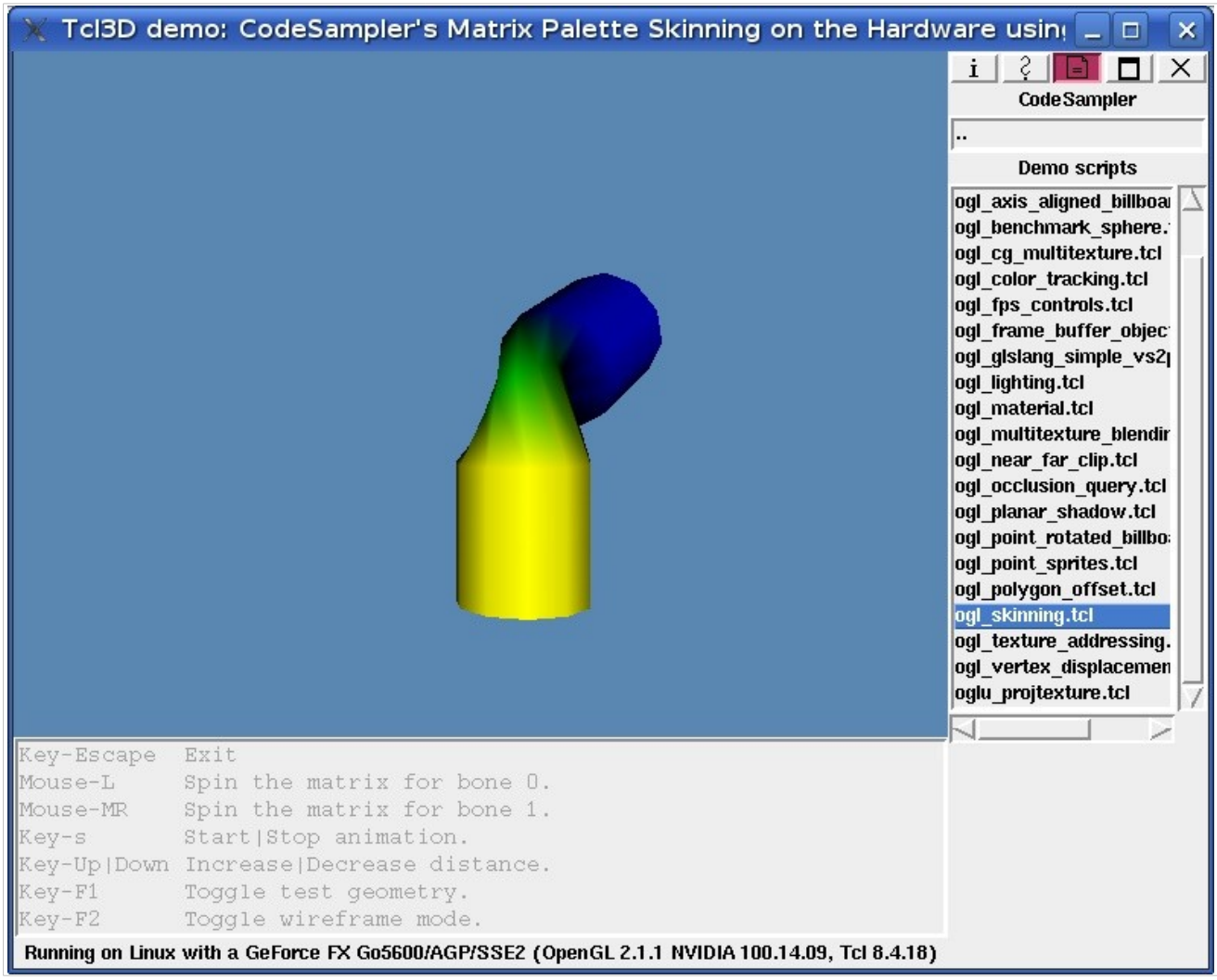
  Control Keys: Left Mouse Button - Spin the view
                F1 - Increase Offset Factor
                F2 - Decrease Offset Factor
                F3 - Increase Offset Unit
                F4 - Decrease Offset Unit
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 5: Polygon Offset

Modified for Tcl3D by Paul Obermeier 2007/03/05
See www.tcl3d.org for the Tcl3D extension.

See http://www.opengl.org/sdk/docs/man/xhtml/glPolygonOffset.xml
for the glPolygonOffset command.
```

Demo:	**ogl_skinning**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
--------------------------------------------------------------------------------
          Name: ogl_cg_skinning.cpp ogl_glslang_skinning.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 04/28/05
   Description: This sample demonstrates how to skin a mesh on the hardware
                using a Cg or GLSL shader. To keep things simple, the skeletal
                system used in this sample is very simple and only consists
                of two bones or bone matrices.

                Special thanks go out to Cyril Zeller, and Matthias Wloka
                of nVIDIA for their help in straightening out a few oddities
                that my sample was suffering from. In short, Cg works fine
                and I'm occasionally a big dummy! ;)

  Control Keys: Left Mouse Button  - Spin the matrix for bone0.
                Right Mouse Button - Spin the matrix for bone1.

                F1 - Toggle test geometry between a cylinder and a simple
                     grouping of 3 quads.
                F2 - Toggle wire-frame mode
--------------------------------------------------------------------------------

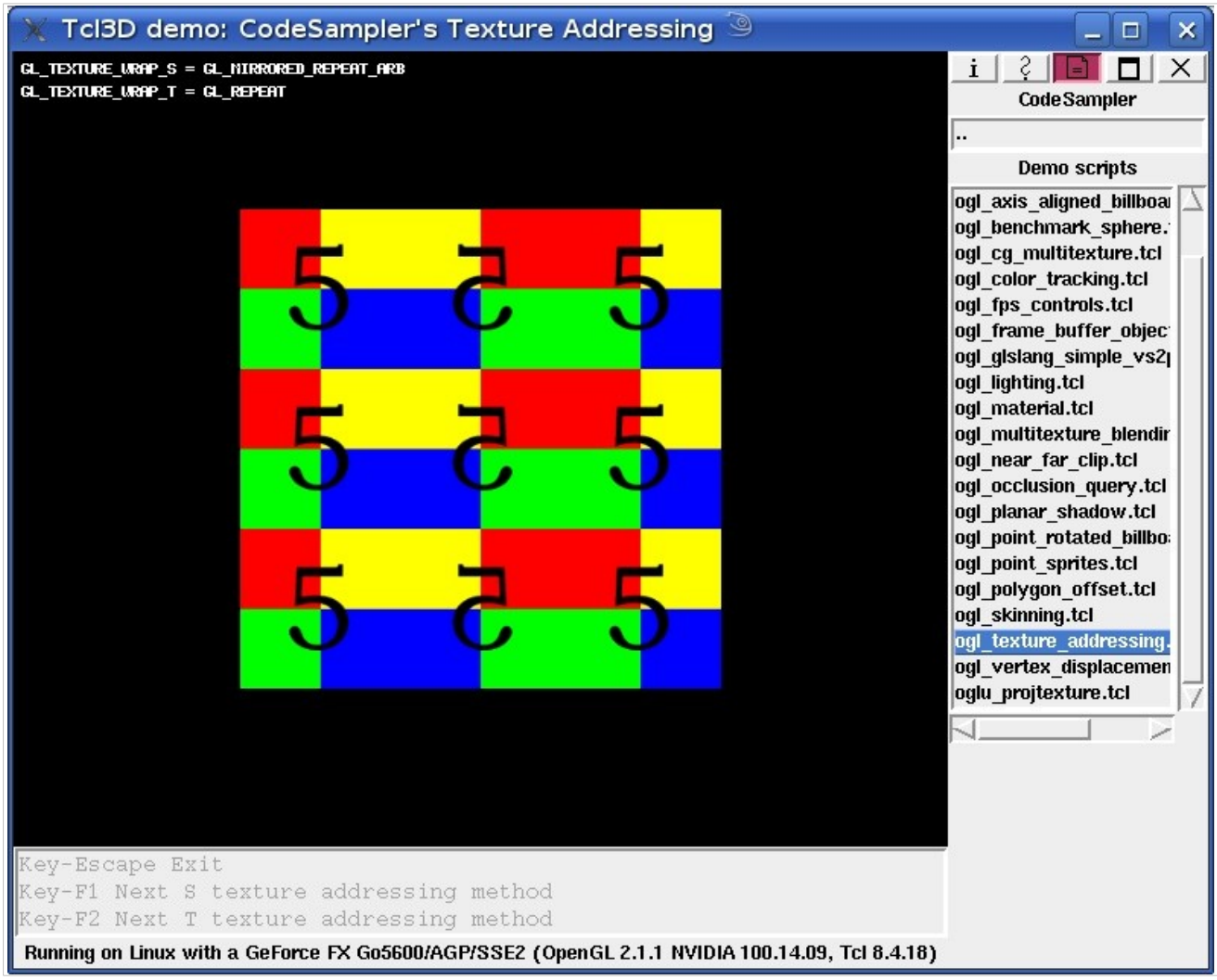
 Original C++ code by Kevin Harris (kevin@codesampler.com)
```

```
See www.codesampler.com for the original files
OpenGL samples page 11: Matrix Palette Skinning on the Hardware

Modified for Tcl3D by Paul Obermeier 2005/11/05
See www.tcl3d.org for the Tcl3D extension.

This sample integrates Cg and GLSL code into one file.
If called with no command line arguments, it uses the Cg shader.
Use "glsl" as parameter to use the GLSL shader.
```

Demo:	ogl_texture_addressing
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
--------------------------------------------------------------------------------
          Name: ogl_texture_addressing.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 02/01/05
   Description: This sample demonstrates the two methods of texture
                addressing that are available under OpenGL:

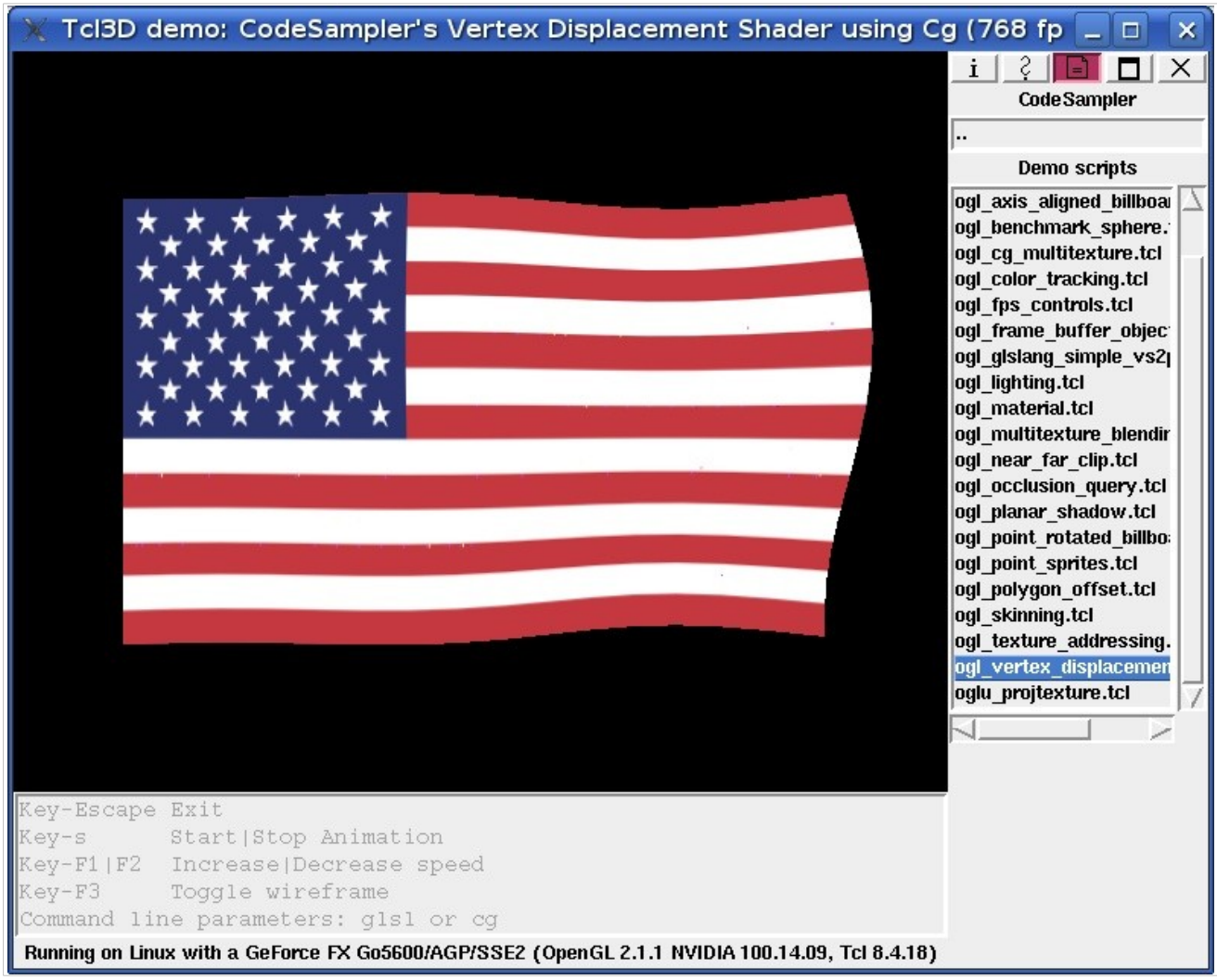
                GL_REPEAT
                GL_CLAMP
                GL_MIRRORED_REPEAT_ARB ( GL_ARB_texture_mirrored_repeat )
                GL_CLAMP_TO_BORDER_ARB ( GL_ARB_texture_border_clamp )
                GL_CLAMP_TO_EDGE       ( GL_SGIS_texture_edge_clamp )

  Control Keys: F1 - Changes addressing method for the S coordinates
                F2 - Changes addressing method for the T coordinates
--------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 3: Texture Addressing

Modified for Tcl3D by Paul Obermeier 2007/03/06
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**ogl_vertex_displacement**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
------------------------------------------------------------------------------
          Name: ogl_cg_vertex_displacement.cpp
                ogl_glslang_vertex_displacement.cpp
        Author: Kevin Harris (kevin@codesampler.com)
 Last Modified: 04/21/05
   Description: This sample demonstrates how to perform mesh deformation or
                vertex displacement with OpenGL using a Cg or GLSL shader.

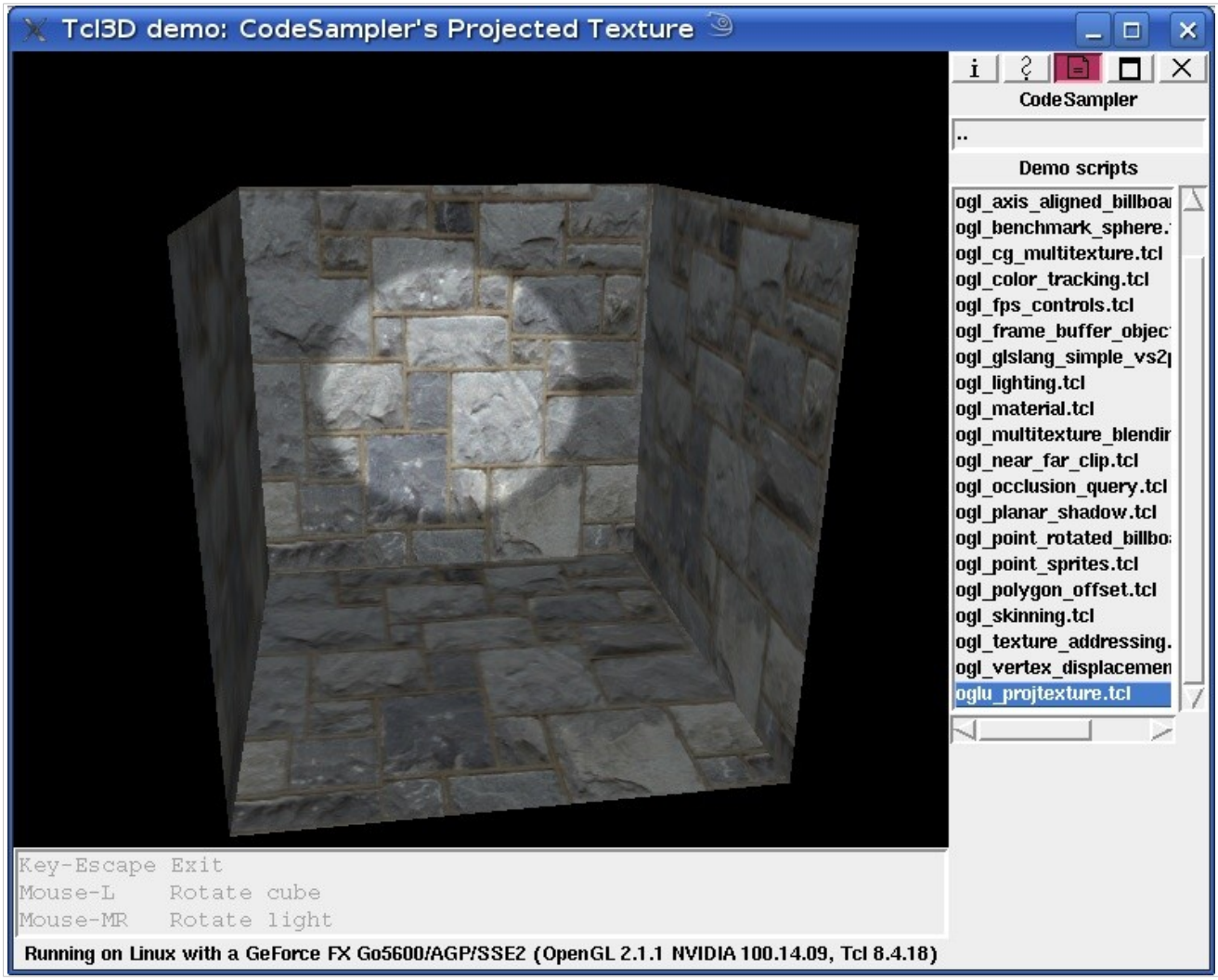
  Control Keys: F1 - Increase flag motion
                F2 - Decrease flag motion
                F3 - Toggle wire-frame mode
------------------------------------------------------------------------------

Original C++ code by Kevin Harris (kevin@codesampler.com)
See www.codesampler.com for the original files
OpenGL samples page 11: Vertex Displacement or Mesh Deformation Shader

Modified for Tcl3D by Paul Obermeier 2005/11/05
See www.tcl3d.org for the Tcl3D extension.

This sample integrates the Cg and GLSL code into one file.
If called with no command line arguments, it uses the GLSL shader.
Use "cg" as command line parameter to use the Cg shader.
```

Demo:	**oglu_projtexture**
Type:	CodeSampler
Category:	TutorialsAndBooks
Root:	Contents




```
 This program demonstrates how one would go about doing a projected texture.
 The sample here shows how a projected texture technique can be used to produce a
light map.
 The point is that even though you have very few vertices available for the fixed
function
 pipeline lighting solution, you can achieve nice per pixel lighting even though
the surface
 has only a handful of vertices.
 This sample draws a cube, only allowing the inside being visible via culling
front facing polys,
 and then projects the light map texture on the second texture stage all through
the fixed
 function pipeline.
 The left mouse button will move the cube around and the right mouse button will
move the
 projected # light map around.
```

Type:	**GameProgrammer**
Category:	TutorialsAndBooks
Root:	Contents

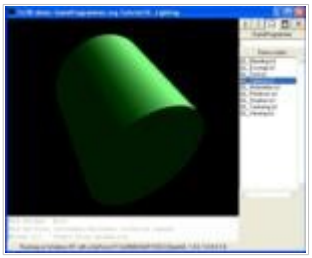
Several demo applications from Vahid Kazemi's page have been ported to Tcl3D.
Original sources available at: http://www.GameProgrammer.org

Available demos

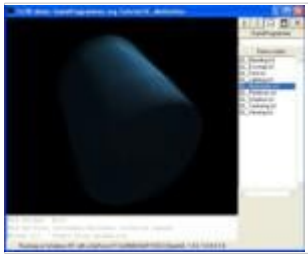
GL_Blending

GL_Envmap

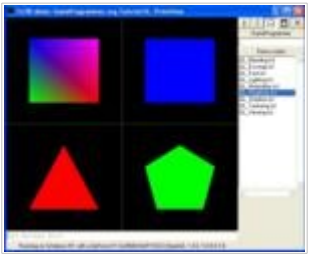
GL_Font



GL_Lighting

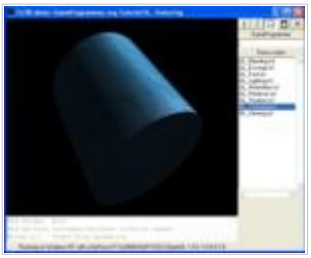


GL_Motionblur

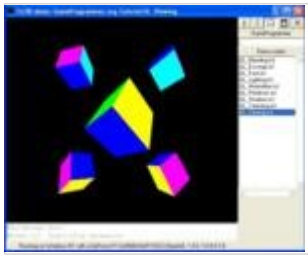


GL_Primitives

GL_Shadow



GL_Texturing



GL_Viewing

Demo:	**GL_Blending**
Type:	GameProgrammer
Category:	TutorialsAndBooks
Root:	Contents

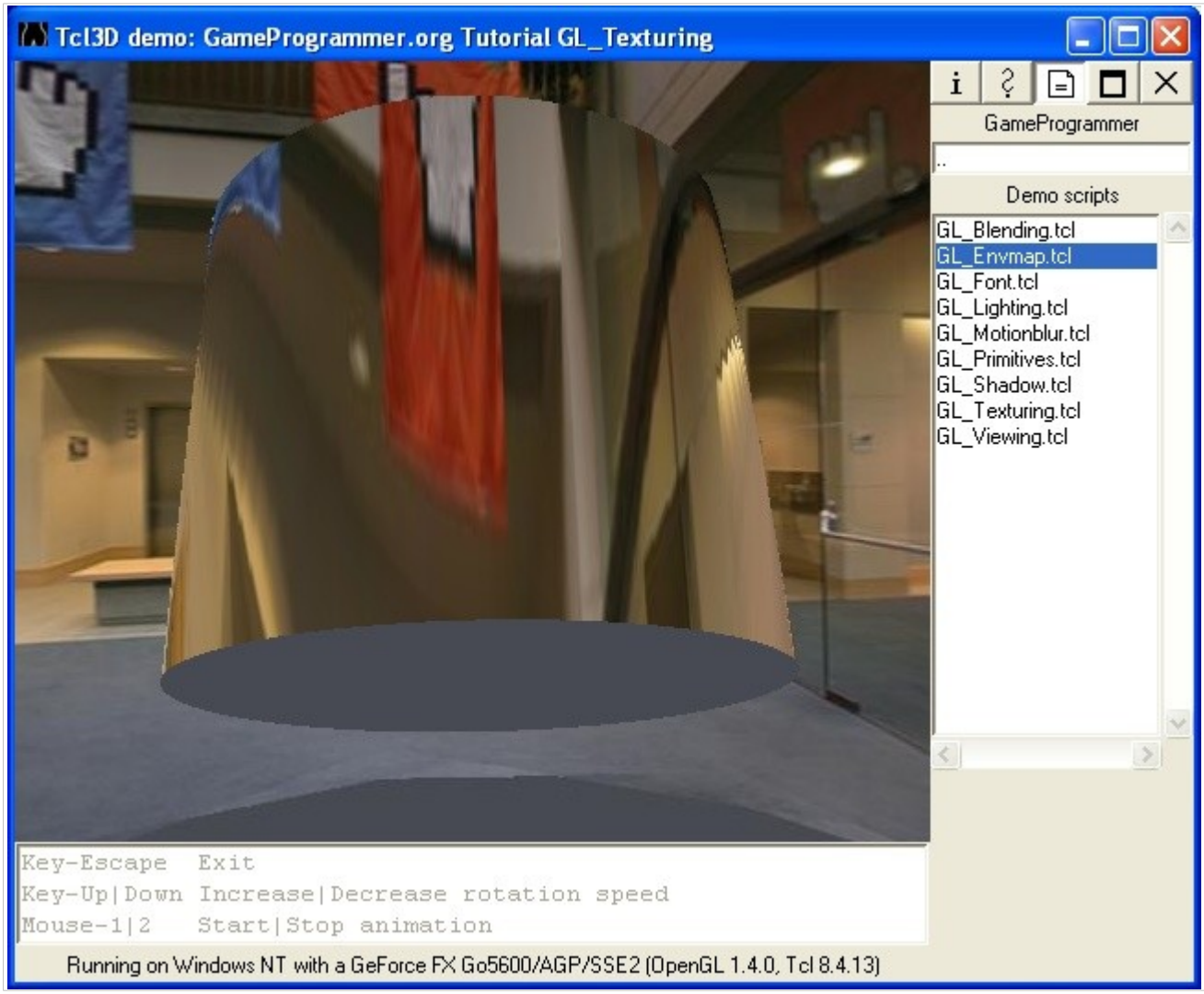

```
GL_Blending.tcl

Tutorial from www.GameProgrammer.org
Blending demo

Original code Copyright 2005 by Vahid Kazemi

Modified for Tcl3D by Paul Obermeier 2006/09/12
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**GL_Envmap**
Type:	GameProgrammer
Category:	TutorialsAndBooks
Root:	Contents



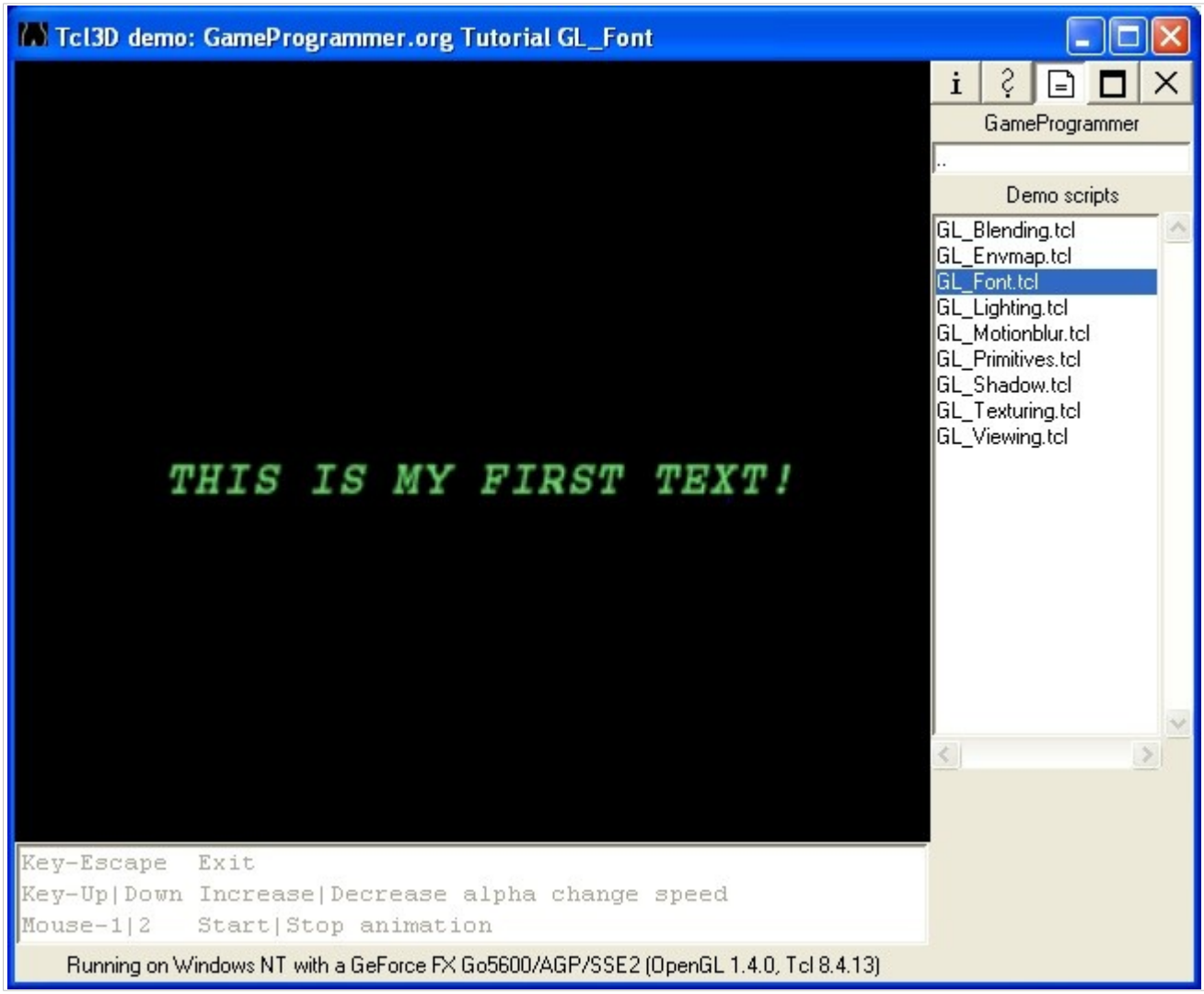

```
GL_Texturing.tcl

Tutorial from www.GameProgrammer.org
Using Textures

Original code Copyright 2004 by Vahid Kazemi

Modified for Tcl3D by Paul Obermeier 2006/09/12
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**GL_Font**
Type:	GameProgrammer
Category:	TutorialsAndBooks
Root:	Contents



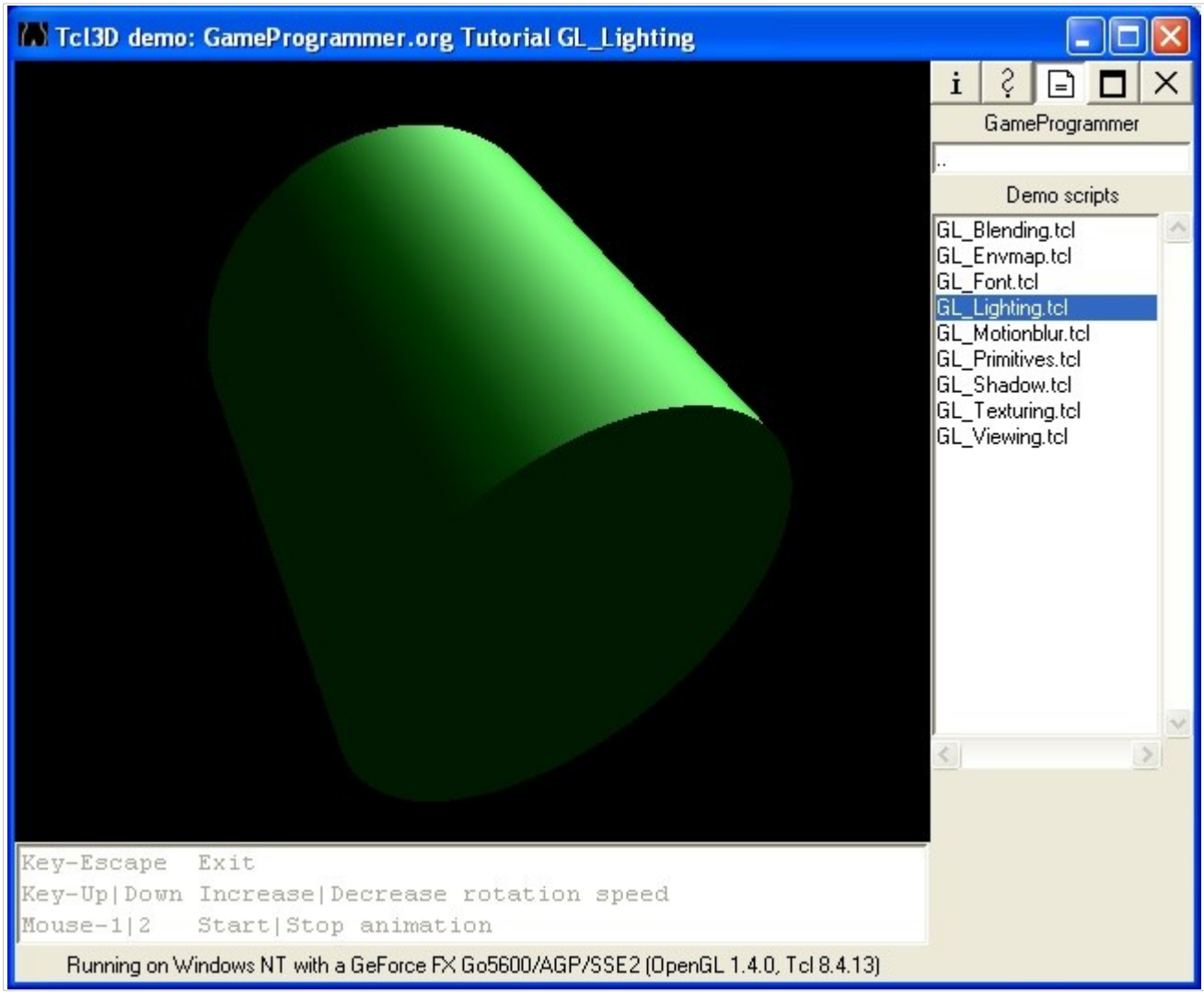

```
GL_Font.tcl

Tutorial from www.GameProgrammer.org
Bitmap fonts

Original code Copyright 2005 by Vahid Kazemi

Modified for Tcl3D by Paul Obermeier 2006/09/15
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**GL_Lighting**
Type:	GameProgrammer
Category:	TutorialsAndBooks
Root:	Contents



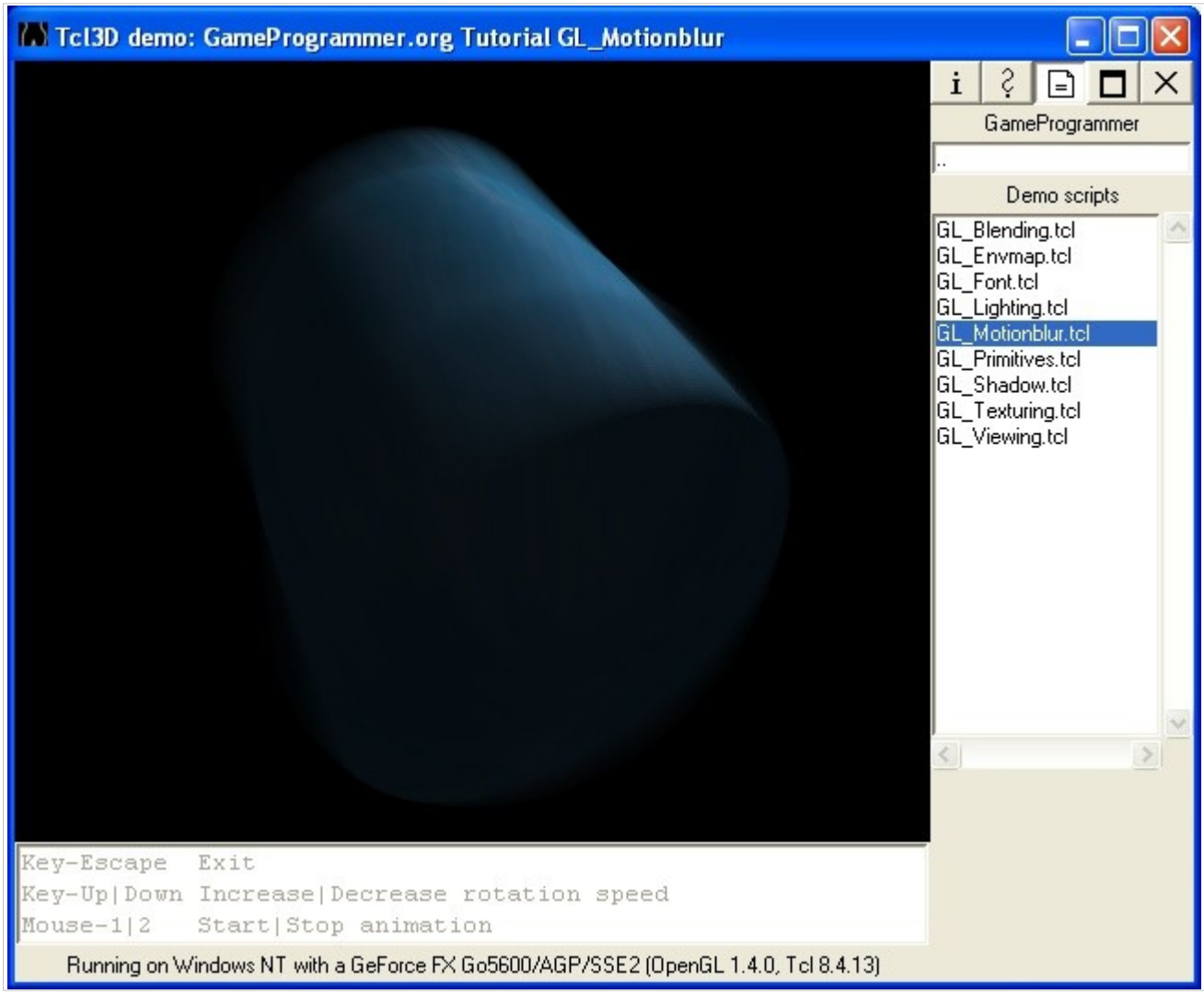

```
GL_Lighting.tcl

Tutorial from www.GameProgrammer.org
Turn the lights on!

Original code Copyright 2004 by Vahid Kazemi

Modified for Tcl3D by Paul Obermeier 2006/09/11
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**GL_Motionblur**
Type:	GameProgrammer
Category:	TutorialsAndBooks
Root:	Contents



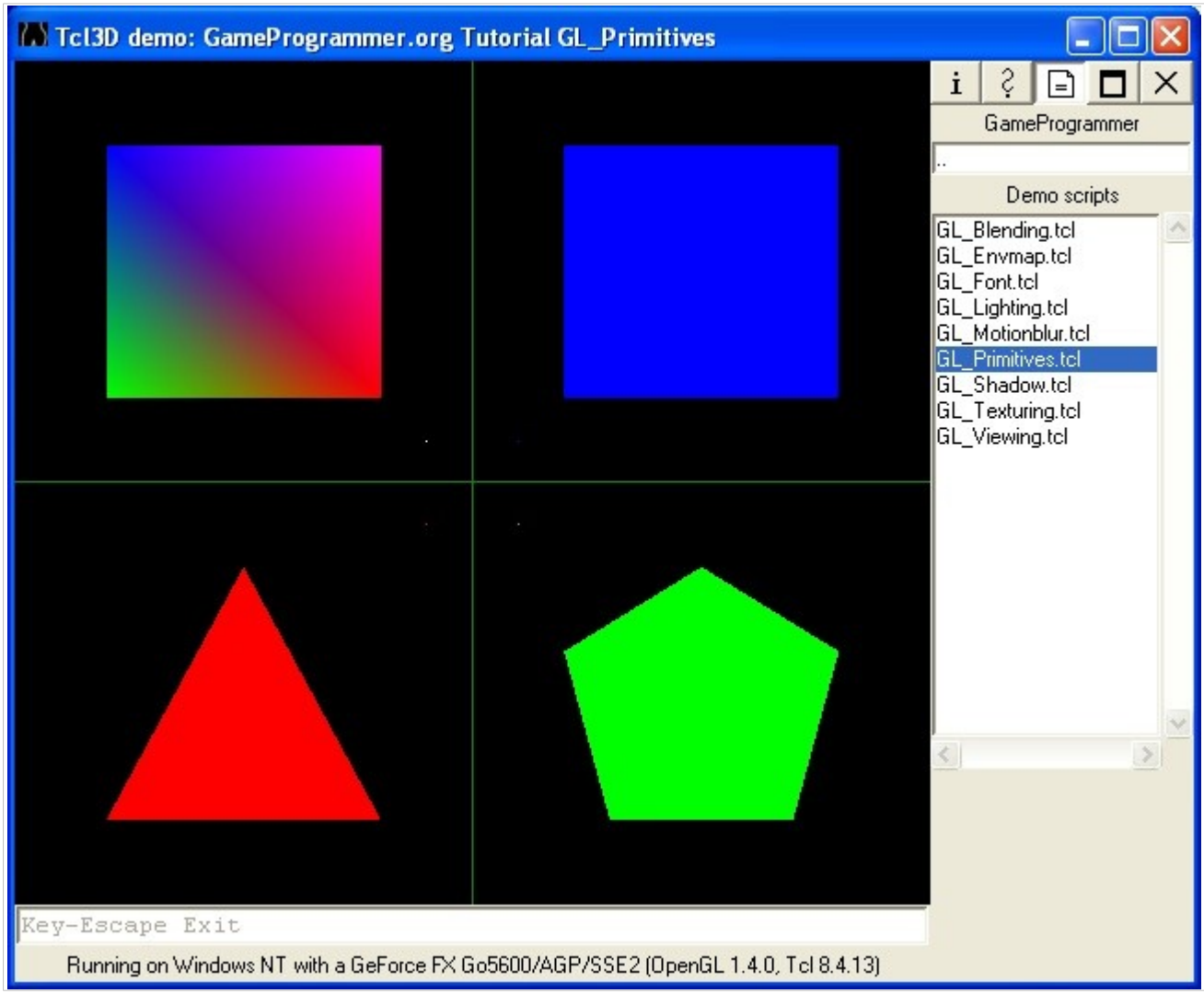

```
GL_Motionblur.tcl

Tutorial from www.GameProgrammer.org
Using Textures

Original code Copyright 2006 by Vahid Kazemi

Modified for Tcl3D by Paul Obermeier 2006/09/14
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**GL_Primitives**
Type:	GameProgrammer
Category:	TutorialsAndBooks
Root:	Contents



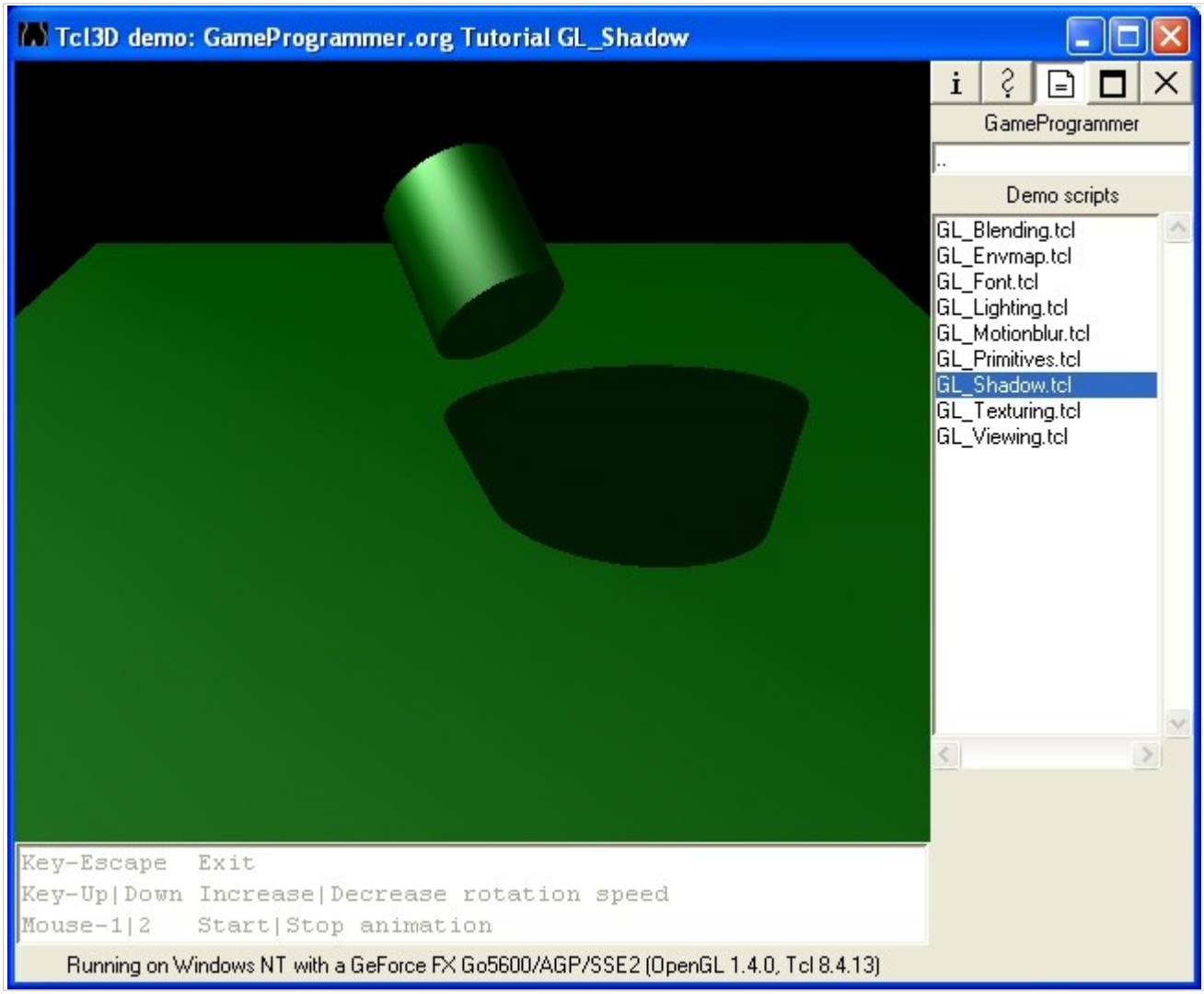

```
GL_Primitives.tcl

Tutorial from www.GameProgrammer.org
OpenGL Primitives.

Original code Copyright 2004 by Vahid Kazemi

Modified for Tcl3D by Paul Obermeier 2006/09/11
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**GL_Shadow**
Type:	GameProgrammer
Category:	TutorialsAndBooks
Root:	Contents



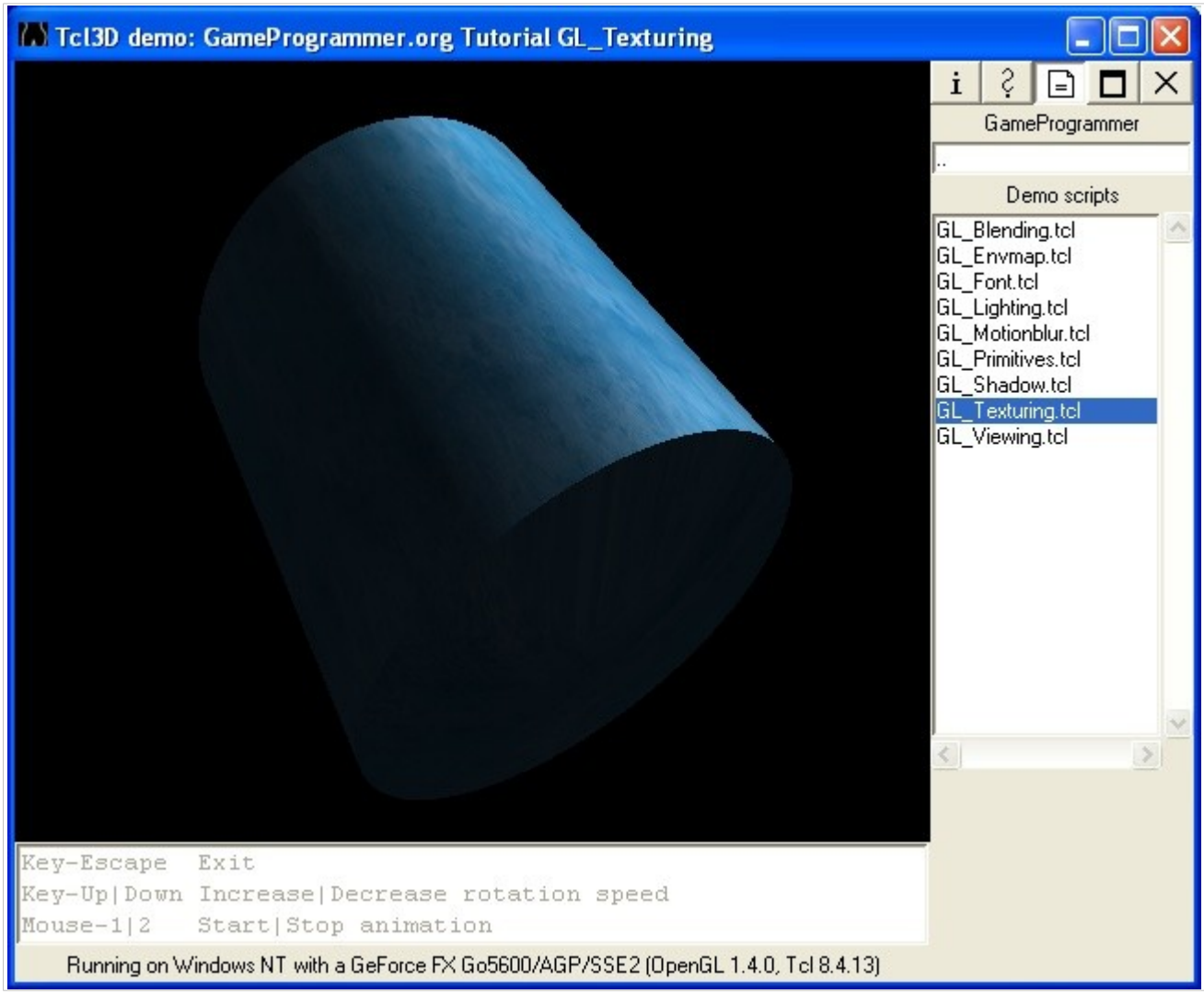

```
GL_Shadow.tcl

Tutorial from www.GameProgrammer.org
Stencil shadows.

Original code Copyright 2005 by Vahid Kazemi

Modified for Tcl3D by Paul Obermeier 2006/09/10
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**GL_Texturing**
Type:	GameProgrammer
Category:	TutorialsAndBooks
Root:	Contents



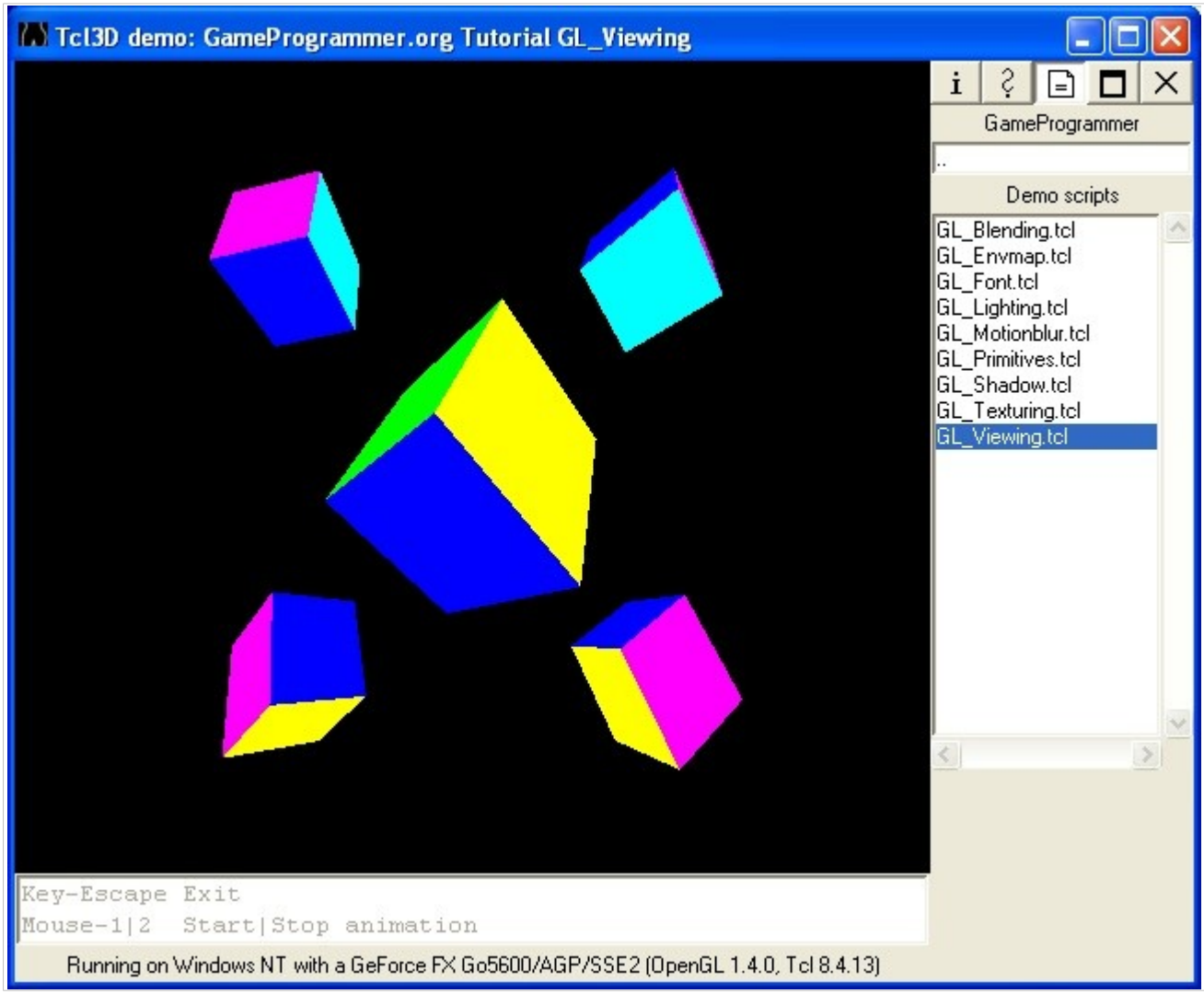

```
GL_Texturing.tcl

Tutorial from www.GameProgrammer.org
Using Textures

Original code Copyright 2004 by Vahid Kazemi

Modified for Tcl3D by Paul Obermeier 2006/09/12
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**GL_Viewing**
Type:	GameProgrammer
Category:	TutorialsAndBooks
Root:	Contents




```
GL_Viewing.tcl

Tutorial from www.GameProgrammer.org
Viewing and Transformations.

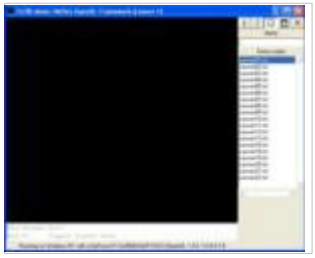
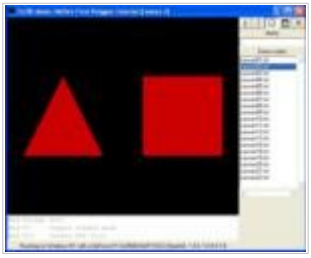
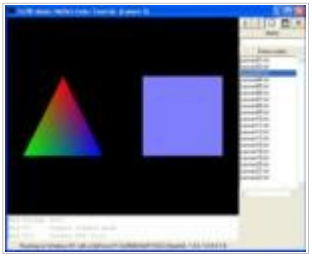
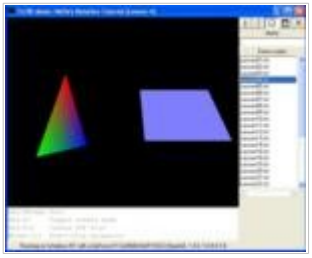
Original code Copyright 2004 by Vahid Kazemi

Modified for Tcl3D by Paul Obermeier 2006/09/11
See www.tcl3d.org for the Tcl3D extension.
```

Type:	**NeHe**
Category:	TutorialsAndBooks
Root:	Contents

Some of the NeHe OpenGL tutorials have been ported to run with Tcl3D. Currently 34 out of 48 lessons are available.
Original sources available at: http://nehe.gamedev.net/

Available demos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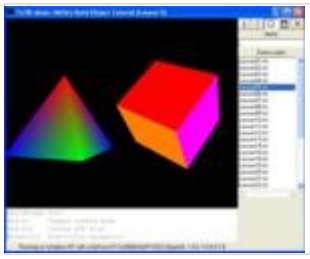
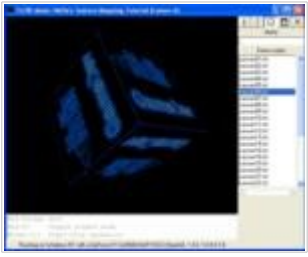
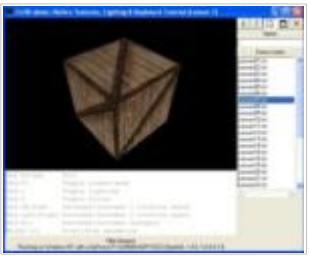
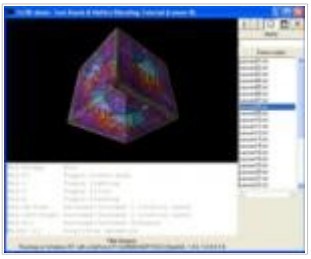
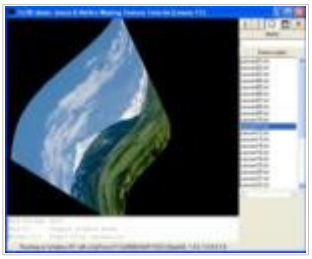
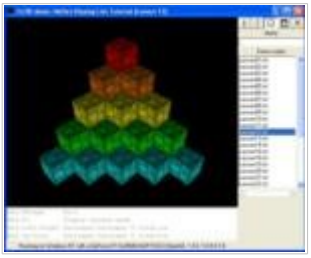
			
Lesson05	Lesson06	Lesson07	Lesson08
			
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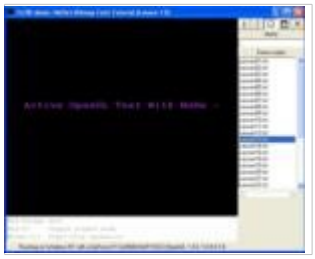
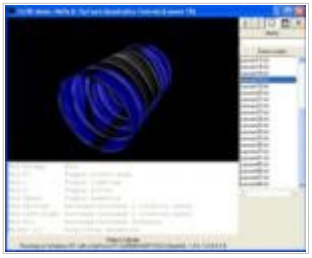
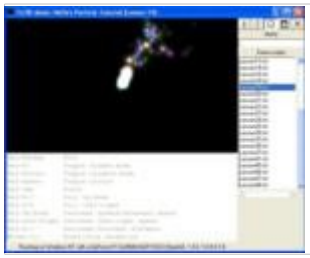
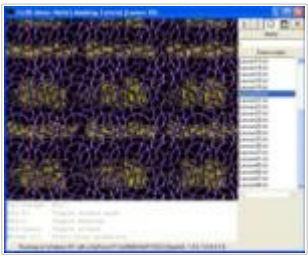
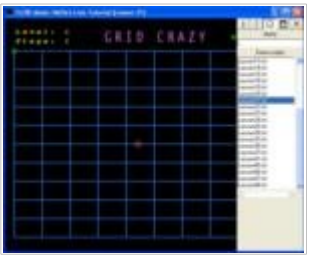
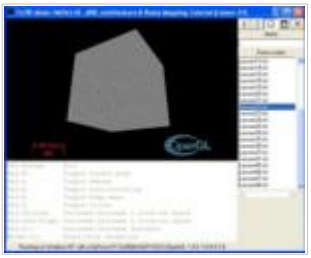
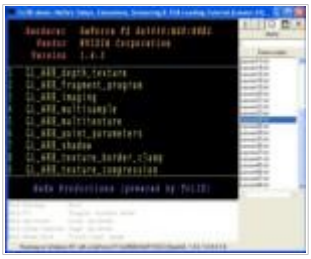
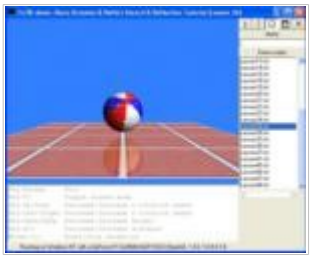
			
Lesson13	Lesson14	Lesson16	Lesson18
			
Lesson19	Lesson20	Lesson21	Lesson22

Lesson23



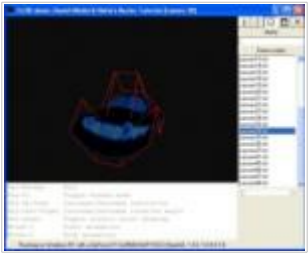
Lesson24

Lesson25



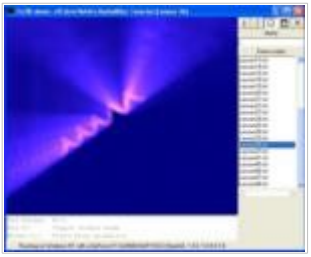
Lesson26

Lesson27



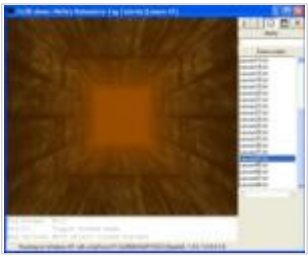
Lesson28

Lesson33

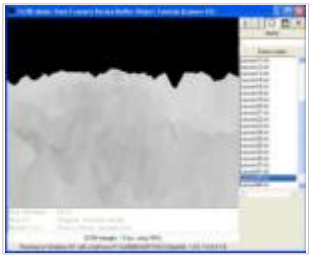


Lesson36

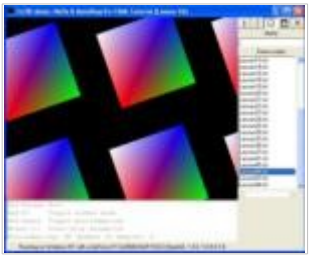
Lesson37



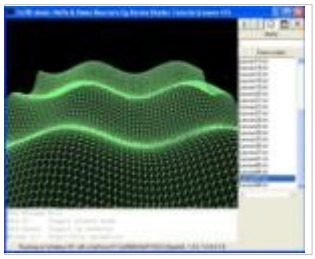
Lesson41



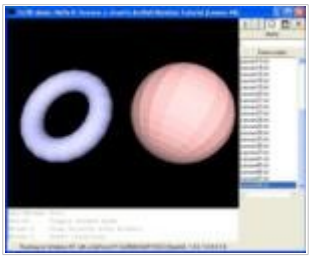
Lesson45



Lesson46

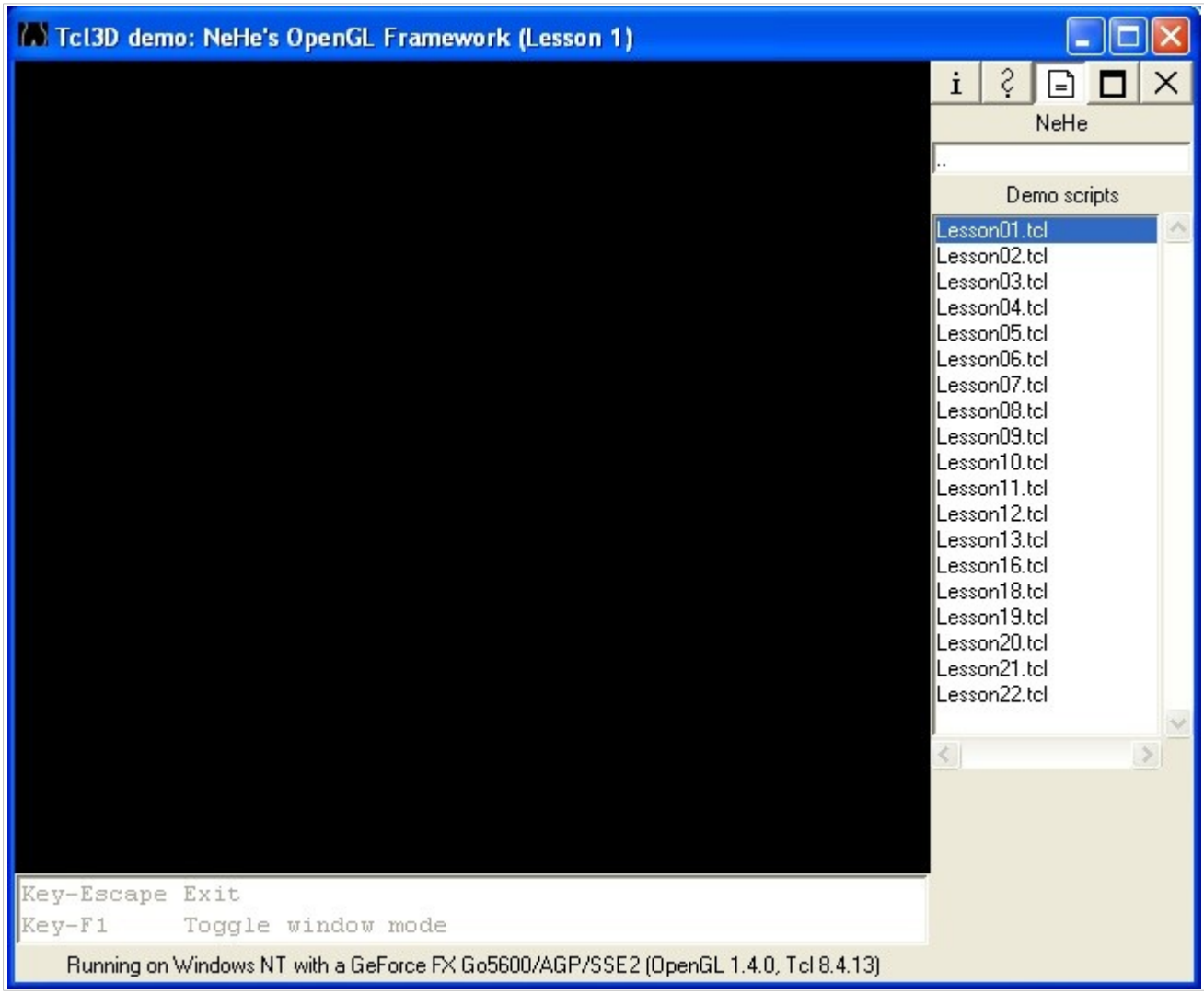


Lesson47



Lesson48

Demo:	**Lesson01**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



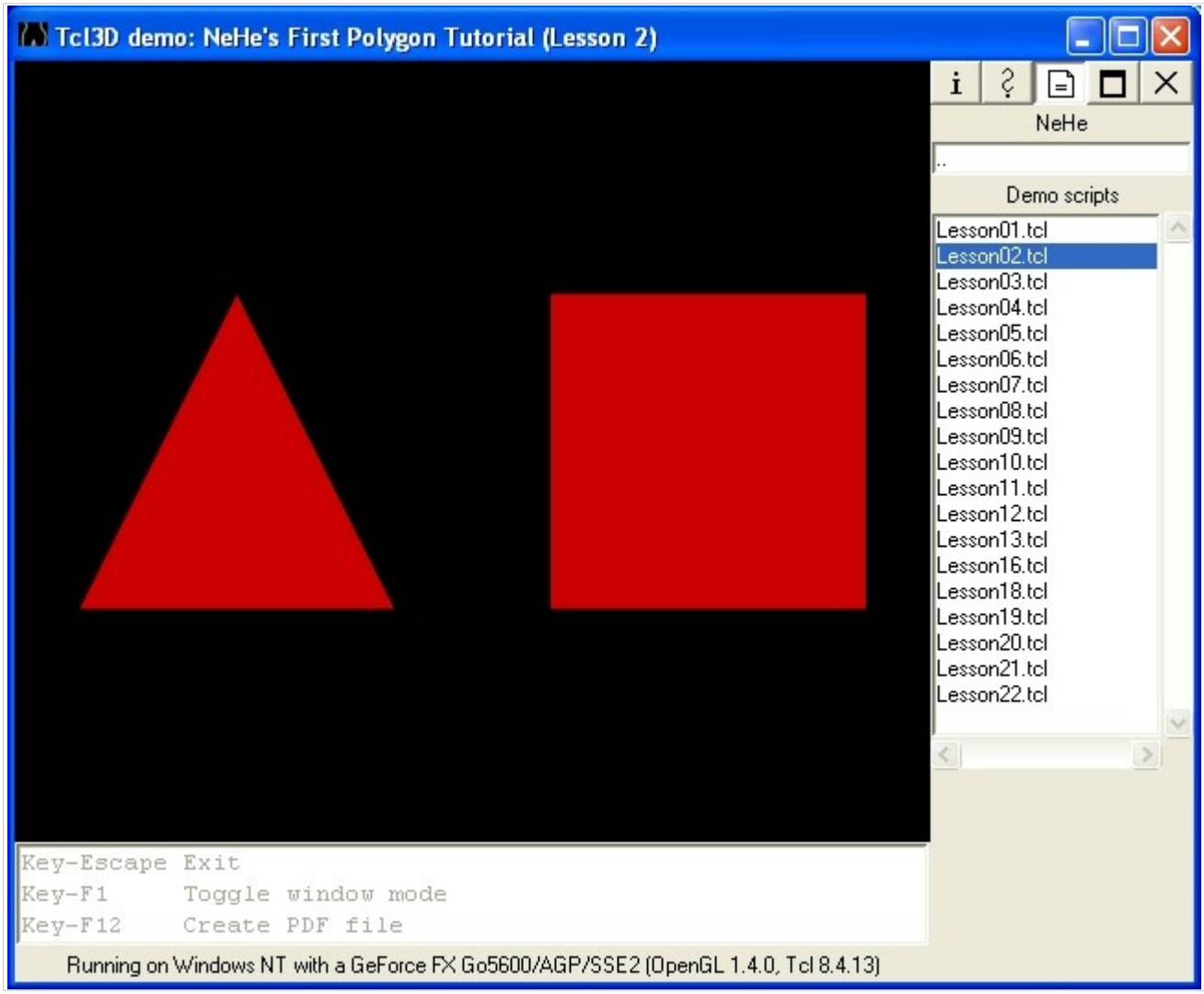

```
Lesson01.tcl

NeHe's OpenGL Framework

This Code Was Created By Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson02**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



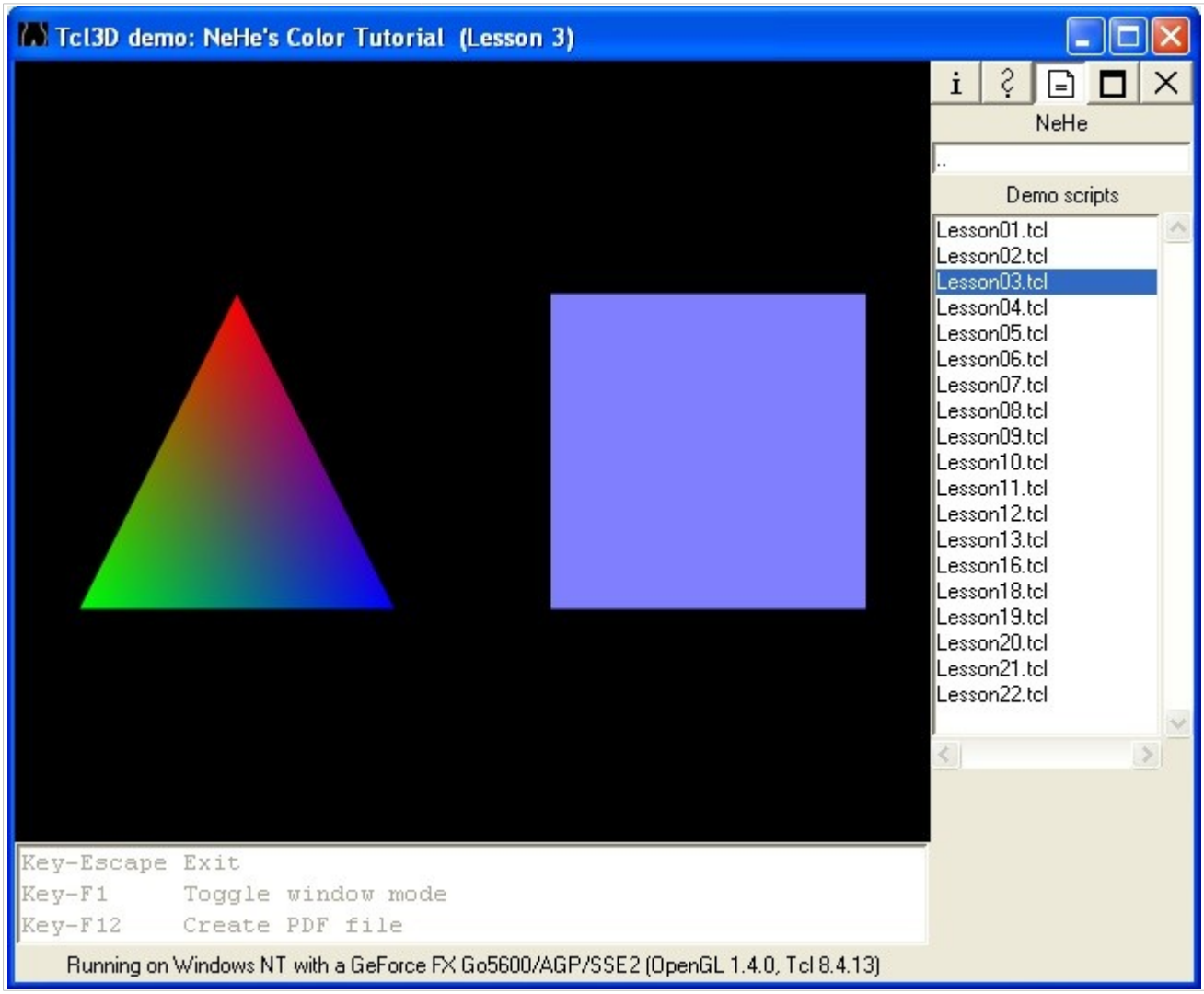

```
Lesson02.tcl

NeHe's First Polygon Tutorial

This Code Was Created By Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson03**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



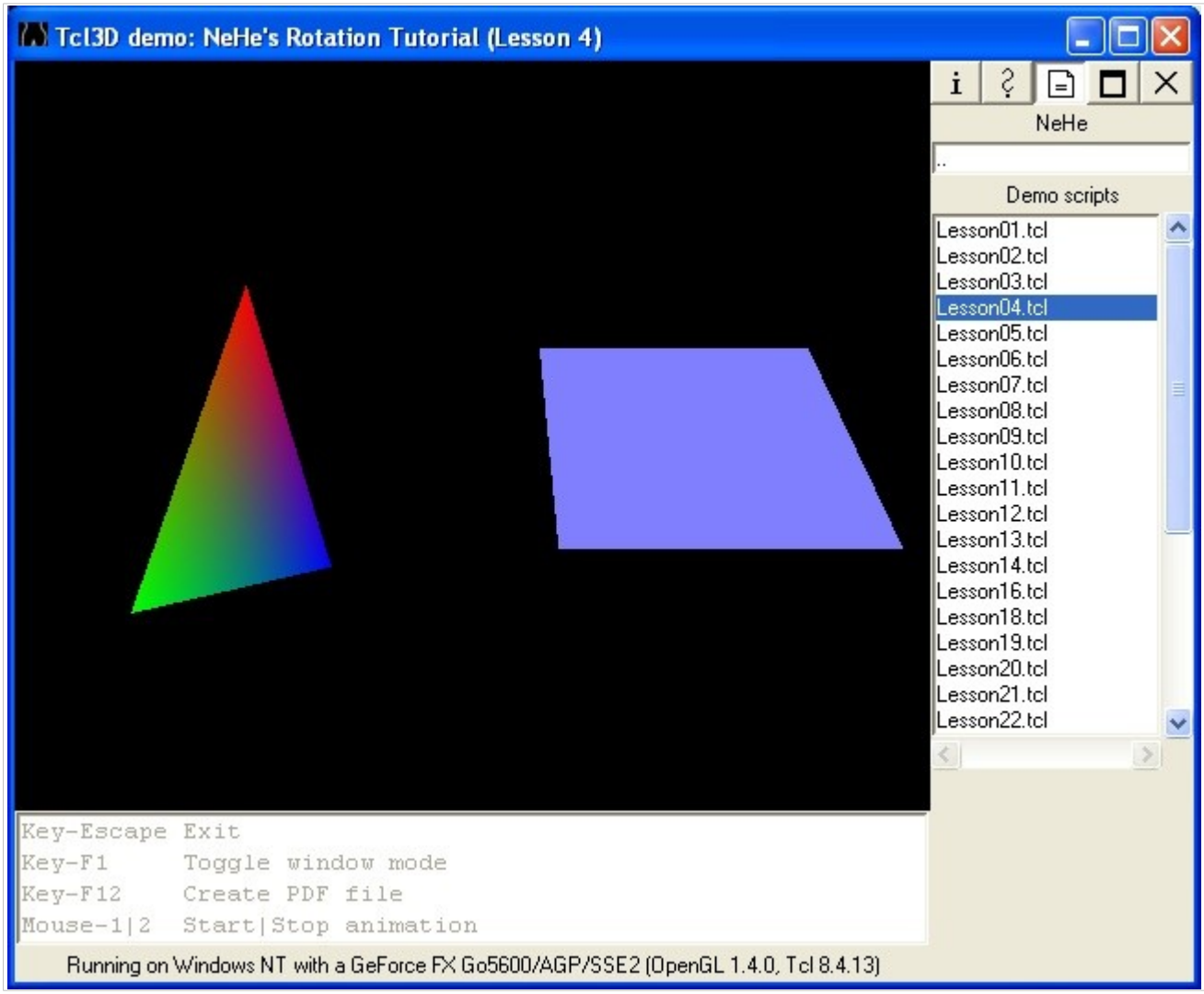

```
Lesson03.tcl

NeHe's Color Tutorial

This Code Was Created By Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson04**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



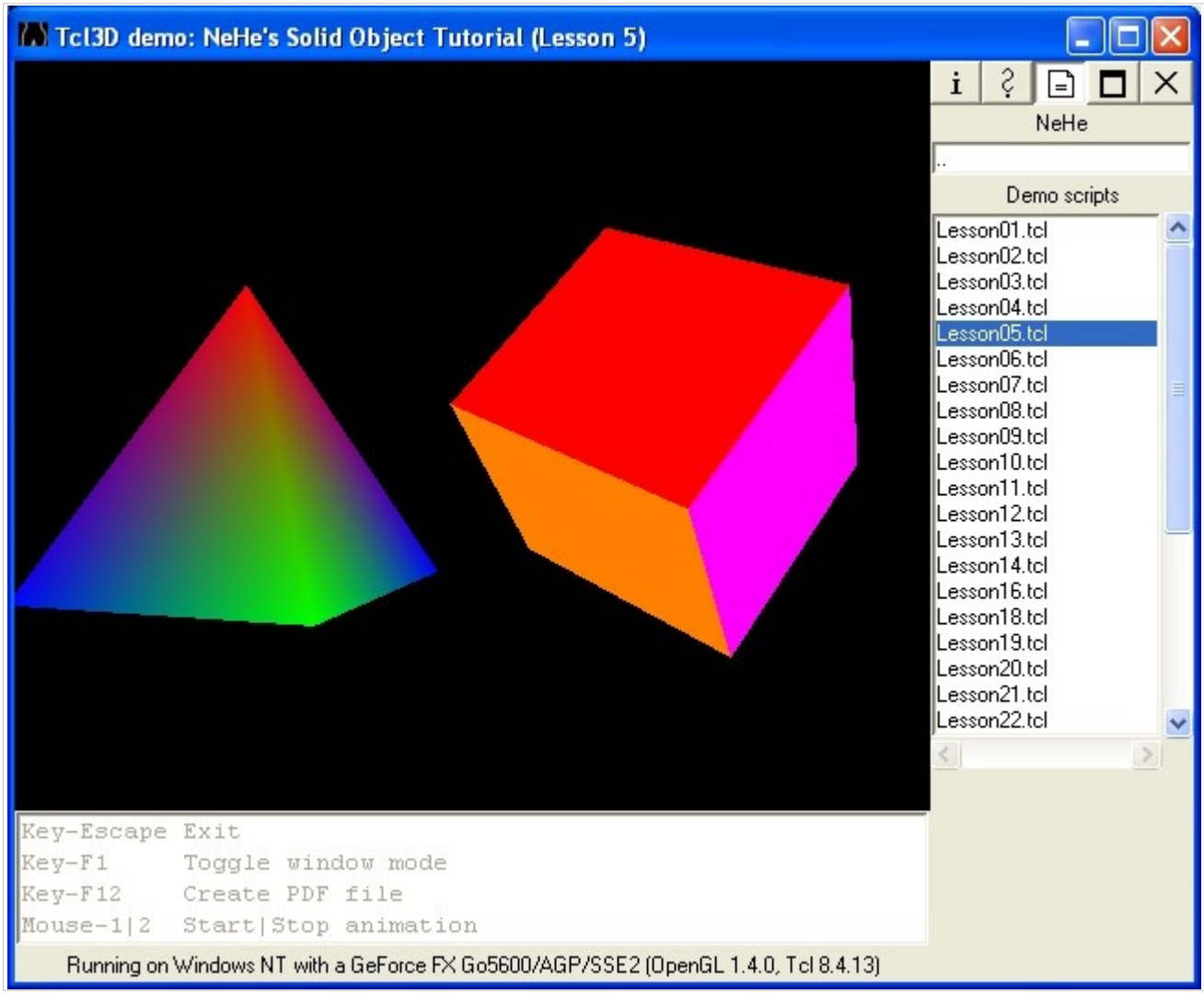

```
Lesson04.tcl

NeHe's Rotation Tutorial

This Code Was Created By Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson05**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



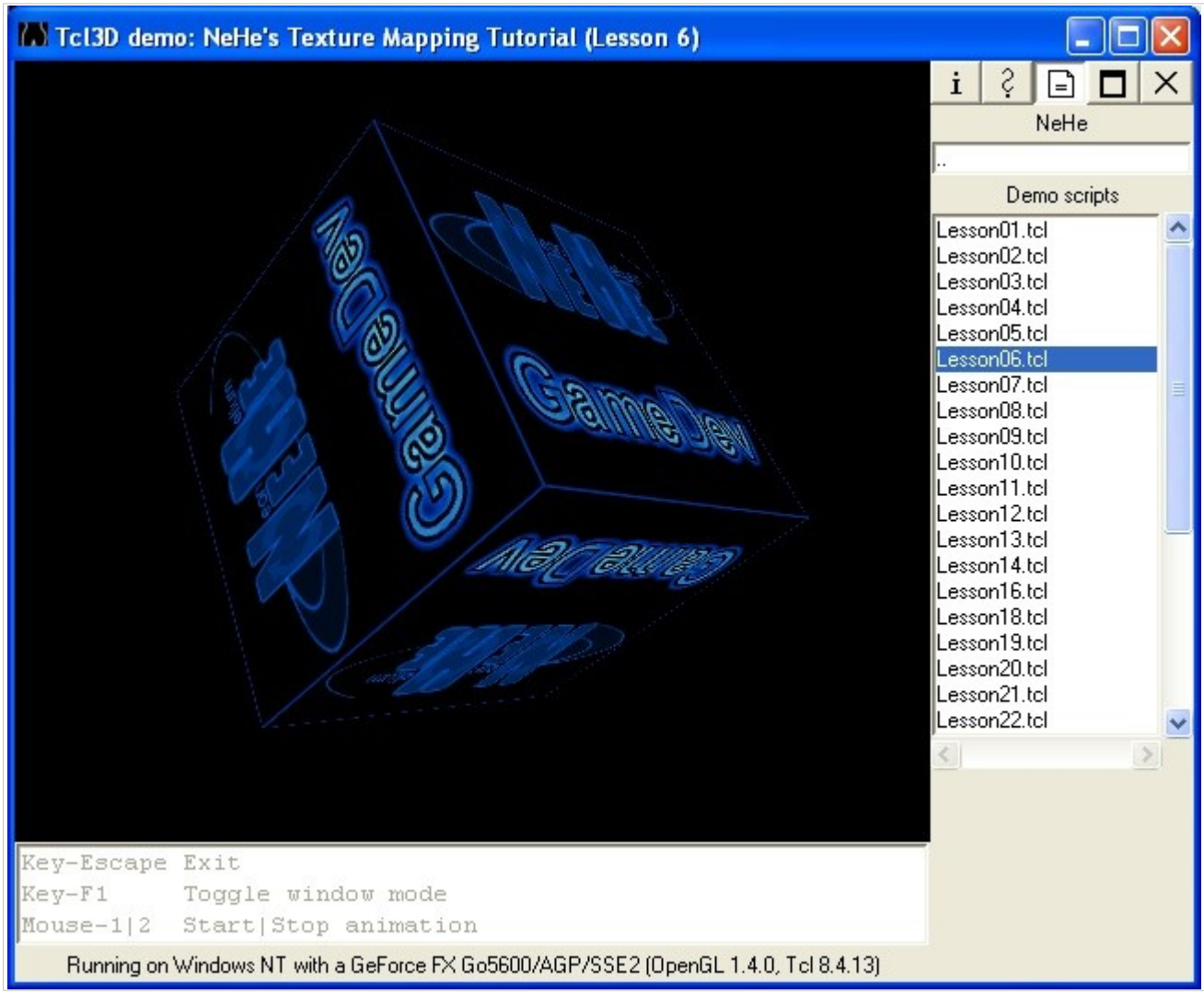

```
Lesson05.tcl

NeHe's Solid Object Tutorial

This Code Was Created By Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson06**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



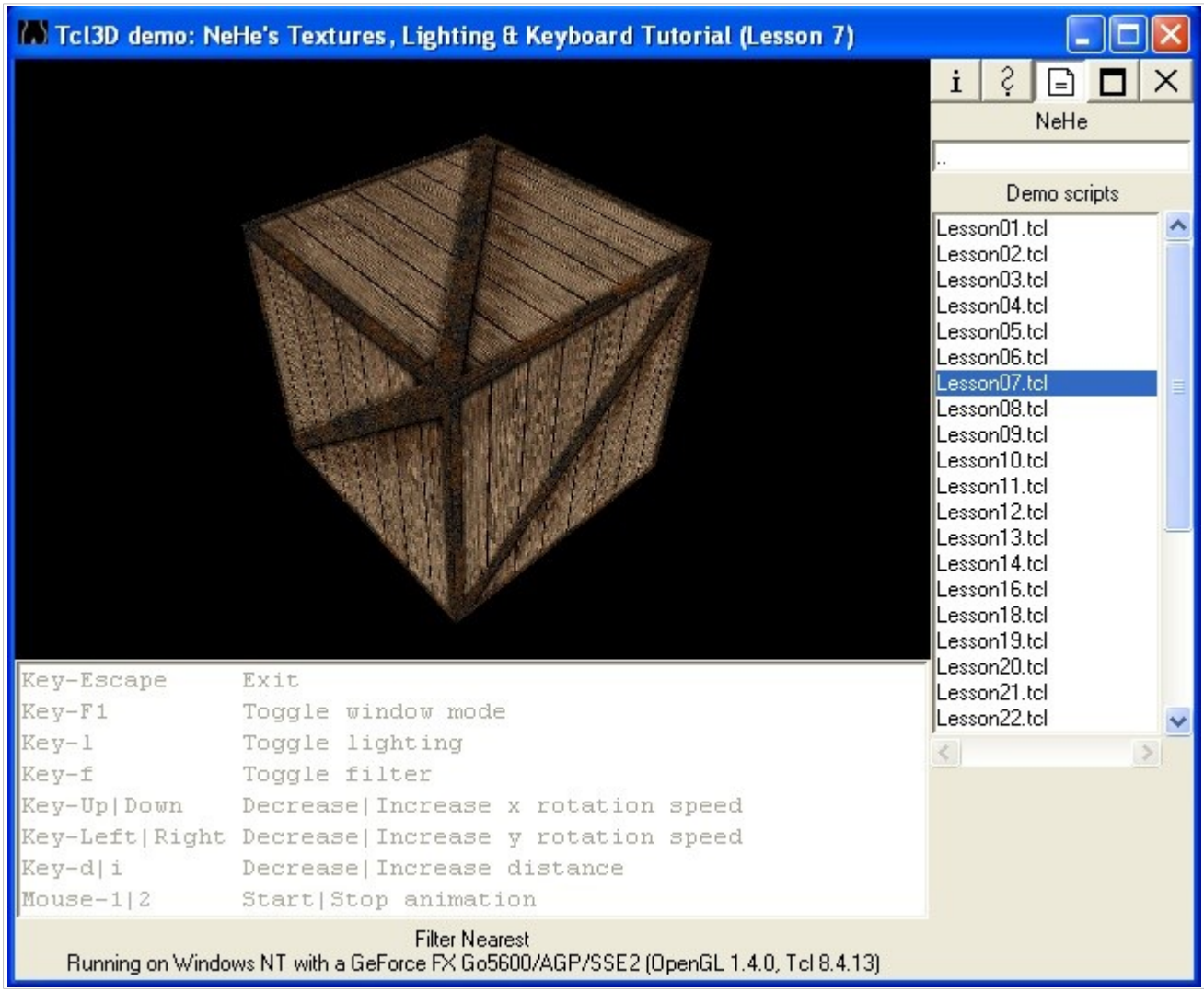

```
Lesson06.tcl

NeHe's Texture Mapping Tutorial

This Code Was Created By Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson07**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



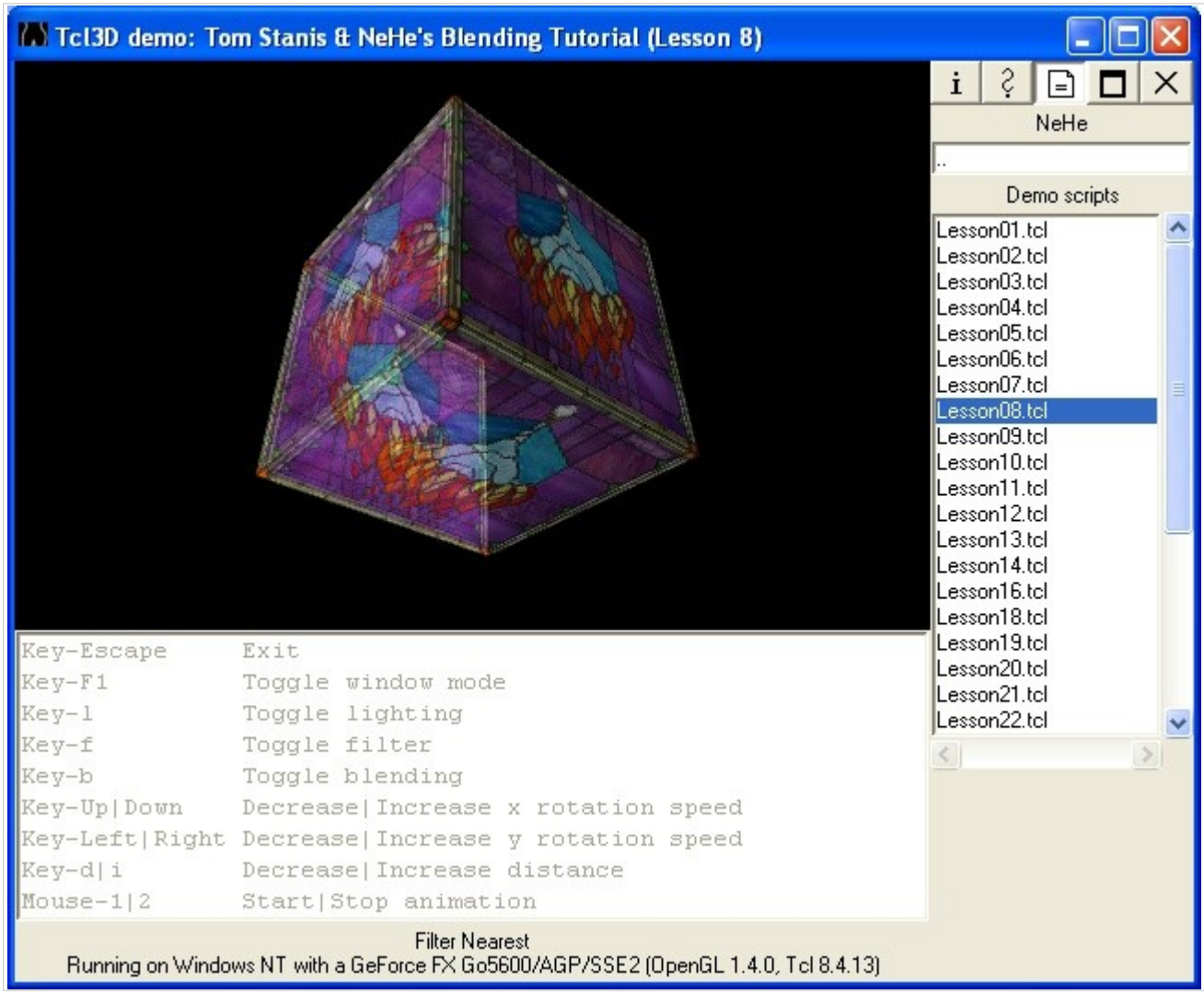

```
Lesson07.tcl

NeHe's Textures, Lighting & Keyboard Tutorial

This Code Was Created By Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson08**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



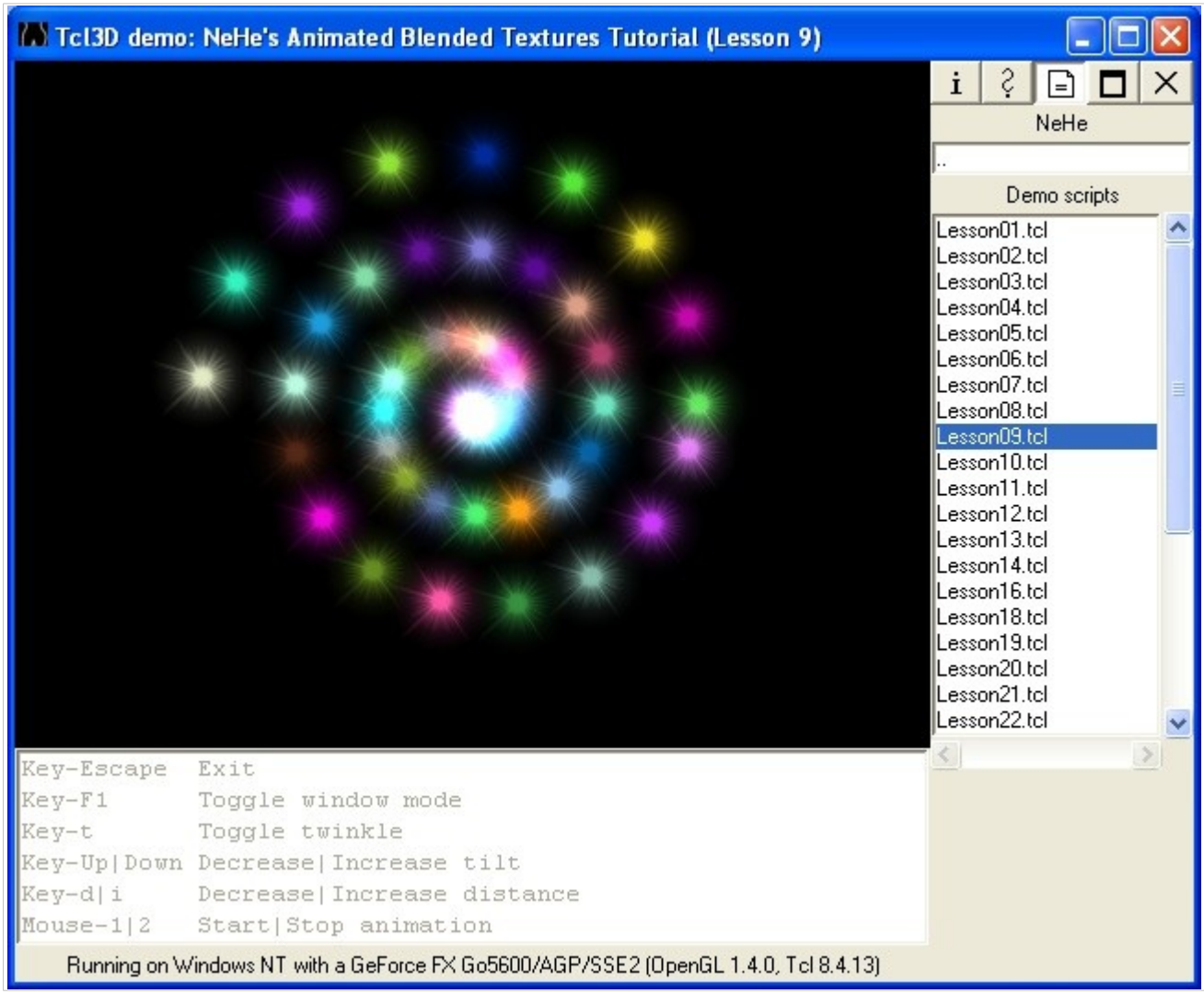

```
Lesson08.tcl

Tom Stanis & NeHe's Blending Tutorial

This Code Was Created By Tom Stanis / Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson09**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



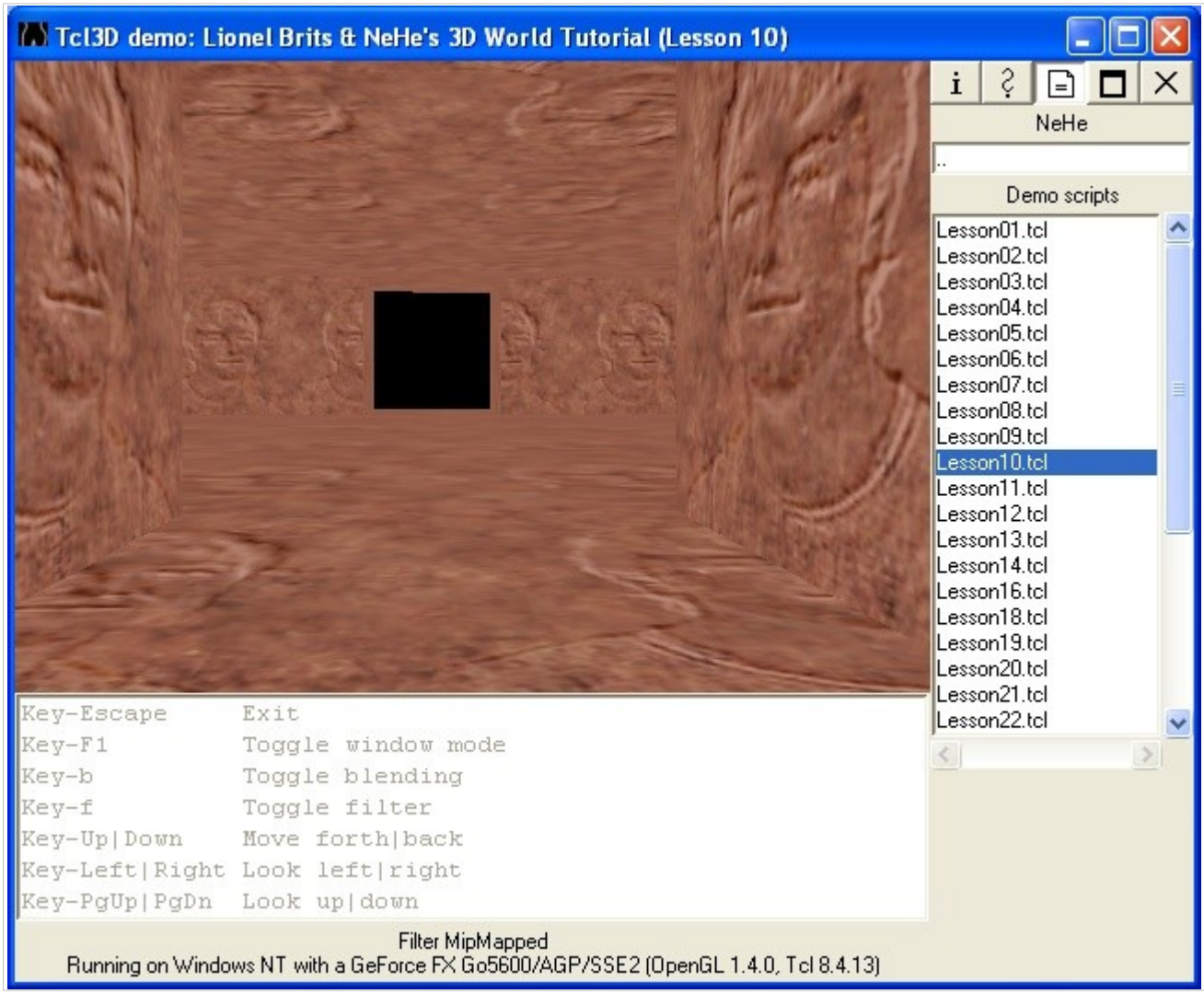

```
Lesson09.tcl

NeHe's Animated Blended Textures Tutorial

This Code Was Created By Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson10**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



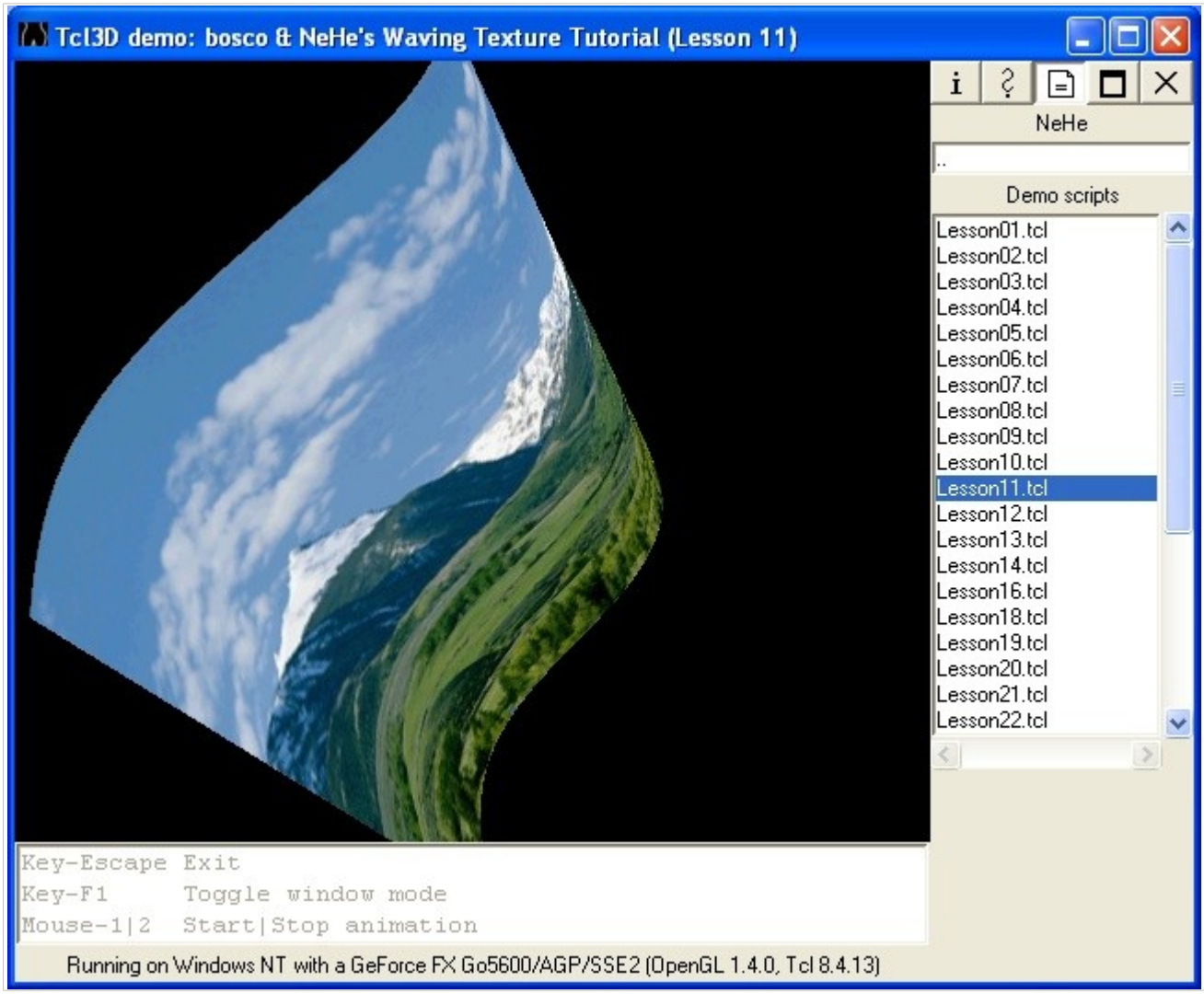

```
Lesson10.tcl

Lionel Brits & NeHe's 3D World Tutorial

This Code Was Created By Lionel Brits & Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson11**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



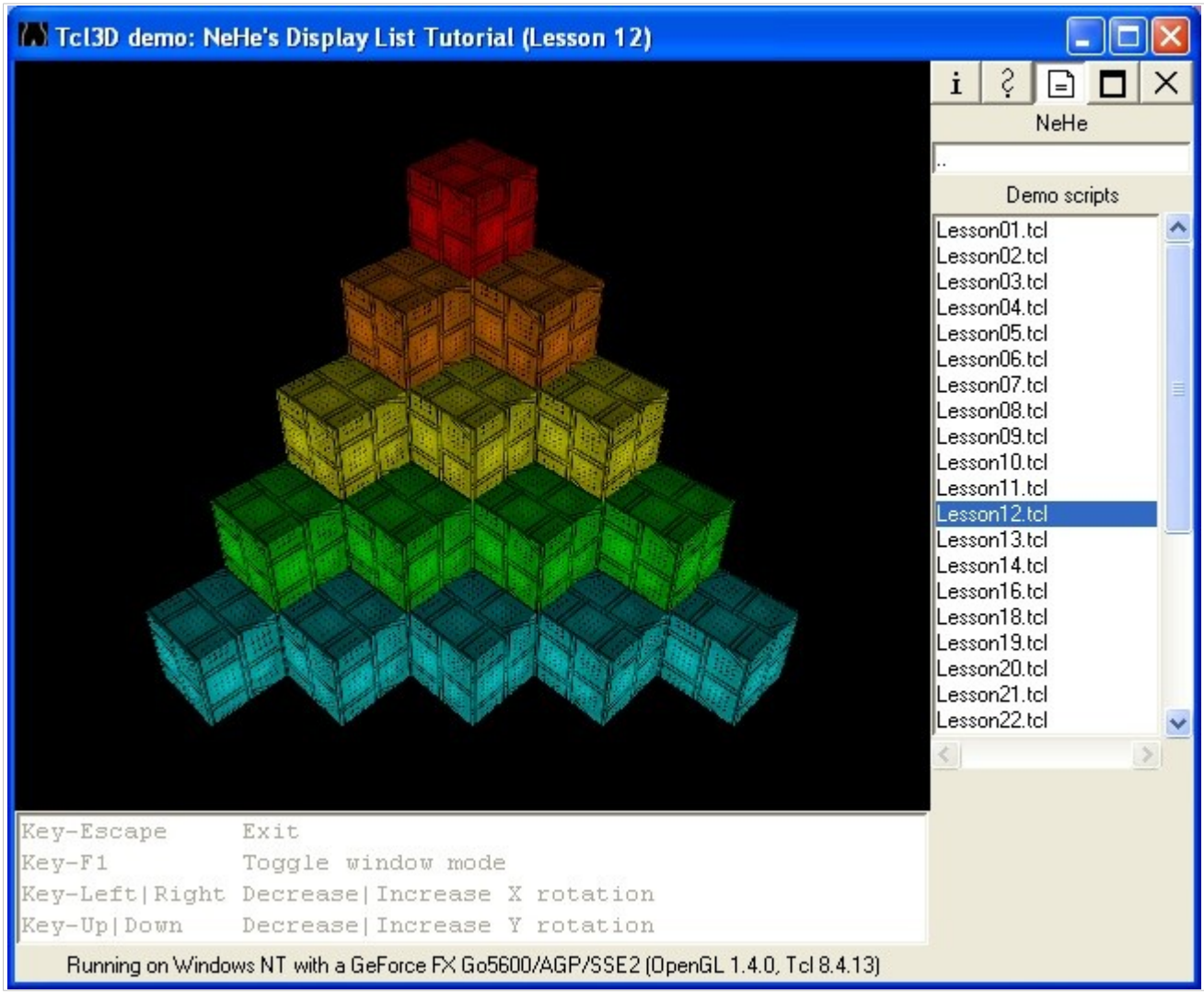

```
Lesson11.tcl

bosco & NeHe's Waving Texture Tutorial

This Code Was Created By bosco / Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson12**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



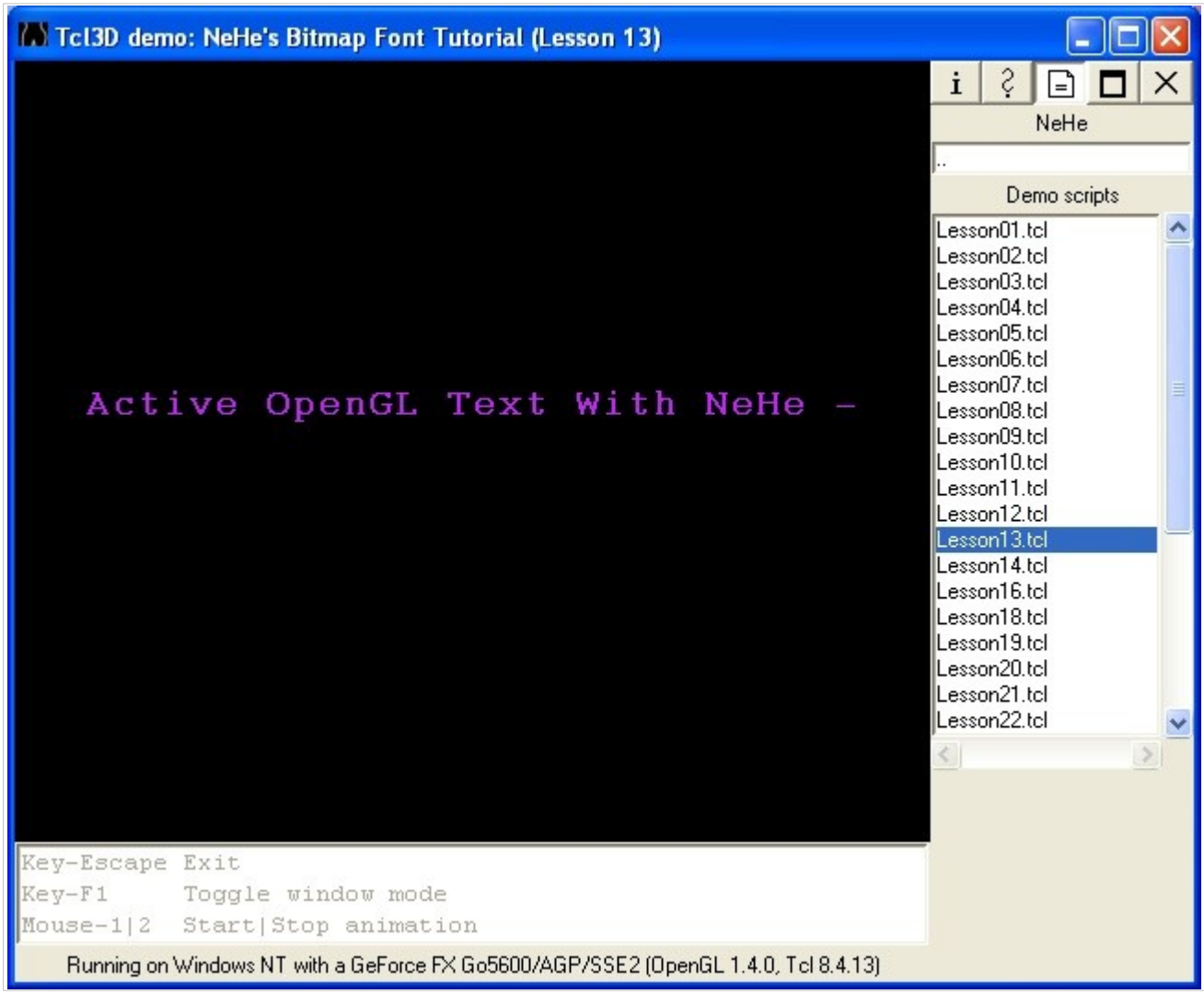

```
Lesson12.tcl

NeHe's Display List Tutorial

This Code Was Created By Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson13**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



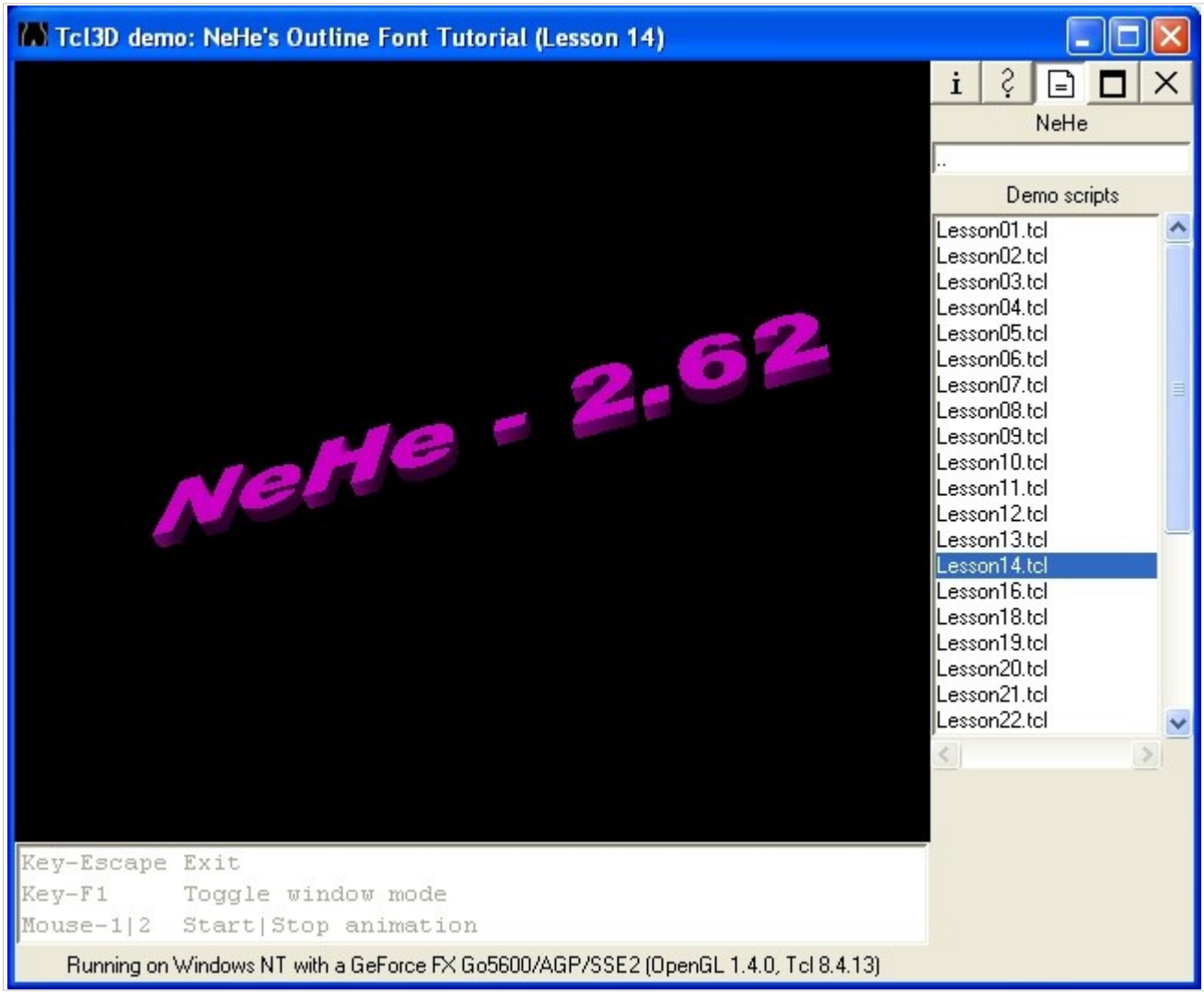

```
Lesson13.tcl

NeHe's Bitmap Font Tutorial

This Code Was Created By Jeff Molofee 2000
Modified by Shawn T. to handle (%3.2f, num) parameters.
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing The Base Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson14**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



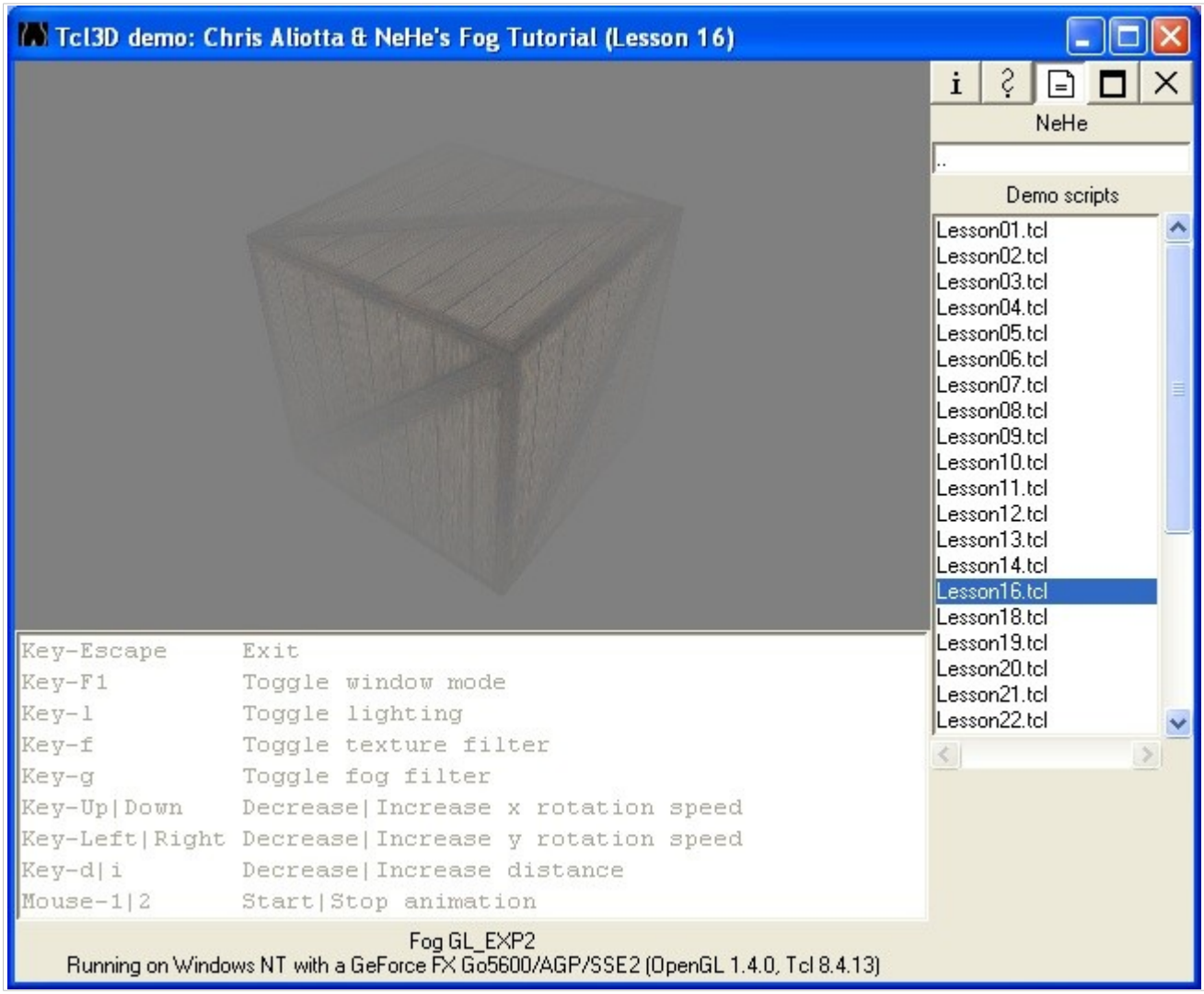

```
Lesson14.tcl

NeHe's Outline Font Tutorial

This Code Was Created By Jeff Molofee 2000
Modified by Shawn T. to handle (%3.2f, num) parameters.
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing The Base Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/26
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson16**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



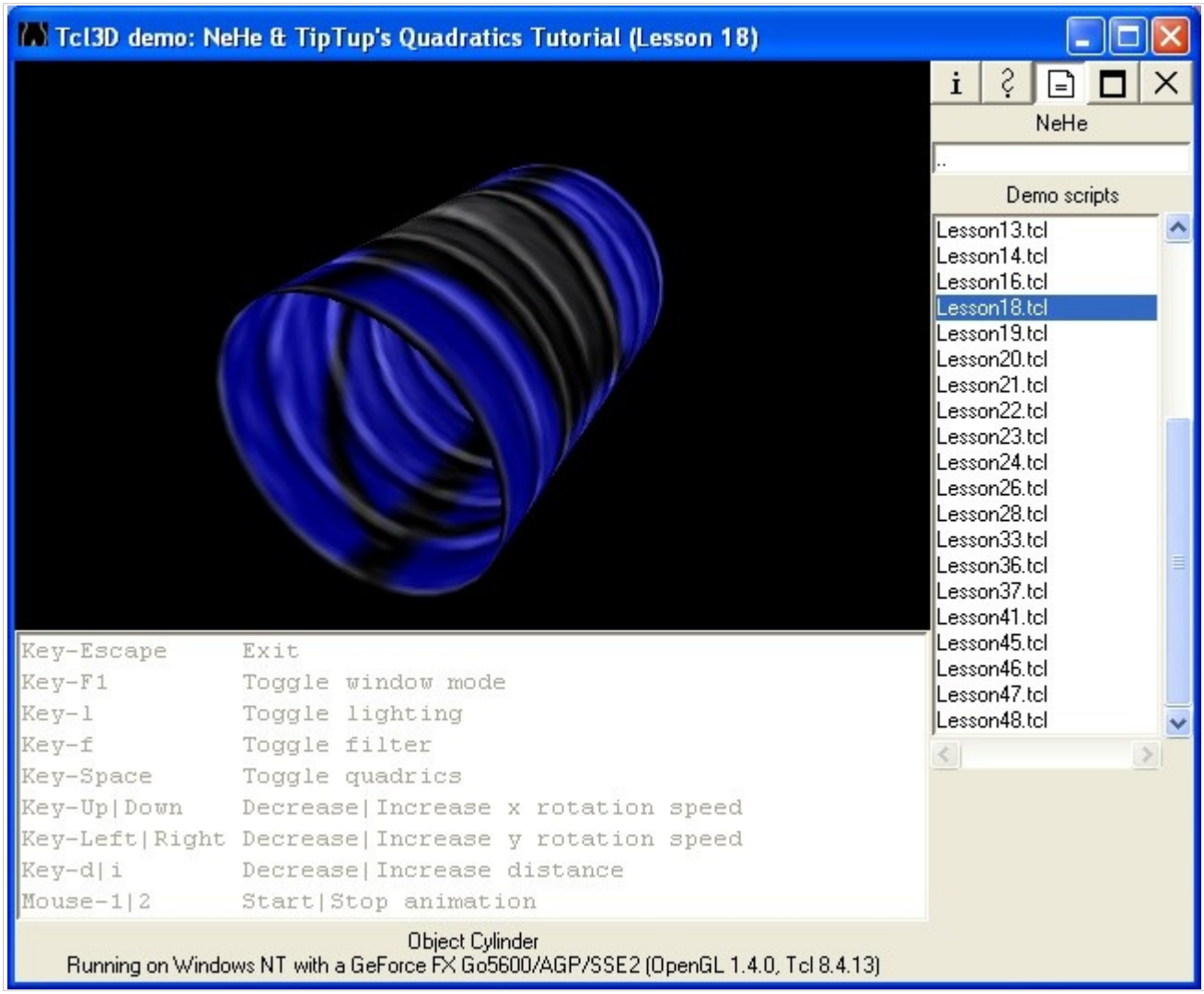

```
Lesson16.tcl

Chris Aliotta & NeHe's Fog Tutorial

This Code Was Created By Christopher Aliotta & Jeff Molofee 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson18**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



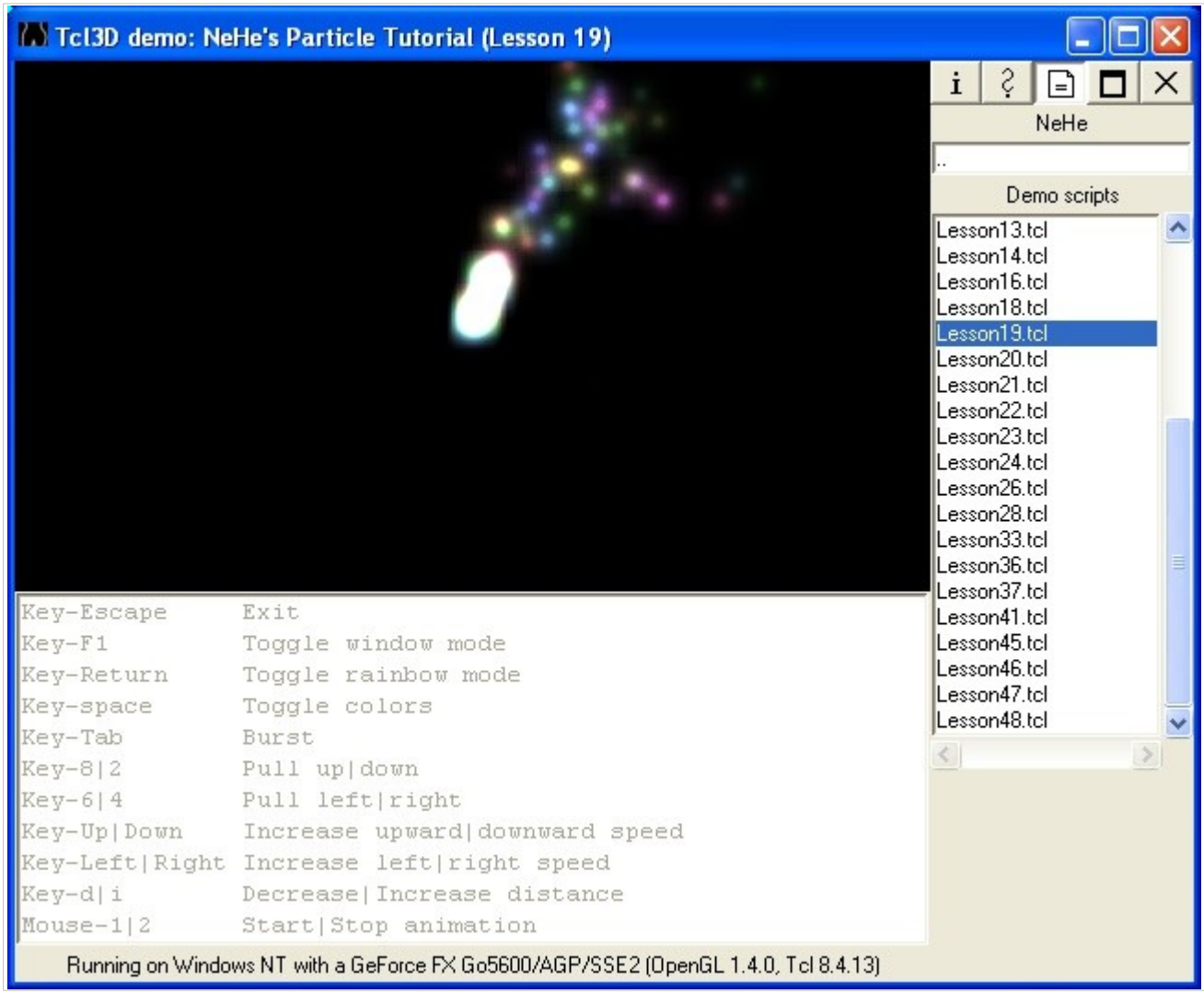

```
Lesson18.tcl

NeHe & TipTup's Quadratics Tutorial

This Code Was Created By Jeff Molofee and GB Schmick 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing This Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit Our Sites At www.tiptup.com and nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/01/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson19**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



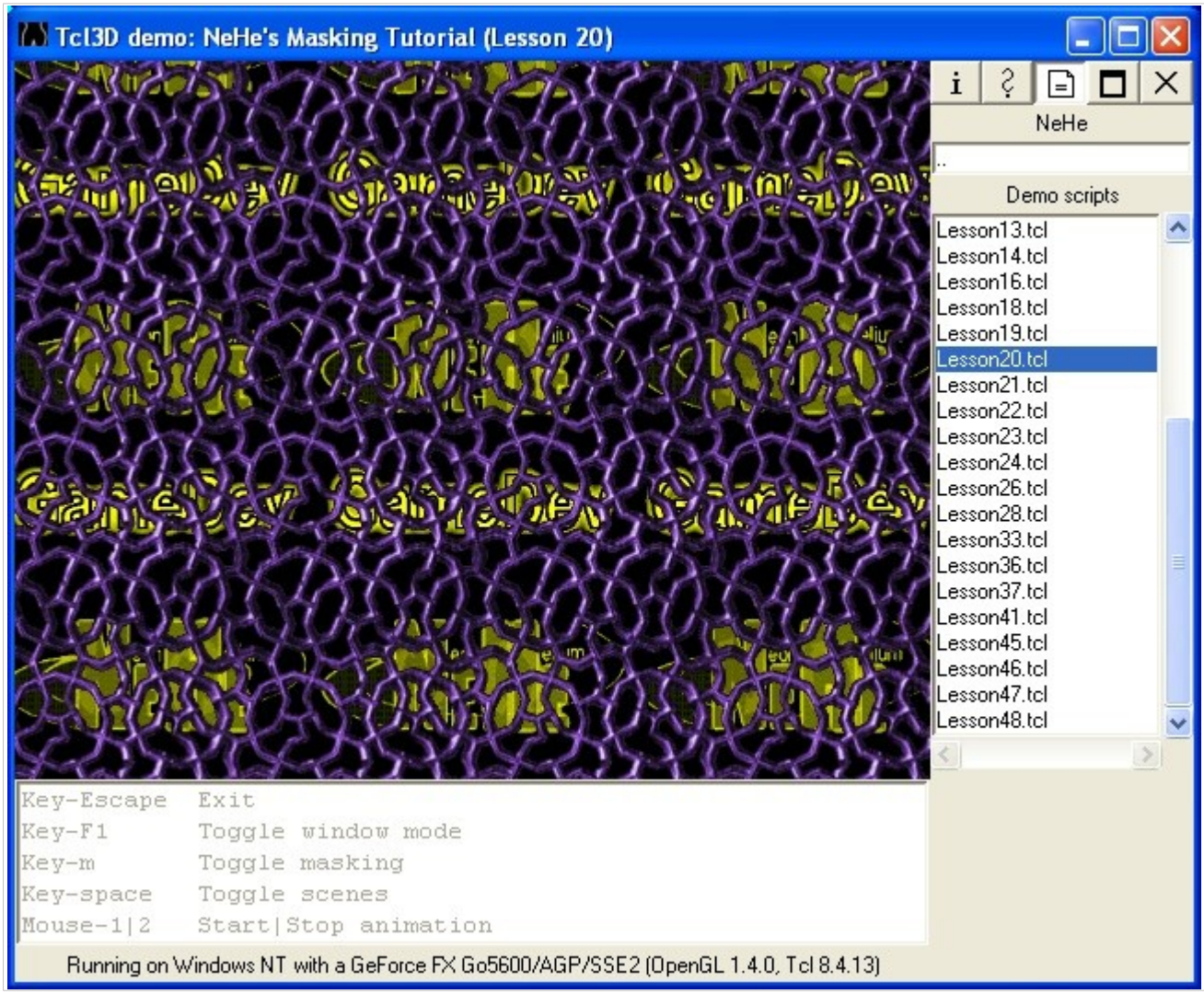

```
Lesson19.tcl

NeHe's Particle Tutorial

This Code Was Created By Jeff Molofee 2000
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/03/14
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson20**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents




```
Lesson20.tcl

NeHe's Masking Tutorial

This Code Was Created By Jeff Molofee 2000
And Modified By Giuseppe D'Agata (waveform@tiscalinet.it)
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/03/14
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson21**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents

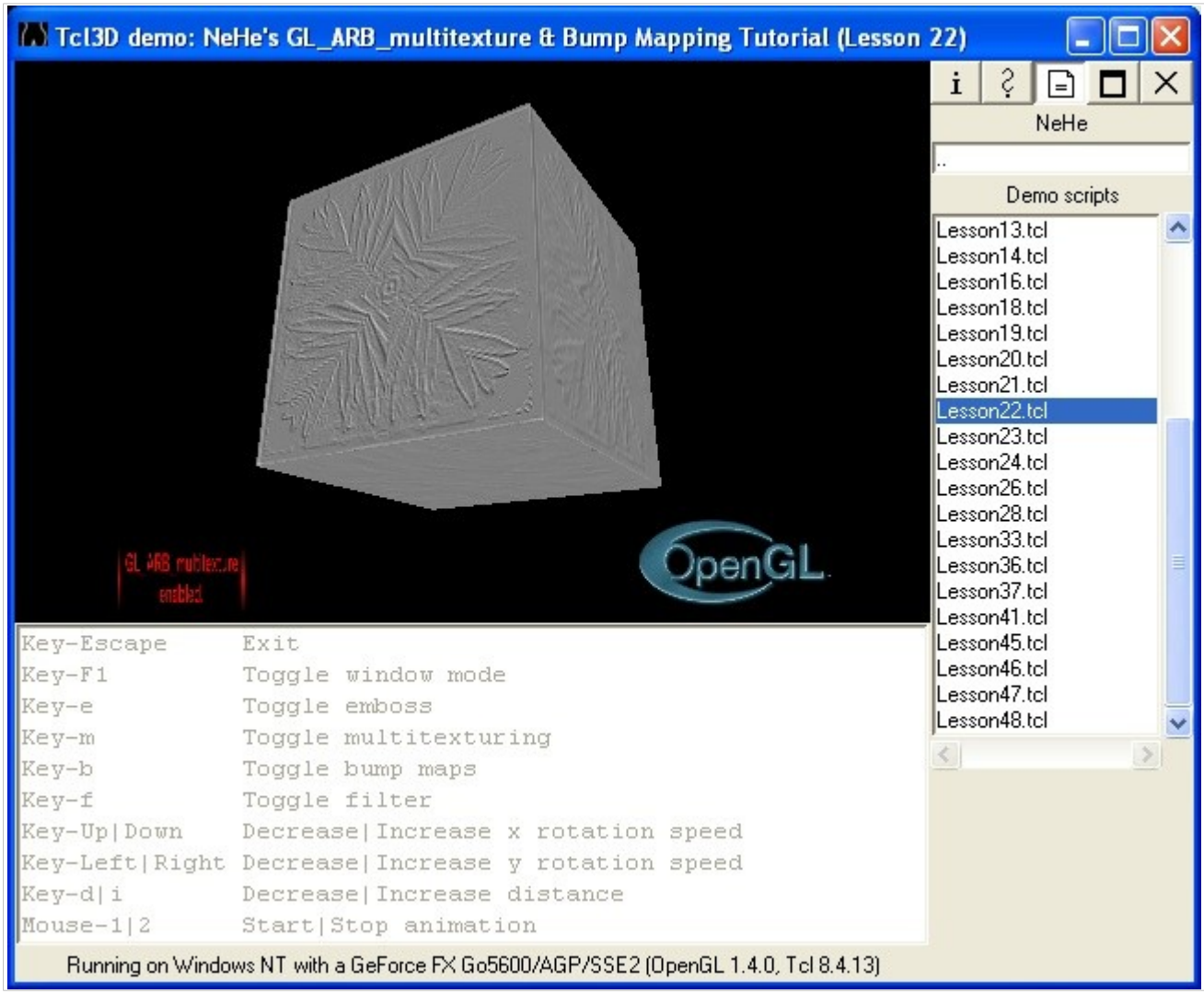

```
Lesson21.tcl

NeHe's Line Tutorial

This Code Was Created By Jeff Molofee 2000
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/03/14
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson22**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents




```
Lesson22.tcl

NeHe's GL_ARB_multitexture & Bump Mapping Tutorial

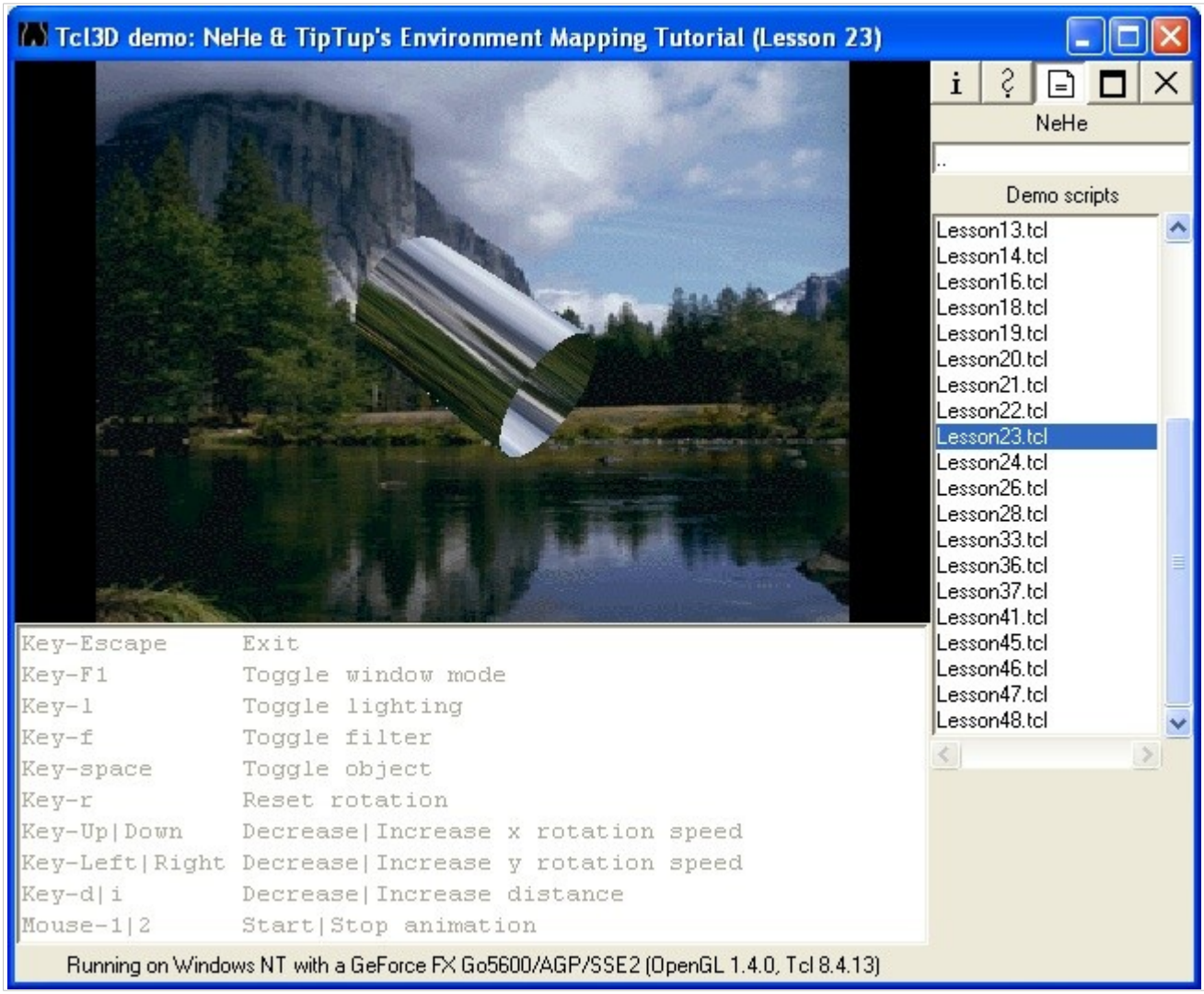
This Code Was Created by Jens Schneider (WizardSoft) 2000
Lesson22 to the series of OpenGL tutorials by NeHe-Production

This Code is loosely based upon Lesson06 by Jeff Molofee.
contact me at: schneide@pool.informatik.rwth-aachen.de

Basecode Was Created By Jeff Molofee 2000
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/16
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson23**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



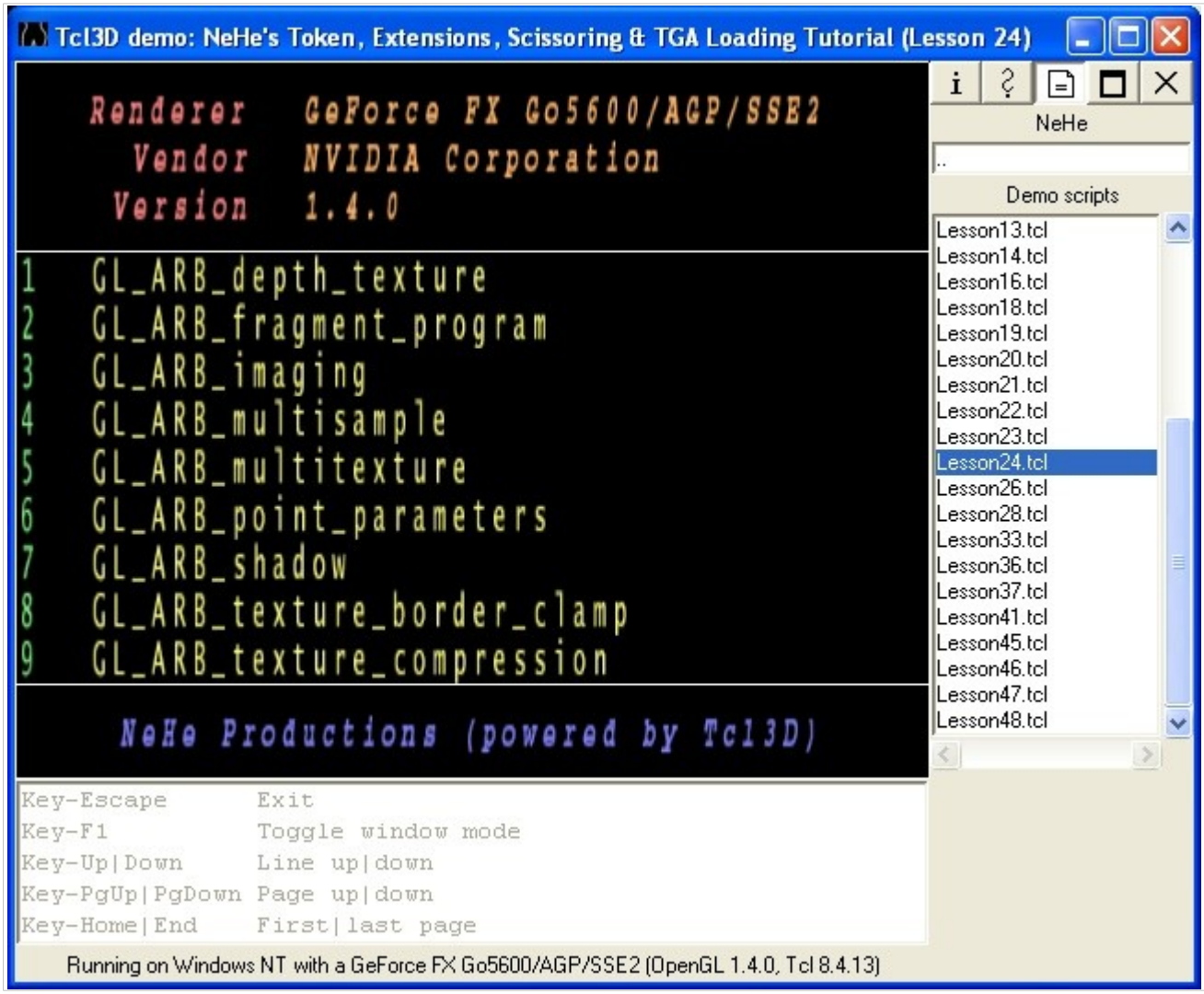

```
Lesson23.tcl

NeHe & TipTup's Environment Mapping Tutorial

This Code Was Created By Jeff Molofee and GB Schmick 2000
A HUGE Thanks To Fredric Echols For Cleaning Up
And Optimizing The Base Code, Making It More Flexible!
If You've Found This Code Useful, Please Let Me Know.
Visit Our Sites At www.tiptup.com and nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/27
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson24**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



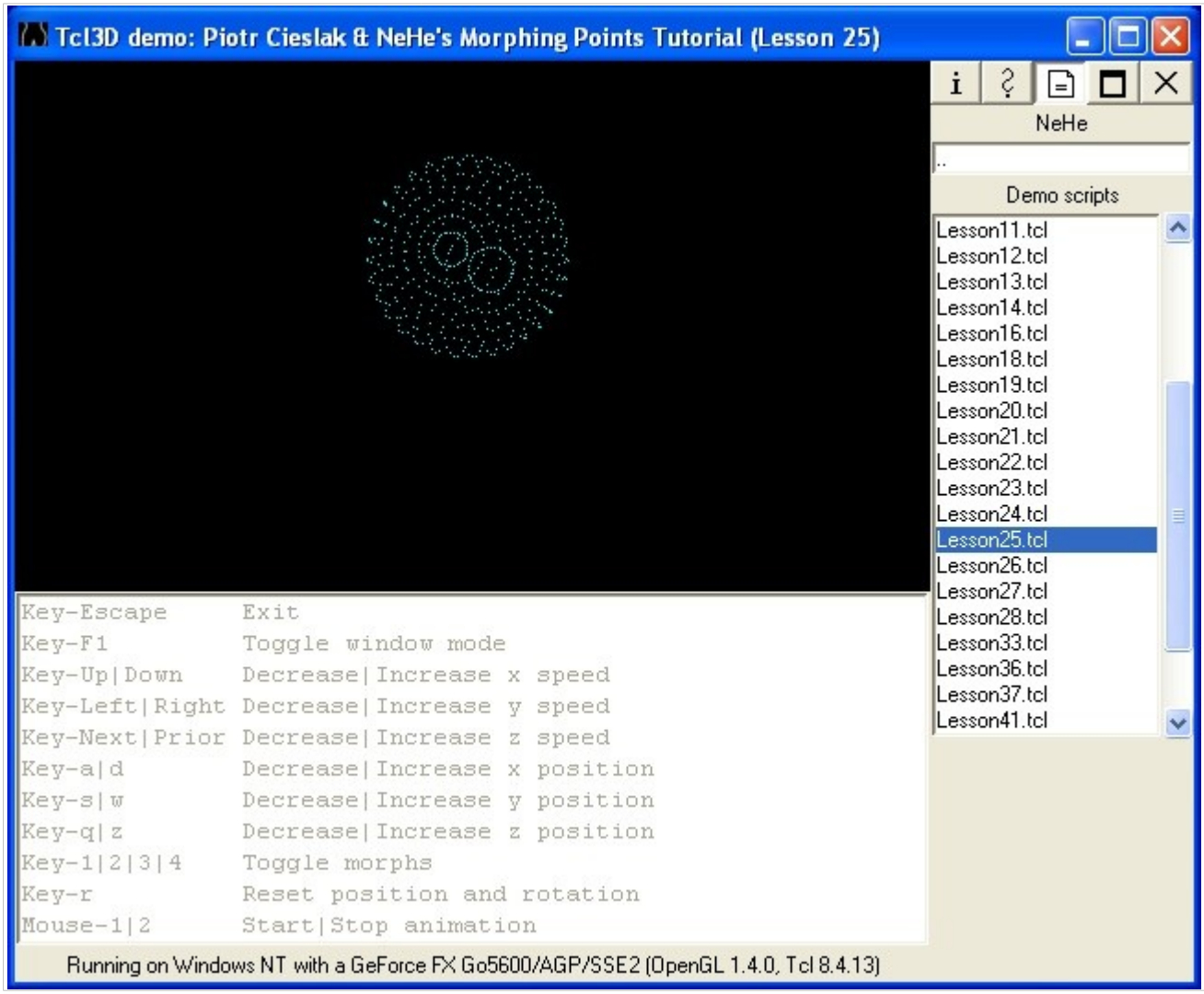

```
Lesson24.tcl

NeHe's Token, Extensions, Scissoring & TGA Loading Tutorial

This Code Was Created By Jeff Molofee 2000
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/25
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson25**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



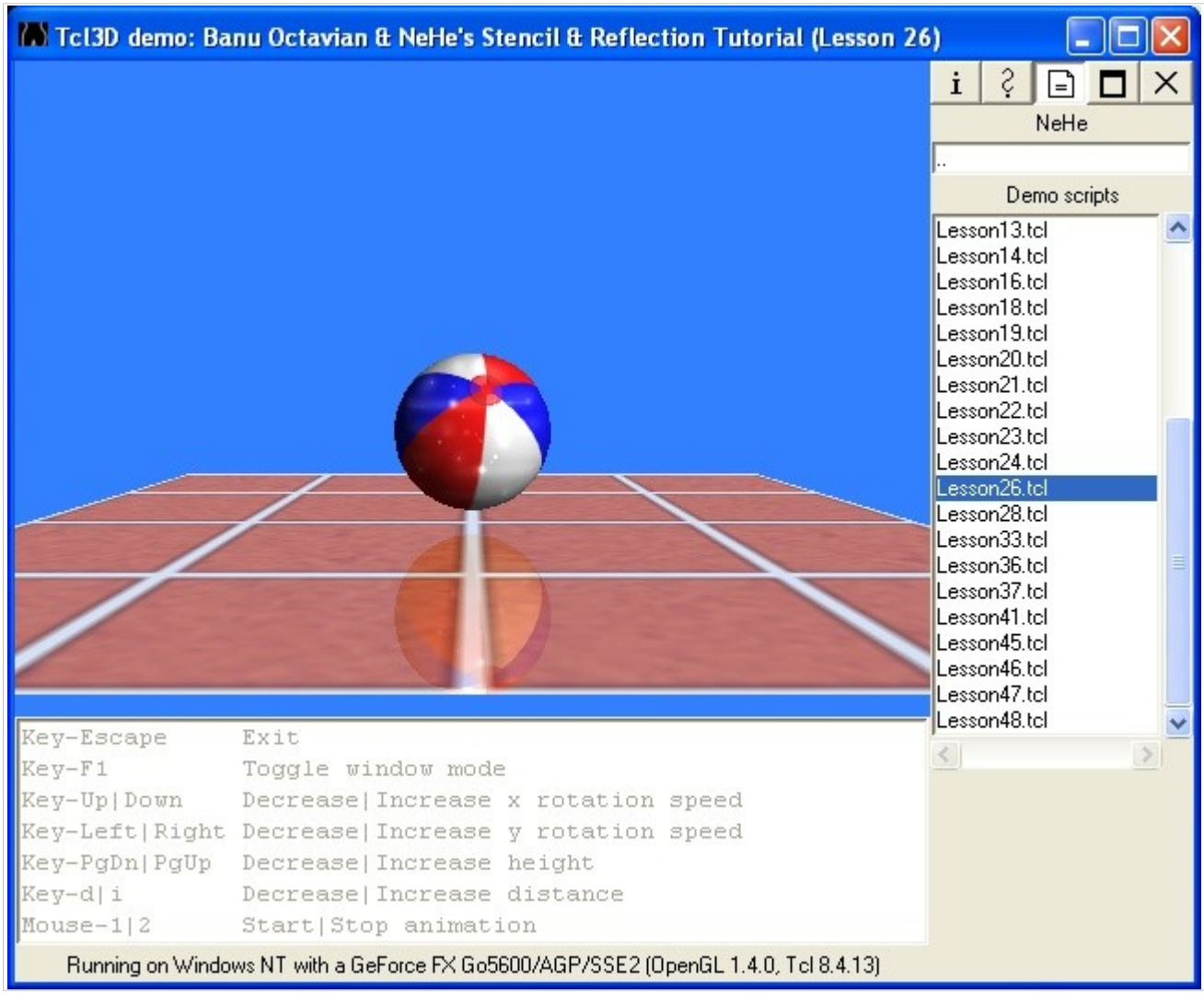

```
Lesson25.tcl

Piotr Cieslak & NeHe's Morphing Points Tutorial

This Code Was Created By Pet & Commented/Cleaned Up By Jeff Molofee
If You've Found This Code Useful, Please Let Me Know.
Visit NeHe Productions At http://nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2007/03/03
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson26**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents




```
Lesson26.tcl

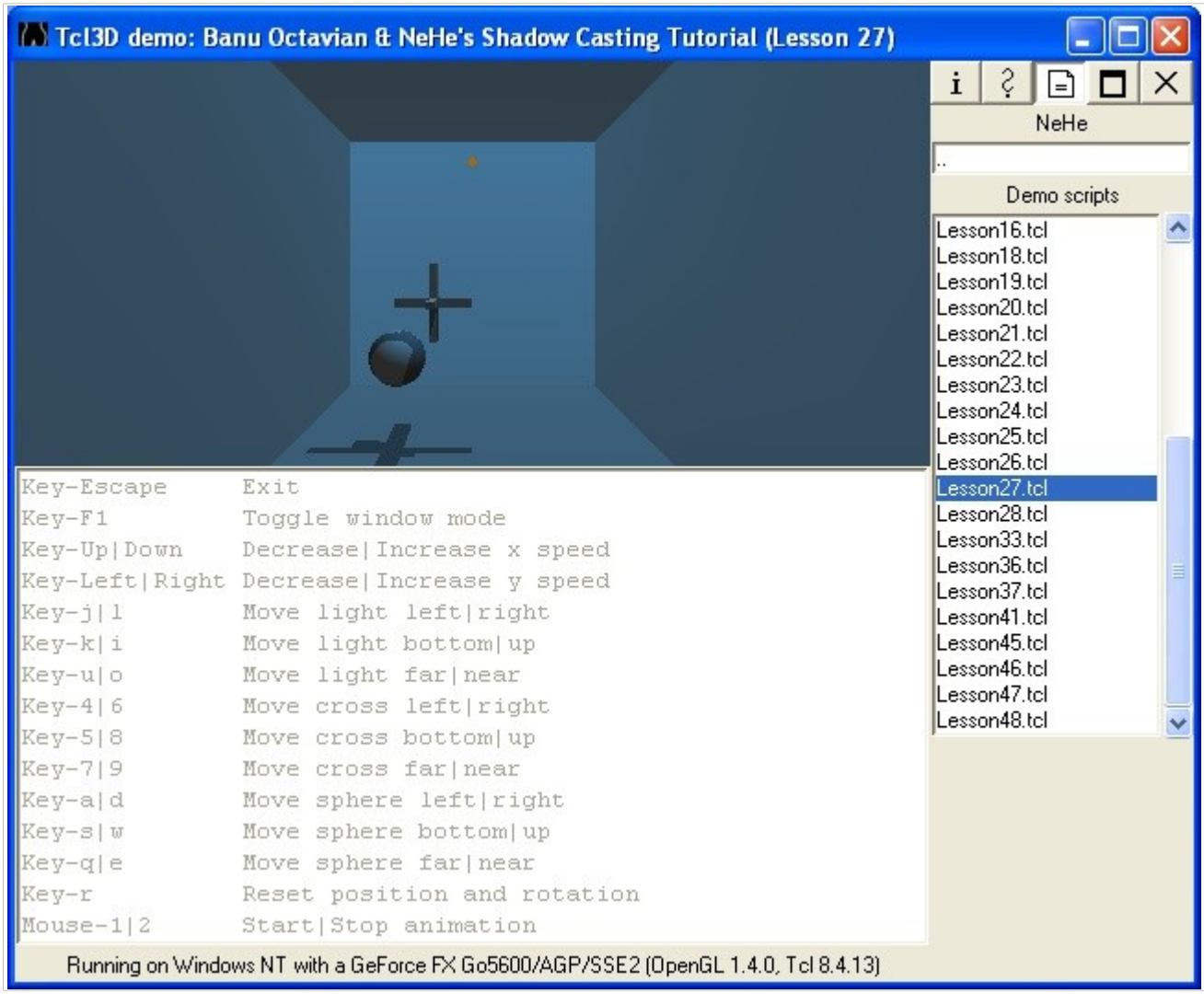
Banu Octavian & NeHe's Stencil & Reflection Tutorial

This code has been created by Banu Octavian aka Choko - 20 may 2000
and uses NeHe tutorials as a starting point (window initialization,
texture loading, GL initialization and code for keypresses) - very good
tutorials, Jeff. If anyone is interested about the presented algorithm
please e-mail me at boct@romwest.ro

Code Commmenting And Clean Up By Jeff Molofee ( NeHe )
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/16
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson27**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



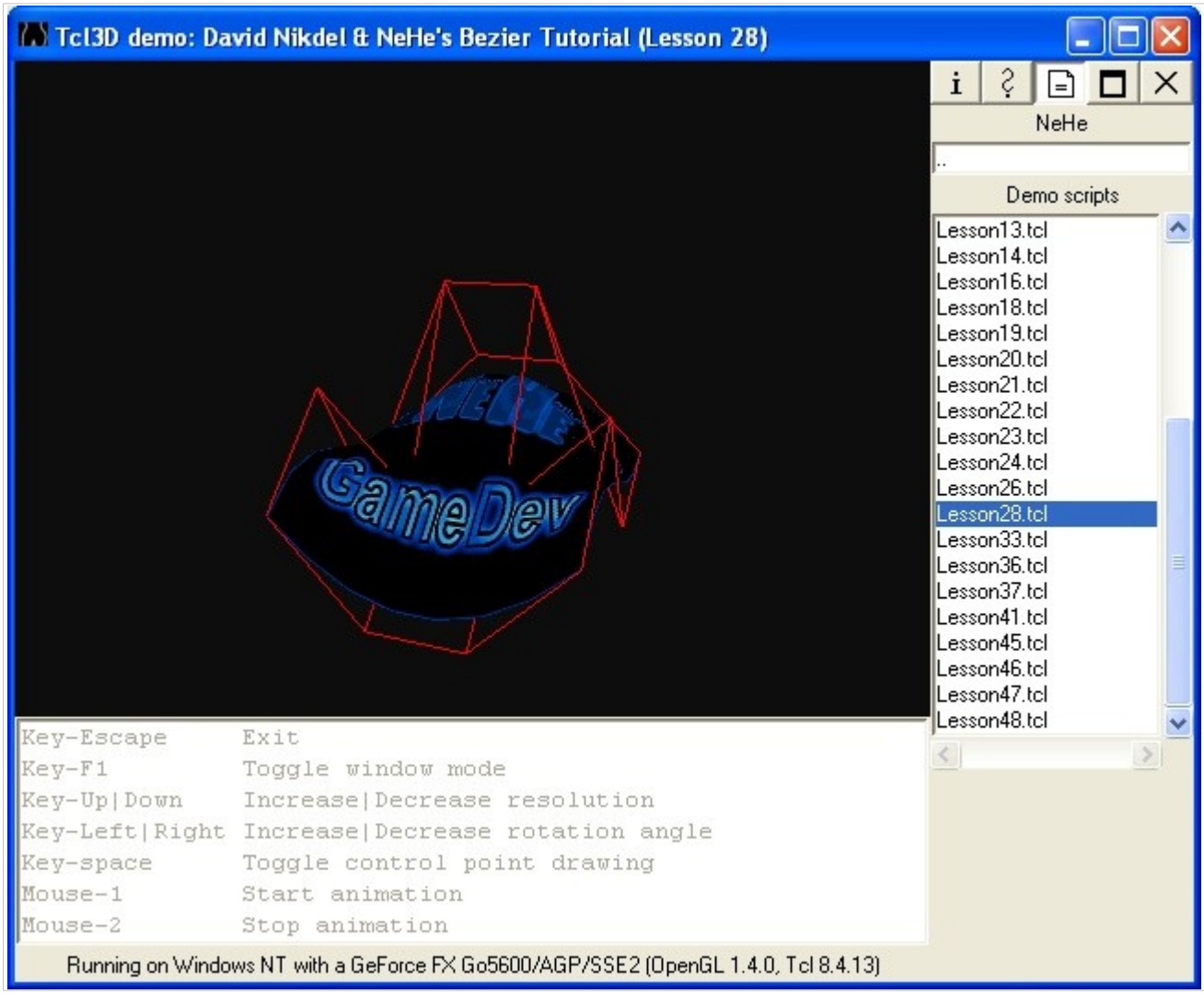

```
Lesson27.tcl

"Banu Octavian & NeHe's Shadow Casting Tutorial"

This code has been created by Banu Octavian aka Choko - 20 may 2000
and uses NeHe tutorials as a starting point (window initialization,
texture loading, GL initialization and code for keypresses) - very good
tutorials, Jeff. If anyone is interested about the presented algorithm
please e-mail me at boct@romwest.ro
Attention!!! This code is not for beginners.

Modified for Tcl3D by Paul Obermeier 2007/02/27
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson28**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



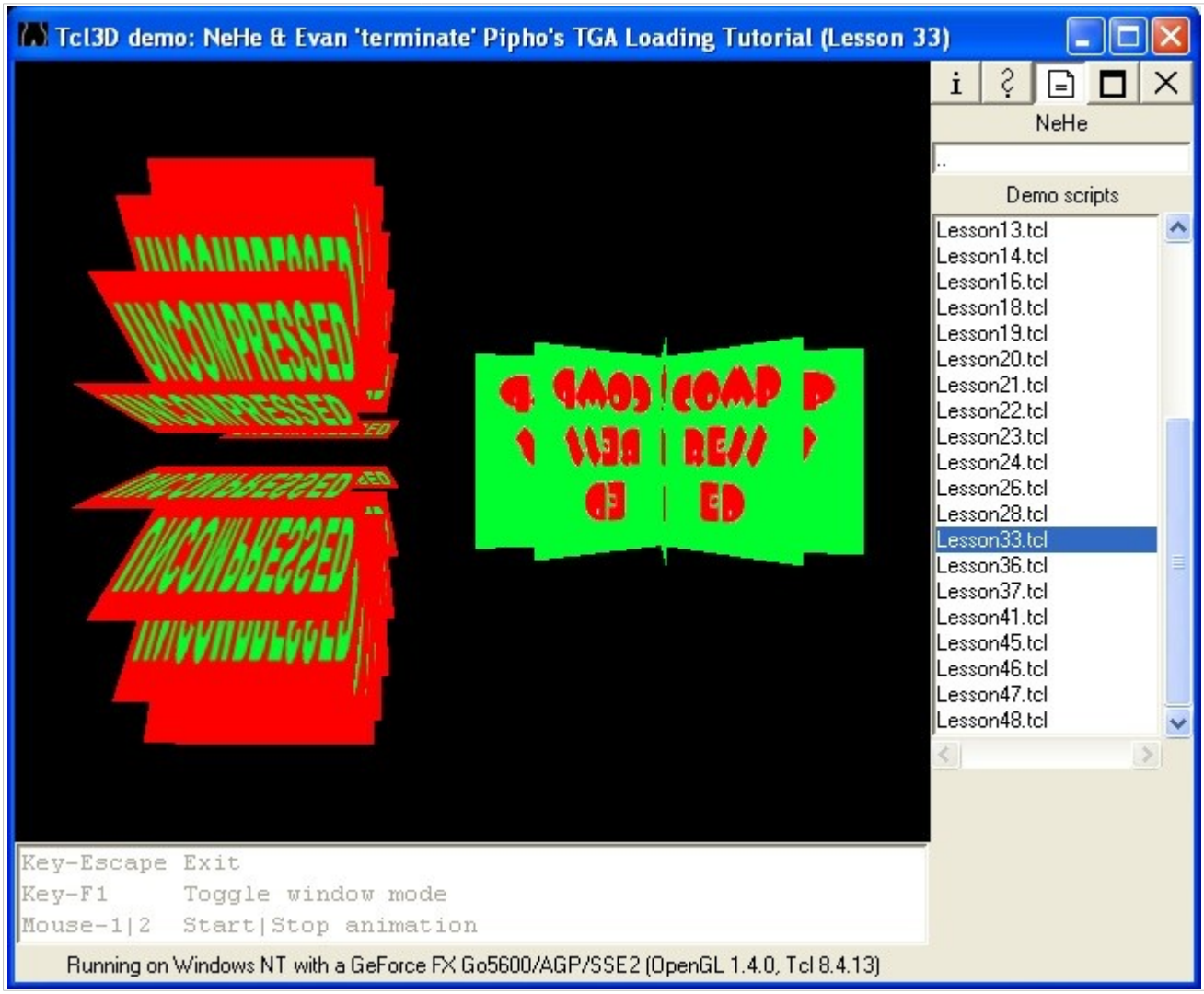

```
Lesson28.tcl

David Nikdel & NeHe's Bezier Tutorial

This Code Was Published By Jeff Molofee 2000
Code Was Created By David Nikdel For NeHe Productions
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/29
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	Lesson33
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents




```
Lesson33.tcl

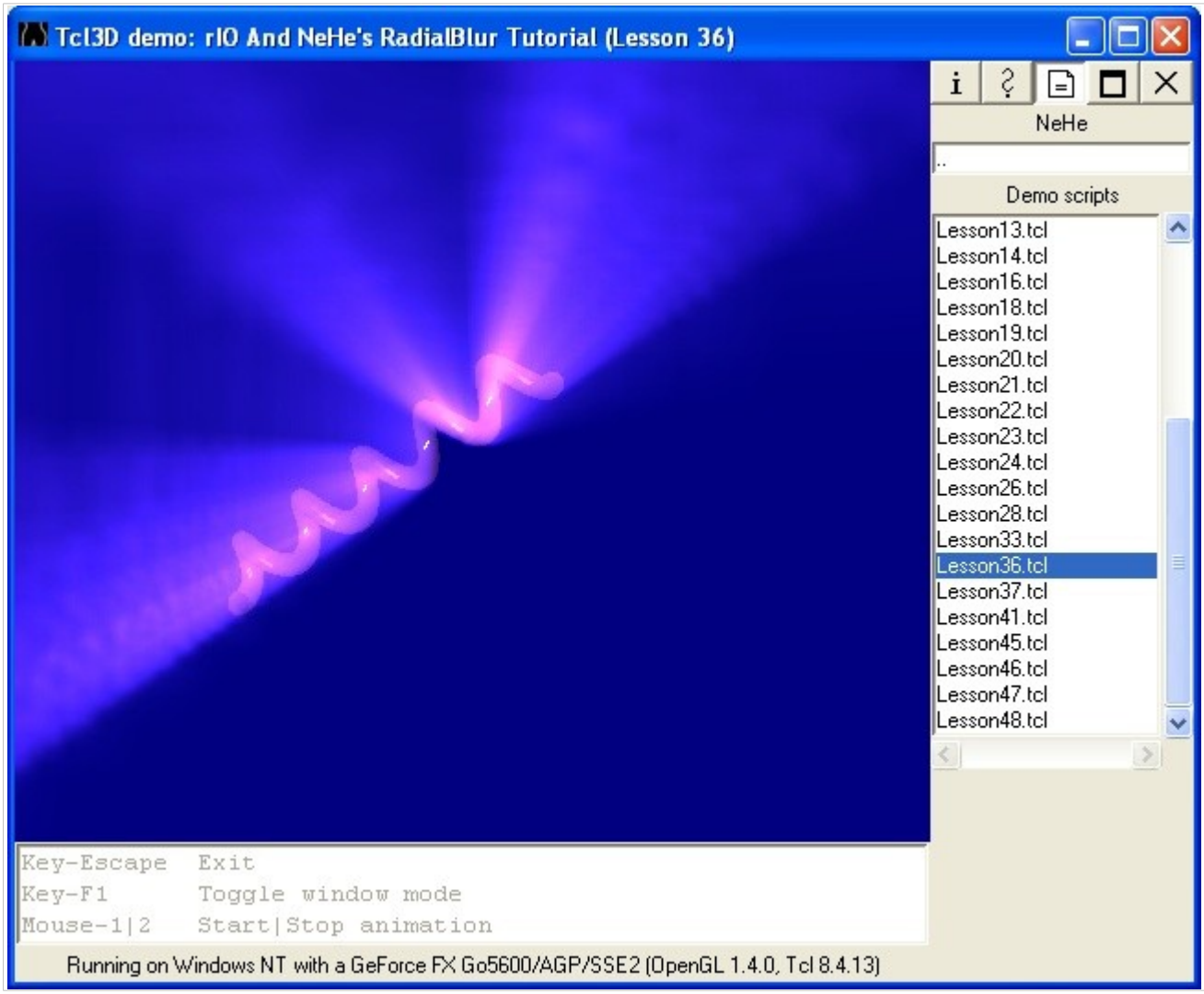
NeHe & Evan 'terminate' Pipho's TGA Loading Tutorial

Loading Uncompressed and Compressed .TGA Files with the Img extension.

This Code Was Created By Evan Pipho
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/16
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson36**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



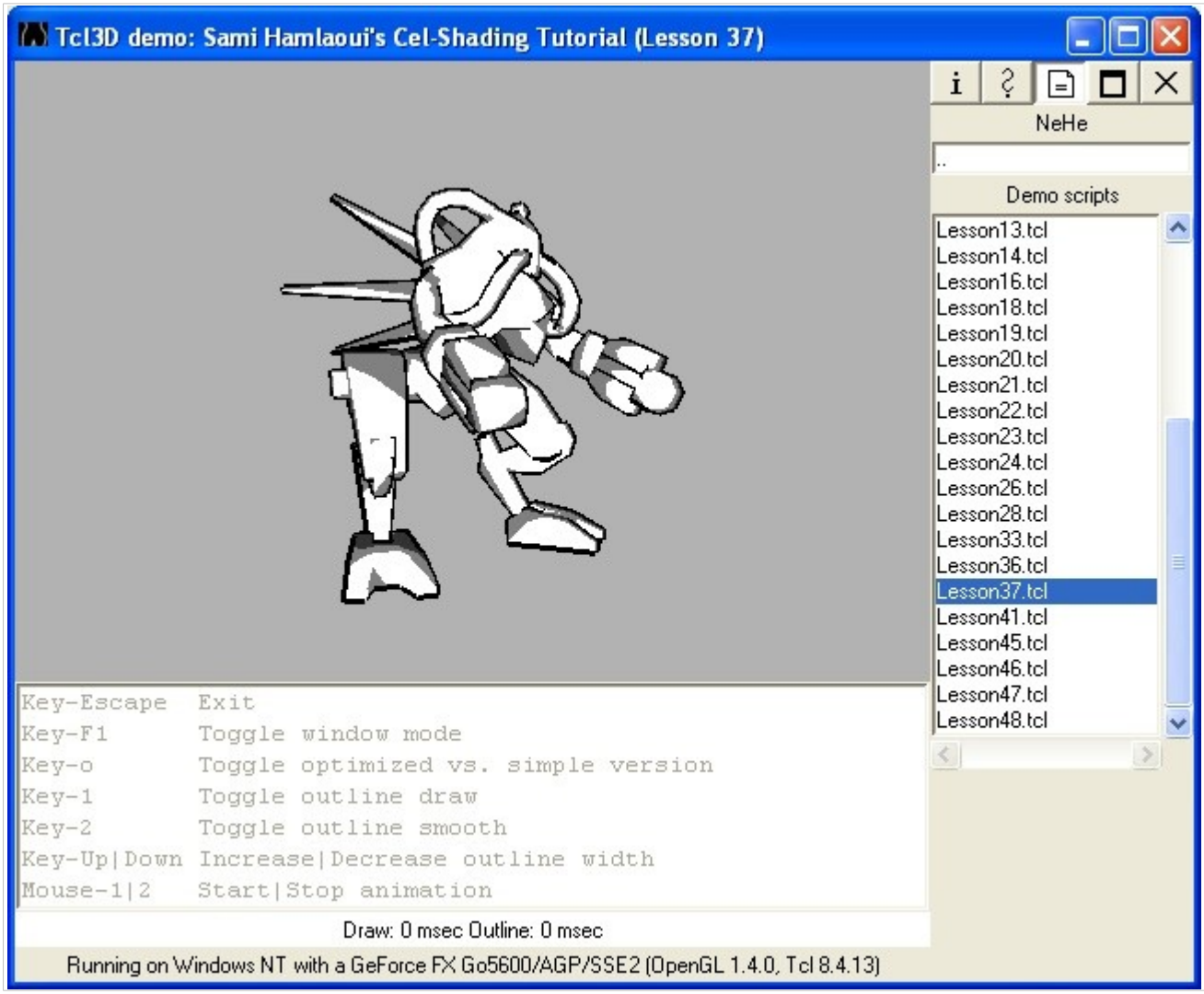

```
Lesson36.tcl

Dario Corno's Radial Blur & Rendering To A Texture Tutorial

If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/23
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson37**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents




```
Lesson37.tcl

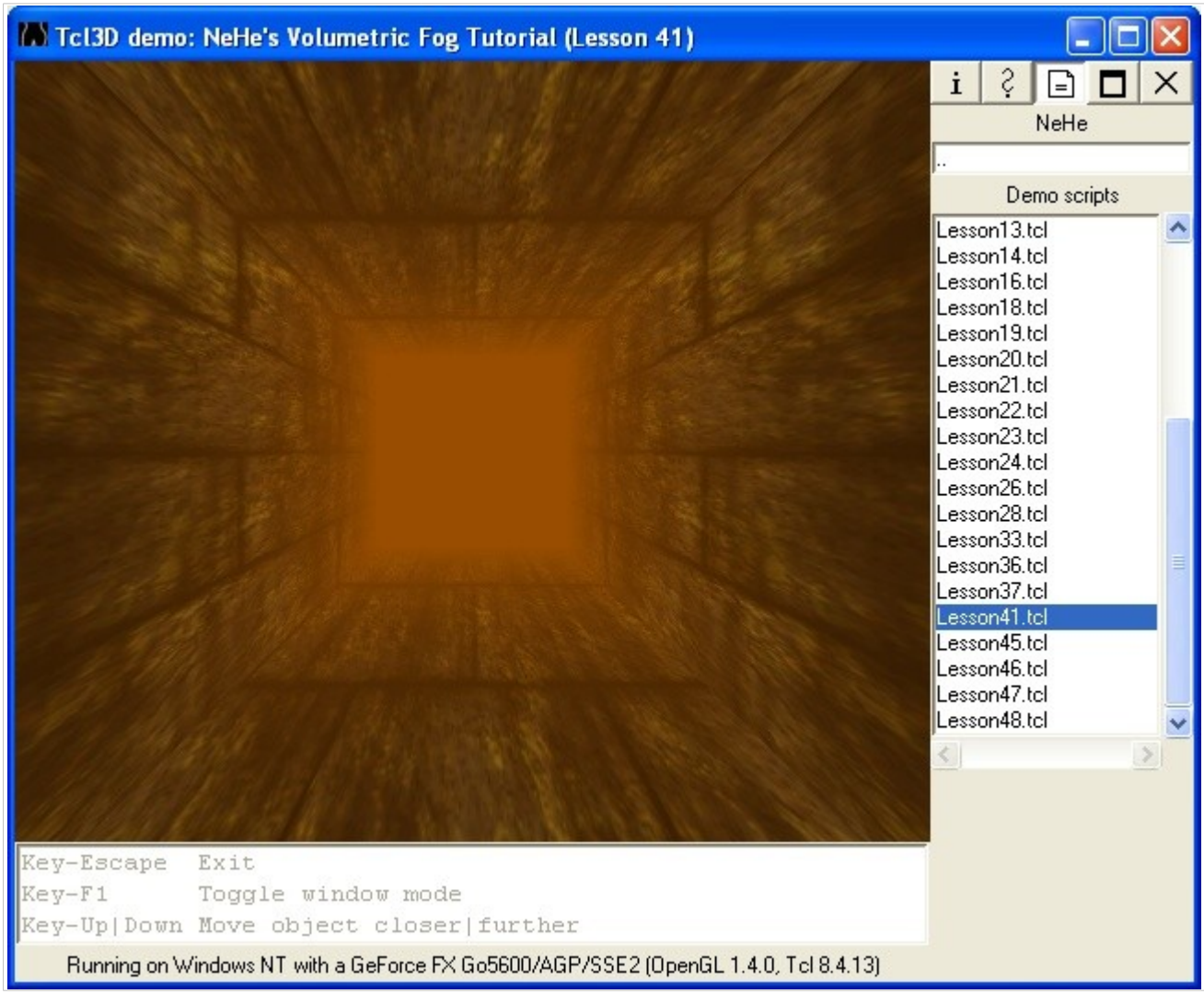
Sami Hamlaoui's Cel-Shading Code

Note: The original article for this code can be found at:
      http://www.gamedev.net/reference/programming/features/celshading

If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/22
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson41**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



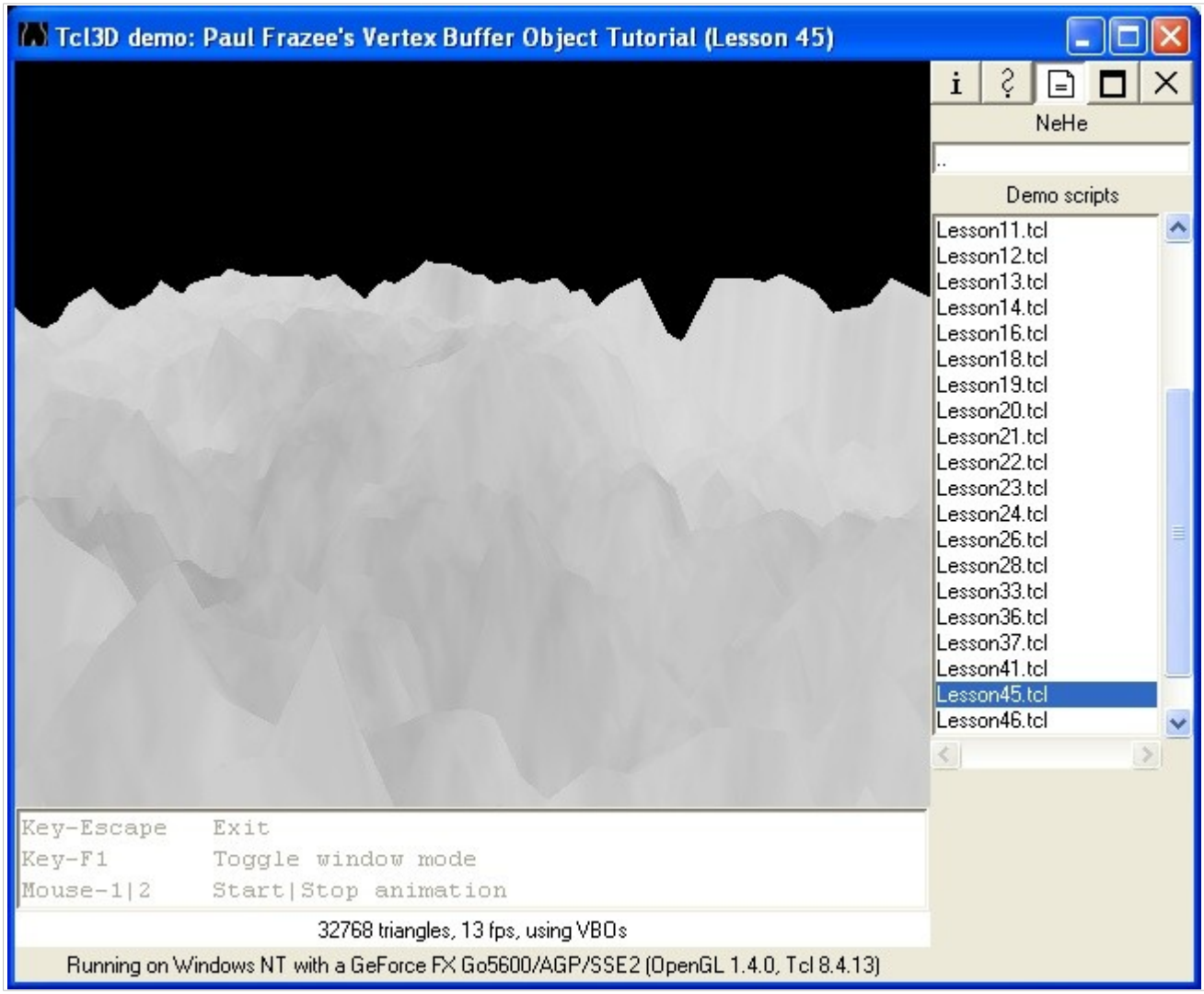

```
Lesson41.tcl

NeHe's Volumetric Fog Tutorial

This Code Was Created By Jeff Molofee 2003
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/27
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson45**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents



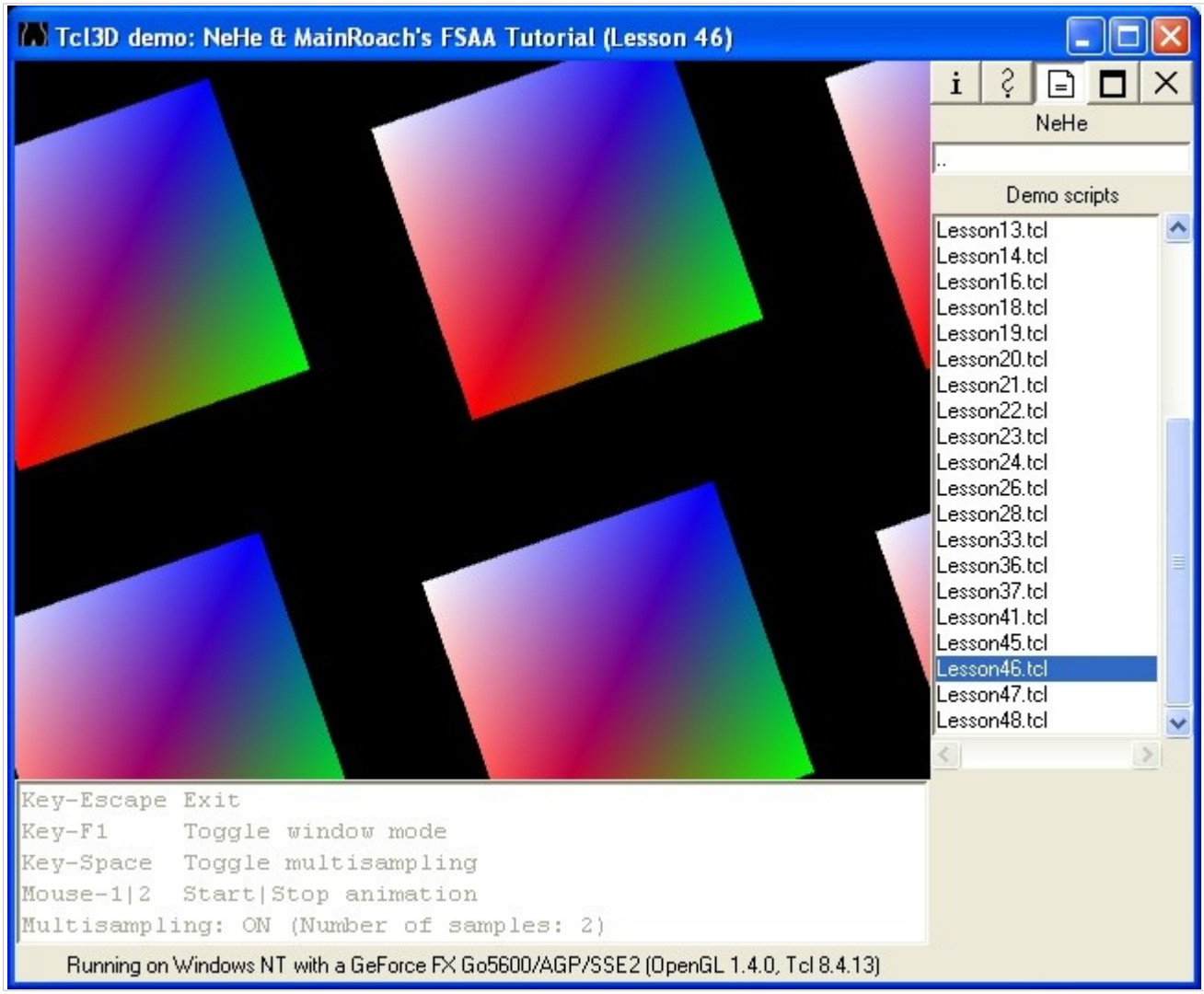

```
Lesson45.tcl

Paul Frazee's Vertex Buffer Object Tutorial

Code Commmenting And Clean Up By Jeff Molofee ( NeHe )
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/17
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson46**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents




```
Lesson46.tcl

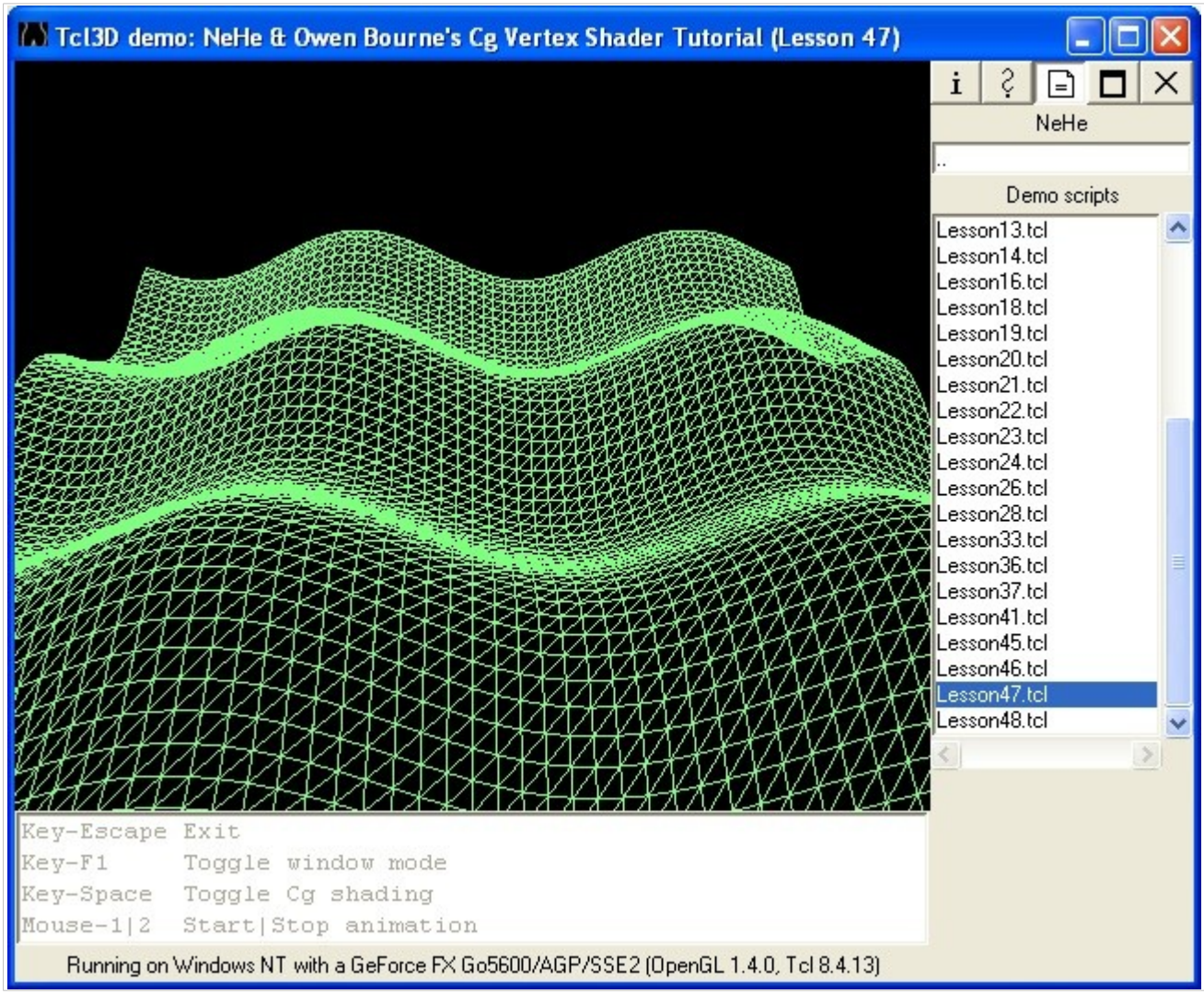
NeHe & MainRoach's FSAA Tutorial

This Code Was Created By Jeff Molofee 2001
and Colt McAnlis ( MainRoach ).
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/13
See www.tcl3d.org for the Tcl3D extension.

This demo uses the multisampling options built into tcl3dTogl starting
from version 0.3.2.
Another way to set the number of samples is via the driver specific GUI under
Windows, or by setting the environment variable __GL_FSAA_MODE under Linux.
```

Demo:	**Lesson47**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents




```
Lesson47.tcl

NeHe & Owen Bourne's Cg Vertex Shader Tutorial

If You've Found This Code Useful, Please Let Me Know.
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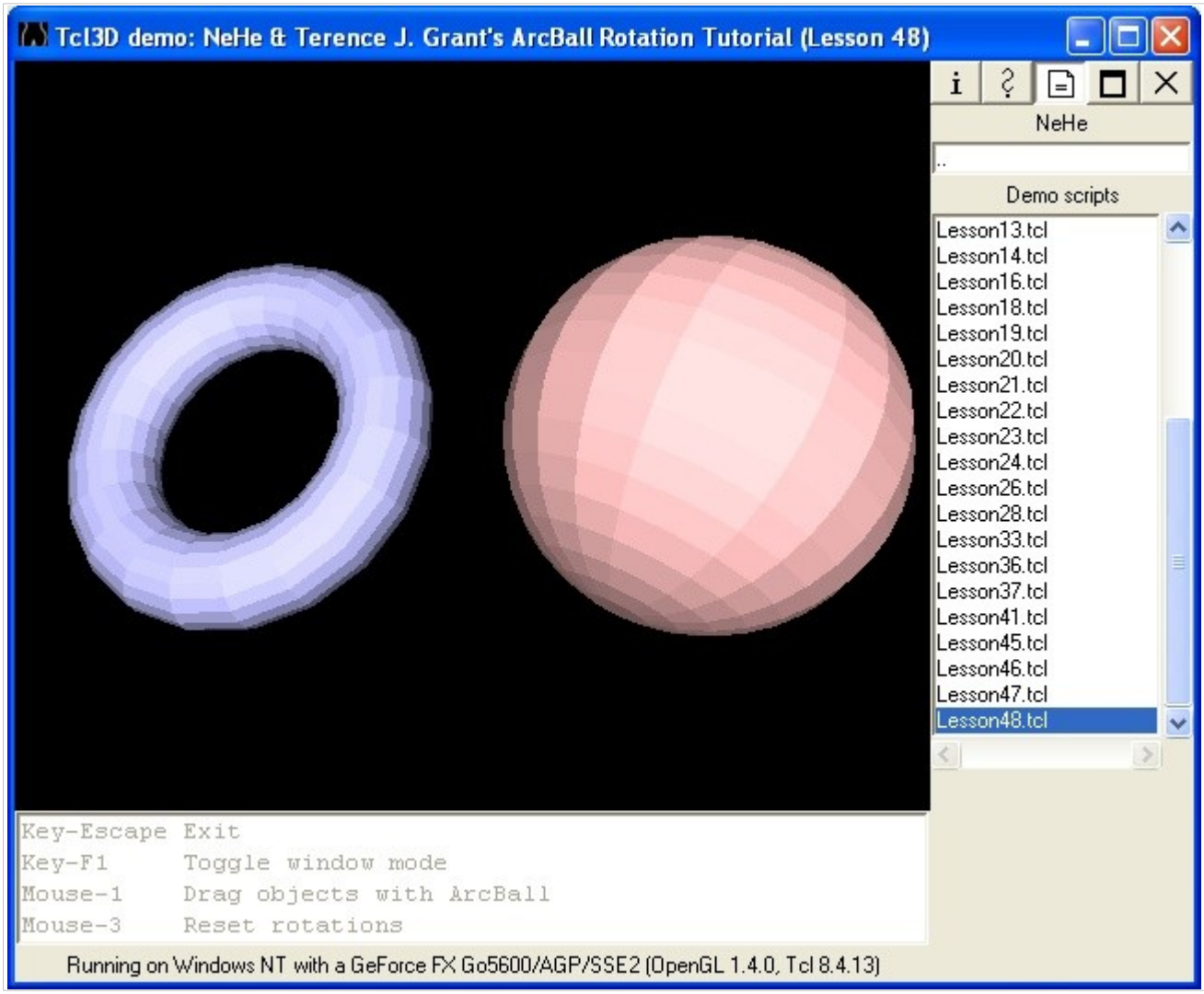
Modified for Tcl3D by Paul Obermeier 2006/09/05
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lesson48**
Type:	NeHe
Category:	TutorialsAndBooks
Root:	Contents




```
Lesson48.tcl

NeHe & Terence J. Grant's ArcBall Rotation Tutorial

Authors Name: Terence J. Grant

NeHe Productions 1997-2004
If You've Found This Code Useful, Please Let Me Know.
Visit My Site At nehe.gamedev.net

Modified for Tcl3D by Paul Obermeier 2006/08/31
See www.tcl3d.org for the Tcl3D extension.
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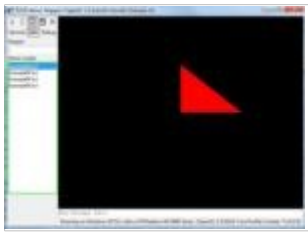
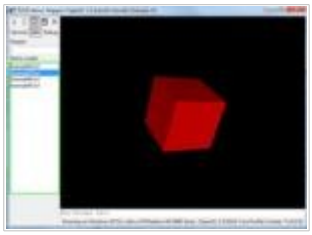
Type:	**Nopper**
Category:	TutorialsAndBooks
Root:	Contents

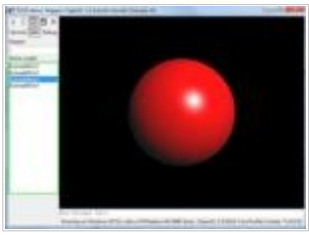
Available demos



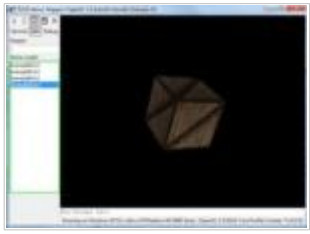
Example02



Example03

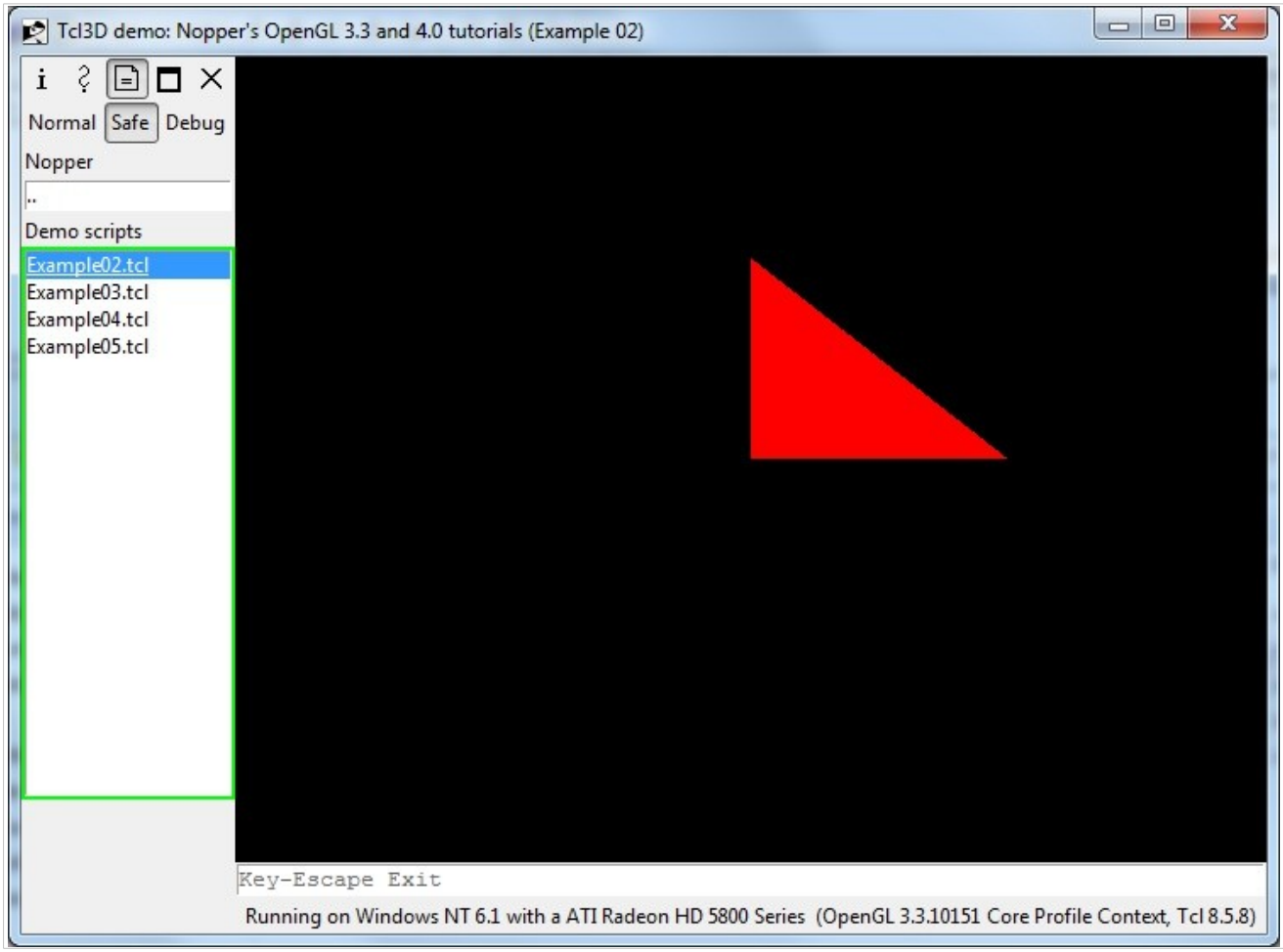


Example04



Example05

Demo:	**Example02**
Type:	Nopper
Category:	TutorialsAndBooks
Root:	Contents




```
OpenGL 3.3 with GLEW - Example 02

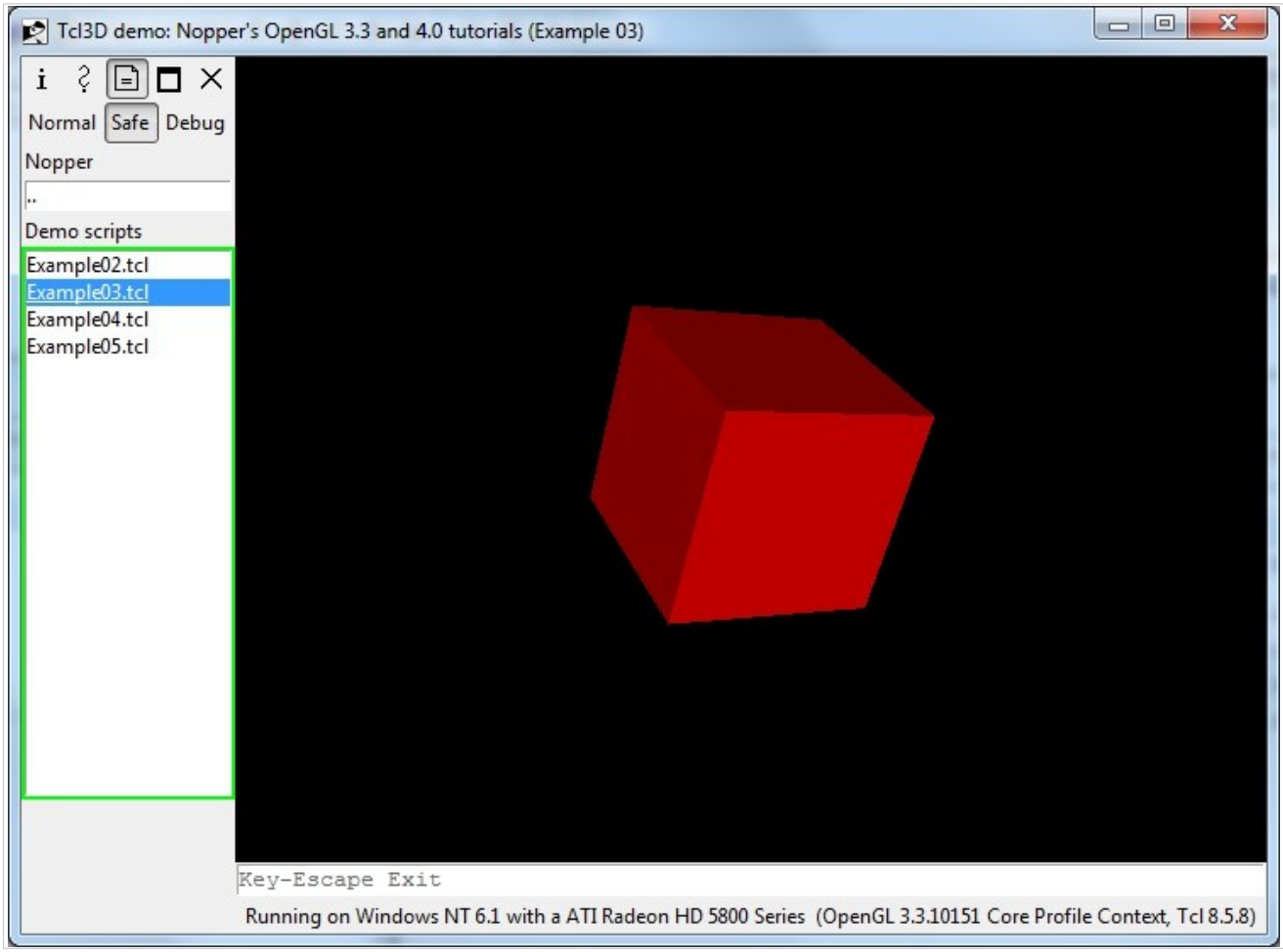
@author   Norbert Nopper norbert@nopper.tv
@version  1.0

Homepage: http://nopper.tv

Copyright Norbert Nopper

Modified for Tcl3D by Paul Obermeier 2010/09/01
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Example03**
Type:	Nopper
Category:	TutorialsAndBooks
Root:	Contents




```
OpenGL 3.3 with GLEW - Example 03

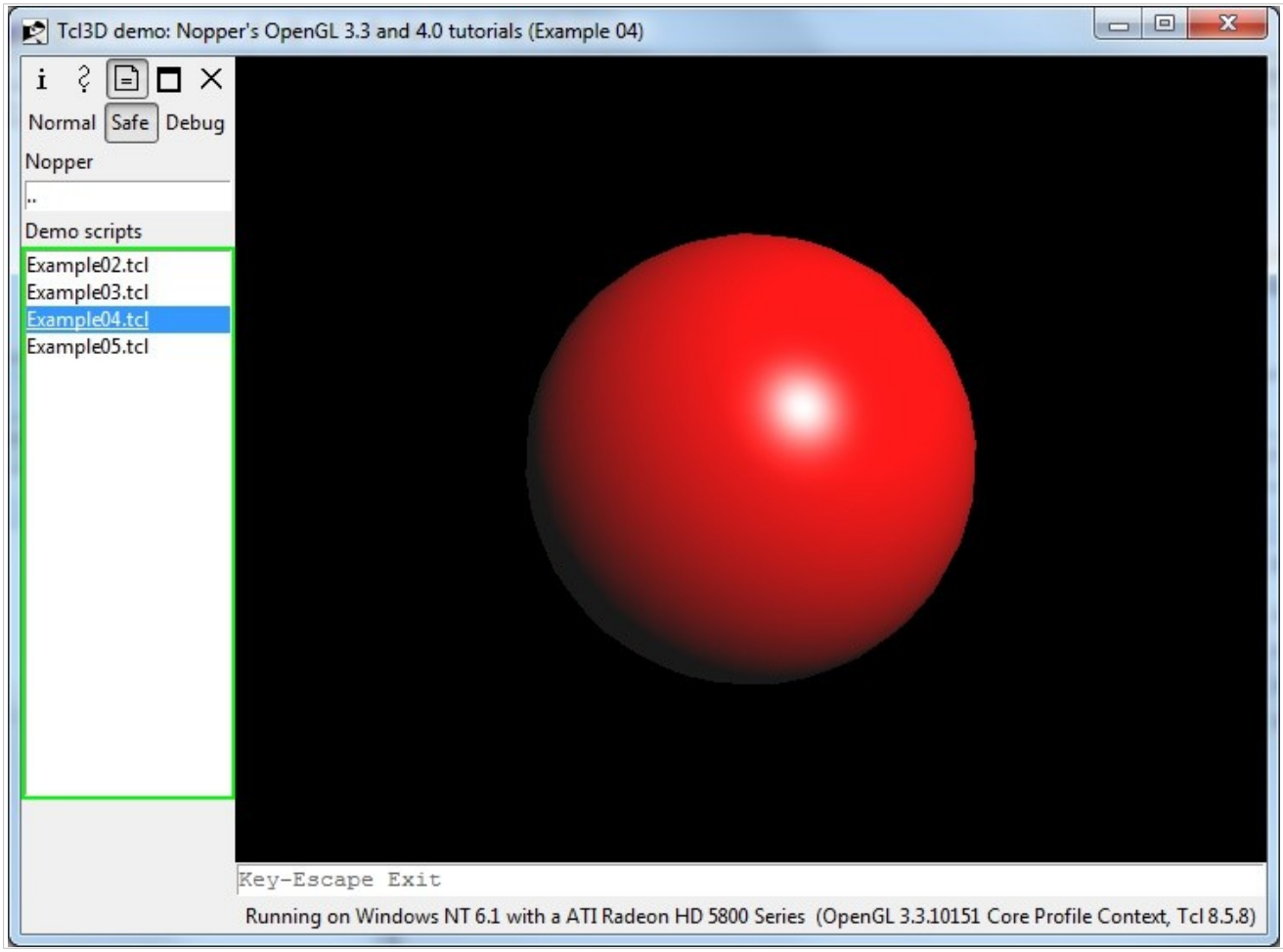
@author   Norbert Nopper norbert@nopper.tv
@version  1.0

Homepage: http://nopper.tv

Copyright Norbert Nopper

Modified for Tcl3D by Paul Obermeier 2010/09/01
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Example04**
Type:	Nopper
Category:	TutorialsAndBooks
Root:	Contents




```
OpenGL 3.3 with GLEW - Example 04

@author   Norbert Nopper norbert@nopper.tv
@version  1.0

Homepage: http://nopper.tv

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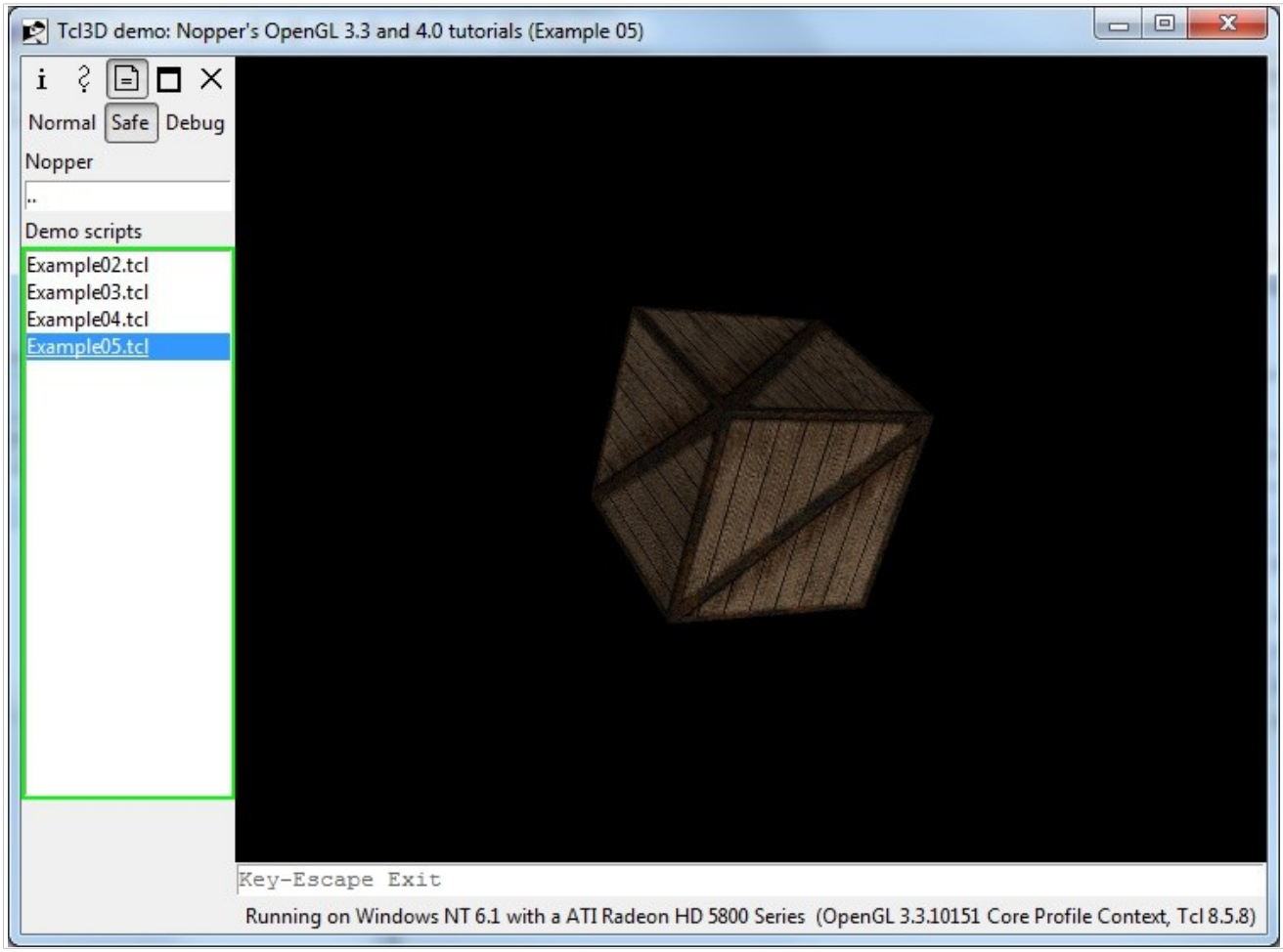
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Example05**
Type:	Nopper
Category:	TutorialsAndBooks
Root:	Contents




```
OpenGL 3.3 with GLEW - Example 05

@author   Norbert Nopper norbert@nopper.tv
@version  1.0

Homepage: http://nopper.tv

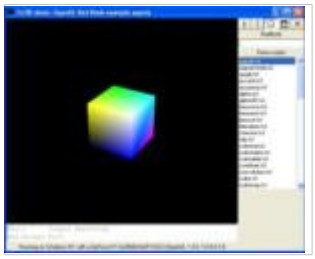
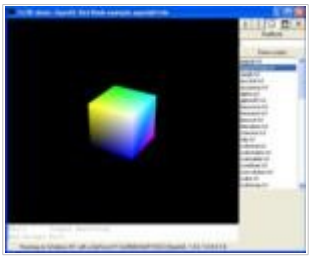
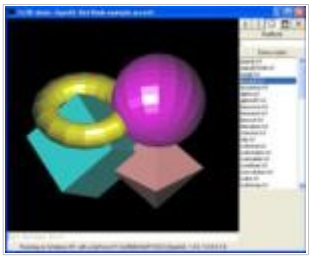
Copyright Norbert Nopper

Modified for Tcl3D by Paul Obermeier 2010/09/01
See www.tcl3d.org for the Tcl3D extension.
```

Type:	**RedBook**
Category:	TutorialsAndBooks
Root:	Contents

The Redbook describing OpenGL Version 1.4 contains 72 examples written in C. 67 of them have been successfully converted into equivalent Tcl3D scripts and the results compared on several operating systems and computers against the C version.
Three of the missing five examples (surfpoints, tess, tesswin) deal with tesselation, which is currently not supported. The other two test programs (aaindex, fogindex) not yet ported deal with color index mode, which is not yet implemented in the tcl3dTogl widget.
Original sources available at: http://www.opengl-redbook.com/source/

Available demos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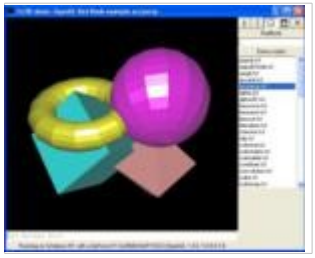	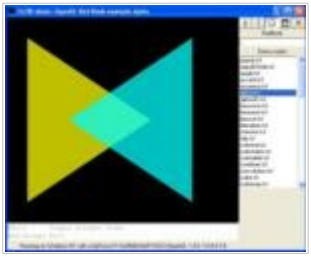	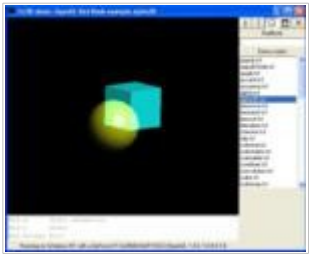	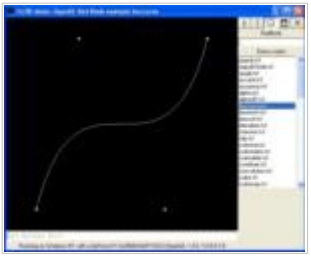
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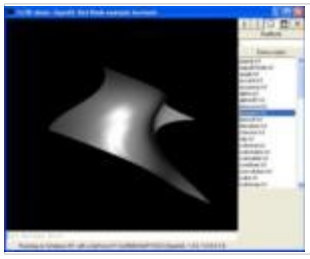	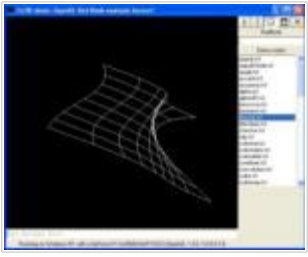		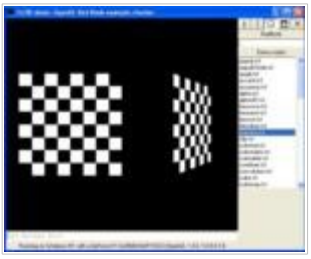
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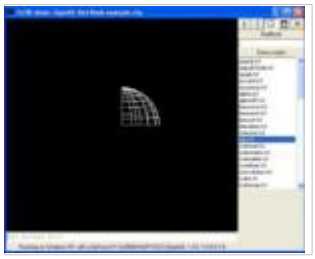	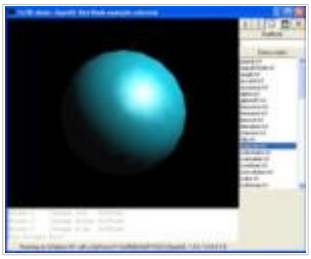		
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			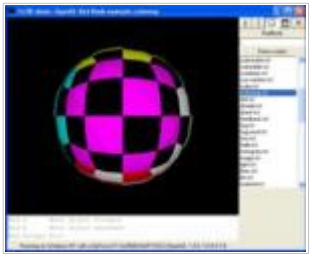

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	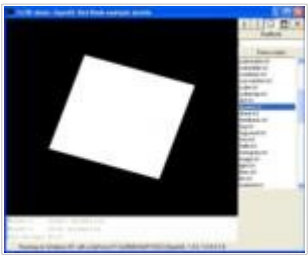	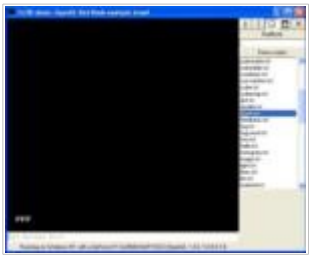	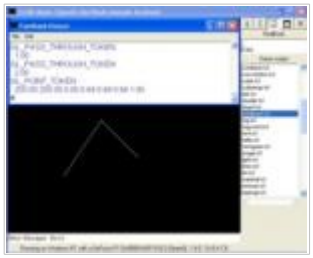
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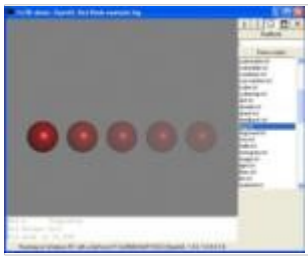	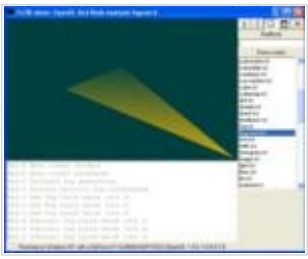	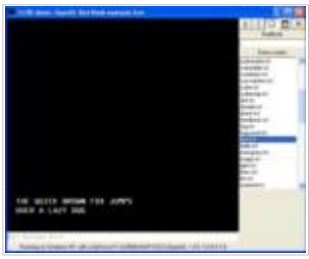	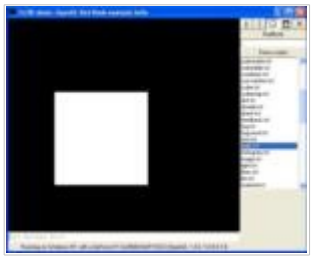
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		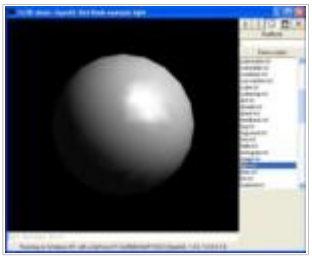	
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	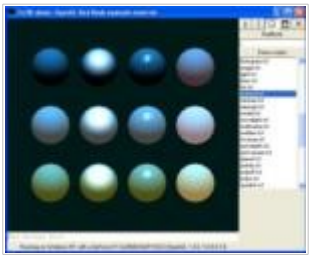		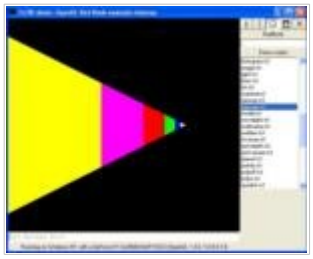
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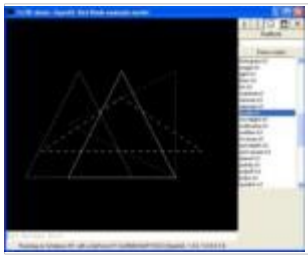	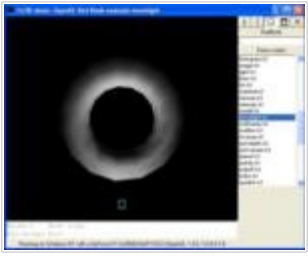		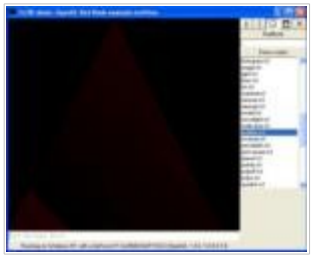
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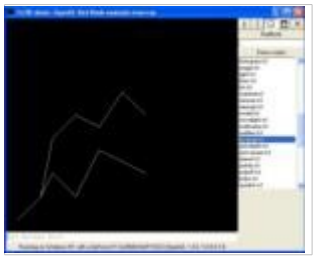	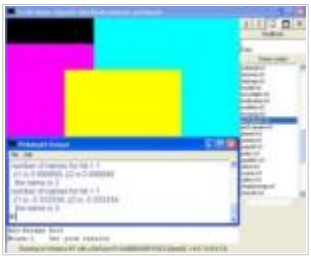	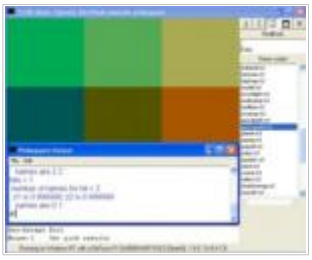	
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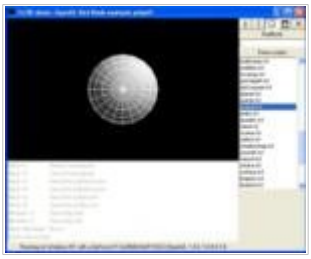
pointp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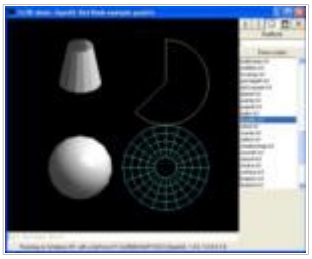
polys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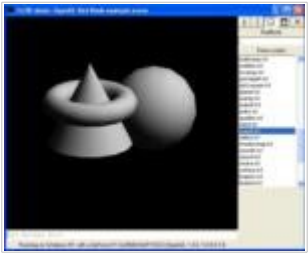
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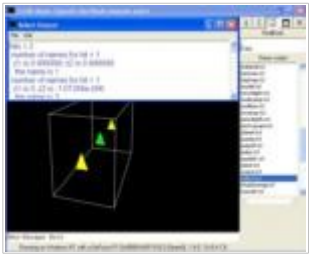
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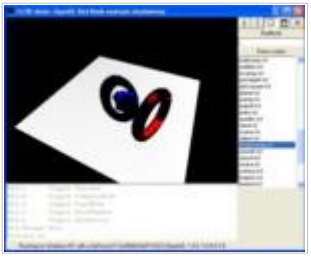
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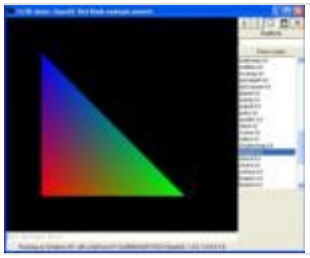
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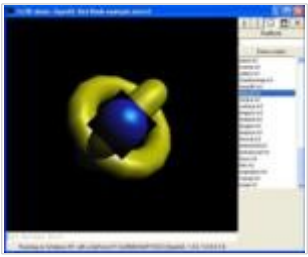
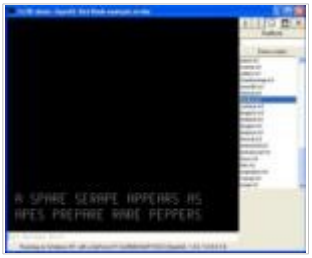
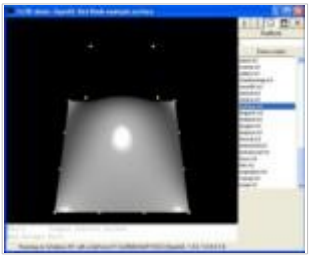

stencil



stroke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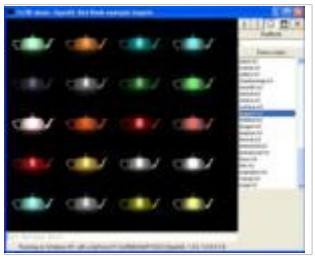
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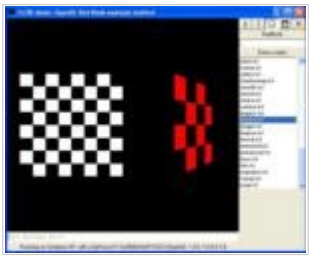
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texgen


texprox


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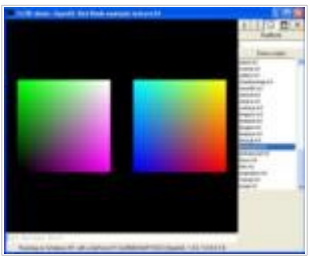
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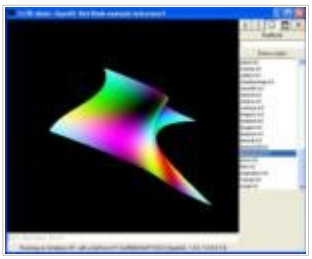
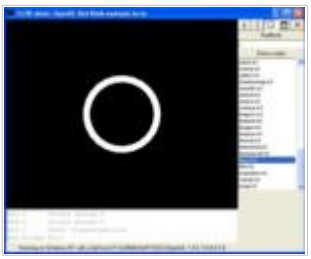
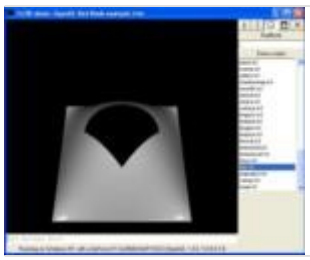
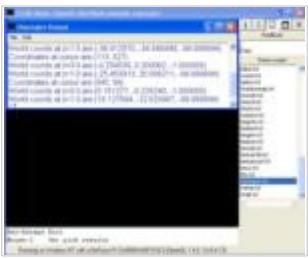
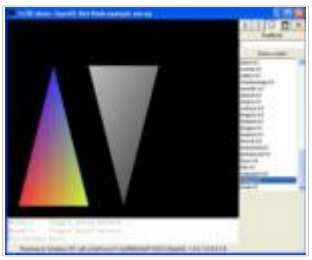

texturesurf


torus

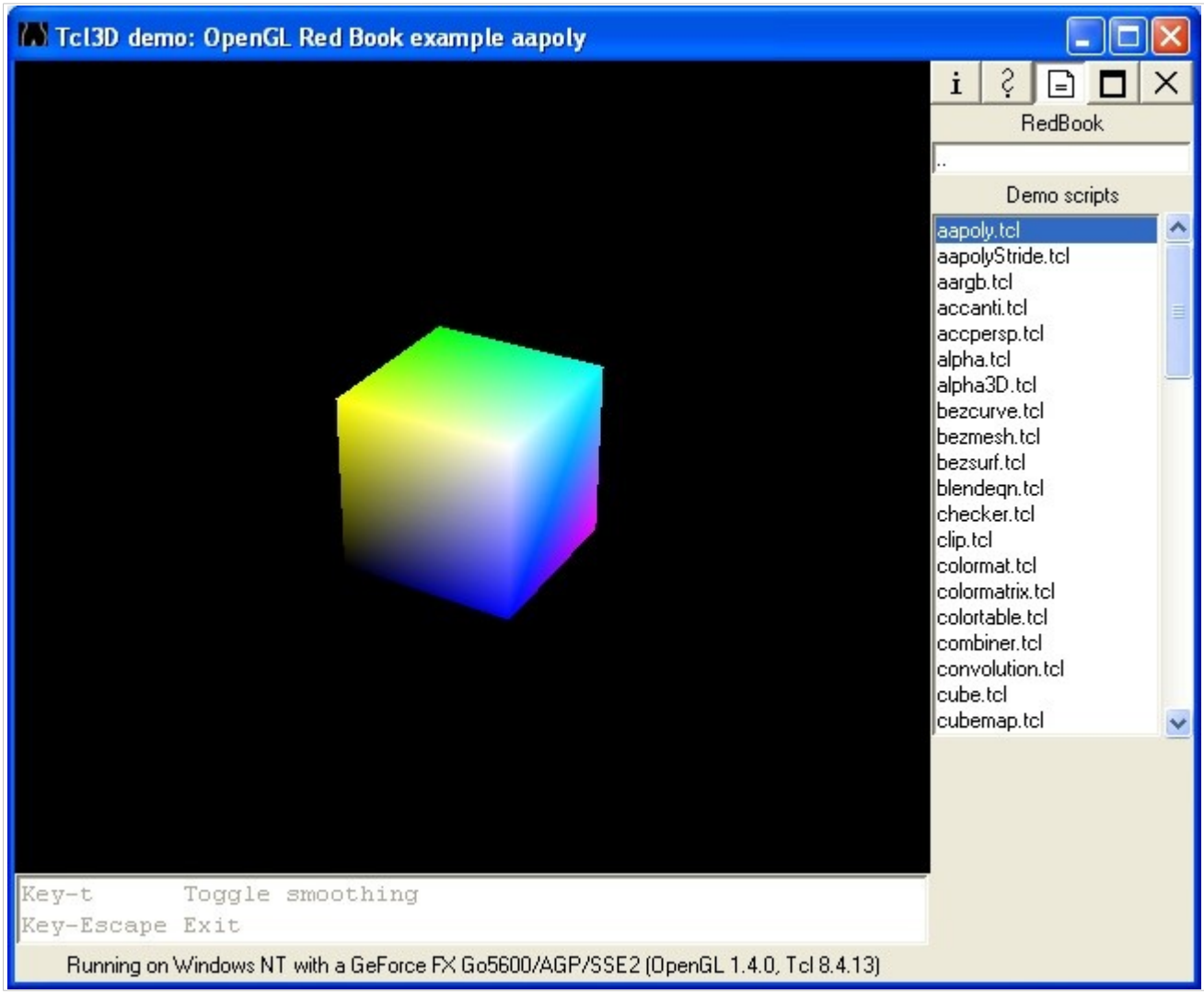

trim


unproject


varray


wrap

Demo:	**aapoly**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
aapoly.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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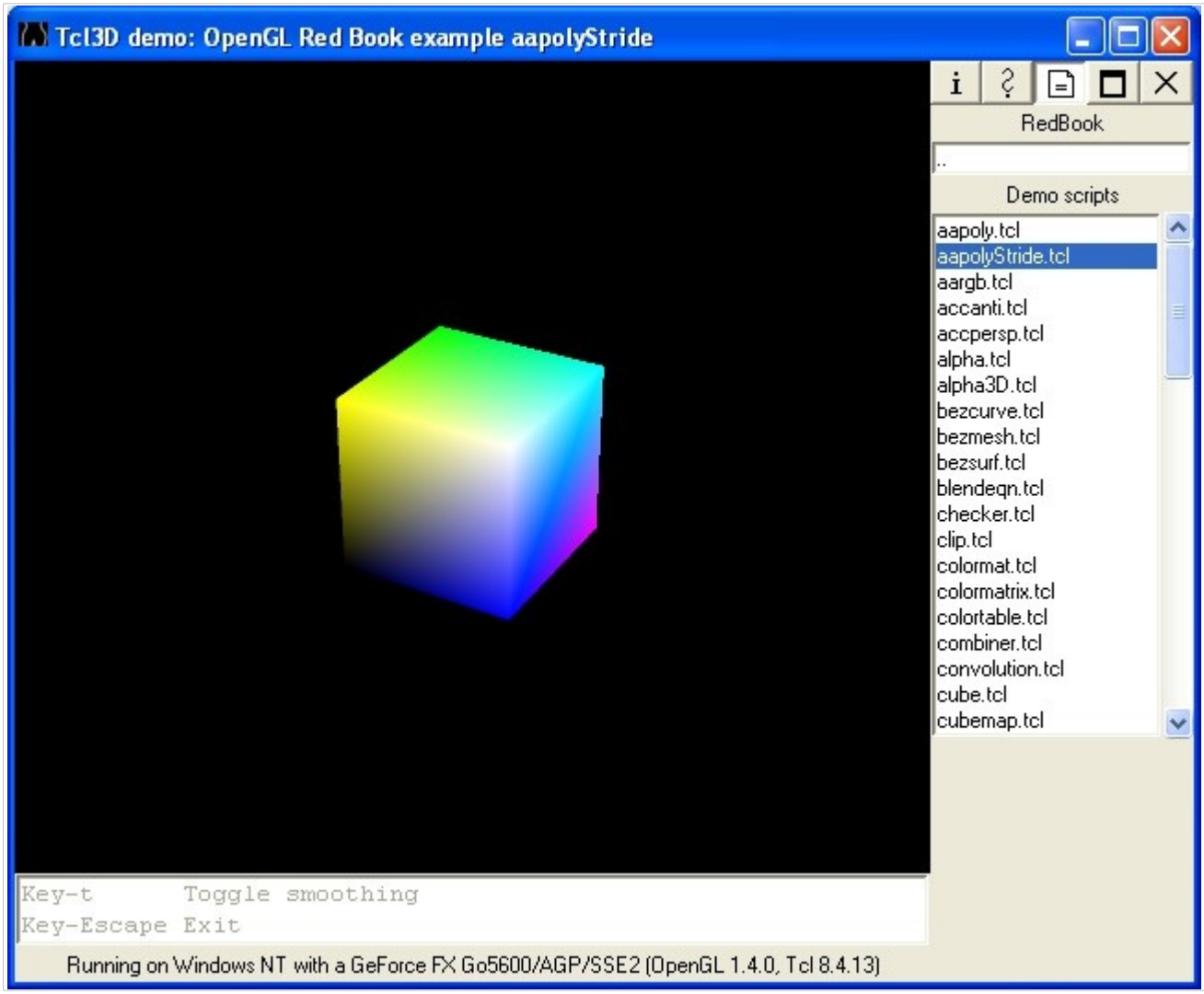
This program draws filled polygons with antialiased
edges.  The special GL_SRC_ALPHA_SATURATE blending
function is used.
Pressing the 't' key turns the antialiasing on and off.
```

Demo:	**aapolyStride**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
aapoly.tcl

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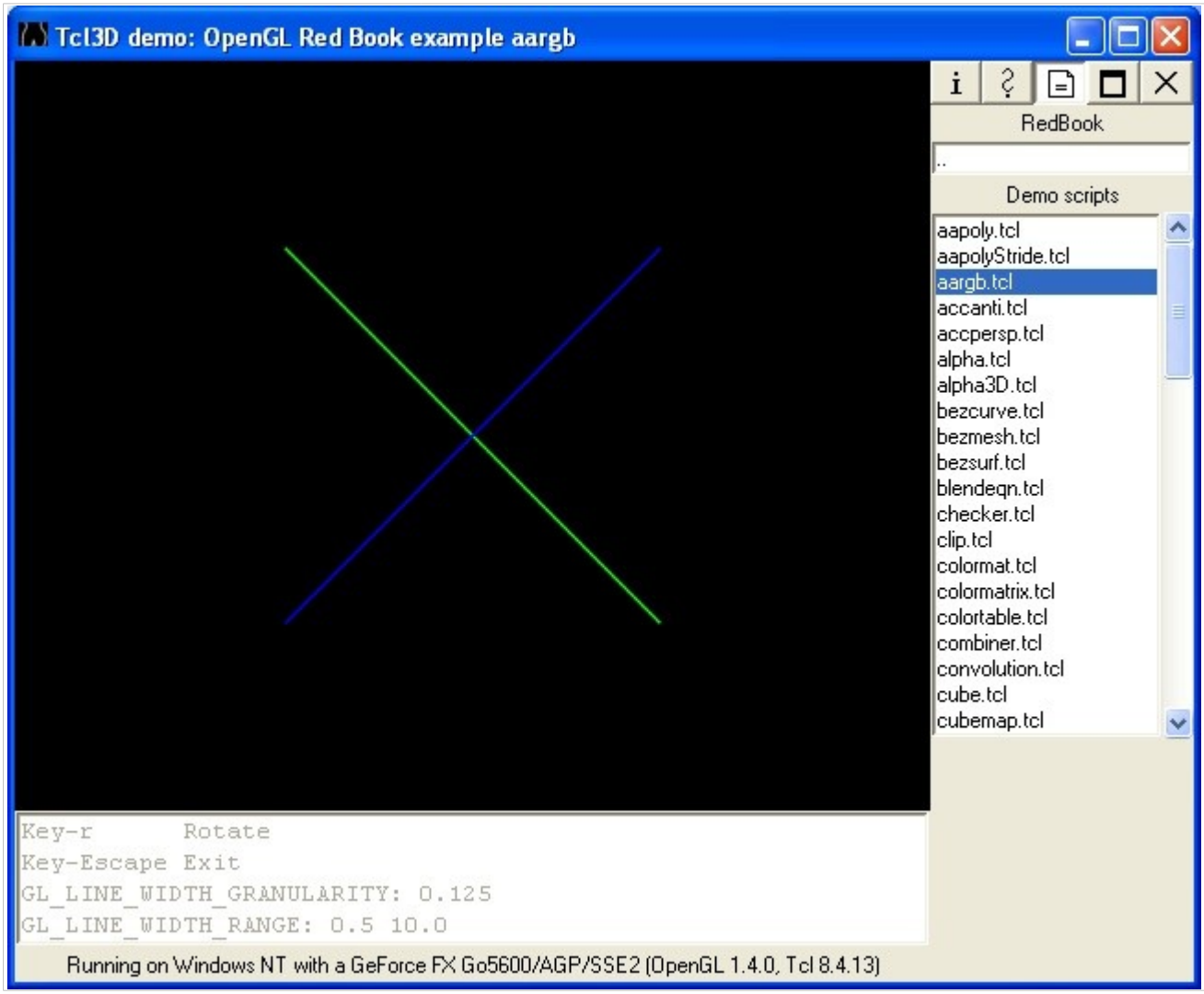
This program draws filled polygons with antialiased
edges.  The special GL_SRC_ALPHA_SATURATE blending
function is used.
Pressing the 't' key turns the antialiasing on and off.
```

Demo:	**aargb**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
aargb.tcl

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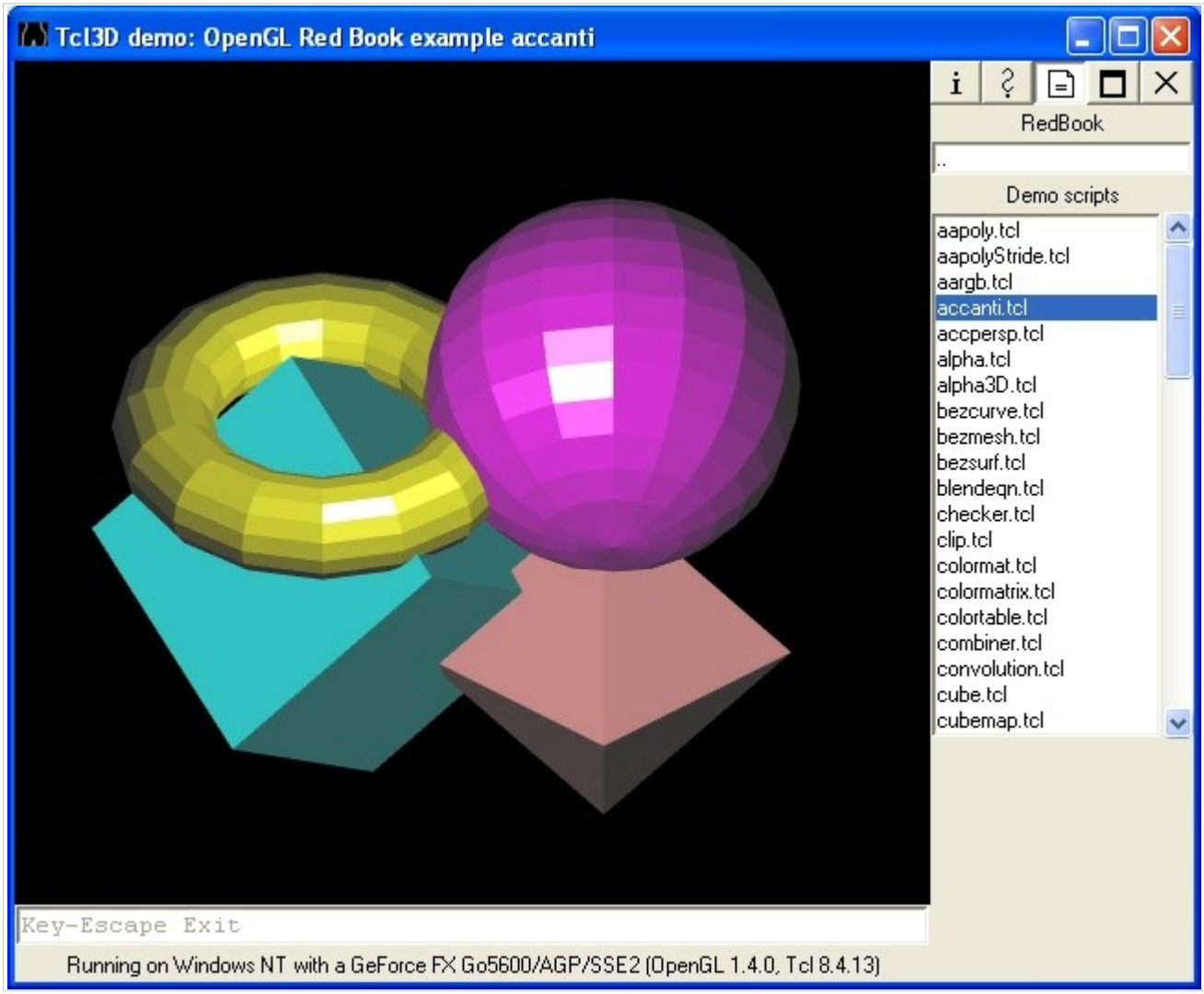
This program draws shows how to draw anti-aliased lines. It draws
two diagonal lines to form an X; when 'r' is typed in the window,
the lines are rotated in opposite directions.
```

Demo:	**accanti**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
accanti.tcl

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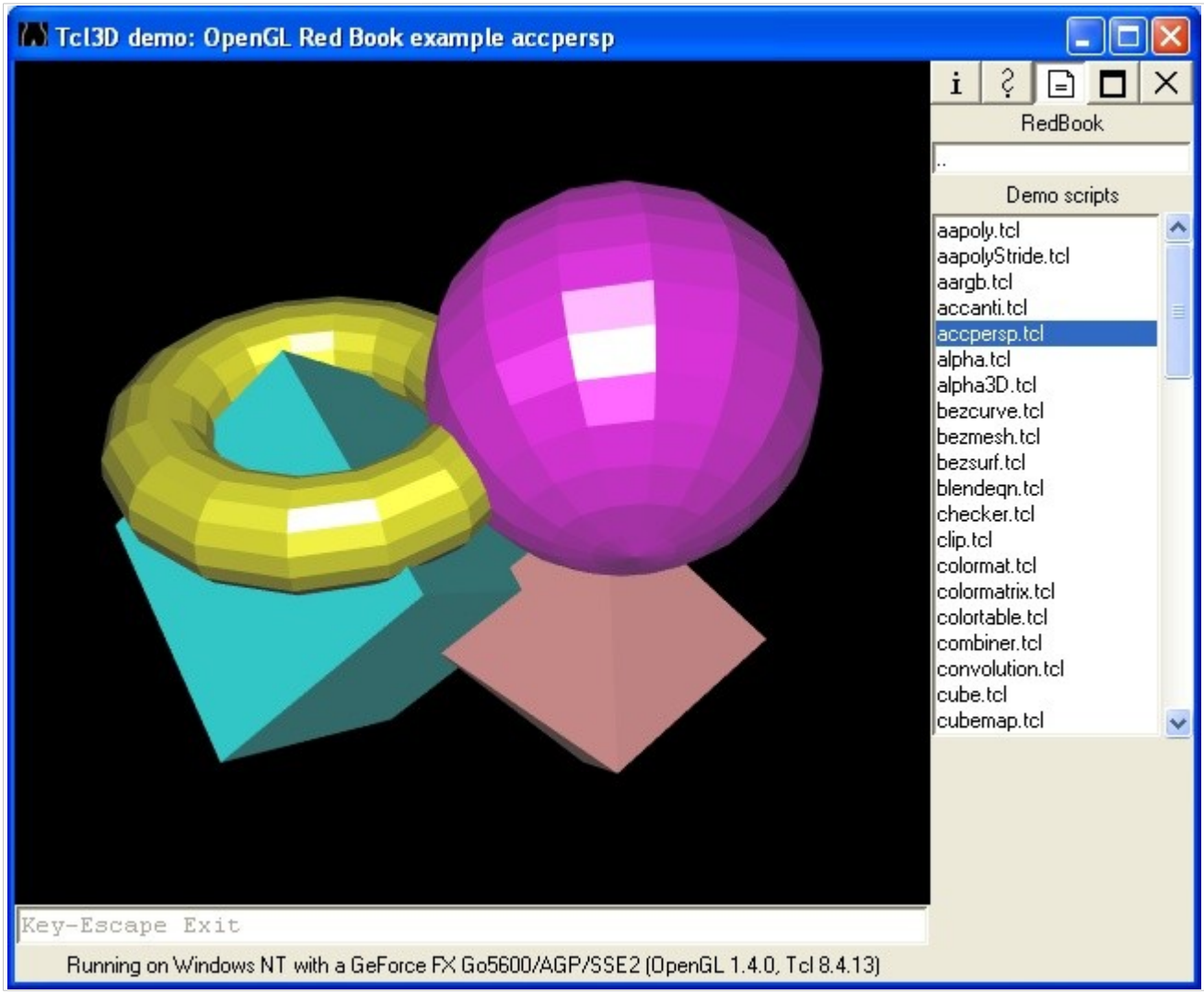
Use the accumulation buffer to do full-scene antialiasing
on a scene with orthographic parallel projection.
```

Demo:	**accpersp**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
accpersp.tcl

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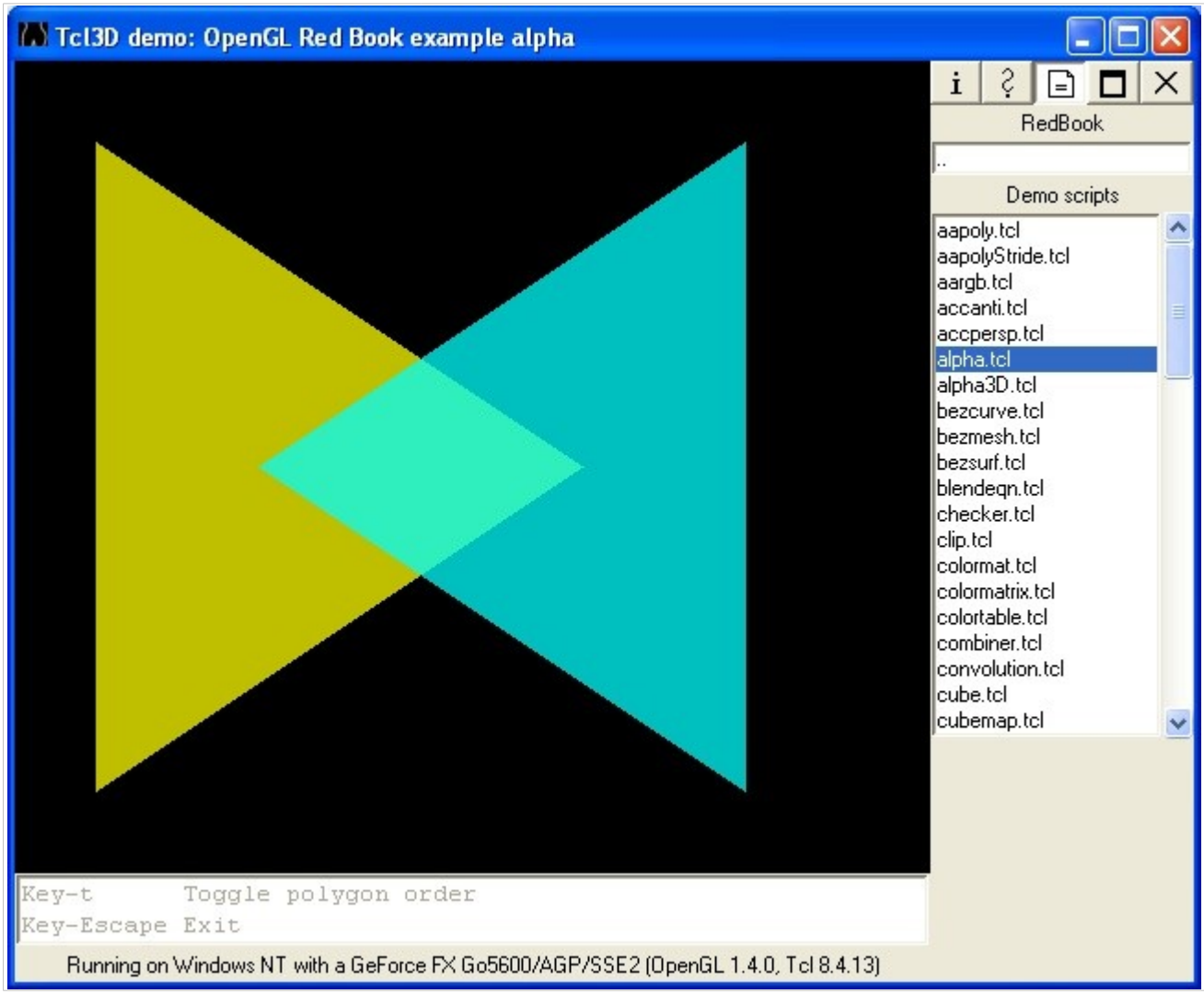
Use the accumulation buffer to do full-scene antialiasing
on a scene with perspective projection, using the special
routines accFrustum() and accPerspective().
```

Demo:	**alpha**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
alpha.tcl

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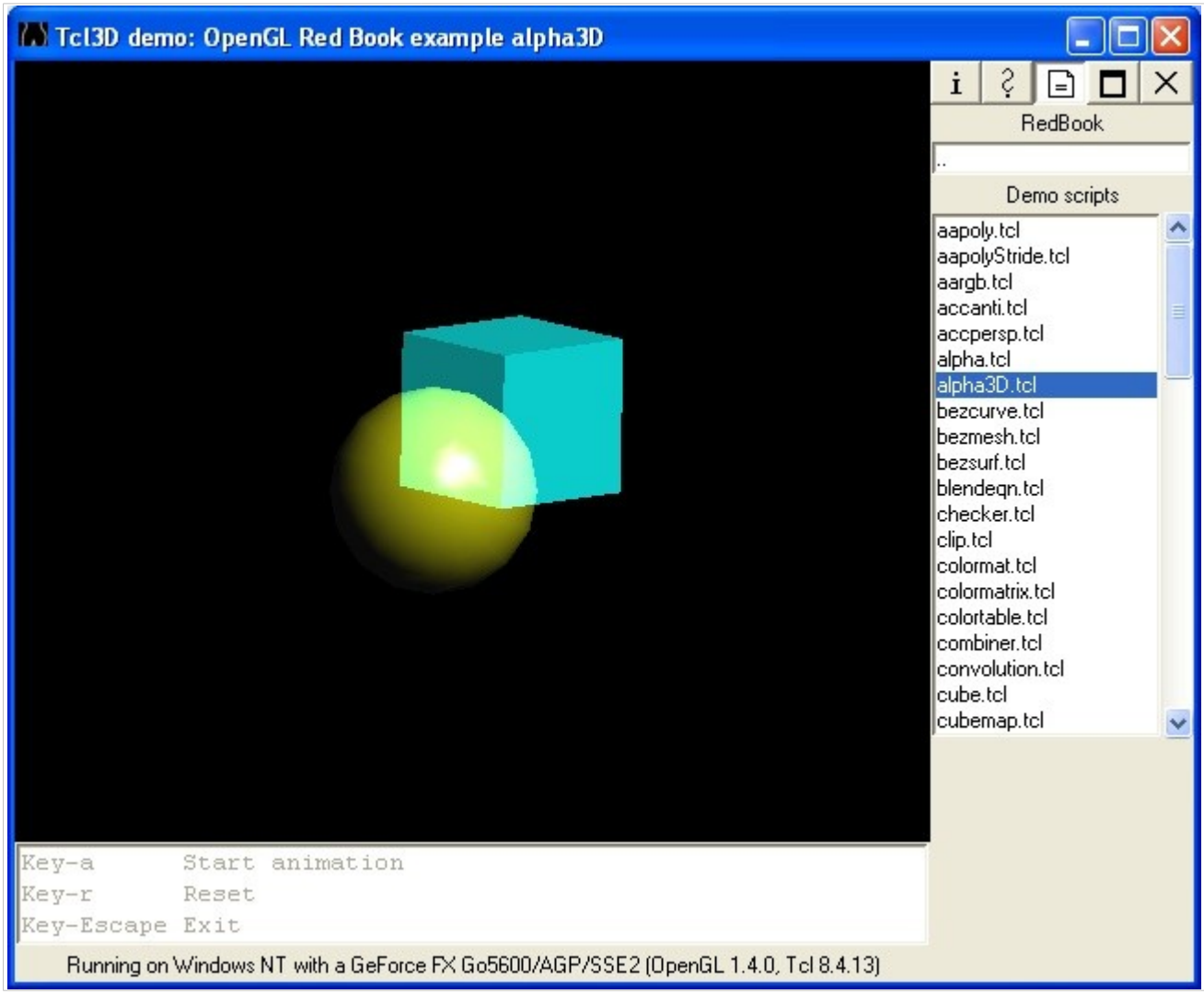
This program draws several overlapping filled polygons
to demonstrate the effect order has on alpha blending results.
Use the 't' key to toggle the order of drawing polygons.
```

Demo:	**alpha3D**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
alpha3D.tcl

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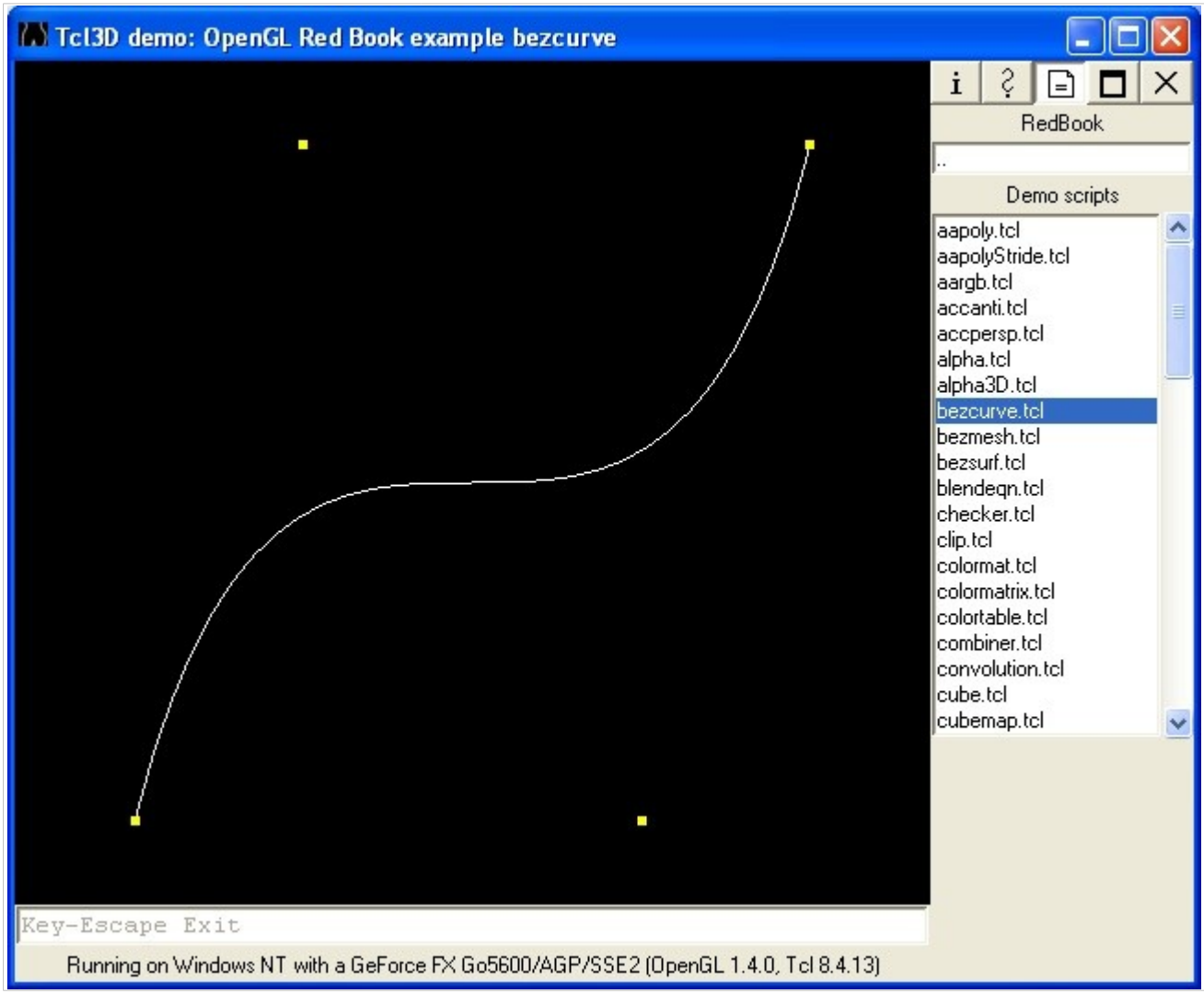
This program demonstrates how to intermix opaque and
alpha blended polygons in the same scene, by using
glDepthMask.  Press the 'a' key to animate moving the
transparent object through the opaque object.  Press
the 'r' key to reset the scene.
```

Demo:	**bezcurve**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
bezcurve.tcl

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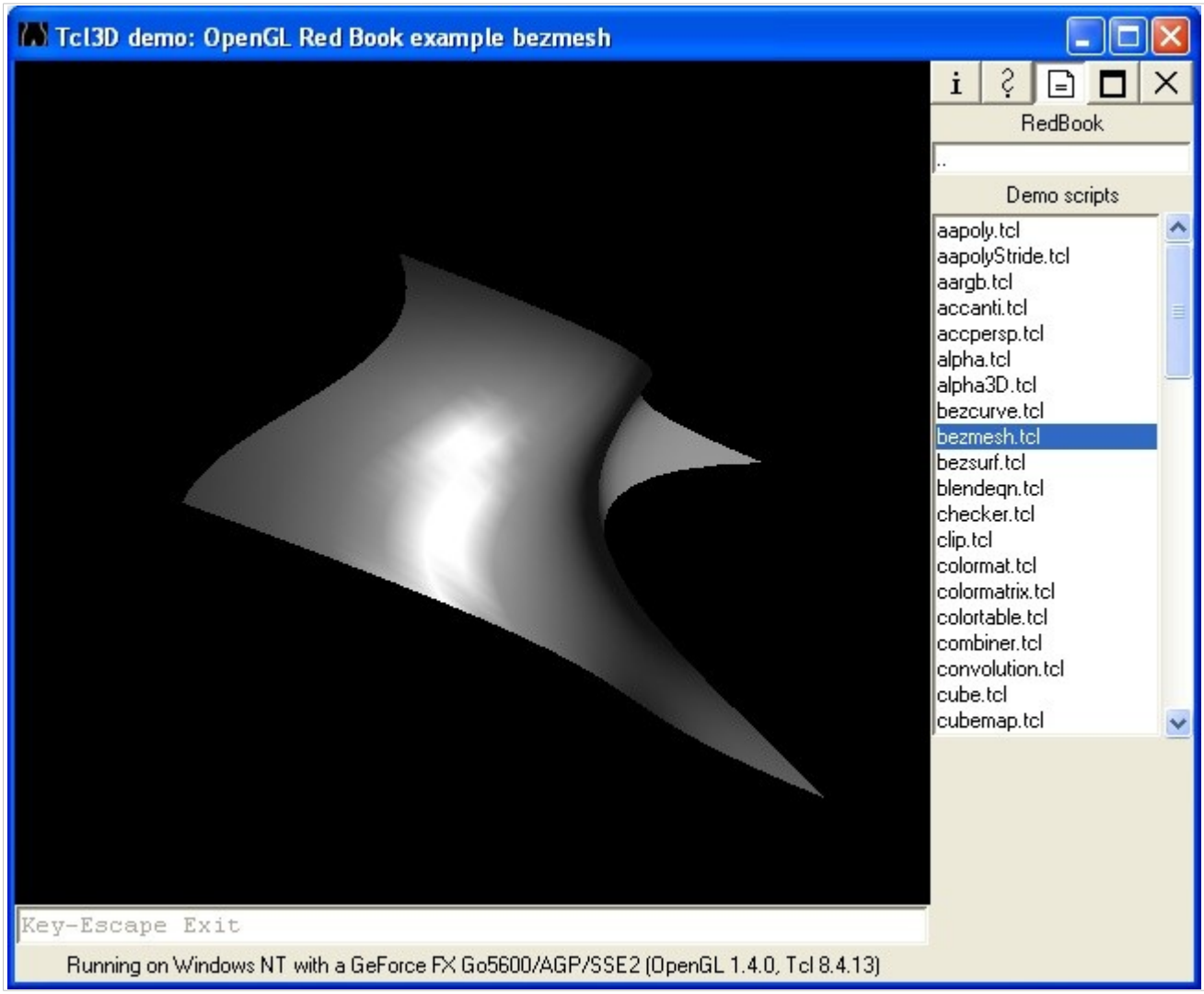
This program uses evaluators to draw a Bezier curve.
```

Demo:	**bezmesh**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
bezmesh.tcl

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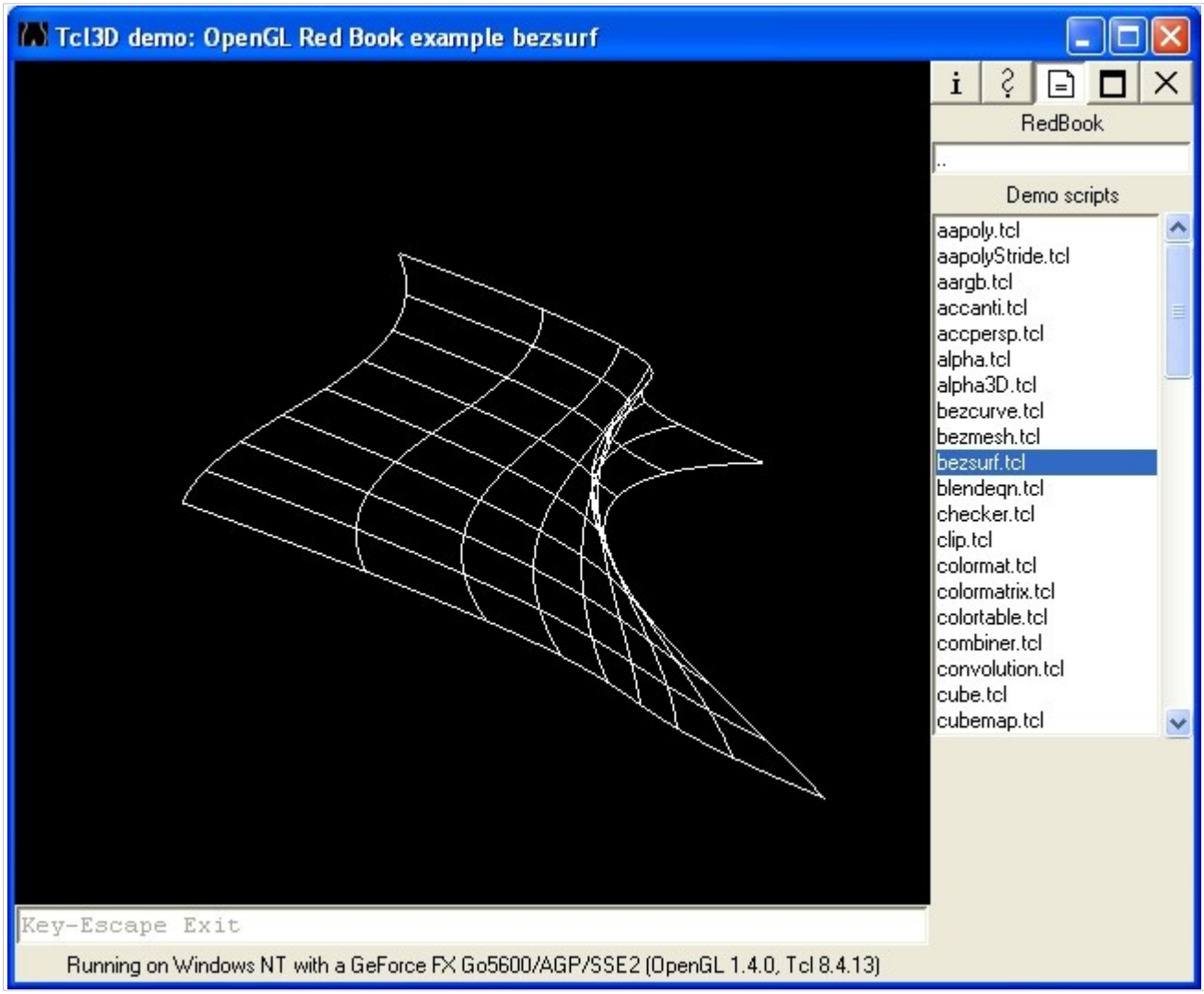
This program renders a lighted, filled Bezier surface,
using two-dimensional evaluators.
```

Demo:	**bezsurf**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
bezsurf.tcl

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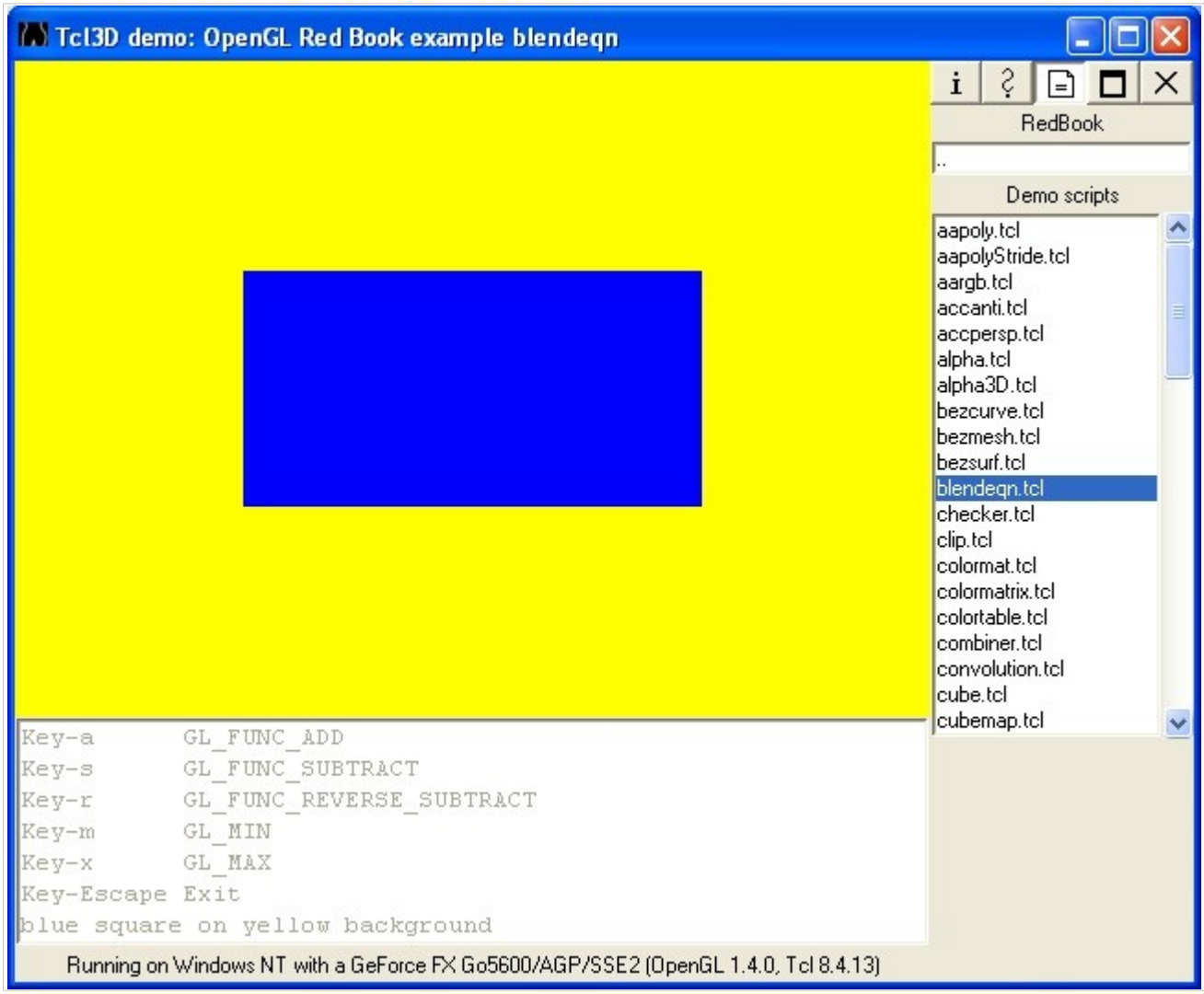
This program renders a wireframe Bezier surface,
using two-dimensional evaluators.
```

Demo:	**blendeqn**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
blendeqn.tcl

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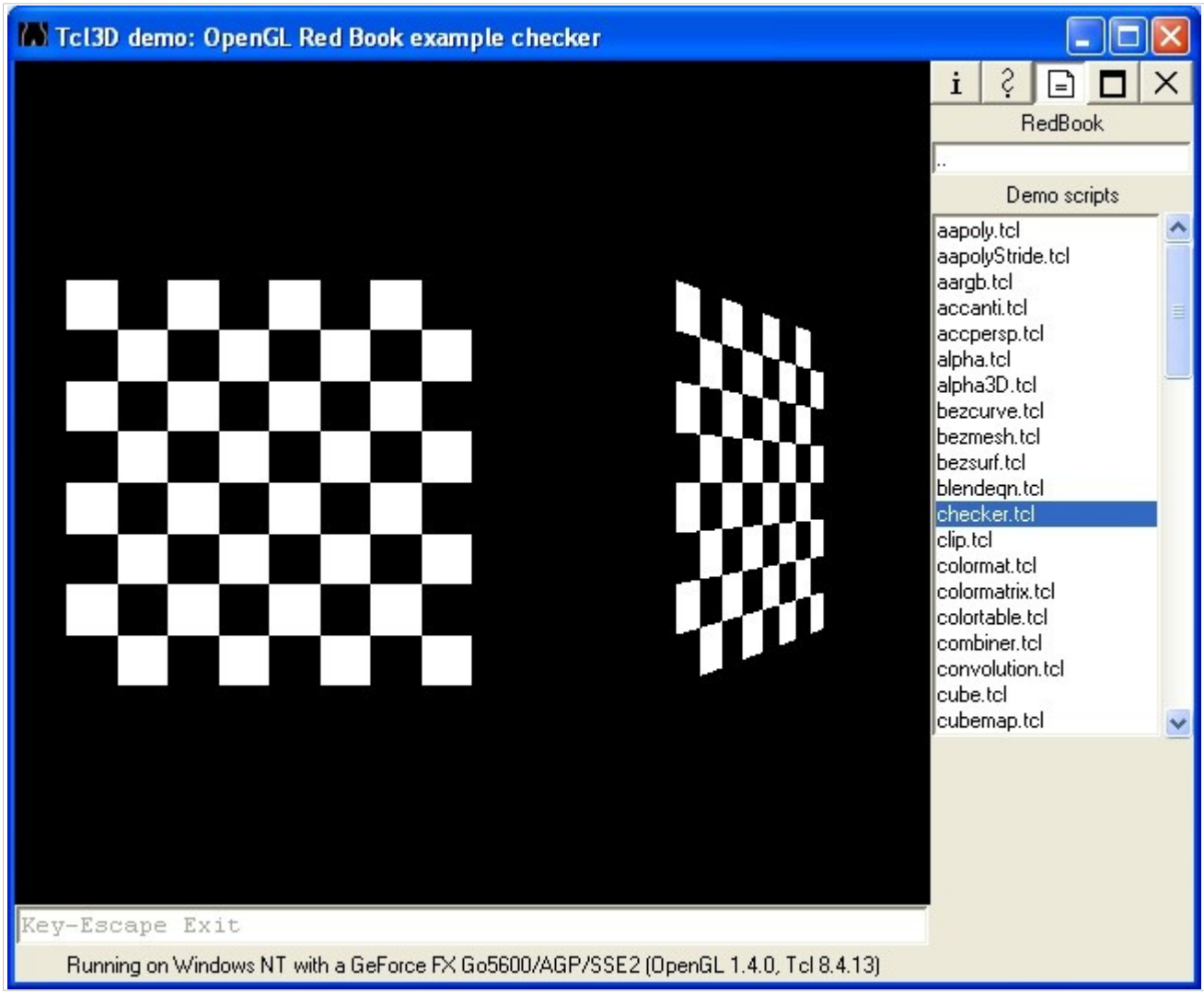
Demonstrate the different blending functions available with the
OpenGL imaging subset.  This program demonstrates use of the
glBlendEquation call.

The following keys change the selected blend equation function:

     'a'  ->  GL_FUNC_ADD
     's'  ->  GL_FUNC_SUBTRACT
     'r'  ->  GL_FUNC_REVERSE_SUBTRACT
     'm'  ->  GL_MIN
     'x'  ->  GL_MAX
```

Demo:	**checker**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
checker.tcl

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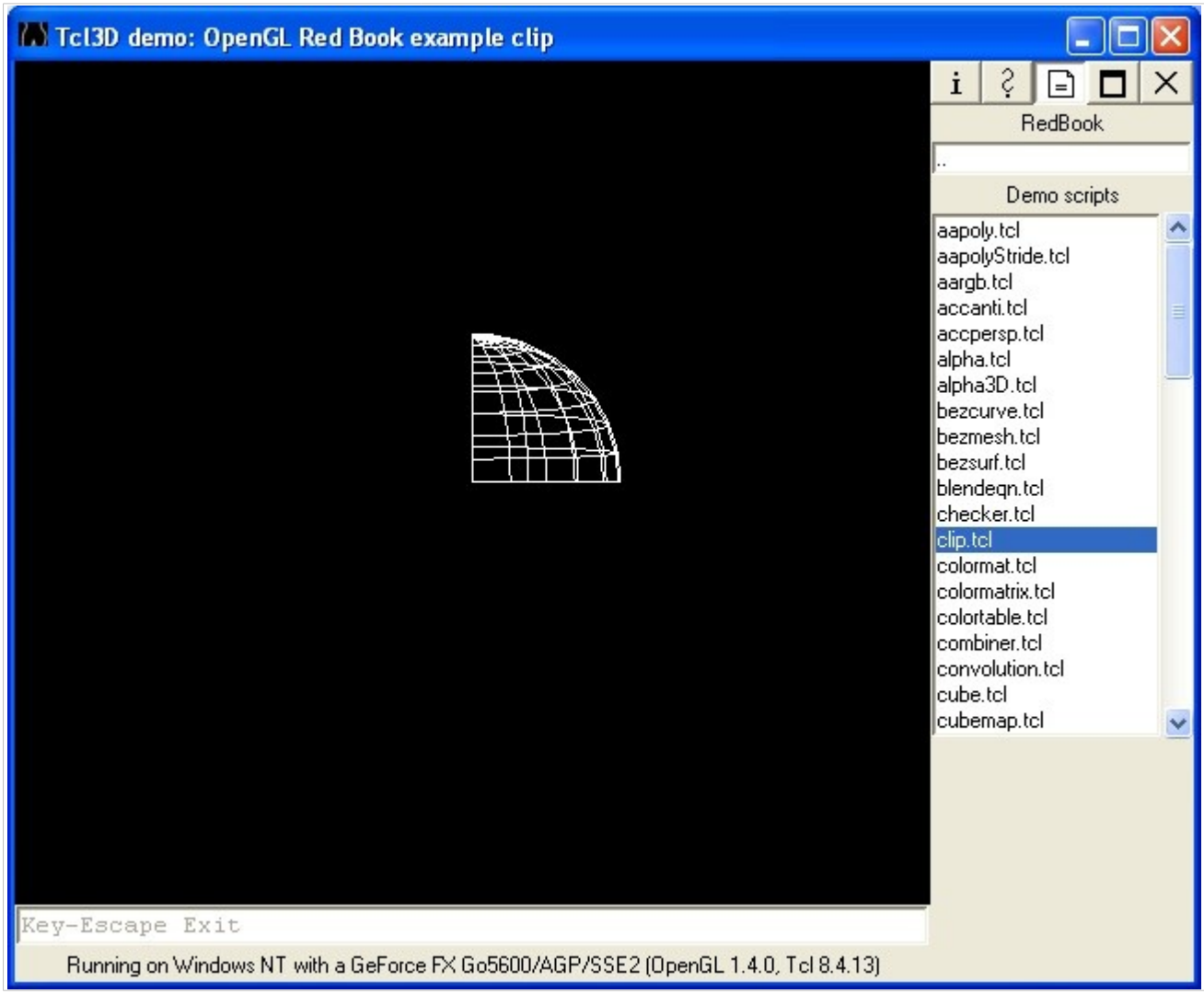
This program texture maps a checkerboard image onto
two rectangles.

If running this program on OpenGL 1.0, texture objects are
not used.
```

Demo:	**clip**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
clip.tcl

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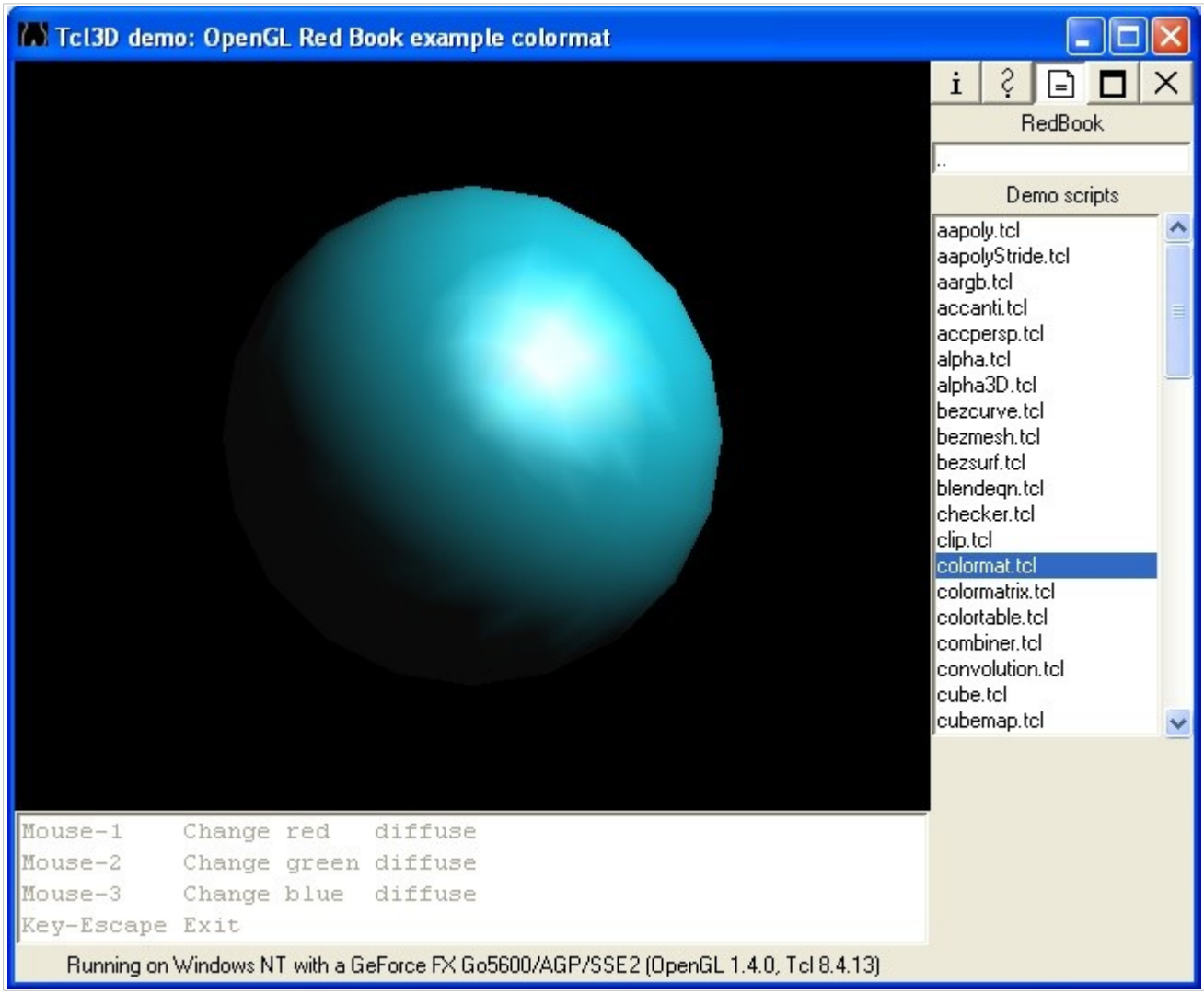
This program demonstrates arbitrary clipping planes.
```

Demo:	**colormat**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
colormat.tcl

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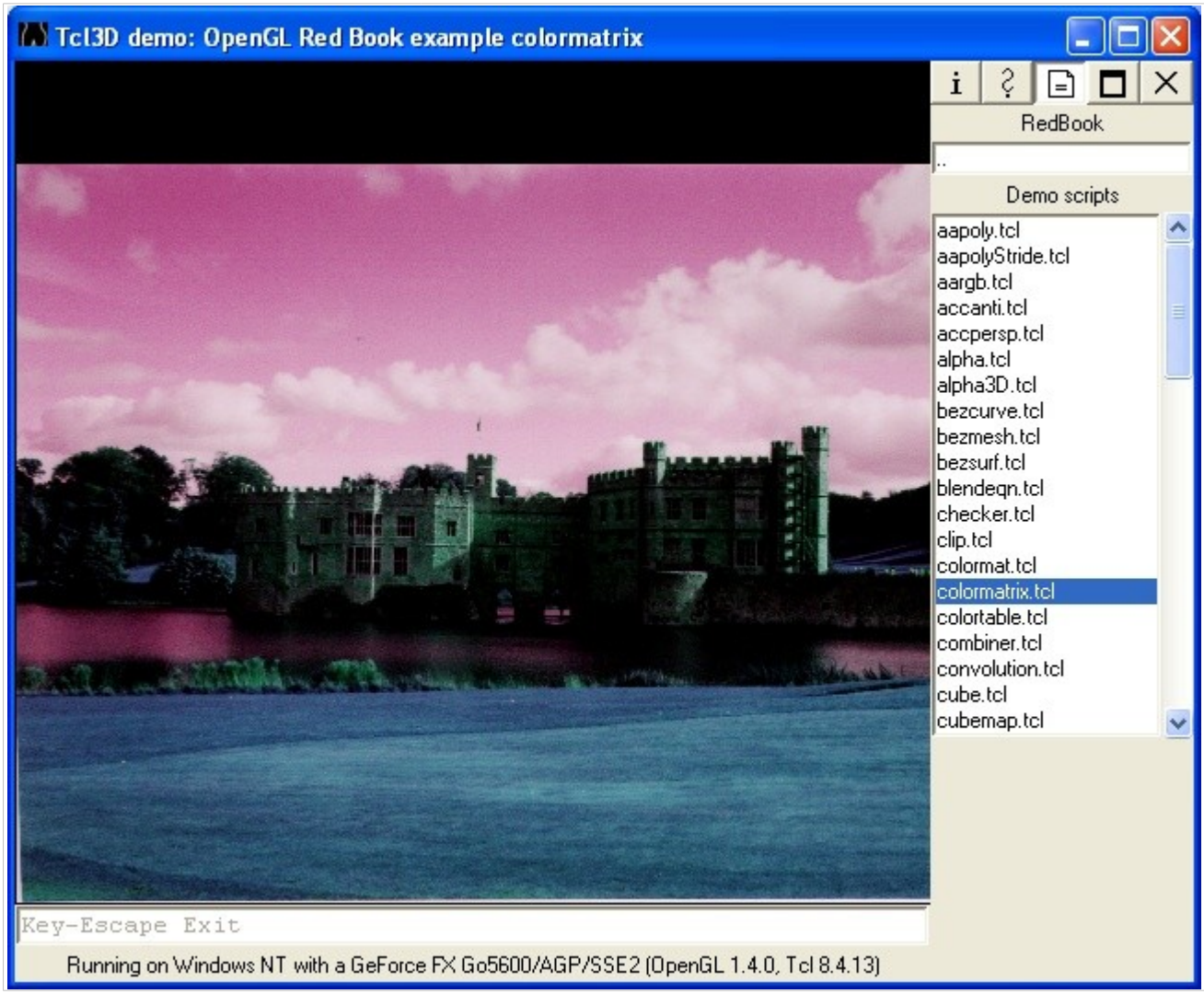
After initialization, the program will be in
ColorMaterial mode. Interaction:  pressing the
mouse buttons will change the diffuse reflection values.
```

Demo:	**colormatrix**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
colormatix.tcl

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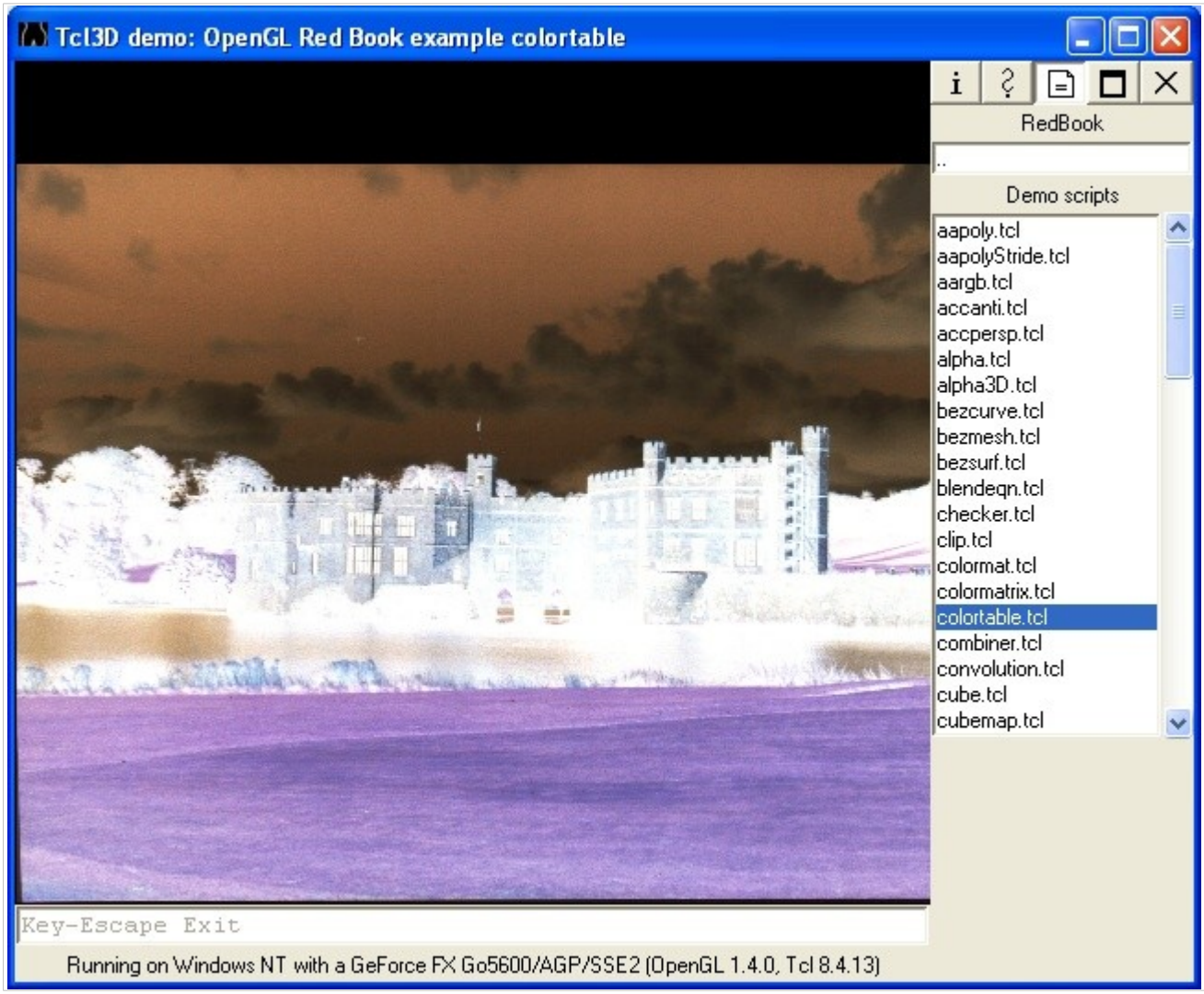
This program uses the color matrix to exchange the color channels of
an image.

Red   -> Green
Green -> Blue
Blue  -> Red
```

Demo:	**colortable**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
colortable.tcl

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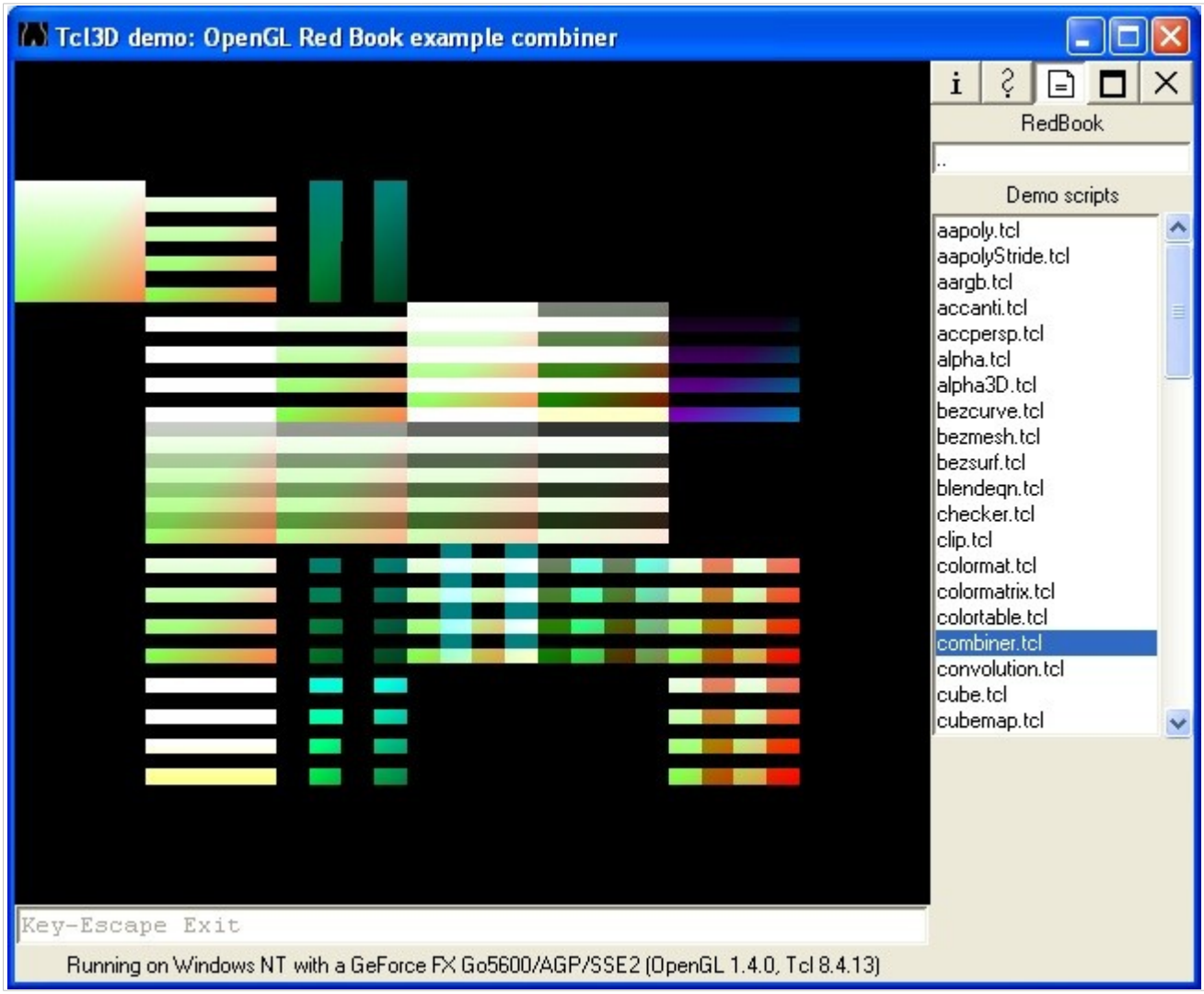
Invert a passed block of pixels.  This program illustrates the
use of the glColorTable() function.
```

Demo:	**combiner**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
combiner.tcl

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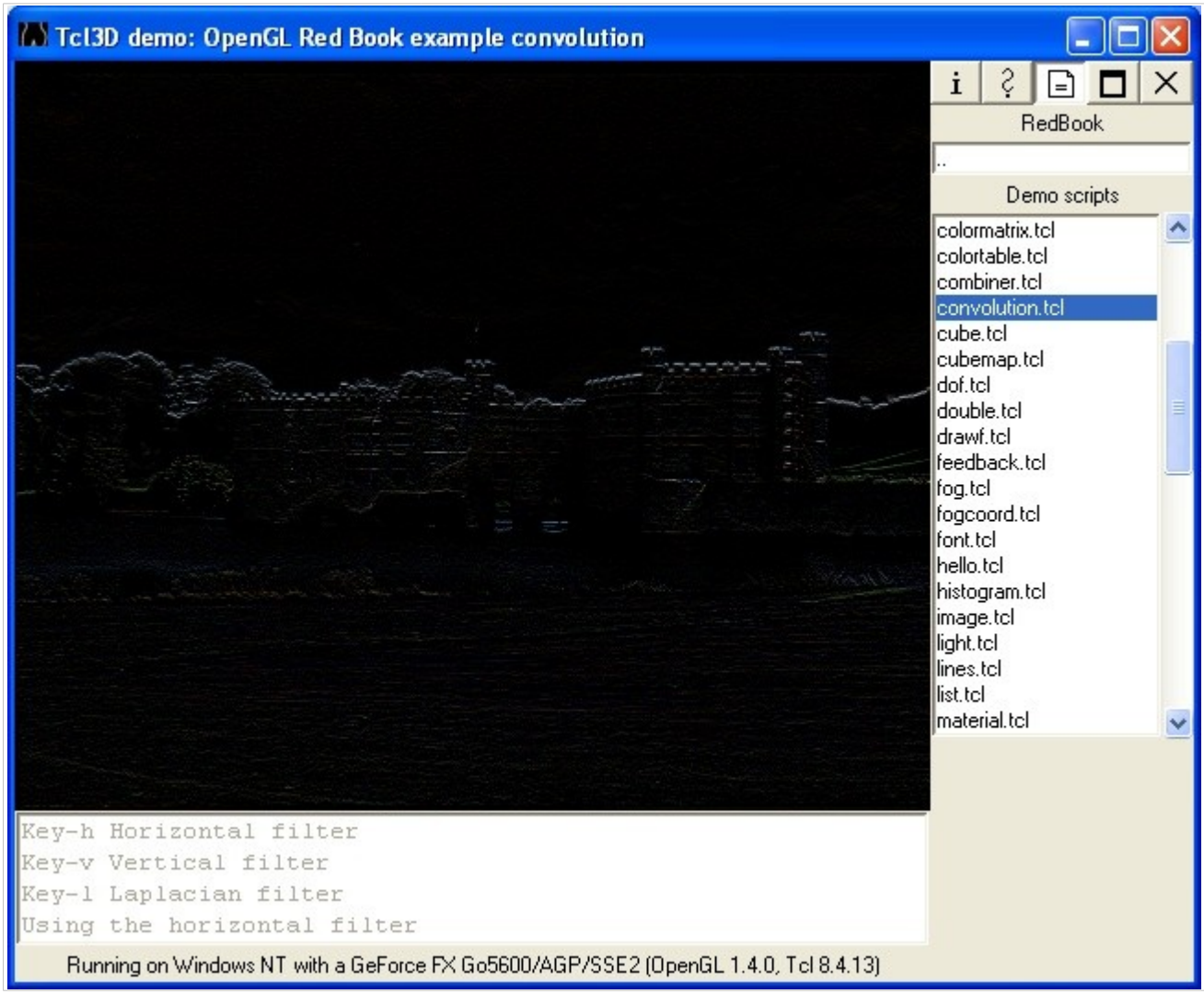
This program renders a variety of quads showing different
effects of texture combiner functions.

The first row renders an untextured polygon (so you can
compare the fragment colors) and then the 2 textures.
The second row shows several different combiner functions
on a single texture:  replace, modulate, add, add-signed,
and subtract.
The third row shows the interpolate combiner function
on a single texture with a constant color/alpha value,
varying the amount of interpolation.
The fourth row uses multitexturing with two textures
and different combiner functions.
The fifth row are some combiner experiments:  using the
scaling factor and reversing the order of subtraction
```

```
for a combination function.
```

Demo:	**convolution**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
convolution.tcl

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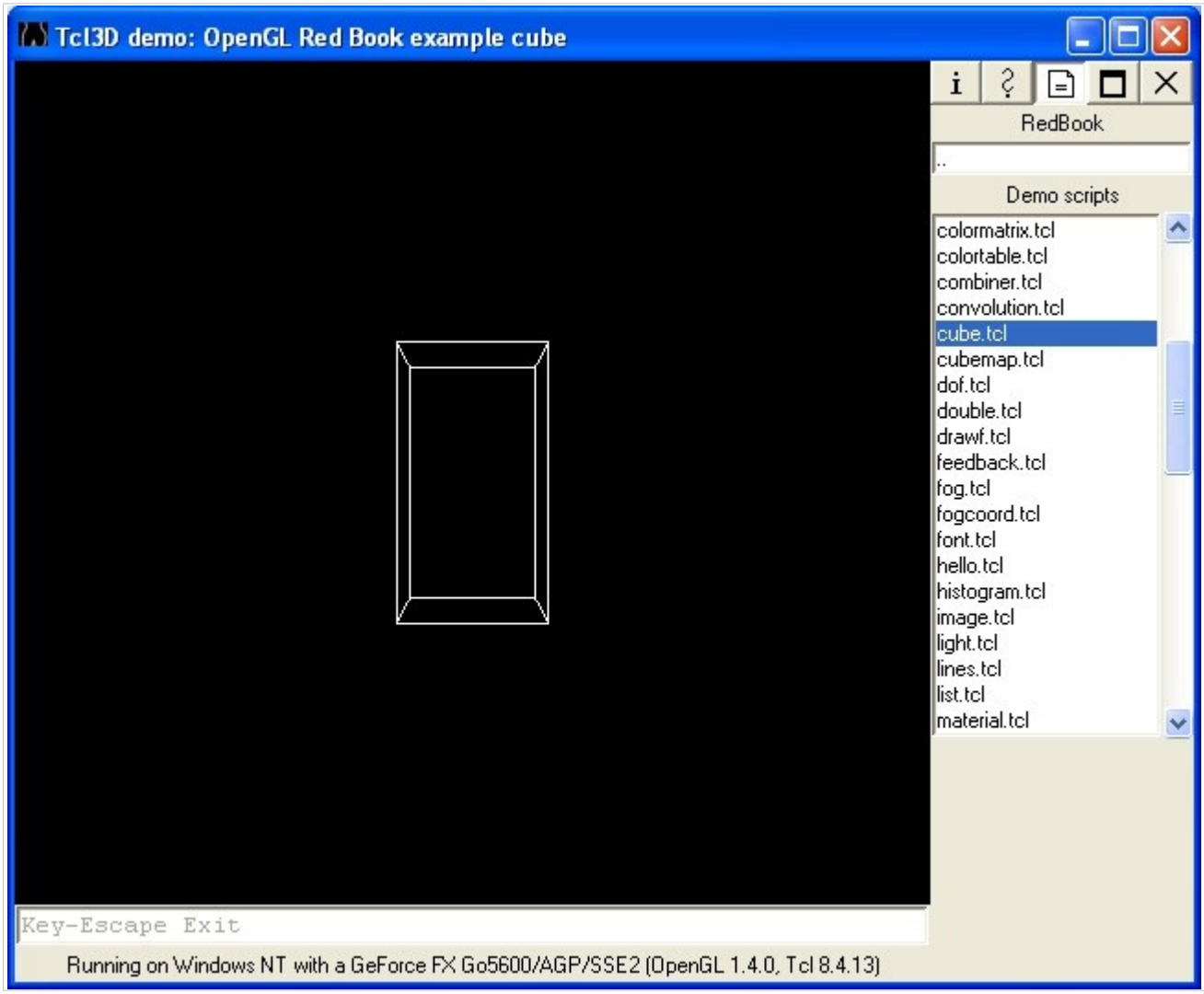
Use various 2D convolutions filters to find edges in an image.
```

Demo:	**cube**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
cube.tcl

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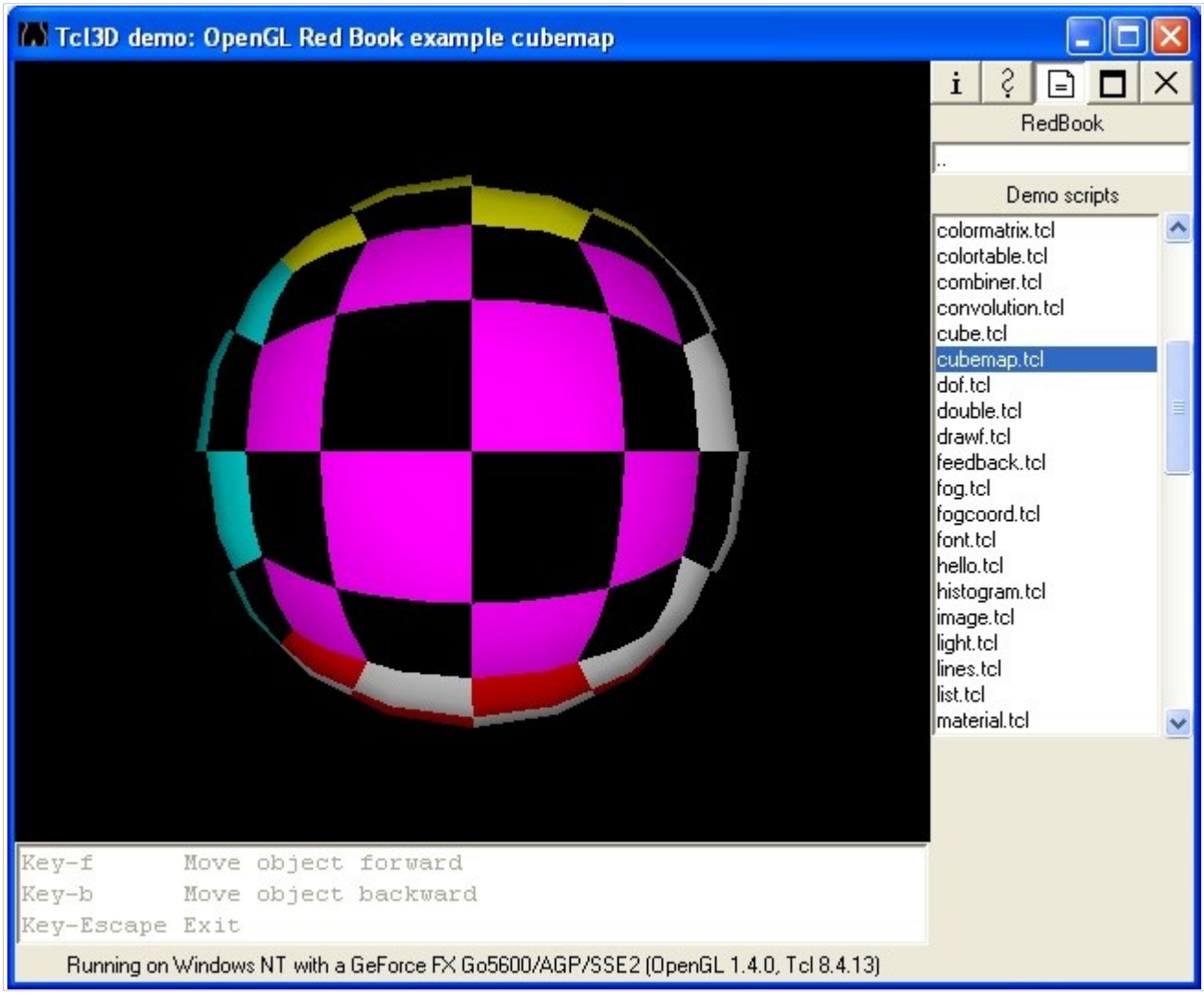
This program demonstrates a single modeling transformation,
glScalef() and a single viewing transformation, gluLookAt().
A wireframe cube is rendered.
```

Demo:	**cubemap**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
cubemap.tcl

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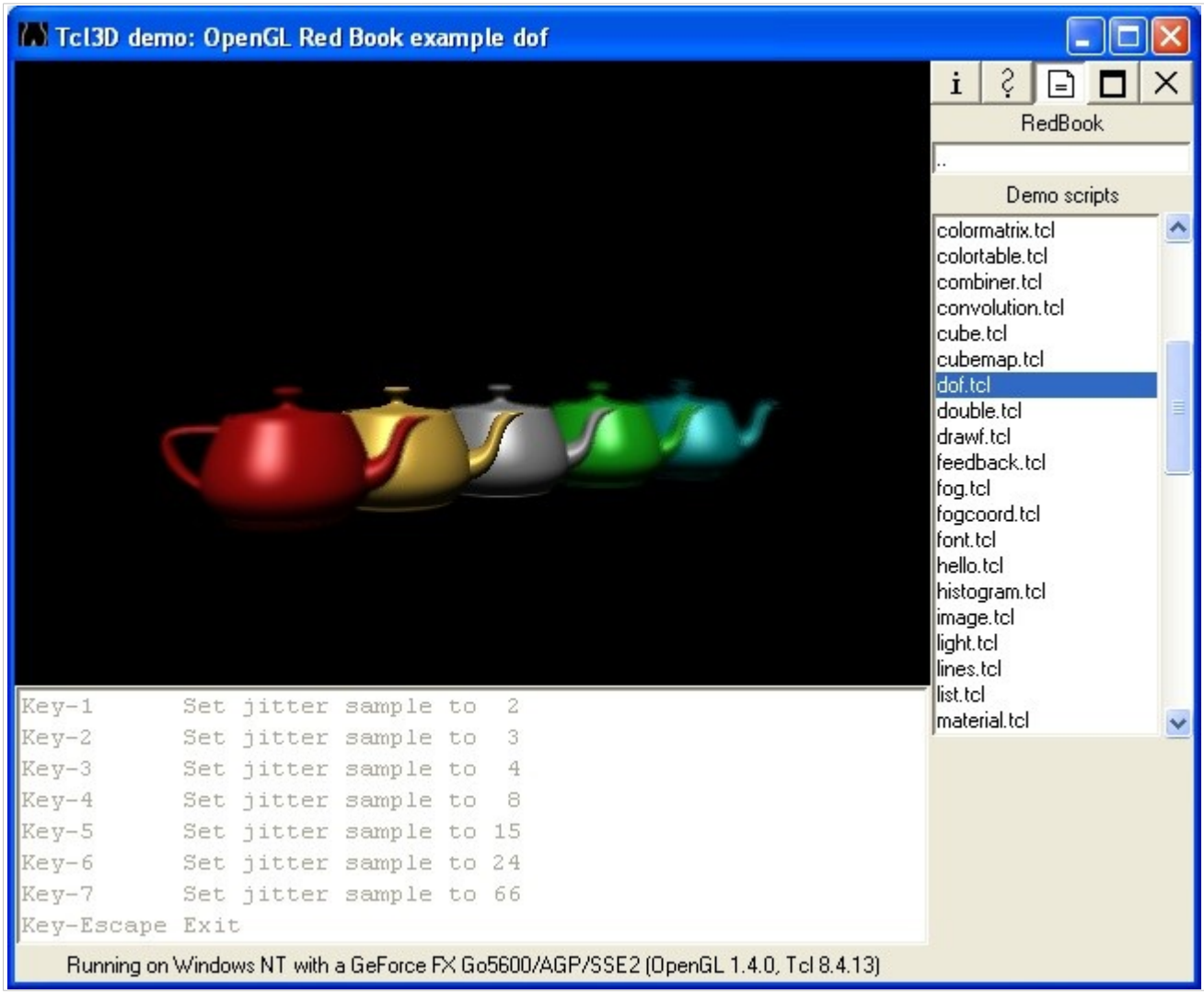
This program demonstrates cube map textures.
Six different colored checker board textures are
created and applied to a lit sphere.

Pressing the 'f' and 'b' keys translate the object
forward and backward.
```

Demo:	**dof**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
dof.tcl

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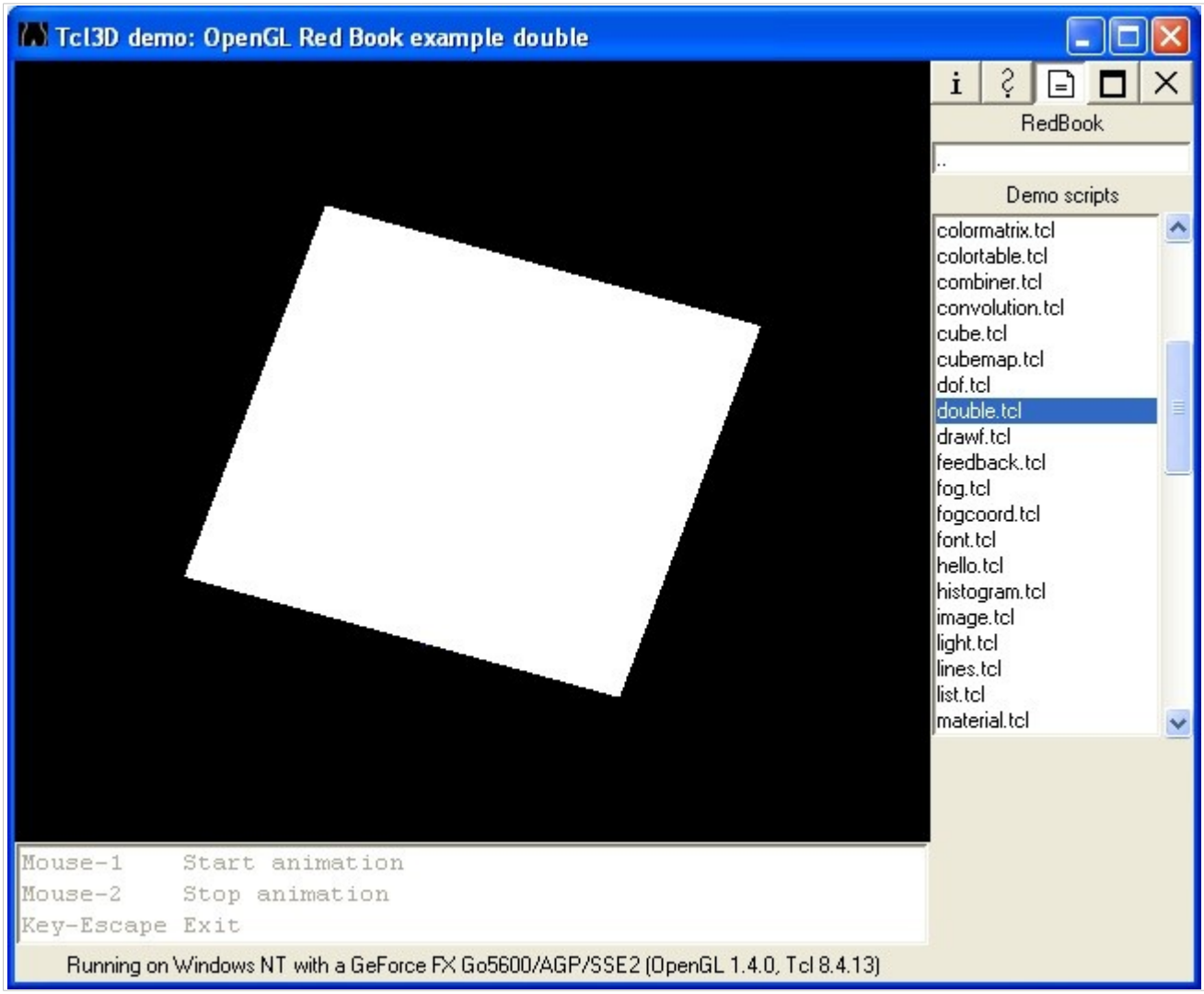
This program demonstrates use of the accumulation buffer to
create an out-of-focus depth-of-field effect.  The teapots
are drawn several times into the accumulation buffer.  The
viewing volume is jittered, except at the focal point, where
the viewing volume is at the same position, each time.  In
this case, the gold teapot remains in focus.
```

Demo:	**double**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
double.tcl

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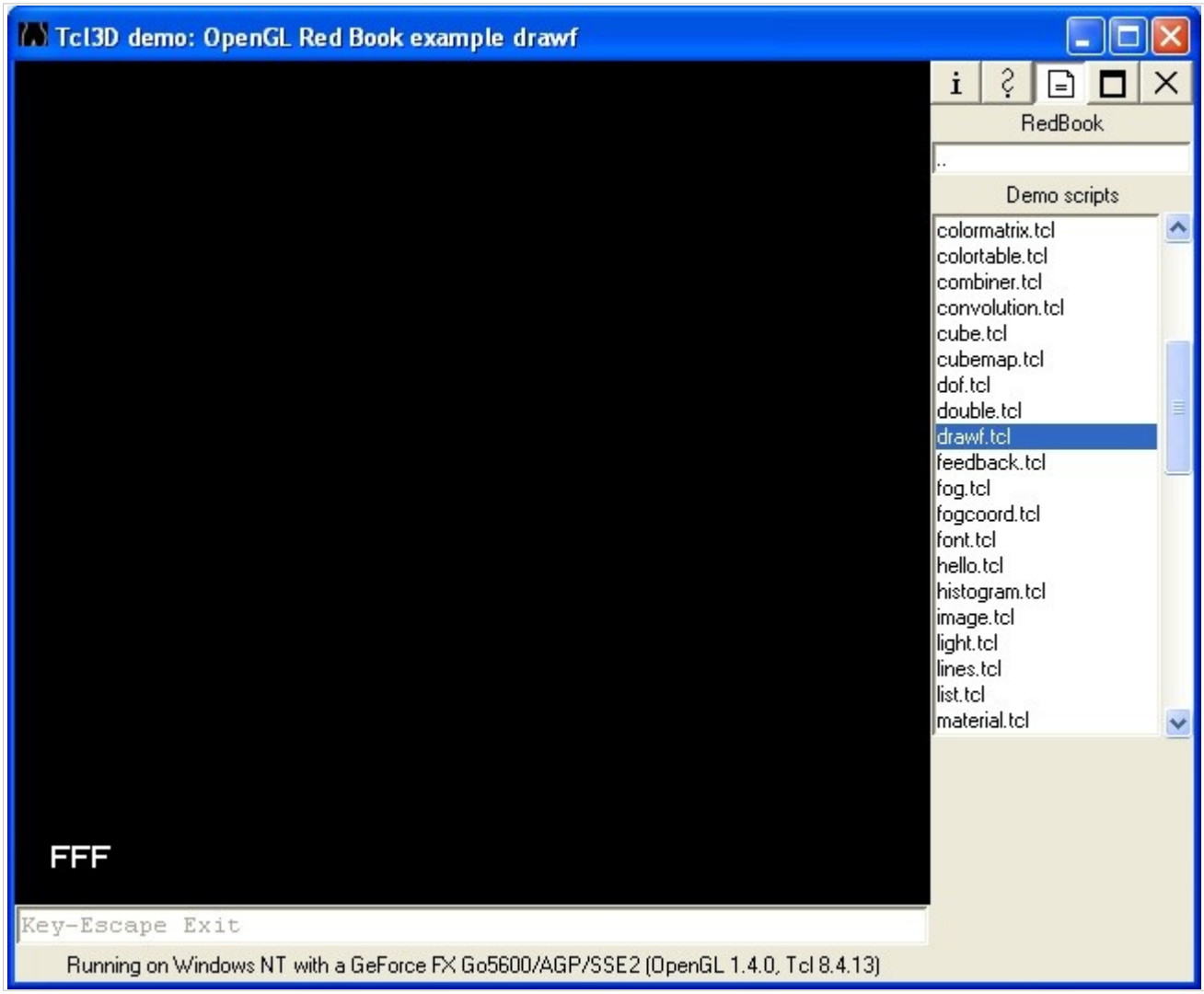
This is a simple double buffered program.
Pressing the left mouse button rotates the rectangle.
Pressing the middle mouse button stops the rotation.
```

Demo:	**drawf**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
drawf.tcl

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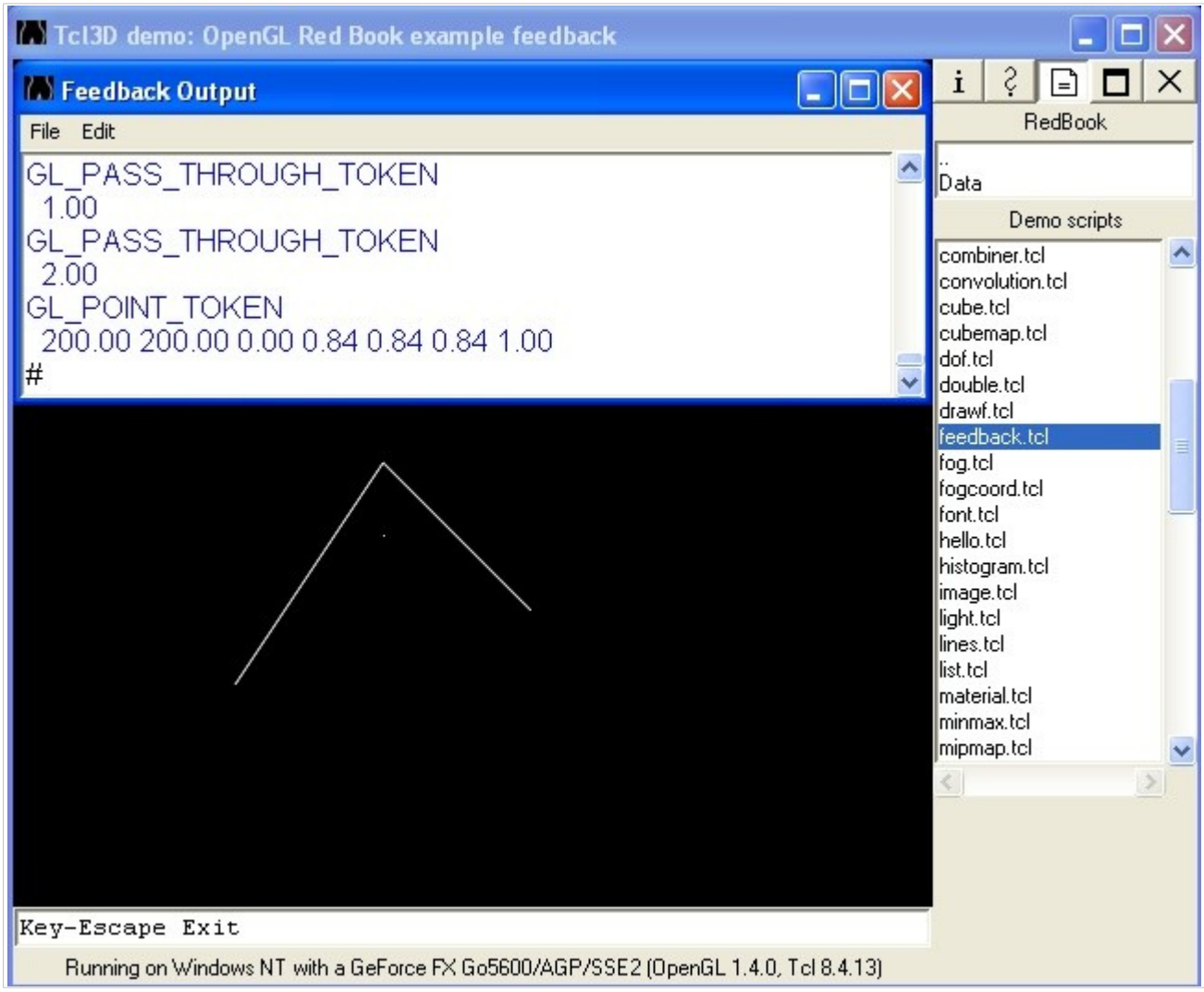
Draws the bitmapped letter F on the screen (several times).
This demonstrates use of the glBitmap() call.
```

Demo:	**feedback**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
feedback.tcl

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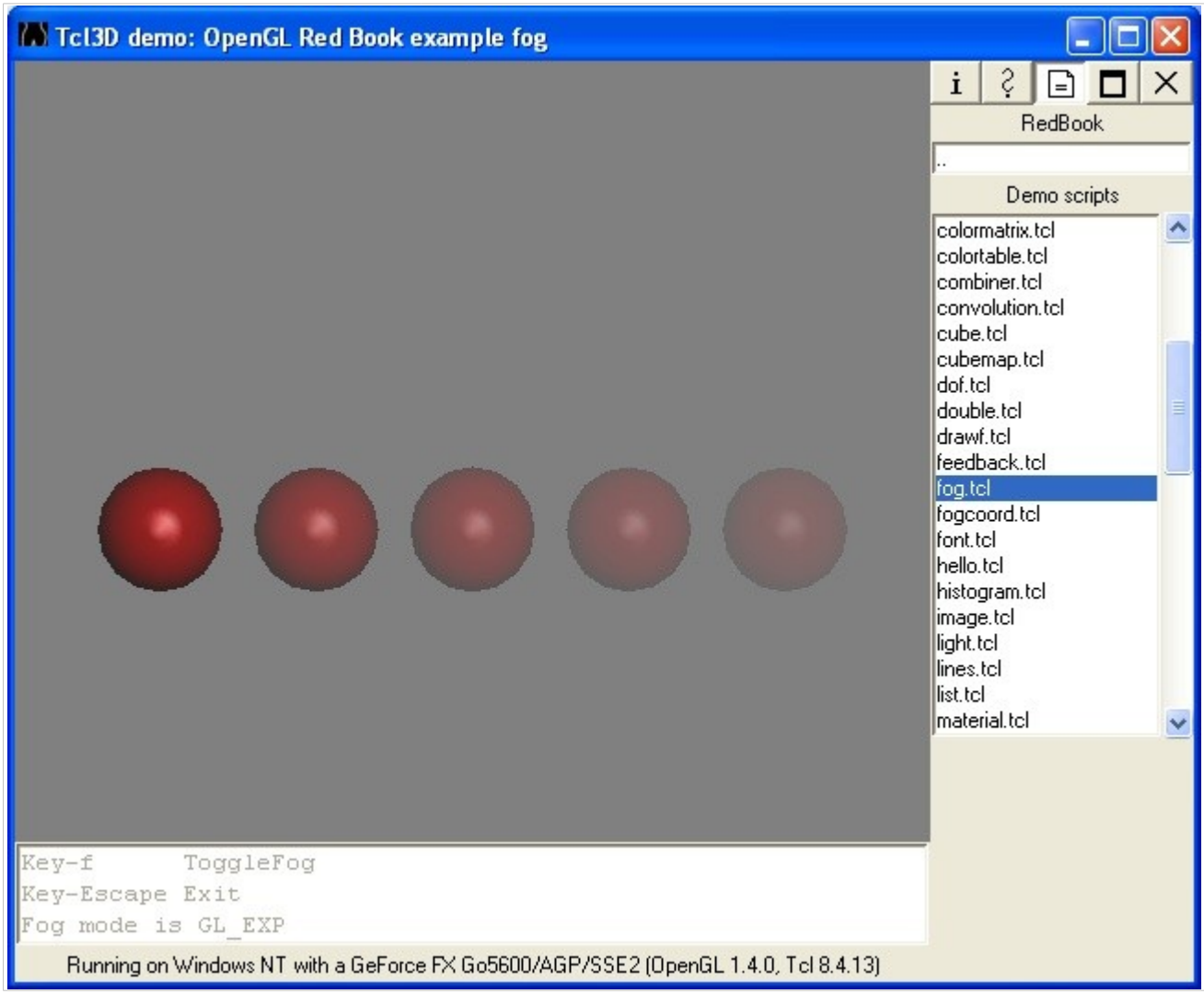
This program demonstrates use of OpenGL feedback.  First,
a lighting environment is set up and a few lines are drawn.
Then feedback mode is entered, and the same lines are
drawn. The results in the feedback buffer are printed.
```

Demo:	**fog**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
fog.tcl

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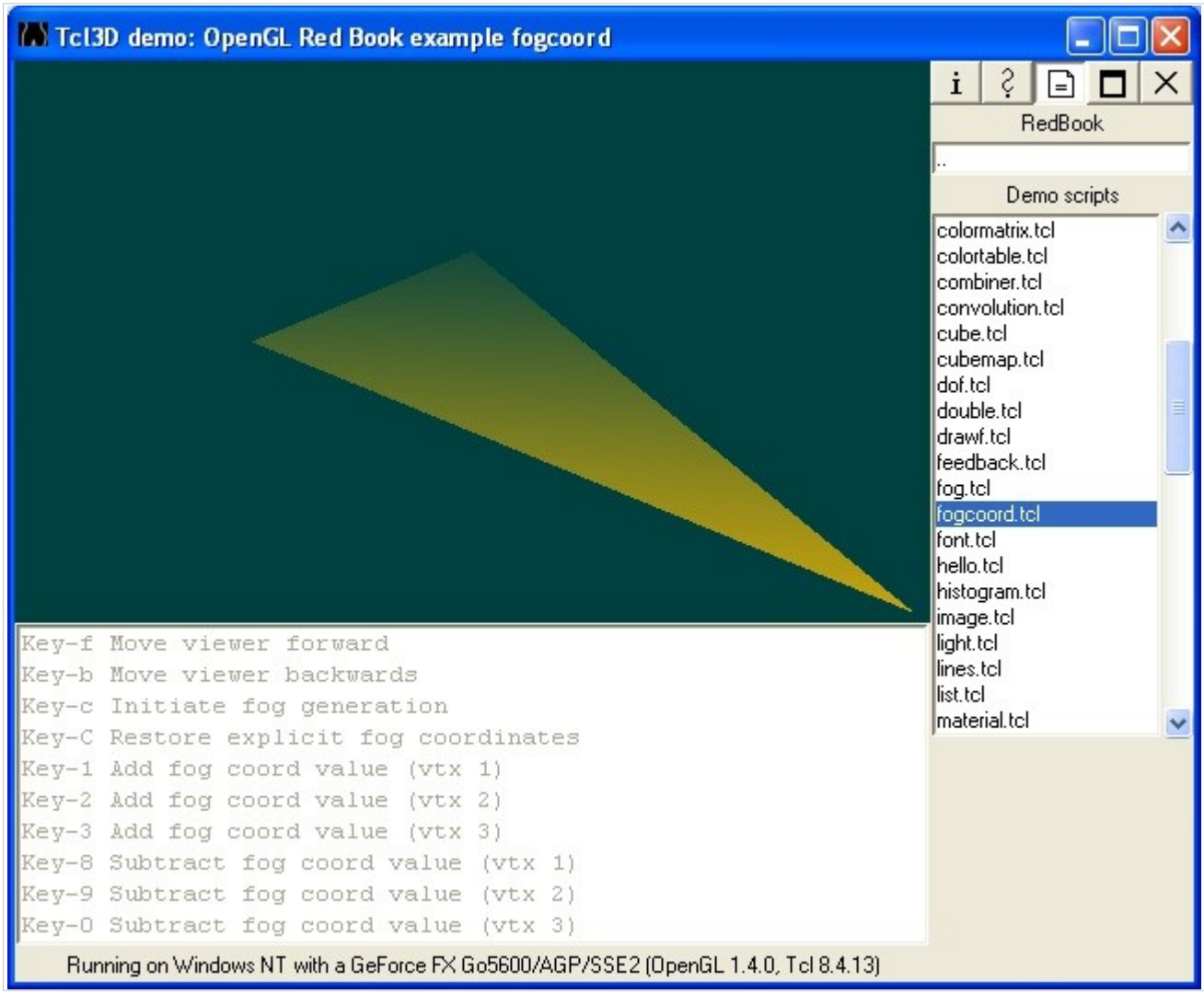
This program draws 5 red spheres, each at a different
z distance from the eye, in different types of fog.
Pressing the f key chooses between 3 types of
fog:  exponential, exponential squared, and linear.
In this program, there is a fixed density value, as well
as fixed start and end values for the linear fog.
```

Demo:	**fogcoord**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
fogcoord.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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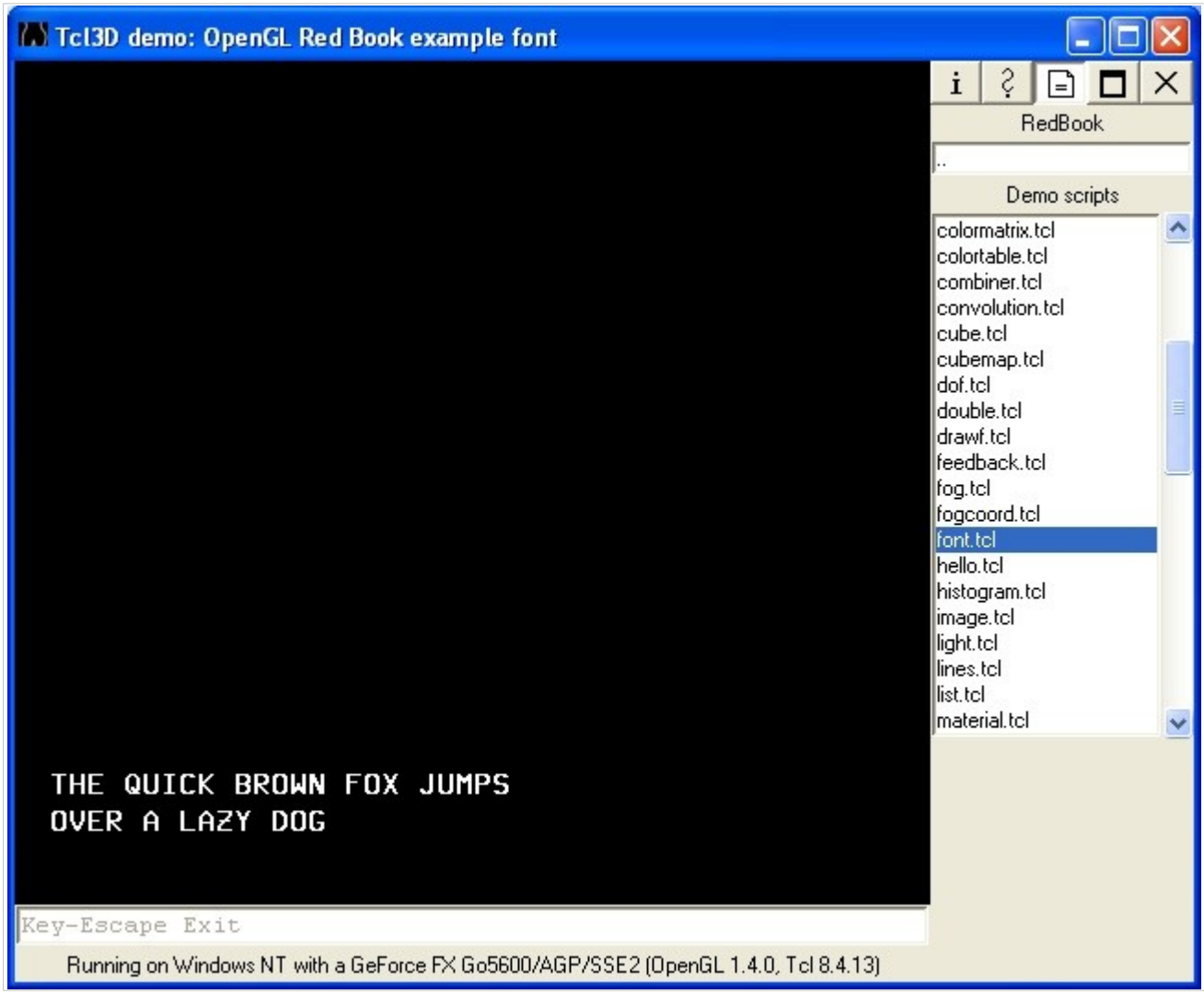
This program demonstrates the use of explicit fog
coordinates.  You can press the keyboard and change
the fog coordinate value at any vertex.  You can
also switch between using explicit fog coordinates
and the default fog generation mode.

Pressing the 'f' and 'b' keys move the viewer forward
and backwards.
Pressing 'c' initiates the default fog generation.
Pressing capital 'C' restores explicit fog coordinates.
Pressing '1', '2', '3', '8', '9', and '0' add or
subtract from the fog coordinate values at one of the
three vertices of the triangle.
```

Demo:	**font**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
font.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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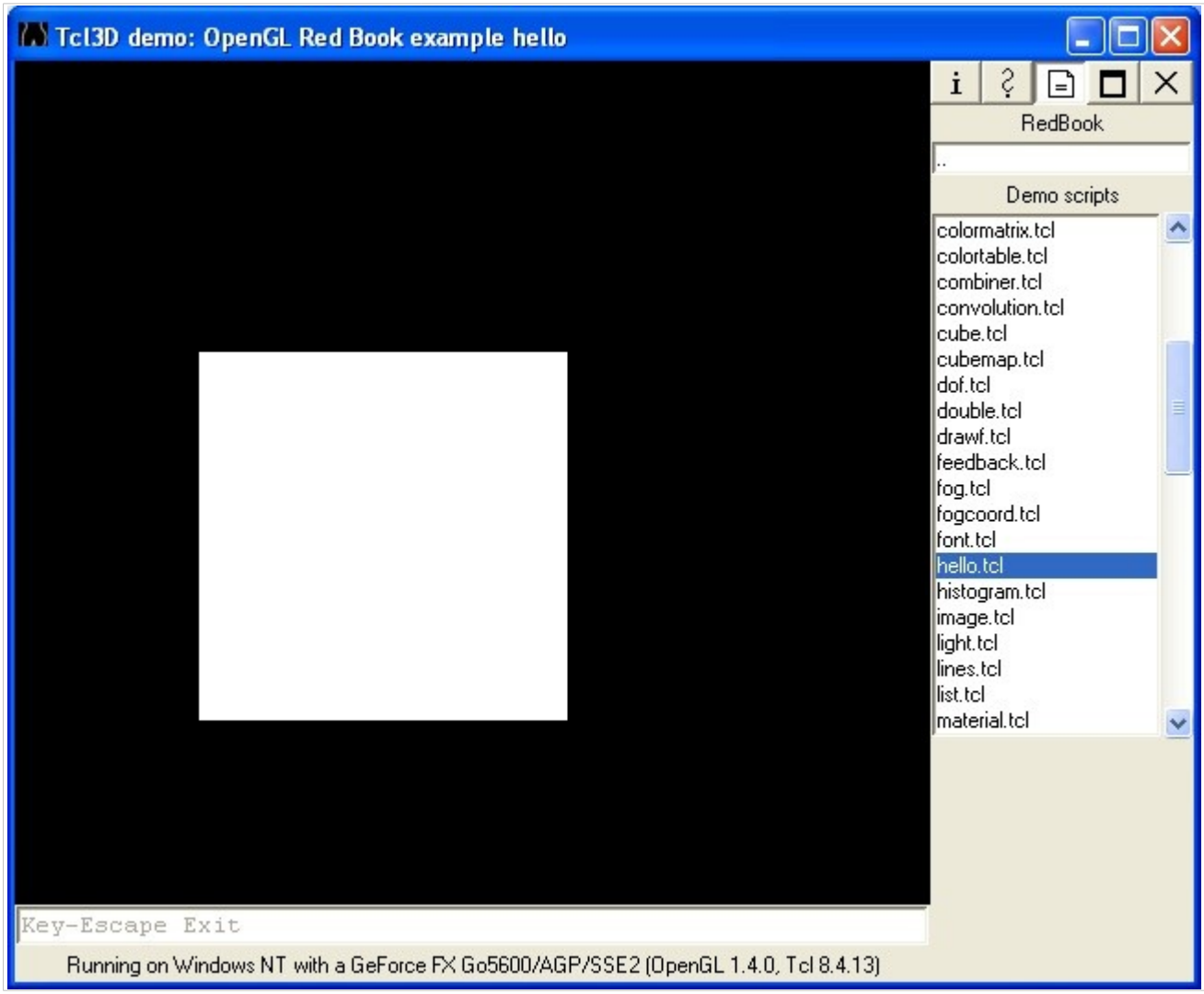
Draws some text in a bitmapped font.  Uses glBitmap()
and other pixel routines.  Also demonstrates use of
display lists.
```

Demo:	**hello**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
hello.tcl

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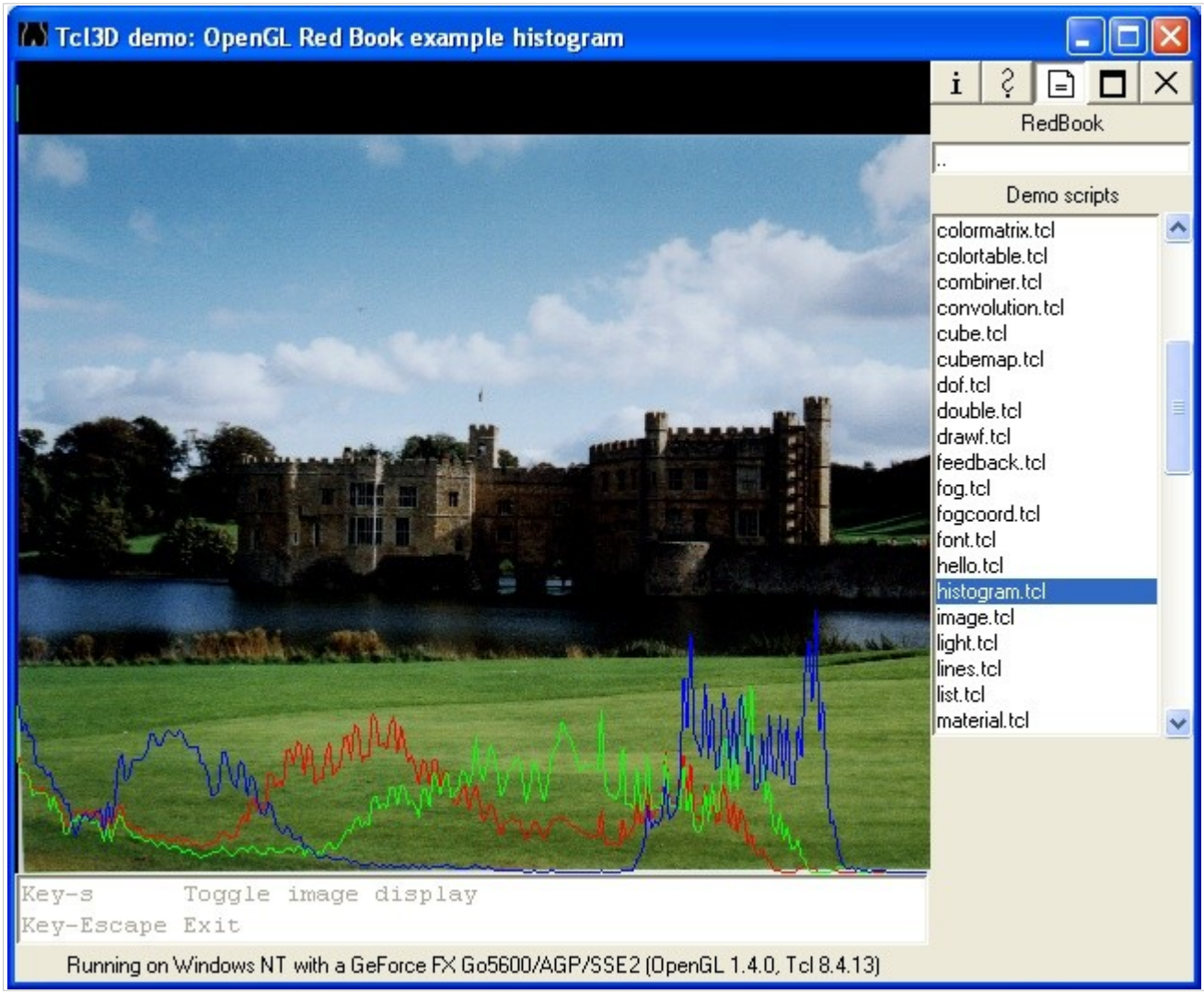
This is a simple, introductory OpenGL program.
```

Demo:	**histogram**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
histogram.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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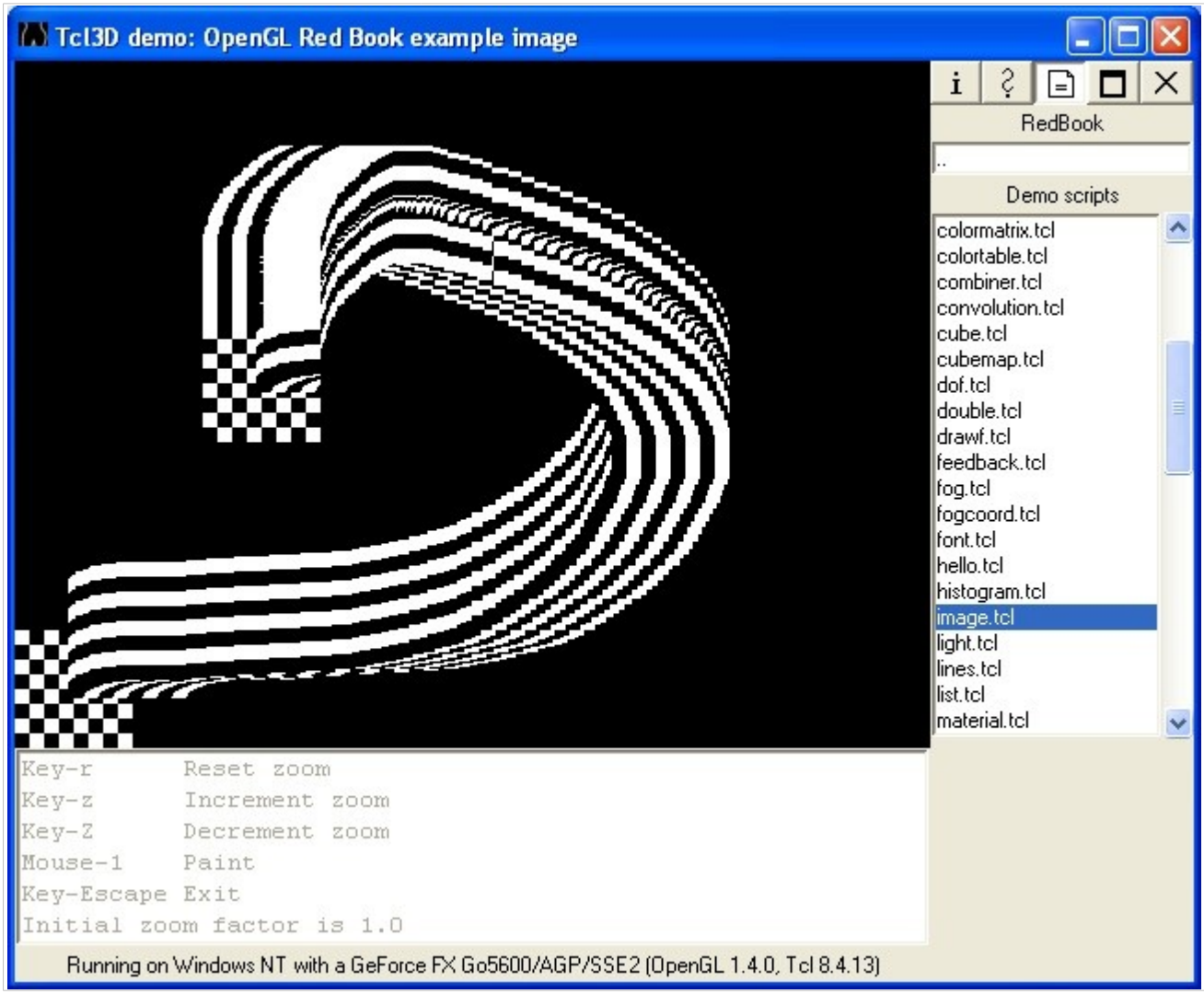
Compute the histogram of the image. This program illustrates the
use of the glHistogram() function.
```

Demo:	**image**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
image.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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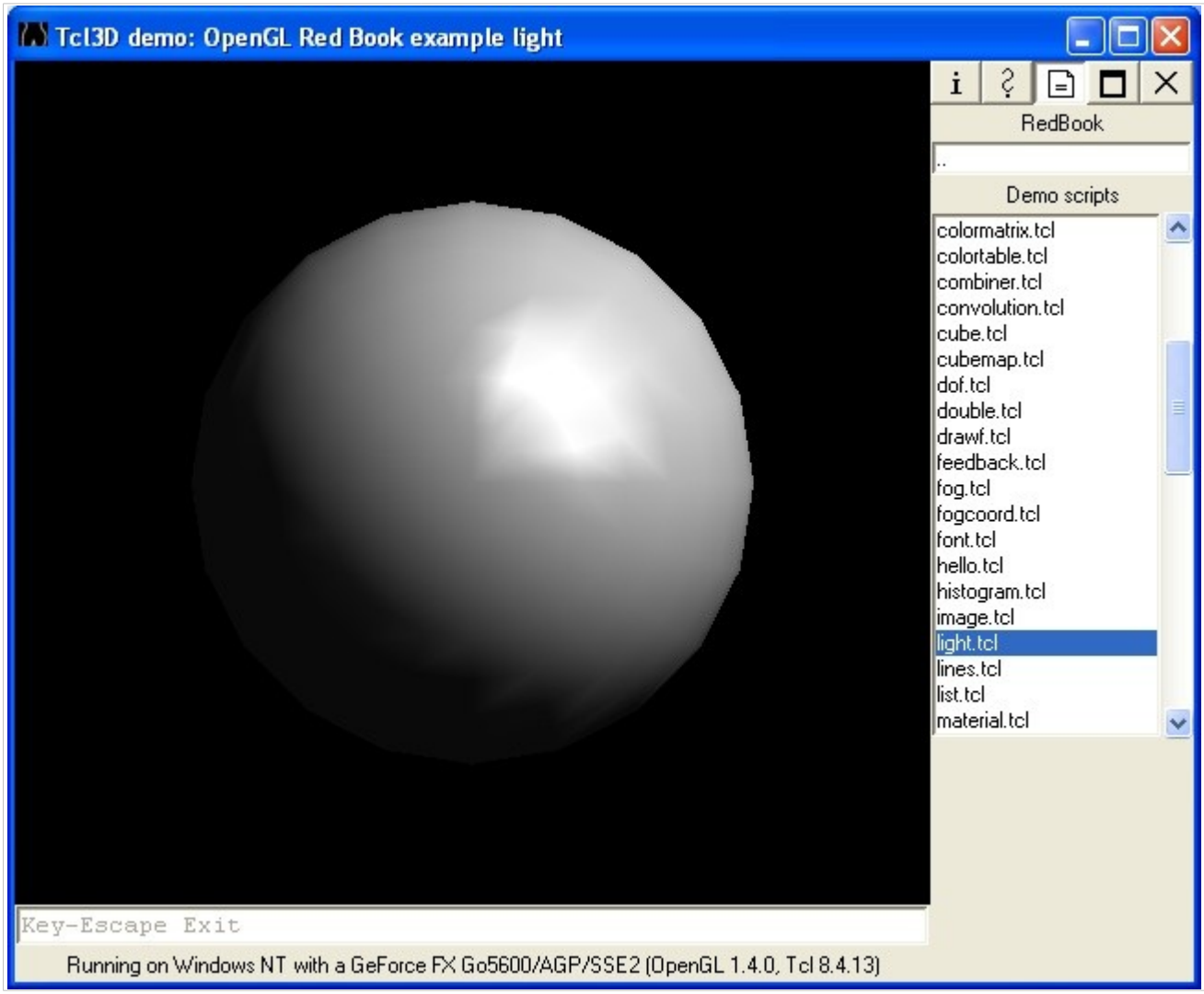
This program demonstrates drawing pixels and shows the effect
of glDrawPixels(), glCopyPixels(), and glPixelZoom().
Interaction: moving the mouse while pressing the mouse button
will copy the image in the lower-left corner of the window
to the mouse position, using the current pixel zoom factors.
There is no attempt to prevent you from drawing over the original
image.  If you press the 'r' key, the original image and zoom
factors are reset.  If you press the 'z' or 'Z' keys, you change
the zoom factors.
```

Demo:	**light**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
light.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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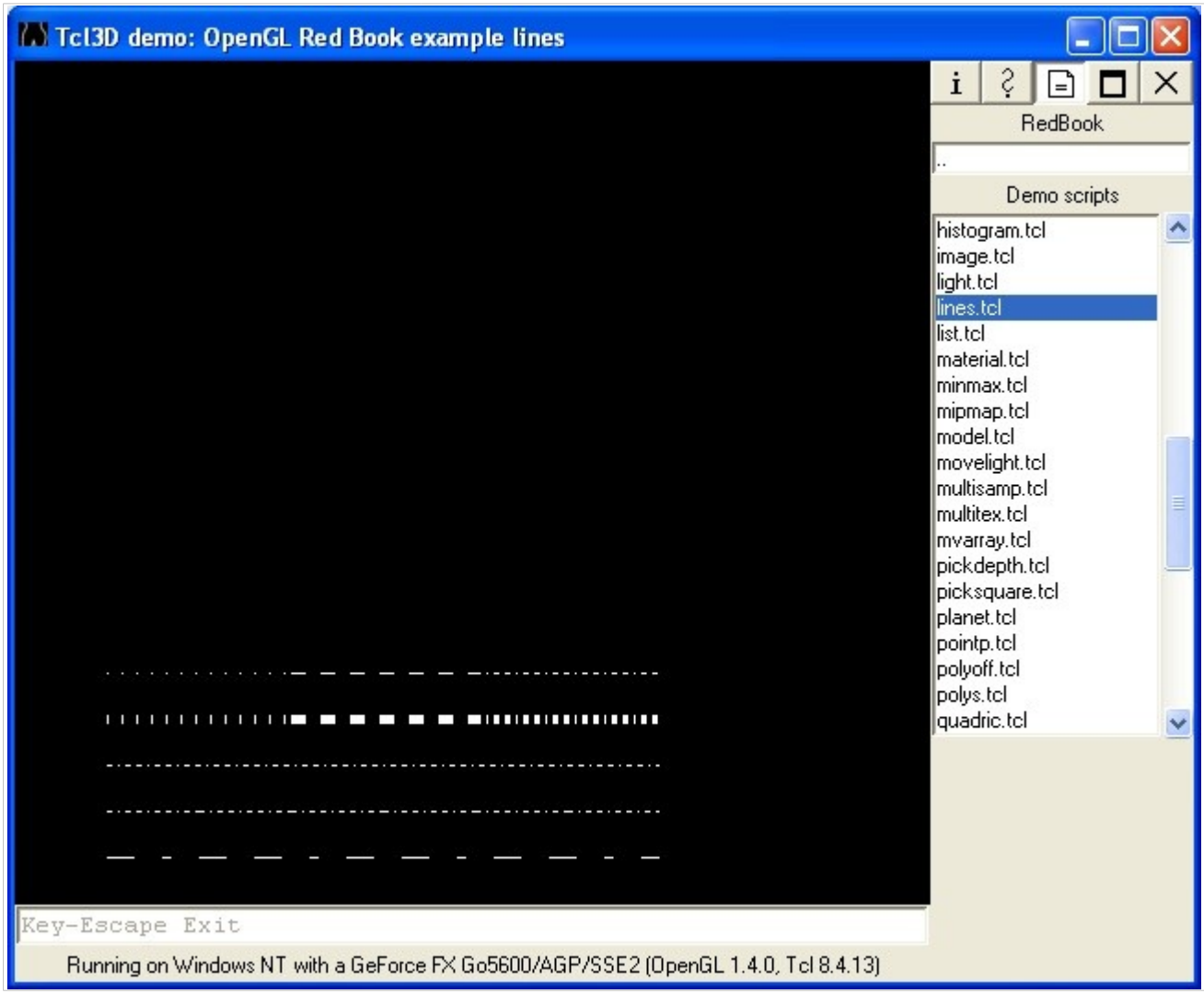
This program demonstrates the use of the OpenGL lighting
model. A sphere is drawn using a grey material characteristic.
A single light source illuminates the object.
```

Demo:	**lines**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
lines.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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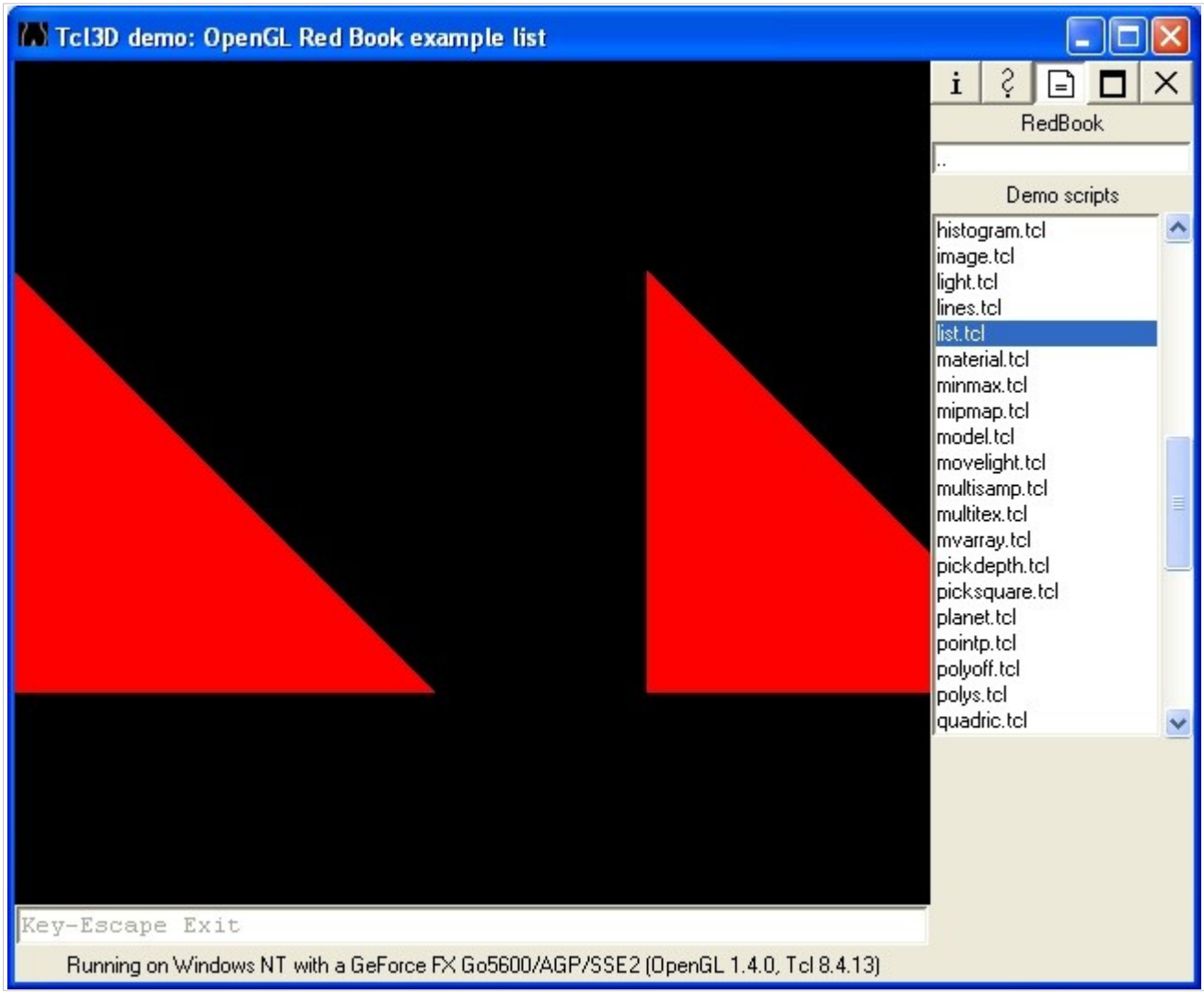
This program demonstrates geometric primitives and
their attributes.
```

Demo:	**list**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
list.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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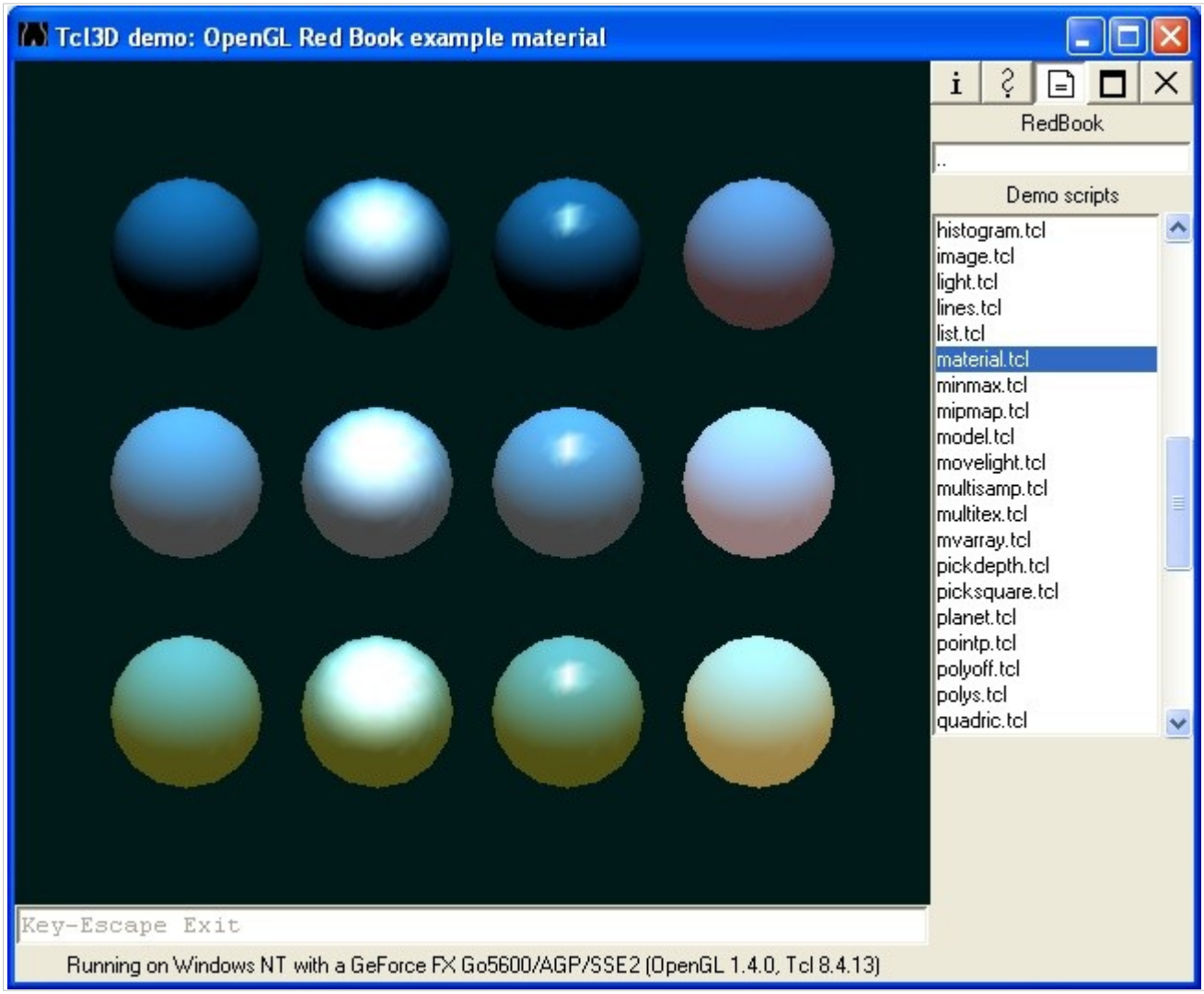
This program demonstrates how to make and execute a
display list.  Note that attributes, such as current
color and matrix, are changed.
```

Demo:	**material**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
material.tcl

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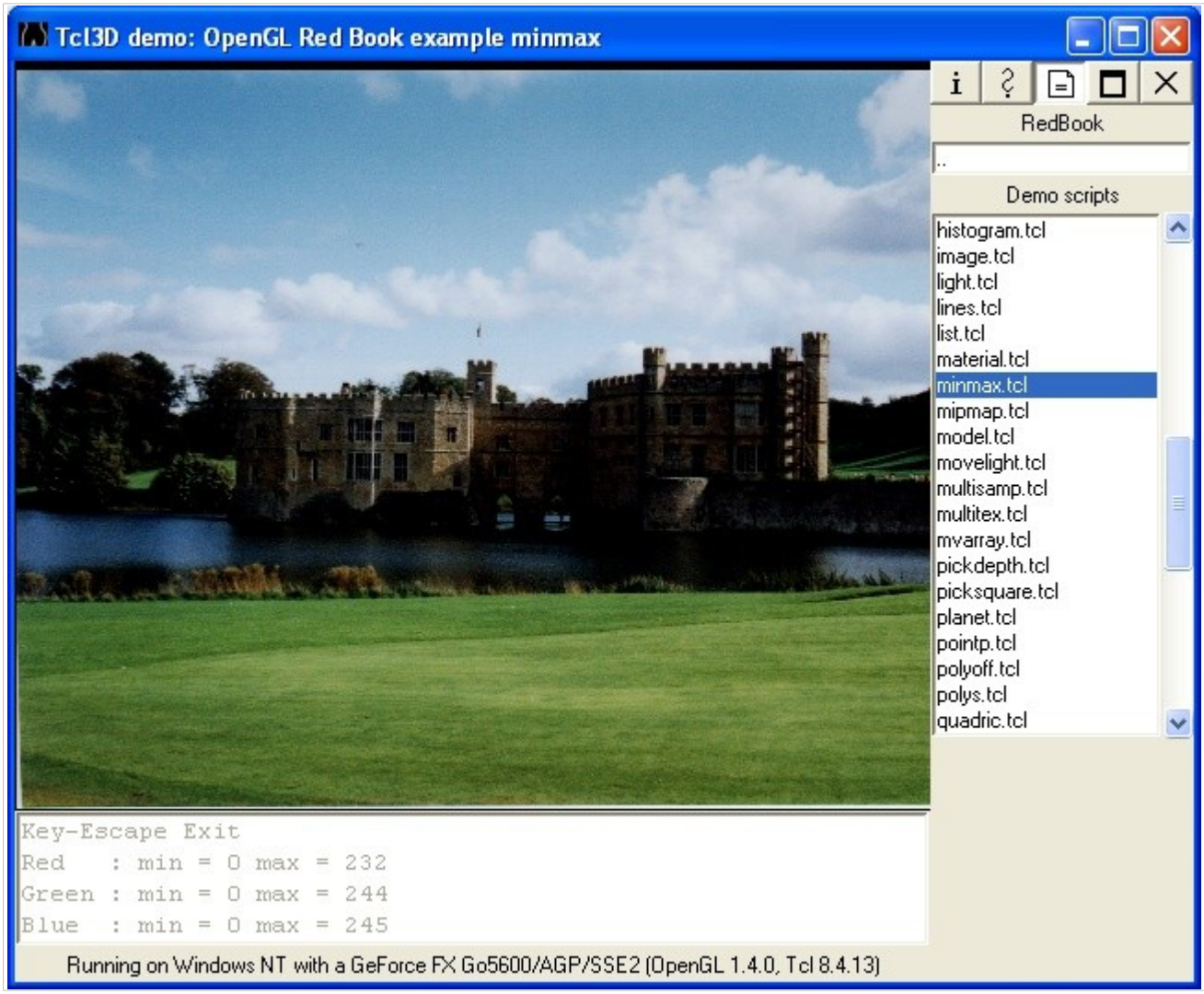
This program demonstrates the use of the GL lighting model.
Several objects are drawn using different material characteristics.
A single light source illuminates the objects.
```

Demo:	**minmax**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
minmax.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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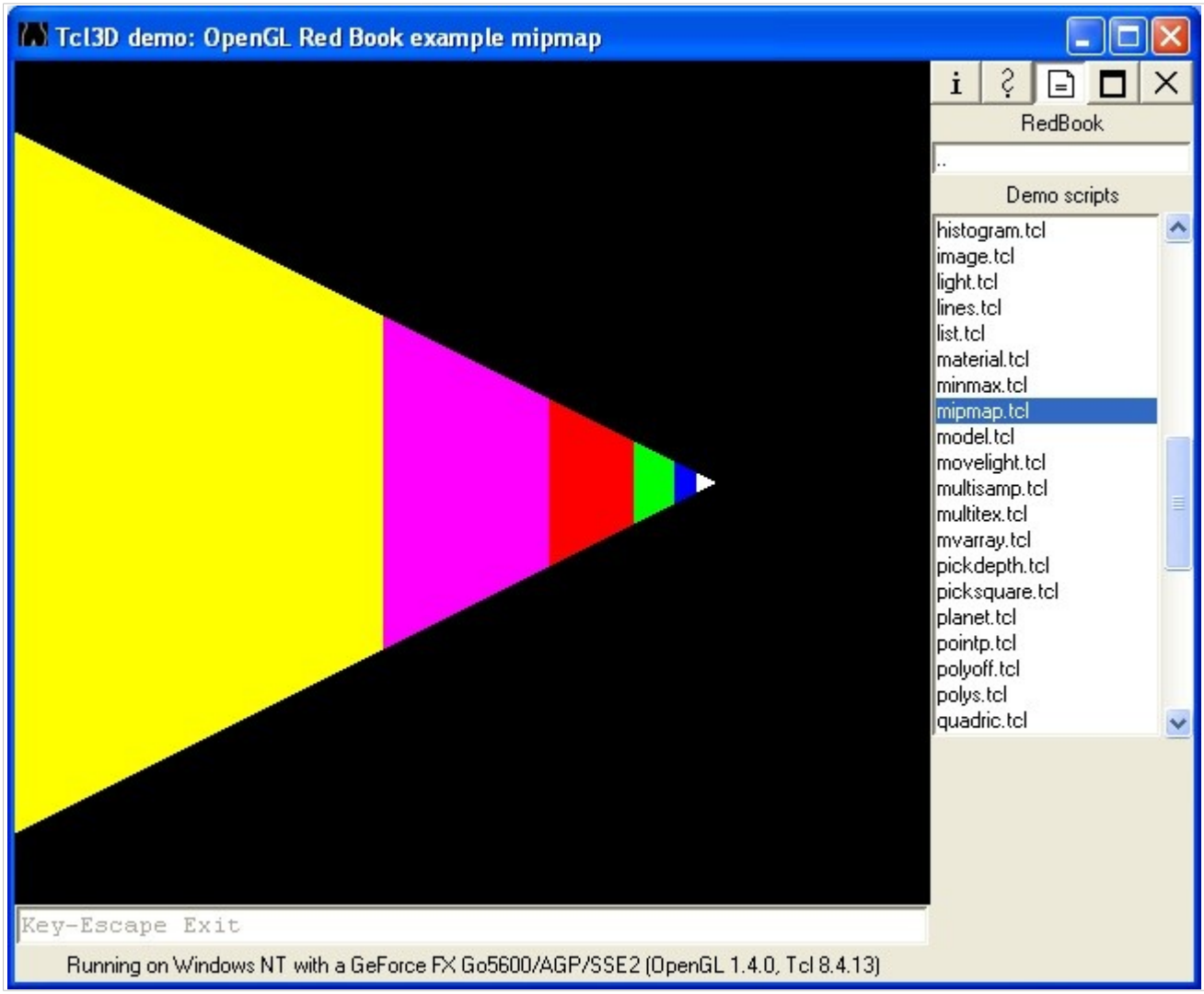
Determine the minimum and maximum values of a group of pixels.
This demonstrates use of the glMinmax() call.
```

Demo:	**mipmap**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
mipmap.tcl

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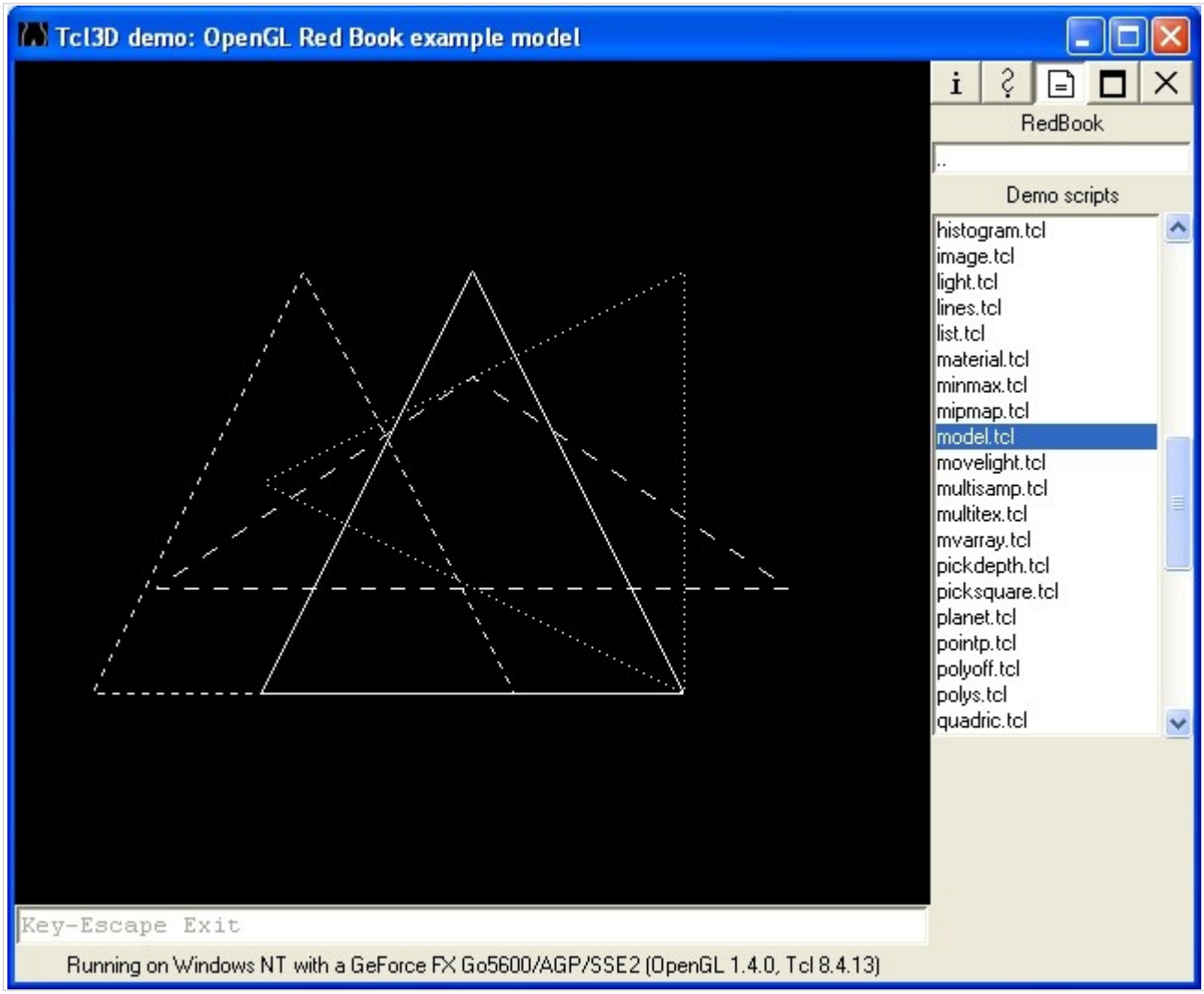
This program demonstrates using mipmaps for texture maps.
To overtly show the effect of mipmaps, each mipmap reduction
level has a solidly colored, contrasting texture image.
Thus, the quadrilateral which is drawn is drawn with several
different colors.
```

Demo:	**model**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
model.tcl

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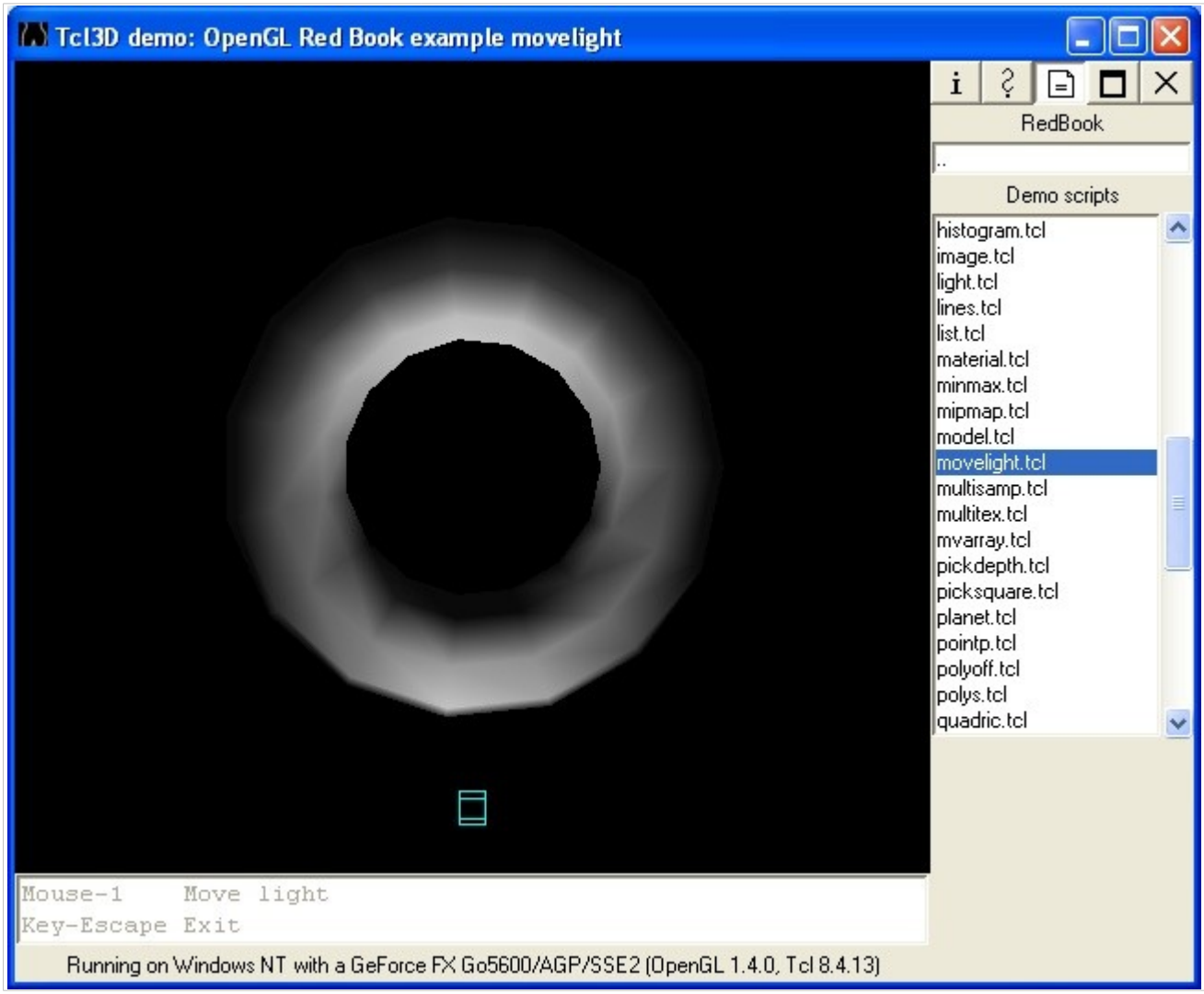
This program demonstrates modeling transformations
```

Demo:	**movelight**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
movelight.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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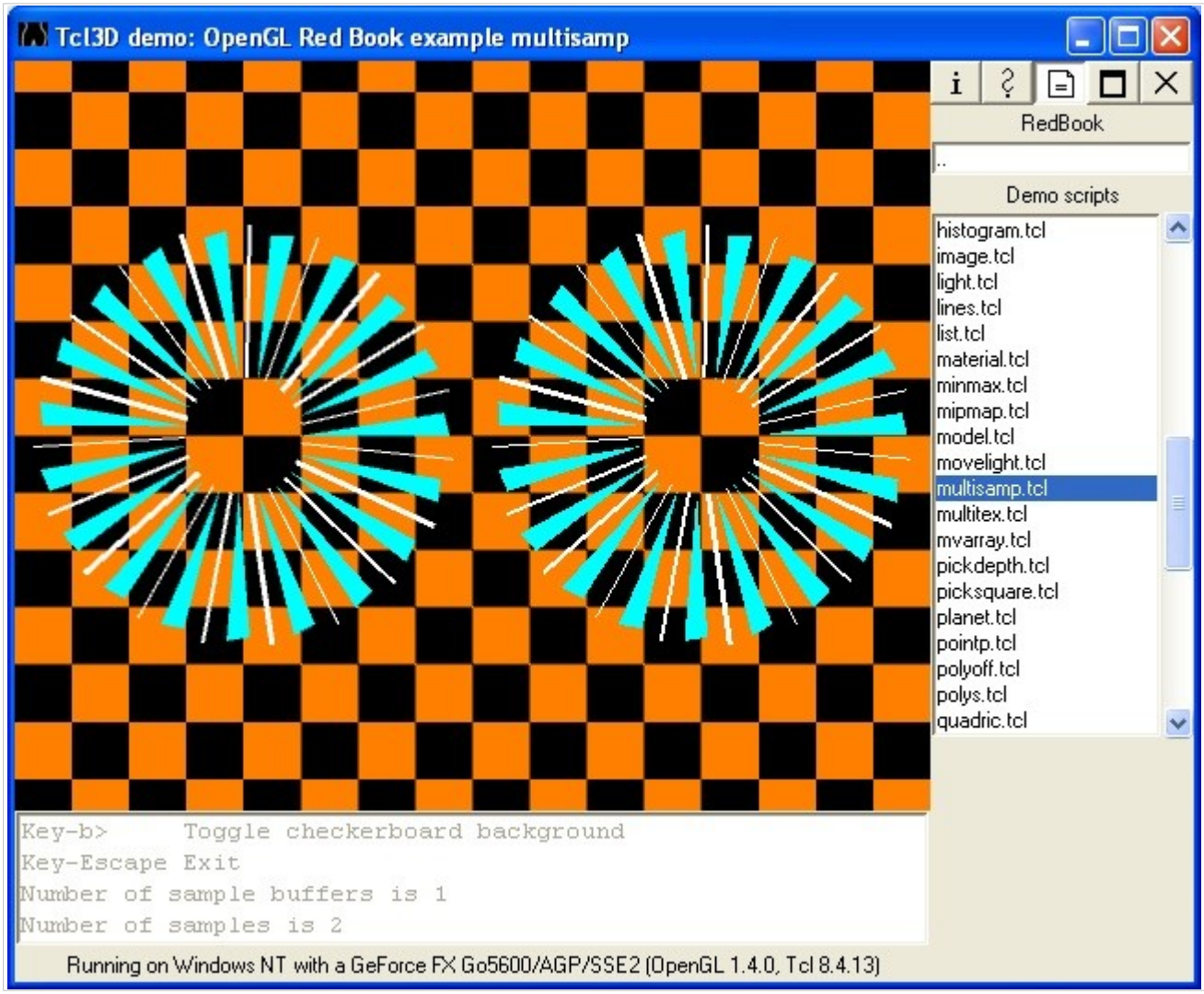
This program demonstrates when to issue lighting and
transformation commands to render a model with a light
which is moved by a modeling transformation (rotate or
translate).  The light position is reset after the modeling
transformation is called.  The eye position does not change.

A sphere is drawn using a grey material characteristic.
A single light source illuminates the object.

Interaction:  pressing the left mouse button alters
the modeling transformation (x rotation) by 30 degrees.
The scene is then redrawn with the light in a new position.
```

Demo:	**multisamp**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
multisamp.tcl

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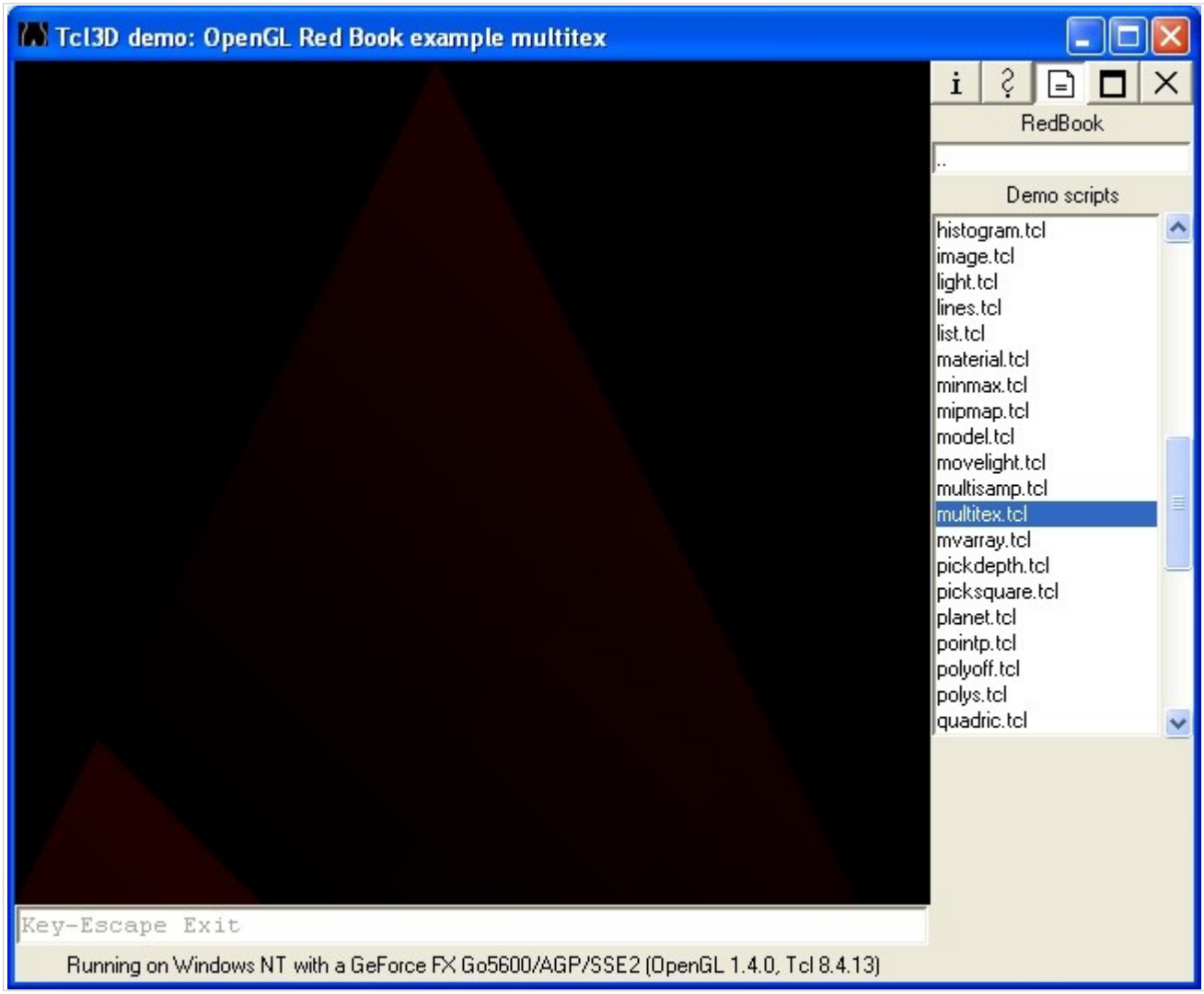
This program draws shows how to use multisampling to
draw anti-aliased geometric primitives.  The same
display list, a pinwheel of triangles and lines of
varying widths, is rendered twice.  Multisampling is
enabled when the left side is drawn.  Multisampling is
disabled when the right side is drawn.

Pressing the 'b' key toggles drawing of the checkerboard
background.  Antialiasing is sometimes easier to see
when objects are rendered over a contrasting background.

This demo uses the multisampling options built into tcl3dTogl starting
from version 0.3.2.
Another way to set the number of samples is via the driver specific GUI under
Windows, or by setting the environment variable __GL_FSAA_MODE under Linux.
```

Demo:	**multitex**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
multitex.tcl

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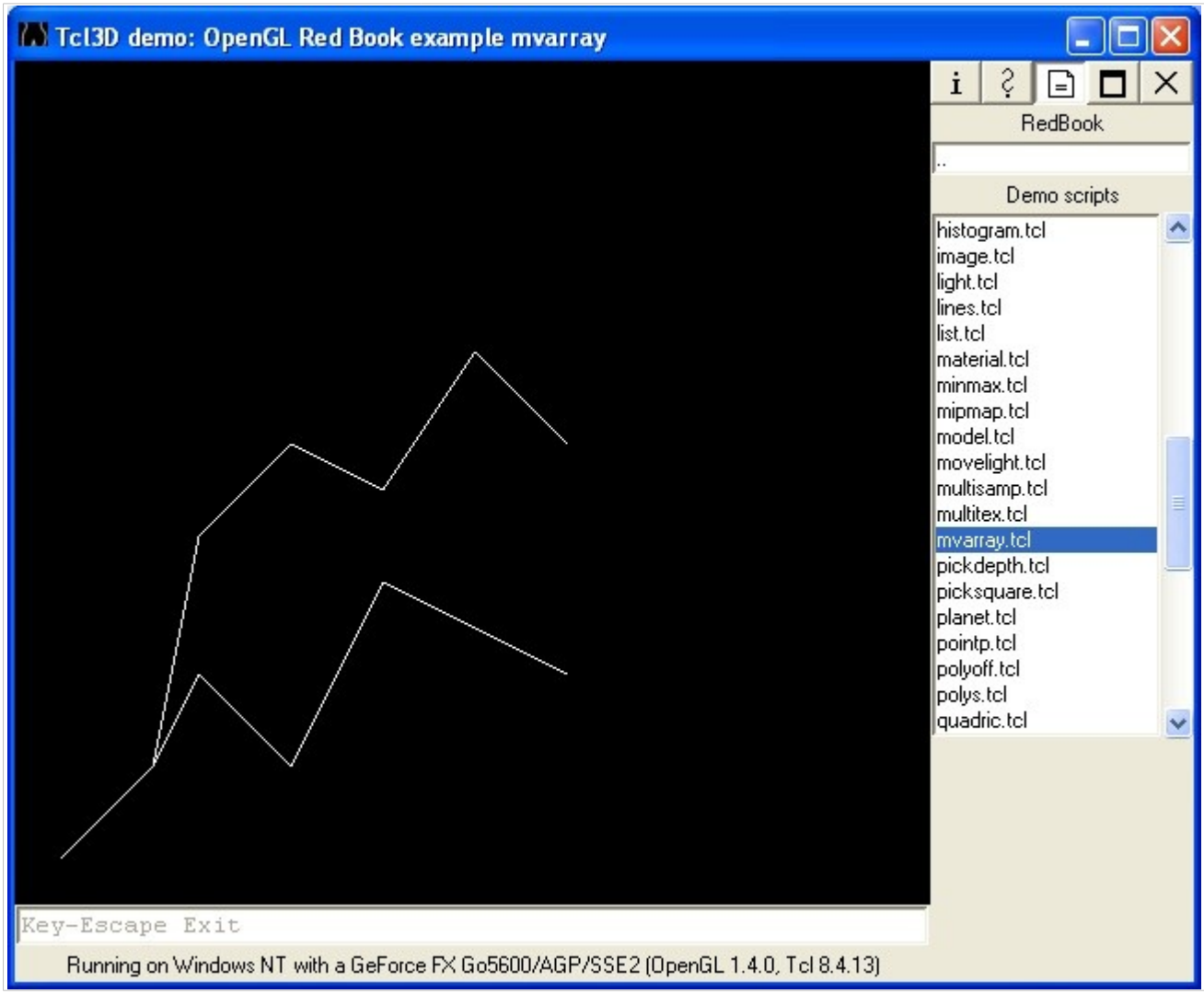
```

Demo:	**mvarray**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
mvarray.tcl

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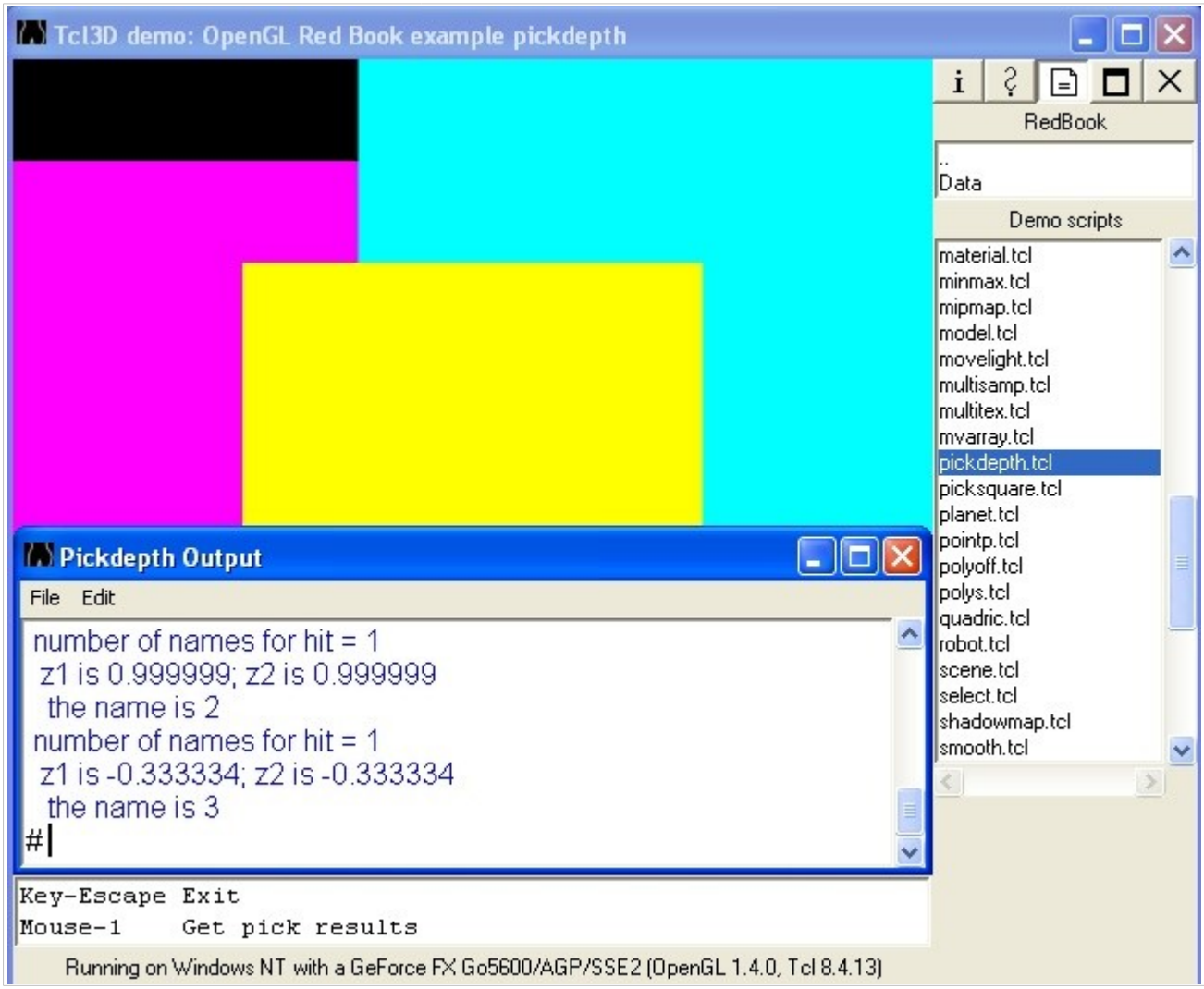
This program demonstrates multiple vertex arrays,
specifically the OpenGL routine glMultiDrawElements().
```

Demo:	**pickdepth**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
pickdepth.tcl

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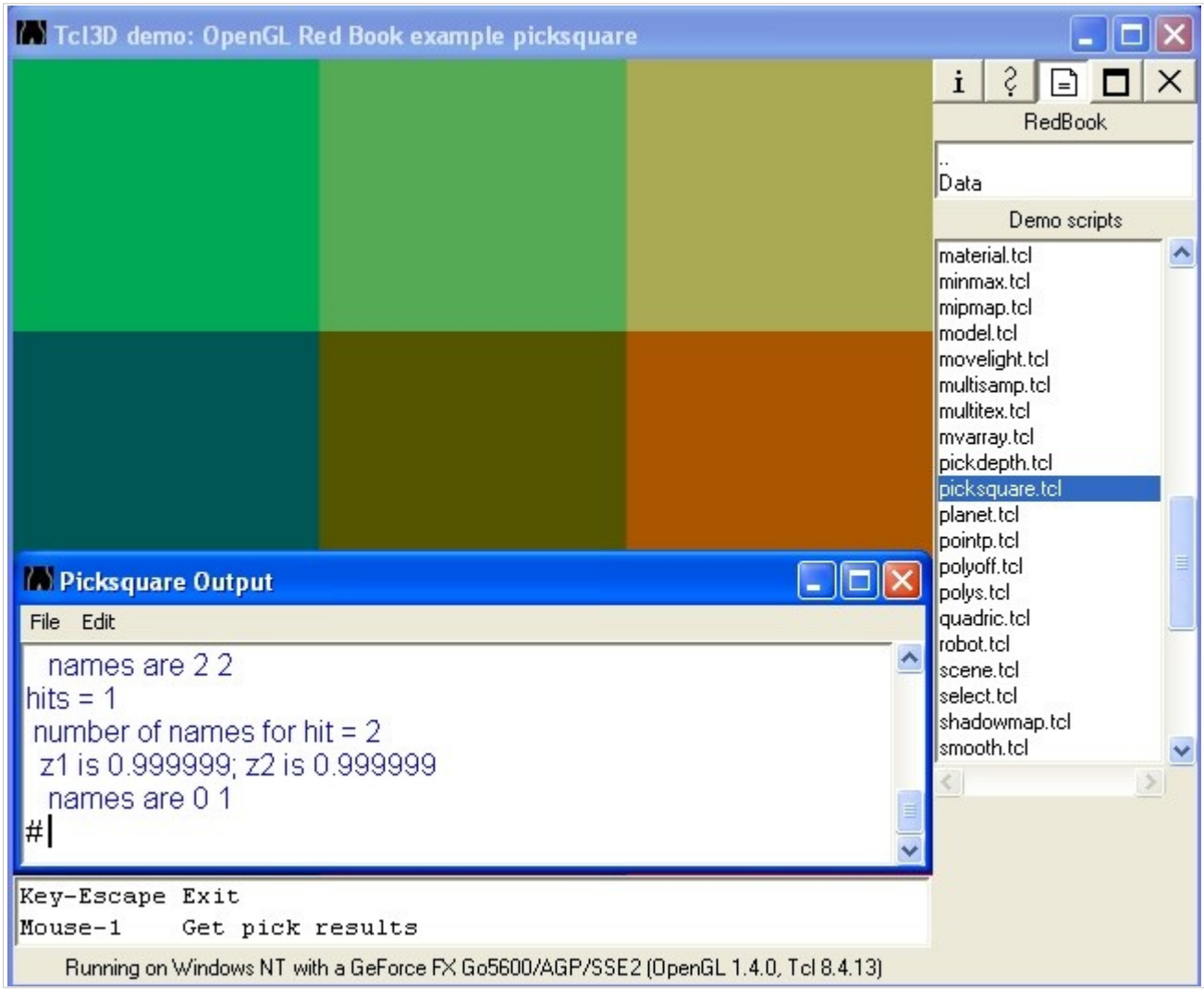
Picking is demonstrated in this program.  In
rendering mode, three overlapping rectangles are
drawn.  When the left mouse button is pressed,
selection mode is entered with the picking matrix.
Rectangles which are drawn under the cursor position
are "picked."  Pay special attention to the depth
value range, which is returned.
```

Demo:	**picksquare**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
picksquare.tcl

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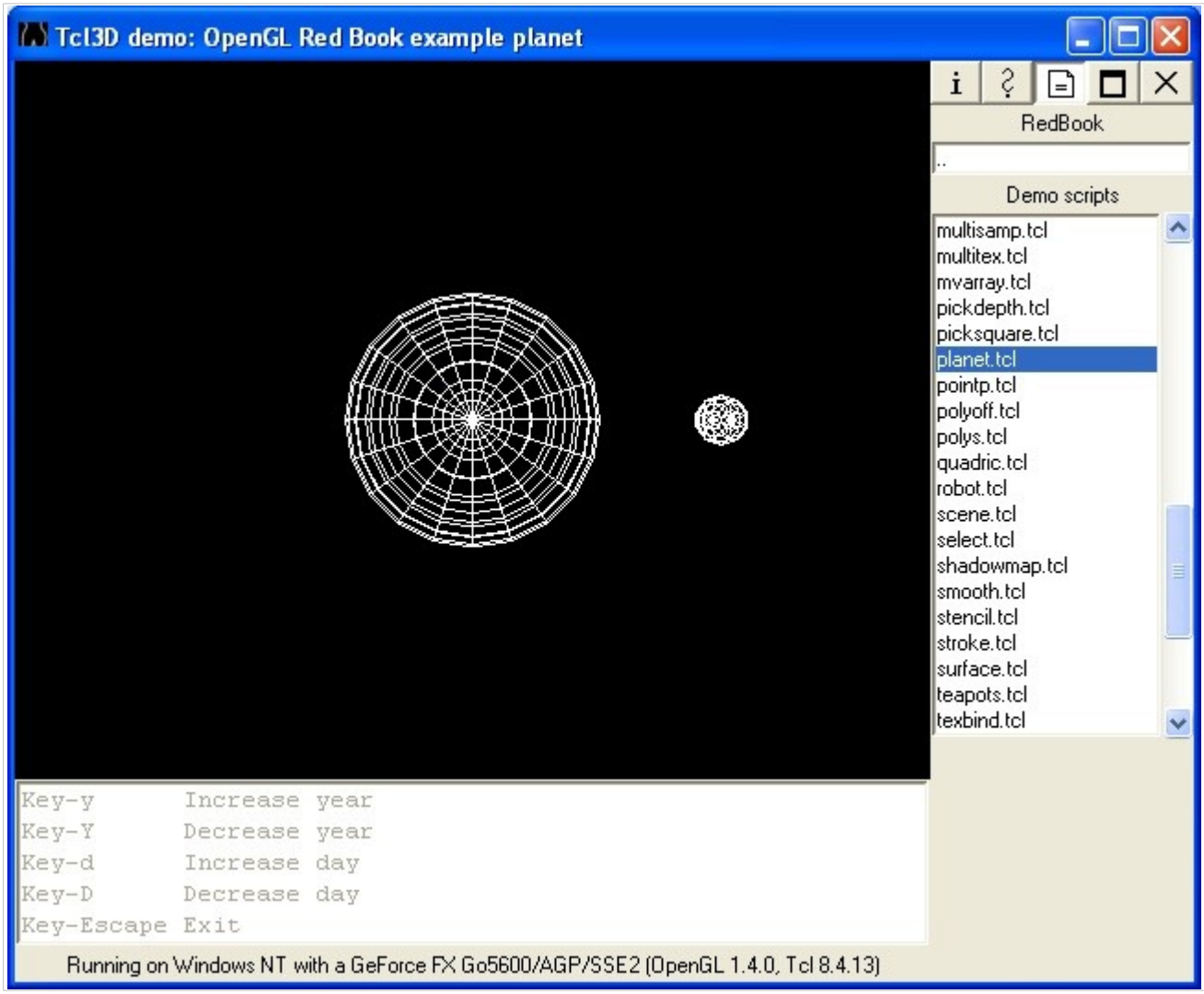
Use of multiple names and picking are demonstrated.
A 3x3 grid of squares is drawn.  When the left mouse
button is pressed, all squares under the cursor position
have their color changed.
```

Demo:	**planet**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
planet.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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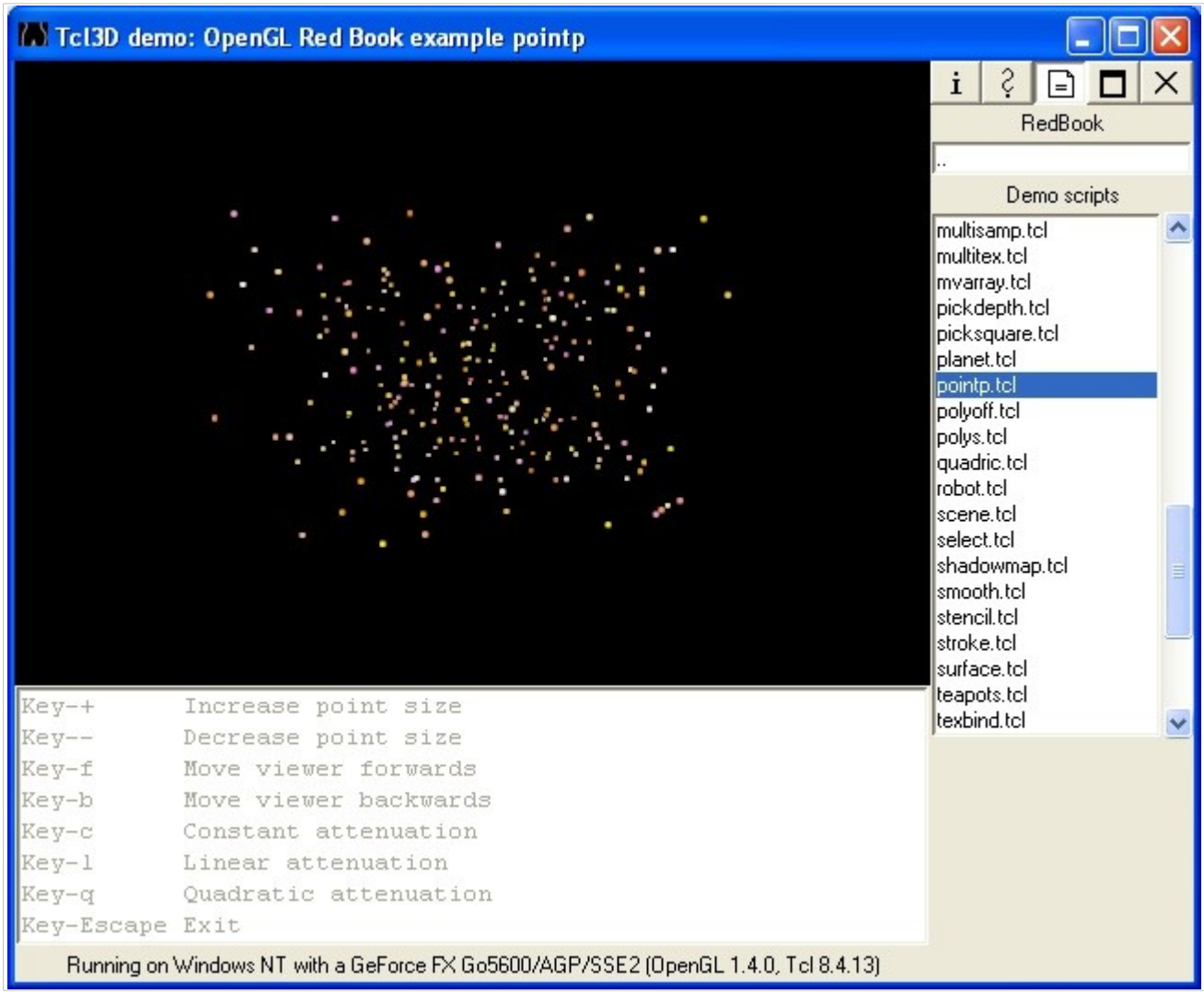
This program shows how to composite modeling transformations
to draw translated and rotated models.
Interaction:  pressing the d and y keys (day and year)
alters the rotation of the planet around the sun.
```

Demo:	**pointp**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
pointp.tcl

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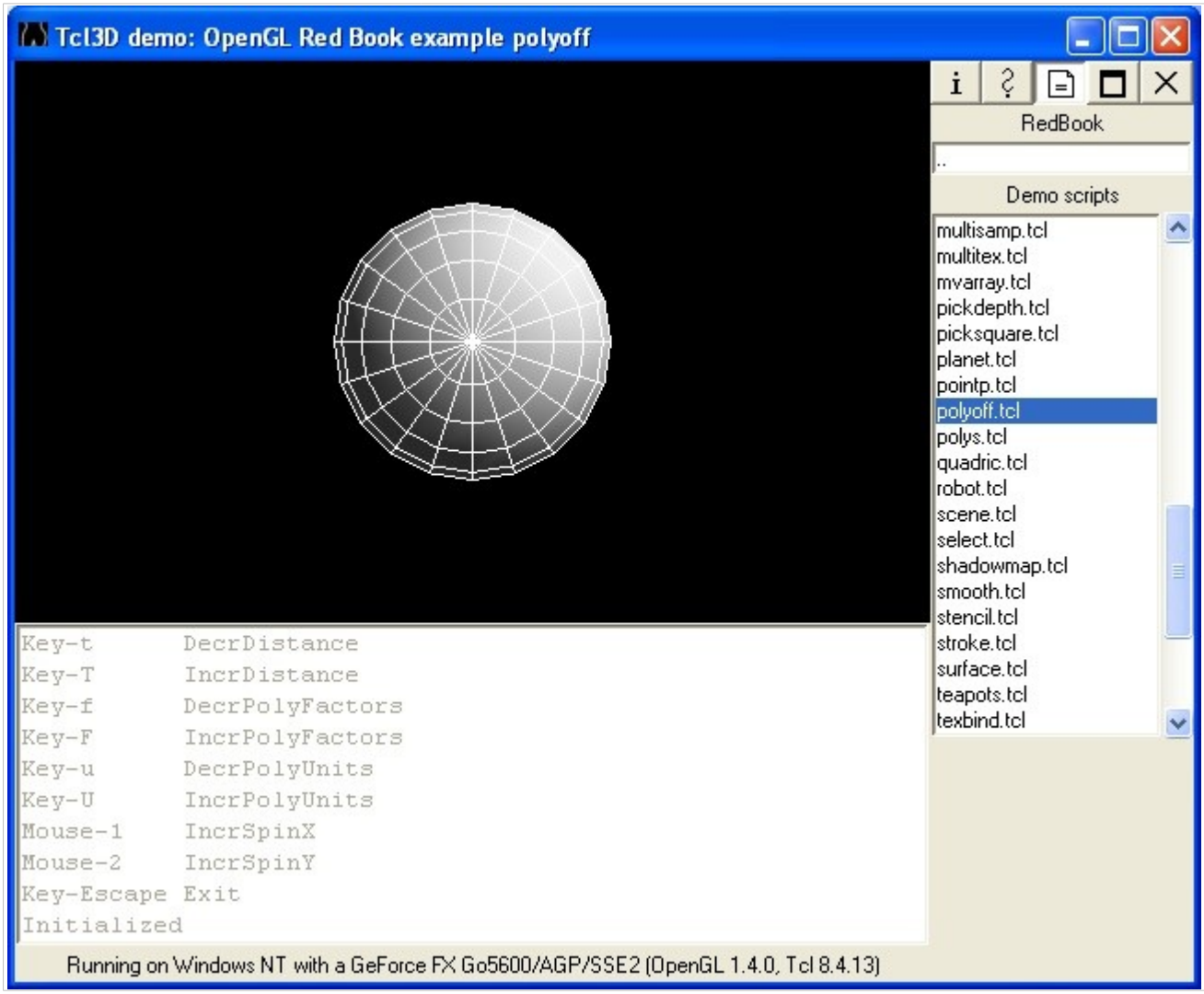
This program demonstrates point parameters and their effect
on point primitives.
250 points are randomly generated within a 10 by 10 by 40
region, centered at the origin.  In some modes (including the
default), points that are closer to the viewer will appear larger.

Pressing the 'l', 'q', and 'c' keys switch the point
parameters attenuation mode to linear, quadratic, or constant,
respectively.
Pressing the 'f' and 'b' keys move the viewer forward
and backwards.  In either linear or quadratic attenuation
mode, the distance from the viewer to the point will change
the size of the point primitive.
Pressing the '+' and '-' keys will change the current point
size. In this program, the point size is bounded, so it
```

```
will not get less than 2.0, nor greater than GL_POINT_SIZE_MAX.
```

Demo:	**polyoff**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
polyoff.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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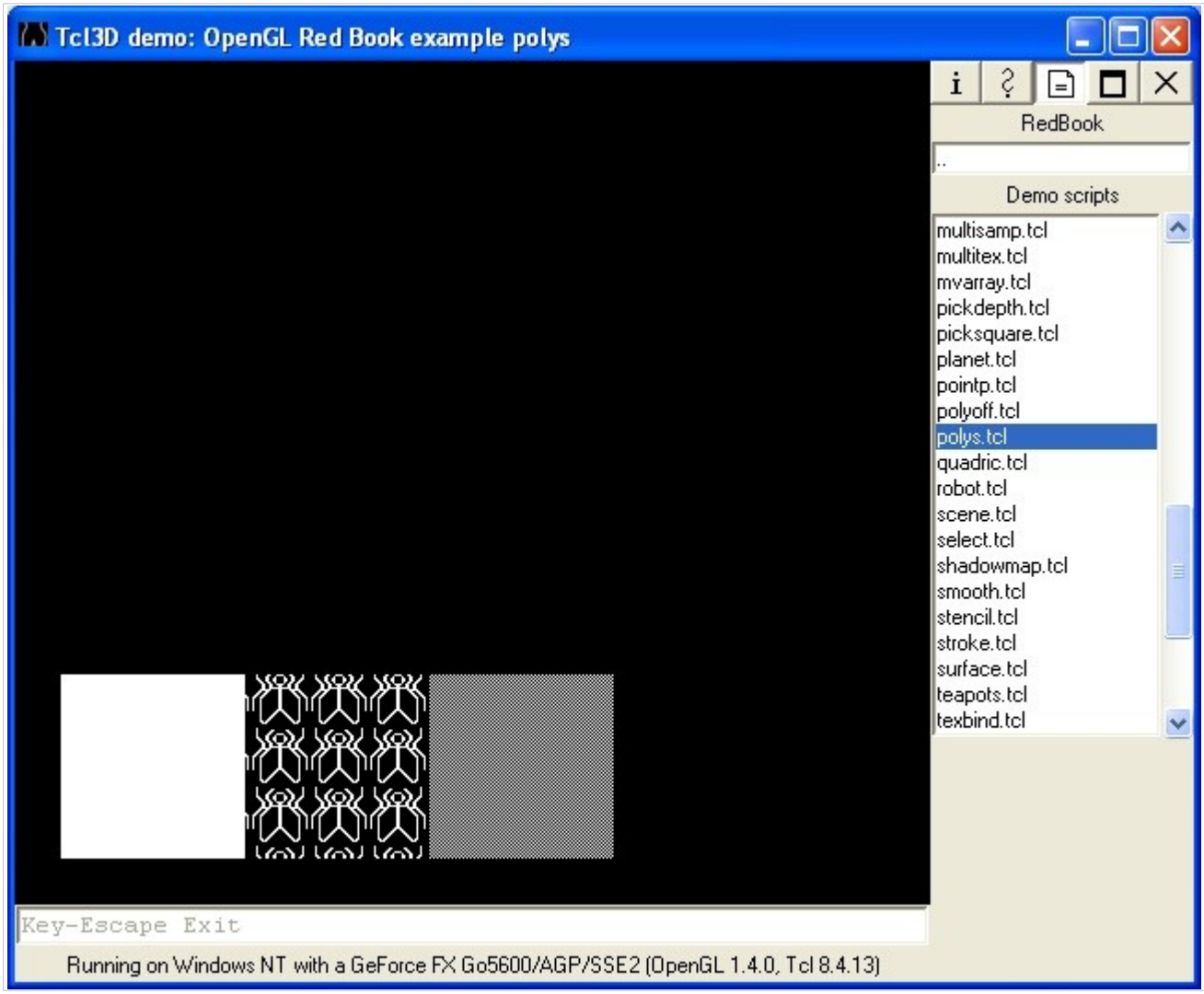
This program demonstrates polygon offset to draw a shaded
polygon and its wireframe counterpart without ugly visual
artifacts ("stitching").
```

Demo:	**polys**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
polys.tcl

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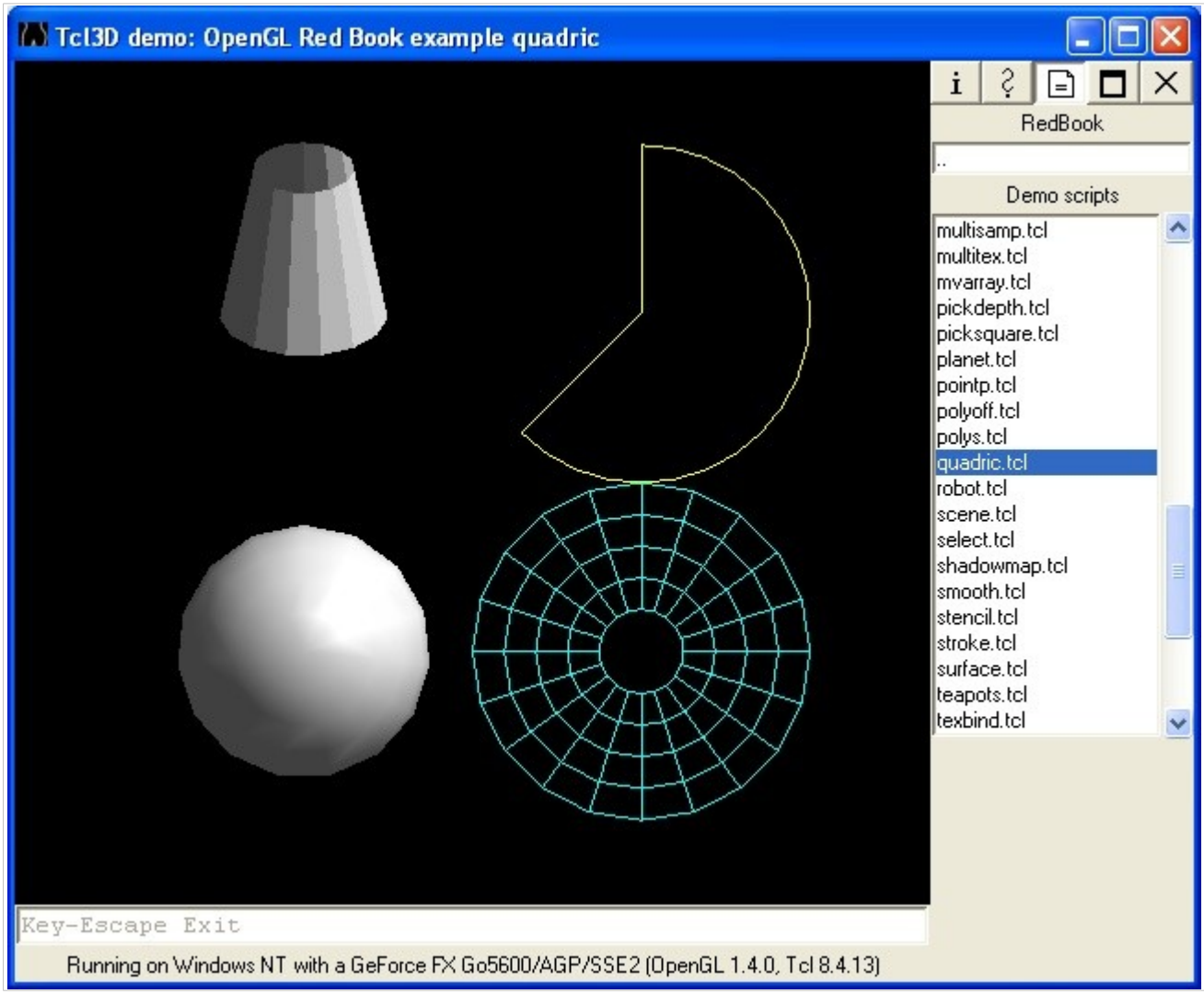
This program demonstrates polygon stippling.
```

Demo:	**quadric**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
quadric.tcl

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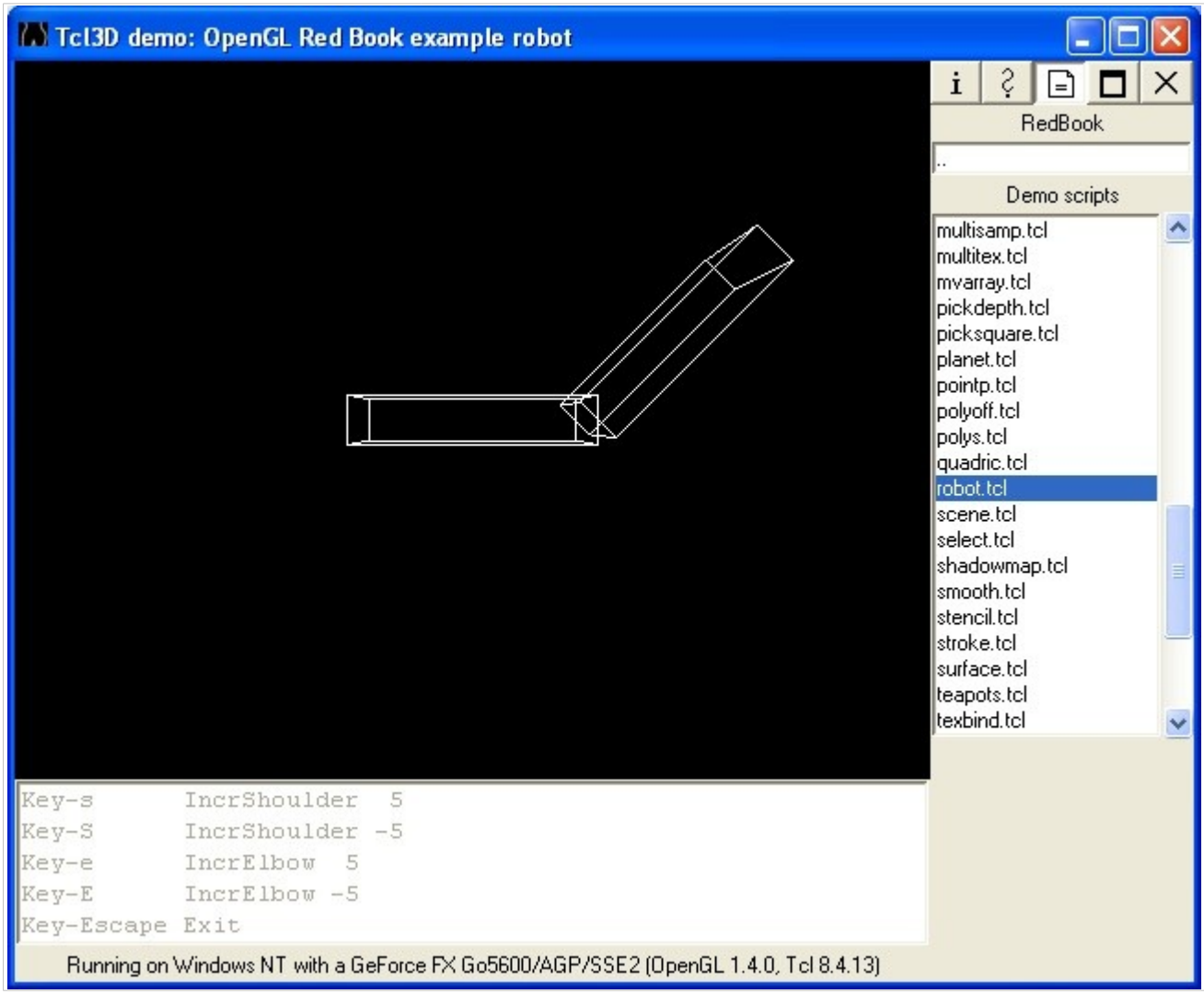
This program demonstrates the use of some of the gluQuadric*
routines. Quadric objects are created with some quadric
properties and the callback routine to handle errors.
Note that the cylinder has no top or bottom and the circle
has a hole in it.
```

Demo:	**robot**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
robot.tcl

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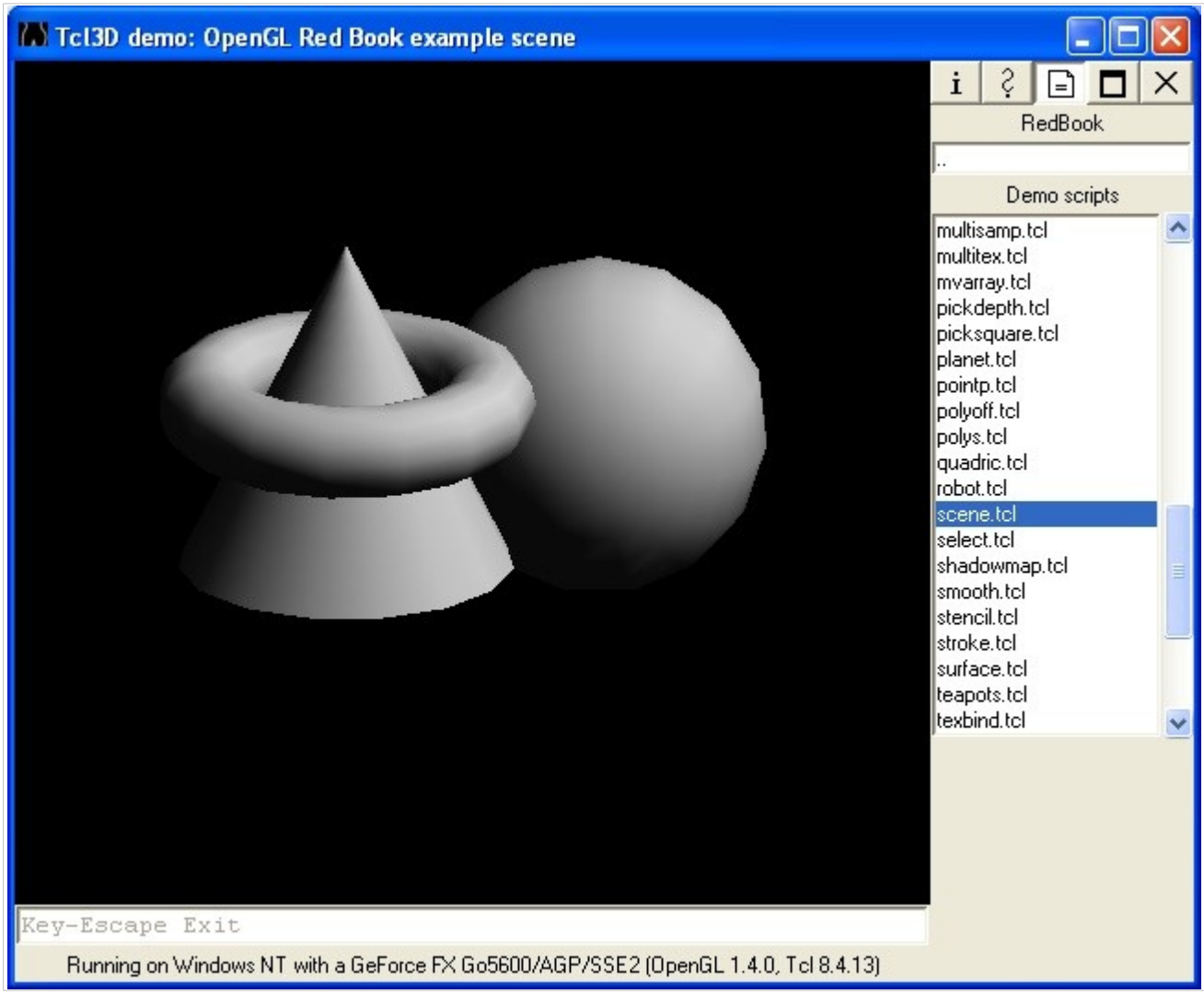
This program shows how to composite modeling transformations
to draw translated and rotated hierarchical models.
Interaction:  pressing the s and e keys (shoulder and elbow)
alters the rotation of the robot arm.
```

Demo:	**scene**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
scene.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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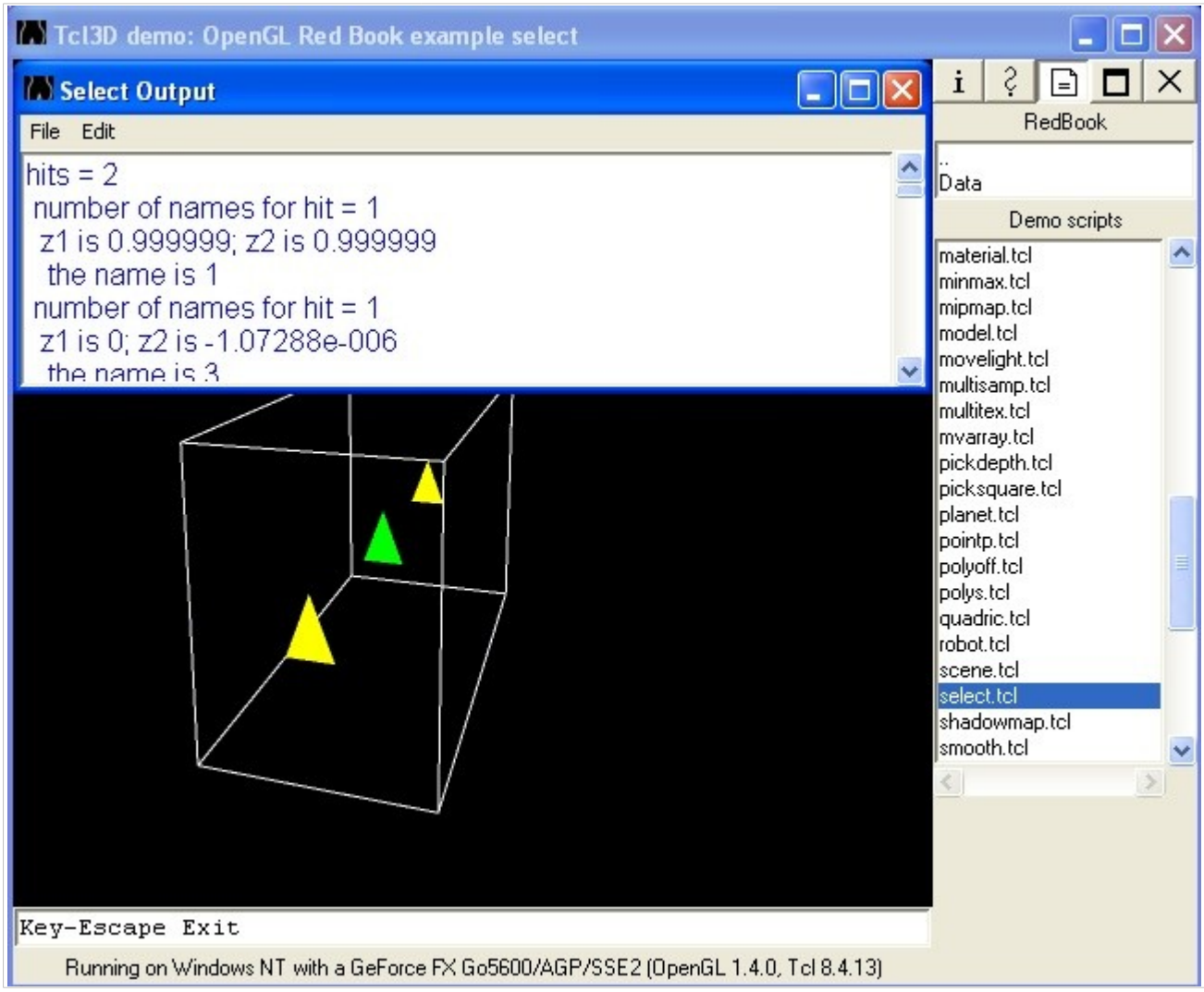
This program demonstrates the use of the GL lighting model.
Objects are drawn using a grey material characteristic.
A single light source illuminates the objects.
```

Demo:	**select**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
select.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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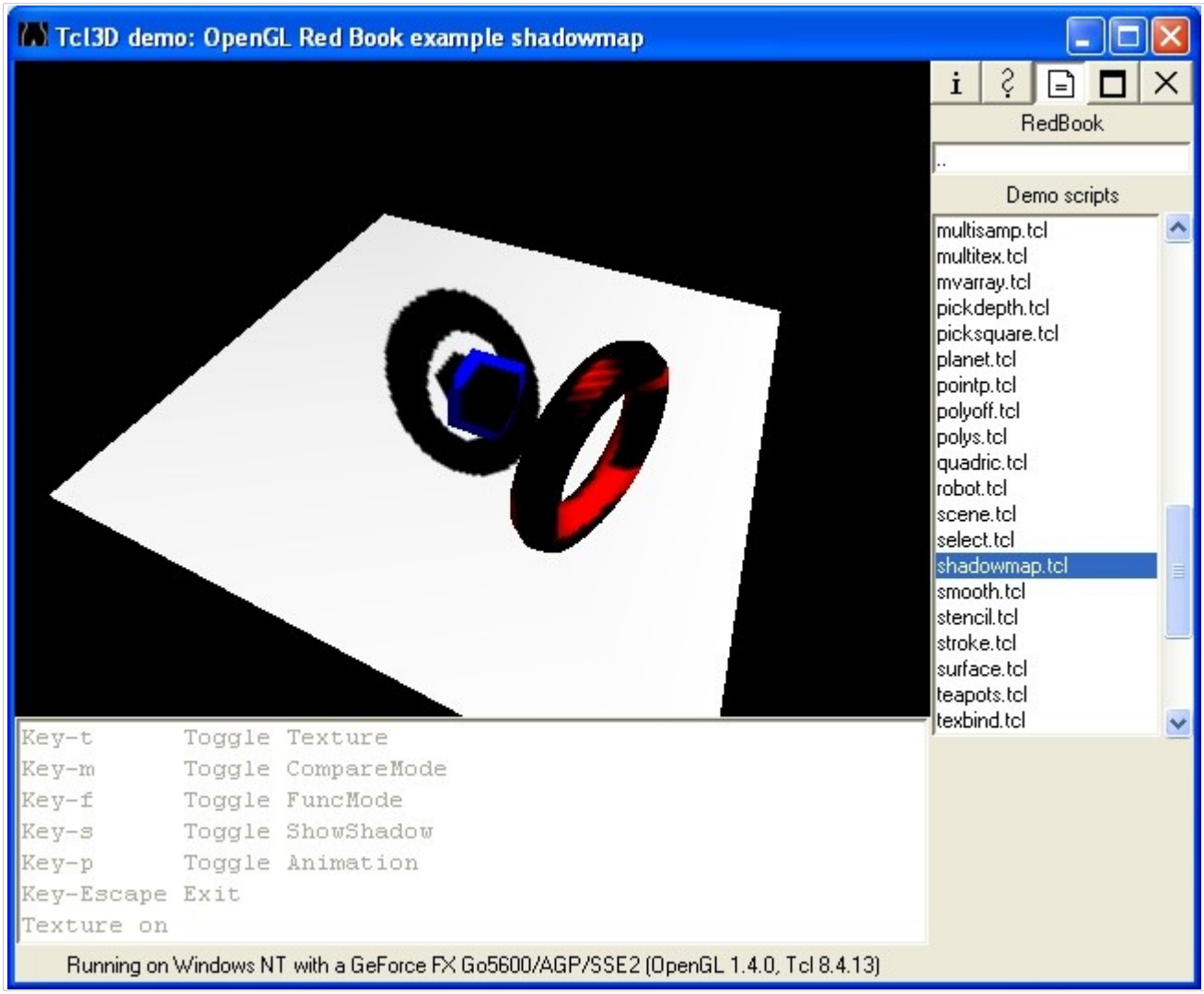
This is an illustration of the selection mode and
name stack, which detects whether objects which collide
with a viewing volume.  First, four triangles and a
rectangular box representing a viewing volume are drawn
(drawScene routine).  The green triangle and yellow
triangles appear to lie within the viewing volume, but
the red triangle appears to lie outside it.  Then the
selection mode is entered (selectObjects routine).
Drawing to the screen ceases.  To see if any collisions
occur, the four triangles are called.  In this example,
the green triangle causes one hit with the name 1, and
the yellow triangles cause one hit with the name 3.
```

Demo:	**shadowmap**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
shadowmap.tcl

An example of the OpenGL red book modified to work with Tcl3D.
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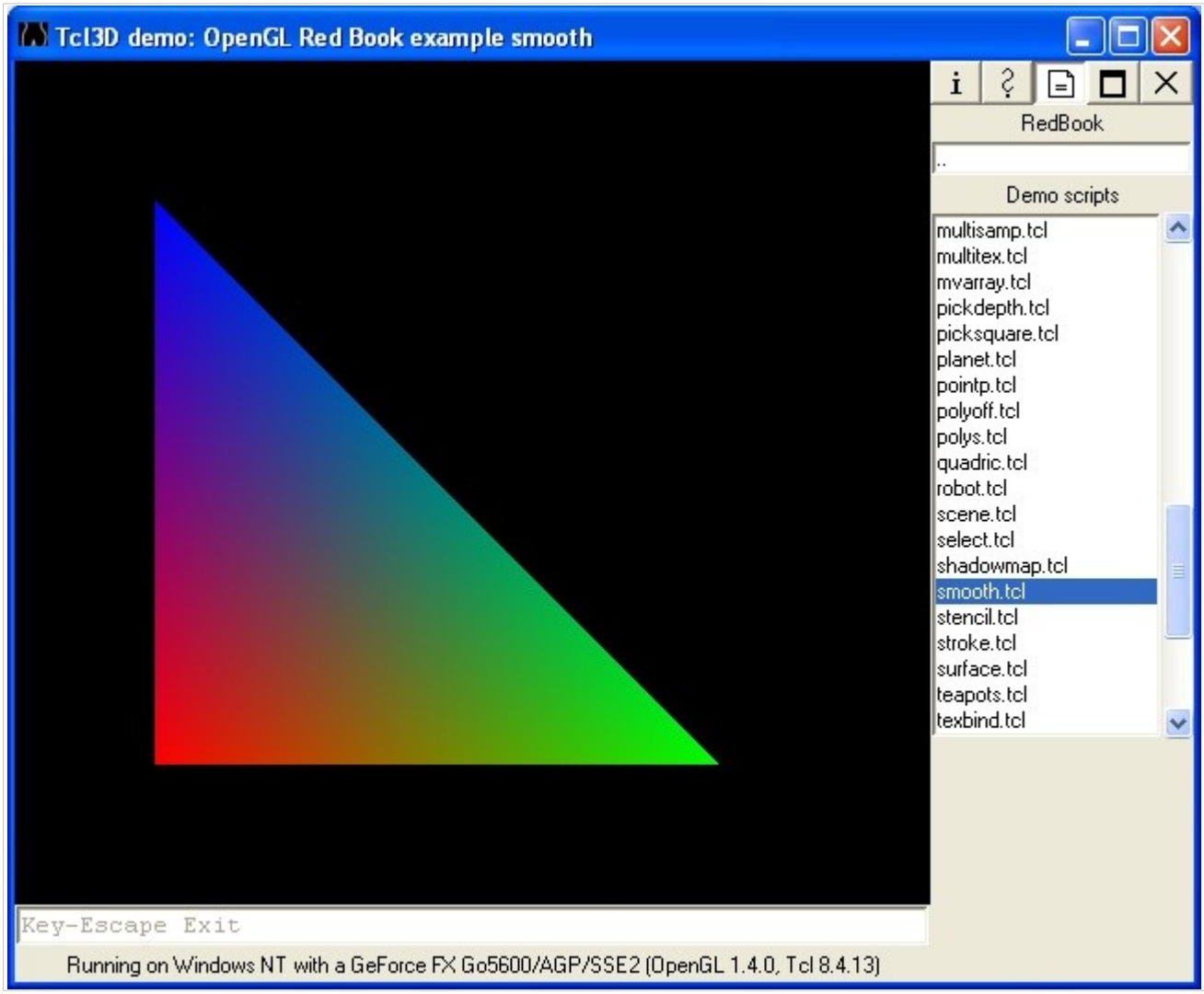
```

Demo:	**smooth**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

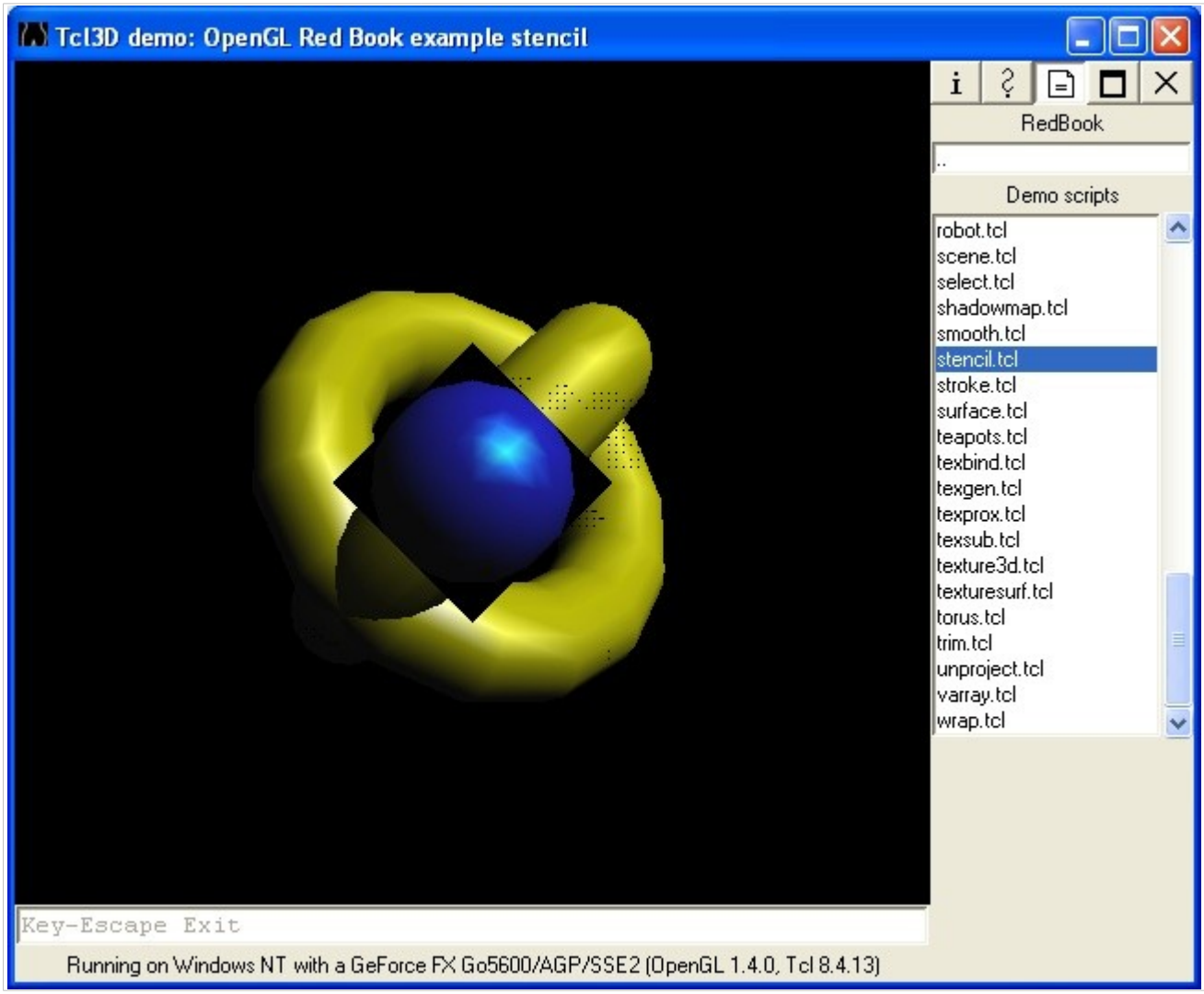



```
smooth.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

This program demonstrates smooth shading.
A smooth shaded polygon is drawn in a 2-D projection.
```

Demo:	**stencil**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

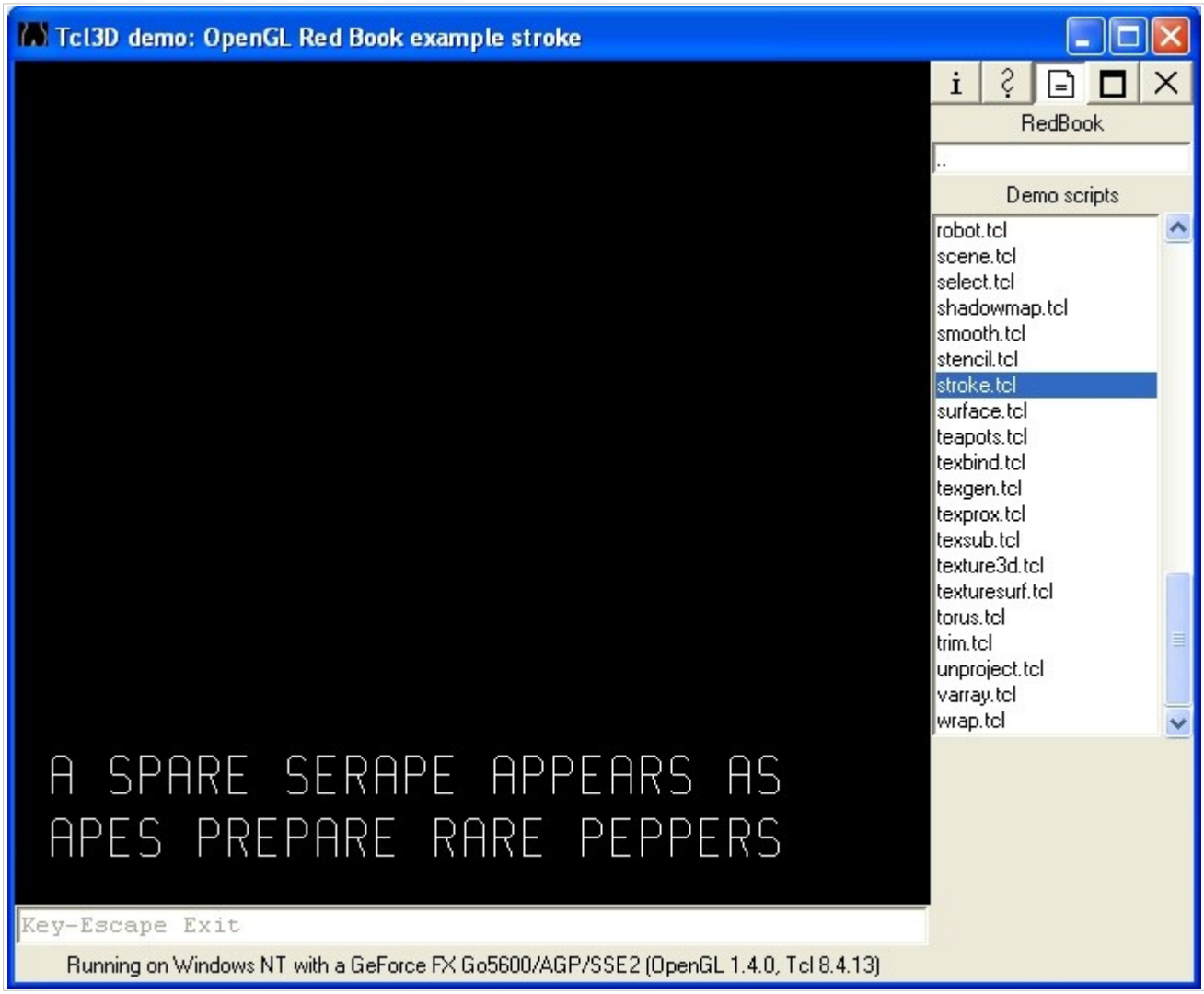



```
stencil.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

This program demonstrates use of the stencil buffer for
masking nonrectangular regions.
Whenever the window is redrawn, a value of 1 is drawn
into a diamond-shaped region in the stencil buffer.
Elsewhere in the stencil buffer, the value is 0.
Then a blue sphere is drawn where the stencil value is 1,
and yellow torii are drawn where the stencil value is not 1.
```

Demo:	**stroke**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

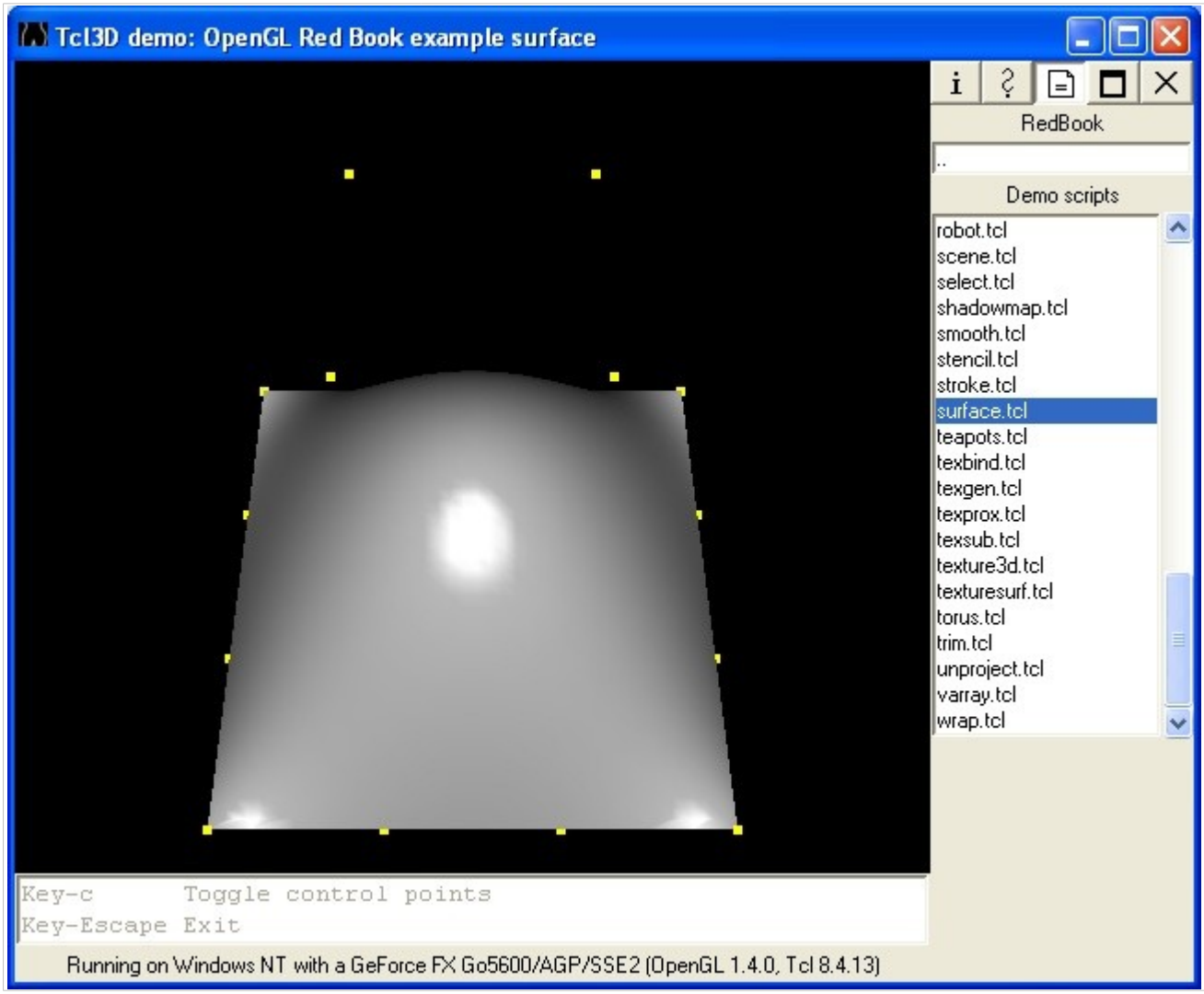



```
stroke.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

This program demonstrates some characters of a
stroke (vector) font.  The characters are represented
by display lists, which are given numbers which
correspond to the ASCII values of the characters.
Use of glCallLists() is demonstrated.
```

Demo:	**surface**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
surface.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
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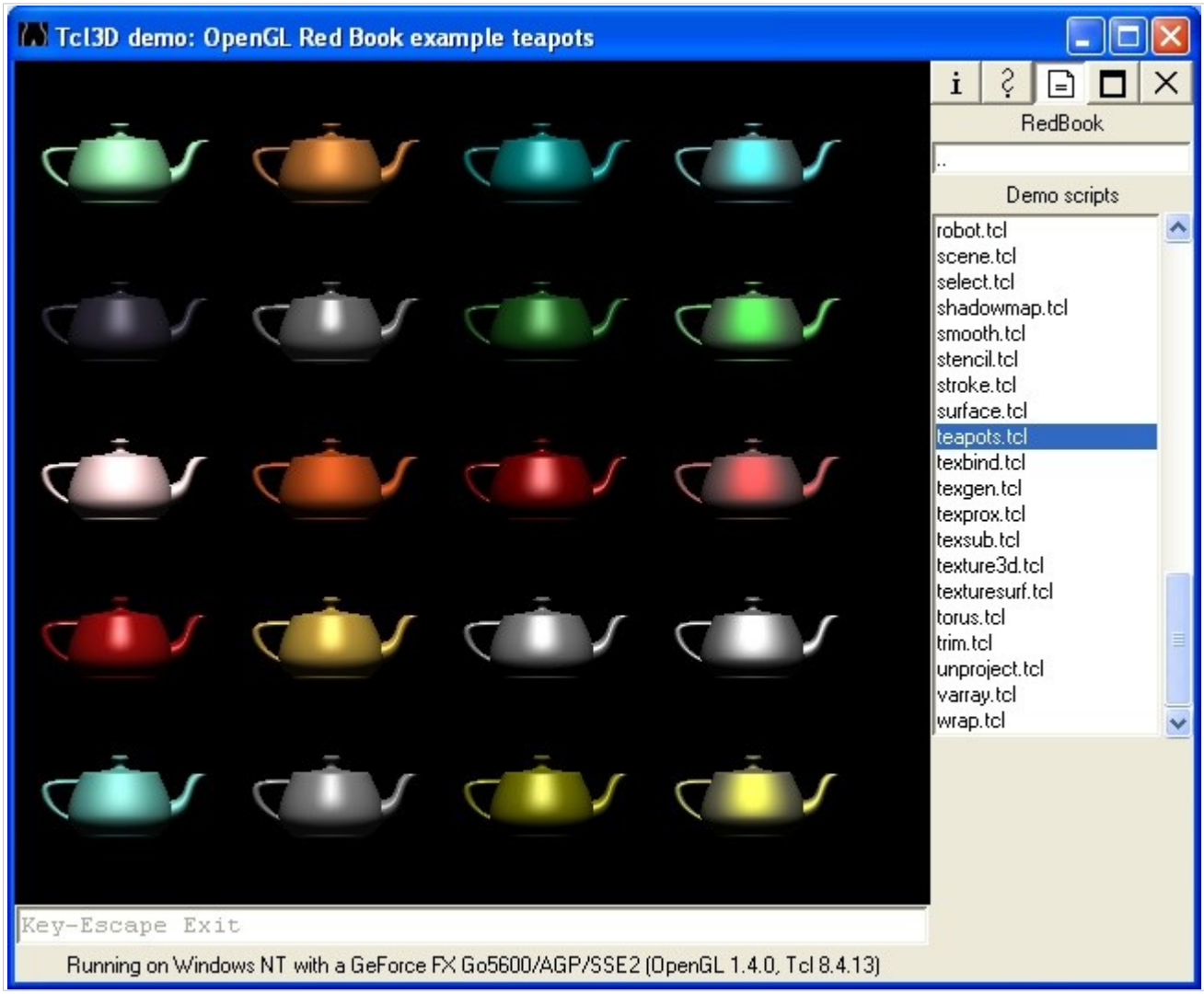
This program draws a NURBS surface in the shape of a
symmetrical hill. The 'c' keyboard key allows you to
toggle the visibility of the control points themselves.
Note that some of the control points are hidden by the
surface itself.
```

Demo:	**teapots**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

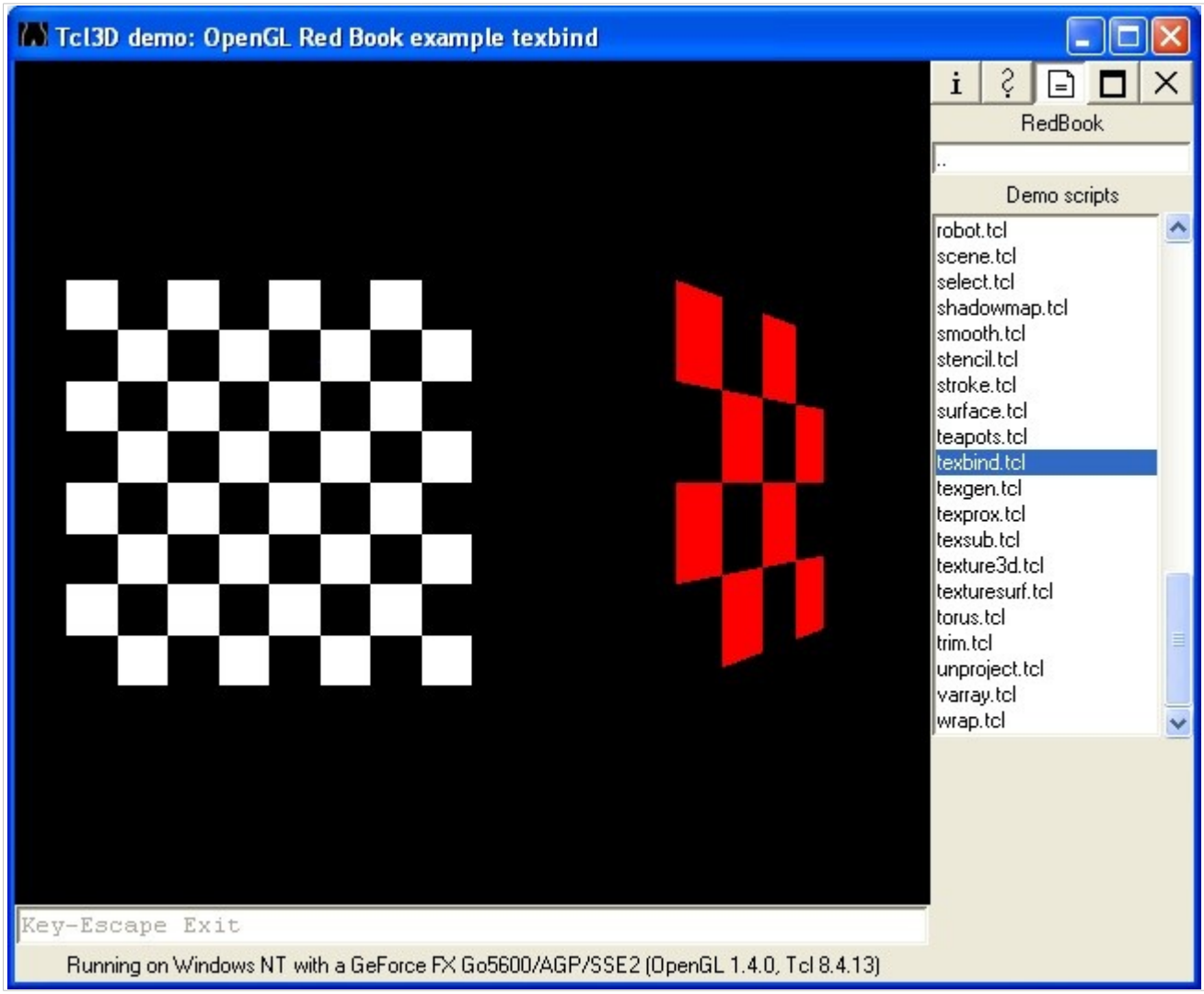



```
teapots.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

This program demonstrates lots of material properties.
A single light source illuminates the objects.
```

Demo:	**texbind**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
texbind.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
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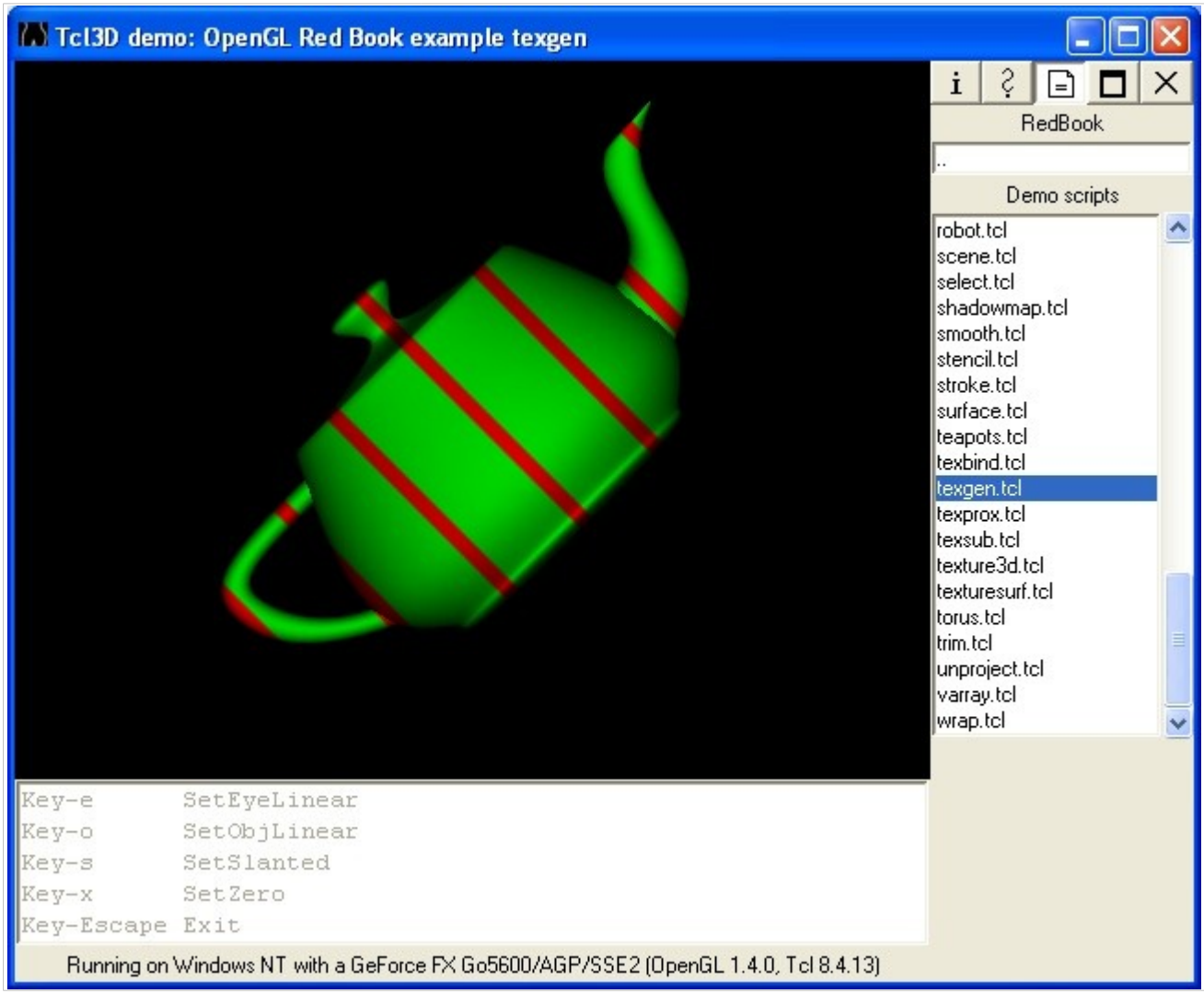
This program demonstrates using glBindTexture() by
creating and managing two textures.
```

Demo:	**texgen**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
texgen.c

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
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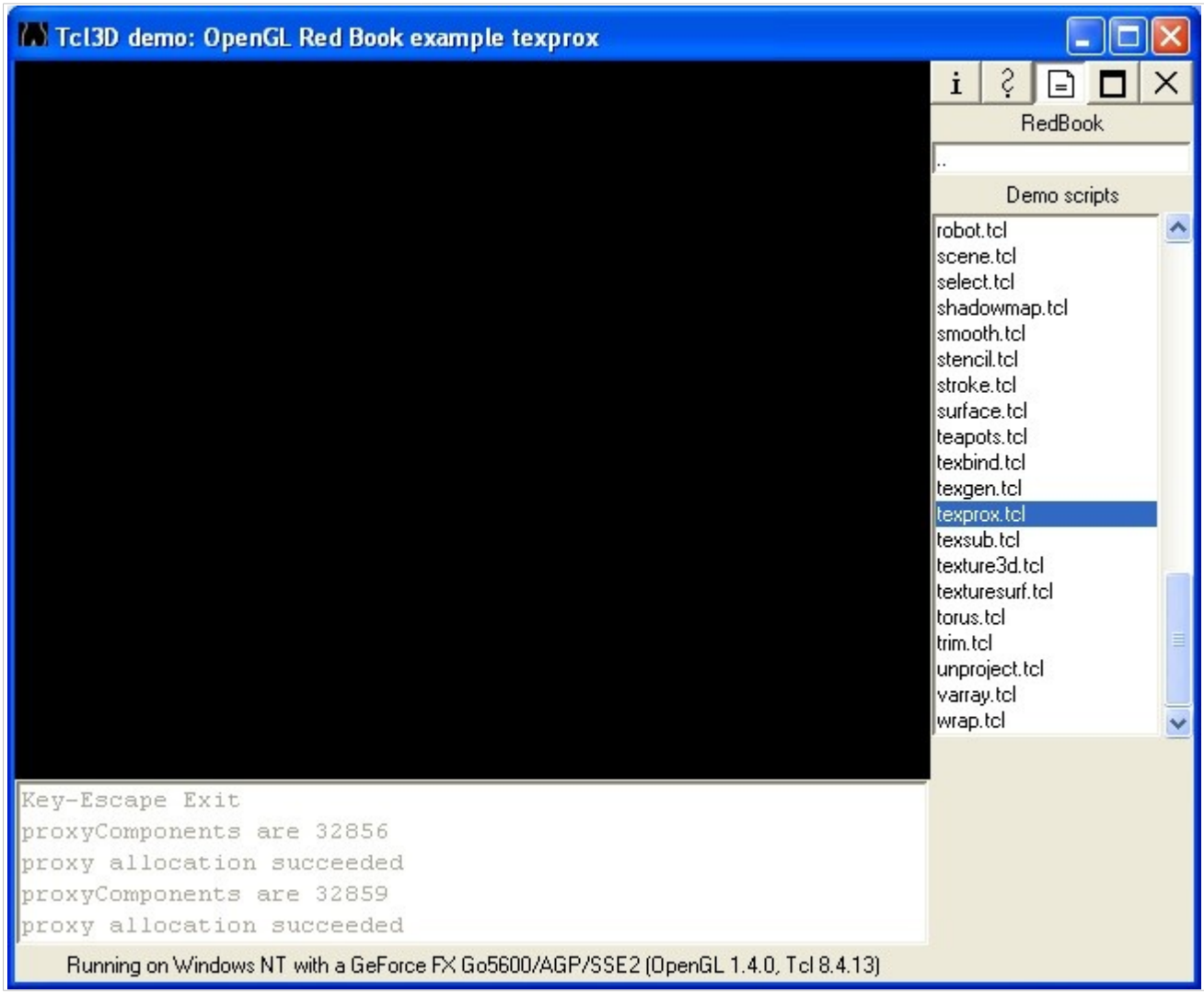
This program draws a texture mapped teapot with
automatically generated texture coordinates.  The
texture is rendered as stripes on the teapot.
Initially, the object is drawn with texture coordinates
based upon the object coordinates of the vertex
and distance from the plane x = 0.  Pressing the 'e'
key changes the coordinate generation to eye coordinates
of the vertex. Pressing the 'o' key switches it back
to the object coordinates.  Pressing the 's' key
changes the plane to a slanted one (x + y + z = 0).
Pressing the 'x' key switches it back to x = 0.
```

Demo:	**texprox**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

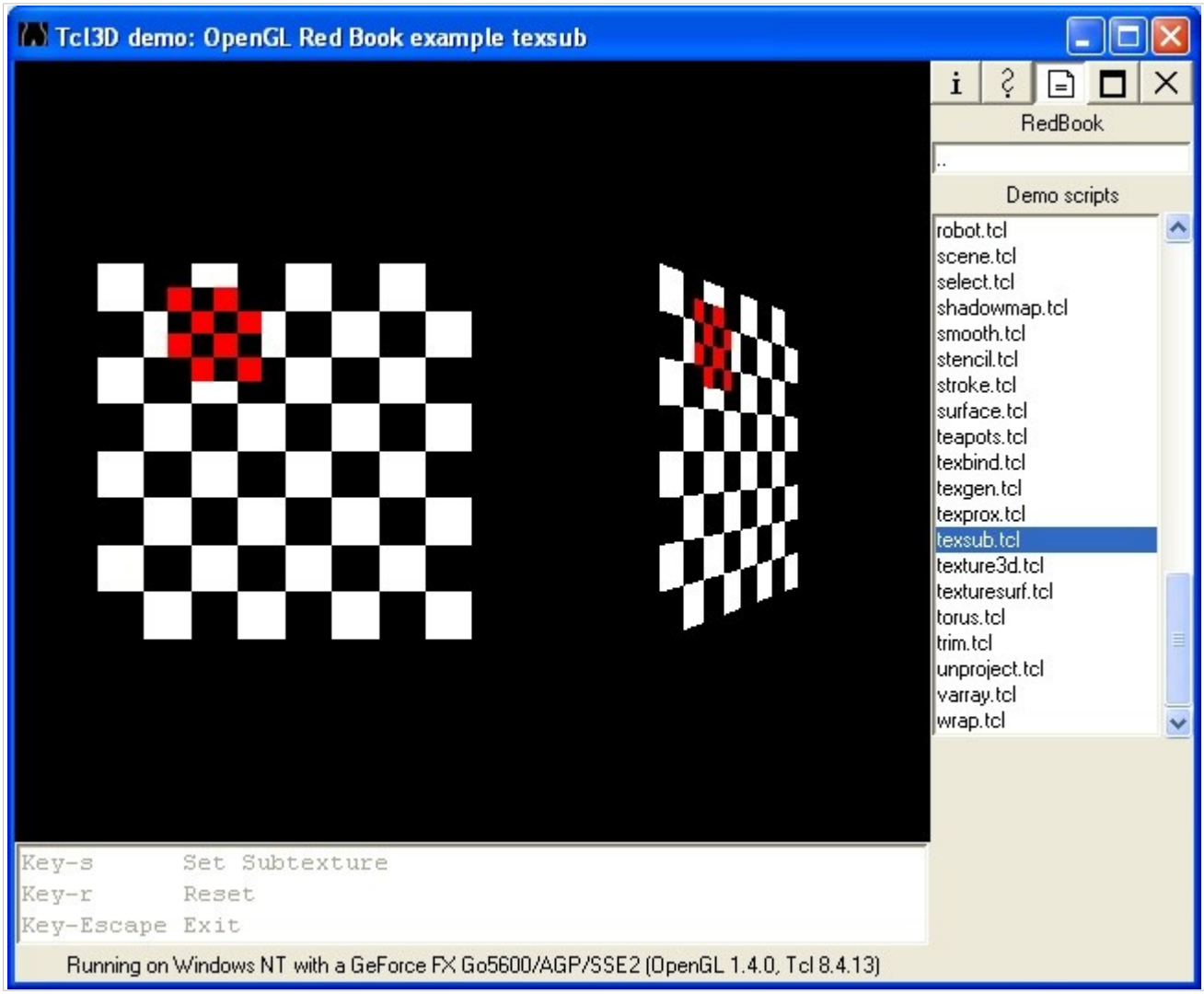



```
texprox.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

The brief program illustrates use of texture proxies.
This program only prints out some messages about whether
certain size textures are supported and then exits.
```

Demo:	**texsub**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

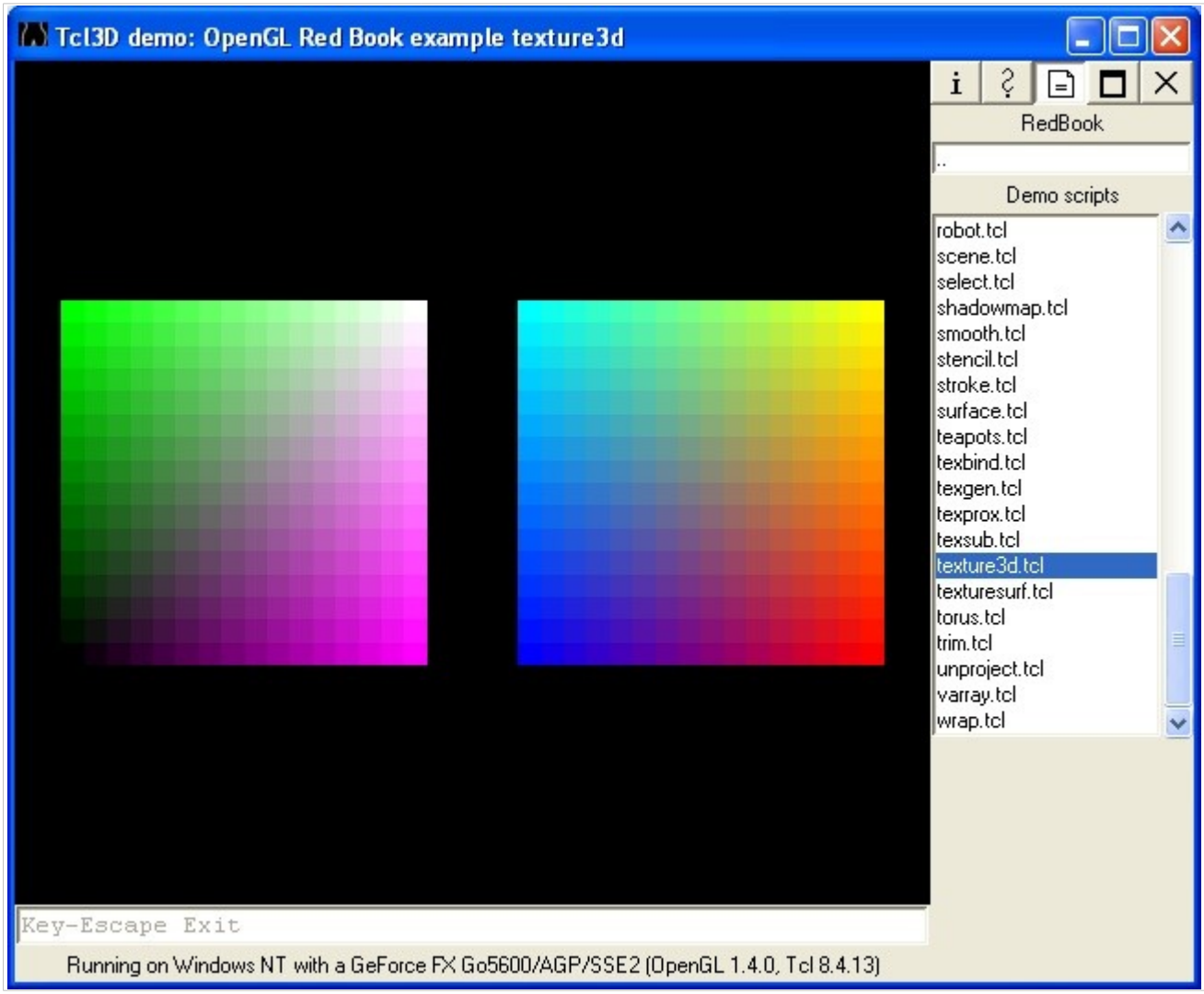



```
texsub.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

This program texture maps a checkerboard image onto
two rectangles.  This program clamps the texture, if
the texture coordinates fall outside 0.0 and 1.0.
If the s key is pressed, a texture subimage is used to
alter the original texture.  If the r key is pressed,
the original texture is restored.
```

Demo:	**texture3d**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
texture3d.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
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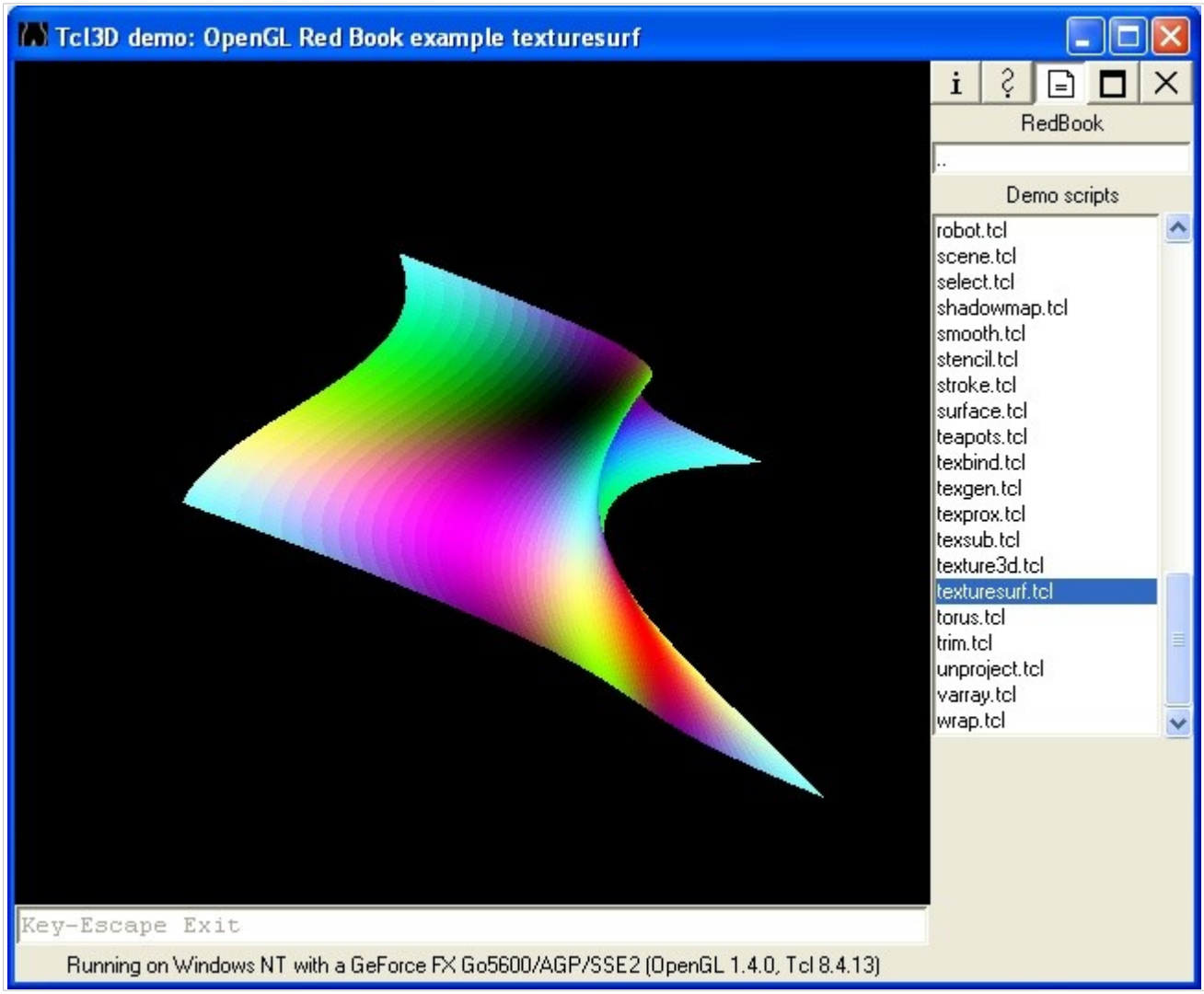
This program demonstrates using a three-dimensional texture.
It creates a 3D texture and then renders two rectangles
with different texture coordinates to obtain different
"slices" of the 3D texture.
```

Demo:	**texturesurf**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
texturesurf.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
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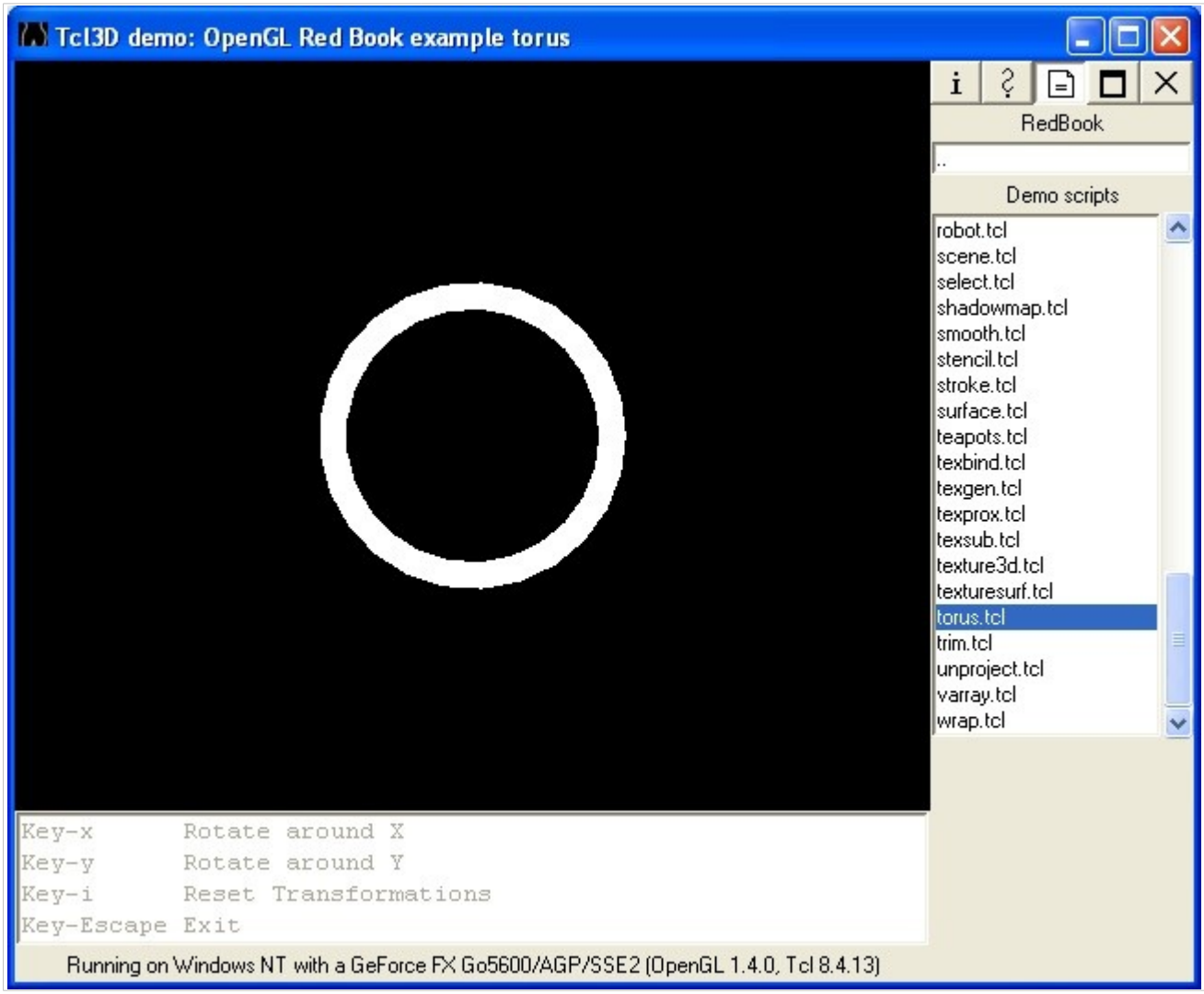
This program uses evaluators to generate a curved
surface and automatically generated texture coordinates.
```

Demo:	**torus**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

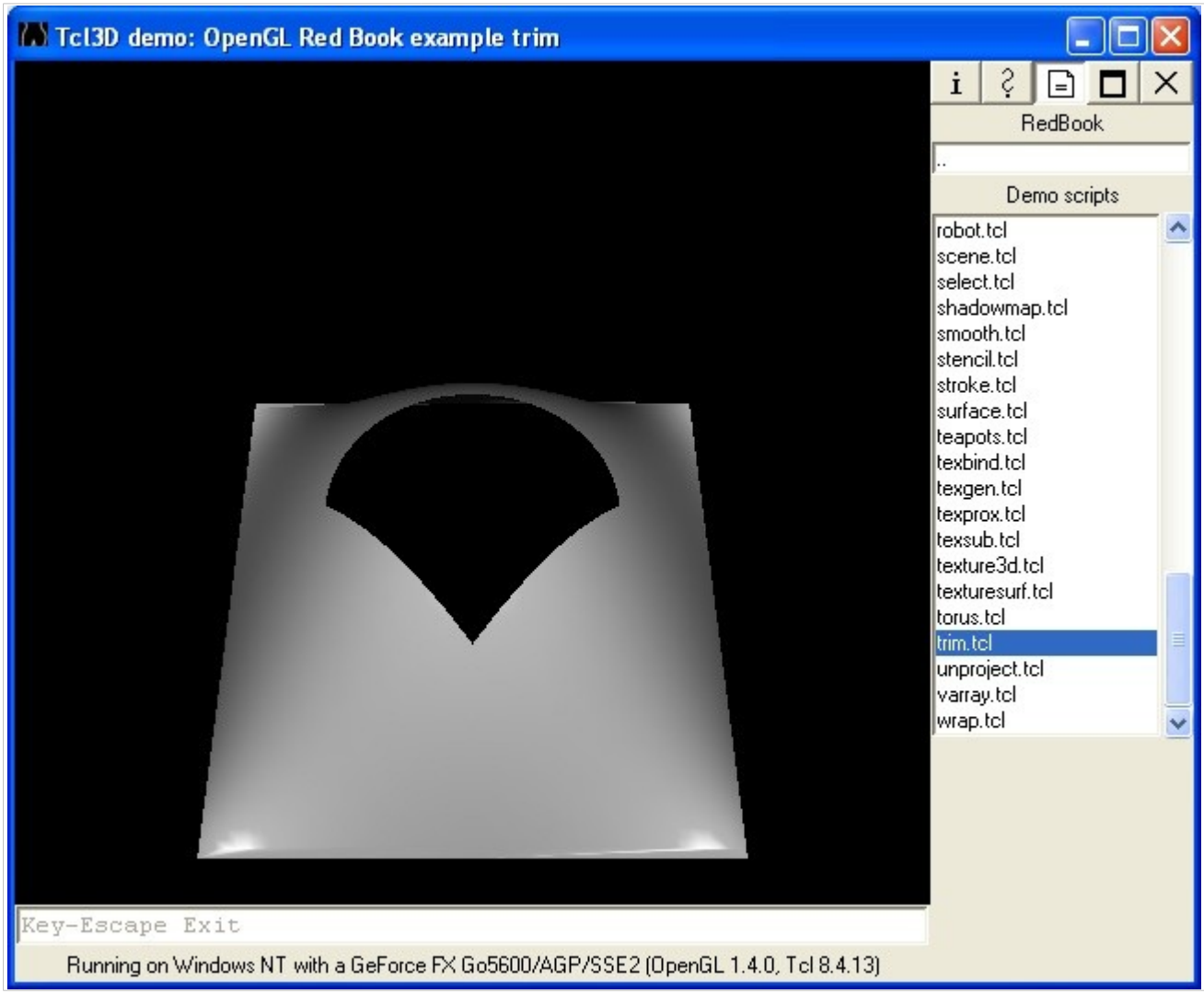



```
torus.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

This program demonstrates the creation of a display list.
```

Demo:	**trim**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

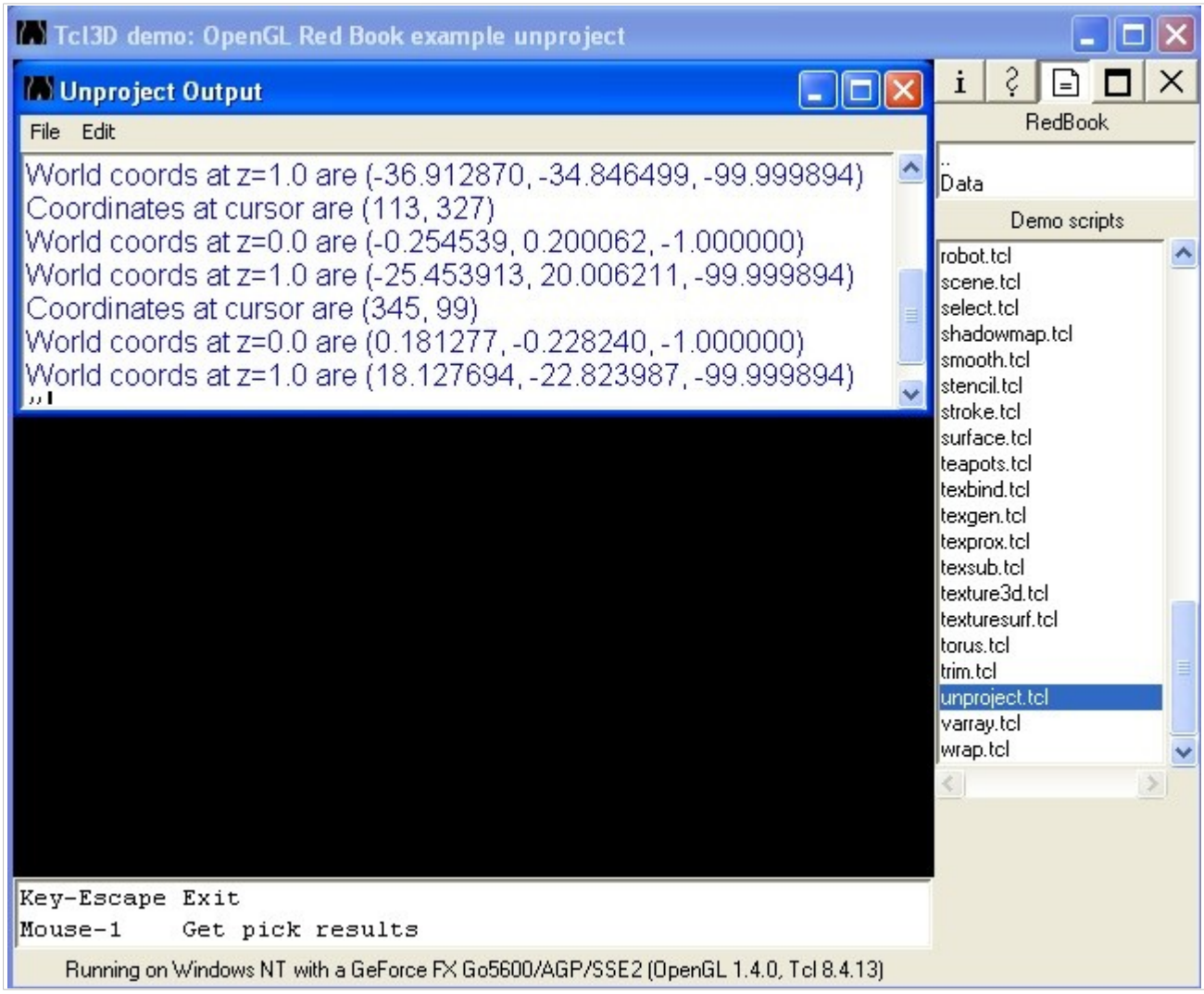



```
trim.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

This program draws a NURBS surface in the shape of a
symmetrical hill, using both a NURBS curve and pwl
(piecewise linear) curve to trim part of the surface.
```

Demo:	**unproject**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

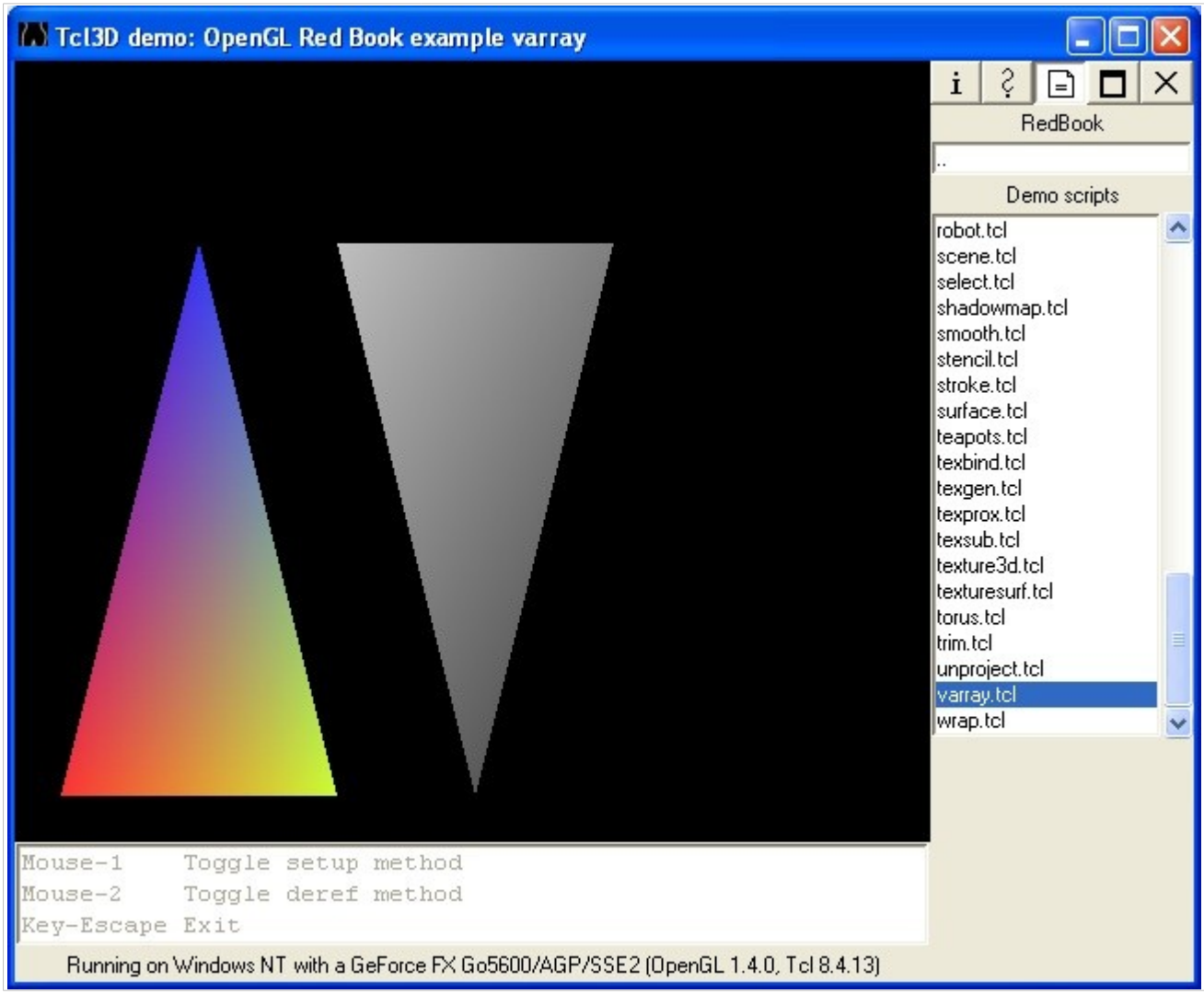



```
unproject.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

When the left mouse button is pressed, this program
reads the mouse position and determines two 3D points
from which it was transformed. Very little is displayed.
```

Demo:	**varray**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents

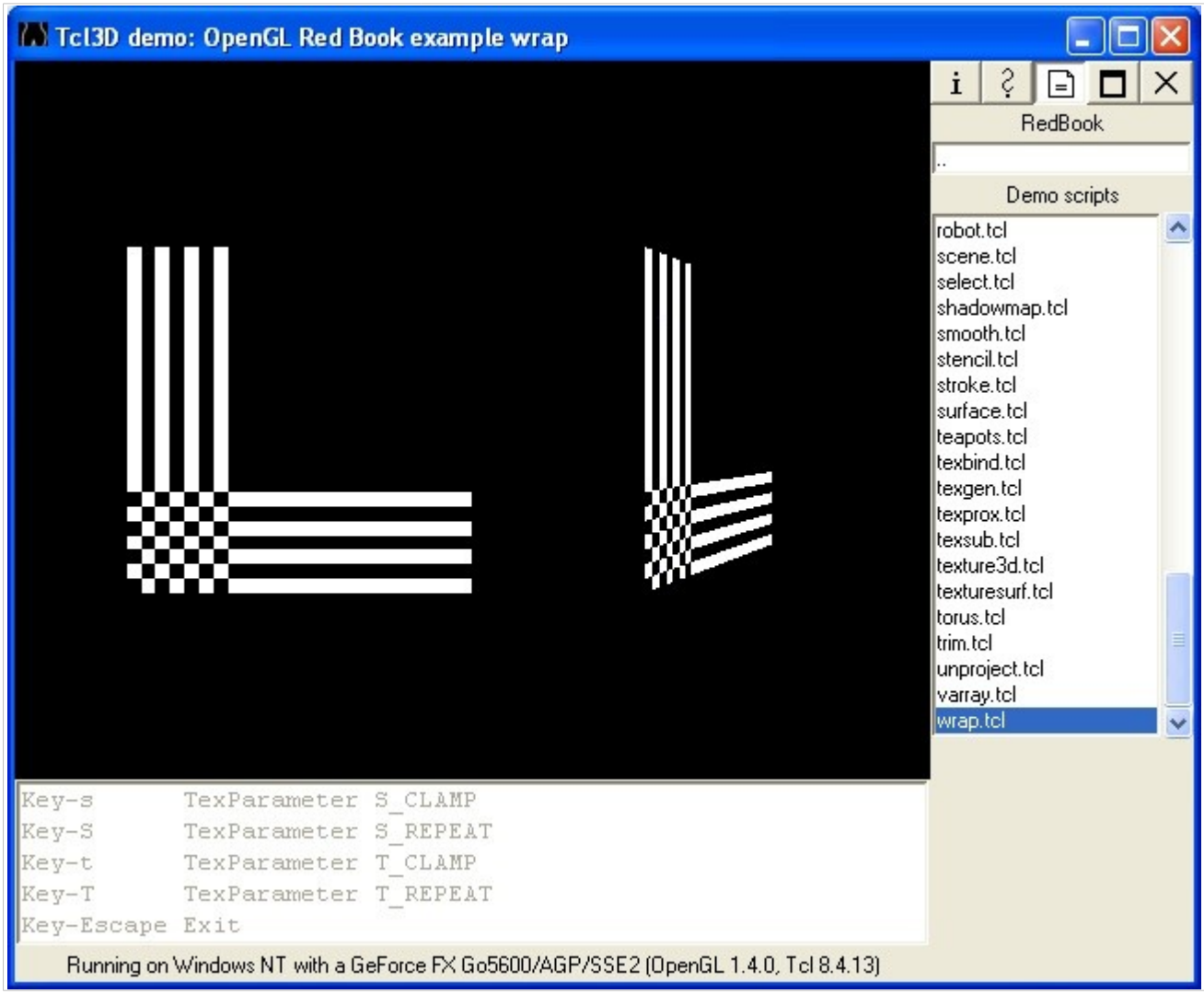



```
varray.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

This program demonstrates vertex arrays.
```

Demo:	**wrap**
Type:	RedBook
Category:	TutorialsAndBooks
Root:	Contents




```
wrap.tcl

An example of the OpenGL red book modified to work with Tcl3D.
The original C sources are Copyright (c) 1993-2003, Silicon Graphics, Inc.
The Tcl3D sources are Copyright (c) 2005, Paul Obermeier.
See file LICENSE for complete license information.

This program texture maps a checkerboard image onto
two rectangles.  This program demonstrates the wrapping
modes, if the texture coordinates fall outside 0.0 and 1.0.
Interaction: Pressing the 's' and 'S' keys switch the
wrapping between clamping and repeating for the s parameter.
The 't' and 'T' keys control the wrapping for the t parameter.

If running this program on OpenGL 1.0, texture objects are
not used.
```

Category:	**OpenSceneGraph**
Root:	Contents
Types:	CubosLocos FopingTutorials NPS-Tutorials OsgHelp QuickStartGuide

Type:	**CubosLocos**
Category:	OpenSceneGraph
Root:	Contents

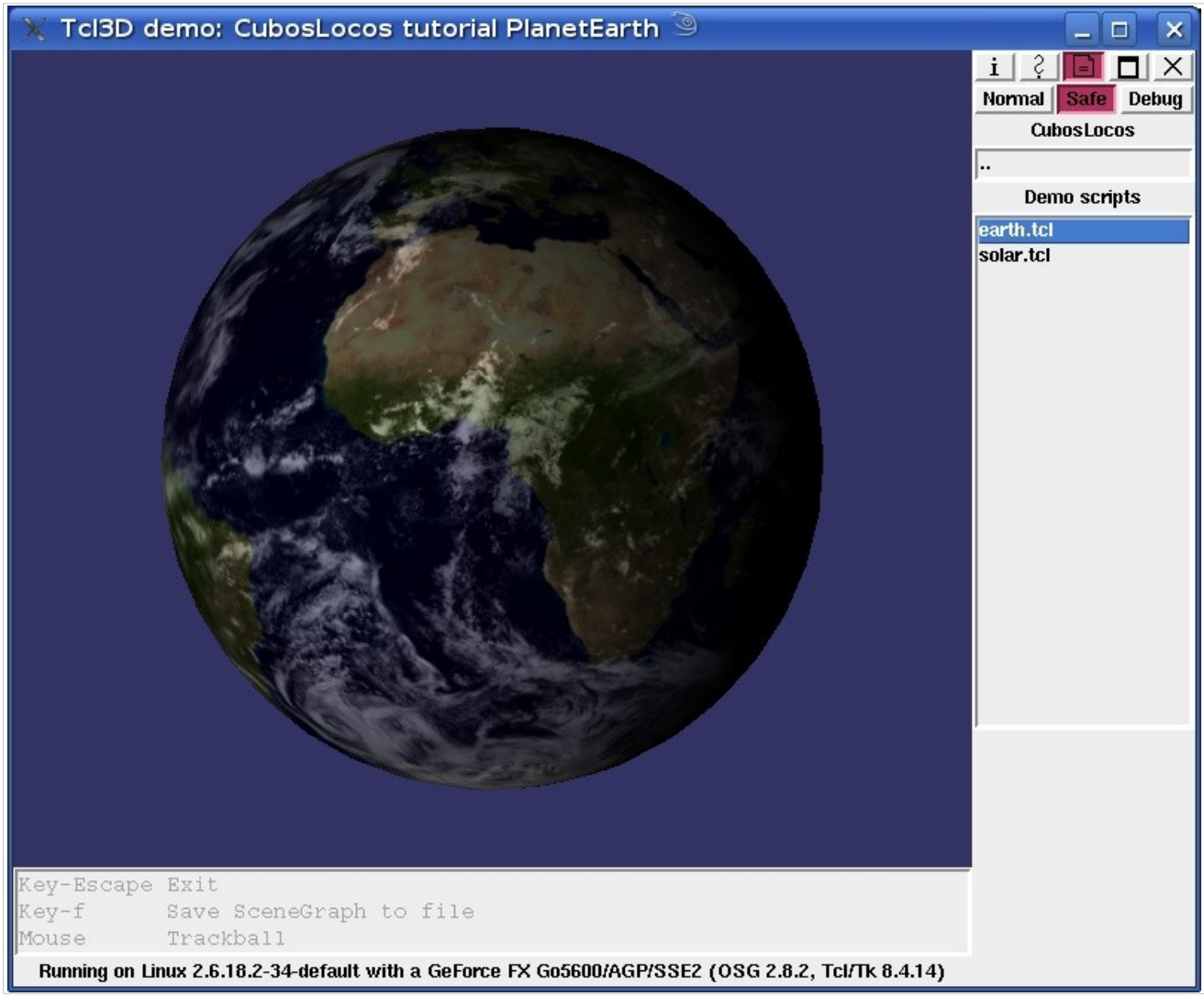
Some of the OpenSceneGraph tutorials from CubosLocos have been ported to run with Tcl3D. Original sources available at: http://www.cuboslocos.com/

Available demos

earth

solar

Demo:	**earth**
Type:	CubosLocos
Category:	OpenSceneGraph
Root:	Contents

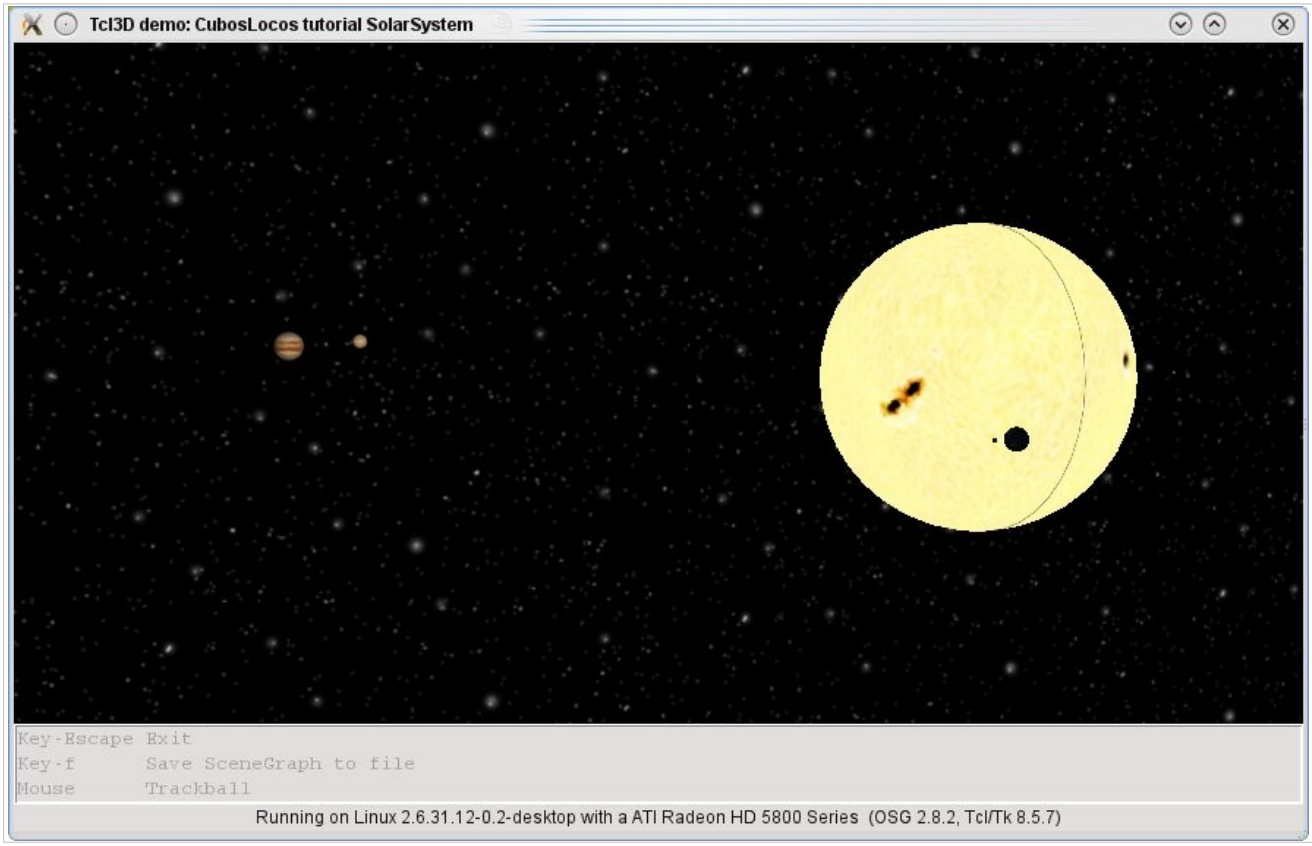



```
earth.tcl

Original C++ code by Katja Treiber and Matthias Schmidt.
See www.cuboslocos.com for the original files.

Modified for Tcl3D by Paul Obermeier 2009/08/30.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**solar**
Type:	CubosLocos
Category:	OpenSceneGraph
Root:	Contents




```
solar.tcl

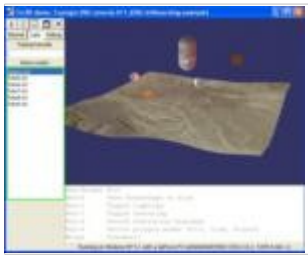
Original C++ code by Katja Treiber and Matthias Schmidt.
See www.cuboslocos.com for the original files.

Modified for Tcl3D by Paul Obermeier 2009/06/10.
See www.tcl3d.org for the Tcl3D extension.
```

Type:	**FopingTutorials**
Category:	OpenSceneGraph
Root:	Contents

Some of the OpenSceneGraph tutorials from Franclin Foping have been ported to run with Tcl3D.
Original sources available at: http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials/

Available demos



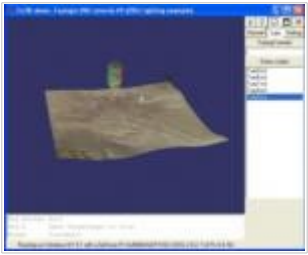
Tuto11

Tuto5

Tuto6

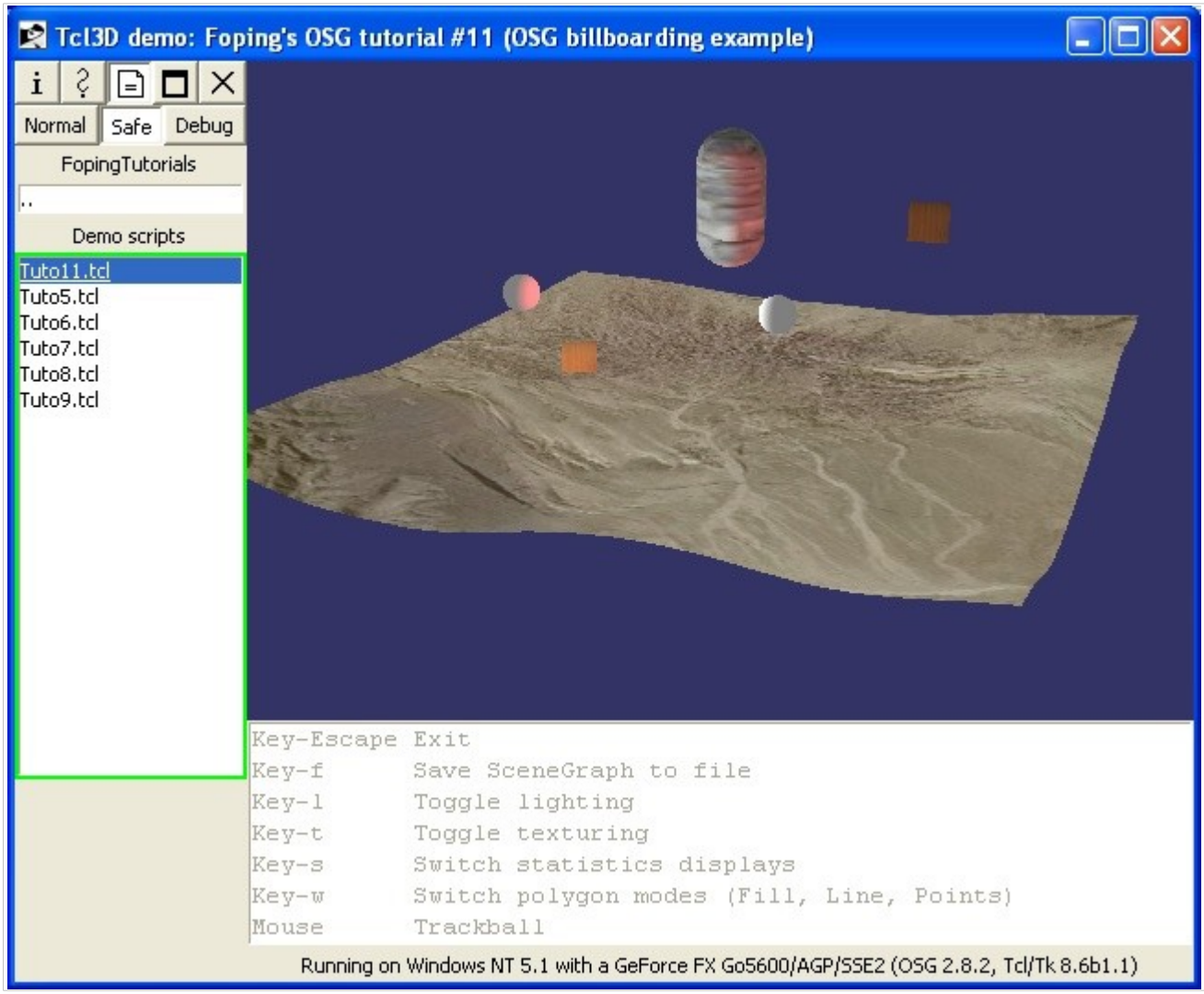
Tuto7

Tuto8



Tuto9

Demo:	**Tuto11**
Type:	FopingTutorials
Category:	OpenSceneGraph
Root:	Contents



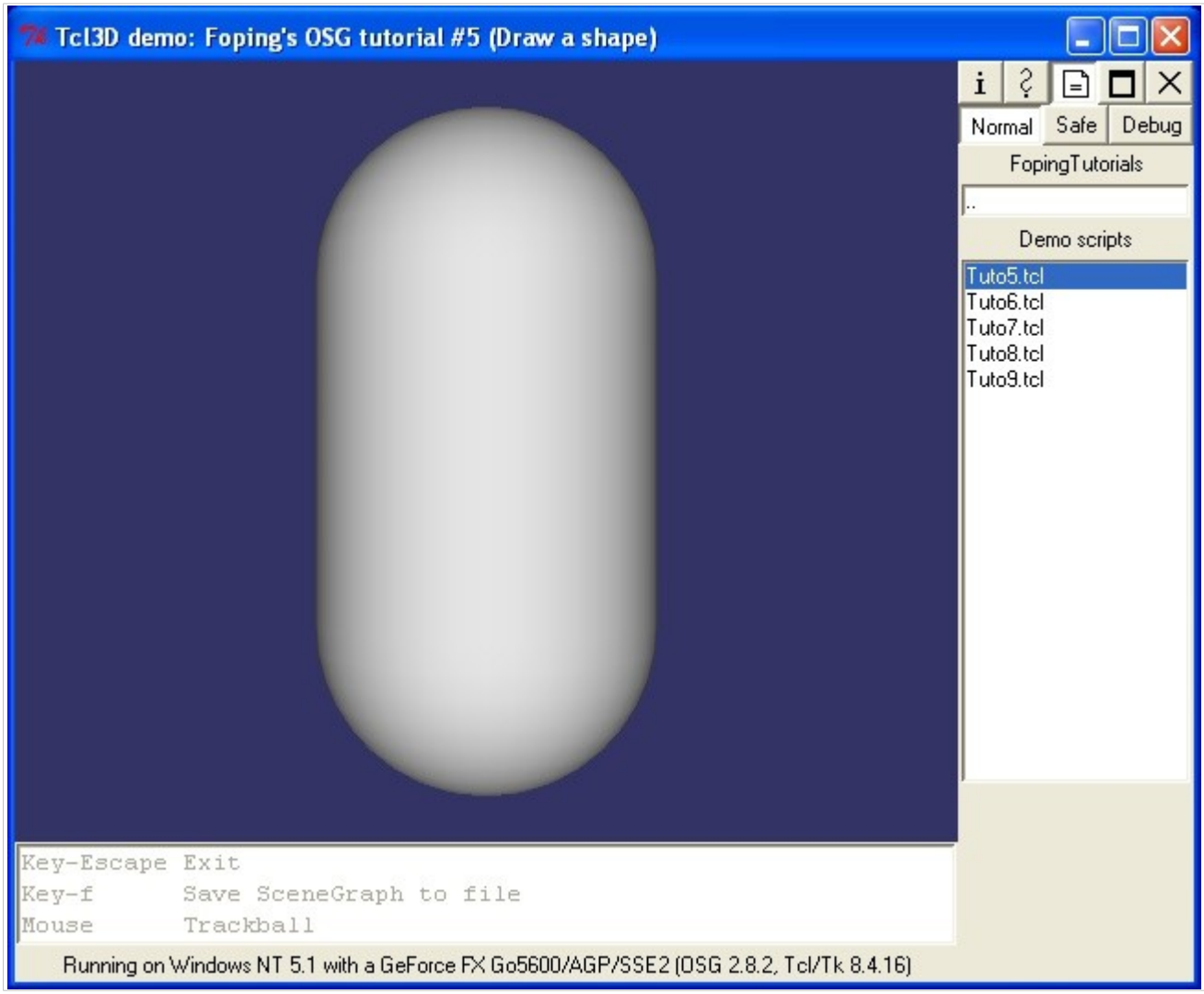

```
Tuto11.tcl: A billboarding effect

This tutorial will extend the previous one on lighting by adding
two billboard quads. These are also textured and shaded.

Original C++ code by Franclin Foping.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/06/10.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Tuto5**
Type:	FopingTutorials
Category:	OpenSceneGraph
Root:	Contents

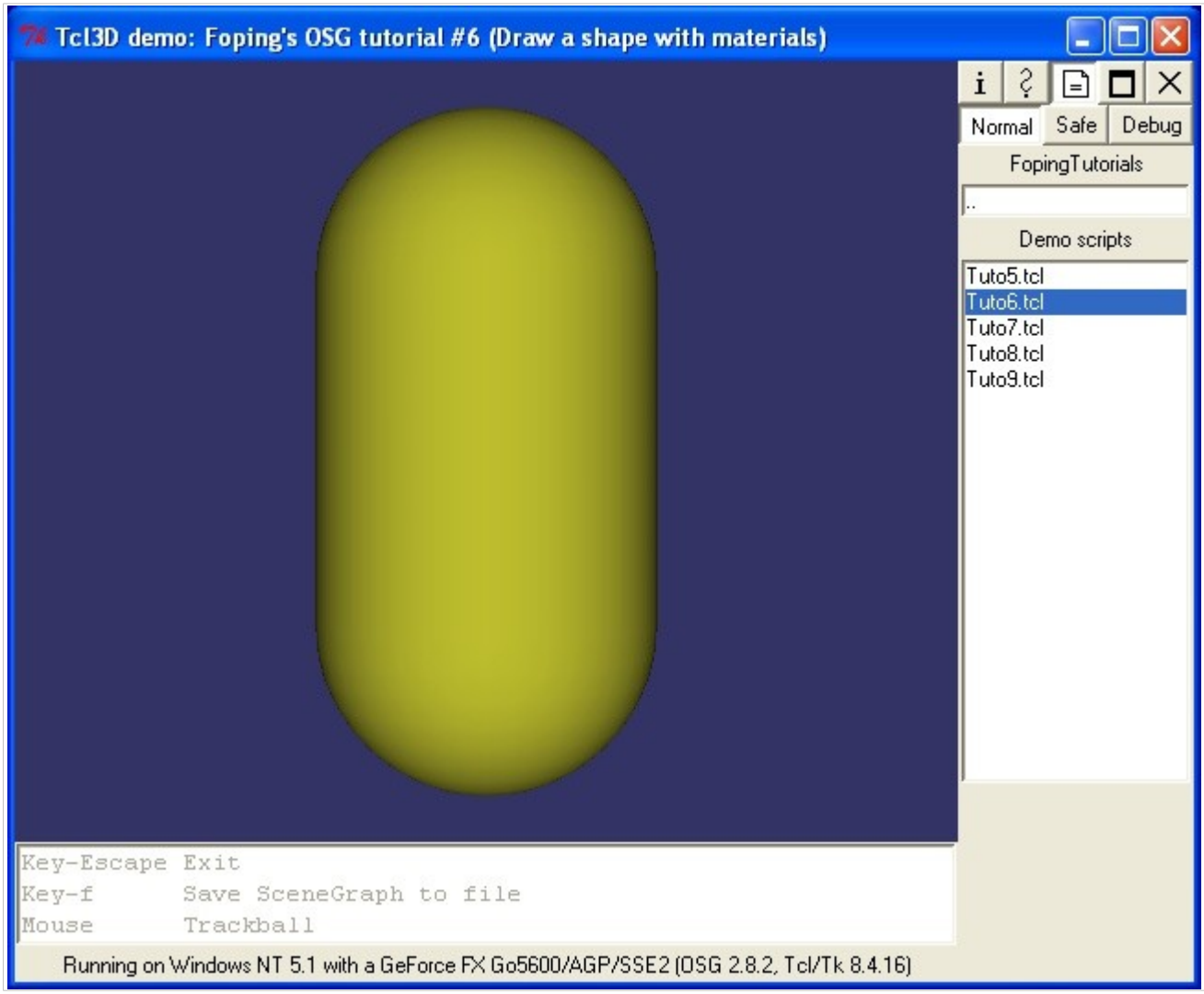



```
Tuto5.tcl: Draw a shape

Original C++ code by Franclin Foping.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Tuto6**
Type:	FopingTutorials
Category:	OpenSceneGraph
Root:	Contents

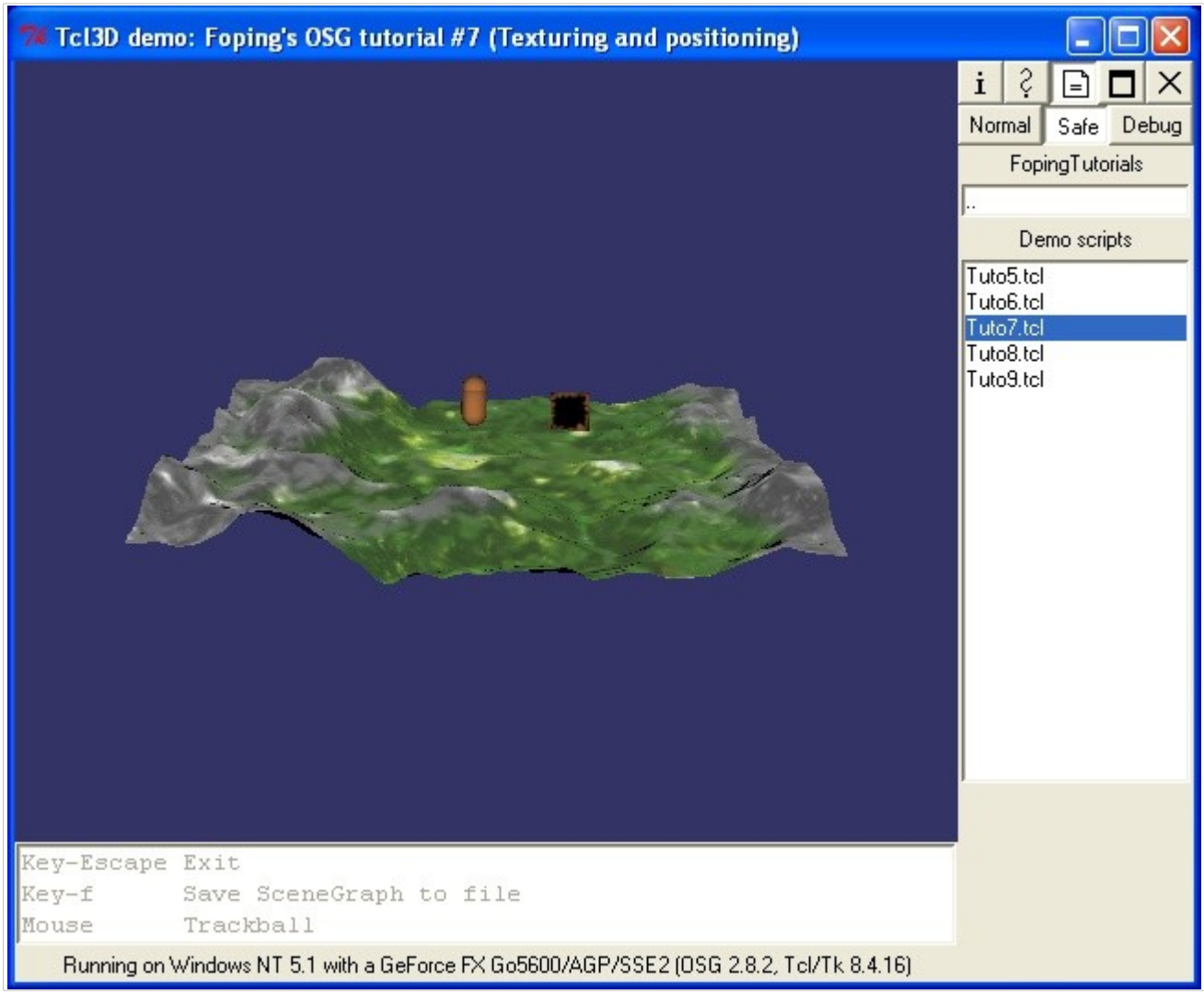



```
Tuto6.tcl: Draw a shape with materials.

Original C++ code by Franclin Foping.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Tuto7**
Type:	FopingTutorials
Category:	OpenSceneGraph
Root:	Contents

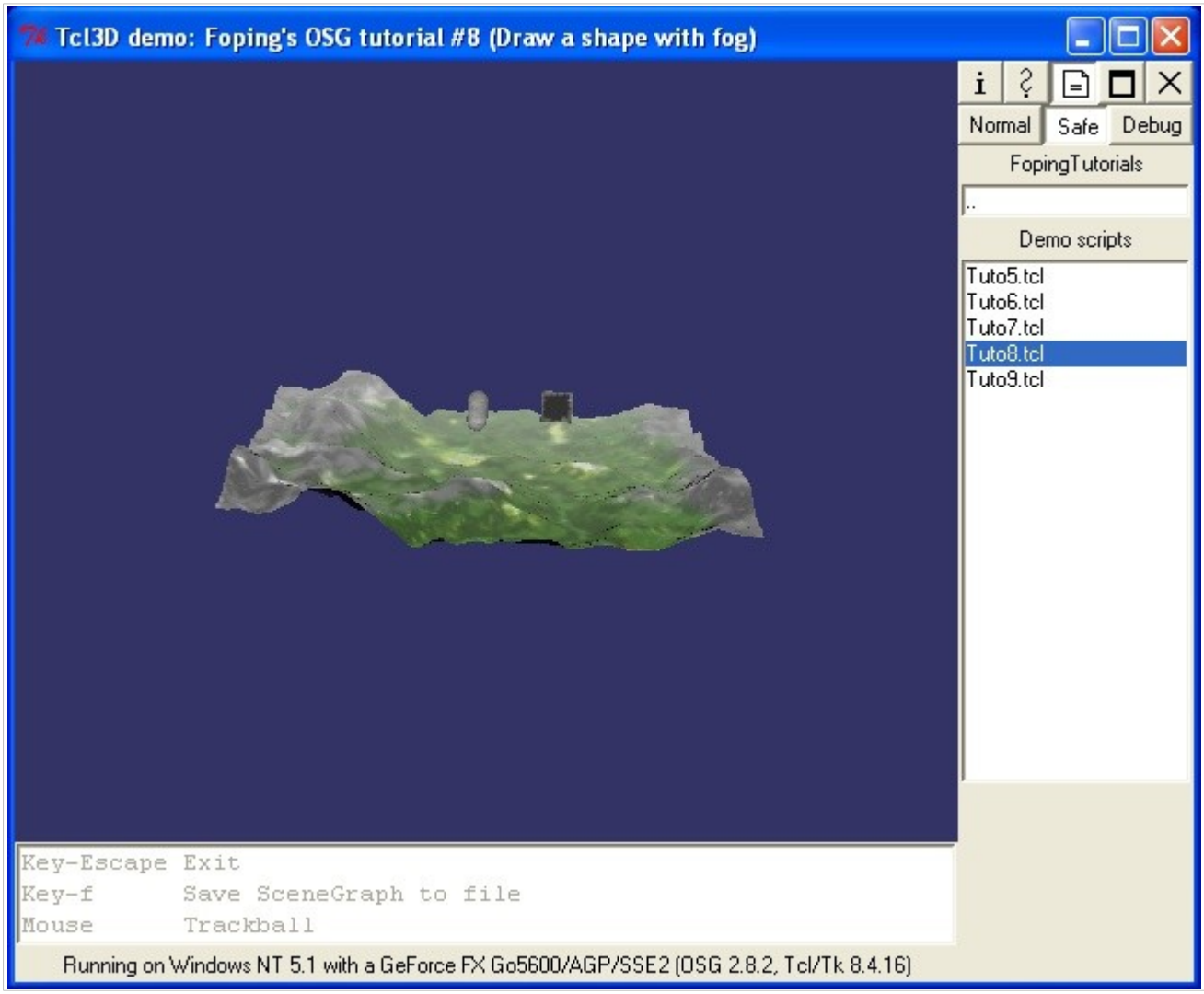



```
Tuto7.tcl: Texturing and positioning

Original C++ code by Franclin Foping.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Tuto8**
Type:	FopingTutorials
Category:	OpenSceneGraph
Root:	Contents

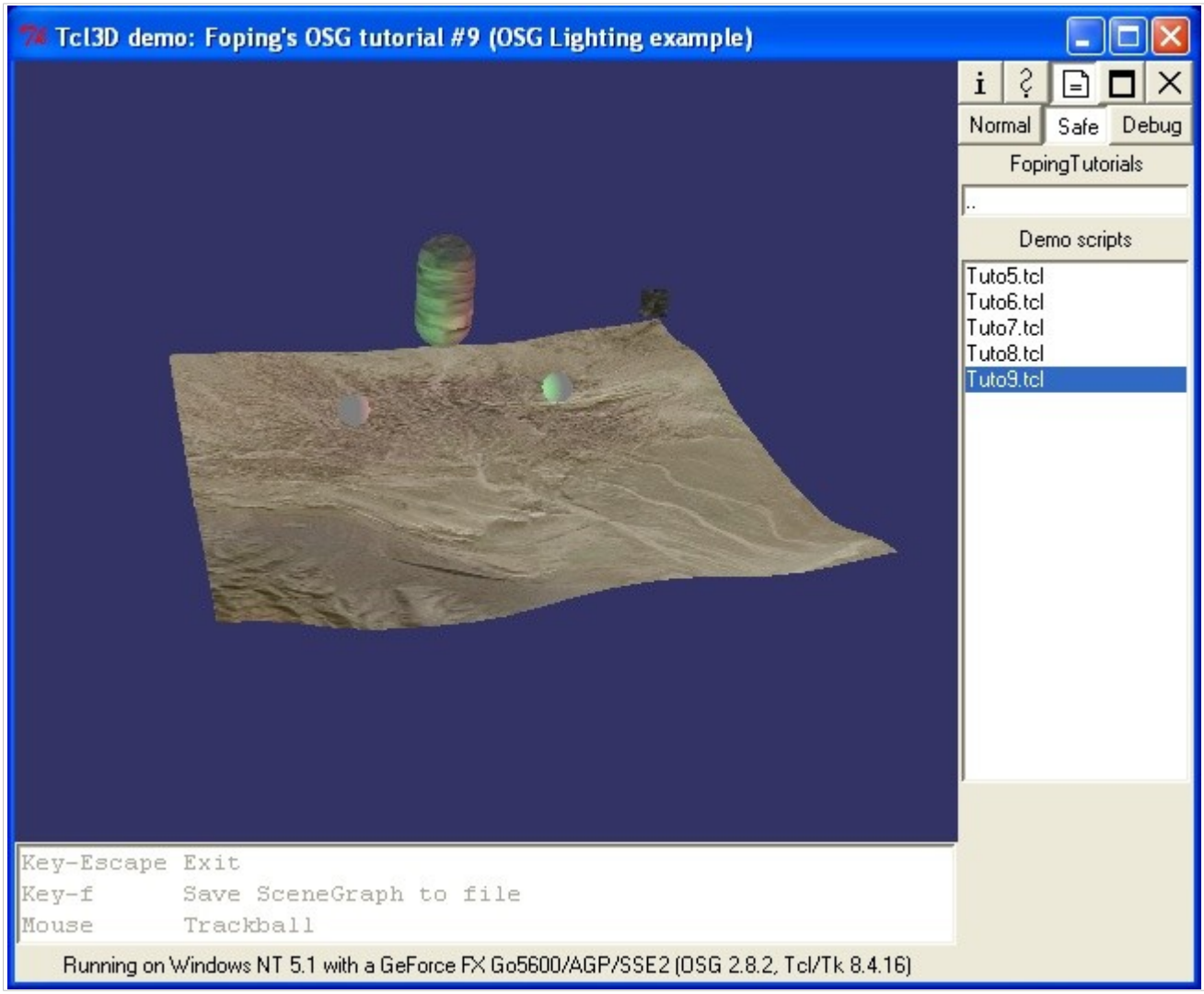



```
Tuto8.tcl: Draw a shape with fog.

Original C++ code by Franclin Foping.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Tuto9**
Type:	FopingTutorials
Category:	OpenSceneGraph
Root:	Contents




```
Tuto9.tcl: OSG Lighting example

This simple example will show how to easily shade your scene.
We will be making use of 2 light sources, one is red and the other one is
green. We will also render light markers to help you locate light source
in the scene. This is helpful for debugging purposes.

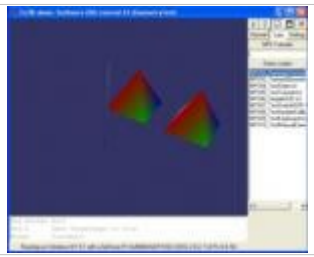
Original C++ code by Franclin Foping.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

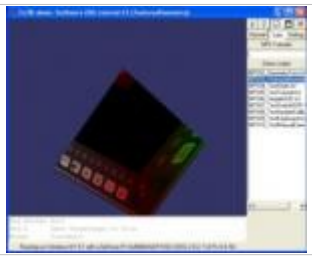
Type:	**NPS-Tutorials**
Category:	OpenSceneGraph
Root:	Contents

Some of the OpenSceneGraph tutorials from Joseph Sullivan have been ported to run with Tcl3D.
Original sources available at: http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials/

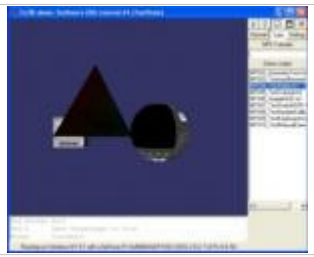
Available demos



NPS02_GeometryTest



NPS03_TexturedGeometry



NPS04_TestState

NPS05_TestTutoria

NPS06_SimpleHUD

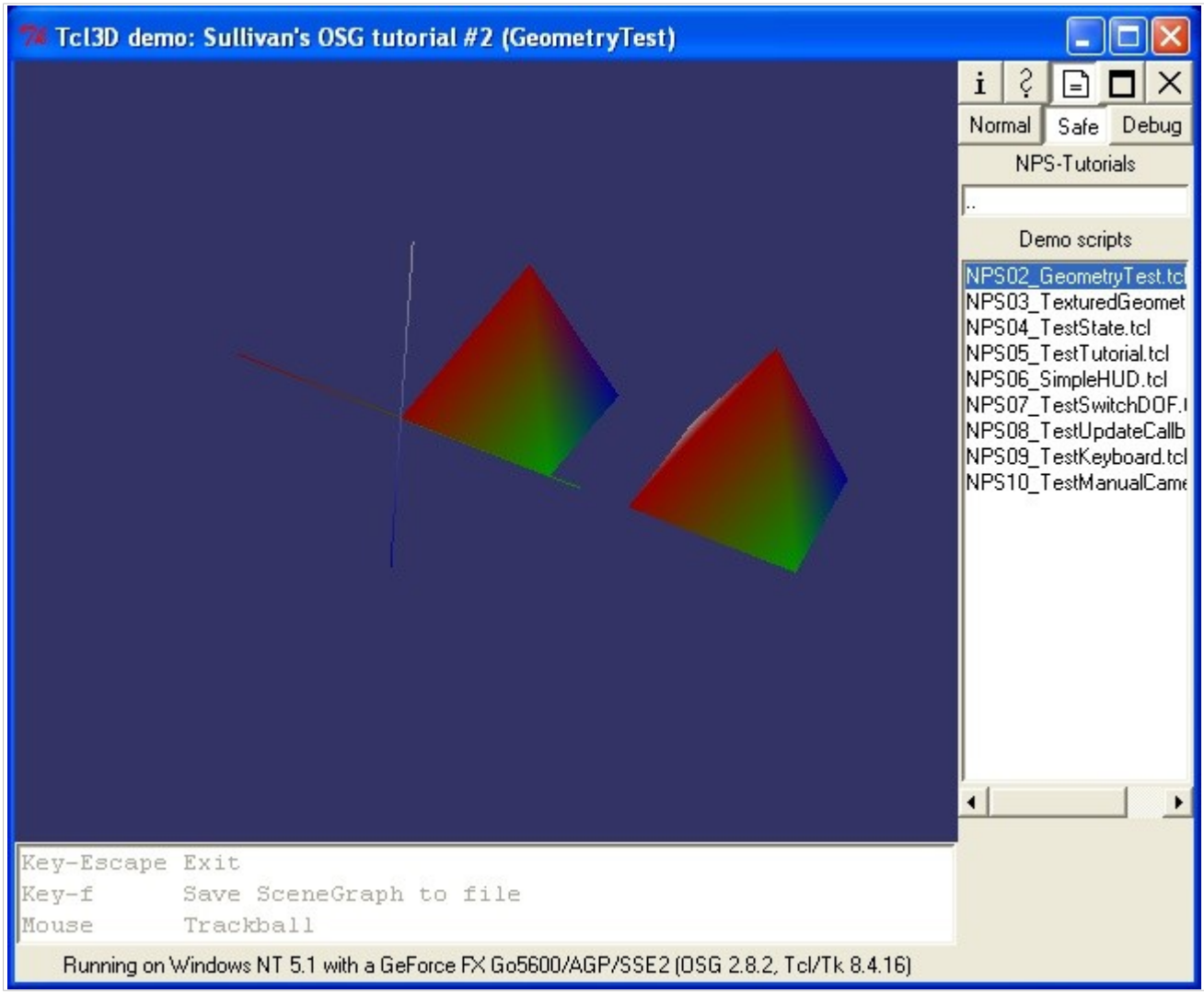
NPS07_TestSwitchDOF

NPS08_TestUpdateCallback

NPS09_TestKeyboa

NPS10_TestManualCamera

Demo:	**NPS02_GeometryTest**
Type:	NPS-Tutorials
Category:	OpenSceneGraph
Root:	Contents

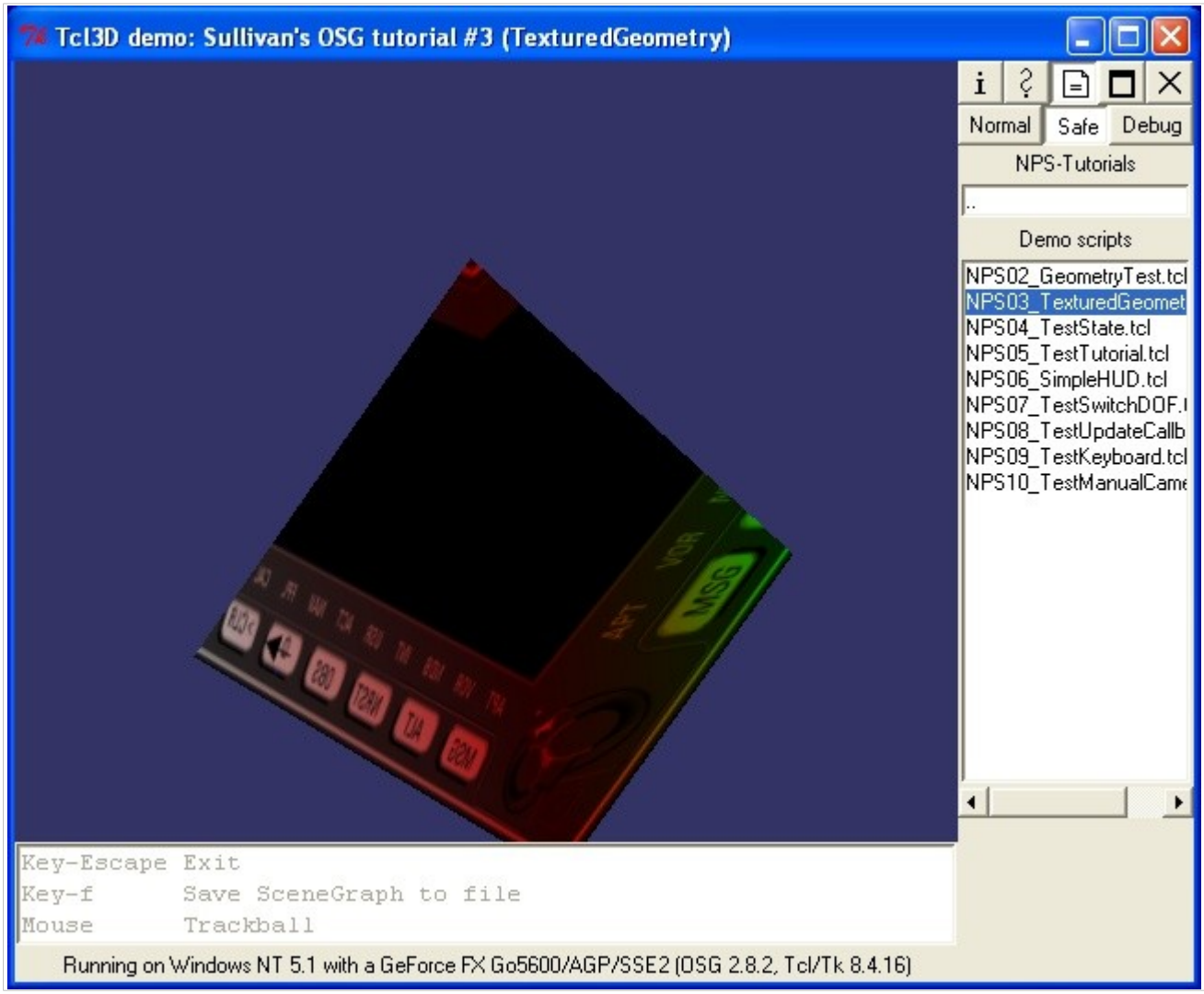



```
NPS02_GeometryTest.tcl

Original C++ code by Joseph Sullivan.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**NPS03_TexturedGeometry**
Type:	NPS-Tutorials
Category:	OpenSceneGraph
Root:	Contents

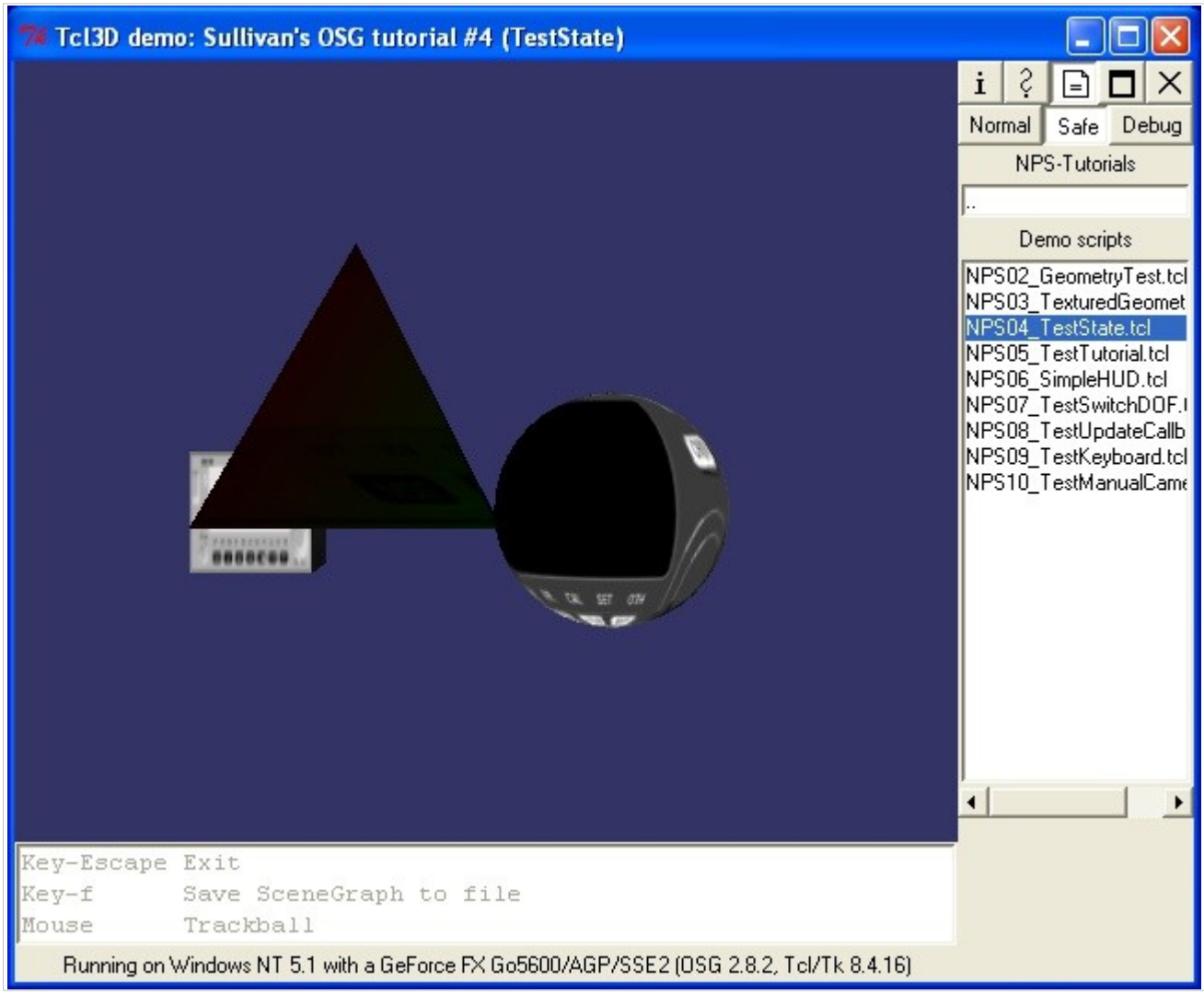



```
NPS03_TexturedGeometry.tcl

Original C++ code by Joseph Sullivan.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**NPS04_TestState**
Type:	NPS-Tutorials
Category:	OpenSceneGraph
Root:	Contents

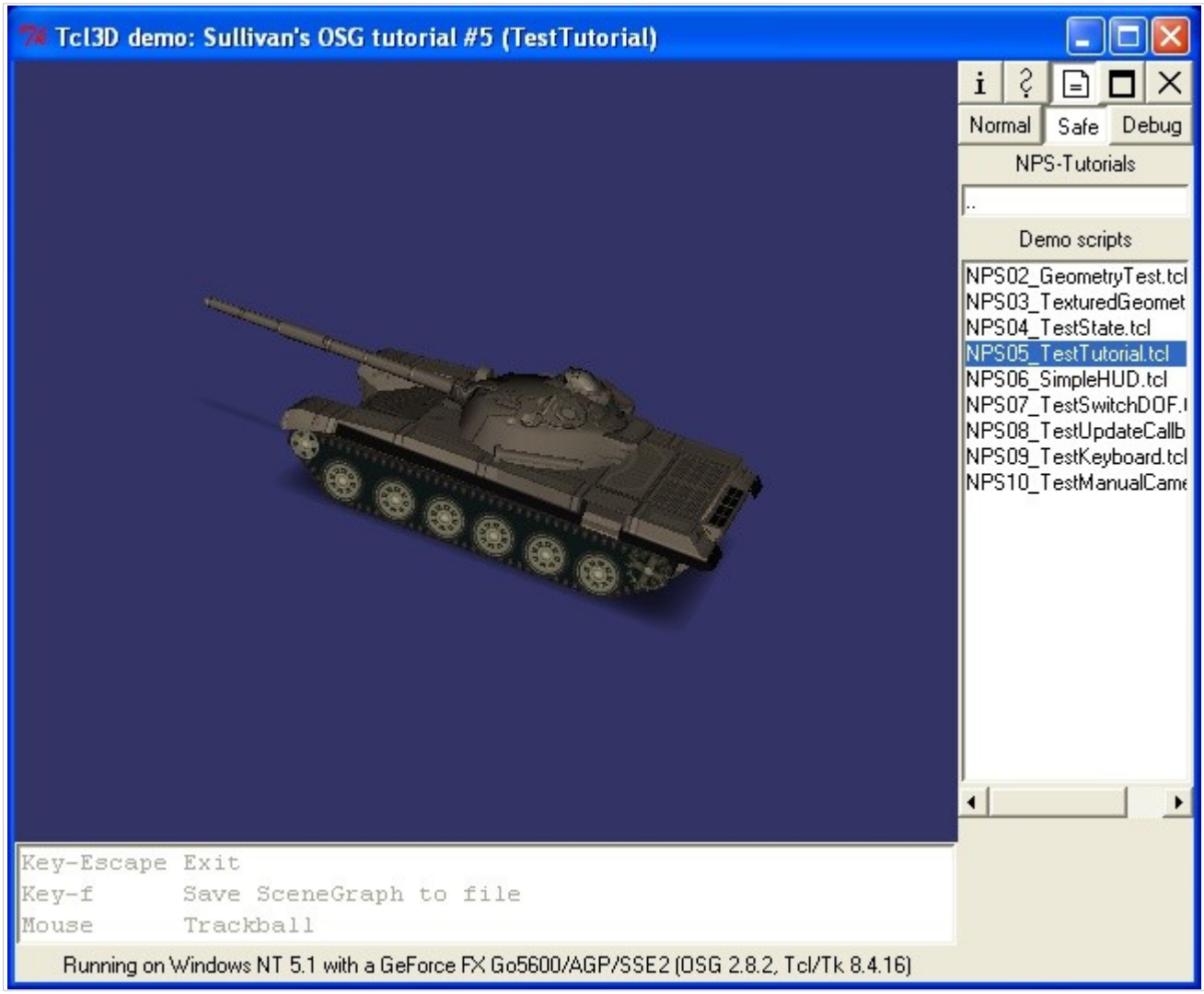



```
NPS04_TestState.tcl

Original C++ code by Joseph Sullivan.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**NPS05_TestTutorial**
Type:	NPS-Tutorials
Category:	OpenSceneGraph
Root:	Contents

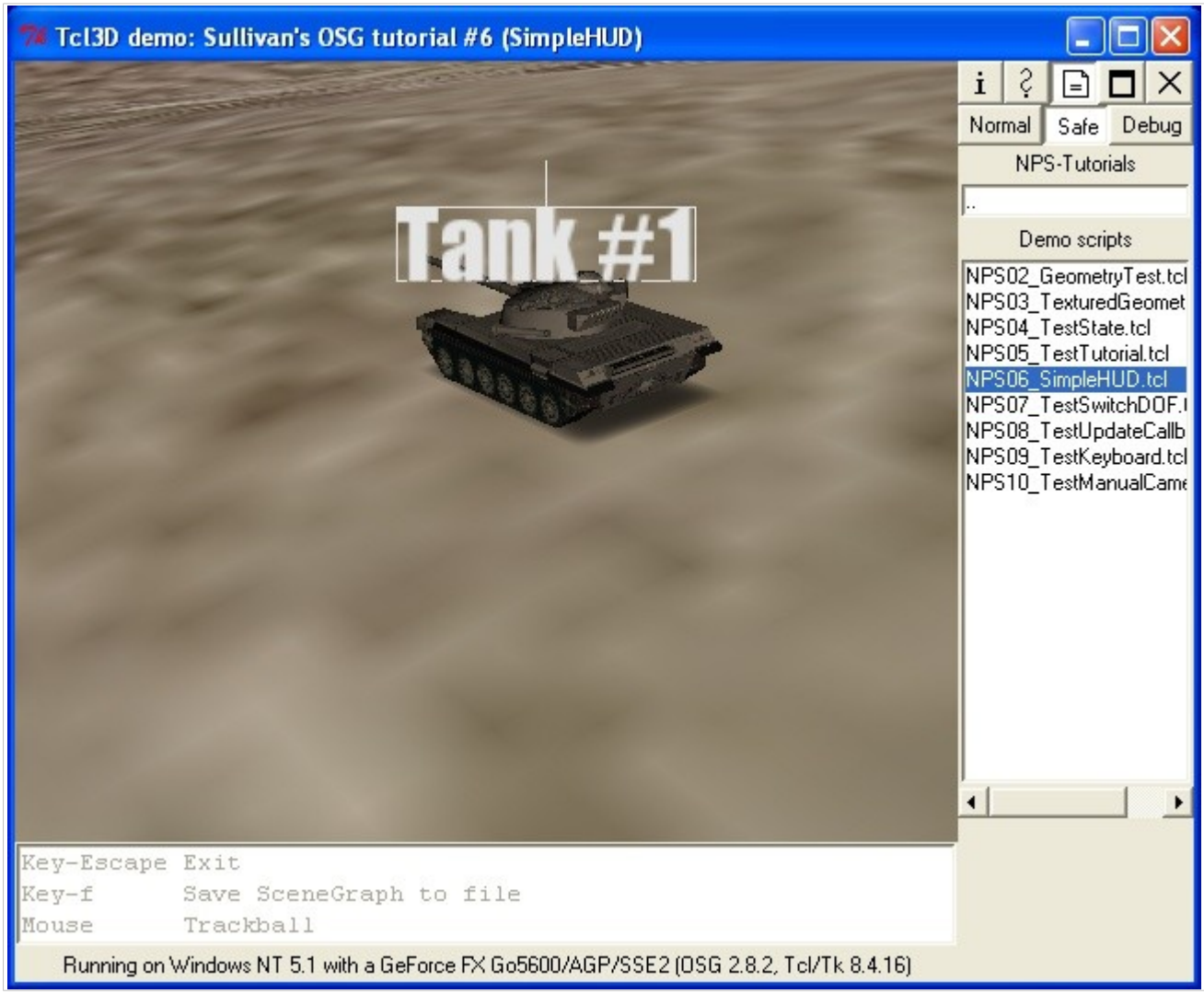



```
NPS05_TestTutorial.tcl

Original C++ code by Joseph Sullivan.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**NPS06_SimpleHUD**
Type:	NPS-Tutorials
Category:	OpenSceneGraph
Root:	Contents

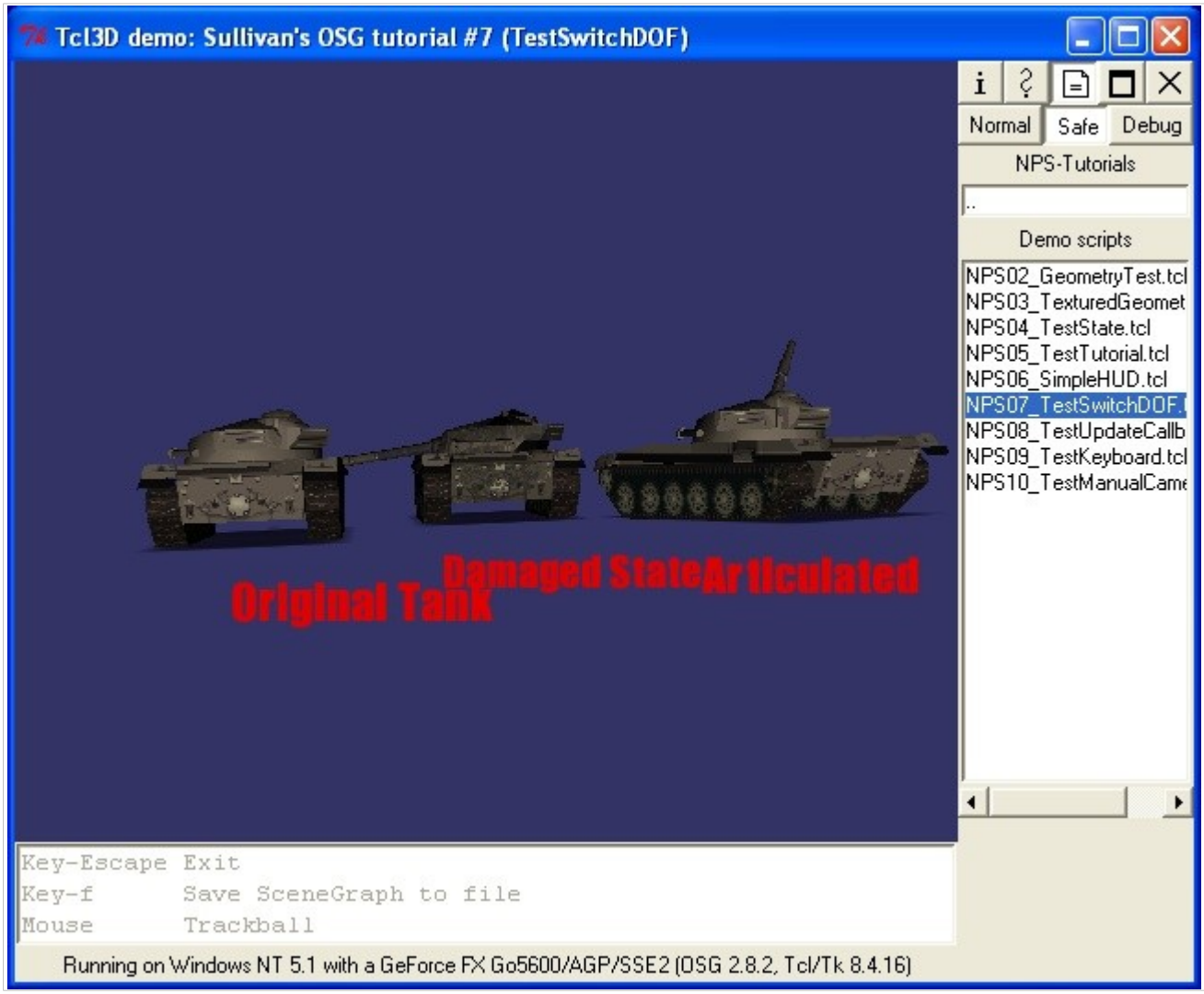



```
NPS06_SimpleHUD.tcl

Original C++ code by Joseph Sullivan.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**NPS07_TestSwitchDOF**
Type:	NPS-Tutorials
Category:	OpenSceneGraph
Root:	Contents

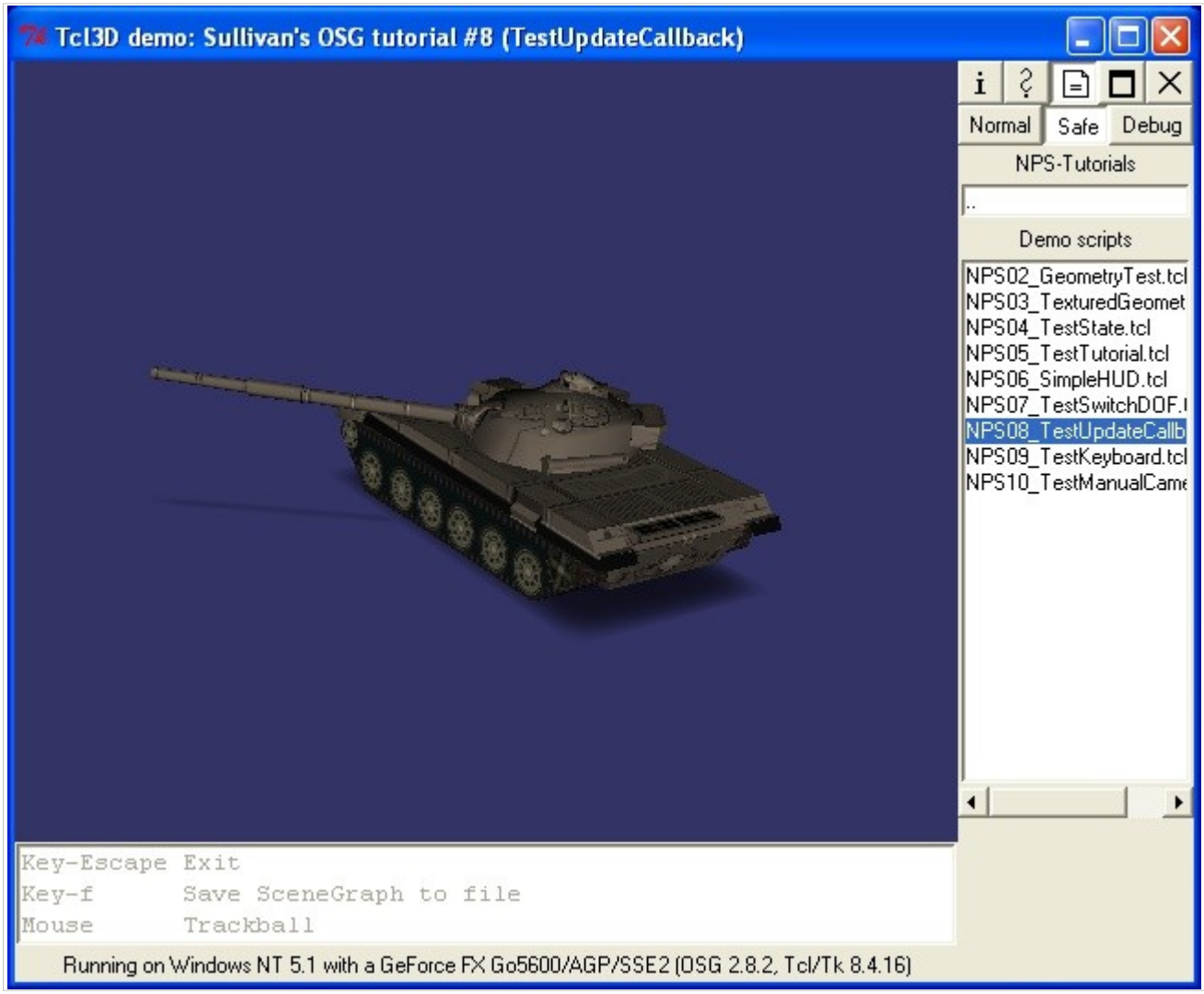



```
NPS07_TestSwitchDOF.tcl

Original C++ code by Joseph Sullivan.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**NPS08_TestUpdateCallback**
Type:	NPS-Tutorials
Category:	OpenSceneGraph
Root:	Contents

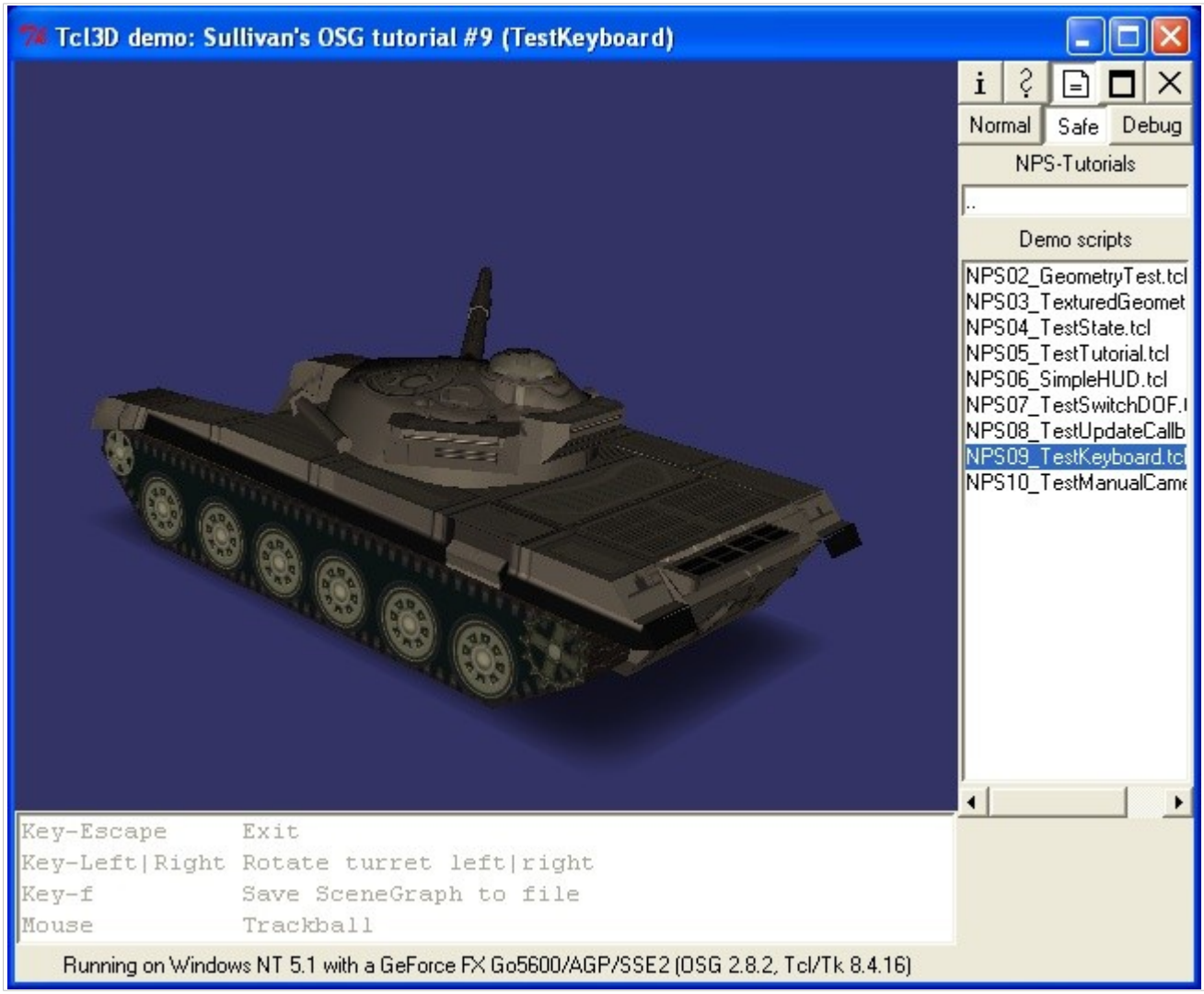



```
NPS08_TestUpdateCallback.tcl

Original C++ code by Joseph Sullivan.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**NPS09_TestKeyboard**
Type:	NPS-Tutorials
Category:	OpenSceneGraph
Root:	Contents

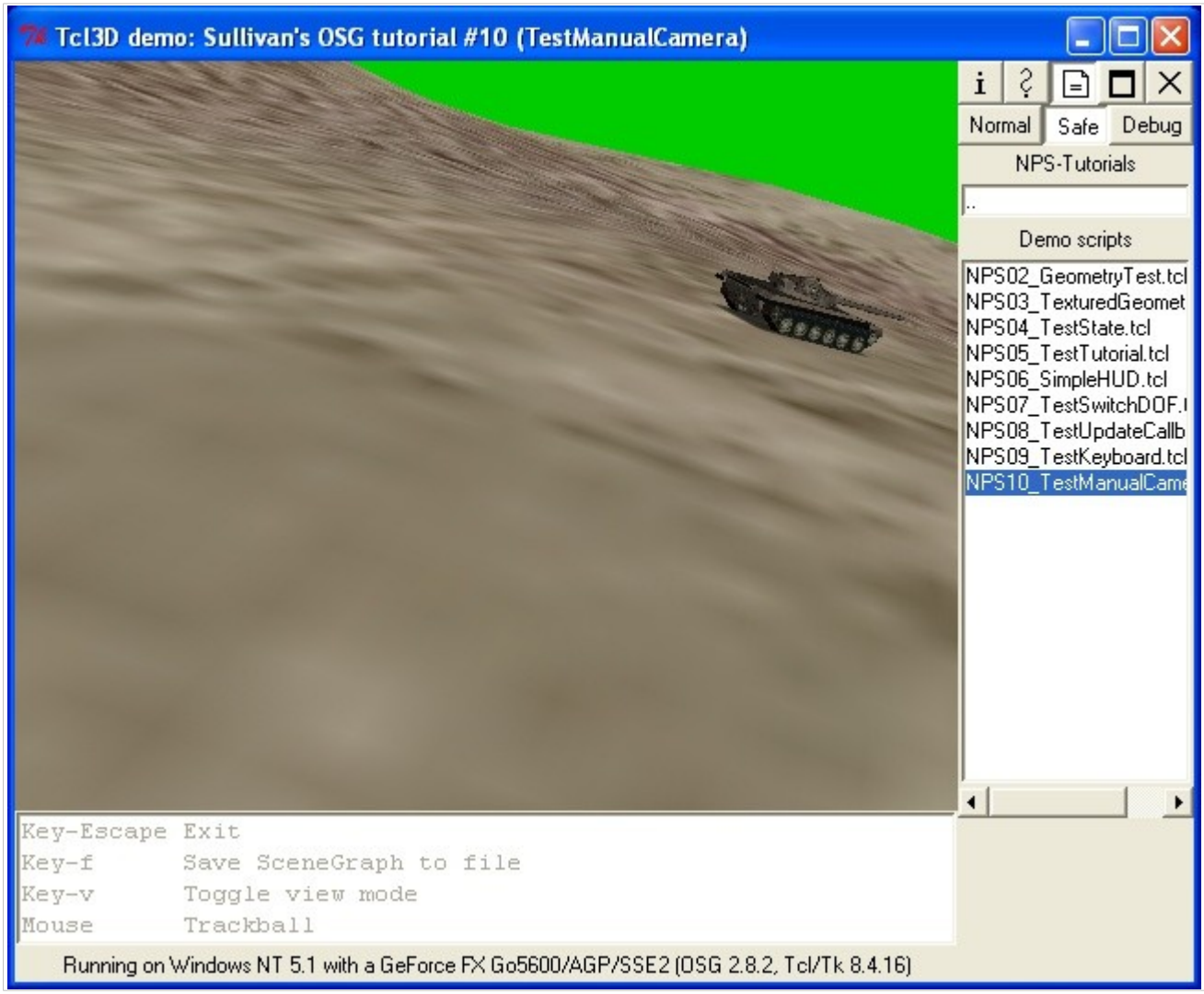



```
NPS09_TestKeyboard.tcl

Original C++ code by Joseph Sullivan.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**NPS10_TestManualCamera**
Type:	NPS-Tutorials
Category:	OpenSceneGraph
Root:	Contents




```
NPS10_TestManualCamera.tcl

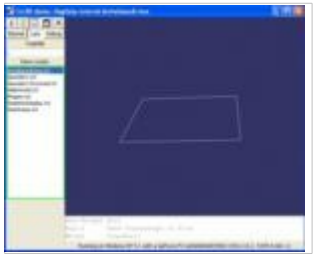
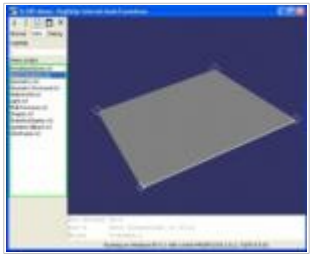
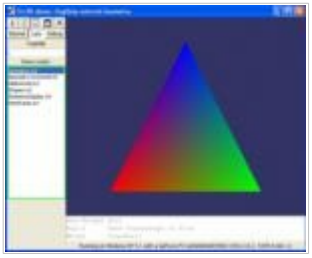
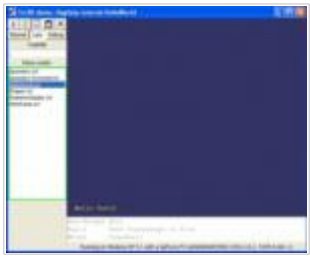
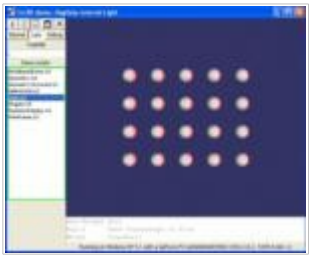
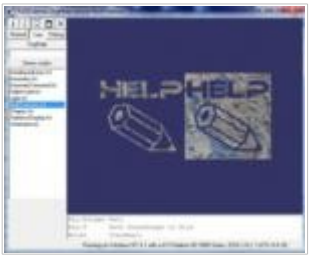
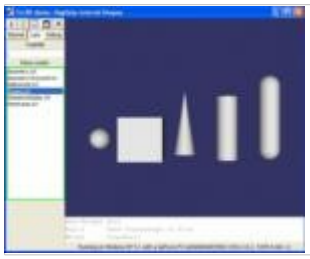
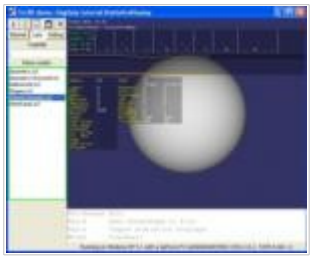
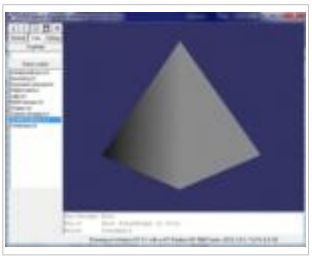
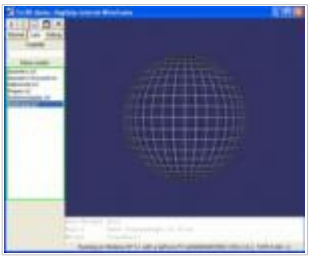
Original C++ code by Joseph Sullivan.
See http://www.openscenegraph.org/projects/osg/wiki/Support/Tutorials
for the original files.

Modified for Tcl3D by Paul Obermeier 2009/05/01.
See www.tcl3d.org for the Tcl3D extension.
```

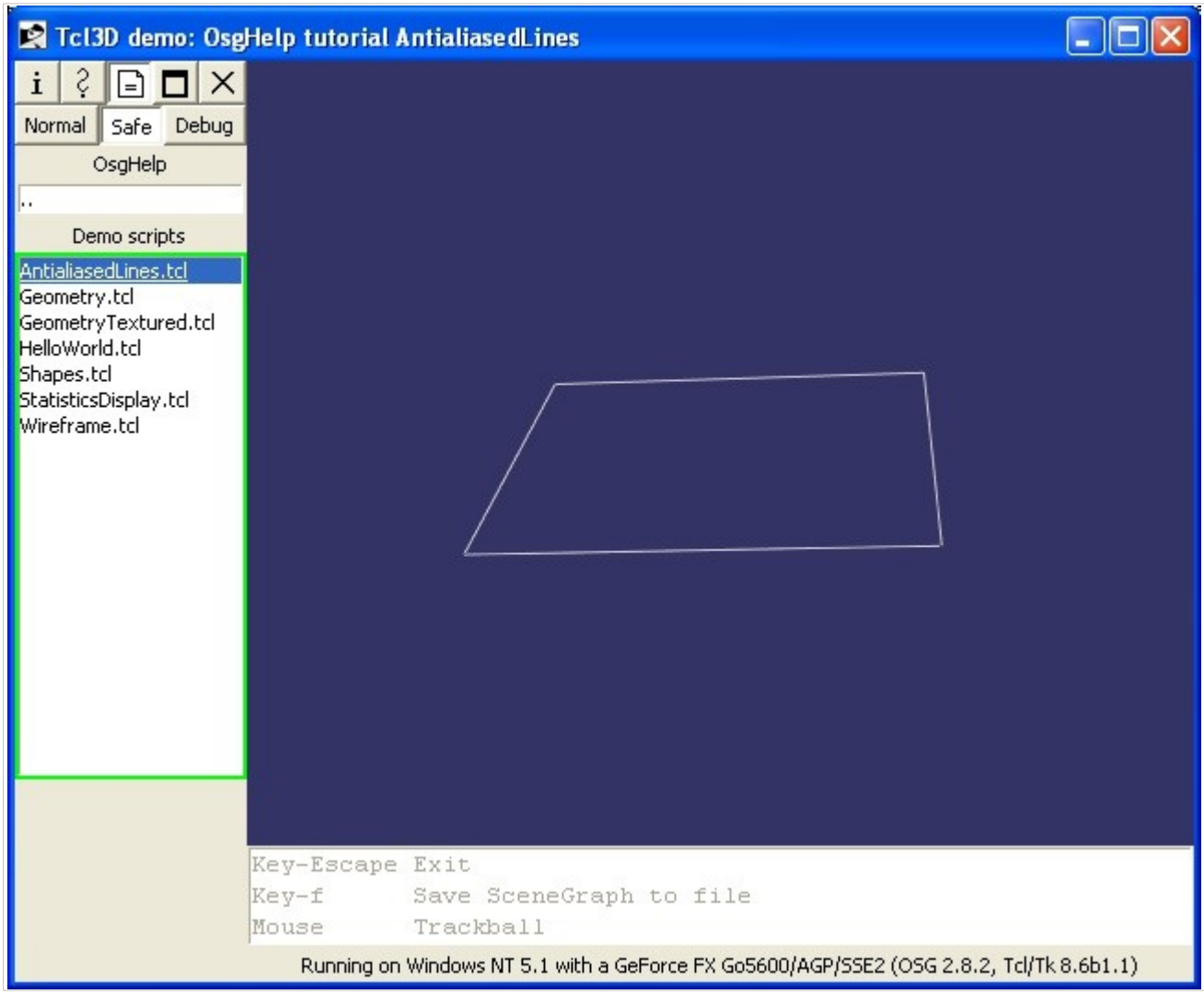
Type:	**OsgHelp**
Category:	OpenSceneGraph
Root:	Contents

Some of the OpenSceneGraph tutorials from Peter Wraae Marino and Michael Bach Jensen have been ported to run with Tcl3D.
Original sources available at their OsgHelp website.

Available demos

			
AntialiasedLines	AutoTransform	Billboard	Geometry
			
GeometryTextured	HelloWorld	Light	MultiTextures
			
Shapes	StatisticsDisplay	UpdateCallback	Wireframe

Demo:	**AntialiasedLines**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

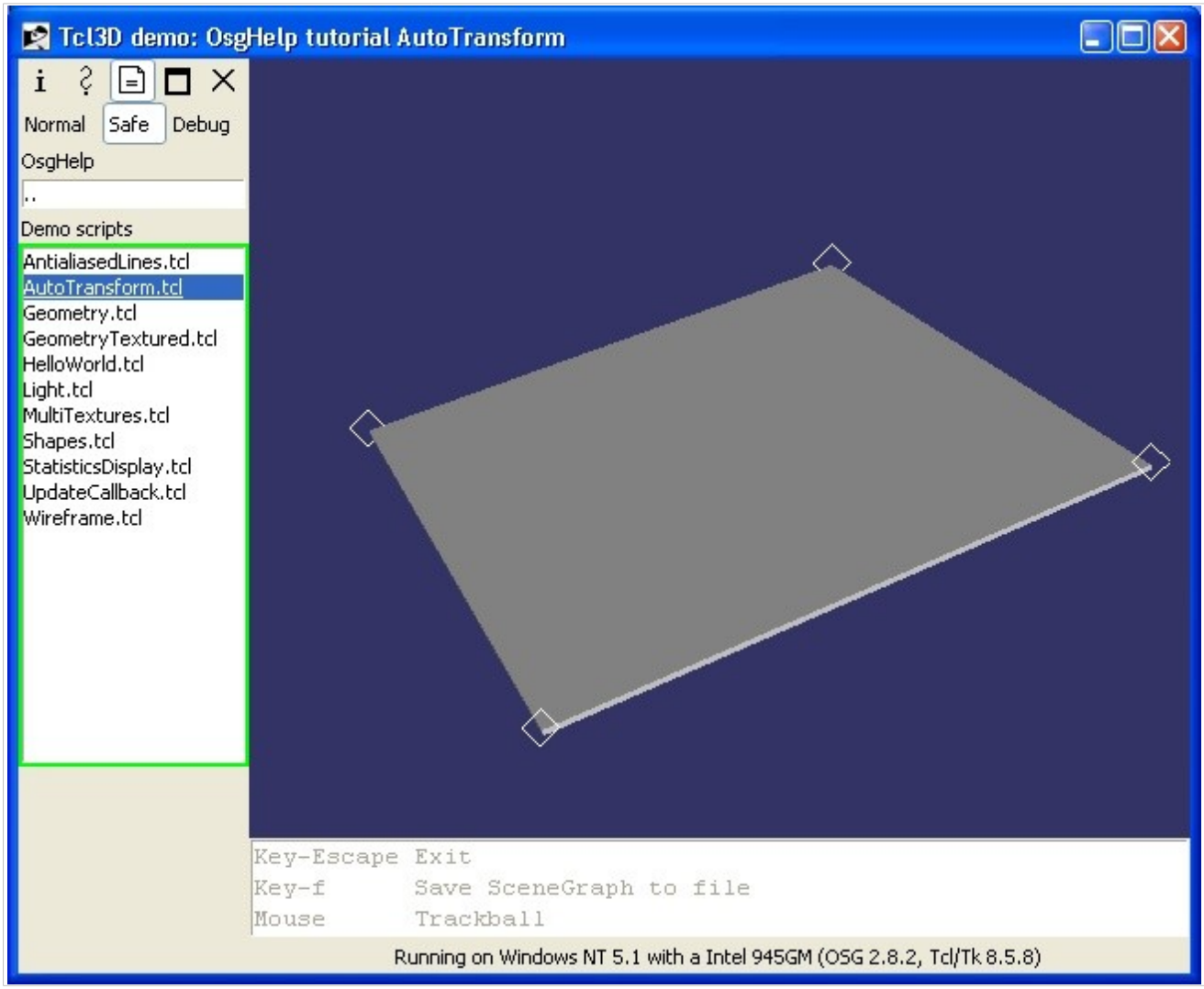



```
AntialiasedLines.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**AutoTransform**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

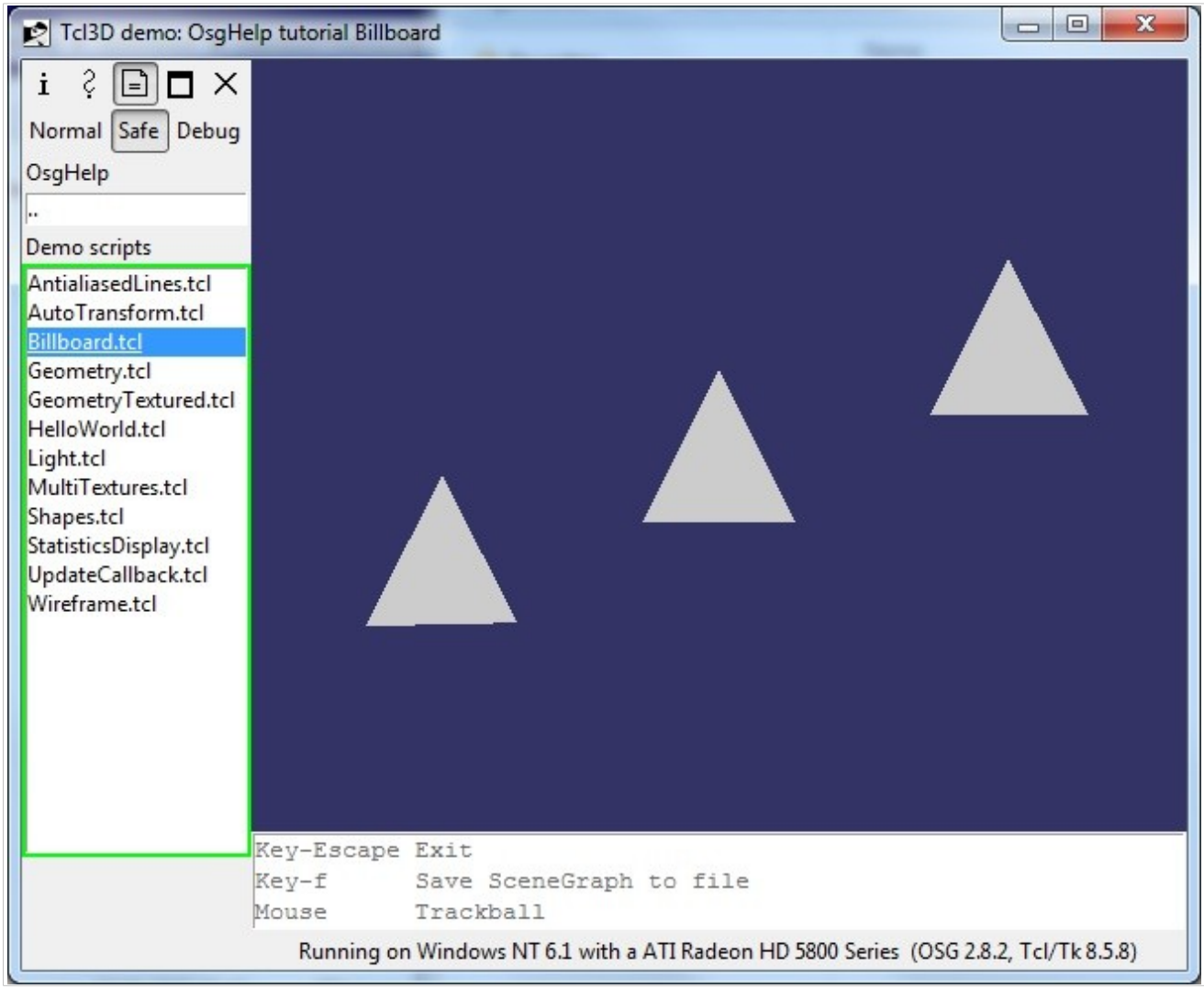



```
AutoTransform.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Billboard**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

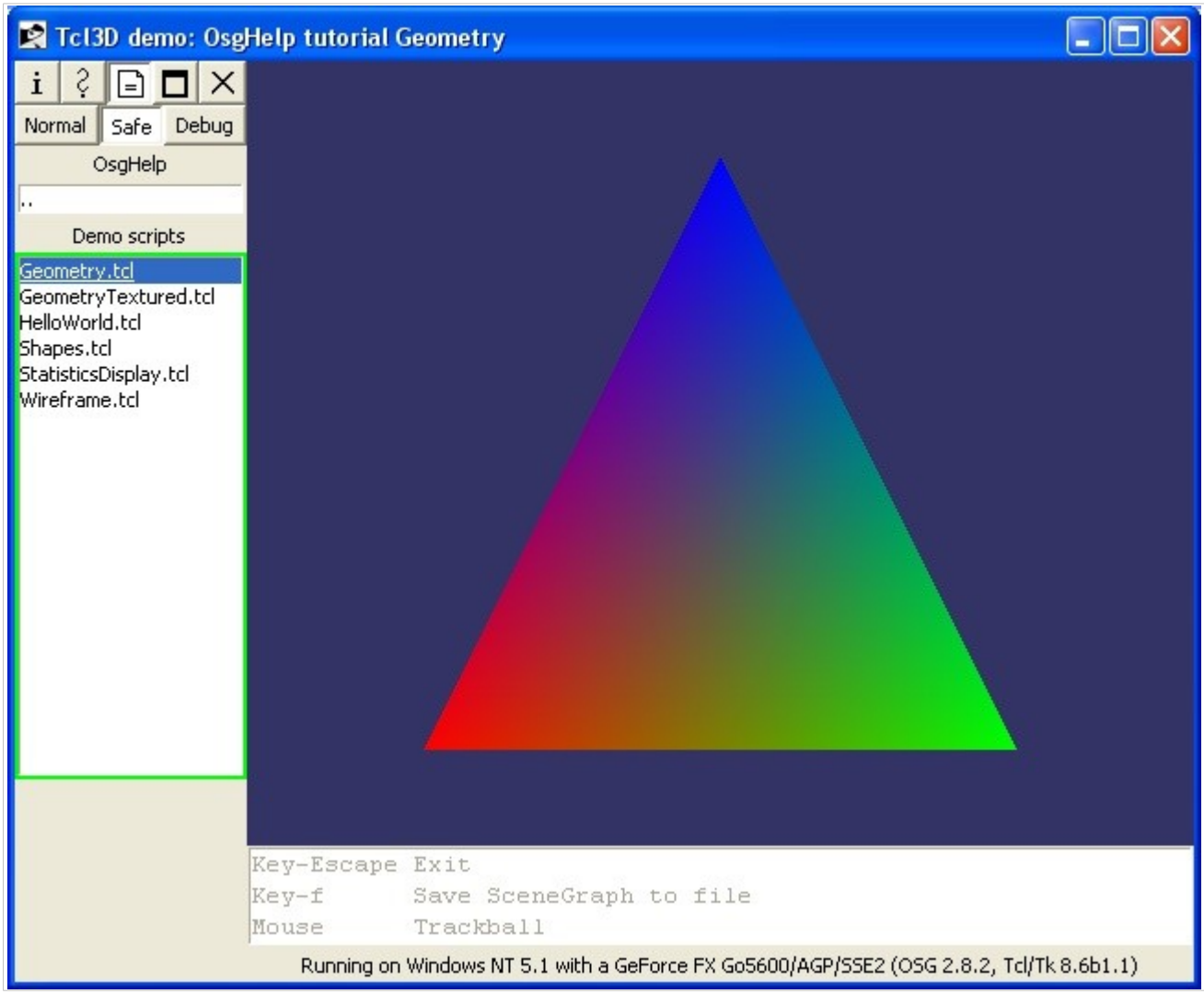



```
Billboard.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Geometry**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

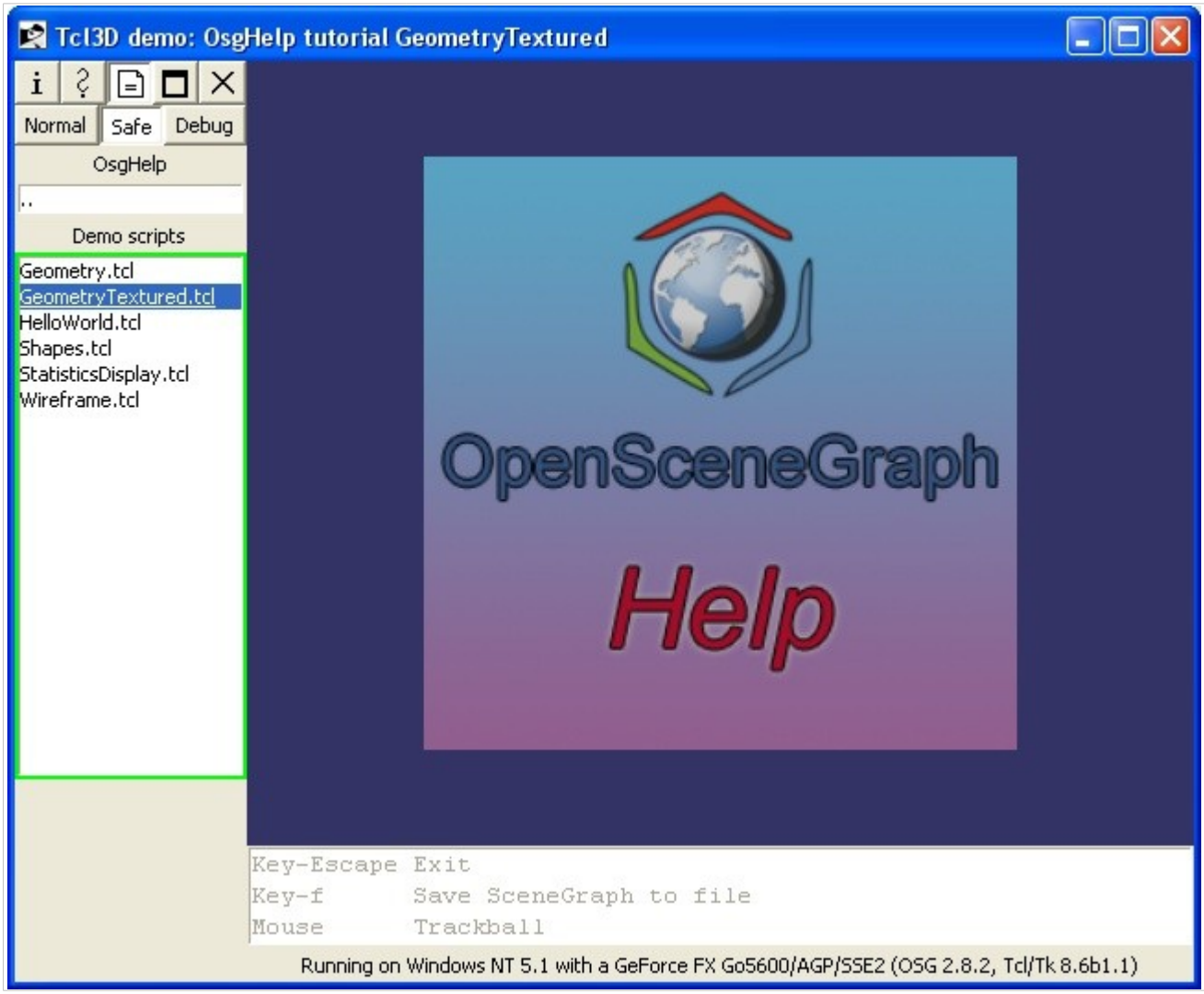



```
Geometry.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**GeometryTextured**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

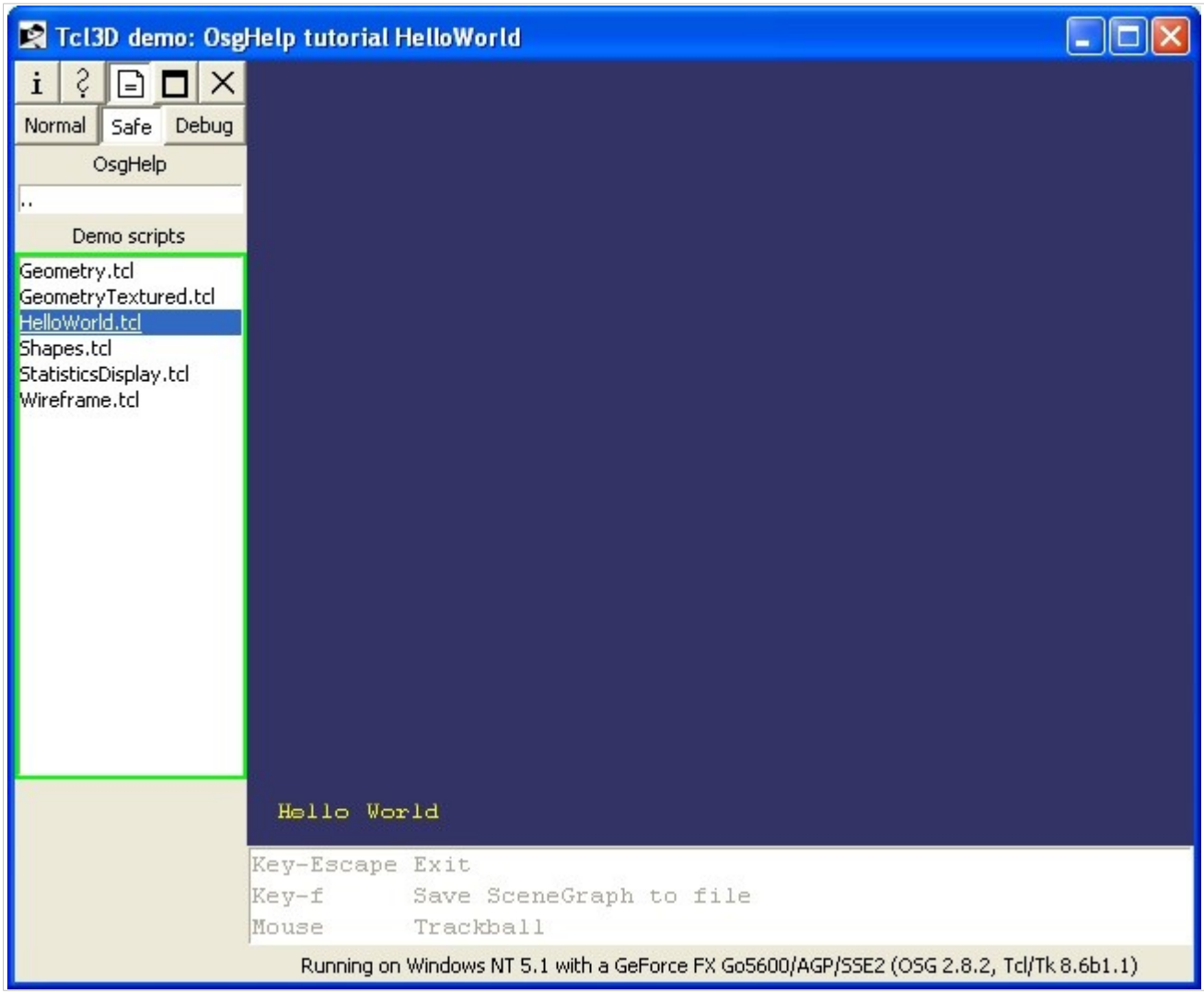



```
GeometryTextured.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**HelloWorld**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

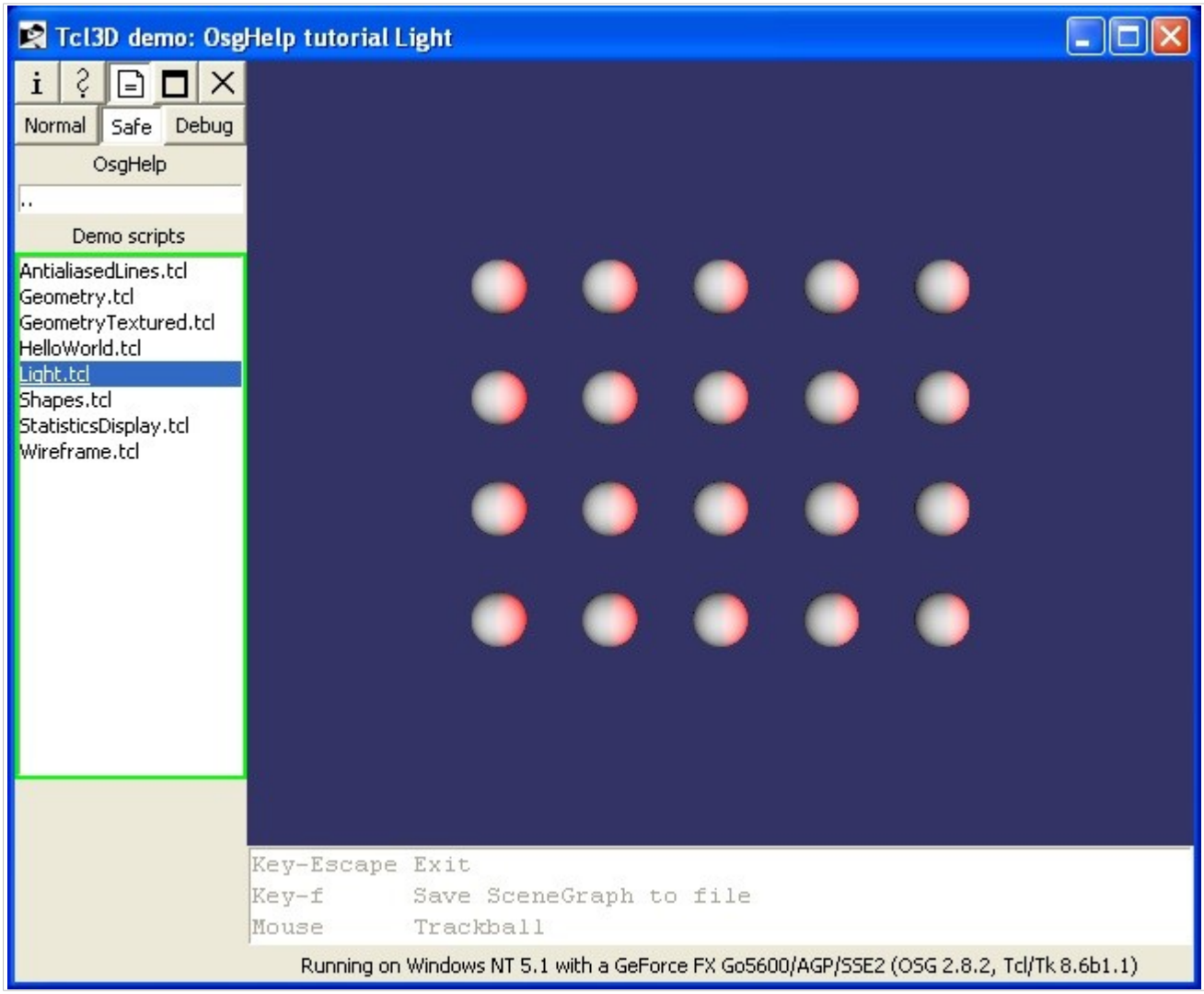



```
HelloWorld.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Light**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

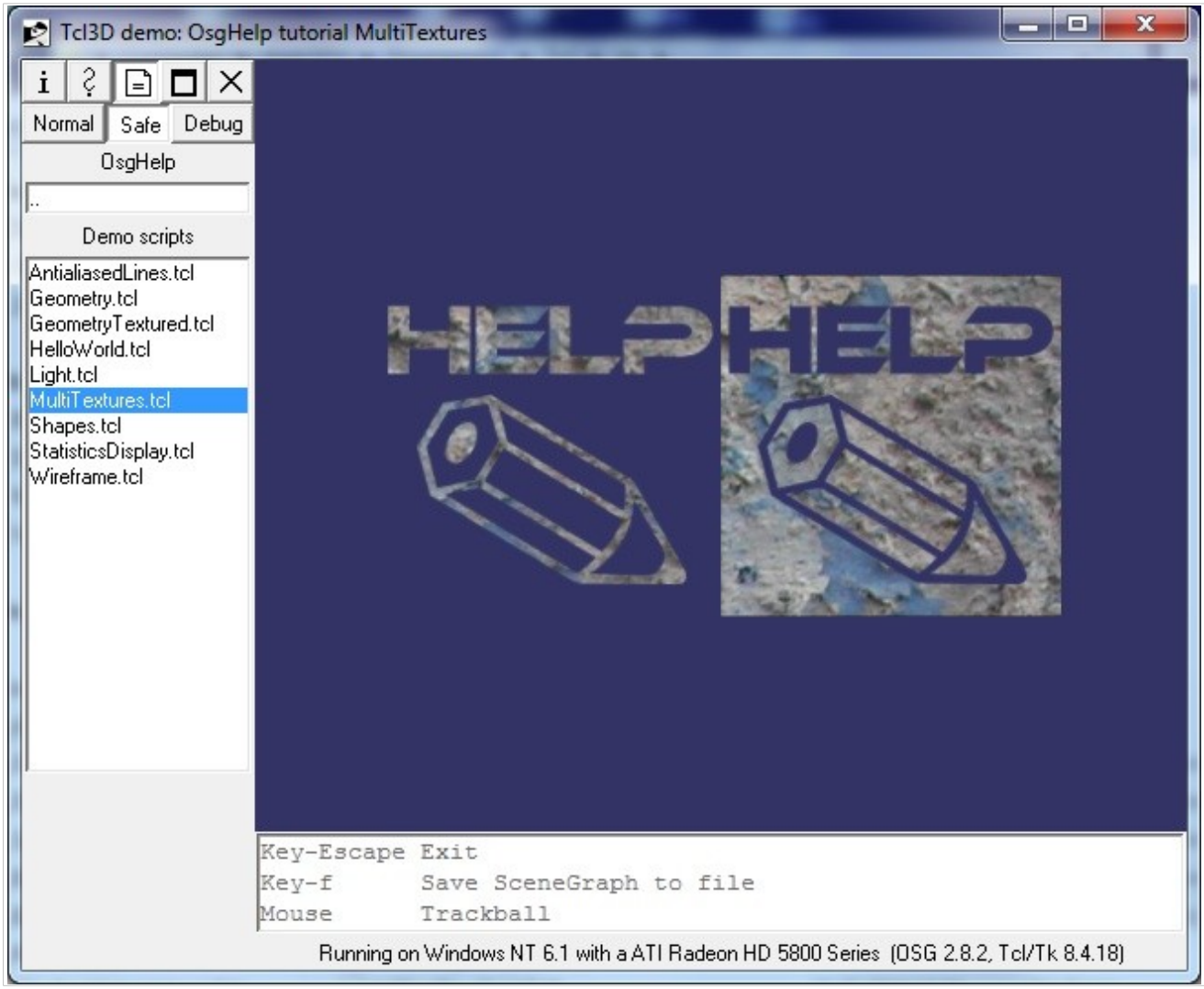



```
Light.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**MultiTextures**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

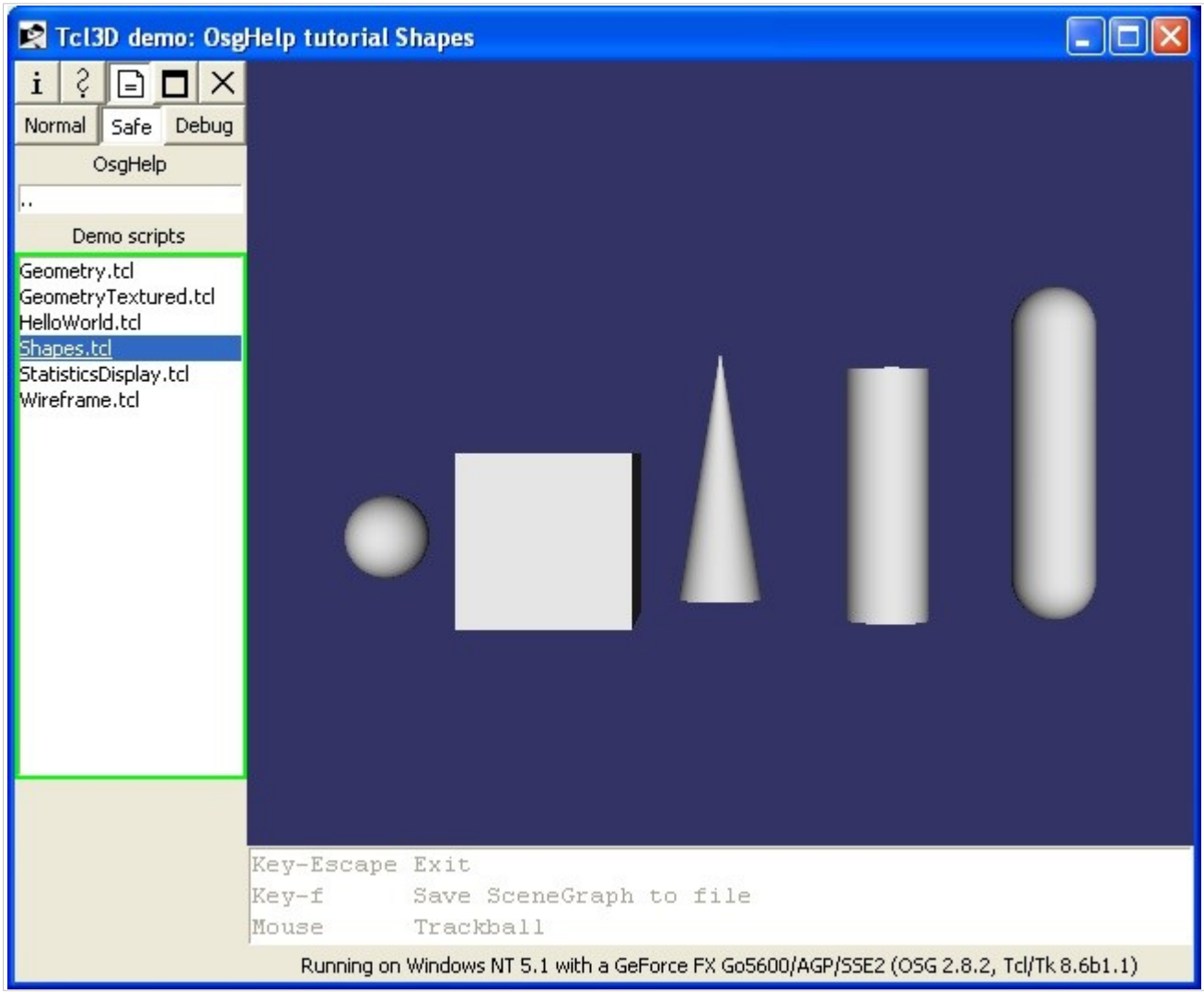



```
MultiTextures.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Shapes**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

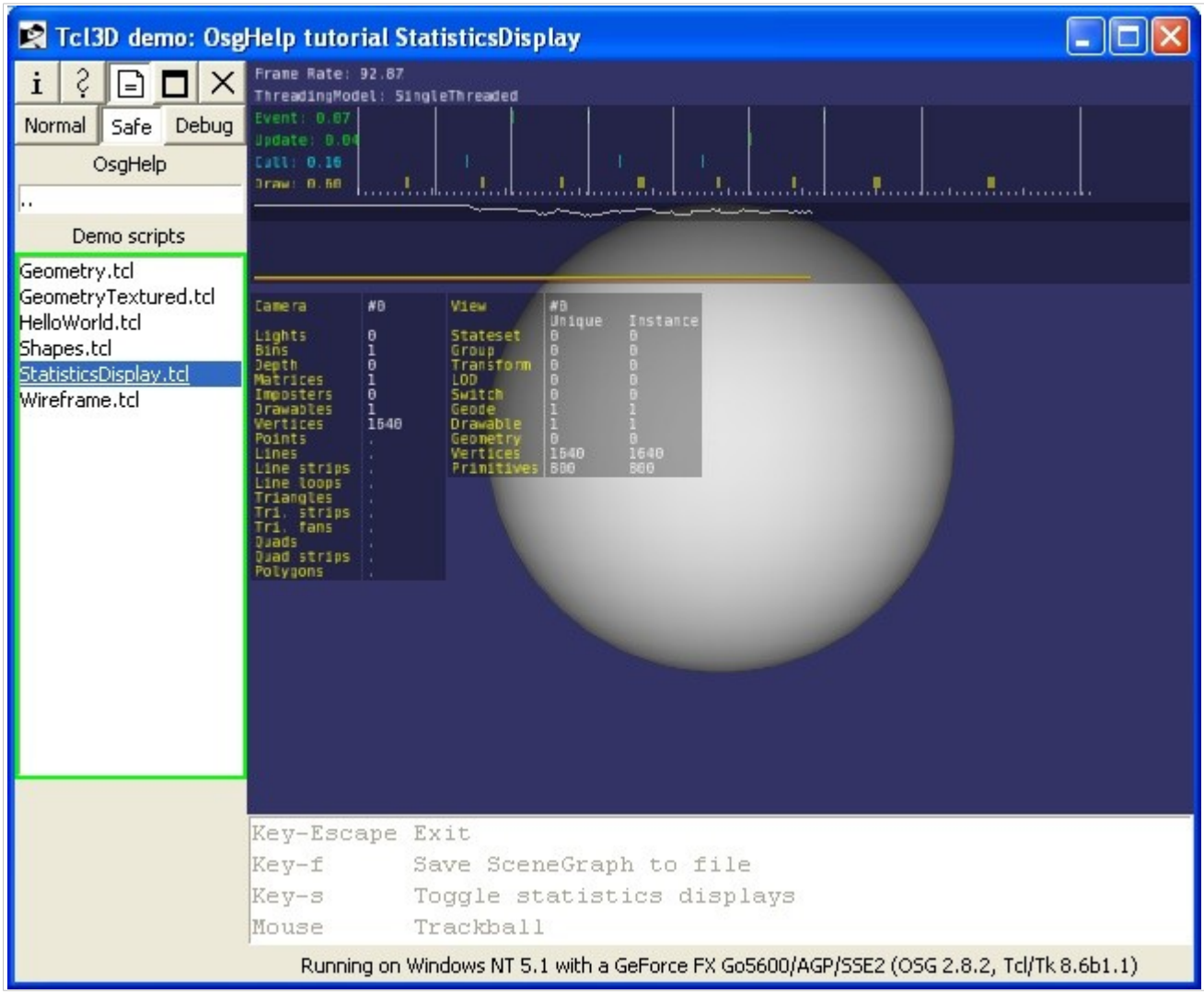



```
Shapes.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**StatisticsDisplay**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

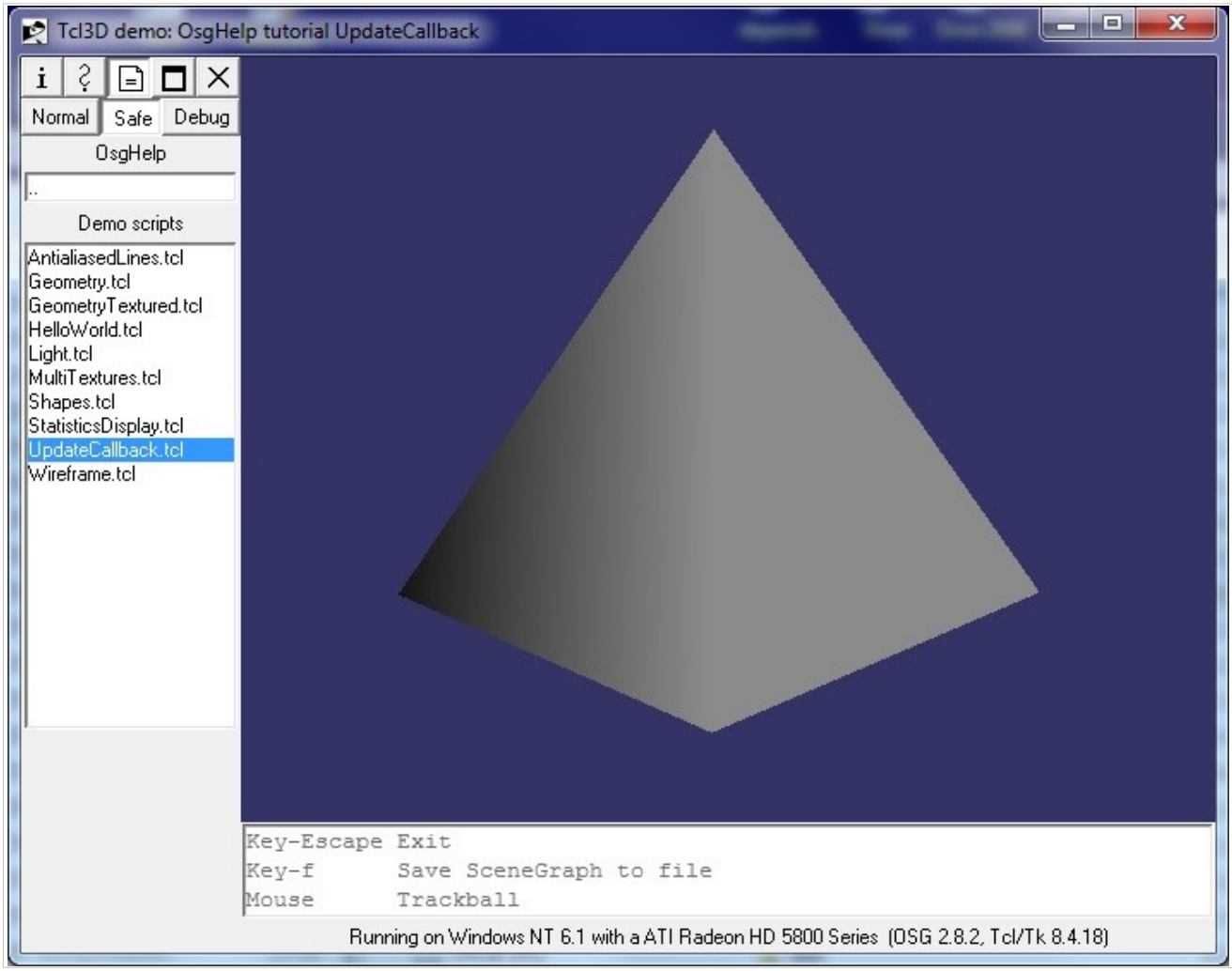



```
StatisticsDisplay.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**UpdateCallback**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents

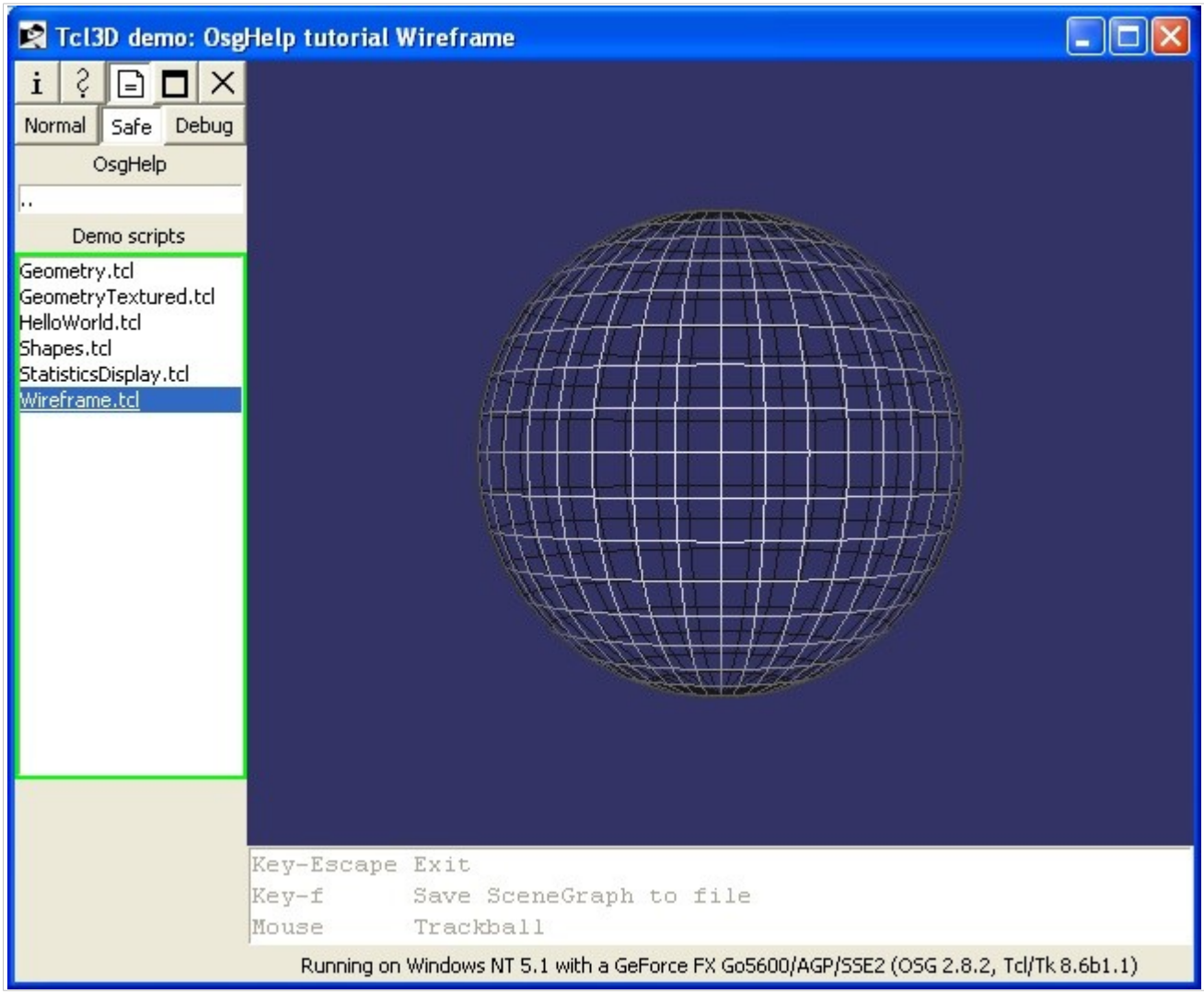



```
UpdateCallback.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Wireframe**
Type:	OsgHelp
Category:	OpenSceneGraph
Root:	Contents




```
Wireframe.tcl

Original C++ code by Peter Wraae Marino and Michael Bach Jensen.
See www.osghelp.com for the original files.

Modified for Tcl3D by Paul Obermeier 2010/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Type:	**QuickStartGuide**
Category:	OpenSceneGraph
Root:	Contents

Some of the OpenSceneGraph examples from Paul Martz's Quick Start Guide have been ported to run with Tcl3D.
Book and original sources available at: http://www.skew-matrix.com/OSGQSG/

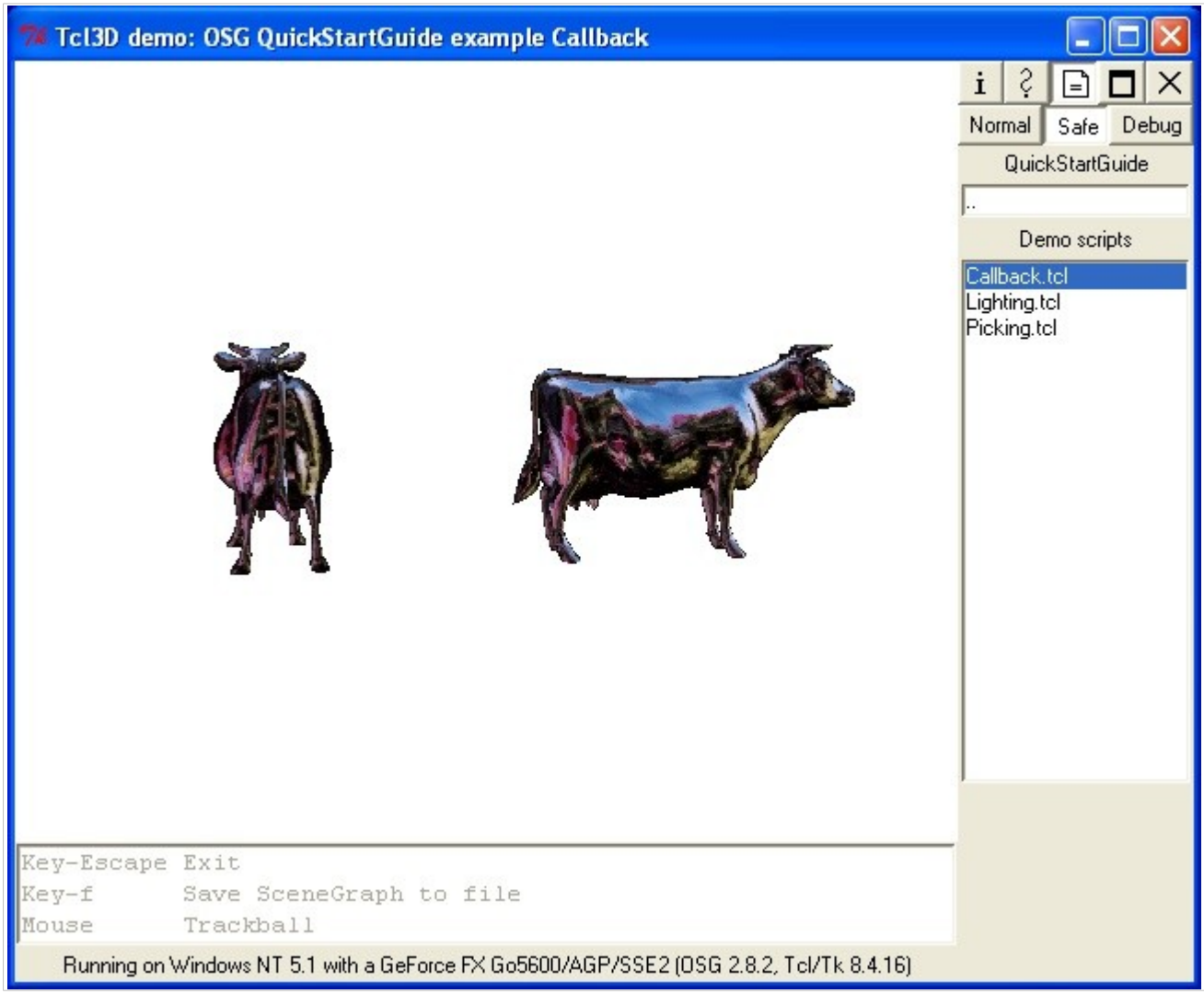
Available demos

Callback

Lighting

Picking

Demo:	**Callback**
Type:	QuickStartGuide
Category:	OpenSceneGraph
Root:	Contents

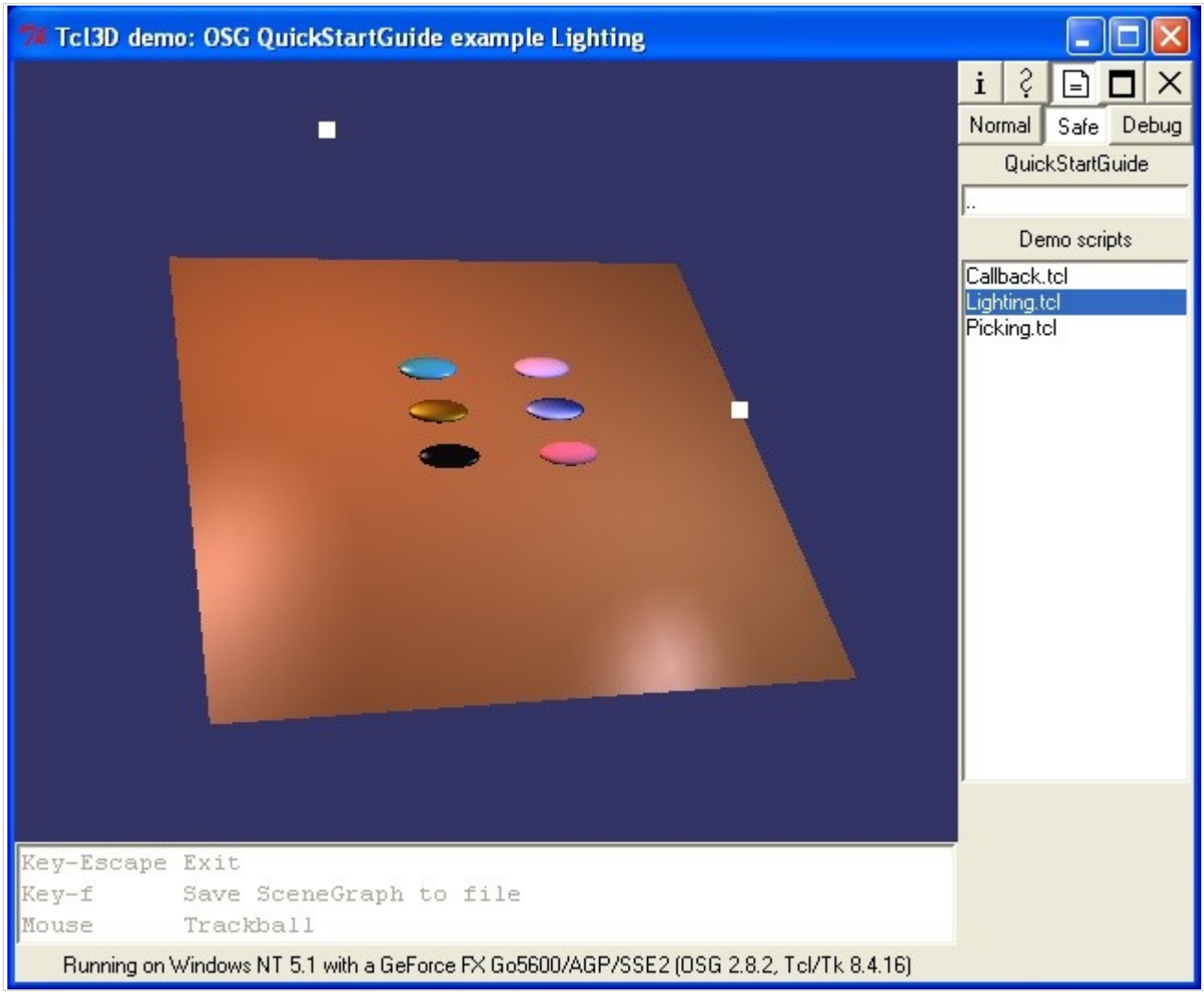



```
OpenSceneGraph Quick Start Guide
http://www.skew-matrix.com/OSGQSG

Callback Example, Using an update callback to modify the scene graph

Modified for Tcl3D by Paul Obermeier 2009/10/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Lighting**
Type:	QuickStartGuide
Category:	OpenSceneGraph
Root:	Contents




```
OpenSceneGraph Quick Start Guide
http://www.skew-matrix.com/OSGQSG

Lighting Example, Basic light and material control

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```

Demo:	**Picking**
Type:	QuickStartGuide
Category:	OpenSceneGraph
Root:	Contents


```
OpenSceneGraph Quick Start Guide
http://www.skew-matrix.com/OSGQSG

Picking Example, Using the osgUtil Intersection classes and osgGA NodeKit

Code derived from an OSG example. Original comment block follows.

C++ source file - (C) 2003 Robert Osfield, released under the OSGPL.

Simple example of use of osgViewer::GraphicsWindow + SimpleViewer
that provides the user with control over view position with basic picking.

Modified for Tcl3D by Paul Obermeier 2009/03/20.
See www.tcl3d.org for the Tcl3D extension.
```