Subject: Re: Drawing 3D Objects properly
Posted by Karl Schultz on Thu, 05 Sep 2002 21:07:28 GMT
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Try reducing the ZCLIP range..

If I made ZCLIP=[999,-999] / 100, the problem went away.

Here's why:

The hardware Z buffer has limited precision. Many Z buffers have only 16 bits per pixel and it varies with the implementation. This may explain why the problem appears worse on some systems as compared to others. In addition, if you are on a machine that supports OpenGL, you may see some differences between the hardware and software renderers, because the Z buffer depths may be different between the OpenGL on your machine and the IDL software renderer (Mesa).

When you draw a unit polygon like this that takes up about 2 units in a Z buffer range of [-999, 999], you are only using 1/1000th of the Z buffer. So, if the Z buffer is 16-bit, you are only going to be using 64 of the possible 64K Z buffer values. This results in essentially 64 discreet "depth" values used while drawing these two polygons. If the polygons get close enough in Z as you spin them around, the Z values of some of the pixels after the view projection will map to the same Z buffer value. When there is a tie in Z, the drawing order becomes the deciding factor.

The graphics system (OpenGL) maps the Z part of the viewport to the Z buffer differently, depending on the PROJECTION, which may account for the difference there. When the projection is perspective, the ZCLIP-to-Zbuffer mapping is not linear. This means that you might be able to resolve the polygons at one end of the ZCLIP space and not the other. This explains why you were not able to resolve the polygons in the perspective projection.

If you were to make the ZCLIP values really big, you'd start to see stitching effects in both projections.

In general, you don't want to set your ZCLIP values to such large numbers. It is better to get them closer to the actual extents of your model.

This problem did not show up in XOBJVIEW because XOBJVIEW walks the graphics tree you provide to determine the Z extents of your data.

Try setting ZCLIP to [10,-10].

Hope this helps,
Karl