

## Orthographic Display of Satellite Orbits

This *Numerit* computer program (`satplot3`) can be used to create a graphic display of satellite orbits relative to an orthographic view of the Earth. An orthographic view assumes that the user is looking at the Earth from a very distant point in space. The user can specify the latitude and longitude viewpoint of the picture.

The software will prompt you for the initial calendar date, universal time and classical orbital elements of the satellite. It will also ask you to input a simulation duration in days and the graphics step size for plotting in minutes.

The following is a typical display created with this software. The meridians (lines of constant longitude) are plotted at  $45^\circ$  increments and the parallels (lines of constant latitude) are labeled at  $30^\circ$  increments. Each orbit data point is plotted at the graphics step size input by the user. The separation of the data points is an indication of the speed of the satellite in its orbit. To help visualize the geometry, the prime meridian and equator are marked on the Earth with small + symbols.

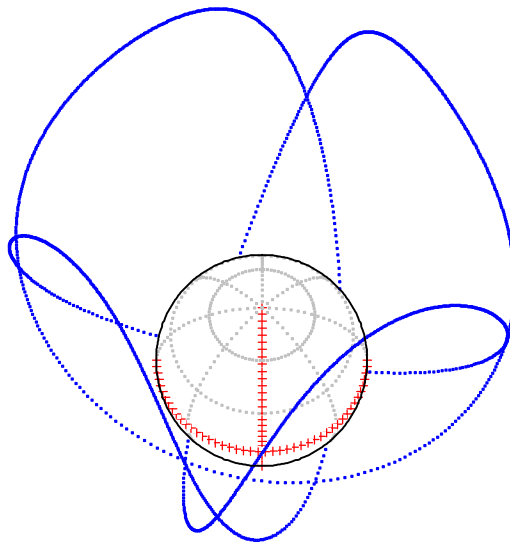


Figure 1. Orthographic View of Satellite Orbit

You can zoom the plot in and out by interactively changing the  $x$  and  $y$ -axis scales. However, be sure to make the magnitude of the plus and minus values for both scales *equal* ( $-3$  to  $+3$ , etc.). Please note that the orbit coordinates are scaled with respect to the Earth's radius. If you change the physical size of the plot be sure to make the width and height dimensions equal (4 inches by 4 inches, etc.).