

Example DISGCL Applications

DISGCL is a freeware interpreter that can be downloaded from www.dislin.de. It can be used to create stand-alone graphics applications with GUIs and the ability to save graphic images to disk.

The zip file `disgcl.zip` contains two applications for orbital mechanics.

- 1) **satplot1.gcl** – this application creates a Mercator map display of the ground track of a user-defined orbit. The user must edit the `satplot1.gcl` file in order to change the classical orbital elements of the orbit. This code starts at line 406 and appears as follows:

```
////////////////////////////////////  
// create groundtrack for user-defined orbit //  
////////////////////////////////////  
  
// semimajor axis (kilometers)  
  
oev[1] = req + 250.0 * 1.852  
  
// orbital eccentricity (non-dimensional)  
  
oev[2] = 0.0  
  
// orbital inclination (degrees)  
  
oev[3] = 51.6 * dtr  
  
// argument of perigee (degrees)  
  
oev[4] = 0.0 * dtr  
  
// longitude of ascending node (degrees)  
  
oev[5] = 120.0 * dtr  
  
// true anomaly (degrees)  
  
oev[6] = 0.0 * dtr
```

The total simulation period (in seconds) can be changed by editing the following line (491)

```
tsim = 1.0 * tperiod
```

where `tperiod` is the satellite's orbital period in seconds calculated by the software.

The plot step size (in seconds) can be changed by editing the following line (483)

```
dtstep = 60.0
```

- 2) **satplot2.gcl** – this application creates a Mercator map display using a simple ASCII ground track data file. This zipped archive includes an example data file named `gtrack.gdf`. The format of this data file is described within the source code. Here's a copy of the explanatory text.

```
// file format is as follows:  
  
//      %GCL-ASC  
//      %DATA  
//      2      // number of columns of data  
//      // latitude (+N, -S) longitude (+E, -W)  
//      33.6525   -38.8642  
//      36.1157   -35.3796  
//      38.4706   -31.9267  
//      ...      ...
```

Installation

Unzip all the files in this archive to a directory of your choice; perhaps named `disgcl`. The map files must be copied to a directory named `c:\dislin\map`. To run an application, open a DOS window, log into the `disgcl` directory and type either `sp1.bat` or `sp2.bat`.

Running Applications

DISGCL applications are run by typing **`disgcl filename`**, where `filename` is the name of your application. The filename should have an extension of `.gcl`.

Here's an example created with `satplot1`.

Mercator Display of Satellite Groundtrack

