

RAPID GEOSYNCHRONOUS TRANSFER ORBIT ASCENT PLAN GENERATION

Daniel X.Junker

LSE Space GmbH, Argelsrieder Feld 22, 82234 Wessling, Germany

Contact: +49 81538810 99 31 daniel.junker@lspacespace.com

Abstract: Geosynchronous Transfer Orbits require several maneuvers conducted at selected subsequent apogees in a manner that bring spacecraft to final target longitude and drift rate relative to a geosynchronous orbit. These maneuvers are designed to occur at longitudes free from Radiofrequency interference with operational spacecraft. In addition they are optimized to minimize propellant consumption. Finally, one must also account for cancellation of any single burn. Therefore one must also design backup plans also clear of Radiofrequency interference. This paper presents a methodology to rapidly construct a wide range of available alternatives addressing these constraints. The methodology uses several kinds of optimizing targeting algorithms, combining analytic equations to minimize propellant consumption for each maneuver while at the same time using techniques of differential correction to target relevant orbital products such as burn longitude and argument of latitude.

The technique will be demonstrated to the audience via a Java program based on Orekit. It can be displayed using an author provided laptop compatible with a standard VGA hookup at the podium.