



Meridian

Commercial Flight Dynamics Ground System Offering

a.i. solutions developed the Meridian software application to address common commercial geosynchronous and low earth orbit (GEO/LEO) spacecraft flight dynamics requirements. The full astrodynamics engine of the FreeFlyer® COTS product is accessed through user-friendly graphical interfaces developed for spacecraft operations. Meridian was designed to provide an exceptional set of system-specific analysis and planning capabilities with minimal customization when integrating into a larger ground system.

- **The look and feel of a modern application, developed using industry-leading technologies**
- **Architecture that consists of three components that can be configured for any ground system need**
- **Straightforward operator interface enables flight dynamics product generation, such as maneuver planning**



Learn more about Meridian through a [video demonstration on YouTube](#)
Or contact us meridian@ai-solutions.com (301)306-1756

GEO-1 : EAST WEST MANEUVER PLANNING

● GENERAL SETTINGS

● THRUSTERS AND TANKS

● REVIEW

STATE VECTOR

STATE VECTOR 1

MANEUVER DAY UTC

10/18/2014

CONTROL BOX

STATION LONGITUDE DEG

CONTROL BOX WIDTH DEG

298.58

0.14

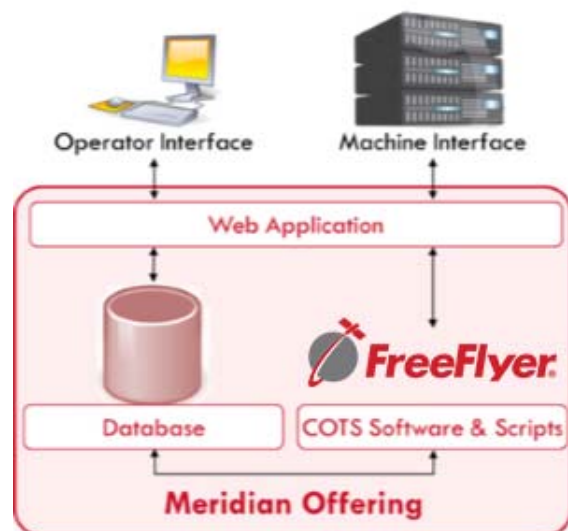
INITIAL VECTOR MJ2000

System Architecture

Meridian consists of three components: a web application, FreeFlyer with commercial ground system scripts, and an internal database. This architecture allows for flexible configurations as a standalone application or client/server, running on 32 or 64 bit machines, using Windows or Linux operating systems.

Web Interface

The web application is the interface layer for Meridian and can be accessed by the operator via a web browser or directly from other ground system software components, such as a TT&C system. Role-based permissions can restrict operator access to specific spacecraft, tasks, or other levels of control. The machine interface allows Meridian to ingest telemetry and tracking data, generate products on demand, and share those products with other ground system components.



System activity is logged and can be sorted/filtered to review what was run and troubleshoot any issues. Operator inputs are stored internally and tied to the resulting products, making it easy to rerun tasks.

Flight Dynamics Functionality

Meridian comes packaged with FreeFlyer, the space mission design, analysis, and operations software used in more than 225 missions. The FreeFlyer software and accompanying scripts are executed by Meridian to generate flight dynamics products. These products include orbit determination, maneuver planning (e.g. North/South and East/West stationkeeping, station change, and orbit raise for GEO satellites), orbit propagation, orbit events (e.g. eclipses, sensor intrusions, view periods, solar transits), orbit comparison, maneuver calibration, and lifetime analysis.

With Meridian, **a.i. solutions** can rapidly deliver a cost-effective modern flight dynamics ground system solution to meet the needs of a commercial GEO or LEO satellite.