



Semi-Major Axis Knowledge and GPS Orbit Determination

By -

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 28 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. In recent years spacecraft designers have increasingly sought to use onboard Global Positioning System receivers for orbit determination. The superb positioning accuracy of GPS has tended to focus more attention on the systems capability to determine the spacecrafts location at a particular epoch than on accurate orbit determination, per se. The determination of orbit plane orientation and orbit shape to acceptable levels is less challenging than the determination of orbital period or semi-major axis. It is necessary to address semi-major axis mission requirements and the GPS receiver capability for orbital maneuver targeting and other operations that require trajectory prediction. Failure to determine semi-major axis accurately can result in a solution that may not be usable for targeting the execution of orbit adjustment and rendezvous maneuvers. Simple formulas, charts, and rules of thumb relating position, velocity, and semi-major axis are useful in design and analysis of GPS receivers for near circular orbit operations, including rendezvous and formation flying missions. Space Shuttle flights of a number of different GPS receivers, including a mix of unfiltered and filtered solution data and Standard and Precise...

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