RTOrb SOFTWARE

RTOrb is designed to determine the orbits of artificial Earth satellites that are equipped with a GNSS receiver

RTOrb is user-friendly yet versatile orbit determination software.

RTOrb has been developed for real-time on-orbit processing and for ground-based post-processing.

Orbital parameters (initial conditions and dynamic parameters) may be treated either as deterministic parameters (specifying zero noise) or stochastic parameters. The resulting satellite orbit thus may vary from a purely dynamic through reduced dynamic to almost purely kinematic orbit.

RTOrb fast and efficiently processes the data from one satellite at a time in PPP mode.

SOFTWARE AT A GLANCE

Feature	Comment
User friendly	One-step processing with one input file
Position based on integration of equation of motion	Includes gravitational and non-gravitational forces
Output	SP3 Format positions, velocities, clocks
Gravity field	Eigen-S, Sun, Moon, Tides
Sat. Attitude	Can be used
Data	Phase and pseudorange
Kinematic orbits	Possible with many satellites in view (LEO)
Dynamic orbits	Possible with few satellites in view (GEO)
Processing	1-step PPP processing

Additional Information:
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PRECISION ORBIT DETERMINATION

POD GNSS SOFTWARE

GPS - Solutions Inc.

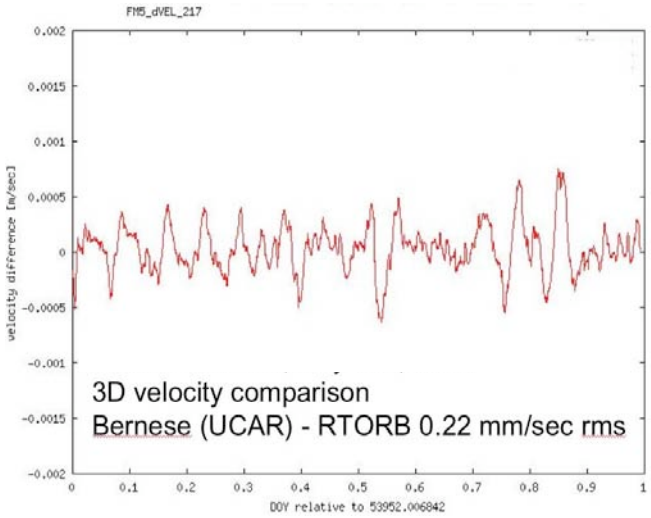
RTOrb

- Accurate
- Easy to Use
- LEO to GEO
- Post-processing & Real-time

RESULTS AND APPLICATIONS

RTOrb orbits have been compared to orbits estimated with established high accuracy software systems like the Bernese GPS software.

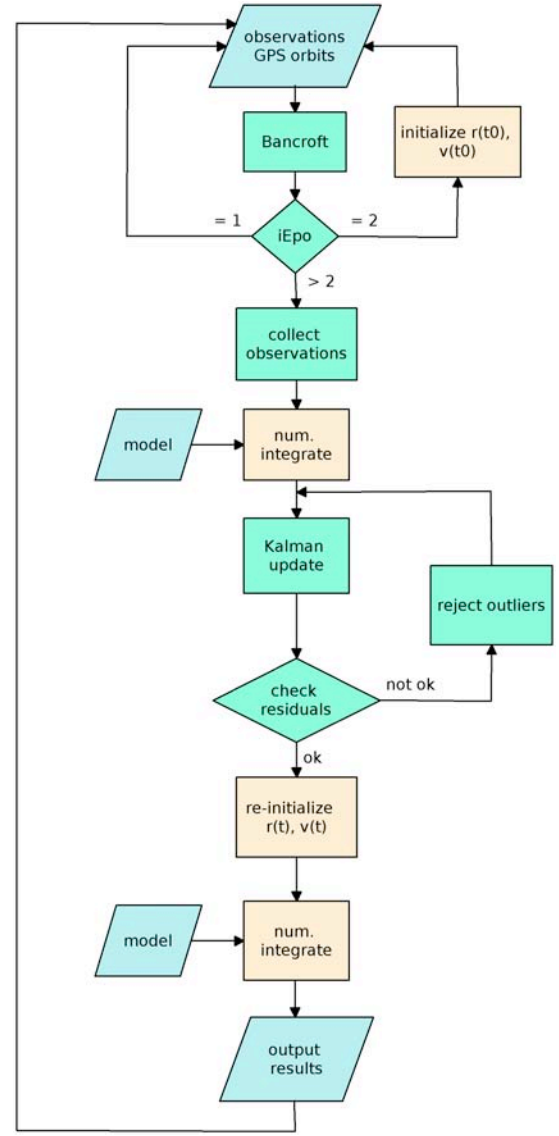
Comparison with high accuracy POD packages like the Bernese GPS software shows that dcm – level orbit positions and better than 0.2 mm/sec velocities can be achieved in low orbit.



Possible applications of RTOrb:

- Positioning from LEO orbit (10cm-level) to GEO orbit (100 m –level)
- Remote sensing
- Radio occultation POD
- Synthetic Aperture Radar (SAR)

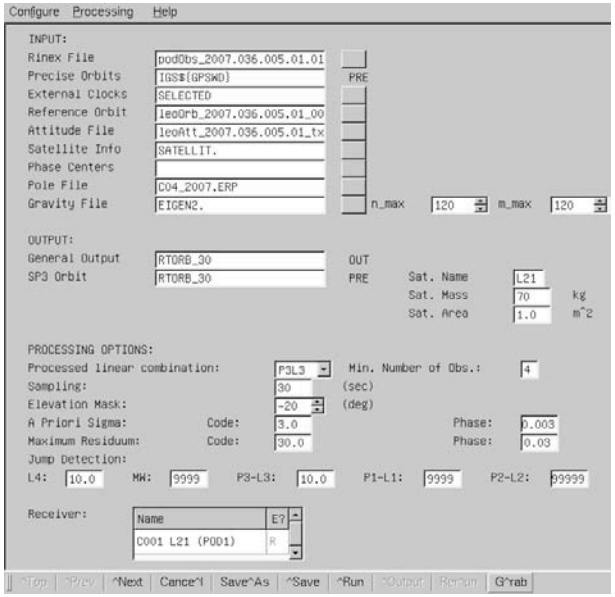
SOFTWARE FLOWCHART



Initialization of the orbit, cycle slip fixing, ambiguity solution, and outlier rejection are all done in one processing step.

USER INTERFACE

A GUI interface can be used to run RTOrb. The input requires specification of several files and processing parameters. An example input panel:



The estimated parameters are:

- receiver clock corrections
- satellite clock corrections
- phase ambiguities
- initial conditions of the equation of motion (in the form of satellite position and velocity)
- dynamic orbital parameters (air drag and radiation pressure)