



GLOBAL NAVIGATION SATELLITE SYSTEM

GLONASS

Open Service Performance Standard (OS PS)

APPENDIX E
GLONASS Space Service Volume Characteristics

Revision 1.0

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E.1 Space Service Volume

GLONASS characteristics for Space Service Volume (SSV) are provided in the following table E.1 and are illustrated on the associated figure E.1.

Table E.1 – GLONASS SSV Characteristics

Definitions	Notes	
Lower Space Service Volume: 2000 to 8000 km altitude	Signals broadcast by four GLONASS SVs are available simultaneously for the majority of the time; however, GLONASS signals over the limb of the Earth are considerably more important. Orbit determination accuracies within 1 m are feasible (for post-processed solution).	
Upper Space Service Volume: 8000 to 36000 km altitude	Signals of nearly all GLONASS SVs received over the limb of the Earth. Accuracies ranging from 20 to 200 meters are feasible (for post-processed solution) depending on receiver sensitivity and oscillator stability.	

Parameter	Value	
User Range Error ¹	1.4 m	
Signal Carrier Frequency ^{2,3}		
L1	1602 ± 0.5625 MHz (1598,0625 - 1605,375 MHz)	
L2	1246 ± 0.4375 MHz (1242,9375 - 1248,625 MHz)	
L3	1202,025 MHz	
Minimum Received Signal Power (for GEO) ^{2,3}	0 dBi RCP antenna at GEO	Reference Off-Boresight Angle
L1	-179 dBW	26°
L2	-178 dBW	34°
L3	-178 dBW	34°
Signal availability ^{2,3,4}		
MEO ⁵ at 8000 km	At least 1 signal	4 or more signals
L1	59,1%	64%
L2, L3	100%	66%
Upper Space Service Volume	At least 1 signal	4 or more signals
L1	70%	2,7%
L2, L3	100%	29%
Note 1: This value represents pseudorange accuracy, not the final user position error, which is dependent on many mission-specific factors such as orbit geometry and receiver design.		
Note 2: Open access FDMA signals in L1 and L2 (L1OF, L2OF) and open access CDMA signal in L3 (L3OC).		
Note 3: L1 and L2 signals are transmitted by all GLONASS-M and GLONASS-K satellites. The L3 signal is transmitted by seven GLONASS-M satellites (GLONASS-M No. 755 – 761) and all operational GLONASS-K satellites.		
Note 4: Assumes that there is at least one GLONASS satellite in view for a space vehicle in the Upper Space Service Volume.		
Note 5: Availability for 8000 km altitude MEO is given as the worst site level in the Lower Space Service Volume domain.		

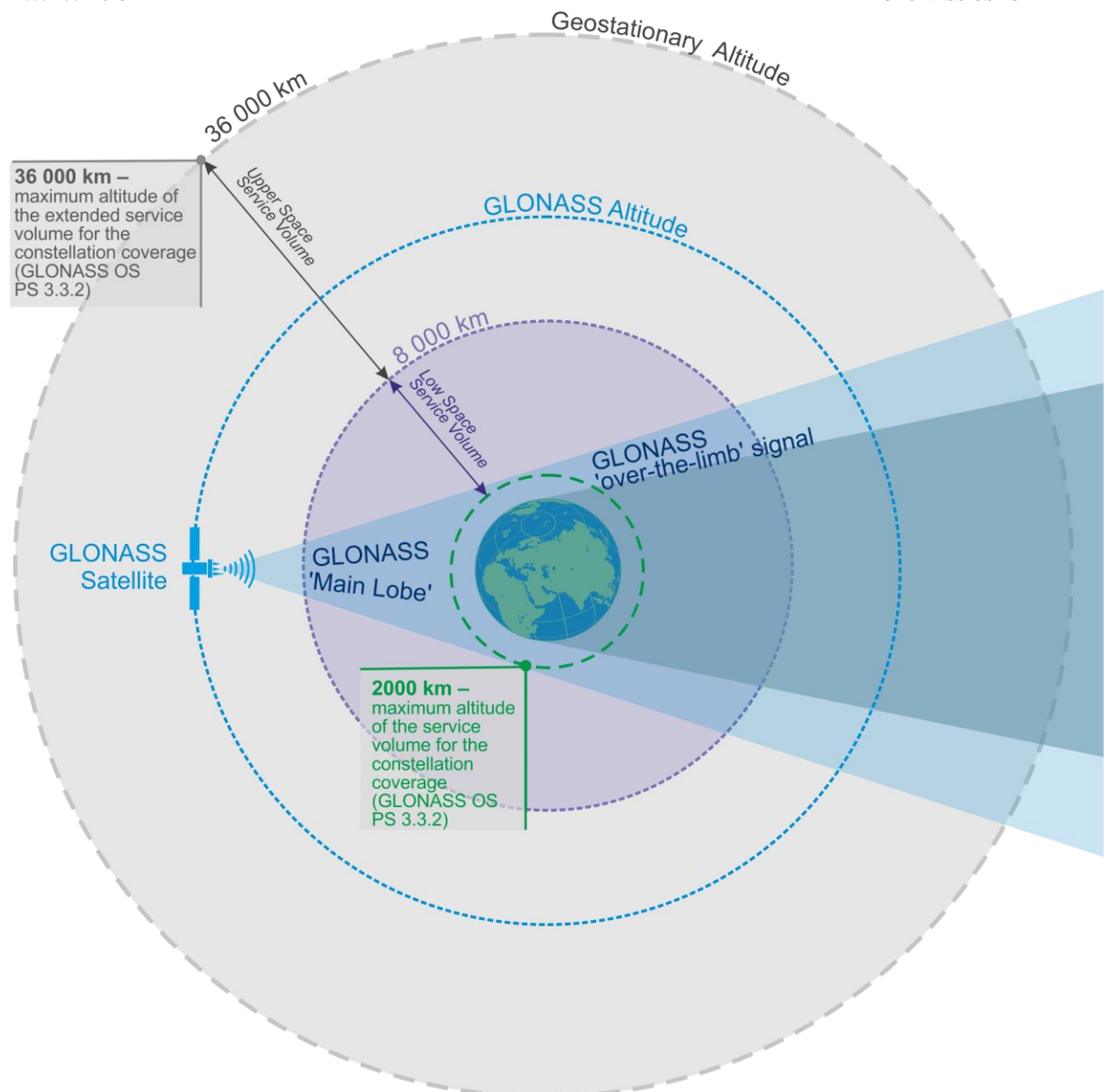


Figure E.1 – GLONASS Space Service Volume