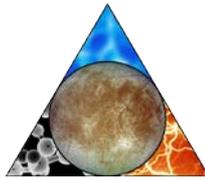


Europa Clipper Pre-Project - Update to ICEE Teams

March 19, 2014



Introduction



- The material in this package is a compilation of information the ICEE teams may find useful based on recent discussions and requests the Europa Clipper Pre-Project team has received since the last update (dated January 6, 2014).
- The spacecraft and trajectory information is subject to change as the design matures.
- For additional information or questions, please contact:

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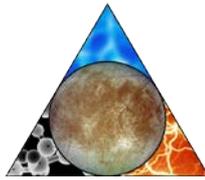
Ken Klaasen

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Planetary Protection Requirements



- NASA is in the process of updating the Planetary Protection requirements (NPR8020.12D). We've been given preliminary recommendations for the Dry Heat Microbial Reduction (DHMR) durations, which have increased from what you may have seen previously:

204.75hr @111C

180.4hr @115C

154.5hr @120C

131.75hr @125C

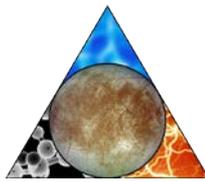
114.75hr @130C

64.2hr @135C

The Clipper Project is working to see if these can be reduced – we anticipate they won't be increased. However, we wanted to give you a heads up in case you are planning on performing any risk reduction DHMR testing.



NAIF/Spice Products and WebGeocalc



We have posted a complete set of NAIF/Spice products for the Europa Clipper 13-F7 trajectory to the public website:

<http://solarsystem.nasa.gov/europa/iceedocs.cfm>

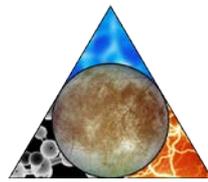
Some teams have asked whether the Europa Clipper 13-F7 trajectory would also be available on the NAIF-supported WebGeoCalc server:

<http://wgc.jpl.nasa.gov:8080/webgeocalc/>

The NAIF WebGeocalc tool (WGC) can be used to compute some observation geometry that could be useful to the ICEE teams. However, as WGC was constructed primarily to make use of archived SPICE ancillary data, (a) a little extra effort is needed to load the tool with Europa Clipper data, (b) a number of WGC calculations will not work, and (c) much of the "About the Data" text available under a link on the WGC home page is NOT applicable to Europa Clipper. Nevertheless, this partial capability will be provided. Please contact us for additional instructions on how to use the tool.



Model Payload Resources Summary



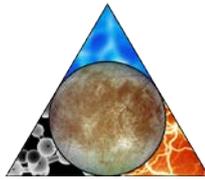
From the Europa Clipper System Model version 7.4, 2-25-14

Instrument	Unshielded Mass (kg)	Shielding Mass (kg)	Total CBE Mass (kg)	CBE Power (W)	Data Volume (Gb/flyby)	Comments
Ice Penetrating Radar (IPR)	31.7	5	36.7	57	23.5	Bringing down data between ± 1000 km
Topographical Imager (TI)	3.8	1.5	5.3	7.9	4.8	3:1 lossy compression; each additional 4 k x 4 k image is 0.07 Gbit compressed
ShortWave IR Spectrometer (SWIRS)	14.4	5.9	20.3	21.1	0.53	3:1 lossy compression; 2 full disk scans on approach; 2 full images during flyby
Reconnaissance Camera (RC)	13.5	2	15.5	22	up to 26.5	Data volume varies with flyby altitude; max for 25-km flyby
Thermal Imager (ThI)	7.2	1.3	8.5	11	0.23	Operating for ~8 hr/flyby
Neutral Mass Spectrometer (NMS)	6.1	2	8.1	15	0.001	3 Kbps rate, acquiring data between ± 1000 km from surface
Magnetometer (MAG)	2.7	0	2.7	4.5	0.1 per orbit	Operates continuously; increased sample rate $E\pm 2$ hr
Langmuir Probe (LP)	2.9	0.4	4.3	2.8	1.2 per orbit	Operates continuously
Totals:	82.3	18.1	100.4	141.3	56.9	

New: Assumes each instrument has its own chassis inside the spacecraft vault



Status of Preferred Parts List



Preferred Parts list is under review and is expected to be released by the end of April