CASSINI SOST SEGMENT

Rev 166 Handoff Package

Segment Boundary 2012-141T01:16:00 – 2012-142T08:31:00

13 Oct 2011

Sarah Milkovich

SMT report and SPASS

Science Highlights

Notes & Liens

SMT report

DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

			OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4						P5	RECORDED		PLAYBACK					
DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	START (Mb)	SCI (Mb)	HK+E (Mb)	TOTAL (Mb)	CPACTY (Mb)	MRGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	(%)	CAROVR (Mb)
SP_166EA_G70METNON141_PRIME	141 23:31	142 08:31	0	3157	94	3251	3322	71	0	350	53	3654	3665	10	10	0%	0

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S73, length = 73 days		2012-097T11:47:00		073T11:11:00	2012-170T22:58:00			
SOST_166 Segment		2012-141T01:16:00		001T07:15:00	2012-142T08:31:00			
SP_166EA_WAYPTTURN141_PRIME		2012-141T01:16:00		000T00:01:00	2012-141T01:17:00	XBAND to Earth	NEG_X to NSP	
NEW WAYPOINT		**2012-141T01:17:00**		**001T07:14:00**	**2012-142T08:31:00**	**XBAND to Earth**	**NEG_X to NSP**	
Begin Custom		**2012-141T01:17:00**		**000T00:00:01**	**2012-141T01:17:01**	**XBAND to Earth**	**NEG_X to NSP**	
CIRS_166TE_TETHYS001_PIE	I, U, V	2012-141T01:17:00		000T05:17:00	2012-141T06:34:00	NEG_Y to Tethys	POS_Z to 213.5/-81.5	Pick up at XBAND to Earth, NEG_X to NSP; Hand off at ISS_NAC to Tethys (0.0,-34.377,0.0 deg. offset), NEG_X to Sun.
Periapse R = 3.222 Rs, lat ...		2012-141T06:26:25		000T00:00:01	2012-141T06:26:26			
ISS_166ME_METHONE001_PIE	C, U, V	2012-141T06:34:00		000T01:52:00	2012-141T08:26:00	ISS_NAC to Methone	NEG_X to NSP	Collaborative Rider(s): CIRS. Collaborative Rider(s): CIRS. Pick up at ISS_NAC to Tethys (0.0,-34.377,0.0 deg. offset), NEG_X to Sun; Hand off at ISS_NAC to Methone, NEG_X to NSP. Collaborative Rider(s): CIRS. Turn to Methone is via an interim pointing of ISS_NAC to 140.5/22.0, NE...
166ME (nt) METHONE Outbou...		2012-141T06:56:42		000T00:00:01	2012-141T06:56:43			
CAPS_166SA_EINMAGPTG001_PIE	M	2012-141T08:26:00		000T03:00:00	2012-141T11:26:00	ISS_NAC to 201.298/-11.161 (1.833,0.0,0.0 deg. offset)	NEG_X to NSP	Pick up at ISS_NAC to Methone, NEG_X to NSP; Hand off at ISS_NAC to 201.298/-11.161 (1.833,0.0,0.0 deg. offset), NEG_X to NSP. Combined CAPS pointing with a UVIS calibration
CAPS_166SA_EINMAGPTG002_PIE	M	2012-141T11:26:00		000T10:35:00	2012-141T22:01:00	POS_Y to COROT	NEG_X to NSP	Pick up at ISS_NAC to 201.298/-11.161 (1.833,0.0,0.0 deg. offset), NEG_X to NSP; Hand off at XBAND to Earth, NEG_X to NSP. Secondary axis and TBD offsets for MIMI and RBOT
End Custom		**2012-141T22:01:00**		**000T00:00:01**	**2012-141T22:01:01**	**XBAND to Earth**	**NEG_X to NSP**	
SP_166EA_YGAP141_PRIME	E	2012-141T22:01:00		000T01:30:00	2012-141T23:31:00	XBAND to Earth	NEG_X to NSP	
SP_166EA_G70METNON141_PRIME	C, E	2012-141T23:31:00		000T09:00:00	2012-142T08:31:00	XBAND to Earth	NEG_X to NSP	

Science Highlights

DOY 141

This day contains three major observing campaigns. We begin with high spatial resolution optical studies of Tethys. CIRS takes the lead in mapping Tethys' leading hemisphere to confirm the previously-detected thermal anomaly, to determine thermal surface properties inside and outside of the anomaly, and to characterize the moon's shape and spatial extent. The higher daytime temperatures provide a high enough signal to allow CIRS to use their high spatial resolution detector FP3. The CIRS scans across the surface are designed to allow ISS and VIMS to mosaic the surface to contribute to a global map of the moon; UVIS rides along to measure variations in Tethys' albedo across its surface.

ISS then turns Cassini to look at the moon Methone. This close flyby (<2000 km) will be the first opportunity to characterize the geology of Methone, to obtain compositional information, and to understand the relationship of the moon to the ring system of Saturn.

Finally, CAPS takes control and turns to an attitude which allows optimal measurements of ions and electrons in Saturn's inner magnetosphere. These observations, on equatorial orbits, are in parallel with higher time resolution measurements by all the MAPS instruments. They are performed roughly every six months to study long-term, solar cycle and seasonal variability in Saturn's magnetosphere. The same observations are also used to investigate magnetospheric periodicities and their coupling to the ionosphere.

Cassini then turns to Earth and downlinks the day's science data over the Goldstone 70M antenna.

Notes

- Pointing:
  - Our “waypoint” is the downlink attitude from the previous segment. There is a 1-minute “turn” in order to declare it the waypoint.
  - CIRS Tethys observation is >3 hrs long but changes secondaries partway through. Finding good pointing was difficult, not using RBOT-friendly secondaries for science reasons
  - ISS Methone PIE: no RBOT-friendly secondary exists
  - CAPS observation is 10 hrs long but changes attitudes – includes UVIS calibration rider and collaborative design for the rest of MAPS.
- DSN:
  - No issues.
- Special Activities:
  - We have a very long custom period, but felt that this was the most RBOT-friendly way to handle the three PIEs that make up this segment.