TOST: 025TI (T15) Handoff Package

Segment: 2006-182T17:22:00 – 2006-184T17:22:00

Titan C/A: 2006-183T09:12:19, Altitude = 1911 km

Epoch: GMB_E025_Titan15

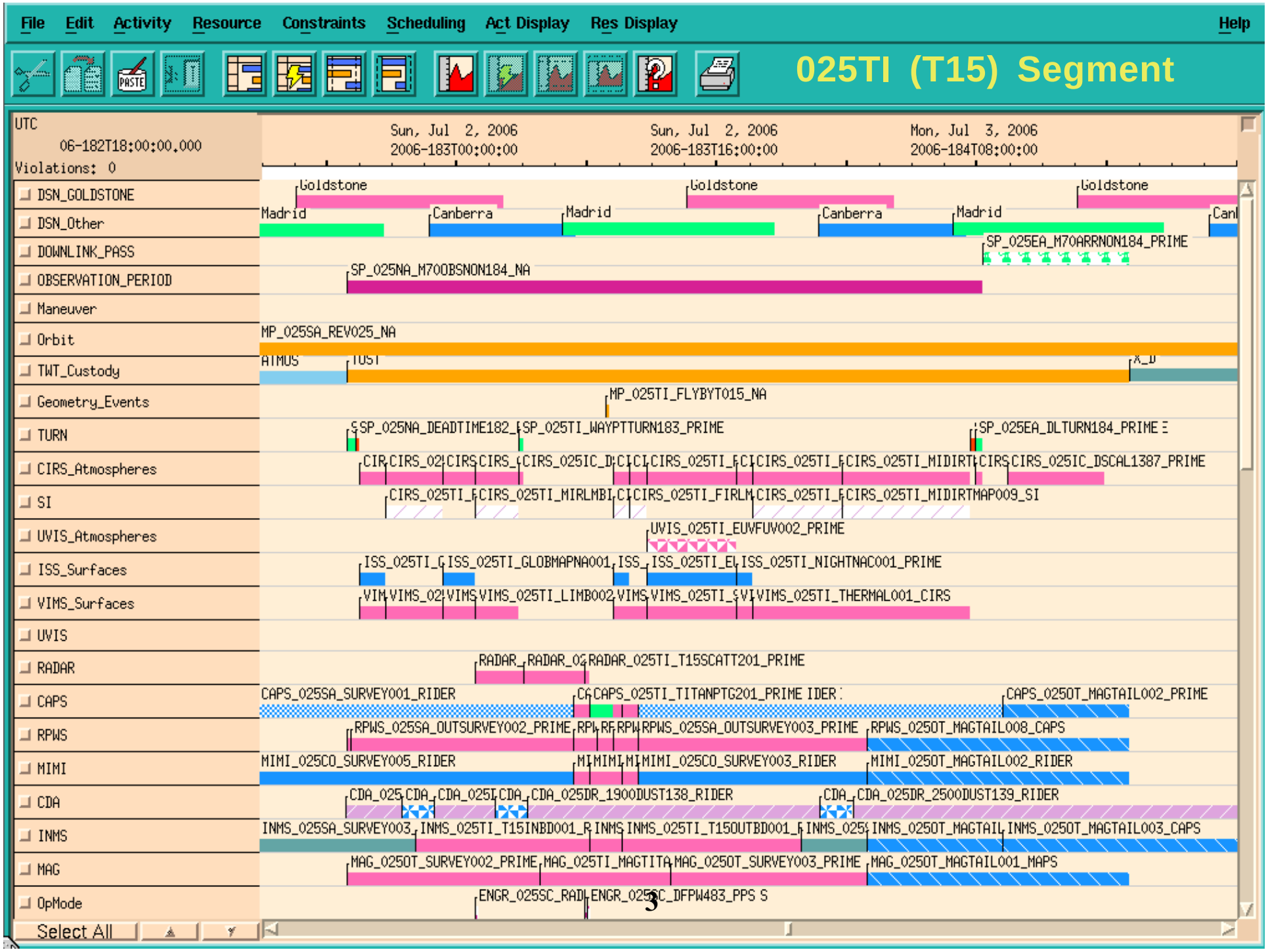
May 14, 2003

Scott Bolton, Candy Hansen, Dave Mohr, Trina Ray and Jerod Gross

025TI(T15) Timeline

C/A= 2006-183T09:12:19 @ 1911 km

Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
182T17:22	182T17:52	SP Turn to waypoint	-Y toTitan, -X to Sun	DFPW Normal	S_N_ER_3	
182T17:52	182T18:07	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
-15:05	-13:30	VIMS	Global Map	DFPW Normal	S_N_ER_3	
-13:30	-10:00	CIRS	FP1 long integration; 60° emision angle; co-aligned ORS boresights on Titan; may choose orientation to optimize pointing.	DFPW Normal	S_N_ER_3	
-10:00	-8:00	ISS	Global Map, 5 min. dwell time	DFPW Normal	S_N_ER_3	
-8:00	-05:20	CIRS	Limb integration	RADWU	S_N_ER_5a	
-05:20	-05:00	SP Turn to RADAR waypoint	NEG_Z to Titan, POS_X to NTP	RADWU	S_N_ER_8	
-05:00		Begin Custom Period				
-05:00	-01:15	RADAR	Radiometry	RADRWA	S_N_ER_8	Potential CIRS Radiator violation.
-01:15	-01:00	RADAR	Scatterometry	RADRWA	S_N_ER_8	Leave at -Z to Titan, -Y to NTP
-01:00	+00:30	MAPS	-X to 345/-20; +Z to NSP	DFPW Normal	S_N_ER_2	Pick up at RADAR attitude; leave at MAPS attitude
+00:30	+02:30	CIRS	Limb integration	DFPW Normal	S_N_ER_3	Pick up at MAPS attitude; leave at waypoint
+02:30		End Custom Period				
+02:30	+08:00	UVIS	Slow scan limb to limb	DFPW Normal	S_N_ER_3	
+08:00	+09:00	ISS	Photometry	DFPW Normal	S_N_ER_3	
+09:00	+22:24	CIRS	FP1 integration	DFPW Normal	S_N_ER_3	
184T07:37	184T07:52	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
184T07:52	184T08:22	SP Turn to Earth for downlink		DFPW Normal	S_N_ER_3	
184T08:22	184T17:22	Madrid 70-m Array		DFPW Normal	S_N_ER_3	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025TI (T15) Segment
UTC
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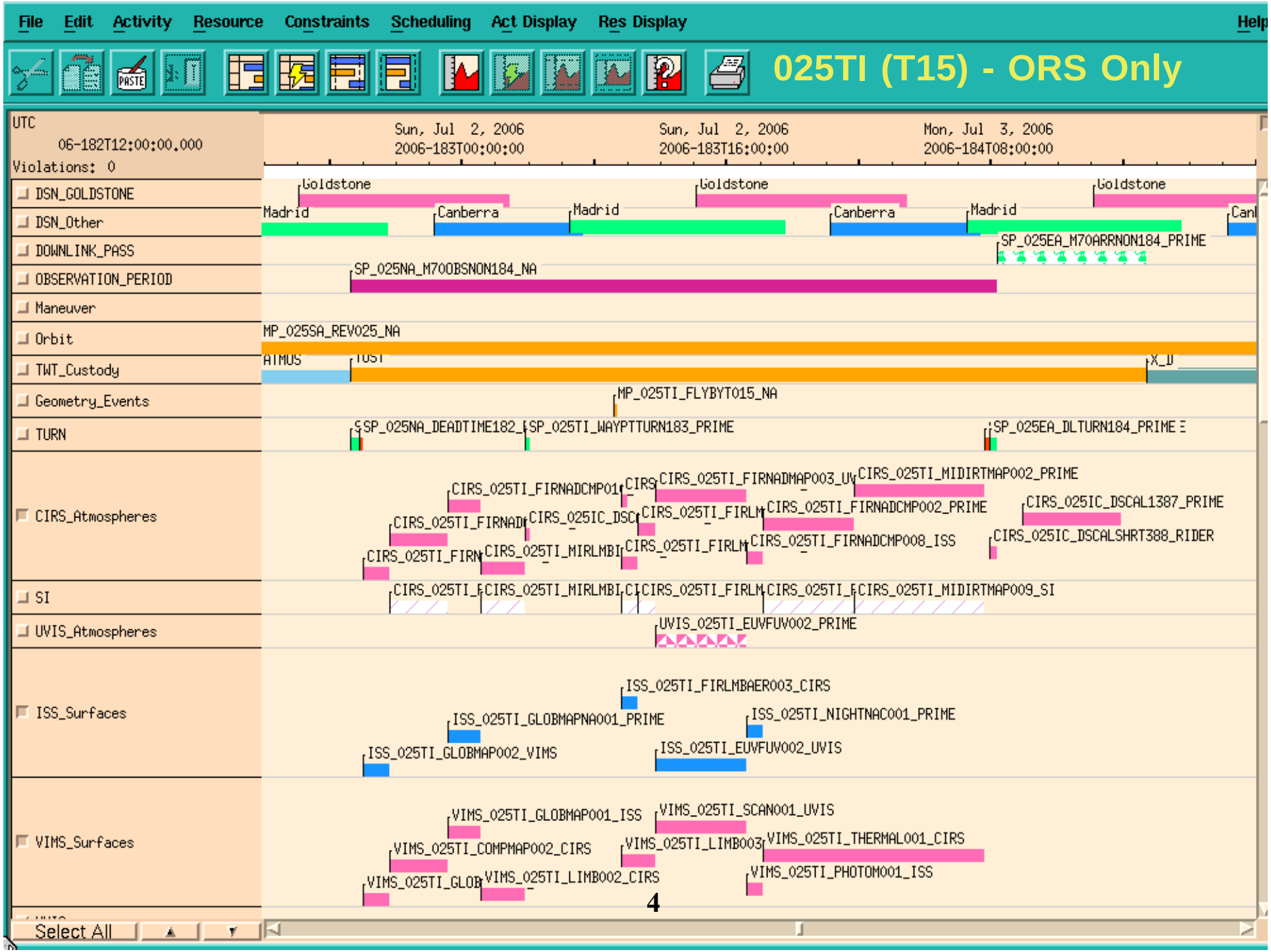
Violations: 0
Sun, Jul 2, 2006
2006-183T00:00:00
Sun, Jul 2, 2006
2006-183T16:00:00
Mon, Jul 3, 2006
2006-184T08:00:00
DSN_GOLDSTONE
DSN_Other
DOWNLINK_PASS
OBSERVATION_PERIOD
Maneuver
Orbit
TWT_Custody
Geometry_Events
TURN
CIRS_Atmospheres
SI
UVIS_Atmospheres
ISS_Surfaces
VIMS_Surfaces
UVIS
RADAR
CAPS
RPWS
MIMI
CDA
INMS
MAG
OpMode
Goldstone
Madrid
Canberra
SP_025EA_M70ARRNON184_PRIME
SP_025NA_M70OBSNON184_NA
MP_025SA_REV025_NA
MP_025TI_FLYBYT015_NA
SP_025NA_DEADTIME182_
SP_025TI_WAYPTTURN183_PRIME
SP_025EA_DLTURN184_PRIME
CIRS_025IC_DSCAL1387_PRIME
CIRS_025TI_MIRLMBI
CIRS_025TI_FIRLM
CIRS_025TI_MIDIRTMAP009_SI
UVIS_025TI_EUVFUV002_PRIME
ISS_025TI_GLOBMAPNA001
ISS_025TI_NIGHTNAC001_PRIME
VIMS_025TI_LIMB002
VIMS_025TI_THERMAL001_CIRS
RADAR_025TI_T15SCATT201_PRIME
CAPS_025SA_SURVEY001_RIDER
CAPS_025TI_TITANPTG201_PRIME
CAPS_025OT_MAGTAIL002_PRIME
RPWS_025SA_OUTSURVEY002_PRIME
RPWS_025SA_OUTSURVEY003_PRIME
RPWS_025OT_MAGTAIL008_CAPS
MIMI_025CO_SURVEY005_RIDER
MIMI_025CO_SURVEY003_RIDER
MIMI_025OT_MAGTAIL002_RIDER
CDA_025DR_1900DUST138_RIDER
CDA_025DR_2500DUST139_RIDER
INMS_025SA_SURVEY003
INMS_025TI_T15INBD001_R
INMS_025TI_T15OUTBD001_R
INMS_025OT_MAGTAIL003_CAPS
MAG_025OT_SURVEY002_PRIME
MAG_025TI_MAGTITA
MAG_025OT_SURVEY003_PRIME
MAG_025OT_MAGTAIL001_MAPS
ENGR_025SC_RAD
Select All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025TI (T15) - ORS Only
UTC
06-182T12:00:00.000
Violations: 0
Sun, Jul 2, 2006
2006-183T00:00:00
Sun, Jul 2, 2006
2006-183T16:00:00
Mon, Jul 3, 2006
2006-184T08:00:00
DSN_GOLDSTONE
DSN_Other
DOWNLINK_PASS
OBSERVATION_PERIOD
Maneuver
Orbit
TWT_Custody
Geometry_Events
TURN
CIRS_Atmospheres
SI
UVIS_Atmospheres
ISS_Surfaces
VIMS_Surfaces
Goldstone
Madrid
Canberra
SP_025EA_M70ARRNON184_PRIME
SP_025NA_M70OBSNON184_NA
MP_025SA_REV025_NA
MP_025TI_FLYBYT015_NA
SP_025NA_DEADTIME182_
SP_025TI_WAYPTTURN183_PRIME
SP_025EA_DLTURN184_PRIME
CIRS_025TI_FIRNADCMP01
CIRS_025TI_FIRNADMAP003_UV
CIRS_025TI_MIDIRTMAP002_PRIME
CIRS_025TI_FIRNADCMP002_PRIME
CIRS_025IC_DSCAL1387_PRIME
CIRS_025IC_DSCALSHRT388_RIDER
CIRS_025TI_FIRNADCMP008_ISS
CIRS_025TI_MIRLMBI
CIRS_025TI_FIRLM
CIRS_025TI_MIDIRTMAP009_SI
UVIS_025TI_EUVFUV002_PRIME
ISS_025TI_FIRLMBAER003_CIRS
ISS_025TI_GLOBMAPNA001_PRIME
ISS_025TI_NIGHTNAC001_PRIME
ISS_025TI_GLOBMAP002_VIMS
ISS_025TI_EUVFUV002_UVIS
VIMS_025TI_GLOBMAP001_ISS
VIMS_025TI_SCAN001_UVIS
VIMS_025TI_COMPMAP002_CIRS
VIMS_025TI_LIMB003
VIMS_025TI_THERMAL001_CIRS
VIMS_025TI_LIMB002_CIRS
VIMS_025TI_PHOTOM001_ISS
Select All

025TI (T15) Attitude Strategy Spreadsheet

Request	Riders	Start(SCET)	Start(Epoch)	Duration	End(SCET)	Primary Pointing	Secondary Pointing	Comments
Sequence S021, length = 43 ...		2006-154T02:39:00		043T21:27:00	2006-198T00:06:00			
TOST rev 25 Segment		**2006-182T17:22:00**		**002T00:00:00**	**2006-184T17:22:00**			
SP_025TI_WAYPTTURN182_PRIME		2006-182T17:22:00		000T00:30:00	2006-182T17:52:00	ISS_NAC to Titan	NEG_X to Sun	
NEW WAYPOINT		**2006-182T17:52:00**		**001T23:30:00**	**2006-184T17:22:00**	**ISS_NAC to Titan**	**NEG_X to Sun**	
SP_025NA_DEADTIME182_PRIME		**2006-182T17:52:00**		**000T00:15:00**	**2006-182T18:07:00**	**ISS_NAC to Titan**	**NEG_X to Sun**	
VIMS_025TI_GLOBMAP002_PRIME	C, I	2006-182T18:07:19	GMB_E025_Titan15-000T15:05:00	000T01:35:00	2006-182T19:42:19	ISS_NAC to Titan	NEG_X to Sun	
CIRS_025TI_FIRNADCMP003_PRIME	C, V	2006-182T19:42:19	GMB_E025_Titan15-000T13:30:00	000T03:30:00	2006-182T23:12:19	CIRS_FP1 to Titan	NEG_X to Sun	
ISS_025TI_GLOBMAPNA001_PRIME	C, V	2006-182T23:12:19	GMB_E025_Titan15-000T10:00:00	000T02:00:00	2006-183T01:12:19	ISS_NAC to Titan	NEG_X to Sun	
CIRS_025TI_MIRLMBINT002_PRIME	C, R, V	2006-183T01:12:19	GMB_E025_Titan15-000T08:00:00	000T02:40:00	2006-183T03:52:19	CIRS_FPB to Titan	PIC	
SP_025TI_WAYPTTURN183_PRIME	C,R	2006-183T03:52:19	GMB_E025_Titan15-000T05:20:00	000T00:20:00	2006-183T04:12:19	NEG_Z to Titan	POS_X to North_Pole_Dir	set up for RADAR
Begin Custom Period		**2006-183T04:12:19**	**GMB_E025_Titan15-000T05:00:00**	**000T00:01:00**	**2006-183T04:13:19**			
RADAR_025TI_T15RADIOM001_PRIME	M	2006-183T04:12:19	GMB_E025_Titan15-000T05:00:00	000T03:45:00	2006-183T07:57:19	NEG_Z to Titan	POS_X to North_Pole_Dir	
RADAR_025TI_T15SCATT201_PRIME	M	2006-183T07:57:19	GMB_E025_Titan15-000T01:15:00	000T00:15:00	2006-183T08:12:19	NEG_Z to Titan	NEG_Y to North_Pole_Dir	Leave at NEG_Z to Titan, NEG_Y to NTP.
CAPS_025TI_TITANPTG201_PRIME	M	2006-183T08:12:19	GMB_E025_Titan15-000T01:00:00	000T01:30:00	2006-183T09:42:19	NEG_X to 345.0/-20.0	POS_Z to NSP	Pick up from -Z to Titan (center), -Y to NTP; leave at -X to 345/-20, +Z to NSP
CIRS_025TI_FIRLMBAER003_PRIME	C, I, M, V	2006-183T09:42:19	GMB_E025_Titan15+000T00:30:00	000T01:00:00	2006-183T10:42:19	CIRS_FP1 to Titan	PIC	Pick up at NEG_X to 345/-20, POS_Z to NSP
CIRS_025TI_FIRLMBINT003_PRIME	C, M, V	2006-183T10:42:19	GMB_E025_Titan15+000T01:30:00	000T01:00:00	2006-183T11:42:19	CIRS_FP1 to Titan	PIC	Leave at ISS_NAC to Titan, NEG_X to SUN
End Custom Period		**2006-183T11:42:19**	**GMB_E025_Titan15+000T02:30:00**	**000T00:01:00**	**2006-183T11:43:19**			
UVIS_025TI_EUVFUV002_PRIME	C, I, V	2006-183T11:42:19	GMB_E025_Titan15+000T02:30:00	000T05:30:00	2006-183T17:12:19	UVIS_EUV to Titan	NEG_X to Sun	
ISS_025TI_NIGHTNAC001_PRIME	C, V	2006-183T17:12:19	GMB_E025_Titan15+000T08:00:00	000T01:00:00	2006-183T18:12:19	ISS_NAC to Titan	NEG_X to Sun	
CIRS_025TI_FIRNADCMP002_PRIME	C, V	2006-183T18:12:19	GMB_E025_Titan15+000T09:00:00	000T05:30:00	2006-183T23:42:19	CIRS_FP1 to Titan	PIC	
CIRS_025TI_MIDIRTMAP002_PRIME	C, M, V	2006-183T23:42:19	GMB_E025_Titan15+000T14:30:00	000T07:54:00	2006-184T07:36:19	CIRS_FPB to Titan	POS_X to North_Pole_Dir	
SP_025NA_DEADTIME184_PRIME	**M**	**2006-184T07:37:00**		**000T00:15:00**	**2006-184T07:52:00**	**ISS_NAC to Titan**	**NEG_X to Sun**	
SP_025EA_DLTURN184_PRIME	C, M	2006-184T07:52:00		000T00:30:00	2006-184T08:22:00	XBAND to Earth	POS_X to NEP	
SP_025EA_M70ARRNON184_PRIME	C, M	2006-184T08:22:00		000T09:00:00	2006-184T17:22:00	XBAND to Earth	Rolling	

025TI (T15) Telemetry Modes

TELEMETRY MODE REPORT

SCET	TELEMETRY MODE	REQUEST
2006-182T17:22:00	S_N_ER_3	SP_025NA_M70OBSNON184_NA
2006-183T01:12:19	S_N_ER_5A	SP_025NA_M70OBSNON184_NA
2006-183T03:52:19	S_N_ER_8	SP_025NA_M70OBSNON184_NA
2006-183T08:12:19	S_N_ER_2	SP_025NA_M70OBSNON184_NA
2006-183T09:42:19	S_N_ER_3	SP_025NA_M70OBSNON184_NA
2006-184T08:22:00	RTE_N_SPB_110600	SP_025EA_M70ARRNON184_PRIME
2006-184T08:52:00	RTE_N_SPB_124425	SP_025EA_M70ARRNON184_PRIME
2006-184T09:52:00	RTE_N_SPB_142200	SP_025EA_M70ARRNON184_PRIME
2006-184T16:07:00	RTE_N_SPB_124425	SP_025EA_M70ARRNON184_PRIME
2006-184T17:07:00	RTE_N_SPB_110600	SP_025EA_M70ARRNON184_PRIME

025TI (T15) SMT Results

DATA VOLUME SUMMARY

			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)	MARGIN (Mb)	(%)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGIN (Mb)	CAROVR (%)	CAROVR (Mb)	
SP_025EA_M70ARRNON184_PRIME	184 08:22	184 17:22	0	2694	135	2830	3565	735	21%	0	496	53	3379	3709	331	9%	0	

DATA VOLUME REPORT

Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	182 17:22	184 08:22	270.0	38.5	348.5	21.5	271.0	159.1	166.6	99.0	754.6	99.6	440.0	0.0	0.0	2668.4
OBSERVATION_SI	182 17:22	184 08:22	0.0	0.0	26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0
SP_025EA_M70ARRNON184_PRIME	184 08:22	184 17:22	116.6	4.9	86.4	3.2	0.0	64.0	58.5	0.0	162.0	0.0	0.0	0.0	0.0	495.7
DAILY TOTAL SCIENCE	182 17:22	184 17:22	386.6	43.4	460.9	24.7	271.0	223.1	225.1	99.0	916.6	99.6	440.0	0.0		

AVERAGE DATA RATE REPORT (calculated over observation periods and downlink passes)

Event	Start doy hh:mm	End doy hh:mm	CAPS (bps)	CDA (bps)	INMS (bps)	MAG (bps)	MIMI (bps)	RPWS (bps)	UVIS (bps)
SP_025NA_M70OBSNON184_NA	182 17:22	184 08:22	1923.1	274.2	152.9	1133.3	1186.3	5374.6	709.6
SP_025EA_M70ARRNON184_PRIME	184 08:22	184 17:22	3600.0	149.9	100.0	1976.0	1806.0	5000.0	0.0

025TI (T15) DSN Requests

CASSINI DSN COVERAGE SUMMARY for 025TI_T15_030514.apf generated on 2003-May-14 10:12:56

(+ = pass overlaps with previous pass; * = in conflict with DSN weekly maintenance)

C	ANT	ID	BOT_TO_EOT ERT	DUR hh:mm	XMT_AT ERT	2WAY_PERIOD ERT	DUR hh:mm	DL_PERIOD ERT	DL_PERIOD SCET	DUR hh:mm	NOT	CALS min	RADIO_CONFG UD	D	UD	MAR	DATA_RATES kbps
M	70ARR	54	184T09:45-18:45	09:00	184T09:55	12:41-18:45	06:04	184T09:45-18:45	184T08:22-17:22	09:00	---	15/15	XX	-	--	--0	110,124,142,124,110
+M	70ARR	63	184T09:45-18:45	09:00	184T09:55	12:41-18:45	06:04	184T09:45-18:45	184T08:22-17:22	09:00	---	15/15	XX	-	--	--0	110,124,142,124,110

025TI (T15) OpMode Strategy

Start Time	End Time	Request
2006-183T01:12:19e	2006-183T01:12:28	ENGR_025SC_RADWU183_PPS
2006-183T04:12:19e	2006-183T04:13:03	ENGR_025SC_RADRWA183_PPS
2006-183T08:06:44e	2006-183T08:12:19	ENGR_025SC_DFPW483_PPS

025TI (T15) Notes

- **Pointing**
  - Waypoint of ISS_NAC to Titan, NEG_X to Sun is safe for entire segment.
  - SP turns are FR-safe and have enough time allocated to them.
  - RADAR, CAPS, and CIRS modeled all of the custom handoffs; no issues.
- **Data Volume**
  - No issues. P4 has 21% margin, and there is 9% margin on the DSN capability at the end of the segment.
- **CIMS Issues**
  - None. All expected requests are in the database. All requests in the Moveable Block are tied to the GMB_025TI_Titan15 epoch.
- **Power Issues**
  - None.
- **MP Guidelines & Constraint Issues**
  - None. Nav & MP approve of DSN plan, and requested pass does not conflict with maintenance.
  - Flyby altitude = 1911 km, so RCS usage is not required
- **Special Activities**
  - ENGR_025EA_MECVROPN001_THERM at 184T08:32 (over DSN pass)

TWT/OST Integration Constraint and Guideline Checklist

Below are Target Working Team (TWT) and Orbiter Science Team (OST) constraints that must be followed during segment implementation. Any exceptions to constraint numbers 3, 4, 6, or 7 must be approved by the Science Planning Manager.

Constraint	C=Comply V=Violate N/A=Not Applicable	Comments	Disposition
1. A. SP has checked all waypoints turns to and from waypoints.	C		
B. All initial downlink attitudes have been checked as waypoints.	C		
2. All turns to and from waypoints checked for violations and margins. ☐CAPS ☐CDA ☒CIRS ☐INMS ☐ISS ☐MIMI ☐MAG ☐NAV ☒RADAR ☐RPWS ☐RSS ☐UVIS ☐VIMS Each Prime Instrument agrees to accept a reduction in observation time during implementation if problems arise.	C	SP also checked SP turns; no problems found	
3. Custom handoffs limited to:			
A. ±3 hours from targeted Icy Satellite flyby			
B. ± 3 hours from targeted Titan Flyby	C	All teams modeled custom turns; no issues	
C. O pNavs preceding/following a downlink			
4. Minimum 30. min SPASS Prime request duration outside ±5 min. from targeted satellite flyby (5 min. integer duration if >30 min.)	C		
5. Live and Ground Movable Blocks include appropriate time margins.	C	K. Klaasen's margin for flyby is min. according to memo dated .	
6. Waypoints changes are ≤3 per day	C		
A. All turns that accomplish the waypoint strategy are requested by SP or OpNav.	C		
7. Live Movable Blocks limited to the following orbits: 7, 8, 9, 10, 12, 28, 51, 56, 57, 60, 63, 64	N/A		

Guideline	Yes / No	Comments
1. Were repeatable/reusable templates used where possible?	Yes	
2. During Pre-Integration: Was 30 min. used for 90º RWA turns and/or 10 min. for RCS turns?	Yes	

(DOUBLE-CLICK TO MAKE CHANGES)