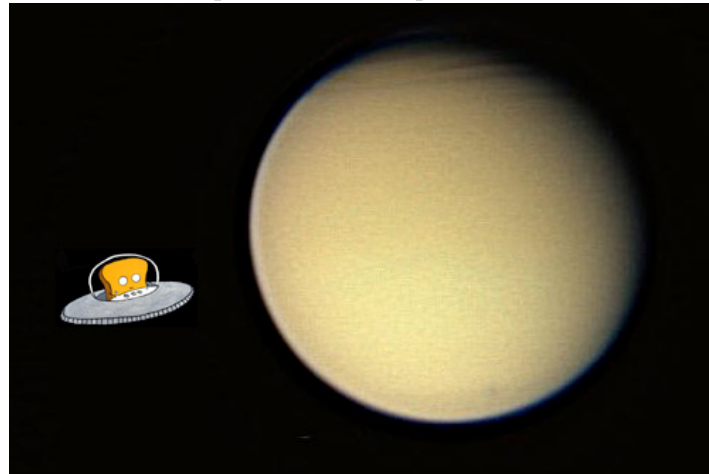


TOST: Integration 097TI (T49) Wrapup



March 21, 2008

Jo Pitesky, Douglas Equils, Trina Ray, Kim Steadman

T49 Segment Basics

Segment times:

BEG: 2008-355T16:29:00

END: 2008-357T22:14:00

APOAPSE: 2008-356T13:04:00

Heads up: T49 has requests in Revs 97 and 98

Altitude: 970 km

Time of C/A: 2008-356T12:59:52

Epoch: GMB_E097_Titan49

<p>At least 2 weeks prior to the Kickoff Meeting make sure that all requests are in CIMS</p>	<p>Kickoff Meeting</p> <p><u>Present</u> Master Timeline</p> <p><u>Discuss</u> Timeline Op Modes Telem Modes Deadbands for RCS</p> <p><u>Homework</u> Custom Handoff Attitudes Unique Op Mode Requirements (SCO) Turn Assignments CCRs High Level Science Objectives</p>	<p>Detailed Meeting</p> <p><u>Present</u> Master Timeline SMT Report Timeline Graphic TOL SPASS DSN Reports High Value Science</p> <p><u>Discuss</u> Data Volume Cuts</p> <p><u>Homework</u> CCRs High Level Science Objectives</p>	<p>Wrap-up Meeting</p> <p><u>Present</u> Wrap-up Package Checklist High Level Science Objectives</p> <p><u>Discuss</u> N/A</p> <p><u>Homework</u> N/A</p>
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T49 High-level Science Objectives

CIRS – On T49 CIRS continues to extend spatial and temporal coverage of our Titan dataset, performing most major observational activity types. These include: global temperature mapping, vertical profiles of minor gas species in the mid-infrared, and global mapping of far-infrared trace species such as CO, H₂O and HCN.

RADAR – T49 features altimetry across Ontario Lacus, the first time in the mission RADAR has obtained altimetry across a known or suspected lake. The topography profile will help us understand the slopes driving drainage into Ontario as well as providing evidence about whether it is presently liquid-filled. T49 also includes SAR of the almost completely unmapped southwestern quadrant of Titan, as well as of south polar terrain.

T49 High-level Science Objectives (2)

ISS –

VIMS –

MAPS –

Master Timeline for T49

T49	970
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Start Time	End Time	Prime Activity	Obs. Detail	Op Mode	TLM Mode	Comments
2008-355T16:29:00	2008-355T17:09:00	SP Turn to WP	NEG_Y to Titan, NEG_Z to 340/0 (0, -15, 0 offset)	DFPW Normal	S_N_ER_3	
2008-355T17:09	C/A - 19:35:20	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
C/A - 19:35:20	-13:00	CIRS	Template A	DFPW Normal	S_N_ER_3	
-13:00	-09:00	CIRS	Template C	DFPW Normal	S_N_ER_3	
-09:00	-05:00	ISS	Template H	DFPW Normal	S_N_ER_3	
-05:00	-03:00	ISS	Template S2	DFPW Normal		
-03:00	-02:00	CIRS	Template S2	RADWU	S_N_ER_5a for 00:15, then S_N_ER_3	
-02:00	-00:46	VIMS		RADWU	S_N_ER_3	
-00:46	-00:45	RWA to RCS Transition		RADRCs	S_N_ER_3	
-00:45	-00:24	VIMS		RADRCs	S_N_ER_3	
-00:24	-00:07	RADAR	SAR	RADRCs	S_N_ER_8	
-00:07	0	RADAR	Altimetry over Ontario	RADRCs	S_N_ER_8	
2008-356T12:59:20		CLOSEST APPROACH	NEG_Z to Titan, NEG_X to RAM	RADRCs	S_N_ER_8	
0	+00:18	RADAR	SAR	RADRCs	S_N_ER_8	
+00:18	+00:30	RADAR	Altimetry	RADRCs	S_N_ER_8	
+00:30	+00:50	RADAR	HiSAR + Alt (Radiometry?)	RADRCs	S_N_ER_8	
+00:50	+01:12	RCS to RWA Transition		RADRWA	S_N_ER_8	
+01:12	+02:00	RADAR	Radiometry	RADRWA	S_N_ER_8	
+02:00	+05:30	RADAR	Template L	RADRWA	S_N_ER_8	
+05:30	+09:00	CIRS (FP3/FP4)	Template R	DFPW Normal	S_N_ER_3	
+09:00	+13:00	VIMS	Template O	DFPW Normal	S_N_ER_3	
+13:00	+13:30	ISS (stare)	Template M2	DFPW Normal	S_N_ER_3	
+13:30	+17:00	CIRS	Template M2	DFPW Normal	S_N_ER_3	
+17:00	+17:30	ISS (stare)	Template M2	DFPW Normal	S_N_ER_3	
C/A + 17:30:0	2008-357T6:34:00	OD Uncertainty Dead Time		DFPW Normal	S_N_ER_3	
2008-357T6:34:00	2008-357T07:14:00	SP Turn to Earth for downlink	XBAND to Earth, NEG_X to NEP	DFPW Normal	S_N_ER_3	SRU Bright Body violation
		70-m Array	XBAND to Earth, Rolling	DFPW Normal	RTE_N_SPB	CIRS FR violation (max delta temp=4.33, final delta T=3.4748. CIRS rad exposure
2008-357T07:14:00	2008-357T16:14:00	2 hours: C34/70 array 4 hours: HEF	XBAND to Earth, NEG_X to NEP	DFPW Normal	RTE_N_SPB	
2008-357T16:14:00	2008-357T22:14:00					

Dual Playback: currently -00:18 to +00:18
 Deadband: (0.5, 0.5, 2) (per RADAR, tighter deadband needed for altimetry pass to target Ontario Lacus at C/A)

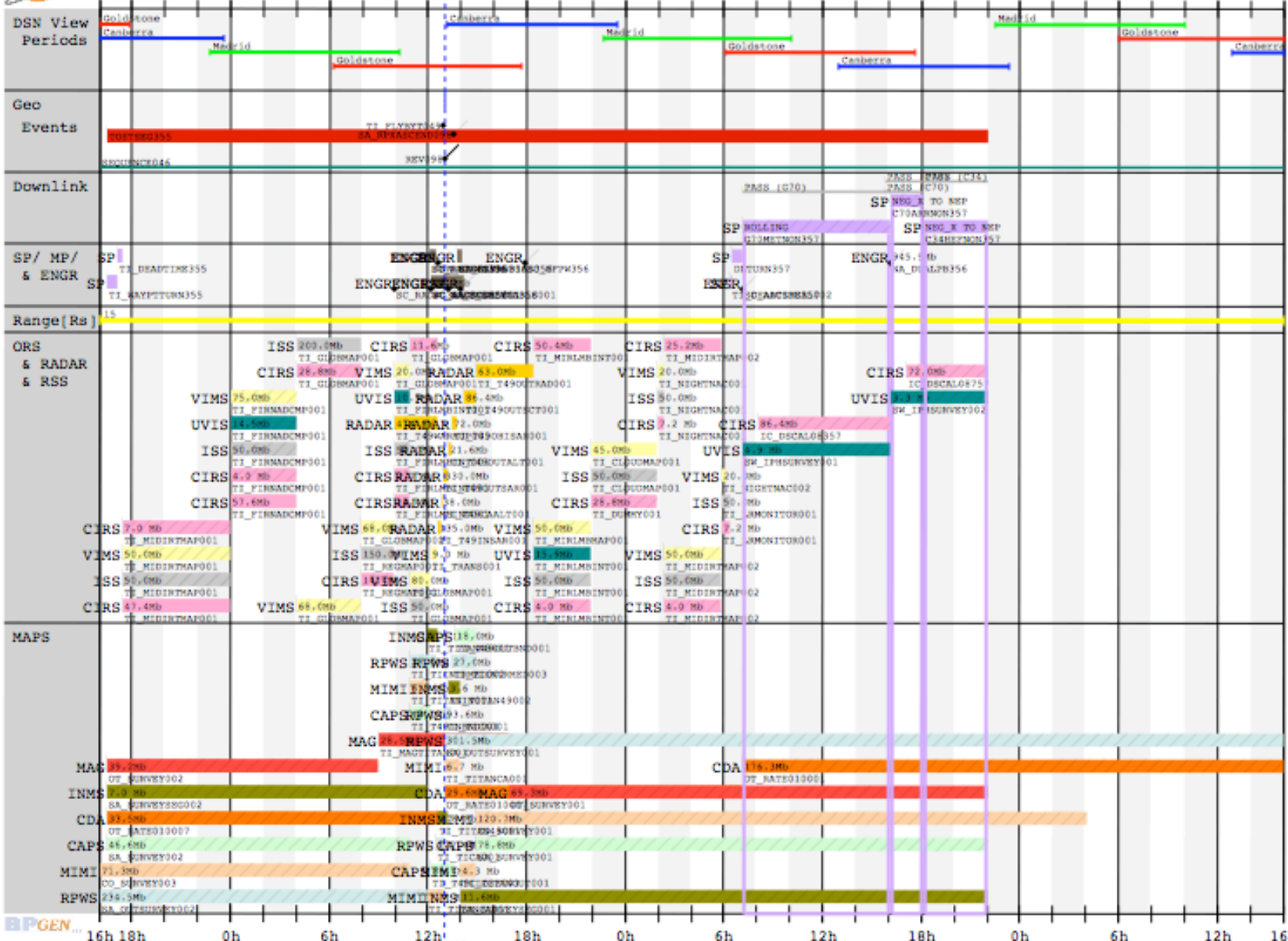


T49-Wrapup

2008 DOY 355 DOY 356
16h 18h 0h 6h 12h 18h

DOY 357
0h 6h 12h 18h

DOY 358
0h 6h 12h 16h



BP GEN...

16h 18h 0h 6h 12h 18h

DOY 357
0h 6h 12h 18h

DOY 358
0h 6h 12h 16h

T49 Detailed Telemetry Mode Report

TELEMETRY MODE REPORT

EPOCH RELATIVE	UTC	DURATION	TELEMETRY MODE	REQUEST
	2008-355T16:29:00.000	17:30:52	S_N_ER_3	SP_097NA_G70OBSNON357_NA
GMB_E097_Titan49-000T03:00:00	2008-356T09:59:52.000	00:15:00	S_N_ER_5A	SP_097NA_G70OBSNON357_NA
GMB_E097_Titan49-000T02:45:00	2008-356T10:14:52.000	02:21:00	S_N_ER_3	SP_097NA_G70OBSNON357_NA
GMB_E097_Titan49-000T00:24:00	2008-356T12:35:52.000	05:54:00	S_N_ER_8	SP_097NA_G70OBSNON357_NA
GMB_E097_Titan49+000T05:30:00	2008-356T18:29:52.000	12:44:08	S_N_ER_3	SP_097NA_G70OBSNON357_NA
	2008-357T07:14:00.000	00:15:00	RTE_N_SPB_110600	SP_098EA_G70METNON357_PRIME
	2008-357T07:29:00.000	00:30:00	RTE_N_SPB_124425	SP_098EA_G70METNON357_PRIME
	2008-357T07:59:00.000	08:00:00	RTE_N_SPB_142200	SP_098EA_G70METNON357_PRIME
	2008-357T15:59:00.000	00:15:00	RTE_N_SPB_124425	SP_098EA_G70METNON357_PRIME
	2008-357T16:14:00.000	00:45:00	RTE_N_SPB_142200	SP_098EA_C70ARRNON357_PRIME
	2008-357T16:59:00.000	01:15:00	RTE_N_SPB_165900	SP_098EA_C70ARRNON357_PRIME
	2008-357T18:14:00.000	02:45:00	RTE_N_SPB_35550	SP_098EA_C34HEFNON357_PRIME
	2008-357T20:59:00.000	00:45:00	RTE_N_SPB_33180	SP_098EA_C34HEFNON357_PRIME
	2008-357T21:44:00.000	00:30:00	RTE_N_SPB_27650	SP_098EA_C34HEFNON357_PRIME

T49 Detailed SMT Report

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

DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4				P5			RECORDED		PLAYBACK					
			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)	NET_MARGN (%)	CAROVR (Mb)
SP_098EA_G70METNON357_PRIME	357 07:14	357 16:14	0	3477	176	3653	3552	-100	0	229	53	3834	3834	-1	201	4%	0
SP_098EA_C70ARRNON357_PRIME	357 16:14	357 18:14	0	0	946	946	3552	2606	0	46	12	1004	955	-50	201	15%	50
SP_098EA_C34HEFNON357_PRIME	357 18:14	357 22:14	50	0	0	50	3552	3502	0	121	24	195	396	201	201	51%	0

- Need to cut 10 Mb for P4
- Dual PB data volume saved by Canberra 70m downtime being shortened.

T49 Detailed SMT Report (continued)

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

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	355 16:29	357 07:14	210.0	63.1	293.0	24.0	800.0	101.4	137.8	746.4	452.7	41.2	555.0	0.0	43.8	3468.3
OBSERVATION_SI	355 16:29	357 07:14	0.0	0.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0
SP_098EA_G70METNON357_PRIME	357 07:14	357 16:14	22.7	17.0	86.4	3.2	0.0	21.3	29.2	0.0	42.4	4.9	0.0	0.0	0.0	227.2
OBSERVATION_NOR	355 16:29	357 16:14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	945.9	945.9
SP_098EA_C70ARRNON357_PRIME	357 16:14	357 18:14	5.0	3.8	14.4	0.7	0.0	4.7	6.5	0.0	9.4	1.1	0.0	0.0	0.0	45.7
SP_098EA_C34HEFNON357_PRIME	357 18:14	357 22:14	10.1	7.5	57.6	1.4	0.0	9.5	13.0	0.0	18.9	2.2	0.0	0.0	0.0	120.2
DAILY TOTAL SCIENCE	355 16:29	357 22:14	247.8	91.4	472.4	29.4	800.0	136.9	186.4	746.4	523.5	49.4	555.0	0.0		

	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)
TOTAL RECORDED (OPNAV data not included)	247.8	91.4	472.4	29.4	800.0	136.9	186.4	746.4	523.5	49.4	555.0	0.0

T49 Detailed DSN Report

CASSINI DOWNLINK/DSN COVERAGE SUMMARY for T49_080320c.apf on 2008-Mar-20 15:13:50
 (+ = pass overlaps with previous pass; * = conflicts with DSN maintenance; o = overlaps occultation)

DOWNLINK PASS					DSN PASS						
NAME	START_TO_END SCET	START_TO_END ERT	DUR hh:mm	DATA_RATES kbps	ID	START_TO_END SCET	START_TO_END ERT	DUR hh:mm	CALS min	LABEL	CNFG
G70METNON357	357T07:14-16:14	357T08:30-17:30	09:00	110,124,142,124	14*	357T07:14-16:14	357T08:30-17:30	09:00	60 /15	TP	N003
+C70ARRNON357	357T16:14-18:14	357T17:30-19:30	02:00	142,165	45	357T15:54-18:14	357T17:10-19:30	02:20	60 /15	TP	N003
				^-- and also -->	43	357T15:54-18:14	357T17:10-19:30	02:20	60 /15	TP	N003
+C34HEFNON357	357T18:14-22:14	357T19:30-23:30	04:00	35,33,27	45	357T18:14-22:14	357T19:30-23:30	04:00	60 /15	TP	N003

(Small) maintenance conflict on DSS-14 (0.8 hours)

T49 Detailed SPASS

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End (SCET)	Primary	Secondary	Comments
Sequence S46, length = 44 days		2008-331T17:55:00		043T21:21:00	2009-009T15:16:00			
Titan Flyby T49 Segment		2008-355T16:29:00		002T05:45:00	2008-357T22:14:00			
SP_097TI_WAYPTTURN355_PRIME		2008-355T16:29:00		000T00:40:00	2008-355T17:09:00	NEG_Y to Titan (0.0,-15.0,0.0 deg. off)	NEG_Z to 340.0/0.0	
NEW WAYPOINT		2008-355T17:09:00		002T05:05:00	2008-357T22:14:00	NEG_Y to Titan (0.0,-15.0,0.0 deg. off)	NEG_Z to 340.0/0.0	
SP_097TI_DEADTIME355_PRIME		2008-355T17:09:00		000T00:15:32	2008-355T17:24:32	NEG_Y to Titan	NEG_X to Sun	
CIRS_097TI_MIDIRTMAP001_PRIME	C, I, V	2008-355T17:24:32	GMB_E097_Titan49-000T19:35:2000T06:35:20	2008-355T23:59:52	2008-355T23:59:52	CIRS_FPB to Titan	POS_X to North_Pole_Dir	
CIRS_097TI_FIRNADCMP001_PRIME	C, I, U, V	2008-355T23:59:52	GMB_E097_Titan49-000T13:00:0000T04:00:00	2008-356T03:59:52	2008-356T03:59:52	CIRS_FP1 to Titan	PIC	
ISS_097TI_GLOBMAP001_PRIME	C, V	2008-356T03:59:52	GMB_E097_Titan49-000T09:00:0000T04:00:00	2008-356T07:59:52	2008-356T07:59:52	ISS_NAC to Titan	NEG_X to Sun	
ISS_097TI_REGMAP001_PRIME	C, V	2008-356T07:59:52	GMB_E097_Titan49-000T05:00:0000T02:00:00	2008-356T09:59:52	2008-356T09:59:52	ISS_NAC to Titan	NEG_X to Sun	
CIRS_097TI_FIRLMBINT001_PRIME	C, I, R, U, V	2008-356T09:59:52	GMB_E097_Titan49-000T03:00:0000T01:00:00	2008-356T10:59:52	2008-356T10:59:52	CIRS_FP1 to Titan	PIC	
VIMS_097TI_GLOBMAP001_PRIME	C, I, M, R	2008-356T10:59:52	GMB_E097_Titan49-000T02:00:0000T01:14:00	2008-356T12:13:52	2008-356T12:13:52	VIMS_IR to Titan	NEG_X to Sun	
ENGR_097SC_RADRCS356_PRIME	C, M, R	2008-356T12:13:52	GMB_E097_Titan49-000T00:46:0000T00:01:00	2008-356T12:14:52	2008-356T12:14:52	NEG_Y to Titan (0.0,-15.0,0.0 deg. off)	NEG_Z to 340.0/0.0	
VIMS_097TI_TRANS001_PRIME	C, M, R	2008-356T12:14:52	GMB_E097_Titan49-000T00:45:0000T00:21:00	2008-356T12:35:52	2008-356T12:35:52	VIMS_IR to Titan	NEG_X to Sun	
RADAR_097TI_T49INSAR001_PRIME	C, M	2008-356T12:35:52	GMB_E097_Titan49-000T00:24:0000T00:15:00	2008-356T12:50:52	2008-356T12:50:52	NEG_Z to Titan	NEG_X to Titan_SC_RAM	
Start of T49 Dual Playback ...		2008-356T12:36:52	GMB_E097_Titan49-000T00:2:000T00:00:01	2008-356T12:36:53				
RADAR_097TI_T49CAALT001_PRIME	M	2008-356T12:50:52	GMB_E097_Titan49-000T00:09:0000T00:05:00	2008-356T12:55:52	2008-356T12:55:52	NEG_Z to Titan	PIC	
RADAR_097TI_T49OUTSAR001_PRIME	M	2008-356T12:55:52	GMB_E097_Titan49-000T00:04:0000T00:22:00	2008-356T13:17:52	2008-356T13:17:52	NEG_Z to Titan	NEG_X to Titan_SC_RAM	
97TI (t) T49 TITAN Outbou...		2008-356T12:59:52	000T00:00:01	2008-356T12:59:53	2008-356T12:59:53			
Apoapse Per = 9.4 d, inc = ...		2008-356T13:04:10	000T00:00:01	2008-356T13:04:11	2008-356T13:04:11			
End of T49 Dual Playback pe...		2008-356T13:17:52	GMB_E097_Titan49+000T00:18:0000T00:00:01	2008-356T13:17:53	2008-356T13:17:53			
RADAR_098TI_T49OUTALT001_PRIME	M	2008-356T13:17:52	GMB_E097_Titan49+000T00:18:0000T00:12:00	2008-356T13:29:52	2008-356T13:29:52	NEG_Z to Titan (0.0,0.0,-45.0 deg. off)	NEG_X to NTP	
RADAR_098TI_T49OHISAR001_PRIME	M	2008-356T13:29:52	GMB_E097_Titan49+000T00:30:0000T00:20:00	2008-356T13:49:52	2008-356T13:49:52	NEG_Z to Titan (0.0,0.0,-45.0 deg. off)	NEG_X to NTP	
ENGR_098SA_RADRWBIAS356_PPS	M	2008-356T13:49:52	GMB_E097_Titan49+000T00:50:0000T00:21:14	2008-356T14:11:06	2008-356T14:11:06	NEG_Y to Titan (0.0,-15.0,0.0 deg. off)	NEG_Z to 340.0/0.0	
RADAR_098TI_T49OUTSCT001_PRIME	M	2008-356T14:11:52	GMB_E097_Titan49+000T01:12:0000T00:48:00	2008-356T14:59:52	2008-356T14:59:52	NEG_Z to Titan (0.0,0.0,-45.0 deg. off)	NEG_X to NTP	
RADAR_098TI_T49OUTRAD001_PRIME	M	2008-356T14:59:52	GMB_E097_Titan49+000T02:00:0000T03:30:00	2008-356T18:29:52	2008-356T18:29:52	NEG_Z to Titan (0.0,0.0,-45.0 deg. off)	NEG_X to NTP	Use -X_NTP and -Y_NTP for the 2ndary with (0,0,45 deg) offset for the two polarizations.
CIRS_098TI_MIRLMBINT001_PRIME	C, I, U, V	2008-356T18:29:52	GMB_E097_Titan49+000T05:30:0000T03:30:00	2008-356T21:59:52	2008-356T21:59:52	CIRS_FPB to Titan	PIC	
VIMS_098TI_CLOUDMAP001_PRIME	C, I	2008-356T21:59:52	GMB_E097_Titan49+000T09:00:0000T04:00:00	2008-357T01:59:52	2008-357T01:59:52	VIMS_IR to Titan	NEG_X to Sun	
ISS_098TI_NIGHTNAC001_PRIME	C, V	2008-357T01:59:52	GMB_E097_Titan49+000T13:00:0000T00:30:00	2008-357T02:29:52	2008-357T02:29:52	ISS_NAC to Titan	NEG_X to Sun	
CIRS_098TI_MIDIRTMAP002_PRIME	C, I, V	2008-357T02:29:52	GMB_E097_Titan49+000T13:30:0000T03:30:00	2008-357T05:59:52	2008-357T05:59:52	CIRS_FPB to Titan	POS_X to North_Pole_Dir	
ISS_098TI_LRMONITOR001_PRIME	C, V	2008-357T05:59:52	GMB_E097_Titan49+000T17:00:0000T00:30:00	2008-357T06:29:52	2008-357T06:29:52	ISS_NAC to Titan	NEG_X to Sun	
SP_098TI_DEADTIME357_PRIME		2008-357T06:29:52	GMB_E097_Titan49+000T17:0000T00:04:08	2008-357T06:34:00	2008-357T06:34:00	NEG_Y to Titan	NEG_X to Sun	
SP_098EA_DLTRN357_PRIME		2008-357T06:34:00	000T00:40:00	2008-357T07:14:00	2008-357T07:14:00	XBAND to Earth	NEG_X to NEP	
SP_098EA_G70METNON357_PRIME	C	2008-357T07:14:00	000T09:00:00	2008-357T16:14:00	2008-357T16:14:00	XBAND to Earth	Rolling	
SP_098EA_C70ARRNON357_PRIME	C	2008-357T16:14:00	000T02:00:00	2008-357T18:14:00	2008-357T18:14:00	XBAND to Earth	NEG_X to NEP	DSCAL over dual playback
SP_098EA_C34HEFNON357_PRIME	C	2008-357T18:14:00	000T04:00:00	2008-357T22:14:00	2008-357T22:14:00	XBAND to Earth	NEG_X to NEP	DSCAL over dual playback

Dual PB extends across apoapse

T49 Detailed Open Issues

- P4 issue (10 Mb cut)
- ISS, VIMS to submit high level science objectives
MAPS: Optional extra credit
- Notes for Handoff:
 - ISS is aware of telemetry mode switch during an observation, will handle this internally
 - Dual Playback data volume calculation is complicated by straddling an apoapse; data volume in ENGR activity IS correct