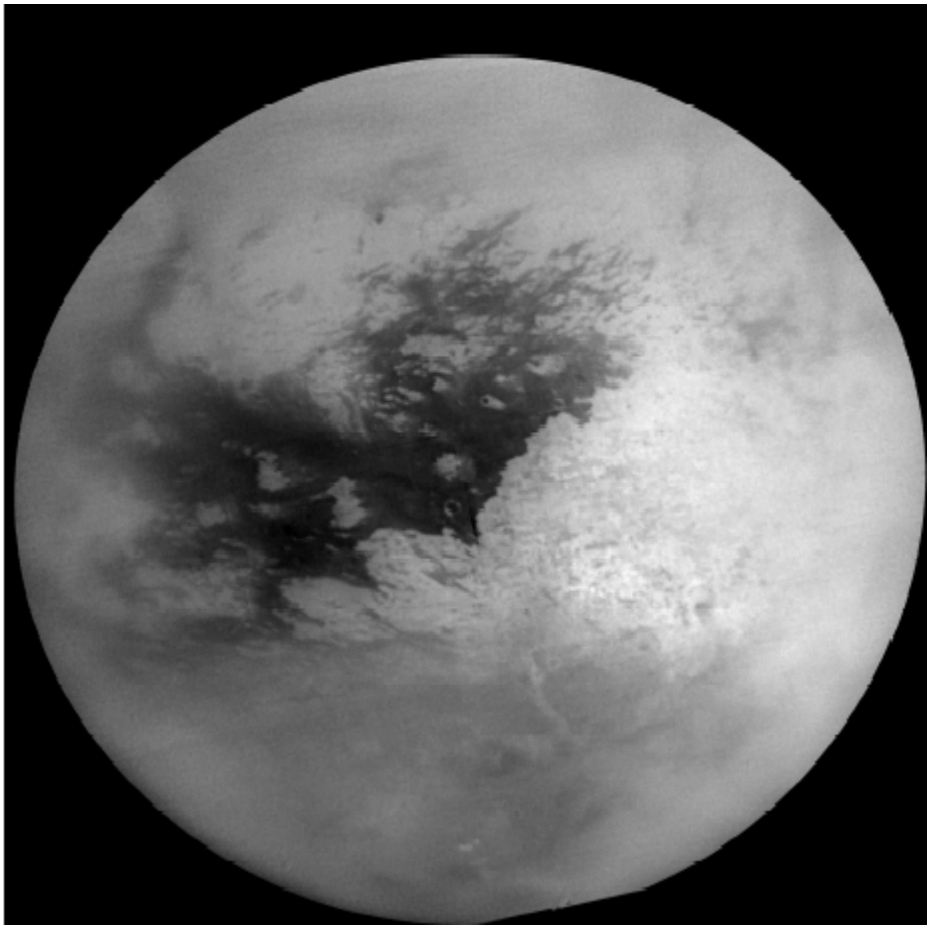
C A S S I N I



TITAN 017TI(T8) MISSION DESCRIPTION

October 2005

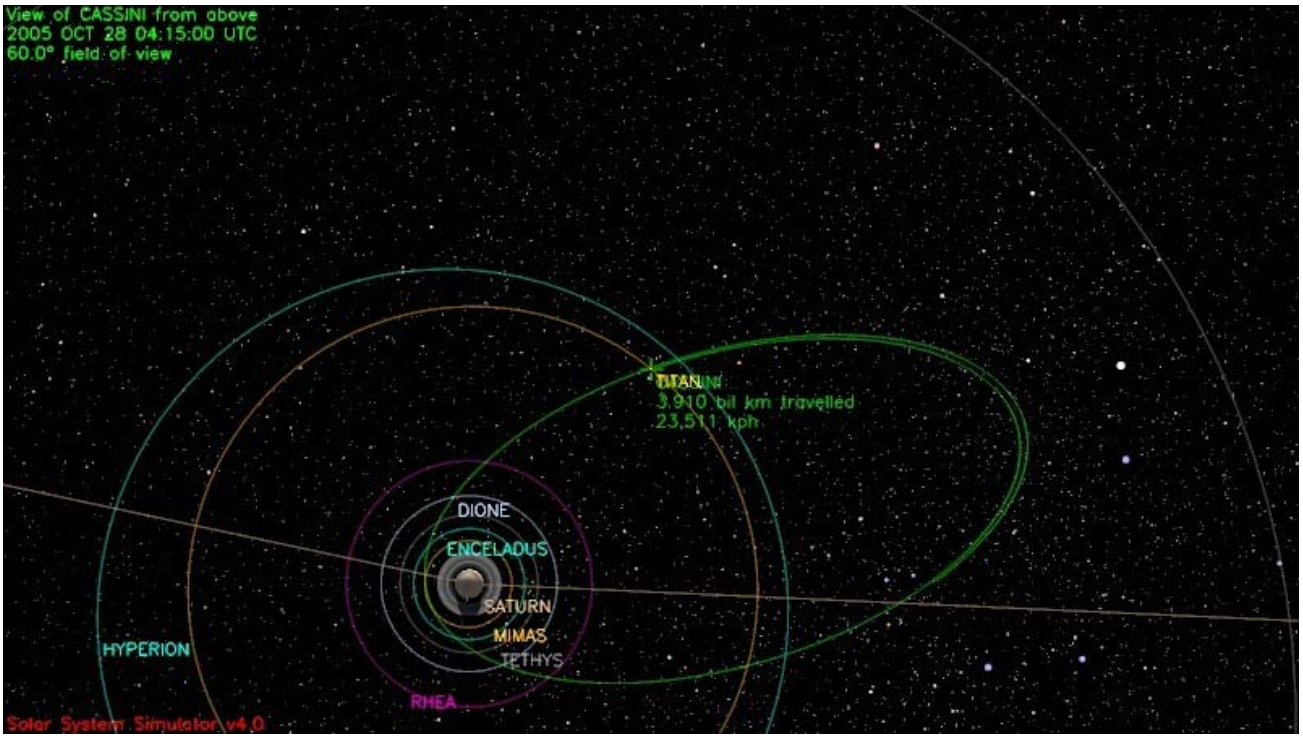
Jet Propulsion Laboratory
California Institute of Technology

1.0 OVERVIEW

After three amazing closest-ever encounters with the icy moons Tethys, Hyperion, and Dione, the spacecraft is returning to its 9th targeted encounter with the large atmosphere-enshrouded moon Titan.

The closest approach to Titan occurs on Friday, October 28th, at 04:15 spacecraft time (Thursday October 27th,10:31 PM Pacific Time) at an altitude of 1353 km (841 miles) above the surface and at a speed of 5.9 kilometers per second (13,200 mph). The latitude at closest approach is 1° and the encounter occurs on orbit number 17.

This encounter is set up with two maneuvers: an apoapsis maneuver scheduled for October 21st, and an approach maneuver, scheduled for October 25th. This inbound encounter occurs about 2 days before Saturn closest approach.



1.1 ABOUT TITAN

Titan is one of the primary scientific interests of the Cassini-Huygens mission. Through observations by Earth based telescopes and the Voyager spacecraft, Titan has been revealed to be an intriguing world both similar in nature to Earth and unique among both satellites and terrestrial planets. The largest of Saturn's satellites, Titan is larger than the planets Mercury or Pluto. Titan is the only satellite in the solar system with an appreciable atmosphere. Like Earth's atmosphere, Titan's atmosphere is composed mostly of Nitrogen, yet appears to have few clouds. However, it also contains significant quantities of aerosols and organic compounds (hydrocarbons), including methane and ethane. Although Titan's thick smoggy atmosphere masks its surface, scientists have speculated Titan's surface could contain solid, liquid and muddy material creating features such as lakes, seas, or rivers. Additionally liquid reservoirs may exist beneath the surface forming geysers or volcanoes that feed flowing liquid onto the surface.

Titan's peak surface temperature is about 95 Kelvin, too cold for liquid water, and due to its thick atmosphere, the pressure at the surface is 1.6 times greater than Earth's atmosphere. At this temperature and pressure, chemicals such as methane, ethane, propane, ammonia, water-ice and acetylene may be involved in complex interior-surface-atmosphere chemical cycles resulting in eruptions, condensation and precipitation (or rain). Initial observations obtained by Cassini during the first several passes of Titan provided our first close up views of Titan in wavelengths ranging from visible light to infrared to radar. The Huygens probe successfully returned atmospheric data and images of the surface, providing ground truth for the Cassini Orbiter measurements. The results show a mysterious world even more complex than previously thought. The diversity of surface composition and its connection to Titan's geologic features remains a fundamental question. Huygens' results indicate that methane exits as a liquid just below the surface and may rain from the atmosphere periodically. Clouds in Titan's atmosphere were observed in the southern hemisphere, yet no clear explanation has emerged on what the clouds are composed of, or why more clouds do not exist. Observations of Titan's interaction with Saturn's magnetosphere indicate the presence of complex processes complicated by Titan's occasional emergence out of Saturn's magnetosphere into the solar wind.

1.2 TITAN-6 SCIENCE ACTIVITIES

- RADAR will perform SAR imaging of the dark terrain west of Xanadu. This area includes the Huygens landing site.
- The Ion and Neutral Mass Spectrometer (INMS) will obtain data regarding atmospheric and ionospheric composition and thermal structure.
- The Magnetospheric and Plasma Science (MAPS) teams, in general, will continue observations of Titan's interaction with Saturn's magnetosphere – including the period within one hour of Titan closest approach.

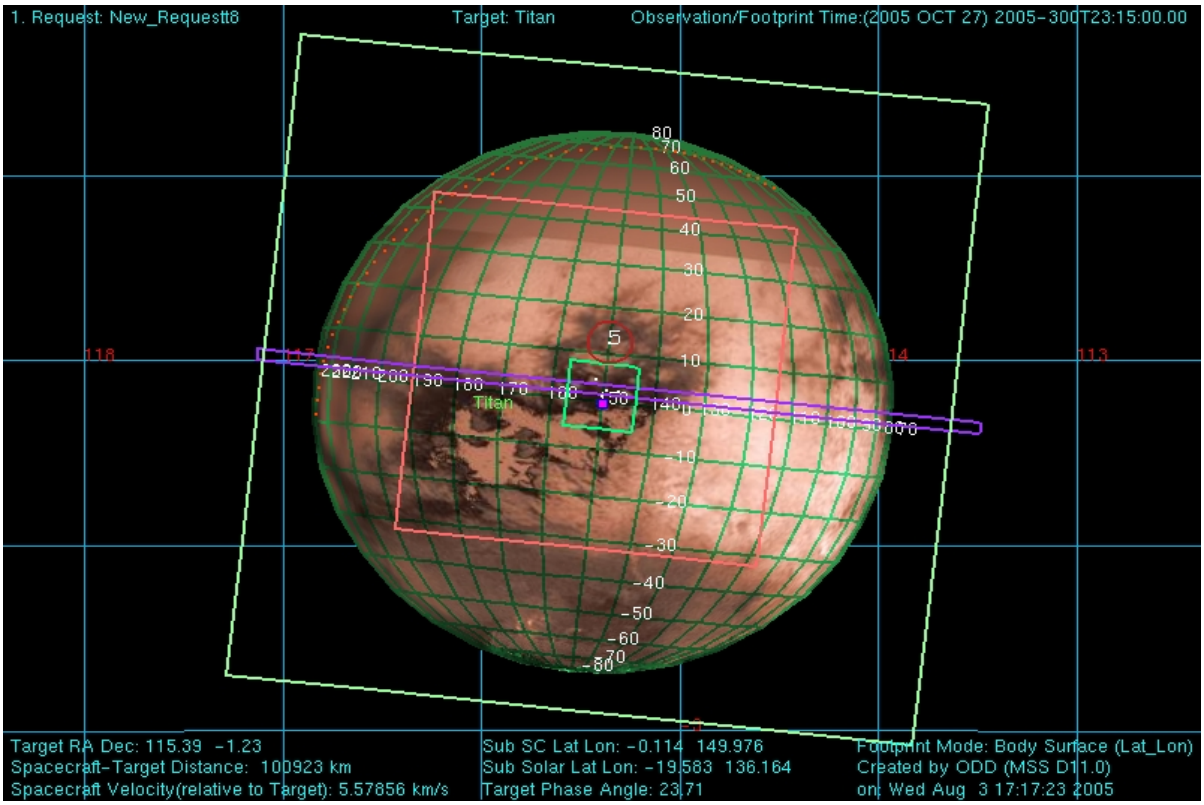
- The Radio and Plasma Wave Spectrometer (RPWS) will look for lightning and other radio emissions, perform a characterization of the plasma wave spectrum, and search for evidence of pickup ions.
- The Composite Infrared Spectrometer (CIRS) will obtain vertical profiles of temperatures, HCN, and C2H2 in Titan's tropopause, stratosphere, and on the surface. CIRS will also obtain information on trace constituents in the stratosphere.
- The Imaging Science Subsystem (ISS) will monitor Titan for surface and atmospheric changes, including cloud motion. Some high-resolution imaging also will occur.
- This is the first close encounter that is upstream of the wake Titan creates in the magnetospheric plasma. There is deep penetration into this magnetic "pile-up" region. The Magnetometer (MAG) team considers this to be "Grade 1" priority.

1.3 SAMPLE SNAPSHOTS

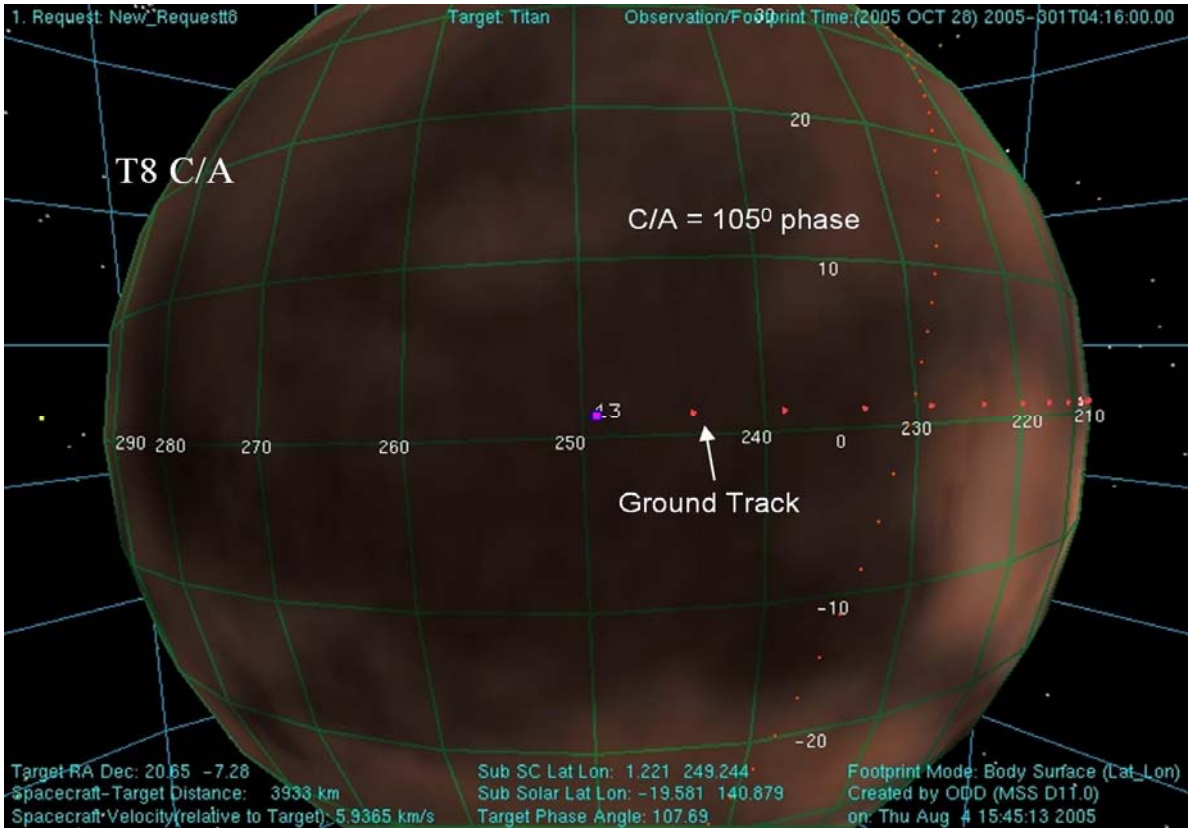
Three views of Titan from Cassini before, during, and after closest approach to Titan are shown below. The views are oriented such that the direction towards the top of the page is aligned with the Titan North Pole. Sample remote sensing instrument fields of view are drawn assuming that Cassini is pointed towards the center of Titan. The size of these fields of view vary as a function of the distance between Cassini and Titan. A key for use in identifying these instruments fields of view in the figures is listed below.

Key to Instrument Fields of View in Figures

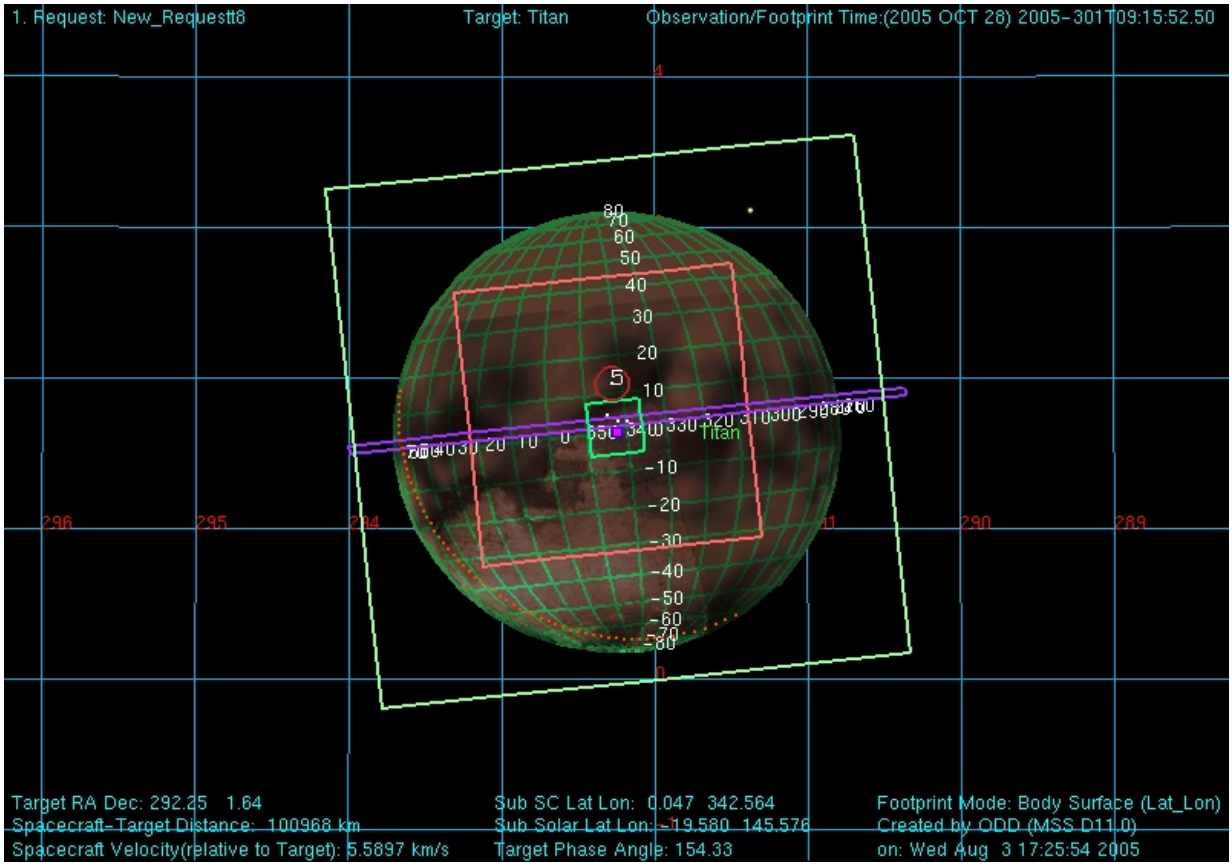
Instrument Field of View	Depiction in Figure
ISS WAC (imaging wide angle camera)	Largest square
VIMS (visual and infrared mapping spectrometer)	Next smallest pink square
ISS NAC (imaging narrow angle camera)	Smallest green square
CIRS (composite infrared spectrometer) – Focal Plane 1	Small red circle near ISS_NAC FOV
UVIS (ultraviolet imaging spectrometer)	Vertical purple rectangle centered within largest square



View of Titan from Cassini 5 hours Before Closest Approach (above)



View of Titan from Cassini at Closest Approach (above)



View of Titan from Cassini 5 hours After Closest Approach

Cassini Titan-8 Timeline - October 2005

Colors: yellow = maneuvers; blue = geometry; pink = T8-related; green = data playbacks

Orbiter UTC	Ground UTC	Pacific Time	Time wrt T8	Activity	Description
281T12:30:00	Oct 08 13:53	Sat Oct 08 06:53 AM	T8-19d16h	Start of Sequence S15	Start of Sequence which contains Titan-8.
298T01:14:00	Oct 25 02:37	Mon Oct 24 07:37 PM	T8-03d03h	OTM #40 Prime	Titan-8 minus 3 day targeting maneuver
299T01:14:00	Oct 26 02:37	Tue Oct 25 07:37 PM	T8-02d03h	OTM #40 Backup	
300T18:29:00	Oct 27 19:52	Thu Oct 27 12:52 PM	T8-09h46m	Start of the TOST Segment	
300T18:29:00	Oct 27 19:52	Thu Oct 27 12:52 PM	T8-09h46m	Turn cameras to Titan	
300T18:59:00	Oct 27 20:22	Thu Oct 27 01:22 PM	T8-09h16m	Deadtime	Used to accommodate changes in flyby time
300T19:14:00	Oct 27 20:37	Thu Oct 27 01:37 PM	T8-09h01m	Narrow Angle Camera observations	Monitor for surface/atmospheric changes - including color
300T23:27:00	Oct 28 00:50	Thu Oct 27 05:50 PM	T8-04h48m	Infrafed mapping and high resolution imaging	Observations of surface features
301T00:00:00	Oct 28 01:23	Thu Oct 27 06:23 PM	T8-04h15m	Turn to RADAR attitude	High Gain Antennae to Titan
301T00:30:00	Oct 28 01:53	Thu Oct 27 06:53 PM	T8-03h45m	RADAR Radiometry	
301T02:32:00	**Oct 28 03:55**	Thu Oct 27 08:55 PM	T8-01h43m	**Transition to thrusters**	Duration = 21 minutes
301T02:54:00	Oct 28 04:17	Thu Oct 27 09:17 PM	T8-01h21m	RADAR Scatterometry	
301T03:43:00	Oct 28 05:06	Thu Oct 27 10:06 PM	T8-00h32m	RADAR Altimetry	
301T04:00:00	Oct 28 05:23	Thu Oct 27 10:23 PM	T8-00h15m	Synthetic Aperture RADAR (SAR)	Coverage of Huygens probe landing site
301T04:15:25	**Oct 28 05:38**	Thu Oct 27 10:38 PM	T8+00h00m	**Titan-8 Flyby Closest Approach Time**	**Altitude = 1353 km (841 miles), speed = 6.0 km/s (13,400 mph); 105 deg phase at closest approach**
301T04:18:00	Oct 28 05:41	Thu Oct 27 10:41 PM	T8+00h03m	Synthetic Aperture RADAR (SAR)	
301T04:30:00	Oct 28 05:53	Thu Oct 27 10:53 PM	T8+00h15m	RADAR Altimetry and Scatterometry	
301T04:30:00	Oct 28 05:53	Thu Oct 27 10:53 PM	T8+00h15m	RADAR Altimetry and Scatterometry	
301T05:36:00	Oct 28 06:59	Thu Oct 27 11:59 PM	T8+01h21m	Transition to reaction wheels	
301T06:00:00	Oct 28 07:23	Fri Oct 28 12:23 AM	T8+01h45m	RADAR Radiometry	
301T09:55:00	Oct 28 11:18	Fri Oct 28 04:18 AM	T8+05h40m	Remote sensing scans of Titan	Obtain vertical profiles of temperatures, HCN, and C_2H_2 in Titan's stratosphere
302T00:04:00	Oct 29 01:27	Fri Oct 28 06:27 PM	T8+19h49m	Deadtime	Used to accommodate changes in flyby time
302T00:19:00	Oct 29 01:42	Fri Oct 28 06:42 PM	T8+20h04m	Turn to Earth-Line	
302T00:49:00	Oct 29 02:12	Fri Oct 28 07:12 PM	T8+20h34m	Begin Playback of T8 Data	Madrid 70M
302T09:49:00	Oct 29 11:12	Sat Oct 29 04:12 AM	T8+01d06h	End Playback of T8 Data	
302T22:56:00	**Oct 30 00:19**	Sat Oct 29 05:19 PM	T8+01d19h	**Saturn periapsis**	

OWLT (mins)	83
C/A Time	Thu Oct 27 10:38 PM

1.4 FLYBY GEOMETRY

Event Name at Event Time Only	SCET Date (YYYY-DOYTHH:MM:SS.FF) UTC	SCET Date (MM/DD/YYYY HH:MM:SS) UTC	SCET Date (MM/DD/YYYY HH:MM:SS) ET	Hours wrt Event Epoch	Minutes wrt Event Epoch	S/C Range (km)	S/C Altitude wrt Tri-axial Ellipsoid (km)	S/C North Latitude (deg)	S/C West Longitude SMEQPM Date (deg)	S/C Inertial Velocity (km/s)	S/C Radial Inertial Velocity (km/s)	S/C Tangential Inertial Velocity (km/s)	Central Body Angular Diameter (mrad)	Phase = Sun-Central_Body-S/C Angle (deg)	Sun-S/C-Central_Body Angle (deg)	S/C Local True Solar Time wrt Central Body (hh:mm)	Sub-solar Latitude wrt Central Body (deg)	Sub-solar West Longitude wrt Central Body SMEQPM Date
	2005-300T04:15:24.81	27-Oct-05	04:16:29	-24	-1440	490,240.4	487,665.4	-0.1	131.9	5.845	-5.839	0.269	10.5	23.5	156.5	11.05	-19.6	118.3
	2005-300T08:15:24.81	27-Oct-05	08:16:29	-20	-1200	406,627.2	404,052.2	-0.1	135.2	5.777	-5.774	0.169	12.7	23.3	156.7	11.07	-19.6	122.1
	2005-300T10:15:24.81	27-Oct-05	10:16:29	-18	-1080	365,167.7	362,592.7	-0.1	136.9	5.744	-5.742	0.122	14.1	23.2	156.8	11.08	-19.6	124.0
	2005-300T12:15:24.81	27-Oct-05	12:16:29	-16	-960	323,936.8	321,361.8	-0.1	138.7	5.711	-5.711	0.077	15.9	23.2	156.8	11.08	-19.6	125.8
	2005-300T14:15:24.81	27-Oct-05	14:16:29	-14	-840	282,928.7	280,353.7	-0.1	140.5	5.681	-5.680	0.033	18.2	23.1	156.9	11.08	-19.6	127.7
	2005-300T16:15:24.81	27-Oct-05	16:16:29	-12	-720	242,133.8	239,558.8	-0.1	142.4	5.652	-5.652	0.011	21.3	23.1	156.9	11.08	-19.6	129.6
	2005-300T18:15:24.81	27-Oct-05	18:16:29	-10	-600	201,538.5	198,963.5	-0.1	144.3	5.625	-5.625	0.056	25.6	23.2	156.8	11.08	-19.6	131.5
	2005-300T20:15:24.81	27-Oct-05	20:16:29	-8	-480	161,123.8	158,548.8	-0.1	146.4	5.603	-5.602	0.106	32.0	23.3	156.7	11.07	-19.6	133.4
	2005-300T22:15:24.81	27-Oct-05	22:16:29	-6	-360	120,864.3	118,289.3	-0.1	148.7	5.585	-5.582	0.171	42.6	23.5	156.5	11.06	-19.6	135.2
	2005-300T23:15:24.81	27-Oct-05	23:16:29	-5	-300	100,783.0	98,208.0	-0.1	150.0	5.579	-5.574	0.217	51.1	23.7	156.3	11.04	-19.6	136.2
	2005-301T00:15:24.81	28-Oct-05	00:16:29	-4	-240	80,727.7	78,152.7	-0.1	151.5	5.575	-5.568	0.280	63.8	24.0	156.0	11.02	-19.6	137.1
	2005-301T01:15:24.81	28-Oct-05	01:16:29	-3	-180	60,694.4	58,119.4	-0.1	153.4	5.575	-5.562	0.379	84.9	24.6	155.4	10.58	-19.6	138.0
	2005-301T02:15:24.81	28-Oct-05	02:16:29	-2	-120	40,683.9	38,108.9	0.0	156.3	5.583	-5.554	0.571	126.7	25.9	154.1	10.50	-19.6	139.0
	2005-301T03:15:24.81	28-Oct-05	03:16:29	-1	-60	20,746.2	18,171.2	0.1	162.9	5.618	-5.504	1.124	248.9	29.9	150.1	10.28	-19.6	139.9
	2005-301T03:45:24.81	28-Oct-05	03:46:29	-1	-30	10,976.9	8,401.9	0.3	174.0	5.685	-5.273	2.124	473.6	38.5	141.5	09.45	-19.6	140.4
	2005-301T04:00:24.81	28-Oct-05	04:01:29	0	-15	6,476.4	3,901.4	0.6	-168.7	5.784	-4.526	3.601	817.8	53.6	126.4	08.37	-19.6	140.6
	2005-301T04:10:24.81	28-Oct-05	04:11:29	0	-5	4,288.5	1,713.5	1.1	-138.4	5.905	-2.301	5.438	1288.1	81.7	98.3	06.36	-19.6	140.8
T8_17TI	**2005-301T04:15:24.81**	**28-Oct-05**	**04:16:29**	**0**	**0**	**3,927.9**	**1,352.9**	**1.2**	**-113.8**	**5.937**	**0.000**	**5.937**	**1429.9**	**104.8**	**75.2**	**04.58**	**-19.6**	**140.9**
	2005-301T04:20:24.81	28-Oct-05	04:21:29	0	5	4,288.5	1,713.5	1.1	-89.2	5.905	2.301	5.438	1288.1	127.6	52.4	03.20	-19.6	140.9
	2005-301T04:30:24.81	28-Oct-05	04:31:29	0	15	6,476.3	3,901.3	0.8	-59.0	5.784	4.526	3.601	817.8	152.8	27.2	01.20	-19.6	141.1
	2005-301T04:45:24.81	28-Oct-05	04:46:29	1	30	10,976.5	8,401.5	0.5	-41.6	5.685	5.273	2.125	473.6	160.7	19.3	00.11	-19.6	141.3
	2005-301T05:15:24.81	28-Oct-05	05:16:29	1	60	20,744.8	18,169.8	0.2	-30.5	5.617	5.503	1.125	248.9	159.2	20.8	23.29	-19.6	141.8
	2005-301T06:15:24.81	28-Oct-05	06:16:29	2	120	40,680.2	38,105.2	0.1	-23.9	5.583	5.553	0.576	126.7	156.5	23.5	23.06	-19.6	142.7
	2005-301T07:15:24.81	28-Oct-05	07:16:29	3	180	60,691.5	58,116.5	0.1	-20.9	5.577	5.563	0.390	84.9	155.4	24.6	22.58	-19.6	143.7
	2005-301T08:15:24.81	28-Oct-05	08:16:29	4	240	80,734.3	78,159.3	0.1	-19.0	5.580	5.572	0.299	63.8	154.7	25.3	22.54	-19.6	144.6
	2005-301T09:15:24.81	28-Oct-05	09:16:29	5	300	100,814.6	98,239.6	0.0	-17.4	5.590	5.584	0.246	51.1	154.3	25.7	22.52	-19.6	145.6
	2005-301T10:15:24.81	28-Oct-05	10:16:29	6	360	120,945.1	118,370.1	0.0	-16.1	5.604	5.600	0.213	42.6	154.1	25.9	22.50	-19.6	146.5
	2005-301T12:15:24.81	28-Oct-05	12:16:29	8	480	161,417.4	158,842.4	0.0	-13.6	5.648	5.645	0.179	31.9	153.7	26.3	22.48	-19.6	148.4
	2005-301T14:15:24.81	28-Oct-05	14:16:29	10	600	202,284.7	199,709.7	0.0	-11.4	5.713	5.710	0.166	25.5	153.4	26.6	22.46	-19.6	150.3
	2005-301T16:15:24.81	28-Oct-05	16:16:29	12	720	243,702.6	241,127.6	0.0	-9.2	5.801	5.799	0.165	21.1	153.2	26.8	22.45	-19.6	152.1
	2005-301T18:15:24.81	28-Oct-05	18:16:29	14	840	285,853.2	283,278.2	0.0	-7.0	5.917	5.915	0.169	18.0	153.0	27.0	22.44	-19.6	154.0
	2005-301T20:15:24.81	28-Oct-05	20:16:29	16	960	328,951.6	326,376.6	0.0	-4.9	6.066	6.063	0.175	15.7	152.9	27.1	22.43	-19.6	155.9
	2005-301T22:15:24.81	28-Oct-05	22:16:29	18	1080	373,253.1	370,678.1	0.0	-2.8	6.253	6.250	0.179	13.8	152.7	27.3	22.42	-19.6	157.8
	2005-302T00:15:24.81	29-Oct-05	00:16:29	20	1200	419,062.7	416,487.7	0.0	-0.8	6.486	6.483	0.175	12.3	152.6	27.4	22.41	-19.6	159.7
	2005-302T04:15:24.81	29-Oct-05	04:16:29	24	1440	516,750.4	514,175.4	0.0	3.3	7.131	7.130	0.116	10.0	152.4	27.6	22.40	-19.6	163.4

1.5 DATA PLAYBACK TIMELINE

For each science observation, the table below contains a time-ordered listing of the data playback times. One-way light time at the time of the encounter is 1 hour and 16 minutes.

017TI (T8) Playback Timeline

Event or Observation	Observation Type (APGEN)	Observation Record Start Time (yyyy-dddThh:mm:ss) (SCET)	Record Start Time - Reference Epoch (ddThh:m	Start Playback (Ground UTC)		Start Playback (Pacific Time)	
				Best Estimate	Latest Possible	Best Estimate	Latest Possible
RADAR_017TI_TI8P4LSAR001_PRIME	RADAR_364800	2005-301T03:57:24	-00T09:46	29-Oct Sat 02:10 AM	Sat 02:10 AM	28-Oct Fri 07:10 PM	Fri 07:10 PM
CAPS_017SA_SURVEY002_RIDER	CAPS_16000	2005-300T18:29:00	-00T09:46	29-Oct Sat 02:20 AM	Sat 02:20 AM	28-Oct Fri 07:20 PM	Fri 07:20 PM
CIRS_017IC_DSCALSHRT231_RIDER	CIRS_4000	2005-300T18:29:00	-00T09:46	29-Oct Sat 02:20 AM	Sat 02:20 AM	28-Oct Fri 07:20 PM	Fri 07:20 PM
MAG_017OT_SURVEY001_RIDER	MAG_1976	2005-300T18:29:00	-00T09:46	29-Oct Sat 02:20 AM	Sat 02:20 AM	28-Oct Fri 07:20 PM	Fri 07:20 PM
MIMI_017CO_SURVEY002_MAPS	MIMI_8000	2005-300T18:29:00	-00T09:46	29-Oct Sat 02:20 AM	Sat 02:20 AM	28-Oct Fri 07:20 PM	Fri 07:20 PM
RADAR_017OT_TI8P0WARM001_RIDER	RADAR_364800	2005-300T18:29:00	-00T09:46	29-Oct Sat 02:20 AM	Sat 02:20 AM	28-Oct Fri 07:20 PM	Fri 07:20 PM
RPWS_017SA_OUTSURVEY005_PRIME	RPWS_30464	2005-300T18:29:00	-00T09:46	29-Oct Sat 02:20 AM	Sat 02:20 AM	28-Oct Fri 07:20 PM	Fri 07:20 PM
ISS_017TI_GLOBMAP001_PRIME	ISS_Phot_1_by_1	2005-300T19:14:25	-00T09:00	29-Oct Sat 02:23 AM	Sat 02:23 AM	28-Oct Fri 07:23 PM	Fri 07:23 PM
UVIS_017TI_GLOBMAP001_ISS	UVIS_5032	2005-300T19:14:25	-00T09:00	29-Oct Sat 02:23 AM	Sat 02:23 AM	28-Oct Fri 07:23 PM	Fri 07:23 PM
VIMS_017TI_MONITOR001_ISS	VIMS_18432	2005-300T19:14:25	-00T09:00	29-Oct Sat 02:23 AM	Sat 02:23 AM	28-Oct Fri 07:23 PM	Fri 07:23 PM
CIRS_017TI_FIRNADMAP002_ISS	CIRS_4000	2005-300T19:31:25	-00T08:43	29-Oct Sat 02:34 AM	Sat 02:37 AM	28-Oct Fri 07:34 PM	Fri 07:37 PM
CIRS_017TI_FIRNADMAP003_VIMS	CIRS_4000	2005-300T20:01:25	-00T08:13	29-Oct Sat 02:54 AM	Sat 03:02 AM	28-Oct Fri 07:54 PM	Fri 08:02 PM
ISS_017TI_MEDRES001_VIMS	ISS_Phot_1_by_1	2005-300T20:01:25	-00T08:13	29-Oct Sat 02:54 AM	Sat 03:02 AM	28-Oct Fri 07:54 PM	Fri 08:02 PM
UVIS_017TI_MEDRES001_VIMS	UVIS_5032	2005-300T20:01:25	-00T08:13	29-Oct Sat 02:54 AM	Sat 03:02 AM	28-Oct Fri 07:54 PM	Fri 08:02 PM
VIMS_017TI_MEDRES001_PRIME	VIMS_18432	2005-300T20:01:25	-00T08:13	29-Oct Sat 02:54 AM	Sat 03:02 AM	28-Oct Fri 07:54 PM	Fri 08:02 PM
CIRS_017TI_FIRNADMAP004_ISS	CIRS_4000	2005-300T23:27:25	-00T04:47	29-Oct Sat 04:05 AM	Sat 04:33 AM	28-Oct Fri 09:05 PM	Fri 09:33 PM
ISS_017TI_HIGHRESNA001_PRIME	ISS_Phot_1_by_1	2005-300T23:27:25	-00T04:47	29-Oct Sat 04:05 AM	Sat 04:33 AM	28-Oct Fri 09:05 PM	Fri 09:33 PM
UVIS_017TI_HIGHRESNA001_ISS	UVIS_5032	2005-300T23:27:25	-00T04:47	29-Oct Sat 04:05 AM	Sat 04:33 AM	28-Oct Fri 09:05 PM	Fri 09:33 PM
VIMS_017TI_HIRES001_ISS	VIMS_18432	2005-300T23:27:25	-00T04:47	29-Oct Sat 04:05 AM	Sat 04:33 AM	28-Oct Fri 09:05 PM	Fri 09:33 PM
MAG_017TI_MAGTITAN001_PRIME	MAG_1976	2005-301T00:15:25	-00T03:59	29-Oct Sat 04:32 AM	Sat 05:11 AM	28-Oct Fri 09:32 PM	Fri 10:11 PM
RADAR_017TI_TI8P1RADI001_PRIME	RADAR_364800	2005-301T00:30:25	-00T03:44	29-Oct Sat 04:33 AM	Sat 05:12 AM	28-Oct Fri 09:33 PM	Fri 10:12 PM
CAPS_017TI_T8INBND001_RADAR	CAPS_16000	2005-301T02:15:25	-00T01:59	29-Oct Sat 04:43 AM	Sat 05:22 AM	28-Oct Fri 09:43 PM	Fri 10:22 PM
MIMI_017TI_T8INBND001_RADAR	MIMI_8000	2005-301T02:15:25	-00T01:59	29-Oct Sat 04:43 AM	Sat 05:22 AM	28-Oct Fri 09:43 PM	Fri 10:22 PM
RPWS_017TI_TIINTRMED001_PRIME	RPWS_30464	2005-301T02:15:25	-00T01:59	29-Oct Sat 04:43 AM	Sat 05:22 AM	28-Oct Fri 09:43 PM	Fri 10:22 PM
1WAY_TO_2WAY_M70ARRNON302	P/B_PAUSE	5 min. Prevents Gap	n/a	29-Oct Sat 04:45 AM	Sat 04:45 AM	28-Oct Fri 09:45 PM	Fri 09:45 PM
RADAR_017TI_TI8P2SCAT001_PRIME	RADAR_364800	2005-301T02:54:25	-00T01:20	29-Oct Sat 04:47 AM	Sat 05:27 AM	28-Oct Fri 09:47 PM	Fri 10:27 PM
CAPS_017TI_T8CLOSE001_RADAR	CAPS_16000	2005-301T03:15:25	-00T00:59	29-Oct Sat 04:55 AM	Sat 05:34 AM	28-Oct Fri 09:55 PM	Fri 10:34 PM
INMS_017TI_T8CLOSE001_RADAR	INMS_1498	2005-301T03:15:25	-00T00:59	29-Oct Sat 04:55 AM	Sat 05:34 AM	28-Oct Fri 09:55 PM	Fri 10:34 PM
MIMI_017TI_T8CLOSE001_RADAR	MIMI_8000	2005-301T03:15:25	-00T00:59	29-Oct Sat 04:55 AM	Sat 05:34 AM	28-Oct Fri 09:55 PM	Fri 10:34 PM
RADAR_017TI_TI8P3ALTI001_PRIME	RADAR_364800	2005-301T03:43:25	-00T00:31	29-Oct Sat 05:07 AM	Sat 05:47 AM	28-Oct Fri 10:07 PM	Fri 10:47 PM
RPWS_017TI_TICA001_PRIME	RPWS_182784	2005-301T03:47:25	-00T00:27	29-Oct Sat 05:09 AM	Sat 05:49 AM	28-Oct Fri 10:09 PM	Fri 10:49 PM
RADAR_017TI_TI8P4LSAR001_PRIME	RADAR_364800	2005-301T04:00:13	-00T00:15	29-Oct Sat 05:20 AM	Sat 06:01 AM	28-Oct Fri 10:20 PM	Fri 11:01 PM
RADAR_017TI_TI8P5HSAR001_PRIME	RADAR_364800	2005-301T04:12:25	-00T00:02	29-Oct Sat 05:40 AM	Sat 06:42 AM	28-Oct Fri 10:40 PM	Fri 11:42 PM
RADAR_017TI_TI8P6LSAR001_PRIME	RADAR_364800	2005-301T04:18:25	00T00:03	29-Oct Sat 06:18 AM	Sat 07:04 AM	28-Oct Fri 11:18 PM	Sat 12:04 AM
RADAR_017TI_TI8P7ALTO001_PRIME	RADAR_364800	2005-301T04:30:25	00T00:15	29-Oct Sat 06:48 AM	Sat 07:35 AM	28-Oct Fri 11:48 PM	Sat 12:35 AM
RPWS_017TI_TIINTRMED002_PRIME	RPWS_30464	2005-301T04:42:25	00T00:27	29-Oct Sat 06:58 AM	Sat 07:46 AM	28-Oct Fri 11:58 PM	Sat 12:46 AM
RADAR_017TI_TI8P8SCAT001_PRIME	RADAR_364800	2005-301T04:47:25	00T00:32	29-Oct Sat 07:01 AM	Sat 07:48 AM	29-Oct Sat 12:01 AM	Sat 12:48 AM

017TI (T8) Playback Timeline Continued — **Created Aug. 30, 2005**

Event or Observation	Observation Type (APGEN)	Observation Record Start Time (yyyy-dddThh:mm:ss) (SCET)	Record Start Time - Reference	Start Playback (Ground UTC)		Start Playback (Pacific Time)	
				Best Estimate	Latest Possible	Best Estimate	Latest Possible
CAPS_017TI_T8OUTBND001_RADAR	CAPS_16000	2005-301T05:15:25	00T01:00	29-Oct Sat 07:13 AM	Sat 08:01 AM	29-Oct Sat 12:13 AM	Sat 01:01 AM
INMS_017TI_T8OUTBD001_RADAR	INMS_1498	2005-301T05:15:25	00T01:00	29-Oct Sat 07:13 AM	Sat 08:01 AM	29-Oct Sat 12:13 AM	Sat 01:01 AM
MIMI_017TI_T8OUTBND001_RADAR	MIMI_8000	2005-301T05:15:25	00T01:00	29-Oct Sat 07:13 AM	Sat 08:01 AM	29-Oct Sat 12:13 AM	Sat 01:01 AM
RADAR_017TI_TI8P9RADO001_PRIME	RADAR_364800	2005-301T06:00:25	00T01:45	29-Oct Sat 07:23 AM	Sat 08:11 AM	29-Oct Sat 12:23 AM	Sat 01:11 AM
CAPS_017SA_SURVEY004_RIDER	CAPS_16000	2005-301T06:15:25	00T02:00	29-Oct Sat 07:25 AM	Sat 08:13 AM	29-Oct Sat 12:25 AM	Sat 01:13 AM
MIMI_017CO_SURVEY003_MAPS	MIMI_8000	2005-301T06:15:25	00T02:00	29-Oct Sat 07:25 AM	Sat 08:13 AM	29-Oct Sat 12:25 AM	Sat 01:13 AM
RPWS_017SA_OUTSURVEY003_PRIME	RPWS_30464	2005-301T06:15:25	00T02:00	29-Oct Sat 07:25 AM	Sat 08:13 AM	29-Oct Sat 12:25 AM	Sat 01:13 AM
MAG_017OT_SURVEY005_RIDER	MAG_1976	2005-301T07:15:25	00T03:00	29-Oct Sat 07:30 AM	Sat 08:19 AM	29-Oct Sat 12:30 AM	Sat 01:19 AM
CIRS_017TI_MIRLMBMAP003_PRIME	CIRS_4000	2005-301T09:55:25	00T05:40	29-Oct Sat 07:42 AM	Sat 08:31 AM	29-Oct Sat 12:42 AM	Sat 01:31 AM
CIRS_017TI_MIRLMBMAP003_SI	ISS_SUPPORT_IMAGING	2005-301T09:55:25	00T05:40	29-Oct Sat 07:42 AM	Sat 08:31 AM	29-Oct Sat 12:42 AM	Sat 01:31 AM
ISS_017TI_MIRLMBMAP003_CIRS	ISS_Phot_1_by_1	2005-301T09:55:25	00T05:40	29-Oct Sat 07:42 AM	Sat 08:31 AM	29-Oct Sat 12:42 AM	Sat 01:31 AM
UVIS_017TI_MIRLMBINT001_CIRS	UVIS_5032	2005-301T09:55:25	00T05:40	29-Oct Sat 07:42 AM	Sat 08:31 AM	29-Oct Sat 12:42 AM	Sat 01:31 AM
VIMS_017TI_LIMBNADIR001_CIRS	VIMS_18432	2005-301T09:55:25	00T05:40	29-Oct Sat 07:42 AM	Sat 08:31 AM	29-Oct Sat 12:42 AM	Sat 01:31 AM
CIRS_017TI_FIRNADCMP003_PRIME	CIRS_4000	2005-301T13:15:25	00T09:00	29-Oct Sat 08:03 AM	Sat 09:01 AM	29-Oct Sat 01:03 AM	Sat 02:01 AM
CIRS_017TI_FIRNADCMP003_SI	ISS_SUPPORT_IMAGING	2005-301T13:15:25	00T09:00	29-Oct Sat 08:03 AM	Sat 09:01 AM	29-Oct Sat 01:03 AM	Sat 02:01 AM
ISS_017TI_FIRNADCMP003_CIRS	ISS_Phot_1_by_1	2005-301T13:15:25	00T09:00	29-Oct Sat 08:03 AM	Sat 09:01 AM	29-Oct Sat 01:03 AM	Sat 02:01 AM
UVIS_017TI_FIRNADCMP003_CIRS	UVIS_5032	2005-301T13:15:25	00T09:00	29-Oct Sat 08:03 AM	Sat 09:01 AM	29-Oct Sat 01:03 AM	Sat 02:01 AM
CDA_017RI_1600RINGM013_RIDER	CDA_524	2005-301T14:02:11	00T09:46	29-Oct Sat 08:08 AM	Sat 09:08 AM	29-Oct Sat 01:08 AM	Sat 02:08 AM
CDA_017DR_1500DUST087_RIDER	CDA_524	2005-301T16:03:10	00T11:47	29-Oct Sat 08:20 AM	Sat 09:25 AM	29-Oct Sat 01:20 AM	Sat 02:25 AM
CIRS_017TI_MIDIRTMAP005_PRIME	CIRS_4000	2005-301T16:15:25	00T12:00	29-Oct Sat 08:21 AM	Sat 09:26 AM	29-Oct Sat 01:21 AM	Sat 02:26 AM
CIRS_017TI_MIDIRTMAP005_SI	ISS_SUPPORT_IMAGING	2005-301T16:15:25	00T12:00	29-Oct Sat 08:21 AM	Sat 09:26 AM	29-Oct Sat 01:21 AM	Sat 02:26 AM
INMS_017SA_SURVEY002_RIDER	INMS_1498	2005-301T16:15:25	00T12:00	29-Oct Sat 08:21 AM	Sat 09:26 AM	29-Oct Sat 01:21 AM	Sat 02:26 AM
ISS_017TI_MIDIRTMAP005_CIRS	ISS_Phot_1_by_1	2005-301T16:15:25	00T12:00	29-Oct Sat 08:21 AM	Sat 09:26 AM	29-Oct Sat 01:21 AM	Sat 02:26 AM
UVIS_017TI_MIDIRTMAP005_CIRS	UVIS_5032	2005-301T16:15:25	00T12:00	29-Oct Sat 08:21 AM	Sat 09:26 AM	29-Oct Sat 01:21 AM	Sat 02:26 AM
RPWS_017SA_INSURVEY001_PRIME	RPWS_30464	2005-301T19:10:00	00T14:54	29-Oct Sat 08:38 AM	Sat 09:50 AM	29-Oct Sat 01:38 AM	Sat 02:50 AM
CDA_017RI_1400RINGM011_RIDER	CDA_524	2005-301T19:30:28	00T15:15	29-Oct Sat 08:40 AM	Sat 09:53 AM	29-Oct Sat 01:40 AM	Sat 02:53 AM
CDA_017DR_1300DUST088_RIDER	CDA_524	2005-301T21:31:28	00T17:16	29-Oct Sat 08:52 AM	Sat 10:10 AM	29-Oct Sat 01:52 AM	Sat 03:10 AM
RSS_017TI_KADOWN002_RSS	RSS_Activity	2005-301T22:44:00	00T18:28	29-Oct Sat 08:59 AM	Sat 10:19 AM	29-Oct Sat 01:59 AM	Sat 03:19 AM
CIRS_017IC_DSCALSHRT232_RIDER	CIRS_4000	2005-302T00:19:00	00T20:03	29-Oct Sat 09:06 AM	Sat 10:27 AM	29-Oct Sat 02:06 AM	Sat 03:27 AM
CDA_017RI_1200RINGM011_RIDER	CDA_524	2005-302T00:37:11	00T20:21	29-Oct Sat 09:07 AM	Sat 10:29 AM	29-Oct Sat 02:07 AM	Sat 03:29 AM
UVIS_017SW_IPHSURVEY022_RIDER	UVIS_5032	2005-302T00:49:00	00T20:33	29-Oct Sat 05:58 AM	Sat 10:30 AM	28-Oct Fri 10:58 PM	Sat 03:30 AM
CIRS_017IC_DSCAL1263_RIDER	CIRS_4000	2005-302T01:34:00	00T21:18	29-Oct Sat 06:00 AM	Sat 06:01 AM	28-Oct Fri 11:00 PM	Fri 11:01 PM
CDA_017DR_1100DUST089_RIDER	CDA_524	2005-302T02:38:11	00T22:22	29-Oct Sat 06:05 AM	Sat 06:06 AM	28-Oct Fri 11:05 PM	Fri 11:06 PM
CDA_017RI_1000RINGM011_RIDER	CDA_524	2005-302T06:07:25	01T01:52	29-Oct Sat 09:12 AM	Sat 10:35 AM	29-Oct Sat 02:12 AM	Sat 03:35 AM
CDA_017DR_1000DUST090_RIDER	CDA_524	2005-302T06:58:24	01T02:42	29-Oct Sat 09:16 AM	Sat 10:39 AM	29-Oct Sat 02:16 AM	Sat 03:39 AM
RPWS_017SA_EQPWDUST001_RPWS	RPWS_30464	2005-302T07:03:16	01T02:47	29-Oct Sat 09:16 AM	Sat 10:40 AM	29-Oct Sat 02:16 AM	Sat 03:40 AM
CDA_017RI_0900RINGM011_RIDER	CDA_524	2005-302T08:27:04	01T04:11	29-Oct Sat 09:44 AM	Sat 10:51 AM	29-Oct Sat 02:44 AM	Sat 03:51 AM
CDA_017DR_0900DUST091_RIDER	CDA_524	2005-302T09:18:03	01T05:02	29-Oct Sat 10:37 AM	Sat 10:57 AM	29-Oct Sat 03:37 AM	Sat 03:57 AM