S71 Rev 158 Timeline for RSS Dione (D3) Gravity Observation

and Gravity Science Enhancements

2011/345-347, Sat-Mon December 10-12, 2011 PST
Dione Closest Approach: 2011/346-11:04 ERT

OWLT = 01:25, RTLT = ~02:50

Closed-loop Doppler is prime for gravity. Open-loop is backup

RSR = Radio Science Receiver (open-loop receiver) RSSG = Radio Science Systems Group GSE = Gravity Science Enhancement

RSSG: Note telemetry bit rate changes. Playback periods. Set RSR fgain accordingly and do not change during observation

DOY	Time ERT	Date/Day PST	Time PST	Event	Comments
				X-TWTA ON	Has been ON for days
345	02:30	Sat 12/10	6:30 PM	DSS-55 Pre-cal	Pass# 0345. Cas specific 4th-order pointing model, TLC enabled
	04:00		8:00 PM	DSS-55 BOT	1-way
				Begin Inbound GSE	
	04:05		8:05 PM	Ka-band ON (KEX & Ka-TWTA)	DKF time 040529. Stays ON until end of outbound GSE
				DSS-55 Enable Monopulse	At 1-way acquisition
	04:10		8:10 PM	DSS-55 Transmitter ON	DKF time 041000
	07:00		11:00 PM	DSS-55 Tracking Mode Change	1-way to 2-way. DKF time 070039
	10:10	Sun 12/11	2:10 AM	DSS-55 Transmitter OFF	DKF time 100941
	13:00		5:00 AM	End Inbound GSE	Ka-band stays ON until end of outbound GSE
				DSS-55 Disable Monopulse	At loss of Ka-band signal
	13:00		5:00 AM	DSS-55 EOT	
	21:30		1:30 PM	DSS-34 Pre-cal	Pass# 0345. Cassini specific 4th-order pointing model
	23:00		3:00 PM	DSS-34 BOT	No signal until ~0225 ERT
	23:35		3:35 PM	DSS-34 Transmitter ON	DKF time 233445
346	02:00		6:00 PM	*RSSG: Begin RSR recordings (X & Ka) at DSS-34*	Att auto at 01:55
	02:10		6:10 PM	DSS-55 Pre-Cal	Pass# 0346. Cas specific 4th-order pointing model, TLC enabled
	02:25		6:25 PM	Begin 1st Segment - Begin Coherent Downlink	DKF time 022514 ERT
				DSS-34 Acquire 2-way Signal	
				DSS-34 Enable Monopulse	As requested by RSSG
	02:49		6:49 PM	DSS-34 Transmitter OFF	5 minutes after DKF time 024408
	03:20		7:20 PM	*RSSG: Begin RSR recordings (X & Ka) at DSS-55*	
	03:40		7:40 PM	DSS-55 BOT	
				DSS-55 Acquire 3-way Signal	3-way with DSS-34
				DSS-55 Enable Monopulse	As requested by RSSG. Wait till elevation angle > 10 degrees
	04:15		8:15 PM	DSS-34 EOT	
	05:35		9:35 PM	End 1st Segment	DKF time 053435
				Begin s/c turn from Earth	
				DSS-55 Disable Monopulse	
	06:44		10:44 PM	DSS-55 Transmitter ON	DKF time 064410
	09:10	Mon 12/12	1:10 AM	*RSSG: Begin RSR recordings (X & Ka) at DSS-55*	Att auto 09:05 ERT
	09:34		1:34 AM	Begin 2nd Segment - Begin Coherent Downlink	DKF time 093433
				DSS-55 Acquire 2-way Signal	
				DSS-55 Enable Monopulse	As requested by RSSG
	09:35		1:35 AM	DSS-25 Pre-cal	Pass# 0346. Cas specific 4th-order pointing model, TLC enabled

DOY	Time ERT	Date/Day PST	Time PST	Event	Comments
	09:49		1:49 AM	DSS-55 Transmitter OFF	5 minutes after DKF time 094411
	10:45		2:45 AM	*RSSG: Begin RSR recordings (X & Ka) at DSS-25*	
	11:04		3:04 AM	D3 Dione Closest Approach	09:39 SCET. Altitude 100 km
	11:05		3:05 AM	DSS-25 BOT	
				DSS-25 Acquire 3-way signal	3-way with DSS-55
				DSS-25 Enable Monopulse	As requested by RSSG. Wait till elevation angle > 10 degrees
	12:35		4:35 AM	End 2nd Segment	DKF time 123432
				Begin s/c turn from Earth	
				DSS-55 Disable Monopulse	At loss of Ka-band signal
				DSS-25 Disable Monopulse	At loss of Ka-band signal
	13:00		5:00 AM	DSS-55 EOT	
	13:14		5:14 AM	DSS-25 Transmitter ON	DKF time 131413
	15:45		7:45 AM	*RSSG: Begin RSR recordings (X & Ka) at DSS-25*	
	16:04		8:04 AM	Begin 3rd Segment - Begin Coherent Downlink	DKF time 160431
				DSS-25 Acquire 2-way Signal	
				DSS-25 Enable Monopulse	As requested by RSSG
	17:35		9:35 AM	DSS-34 Pre-cal	Pass# 0346. Cas specific 4th-order pointing model
	18:05		10:05 AM	DSS-43 Pre-cal	Pass# 0346. Cas specific 4th-order pointing model
	19:05		11:05 AM	End 3rd Segment	
	19:05		11:05 AM	DSS-34 BOT	3-way with DSS-25
	19:05		11:05 AM	DSS-43 BOT	3-way with DSS-25
				Begin Outbound GSE	Ka-band ON since Inbound GSE
				DSS-34 Enable Monopulse	At 3-way acquisition
	19:15		11:15 AM	Uplink Transfer from DSS-25 to DSS-34	
	21:10		1:10 PM	DSS-25 EOT	
	22:05		2:05 PM	DSS-34 Tracking Mode Change	2-way. DKF time 220513
	22:05		2:05 PM	DSS-43 Tracking Mode Change	3-way with DSS-34. DKF time 220513
347	01:10		5:10 PM	DSS-34 Transmitter OFF	DKF time 011011
	03:25		7:25 PM	DSS-43 EOT	
	04:00		8:00 PM	Ka-band OFF	
	04:00		8:00 PM	End Outbound GSE	
				Being s/c turn from Earth	
				DSS-34 Disable Monopulse	At loss of Ka-band signal
	04:00		8:00 PM	DSS-34 EOT	

Gravity Science Enhancement (GSE) passes:

Inbound
11 345 0230 0400 1300 1315 DSS-55 CAS TP RS158-GSE1 5184 N750 1A1

Outbound
11 346 1735 1905 0400 0415 DSS-34 CAS TP RS158-GSE2 5186 N750 1A1
11 346 1805 1905 0325 0340 DSS-43 CAS TKG PASS D3PB 5186 N003 1A1