



13055 - Orbital Evolution and Stability of the Inner Uranian Moons

Cycle: 20, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
41	(20) URANUS-MAB-SOUTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:00.0	yes
42	(21) URANUS-MAB-NORTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:08.0	yes
43	(20) URANUS-MAB-SOUTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:14.0	yes
44	(21) URANUS-MAB-NORTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:19.0	yes
45	(20) URANUS-MAB-SOUTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:25.0	yes
46	(21) URANUS-MAB-NORTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:30.0	yes
50	(23) URANUS-MAB-CUPID	WFC3/UVIS	1	22-May-2013 21:03:36.0	yes
51	(21) URANUS-MAB-NORTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:43.0	yes

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
52	(20) URANUS-MAB-SOUTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:48.0	yes
53	(21) URANUS-MAB-NORTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:54.0	yes
54	(20) URANUS-MAB-SOUTH-CUPID	WFC3/UVIS	1	22-May-2013 21:03:59.0	yes
55	(21) URANUS-MAB-NORTH-CUPID	WFC3/UVIS	1	22-May-2013 21:04:04.0	yes
56	(20) URANUS-MAB-SOUTH-CUPID	WFC3/UVIS	1	22-May-2013 21:04:09.0	yes

13 Total Orbits Used

ABSTRACT

Nine densely-packed inner moons of Uranus show signs of chaos and orbital instability over a variety of time scales. Many moons show measureable orbital changes within a decade or less. Long-term integrations predict that some moons could collide in less than one million years. One faint ring embedded in the system may, in fact, be the debris left behind from an earlier such collision. Meanwhile, the nearby moon Mab falls well outside the influence of the others but nevertheless shows rapid, as yet unexplained, changes in its orbit. It is embedded within a dust ring that also shows surprising variability. A highly optimized series of observations with WFC3 over the next three cycles will address some of the fundamental open questions about this dynamically active system: Do the orbits truly show evidence of chaos? If so, over what time scales? What can we say about the masses of the moons involved? What is the nature of the variations in Mab's orbit? Is Mab's motion predictable or random? Astrometry will enable us to derive the orbital elements of these moons with 10-km precision. This will be sufficient to study the year-by-year changes and, combined with other data from 2003-2007, the decadal evolution of the orbits. The pairing of precise astrometry with numerical integrations will enable us to derive new dynamical constraints on the masses of these moons. Mass is the fundamental unknown quantity currently limiting our ability to reproduce the interactions within this system. This program will also capitalize upon our best opportunity for nearly 40 years to study the unexplained variations in Uranus's faint outer rings.

OBSERVING DESCRIPTION

Astrometry of the Uranian satellites is accomplished via three visits in 2012 and three in 2013. Each visit consists of a sequence of long exposures through the broad F350LP filter. Visits begin with one unsaturated image of the planet for geometric reference and calibration checking. The orbital

Proposal 13055 (STScI Edit Number: 6, Created: Wednesday, May 22, 2013 8:04:16 PM EST) - Overview

plane is oriented within 20 degrees of the X-axis in the images to separate the moons from the wide vertical band caused by saturation bloom from the planet. From orbit to orbit, Uranus is shifted upward and downward by ~ 40 pixels within the 512x512 subarray to achieve most of the benefits of dithering; however, moons can always be distinguished from hot pixels by their motion. Each visit is timed to place Cupid and Mab near their maximum orbital elongations to ensure that these high-priority targets are both detectable. The other moons will be captured by chance and require no special targeting. Timing constraints are specified to ensure that we maximize the time baseline within both 2012 and 2013. We also ensure that Mab is captured at both north and south elongations each year to better constrain its orbital eccentricity.

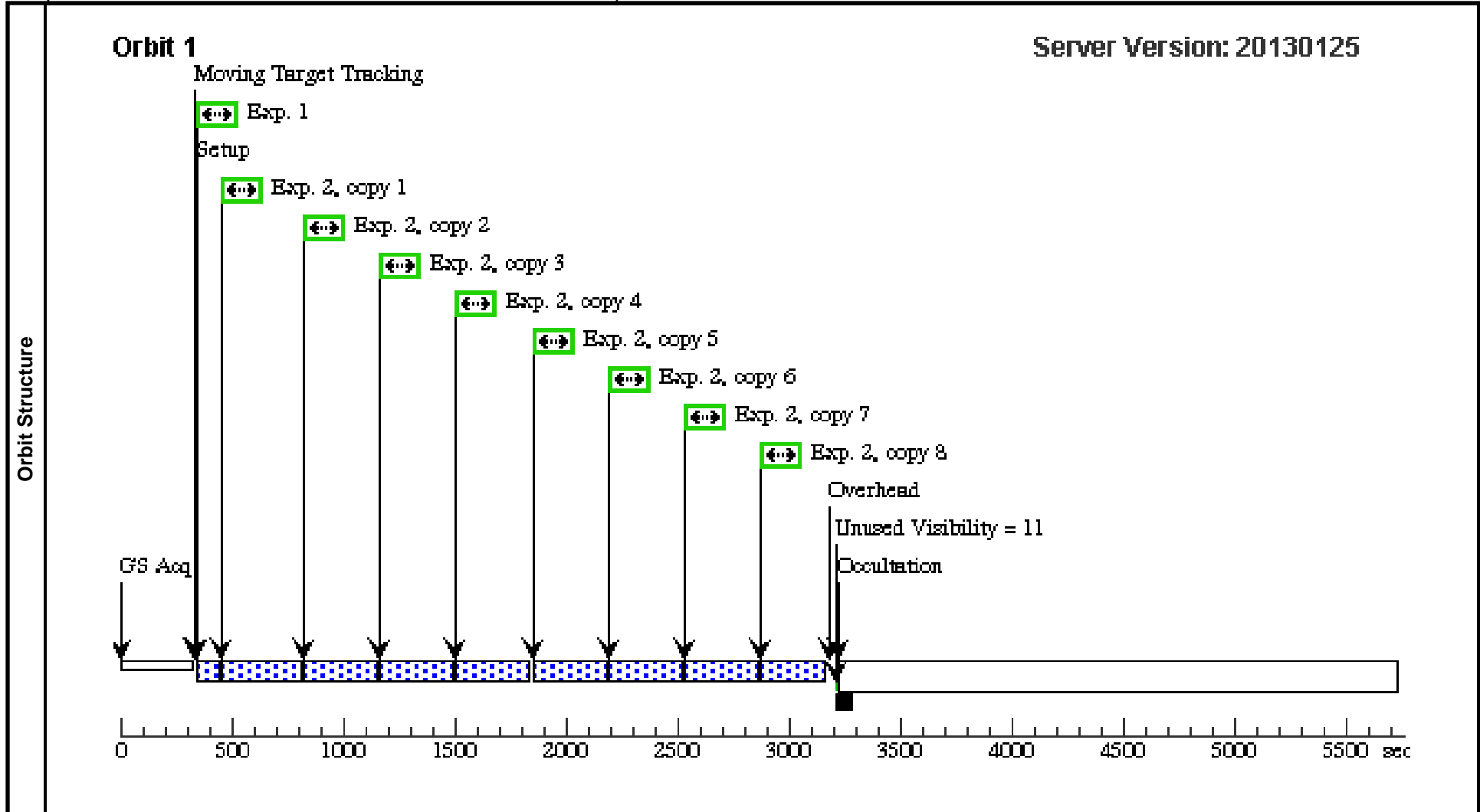
ADDITIONAL COMMENTS

Visits 44-46 are designated ON HOLD and are provided as an alternative set to 41-43. Schedule either 41-43 or 44-46; they are scientifically equivalent. Similarly, Visits 54-56 are provided as a scheduling alternative to 51-53; schedule either set of three. Note also that Uranus falls within the restricted range of RA. Nevertheless, we have not selected SCHED=100 because our scheduling constraints are defined by other factors. With SCHED=30-50, we obtain ~ 3 minutes of extra integration time per visit without affecting schedulability.

Proposal 13055 - Visit 41 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:17 GMT 2013

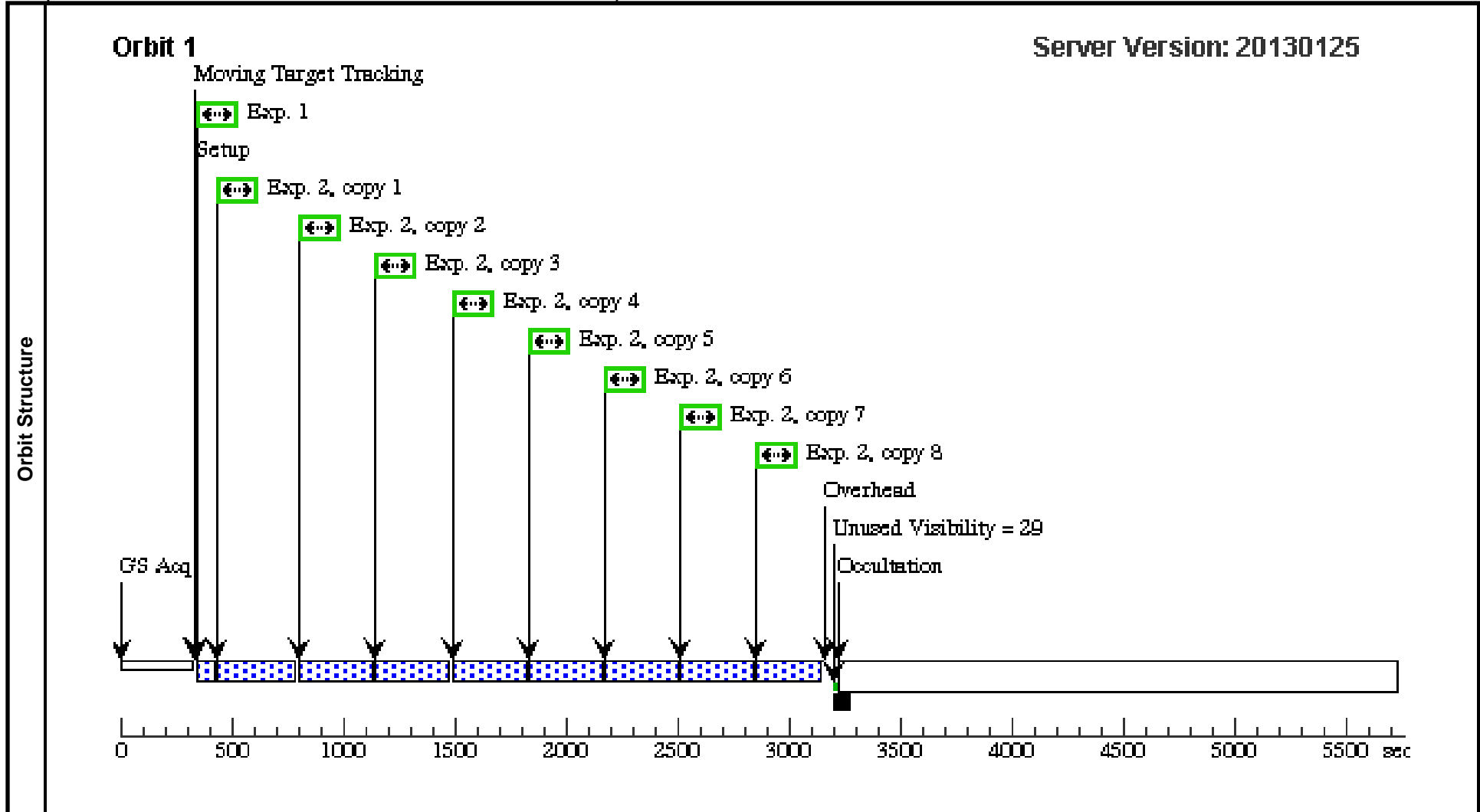
Visit	Proposal 13055, Visit 41, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 30%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; BEFORE 01-NOV-2012:00:00:00 <i>Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab south of Uranus. To be scheduled in October 2012.</i>									
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
Solar System Targets	(20)	URANUS-MAB-SOUTH-CUPID	STD=URANUS			OLG OF MAB BETWEEN 60 120, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F845M, 25 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	CR-SPLIT=NO	POS TARG 0,1.5	Sequence 1-2 Non-Int in Visit 41	25 Secs [==>]	[1]
2	F350LP, 8 x 292 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 41	292 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]	



Proposal 13055 - Visit 42 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:18 GMT 2013

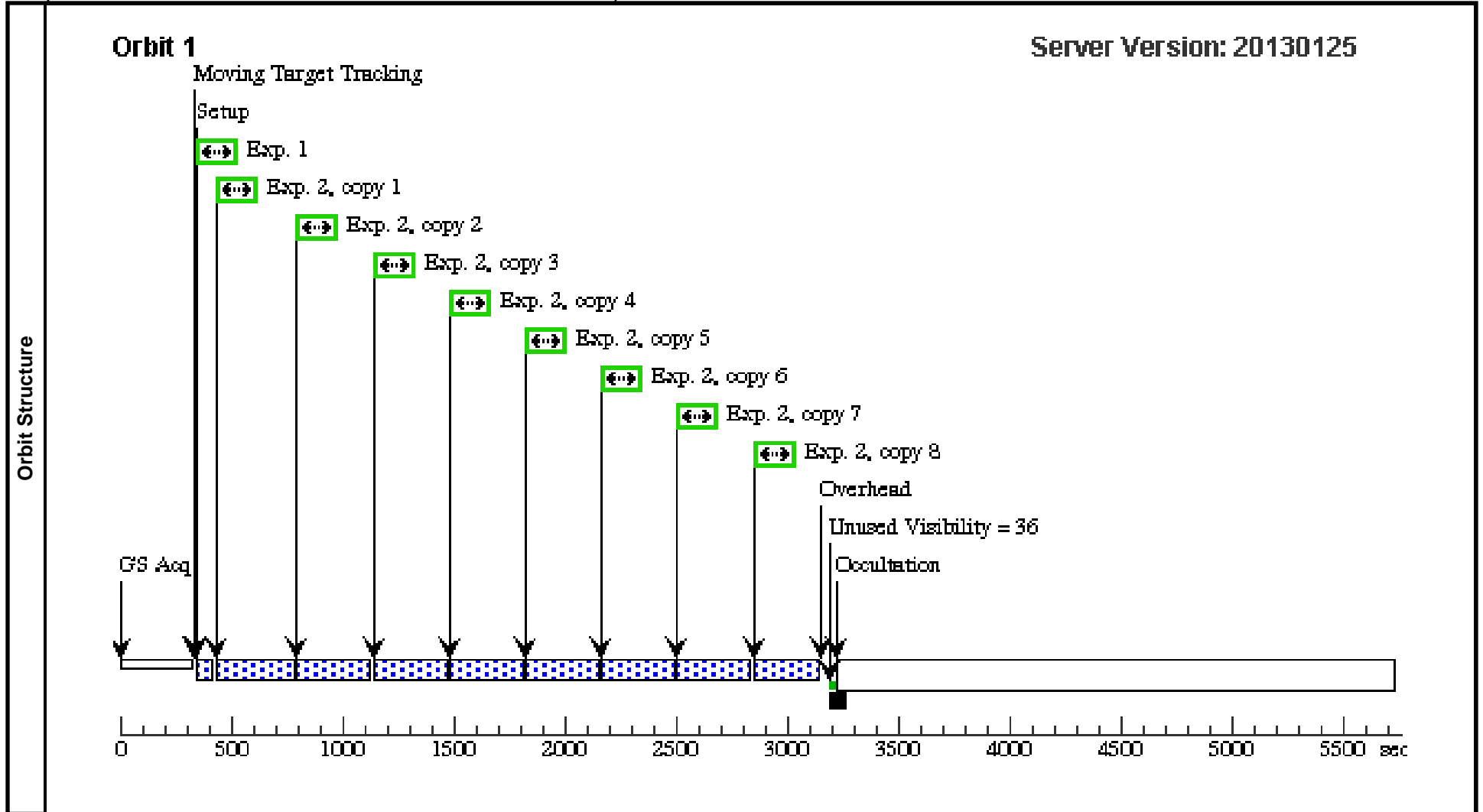
Visit	Proposal 13055, Visit 42, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 30%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; AFTER 41 BY 14 D TO 60 D; BETWEEN 01-NOV-2012:00:00:00 AND 01-DEC-2012:00:00:00 Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab north of Uranus. To be scheduled in November 2012, at least two weeks after Visit 41.									
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
Solar System Targets	(21)	URANUS-MAB-NORTH-CUPID	STD=URANUS			OLG OF MAB BETWEEN 240 300, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F467M, 10 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F467M	CR-SPLIT=NO	POS TARG 0,-1.5	Sequence 1-2 Non-Int in Visit 42	10 Secs [==>]	[1]
2	F350LP, 8 x 292 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 42	292 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]	



Proposal 13055 - Visit 43 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:20 GMT 2013

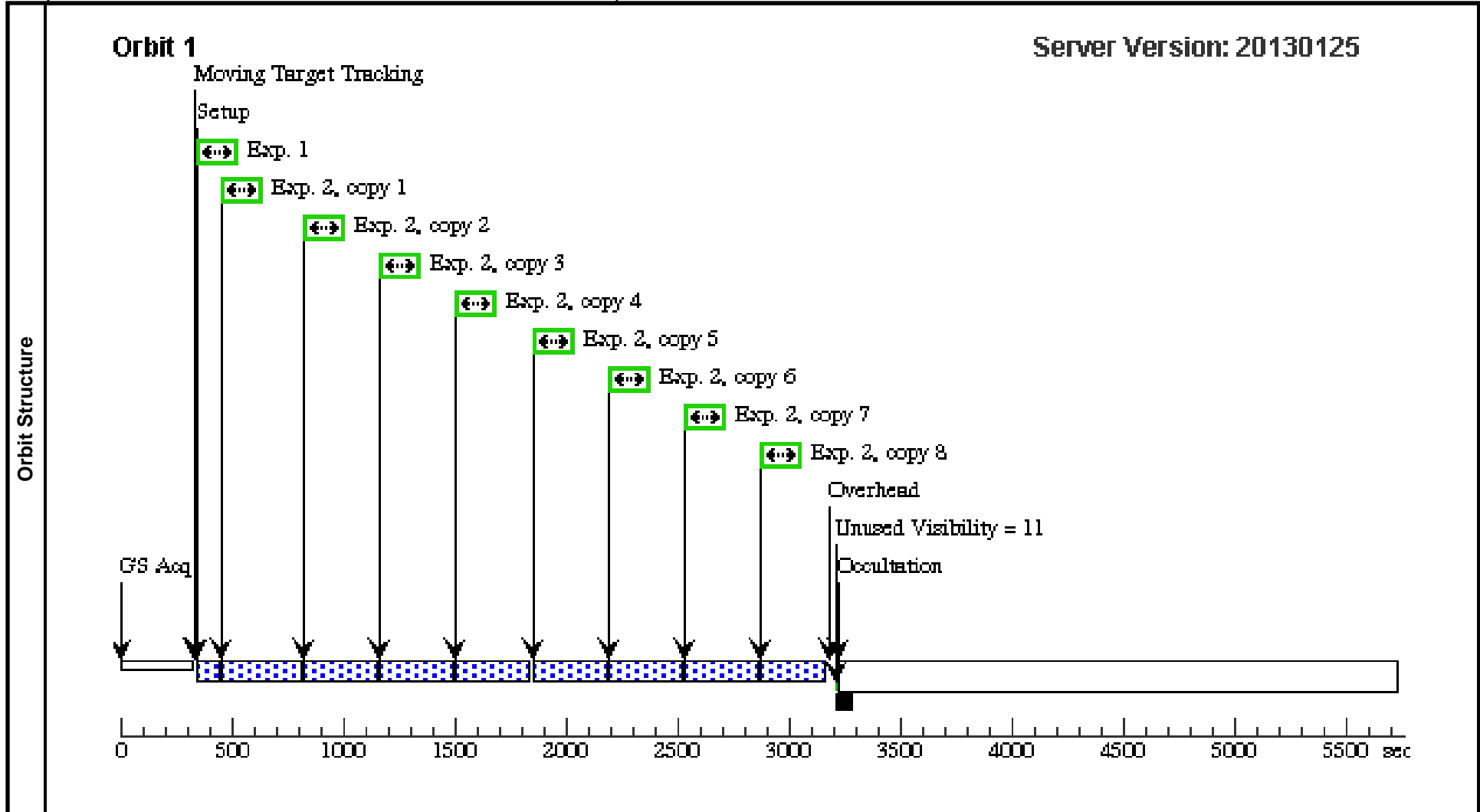
Visit	Proposal 13055, Visit 43, withdrawn Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 30%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; AFTER 42 BY 14 D TO 60 D; BETWEEN 01-DEC-2012:00:00:00 AND 31-JAN-2013:00:00:00 Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab south of Uranus. To be scheduled in December 2012, at least two weeks after Visit 42.									
	Solar System Targets									
#	Name	Level 1	Level 2	Level 3	Window	Ephem Center				
(20)	URANUS-MAB-SOUTH-CUPID	STD=URANUS			OLG OF MAB BETWEEN 60 120, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F621M, 3 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F621M	CR-SPLIT=NO	POS TARG 0,0	Sequence 1-2 Non-Int in Visit 43	3 Secs [==>]	[1]
	2	F350LP, 8 x 292 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 43	292 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]



Proposal 13055 - Visit 44 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:21 GMT 2013

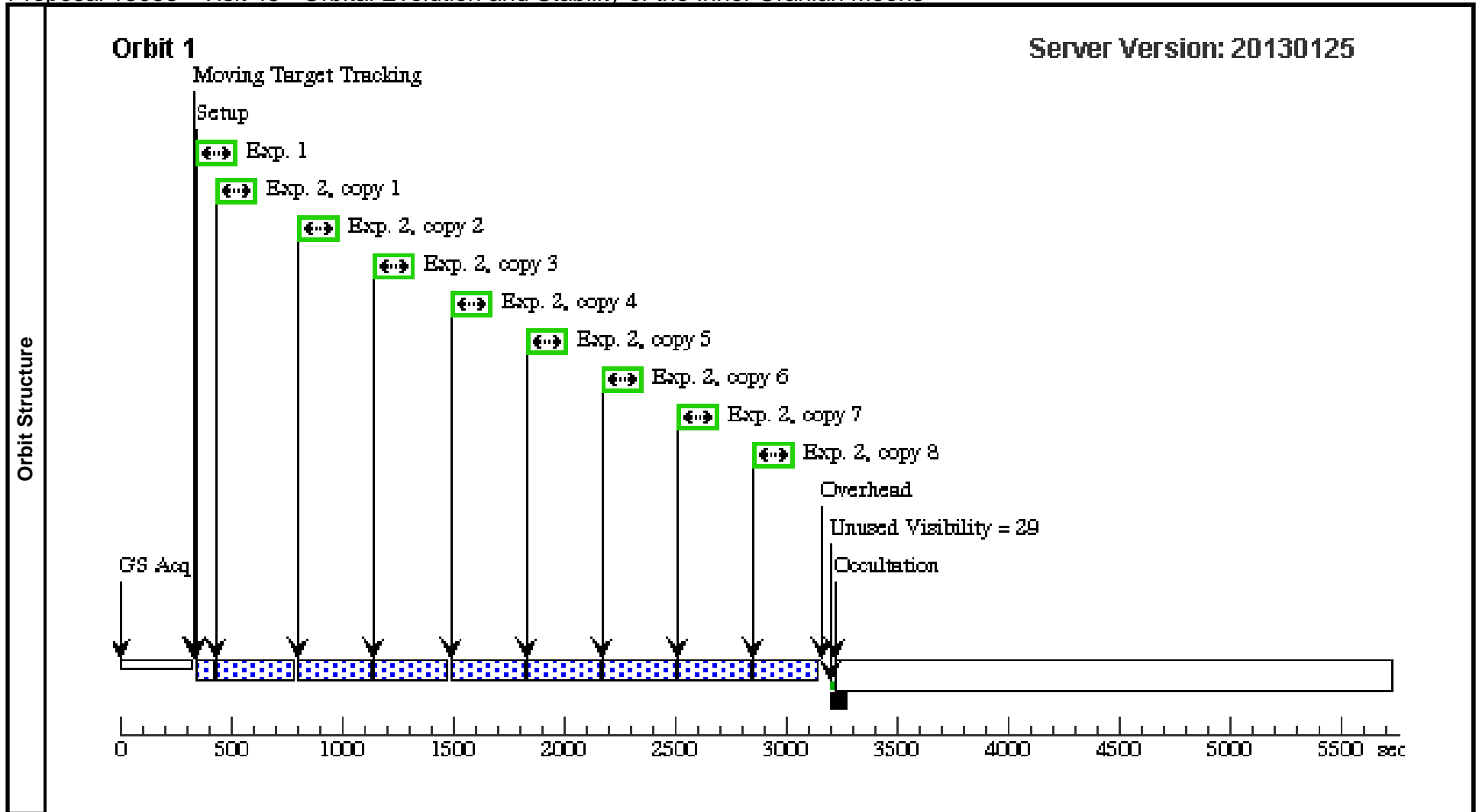
Visit	Proposal 13055, Visit 44, withdrawn Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 30%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; BEFORE 01-NOV-2012:00:00:00; ON HOLD Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab north of Uranus. To be scheduled in October 2012. On Hold Comments: Visits 44-46 are provided as an alternative to Visits 41-43 for extra scheduling flexibility. Schedule either the set 41-43 or the set 44-46; they are scientifically equivalent.									
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
Solar System Targets	(21)	URANUS-MAB-NORTH-CUPID	STD=URANUS			OLG OF MAB BETWEEN 240 300, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F845M, 25 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	CR-SPLIT=NO	POS TARG 0,1.5	Sequence 1-2 Non-Int in Visit 44	25 Secs [==>]	[1]
2	F350LP, 8 x 292 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 44	292 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]	



Proposal 13055 - Visit 45 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:22 GMT 2013

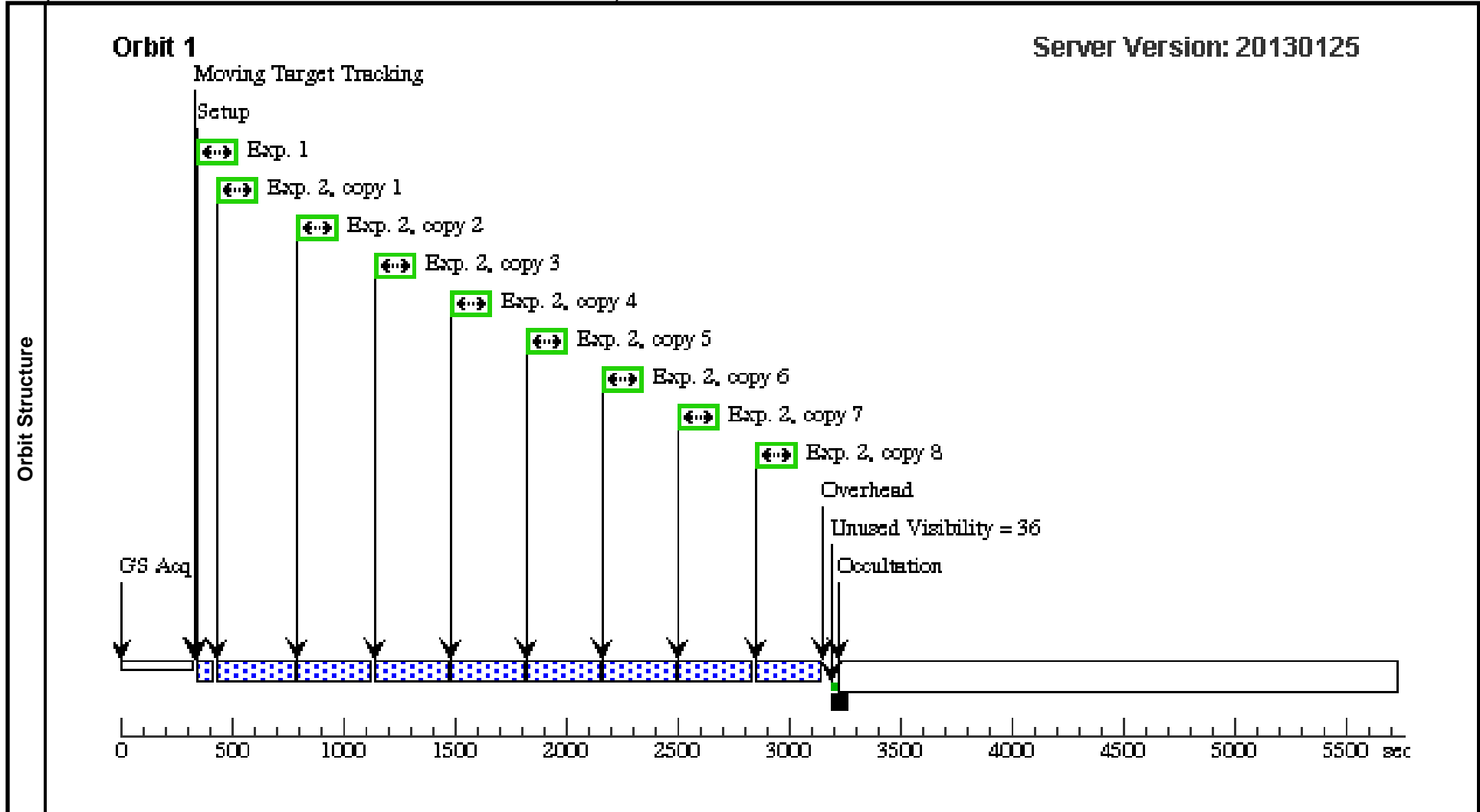
Visit	<p>Proposal 13055, Visit 45, withdrawn</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS</p> <p>Special Requirements: SCHED 30%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; AFTER 44 BY 14 D TO 60 D; BETWEEN 01-NOV-2012:00:00:00 AND 01-DEC-2012:00:00:00; ON HOLD</p> <p><i>Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab south of Uranus. To be scheduled in November 2012, at least two weeks after Visit 51.</i></p> <p><i>On Hold Comments: Visits 44-46 are provided as an alternative to Visits 41-43 for extra scheduling flexibility. Schedule either the set 41-43 or the set 44-46; they are scientifically equivalent.</i></p>									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
(20)		URANUS-MAB-SOUTH-CUPID	STD=URANUS				OLG OF MAB BETWEEN 60 120, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F467M, 10 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F467M	CR-SPLIT=NO	POS TARG 0,-1.5	Sequence 1-2 Non-Int in Visit 45	10 Secs [==>]	[1]
	2	F350LP, 8 x 292 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 45	292 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]



Proposal 13055 - Visit 46 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:23 GMT 2013

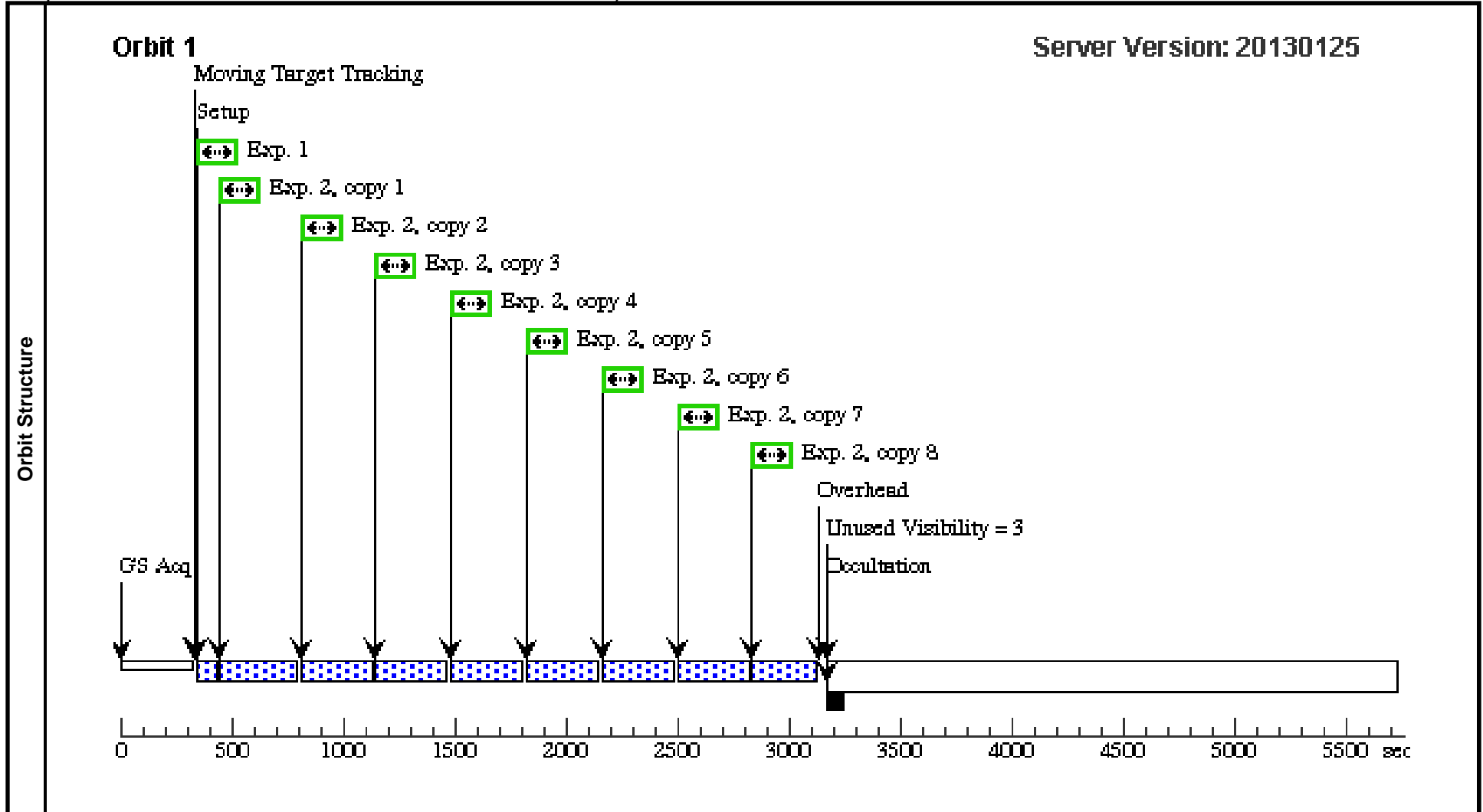
Visit	<p>Proposal 13055, Visit 46, withdrawn</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS</p> <p>Special Requirements: SCHED 30%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; AFTER 45 BY 14 D TO 60 D; BETWEEN 01-DEC-2012:00:00:00 AND 31-JAN-2013:00:00:00; ON HOLD</p> <p><i>Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab north of Uranus. To be scheduled in December 2012, at least two weeks after Visit 42.</i></p> <p><i>On Hold Comments: Visits 44-46 are provided as an alternative to Visits 41-43 for extra scheduling flexibility. Schedule either the set 41-43 or the set 44-46; they are scientifically equivalent.</i></p>									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
(21)		URANUS-MAB-NORTH-CUPID	STD=URANUS				OLG OF MAB BETWEEN 240 300, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F621M, 3 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F621M	CR-SPLIT=NO	POS TARG 0,0	Sequence 1-2 Non-Int in Visit 46	3 Secs [==>]	[1]
	2	F350LP, 8 x 292 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 46	292 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]



Proposal 13055 - Visit 50 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:24 GMT 2013

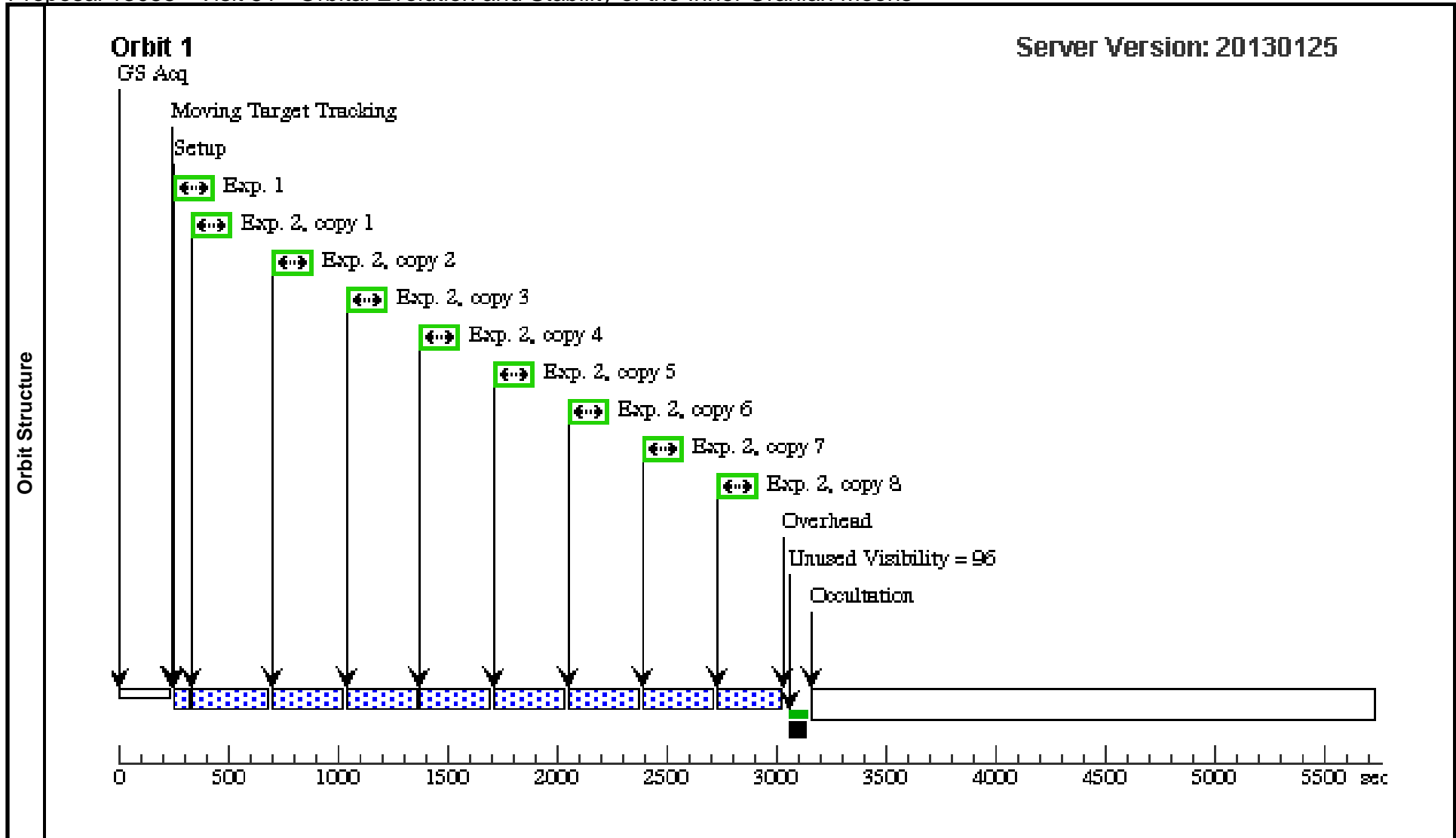
Visit	<p>Proposal 13055, Visit 50, implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS</p> <p>Special Requirements: SCHED 40%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; BETWEEN 01-JAN-2013:00:00:00 AND 01-NOV-2013:00:00:00</p> <p><i>Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab south of Uranus.</i></p> <p><i>This visit replaces visit 43 which was missed due to an HST safing.</i></p>									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
(23)		URANUS-MAB-CUPID	STD=URANUS				NOT OLG OF MAB BETWEEN 0 60, EARTH NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4", NOT OLG OF MAB FROM EARTH BETWEEN 120 240, NOT OLG OF MAB FROM EARTH BETWEEN 300 360			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F845M, 15s	(23) URANUS-MA B-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	CR-SPLIT=NO		Sequence 1-2 Non-In t in Visit 50	15 Secs [==>]	[1]
	2	F350LP, 8 x 288 s	(23) URANUS-MA B-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO		Sequence 1-2 Non-In t in Visit 50	288 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]



Proposal 13055 - Visit 51 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:25 GMT 2013

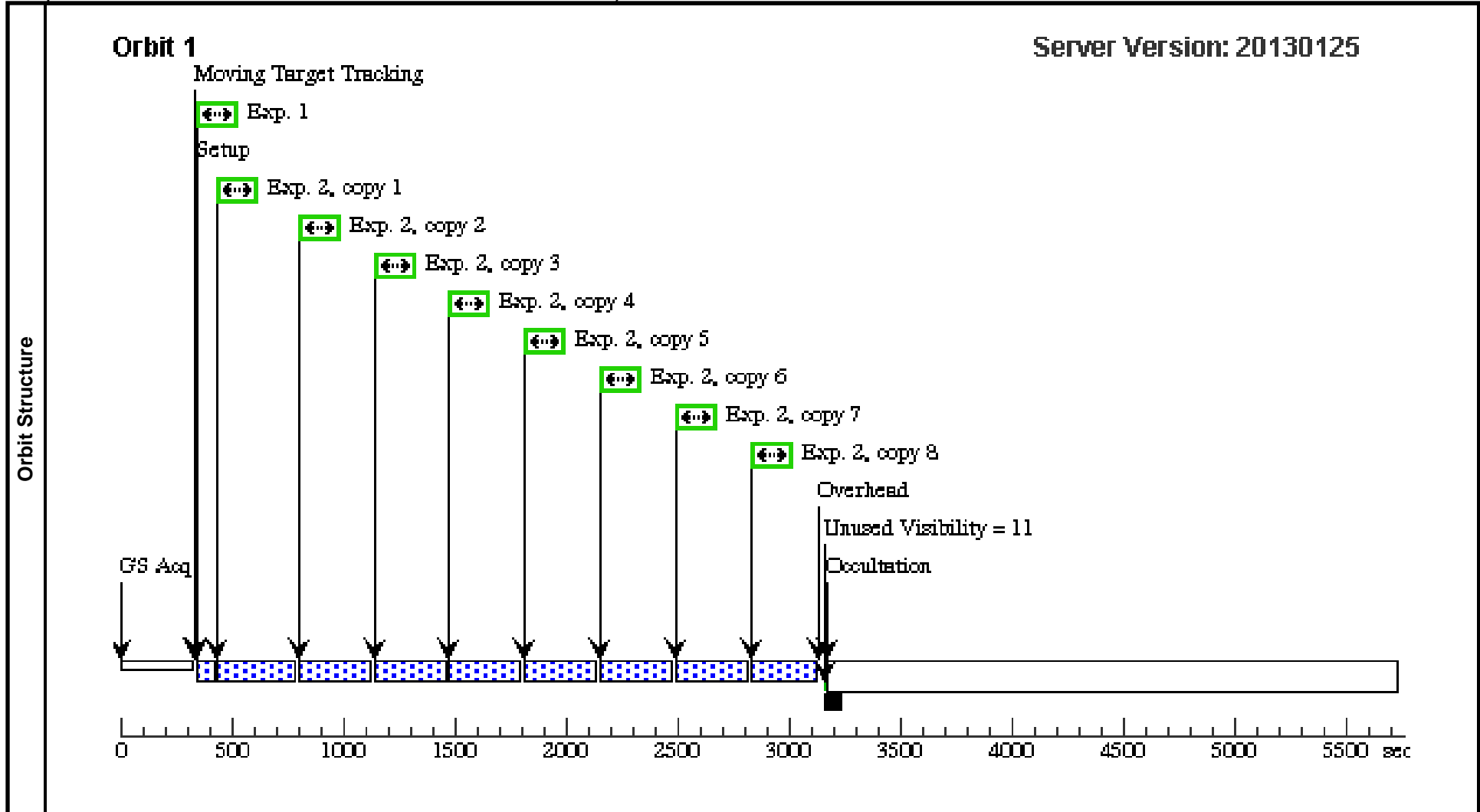
Visit	Proposal 13055, Visit 51, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 50%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; BETWEEN 31-JAN-2013:00:00:00 AND 01-AUG-2013:00:00:00 Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab north of Uranus. To be scheduled in July 2013.									
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
Solar System Targets	(21)	URANUS-MAB-NORTH-CUPID	STD=URANUS			OLG OF MAB BETWEEN 240 300, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F621M, 3 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F621M	CR-SPLIT=NO	POS TARG 0,1.5; GS ACQ SCENARIO SINGLE	Sequence 1-2 Non-Int in Visit 51	3 Secs [==>]	[1]
2	F350LP, 8 x 288 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 51	288 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]	



Proposal 13055 - Visit 52 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:26 GMT 2013

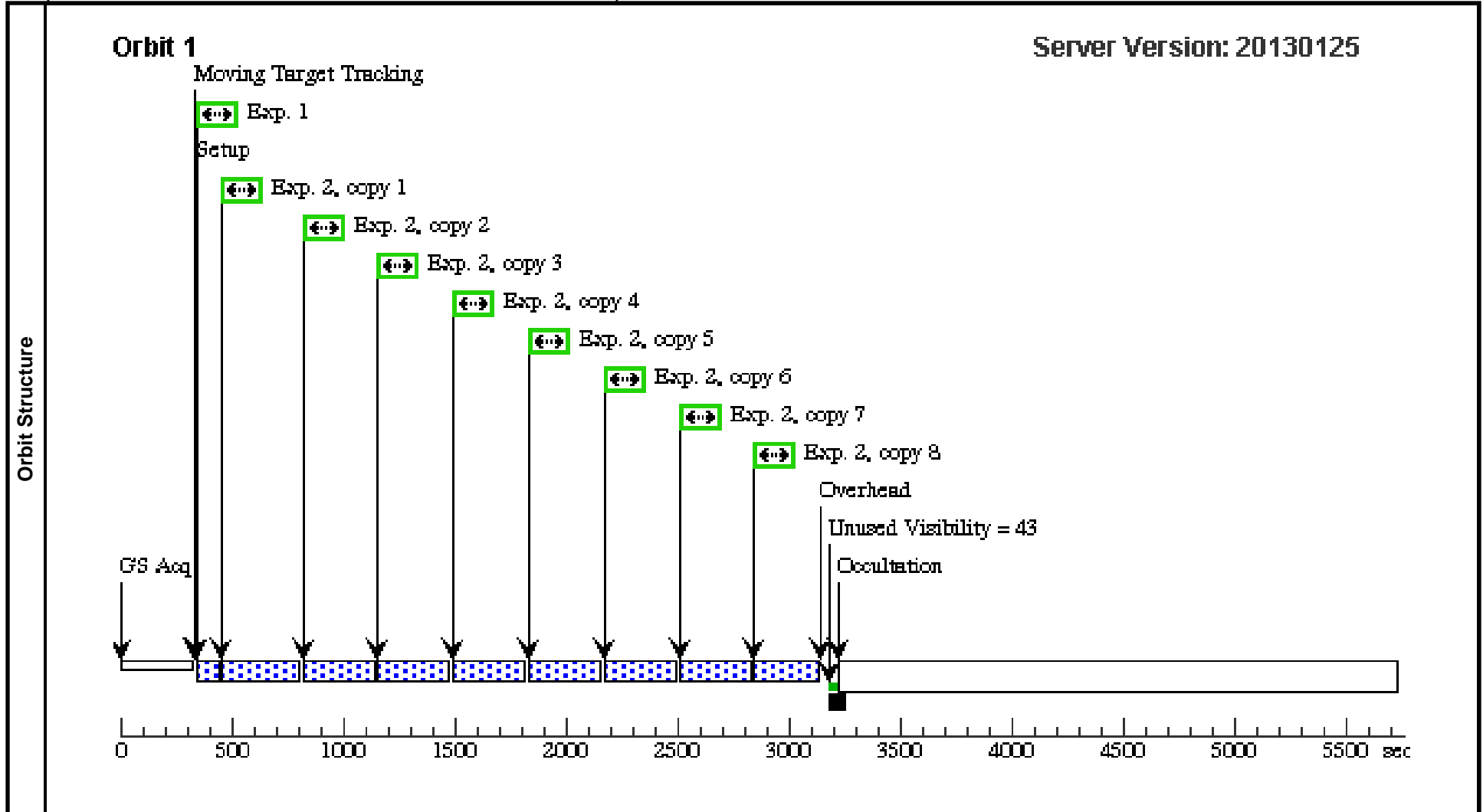
Visit	Proposal 13055, Visit 52, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 40%; ORIENT 186D TO 226 D; AFTER 51 BY 14 D TO 60 D; BETWEEN 01-AUG-2013:00:00:00 AND 01-SEP-2013:00:00:00 Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab south of Uranus. To be scheduled in August 2013, at least two weeks after Visit 51.									
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
Solar System Targets	(20)	URANUS-MAB-SOUTH-CUPID	STD=URANUS			OLG OF MAB BETWEEN 60 120, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F467M, 10 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F467M	CR-SPLIT=NO	POS TARG 0,-1.5; GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Visit 52	10 Secs [==>]	[1]
2	F350LP, 8 x 288 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 52	288 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]	



Proposal 13055 - Visit 53 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:27 GMT 2013

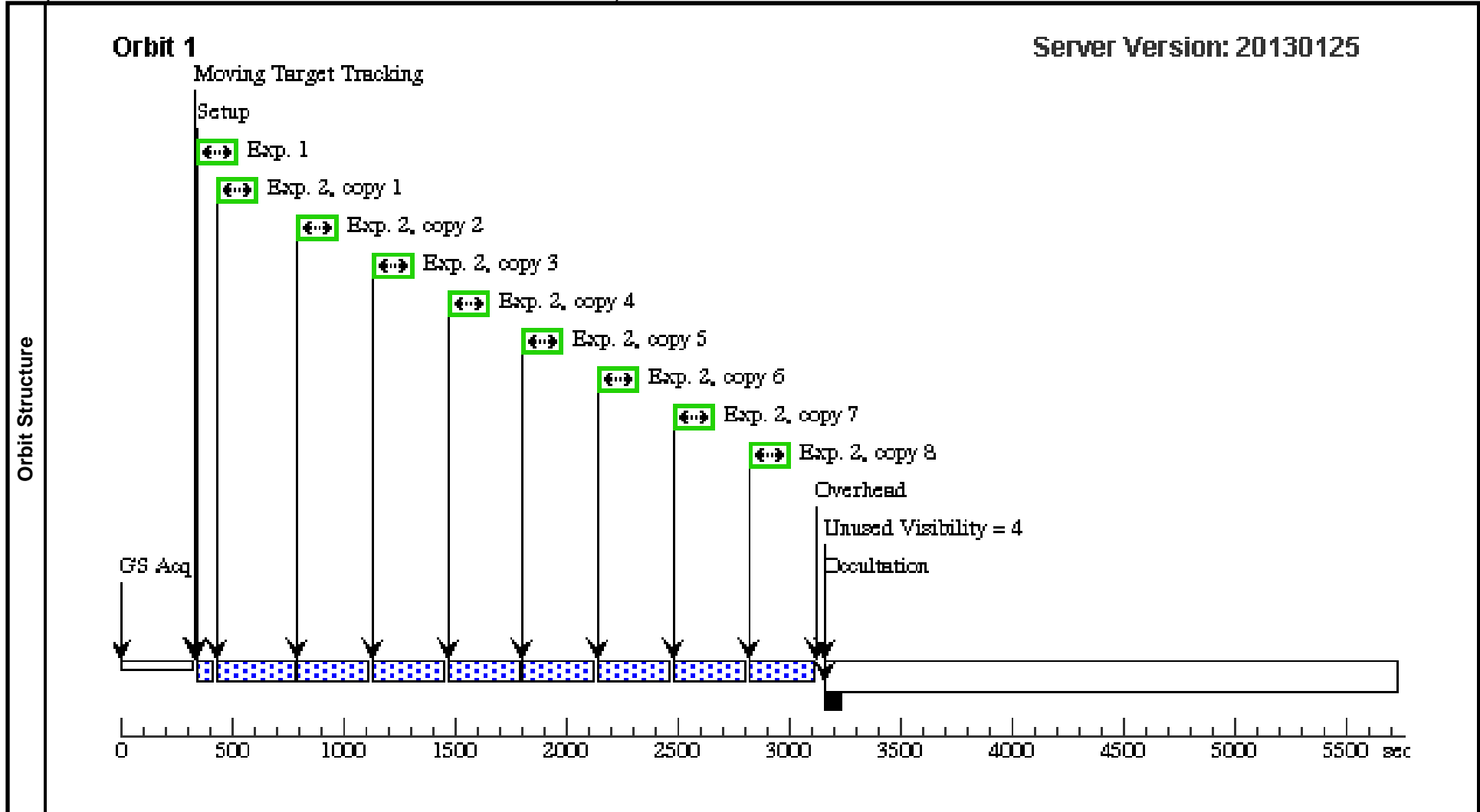
Visit	Proposal 13055, Visit 53, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 30%; ORIENT 186D TO 226 D; AFTER 01-SEP-2013:00:00:00; AFTER 52 BY 14 D TO 60 D Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab north of Uranus. To be scheduled in September 2013, at least two weeks after Visit 52.									
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
Solar System Targets	(21)	URANUS-MAB-NORTH-CUPID	STD=URANUS			OLG OF MAB BETWEEN 240 300, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F845M, 25 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	CR-SPLIT=NO	POS TARG 0,0; GS ACQ SCENARIO BASE1B3	Sequence 1-2 Non-Int in Visit 53	25 Secs [==>]	[1]
2	F350LP, 8 x 288 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 53	288 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]	



Proposal 13055 - Visit 54 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:28 GMT 2013

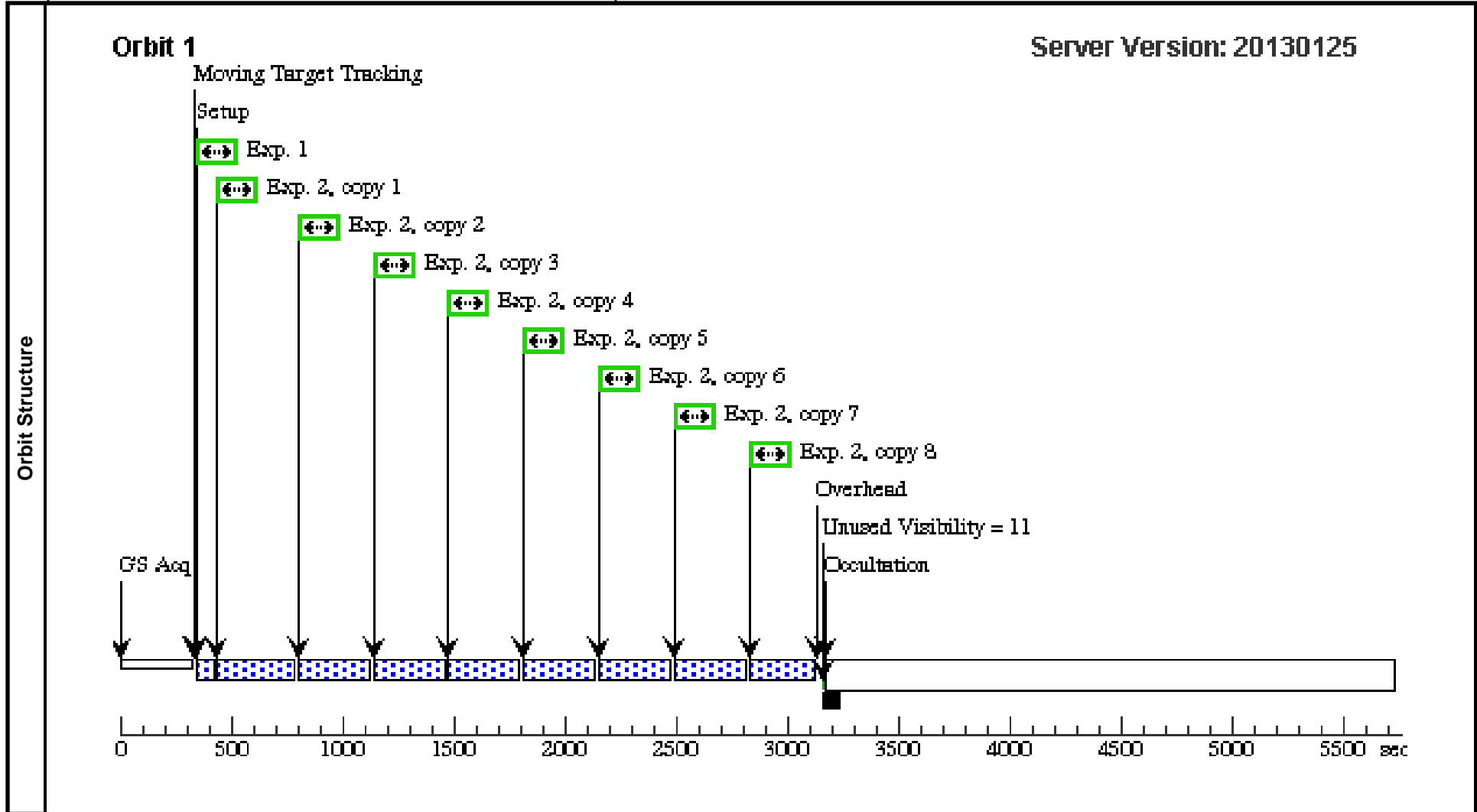
Visit	Proposal 13055, Visit 54, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 50%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; BETWEEN 31-JAN-2013:00:00:00 AND 01-AUG-2013:00:00:00; ON HOLD Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab south of Uranus. To be scheduled in July 2013. On Hold Comments: Visits 54-56 are provided as an alternative to Visits 51-53 for extra scheduling flexibility. Schedule either the set 51-53 or the set 54-56; they are scientifically equivalent.									
	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
Solar System Targets	(20)	URANUS-MAB-SOUTH-CUPID	STD=URANUS			OLG OF MAB BETWEEN 60 120, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F621M, 3 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F621M	CR-SPLIT=NO	POS TARG 0,1.5	Sequence 1-2 Non-Int in Visit 54	3 Secs [==>]	[1]
2	F350LP, 8 x 288 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 54	288 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]	



Proposal 13055 - Visit 55 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:28 GMT 2013

Visit	Proposal 13055, Visit 55, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 40%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; AFTER 54 BY 14 D TO 60 D; BETWEEN 01-AUG-2013:00:00:00 AND 01-SEP-2013:00:00:00; ON HOLD Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab north of Uranus. To be scheduled in August 2013, at least two weeks after Visit 54. On Hold Comments: Visits 54-56 are provided as an alternative to Visits 51-53 for extra scheduling flexibility. Schedule either the set 51-53 or the set 54-56; they are scientifically equivalent.									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
(21)		URANUS-MAB-NORTH-CUPID	STD=URANUS				OLG OF MAB BETWEEN 240 300, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F467M, 10 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F467M	CR-SPLIT=NO	POS TARG 0,-1.5	Sequence 1-2 Non-Int in Visit 55	10 Secs [==>]	[1]
	2	F350LP, 8 x 288 s	(21) URANUS-MA B-NORTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 55	288 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]



Proposal 13055 - Visit 56 - Orbital Evolution and Stability of the Inner Uranian Moons

Thu May 23 01:04:29 GMT 2013

Visit	Proposal 13055, Visit 56, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 30%; ORIENT 6D TO 46 D; ORIENT 186D TO 226 D; AFTER 01-SEP-2013:00:00:00; AFTER 55 BY 14 D TO 60 D; ON HOLD Comments: Uranus with the ring plane oriented within 20 degrees of horizontal. Mab and Cupid near maximum elongation, with Mab south of Uranus. To be scheduled in September 2013, at least two weeks after Visit 55. On Hold Comments: Visits 54-56 are provided as an alternative to Visits 51-53 for extra scheduling flexibility. Schedule either the set 51-53 or the set 54-56; they are scientifically equivalent.									
	Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center		
(20)		URANUS-MAB-SOUTH-CUPID	STD=URANUS				OLG OF MAB BETWEEN 60 120, NOT OLG OF CUPID BETWEEN 0 60, NOT OLG OF CUPID BETWEEN 120 240, NOT OLG OF CUPID BETWEEN 300 360, SEP OF MAB OBERON FROM EARTH GT 5", SEP OF CUPID OBERON FROM EARTH GT 5", SEP OF MAB TITANIA FROM EARTH GT 5", SEP OF CUPID TITANIA FROM EARTH GT 5", SEP OF MAB UMBRIEL FROM EARTH GT 4", SEP OF CUPID UMBRIEL FROM EARTH GT 4", SEP OF MAB ARIEL FROM EARTH GT 4", SEP OF CUPID ARIEL FROM EARTH GT 4"	EARTH		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F845M, 25 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F845M	CR-SPLIT=NO	POS TARG 0,0	Sequence 1-2 Non-Int in Visit 56	25 Secs [==>]	[1]
	2	F350LP, 8 x 288 s	(20) URANUS-MA B-SOUTH-CUPID	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	SAME POS AS 1	Sequence 1-2 Non-Int in Visit 56	288 Secs X 8 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)]	[1]

