



17417 - Exploring the Dynamics of Quaoar's Rings

Cycle: 31, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
Dr. Benjamin Proudfoot (PI) (Contact)	University of Central Florida Board of Trustees
Prof. Darin Ragozzine (CoI)	Brigham Young University
Dr. Will M. Grundy (CoI)	Lowell Observatory
Dallin J Spencer (CoI)	Brigham Young University

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>
01	(1) QUAOAR	WFC3/UVIS	1	16-Aug-2024 13:00:15.0	yes
02	(1) QUAOAR	WFC3/UVIS	1	16-Aug-2024 13:00:16.0	yes
03	(1) QUAOAR	WFC3/UVIS	1	16-Aug-2024 13:00:17.0	yes
04	(1) QUAOAR	WFC3/UVIS	1	16-Aug-2024 13:00:18.0	yes
05	(1) QUAOAR	WFC3/UVIS	1	16-Aug-2024 13:00:18.0	yes

5 Total Orbits Used

ABSTRACT

Recent stellar occultations have revealed a pair of enigmatic rings around the dwarf planet Quaoar. These narrow rings, which lie well outside Quaoar's Roche limit are extremely interesting targets for study into ring formation, evolution, and ring particle interactions. Quaoar and its moon Weywot, are, unfortunately, not well enough characterized to study the dynamics of the newly discovered ring system. In this 5 orbit program, we propose to study the orbit of Weywot to constrain the dynamics of Quaoar's rings. By using state-of-the-art non-Keplerian orbit fitting techniques, the

additional astrometric observations obtained in this program will strongly constrain Weywot's orbit and orbital precession, as well as Quaoar's mass and shape. This will enable further study of Quaoar's rings, allowing the system to act as a touchstone for future studies of rings around TNOs. Our proposal uses a novel observing strategy to ensure the most efficient use of HST time, while still allowing us to accomplish our goals.

OBSERVING DESCRIPTION

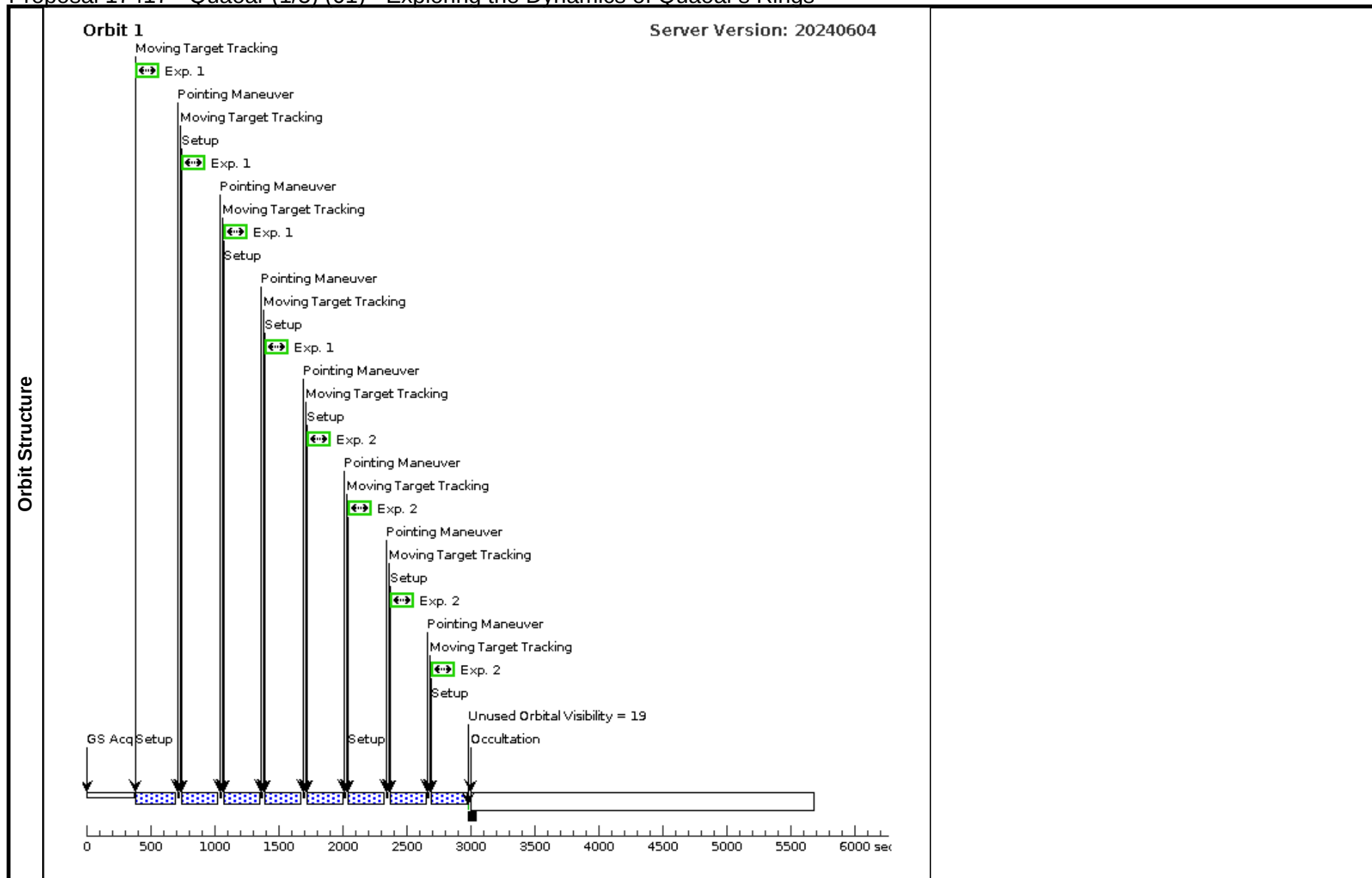
Our observations call for 5 single-orbit visits to image the Quaoar-Weywot binary system using the WFC3/UVIS instrument. During each visit, images will be acquired using the UVIS2-C512C-SUB aperture, paired with the F350LP filter to optimize astrometric precision. Exposure times are chosen to optimize SNR and schedulability, with 8 dithered images taken during each visit. This allows us to remain robust to unlucky cosmic ray hits.

Each visit has been scheduled to best achieve the goals of our program. We request that Visit 01 is scheduled as soon as possible in the cycle, at times which best optimize target visibility. Visit 02 should take place ~90 days later, again at times of maximum visibility. Lastly, we request Visits 03-05 are scheduled as late as possible in the cycle. These should be taken in a sequence with 2-4 days between each visit. While these scheduling constraints are quite stringent, this observing cadence allows us to optimize our use of precious HST time. If the scheduling requirements are too onerous, we are happy to work with schedulers to relax these requirements as needed. Once each visit has a planned window/schedule, we will be able to check whether any bright objects are too close to our target, as we have done in previous programs.

Reduced gyro operations will not significantly affect the execution of this program, apart from potentially requiring a rescheduling of observations due to reductions in observing windows. As needed, we can flexibly reschedule observations without significantly harming the goals of this program. Reduced spatial scan speed will not prohibit observations of our target as the maximum needed spatial scan speed is ~5 arcseconds/hour, well within the limits of reduced gyro operations.

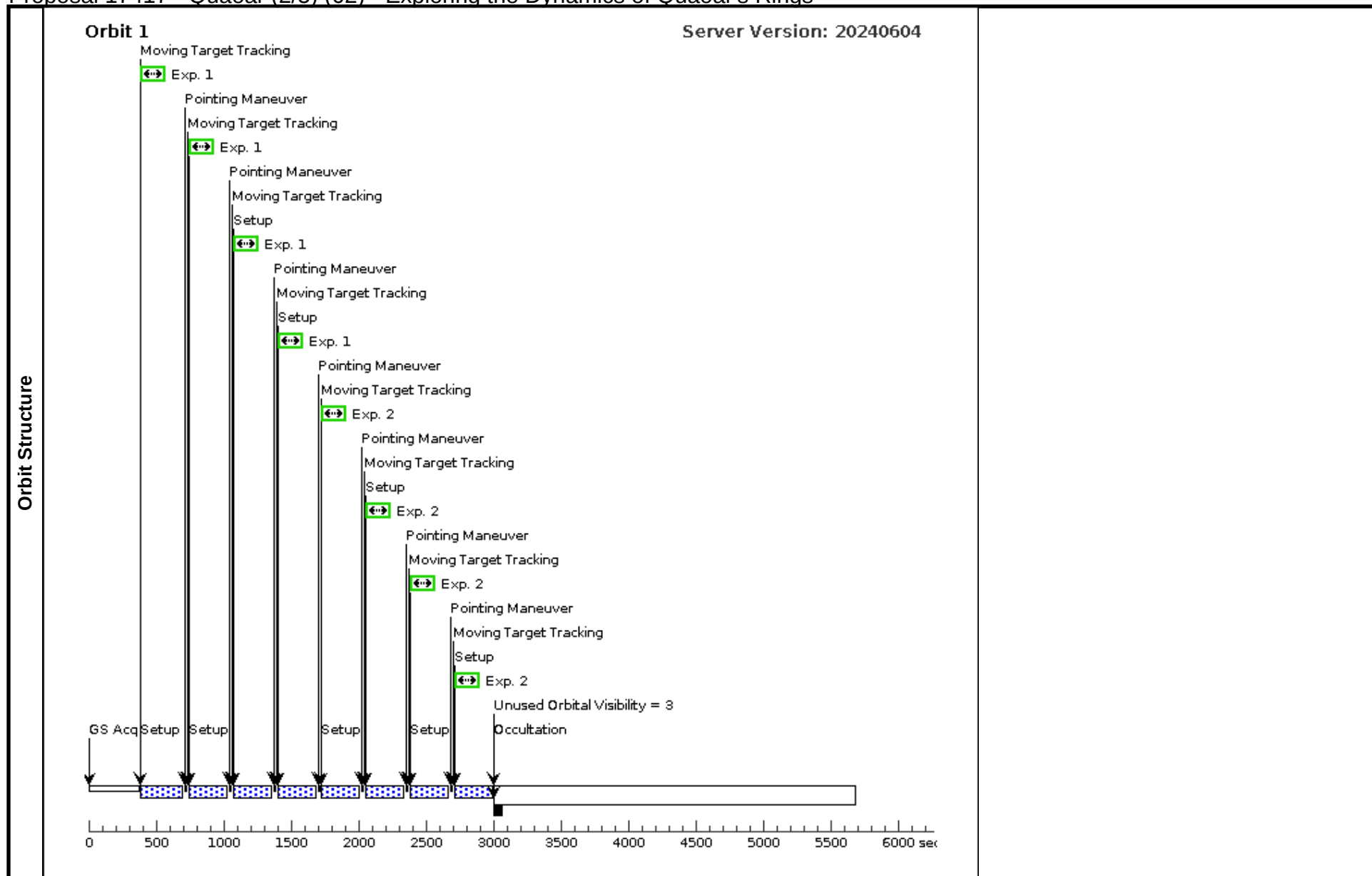
Proposal 17417 - Quaoar (1/5) (01) - Exploring the Dynamics of Quaoar's Rings

Visit	Proposal 17417, Quaoar (1/5) (01), completed										Fri Aug 16 17:00:19 GMT 2024		
	Diagnostic Status: Informational												
	Scientific Instruments: WFC3/UVIS												
	Special Requirements: BETWEEN 08-MAY-2024:00:00:00 AND 09-MAY-2024:12:00:00; BETWEEN 14-MAY-2024:06:00:00 AND 14-MAY-2024:12:00:00; BETWEEN 21-MAY-2024:17:00:00 AND 23-MAY-2024:13:00:00; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET												
Comments: The first visit to image Quaoar. This visit will act as an anchor to ensure all subsequent visits are as constraining as possible. In this visit, observation timing is optimized to ensure the highest chance of detection. This should be scheduled as early in the Cycle as possible.													
Diagnostics	(Quaoar (1/5) (01)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.												
Patterns	#	Primary Pattern					Secondary Pattern				Exposures		
	(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Coordinate Frame=POS-TARG Pattern Orientation=23.884 Purpose=DITHER Angle Between Sides=81.785 Number Of Points=4 Center Pattern=false Point Spacing=0.173 Line Spacing=0.112									(1), (2)		
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center						
	(1)	QUAOAR	TYPE=ASTEROID,A=43.3562106259 2979,E=0.03993647193741599,I=7.99 12917217563 ,O=189.0992394650243,W=158.60707 23684032,M=293.8106399929501,EQ UINOX=J2000,EPOCH=25-MAY- 2023:00:00:00,EpochTimeScale=TDB					EARTH					
	Comments: Description=The dwarf planet Quaoar												
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit		
	1		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO		Sequence 1-2 Non-Int in Quaoar (1/5) (01)	240 Secs (960 Secs)				
								Pattern 1, Exps 1-1 in Sequence 1-2 Non-Int in Quaoar (1/5) (01) (1)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]		[1]		
	2		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO		Sequence 1-2 Non-Int in Quaoar (1/5) (01)	240 Secs (960 Secs)				
								Pattern 1, Exps 2-2 in Sequence 1-2 Non-Int in Quaoar (1/5) (01) (1)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]		[1]		



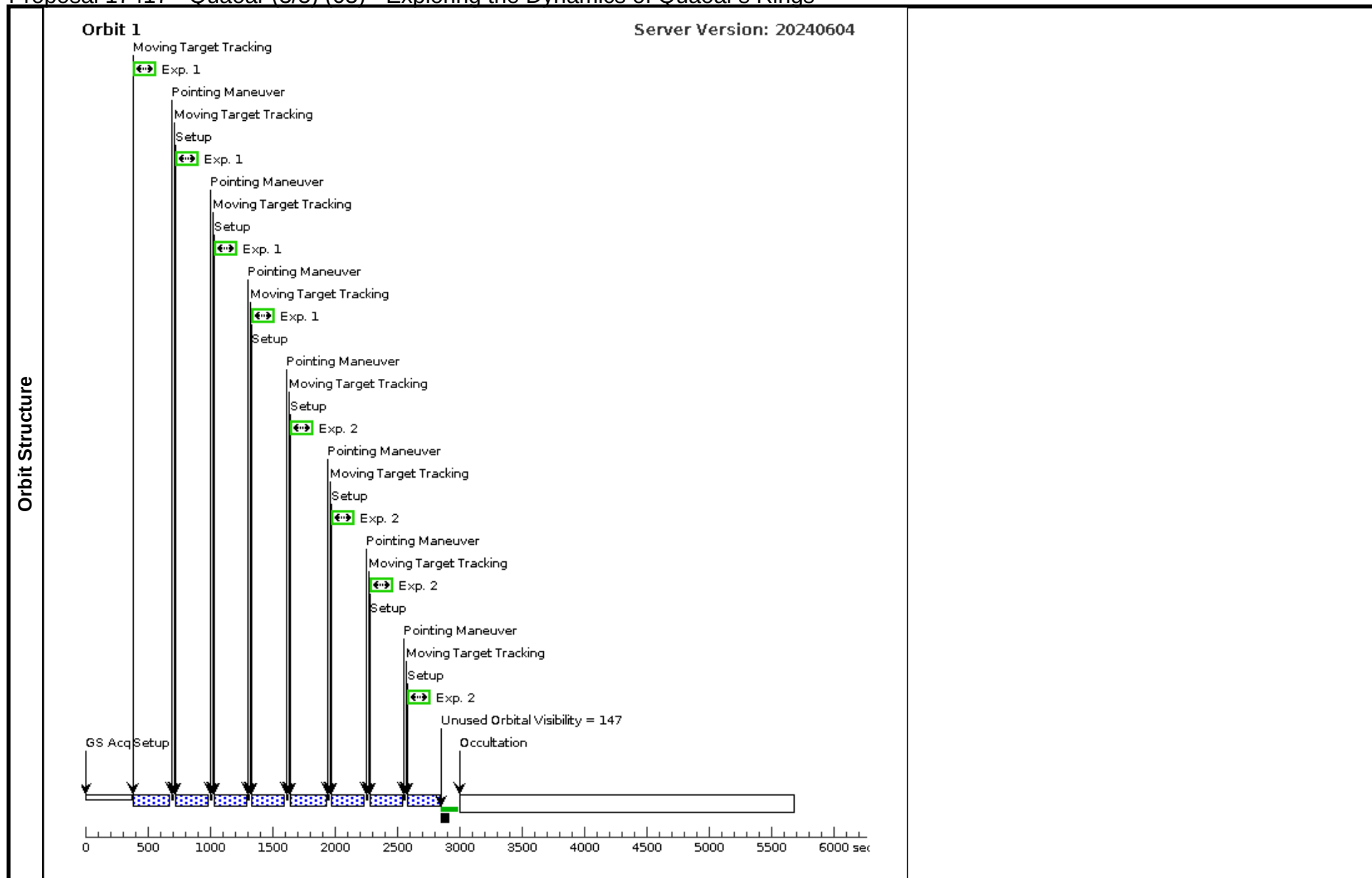
Proposal 17417 - Quaoar (2/5) (02) - Exploring the Dynamics of Quaoar's Rings

Visit	Proposal 17417, Quaoar (2/5) (02), completed										Fri Aug 16 17:00:19 GMT 2024	
	Diagnostic Status: Informational											
	Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 14-JUN-2024:10:00:00 AND 15-JUN-2024:00:00:00; BETWEEN 16-JUN-2024:06:00:00 AND 16-JUN-2024:14:00:00; BETWEEN 21-JUN-2024:10:00:00 AND 23-JUN-2024:09:00:00; BETWEEN 26-JUN-2024:16:00:00 AND 26-JUN-2024:20:00:00; BETWEEN 27-JUN-2024:00:00:00 AND 27-JUN-2024:04:00:00; BETWEEN 27-JUN-2024:12:00:00 AND 28-JUN-2024:00:00:00; BETWEEN 28-JUN-2024:04:00:00 AND 28-JUN-2024:08:00:00; BETWEEN 02-JUL-2024:20:00:00 AND 03-JUL-2024:08:00:00; BETWEEN 03-JUL-2024:16:00:00 AND 03-JUL-2024:22:00:00; BETWEEN 04-JUL-2024:10:00:00 AND 04-JUL-2024:17:00:00; BETWEEN 05-JUL-2024:08:00:00 AND 06-JUL-2024:00:00:00; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET Comments: The second visit to image Quaoar. This should take place about 30 days after Visit 1. This observation allows for maximum separation of possible period aliases.											
Diagnostics	(Quaoar (2/5) (02)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Coordinate Frame=POS-TARG Pattern Orientation=23.884 Purpose=DITHER Angle Between Sides=81.785 Number Of Points=4 Center Pattern=false Point Spacing=0.173 Line Spacing=0.112									(1), (2)	
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(1)	QUAOAR	TYPE=ASTEROID,A=43.3562106259 2979,E=0.03993647193741599,I=7.99 12917217563 ,O=189.0992394650243,W=158.60707 23684032,M=293.8106399929501,EQ UINOX=J2000,EPOCH=25-MAY-2023:00:00:00,EpochTimeScale=TDB				EARTH					
	Comments: Description=The dwarf planet Quaoar											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO		Sequence 1-2 Non-Int in Quaoar (2/5) (02)	230 Secs (968 Secs)			
								Pattern 1, Exps 1-1 in Sequence 1-2 Non-Int in Quaoar (2/5) (02) (1)	[==>242.0 Secs (Pattern 1)] [==>242.0 Secs (Pattern 2)] [==>242.0 Secs (Pattern 3)] [==>242.0 Secs (Pattern 4)]		[1]	
	2		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO		Sequence 1-2 Non-Int in Quaoar (2/5) (02)	230 Secs (968 Secs)			
								Pattern 1, Exps 2-2 in Sequence 1-2 Non-Int in Quaoar (2/5) (02) (1)	[==>242.0 Secs (Pattern 1)] [==>242.0 Secs (Pattern 2)] [==>242.0 Secs (Pattern 3)] [==>242.0 Secs (Pattern 4)]		[1]	



Proposal 17417 - Quaoar (3/5) (03) - Exploring the Dynamics of Quaoar's Rings

Visit	Proposal 17417, Quaoar (3/5) (03), implementation					Fri Aug 16 17:00:19 GMT 2024				
	Diagnostic Status: Informational									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 15-FEB-2025:00:00:00 AND 16-FEB-2025:00:00:00; BETWEEN 16-FEB-2025:12:00:00 AND 17-FEB-2025:06:00:00; BETWEEN 17-FEB-2025:18:00:00 AND 19-FEB-2025:06:00:00; BETWEEN 19-FEB-2025:09:00:00 AND 21-FEB-2025:18:00:00; BETWEEN 22-FEB-2025:00:00:00 AND 22-FEB-2025:22:00:00; BETWEEN 23-FEB-2025:09:00:00 AND 24-FEB-2025:18:00:00; BETWEEN 25-FEB-2025:06:00:00 AND 26-FEB-2025:17:00:00; BETWEEN 26-FEB-2025:23:00:00 AND 27-FEB-2025:03:00:00; BETWEEN 27-FEB-2025:08:00:00 AND 27-FEB-2025:15:00:00; BETWEEN 28-FEB-2025:09:00:00 AND 28-FEB-2025:16:00:00; BETWEEN 01-MAR-2025:04:00:00 AND 02-MAR-2025:02:00:00; BETWEEN 02-MAR-2025:20:00:00 AND 05-MAR-2025:20:00:00; BETWEEN 07-MAR-2025:02:00:00 AND 07-MAR-2025:05:00:00; BETWEEN 07-MAR-2025:12:00:00 AND 07-MAR-2025:22:00:00; BETWEEN 08-MAR-2025:06:00:00 AND 08-MAR-2025:14:00:00; BETWEEN 09-MAR-2025:18:00:00 AND 11-MAR-2025:00:00:00; BETWEEN 11-MAR-2025:12:00:00 AND 12-MAR-2025:16:00:00; BETWEEN 13-MAR-2025:18:00:00 AND 14-MAR-2025:18:00:00; BETWEEN 15-MAR-2025:11:00:00 AND 16-MAR-2025:18:00:00; BETWEEN 18-MAR-2025:00:00:00 AND 18-MAR-2025:18:00:00; BETWEEN 19-MAR-2025:00:00:00 AND 20-MAR-2025:00:00:00; BETWEEN 21-MAR-2025:00:00:00 AND 22-MAR-2025:00:00:00; BETWEEN 22-MAR-2025:20:00:00 AND 26-MAR-2025:00:00:00; BETWEEN 26-MAR-2025:14:00:00 AND 28-MAR-2025:04:00:00; BETWEEN 29-MAR-2025:06:00:00 AND 30-MAR-2025:04:00:00; BETWEEN 30-MAR-2025:09:00:00 AND 31-MAR-2025:00:00:00; BETWEEN 31-MAR-2025:16:00:00 AND 03-APR-2025:16:00:00; BETWEEN 05-APR-2025:00:00:00 AND 08-APR-2025:16:00:00; BETWEEN 10-APR-2025:00:00:00 AND 17-APR-2025:16:00:00; BETWEEN 18-APR-2025:00:00:00 AND 21-APR-2025:04:00:00; BETWEEN 22-APR-2025:00:00:00 AND 23-APR-2025:18:00:00; BETWEEN 24-APR-2025:06:00:00 AND 25-APR-2025:18:00:00; BETWEEN 26-APR-2025:00:00:00 AND 26-APR-2025:12:00:00; BETWEEN 27-APR-2025:12:00:00 AND 01-MAY-2025:00:00:00; Period 12.431 D AND ZERO-PHASE HJD2460281.5; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET									
Comments: The third visit to image Quaoar. Taken at particular orbital phase. Betweens represent times when nearby bright objects are too close to Quaoar for good imaging.										
Diagnostics	(Quaoar (3/5) (03)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.									
Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
	(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Coordinate Frame=POS-TARG Pattern Orientation=23.884 Purpose=DITHER Angle Between Sides=81.785 Number Of Points=4 Center Pattern=false Point Spacing=0.173 Line Spacing=0.112							(1), (2)	
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
	(1)	QUAOAR	TYPE=ASTEROID,A=43.3562106259 2979,E=0.03993647193741599,I=7.99 12917217563 ,O=189.0992394650243,W=158.60707 23684032,M=293.8106399929501,EQ UINOX=J2000,EPOCH=25-MAY-2023:00:00:00,EpochTimeScale=TDB				EARTH			
Comments: Description=The dwarf planet Quaoar										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	PHASE 0.3 TO 0.44	Sequence 1-2 Non-Int in Quaoar (3/5) (03)	220 Secs (880 Secs)	[1]
								Pattern 1, Exps 1-1 in Sequence 1-2 Non-Int in Quaoar (3/5) (03) (1)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	
	2		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	PHASE 0.3 TO 0.44	Sequence 1-2 Non-Int in Quaoar (3/5) (03)	220 Secs (880 Secs)	
							Pattern 1, Exps 2-2 in Sequence 1-2 Non-Int in Quaoar (3/5) (03) (1)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]		
										[1]



Proposal 17417 - Quaoar (4/5) (04) - Exploring the Dynamics of Quaoar's Rings

Visit	Proposal 17417, Quaoar (4/5) (04), implementation				Fri Aug 16 17:00:19 GMT 2024					
	Diagnostic Status: Informational									
	Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 15-FEB-2025:00:00:00 AND 16-FEB-2025:00:00:00; BETWEEN 16-FEB-2025:12:00:00 AND 17-FEB-2025:06:00:00; BETWEEN 17-FEB-2025:18:00:00 AND 19-FEB-2025:06:00:00; BETWEEN 19-FEB-2025:09:00:00 AND 21-FEB-2025:18:00:00; BETWEEN 22-FEB-2025:00:00:00 AND 22-FEB-2025:22:00:00; BETWEEN 23-FEB-2025:09:00:00 AND 24-FEB-2025:18:00:00; BETWEEN 25-FEB-2025:06:00:00 AND 26-FEB-2025:17:00:00; BETWEEN 26-FEB-2025:23:00:00 AND 27-FEB-2025:03:00:00; BETWEEN 27-FEB-2025:08:00:00 AND 27-FEB-2025:15:00:00; BETWEEN 28-FEB-2025:09:00:00 AND 28-FEB-2025:16:00:00; BETWEEN 01-MAR-2025:04:00:00 AND 02-MAR-2025:02:00:00; BETWEEN 02-MAR-2025:20:00:00 AND 05-MAR-2025:20:00:00; BETWEEN 07-MAR-2025:02:00:00 AND 07-MAR-2025:05:00:00; BETWEEN 07-MAR-2025:12:00:00 AND 07-MAR-2025:22:00:00; BETWEEN 08-MAR-2025:06:00:00 AND 08-MAR-2025:14:00:00; BETWEEN 09-MAR-2025:18:00:00 AND 11-MAR-2025:00:00:00; BETWEEN 11-MAR-2025:12:00:00 AND 12-MAR-2025:16:00:00; BETWEEN 13-MAR-2025:18:00:00 AND 14-MAR-2025:18:00:00; BETWEEN 15-MAR-2025:11:00:00 AND 16-MAR-2025:18:00:00; BETWEEN 18-MAR-2025:00:00:00 AND 18-MAR-2025:18:00:00; BETWEEN 19-MAR-2025:00:00:00 AND 20-MAR-2025:00:00:00; BETWEEN 21-MAR-2025:00:00:00 AND 22-MAR-2025:00:00:00; BETWEEN 22-MAR-2025:20:00:00 AND 26-MAR-2025:00:00:00; BETWEEN 26-MAR-2025:14:00:00 AND 28-MAR-2025:04:00:00; BETWEEN 29-MAR-2025:06:00:00 AND 30-MAR-2025:04:00:00; BETWEEN 30-MAR-2025:09:00:00 AND 31-MAR-2025:00:00:00; BETWEEN 31-MAR-2025:16:00:00 AND 03-APR-2025:16:00:00; BETWEEN 05-APR-2025:00:00:00 AND 08-APR-2025:16:00:00; BETWEEN 10-APR-2025:00:00:00 AND 17-APR-2025:16:00:00; BETWEEN 18-APR-2025:00:00:00 AND 21-APR-2025:04:00:00; BETWEEN 22-APR-2025:00:00:00 AND 23-APR-2025:18:00:00; BETWEEN 24-APR-2025:06:00:00 AND 25-APR-2025:18:00:00; BETWEEN 26-APR-2025:00:00:00 AND 26-APR-2025:12:00:00; BETWEEN 27-APR-2025:12:00:00 AND 01-MAY-2025:00:00:00; Period 12.431 D AND ZERO-PHASE HJD2460281.5; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET Comments: The fourth visit to image Quaoar. Taken at particular orbital phase. Betweens represent times when nearby bright objects are too close to Quaoar for good imaging.									
Diagnostics	(Quaoar (4/5) (04)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.									
Patterns	#	Primary Pattern			Secondary Pattern		Exposures			
	(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Coordinate Frame=POS-TARG Pattern Orientation=23.884 Purpose=DITHER Angle Between Sides=81.785 Number Of Points=4 Center Pattern=false Point Spacing=0.173 Line Spacing=0.112					(1), (2)			
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
	(1)	QUAOAR	TYPE=ASTEROID,A=43.3562106259 2979,E=0.03993647193741599,I=7.99 12917217563 ,O=189.0992394650243,W=158.60707 23684032,M=293.8106399929501,EQ UINOX=J2000,EPOCH=25-MAY-2023:00:00:00,EpochTimeScale=TDB				EARTH			
Comments: Description=The dwarf planet Quaoar										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	PHASE 0.56 TO 0.7	Sequence 1-2 Non-Int in Quaoar (4/5) (04)	220 Secs (880 Secs)	[1]
								Pattern 1, Exps 1-1 in Sequence 1-2 Non-Int in Quaoar (4/5) (04) (1)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	
	2		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	PHASE 0.56 TO 0.7	Sequence 1-2 Non-Int in Quaoar (4/5) (04)	220 Secs (880 Secs)	
							Pattern 1, Exps 2-2 in Sequence 1-2 Non-Int in Quaoar (4/5) (04) (1)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]	

Proposal 17417 - Quaoar (5/5) (05) - Exploring the Dynamics of Quaoar's Rings

Visit	Proposal 17417, Quaoar (5/5) (05), implementation					Fri Aug 16 17:00:19 GMT 2024				
	Diagnostic Status: Informational									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 15-FEB-2025:00:00:00 AND 16-FEB-2025:00:00:00; BETWEEN 16-FEB-2025:12:00:00 AND 17-FEB-2025:06:00:00; BETWEEN 17-FEB-2025:18:00:00 AND 19-FEB-2025:06:00:00; BETWEEN 19-FEB-2025:09:00:00 AND 21-FEB-2025:18:00:00; BETWEEN 22-FEB-2025:00:00:00 AND 22-FEB-2025:22:00:00; BETWEEN 23-FEB-2025:09:00:00 AND 24-FEB-2025:18:00:00; BETWEEN 25-FEB-2025:06:00:00 AND 26-FEB-2025:17:00:00; BETWEEN 26-FEB-2025:23:00:00 AND 27-FEB-2025:03:00:00; BETWEEN 27-FEB-2025:08:00:00 AND 27-FEB-2025:15:00:00; BETWEEN 28-FEB-2025:09:00:00 AND 28-FEB-2025:16:00:00; BETWEEN 01-MAR-2025:04:00:00 AND 02-MAR-2025:02:00:00; BETWEEN 02-MAR-2025:20:00:00 AND 05-MAR-2025:20:00:00; BETWEEN 07-MAR-2025:02:00:00 AND 07-MAR-2025:05:00:00; BETWEEN 07-MAR-2025:12:00:00 AND 07-MAR-2025:22:00:00; BETWEEN 08-MAR-2025:06:00:00 AND 08-MAR-2025:14:00:00; BETWEEN 09-MAR-2025:18:00:00 AND 11-MAR-2025:00:00:00; BETWEEN 11-MAR-2025:12:00:00 AND 12-MAR-2025:16:00:00; BETWEEN 13-MAR-2025:18:00:00 AND 14-MAR-2025:18:00:00; BETWEEN 15-MAR-2025:11:00:00 AND 16-MAR-2025:18:00:00; BETWEEN 18-MAR-2025:00:00:00 AND 18-MAR-2025:18:00:00; BETWEEN 19-MAR-2025:00:00:00 AND 20-MAR-2025:00:00:00; BETWEEN 21-MAR-2025:00:00:00 AND 22-MAR-2025:00:00:00; BETWEEN 22-MAR-2025:20:00:00 AND 26-MAR-2025:00:00:00; BETWEEN 26-MAR-2025:14:00:00 AND 28-MAR-2025:04:00:00; BETWEEN 29-MAR-2025:06:00:00 AND 30-MAR-2025:04:00:00; BETWEEN 30-MAR-2025:09:00:00 AND 31-MAR-2025:00:00:00; BETWEEN 31-MAR-2025:16:00:00 AND 03-APR-2025:16:00:00; BETWEEN 05-APR-2025:00:00:00 AND 08-APR-2025:16:00:00; BETWEEN 10-APR-2025:00:00:00 AND 17-APR-2025:16:00:00; BETWEEN 18-APR-2025:00:00:00 AND 21-APR-2025:04:00:00; BETWEEN 22-APR-2025:00:00:00 AND 23-APR-2025:18:00:00; BETWEEN 24-APR-2025:06:00:00 AND 25-APR-2025:18:00:00; BETWEEN 26-APR-2025:00:00:00 AND 26-APR-2025:12:00:00; BETWEEN 27-APR-2025:12:00:00 AND 01-MAY-2025:00:00:00; Period 12.431 D AND ZERO-PHASE HJD2460281.5; VISIBILITY INTERVAL NO GYRO BIAS UPDATE ON MOVING TARGET									
Comments: The fifth visit to image Quaoar. Taken at particular orbital phase. Betweens represent times when nearby bright objects are too close to Quaoar for good imaging.										
Diagnostics	(Quaoar (5/5) (05)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.									
Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
	(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Coordinate Frame=POS-TARG Pattern Orientation=23.884 Purpose=DITHER Angle Between Sides=81.785 Number Of Points=4 Center Pattern=false Point Spacing=0.173 Line Spacing=0.112							(1), (2)	
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center			
	(1)	QUAOAR	TYPE=ASTEROID,A=43.3562106259 2979,E=0.03993647193741599,I=7.99 12917217563 ,O=189.0992394650243,W=158.60707 23684032,M=293.8106399929501,EQ UINOX=J2000,EPOCH=25-MAY-2023:00:00:00,EpochTimeScale=TDB					EARTH		
Comments: Description=The dwarf planet Quaoar										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	PHASE 0.8 TO 0.94	Sequence 1-2 Non-Int in Quaoar (5/5) (05)	220 Secs (880 Secs)	[1]
								Pattern 1, Exps 1-1 in Sequence 1-2 Non-Int in Quaoar (5/5) (05) (1)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	
	2		(1) QUAOAR	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F350LP	CR-SPLIT=NO	PHASE 0.8 TO 0.94	Sequence 1-2 Non-Int in Quaoar (5/5) (05)	220 Secs (880 Secs)	
							Pattern 1, Exps 2-2 in Sequence 1-2 Non-Int in Quaoar (5/5) (05) (1)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]		
										[1]

