



18426 - Enabling New Horizons Observations of Distant Scattered Disk Objects

Cycle: 34, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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Dr. Anne J. Verbiscer (CoI)	The University of Virginia
Dr. Susan D. Benecchi (CoI)	Planetary Science Institute
Dr. J. J. Kavelaars (CoI) (CSA Member)	National Research Council of Canada
Dr. Alan Stern (CoI)	Southwest Research Institute

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) NHKBO1	WFC3/UVIS	1	18-Aug-2026 15:01:08.0	yes
02	(1) NHKBO1	WFC3/UVIS	1	18-Aug-2026 15:01:08.0	yes
03	(2) NHKBO2	WFC3/UVIS	1	18-Aug-2026 15:01:08.0	yes
04	(2) NHKBO2	WFC3/UVIS	1	18-Aug-2026 15:01:09.0	yes
05	(3) NHKBO3	WFC3/UVIS	1	18-Aug-2026 15:01:09.0	yes
06	(3) NHKBO3	WFC3/UVIS	1	18-Aug-2026 15:01:09.0	yes

6 Total Orbits Used

ABSTRACT

Proposal 18426 (STScI Edit Number: 0, Created: Tuesday, August 18, 2026, 2:01:10PM Eastern Standard Time) - Overview

This program would observe up to three Target of Opportunity Scattered Disk Objects (SDOs) discovered in 2025 observations by the Vera C. Rubin Observatory (Rubin) in order to enable them to be observed up close by the New Horizons spacecraft. The Scattered Disk occupies a vast area of solar system beyond 55 AU, and the New Horizons spacecraft is the only facility now or in the foreseeable future that observe SDOs at distances less than 1 AU and phase angles up to 120 degrees (SDOs can only be seen at <2 degrees phase from Earth). These high-phase observations of SDOs would enable studies of their shapes and surfaces, critical for understanding both their origin in the Giant Planet zone and how SDOs presently evolve to become comets. The 2025 Rubin observations are presently being analyzed for any objects that may be observable by New Horizons. The ground based astrometry from Rubin and follow up from Subaru is sufficient to tell if an SDO is possibly observable from New Horizons, but not sufficient to actually enable those observations. The proposed HST observations would provide sufficient quality astrometry to enable the New Horizons observations of these SDOs without further follow up. Adding to the urgency, New Horizons is moving rapidly out of the solar system, and every year these SDO observations become harder to perform.

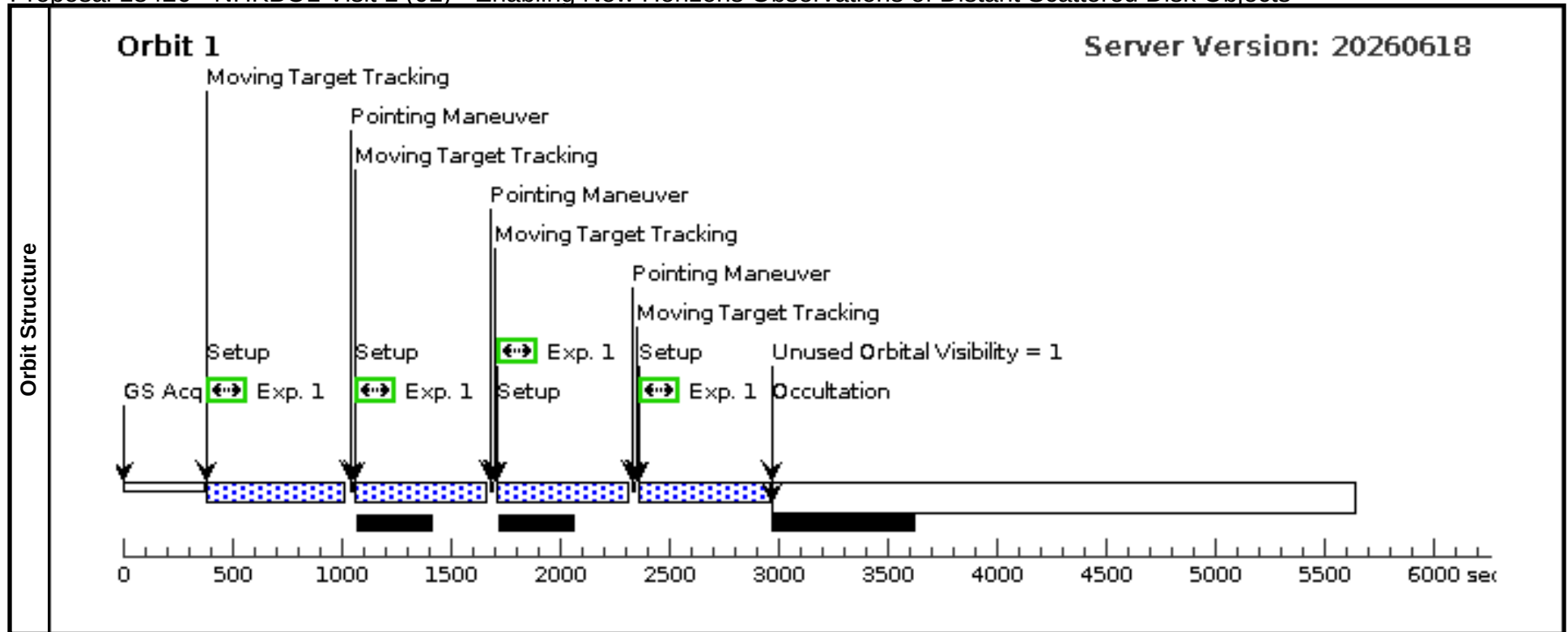
OBSERVING DESCRIPTION

The purpose of this proposal is to observe up to three Kuiper Belt Objects (KBOs) to obtain astrometry to improve their orbit enough that can be observed by New Horizons in 2027-2030. Those targets are not currently known, but will be defined by the end of the calendar year 2026.

Nominally, two orbits are allocated per target, for a max of three targets. Any targets would be roughly in the same area of the sky (within a degree or so) as the one already confirmed 2027 New Horizons target, 2020 KV11, and so we used the orbit of that KBO as nominal placeholder for planning purposes. We would update the Phase II with the correct orbits (by entering the orbital elements directly) before triggering the TOO. The nominal plan has the objects separated by 30 days, though there could be some flexibility in that timing (depending on the sky motion of the KBO) if required for schedulability. All the visits are the same, using a 4-point box dither with the full frame WFC3/UVIS and the F350LP broadband filter. We need a few Gaia DR3 stars in the field for absolute astrometry, but the expected star density is high enough that this is unlikely be a problem.

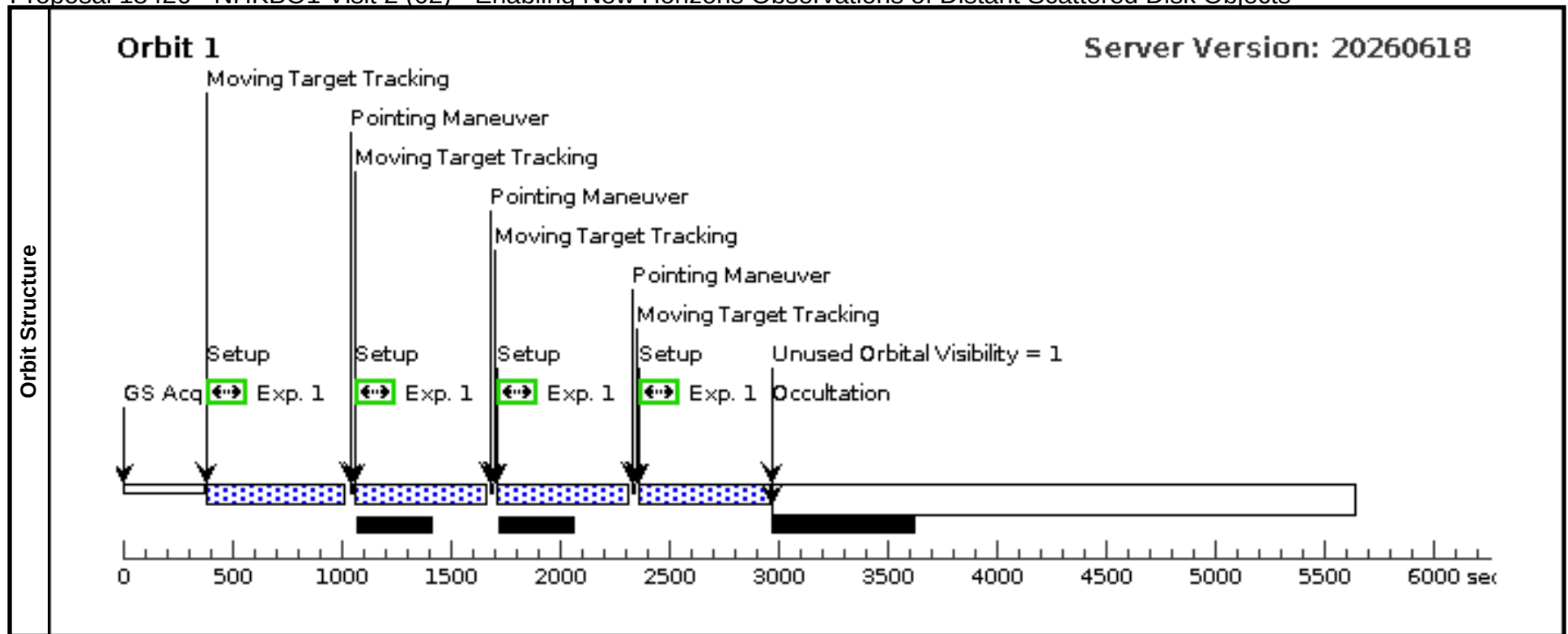
Proposal 18426 - NHKBO1 Visit 1 (01) - Enabling New Horizons Observations of Distant Scattered Disk Objects

Visit	Proposal 18426, NHKBO1 Visit 1 (01)										Tue Aug 18 19:01:10 GMT 2026	
	Diagnostic Status: Informational											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: TOO MIN RESPONSE TIME 30.0D; TOO MAX RESPONSE TIME 180.0D											
Diagnostics	(NHKBO1 Visit 1 (01)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=BOX Purpose=OTHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112 Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false									(1)	
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(1)	NHKBO1	TYPE=ASTEROID,A=100.783874222 854,E=0.099773153155,I=3.31457202 2986,O=166.914905426798,W=331.17 6766747966,M=141.121051314833,E QUINOX=J2000,EPOCH=29-MAY-2020:11:22:33,EpochTimeScale=UTC				EARTH					
	Comments: Description=New Horizons KBO 1											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(1) NHKBO1	WFC3/UVIS, ACCUM, UVIS2	F350LP			Sequence 1-1 Non-Int in NHKBO1 Visit 1 (01) Pattern 1, Exps 1-1 in Sequence 1-1 Non-Int in NHKBO1 Visit 1 (01) (1)	400 Secs (1940 Secs) [>=>485.0 Secs (Pattern 1)] [>=>485.0 Secs (Pattern 2)] [>=>485.0 Secs (Pattern 3)] [>=>485.0 Secs (Pattern 4)]		[1]	



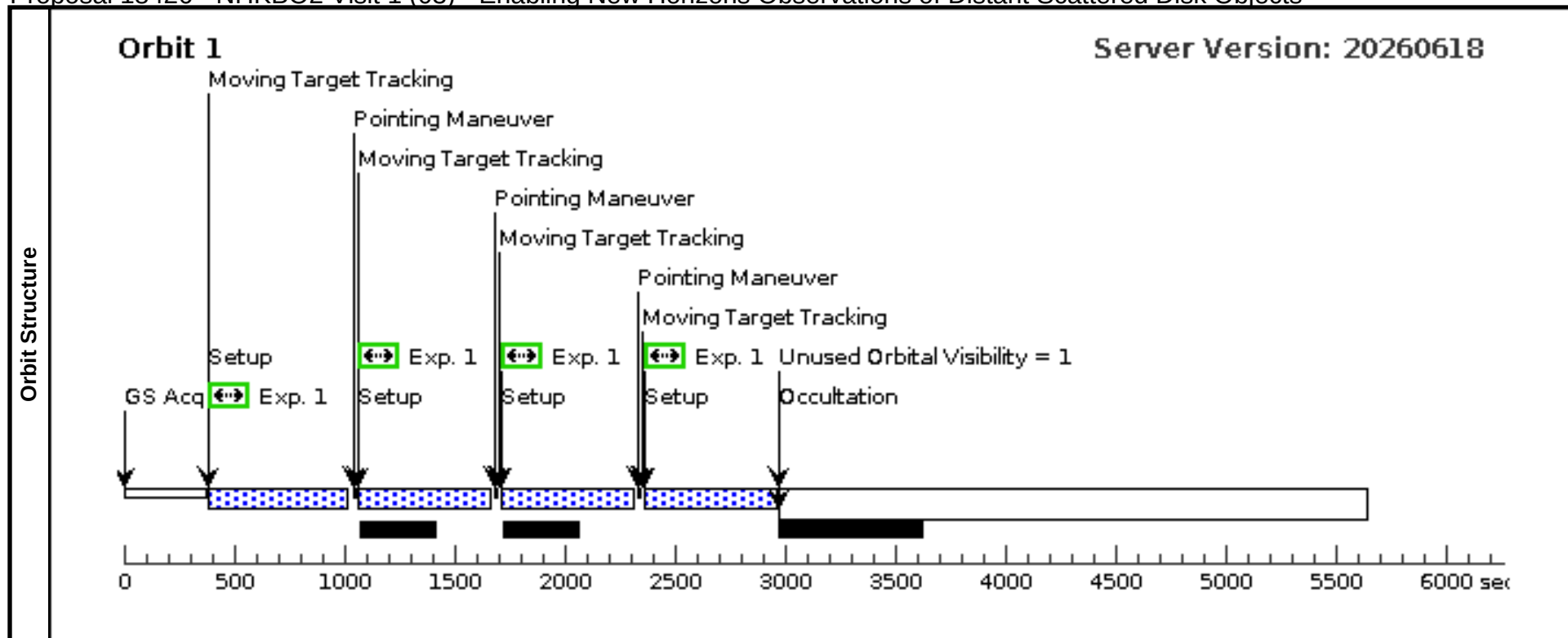
Proposal 18426 - NHKBO1 Visit 2 (02) - Enabling New Horizons Observations of Distant Scattered Disk Objects

Visit	Proposal 18426, NHKBO1 Visit 2 (02)										Tue Aug 18 19:01:10 GMT 2026	
	Diagnostic Status: Informational											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: AFTER 01 BY 30 D TO 1000 D; TOO MIN RESPONSE TIME 30.0D; TOO MAX RESPONSE TIME 180.0D											
Diagnostics	(NHKBO1 Visit 2 (02)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=BOX Purpose=OTHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112			Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false						(1)	
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(1)	NHKBO1	TYPE=ASTEROID,A=100.783874222 854,E=0.099773153155,I=3.31457202 2986,O=166.914905426798,W=331.17 6766747966,M=141.121051314833,E QUINOX=J2000,EPOCH=29-MAY-2020:11:22:33,EpochTimeScale=UTC				EARTH					
	Comments: Description=New Horizons KBO 1											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(1) NHKBO1	WFC3/UVIS, ACCUM, UVIS2	F350LP			Sequence 1-1 Non-Int in NHKBO1 Visit 2 (02)	400 Secs (1940 Secs)			
								Pattern 1, Exps 1-1 in Sequence 1-1 Non-Int in NHKBO1 Visit 2 (02) (1)	[>=>485.0 Secs (Pattern 1)] [>=>485.0 Secs (Pattern 2)] [>=>485.0 Secs (Pattern 3)] [>=>485.0 Secs (Pattern 4)]		[1]	



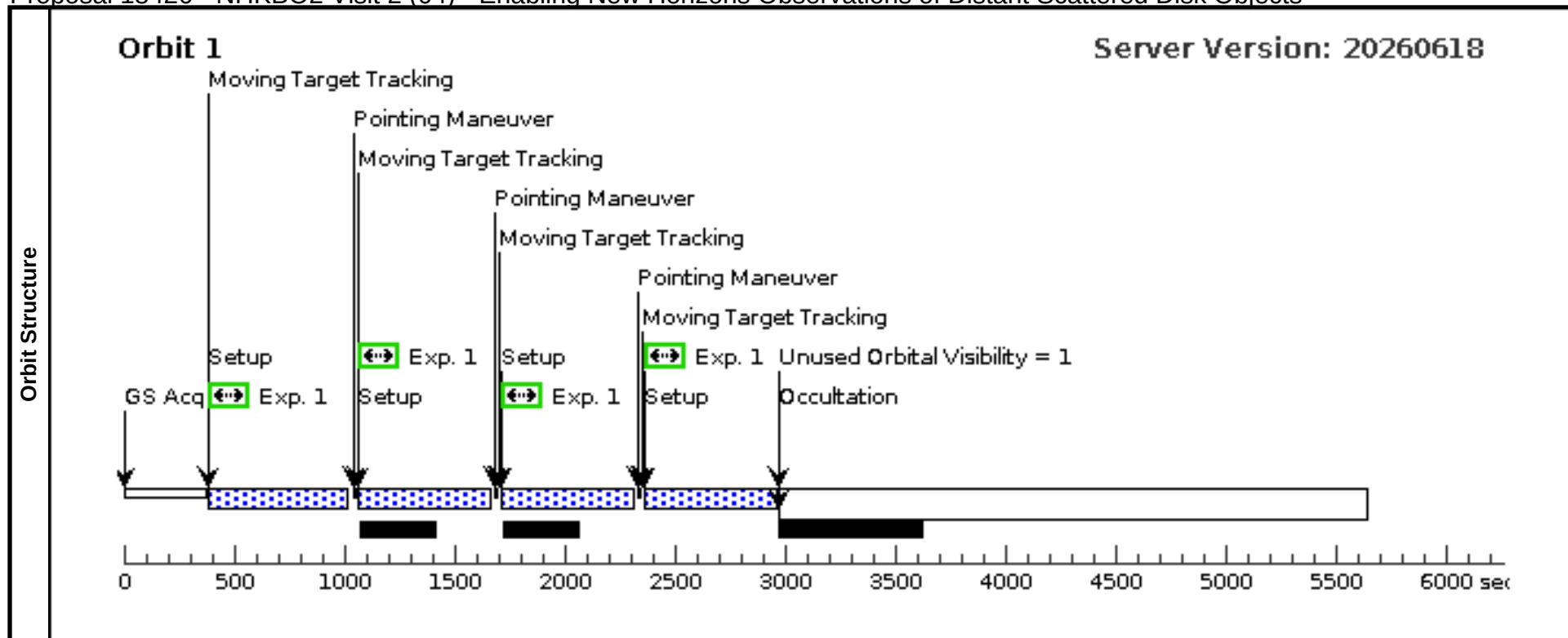
Proposal 18426 - NHKBO2 Visit 1 (03) - Enabling New Horizons Observations of Distant Scattered Disk Objects

Visit	Proposal 18426, NHKBO2 Visit 1 (03)										Tue Aug 18 19:01:10 GMT 2026	
	Diagnostic Status: Informational											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: TOO MIN RESPONSE TIME 30.0D; TOO MAX RESPONSE TIME 180.0D											
Diagnostics	(NHKBO2 Visit 1 (03)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=BOX Purpose=OTHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112			Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false						(1)	
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(2)	NHKBO2	TYPE=ASTEROID,A=100.783874222 854,E=0.099773153155,I=3.31457202 2986,O=166.914905426798,W=331.17 6766747966,M=141.121051314833,E QUINOX=J2000,EPOCH=29-MAY-2020:11:22:33,EpochTimeScale=UTC				EARTH					
	Comments: Description=New Horizons KBO 2											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(2) NHKBO2	WFC3/UVIS, ACCUM, UVIS2	F350LP			Sequence 1-1 Non-Int in NHKBO2 Visit 1 (03) Pattern 1, Exps 1-1 in Sequence 1-1 Non-Int in NHKBO2 Visit 1 (03) (1)	400 Secs (1940 Secs) [>=>485.0 Secs (Pattern 1)] [>=>485.0 Secs (Pattern 2)] [>=>485.0 Secs (Pattern 3)] [>=>485.0 Secs (Pattern 4)]		[1]	



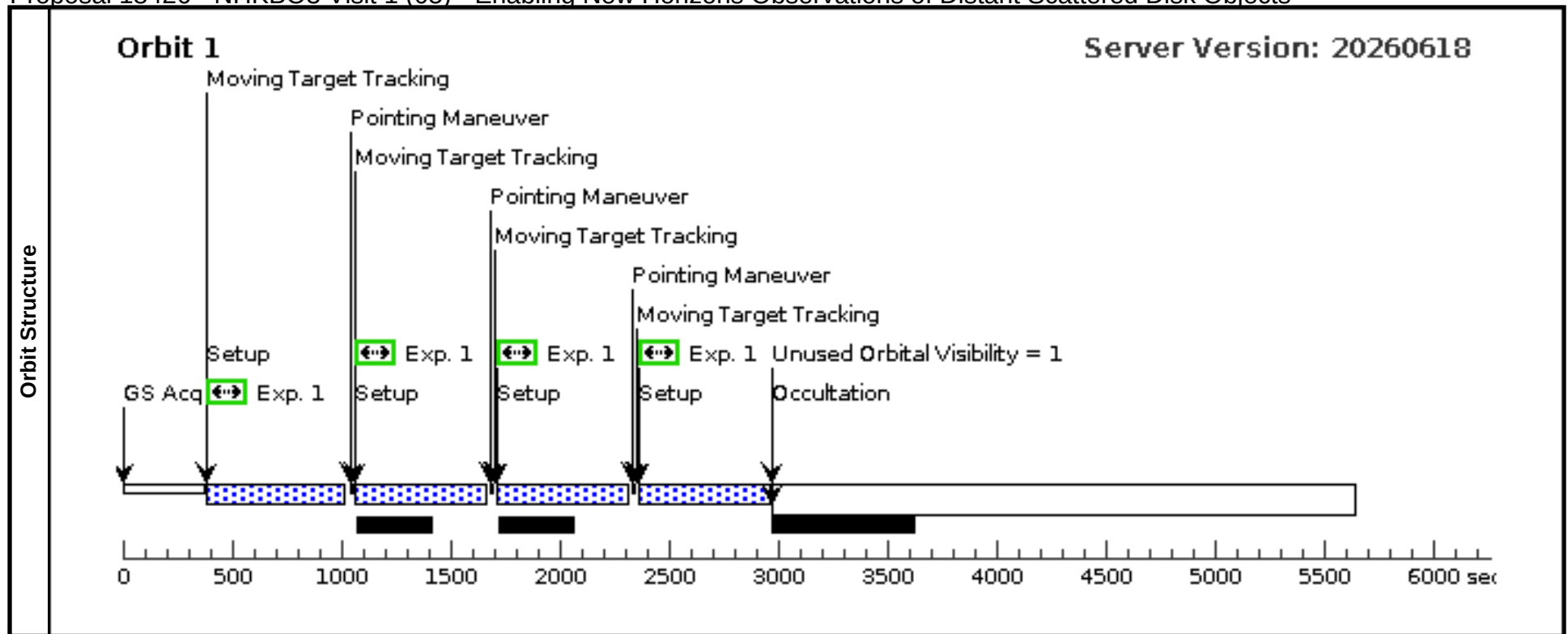
Proposal 18426 - NHKBO2 Visit 2 (04) - Enabling New Horizons Observations of Distant Scattered Disk Objects

Visit	Proposal 18426, NHKBO2 Visit 2 (04)										Tue Aug 18 19:01:10 GMT 2026		
	Diagnostic Status: Informational												
	Scientific Instruments: WFC3/UVIS												
	Special Requirements: AFTER 03 BY 30 D TO 1000 D; TOO MIN RESPONSE TIME 30.0D; TOO MAX RESPONSE TIME 180.0D												
Diagnostics	(NHKBO2 Visit 2 (04)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.												
Patterns	#	Primary Pattern				Secondary Pattern				Exposures			
	(1)	Pattern Type=BOX Purpose=OTHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112		Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false						(1)			
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center						
	(2)	NHKBO2	TYPE=ASTEROID,A=100.783874222 854,E=0.099773153155,I=3.31457202 2986,O=166.914905426798,W=331.17 6766747966,M=141.121051314833,E QUINOX=J2000,EPOCH=29-MAY- 2020:11:22:33,EpochTimeScale=UTC					EARTH					
	Comments: Description=New Horizons KBO 2												
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit		
	1		(2) NHKBO2	WFC3/UVIS, ACCUM, UVIS2	F350LP			Sequence 1-1 Non-Int in NHKBO2 Visit 2 (04) Pattern 1, Exps 1-1 in Sequence 1-1 Non-Int in NHKBO2 Visit 2 (04) (1)	400 Secs (1940 Secs) [>=>485.0 Secs (Pattern 1)] [>=>485.0 Secs (Pattern 2)] [>=>485.0 Secs (Pattern 3)] [>=>485.0 Secs (Pattern 4)]		[1]		



Proposal 18426 - NHKBO3 Visit 1 (05) - Enabling New Horizons Observations of Distant Scattered Disk Objects

Visit	Proposal 18426, NHKBO3 Visit 1 (05)										Tue Aug 18 19:01:10 GMT 2026	
	Diagnostic Status: Informational											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: TOO MIN RESPONSE TIME 30.0D; TOO MAX RESPONSE TIME 180.0D											
Diagnostics	(NHKBO3 Visit 1 (05)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=BOX Purpose=OTHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112 Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false									(1)	
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(3)	NHKBO3	TYPE=ASTEROID,A=100.783874222 854,E=0.099773153155,I=3.31457202 2986,O=166.914905426798,W=331.17 6766747966,M=141.121051314833,E QUINOX=J2000,EPOCH=29-MAY- 2020:11:22:33,EpochTimeScale=UTC				EARTH					
	Comments: Description=New Horizons KBO 3											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(3) NHKBO3	WFC3/UVIS, ACCUM, UVIS2	F350LP			Sequence 1-1 Non-Int in NHKBO3 Visit 1 (05) Pattern 1, Exps 1-1 in Sequence 1-1 Non-Int in NHKBO3 Visit 1 (05) (1)	400 Secs (1940 Secs) [>=>485.0 Secs (Pattern 1)] [>=>485.0 Secs (Pattern 2)] [>=>485.0 Secs (Pattern 3)] [>=>485.0 Secs (Pattern 4)]		[1]	



Proposal 18426 - NHKBO3 Visit 2 (06) - Enabling New Horizons Observations of Distant Scattered Disk Objects

Visit	Proposal 18426, NHKBO3 Visit 2 (06)										Tue Aug 18 19:01:10 GMT 2026	
	Diagnostic Status: Informational											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: AFTER 05 BY 30 D TO 1000 D; TOO MIN RESPONSE TIME 30.0D; TOO MAX RESPONSE TIME 180.0D											
Diagnostics	(NHKBO3 Visit 2 (06)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=BOX Purpose=OTHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112			Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false						(1)	
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(3)	NHKBO3	TYPE=ASTEROID,A=100.783874222 854,E=0.099773153155,I=3.31457202 2986,O=166.914905426798,W=331.17 6766747966,M=141.121051314833,E QUINOX=J2000,EPOCH=29-MAY-2020:11:22:33,EpochTimeScale=UTC				EARTH					
	Comments: Description=New Horizons KBO 3											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(3) NHKBO3	WFC3/UVIS, ACCUM, UVIS2	F350LP			Sequence 1-1 Non-Int in NHKBO3 Visit 2 (06) Pattern 1, Exps 1-1 in Sequence 1-1 Non-Int in NHKBO3 Visit 2 (06) (1)	400 Secs (1940 Secs) [>=>485.0 Secs (Pattern 1)] [>=>485.0 Secs (Pattern 2)] [>=>485.0 Secs (Pattern 3)] [>=>485.0 Secs (Pattern 4)]		[1]	

