



13663 - Precise Orbit Determination for a New Horizons KBO

Cycle: 22, 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>
01	(1) KBO-G1	WFC3/UVIS	1	06-Oct-2014 21:00:44.0	yes
02	(1) KBO-G1	WFC3/UVIS	1	06-Oct-2014 21:00:46.0	yes
03	(1) KBO-G1	WFC3/UVIS	1	06-Oct-2014 21:00:47.0	yes
04	(1) KBO-G1	WFC3/UVIS	1	06-Oct-2014 21:00:48.0	yes

4 Total Orbits Used

ABSTRACT

The New Horizons (NH) spacecraft will flyby the Pluto system next summer, after this the spacecraft will be retargeted to one or more Kuiper Belt Objects (KBOs) to learn about the remnant material from our outer solar system's formation. We are actively carrying out dedicated ground-based observations to identify a target for NH to flyby and continue to improve our analysis algorithms. To date, we have 52 discoveries including five

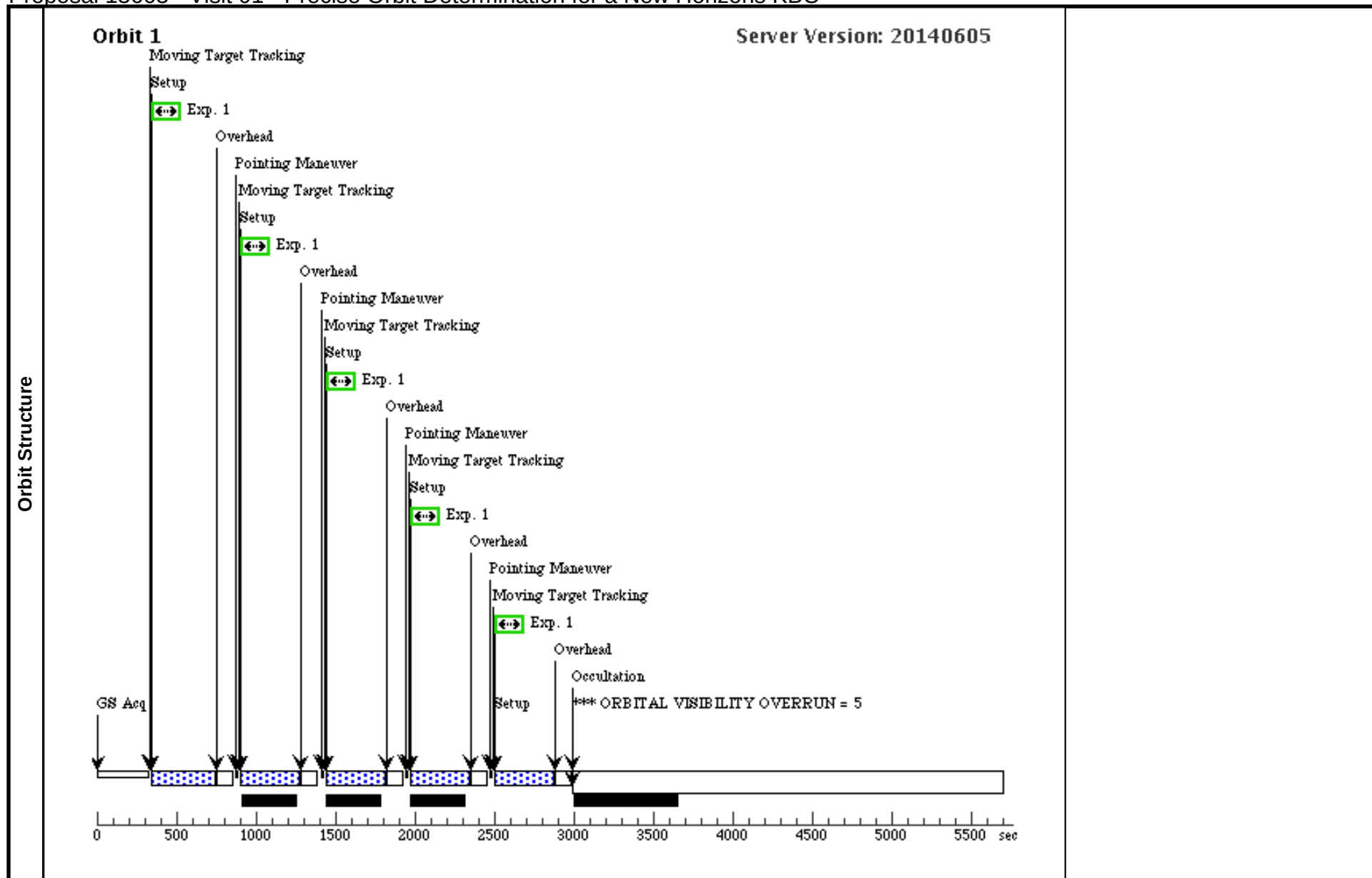
objects that are long-range reconnaissance candidates, and two that current orbit predictions require about a factor of 2 more propellant than is available for the encounter maneuver. Our searches are continuing in to 2014 and we anticipate as many as 2 objects that will require high precision HST imaging. Unfortunately, NH's trajectory line of sight is within the galactic center (Sagittarius) making stellar confusion a major problem in recovering these objects from the ground to obtain precise astrometry and high precision orbits. HST's sensitivity, resolution and PSF stability are crucial components for the success of the NH Kuiper belt mission component. We are requesting 4 TOO orbits to be triggered when a candidate object is found within the targetable region. These observations will provide the required high precision astrometry required for targeting, will evaluate if the NH candidate is binary (~30%) and will make a preliminary color determination to assist in long or short range encounter planning.

OBSERVING DESCRIPTION

We obtain 5-370 second exposures in the F350LP filter using a line dither pattern to obtain astrometric measurements for a faint NH candidate object. The orbits are scheduled in pairs so that images can be co-added to meet the depth requirement and the pairs separated by days to meet the orbit extension requirements to determine targetability. Colors as described in the abstract have been set aside because the astrometric need is greater and the object is fainter than originally expected.

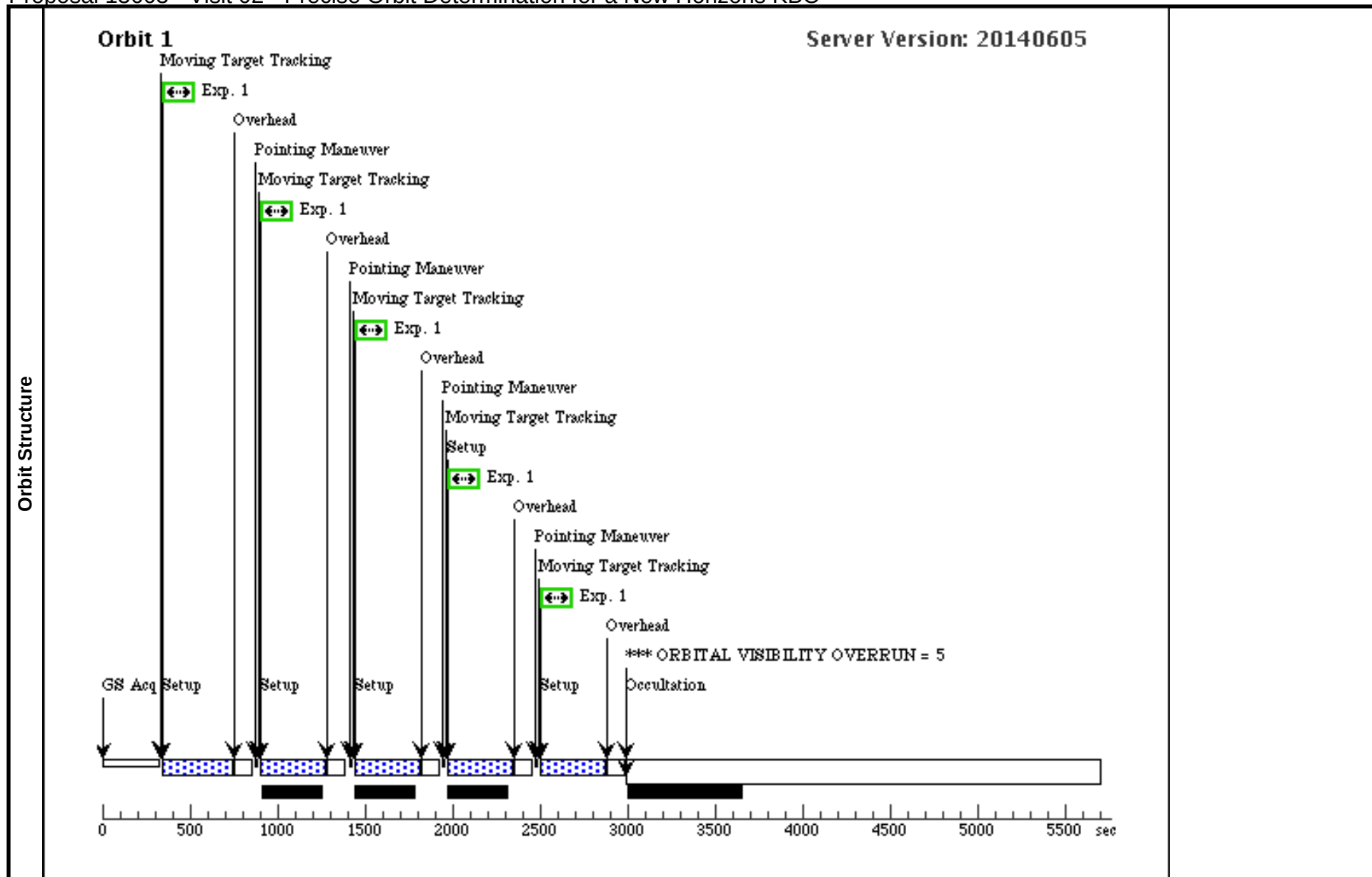
Proposal 13663 - Visit 01 - Precise Orbit Determination for a New Horizons KBO

Visit	Proposal 13663, Visit 01, implementation										Tue Oct 07 01:00:50 GMT 2014	
	Diagnostic Status: Warning											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: SCHED 100%; BETWEEN 15-OCT-2014:00:00:00 AND 18-OCT-2014:00:00:00											
Diagnostics	(Visit 01) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=LINE Purpose=OTHER Number Of Points=5 Point Spacing=0.75 Line Spacing=					Coordinate Frame=CELESTIAL Pattern Orientation=0 Angle Between Sides= Center Pattern=true					(1)
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(1)	KBO-G1	TYPE=ASTEROID,A=46.4056089219 01,E=0.26388505198582,I=4.1466231 993107,O=136.00700117810,W=49.42 6808689232,M=64.734133299721,EQ UINOX=J2000,EPOCH=20-AUG- 2014:00:00:00,EpochTimeScale=UTC				EARTH					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(1) KBO-G1	WFC3/UVIS, ACCUM, UVIS2	F350LP			Pattern 1, Exps 1-1 i n Visit 01 (1)	370.0 Secs (1850 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)] [==>(Pattern 5)]		[1]	



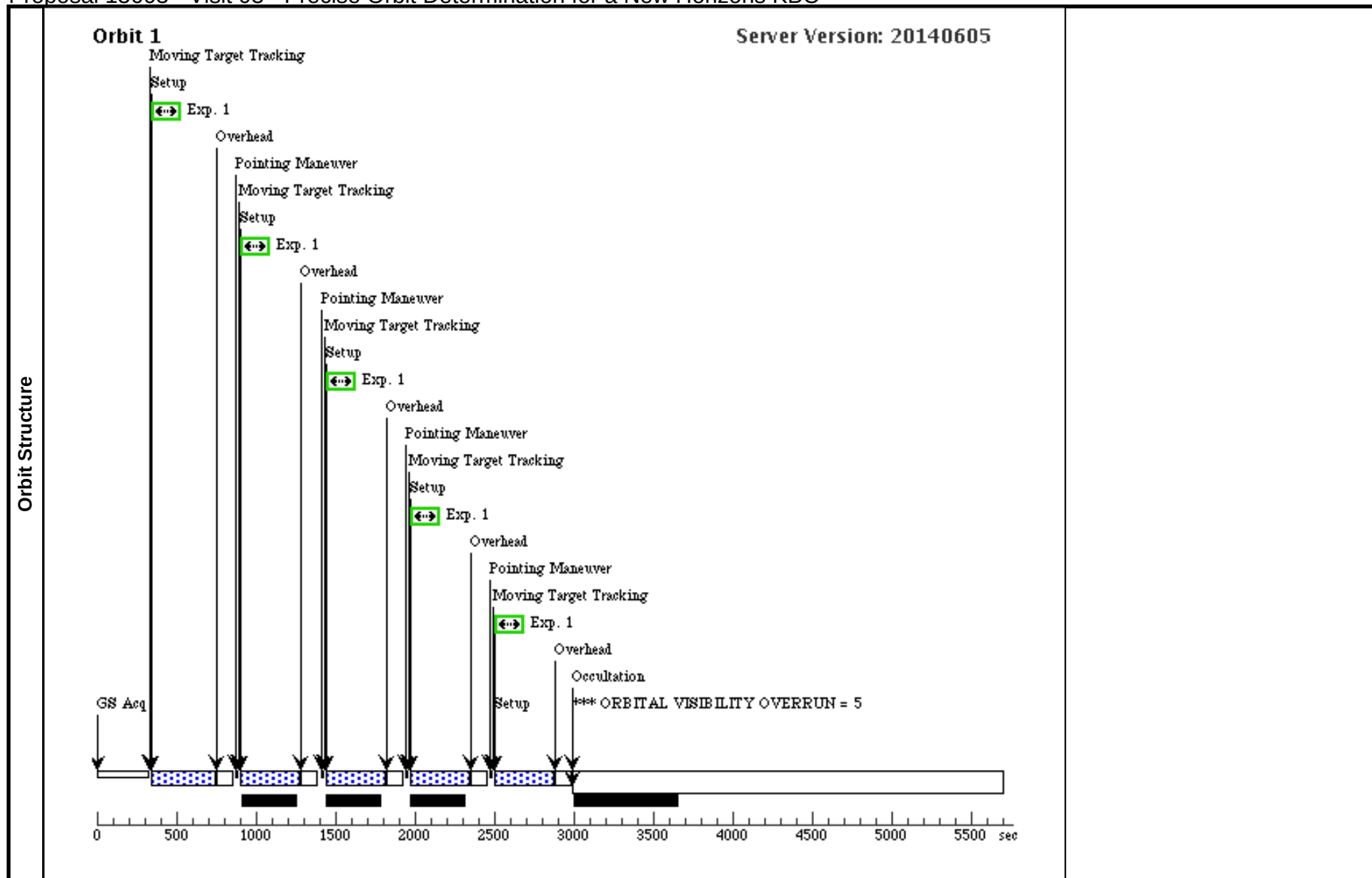
Proposal 13663 - Visit 02 - Precise Orbit Determination for a New Horizons KBO

Visit	Proposal 13663, Visit 02, implementation										Tue Oct 07 01:00:50 GMT 2014	
	Diagnostic Status: Warning											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: SCHED 100%; AFTER 01 BY 0.9 Orbits TO 1.3 Orbits; SEQ 01,02 WITHIN 1.1 Orbits											
Diagnostics	(Visit 02) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=LINE Purpose=OTHER Number Of Points=5 Point Spacing=0.75 Line Spacing=					Coordinate Frame=CELESTIAL Pattern Orientation=0 Angle Between Sides= Center Pattern=true					(1)
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(1)	KBO-G1	TYPE=ASTEROID,A=46.4056089219 01,E=0.26388505198582,I=4.1466231 993107,O=136.00700117810,W=49.42 6808689232,M=64.734133299721,EQ UINOX=J2000,EPOCH=20-AUG- 2014:00:00:00,EpochTimeScale=UTC				EARTH					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(1) KBO-G1	WFC3/UVIS, ACCUM, UVIS2	F350LP			Pattern 1, Exps 1-1 in Visit 02 (1)	370.0 Secs (1850 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)] [==>(Pattern 5)]		[1]	



Proposal 13663 - Visit 03 - Precise Orbit Determination for a New Horizons KBO

Visit	Proposal 13663, Visit 03, implementation										Tue Oct 07 01:00:50 GMT 2014	
	Diagnostic Status: Warning											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: SCHED 100%; BETWEEN 22-OCT-2014:00:00:00 AND 25-OCT-2014:00:00:00											
Diagnostics	(Visit 03) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=LINE Purpose=OTHER Number Of Points=5 Point Spacing=0.75 Line Spacing=					Coordinate Frame=CELESTIAL Pattern Orientation=0 Angle Between Sides= Center Pattern=true					(1)
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(1)	KBO-G1	TYPE=ASTEROID,A=46.4056089219 01,E=0.26388505198582,I=4.1466231 993107,O=136.00700117810,W=49.42 6808689232,M=64.734133299721,EQ UINOX=J2000,EPOCH=20-AUG- 2014:00:00:00,EpochTimeScale=UTC									EARTH
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(1) KBO-G1	WFC3/UVIS, ACCUM, UVIS2	F350LP			Pattern 1, Exps 1-1 i n Visit 03 (1)	370.0 Secs (1850 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)] [==>(Pattern 5)]		[1]	



Proposal 13663 - Visit 04 - Precise Orbit Determination for a New Horizons KBO

Visit	Proposal 13663, Visit 04, implementation										Tue Oct 07 01:00:51 GMT 2014	
	Diagnostic Status: Warning											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: SCHED 100%; AFTER 03 BY 0.9 Orbits TO 1.3 Orbits; SEQ 03,04 WITHIN 1.1 Orbits											
Diagnostics	(Visit 04) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=LINE Purpose=OTHER Number Of Points=5 Point Spacing=0.75 Line Spacing=					Coordinate Frame=CELESTIAL Pattern Orientation=0 Angle Between Sides= Center Pattern=true					(1)
Solar System Targets	#	Name	Level 1	Level 2	Level 3	Window	Ephem Center					
	(1)	KBO-G1	TYPE=ASTEROID,A=46.4056089219 01,E=0.26388505198582,I=4.1466231 993107,O=136.00700117810,W=49.42 6808689232,M=64.734133299721,EQ UINOX=J2000,EPOCH=20-AUG- 2014:00:00:00,EpochTimeScale=UTC				EARTH					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(1) KBO-G1	WFC3/UVIS, ACCUM, UVIS2	F350LP			Pattern 1, Exps 1-1 i n Visit 04 (1)	370.0 Secs (1850 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)] [==>(Pattern 5)]		[1]	

