12535 - Orbital Refinement and Characterization of New Horizons KBO candidates

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(3) VNH0007	WFC3/UVIS	1	28-Aug-2012 21:01:04.0	yes
02	(3) VNH0007	WFC3/UVIS	1	28-Aug-2012 21:01:13.0	yes
11	(4) VNH0008	WFC3/UVIS	1	28-Aug-2012 21:01:19.0	yes
12	(4) VNH0008	WFC3/UVIS	1	28-Aug-2012 21:01:25.0	yes
21	(5) VNH0010	WFC3/UVIS	1	28-Aug-2012 21:01:31.0	yes
22	(5) VNH0010	WFC3/UVIS	1	28-Aug-2012 21:01:37.0	yes

6 Total Orbits Used

ABSTRACT

The New Horizons (NH) spacecraft is on its way to study the Pluto system during a flyby. After the Pluto encounter, it is planned that the spacecraft will be retargeted to one or more yet-to-be-discovered Kuiper Belt Objects (KBOs) to learn about small KBOs and the Kuiper Belt debris body population. We are actively carrying out dedicated ground-based observations in 2011 and 2012 using large class telescopes to discover a KBO target that will be within the trajectory cone of NH. Unfortunately, the NH trajectory's line of site is within the galactic plane (Sagittarius) making stellar confusion a major problem in detecting and tracking KBOs in this region. HST’s sensitivity, resolution and PSF stability are a significant advantage in these confusion-limited starfields. We are requesting TOO orbits for up to 3 KBOs (2 orbits per KBO) to be triggered in the event that a candidate object is found in the NH trajectory. Objects must be recovered at multiple epochs to determine if their orbits will continue to place the object within the NH trajectory in the future. The observations we propose will also determine if the candidate is binary (~30% probability per candidate) and make a preliminary color determination.

OBSERVING DESCRIPTION

We obtain 2-455 second exposures in the F606W filter using a manual dither pattern and 2-640 second exposures in the F814W filter to obtain a color measurement (0.1 magnitude uncertainty) on the NH KBO candidate. All the TOO orbits are planned to take the same set of exposures, the only difference is the actual target. This project imposes no orientation constraints and uses ordinary blind target acquisition. We tracking the object under FGS control, target motion rates are very slow, at most a few arcsec per hour.

Visit

Proposal 12535, Visit 01, implementation Wed Aug 29 01:01:45 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 2012.255 AND 2012.256; BETWEEN 2012.257 AND 2012.261; BETWEEN 2012.262 AND 2012.263; BETWEEN 2012.272 AND 2012.274

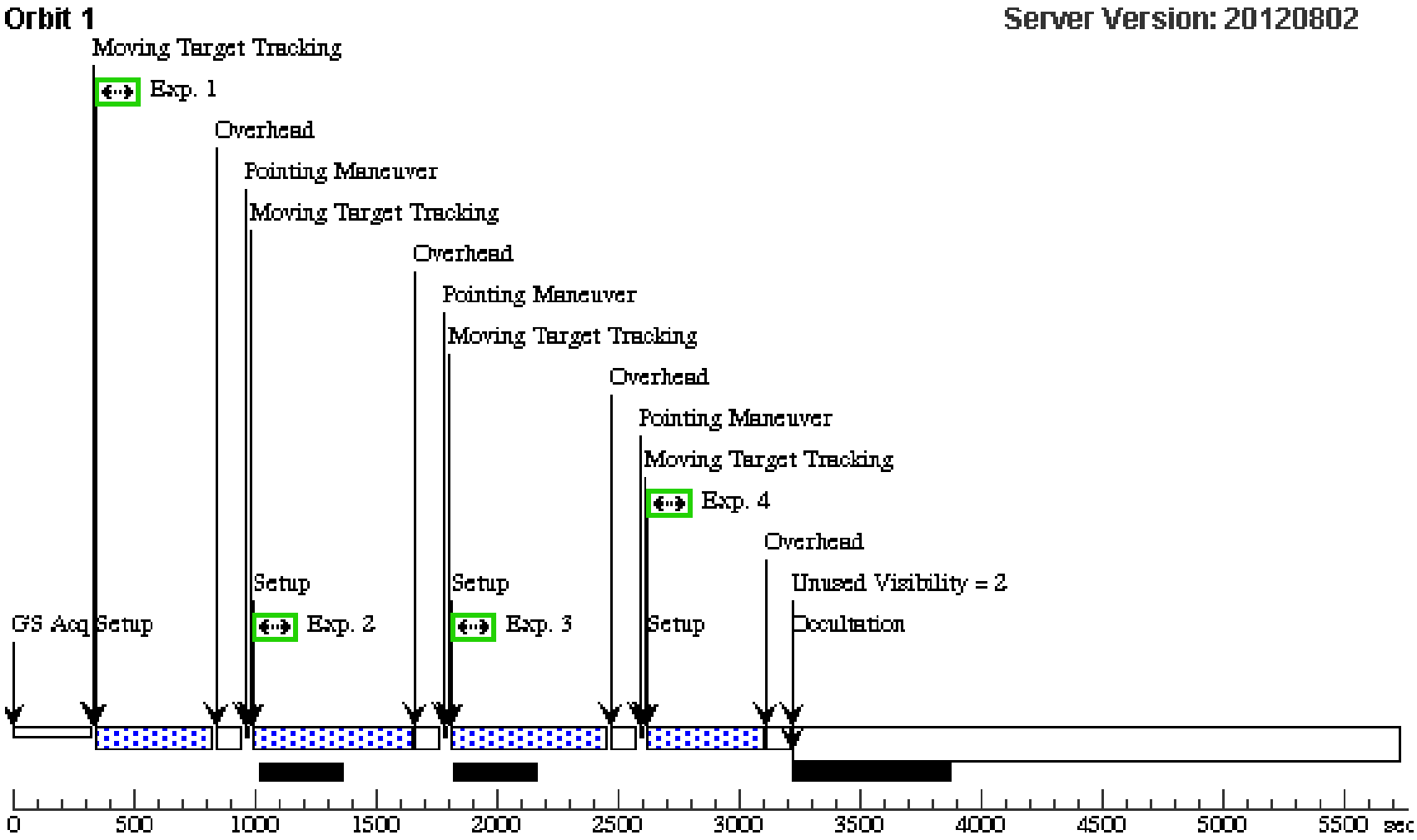
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(3)	VNH0007	TYPE=ASTEROID,A=45.92576064,E=0.13552798,I=1.87353,O=209.21519,W=136.94517,M=304.23985,EQUINOX=J2000,EPOCH=19-APR-2011:00:00:00,EpochTimeScale=UTC				EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(3) VNH0007	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0,0		455 Secs	
								[==>]	***[1]***
2		(3) VNH0007	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0.099,0.106		640 Secs	
								[==>]	***[1]***
3		(3) VNH0007	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0,0		640 Secs	
								[==>]	***[1]***
4		(3) VNH0007	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0.099,0.106		455 Secs	
								[==>]	***[1]***

Orbit Structure



Visit

Proposal 12535, Visit 02, implementation Wed Aug 29 01:01:47 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

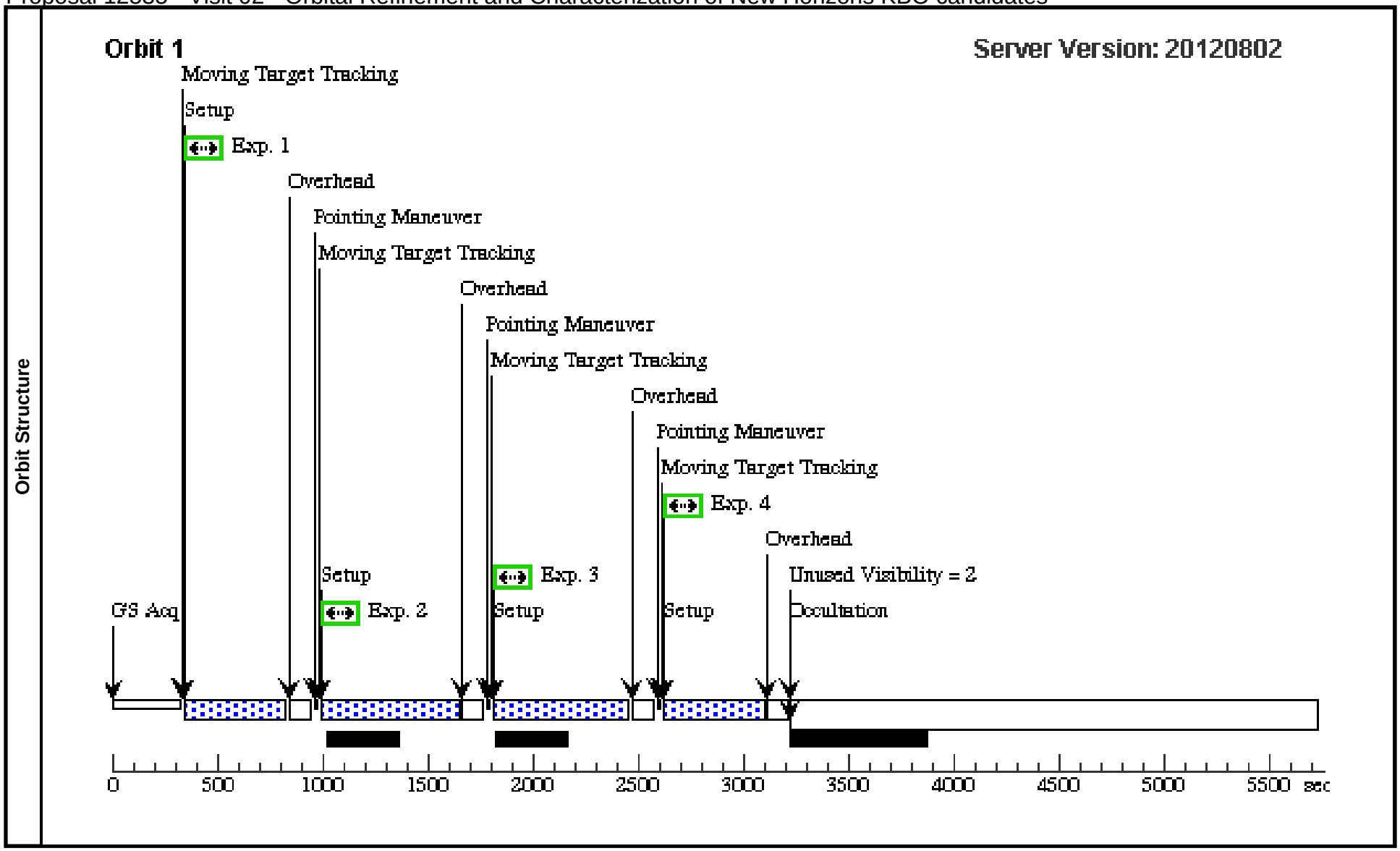
Special Requirements: BETWEEN 2012.255 AND 2012.256; BETWEEN 2012.257 AND 2012.261; BETWEEN 2012.262 AND 2012.263; BETWEEN 2012.272 AND 2012.274; SEQ 01,02 WITHIN 1 D

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(3)	VNH0007	TYPE=ASTEROID,A=45.92576064,E=0.13552798,I=1.87353,O=209.21519,W=136.94517,M=304.23985,EQUINOX=J2000,EPOCH=19-APR-2011:00:00:00,EpochTimeScale=UTC				EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(3) VNH0007	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0,0		455 Secs	
								[==>]	***[1]***
2		(3) VNH0007	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0.099,0.106		640 Secs	
								[==>]	***[1]***
3		(3) VNH0007	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0,0		640 Secs	
								[==>]	***[1]***
4		(3) VNH0007	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0.099,0.106		455 Secs	
								[==>]	***[1]***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Server Version: 20120802
Orbit Structure
Moving Target Tracking
Setup
Exp. 1
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Exp. 4
Overhead
Unused Visibility = 2
Occultation
Setup
Exp. 3
Setup
Setup
Exp. 2
GS Acq
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12535, Visit 11, implementation Wed Aug 29 01:01:50 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

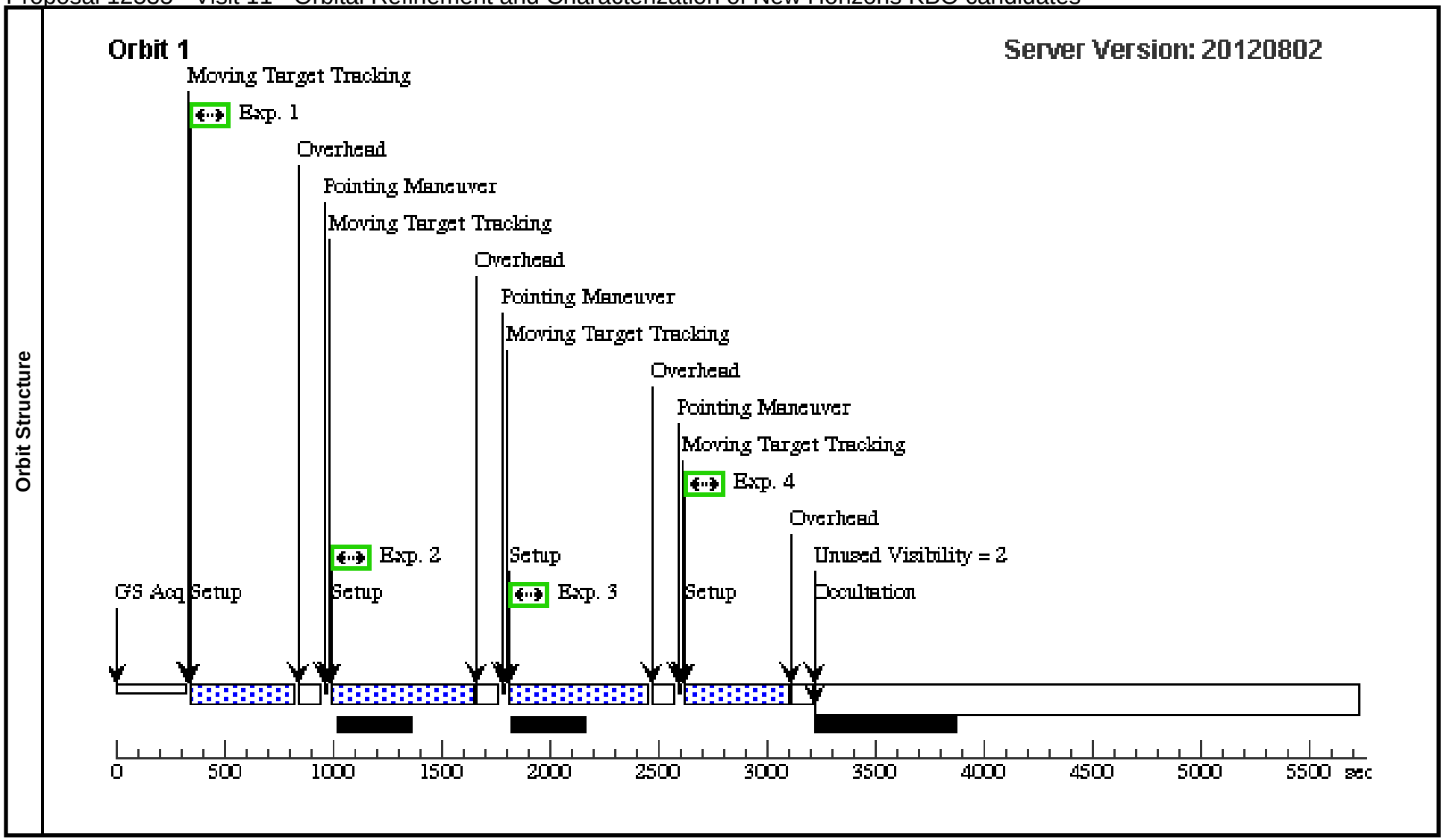
Special Requirements: BETWEEN 2012.255 AND 2012.256; BETWEEN 2012.257 AND 2012.260; BETWEEN 2012.262 AND 2012.267; BETWEEN 2012.270 AND 2012.273

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(4)	VNH0008	TYPE=ASTEROID,A=43.99788026,E=0.03856975,I=2.60734,O=231.49086,W=90.10902,M=317.85132,EQUINOX=J2000,EPOCH=19-APR-2011:00:00:00,EpochTimeScale=UTC				EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(4) VNH0008	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0,0		455 Secs	
								[==>]	***[1]***
2		(4) VNH0008	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0.099,0.106		640 Secs	
								[==>]	***[1]***
3		(4) VNH0008	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0,0		640 Secs	
								[==>]	***[1]***
4		(4) VNH0008	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0.099,0.106		455 Secs	
								[==>]	***[1]***


Orbit Structure
Orbit 1
Server Version: 20120802
Moving Target Tracking
Exp. 1
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Exp. 4
Overhead
Unused Visibility = 2
Occultation
Exp. 2
Setup
Setup
Exp. 3
Setup
GS Acq Setup
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12535, Visit 12, implementation Wed Aug 29 01:01:51 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

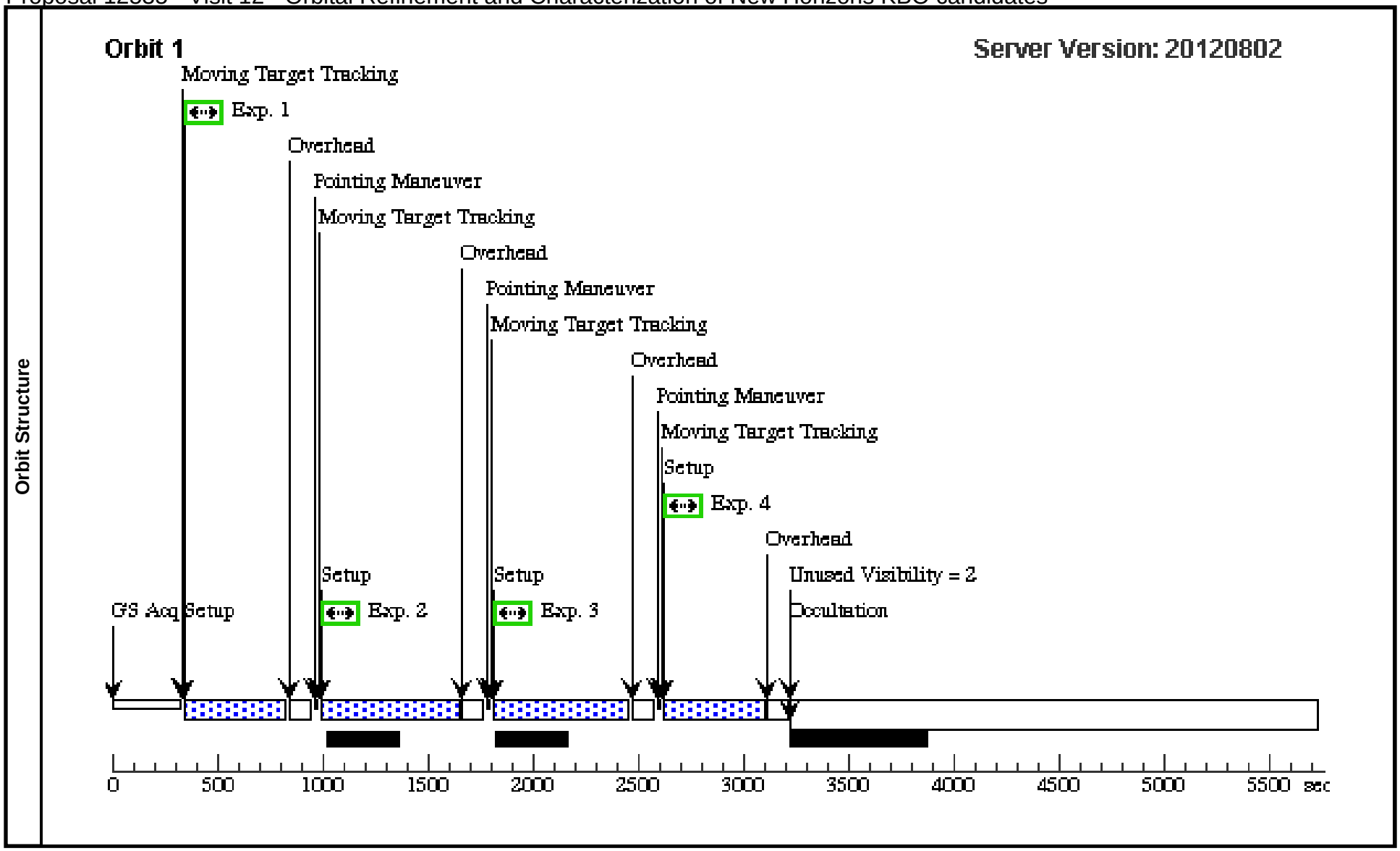
Special Requirements: BETWEEN 2012.255 AND 2012.256; BETWEEN 2012.257 AND 2012.260; BETWEEN 2012.262 AND 2012.267; BETWEEN 2012.270 AND 2012.273; SEQ 11,12 WITHIN 1 D

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(4)	VNH0008	TYPE=ASTEROID,A=43.99788026,E=0.03856975,I=2.60734,O=231.49086,W=90.10902,M=317.85132,EQUINOX=J2000,EPOCH=19-APR-2011:00:00:00,EpochTimeScale=UTC				EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(4) VNH0008	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0,0		455 Secs	
								[==>]	***[1]***
2		(4) VNH0008	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0.099,0.106		640 Secs	
								[==>]	***[1]***
3		(4) VNH0008	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0,0		640 Secs	
								[==>]	***[1]***
4		(4) VNH0008	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0.099,0.106		455 Secs	
								[==>]	***[1]***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Server Version: 20120802
Orbit Structure
Moving Target Tracking
Exp. 1
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 4
Overhead
Unused Visibility = 2
Occultation
GS Acq Setup
Setup
Exp. 2
Setup
Exp. 3
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12535, Visit 21, implementation Wed Aug 29 01:01:53 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

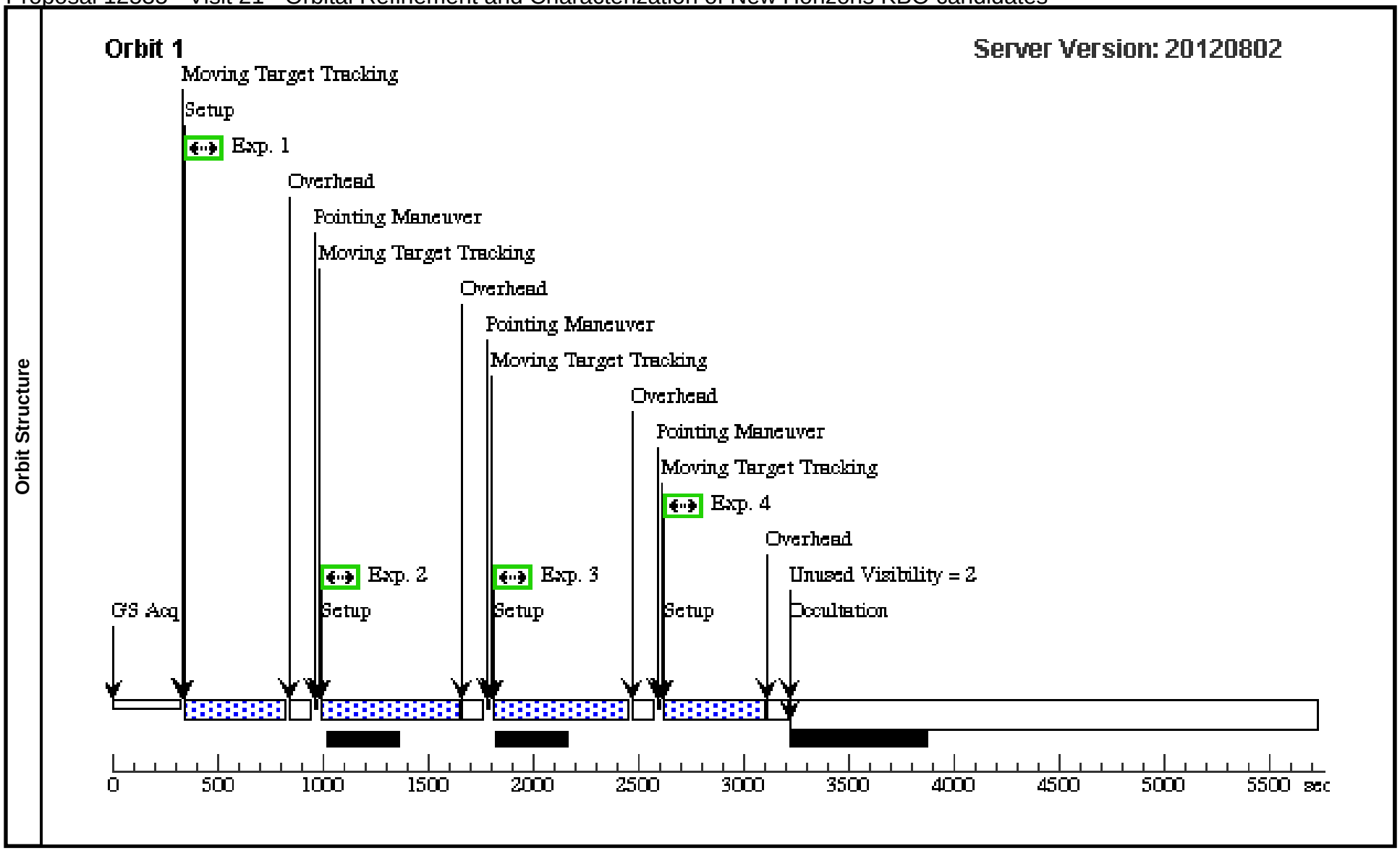
Special Requirements: BETWEEN 2012.254 AND 2012.255; BETWEEN 2012.261 AND 2012.273

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(5)	VNH0010	TYPE=ASTEROID,A=43.15228839,E=0.03596879,I=2.39422,O=154.69962,W=211.72576,M=274.18700,EQUINOX=J2000,EPOCH=19-APR-2011:00:00:00,EpochTimeScale=UTC				EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(5) VNH0010	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0,0		455 Secs	
								[==>]	***[1]***
2		(5) VNH0010	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0.099,0.106		640 Secs	
								[==>]	***[1]***
3		(5) VNH0010	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0,0		640 Secs	
								[==>]	***[1]***
4		(5) VNH0010	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0.099,0.106		455 Secs	
								[==>]	***[1]***


Orbit Structure
Orbit 1
Server Version: 20120802
Moving Target Tracking
Setup
Exp. 1
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Exp. 4
Overhead
Unused Visibility = 2
Occultation
Exp. 2
Setup
Exp. 3
Setup
Setup
GS Acq
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12535, Visit 22, implementation Wed Aug 29 01:01:54 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

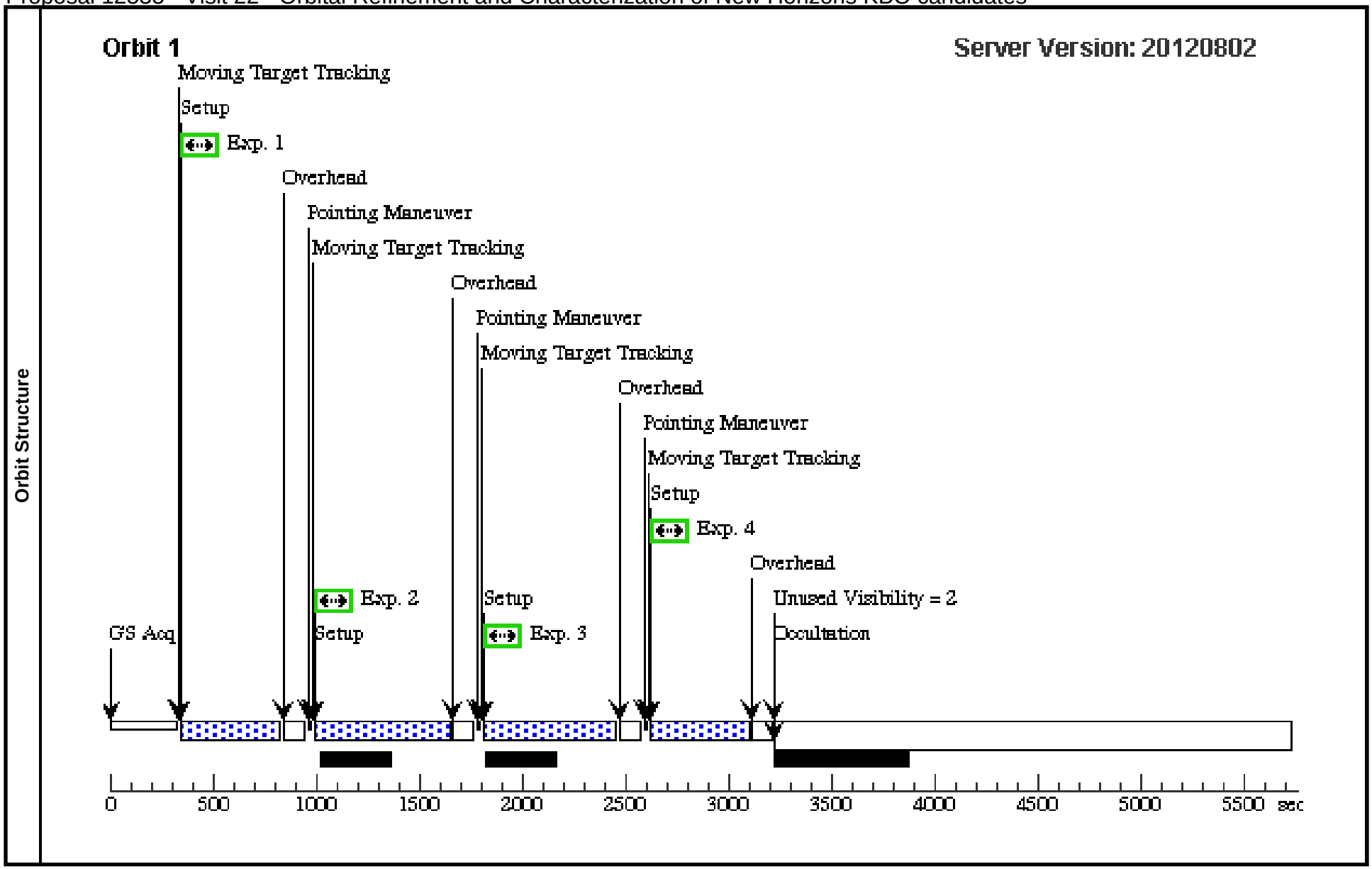
Special Requirements: BETWEEN 2012.254 AND 2012.255; BETWEEN 2012.261 AND 2012.273; SEQ 21,22 WITHIN 1 D

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window	Ephem Center
(5)	VNH0010	TYPE=ASTEROID,A=43.15228839,E=0.03596879,I=2.39422,O=154.69962,W=211.72576,M=274.18700,EQUINOX=J2000,EPOCH=19-APR-2011:00:00:00,EpochTimeScale=UTC				EARTH

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(5) VNH0010	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0,0		455 Secs	
								[==>]	***[1]***
2		(5) VNH0010	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0.099,0.106		640 Secs	
								[==>]	***[1]***
3		(5) VNH0010	WFC3/UVIS, ACCUM, UVIS2	F814W	CR-SPLIT=NO	POS TARG 0,0		640 Secs	
								[==>]	***[1]***
4		(5) VNH0010	WFC3/UVIS, ACCUM, UVIS2	F606W	CR-SPLIT=NO	POS TARG 0.099,0.106		455 Secs	
								[==>]	***[1]***


Orbit 1
Server Version: 20120802
Orbit Structure
Moving Target Tracking
Setup
Exp. 1
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Overhead
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 4
Overhead
Unused Visibility = 2
Occultation
Exp. 2
Setup
Setup
Exp. 3
GS Acq
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec