



# 13037 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

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>
01	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:01:26.0	yes
02	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:01:47.0	yes
03	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:02:07.0	yes
04	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:02:25.0	yes
05	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:02:43.0	yes
06	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:03:04.0	yes
07	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:03:23.0	yes
08	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:03:40.0	yes
09	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:03:57.0	yes
10	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:04:13.0	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>
11	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:04:30.0	yes
12	(1) NAME-FOMALHAUT-COPY	STIS/CCD	1	10-May-2013 21:04:47.0	yes

12 Total Orbits Used

## ABSTRACT

HST has a unique capability to detect tenuous debris disks and exosolar planets at optical wavelengths. Using the ACS/HRC in 2004-2006, we imaged the debris belt surrounding Fomalhaut, finding evidence for a planetary system in the structure of the belt, and then directly imaging a planet candidate, Fomalhaut b. New STIS data recover Fomalhaut b in 2010 with the expected flux and near its expected position. We also discover a tenuous belt halo extending 30 AU beyond the previously measured outer belt edge, demonstrating that the belt structure is more complex than initially assumed.

We propose a GO program dedicated to the study of Fomalhaut b's orbit and structure in the belt. The goals are to constrain the orbital elements of Fomalhaut b and establish with confidence that it is bound. The proposed astrometry is designed to measure the eccentricity with sufficient precision to discriminate between a circular orbit and one that is nested within the belt with  $e \sim 0.12$ . STIS is the only instrument that is demonstrably capable of making these astrometric observations. Moreover, we propose to build a high signal-to-noise image of the belt by combining the proposed Cycle 20 data with those obtained from previous cycles. The Fomalhaut system is of general interest to the community, particularly for studying the dynamical evolution of planetary systems relative to their outer planetesimal belts. Given its proximity (7.7 pc), Fomalhaut's belt is a rare example where we can resolve disk structure on sub-AU scales. The proposed additional STIS observations are critical for discerning between real astrophysical features and instrumental noise.

## OBSERVING DESCRIPTION

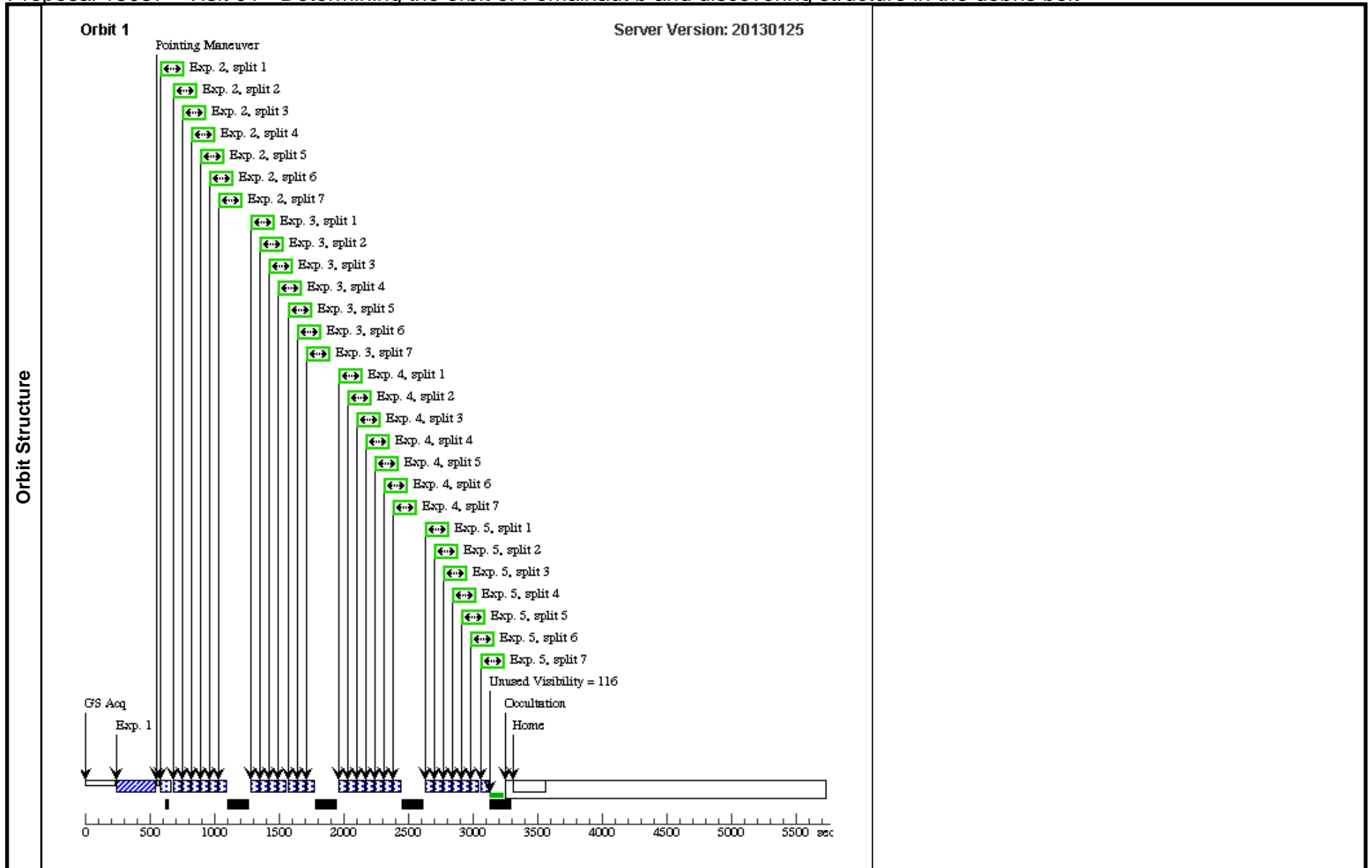
These Visits duplicate STIS observations conducted under GO-11818 during September 2010 (Visits 19-21) and GO-12576 during May, 2012 (Visits 01-12). The star Fomalhaut will be imaged behind the STIS WEDGE. ORIENTs are chosen so that Fomalhaut b, which is at PA=318 approximately 13" from the star, is imaged in a region free of diffraction spikes, focal plane structures, etc. Obtaining a relatively stable PSF between orbits is critical for subtraction of the PSF and the detection of Fomalhaut b. One aim is to execute the observations in a sequence that is not interrupted by other observations or calibration programs. We have implemented GROUP WITHIN constraints so that four orbits at a time are observed consecutively. Ideally, all 12 orbits are executed in the minimum time frame that is feasible. One way to improve this program is if two guide stars

Proposal 13037 (STScI Edit Number: 5, Created: Friday, May 10, 2013 8:05:01 PM EST) - Overview  
can be made available.

Proposal 13037 - Visit 01 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:01 GMT 2013

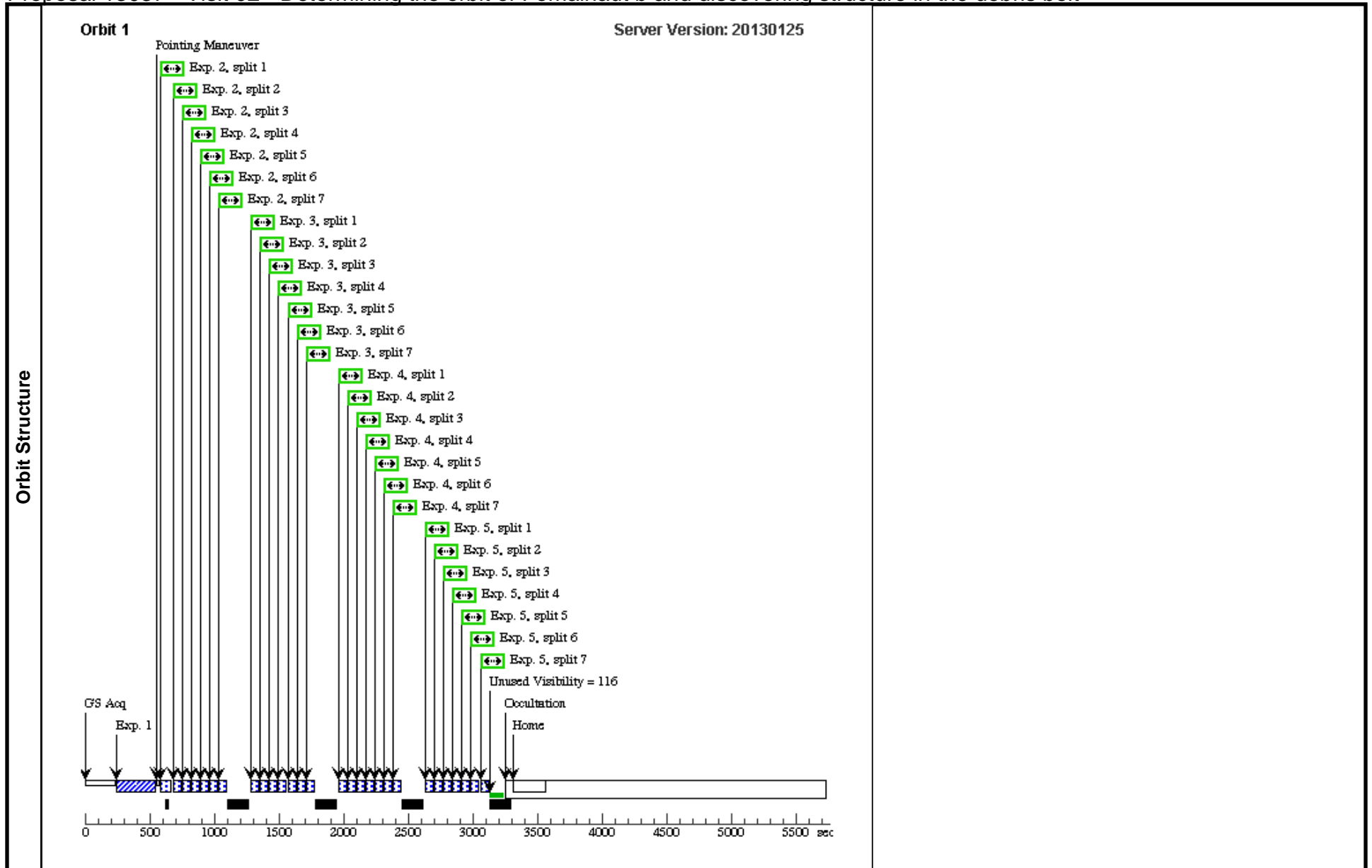
Visit	<b>Proposal 13037, Visit 01, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 235.0D TO 235.0 D; ORIENT 330D TO 330.0 D; GROUP 01,02,03,04 WITHIN 3.6 Orbits									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 02 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:04 GMT 2013

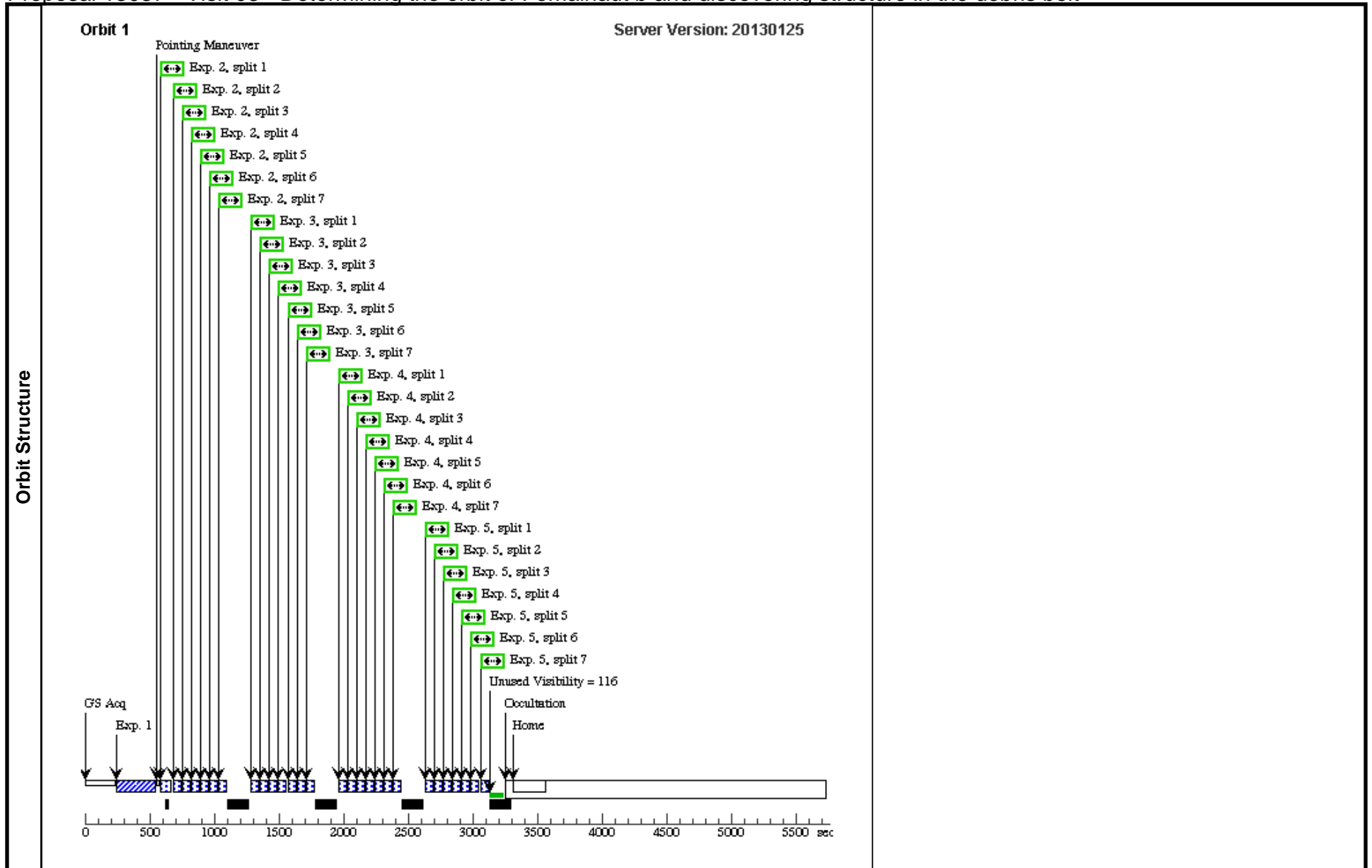
Visit	<b>Proposal 13037, Visit 02, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 243.0D TO 243.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 03 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:06 GMT 2013

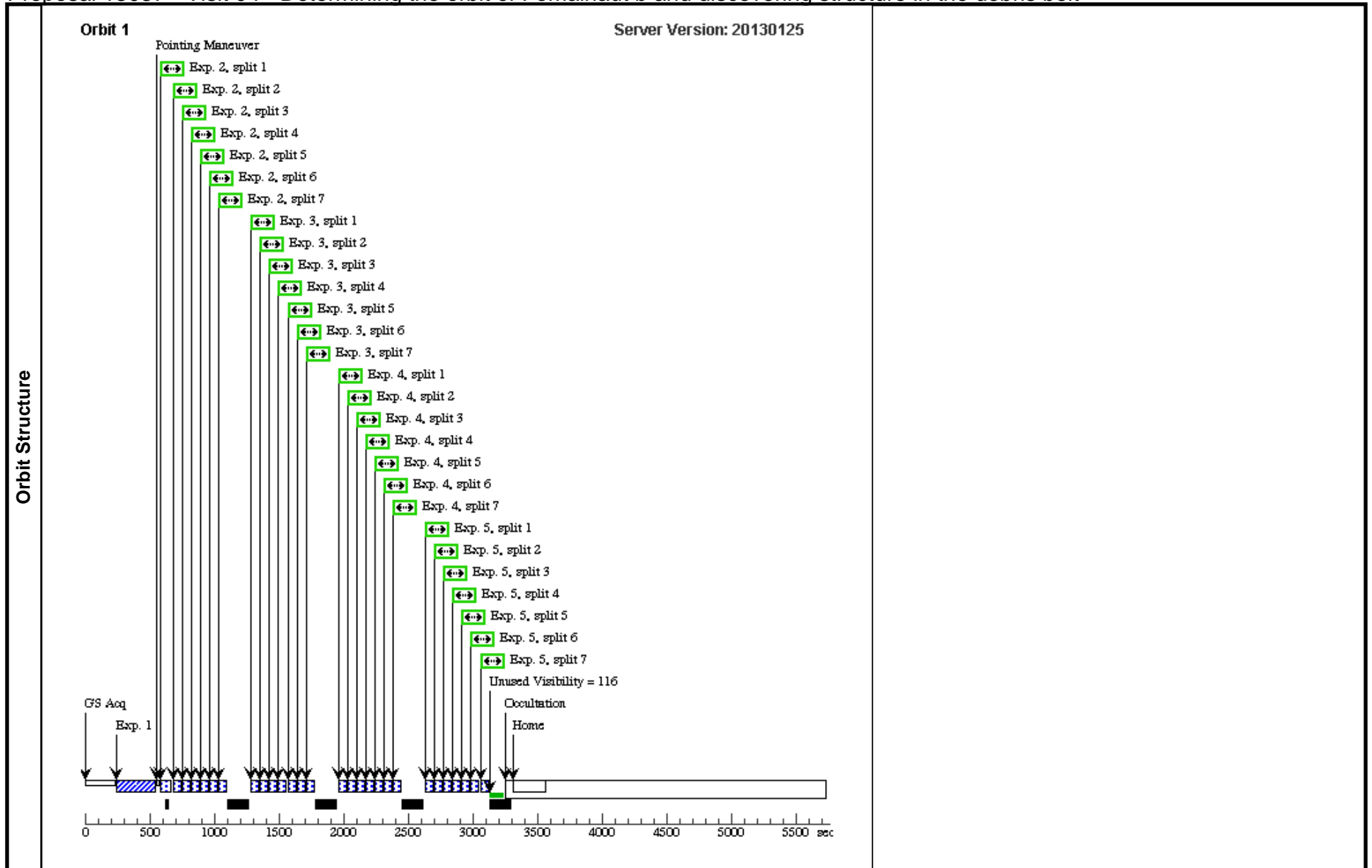
Visit	<b>Proposal 13037, Visit 03, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 251.0D TO 251.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 04 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:07 GMT 2013

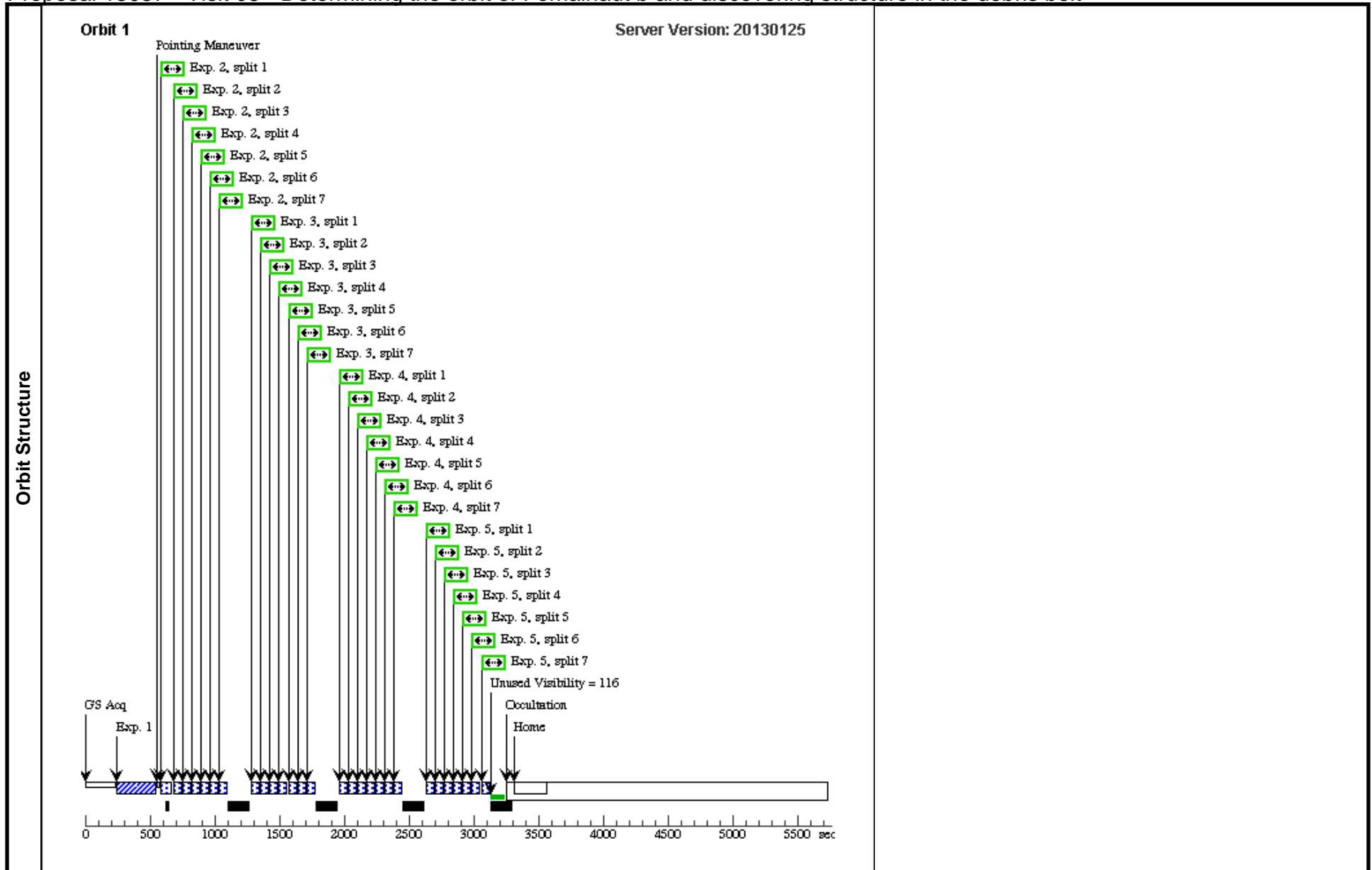
Visit	<b>Proposal 13037, Visit 04, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 259.0D TO 259.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 05 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:08 GMT 2013

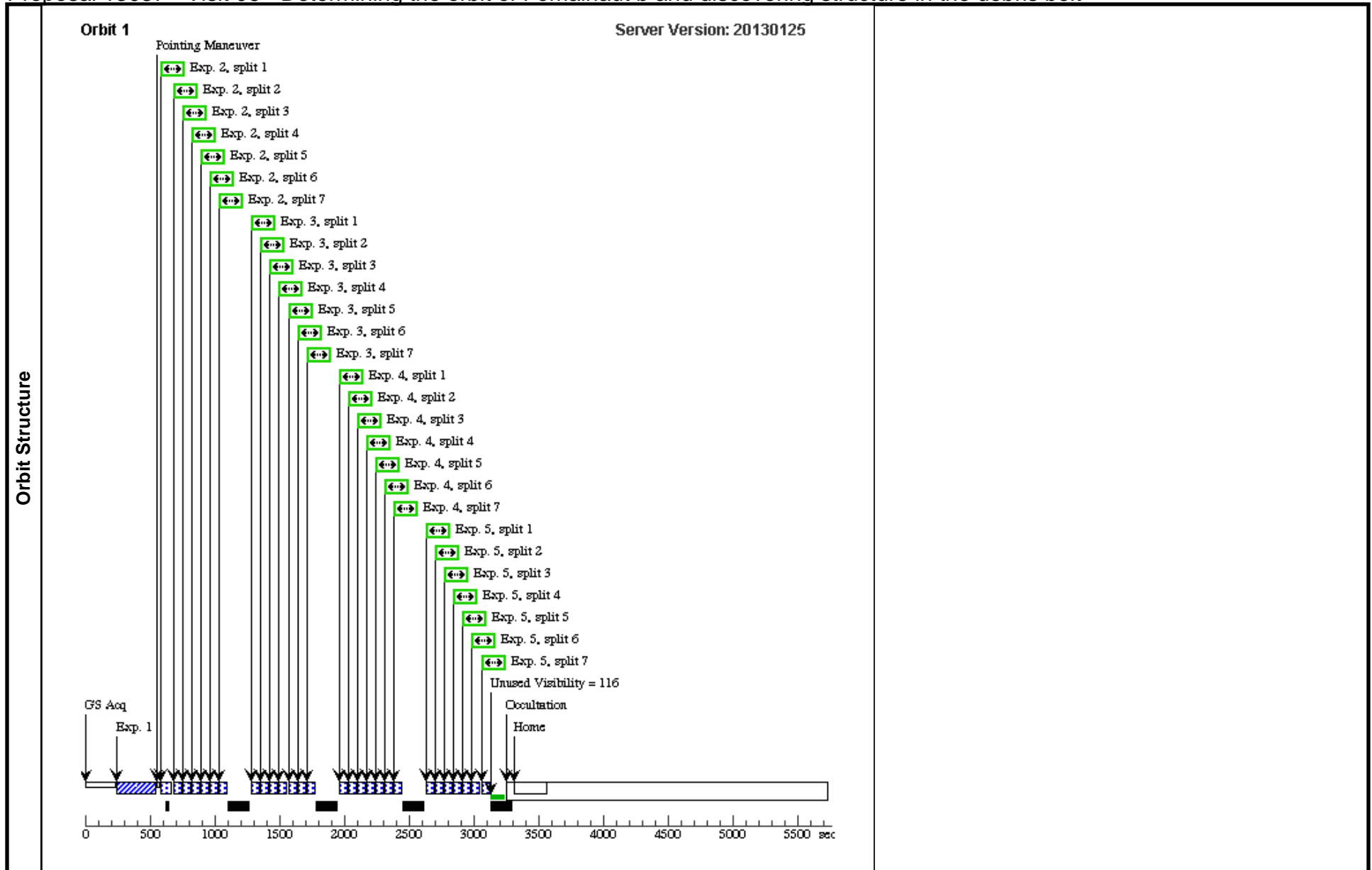
Visit	<b>Proposal 13037, Visit 05, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 237.0D TO 237.0 D; ORIENT 332.0D TO 332.0 D; AFTER 04 BY 1 H TO 36 H; GROUP 05,06,07,08 WITHIN 3.6 Orbits									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 06 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:10 GMT 2013

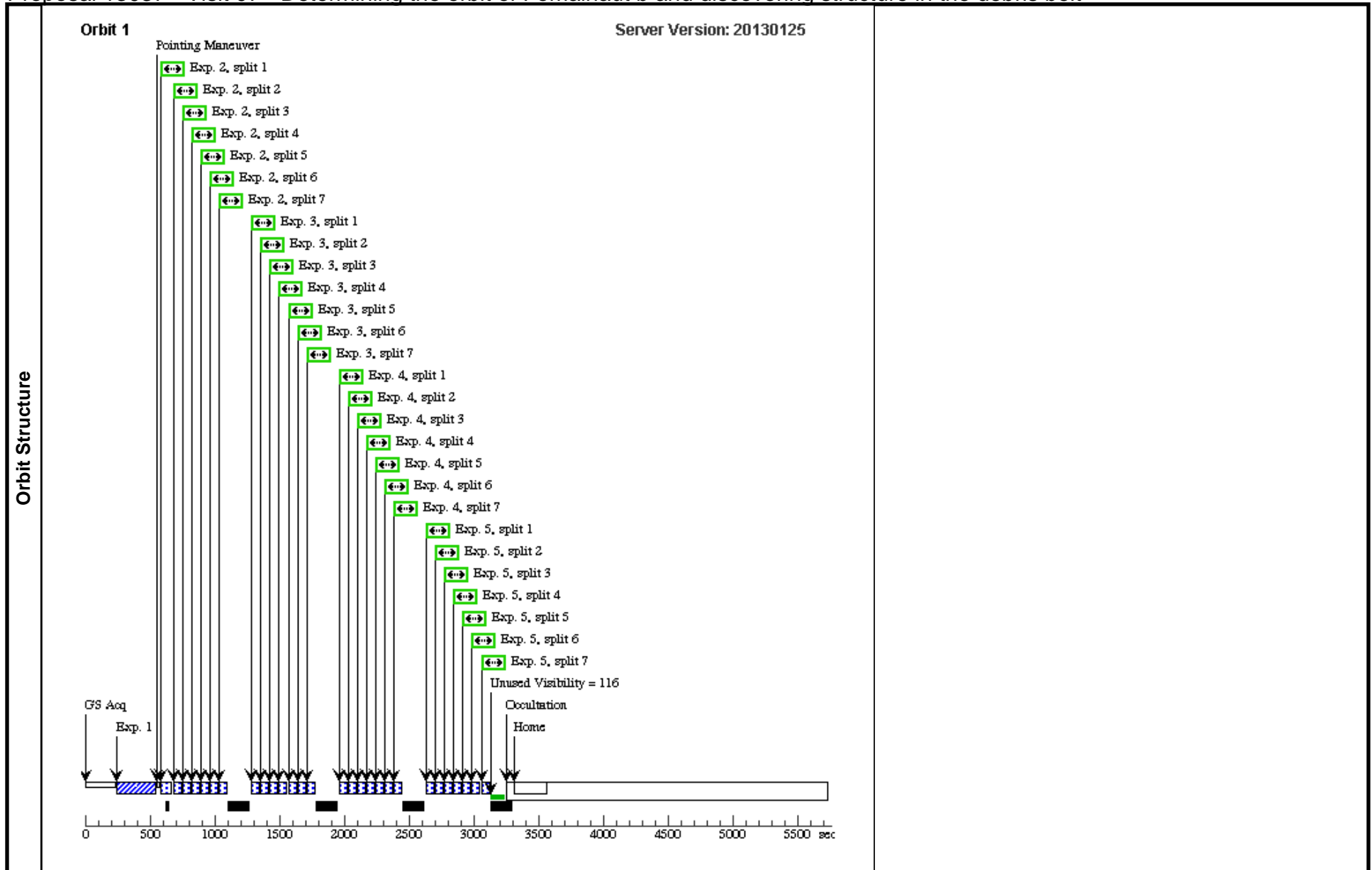
Visit	<b>Proposal 13037, Visit 06, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 245.0D TO 245.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 07 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:11 GMT 2013

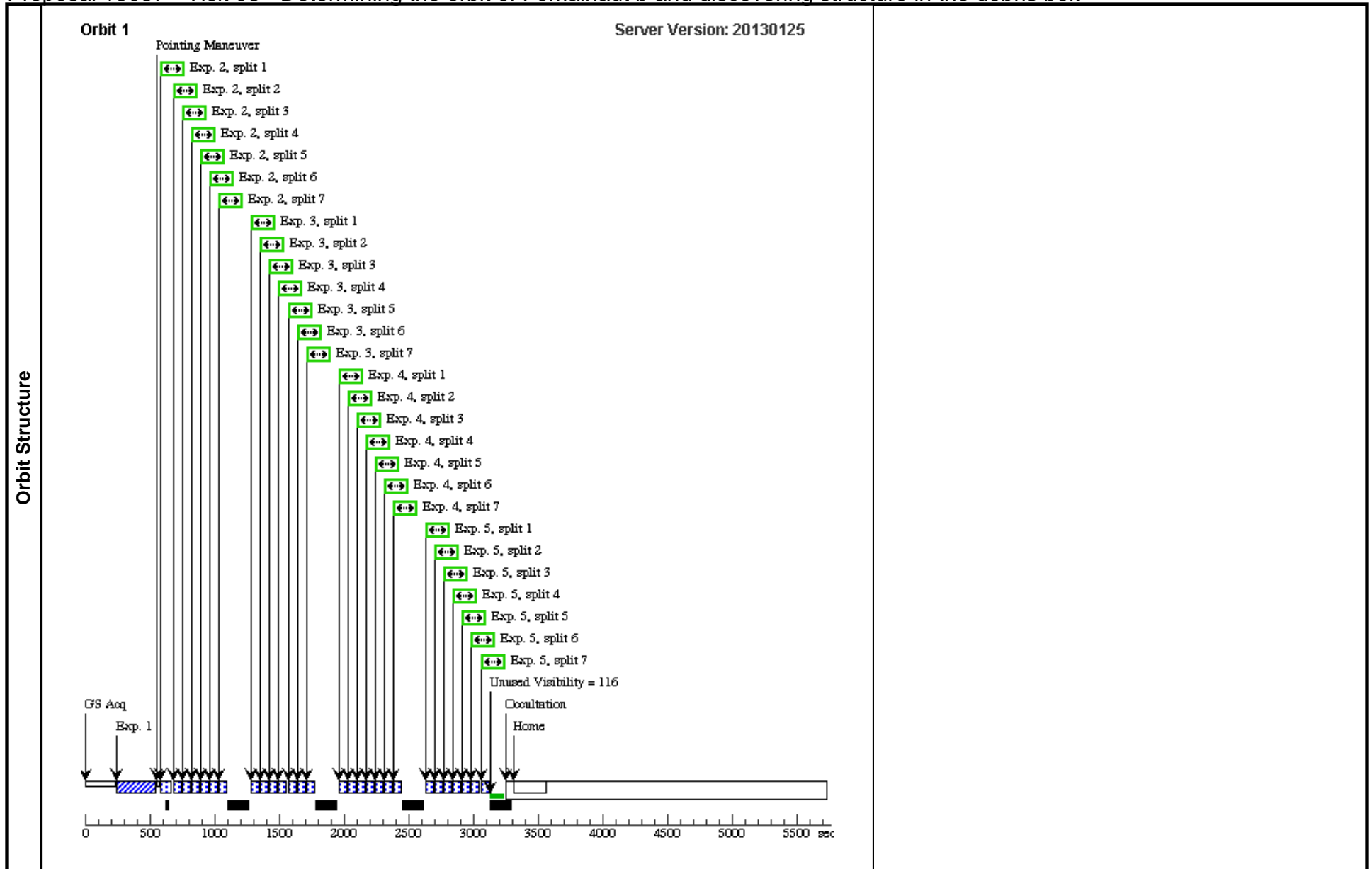
Visit	<b>Proposal 13037, Visit 07, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 253.0D TO 253.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 08 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:12 GMT 2013

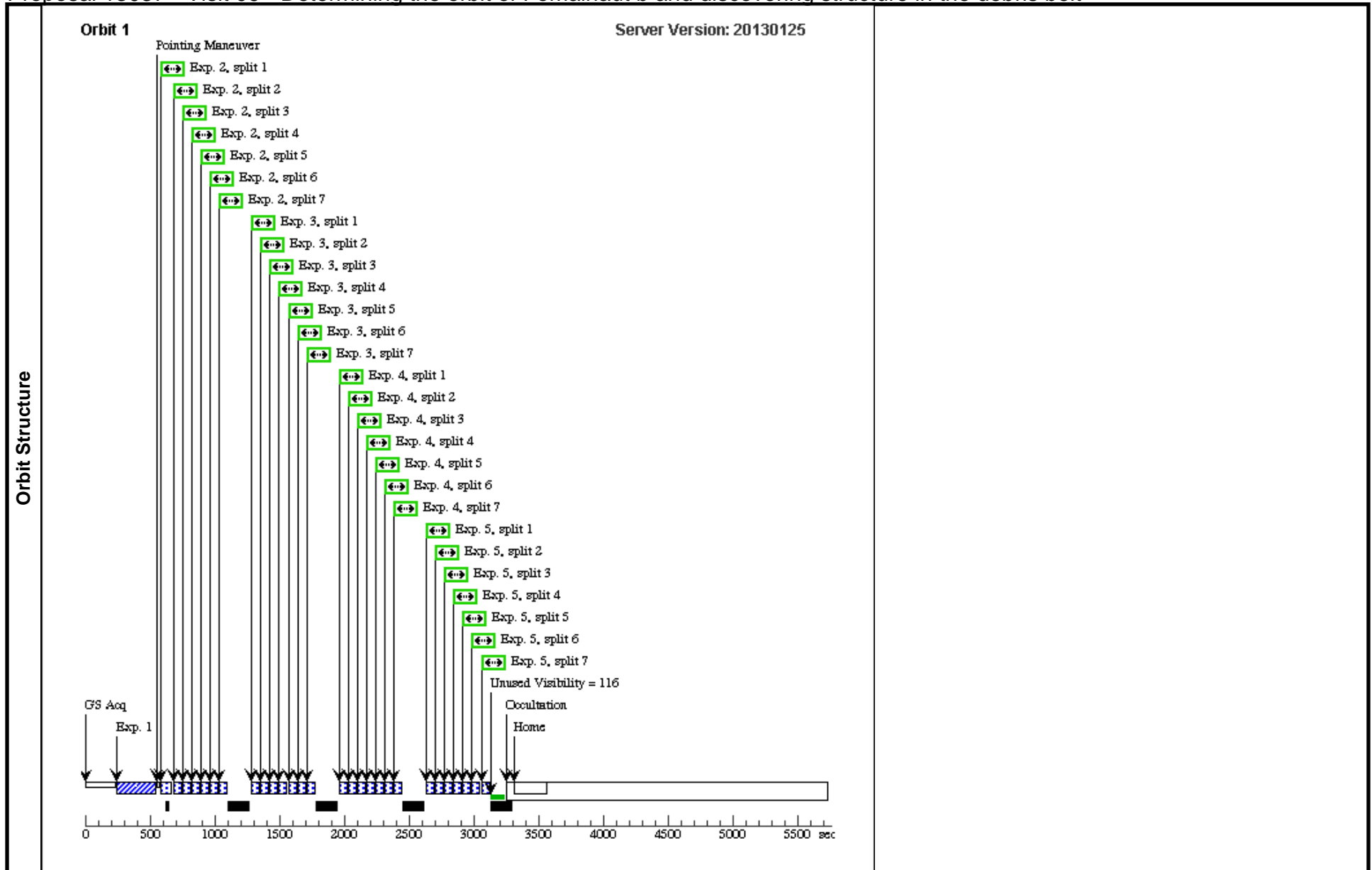
Visit	<b>Proposal 13037, Visit 08, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 261.0D TO 261.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 09 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:14 GMT 2013

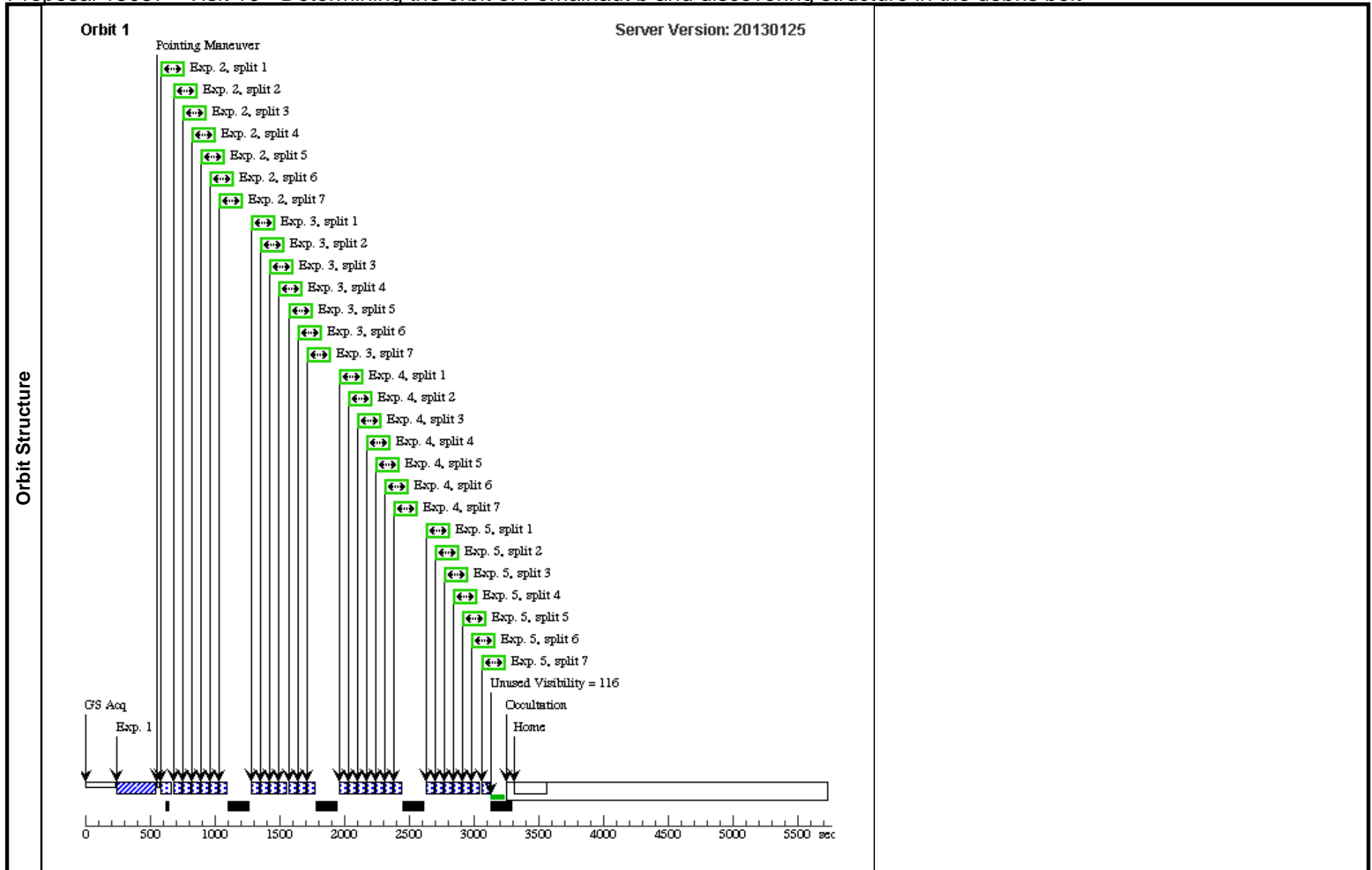
Visit	<b>Proposal 13037, Visit 09, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 239.0D TO 239.0 D; ORIENT 334.0D TO 334.0 D; AFTER 08 BY 1 H TO 36 H; GROUP 09,10,11,12 WITHIN 3.6 Orbits									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 10 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:15 GMT 2013

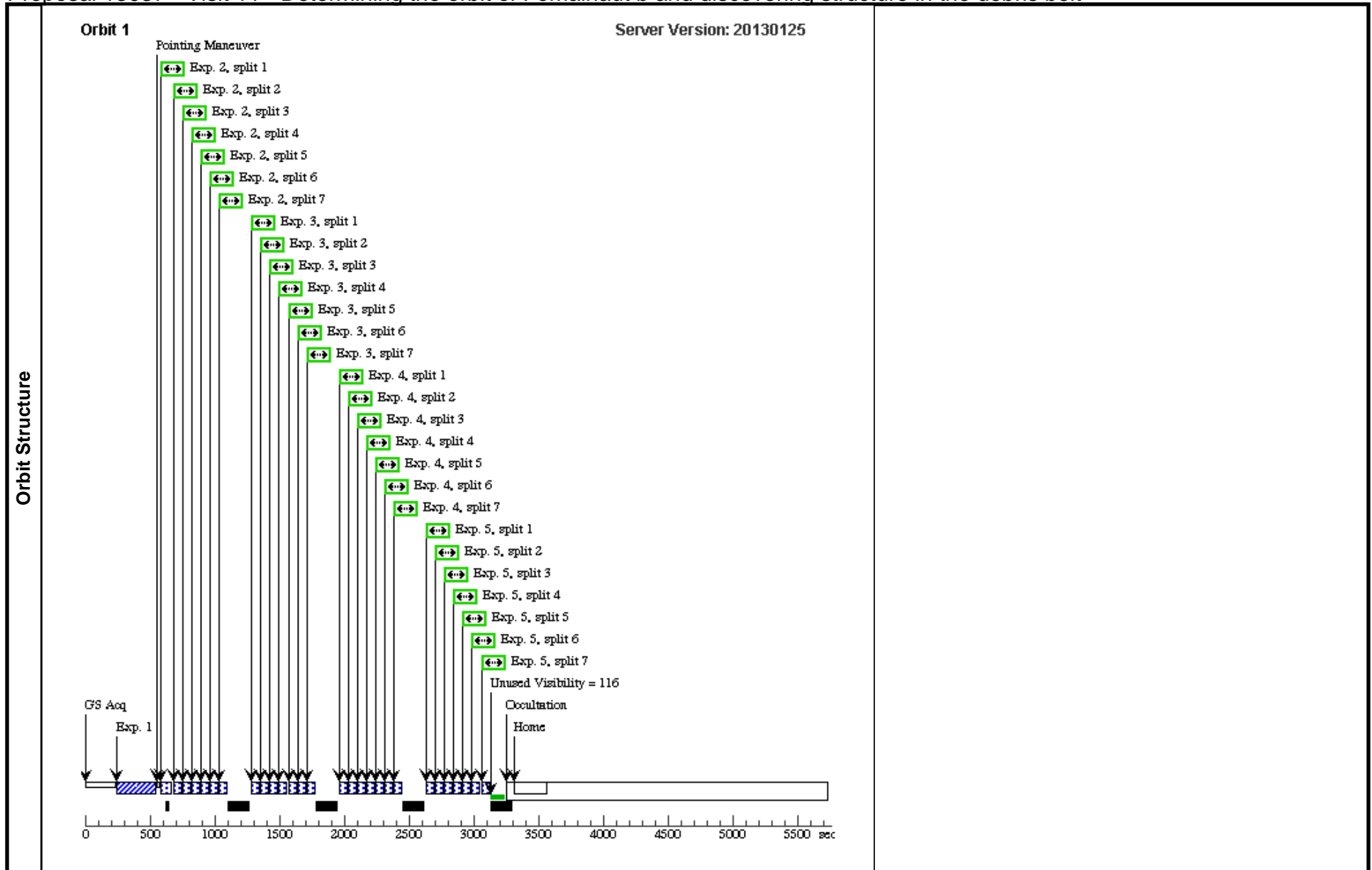
Visit	<b>Proposal 13037, Visit 10, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 247.0D TO 247.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 11 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:16 GMT 2013

Visit	<b>Proposal 13037, Visit 11, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 255.0D TO 255.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]



Proposal 13037 - Visit 12 - Determining the orbit of Fomalhaut b and discovering structure in the debris belt

Sat May 11 01:05:18 GMT 2013

Visit	<b>Proposal 13037, Visit 12, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 263.0D TO 263.0 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	NAME-FOMALHAUT-COPY	RA: 22 57 39.0465 (344.4126938d) Dec: -29 37 20.05 (-29.62224d) Equinox: J2000 Plate Id: 06EI	Proper Motion RA: 0.0255 sec of time/yr Proper Motion Dec: -0.165 arcsec/yr Parallax: 0.13008" Epoch of Position: 2000.0	V=1.16	Reference Frame: GSC1				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACQ, F25ND5	MIRROR		GS ACQ SCENARI O SINGLE		2 Secs [==>]	[1]
	2		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	3		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	4		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]
	5		(1) NAME-FOMALHAUT-COPY	STIS/CCD, ACCUM, WEDGE2.5	MIRROR	CR-SPLIT=7; GAIN=4			189 Secs [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)] [==>(Split 5)] [==>(Split 6)] [==>(Split 7)]	[1]

