11634 - Probing the collimation of pristine post-AGB jets with STIS

Cycle: 17, 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	(1) IRAS16594-4656	STIS/CCD	1	03-Nov-2010 21:01:19.0	yes
02	(2) IRAS19306+1407	STIS/CCD	2	03-Nov-2010 21:01:29.0	yes
03	(3) IRAS21282+5050	STIS/CCD	2	03-Nov-2010 21:01:41.0	yes
04	(4) IRAS22036 (9) I22036-OFFSET	STIS/CCD	3	03-Nov-2010 21:01:50.0	yes
05	(5) IRAS10197 (10) R22-OFFSET	STIS/CCD	1	03-Nov-2010 21:01:57.0	yes
06	(6) IRAS20462+3416	STIS/CCD	1	03-Nov-2010 21:02:08.0	yes
07	(8) IRAS19343 (11) M192-OFFSET	STIS/CCD	1	03-Nov-2010 21:02:17.0	yes
08	(7) IRAS08005-2356	STIS/CCD	1	03-Nov-2010 21:02:26.0	yes

12 Total Orbits Used

ABSTRACT

The shaping of planetary and protoplanetary nebulae (PNe and PPNe) is probably the most exciting yet least understood problem in the late evolution of ~1-8 solar mass stars. An increasing number of astronomers believe that fast jet-like winds ejected in the PPN phase are responsible for carving out the diverse shapes in the dense envelopes of the Asymptotic Giant Branch (AGB) stars. To date, the properties of these post-AGB jets have not been characterized and, indeed, their launching/collimation mechanism is still subject to controversial debate. This is due to the lack of the direct observations probing the spatio-kinematic structure of post-AGB winds in the stellar vicinity (~10e16cm), which is only possible with HST+STIS.

Recently, STIS observations have allowed us for the first time the DIRECT study of the structure and kinematics of the elusive post-AGB winds in one PPN, He3-1475 (Sanchez Contreras & Sahai 2001). Those winds have been discovered through H-alpha blue-shifted absorption features in the inner 0.3"-0.7" of the nebula. These STIS observations have revealed an ultra-fast collimated outflow relatively unaffected by the interaction with the AGB wind that is totally hidden in ground-based spectroscopic observations and HST images. The discovery of the pristine ultra-fast (~2300km/s) jet in He3-1475 is the first observational confirmation of the presence of collimated outflows as close as ~10e16cm from the central star. Most importantly, the spatio-kinematic structure of the ultra-fast jet clearly rules out hydrodynamical collimation alone and favors magnetic wind collimation. Therefore, STIS observations provide a unique method of probing the structure, kinematics, and collimation mechanism of the elusive post-AGB winds. We now propose similar observations for a sample of bipolar PPNe with ongoing post-AGB ejections in order to investigate the frequency of jets like those in He3-1475 in other PPNe and elucidate their nature and collimation mechanism. The observational characterization of these winds is indispensable for understanding this violent and important phase of post-AGB evolution.

OBSERVING DESCRIPTION

We will perform optical long-slit spectroscopy with medium spectral resolution in 8 bi- and multi-polar PPNe. These objects show intense Halpha emission near the center (within 1") with broad wings and P Cygni profiles indicating presently active pAGB ejections.

52×0.2 slits will be used for all the sources except for IRAS 08005. For IRAS 08005, the brightest and most compact nebula in our sample, a 52×0.1 slit is more appropriate. The large brightness of this source compensates the extra time required for narrower slits. The number and position of the slits have been carefully chosen according to the extent and peculiarities for each source (see below). For each object, we will observe the Halpha line emission using several slits parallel to the nebular axis in order to properly study the spatio-kinematic structure of the fast wind. Since the slits

cover a relatively wide region along the equator and the whole nebulae in the axial direction, these observations will provide a very complete view of the properties of a) the pristine jets in the innermost regions and b) the outer shock-excited gas (e.g. the emission knots). In addition, for the brightest sources (M1-92, IRAS 08005, and IRAS 20462) we will obtain Hbeta spectra for the central slit, i.e. passing through the central star. This would be done without any extra orbit cost due to the large intensities of these objects and would allow us to constrain the physical conditions of pAGB winds.

Gratings. We will use the first-order grating G750M centered at 6768A to obtain Halpha spectra with spectral resolution ~70 km/s, which is appropriate to study the expansive kinematics of the inner nebular regions. For the brightest objects we will use the first-order grating G430L to obtain Hbeta spectra. Given the spectral range covered by the selected gratings we will be able to simultaneously obtain (in a single exposure), spectra of many other important nebular lines (e.g. the [N II] 6548,6583 A and [S II] 6716,6731 A doublets), which are necessary to diagnose the excitation and physical conditions in the gas.

Exposure time and orbit time determination. Exposure times have been estimated using the STIS Exposure Time Calculator, given the brightness of the sources in the continuum and line wings (we are interested in observing absorption features that may go below the continuum).

The brightness surface in the region of interest for each source has been estimated combining the information on the continuum and line wing intensities given by spectroscopic ground-based observations and HST images. In all cases, we expect most the line and continuum emission to arise in a small, central region (0.3"×0.3"). We have checked that this procedure gives good intensity estimates when applied to He 3-1475 (for which ground-based and STIS spectra exist). The requested time will provide a S/N> 5 in the continuum around Halpha and Hbeta for regions at < 0.5" from the central star.

CCD exposures are split into two separated images (CR-SPLIT=2 or 3 depending on the source) in order to allow removal of cosmic rays. Also, for the central slit, the position of the source relative to the CCD will be displaced by a non-integer number of pixels along the slit in each individual exposure in order to remove the effects produced by undersampling of compact sources on the rectified spectra. The spatial undersampling of the central star is apparent in the STIS spectra of He 3-1475 (analysed by us), which shows a remarkable flux undulation towards the position of the (unresolved) central star. We expect similar effects in these observations for most tragets (all except for IRAS 22036 and Roberts 22) unless we perform spatial dithering as proposed. We have checked that the intense peak of the line emission does not saturate the STIS/CCD in any of the cases. We have also estimated that the spread of the core emisson (due to the wings of the PSF) is negligible in regions where we intend to study pAGB ejections.

For most of the objects we have chosen a 0.2 slit, therefore we only need target-acquisition to center the target in the scientific aperture. For IRAS 08005, which will be observed with the 0.1-wide slit, additional peakup exposures are required. In all cases we have checked that ACQ and ACQ/PEAK exposures can be done in a time shorter than the maximum allowed. The total number of orbits has been calculated considering the scientific exposure times, and time for acquisition (of the guide stars and the scientific targets), peakups (for IRAS 08005), and other overheads (time to move the slits and grating wheel, additional wavecal every 40min, time for dumping the buffer and return mechanism to normal for CVZs, etc).

For Roberts 22, for which CVZ observations are requested, the total number of CVZ opportunities is 3 and the maximum duration (in days) of any single CVZ opportunity is 4. We have checked using the visit planner that the desired orientation of the slit is possible within the CVZ.

Visit

Proposal 11634, Visit 01, completed Thu Nov 04 01:02:32 GMT 2010

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 113D TO 121 D

Diagnostics

(Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.225	Center Pattern=false		
	Line Spacing=			
(2)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(3), (4)
	Purpose=MOSAIC	Pattern Orientation=0.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.2	Center Pattern=false		
	Line Spacing=			

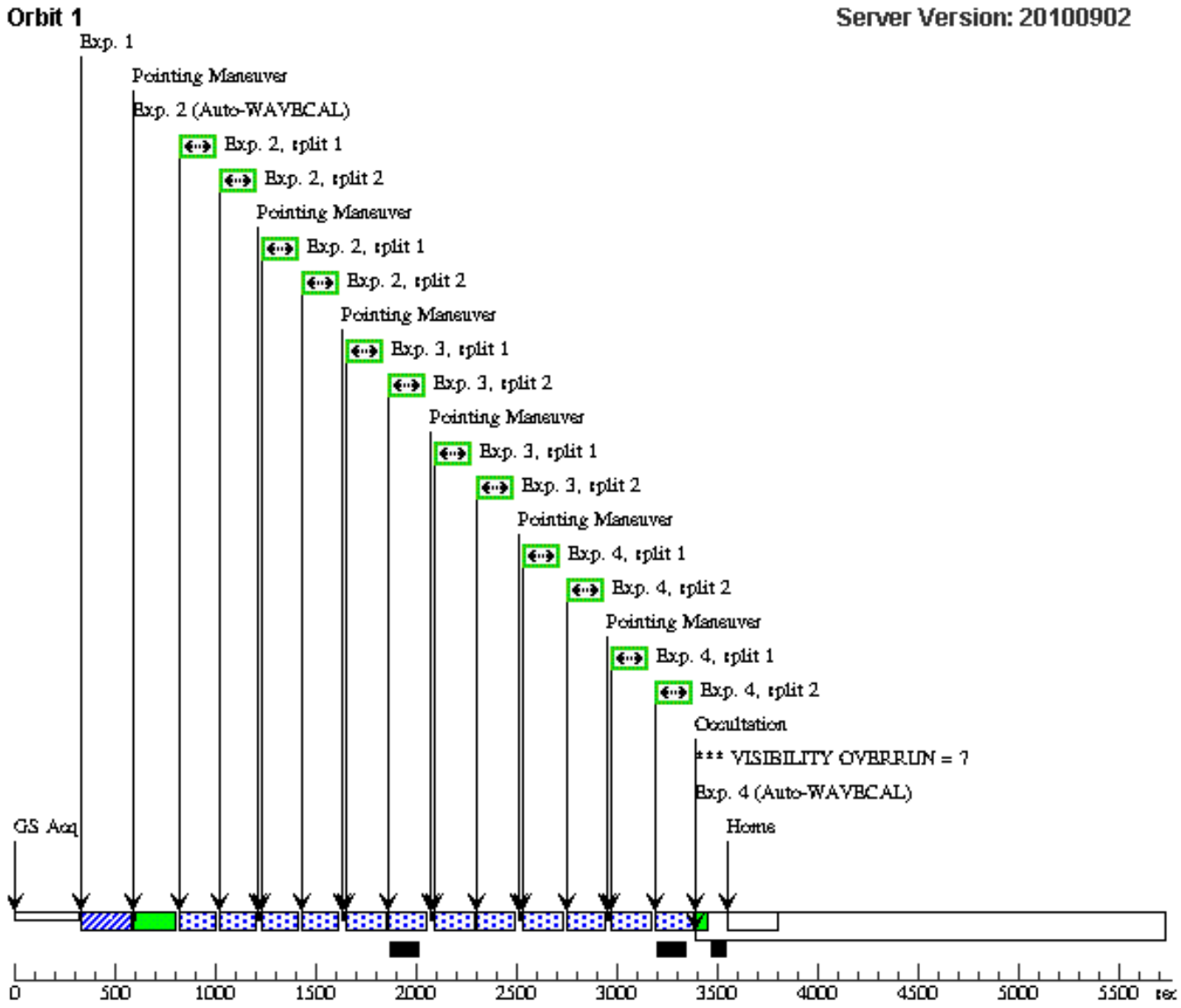
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	IRAS16594-4656	RA: 17 03 9.9955 (255.7916479d)	Proper Motion RA: null	V=13.98+/-0.5	Reference Frame: ICRS
	Alt Name1: S8Q4014967	Dec: -47 00 26.95 (-47.00749d)	Proper Motion Dec: null	R=12.2	
		Equinox: J2000	Epoch of Position:		

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	aqc	(1) IRAS16594-4656	STIS/CCD, ACQ, 50CCD	MIRROR	CHECKBOX=5.; DIFFUSE-CENTER =FLUX-CENTROID ; ACQTYPE=DIFFUSE			0.4 Secs *[==>]*	***[1]***
Comments: The bright, compact nucleus is surrounded by a faint reflection nebulosity.									
2	central_slit	(1) IRAS16594-4656	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2	POS TARG 0,0.0	Pattern 1, Exps 2-2 in Visit 01 (1)	180. Secs *[==>151.0 Secs (Pattern 1, Split 1)]* *[==>151.0 Secs (Pattern 1, Split 2)]* *[==>149.0 Secs (Pattern 2, Split 1)]* *[==>149.0 Secs (Pattern 2, Split 2)]*	***[1]***
Comments: central slit - 2 point sub-pixel DITHER + CR-SPLIT=2									
3	pos_offset	(1) IRAS16594-4656	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2	POS TARG 0.2,0	Pattern 2, Exps 3-3 in Visit 01 (2)	180. Secs *[==>169.0 Secs (Pattern 1, Split 1)]* *[==>159.0 Secs (Pattern 1, Split 2)]* *[==>169.0 Secs (Pattern 2, Split 1)]* *[==>159.0 Secs (Pattern 2, Split 2)]*	***[1]***
Comments: Adjacent slits at positive offsets - NO DITHER									
4	neg_offset	(1) IRAS16594-4656	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2	POS TARG -0.4,0	Pattern 2, Exps 4-4 in Visit 01 (2)	180. Secs *[==>169.0 Secs (Pattern 1, Split 1)]* *[==>159.0 Secs (Pattern 1, Split 2)]* *[==>169.0 Secs (Pattern 2, Split 1)]* *[==>159.0 Secs (Pattern 2, Split 2)]*	***[1]***
Comments: adjacent slits at negative offsets - NO DITHER									

Orbit Structure



Visit

Proposal 11634, Visit 02 Thu Nov 04 01:02:33 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 58D TO 62 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(5)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.225	Center Pattern=false		
	Line Spacing=			
(6)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(3), (4)
	Purpose=MOSAIC	Pattern Orientation=0.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.2	Center Pattern=false		
	Line Spacing=			

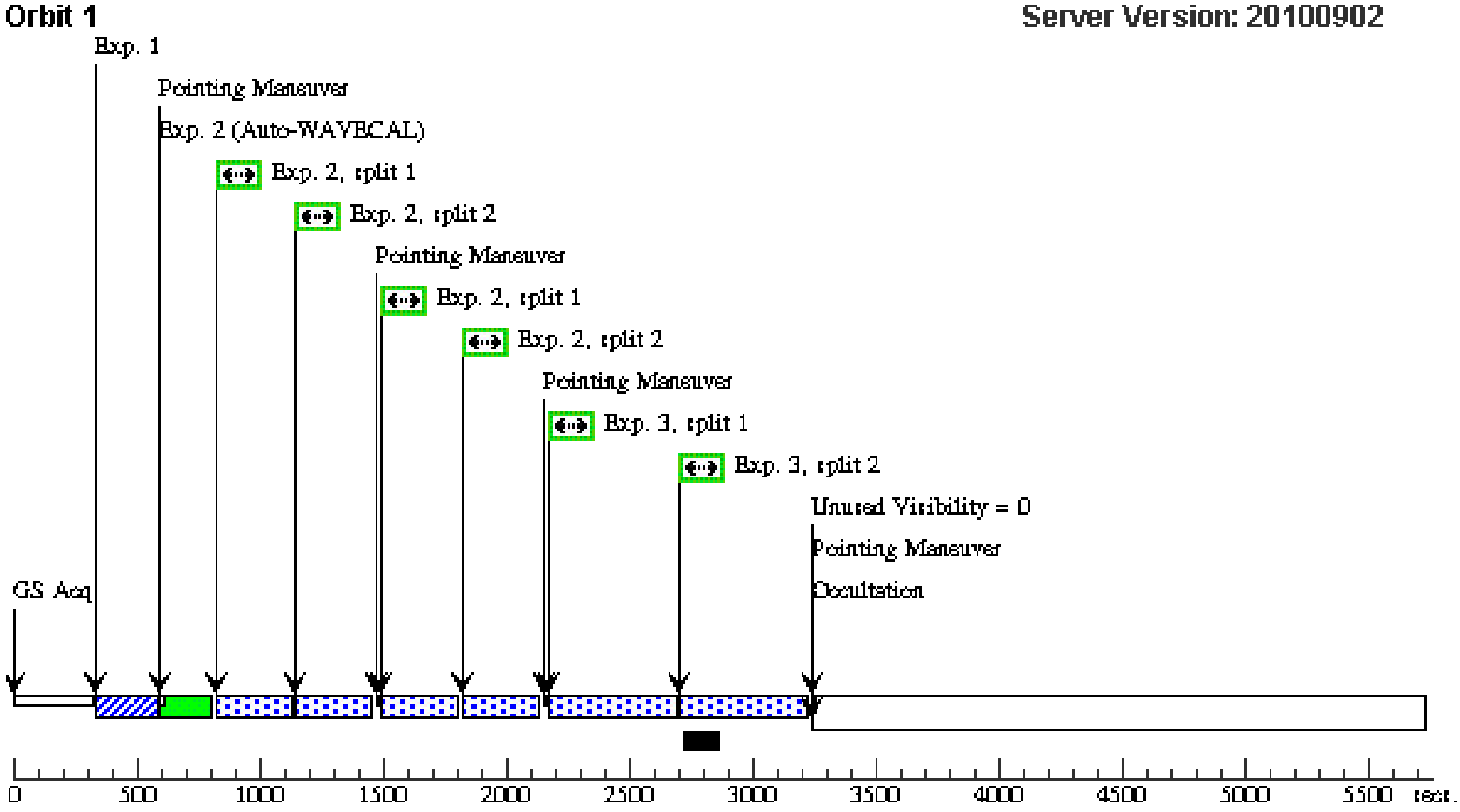
Fixed Targets

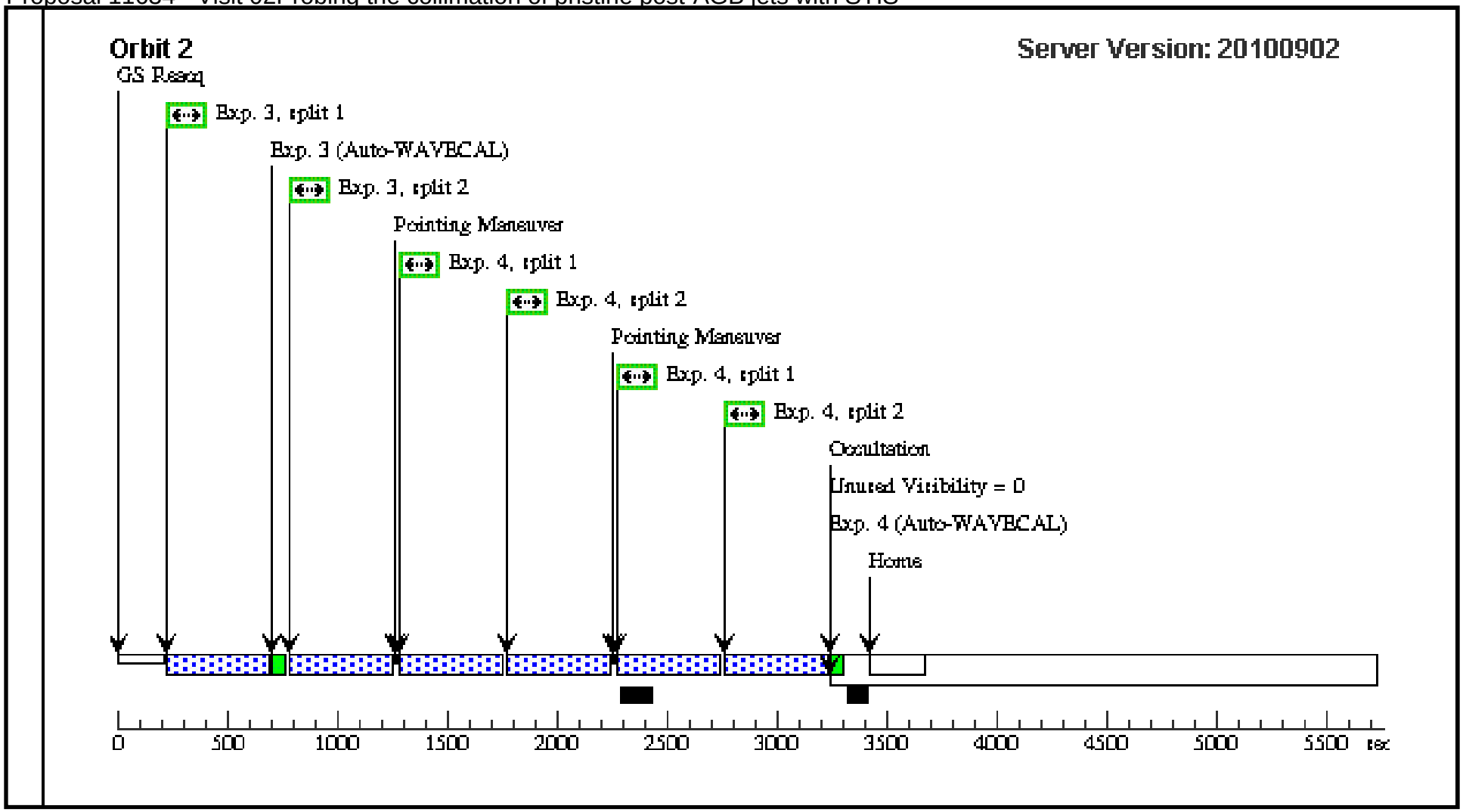
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	IRAS19306+1407	RA: 19 32 55.0873 (293.2295304d)	Proper Motion RA: null	V=14.2+/-0.4	Reference Frame: ICRS
	Alt Name1: N277049412	Dec: +14 13 36.98 (14.22694d)	Proper Motion Dec: null	R=13.3	
		Equinox: J2000	Epoch of Position:		

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	aqc	(2) IRAS19306+1407	STIS/CCD, ACQ, 50CCD	MIRROR	CHECKBOX=5.; DIFFUSE-CENTER=FLUX-CENTROID; ACQTYPE=DIFFUSE			0.4 Secs *[==>]*	*[1]*
	Comments: The bright, compact nucleus is surrounded by a fainter reflection nebulosity.								
2	central_slit	(2) IRAS19306+1407	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=2	POS TARG 0,0.0	Pattern 5, Exps 2-2 in Visit 02 (5)	420. Secs *[==>280.0 Secs (Pattern 1, Split 1)]* *[==>280.0 Secs (Pattern 1, Split 2)]* *[==>280.0 Secs (Pattern 2, Split 1)]* *[==>281.0 Secs (Pattern 2, Split 2)]*	*[1]*
	Comments: Central slit - 2 point sub-pixel dither + CR-SPLIT=2.								
3	pos_offset	(2) IRAS19306+1407	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=2	POS TARG 0.2,0	Pattern 6, Exps 3-3 in Visit 02 (6)	830. Secs *[==>490.0 Secs (Pattern 1, Split 1)]* *[==>490.0 Secs (Pattern 1, Split 2)]* *[==>437.0 Secs (Pattern 2, Split 1)]* *[==>437.0 Secs (Pattern 2, Split 2)]*	*[1]* *[2]*
	Comments: Adjacent slits starting at positive offsets								
4	neg_offset	(2) IRAS19306+1407	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=2	POS TARG -0.4,0	Pattern 6, Exps 4-4 in Visit 02 (6)	830. Secs *[==>437.0 Secs (Pattern 1, Split 1)]* *[==>437.0 Secs (Pattern 1, Split 2)]* *[==>437.0 Secs (Pattern 2, Split 1)]* *[==>438.0 Secs (Pattern 2, Split 2)]*	*[2]*
	Comments: Adjacent slits starting at negative offset								

Orbit Structure




Orbit 2
Server Version: 20100902
GS Reacq
Exp. 3, split 1
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 2
Pointing Maneuver
Exp. 4, split 1
Exp. 4, split 2
Pointing Maneuver
Exp. 4, split 1
Exp. 4, split 2
Occultation
Unused Visibility = 0
Exp. 4 (Auto-WAVECAL)
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11634, Visit 03 Thu Nov 04 01:02:35 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 26D TO 30 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(5)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.225	Center Pattern=false		
	Line Spacing=			
(6)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(3), (4)
	Purpose=MOSAIC	Pattern Orientation=0.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.2	Center Pattern=false		
	Line Spacing=			

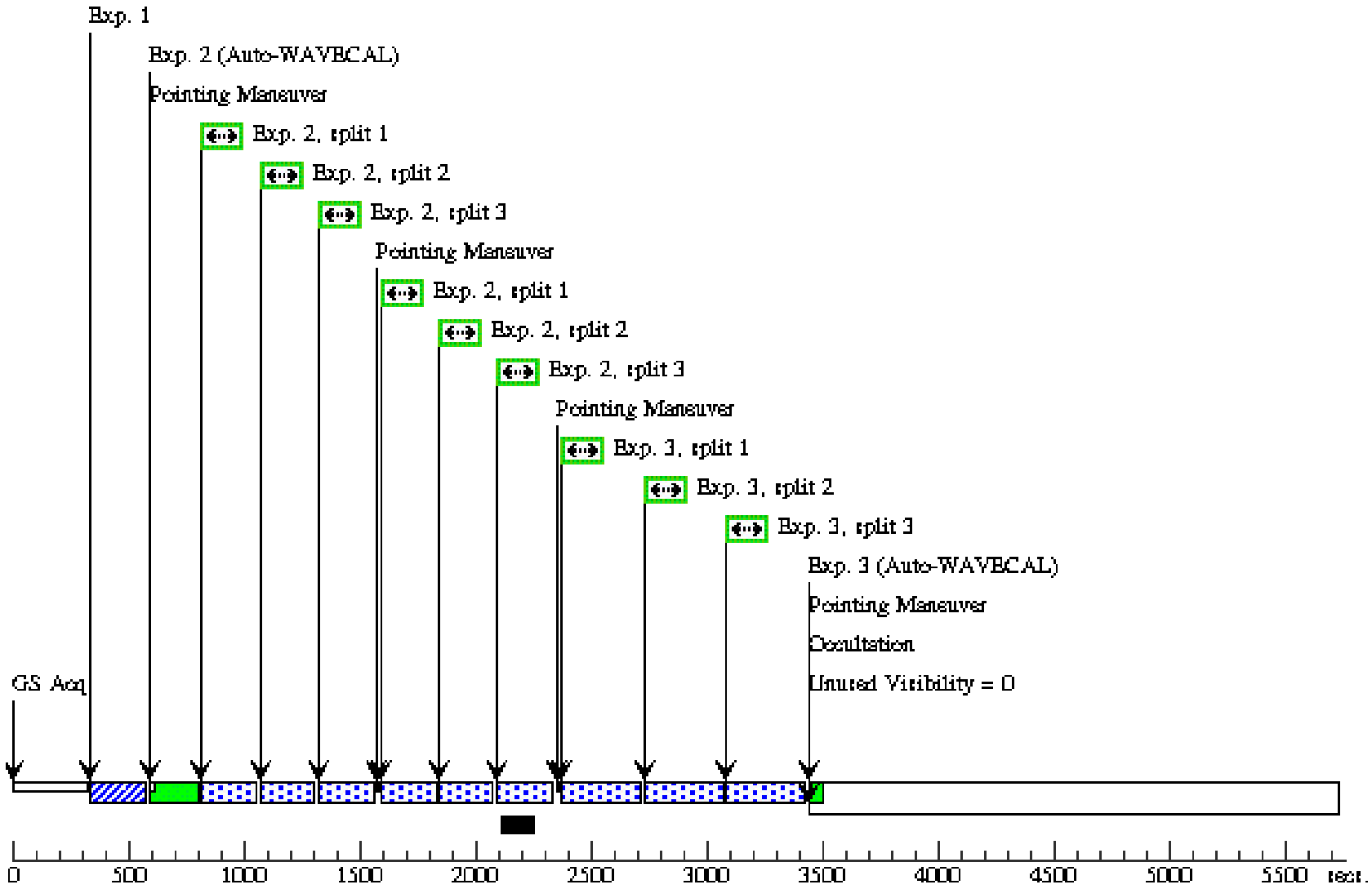
Fixed Targets

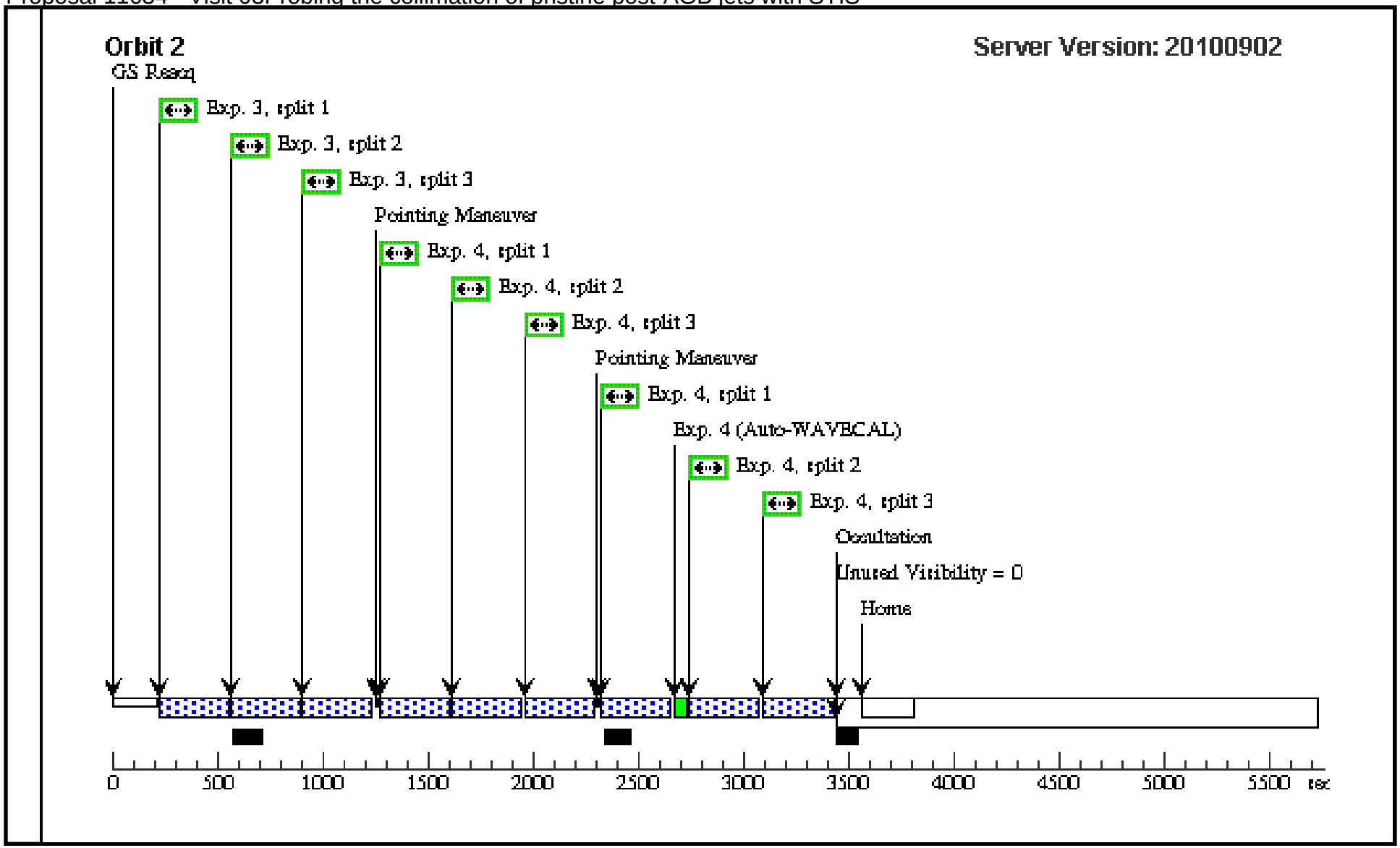
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	IRAS21282+5050	RA: 21 29 58.4850 (322.4936875d)	Proper Motion RA: null	V=13.6+/-0.5	Reference Frame: ICRS
	Alt Name1: N2TO020842	Dec: +51 03 59.89 (51.06664d)	Proper Motion Dec: null		
		Equinox: J2000	Epoch of Position:		

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	acq	(3) IRAS21282+5050	STIS/CCD, ACQ, 50CCD	MIRROR	ACQTYPE=POINT			0.3 Secs	
								[==>]	***[1]***
Comments: The bright, compact nucleus is surrounded by a fainter reflection nebulosity.									
2	central_slit	(3) IRAS21282+5050	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=3	POS TARG 0,0.0	Pattern 5, Exps 2-2 in Visit 03 (5)	200. Secs	
								[==>210.0 Secs (Pattern 1, Split 1)]	***[1]***
								[==>205.0 Secs (Pattern 1, Split 2)]	
								[==>205.0 Secs (Pattern 1, Split 3)]	
								[==>210.0 Secs (Pattern 2, Split 1)]	
								[==>205.0 Secs (Pattern 2, Split 2)]	
								[==>210.0 Secs (Pattern 2, Split 3)]	
Comments: central slit - 2 point sub-pixel dither + CR-SPLIT=2									
3	pos_offset	(3) IRAS21282+5050	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=3	POS TARG 0.2,0	Pattern 6, Exps 3-3 in Visit 03 (6)	800. Secs	
								[==>311.0 Secs (Pattern 1, Split 1)]	***[1]***
								[==>311.0 Secs (Pattern 1, Split 2)]	
								[==>310.0 Secs (Pattern 1, Split 3)]	
								[==>298.0 Secs (Pattern 2, Split 1)]	***[2]***
								[==>298.0 Secs (Pattern 2, Split 2)]	
								[==>298.0 Secs (Pattern 2, Split 3)]	
Comments: adjacent slits at positive offsets									
4	neg_offset	(3) IRAS21282+5050	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=3	POS TARG -0.4,0	Pattern 6, Exps 4-4 in Visit 03 (6)	900. Secs	
								[==>298.0 Secs (Pattern 1, Split 1)]	***[2]***
								[==>299.0 Secs (Pattern 1, Split 2)]	
								[==>299.0 Secs (Pattern 1, Split 3)]	
								[==>299.0 Secs (Pattern 2, Split 1)]	
								[==>299.0 Secs (Pattern 2, Split 2)]	
								[==>300.0 Secs (Pattern 2, Split 3)]	
Comments: adjacent slits at negative offsets									

Orbit Structure




Orbit 2
Server Version: 20100902
GS Reacq
Exp. 3, split 1
Exp. 3, split 2
Exp. 3, split 3
Pointing Maneuver
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Pointing Maneuver
Exp. 4, split 1
Exp. 4 (Auto-WAVECAL)
Exp. 4, split 2
Exp. 4, split 3
Occultation
Unused Visibility = 0
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11634, Visit 04, completed Thu Nov 04 01:02:36 GMT 2010

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 110D TO 113 D

Diagnostics

(Visit 04) Warning (Orbit Planner): VISIBILITY OVERRUN

(Visit 04) Warning (Orbit Planner): VISIBILITY OVERRUN

(Visit 04) Warning (Orbit Planner): VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(2)
	Purpose=MOSAIC	Pattern Orientation=0.0		
	Number Of Points=5	Angle Between Sides=		
	Point Spacing=0.2	Center Pattern=false		
	Line Spacing=			

Fixed Targets

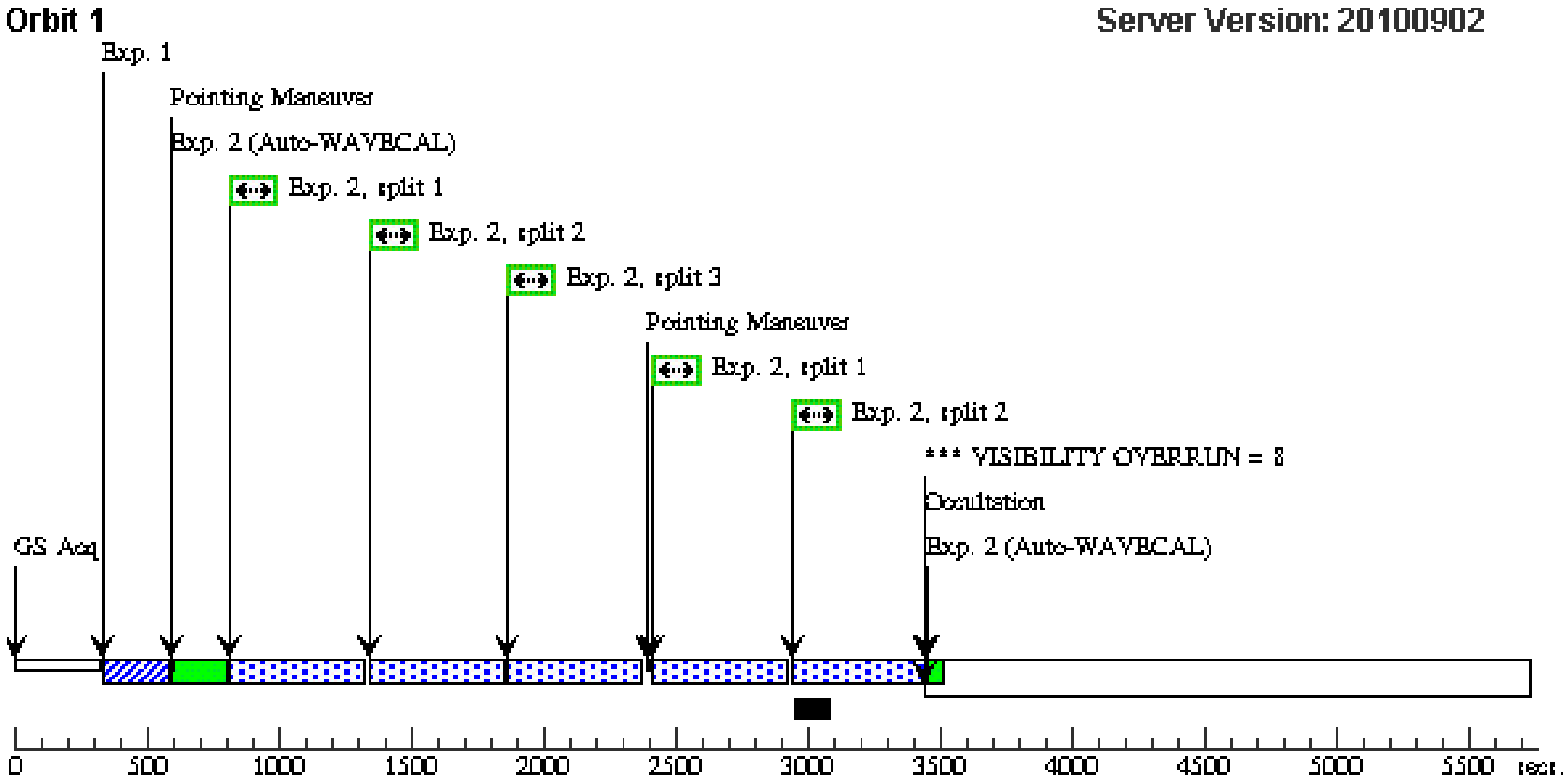
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	IRAS22036	Offset from I22036-OFFSET by	Proper Motion RA: null	V=16.1+/-0.4	Offset Position (IRAS22036)
	Alt Name1: N2UE106560	RA Offset: 0.4450900000119873 Secs	Proper Motion Dec: null		Reference Frame: ICRS
		Dec Offset: -6.798799999887706 Arcsec	Epoch of Position:		
(9)	I22036-OFFSET	RA: 22 05 29.8663 (331.3744429d)	Proper Motion RA: null	V=15.1+/-0.4	Reference Frame: ICRS
	Alt Name1: N2UE106559	Dec: +53 21 39.71 (53.36103d)	Proper Motion Dec: null		
	Alt Name2: 1433-0422251	Equinox: J2000	Epoch of Position:		

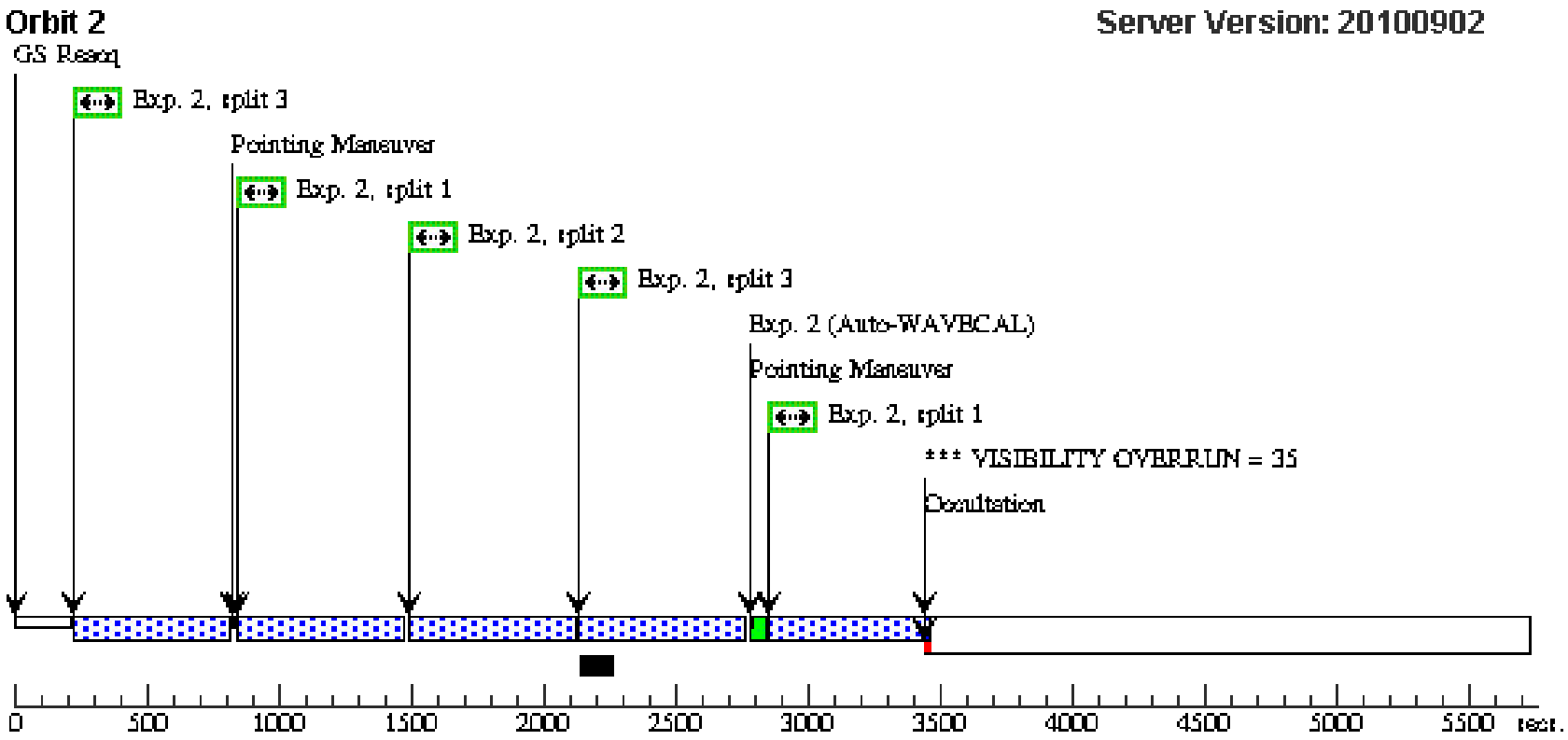
Exposures

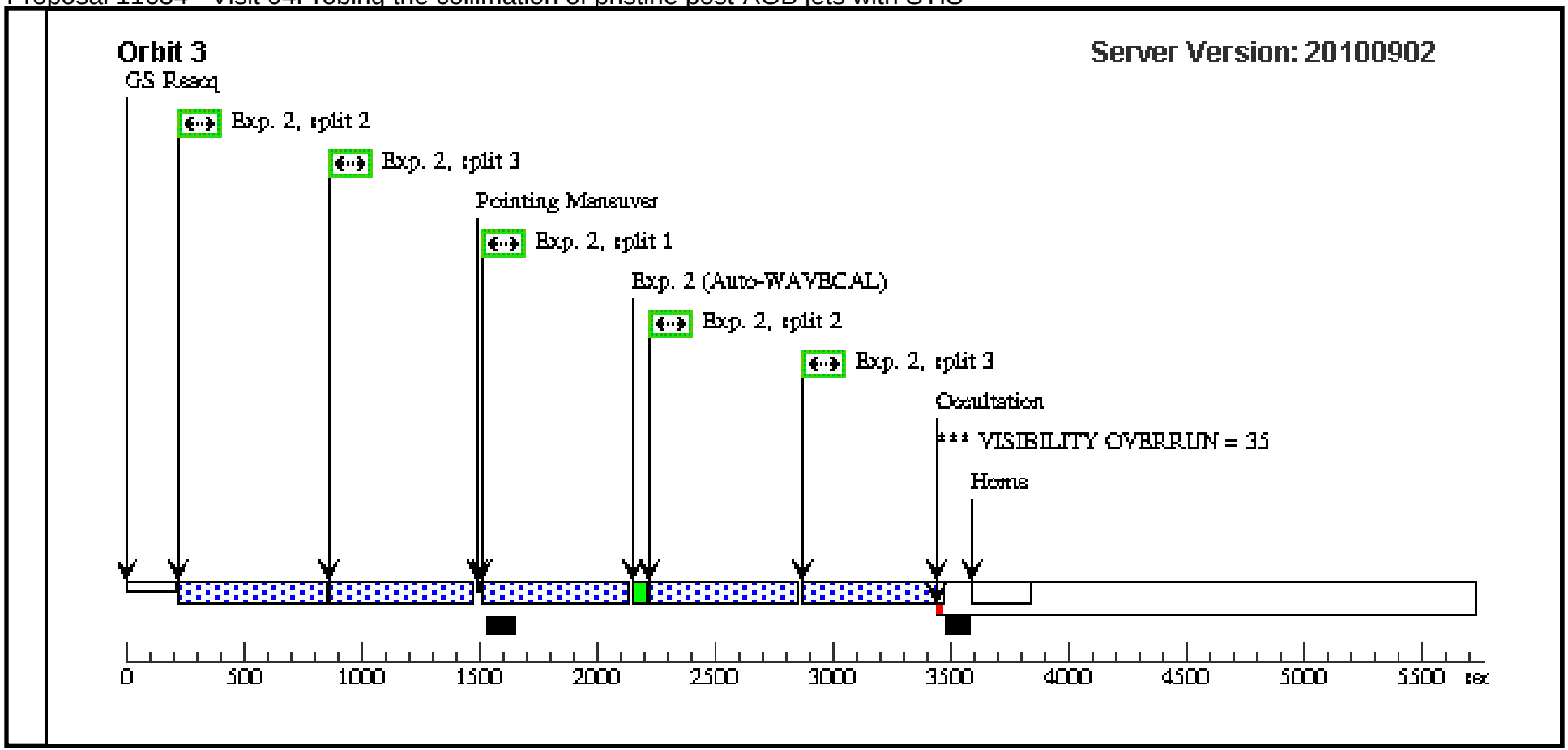
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	acq	(9) I22036-OFFSET	STIS/CCD, ACQ, 50CCD	MIRROR	ACQTYPE=POINT			0.5 Secs	
								[==>]	***[1]***
2	all_5_slits	(4) IRAS22036	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=3	POS TARG -0.4,0.	Pattern 3, Exps 2-2 in Visit 04 (3)	1600 Secs	
								[==>480.0 Secs (Pattern 1, Split 1)]	
								[==>480.0 Secs (Pattern 1, Split 2)]	
								[==>480.0 Secs (Pattern 1, Split 3)]	***[1]***
								[==>480.0 Secs (Pattern 2, Split 1)]	
								[==>465.0 Secs (Pattern 2, Split 2)]	
								[==>552.0 Secs (Pattern 2, Split 3)]	
								[==>600.0 Secs (Pattern 3, Split 1)]	
								[==>600.0 Secs (Pattern 3, Split 2)]	***[2]***
								[==>600.0 Secs (Pattern 3, Split 3)]	
								[==>576.0 Secs (Pattern 4, Split 1)]	
								[==>600.0 Secs (Pattern 4, Split 2)]	
								[==>580.0 Secs (Pattern 4, Split 3)]	
								[==>585.0 Secs (Pattern 5, Split 1)]	***[3]***
								[==>600.0 Secs (Pattern 5, Split 2)]	
								[==>560.0 Secs (Pattern 5, Split 3)]	

Comments: 5 adjacent slits spaced every 0.2arcsec; NO DITHER

Orbit Structure




Orbit 2
Server Version: 20100902
GS Reacq
Exp. 2, split 3
Pointing Maneuver
Exp. 2, split 1
Exp. 2, split 2
Exp. 2, split 3
Exp. 2 (Auto-WAVECAL)
Pointing Maneuver
Exp. 2, split 1
*** VISIBILITY OVERRUN = 35
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.


Orbit 3
Server Version: 20100902
GS Reacq
Exp. 2, split 2
Exp. 2, split 3
Pointing Maneuver
Exp. 2, split 1
Exp. 2 (Auto-WAVECAL)
Exp. 2, split 2
Exp. 2, split 3
Occultation
*** VISIBILITY OVERRUN = 35
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11634, Visit 05, completed Thu Nov 04 01:02:37 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: CVZ; ORIENT 85D TO 90 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(2)
	Purpose=MOSAIC	Pattern Orientation=0.0		
	Number Of Points=5	Angle Between Sides=		
	Point Spacing=0.2	Center Pattern=false		
	Line Spacing=			

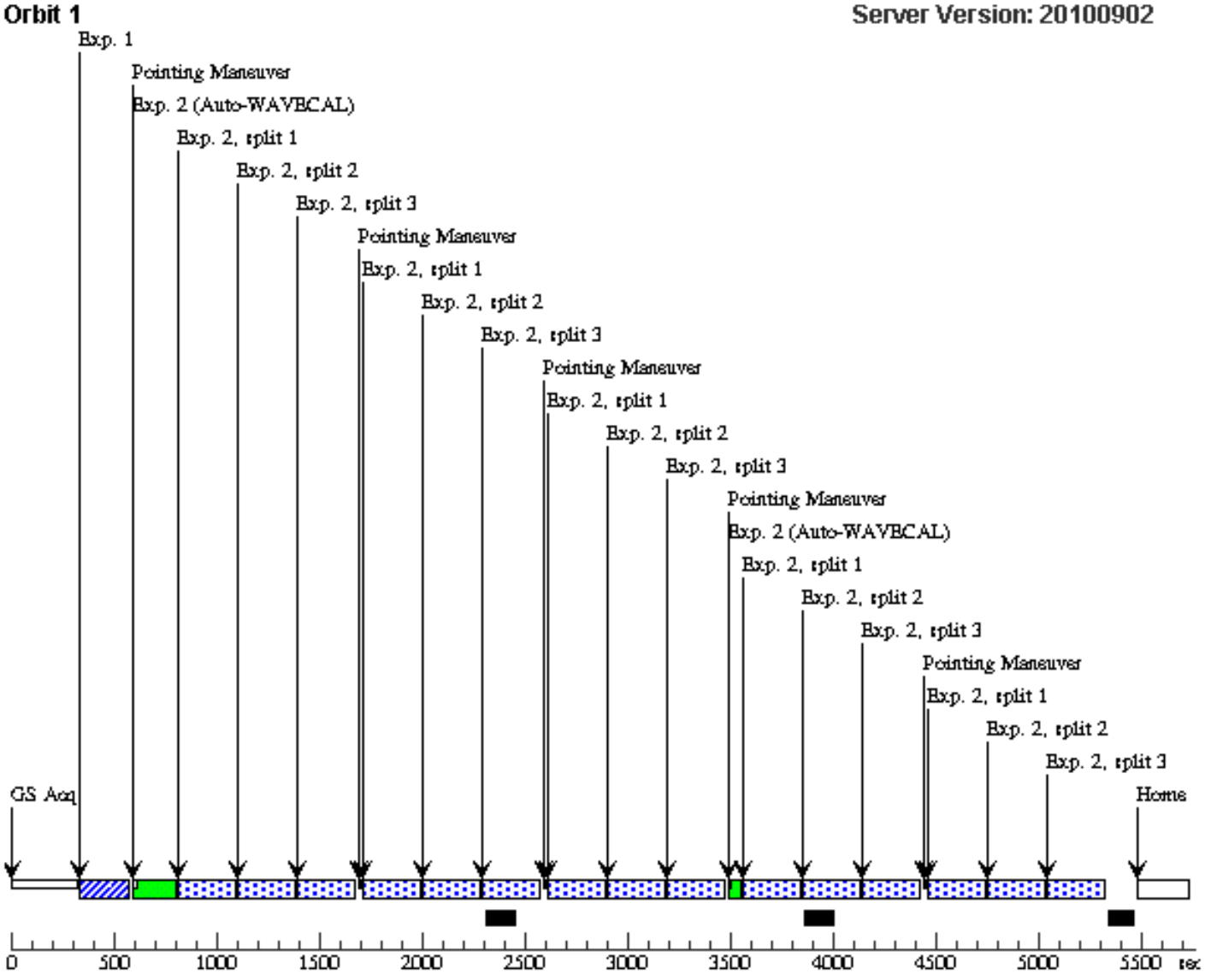
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	IRAS10197	Offset from R22-OFFSET by	Proper Motion RA: null	V=12.25+/-0.4	Offset Position (IRAS10197)
	Alt Name1: ROBERTS22	RA Offset: -1.0752800000000207 Secs	Proper Motion Dec: null		Reference Frame: ICRS
	Alt Name2: S47O000556	Dec Offset: 14.803700000038589 Arcsec	Epoch of Position:		
(10)	R22-OFFSET	RA: 10 21 34.8827 (155.3953446d)	Proper Motion RA: null	V=14.37+/-0.4	Reference Frame: ICRS
	Alt Name1: S47O016447	Dec: -58 06 2.86 (-58.10079d)	Proper Motion Dec: null		
		Equinox: J2000	Epoch of Position:		

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	acq	(10) R22-OFFSET	STIS/CCD, ACQ, 50CCD	MIRROR	ACQTYPE=POINT			0.4 Secs	
								[==>]	***[1]***
2	all_5_slits	(5) IRAS10197	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=3	POS TARG -0.4,0	Pattern 3, Exps 2-2 in Visit 05 (3)	740.1 Secs	
								[==>(Pattern 1, Split 1)]	
								[==>(Pattern 1, Split 2)]	
								[==>(Pattern 1, Split 3)]	
								[==>(Pattern 2, Split 1)]	
								[==>(Pattern 2, Split 2)]	
								[==>(Pattern 2, Split 3)]	
								[==>(Pattern 3, Split 1)]	
								[==>(Pattern 3, Split 2)]	***[1]***
								[==>(Pattern 3, Split 3)]	
								[==>(Pattern 4, Split 1)]	
								[==>(Pattern 4, Split 2)]	
								[==>(Pattern 4, Split 3)]	
								[==>(Pattern 5, Split 1)]	
								[==>(Pattern 5, Split 2)]	
								[==>(Pattern 5, Split 3)]	

Orbit Structure



Visit

Proposal 11634, Visit 06, completed Thu Nov 04 01:02:38 GMT 2010

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 170D TO 175 D

Diagnostics

(Visit 06) Warning (Orbit Planner): VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2), (5)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.225	Center Pattern=false		
	Line Spacing=			
(2)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(3), (4)
	Purpose=MOSAIC	Pattern Orientation=0.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.2	Center Pattern=false		
	Line Spacing=			

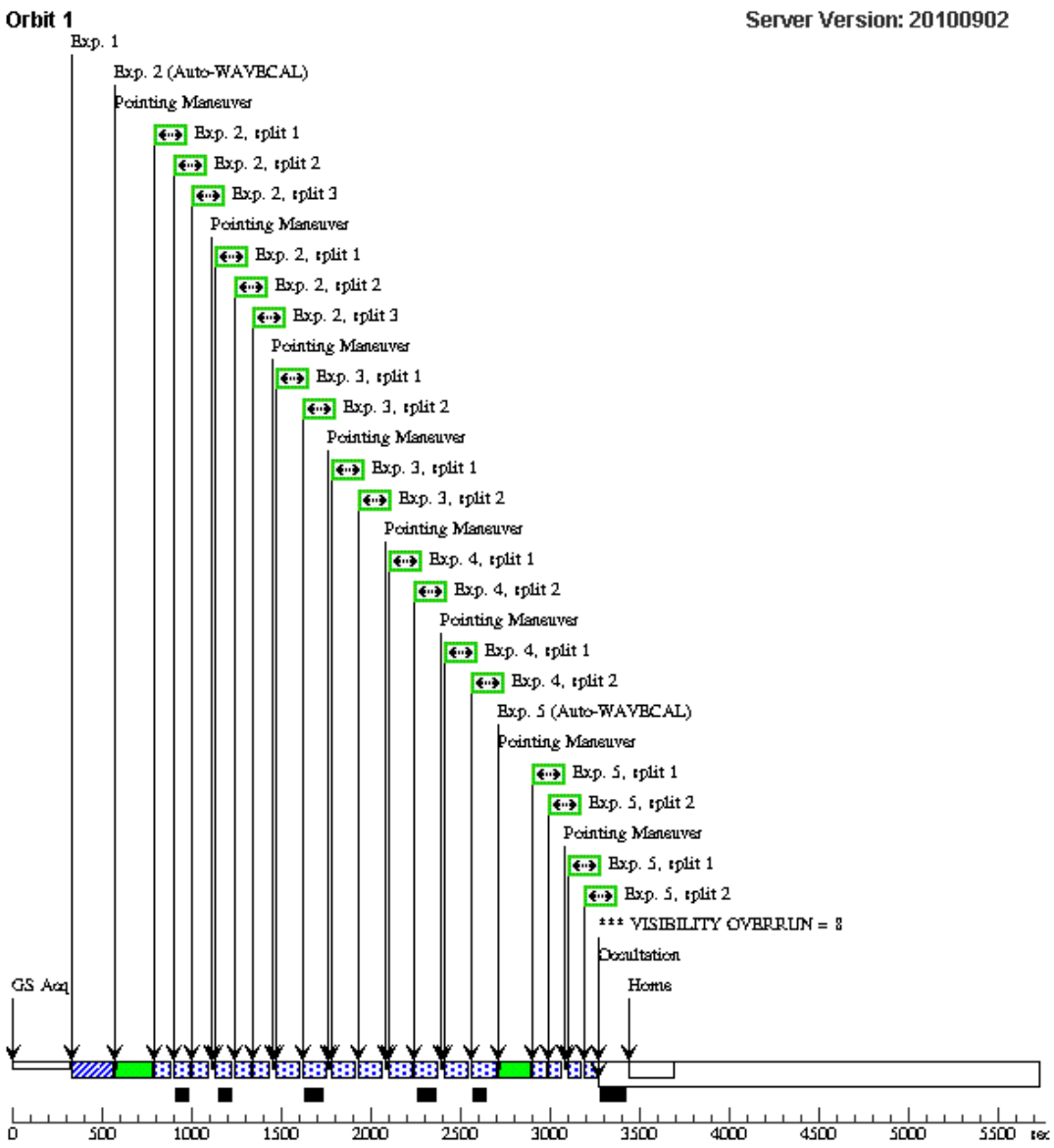
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	IRAS20462+3416	RA: 20 48 16.6197 (312.0692488d)	Proper Motion RA: null	V=10.96+/-0.05	Reference Frame: ICRS
	Alt Name1: N35N001016	Dec: +34 27 24.55 (34.45682d)	Proper Motion Dec: null		
		Equinox: J2000	Epoch of Position:		

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	acq	(6) IRAS20462+3416	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			0.1 Secs	
								[==>]	***[1]***
Comments: The bright, compact nucleus is surrounded by a much fainter reflection nebulosity.									
2	central_slit h alpha	(6) IRAS20462+3416	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=3	POS TARG 0,0.0	Pattern 1, Exps 2-2 in Visit 06 (1)	150. Secs	
								[==>60.0 Secs (Pattern 1, Split 1)] *[==>60.0 Secs (Pattern 1, Split 2)]* *[==>60.0 Secs (Pattern 1, Split 3)]* *[==>60.0 Secs (Pattern 2, Split 1)]* *[==>60.0 Secs (Pattern 2, Split 2)]* *[==>60.0 Secs (Pattern 2, Split 3)]*	***[1]***
3	pos_offset	(6) IRAS20462+3416	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2	POS TARG 0.2,0	Pattern 2, Exps 3-3 in Visit 06 (2)	180. Secs	
								[==>100.0 Secs (Pattern 1, Split 1)] *[==>100.0 Secs (Pattern 1, Split 2)]* *[==>100.0 Secs (Pattern 2, Split 1)]* *[==>100.0 Secs (Pattern 2, Split 2)]*	***[1]***
Comments: adjacent slits at positive offsets									
4	neg_offset	(6) IRAS20462+3416	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2	POS TARG -0.4,0	Pattern 2, Exps 4-4 in Visit 06 (2)	180. Secs	
								[==>100.0 Secs (Pattern 1, Split 1)] *[==>100.0 Secs (Pattern 1, Split 2)]* *[==>100.0 Secs (Pattern 2, Split 1)]* *[==>100.0 Secs (Pattern 2, Split 2)]*	***[1]***
5	central_slit h beta	(6) IRAS20462+3416	STIS/CCD, ACCUM, 52X0.2	G430L 4300 A	CR-SPLIT=2	POS TARG 0,0.0	Pattern 1, Exps 5-5 in Visit 06 (1)	60. Secs	
								[==>44.0 Secs (Pattern 1, Split 1)] *[==>40.0 Secs (Pattern 1, Split 2)]* *[==>40.0 Secs (Pattern 2, Split 1)]* *[==>40.0 Secs (Pattern 2, Split 2)]*	***[1]***

Orbit Structure



Visit

Proposal 11634, Visit 07, completed Thu Nov 04 01:02:38 GMT 2010

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 176D TO 178 D

Diagnostics

(Visit 07) Warning (Orbit Planner): VISIBILITY OVERRUN

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2), (5)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.225	Center Pattern=false		
	Line Spacing=			
(2)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(3), (4)
	Purpose=MOSAIC	Pattern Orientation=0.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.2	Center Pattern=false		
	Line Spacing=			

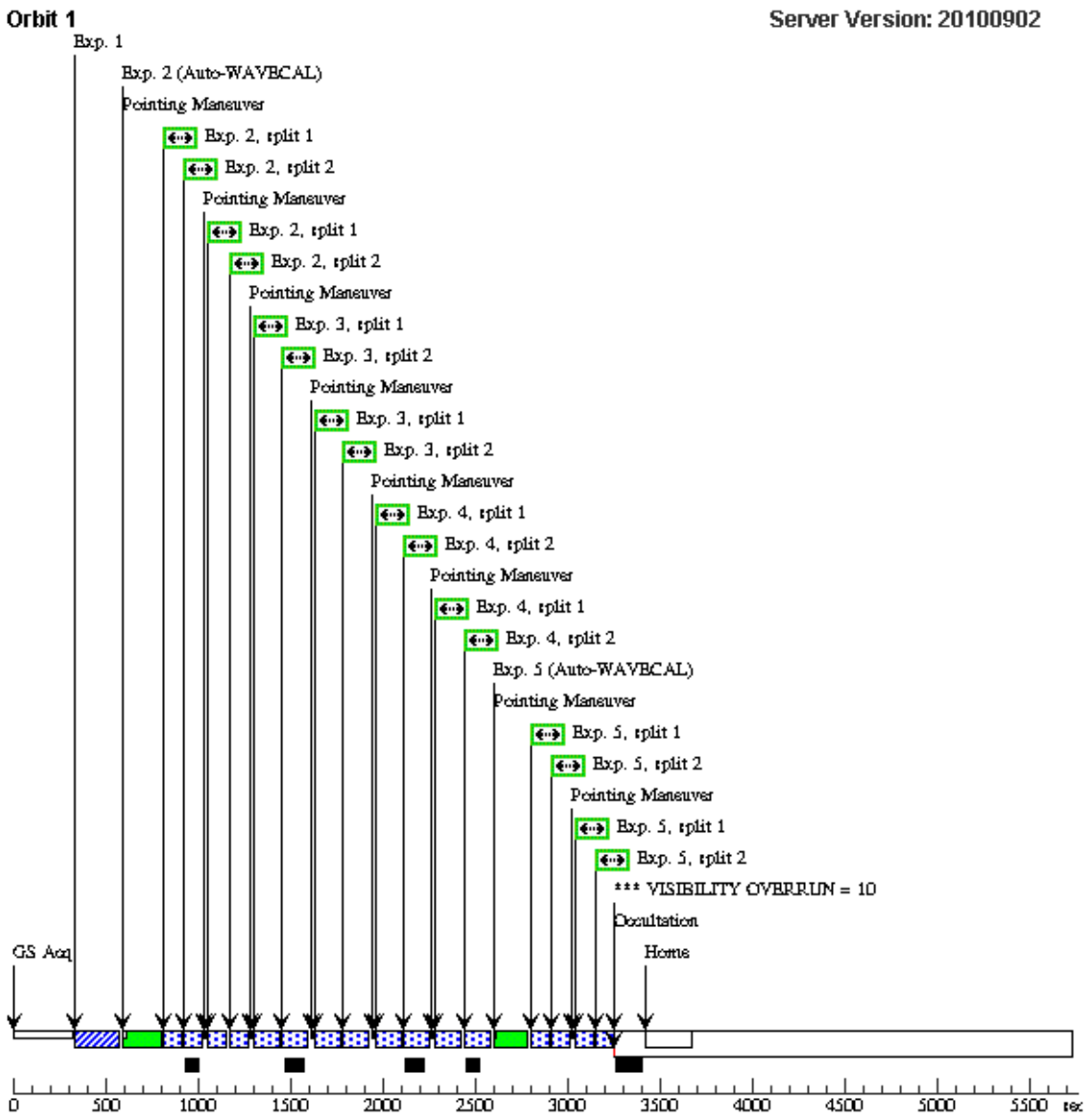
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	IRAS19343	Offset from M192-OFFSET by	Proper Motion RA: null	V=11.0+/-0.4	Offset Position (IRAS19343)
	Alt Name1: M1-92	RA Offset: 1.2996099999963917 Secs	Proper Motion Dec: null		Reference Frame: ICRS
	Alt Name2: N2FF000650	Dec Offset: -1.4854000000696033 Arcsec	Epoch of Position:		
(11)	M192-OFFSET	RA: 19 36 17.6146 (294.0733942d)	Proper Motion RA: null	V=14.5+/-0.7	Reference Frame: ICRS
	Alt Name1: N2FF000649	Dec: +29 32 51.53 (29.54765d)	Proper Motion Dec: null		
	Alt Name2: 1195-0380996	Equinox: J2000	Epoch of Position:		

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	acq-offset	(11) M192-OFFSET	STIS/CCD, ACQ, 50CCD	MIRROR	ACQTYPE=POINT			0.4 Secs	
								[==>]	***[1]***
2	central_slit h alpha	(8) IRAS19343	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in Visit 07 (1)	100. Secs	
								[==>65.0 Secs (Pattern 1, Split 1)] *[==>65.0 Secs (Pattern 1, Split 2)]* *[==>65.0 Secs (Pattern 2, Split 1)]* *[==>65.0 Secs (Pattern 2, Split 2)]*	***[1]***
3	pos_offset	(8) IRAS19343	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2	POS TARG 0.2,0	Pattern 2, Exps 3-3 in Visit 07 (2)	200. Secs	
								[==>109.0 Secs (Pattern 1, Split 1)] *[==>109.0 Secs (Pattern 1, Split 2)]* *[==>103.0 Secs (Pattern 2, Split 1)]* *[==>109.0 Secs (Pattern 2, Split 2)]*	***[1]***
4	neg_offset	(8) IRAS19343	STIS/CCD, ACCUM, 52X0.2	G750M 6768 A	CR-SPLIT=2	POS TARG -0.4,0.	Pattern 2, Exps 4-4 in Visit 07 (2)	200. Secs	
								[==>106.0 Secs (Pattern 1, Split 1)] *[==>109.0 Secs (Pattern 1, Split 2)]* *[==>109.0 Secs (Pattern 2, Split 1)]* *[==>109.0 Secs (Pattern 2, Split 2)]*	***[1]***
5	central_slit h beta	(8) IRAS19343	STIS/CCD, ACCUM, 52X0.2	G430L 4300 A	CR-SPLIT=2		Pattern 1, Exps 5-5 in Visit 07 (1)	110. Secs	
								[==>64.0 Secs (Pattern 1, Split 1)] *[==>64.0 Secs (Pattern 1, Split 2)]* *[==>64.0 Secs (Pattern 2, Split 1)]* *[==>64.0 Secs (Pattern 2, Split 2)]*	***[1]***

Orbit Structure



Visit

Proposal 11634, Visit 08, completed Thu Nov 04 01:02:39 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 359D TO 1 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(3), (6)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.225	Center Pattern=false		
	Line Spacing=			
(4)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(4), (5)
	Purpose=MOSAIC	Pattern Orientation=0.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.1	Center Pattern=false		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	IRAS08005-2356	RA: 08 02 40.7699 (120.6698746d)	Proper Motion RA: null	V=11.5+/-0.5	Reference Frame: ICRS
	Alt Name1: S5S1001027	Dec: -24 04 43.76 (-24.07882d)	Proper Motion Dec: null		
		Equinox: J2000	Epoch of Position:		

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	acq	(7) IRAS08005-2356	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=DIFFUSE; CHECKBOX=5; DIFFUSE-CENTER=FLUX-CENTROID			0.3 Secs *[==>]*	***[1]***
2	acq/peak	(7) IRAS08005-2356	STIS/CCD, ACQ/PEAK, 52X0.1	MIRROR				0.1 Secs *[==>]*	***[1]***
3	central_slit h alpha	(7) IRAS08005-2356	STIS/CCD, ACCUM, 52X0.1	G750M 6768 A	CR-SPLIT=2	POS TARG 0,0	Pattern 1, Exps 3-3 in Visit 08 (1)	80 Secs *[==>42.0 Secs (Pattern 1, Split 1)]* *[==>42.0 Secs (Pattern 1, Split 2)]* *[==>42.0 Secs (Pattern 2, Split 1)]* *[==>42.0 Secs (Pattern 2, Split 2)]*	***[1]***
4	pos_offset step=0.1	(7) IRAS08005-2356	STIS/CCD, ACCUM, 52X0.1	G750M 6768 A	CR-SPLIT=2	POS TARG 0.1,0.	Pattern 4, Exps 4-4 in Visit 08 (4)	160. Secs *[==>83.0 Secs (Pattern 1, Split 1)]* *[==>81.0 Secs (Pattern 1, Split 2)]* *[==>83.0 Secs (Pattern 2, Split 1)]* *[==>81.0 Secs (Pattern 2, Split 2)]*	***[1]***
5	neg_offset step=0.1	(7) IRAS08005-2356	STIS/CCD, ACCUM, 52X0.1	G750M 6768 A	CR-SPLIT=2	POS TARG -0.2,0.	Pattern 4, Exps 5-5 in Visit 08 (4)	160. Secs *[==>83.0 Secs (Pattern 1, Split 1)]* *[==>81.0 Secs (Pattern 1, Split 2)]* *[==>83.0 Secs (Pattern 2, Split 1)]* *[==>81.0 Secs (Pattern 2, Split 2)]*	***[1]***
6	central_slit h beta	(7) IRAS08005-2356	STIS/CCD, ACCUM, 52X0.1	G430L 4300 A	CR-SPLIT=2	POS TARG 0,0	Pattern 1, Exps 6-6 in Visit 08 (1)	150. Secs *[==>77.0 Secs (Pattern 1, Split 1)]* *[==>76.0 Secs (Pattern 1, Split 2)]* *[==>77.0 Secs (Pattern 2, Split 1)]* *[==>76.0 Secs (Pattern 2, Split 2)]*	***[1]***

Orbit Structure