11229 - SEEDS: The Search for Evolution of Emission from Dust in Supernovae with HST and Spitzer

Cycle: 16, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Margaret Meixner (PI)	**Space Telescope Science Institute**	**meixner@stsci.edu**
Dr. Michael J. Barlow (CoI) (ESA Member)	University College London	mjb@star.ucl.ac.uk
Dr. Geoffrey C. Clayton (CoI)	Louisiana State University and A & M College	gclayton@fenway.phys.lsu.edu
Dr. Barbara Ercolano (CoI)	Harvard University	bercolano@head.cfa.harvard.edu
Ms. Joanna Fabbri (CoI) (ESA Member)	University College London	jfabbri@star.ucl.ac.uk
Dr. Tim M. Gledhill (CoI) (ESA Member)	University of Hertfordshire	tmg@star.herts.ac.uk
Dr. Karl D. Gordon (CoI)	University of Arizona	kgordon@as.arizona.edu
Dr. Martin J. Meyer (CoI)	Space Telescope Science Institute	martinm@stsci.edu
Dr. Nino Panagia (CoI)	Space Telescope Science Institute	panagia@stsci.edu
Dr. Angela Karen Speck (CoI)	University of Missouri - Columbia	speckan@missouri.edu
Dr. Ben E. Sugerman (CoI)	Goucher College	ben.sugerman@goucher.edu
Dr. Alexander Tielens (CoI)	NASA Ames Research Center	atielens@arc.nasa.gov
Dr. Douglas L. Welch (CoI)	McMaster University	welch@dogwood.physics.mcmaster.ca
Dr. Roger Wesson (CoI) (ESA Member)	University College London	rwesson@star.ucl.ac.uk
Dr. Michael J. Wolff (CoI)	Space Science Institute	wolff@colorado.edu
Dr. Albert Zijlstra (CoI) (ESA Member)	University of Manchester Institute of Science and Technology	a.zijlstra@umist.ac.uk

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
03	(1) SN-1999BW	WFPC2	2	18-Jan-2008 04:44:00.0	yes
04	(1) SN-1999BW	NIC2	1	18-Jan-2008 04:44:08.0	yes
05	(5) SN-2003GD	WFPC2	2	18-Jan-2008 04:44:14.0	yes
06	(5) SN-2003GD	NIC2	1	18-Jan-2008 04:44:23.0	yes
07	(4) SN-2002HH	WFPC2	3	18-Jan-2008 04:44:30.0	yes
08	(4) SN-2002HH	NIC2	1	18-Jan-2008 04:44:37.0	yes
13	(7) SN-2004DJ	WFPC2	2	18-Jan-2008 04:44:41.0	yes
14	(7) SN-2004DJ	NIC2	1	18-Jan-2008 04:44:47.0	yes
21	(7) SN-2004DJ	WFPC2	2	18-Jan-2008 04:44:54.0	yes
22	(7) SN-2004DJ	NIC2	1	18-Jan-2008 04:45:00.0	yes
15	(8) SN-2004ET	WFPC2	2	18-Jan-2008 04:45:05.0	yes
16	(8) SN-2004ET	NIC2	1	18-Jan-2008 04:45:11.0	yes
23	(8) SN-2004ET	WFPC2	2	18-Jan-2008 04:45:15.0	yes
24	(8) SN-2004ET	NIC2	1	18-Jan-2008 04:45:23.0	yes
17	(9) SN-2005CS	WFPC2	2	18-Jan-2008 04:45:27.0	yes
18	(9) SN-2005CS	NIC2	1	18-Jan-2008 04:45:33.0	yes
25	(9) SN-2005CS	WFPC2	2	18-Jan-2008 04:45:38.0	yes
26	(9) SN-2005CS	NIC2	1	18-Jan-2008 04:45:46.0	yes
19	(10) SN-2006BC	WFPC2	2	18-Jan-2008 04:45:51.0	yes
20	(10) SN-2006BC	NIC2	1	18-Jan-2008 04:45:56.0	yes
27	(10) SN-2006BC	WFPC2	2	18-Jan-2008 04:46:00.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
28	(10) SN-2006BC	NIC2	1	18-Jan-2008 04:46:06.0	yes

34 Total Orbits Used

ABSTRACT

The role that massive stars play in the dust content of the Universe is extremely uncertain. It has long been hypothesized that dust can condense within the ejecta of supernovae (SNe), however there is a frustrating discrepancy between the amounts of dust found in the early Universe, or predicted by nucleation theory, and inferred from SN observations. Our SEEDS collaboration has been carefully revisiting the observational case for dust formation by core-collapse SNe, in order to quantify their role as dust contributors in the early Universe. As dust condenses in expanding SN ejecta, it will increase in optical depth, producing three simultaneously observable phenomena: (1) increasing optical extinction; (2) infrared (IR) excesses; and (3) asymmetric blue-shifted emission lines. Our SEEDS collaboration recently reported all three phenomena occuring in SN2003gd, demonstrating the success of our observing strategy, and permitting us to derive a dust mass of up to 0.02 solar masses created in the SN. To advance our understanding of the origin and evolution of the interstellar dust in galaxies, we propose to use HST's WFPC2 and NICMOS instruments plus Spitzer's photometric instruments to monitor ten recent core-collapse SNe for dust formation and, as a bonus, detect light echoes that can affect the dust mass estimates. These space-borne observations will be supplemented by ground-based spectroscopic monitoring of their optical emission line profiles. These observations would continue our 2-year HST and Spitzer monitoring of this phenomena in order to address two key questions: Do all SNe produce dust? and How much dust do they produce? As all the SN are witin 15 Mpc, each SN stands an excellent chance of detection with HST and Spitzer and of resolving potential light echoes.

OBSERVING DESCRIPTION

The combined use ofWFPC2 and NICMOS on HST and IRAC, IRS PUI 16-?m and MIPS 24-?m on Spitzer will allow us to derive a single SED extending from the optical to mid-infrared for each target at each epoch. Contemporaneous optical and infra-red photometry will make it possible to distinguish between dust condensing in the supernova ejecta and emission from previously existing dust, and it is therefore crucial that the data be temporally homogeneous. As a bonus, we will be able to resolve SNe light echoes that can affect the dust mass estimates because photometry of an

unresolved light echo will cause the optical photometry in a SNe light curve to appear brighter than expected.

We propose to observe each target two times in HST Cycle 16/SST Cycle 4, as accommodated by their visibility windows and as can be coordinated between the telescopes, except for our three oldest targets which, as their fluxes are not expected to change substantially over the course of a year at this late stage in their evolution, we will observe only once. Each Spitzer/Hubble set of observations of a given object will need to be carried out within 30 days of each other. Where two sets of observations are to be carried out, these will need to be separated by approximately six months. The HST strategy is described below and the Spitzer observations are described in the coordinated observations section of this proposal.

HST Observing Strategy

We use SN 2003gd as a template to guide the observing strategy because it had a detected light echo and a measurable drop in flux over a 6 month timescale in both the visible and mid-infrared. We propose to use the WFPC2/PC in three broad-band filters (F450W, F606W, F814W) and the NICMOS/NIC2 in three broad-band filters (F110W, F160W, F205W), thereby providing the necessary flux and colors to constrain the dust properties as well as its 3-D positions should a light echo be detected. PSF-matched difference imaging, which can provide up to a tenfold increase in sensitivity over direct photometry, will be used to detect faint signals since two epochs will be available. Since we require (1) accurate photometry of the SNe, (2) images free from cosmic rays and warm pixels, and (3) the highest resolution possible, we will use a 4-step dither on all observations, which is optimal at rejecting bad pixels while minimizing overhead. These data will be resampled using multidrizzle to further increase the resolution when searching for faint echo signal close to the PSF of the SN. Our choices of filters, visits, and exposure times have been made to use the smallest number of orbits while maximizing the scientific content of our data. Since our first goal is to monitor the light curves of each object (with the exception of the three older supernovae), we will observe each SN two times during Cycle 16, with each visit separated by at least 6 months as allowed
by scheduling constraints. A six month time scale is adequate to measure a change in flux and a movement of a light echo which, at the distances of our targets, travel across the sky as slow as 0.001 yr?1.

Based on our previous observations of SN 2003gd we find that the flux in a SN may drop by a factor of 10 or 2.5 magnitudes over a 6 month period

of time but the light echo develops which is brighter, 21 magnitue per sq. arcsecond for SN 2003gd. Using theWFPC2/PC ETC, we estimate total exposure times of 2500 sec in F450W(B), 1000 sec in F606W(V) and 2000 sec in F814W(I) in order to obtain a SNR of 7 for for SNe with B=27, V =27.0, and I=26.0, respectively for a total of 5500 sec. These integration times provide a SN ratio of 2 per pixel for a light echo of 24 mag. per sq. arcsecond surface brightness. Using the model SED for SN 2003gd, we estimate time for two flux values, 2 ?Jy and 40 ?Jy at 1.0 micron and assume a blackbody shape with a temperature of 3000 K to approximate the flux in all three NICMOS/NIC2 bands. Using the NICMOS ETC for the NIC2 camera, a SNR of 20 for the fainter flux value of 2 ?Jy is obtained with exposure times
of 200 sec in F110W, 200 sec in F160W, and 500 sec in F205W, for a total exposure time of 900 seconds for NICMOS. Assuming a 4 point dither pattern, filter changes and guide star acquisition overheads, we estimate that we can just fit these WFPC2 and NICMOS observations into two orbits. Thus, we estimate two orbits per epoch measurement of the SN, or 4 orbits total per SN.

Special Requirements

The HST and Spitzer observations should be scheduled within one month of each other and it does not matter which comes first.

Coordinated Observations:

We will primarily use 8?m IRAC, 16?m IRS blue PUI and 24?m MIPS photometry, in conjunction with HST optical and near-infrared photometry, to characterise the SEDs.

Visit

Proposal 11229, Visit 03, implementation Fri Jan 18 09:46:10 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

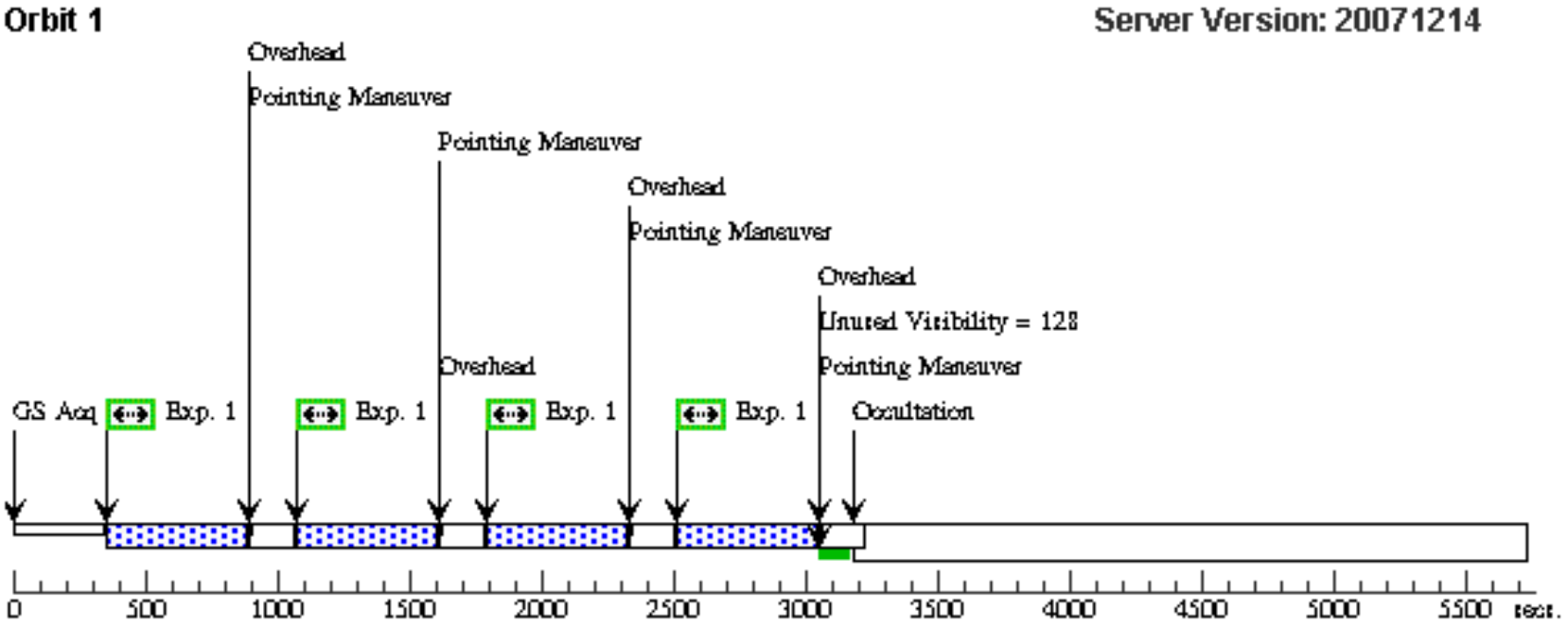
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN-1999BW	RA: 10 19 46.8000 (154.9450000d)		V=24	Reference Frame: ICRS
		Dec: +45 31 35.00 (45.52639d)			
		Equinox: J2000			

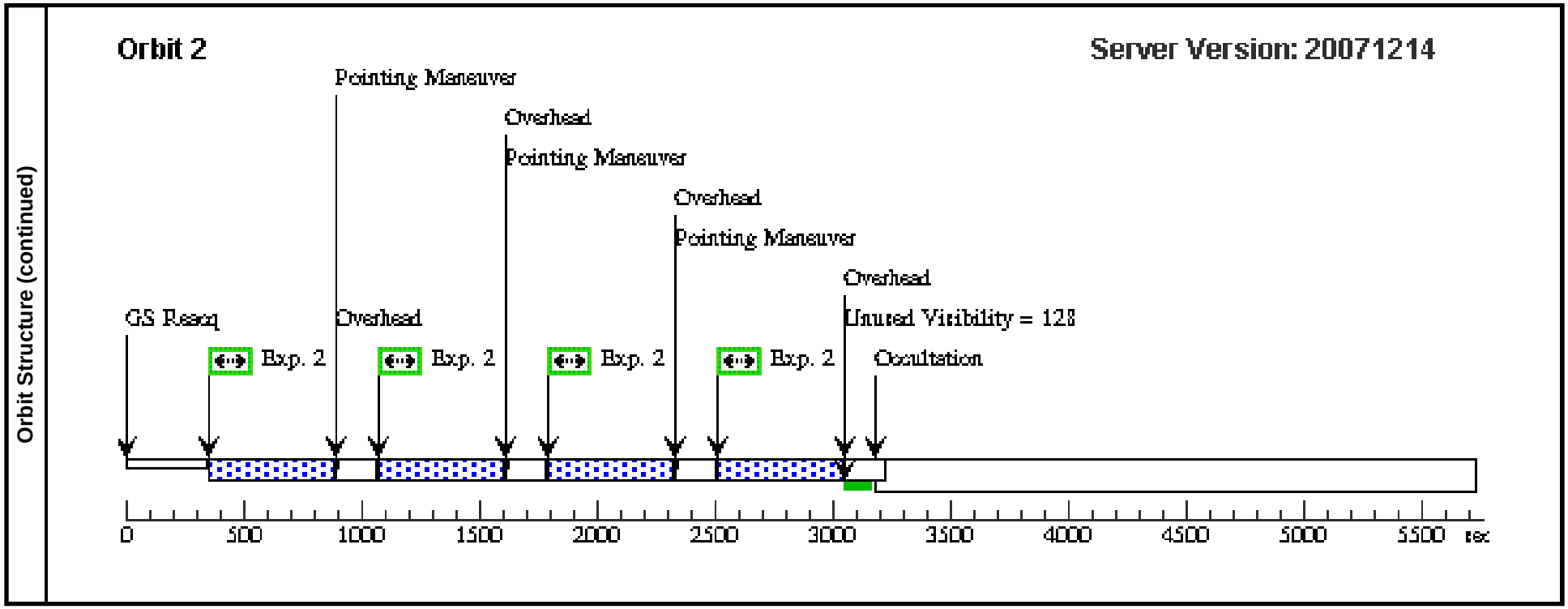
Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(1) SN-1999BW	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(1) SN-1999BW	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20071214
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
GS Reacq
Overhead
Unused Visibility = 128
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11229, Visit 04, implementation Fri Jan 18 09:46:11 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 03 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

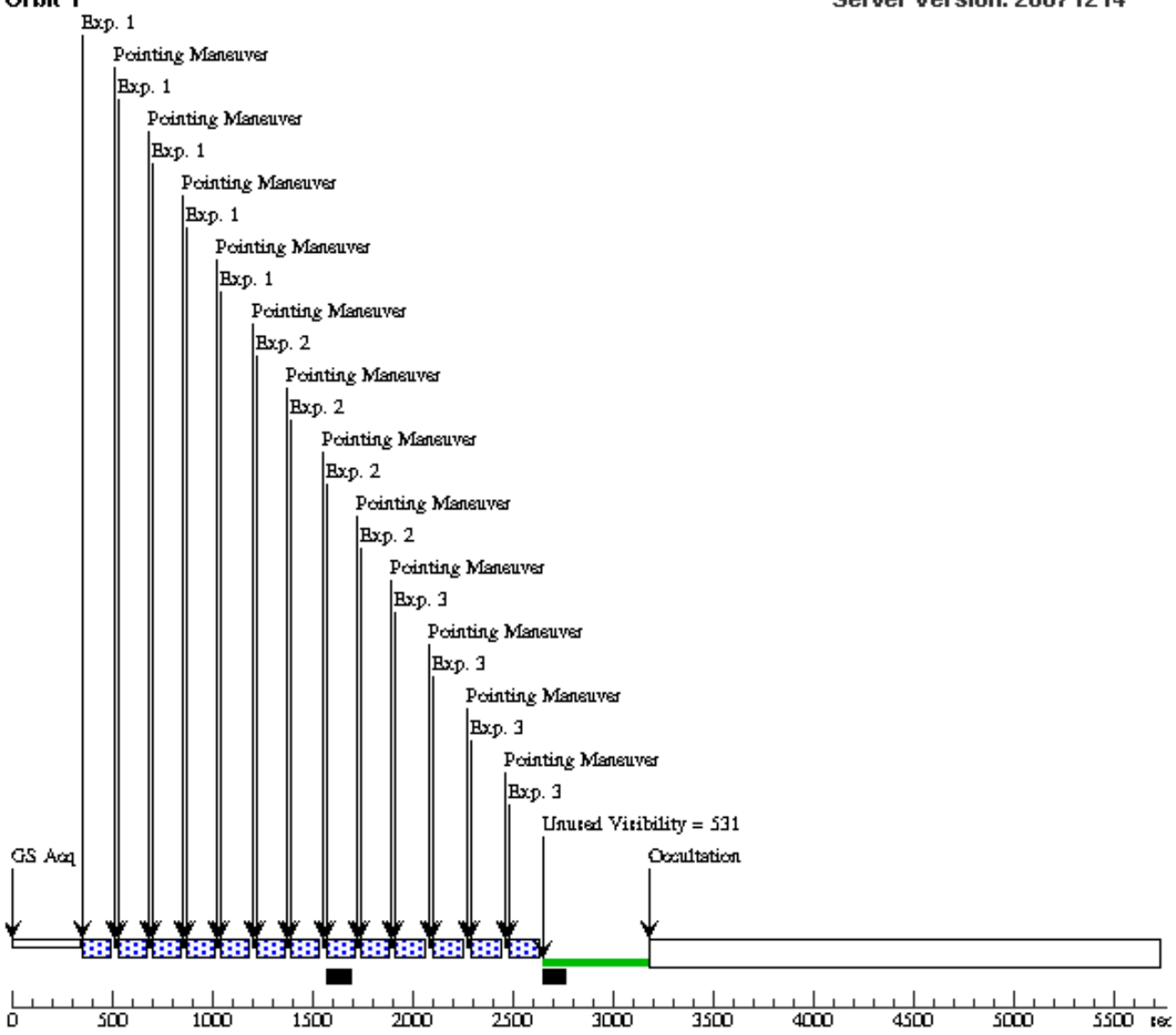
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN-1999BW	RA: 10 19 46.8000 (154.9450000d) Dec: +45 31 35.00 (45.52639d) Equinox: J2000		V=24	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) SN-1999BW	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(1) SN-1999BW	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(1) SN-1999BW	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 05, implementation Fri Jan 18 09:46:12 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

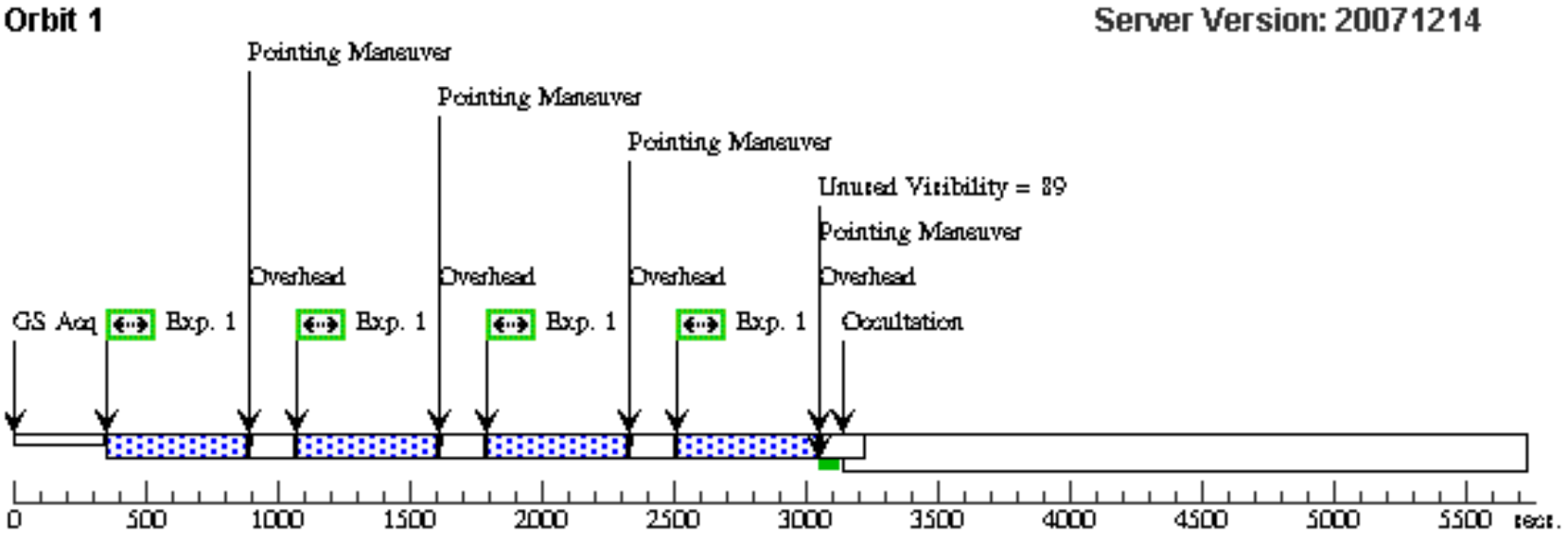
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	SN-2003GD	RA: 01 36 42.6000 (24.1775000d)		V=23	Reference Frame: ICRS
		Dec: +15 44 20.00 (15.73889d)			
		Equinox: J2000			

Comments: This object was generated by the targetselector and retrieved from the NED database.

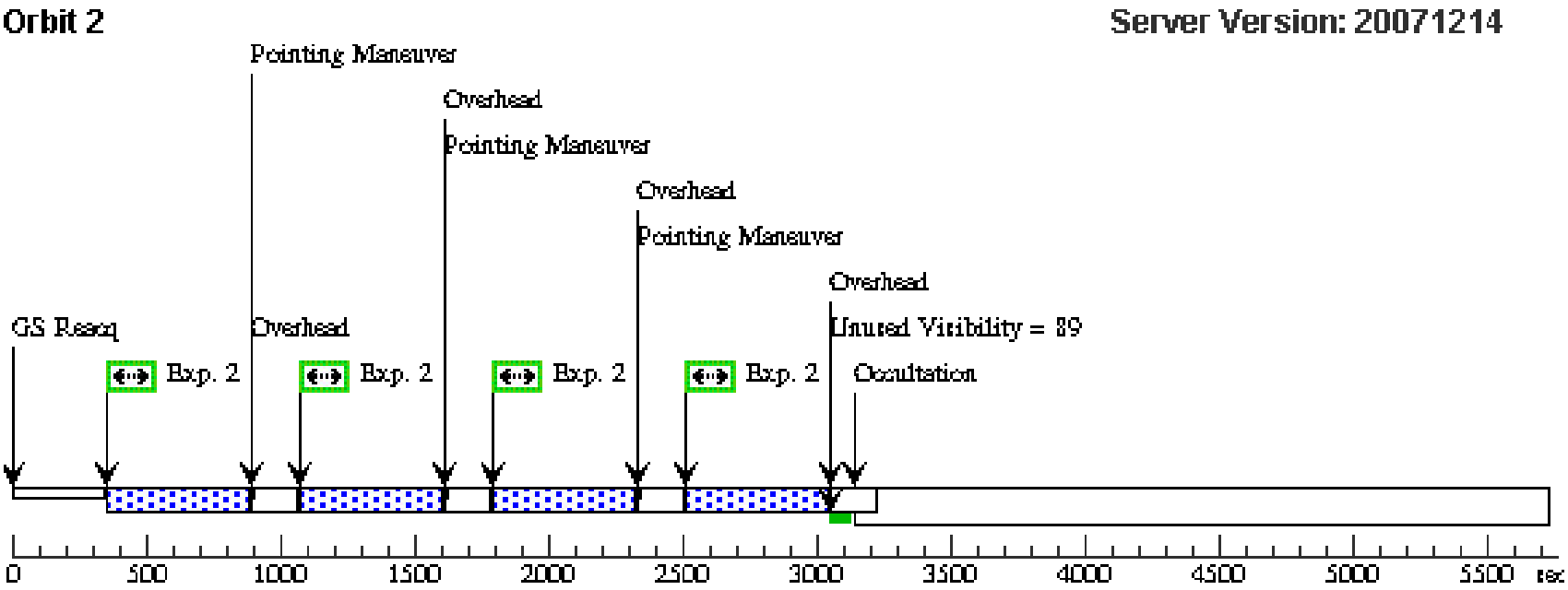
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(5) SN-2003GD	WFPC2, IMAGE, PC1	F622W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(5) SN-2003GD	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure



Orbit Structure (continued)



Visit

Proposal 11229, Visit 06, implementation Fri Jan 18 09:46:13 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 05 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

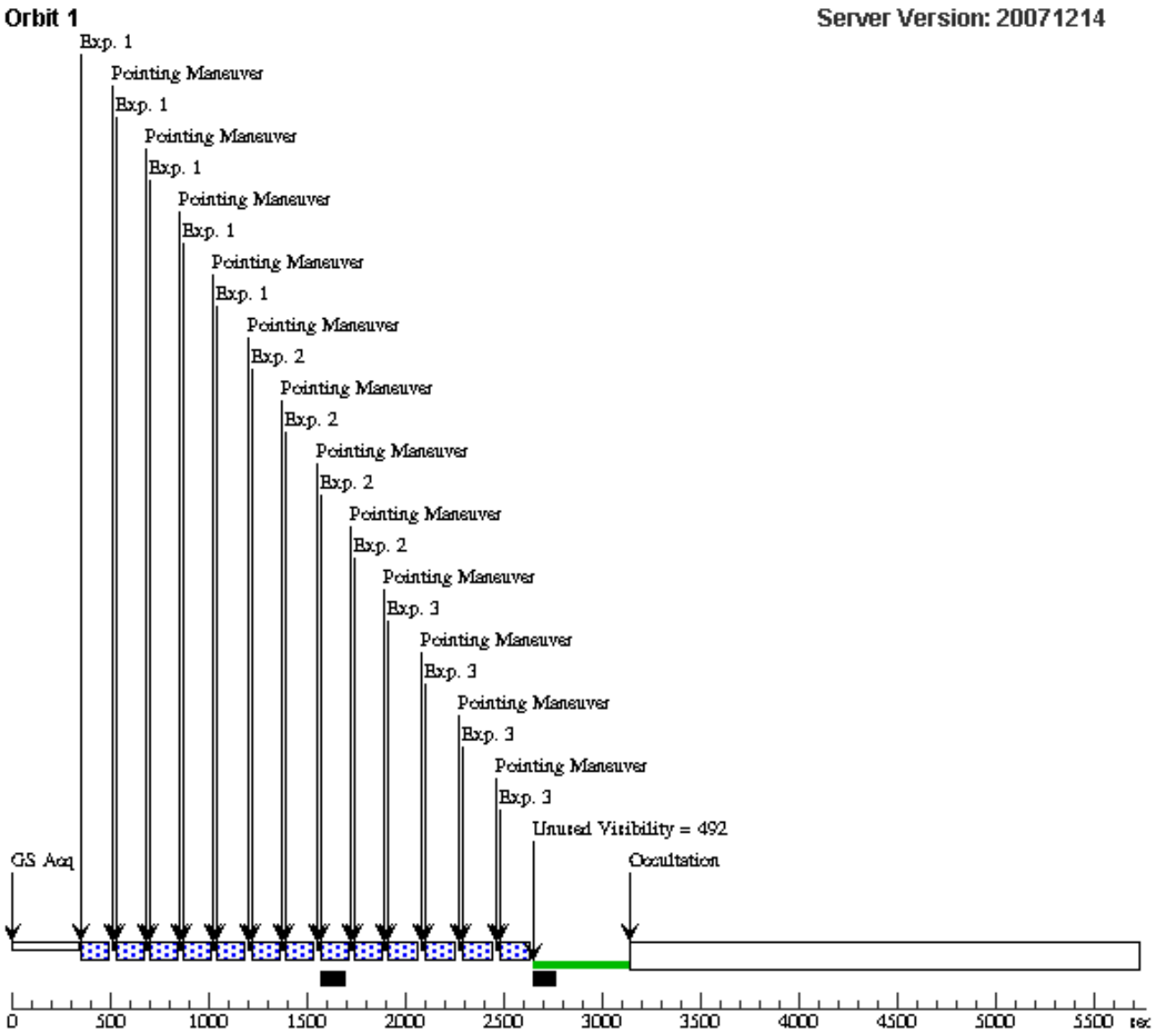
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	SN-2003GD	RA: 01 36 42.6000 (24.1775000d) Dec: +15 44 20.00 (15.73889d) Equinox: J2000		V=23	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(5) SN-2003GD	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(5) SN-2003GD	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(5) SN-2003GD	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 07, implementation Fri Jan 18 09:46:13 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2), (3)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

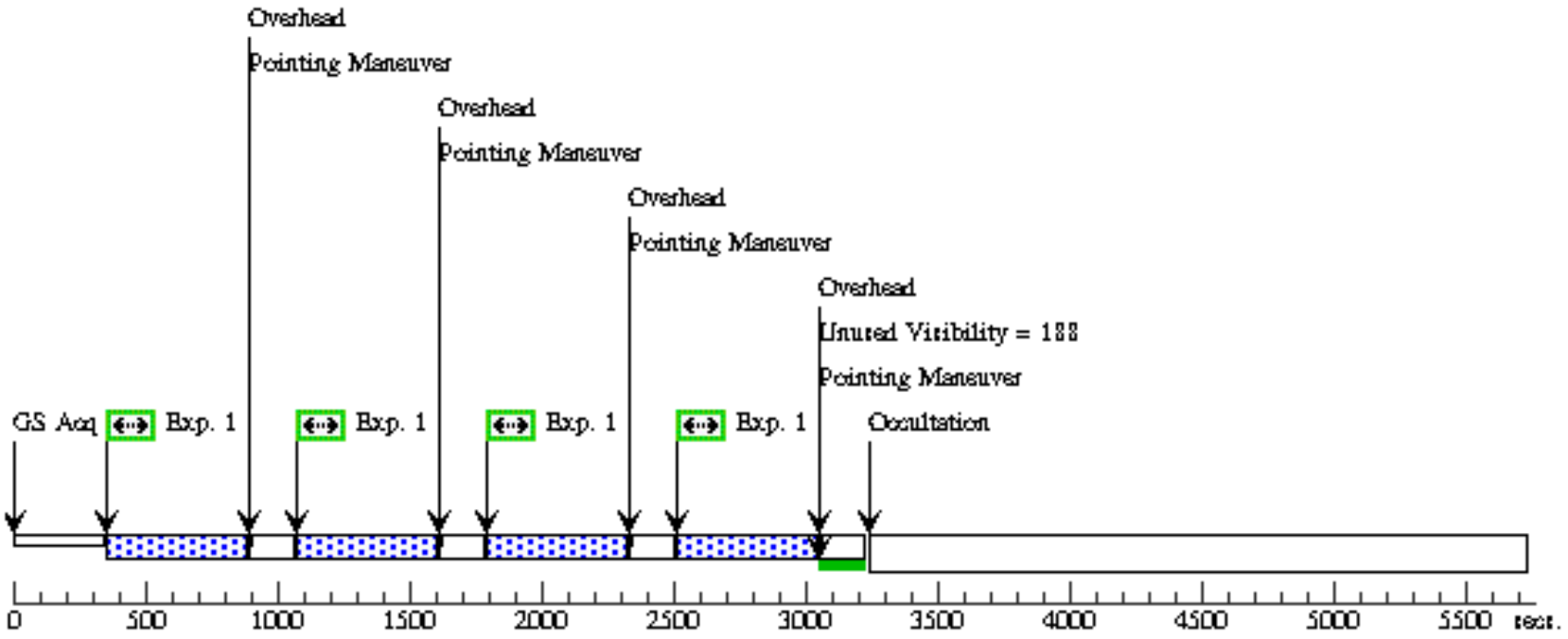
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SN-2002HH	RA: 20 34 44.3000 (308.6845833d)		V=23	Reference Frame: ICRS
		Dec: +60 07 19.00 (60.12194d)			
		Equinox: J2000			

Comments: This object was generated by the targetselector and retrieved from the NED database.

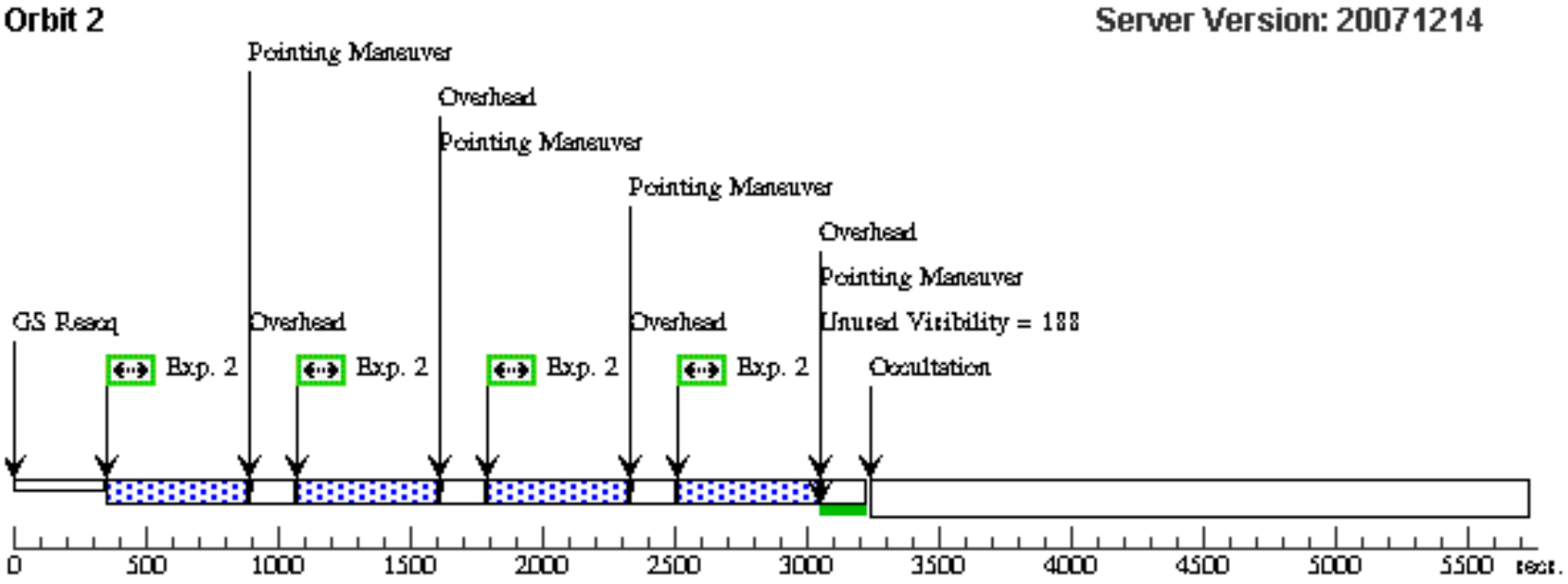
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(4) SN-2002HH	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(4) SN-2002HH	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
3	Exposure 2 1,0	(4) SN-2002HH	WFPC2, IMAGE, PC1	F450W			Pattern 3-3 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[3]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

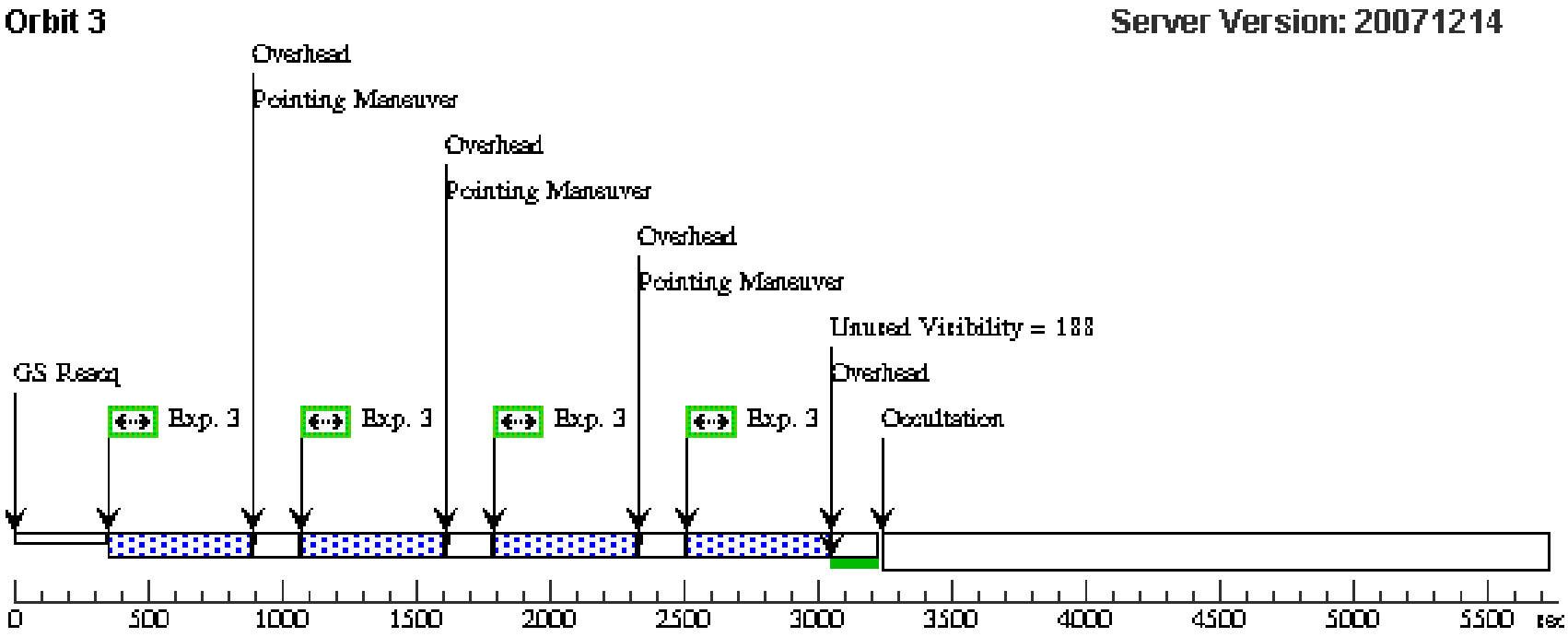
Orbit Structure



Orbit Structure (continued)



Orbit Structure (continued)



Visit

Proposal 11229, Visit 08, implementation Fri Jan 18 09:46:14 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 07 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

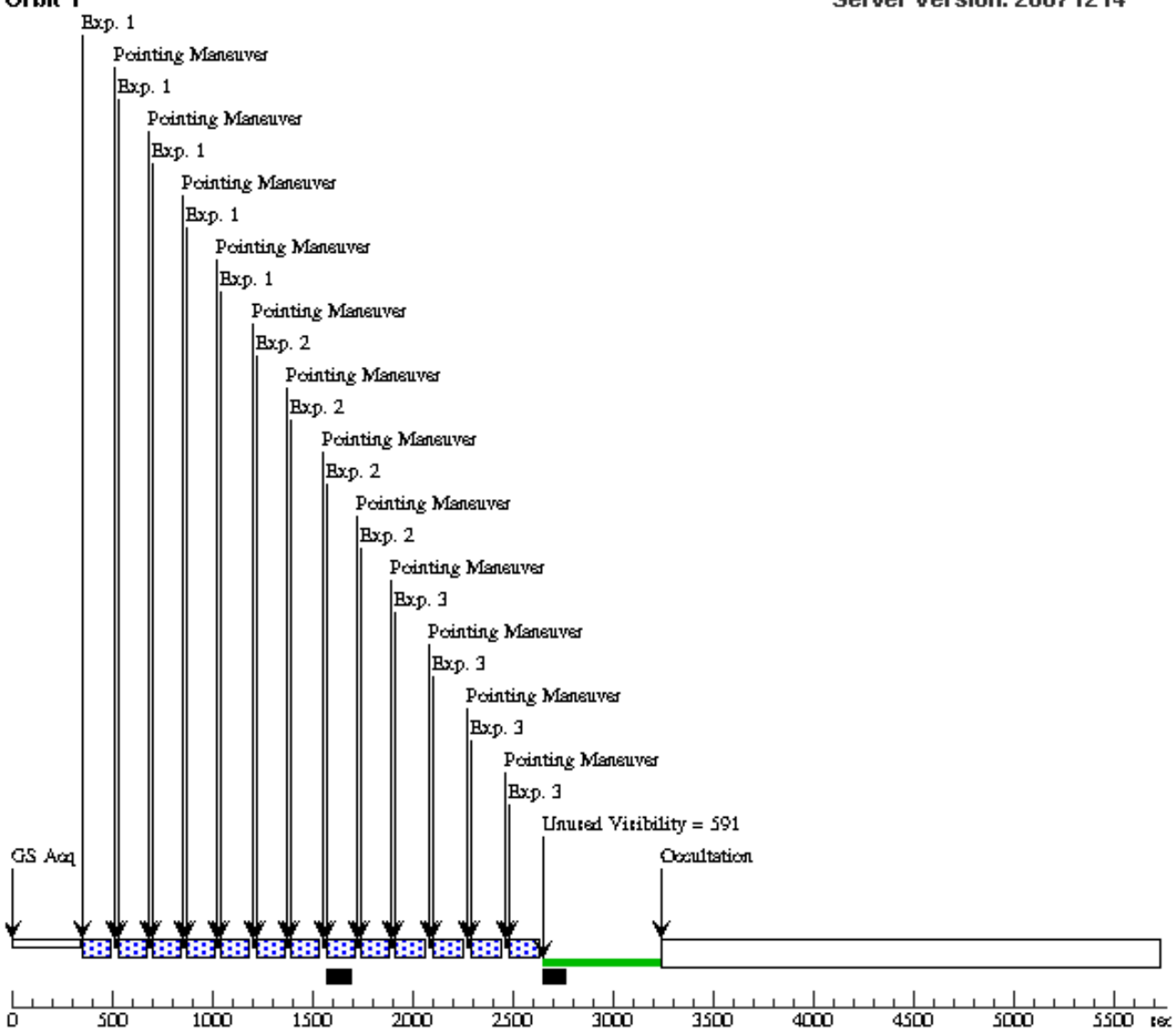
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SN-2002HH	RA: 20 34 44.3000 (308.6845833d) Dec: +60 07 19.00 (60.12194d) Equinox: J2000		V=23	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(4) SN-2002HH	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(4) SN-2002HH	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(4) SN-2002HH	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 13, implementation Fri Jan 18 09:46:14 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

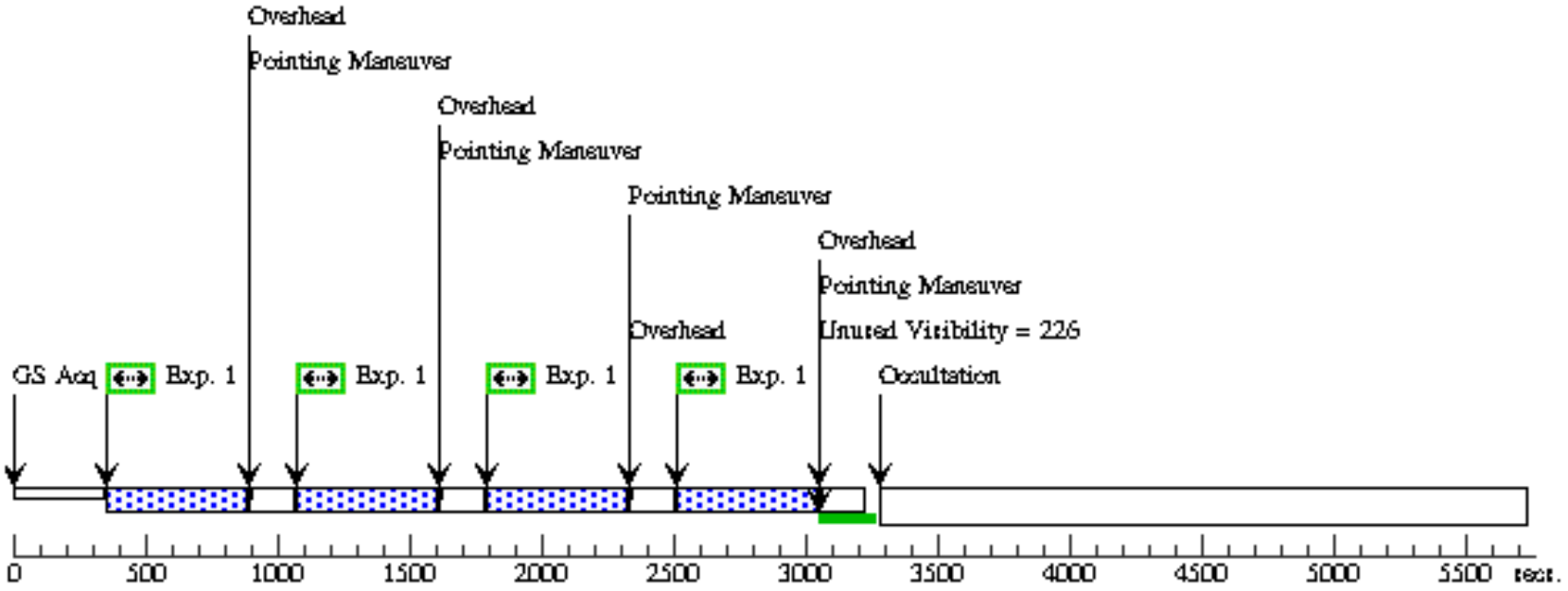
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	SN-2004DJ	RA: 07 37 17.0000 (114.3208333d)		V=22	Reference Frame: ICRS
		Dec: +65 35 58.00 (65.59944d)			
		Equinox: J2000			

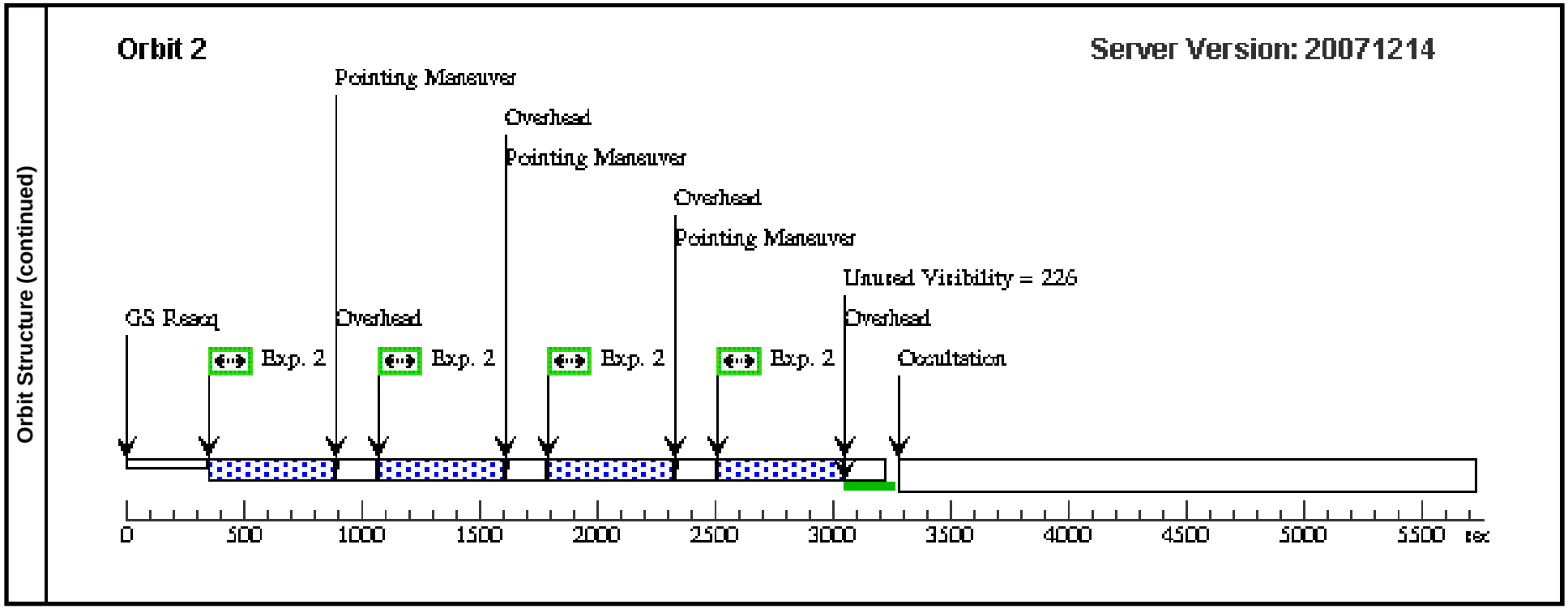
Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(7) SN-2004DJ	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(7) SN-2004DJ	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20071214
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Unused Visibility = 226
GS Reacq
Overhead
Overhead
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11229, Visit 14, implementation Fri Jan 18 09:46:15 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 13 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

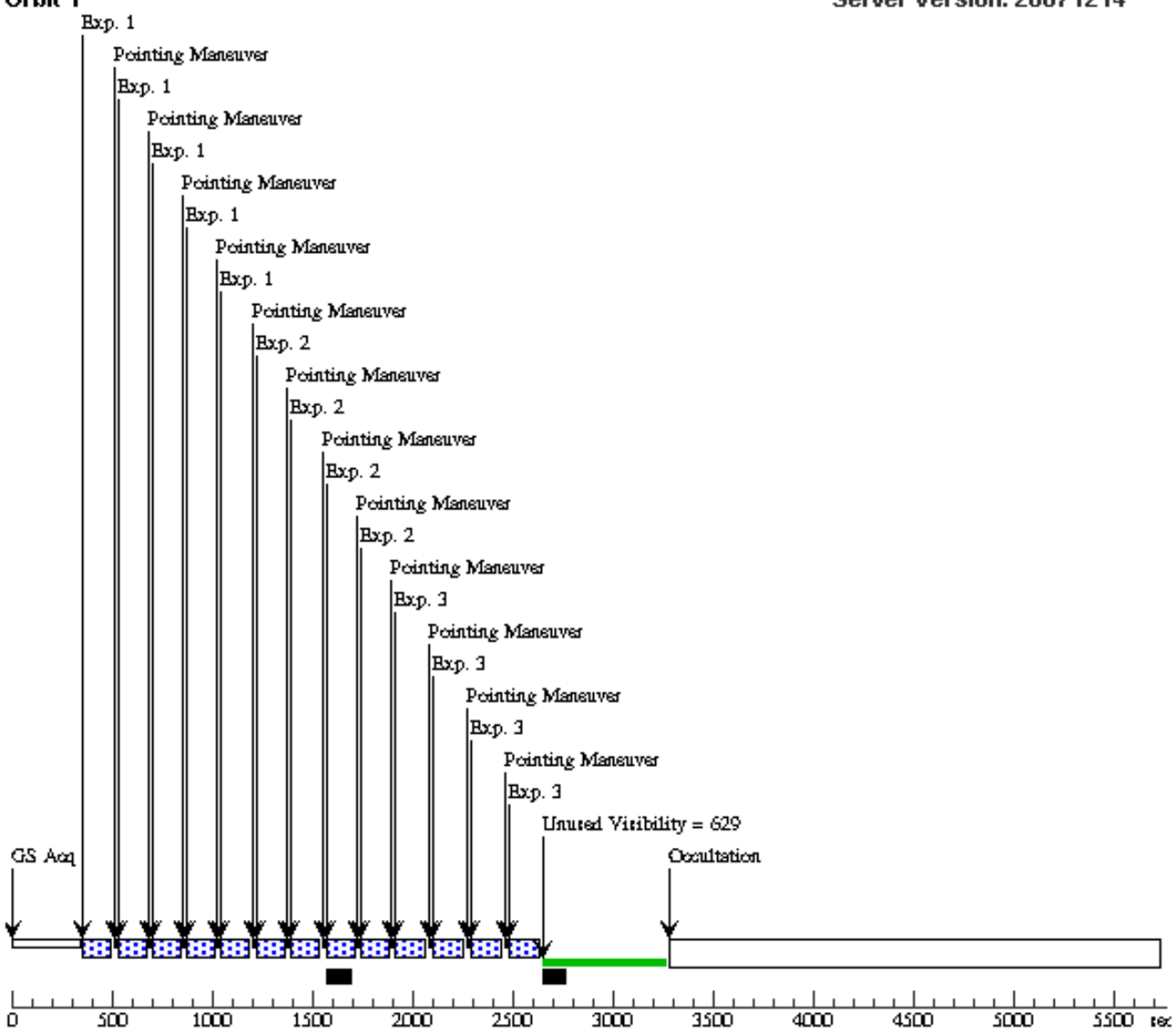
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	SN-2004DJ	RA: 07 37 17.0000 (114.3208333d) Dec: +65 35 58.00 (65.59944d) Equinox: J2000		V=22	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(7) SN-2004DJ	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(7) SN-2004DJ	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(7) SN-2004DJ	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 21, implementation Fri Jan 18 09:46:15 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: AFTER 13 BY 150.0 D TO 250.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

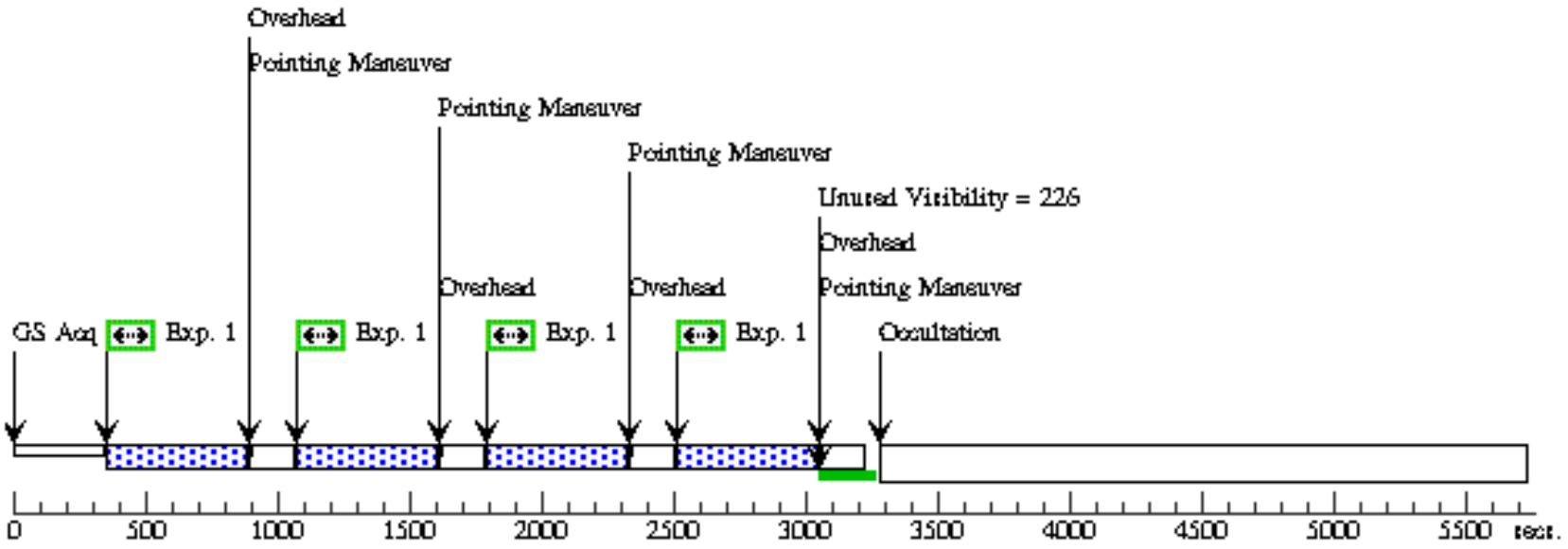
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	SN-2004DJ	RA: 07 37 17.0000 (114.3208333d)		V=22	Reference Frame: ICRS
		Dec: +65 35 58.00 (65.59944d)			
		Equinox: J2000			

Comments: This object was generated by the targetselector and retrieved from the NED database.

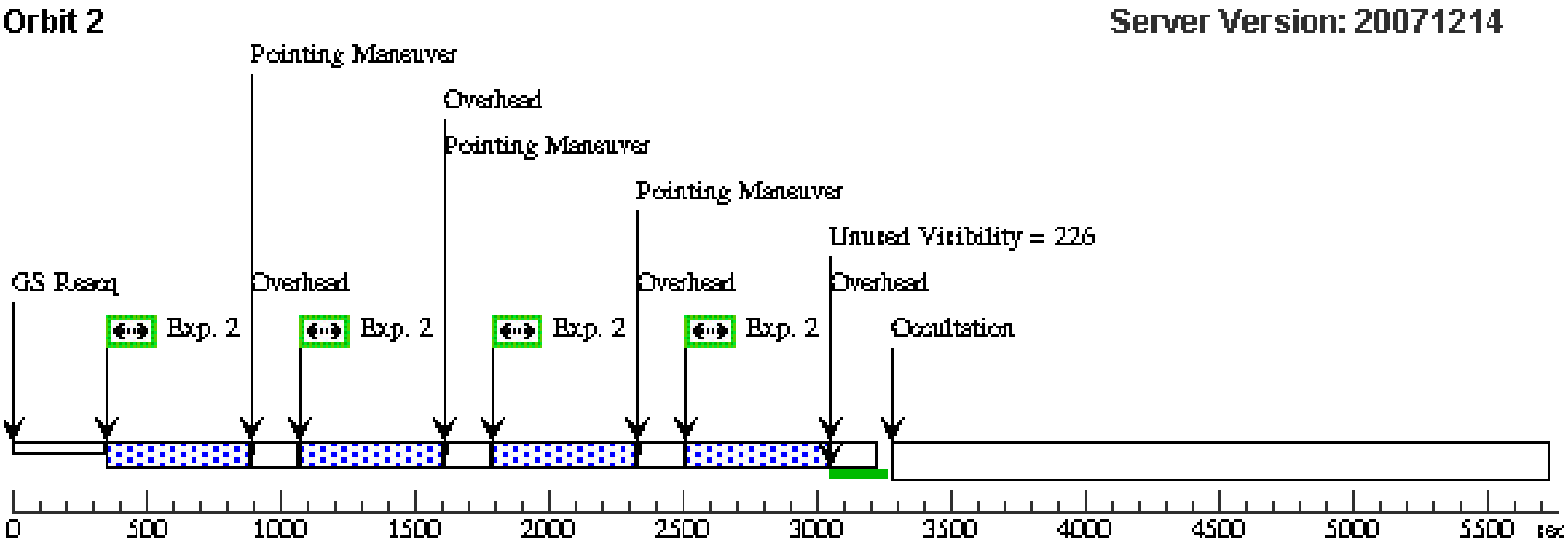
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(7) SN-2004DJ	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(7) SN-2004DJ	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure



Orbit Structure (continued)



Visit

Proposal 11229, Visit 22, implementation Fri Jan 18 09:46:16 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 21 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

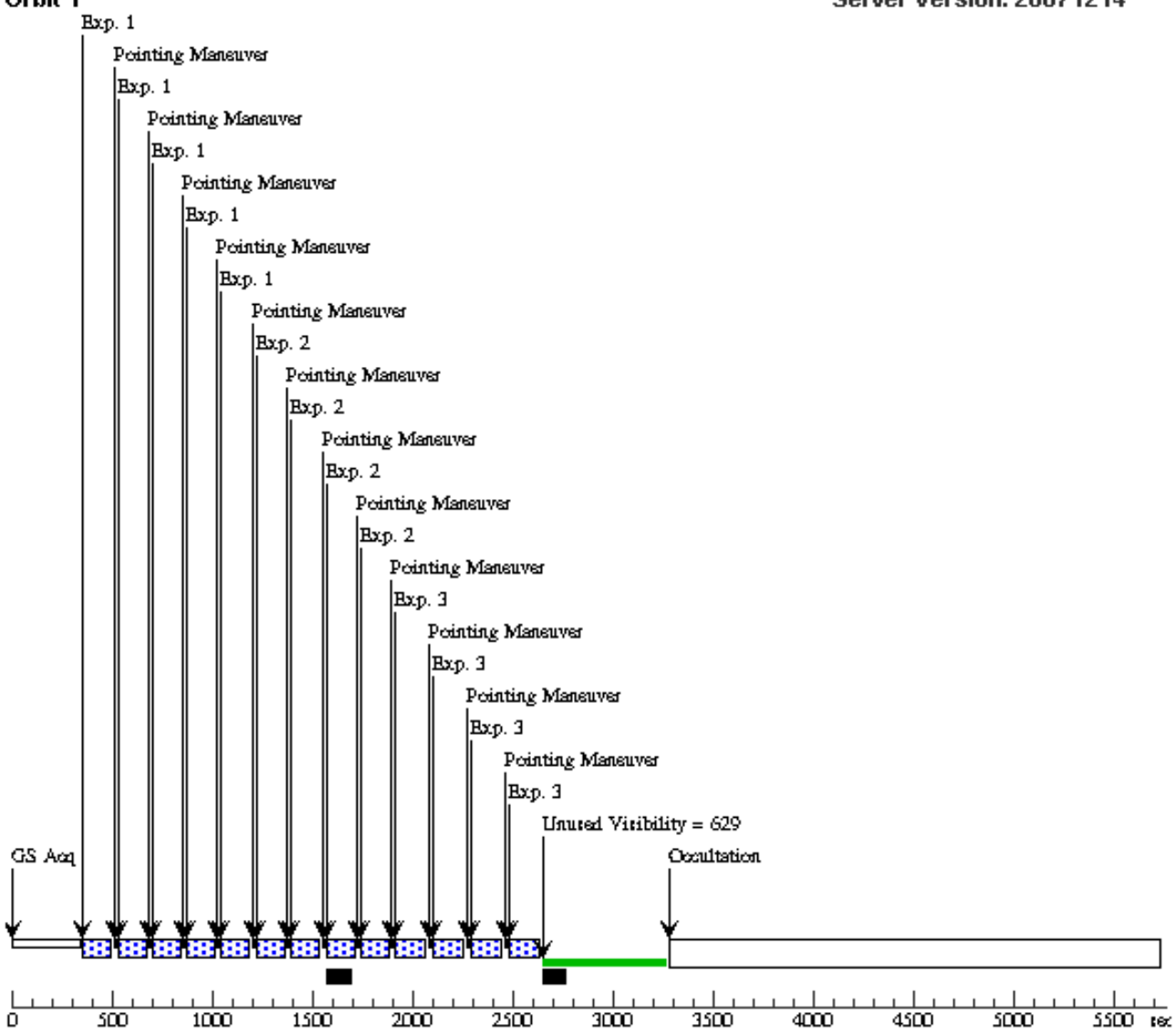
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	SN-2004DJ	RA: 07 37 17.0000 (114.3208333d) Dec: +65 35 58.00 (65.59944d) Equinox: J2000		V=22	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(7) SN-2004DJ	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(7) SN-2004DJ	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(7) SN-2004DJ	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 15, implementation Fri Jan 18 09:46:16 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

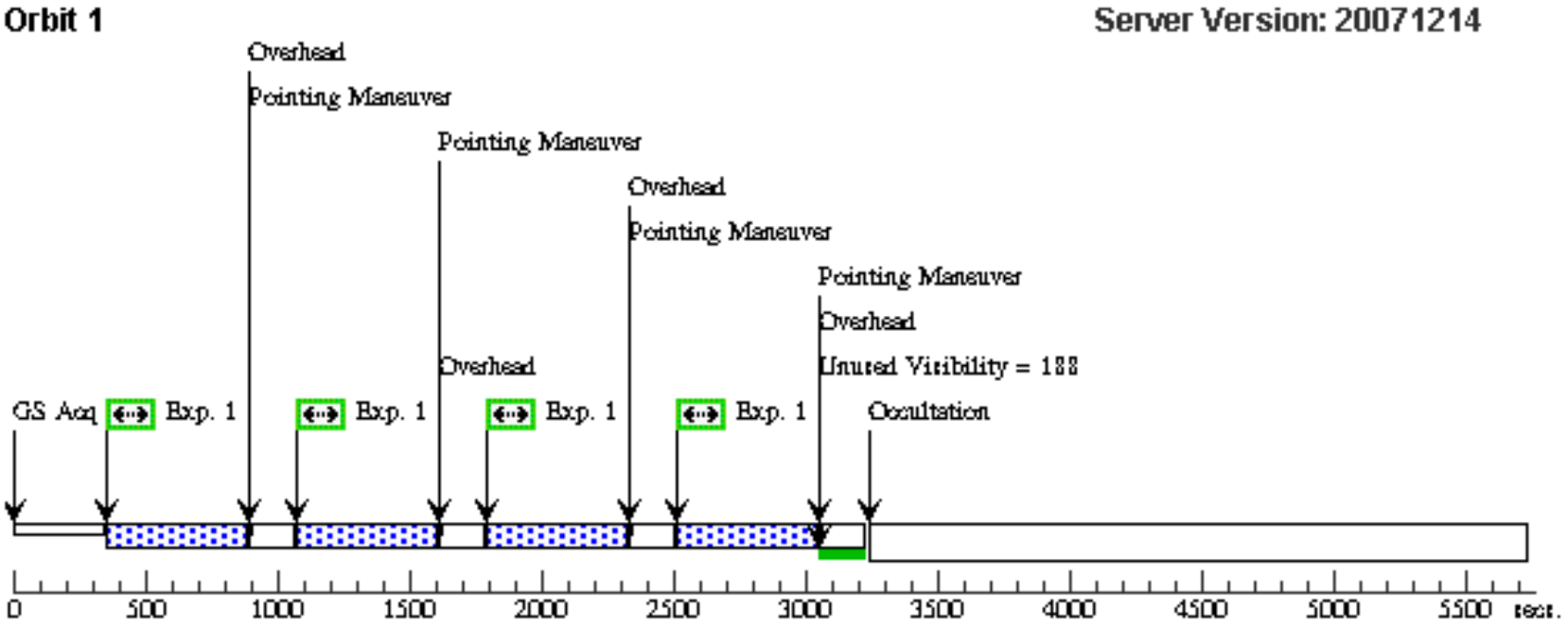
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	SN-2004ET	RA: 20 35 25.3000 (308.8554167d)		V=23	Reference Frame: ICRS
		Dec: +60 07 18.00 (60.12167d)			
		Equinox: J2000			

Comments: This object was generated by the targetselector and retrieved from the NED database.

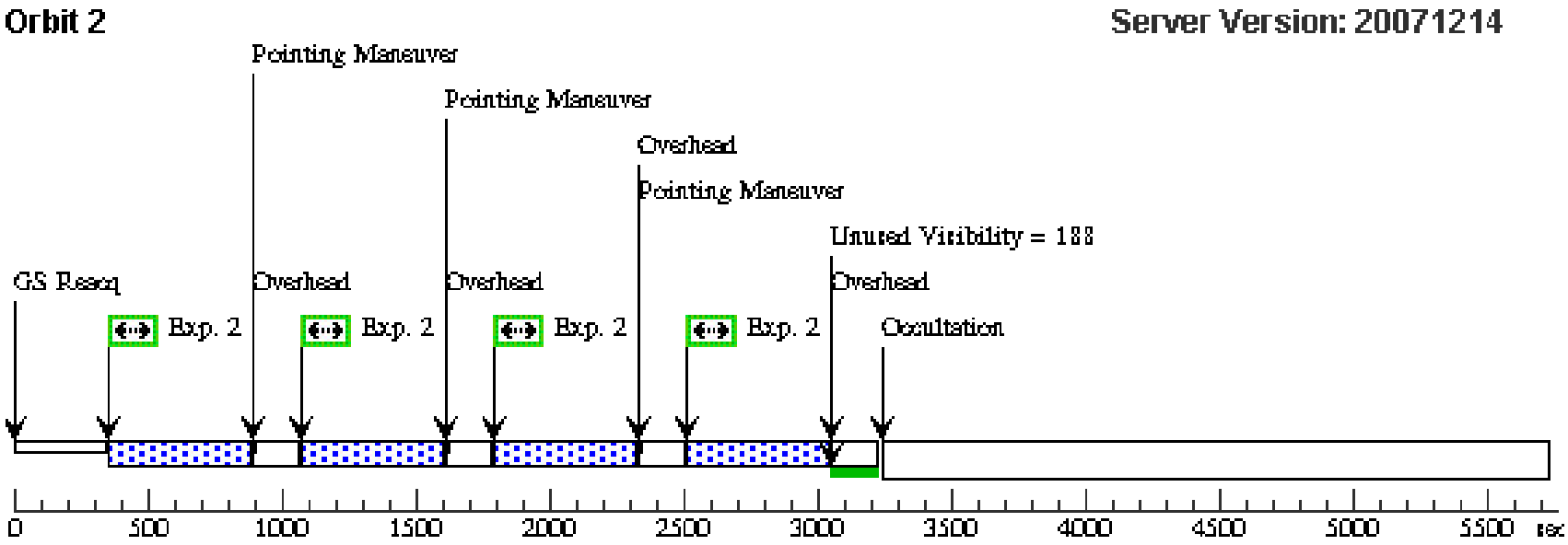
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(8) SN-2004ET	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(8) SN-2004ET	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure



Orbit Structure (continued)



Visit

Proposal 11229, Visit 16, implementation Fri Jan 18 09:46:17 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 15 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

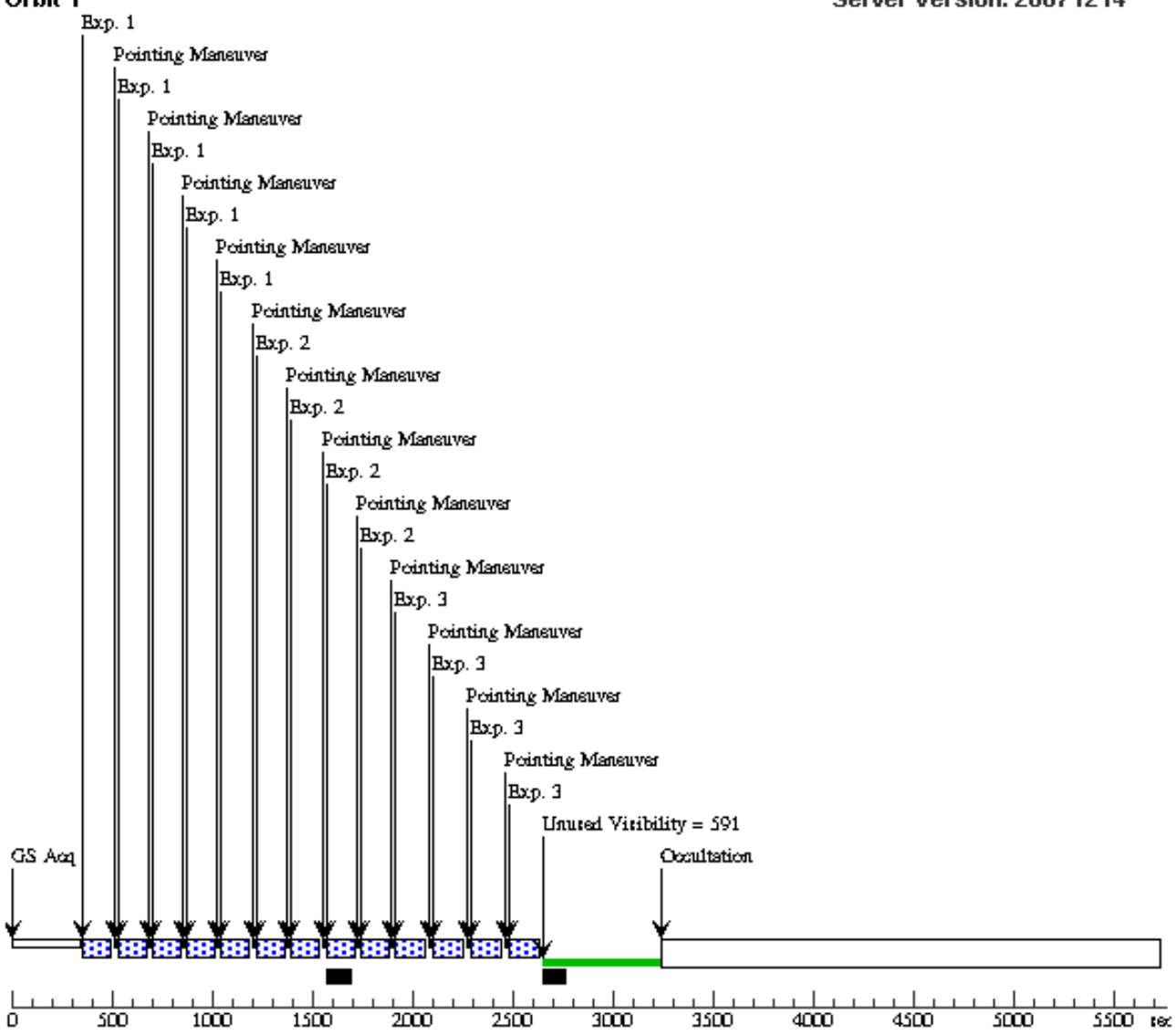
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	SN-2004ET	RA: 20 35 25.3000 (308.8554167d) Dec: +60 07 18.00 (60.12167d) Equinox: J2000		V=23	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) SN-2004ET	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(8) SN-2004ET	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(8) SN-2004ET	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 23, implementation Fri Jan 18 09:46:17 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: AFTER 15 BY 170.0 D TO 200.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

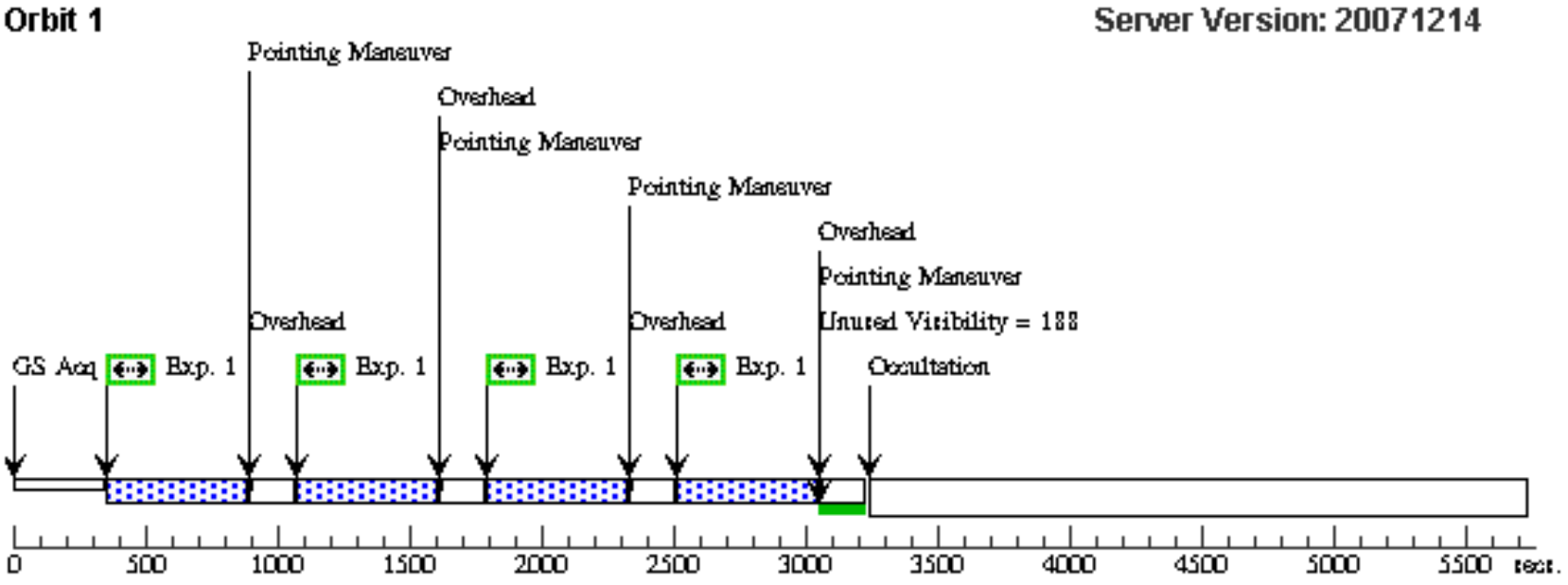
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	SN-2004ET	RA: 20 35 25.3000 (308.8554167d)		V=23	Reference Frame: ICRS
		Dec: +60 07 18.00 (60.12167d)			
		Equinox: J2000			

Comments: This object was generated by the targetselector and retrieved from the NED database.

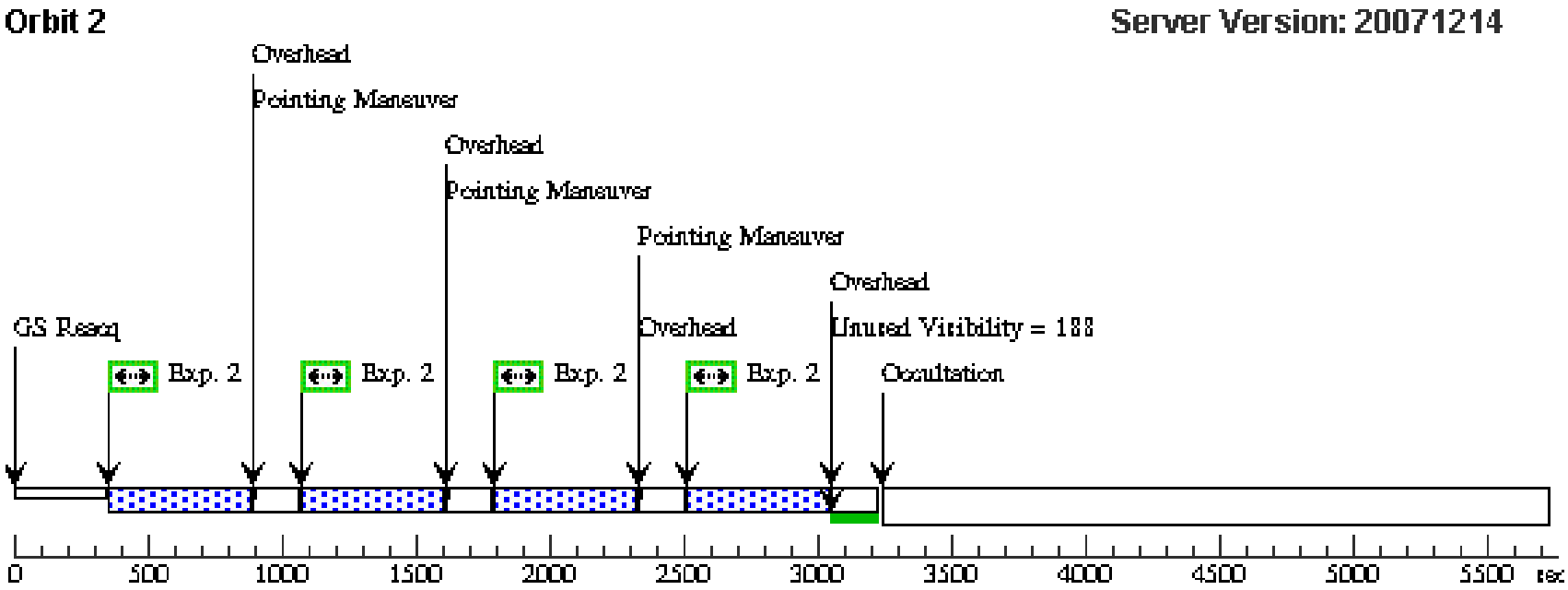
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(8) SN-2004ET	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(8) SN-2004ET	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure



Orbit Structure (continued)



Visit

Proposal 11229, Visit 24, implementation Fri Jan 18 09:46:17 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 23 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

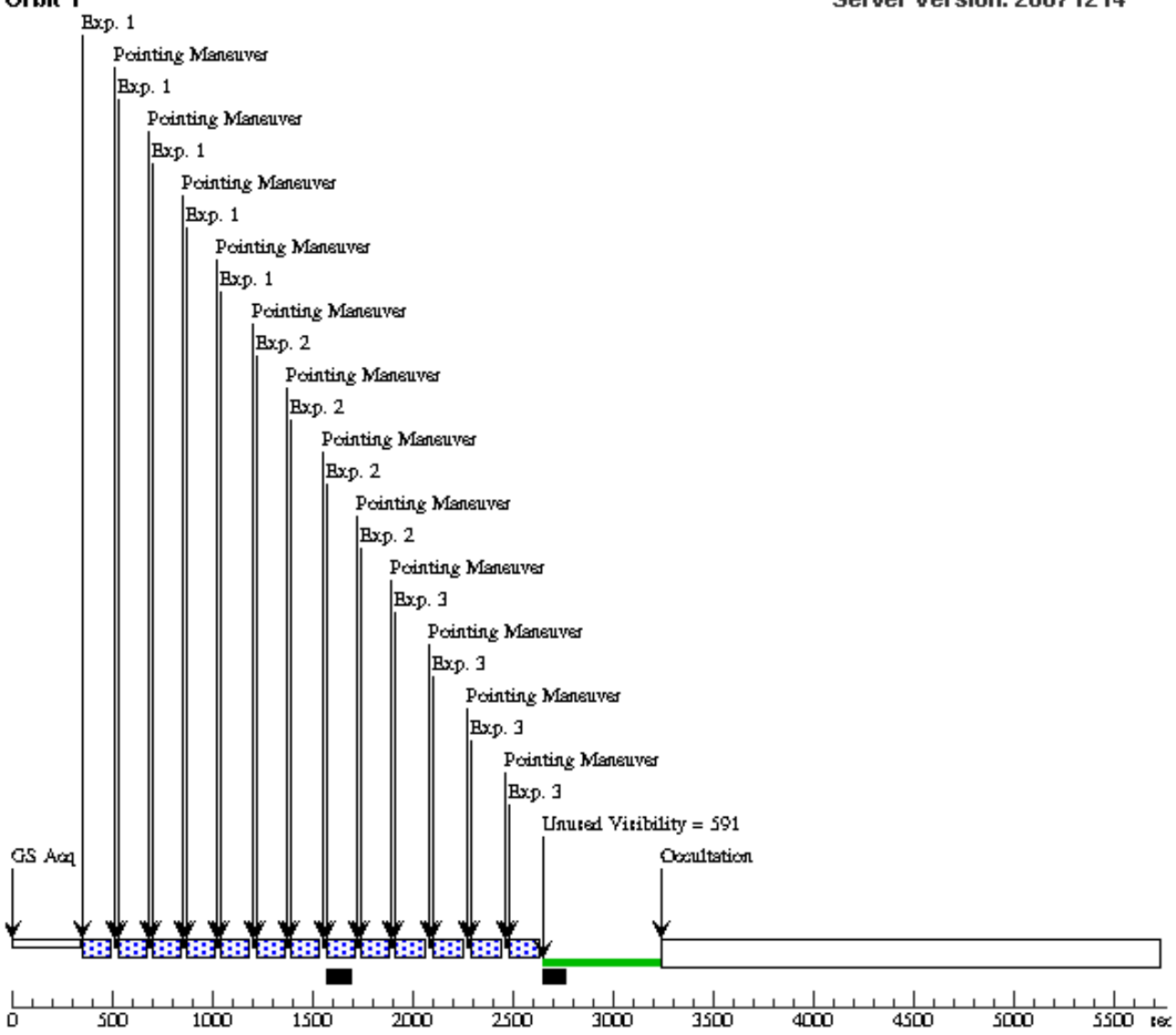
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	SN-2004ET	RA: 20 35 25.3000 (308.8554167d) Dec: +60 07 18.00 (60.12167d) Equinox: J2000		V=23	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) SN-2004ET	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(8) SN-2004ET	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(8) SN-2004ET	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 17, implementation Fri Jan 18 09:46:18 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

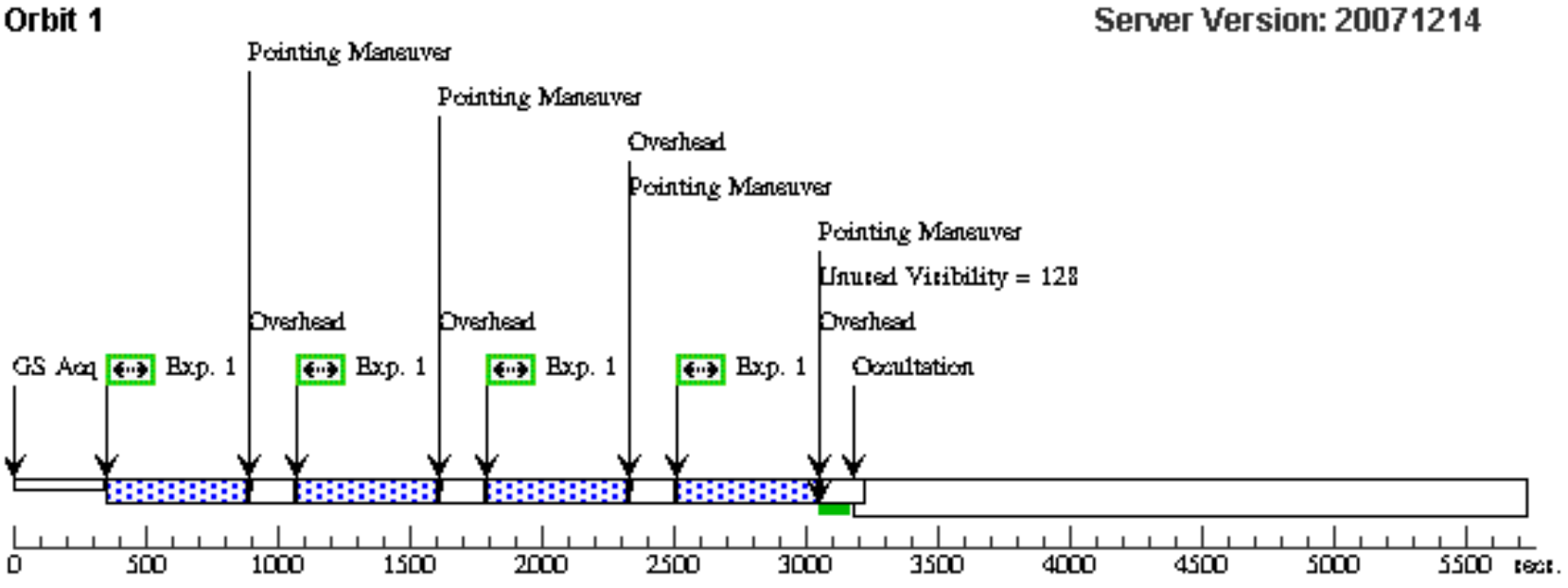
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	SN-2005CS	RA: 13 29 53.4000 (202.4725000d)		V=21	Reference Frame: ICRS
		Dec: +47 10 28.00 (47.17444d)			
		Equinox: J2000			

Comments: This object was generated by the targetselector and retrieved from the NED database.

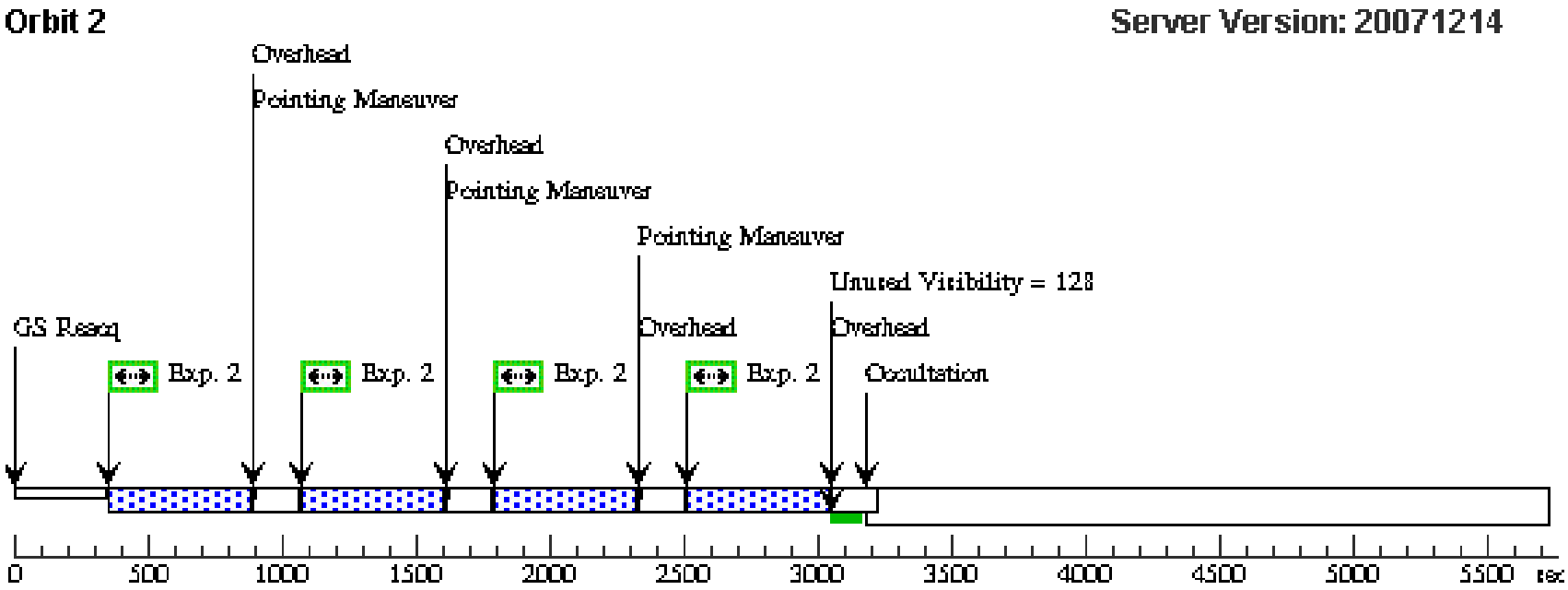
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(9) SN-2005CS	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(9) SN-2005CS	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure



Orbit Structure (continued)



Visit

Proposal 11229, Visit 18, implementation Fri Jan 18 09:46:18 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 17 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

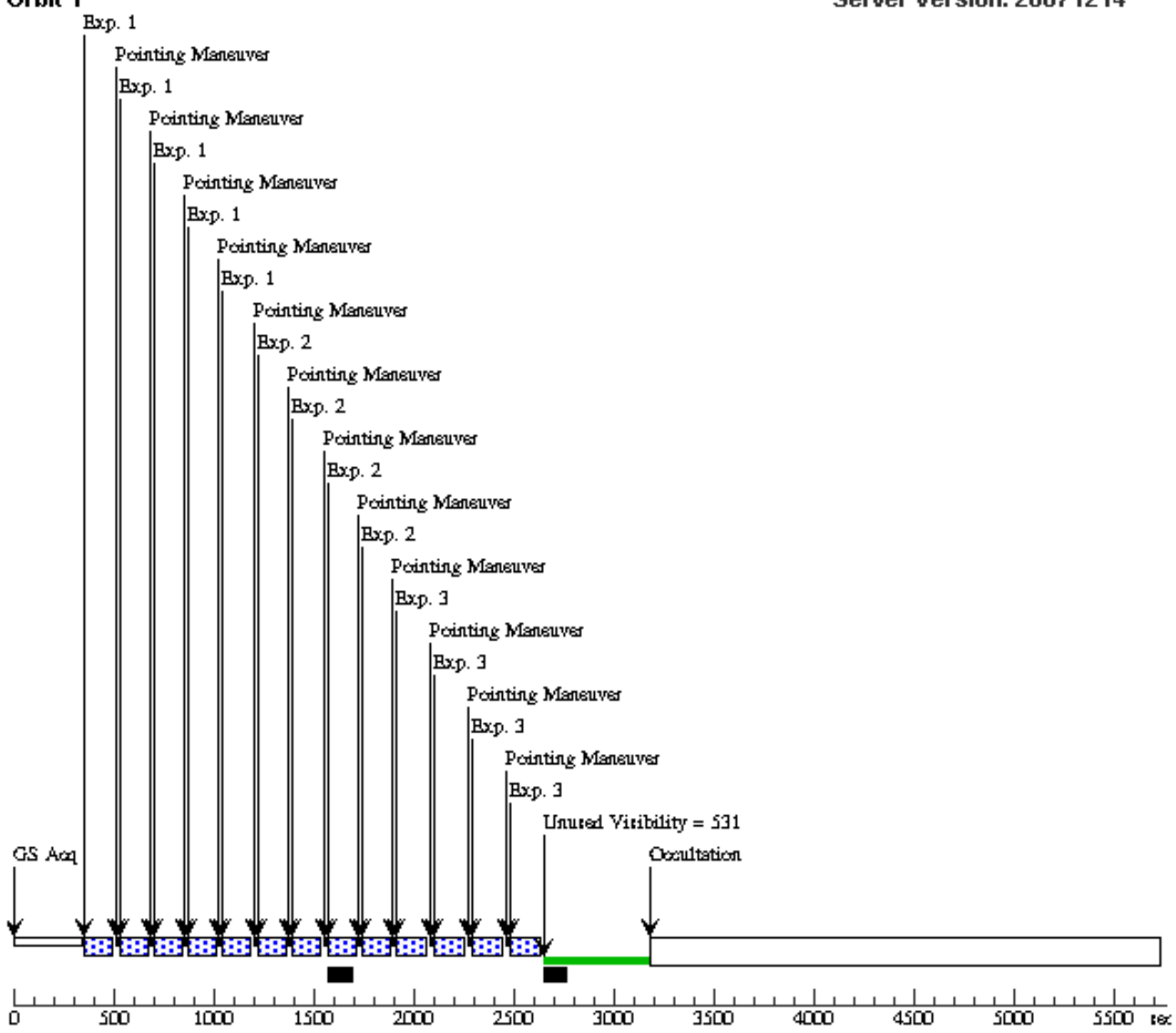
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	SN-2005CS	RA: 13 29 53.4000 (202.4725000d) Dec: +47 10 28.00 (47.17444d) Equinox: J2000		V=21	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(9) SN-2005CS	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(9) SN-2005CS	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(9) SN-2005CS	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 25, implementation Fri Jan 18 09:46:19 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: AFTER 17 BY 150.0 D TO 250.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

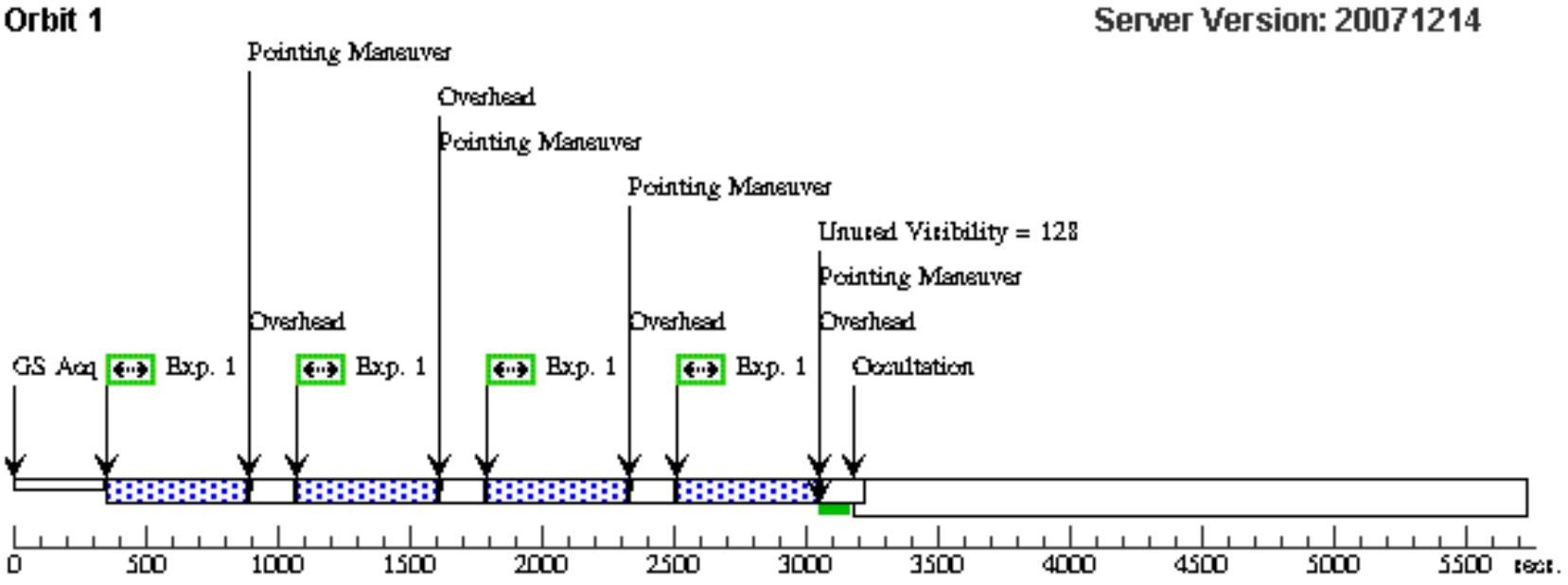
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	SN-2005CS	RA: 13 29 53.4000 (202.4725000d)		V=21	Reference Frame: ICRS
		Dec: +47 10 28.00 (47.17444d)			
		Equinox: J2000			

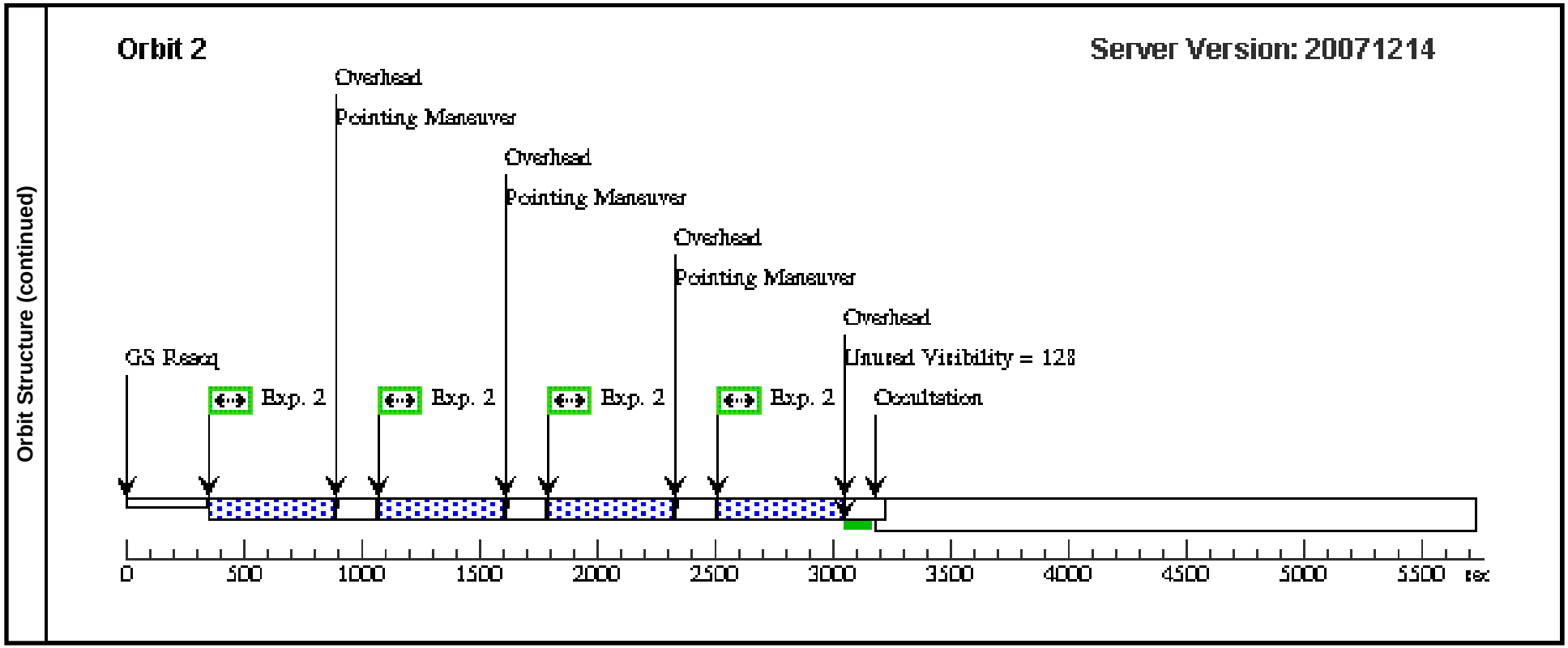
Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(9) SN-2005CS	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(9) SN-2005CS	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20071214
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Unused Visibility = 128
GS Reacq
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11229, Visit 26, implementation Fri Jan 18 09:46:19 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 25 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

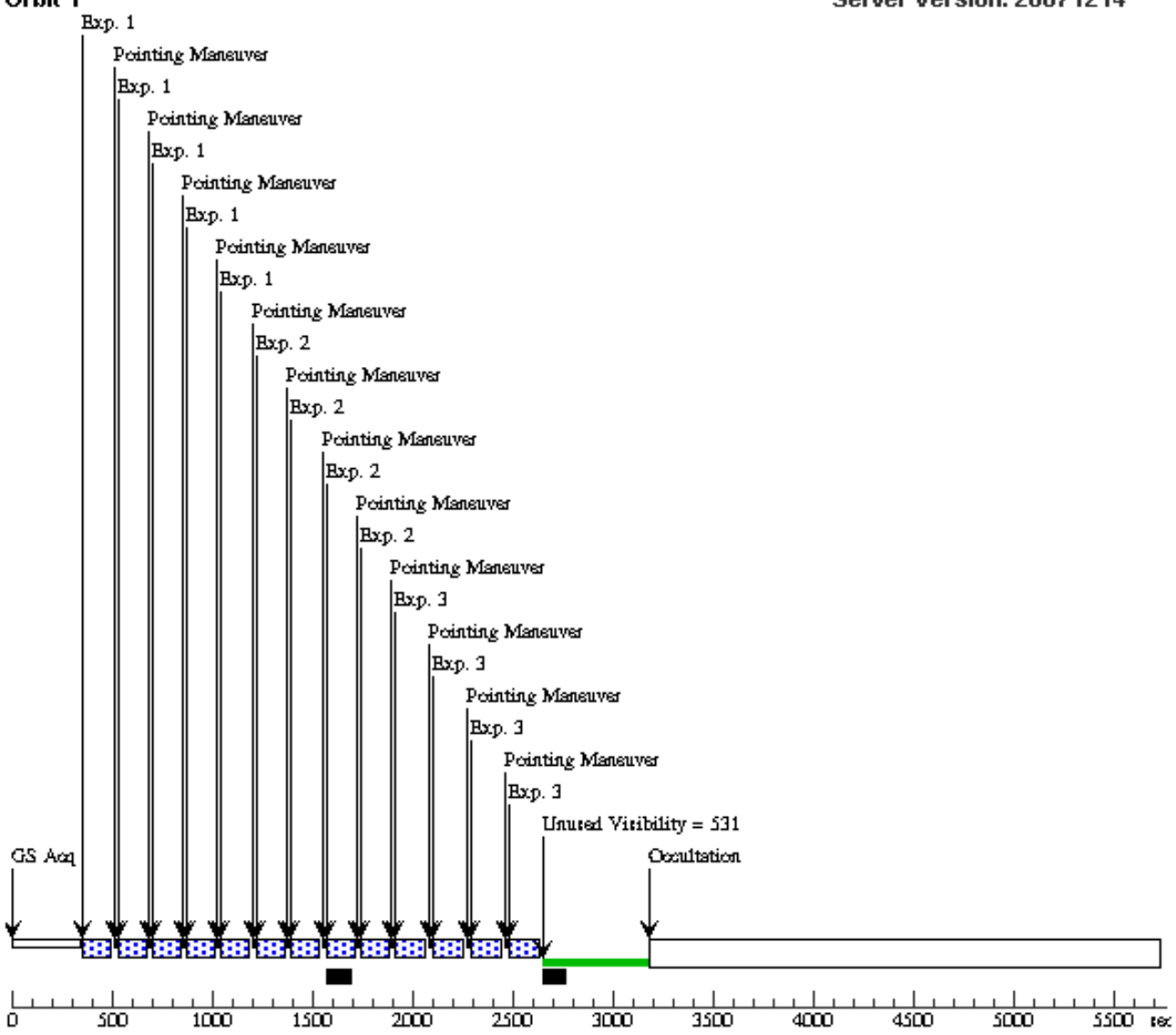
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	SN-2005CS	RA: 13 29 53.4000 (202.4725000d) Dec: +47 10 28.00 (47.17444d) Equinox: J2000		V=21	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(9) SN-2005CS	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(9) SN-2005CS	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(9) SN-2005CS	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 19, implementation Fri Jan 18 09:46:20 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

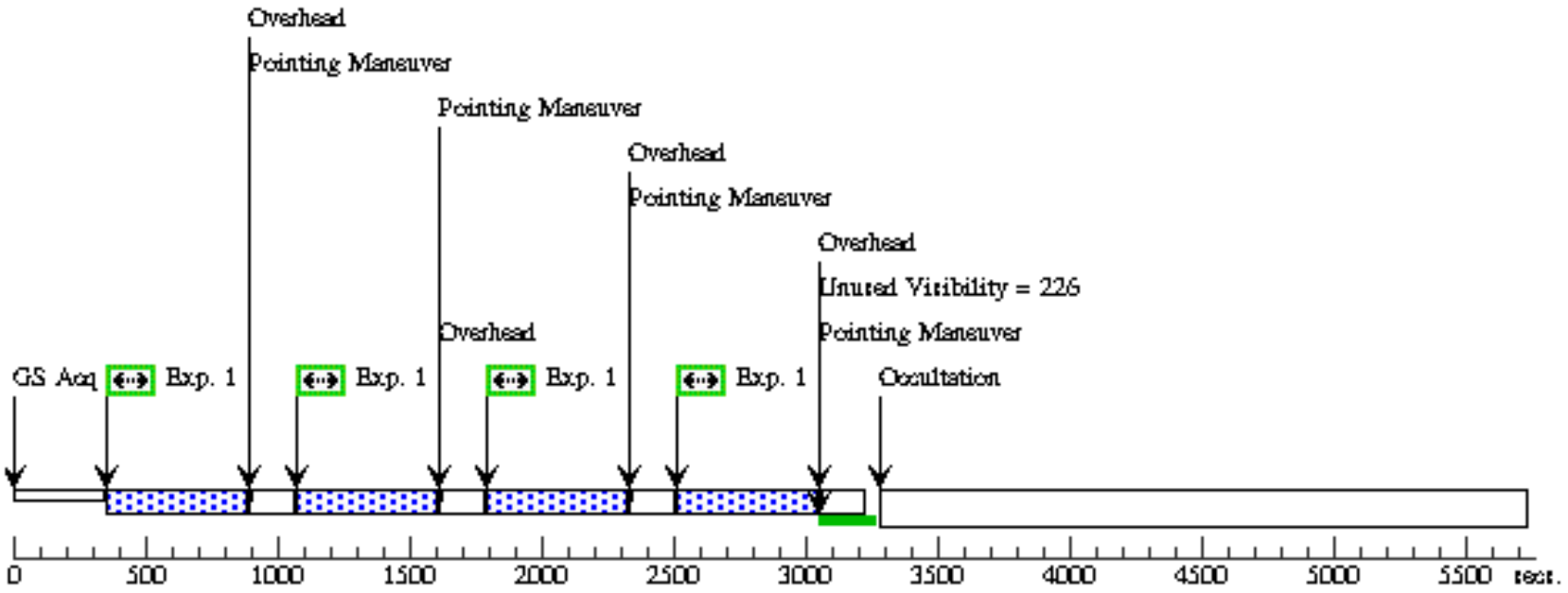
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SN-2006BC	RA: 07 21 16.5000 (110.3187500d)		V=21	Reference Frame: ICRS
		Dec: -68 59 57.00 (-68.99917d)			
		Equinox: J2000			

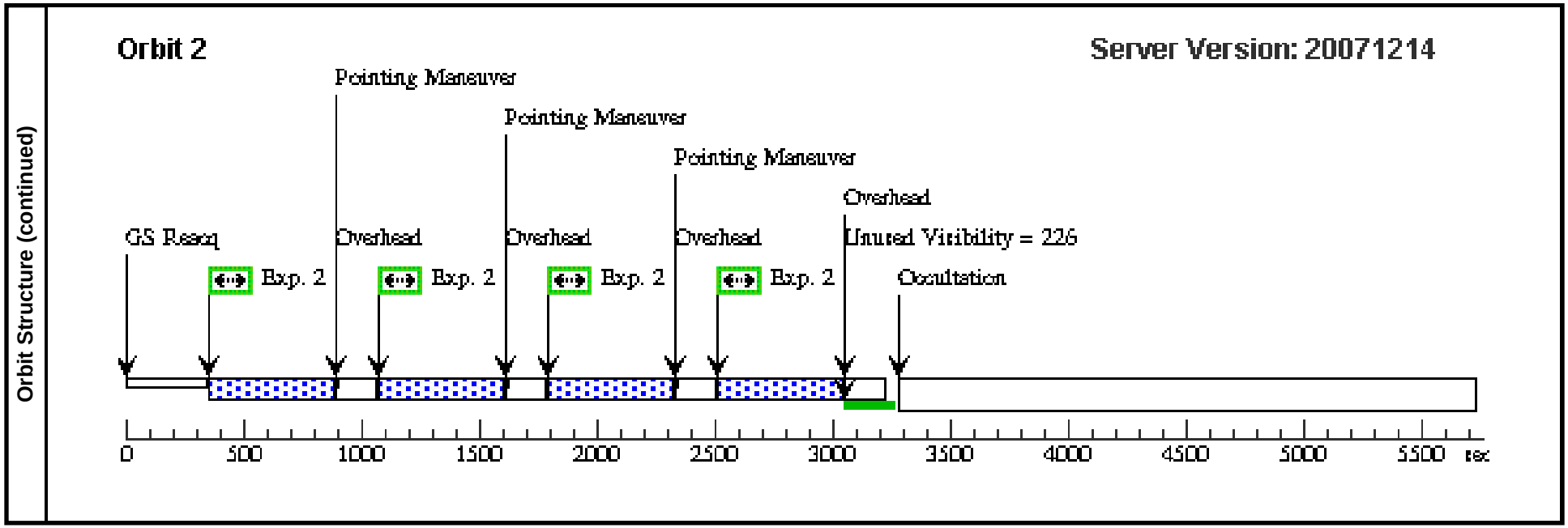
Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(10) SN-2006BC	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(10) SN-2006BC	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20071214
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Overhead
GS Reacq
Overhead
Overhead
Overhead
Unused Vitibility = 226
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11229, Visit 20, implementation Fri Jan 18 09:46:20 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 19 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

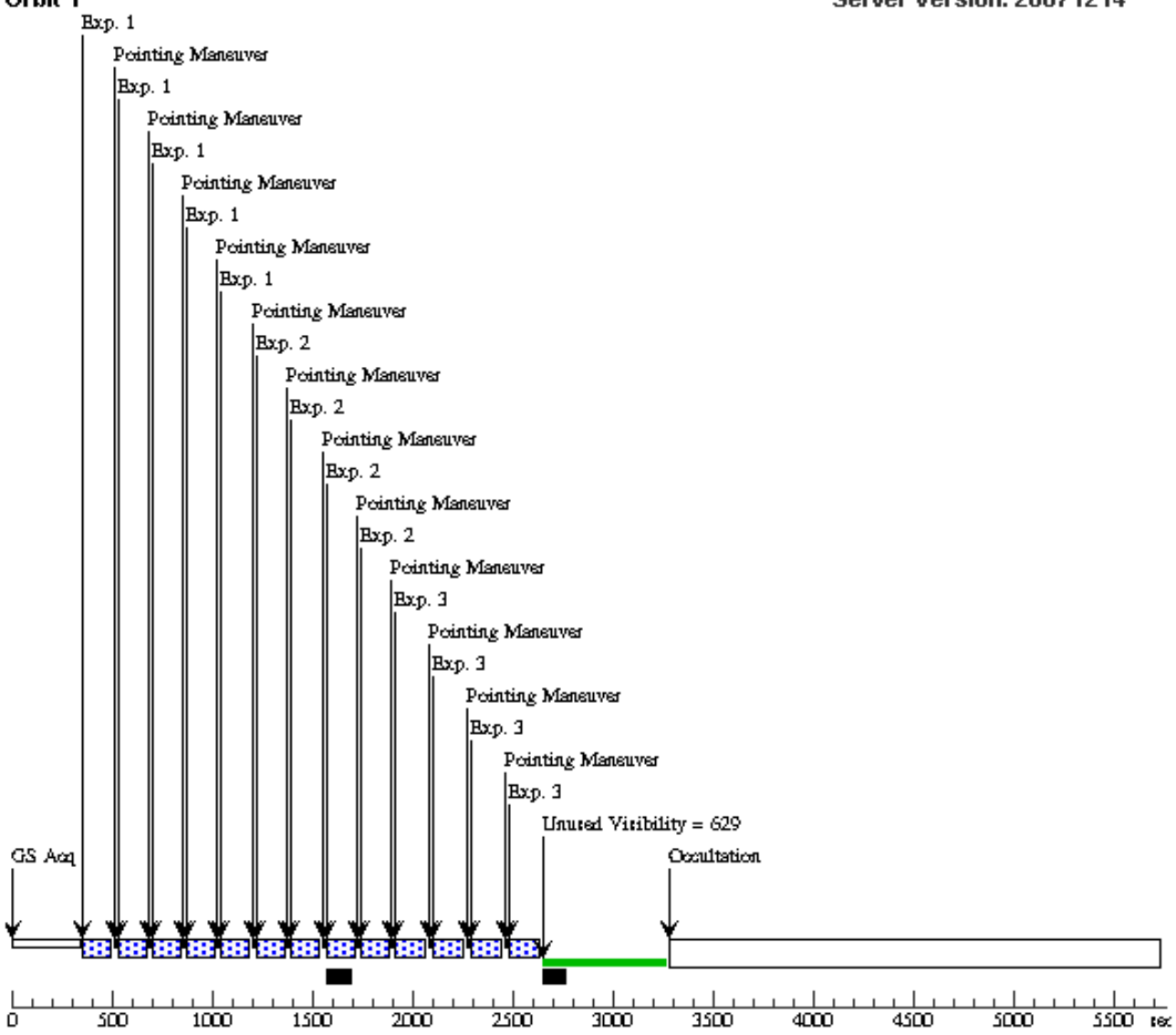
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SN-2006BC	RA: 07 21 16.5000 (110.3187500d) Dec: -68 59 57.00 (-68.99917d) Equinox: J2000		V=21	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(10) SN-2006BC	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(10) SN-2006BC	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(10) SN-2006BC	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 11229, Visit 27, implementation Fri Jan 18 09:46:21 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: AFTER 19 BY 150.0 D TO 250.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=true		
	Line Spacing=0.559017			

Fixed Targets

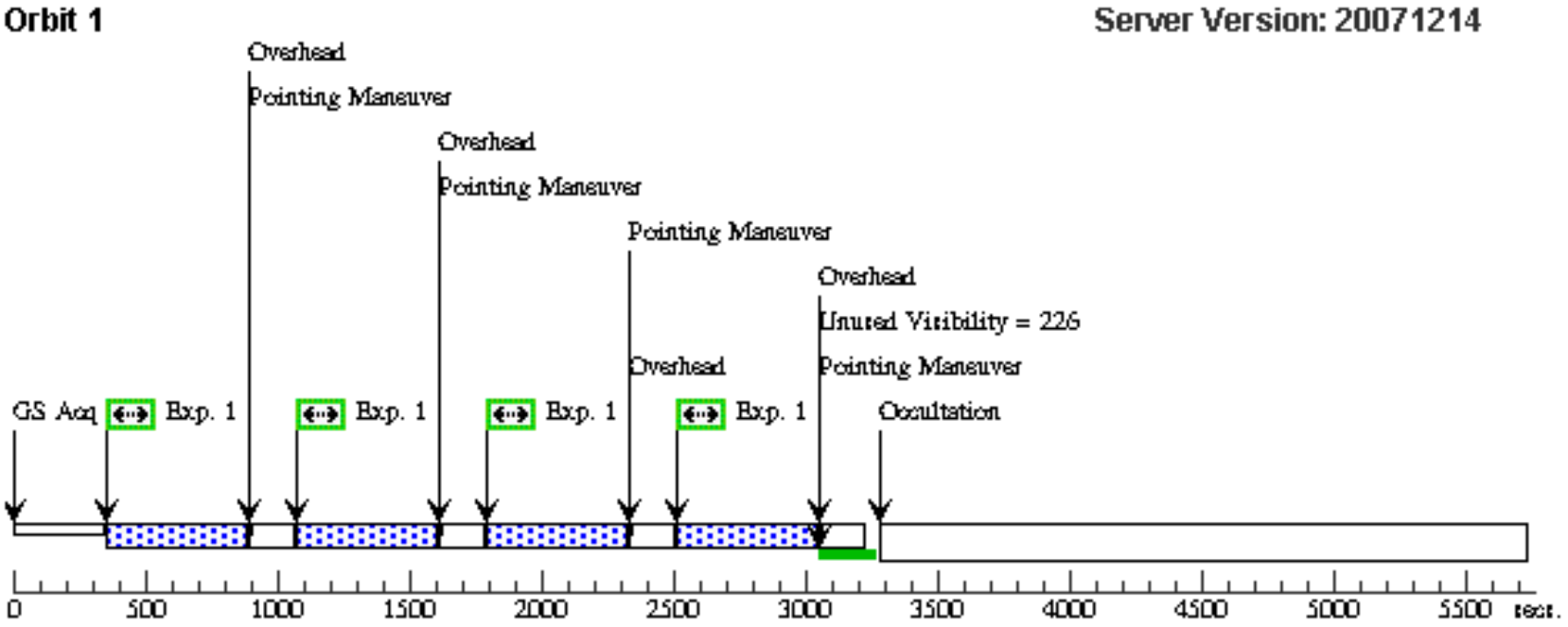
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SN-2006BC	RA: 07 21 16.5000 (110.3187500d)		V=21	Reference Frame: ICRS
		Dec: -68 59 57.00 (-68.99917d)			
		Equinox: J2000			

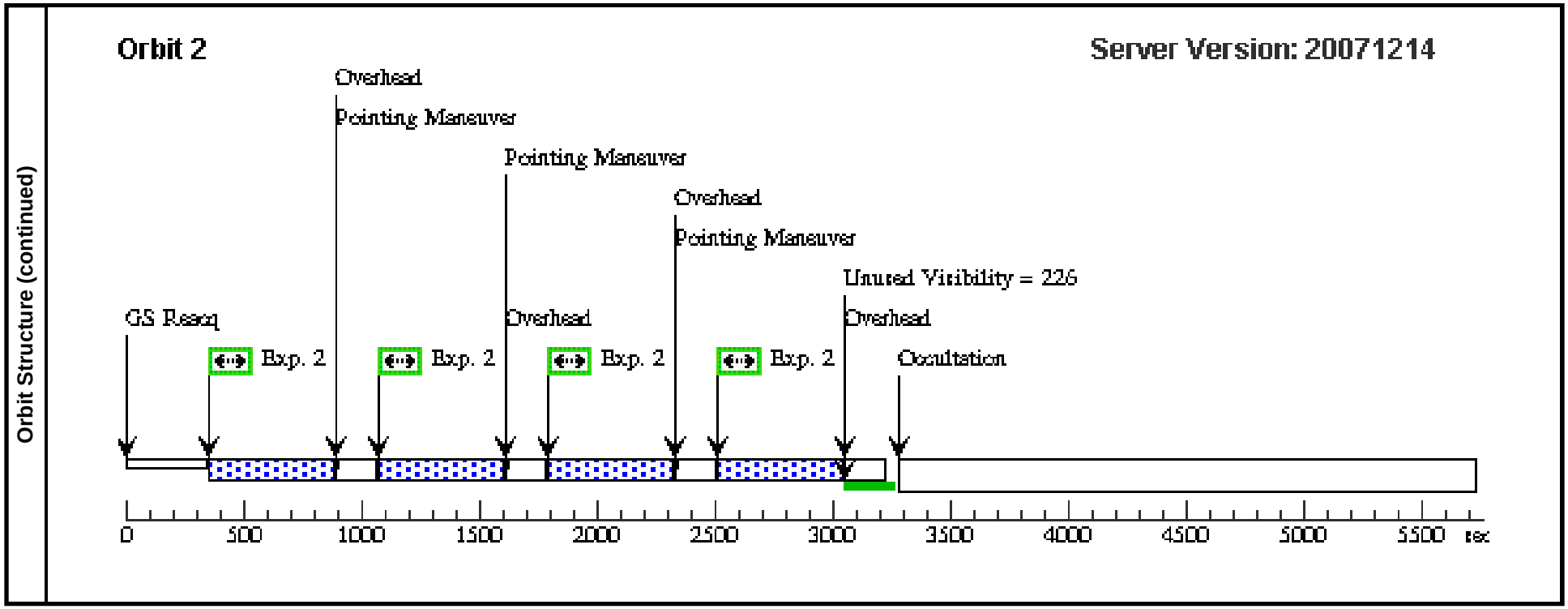
Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Exposure 2 1,0	(10) SN-2006BC	WFPC2, IMAGE, PC1	F606W			Pattern 1-1 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	
2	Exposure 2 1,0	(10) SN-2006BC	WFPC2, IMAGE, PC1	F814W			Pattern 2-2 (1)	400.0 Secs	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20071214
Overhead
Pointing Maneuver
Pointing Maneuver
Overhead
Pointing Maneuver
Unused Visibility = 226
GS Reacq
Overhead
Overhead
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11229, Visit 28, implementation Fri Jan 18 09:46:22 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC2

Special Requirements: AFTER 27 BY 0.0 D TO 30.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(2), (3)
(3)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=5 Point Spacing=1.022 Line Spacing=1.022	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides=270.0 Center Pattern=true		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SN-2006BC	RA: 07 21 16.5000 (110.3187500d) Dec: -68 59 57.00 (-68.99917d) Equinox: J2000		V=21	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(10) SN-2006BC	NIC2, MULTIACCUM, NIC2	F110W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 1-1 (3)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]*	***[1]***
2		(10) SN-2006BC	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=SPARS16; NSAMP=10		Pattern 2-2 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3		(10) SN-2006BC	NIC2, MULTIACCUM, NIC2	F205W	SAMP-SEQ=SPARS16; NSAMP=11		Pattern 3-3 (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure