11207 - Star Formation in the Perseus Cluster Cooling Flow

Cycle: 16, 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) NGC1275-A	ACS/SBC WFPC2	3	18-Jan-2008 03:13:17.0	yes
02	(2) NGC1275-B	ACS/SBC WFPC2	3	18-Jan-2008 03:13:26.0	yes
03	(3) NGC1275-C	ACS/SBC WFPC2	3	18-Jan-2008 03:13:36.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
04	(4) NGC1275-D	ACS/SBC WFPC2	3	18-Jan-2008 03:13:44.0	yes
05	(5) NGC1275-E	ACS/SBC WFPC2	3	18-Jan-2008 03:13:51.0	yes
06	(6) NGC1275-F	ACS/SBC WFPC2	3	18-Jan-2008 03:14:01.0	yes
07	(7) NGC1275-G	ACS/SBC WFPC2	3	18-Jan-2008 03:14:08.0	yes
08	(8) NGC1275-H	ACS/SBC WFPC2	3	18-Jan-2008 03:14:14.0	yes

24 Total Orbits Used

ABSTRACT

We propose to obtain high resolution, UV/optical imaging of the "accretion populations" in the massive cooling flow of the Perseus cluster of galaxies. New GALEX observations show that the dominant galaxy in this nearby cluster, NGC 1275, has an extended network of UV-bright populations apparently formed recently from the intracluster gas. Cluster cooling flows are the most prominent of the environments where we can readily observe the cycle of gas accretion, star formation, and feedback from active nuclei that is thought to play a central role in the formation and evolution of galaxies. Because they can be readily age-dated, the accretion populations help to trace the sequence of exchange of material between galaxies and the intracluster

medium. The ACS/SBC and WFPC2/PC cameras offer the highest spatial resolution and best panchromatic performance available to map the spatial and age distribution of the accretion populations and their relationship to radio-emitting plasma and the hot intracluster gas.

OBSERVING DESCRIPTION

We plan to observe seven fields centered on the brighter UV plumes extending outward from the main body of NGC 1275 and one additional field in its central regions (the selected
fields are shown in Fig. 2). The fields sample a wide range in the projected X-ray surface brightness (see Fig. 3). The SBC camera field of view is 34.5$$??30.5$$; the WFPC2/PC field is well matched at 34$$?? 34$$. Based on our GALEX observations, the integrated FUV light within the chosen NGC 1275 fields is in the range 13.8?17.7 (STMAGs).
ACS/SBC offers a resolution of 0.032$$ per pixel, and WFPC2/PC offers 0.046$$ per pixel. It would have been advantageous to use ACS/HRC to make the near-UV and long wavelength observations because its resolution was higher than the SBC, but this is not now possible. The promised WFC3 could make the near-UV and I band observations at comparable resolution (0.04$$), but it cannot observe in the critical far-UV region.
We emphasize UV observations because these are important discriminants of population ages over the time scales of relevance here (roughly 10?1000 Myr). For instance, (FUV?V) colors change by 7.5 mags over this age range whereas (V?I) colors change only by 1.1 mags. The value of short-wavelength photometry in studies of younger populations in merger remnants and early-type galaxies is well established, and a combination of six UV and optical bands has been shown to deal effectively with ambiguities introduced by extinction (e.g. [6]). In the younger objects of interest here, photometric effects due to metallicity differences tend to be small.

All of the selected fields are UV-bright at the resolution of existing GALEX observations (! 6$$), but we do not, of course, know how the light is distributed within those regions. Based on existing high-resolution HST images of cooling flow systems (e.g. [9] [17] [13]), we expect the star forming regions will be highly structured, with much of the light concentrated in bright clumps with high surface brightnesses or in individual super star clusters.

Our program consists of imaging in the following configurations: ACS-SBC/F140LP, WFPC2-PC/F300W, and WFPC2-PC/F814W. F140LP is a far-UV band. The F300W ?Wide U? filter has good sensitivity in the vacuum near-UV centered at 2890 ?A. The F814W filter corresponds to the I band in the near-infrared. None of these bands contain important emission lines (at the redshift of NGC 1275), so our photometry will offer a clean determination of the stellar continuum.

For our analysis, we will combine our new data with images from GO program 10546 (Cy 14, 24 orbits; Fabian, PI). This employs the ACS/WF (resolution 0.05$$ per pixel) and three filters (F435W, F550M, and F625W) to map the entire inner region of the NGC 1275 filament system. The F625W filter includes H!, so there is some information on line emission. The resulting 6 band spectral coverage provides a strong wavelength lever to obtain good age estimates and to separate out the effects of extinction (whereas the ACS/WF set on its own is not adequate for this).

Exposure depth is set by the far-UV (SBC/F140LP) observations. We have chosen a standard exposure time of 2400 seconds (or one orbit), for which the F140LP point source limiting magnitude is 21.6 (STMAG units) for S/N = 20. The corresponding limits in F300W and F814W are 22.5 and 25.6, respectively. (Younger populations are brighter at short wavelengths, so our chosen exposure times at longer wavelengths do not decrease even though the instrumental sensitivity is higher there.) This choice gives us good detectability to young populations as follows.

? Accretion populations may contain conglomerations of ?super? star clusters, similar to

those found in other disturbed star-forming environments. The brightest have masses of ! 5 ?? 106 M!. At an age of 10 Myr, these have absolute magnitudes of MI ! ?14 and MFUV ! ?18. At the distance of NGC 1275, this corresponds to STMAGS of 22 and 18, respectively, well above the S/N = 20 thresholds. The young cluster luminosity function can be studied for several magnitudes below its maximum brightness, even in the presence of moderate internal extinction.

? The most luminous clusters at an age of 100 Myr would have absolute magnitudes of MI ! ?12 and MFUV ! ?15. These are still above the S/N = 20 thresholds, permitting useful exploration of the fainter luminosity function.

? The integrated luminosity of regions undergoing continuous star formation have UV colors similar to young star clusters but can have much higher luminosities, depending on the duration of the event.

With this choice of exposure time, each of the 8 pointings will require 3 orbits, for a total of 24 orbits. We are aware that for an arbitrary orientation angle, the tiling of the adjacent fields will not be as good as in Figs. 2 and 3. We do not think this is a serious problem, however, and to optimize scheduling we have chosen not to place constraints on the orientation. The WFPC2 WF chips will provide additional (but lower resolution) imaging of surrounding regions of the galaxy, which could prove useful.

Although Galactic foreground extinction is non-negligible in the direction of Perseus, the GALEX images show that it is not a serious hindrance. Our exposure estimates include the effects of the foreground extinction.

Existing HST STIS/FUV-MAMA observations provide a good reality check on the feasibility of this plan. Cooling flow-fed young populations in Abell 1795, 2597 and 2052 have been resolved into diffuse structures, high surface brightness knots, and clusters with exposure times of 1000-1500 seconds [17] [13]. In the case of A2052, one of the detected knots had an indicative star formation rate of only ! 0.001 M! yr?1, which demonstrates the

sensitivity of UV imaging [13]. The high resolution images show that the young structures beautifully trace the interaction region between the hot intracluster gas and the radio jets. The radio and X-ray (see Fig. 3) properties of NGC 1275 are much better established than in these other systems, which are 2-5?? more distant, meaning that correlations can be explored in much greater detail there.

Visit

Proposal 11207, Visit 01, implementation Fri Jan 18 08:14:19 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC, WFPC2

Special Requirements: (none)

Patterns

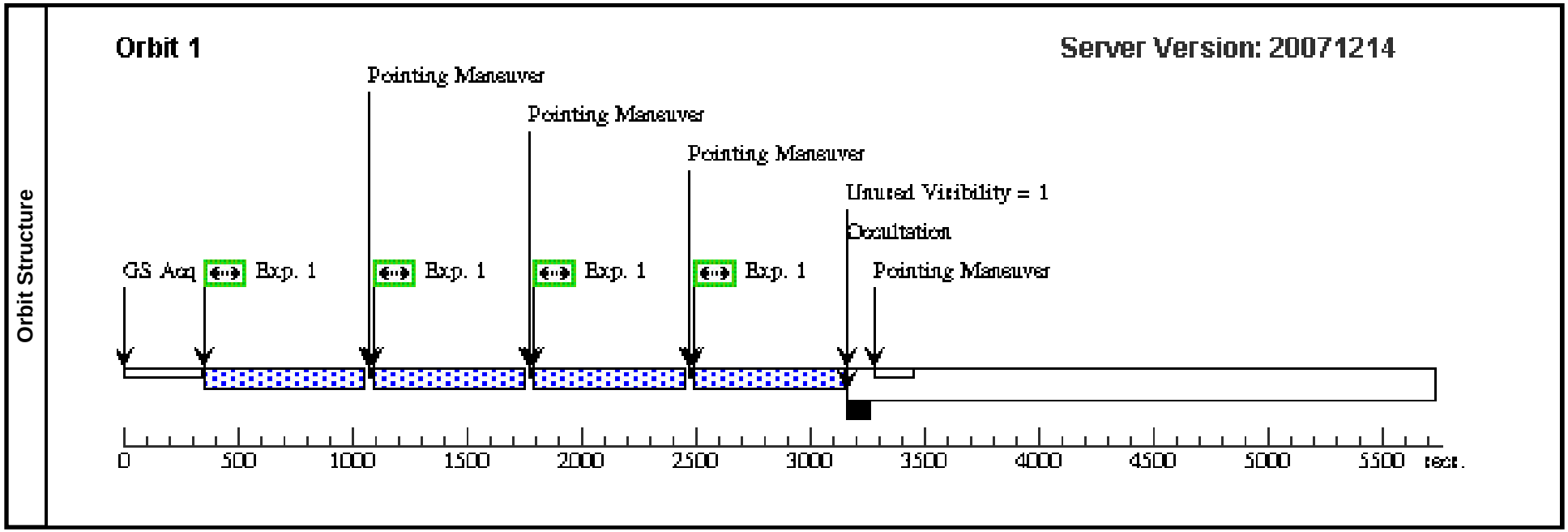
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false		(1)
(2)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559017 Line Spacing=0.559017	Coordinate Frame=POS-TARG Pattern Orientation=26.56505 Angle Between Sides=143.1301 Center Pattern=false		(2), (3)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC1275-A	RA: 03 19 48.2530 (49.9510542d) Dec: +41 31 45.00 (41.52917d) Equinox: J2000		V=11.8	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	NGC1275-A	(1) NGC1275-A	ACS/SBC, ACCUM, SBC-FIX	F140LP			Pattern 1-1 (1)	600.0 Secs	
								[==>638.0 Secs (Pattern 1)] *[==>638.0 Secs (Pattern 2)]* *[==>638.0 Secs (Pattern 3)]* *[==>638.0 Secs (Pattern 4)]*	***[1]***
2	NGC1275-A	(1) NGC1275-A	WFPC2, IMAGE, PC1-FIX	F300W			Pattern 2-2 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[2]***
3	NGC1275-A	(1) NGC1275-A	WFPC2, IMAGE, PC1-FIX	F814W			Pattern 3-3 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[3]***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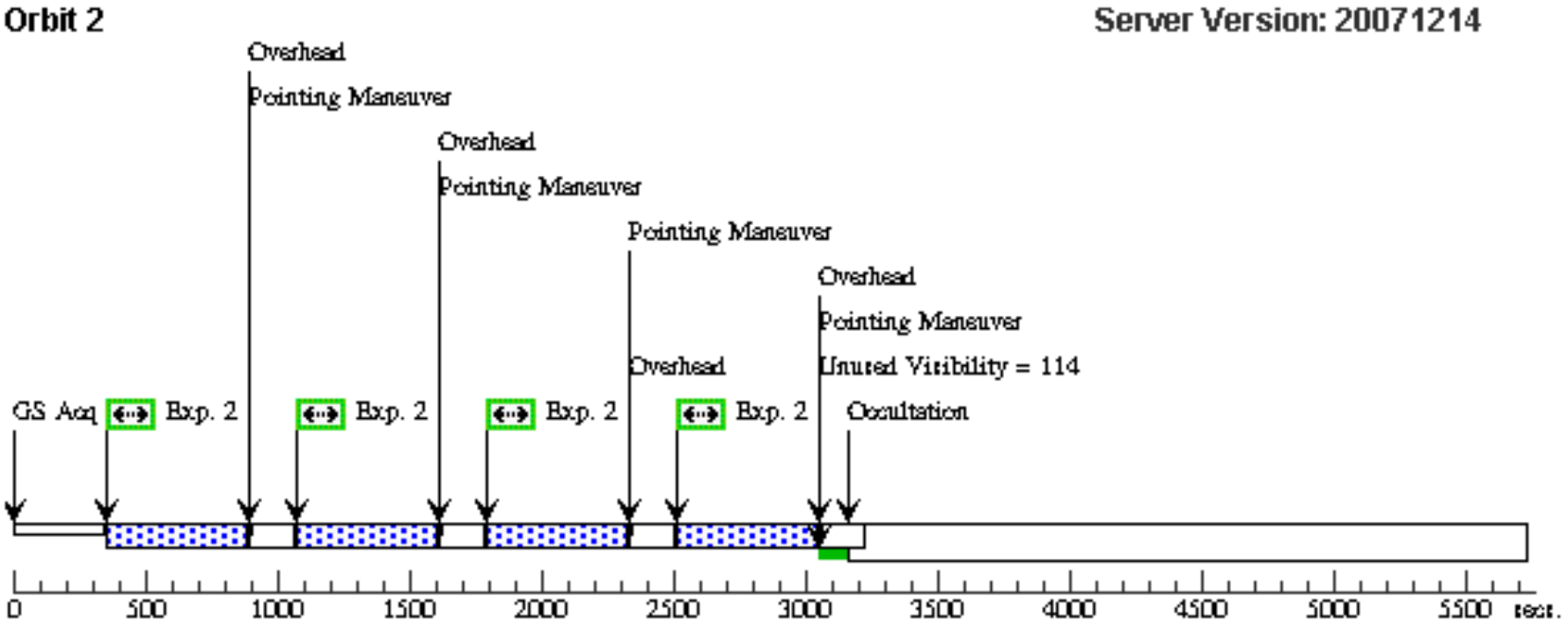

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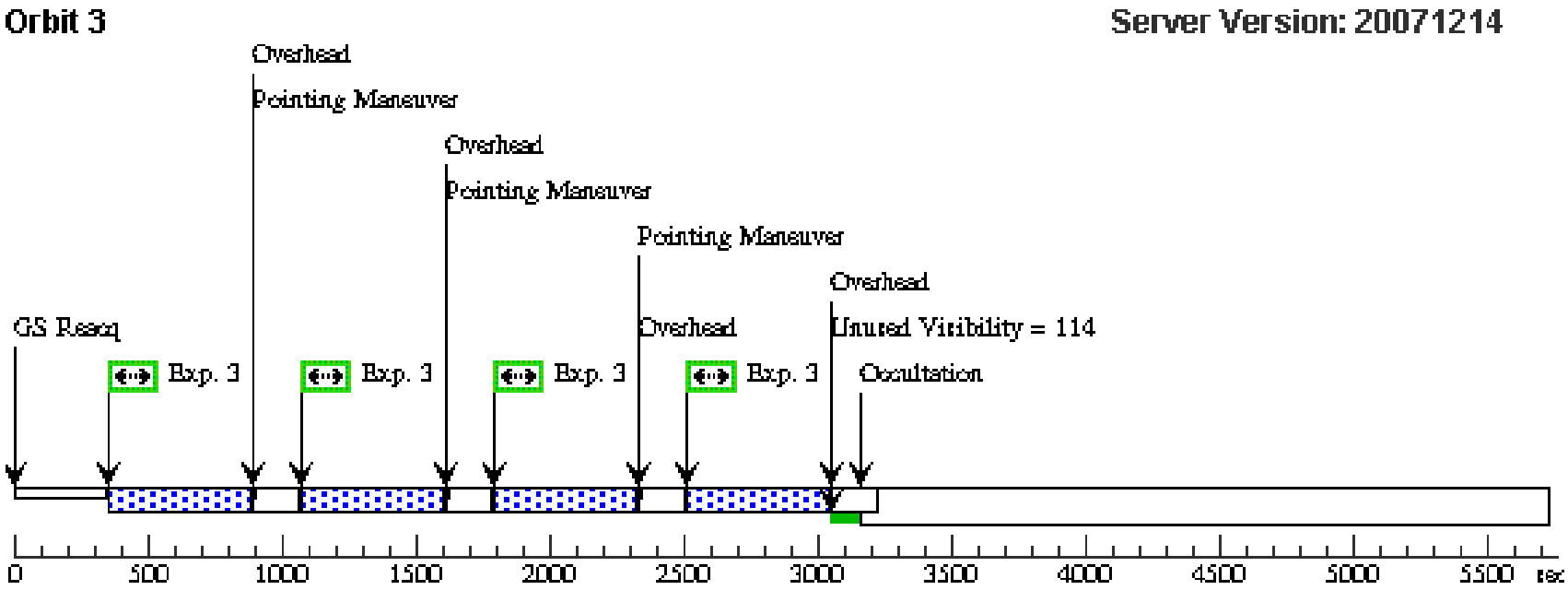

Visit

Proposal 11207, Visit 02, implementation Fri Jan 18 08:14:20 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC, WFPC2

Special Requirements: (none)

Patterns

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Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC1275-B	RA: 03 19 45.8000 (49.9408333d) Dec: +41 31 52.12 (41.53114d) Equinox: J2000		V=11.8	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	NGC1275-B	(2) NGC1275-B	ACS/SBC, ACCUM, SBC-FIX	F140LP			Pattern 1-1 (1)	600.0 Secs	
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2	NGC1275-B	(2) NGC1275-B	WFPC2, IMAGE, PC1-FIX	F300W			Pattern 2-2 (2)	400.0 Secs	
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3	NGC1275-B	(2) NGC1275-B	WFPC2, IMAGE, PC1-FIX	F814W			Pattern 3-3 (2)	400.0 Secs	
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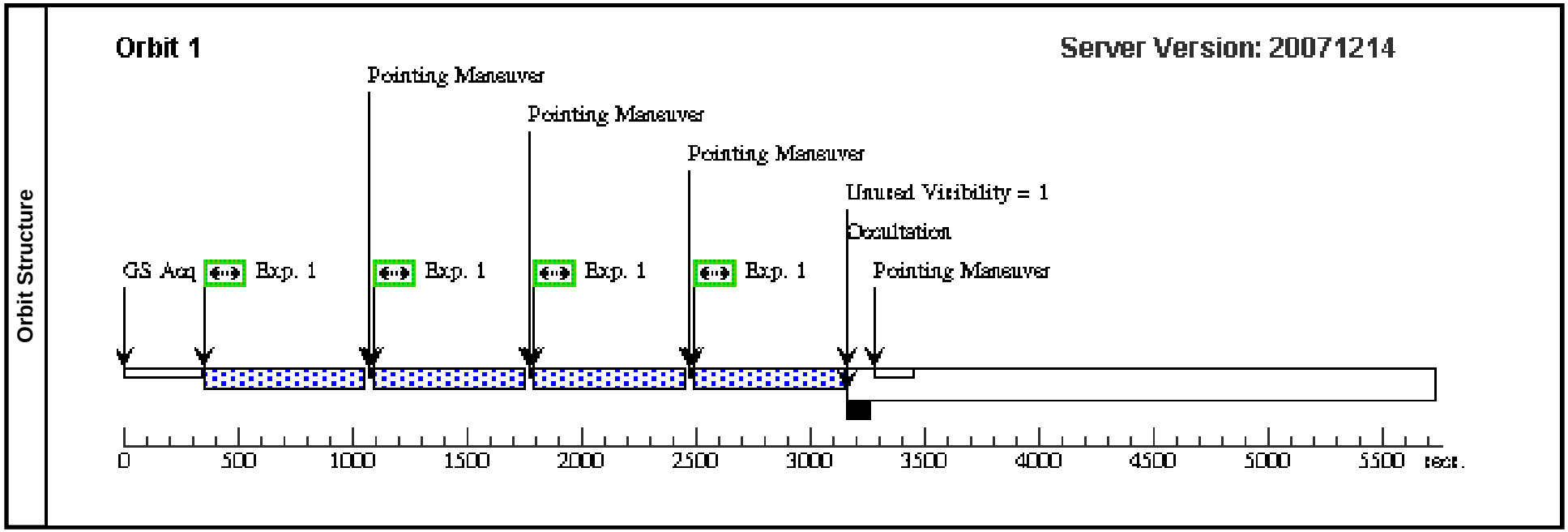
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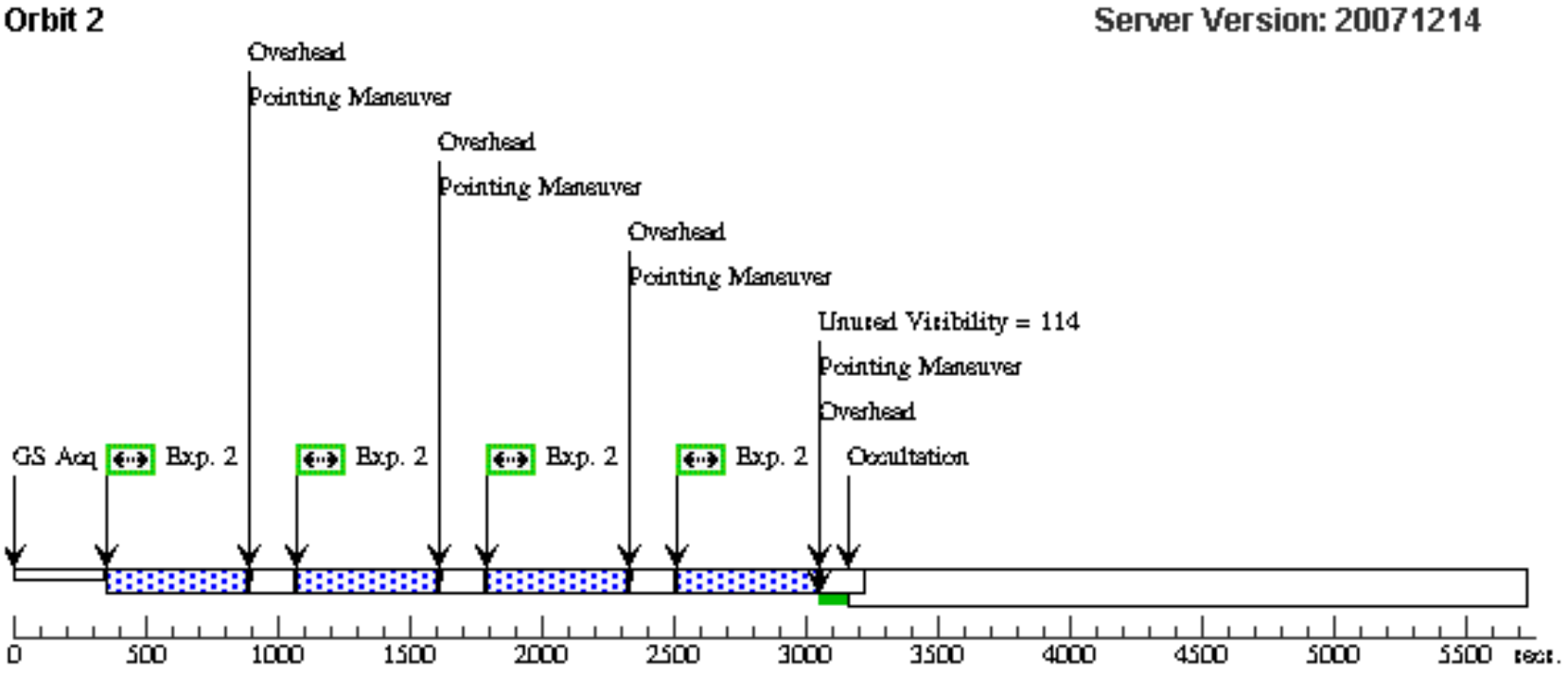

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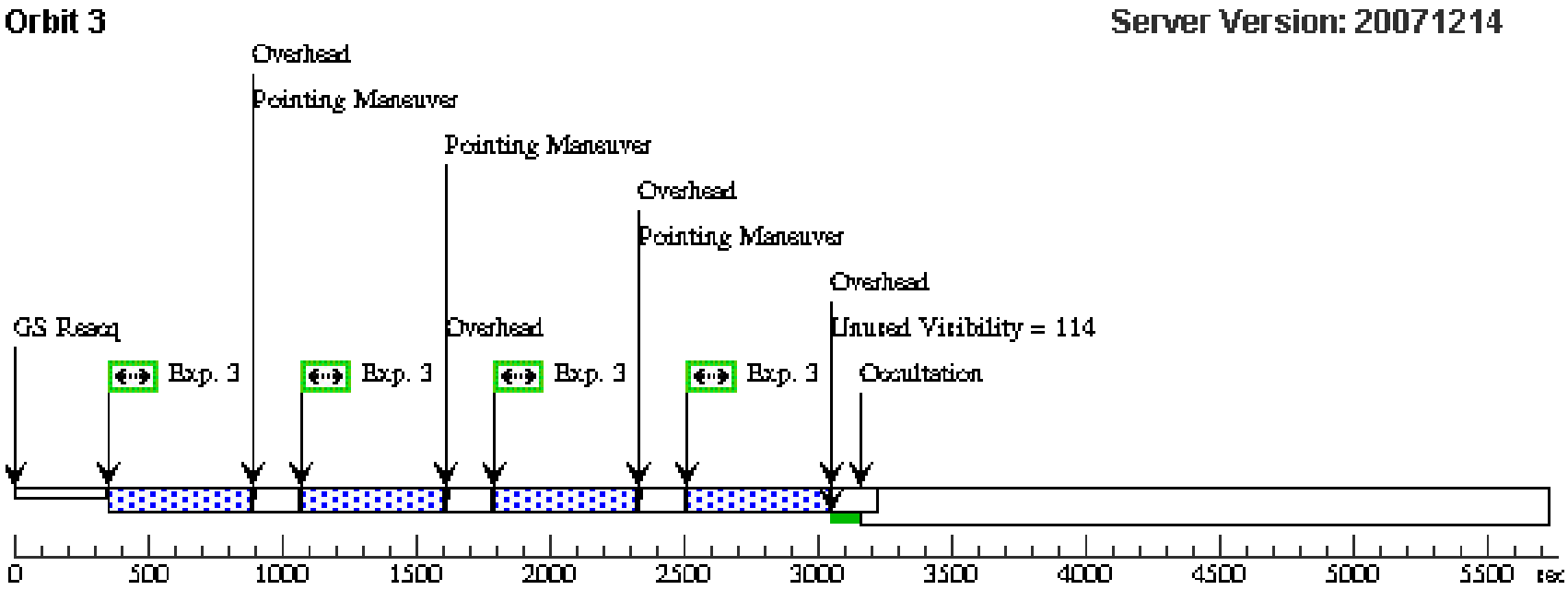

Visit

Proposal 11207, Visit 03, implementation Fri Jan 18 08:14:22 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC, WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false		(1)
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Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	NGC1275-C	RA: 03 19 45.8200 (49.9409167d) Dec: +41 31 26.12 (41.52392d) Equinox: J2000		V=11.8	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	NGC1275-C	(3) NGC1275-C	ACS/SBC, ACCUM, SBC-FIX	F140LP			Pattern 1-1 (1)	600.0 Secs	
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2	NGC1275-C	(3) NGC1275-C	WFPC2, IMAGE, PC1-FIX	F300W			Pattern 2-2 (2)	400.0 Secs	
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3	NGC1275-C	(3) NGC1275-C	WFPC2, IMAGE, PC1-FIX	F814W			Pattern 3-3 (2)	400.0 Secs	
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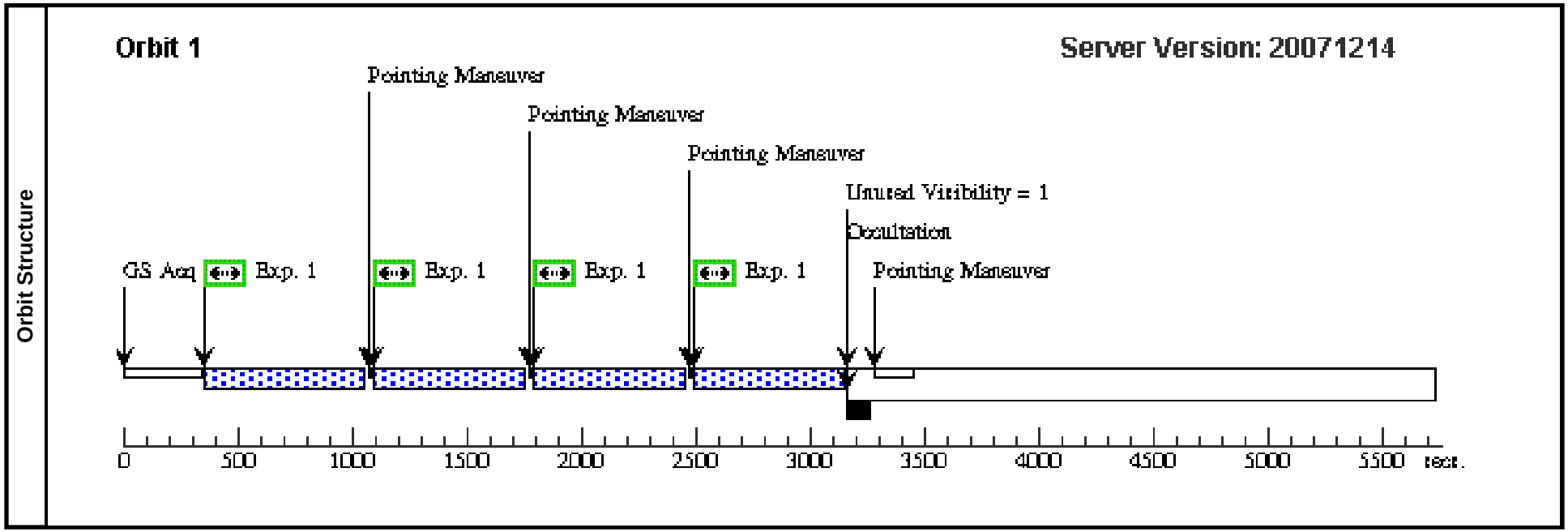
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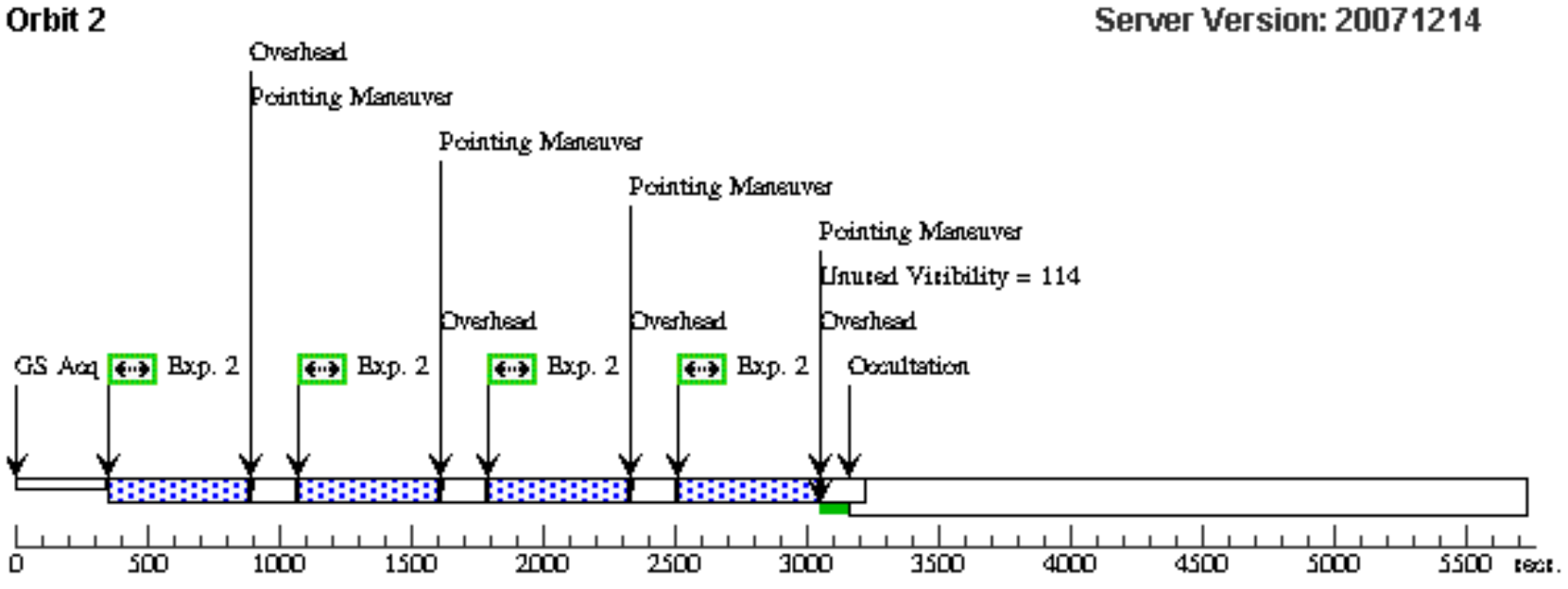

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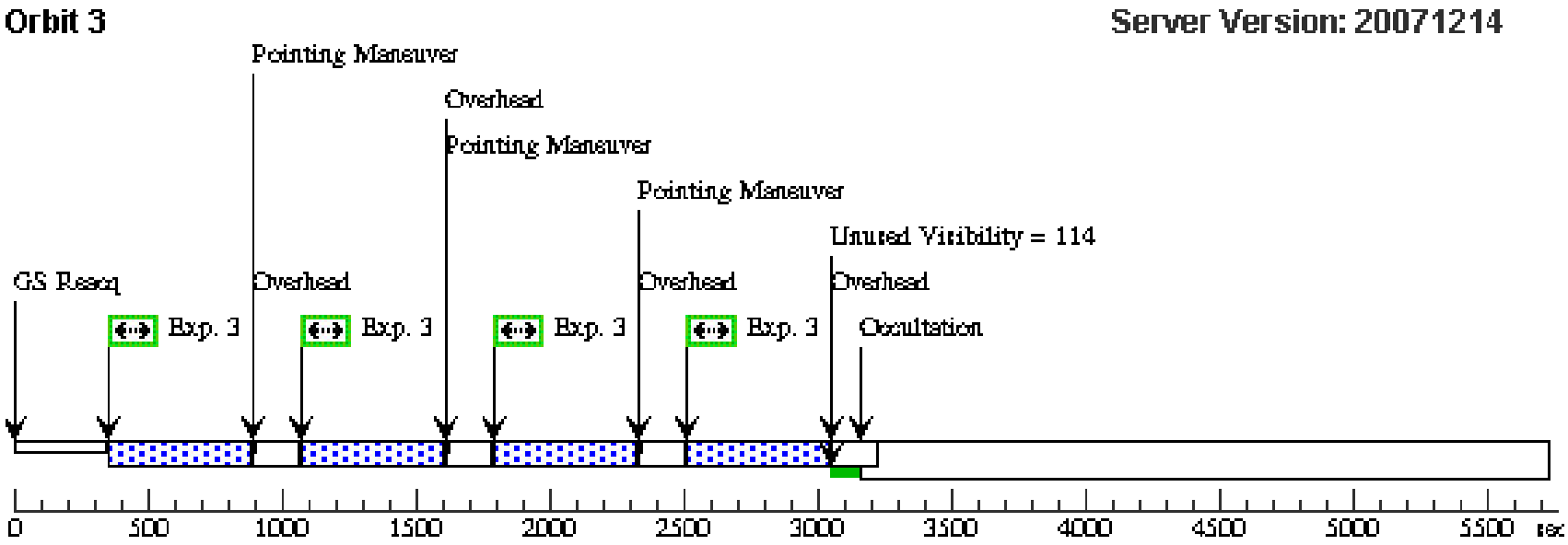

Visit

Proposal 11207, Visit 04, implementation Fri Jan 18 08:14:22 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC, WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
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Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	NGC1275-D	RA: 03 19 45.8200 (49.9409167d) Dec: +41 31 0.12 (41.51670d) Equinox: J2000		V=11.8	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
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								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[2]***
3	NGC1275-D	(4) NGC1275-D	WFPC2, IMAGE, PC1-FIX	F814W			Pattern 3-3 (2)	400.0 Secs	
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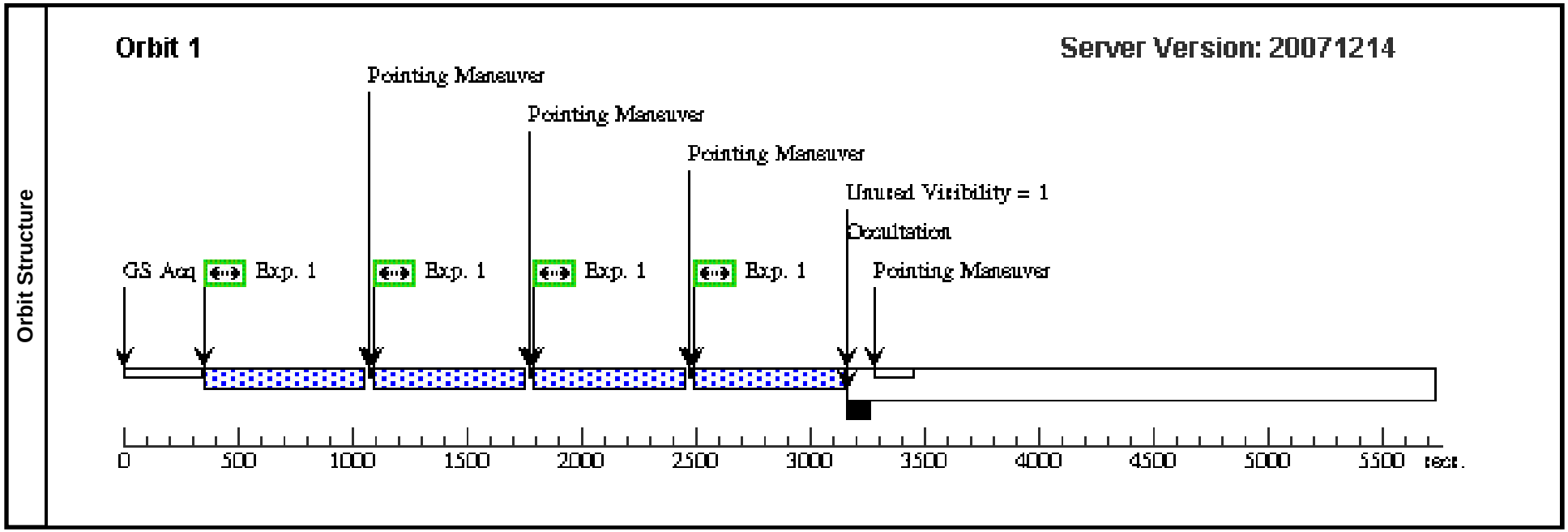
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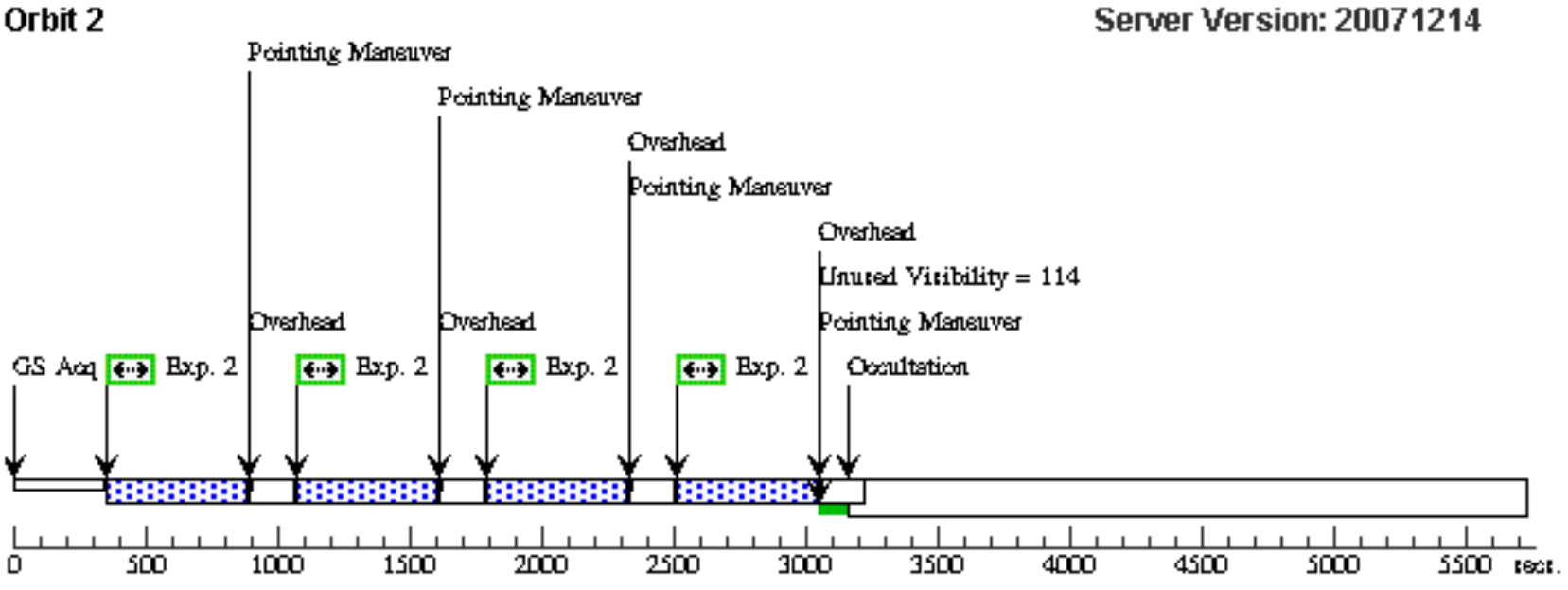

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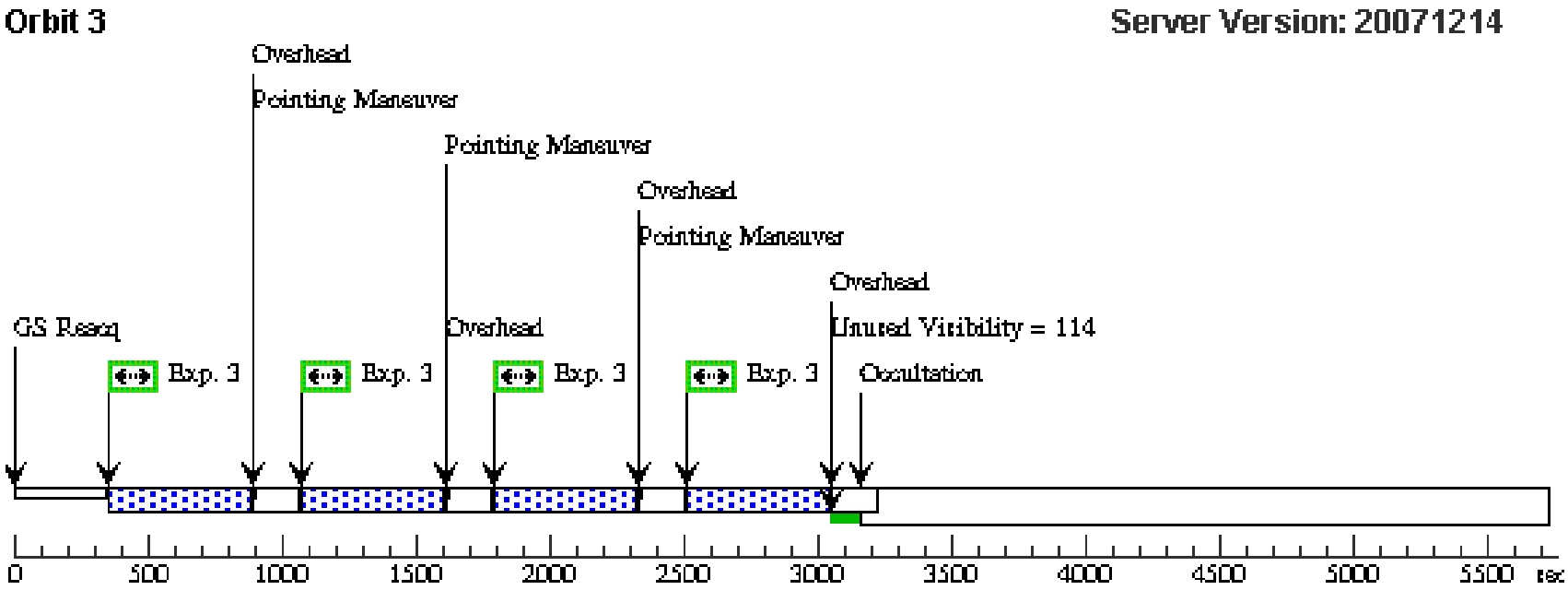

Visit

Proposal 11207, Visit 05, implementation Fri Jan 18 08:14:23 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC, WFPC2

Special Requirements: (none)

Patterns

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Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	NGC1275-E	RA: 03 19 45.8200 (49.9409167d) Dec: +41 30 42.00 (41.51167d) Equinox: J2000		V=11.8	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
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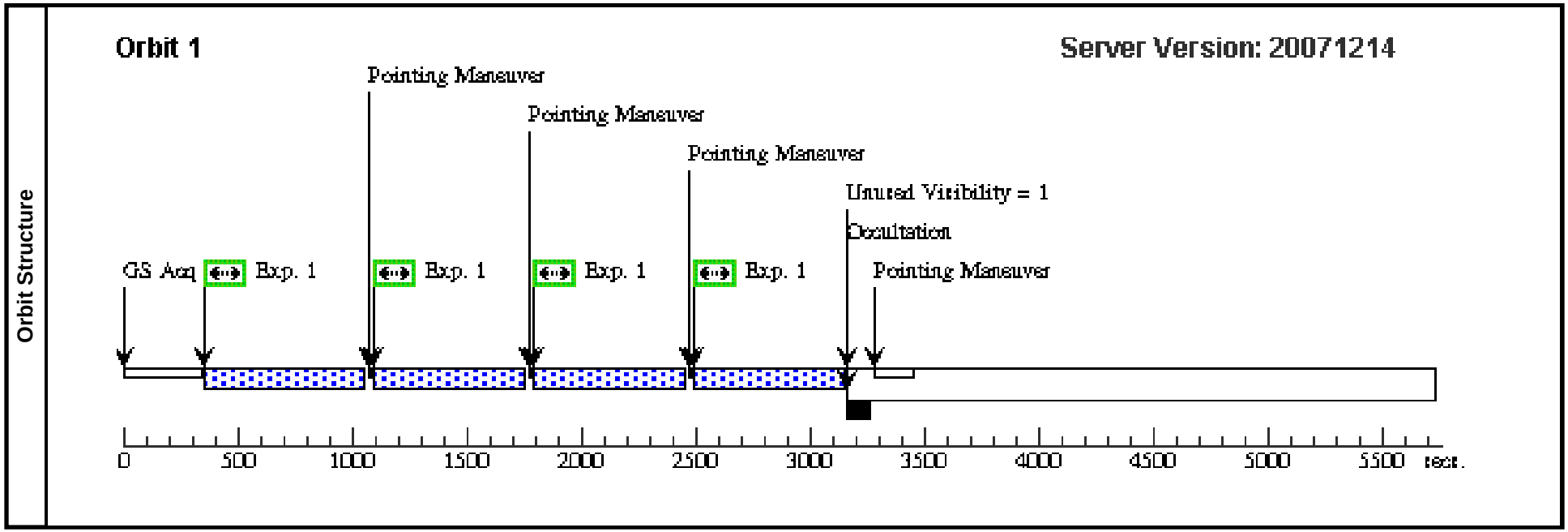
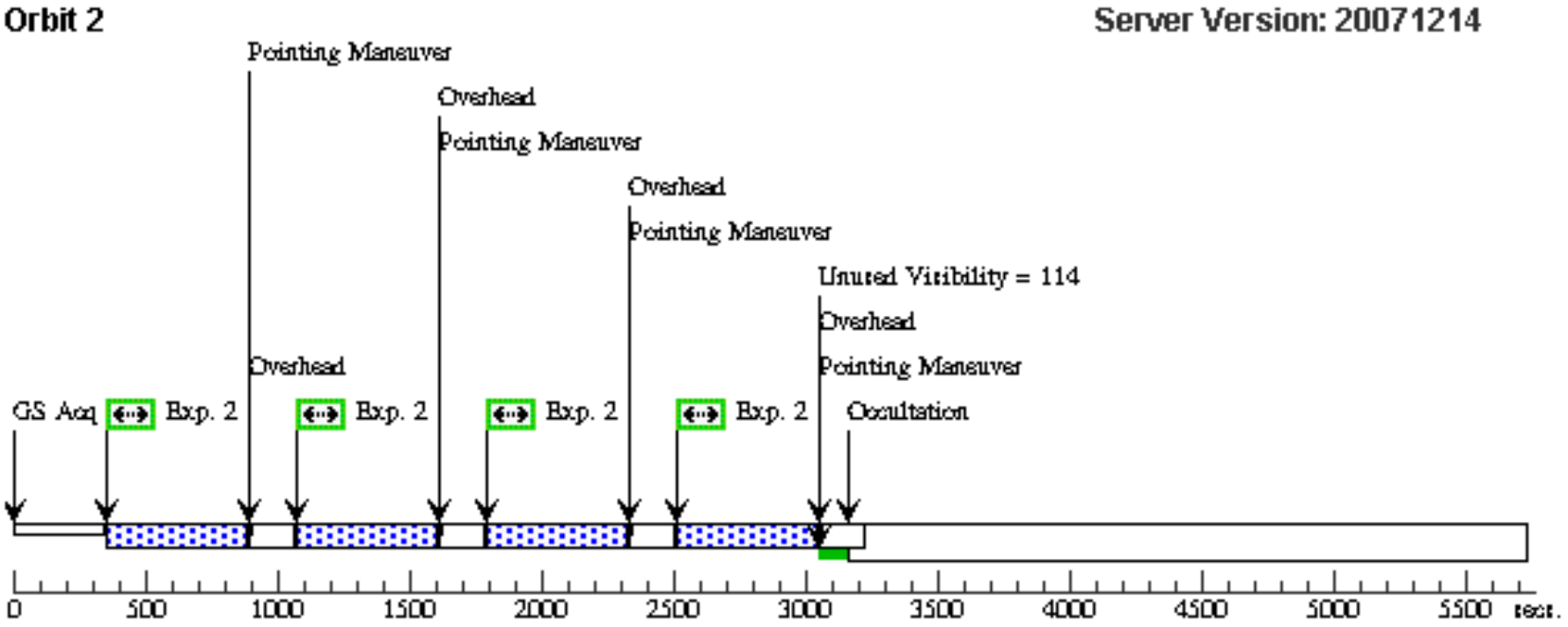
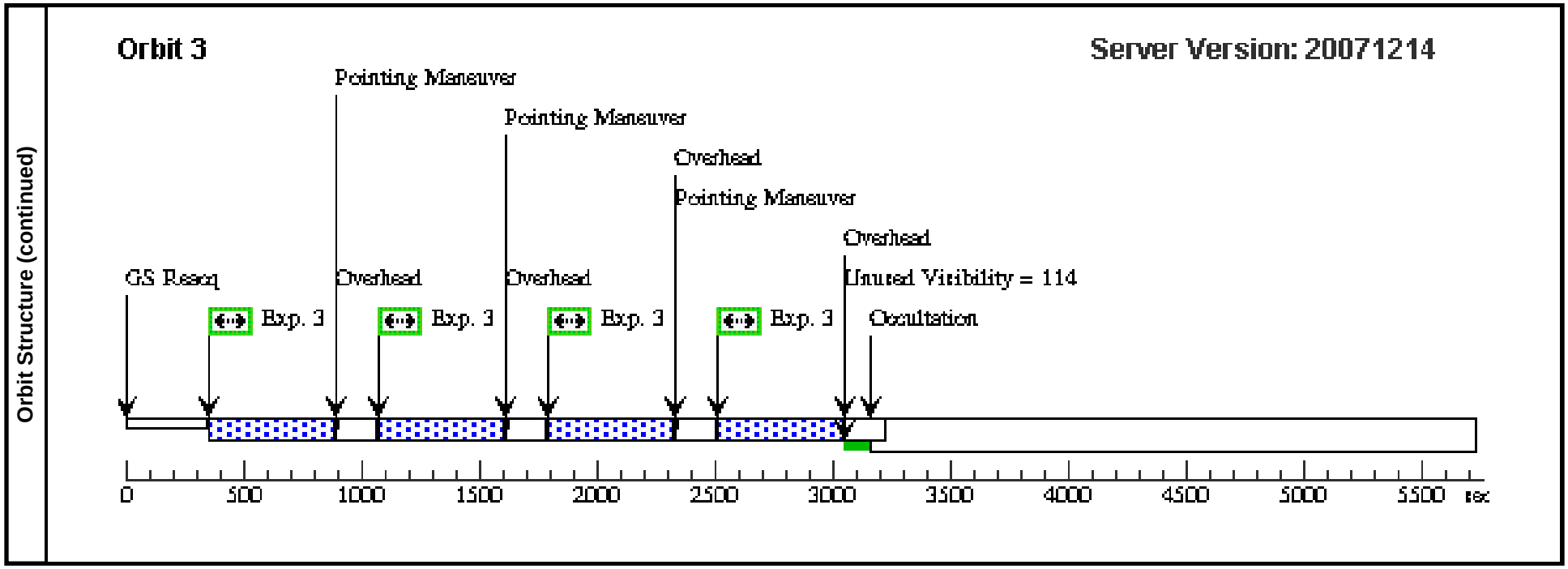
2	NGC1275-E	(5) NGC1275-E	WFPC2, IMAGE, PC1-FIX	F300W			Pattern 2-2 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[2]***
3	NGC1275-E	(5) NGC1275-E	WFPC2, IMAGE, PC1-FIX	F814W			Pattern 3-3 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[3]***


Orbit Structure
Orbit 1
Server Version: 20071214
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 1
Occultation
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Pointing Maneuver
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.

Orbit Structure (continued)




Orbit Structure (continued)
Orbit 3
Server Version: 20071214
Pointing Maneuver
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
GS Reacq
Overhead
Overhead
Unused Visibility = 114
Exp. 3
Exp. 3
Exp. 3
Exp. 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11207, Visit 06, implementation Fri Jan 18 08:14:24 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC, WFPC2

Special Requirements: (none)

Patterns

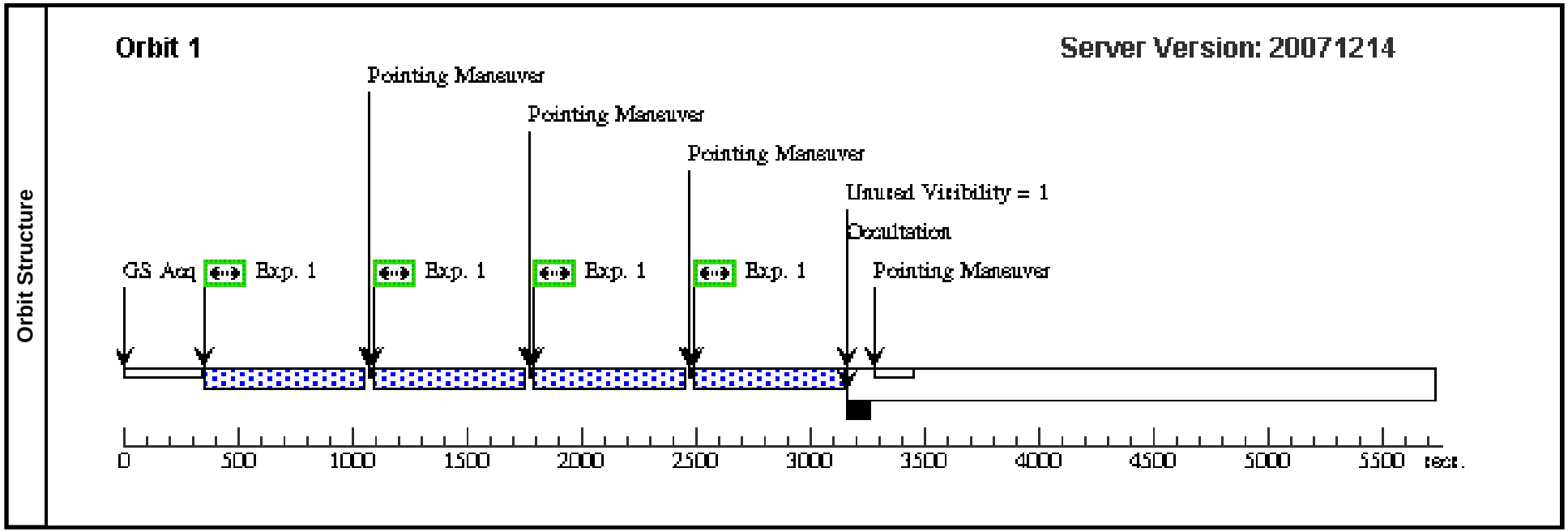
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false		(1)
(2)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559017 Line Spacing=0.559017	Coordinate Frame=POS-TARG Pattern Orientation=26.56505 Angle Between Sides=143.1301 Center Pattern=false		(2), (3)

Fixed Targets

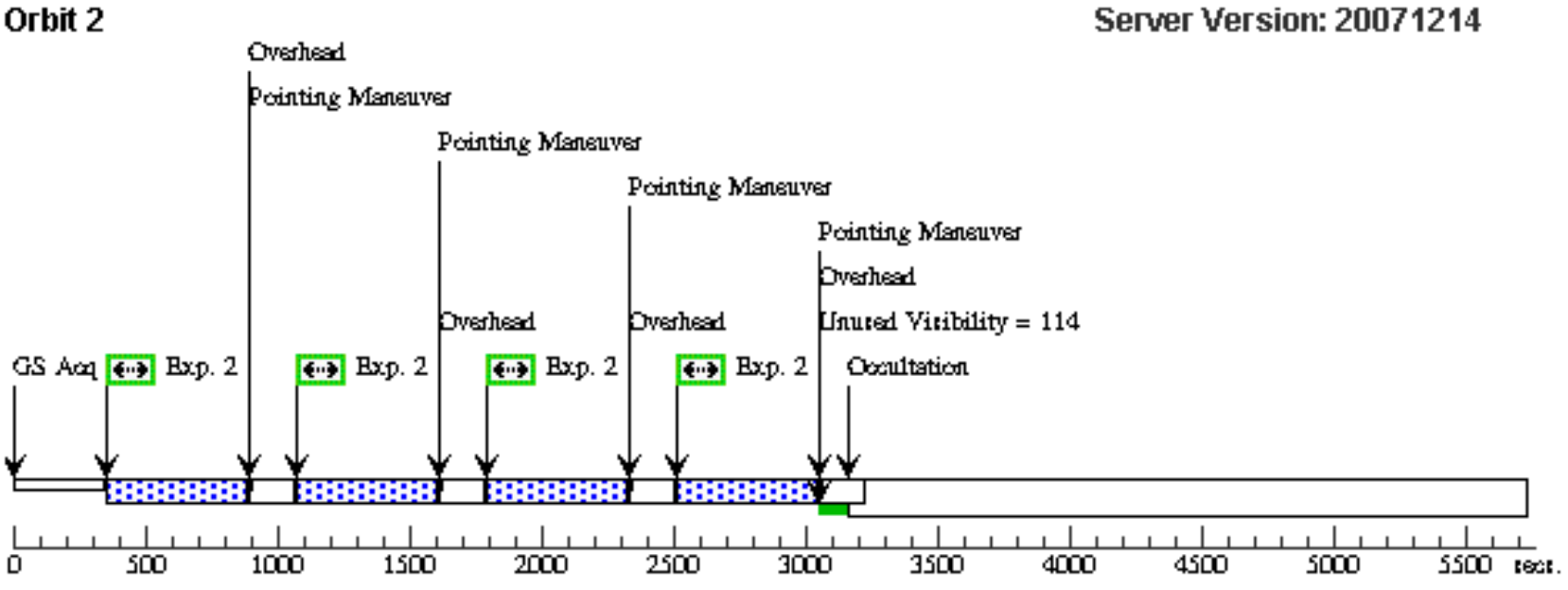
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	NGC1275-F	RA: 03 19 46.9550 (49.9456458d) Dec: +41 30 13.92 (41.50387d) Equinox: J2000		V=11.8	Reference Frame: ICRS

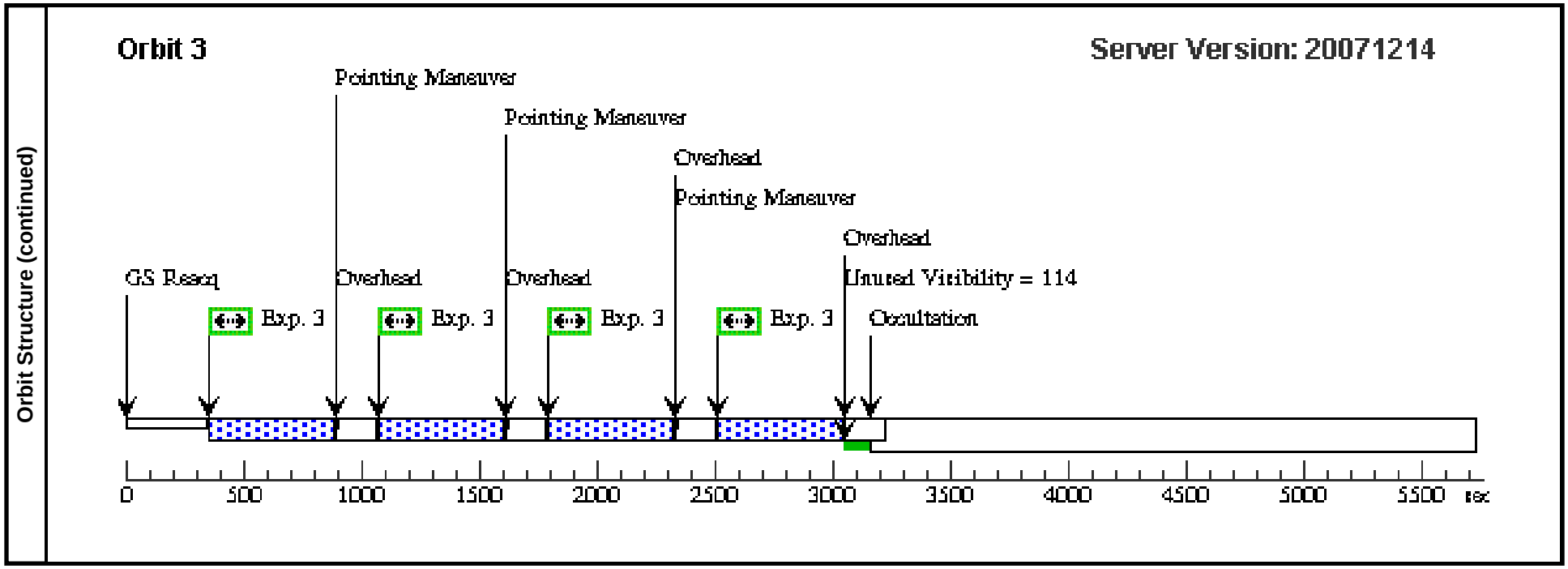
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	NGC1275-F	(6) NGC1275-F	ACS/SBC, ACCUM, SBC-FIX	F140LP			Pattern 1-1 (1)	600.0 Secs	
								[==>638.0 Secs (Pattern 1)] *[==>638.0 Secs (Pattern 2)]* *[==>638.0 Secs (Pattern 3)]* *[==>638.0 Secs (Pattern 4)]*	***[1]***
2	NGC1275-F	(6) NGC1275-F	WFPC2, IMAGE, PC1-FIX	F300W			Pattern 2-2 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[2]***
3	NGC1275-F	(6) NGC1275-F	WFPC2, IMAGE, PC1-FIX	F814W			Pattern 3-3 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[3]***


Orbit Structure
Orbit 1
Server Version: 20071214
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 1
Occultation
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Pointing Maneuver
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.

Orbit Structure (continued)




Orbit Structure (continued)
Orbit 3
Server Version: 20071214
Pointing Maneuver
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
GS Reacq
Overhead
Overhead
Unused Visibility = 114
Exp. 3
Exp. 3
Exp. 3
Exp. 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11207, Visit 07, implementation Fri Jan 18 08:14:25 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC, WFPC2

Special Requirements: (none)

Patterns

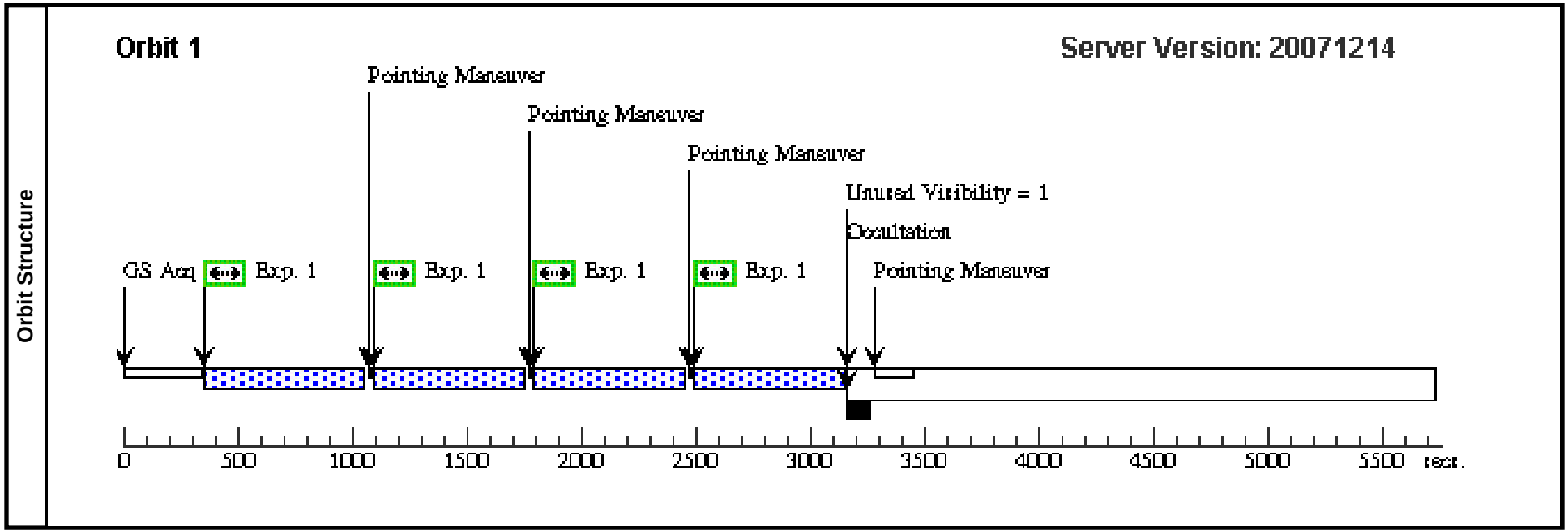
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false		(1)
(2)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559017 Line Spacing=0.559017	Coordinate Frame=POS-TARG Pattern Orientation=26.56505 Angle Between Sides=143.1301 Center Pattern=false		(2), (3)

Fixed Targets

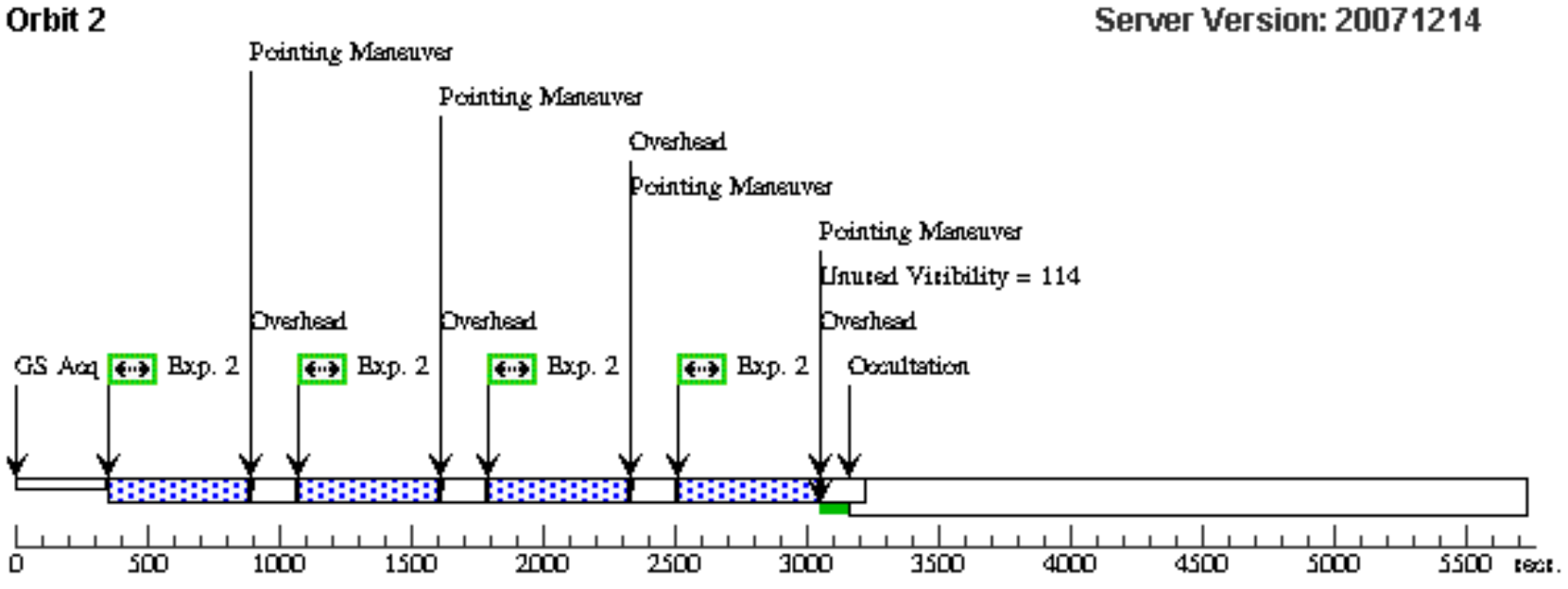
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	NGC1275-G	RA: 03 19 50.9660 (49.9623583d) Dec: +41 30 12.79 (41.50355d) Equinox: J2000		V=11.8	Reference Frame: ICRS

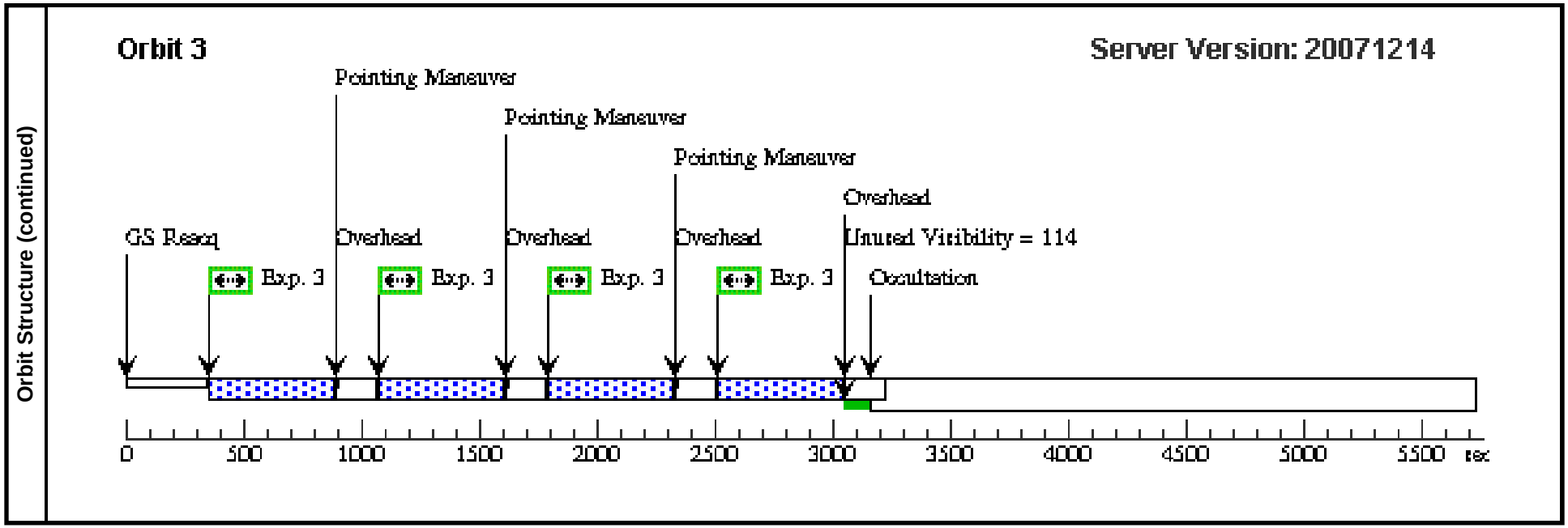
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	NGC1275-G	(7) NGC1275-G	ACS/SBC, ACCUM, SBC-FIX	F140LP			Pattern 1-1 (1)	600.0 Secs	
								[==>638.0 Secs (Pattern 1)] *[==>638.0 Secs (Pattern 2)]* *[==>638.0 Secs (Pattern 3)]* *[==>638.0 Secs (Pattern 4)]*	***[1]***
2	NGC1275-G	(7) NGC1275-G	WFPC2, IMAGE, PC1-FIX	F300W			Pattern 2-2 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[2]***
3	NGC1275-G	(7) NGC1275-G	WFPC2, IMAGE, PC1-FIX	F814W			Pattern 3-3 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[3]***


Orbit Structure
Orbit 1
Server Version: 20071214
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 1
Occultation
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Pointing Maneuver
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.

Orbit Structure (continued)




Orbit Structure (continued)
Orbit 3
Server Version: 20071214
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Overhead
GS Reacq
Overhead
Overhead
Overhead
Unused Visibility = 114
Exp. 3
Exp. 3
Exp. 3
Exp. 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 11207, Visit 08, implementation Fri Jan 18 08:14:25 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC, WFPC2

Special Requirements: (none)

Patterns

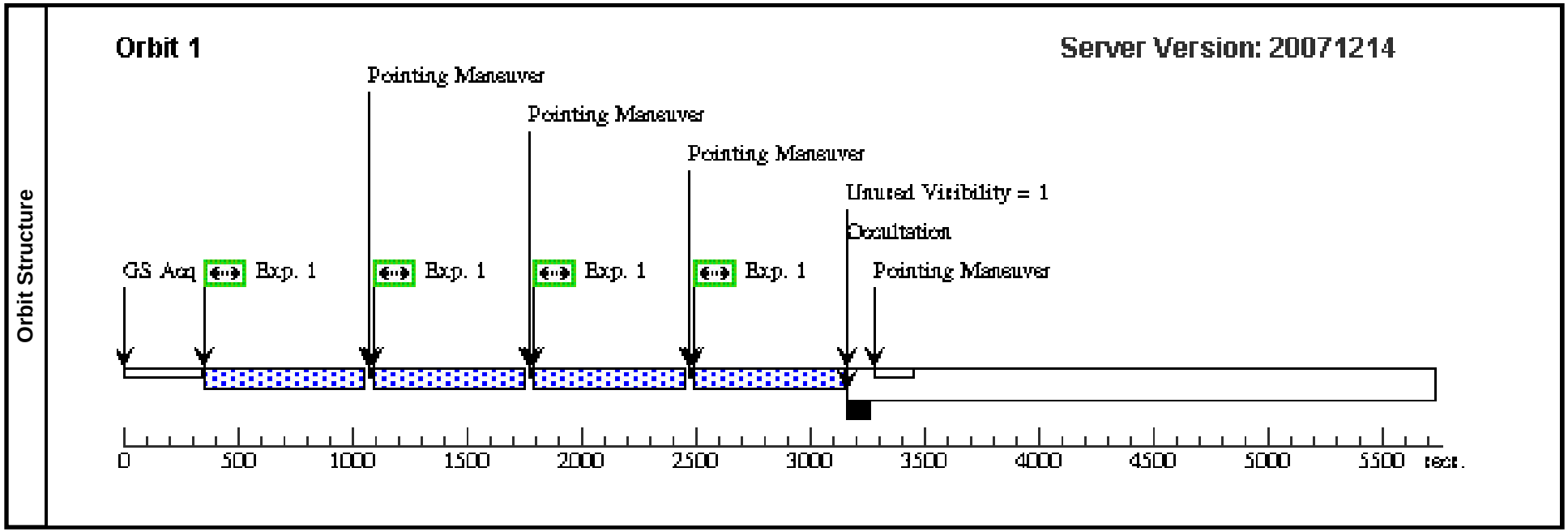
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false		(1)
(2)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559017 Line Spacing=0.559017	Coordinate Frame=POS-TARG Pattern Orientation=26.56505 Angle Between Sides=143.1301 Center Pattern=false		(2), (3)

Fixed Targets

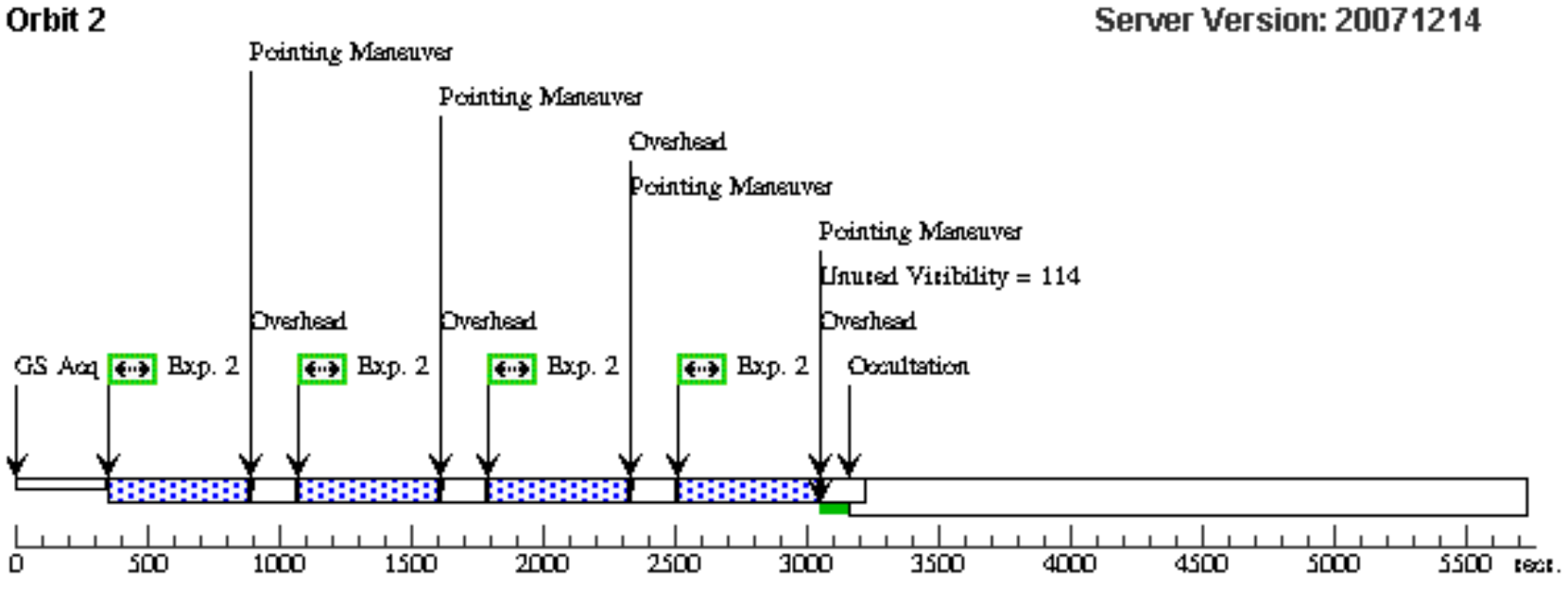
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	NGC1275-H	RA: 03 19 53.3030 (49.9720958d) Dec: +41 30 12.77 (41.50355d) Equinox: J2000		V=11.8	Reference Frame: ICRS

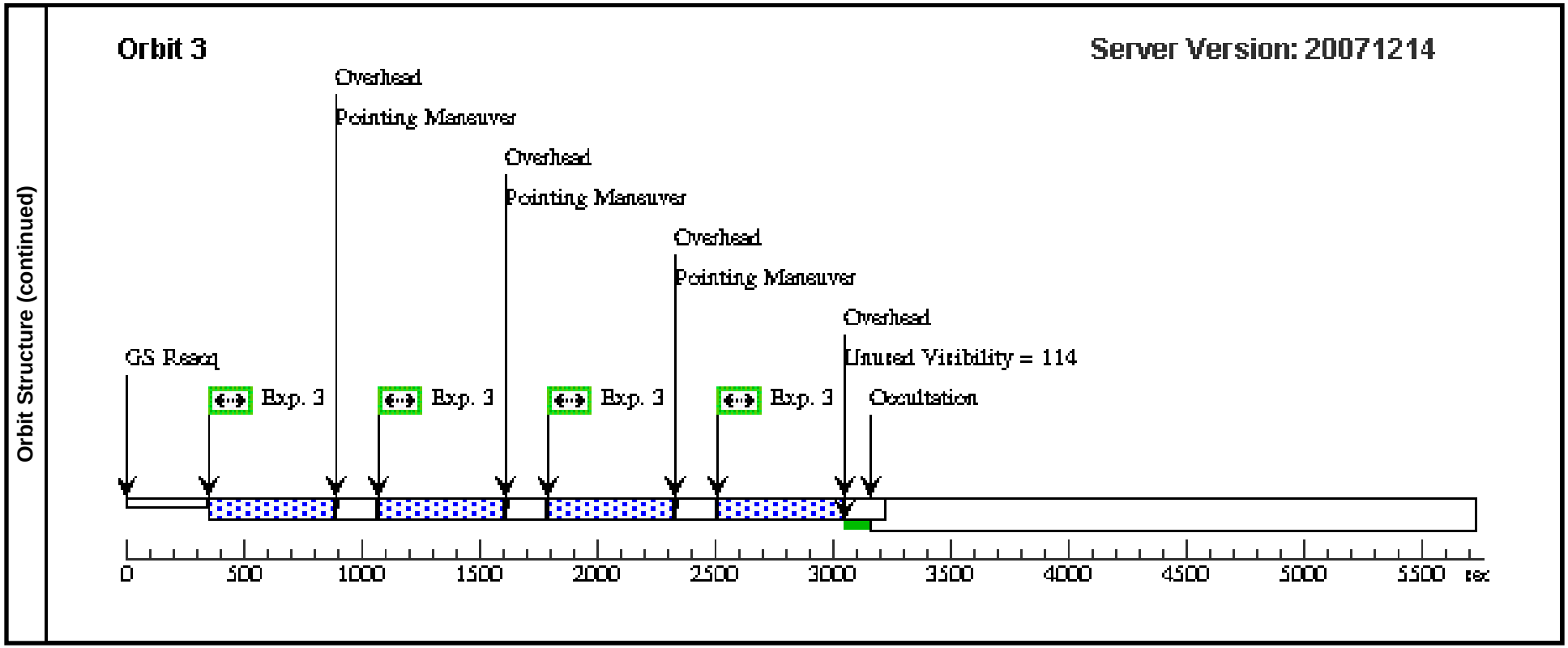
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	NGC1275-H	(8) NGC1275-H	ACS/SBC, ACCUM, SBC-FIX	F140LP			Pattern 1-1 (1)	600.0 Secs	
								[==>638.0 Secs (Pattern 1)] *[==>638.0 Secs (Pattern 2)]* *[==>638.0 Secs (Pattern 3)]* *[==>638.0 Secs (Pattern 4)]*	***[1]***
2	NGC1275-H	(8) NGC1275-H	WFPC2, IMAGE, PC1-FIX	F300W			Pattern 2-2 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[2]***
3	NGC1275-H	(8) NGC1275-H	WFPC2, IMAGE, PC1-FIX	F814W			Pattern 3-3 (2)	400.0 Secs	
								[==>400.0 Secs (Pattern 1)] *[==>400.0 Secs (Pattern 2)]* *[==>400.0 Secs (Pattern 3)]* *[==>400.0 Secs (Pattern 4)]*	***[3]***


Orbit Structure
Orbit 1
Server Version: 20071214
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 1
Occultation
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Pointing Maneuver
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.

Orbit Structure (continued)




Orbit Structure (continued)
Orbit 3
Server Version: 20071214
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Unused Visibility = 114
GS Reacq
Exp. 3
Exp. 3
Exp. 3
Exp. 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec