10633 - GRB afterglows and host galaxies at very high redshifts

Cycle: 14, 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	(8) GRB-060116	NIC3	1	01-Dec-2006 21:03:25.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
31	(8) GRB-060116	ACS/WFC	1	01-Dec-2006 21:03:31.0	yes
41	(8) GRB-060116	ACS/WFC	1	01-Dec-2006 21:03:35.0	yes
51	(8) GRB-060116	NIC3	2	01-Dec-2006 21:03:39.0	yes
52	(8) GRB-060116	NIC3	2	01-Dec-2006 21:03:44.0	yes
53	(8) GRB-060116	ACS/WFC	2	01-Dec-2006 21:03:50.0	yes
54	(8) GRB-060116	ACS/WFC	2	01-Dec-2006 21:04:01.0	yes
61	(9) GRB060121-OPT	ACS/WFC	2	01-Dec-2006 21:04:08.0	yes
63	(9) GRB060121-OPT	ACS/WFC	2	01-Dec-2006 21:04:15.0	yes
62	(9) GRB060121-OPT	ACS/WFC	4	01-Dec-2006 21:04:22.0	yes

19 Total Orbits Used

ABSTRACT

Cosmology is beginning to constrain the nature of the earliest stars and galaxies to form in the universe, but direct observation of galaxies at z>6 remains highly challenging due to their scarcity, intrinsically small size, and high luminosity distance. GRB afterglows, thanks to their extreme luminosities, offer the possibility of circumventing these normal constraints by providing redshifts and spectral information which couldn't be obtained by direct observation of the hosts themselves. In addition, the association of GRBs with massive stars means that they are a tracer of star formation, and that their hosts are likely responsible for a large proportion of the ionizing radiation during that era. Our collaboration is mounting a campaign to rapidly identify and study candidate very high redshift bursts, bringing to bear a network of 2, 4 and 8m telescopes with nIR instrumentation. The capabilities of Swift to detect faint, distant GRBs, and to report accurate positions for many bursts in near real-time makes our program now feasible. HST is crucial to this endeavour, allowing us (a) to monitor the late time afterglows and hence compare them to lower-z bursts and test the use of GRBs as standard candles; and (b) characterise the basic properties, luminosities, and in some cases morphologies, of the hosts, which is essential to understanding these primordial galaxies and their relationship to other populations.

OBSERVING DESCRIPTION

We will concentrate efforts on the NICMOS/f160w band which, while still rest-frame UV, is as red as one can go with HST with reasonable sensitivity, and therefore mitigates as much as possible against dust extinction.

A range of plausible light curves (afterglow and host) is illustrated in Fig. 3. Where possible (pointing constraints permitting) we will rst make two visits 1 orbit at roughly 2 weeks and 3 weeks post burst, to monitor the post-break light curve for suf ciently bright afterglows (on suf ciently faint hosts) and to provide precise localisation of the GRB within its host.

As also shown in Fig. 3, the host, if detectable at all, should dominate the likely afterglow contribution after about 3 months. At this time we will revisit to obtain a deep host observation. With 4 orbits we will reach a 5B detection limit of about H(AB)=26.5. This is below the LC -level for z=3 galaxies redshifted to z=10 and hence offers a fair chance of a successful detection. Note that late time host observations are also necessary to interpret the earlier afterglow observations, since contaminating host light must be removed. For up to 2 targets if found to be ?D E ?6.5 we will also obtain a 2 orbit ACS/WFC z-band (F850LP) exposure (reaching FHGJI $: for a z(AB)=26.8 point source) to provide more detailed colour and morphological information for the host and any other structures in its environment.

Given the big uncertainties in expected numbers, and afterglow and galaxy properties, as discussed above, we request 4 triggers in cycle 14, with IR and in some cases optical followup, typically 7 orbits per trigger. This will be adequate to acquire basic information on the population of very high redshift GRB selected galaxies.

Visit

Proposal 10633, Visit 01, completed Sat Dec 02 02:04:27 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC3

Special Requirements: ON HOLD

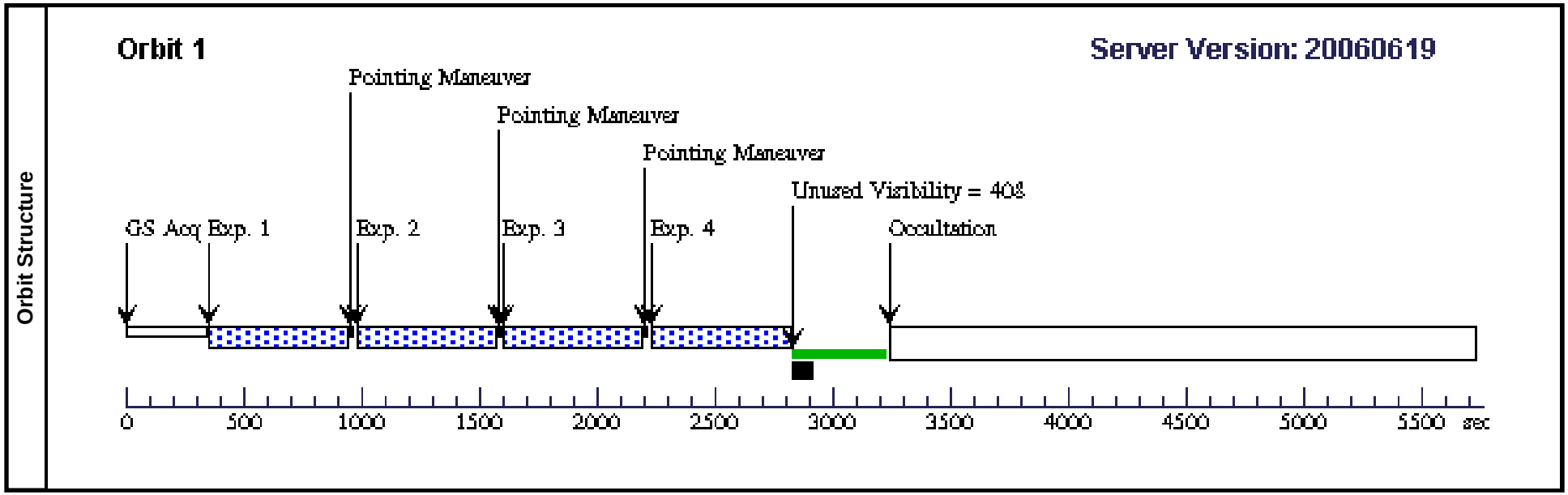
On Hold Comments: This is a ToO

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	GRB-060116	RA: 05 38 46.2800 (84.6928333d) Dec: -05 26 13.10 (-5.43697d) Equinox: J2000		V=30.0+/-2.0 J mag -- 21-24	Coordinate Source: 2Mass Survey

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F160W	NSAMP=11; SAMP-SEQ=SPARS64	POS TARG -1.426,-1.421		*[==>]*	***[1]***
2		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F160W	NSAMP=11; SAMP-SEQ=SPARS64	POS TARG -1.426,1.523		*[==>]*	***[1]***
3		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F160W	NSAMP=11; SAMP-SEQ=SPARS64	POS TARG 1.528,-1.421		*[==>]*	***[1]***
4		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F160W	NSAMP=11; SAMP-SEQ=SPARS64	POS TARG 1.528,1.523		*[==>]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20060619
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 40s
GS Acq
Exp. 1
Exp. 2
Exp. 3
Exp. 4
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10633, Visit 31, failed Sat Dec 02 02:04:28 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Patterns

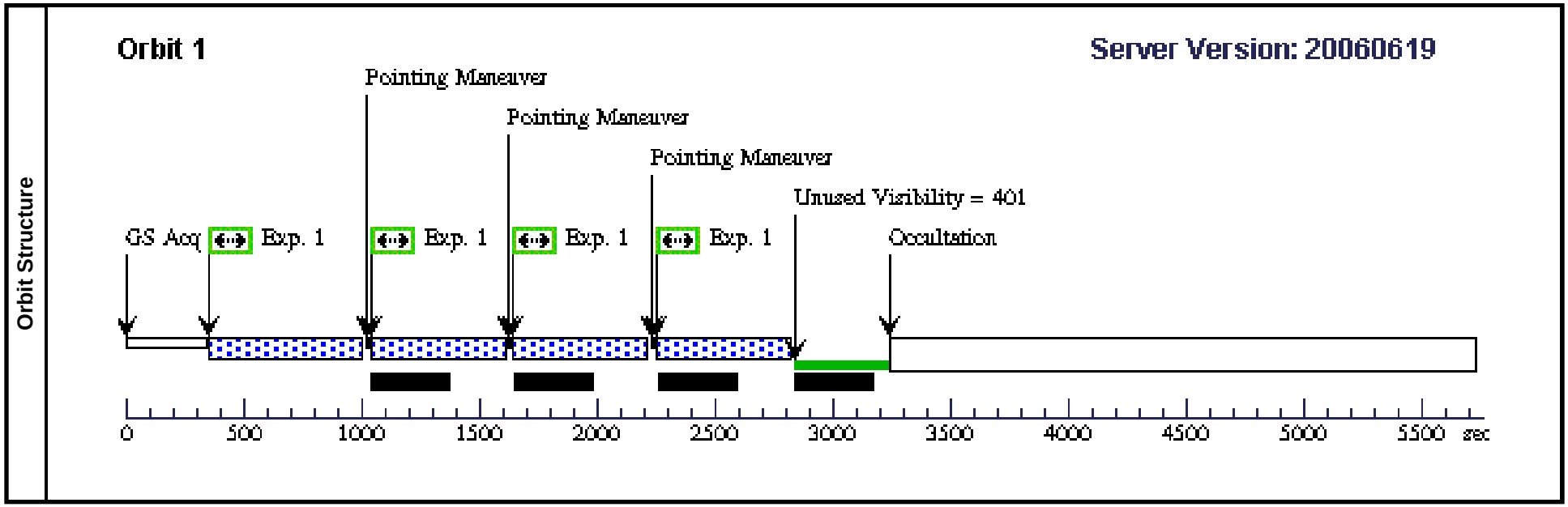
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	GRB-060116	RA: 05 38 46.2800 (84.6928333d) Dec: -05 26 13.10 (-5.43697d) Equinox: J2000		V=30.0+/-2.0 J mag -- 21-24	Coordinate Source: 2Mass Survey

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) GRB-060116	ACS/WFC, ACCUM, WFC1	F775W	CR-SPLIT=NO		Pattern 1-1 (1)	450.0 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***


Orbit Structure
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Server Version: 20060619
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 401
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10633, Visit 41, completed Sat Dec 02 02:04:28 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

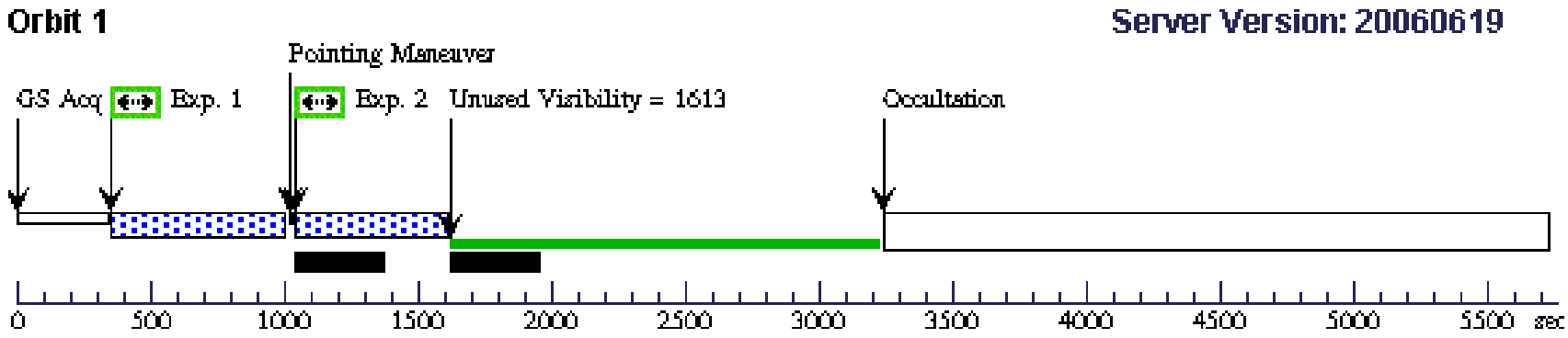
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	GRB-060116	RA: 05 38 46.2800 (84.6928333d) Dec: -05 26 13.10 (-5.43697d) Equinox: J2000		V=30.0+/-2.0 J mag -- 21-24	Coordinate Source: 2Mass Survey

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) GRB-060116	ACS/WFC, ACCUM, WFC1	F775W	CR-SPLIT=NO	POS TARG 0.124,0.233		450.0 Secs *[==>]*	*[1]*
2		(8) GRB-060116	ACS/WFC, ACCUM, WFC1	F775W	CR-SPLIT=NO	POS TARG -0.124,0.14		450.0 Secs *[==>]*	*[1]*

Orbit Structure



Visit

Proposal 10633, Visit 51, scheduling Sat Dec 02 02:04:29 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC3

Special Requirements: ON HOLD

On Hold Comments: This is a ToO

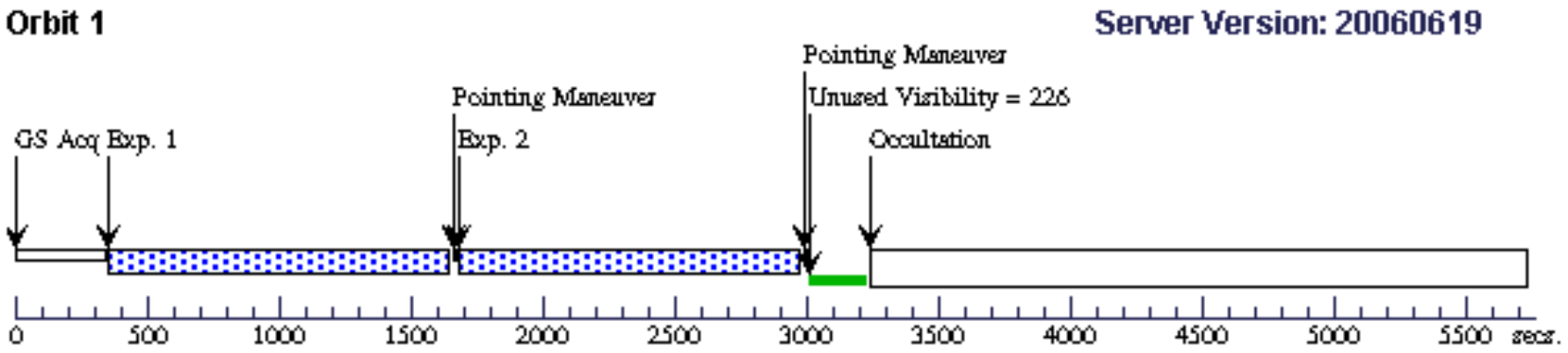
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	GRB-060116	RA: 05 38 46.2800 (84.6928333d) Dec: -05 26 13.10 (-5.43697d) Equinox: J2000		V=30.0+/-2.0 J mag -- 21-24	Coordinate Source: 2Mass Survey

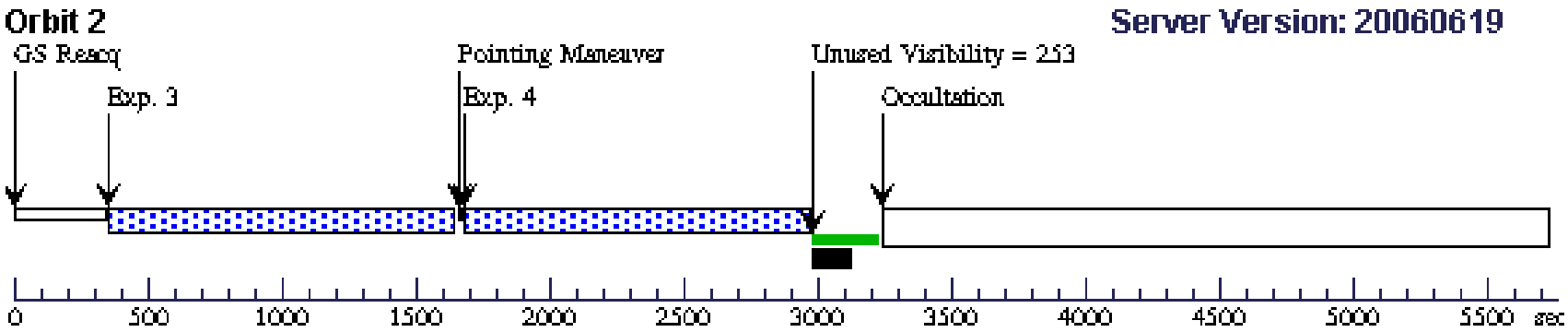
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F110W	NSAMP=22; SAMP-SEQ=SPARS64	POS TARG -1.426,-1.421		*[==>]*	***[1]***
2		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F110W	NSAMP=22; SAMP-SEQ=SPARS64	POS TARG -1.426,1.523		*[==>]*	***[1]***
3		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F110W	NSAMP=22; SAMP-SEQ=SPARS64	POS TARG 1.528,-1.421		*[==>]*	***[2]***
4		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F110W	NSAMP=22; SAMP-SEQ=SPARS64	POS TARG 1.528,1.523		*[==>]*	***[2]***

Orbit Structure



Orbit Structure (continued)



Visit

Proposal 10633, Visit 52, scheduling Sat Dec 02 02:04:30 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: NIC3

Special Requirements: ON HOLD

On Hold Comments: This is a ToO

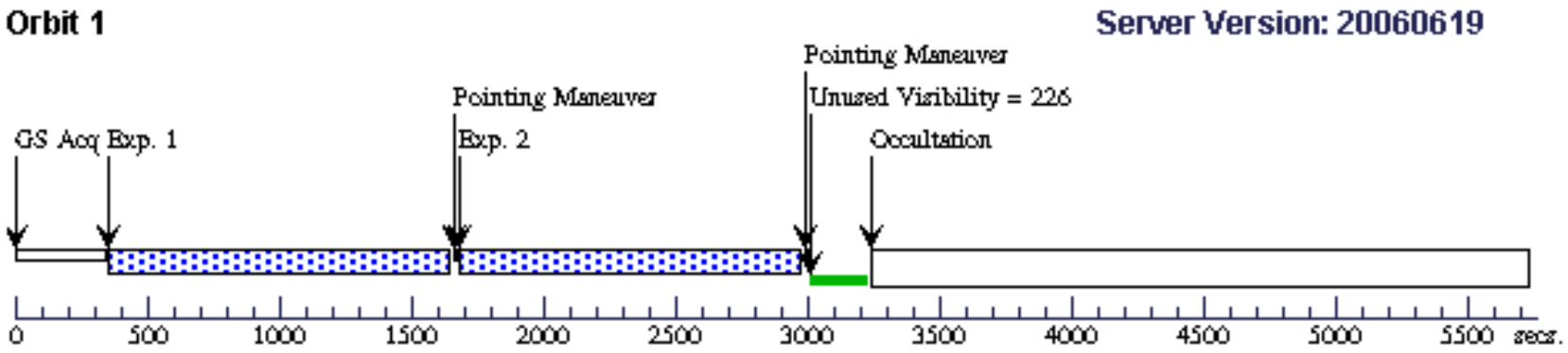
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	GRB-060116	RA: 05 38 46.2800 (84.6928333d) Dec: -05 26 13.10 (-5.43697d) Equinox: J2000		V=30.0+/-2.0 J mag -- 21-24	Coordinate Source: 2Mass Survey

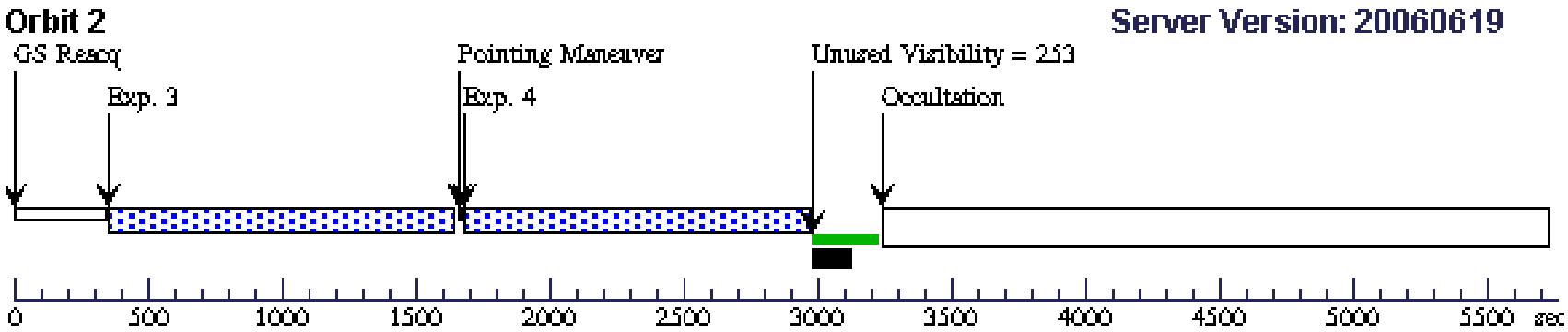
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F160W	NSAMP=22; SAMP-SEQ=SPARS64	POS TARG -1.426,-1.421		*[==>]*	***[1]***
2		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F160W	NSAMP=22; SAMP-SEQ=SPARS64	POS TARG -1.426,1.523		*[==>]*	***[1]***
3		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F160W	NSAMP=22; SAMP-SEQ=SPARS64	POS TARG 1.528,-1.421		*[==>]*	***[2]***
4		(8) GRB-060116	NIC3, MULTIACCUM, NIC3	F160W	NSAMP=22; SAMP-SEQ=SPARS64	POS TARG 1.528,1.523		*[==>]*	***[2]***

Orbit Structure



Orbit Structure (continued)



Visit

Proposal 10633, Visit 53, completed Sat Dec 02 02:04:31 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false	(1)

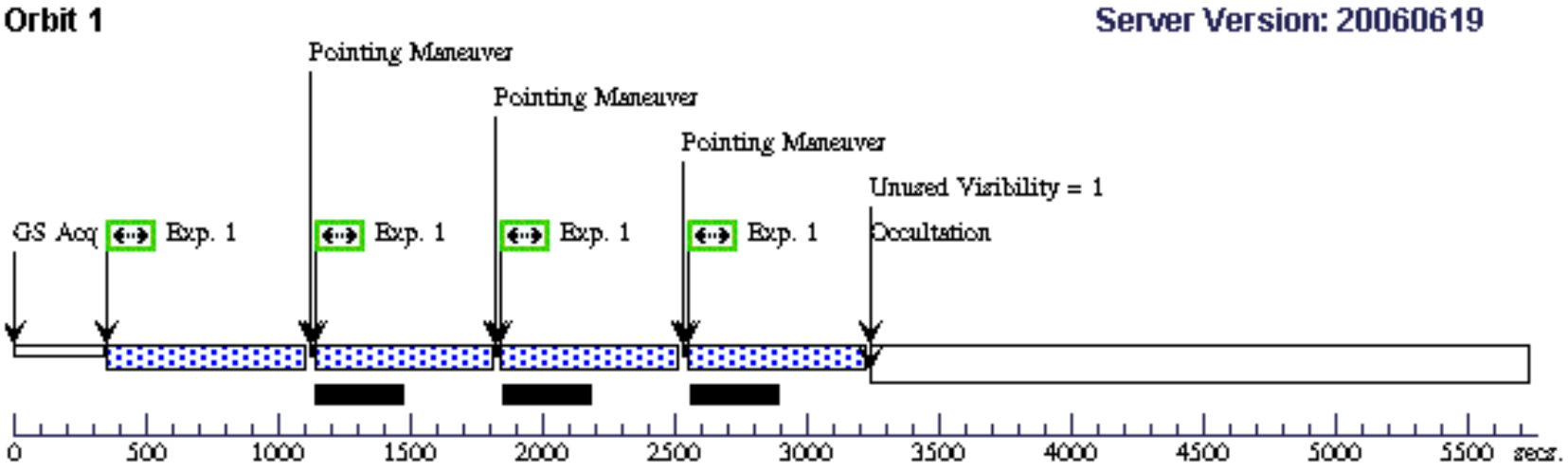
Fixed Targets

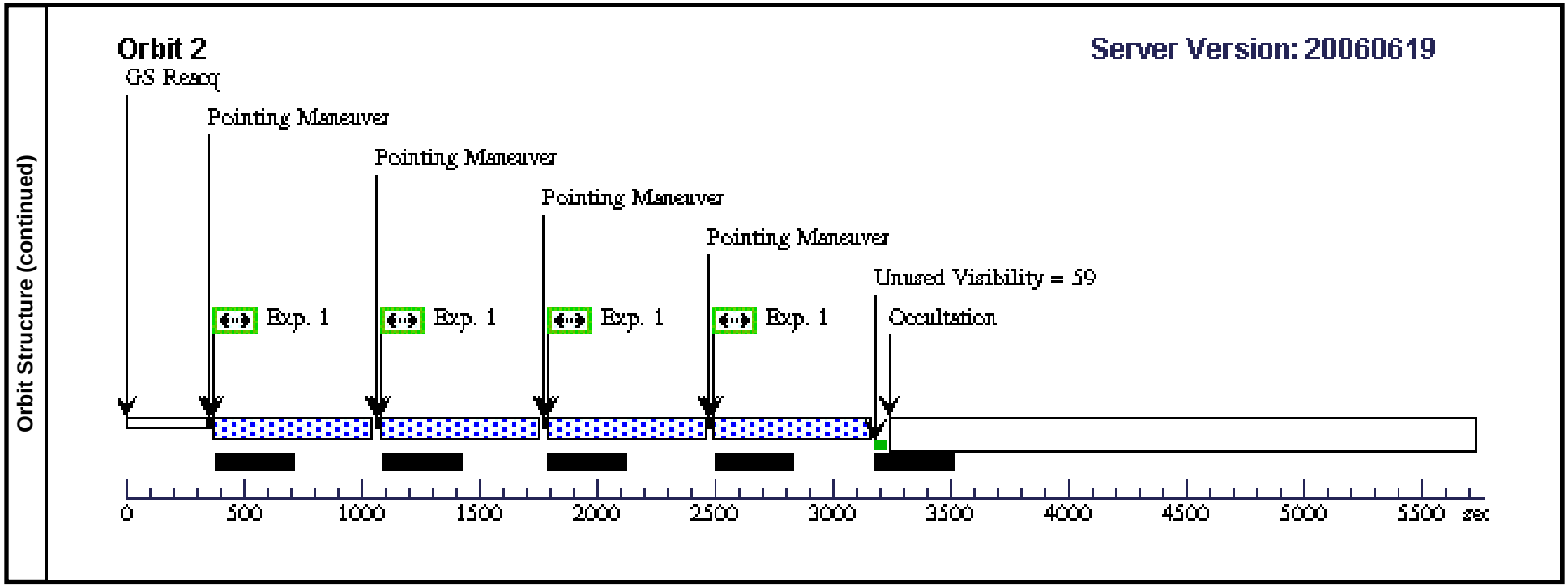
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	GRB-060116	RA: 05 38 46.2800 (84.6928333d) Dec: -05 26 13.10 (-5.43697d) Equinox: J2000		V=30.0+/-2.0 J mag -- 21-24	Coordinate Source: 2Mass Survey

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) GRB-060116	ACS/WFC, ACCUM, WFC1	F850LP	CR-SPLIT=NO		Pattern 1-1 (2)	550.0 Secs	
								[==>(Pattern 1,1)] *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]*	***[1]***
								[==>(Pattern 2,1)] *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[2]***

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20060619
GS Reacq
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 59
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10633, Visit 54, completed Sat Dec 02 02:04:32 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false	(1)

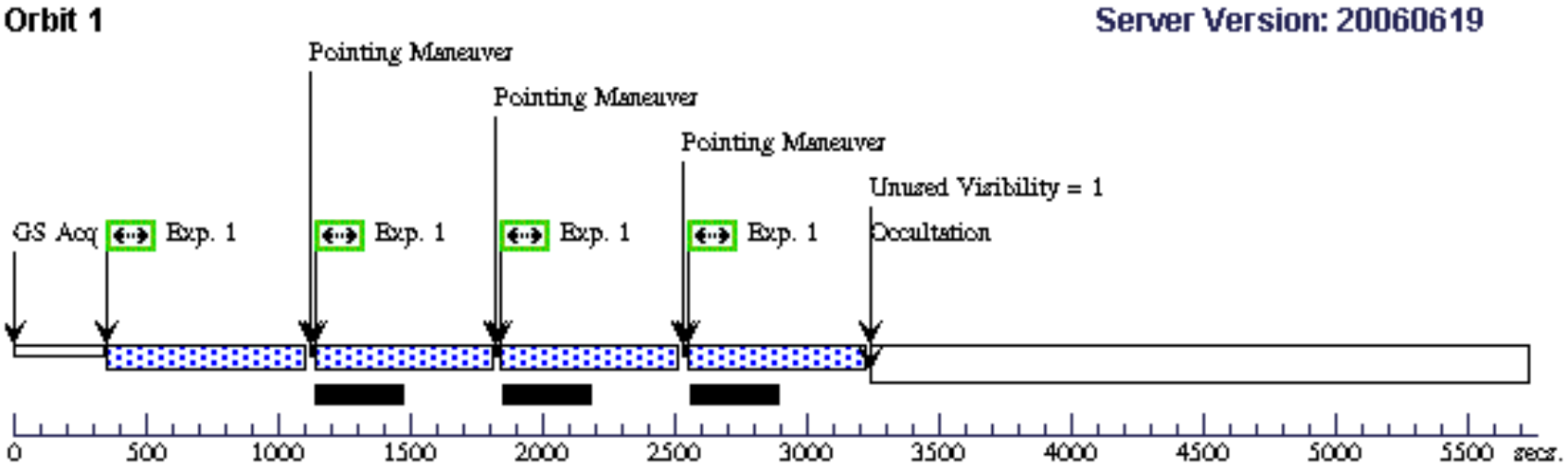
Fixed Targets

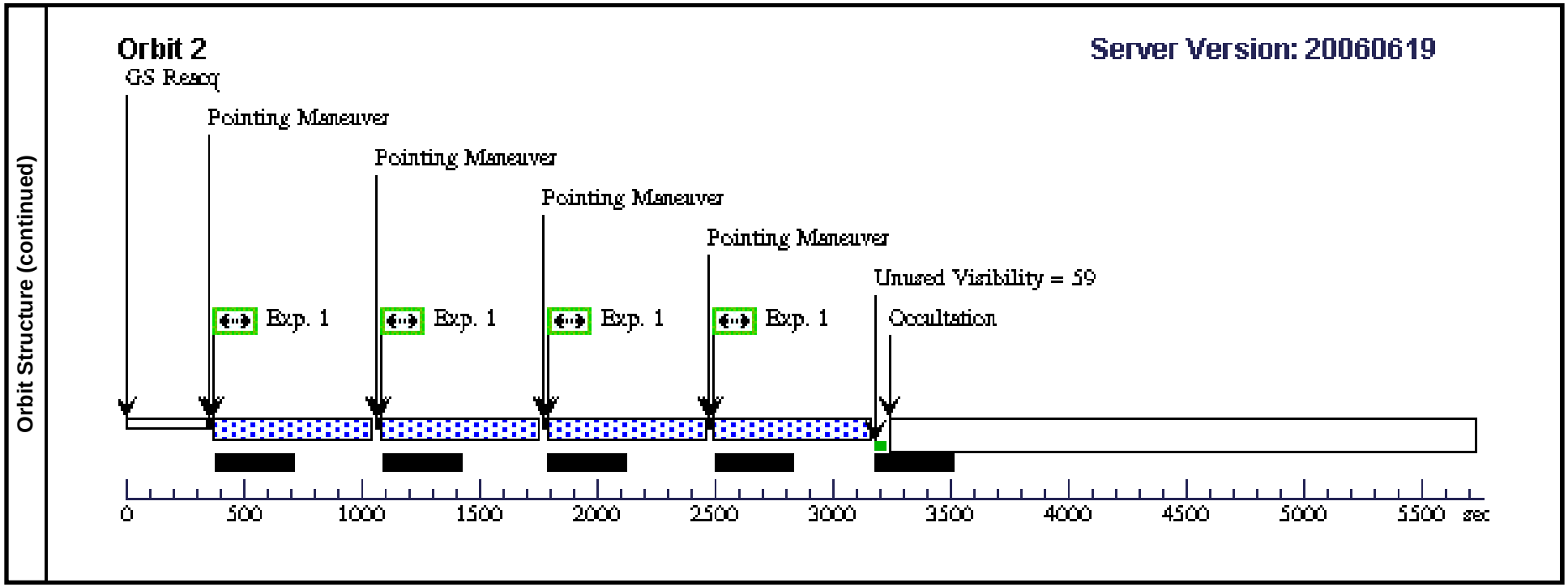
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	GRB-060116	RA: 05 38 46.2800 (84.6928333d) Dec: -05 26 13.10 (-5.43697d) Equinox: J2000		V=30.0+/-2.0 J mag -- 21-24	Coordinate Source: 2Mass Survey

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) GRB-060116	ACS/WFC, ACCUM, WFC1	F775W	CR-SPLIT=NO		Pattern 1-1 (2)	550.0 Secs	
								[==>(Pattern 1,1)] *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]*	***[1]***
								[==>(Pattern 2,1)] *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[2]***

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20060619
GS Reacq
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 59
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10633, Visit 61, failed Sat Dec 02 02:04:32 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false	(1)

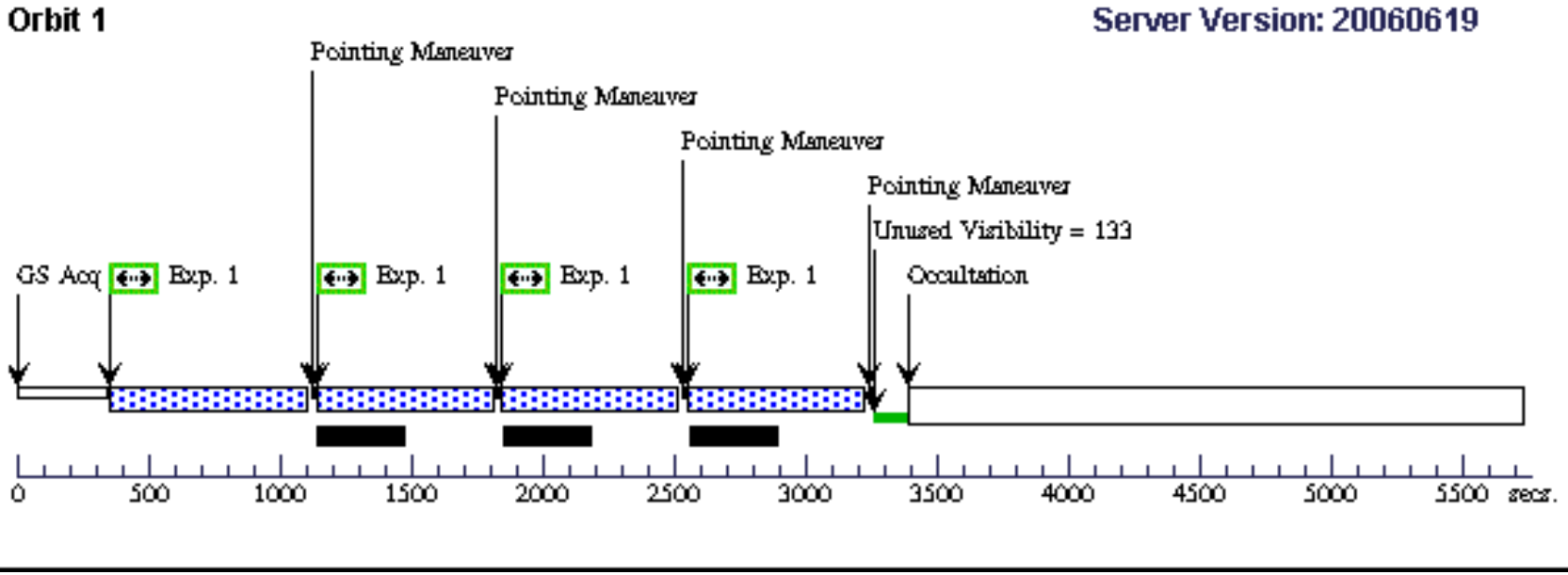
Fixed Targets

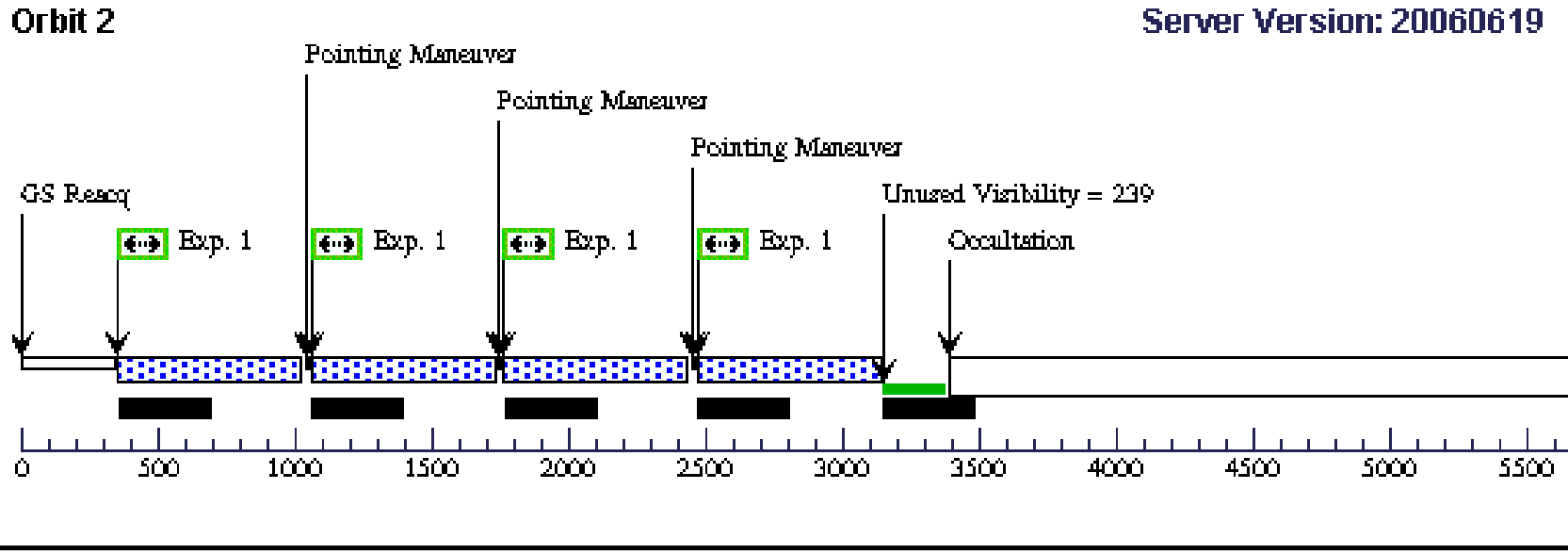
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	GRB060121-OPT	RA: 09 09 51.9900 (137.4666250d) Dec: +45 39 45.60 (45.66267d) Equinox: J2000 Plate Id: (?)		V=27.0+/-1.0	Coordinate Source: GUIDE_STAR_CATALOG

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(9) GRB060121-OPT	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=NO		Pattern 1-1 (2)	550.0 Secs	
								[==>(Pattern 1,1)] *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]*	***[1]***
								[==>(Pattern 2,1)] *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[2]***

Orbit Structure





Visit

Proposal 10633, Visit 63 Sat Dec 02 02:04:33 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Comments: copy of visit 61

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false	(1)

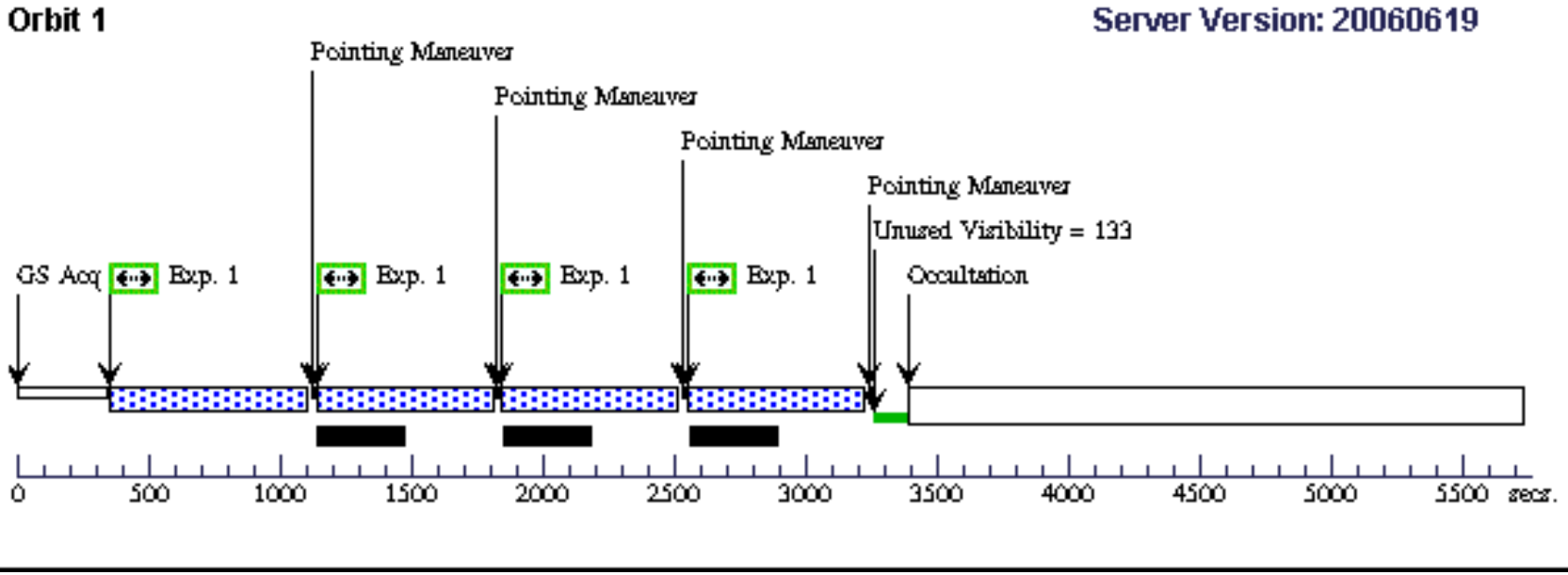
Fixed Targets

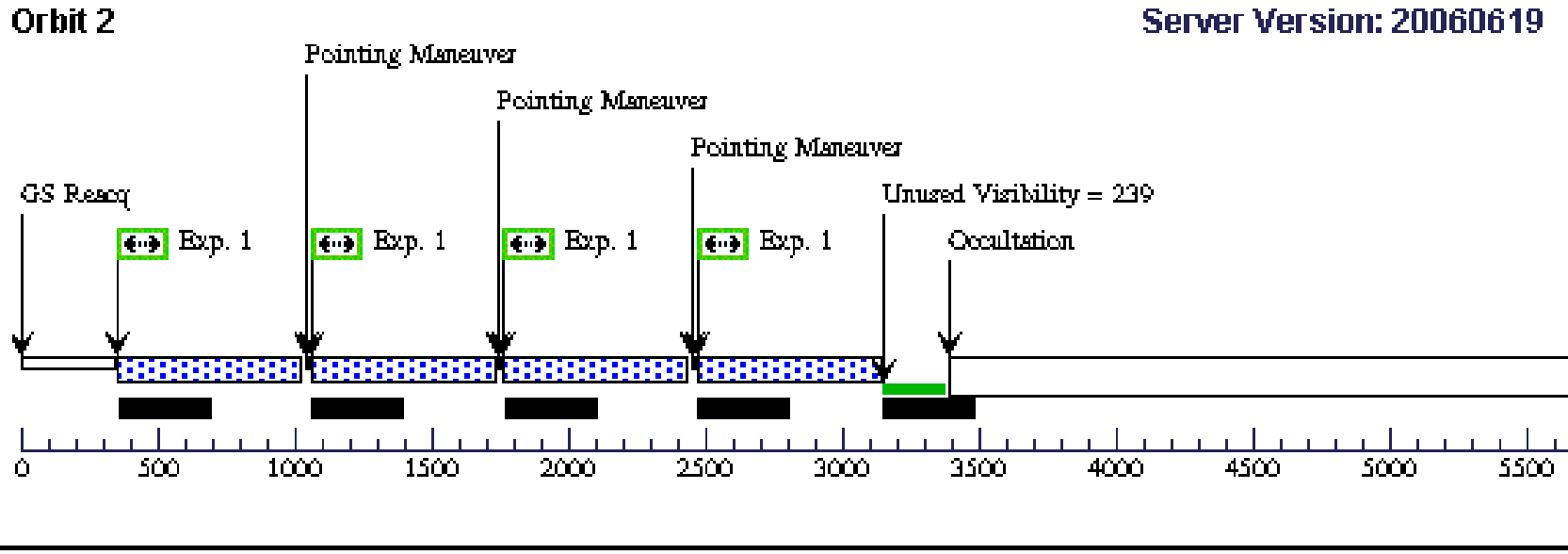
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	GRB060121-OPT	RA: 09 09 51.9900 (137.4666250d) Dec: +45 39 45.60 (45.66267d) Equinox: J2000 Plate Id: (?)		V=27.0+/-1.0	Coordinate Source: GUIDE_STAR_CATALOG

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(9) GRB060121-OPT	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=NO		Pattern 1-1 (2)	550.0 Secs	
								[==>(Pattern 1,1)] *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]*	***[1]***
								[==>(Pattern 2,1)] *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[2]***

Orbit Structure





Visit

Proposal 10633, Visit 62, completed Sat Dec 02 02:04:34 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.3 Angle Between Sides= Center Pattern=false	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.1 Center Pattern=false	(1)

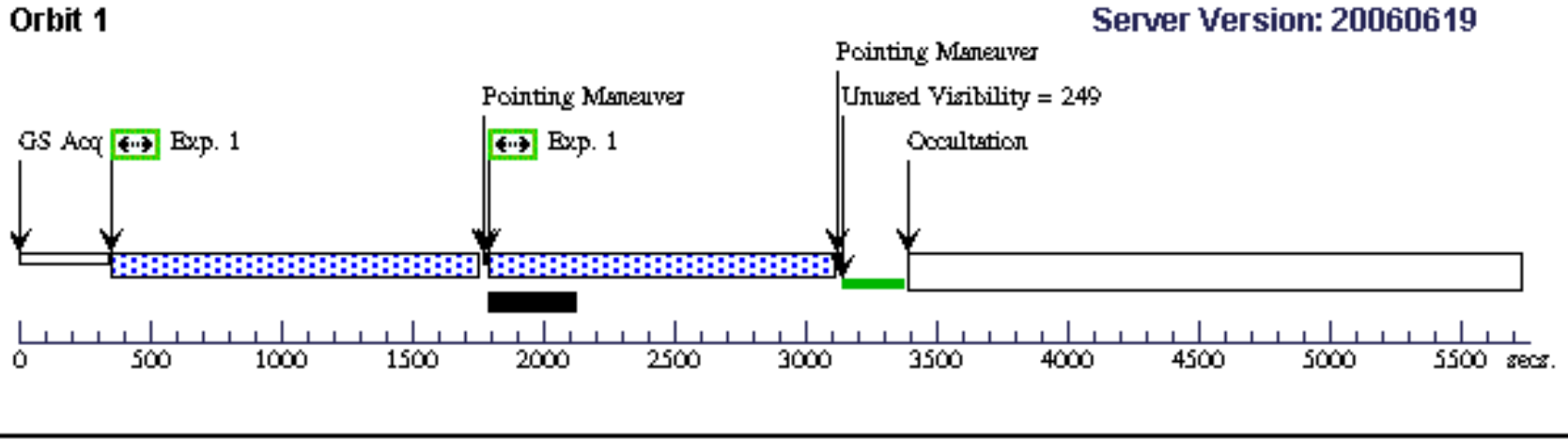
Fixed Targets

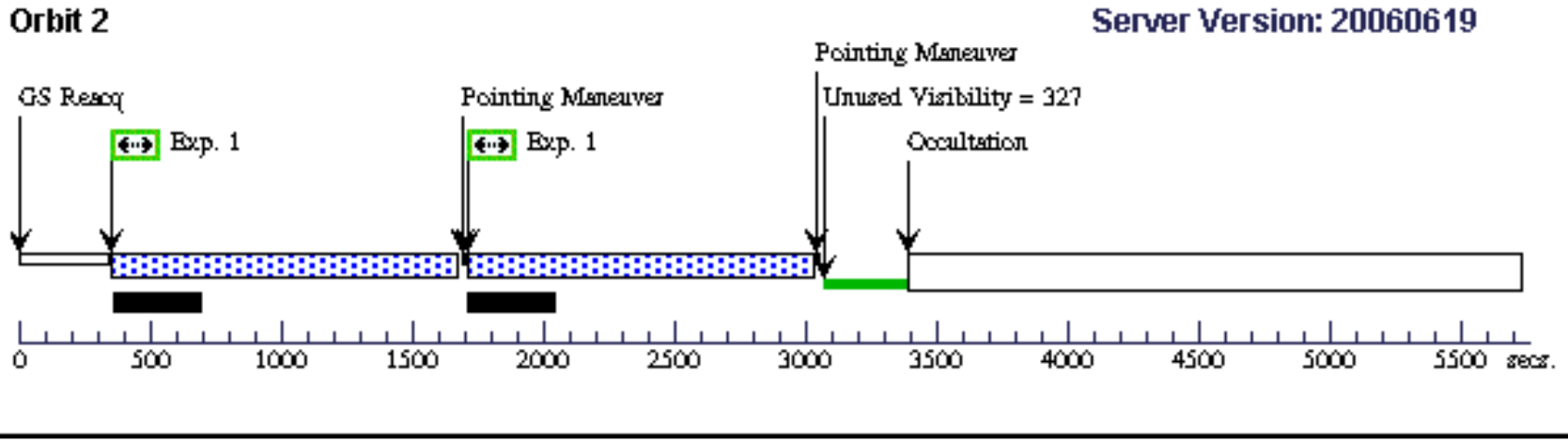
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	GRB060121-OPT	RA: 09 09 51.9900 (137.4666250d) Dec: +45 39 45.60 (45.66267d) Equinox: J2000 Plate Id: (?)		V=27.0+/-1.0	Coordinate Source: GUIDE_STAR_CATALOG

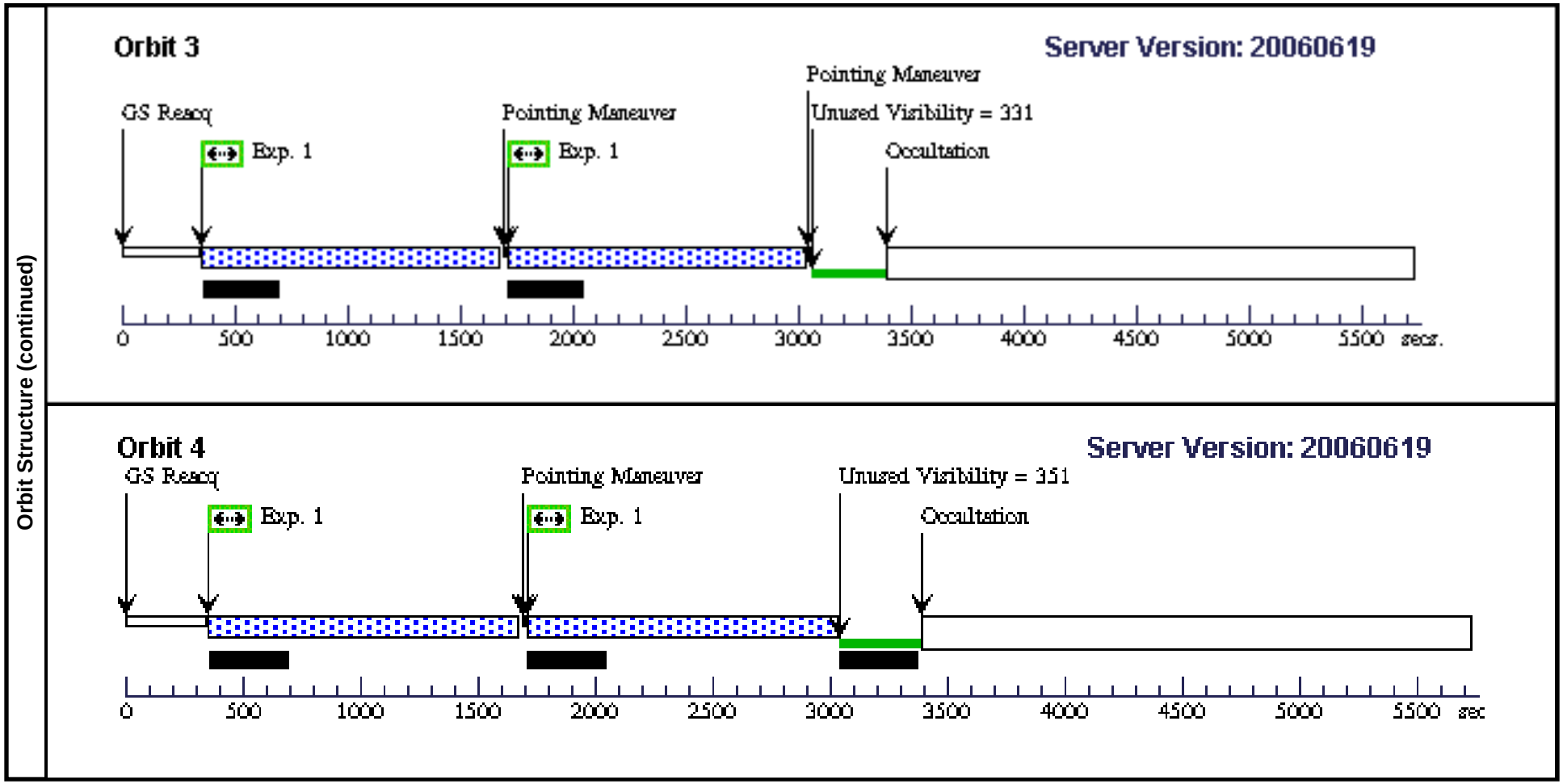
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(9) GRB060121-OPT	ACS/WFC, ACCUM, WFC1	F555W	CR-SPLIT=NO		Pattern 1-1 (2)	1200.0 Secs	
								[==>(Pattern 1,1)] *[==>(Pattern 1,2)]*	***[1]***
								[==>(Pattern 1,3)] *[==>(Pattern 1,4)]*	***[2]***
								[==>(Pattern 2,1)] *[==>(Pattern 2,2)]*	***[3]***
								[==>(Pattern 2,3)] *[==>(Pattern 2,4)]*	***[4]***

Orbit Structure






Orbit Structure (continued)
Orbit 3
Server Version: 20060619
GS Reacq
Exp. 1
Pointing Maneuver
Exp. 1
Pointing Maneuver
Unused Visibility = 331
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.
Orbit 4
Server Version: 20060619
GS Reacq
Exp. 1
Pointing Maneuver
Exp. 1
Unused Visibility = 351
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec