12949 - Unveiling the Dusty Universe with the Host Galaxies of Obscured GRBs

Cycle: 20, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Daniel Perley (PI) (Contact)	**California Institute of Technology**	**dperley@astro.caltech.edu**
Dr. Andrew J. Levan (CoI) (ESA Member)	The University of Warwick	a.j.levan@warwick.ac.uk
Prof. Nial R. Tanvir (CoI) (ESA Member)	University of Leicester	nrt3@star.le.ac.uk
Prof. Jens Hjorth (CoI) (ESA Member)	University of Copenhagen, Niels Bohr Institute	jens@dark-cosmology.dk
Dr. Johan P. U. Fynbo (CoI) (ESA Member)	University of Copenhagen, Niels Bohr Institute	jfynbo@dark-cosmology.dk
Dr. Darach Watson (CoI) (ESA Member)	University of Copenhagen, Niels Bohr Institute	darach@astro.ku.dk
Dr. Stephen Bradley Cenko (CoI)	University of California - Berkeley	bcenko@astro.berkeley.edu
Dr. Daniele Malesani (CoI) (ESA Member)	University of Copenhagen, Niels Bohr Institute	malesani@dark-cosmology.dk
Dr. Thomas Kruehler (CoI) (ESA Member)	University of Copenhagen, Niels Bohr Institute	tom@dark-cosmology.dk
Dr. Patricia Schady (CoI) (ESA Member)	Max-Planck-Institut fur extraterrestrische Physik	pschady@mpe.mpg.de
Prof. Joshua S. Bloom (CoI)	University of California - Berkeley	jbloom@astron.berkeley.edu
Dr. Jason X. Prochaska (CoI)	University of California - Santa Cruz	xavier@ucolick.org
Dr. Andrew S. Fruchter (CoI)	Space Telescope Science Institute	fruchter@stsci.edu
Dr. Hsiao-Wen Chen (CoI)	University of Chicago	hchen@oddjob.uchicago.edu
Dr. Antonino Cucchiara (CoI)	University of California - Santa Cruz	acucchia@ucolick.org
Mr. John Graham (CoI)	The Johns Hopkins University	graham@stsci.edu
Mr. Adam N. Morgan (CoI)	University of California - Berkeley	amorgan@astro.berkeley.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) GRB050408	WFC3/IR	1	18-Jan-2013 21:14:25.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
02	(2) GRB070208	WFC3/IR	1	18-Jan-2013 21:14:36.0	yes
03	(3) GRB070802	WFC3/IR	1	18-Jan-2013 21:14:44.0	yes
04	(4) GRB080603A	WFC3/IR	1	18-Jan-2013 21:14:52.0	yes
05	(5) GRB080605	WFC3/IR	1	18-Jan-2013 21:14:59.0	yes
06	(6) GRB081109	WFC3/IR	1	18-Jan-2013 21:15:07.0	yes
07	(7) GRB120119A	WFC3/IR	1	18-Jan-2013 21:15:15.0	yes
08	(8) GRB060719	WFC3/IR	1	18-Jan-2013 21:15:21.0	yes
09	(9) GRB090404	WFC3/IR	1	18-Jan-2013 21:15:28.0	yes
10	(10) GRB060814A	WFC3/IR	1	18-Jan-2013 21:15:38.0	yes
11	(11) GRB060923A	WFC3/IR	1	18-Jan-2013 21:15:45.0	yes
12	(12) GRB070306	WFC3/IR	1	18-Jan-2013 21:15:53.0	yes
13	(13) GRB071021	WFC3/IR	1	18-Jan-2013 21:15:59.0	yes
14	(14) GRB080325	WFC3/IR	1	18-Jan-2013 21:16:06.0	yes
15	(15) GRB081221	WFC3/IR	1	18-Jan-2013 21:16:13.0	yes
16	(16) GRB090709A	WFC3/IR	1	18-Jan-2013 21:16:20.0	yes
17	(17) GRB100526A	WFC3/IR	1	18-Jan-2013 21:16:27.0	yes
18	(18) GRB100621A	WFC3/IR	1	18-Jan-2013 21:16:36.0	yes

18 Total Orbits Used

ABSTRACT

Recent observations have unveiled a previously hidden population of highly dust-obscured long-duration GRBs, many of which have now been associated with dusty and metal-rich galaxies quite unlike "canonical" GRB hosts. This discovery has the potential to significantly affect our view of the GRB progenitor (and its connection to metallicity) and the ability to use GRBs as a tracers of cosmic star-formation at high redshifts. We propose to observe the hosts of 18 moderately to highly obscured GRBs with WFC3-IR, supplementing existing Spitzer and ground-based observations and allowing direct comparison of the properties of dust-obscured GRB hosts (morphology, color, redshift, stellar mass, etc.) to unobscured hosts and to field populations. Many of the afterglows in the sample also tightly constrain the wavelength-dependence of extinction along the host galaxy

sightline, a measurement that is exceedingly difficult to make via almost any other method outside the Local Group. With these observations we will correlate both the amount and the nature of the dust obscuration along a GRB sightline with the host's overall properties, in order to: (1) determine the relation between the new class of red, dust-obscured GRB host galaxies and the dusty galaxies which contributed substantially to cosmic star-formation at z=1-3, (2) investigate the nature of very blue galaxies which show no extinction in integrated starlight but nevertheless host highly obscured GRBs, indicating an extremely patchy dust distribution, (3) determine the types of high-z environments which lead to the production of dust with different observational signatures, such as the 2175 Angstrom absorption feature.

OBSERVING DESCRIPTION

We will be taking broad-band images of a sample of GRB host galaxies (generally, faint high-redshift galaxies with J~22-25 AB mag and angular sizes of 0.3-1.0 arcsec) with WFC3-IR. All hosts are imaged with F160W, with additional observations in another filter (F105W, F110W, or F125W) chosen based on the redshift. Only a single orbit is used per target. The choice of sampling and dithering method depends on the visiblity and the filter, but typically we employ a 3-point line dither with SPARS25 and 9 reads.

Visit

Proposal 12949, GRB050408 (01), scheduling Sat Jan 19 02:16:45 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%

Patterns

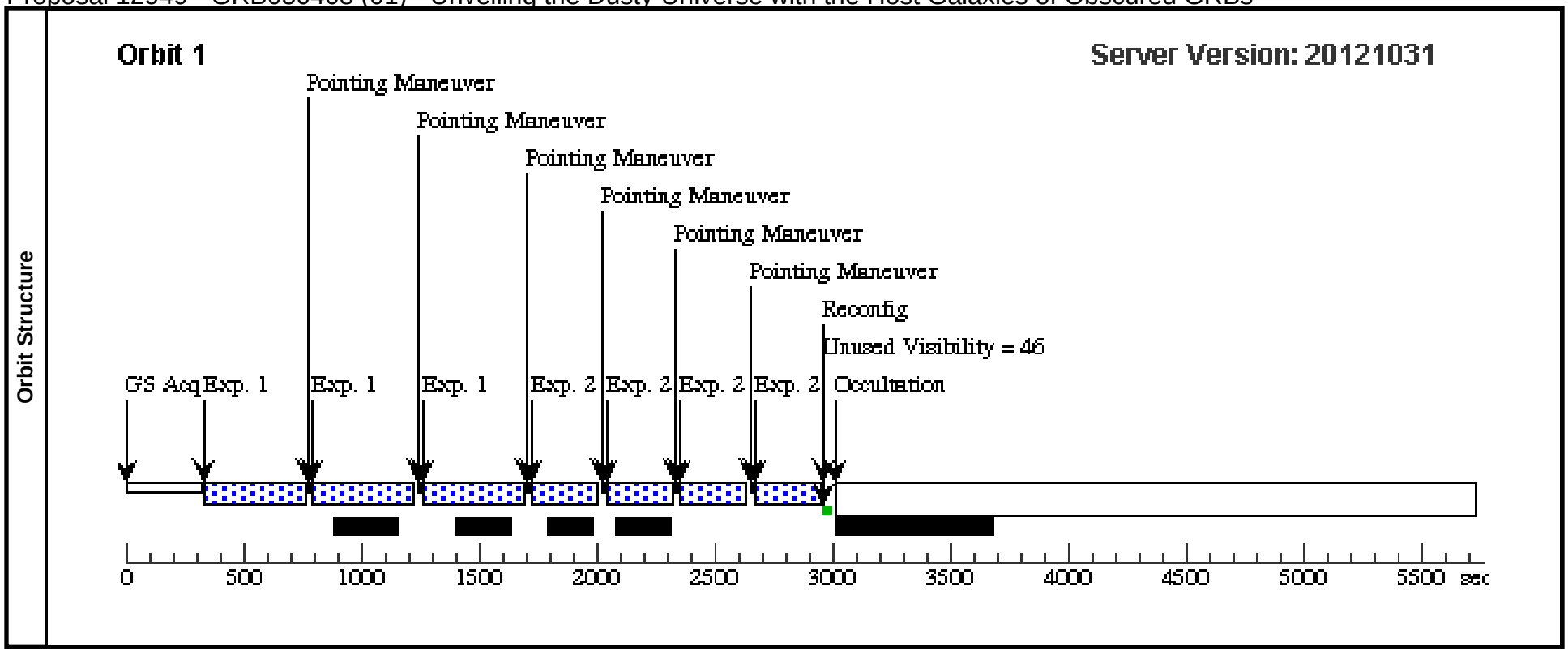
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	GRB050408	RA: 12 02 17.3100 (180.5721250d) Dec: +10 51 9.40 (10.85261d) Equinox: J2000		V=25+/-0.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) GRB050408	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB050408 (01) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(1) GRB050408	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=11; SAMP-SEQ=SPARS25		Pattern 1, Exps 2-2 in GRB050408 (01) (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***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Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
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Pointing Maneuver
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Reconfig
Unused Visibility = 46
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB070208 (02), completed Sat Jan 19 02:16:47 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%

Patterns

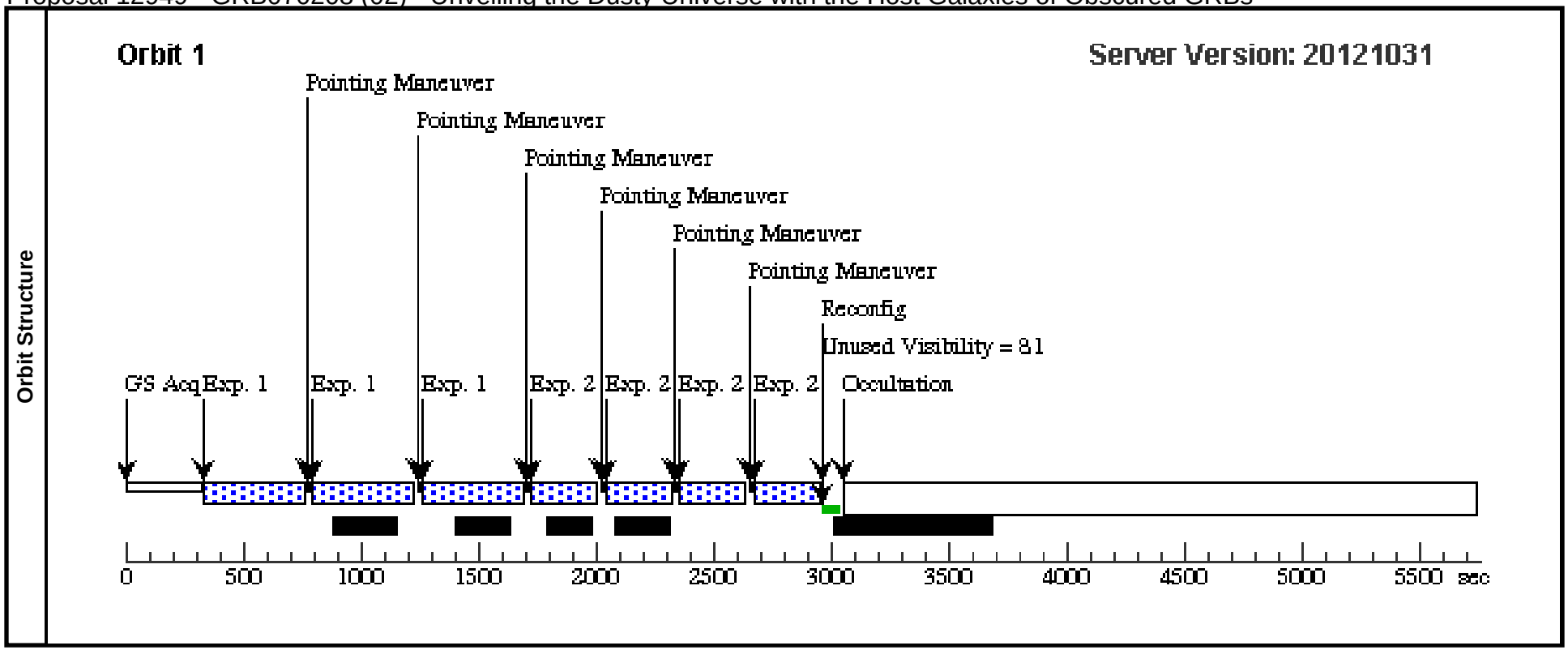
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	GRB070208	RA: 13 11 32.6100 (197.8858750d) Dec: +61 57 54.37 (61.96510d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(2) GRB070208	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB070208 (02) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(2) GRB070208	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=11; SAMP-SEQ=SPARS25		Pattern 1, Exps 2-2 in GRB070208 (02) (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
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Pointing Maneuver
Pointing Maneuver
Reconfig
Unused Visibility = 81
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB070802 (03), scheduling Sat Jan 19 02:16:48 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

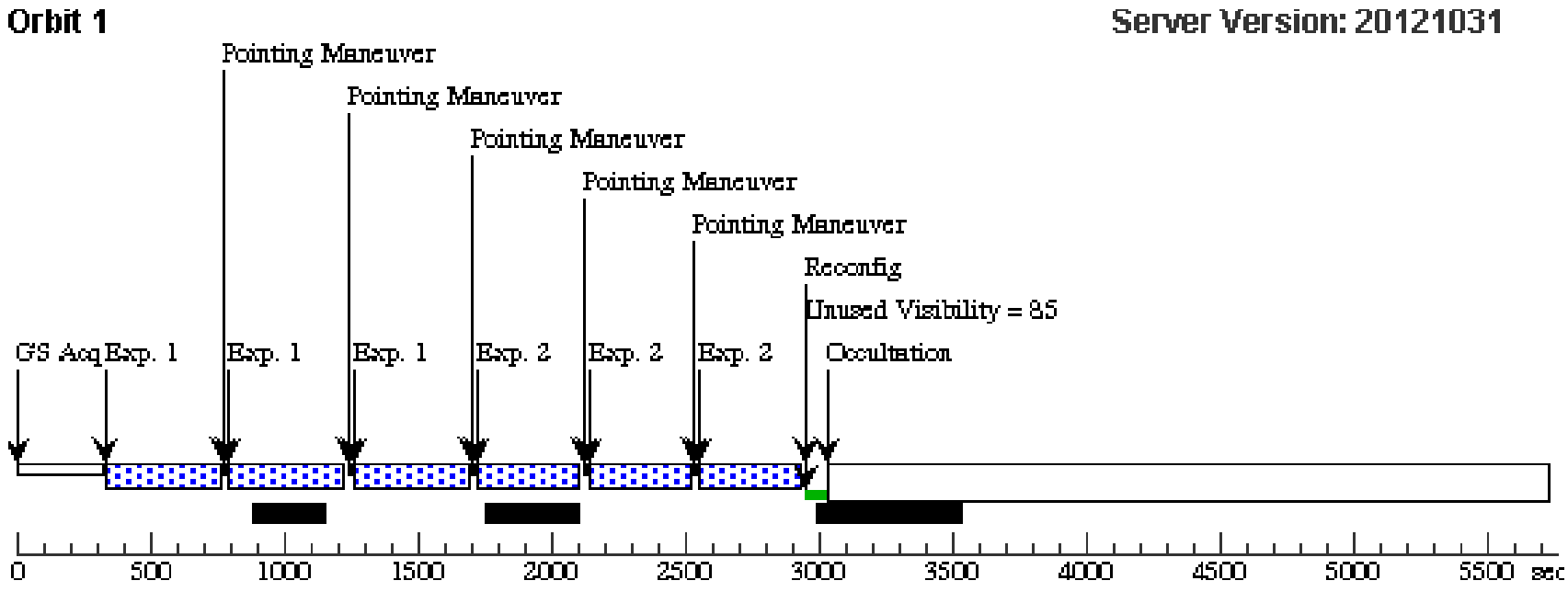
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	GRB070802	RA: 02 27 35.8800 (36.8995000d) Dec: -55 31 39.30 (-55.52758d) Equinox: J2000		V=25+/-0.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(3) GRB070802	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB070802 (03) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(3) GRB070802	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=8; SAMP-SEQ=SPARS50		Pattern 2, Exps 2-2 in GRB070802 (03) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 12949, GRB080603A (04), scheduling Sat Jan 19 02:16:49 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

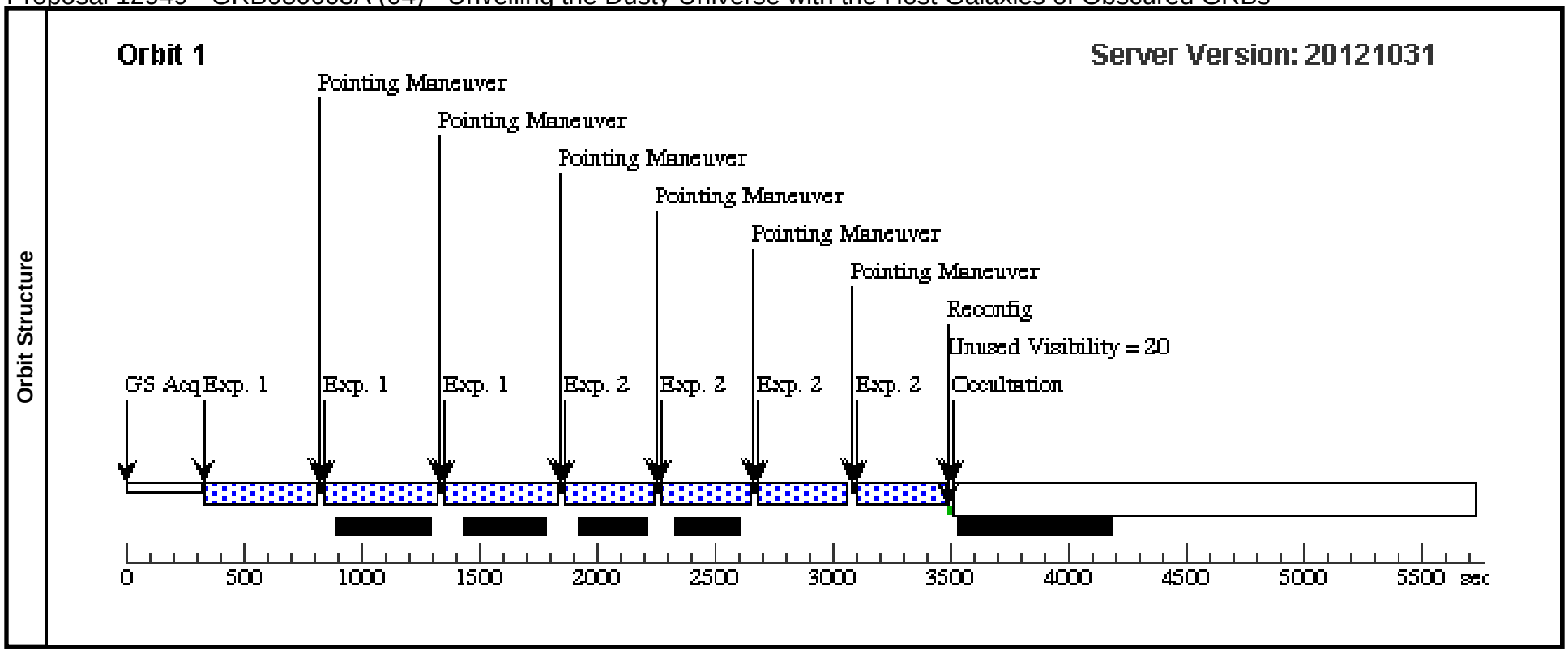
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	GRB080603A	RA: 18 37 38.0600 (279.4085833d) Dec: +62 44 39.30 (62.74425d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(4) GRB080603A	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=14; SAMP-SEQ=STEP50		Pattern 2, Exps 1-1 in GRB080603A (04) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(4) GRB080603A	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=12; SAMP-SEQ=STEP50		Pattern 1, Exps 2-2 in GRB080603A (04) (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***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Orbit 1
Server Version: 20121031
Pointing Maneuver
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Pointing Maneuver
Reconfig
Unused Visibility = 20
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB080605 (05), scheduling Sat Jan 19 02:16:50 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

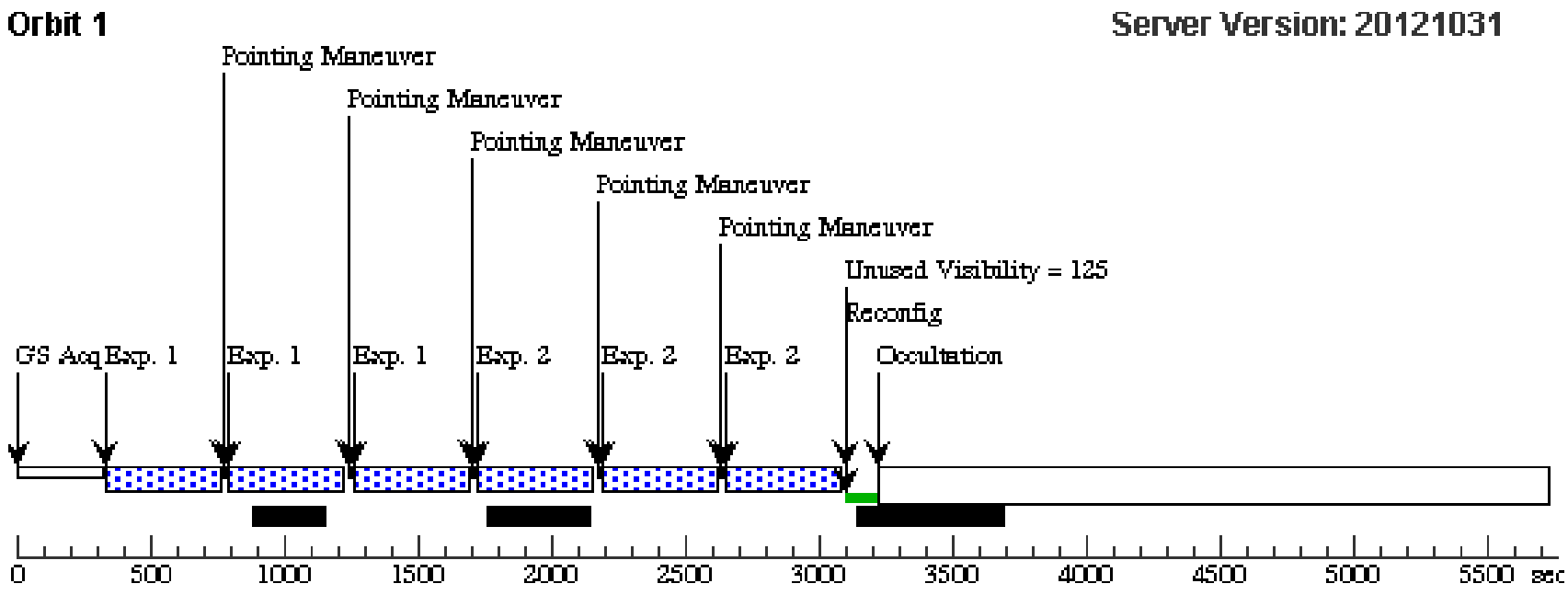
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	GRB080605	RA: 17 28 30.0700 (262.1252917d) Dec: +04 00 56.00 (4.01556d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(5) GRB080605	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB080605 (05) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(5) GRB080605	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 2-2 in GRB080605 (05) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 12949, GRB081109A (06), scheduling Sat Jan 19 02:16:51 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

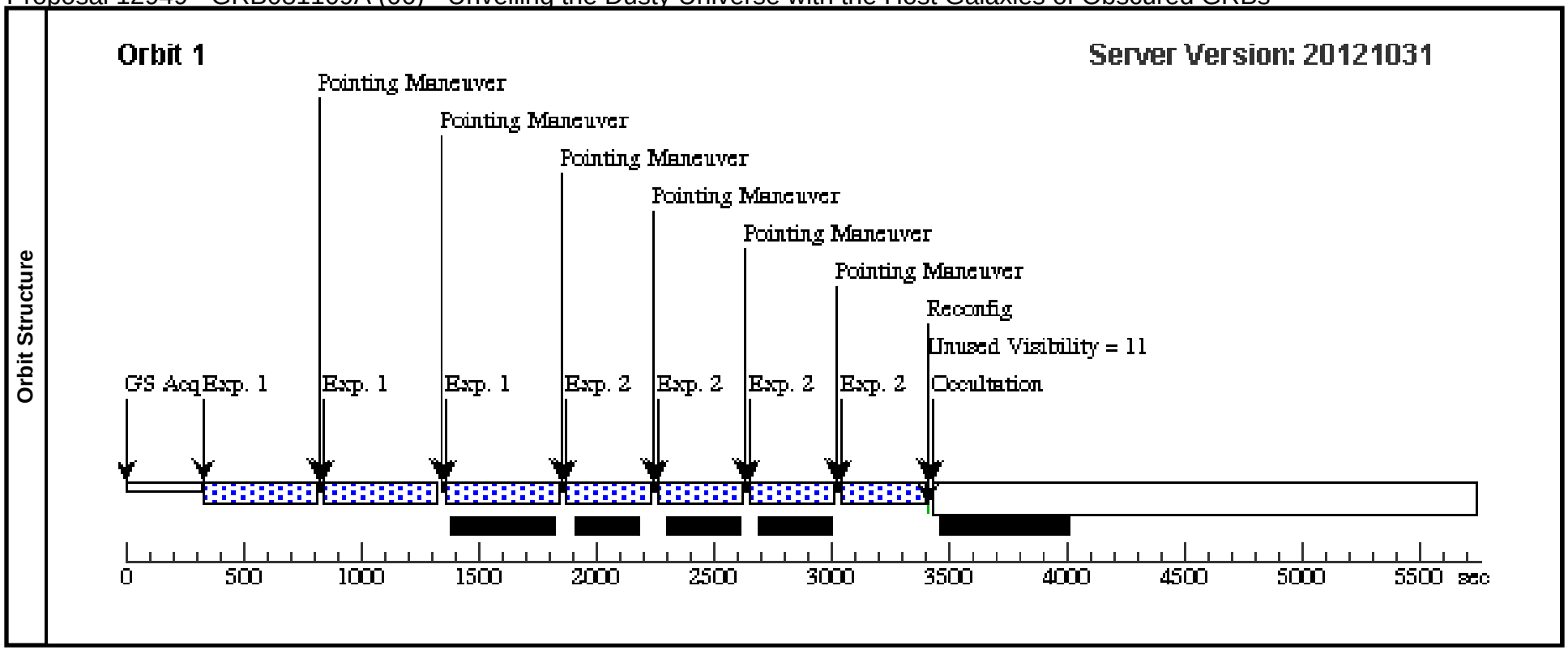
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	GRB081109	RA: 22 03 9.7200 (330.7905000d) Dec: -54 42 39.50 (-54.71097d) Equinox: J2000		V=21+/-1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(6) GRB081109	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=10; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB081109A (06) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(6) GRB081109	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=14; SAMP-SEQ=SPARS25		Pattern 1, Exps 2-2 in GRB081109A (06) (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***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Pointing Maneuver
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Pointing Maneuver
Reconfig
Unused Visibility = 11
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
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5500
sec

Visit

Proposal 12949, GRB120119A (07), completed Sat Jan 19 02:16:52 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

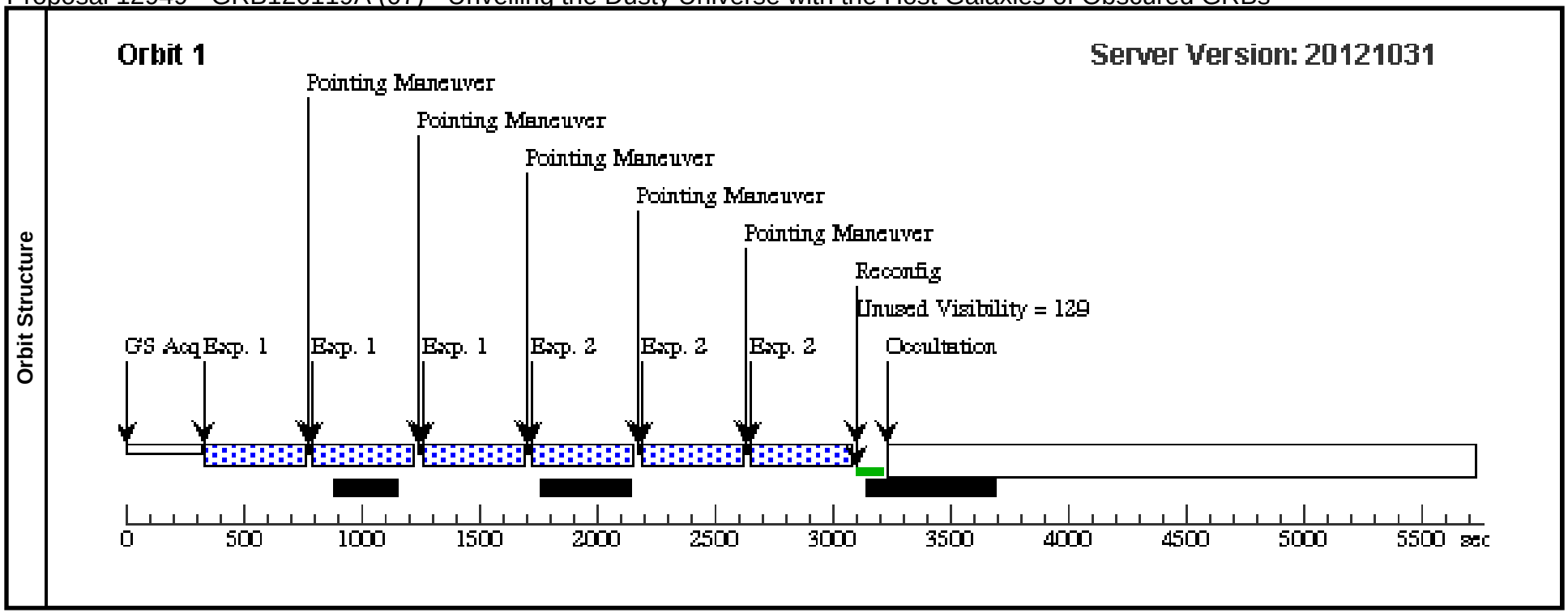
#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	GRB120119A	RA: 08 00 6.9300 (120.0288750d) Dec: -09 04 53.70 (-9.08158d) Equinox: J2000		V=26+/-3	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(7) GRB120119A	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB120119A (07) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(7) GRB120119A	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 2-2 in GRB120119A (07) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
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Pointing Maneuver
Reconfig
Unused Visibility = 129
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB060719 (08), scheduling Sat Jan 19 02:16:53 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%

Patterns

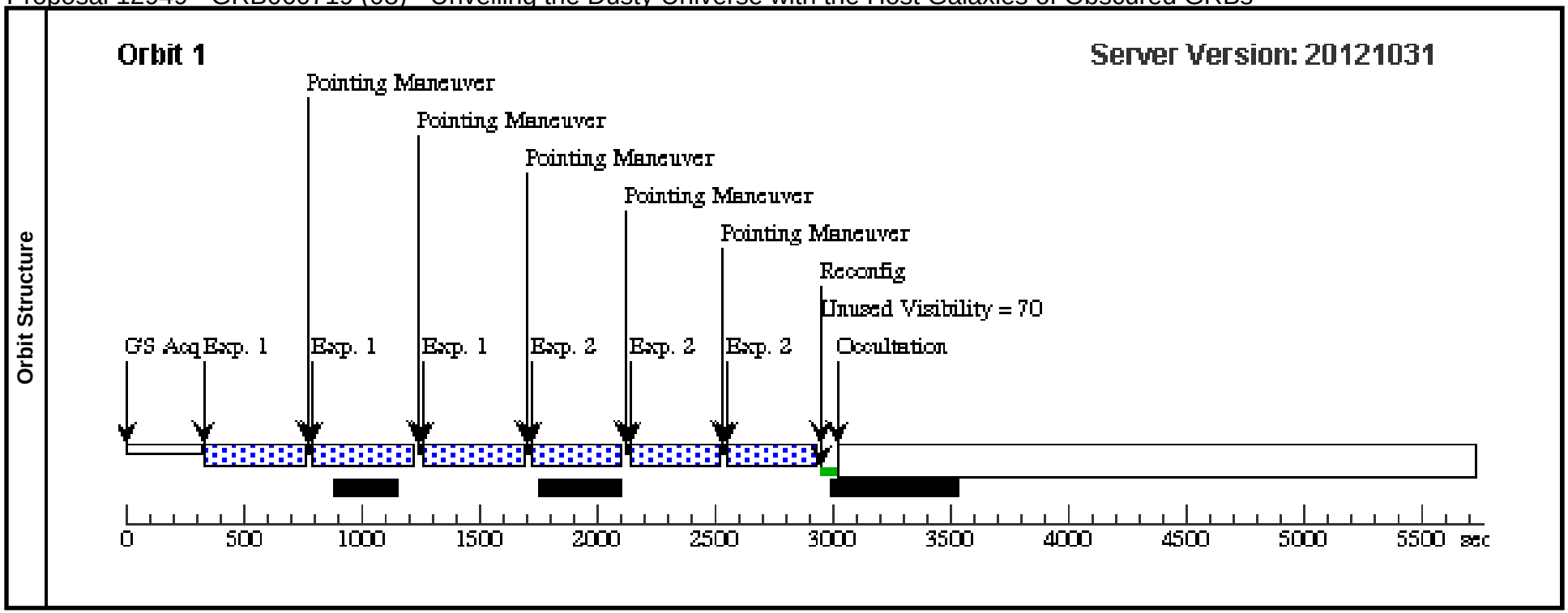
#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	GRB060719	RA: 01 13 43.7600 (18.4323333d) Dec: -48 22 50.10 (-48.38058d) Equinox: J2000		V=26+/-1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(8) GRB060719	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB060719 (08) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(8) GRB060719	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=8; SAMP-SEQ=SPARS50		Pattern 2, Exps 2-2 in GRB060719 (08) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Reconfig
Unused Visibility = 70
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB090404 (09), implementation Sat Jan 19 02:16:54 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

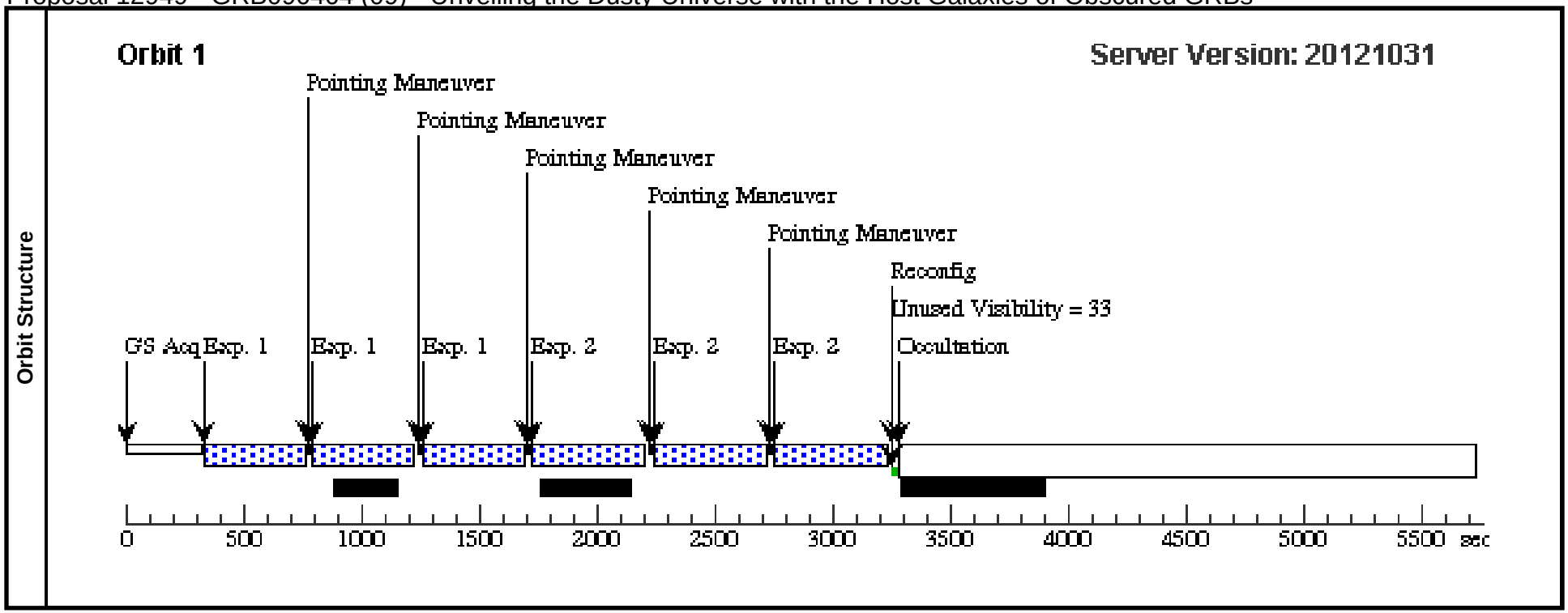
#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	GRB090404	RA: 15 56 57.5200 (239.2396667d) Dec: +35 30 57.50 (35.51597d) Equinox: J2000		V=26+/-1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(9) GRB090404	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB090404 (09) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(9) GRB090404	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=10; SAMP-SEQ=SPARS50		Pattern 2, Exps 2-2 in GRB090404 (09) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Reconfig
Unused Visibility = 33
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB060814A (10), scheduling Sat Jan 19 02:16:55 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

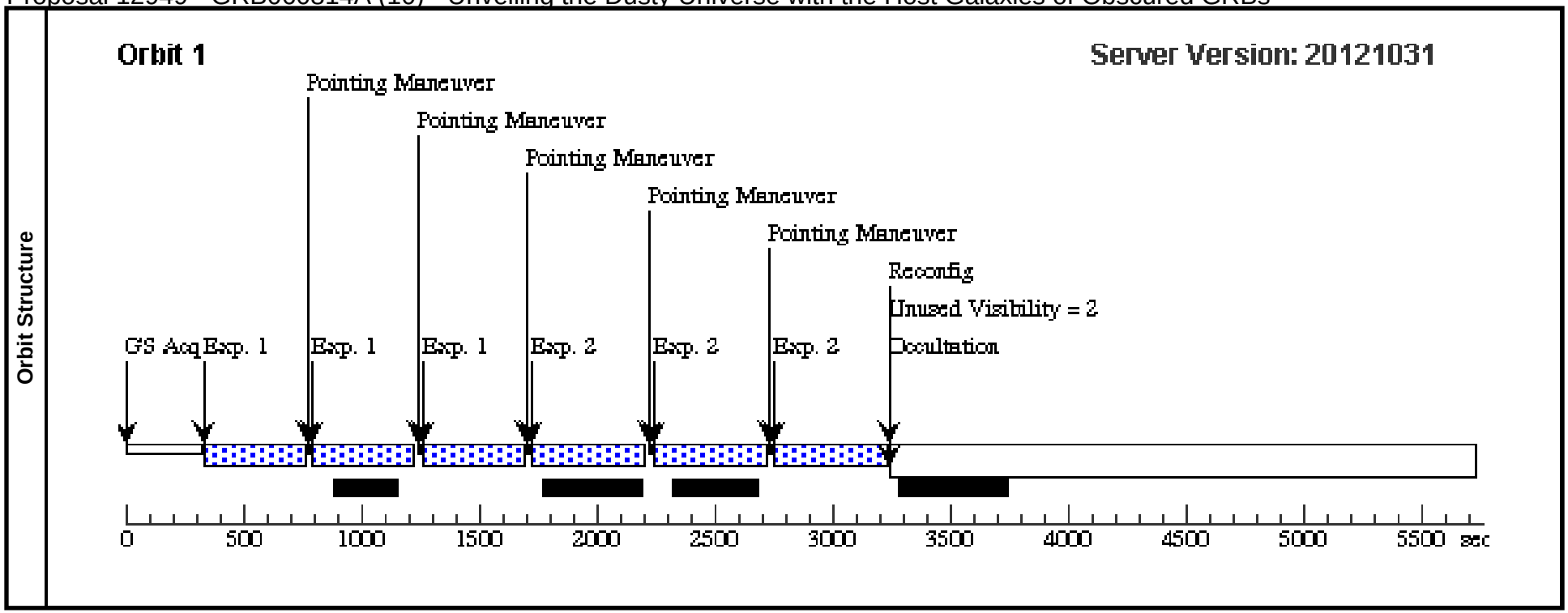
#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	GRB060814A	RA: 14 45 21.1000 (221.3379167d) Dec: +20 35 9.00 (20.58583d) Equinox: J2000		V=23+/-0.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(10) GRB060814A	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB060814A (10) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(10) GRB060814A	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=14; SAMP-SEQ=STEP50		Pattern 2, Exps 2-2 in GRB060814A (10) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Reconfig
Unused Visibility = 2
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB060923A (11), scheduling Sat Jan 19 02:16:56 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

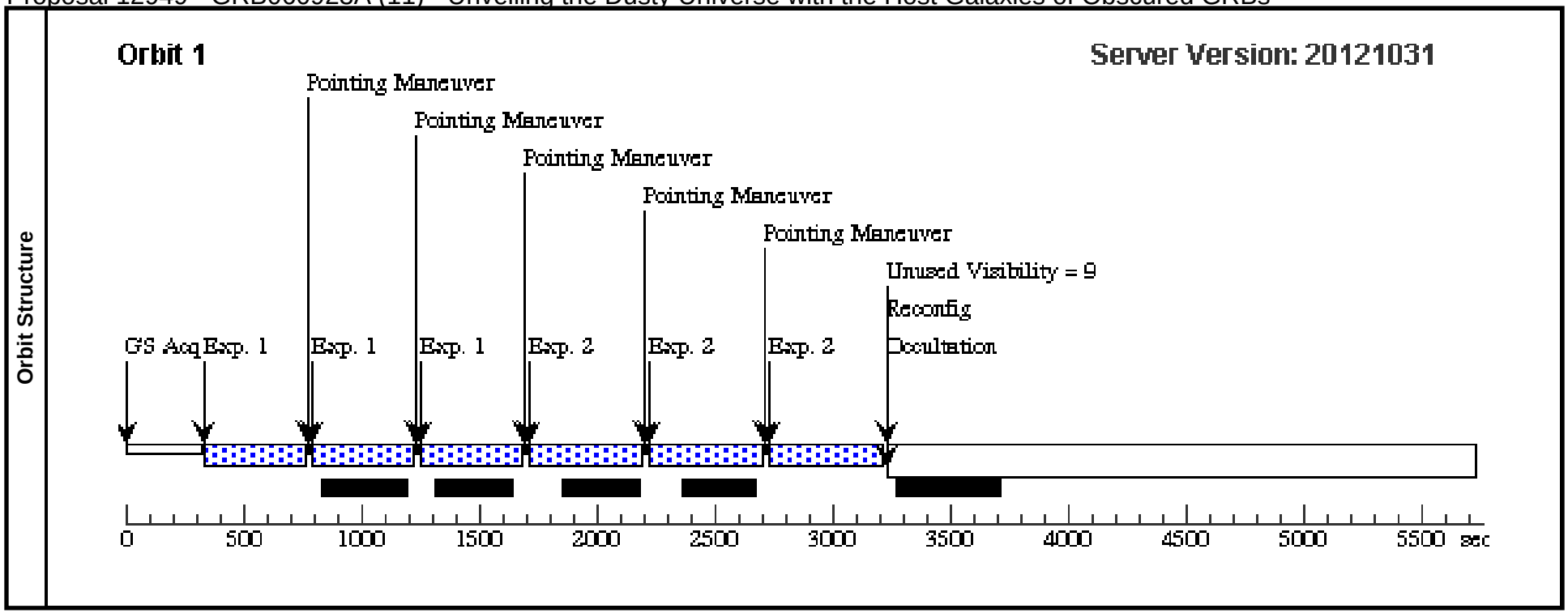
#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(11)	GRB060923A	RA: 16 58 28.1600 (254.6173333d) Dec: +12 21 38.90 (12.36081d) Equinox: J2000		V=24+/-0.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(11) GRB060923A	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=13; SAMP-SEQ=STEP50		Pattern 2, Exps 1-1 in GRB060923A (11) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(11) GRB060923A	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=14; SAMP-SEQ=STEP50		Pattern 2, Exps 2-2 in GRB060923A (11) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 9
Reconfig
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB070306 (12), completed Sat Jan 19 02:16:56 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

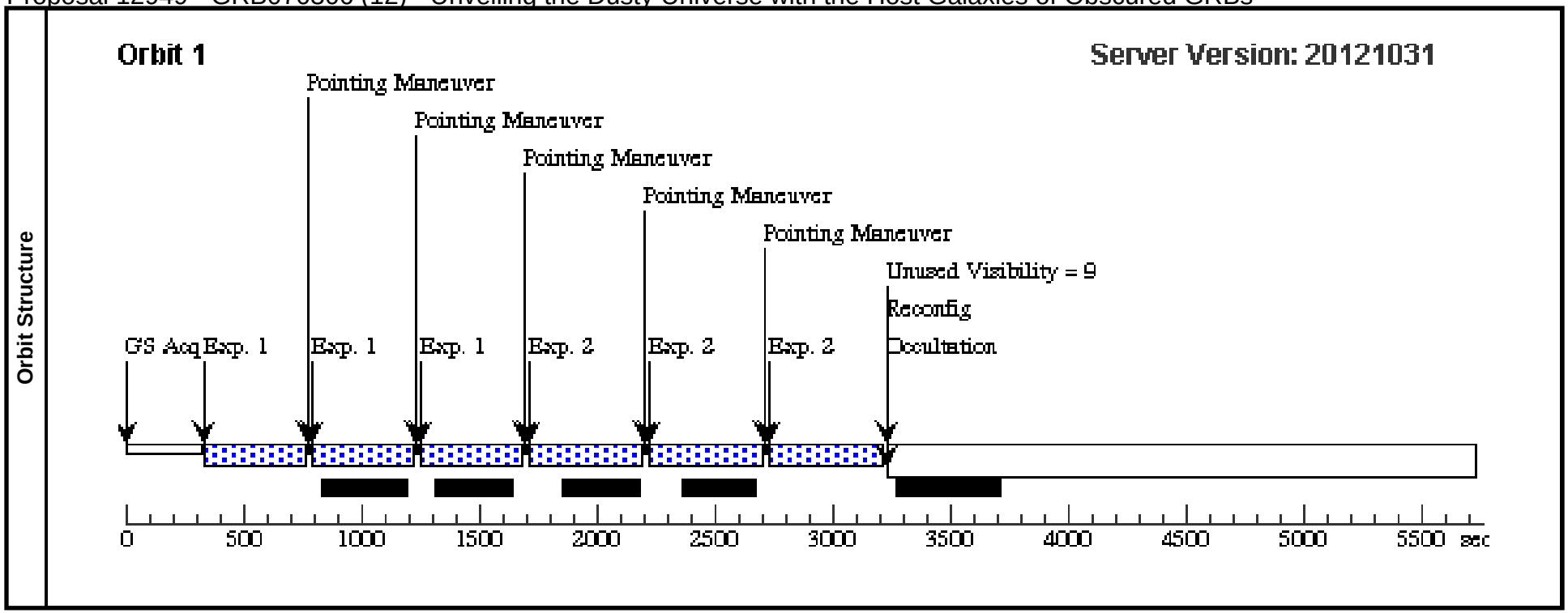
#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(12)	GRB070306	RA: 09 52 23.3100 (148.0971250d) Dec: +10 28 55.30 (10.48203d) Equinox: J2000		V=24+/-0.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(12) GRB070306	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=13; SAMP-SEQ=STEP50		Pattern 2, Exps 1-1 in GRB070306 (12) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(12) GRB070306	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=14; SAMP-SEQ=STEP50		Pattern 2, Exps 2-2 in GRB070306 (12) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 9
Reconfig
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB071021 (13), scheduling Sat Jan 19 02:16:57 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

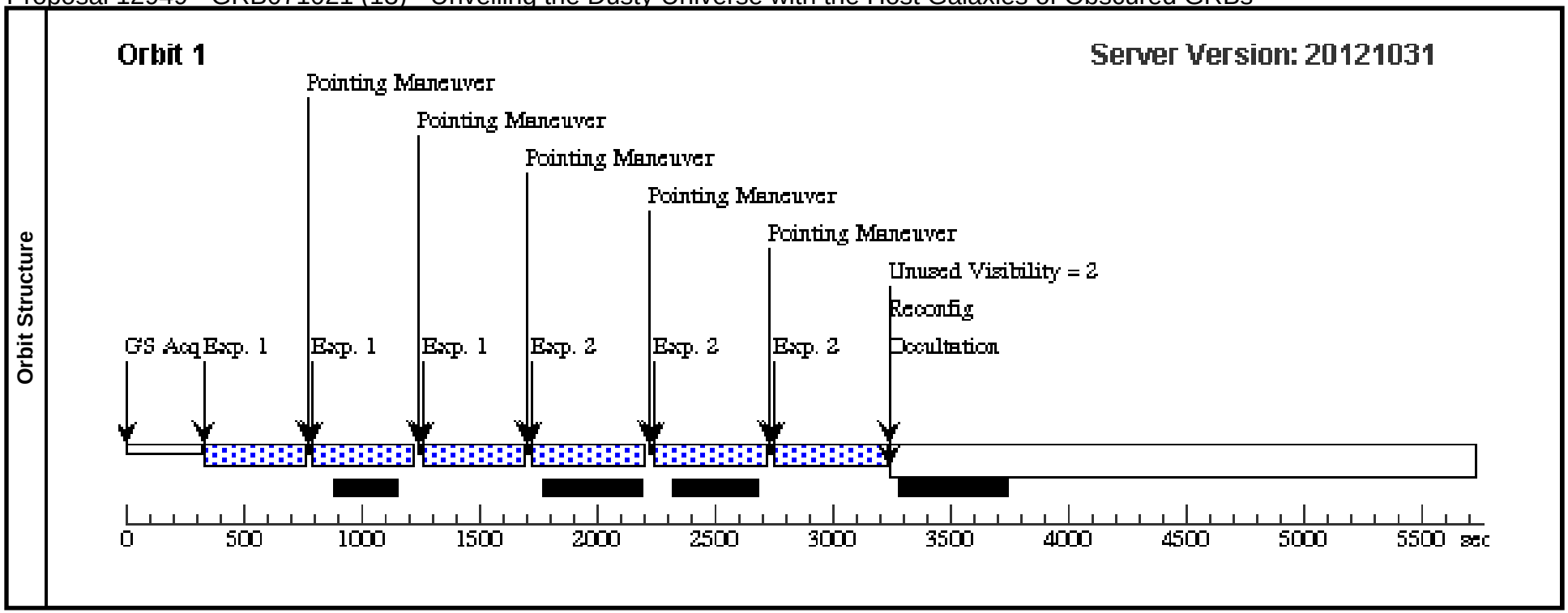
#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(13)	GRB071021	RA: 22 42 34.3100 (340.6429583d) Dec: +23 43 6.50 (23.71847d) Equinox: J2000		V=24.5+/-0.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(13) GRB071021	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB071021 (13) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(13) GRB071021	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=14; SAMP-SEQ=STEP50		Pattern 2, Exps 2-2 in GRB071021 (13) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 2
Reconfig
Occultation
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB080325 (14), completed Sat Jan 19 02:16:58 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

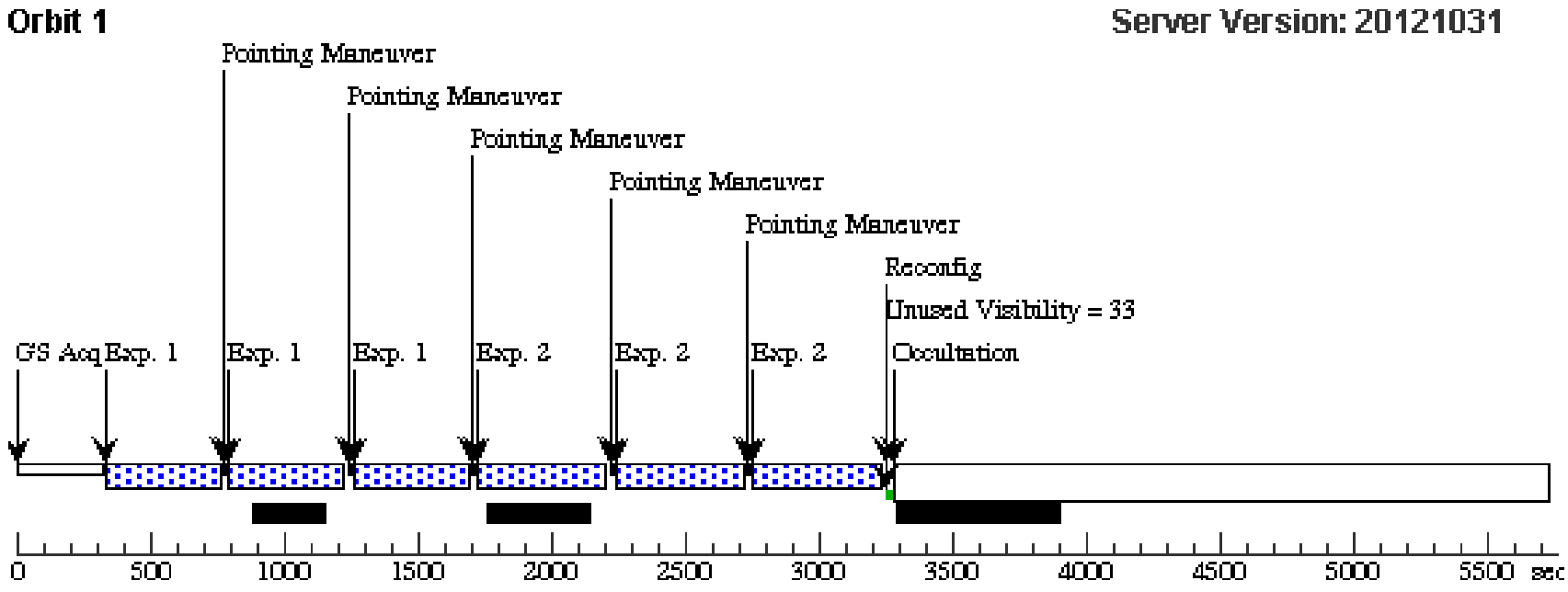
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(14)	GRB080325	RA: 18 31 34.2400 (277.8926667d) Dec: +36 31 24.30 (36.52342d) Equinox: J2000		V=26+/-0.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(14) GRB080325	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB080325 (14) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(14) GRB080325	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=10; SAMP-SEQ=SPARS50		Pattern 2, Exps 2-2 in GRB080325 (14) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 12949, GRB081221 (15), scheduling Sat Jan 19 02:16:59 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%

Patterns

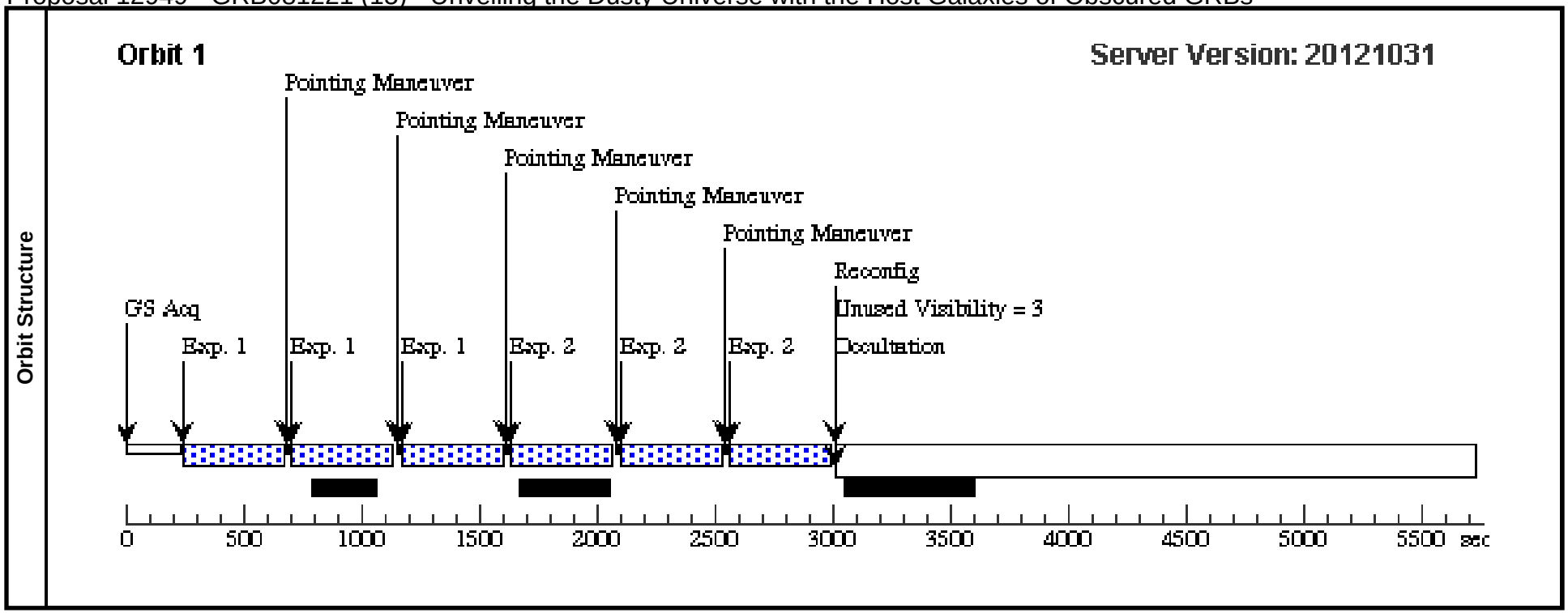
#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(15)	GRB081221	RA: 01 03 10.2200 (15.7925833d) Dec: -24 32 51.70 (-24.54769d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(15) GRB081221	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50	GS ACQ SCENARIO SINGLE	Pattern 2, Exps 1-1 in GRB081221 (15) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(15) GRB081221	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 2-2 in GRB081221 (15) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Reconfig
Unused Visibility = 3
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB090709A (16), completed Sat Jan 19 02:17:00 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

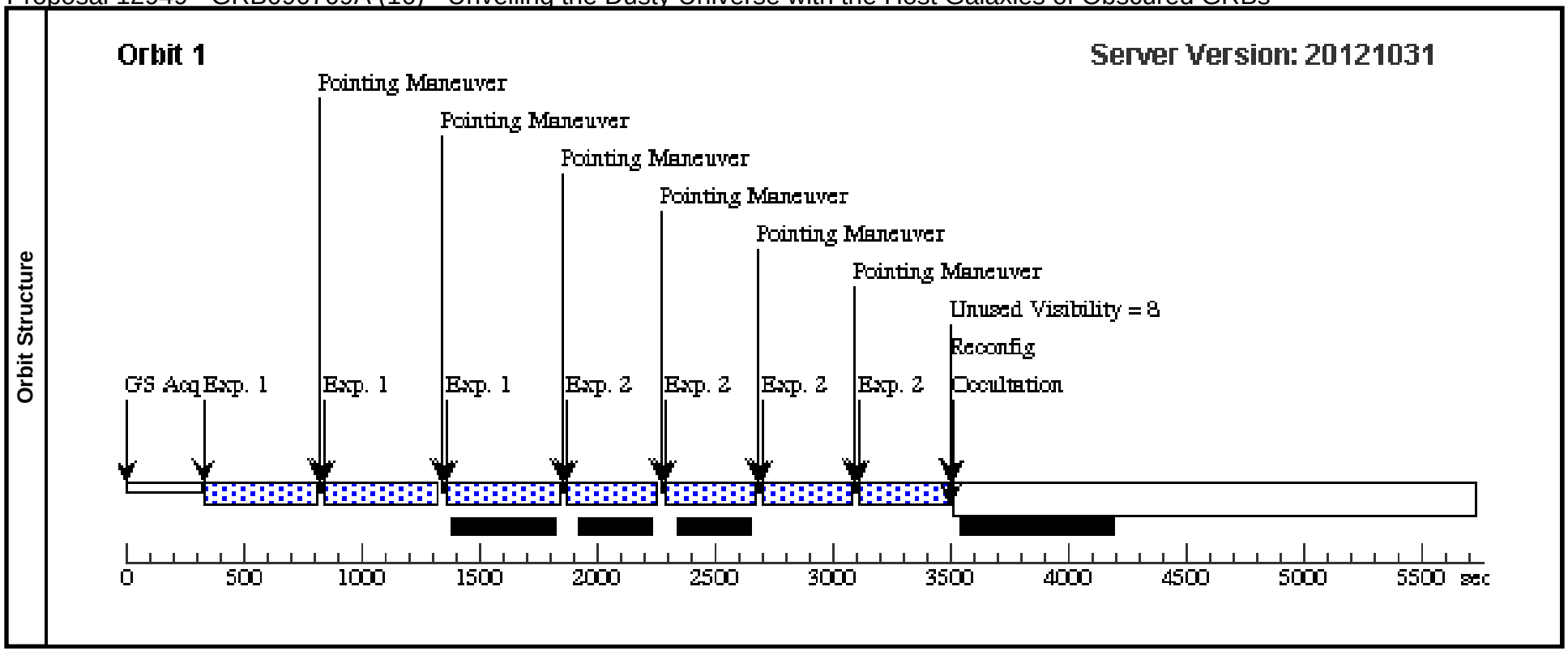
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(16)	GRB090709A	RA: 19 19 42.6400 (289.9276667d) Dec: +60 43 39.30 (60.72758d) Equinox: J2000		V=27+/-1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(16) GRB090709A	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=10; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB090709A (16) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(16) GRB090709A	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=12; SAMP-SEQ=STEP50		Pattern 1, Exps 2-2 in GRB090709A (16) (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 8
Reconfig
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12949, GRB100526A (17), scheduling Sat Jan 19 02:17:01 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)

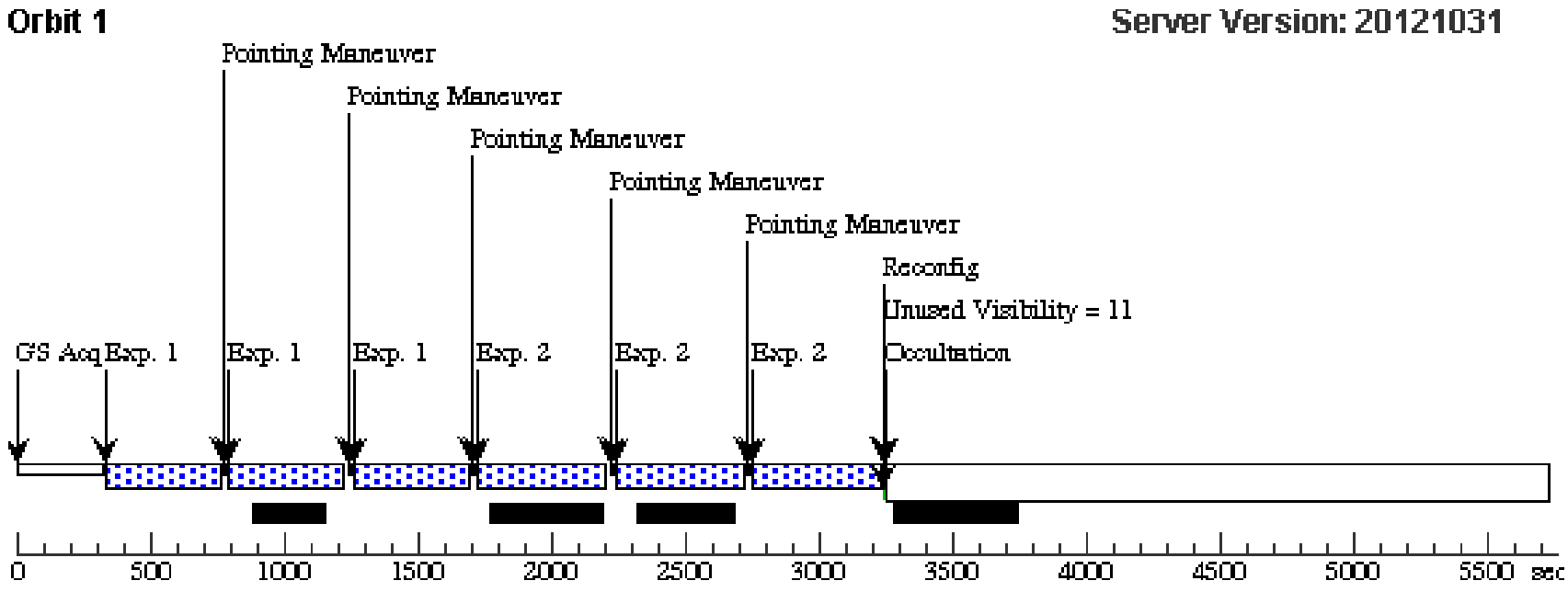
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(17)	GRB100526A	RA: 15 23 4.4800 (230.7686667d) Dec: +25 37 55.20 (25.63200d) Equinox: J2000		V=27+/-1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(17) GRB100526A	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=9; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB100526A (17) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(17) GRB100526A	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=14; SAMP-SEQ=STEP50		Pattern 2, Exps 2-2 in GRB100526A (17) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 12949, GRB100621A (18), scheduling Sat Jan 19 02:17:02 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

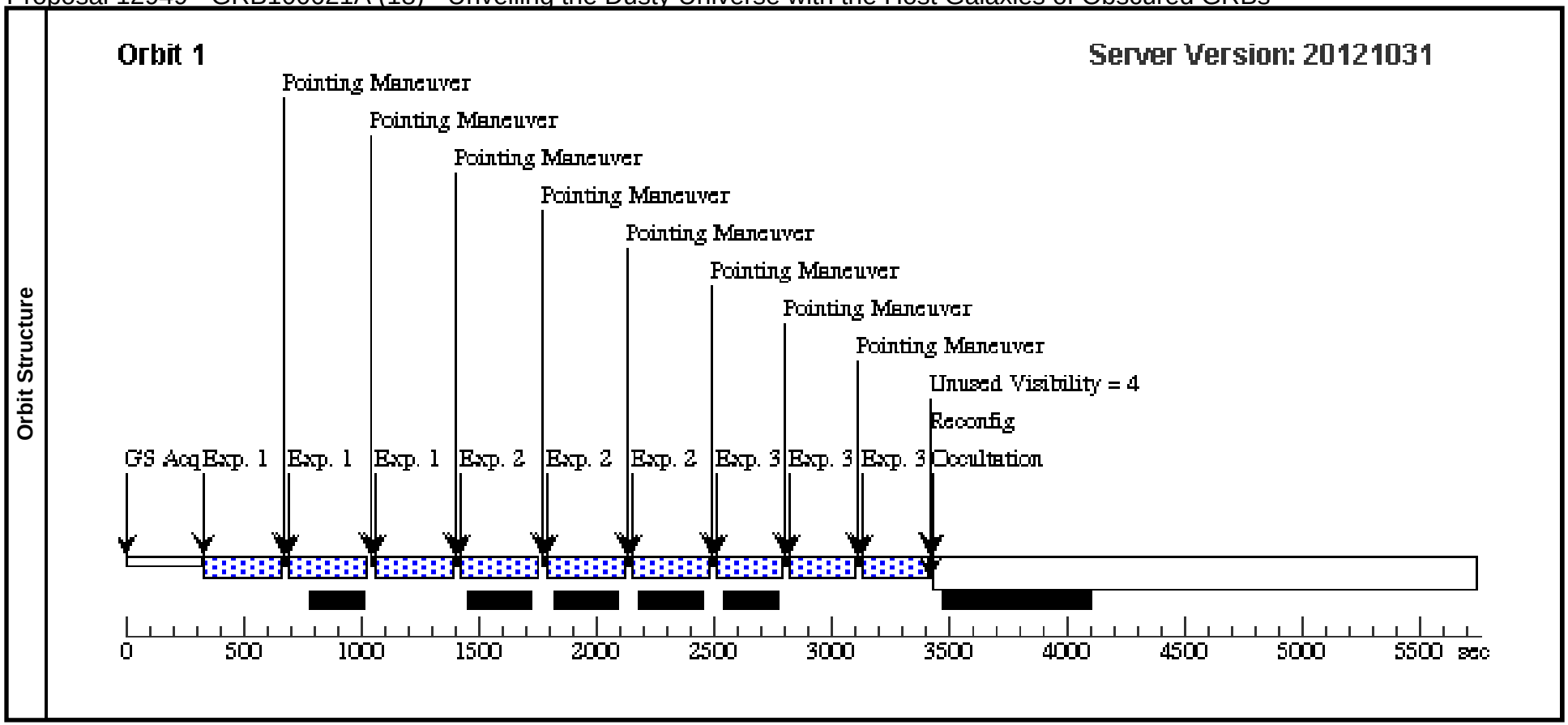
#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2), (3)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(18)	GRB100621A	RA: 21 01 13.0800 (315.3045000d) Dec: -51 06 22.50 (-51.10625d) Equinox: J2000		V=22+/-0.5	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(18) GRB100621A	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=7; SAMP-SEQ=SPARS50		Pattern 2, Exps 1-1 in GRB100621A (18) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(18) GRB100621A	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=11; SAMP-SEQ=STEP50		Pattern 2, Exps 2-2 in GRB100621A (18) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(18) GRB100621A	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=10; SAMP-SEQ=STEP50		Pattern 2, Exps 3-3 in GRB100621A (18) (2)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20121031
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 4
Reconfig
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Exp. 3
Exp. 3
Exp. 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec