13282 - A Search for Surviving Companions of Type Ia Supernovae in the Large Magellanic Cloud

Cycle: 21, 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) SNR0509-67.5	WFC3/IR WFC3/UVIS	1	11-Jul-2013 12:38:59.0	yes
02	(2) SNR0519-69.0	WFC3/UVIS	1	11-Jul-2013 12:39:11.0	yes
03	(3) N103B	WFC3/UVIS	2	11-Jul-2013 12:39:26.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
04	(4) DEML71	WFC3/UVIS	2	11-Jul-2013 12:39:44.0	yes
05	(5) SNR0548-70.4	WFC3/UVIS	2	11-Jul-2013 12:40:00.0	yes
06	(6) DEML316A	WFC3/UVIS	2	11-Jul-2013 12:40:17.0	yes
07	(7) DEML249	WFC3/UVIS	2	11-Jul-2013 12:40:37.0	yes
08	(8) DEML238	WFC3/UVIS	2	11-Jul-2013 12:40:53.0	yes
09	(9) SNR0454-67.2	WFC3/UVIS	2	11-Jul-2013 12:41:08.0	yes

16 Total Orbits Used

ABSTRACT

Type Ia Supernovae (SNe) are widely recognized for their use as standardizable candles. There are two contrasting theories for their origin: a double-degenerate origin that is the result of the merger of two white dwarfs (WDs) and a single-degenerate origin in which a WD accretes material from a non-degenerate companion. The identification of surviving companions indicates a single-degenerate origin and, by comparing observations to model predictions, we can identify potential companions in the region of the SNR. The LMC is an ideal environment for the observation of SNe due to its proximity, orientation, and relatively low extinction. We have identified 9 Type Ia SNRs in the LMC that lack full data sets but are suitable for a search for surviving companions. We request B, V, I, and H-alpha observations of these SNRs. Photometry from these regions will enable us to find potential surviving companions. We further request J and H band observations of SNR 0509-67.5 in order to determine the spectral energy distribution and the nature of a point source in a diffuse patch of emission near its center. We will also use the BVI images to determine the star formation history in order to constraint the delay time of these Type Ia SNe.

OBSERVING DESCRIPTION

This program is designed to make a sensitive search for survivor companions to SN Ia progenitors using WFC3. The observations make use of WFC3/UVIS to obtain F475W, F555W, F814W (roughly B, V, I-bands) and F656N (H-alpha) to probe the stellar population in the vicinity of nine LMC Type Ia supernova remnants (SNRs). Based on model predictions a wide range of possible survivor companions could potentially exist, this program is designed to obtain observations that can identify as wide a range as possible among the possible survivor types. The narrow-band H-alpha images will provide a detailed view of the nebular structure and enable the assessment of the geometric center of each SNR. Our phase 1 proposal contains a more detailed description of our program goals and rationale.

For most of our targets a single visit of two orbits is used to obtain the observations. Two targets (SNR 0509-67.5 and SNR 0519-69.0) have existing HST observations, these observations therefore differ in that they are meant to supplement those existing observations and require a single a single orbit to execute. The observations of each target have been tuned based on the size and morphology of the individual target. Below, we first describe the general observations and then give brief descriptions of the differences employed for each object.

A typical two-orbit visit of a target obtains a single short exposure (20s) in each of the F475W, F555W, and F814W filters. These are needed as some of the possible survivor companions might have magnitidus as bright as V=17 mag. The short exposures are designed to obtain unsaturated measurements for sources as bright as V=15 mag. The remainder of the observations are comprised of 3-dithered exposures per broad band filter with typical exposure times of ~350 s. These are grouped such that the F475W and F555W observations occur in the first orbit and the F656N and F814W exposures occur in the second orbit. The dither pattern used depends on the remnant size, with smaller remnants placing the target field centered in the UVIS1 detector and using small offsets following the WFC3-UVIS-DITHER-LINE-3pt pattern. Those offsets are provided as POS-TARG in order to facilitate mixing short and long exposures with minimal space-craft motion (and in the case of SNR 0509-69.0 to accomodate different exposure configurations for each of the WFC3/IR exposures. The larger remnants all employ the WFC3-UVIS-GAP-LINE pattern with the center option turned off to faciliate an offset of the pattern in some cases. All exposures use the FLASH option to make sure a background of roughly 10-12 e- is present to compensate for CTE issues in WFC3. The specifc times used are based upon the results found in (WFC3-2012-12_v1_0). In addition we have made new checks using the WFC3 ETC to reassure ourselves the science goals are still possible.

The SNR 0509-69.0 observations (Visit 01) differ most from the others as this object has specific goals to probe the nature of a source near the center of that SNR. There WFC3/IR F110W and F160W observations will help better determine whether this source might be a background galaxy or nebular patch with an embedded point source. The WFC3/UVIS F814W observations will supplement existing archival observations. No short exposures are needed for this object. A single orbit is necessary to acquire these observations

The SNR 0519-67.5 observations (Visit 02) need only obtain F475W and F814W observations as previous F656N and F550M observations already exist. A single orbit is need for these observations. Furthermore, this target is small enough that the necessary observations can be obtain using one of the WFC3/UVIS ccds so the UVIS1 aperture and a small dither pattern is employed to obtain sub-pixel sampling.

The SNR N103B observations (Visit 03) use the small size of the remnant and place the target on the UVIS1 aperture. We note that observations of a nearby interstellar structure can also be obtained by constraining the observations to have an ORIENT between 120 and 245 degrees. This contraint was not included in the phase 1 proposal but in discussing with our technical contact how me might construct an observation that used a different aperture depending on the spacecraft orientation at the time of the observations they suggested instead including this constraint (since it was both a very broad constraint and was simpler to schedule). If this constraint is not permitted we request to try and use our other option, setting the UVIS1 vs. UVIS2 aperture depending on the ORIENT at the time of scheduling.

The SNR DEML 71 observations (visit 04) observations are still closer to the nominal/typical description given above. The single difference from the other observations is that a small offset is used so that the UVIS-CENTER apeture can be used but to offset the chip gap slightly from the nebular center. The short exposure use the UVIS1 aperture as the nebula mostly fits with the CCD and the most likely site for a bright companion is near the remnant center.

The SNR 0548-70.4 observations (visit 05) are similar to those in visit 04 except the offset of the UVIS-CENTER aperture is slightly smaller to accomodate the slightly larger size of this remnant.

The SNR DEML 316A observations (visit 06) have had their coordinates updated slightly compared to the original proposal so that the observations also cover the interaction region between SNR DEML 316A and SNR DEML 316B without any further constraint.

The SNR DEML 249 and SNR DEML 238 observation (visit 07 and 08, respectively) have no offset of the UVIS-CENTER aperture as these remnants barely fit within the field-of-view of WFC3. The short exposure use the UVIS1 and target only the remnant center (rather than have the chip gap run directly through the remnant center).

Finally the SNR 0454-67.7 observation (visit 09) also have no offset but now do not employ any offset for the short exposures, because this remnants morphology is poorly understood (possibly due to interaction with its surroundings) and so the center is poorly defined.

Visit

Proposal 13282, Visit 01 Thu Jul 11 16:41:18 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: (none)

Fixed Targets

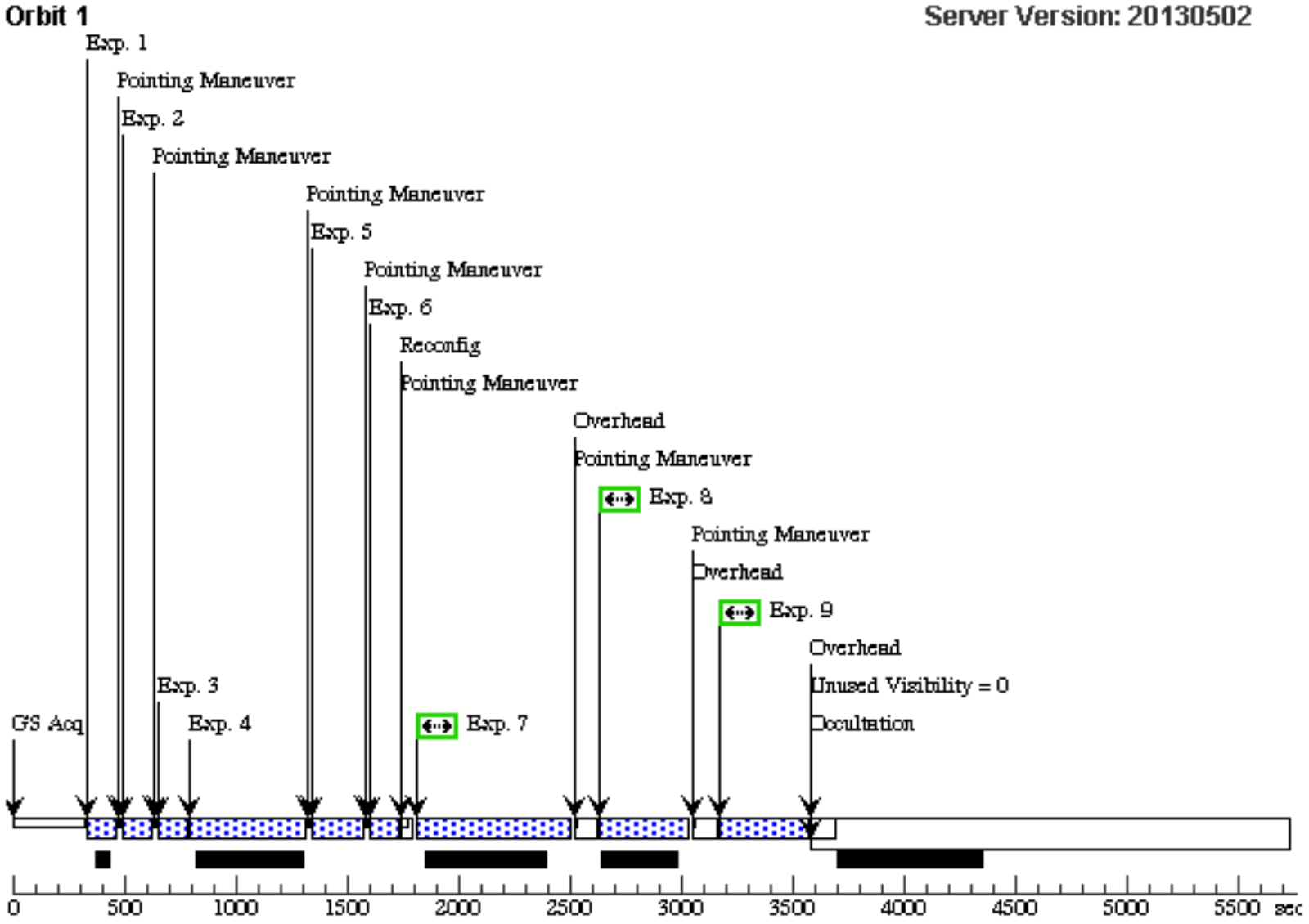
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SNR0509-67.5	RA: 05 09 31.0000 (77.3791667d) Dec: -67 31 18.00 (-67.52167d) Equinox: J2000		V=22	Reference Frame: ICRS

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

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SNR0509-67.5	WFC3/IR, MULTIACCUM, IR-UVIS	F110W	SAMP-SEQ=STEP100; NSAMP=7	POS TARG 0.0,null		99.230677 Secs (99.231 Secs) *[==>]*	 ***[1]***
2		(1) SNR0509-67.5	WFC3/IR, MULTIACCUM, IR-UVIS	F110W	SAMP-SEQ=STEP50; NSAMP=7	POS TARG 0.902,0.806		99.230677 Secs (99.231 Secs) *[==>]*	 ***[1]***
3		(1) SNR0509-67.5	WFC3/IR, MULTIACCUM, IR-UVIS	F110W	SAMP-SEQ=STEP100; NSAMP=7	POS TARG 1.804,1.612		99.230677 Secs (99.231 Secs) *[==>]*	 ***[1]***
4		(1) SNR0509-67.5	WFC3/IR, MULTIACCUM, IR-UVIS	F160W	SAMP-SEQ=STEP100; NSAMP=11	POS TARG 1.804,1.612		499.231969 Secs (499.232 Secs) *[==>]*	 ***[1]***
5		(1) SNR0509-67.5	WFC3/IR, MULTIACCUM, IR-UVIS	F160W	SAMP-SEQ=STEP100; NSAMP=8	POS TARG 0.902,0.806		199.231 Secs (199.231 Secs) *[==>]*	 ***[1]***
6		(1) SNR0509-67.5	WFC3/IR, MULTIACCUM, IR-UVIS	F160W	SAMP-SEQ=STEP100; NSAMP=7	POS TARG 0.0,0.0		99.230677 Secs (99.231 Secs) *[==>]*	 ***[1]***
7		(1) SNR0509-67.5	WFC3/UVIS, ACCUM, UVIS1	F814W				600 Secs (665 Secs) *[==>665.0 Secs]*	 ***[1]***
8		(1) SNR0509-67.5	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=3	POS TARG 0.0923,0.0985		400 Secs (400 Secs) *[==>]*	 ***[1]***
9		(1) SNR0509-67.5	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=3	POS TARG 0.1847,0.1970		400 Secs (400 Secs) *[==>]*	 ***[1]***

Orbit Structure



Visit

Proposal 13282, Visit 02 Thu Jul 11 16:41:21 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

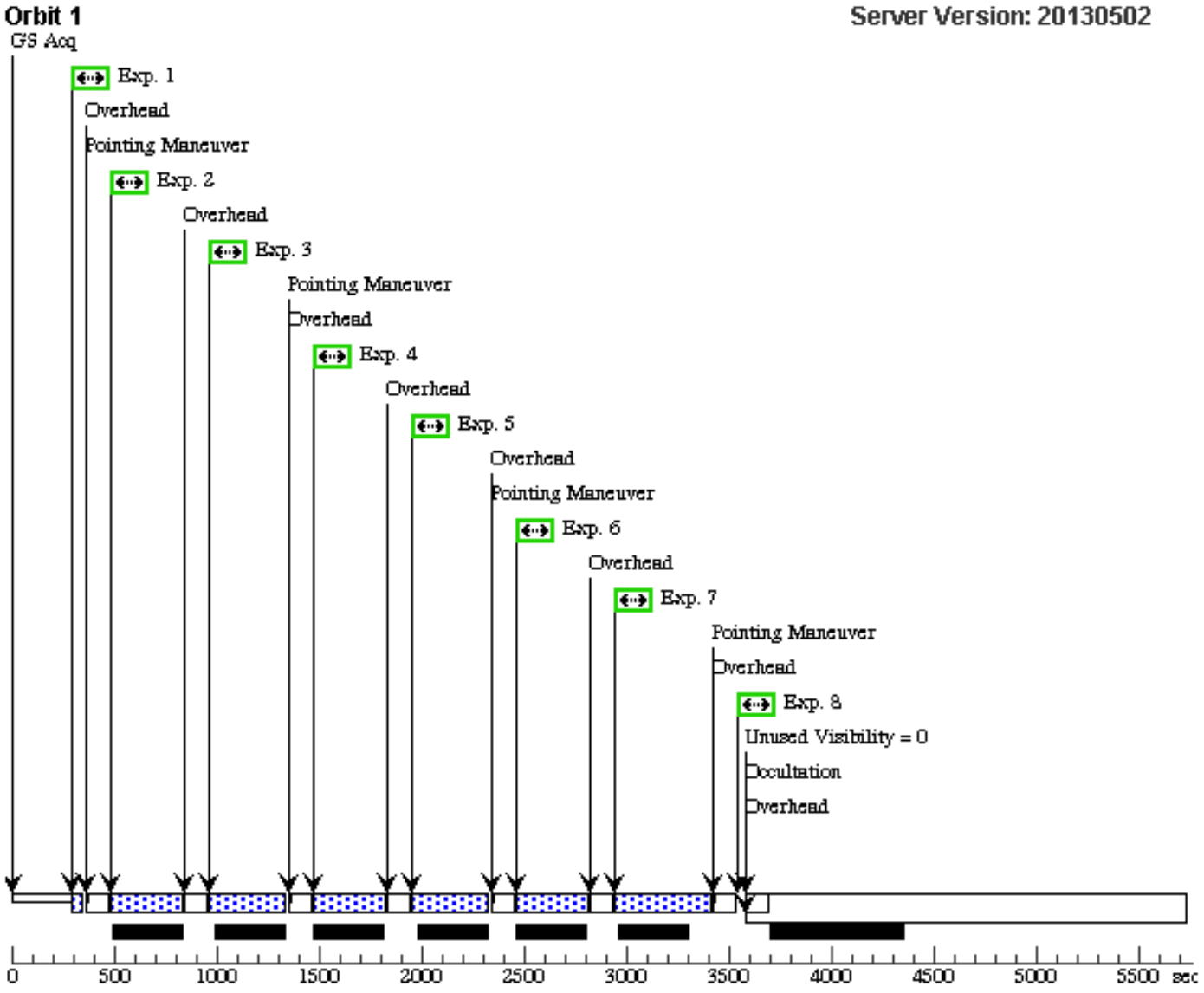
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SNR0519-69.0	RA: 05 19 34.8000 (79.8950000d) Dec: -69 02 9.54 (-69.03598d) Equinox: J2000		V=17	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) SNR0519-69.0	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
2		(2) SNR0519-69.0	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=5	POS TARG 0.0923,0 .0984		350 Secs (350 Secs)	
								[==>]	***[1]***
3		(2) SNR0519-69.0	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=4	POS TARG 0.0923,0 .0984		350 Secs (350 Secs)	
								[==>]	***[1]***
4		(2) SNR0519-69.0	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=4	POS TARG 0.1846,0 .1968		350 Secs (350 Secs)	
								[==>]	***[1]***
5		(2) SNR0519-69.0	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=5	POS TARG 0.1846,0 .1968		350 Secs (350 Secs)	
								[==>]	***[1]***
6		(2) SNR0519-69.0	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=5	POS TARG 0.2769,0 .2952		350 Secs (350 Secs)	
								[==>]	***[1]***
7		(2) SNR0519-69.0	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=4	POS TARG 0.2769,0 .2952		350 Secs (454 Secs)	
								[==>454.0 Secs]	***[1]***
8		(2) SNR0519-69.0	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***

Orbit Structure



Visit

Proposal 13282, Visit 03 Thu Jul 11 16:41:22 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 120D TO 245 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-UVIS-GAP-LINE	Coordinate Frame=POS-TARG		(2-3), (5-6)
	Purpose=MOSAIC	Pattern Orientation=85.759		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.414	Center Pattern=false		
	Line Spacing=			

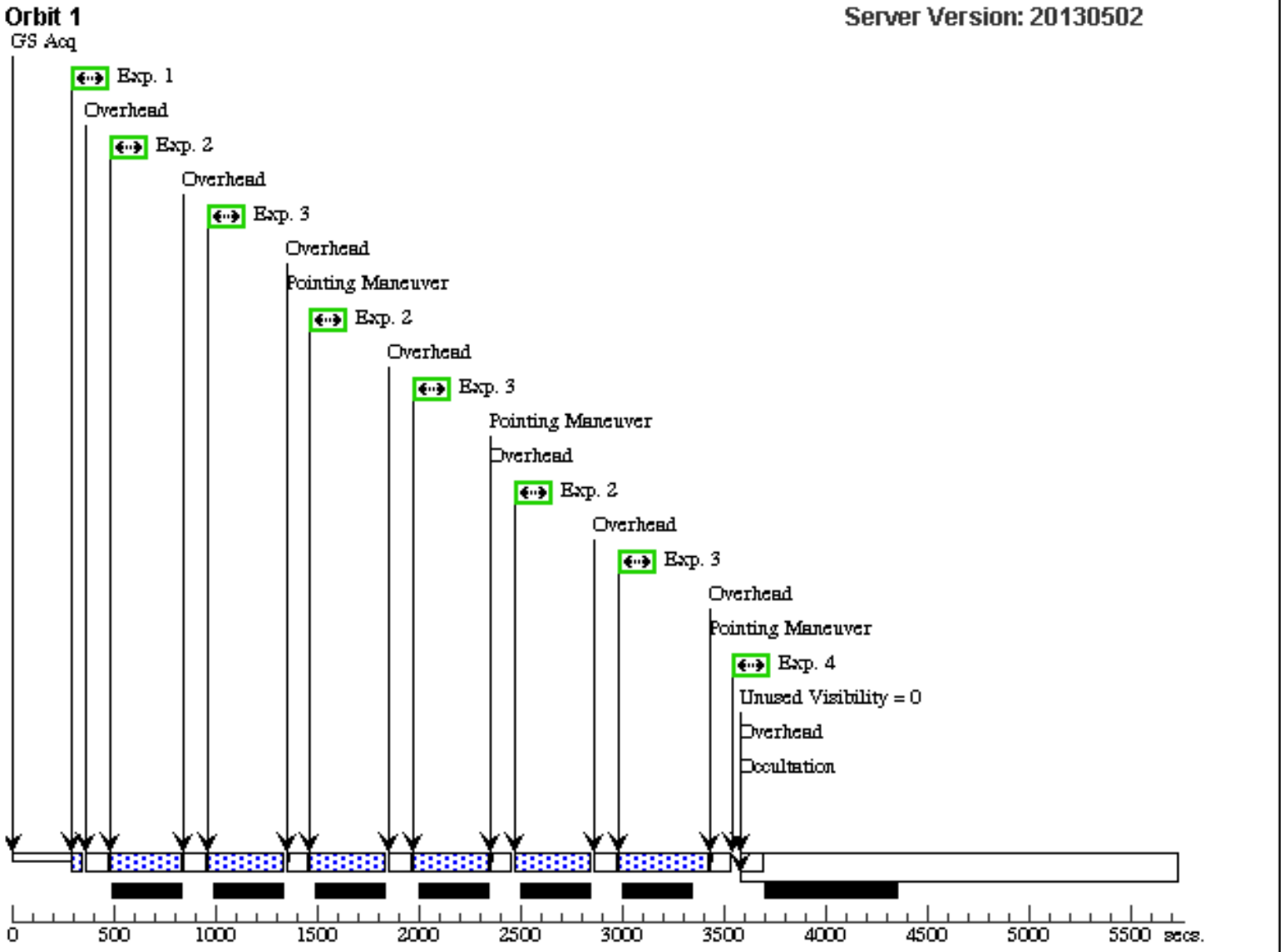
Fixed Targets

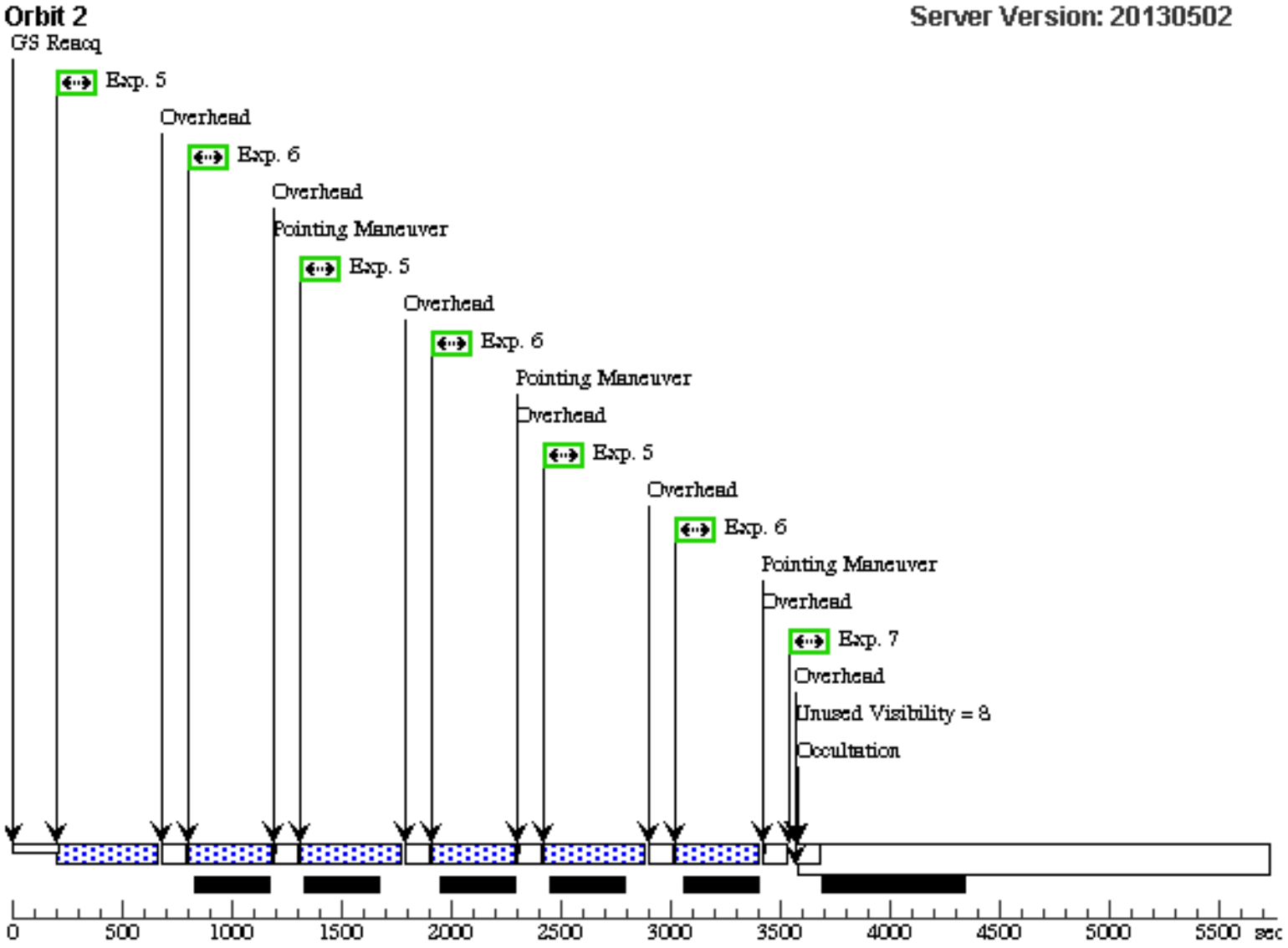
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	N103B	RA: 05 09 0.8000 (77.2533333d) Dec: -68 43 35.00 (-68.72639d) Equinox: J2000		V=17	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) N103B	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
2		(3) N103B	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=5		Pattern 3, Exps 2-3 in Visit 03 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(3) N103B	WFC3/UVIS, ACCUM, UVIS1	F555W			Pattern 3, Exps 2-3 in Visit 03 (3)	350 Secs (1117 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>417.0 Secs (Pattern 3)]*	***[1]***
4		(3) N103B	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
5		(3) N103B	WFC3/UVIS, ACCUM, UVIS1	F656N	FLASH=11		Pattern 3, Exps 5-6 in Visit 03 (3)	450 Secs (1350 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
6		(3) N103B	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=4		Pattern 3, Exps 5-6 in Visit 03 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
7		(3) N103B	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[2]***

Orbit Structure




Orbit 2
Server Version: 20130502
GS Reacq
Exp. 5
Overhead
Exp. 6
Overhead
Pointing Maneuver
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 7
Overhead
Unused Visibility = 8
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13282, Visit 04 Thu Jul 11 16:41:24 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-UVIS-GAP-LINE	Coordinate Frame=POS-TARG		(2-3), (5-6)
	Purpose=MOSAIC	Pattern Orientation=85.759		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.414	Center Pattern=false		
	Line Spacing=			

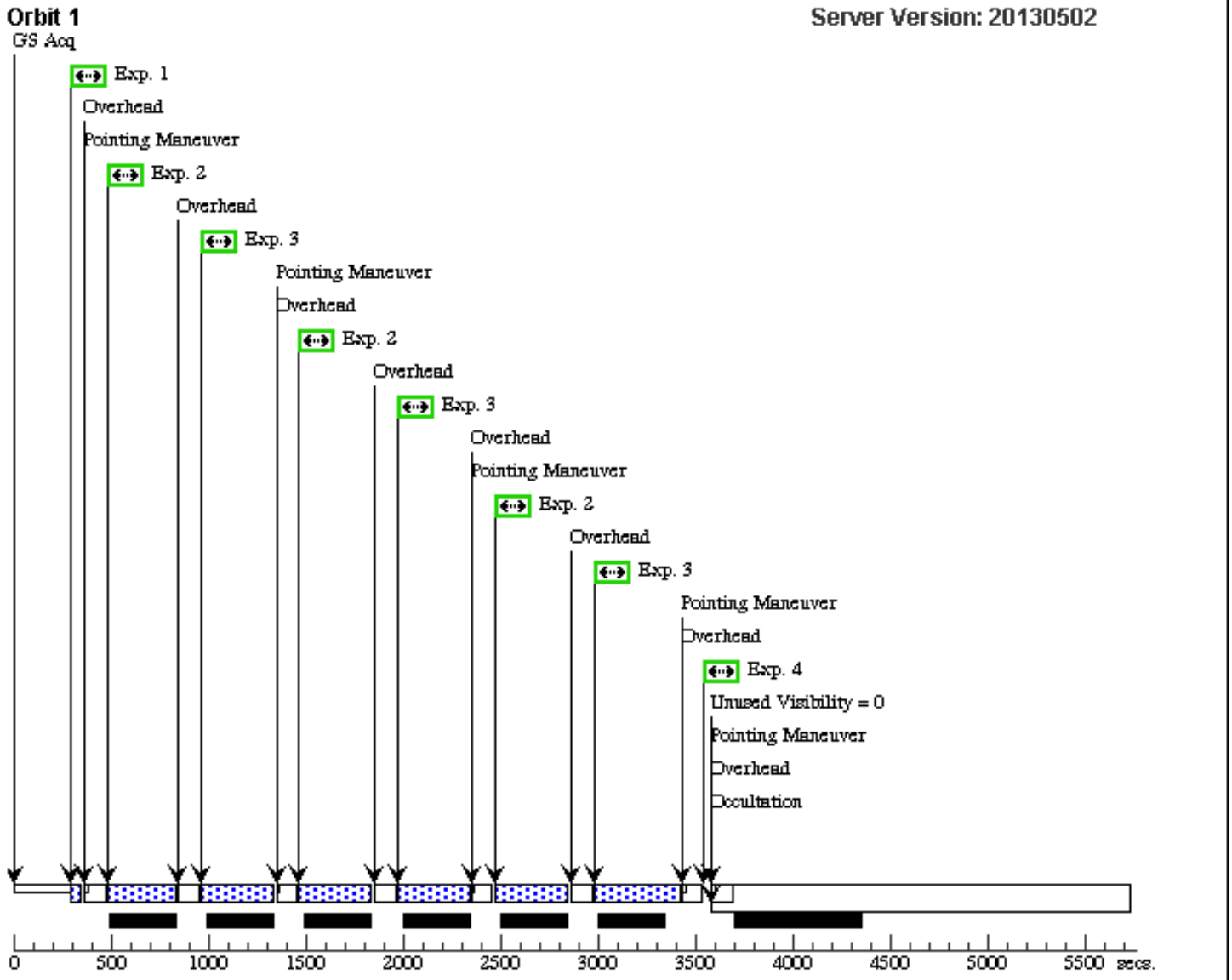
Fixed Targets

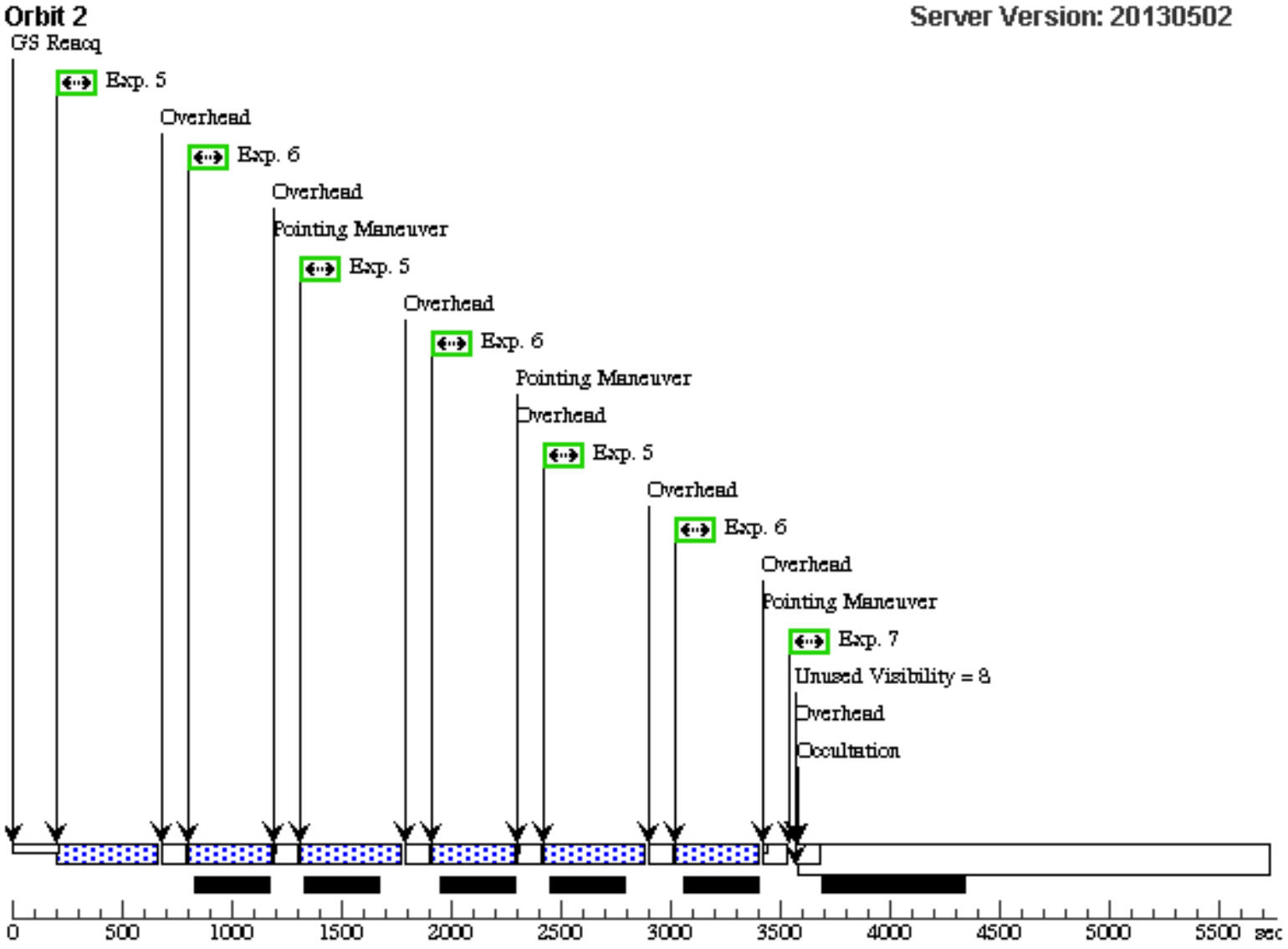
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	DEML71	RA: 05 05 41.7000 (76.4237500d) Dec: -67 52 39.90 (-67.87775d) Equinox: J2000		V=17	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) DEML71	WFC3/UVIS, ACCUM, UVIS1-FIX	F475W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
2		(4) DEML71	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	FLASH=5	POS TARG null,15	Pattern 3, Exps 2-3 in Visit 04 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(4) DEML71	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W		POS TARG null,15	Pattern 3, Exps 2-3 in Visit 04 (3)	350 Secs (1117 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>417.0 Secs (Pattern 3)]*	***[1]***
4		(4) DEML71	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
5		(4) DEML71	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N	FLASH=11	POS TARG null,15	Pattern 3, Exps 5-6 in Visit 04 (3)	450 Secs (1350 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
6		(4) DEML71	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W	FLASH=4	POS TARG null,15	Pattern 3, Exps 5-6 in Visit 04 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
7		(4) DEML71	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[2]***

Orbit Structure




Orbit 2
Server Version: 20130502
GS Reacq
Exp. 5
Overhead
Exp. 6
Overhead
Pointing Maneuver
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Overhead
Pointing Maneuver
Exp. 7
Unused Visibility = 8
Overhead
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13282, Visit 05 Thu Jul 11 16:41:25 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-UVIS-GAP-LINE	Coordinate Frame=POS-TARG		(2-3), (5-6)
	Purpose=MOSAIC	Pattern Orientation=85.759		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.414	Center Pattern=false		
	Line Spacing=			

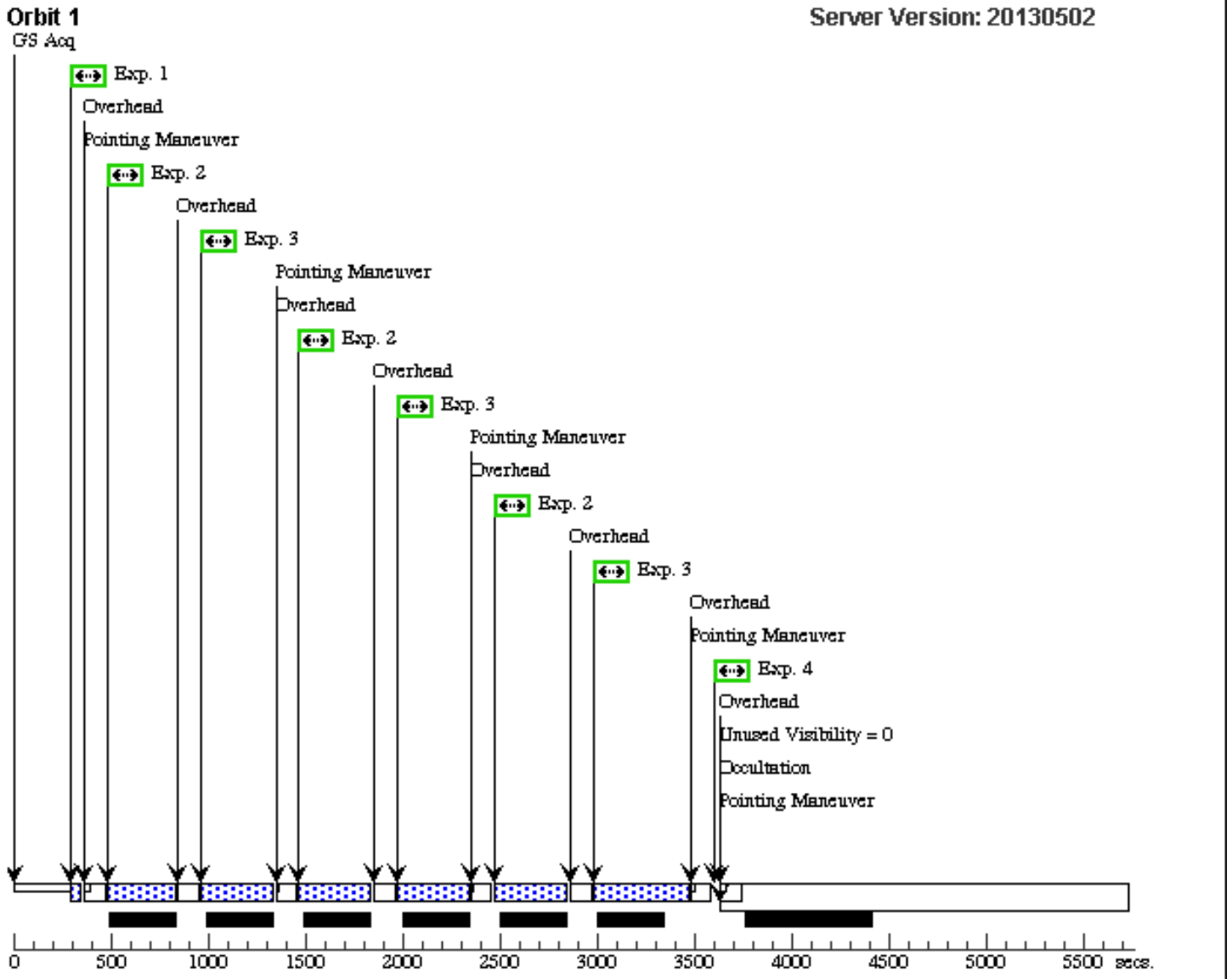
Fixed Targets

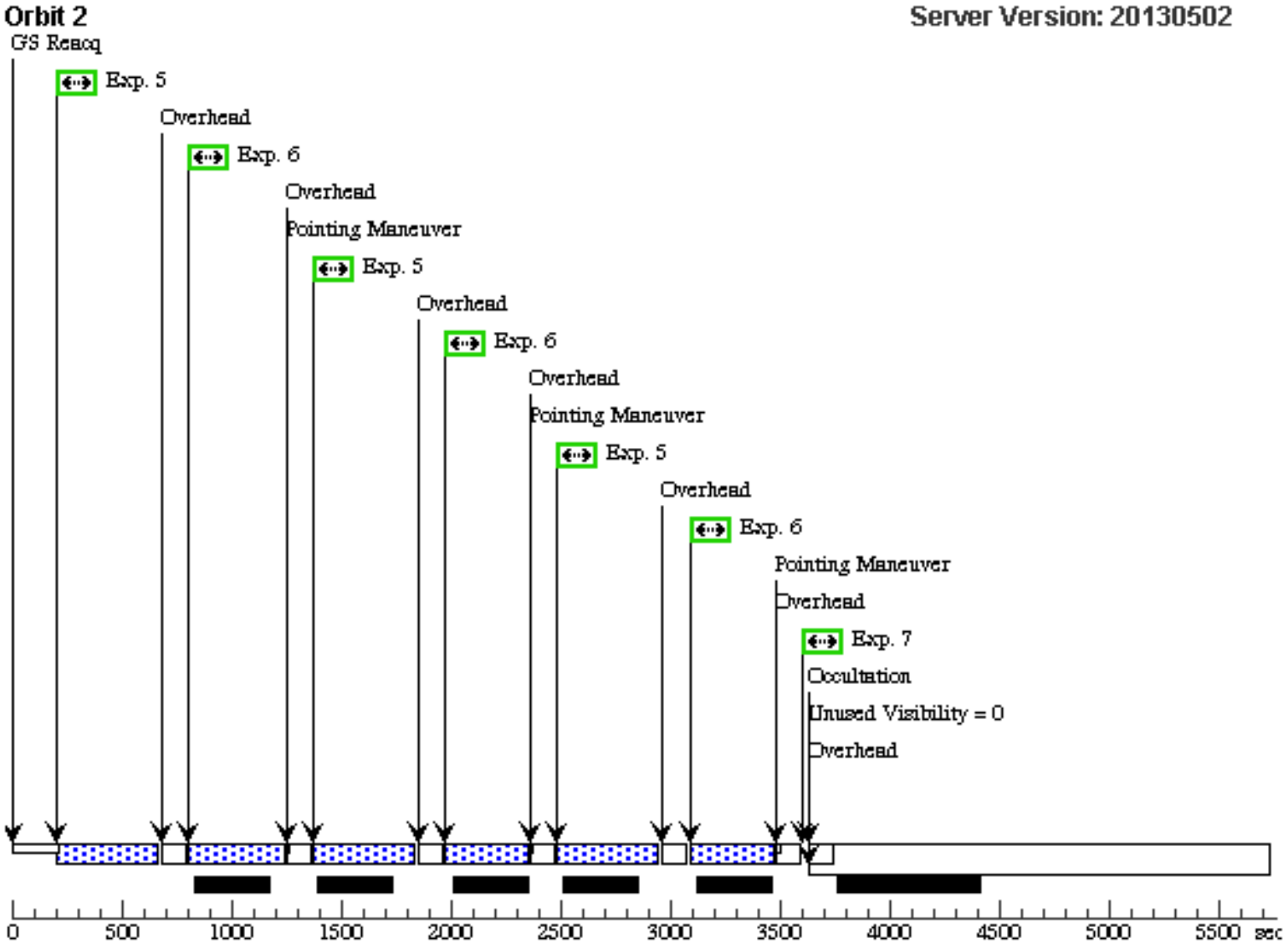
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	SNR0548-70.4	RA: 05 47 48.5000 (86.9520833d) Dec: -70 24 53.32 (-70.41481d) Equinox: J2000		V=17	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) SNR0548-70.4	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=11			20 Secs (20 Secs) *[==>]*	 ***[1]***
2		(5) SNR0548-70.4	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	FLASH=5	POS TARG null,10	Pattern 3, Exps 2-3 in Visit 05 (3)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***
3		(5) SNR0548-70.4	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W		POS TARG null,10	Pattern 3, Exps 2-3 in Visit 05 (3)	350 Secs (1170 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>470.0 Secs (Pattern 3)]*	 ***[1]***
4		(5) SNR0548-70.4	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=11			20 Secs (20 Secs) *[==>]*	 ***[1]***
5		(5) SNR0548-70.4	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N	FLASH=11	POS TARG null,10	Pattern 3, Exps 5-6 in Visit 05 (3)	450 Secs (1350 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[2]***
6		(5) SNR0548-70.4	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W	FLASH=4	POS TARG null,10	Pattern 3, Exps 5-6 in Visit 05 (3)	350 Secs (1111 Secs) *[==>411.0 Secs (Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[2]***
7		(5) SNR0548-70.4	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=11			20 Secs (20 Secs) *[==>]*	 ***[2]***

Orbit Structure




Orbit 2
Server Version: 20130502
GS Reacq
Exp. 5
Overhead
Exp. 6
Overhead
Pointing Maneuver
Exp. 5
Overhead
Exp. 6
Overhead
Pointing Maneuver
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 7
Occultation
Unused Visibility = 0
Overhead
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13282, Visit 06 Thu Jul 11 16:41:27 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-UVIS-GAP-LINE	Coordinate Frame=POS-TARG		(2-3), (5-6)
	Purpose=MOSAIC	Pattern Orientation=85.759		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.414	Center Pattern=false		
	Line Spacing=			

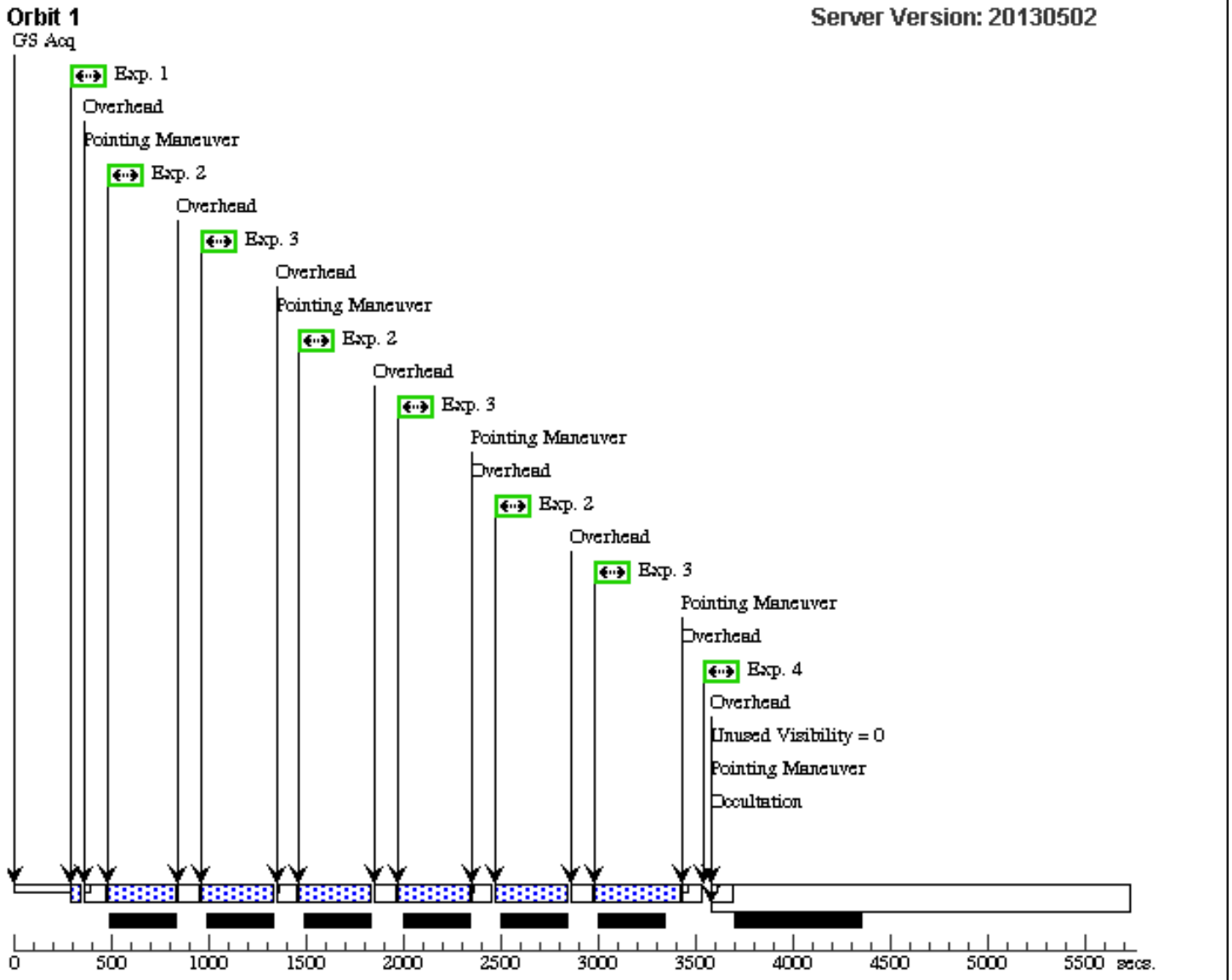
Fixed Targets

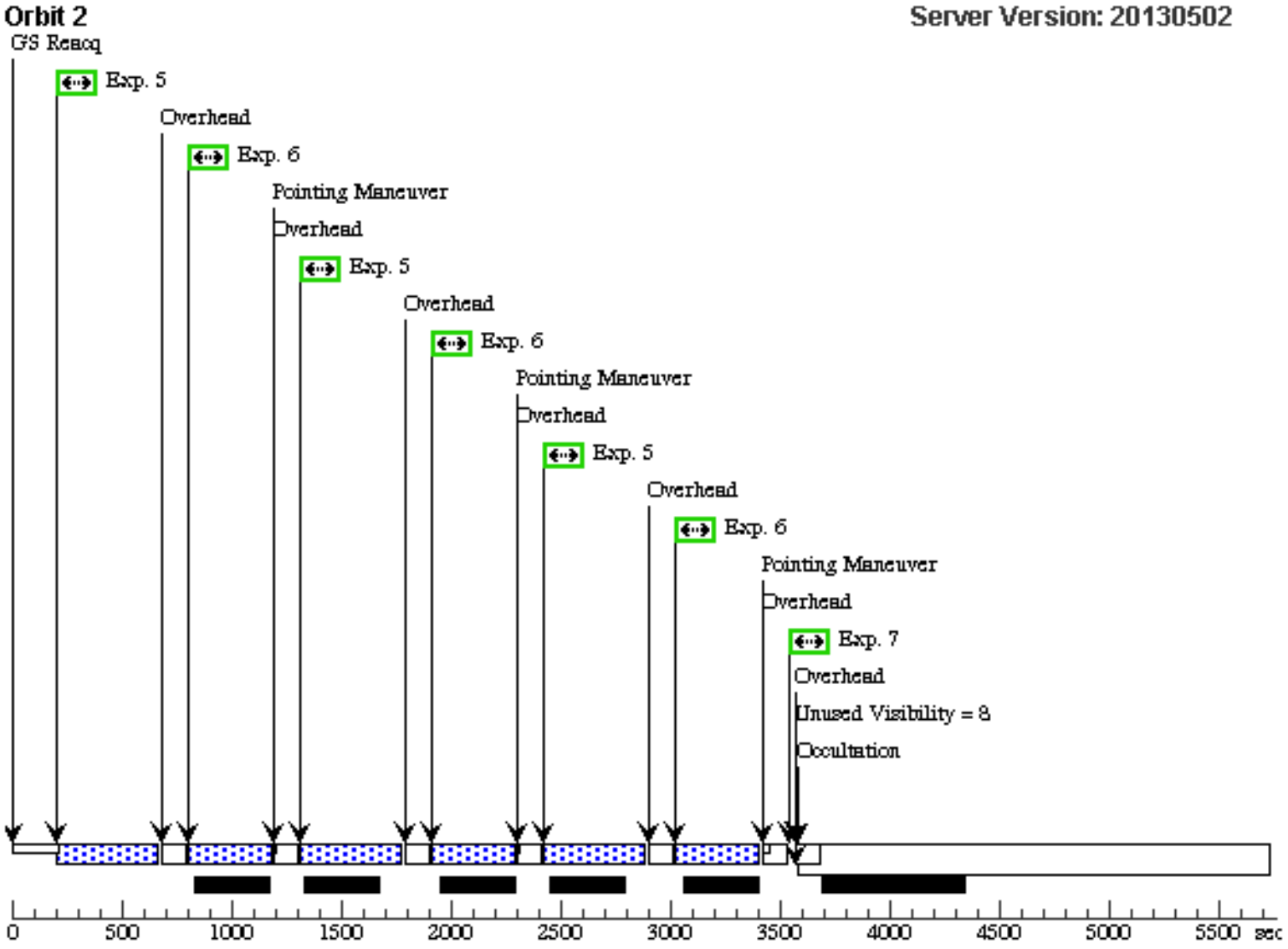
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	DEML316A	RA: 05 47 19.2250 (86.8301042d) Dec: -69 41 36.66 (-69.69352d) Equinox: J2000		V=17	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(6) DEML316A	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
2		(6) DEML316A	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	FLASH=5		Pattern 3, Exps 2-3 in Visit 06 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(6) DEML316A	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Pattern 3, Exps 2-3 in Visit 06 (3)	350 Secs (1117 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>417.0 Secs (Pattern 3)]*	***[1]***
4		(6) DEML316A	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
5		(6) DEML316A	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N	FLASH=11		Pattern 3, Exps 5-6 in Visit 06 (3)	450 Secs (1350 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
6		(6) DEML316A	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W	FLASH=4		Pattern 3, Exps 5-6 in Visit 06 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
7		(6) DEML316A	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[2]***

Orbit Structure




Orbit 2
Server Version: 20130502
GS Reacq
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 7
Overhead
Unused Visibility = 8
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13282, Visit 07 Thu Jul 11 16:41:28 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-UVIS-GAP-LINE	Coordinate Frame=POS-TARG		(2-3), (5-6)
	Purpose=MOSAIC	Pattern Orientation=85.759		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.414	Center Pattern=false		
	Line Spacing=			

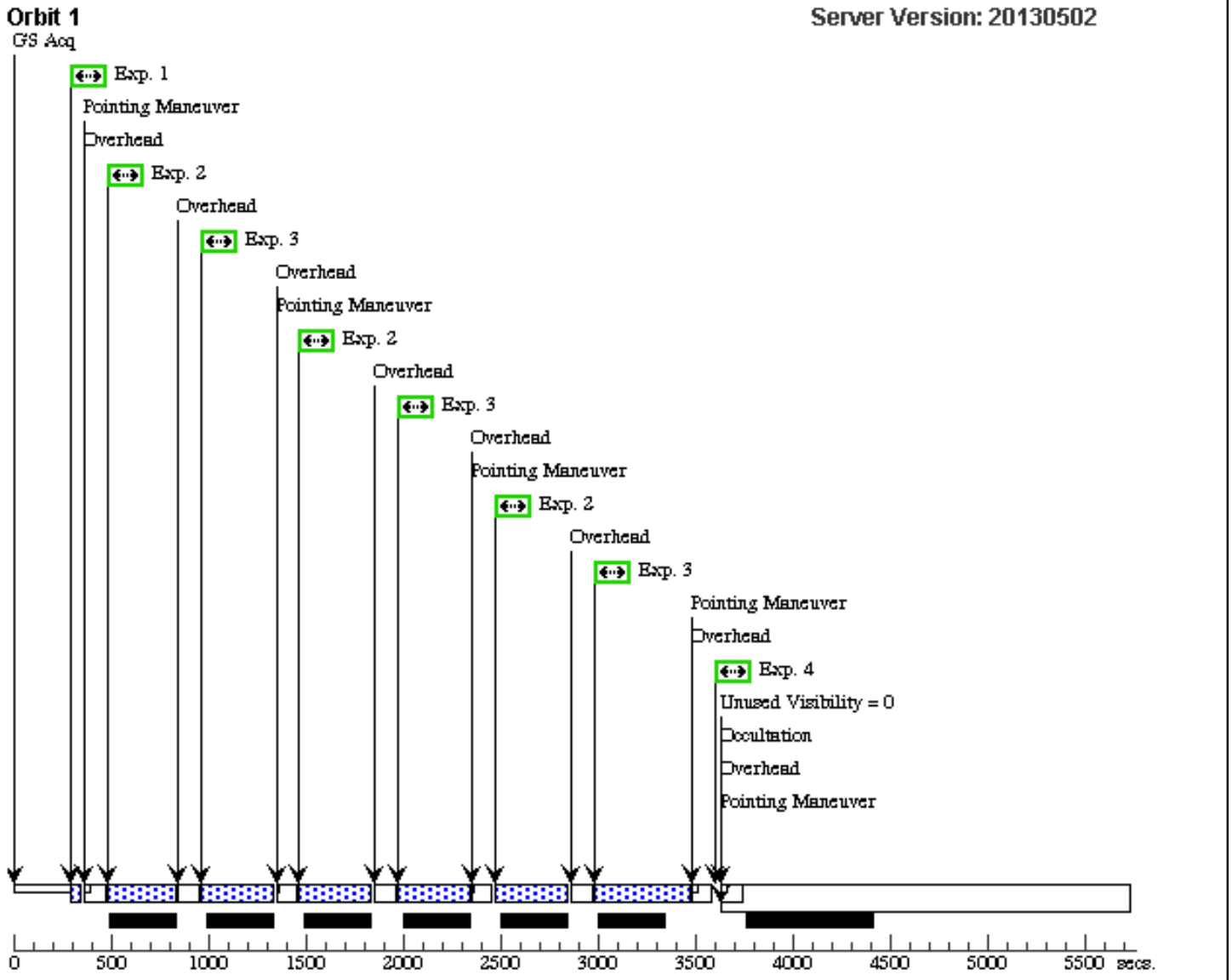
Fixed Targets

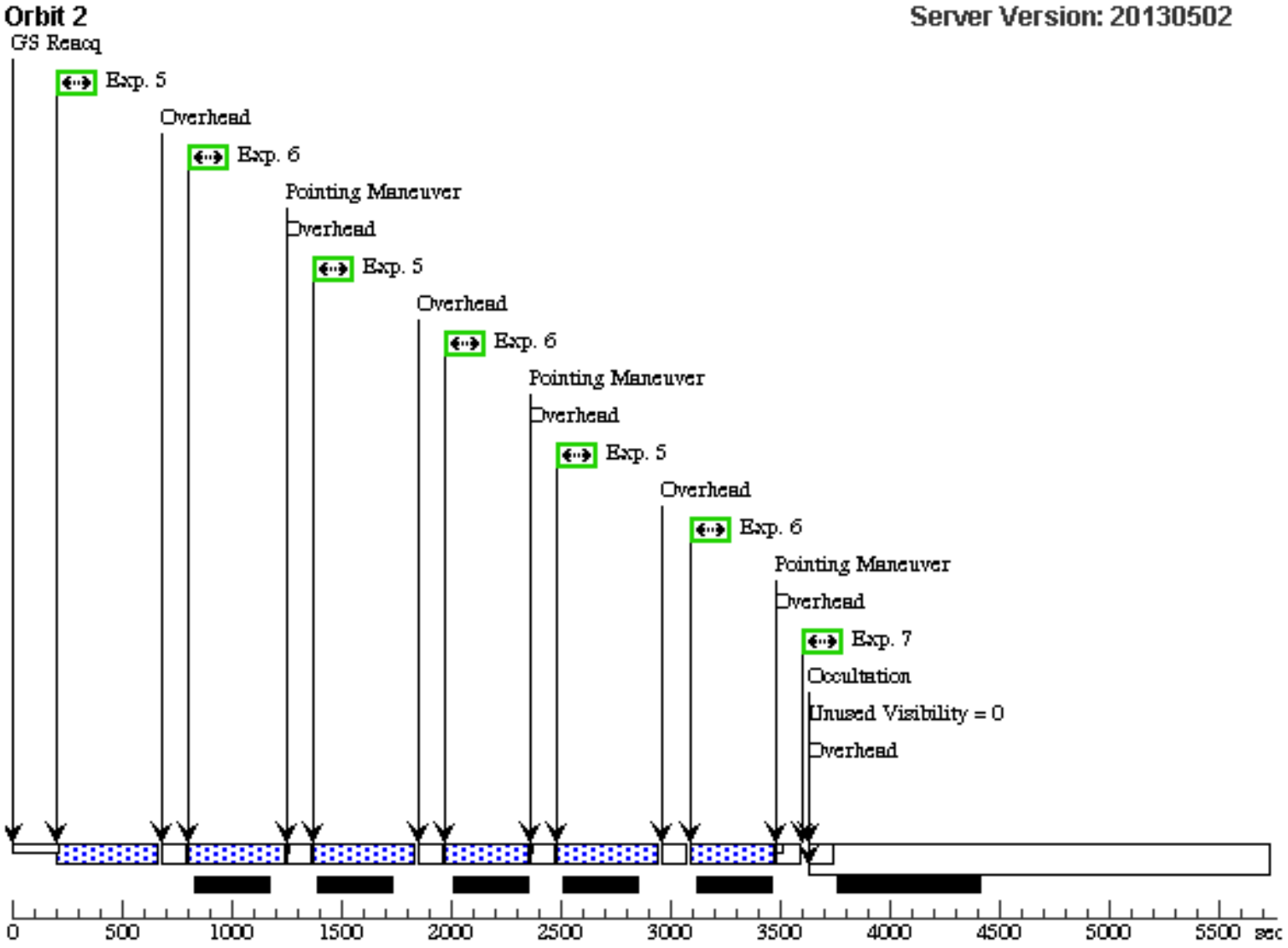
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	DEML249	RA: 05 36 7.4000 (84.0308333d) Dec: -70 38 42.06 (-70.64502d) Equinox: J2000		V=17	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(7) DEML249	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
2		(7) DEML249	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	FLASH=5		Pattern 3, Exps 2-3 in Visit 07 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(7) DEML249	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Pattern 3, Exps 2-3 in Visit 07 (3)	350 Secs (1170 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>470.0 Secs (Pattern 3)]*	***[1]***
4		(7) DEML249	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
5		(7) DEML249	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N	FLASH=11		Pattern 3, Exps 5-6 in Visit 07 (3)	450 Secs (1350 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
6		(7) DEML249	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W	FLASH=4		Pattern 3, Exps 5-6 in Visit 07 (3)	350 Secs (1111 Secs)	
								[==>411.0 Secs (Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
7		(7) DEML249	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[2]***

Orbit Structure




Orbit 2
Server Version: 20130502
GS Reacq
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 7
Occultation
Unused Visibility = 0
Overhead
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13282, Visit 08 Thu Jul 11 16:41:30 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-UVIS-GAP-LINE	Coordinate Frame=POS-TARG		(2-3), (5-6)
	Purpose=MOSAIC	Pattern Orientation=85.759		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.414	Center Pattern=false		
	Line Spacing=			

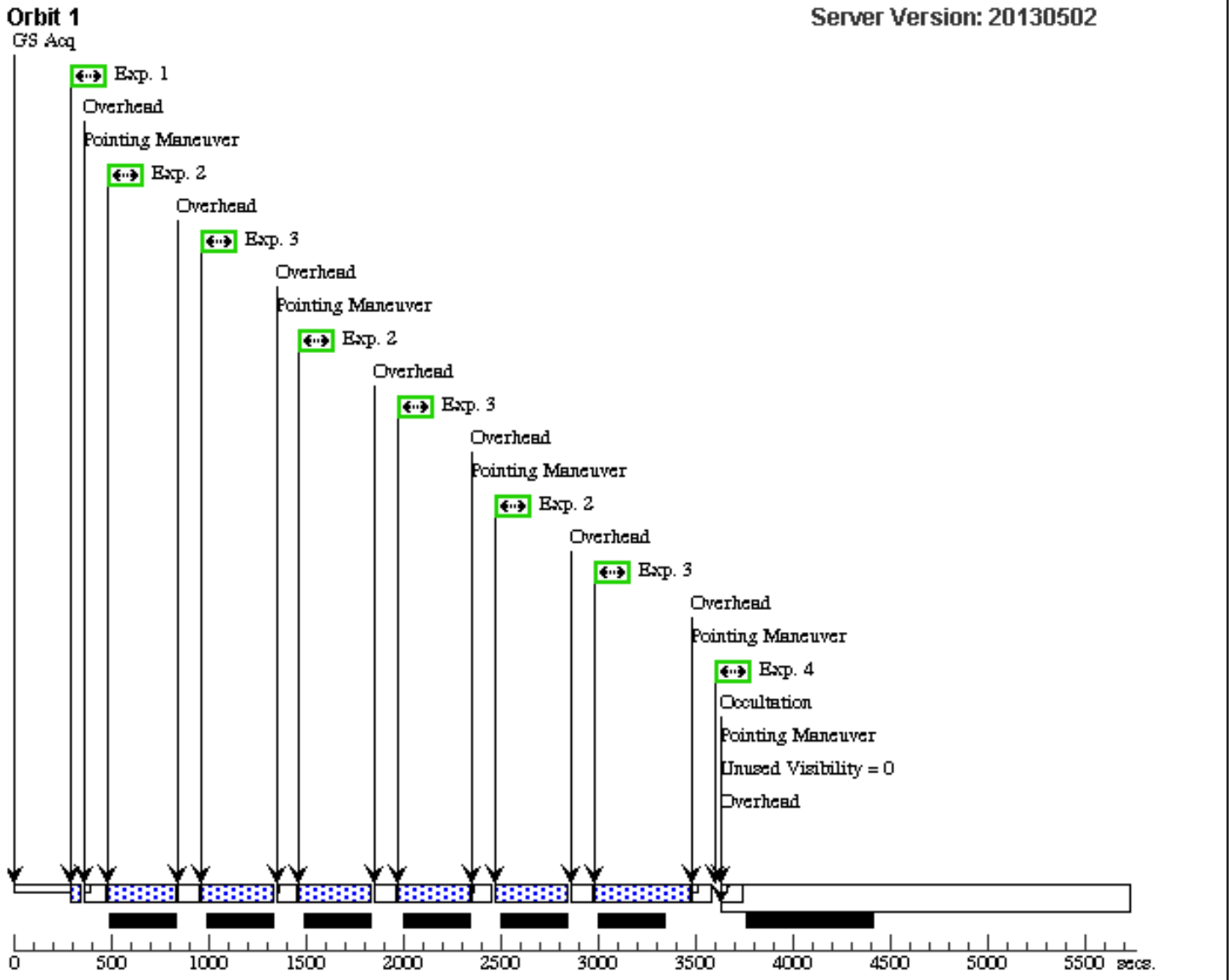
Fixed Targets

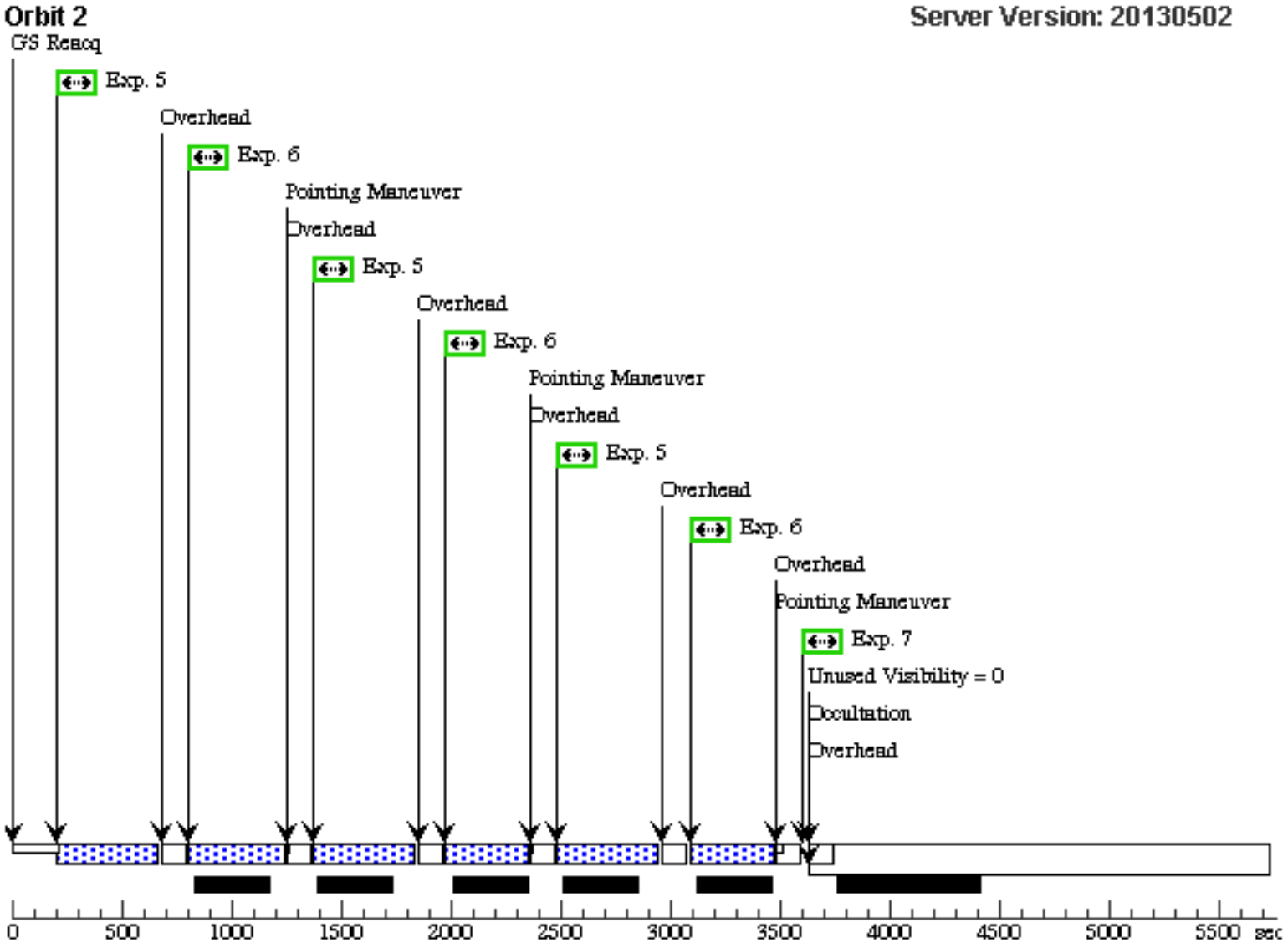
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	DEML238	RA: 05 34 17.9000 (83.5745833d) Dec: -70 33 20.89 (-70.55580d) Equinox: J2000		V=17	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(8) DEML238	WFC3/UVIS, ACCUM, UVIS1	F475W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
2		(8) DEML238	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	FLASH=5		Pattern 3, Exps 2-3 in Visit 08 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3		(8) DEML238	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Pattern 3, Exps 2-3 in Visit 08 (3)	350 Secs (1170 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>470.0 Secs (Pattern 3)]*	***[1]***
4		(8) DEML238	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
5		(8) DEML238	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N	FLASH=11		Pattern 3, Exps 5-6 in Visit 08 (3)	450 Secs (1350 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
6		(8) DEML238	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W	FLASH=4		Pattern 3, Exps 5-6 in Visit 08 (3)	350 Secs (1111 Secs)	
								[==>411.0 Secs (Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
7		(8) DEML238	WFC3/UVIS, ACCUM, UVIS1	F814W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[2]***

Orbit Structure




Orbit 2
Server Version: 20130502
GS Reacq
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Overhead
Pointing Maneuver
Exp. 7
Unused Visibility = 0
Occultation
Overhead
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13282, Visit 09 Thu Jul 11 16:41:31 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=WFC3-UVIS-GAP-LINE	Coordinate Frame=POS-TARG		(2-3), (5-6)
	Purpose=MOSAIC	Pattern Orientation=85.759		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.414	Center Pattern=false		
	Line Spacing=			

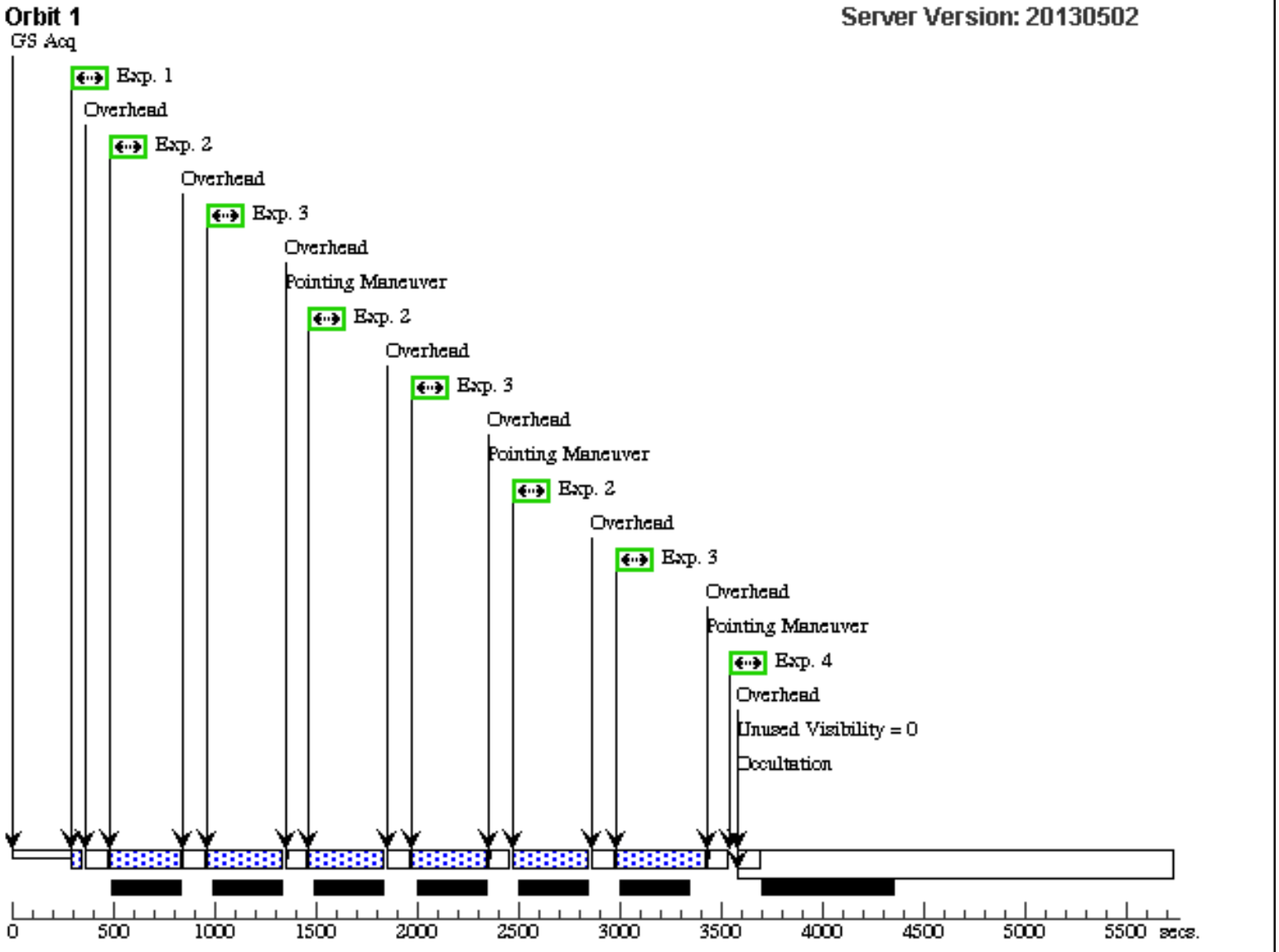
Fixed Targets

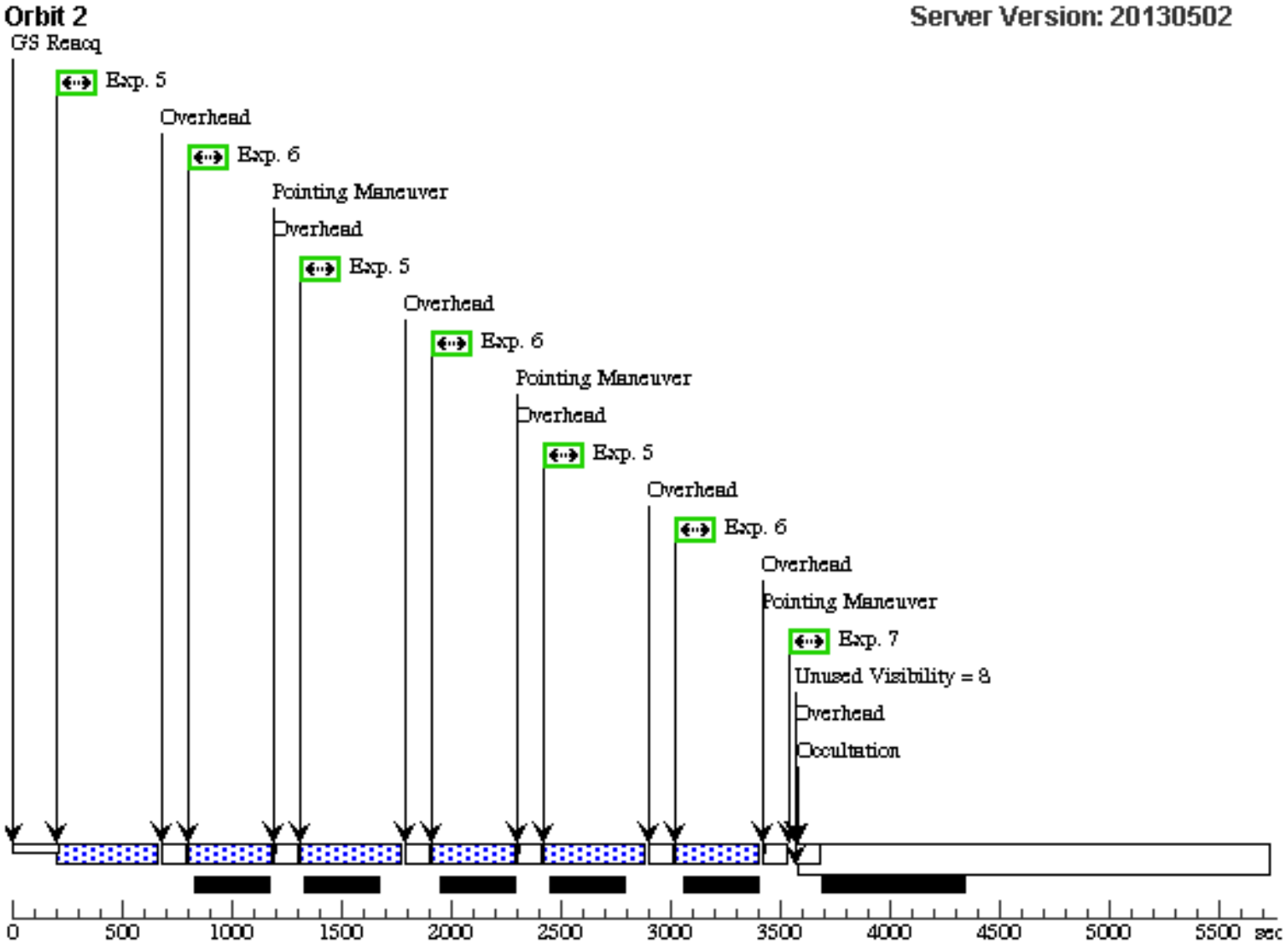
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	SNR0454-67.2	RA: 04 54 31.5000 (73.6312500d)		V=17	Reference Frame: ICRS
		Dec: -67 12 58.32 (-67.21620d)			
		Equinox: J2000			

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(9) SNR0454-67.2	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
2		(9) SNR0454-67.2	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	FLASH=5		Pattern 3, Exps 2-3 in Visit 09 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[1]***
								[==>(Pattern 3)]	
3		(9) SNR0454-67.2	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W			Pattern 3, Exps 2-3 in Visit 09 (3)	350 Secs (1117 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[1]***
								[==>417.0 Secs (Pattern 3)]	
4		(9) SNR0454-67.2	WFC3/UVIS, ACCUM, UVIS-CENTER	F555W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[1]***
5		(9) SNR0454-67.2	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N	FLASH=11		Pattern 3, Exps 5-6 in Visit 09 (3)	450 Secs (1350 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[2]***
								[==>(Pattern 3)]	
6		(9) SNR0454-67.2	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W	FLASH=4		Pattern 3, Exps 5-6 in Visit 09 (3)	350 Secs (1050 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[2]***
								[==>(Pattern 3)]	
7		(9) SNR0454-67.2	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W	FLASH=11			20 Secs (20 Secs)	
								[==>]	***[2]***

Orbit Structure




Orbit 2
Server Version: 20130502
GS Reacq
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Pointing Maneuver
Overhead
Exp. 5
Overhead
Exp. 6
Overhead
Pointing Maneuver
Exp. 7
Unused Visibility = 8
Overhead
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec