10781 - Observations of the active Centaur (60558) 2000 EC98

Cycle: 14, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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VISITS

Visit	*Targets*	*Configurations*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
10	(11) 2000EC98	ACS/WFC	2	16-Mar-2006 23:30:42.0	yes
20	(11) 2000EC98	ACS/WFC	2	16-Mar-2006 23:30:47.0	yes
30	(11) 2000EC98	ACS/WFC	2	16-Mar-2006 23:30:52.0	yes
40	(12) 2000EC98-CORRECTION	ACS/WFC	2	16-Mar-2006 23:31:01.0	yes
50	(12) 2000EC98-CORRECTION	ACS/WFC	2	16-Mar-2006 23:31:04.0	yes
60	(12) 2000EC98-CORRECTION	ACS/WFC	2	16-Mar-2006 23:31:08.0	yes
70	(12) 2000EC98-CORRECTION	ACS/WFC	2	16-Mar-2006 23:31:12.0	yes

14 Total Orbits Used

ABSTRACT

On the next-to-last day of 2005, an amazing discovery was made. A modest member of the population of minor planets was suddenly found to be outbursting. The object, originally classified as an asteroidal body with no visible sign of coma or non-rotational photometric variations, had become a comet. (60558) 2000 EC98 is a Centaur, a class of objects that have long been seen as the precursors to many of the comets in our Solar System. This previously quiescent, fairly well-studied body has now afforded the astronomical community the opportunity to observe the changes that the earliest onset of cometary activity may bring to a planetary surface. It also allows us to test theories as to which physical characteristics may herald the potential for future activity and the existence of primordial substances, like volatiles, within the outer Solar System's asteroidal populations. We are requesting Director's Discretionary Time on the Hubble Space Telescope to observe this rare event with high spatial resolution, while the Centaur is still active, so that we may characterize the changes taking place on the nucleus, the robustness of the activity, and the nature of the dust and gas in the coma. Unlike the surfaces of Jupiter-Family Comets, which have been processed by long periods of activity, and unlike the few other active Centaurs, which were discovered after the onset of their activity, this would be a first and rare opportunity to study changes on a cometary surface soon after it evolved from a likely long period of dormancy into strong outburst.

OBSERVING DESCRIPTION

We request 10 orbits of ACS/WFC observations, consisting of 5 x????????2 orbits with each of 4 filters: F435W, F555W, F625W and FR388N. Because of the 26 hour rotation period of the target (assuming a double-peaked lightcurve), the observations for each filter set are evenly separated by 3 hours in order to obtain well-sampled data over rotational phase. The position of 2000 EC98 is obtained from JPL ephemerides and the exposure estimates are from the ACS imaging ETC to obtain reasonable S/N values, based on Johnson UBVR magnitudes that were recently obtained with the 0.6-m telescope at Table Mountain Observatory. We selected the exposure times to obtain reasonable S/N values in the case of a bare nucleus, while not saturating in the extreme case of a large coma, and adopted CR-SPLIT for easier identification of cosmic-ray events: CR-SPLIT=2 for the F435W, F555W and F625W filters, and CR-SPLIT=4 for the FR388N filter. The FR388N observations are requested for the purpose of detecting CN, which has an emission band at 388.3 nm.

Visit

Proposal 10781, Visit 10 Fri Mar 17 04:31:14 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

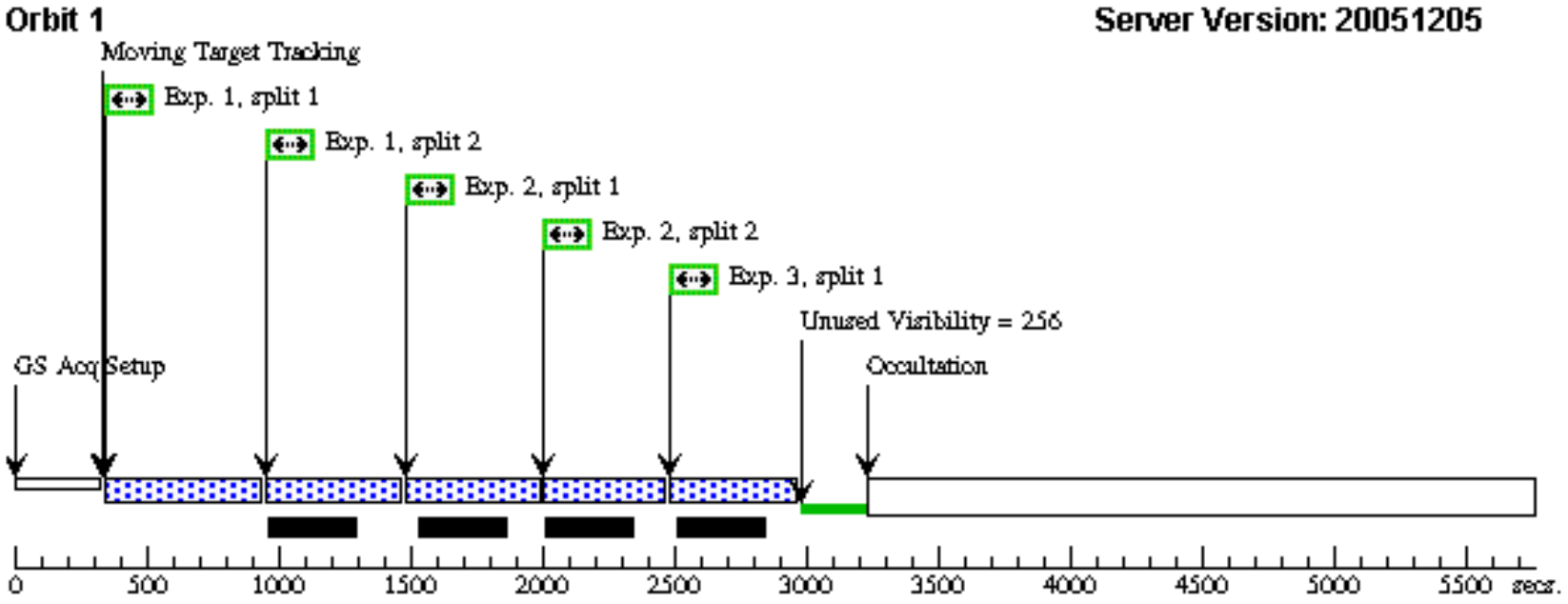
Solar System Targets

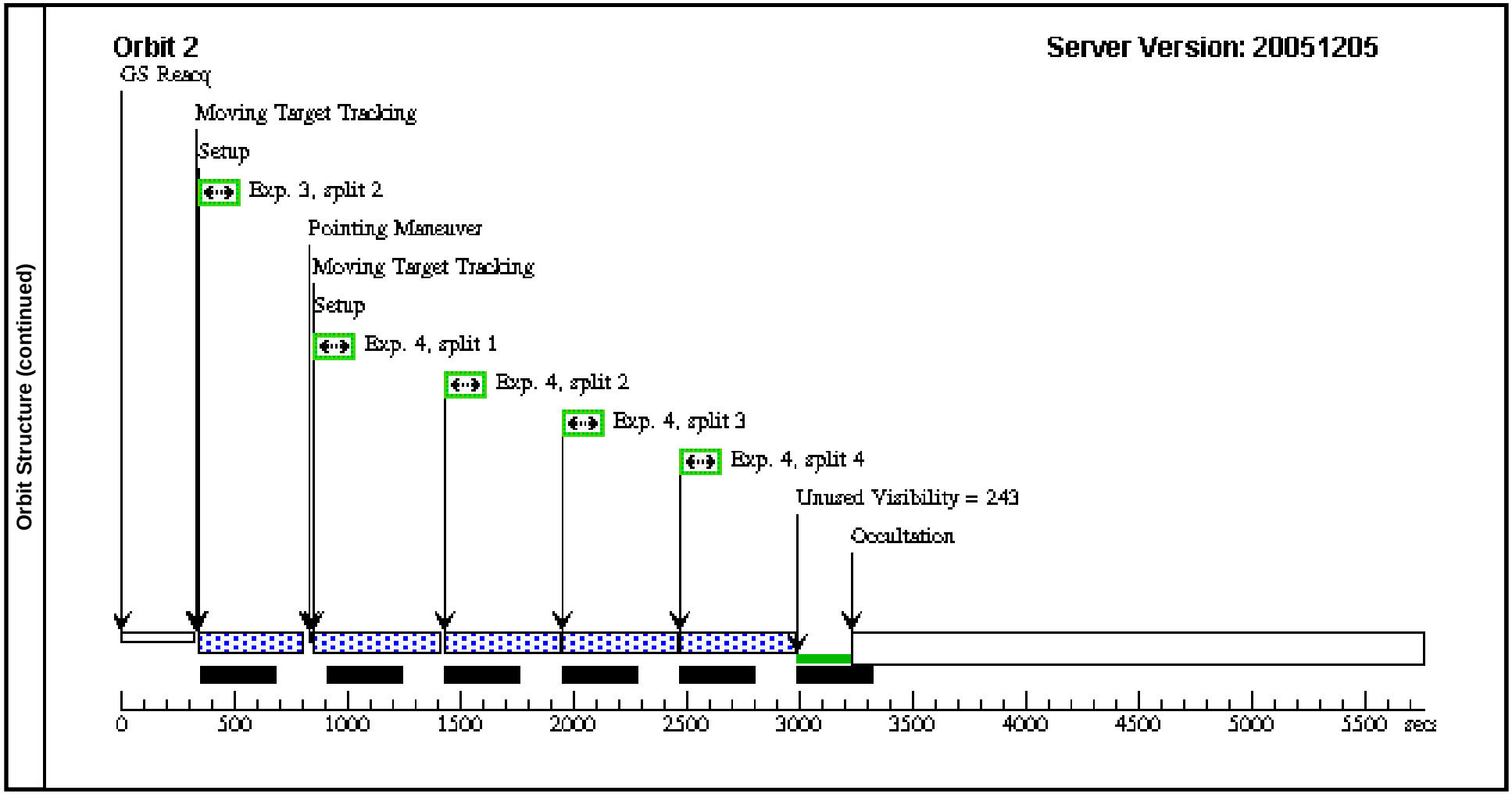
#	Name	Level 1	Level 2	Level 3	Window
(11)	2000EC98	TYPE=COMET,Q=10.72959418282758,E=0.4564002785487747,I=4.3441317424911 52,O=173.3233679342385,W=162.880133 7618634,T=04-MAY-2015:05:59:58,EQUINOX=J2000,EPOCH=16-AUG-2001:00:00:00			

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	EC98-F435W-EX11	(11) 2000EC98	ACS/WFC, ACCUM, WFC	F435W				780.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
2	EC98-F555W-EX12	(11) 2000EC98	ACS/WFC, ACCUM, WFC	F555W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
3	EC98-F625W-EX13	(11) 2000EC98	ACS/WFC, ACCUM, WFC	F625W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	***[2]***
4	Ec98-FR388N-EX14	(11) 2000EC98	ACS/WFC, ACCUM, WFC1-MRAMP	FR388N 3880.0 A	CR-SPLIT=4			1540.0 Secs	
								[==>(Split 1)]	***[2]***
								[==>(Split 2)]	
								[==>(Split 3)]	
								[==>(Split 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20051205
GS Reacq
Moving Target Tracking
Setup
Exp. 3, split 2
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Unused Visibility = 243
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10781, Visit 20 Fri Mar 17 04:31:15 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: AFTER 10 BY 3 H TO 4 H

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window
(11)	2000EC98	TYPE=COMET,Q=10.72959418282758,E=0.4564002785487747,I=4.3441317424911 52,O=173.3233679342385,W=162.880133 7618634,T=04-MAY-2015:05:59:58,EQUINOX=J2000,EPOCH= 16-AUG-2001:00:00:00			

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	EC98-F435 W-EX21	(11) 2000EC98	ACS/WFC, ACCUM, WFC	F435W				780.0 Secs	
								[==>(Split 1)] *[==>(Split 2)]*	***[1]***
2	EC98-F555 W-EX22	(11) 2000EC98	ACS/WFC, ACCUM, WFC	F555W				680.0 Secs	
								[==>(Split 1)] *[==>(Split 2)]*	***[1]***
3	EC98-F625 W-EX23	(11) 2000EC98	ACS/WFC, ACCUM, WFC	F625W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	***[2]***
4	Ec98-FR388 N-EX24	(11) 2000EC98	ACS/WFC, ACCUM, WFC1-MRAMP	FR388N 3880.0 A	CR-SPLIT=4			1540.0 Secs	
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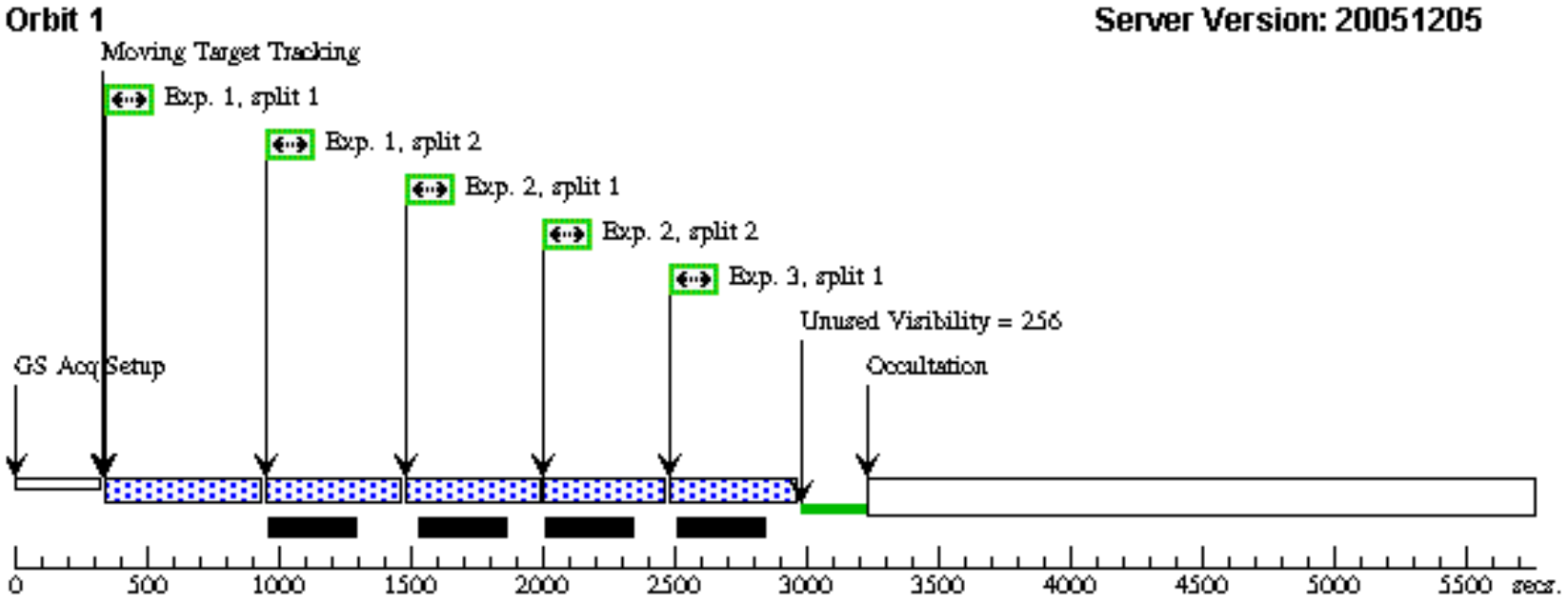
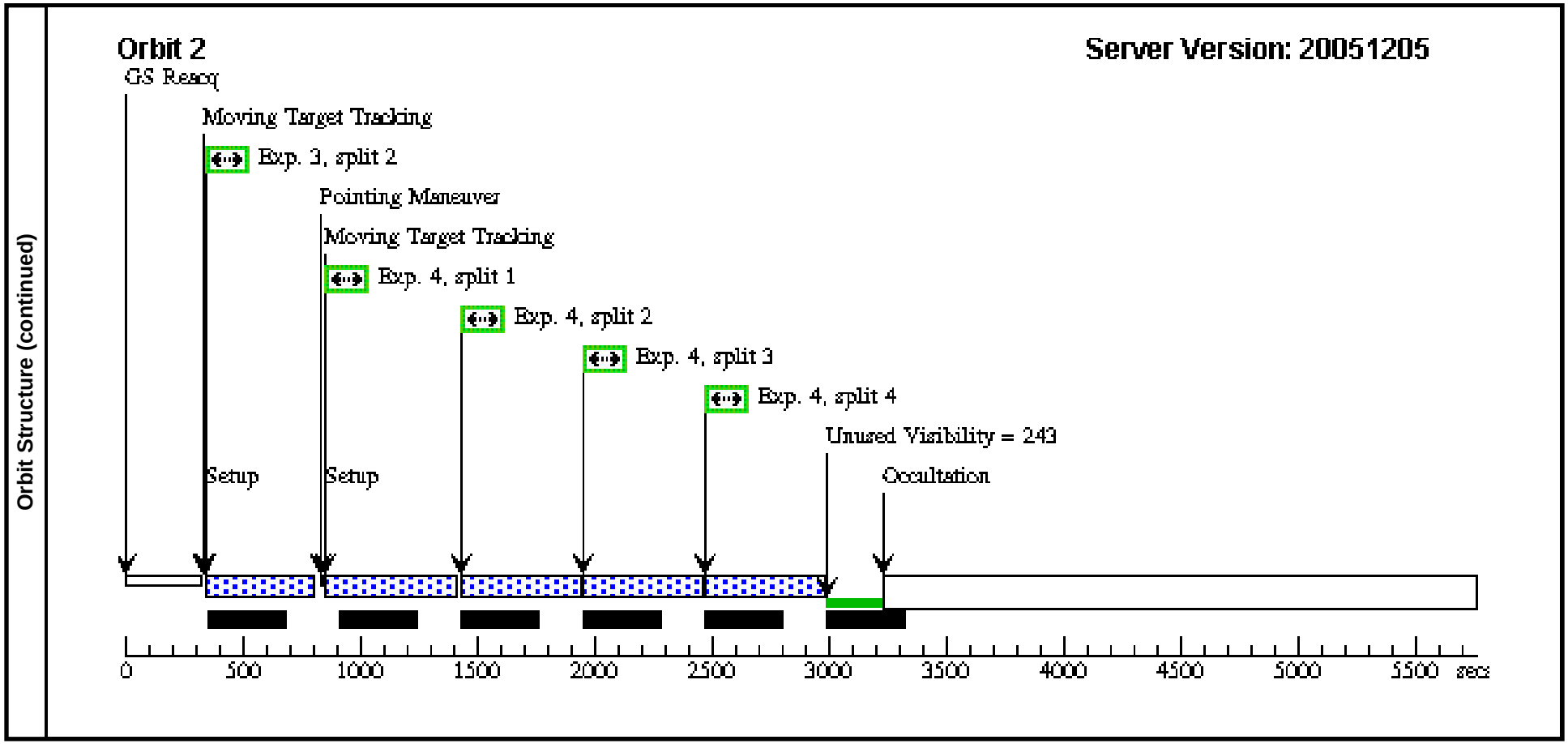
Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20051205
GS Reacq
Moving Target Tracking
Exp. 3, split 2
Pointing Maneuver
Moving Target Tracking
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Unused Visibility = 243
Occultation
Setup
Setup
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10781, Visit 30 Fri Mar 17 04:31:16 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: AFTER 20 BY 3 H TO 4 H

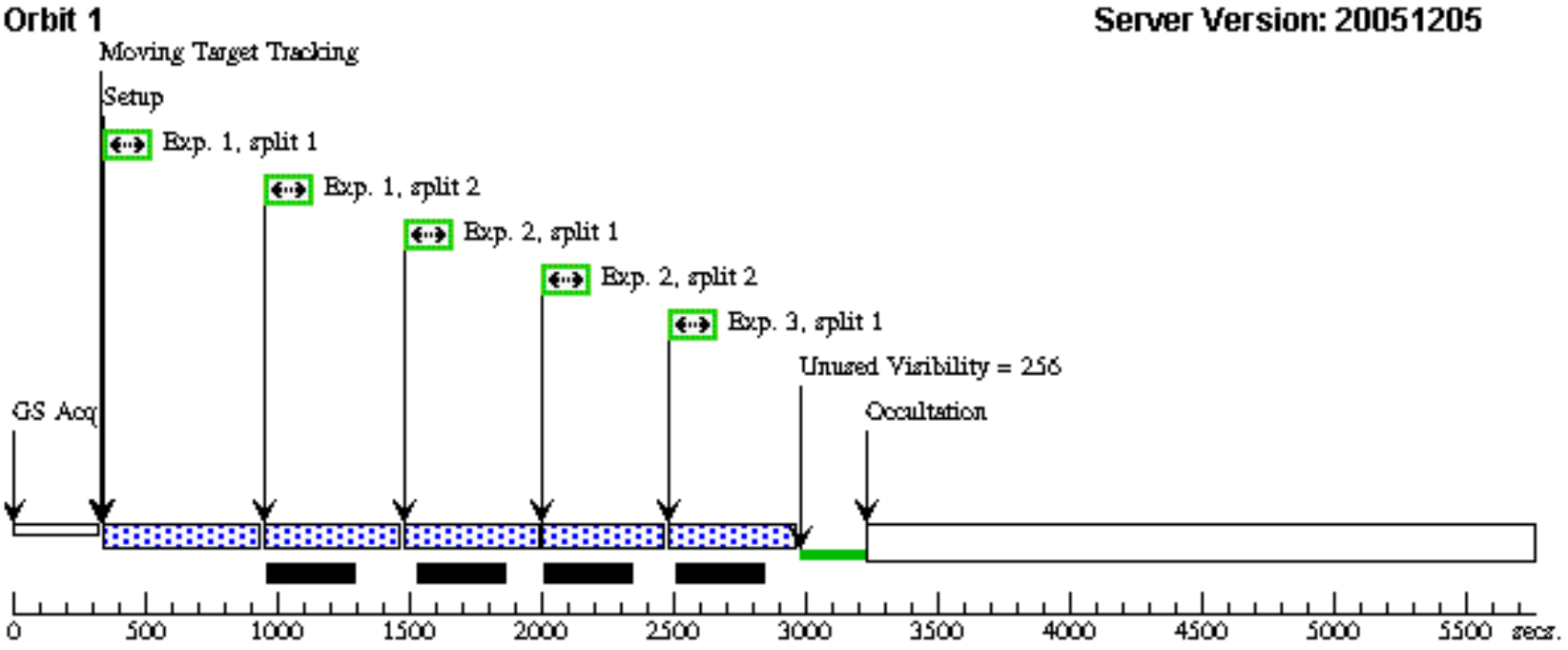
Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window
(11)	2000EC98	TYPE=COMET,Q=10.72959418282758,E=0.4564002785487747,I=4.3441317424911752,O=173.3233679342385,W=162.8801337618634,T=04-MAY-2015:05:59:58,EQUINOX=J2000,EPOCH=16-AUG-2001:00:00:00			

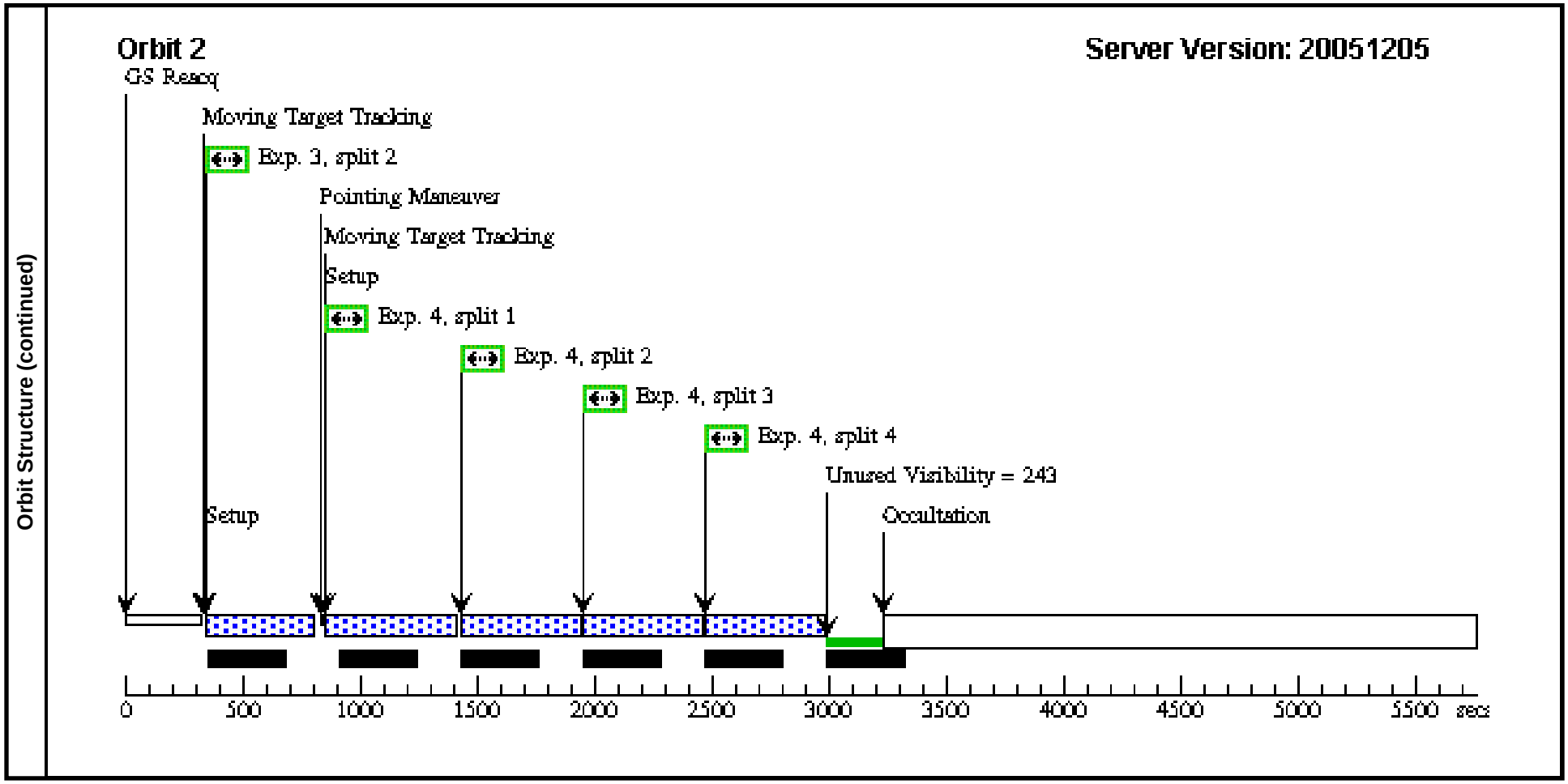
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	EC98-F435W-EX31	(11) 2000EC98	ACS/WFC, ACCUM, WFC	F435W				780.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
2	EC98-F555W-EX32	(11) 2000EC98	ACS/WFC, ACCUM, WFC	F555W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
3	EC98-F625W-EX33	(11) 2000EC98	ACS/WFC, ACCUM, WFC	F625W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	***[2]***
4	Ec98-FR388N-EX34	(11) 2000EC98	ACS/WFC, ACCUM, WFC1-MRAMP	FR388N 3880.0 A	CR-SPLIT=4			1540.0 Secs	
								[==>(Split 1)]	***[2]***
								[==>(Split 2)]	
								[==>(Split 3)]	
								[==>(Split 4)]	

Orbit Structure



Orbit Structure (continued)



Visit

Proposal 10781, Visit 40 Fri Mar 17 04:31:17 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: AFTER 30 BY 110.2 H TO 111.2 H

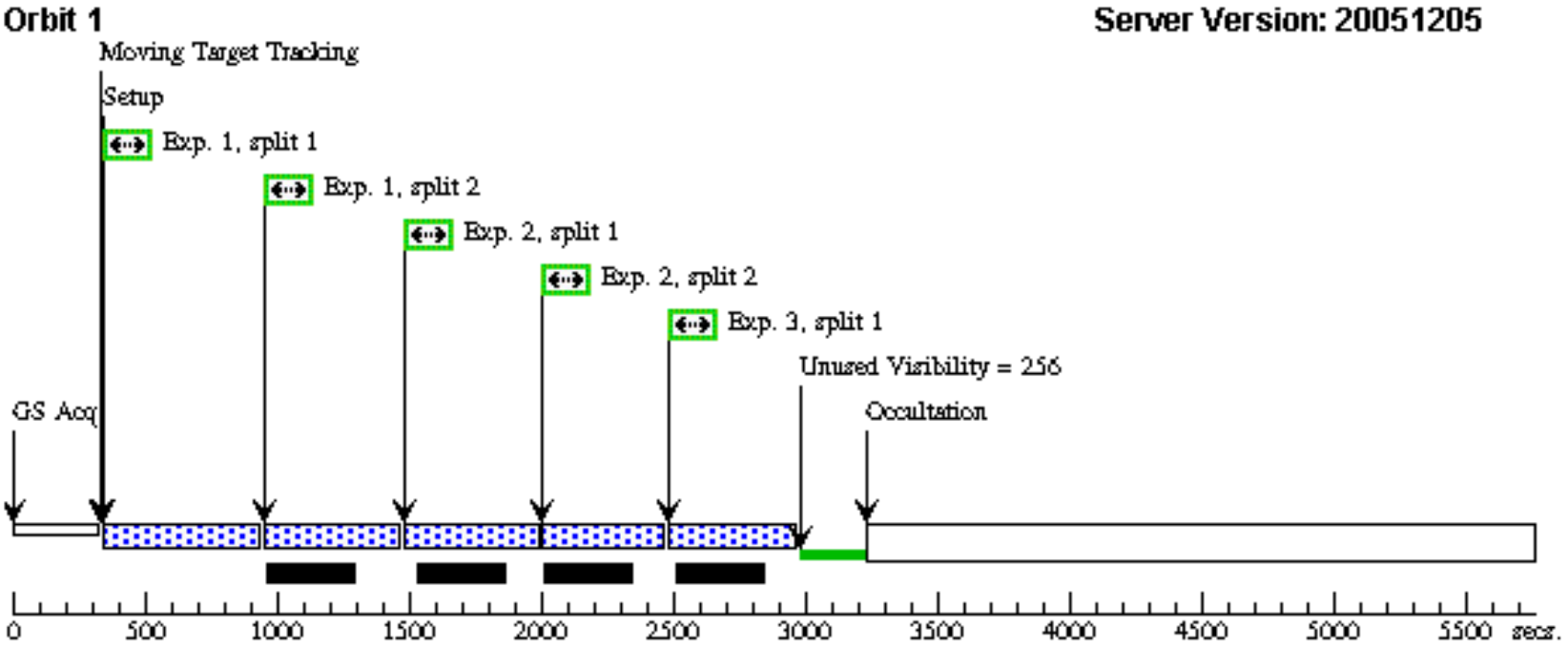
Solar System Targets

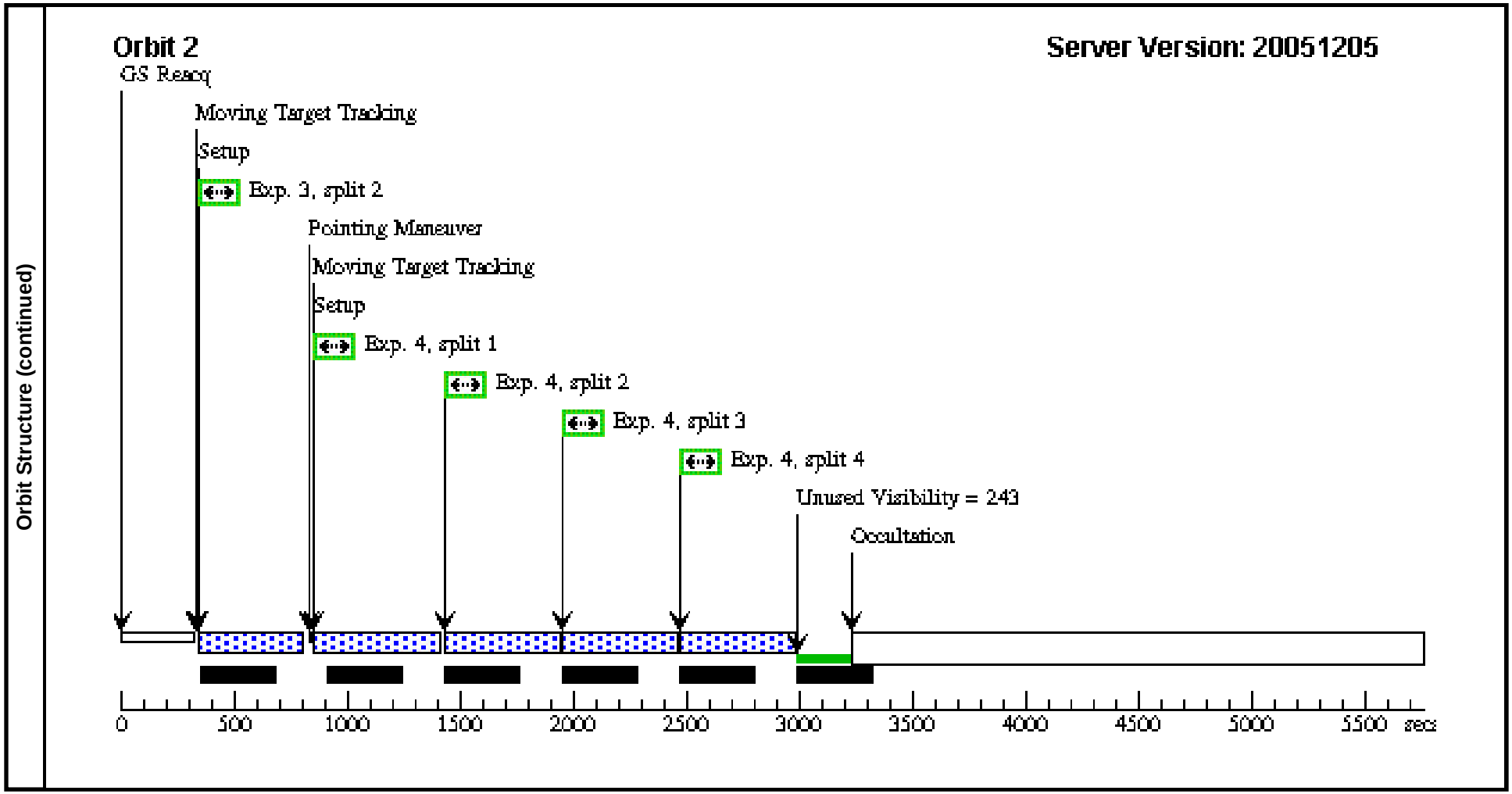
#	Name	Level 1	Level 2	Level 3	Window
(12)	2000EC98-CORRECTION	TYPE=COMET,Q=5.844212514611897,E=0.45567585250106,I=4.34147318056047,O=173.3222006610484,W=162.818113713857,T=06-MAY-2015:03:56:57,EQUINOX=J2000,EPOCH=30-MAR-2002:00:00:00			

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	EC98-F435W-EX41	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F435W				780.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
2	EC98-F555W-EX42	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F555W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
3	EC98-F625W-EX43	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F625W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	***[2]***
4	Ec98-FR388N-EX44	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC1-MRAMP	FR388N 3880.0 A	CR-SPLIT=4			1540.0 Secs	
								[==>(Split 1)]	***[2]***
								[==>(Split 2)]	
								[==>(Split 3)]	
								[==>(Split 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20051205
GS Reacq
Moving Target Tracking
Setup
Exp. 3, split 2
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Unused Visibility = 243
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10781, Visit 50 Fri Mar 17 04:31:17 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: AFTER 40 BY 3 H TO 4 H

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window
(12)	2000EC98-CORRECTION	TYPE=COMET,Q=5.844212514611897,E=0.45567585250106,I=4.34147318056047,O=173.3222006610484,W=162.818113713857,T=06-MAY-2015:03:56:57,EQUINOX=J2000,EPOCH=30-MAR-2002:00:00:00			

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	EC98-F435W-EX51	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F435W				780.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
2	EC98-F555W-EX52	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F555W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
3	EC98-F625W-EX53	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F625W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	***[2]***
4	Ec98-FR388N-EX54	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC1-MRAMP	FR388N 3880.0 A	CR-SPLIT=4			1540.0 Secs	
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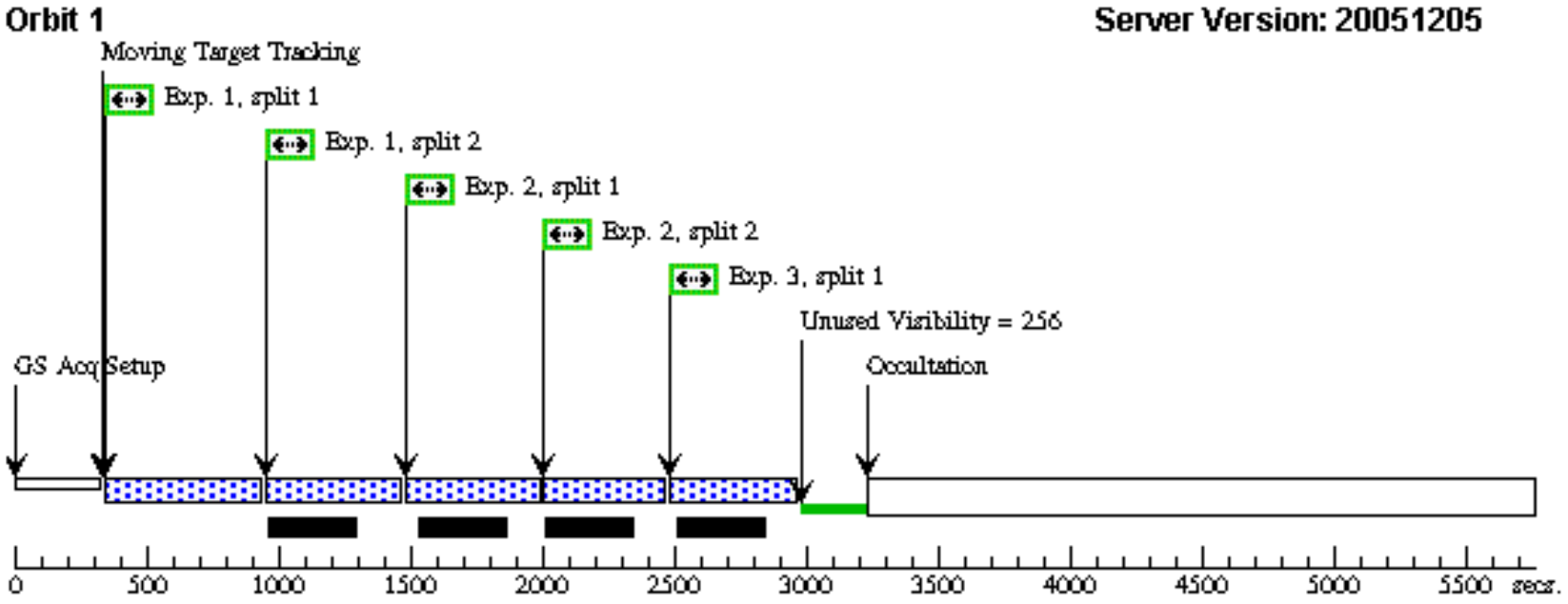
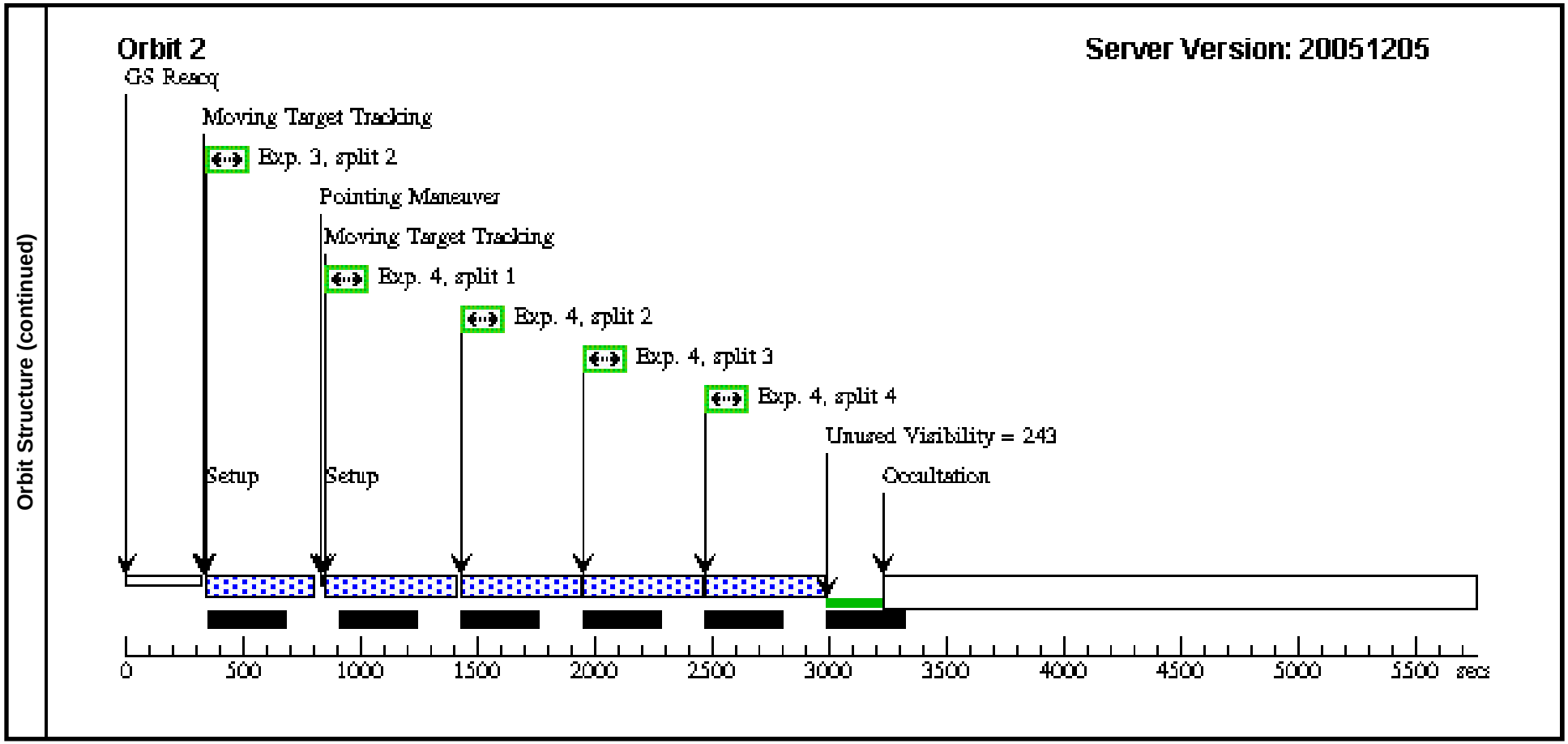
								[==>(Split 2)]	
								[==>(Split 3)]	
								[==>(Split 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20051205
GS Reacq
Moving Target Tracking
Exp. 3, split 2
Pointing Maneuver
Moving Target Tracking
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Unused Visibility = 243
Occultation
Setup
Setup
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10781, Visit 60 Fri Mar 17 04:31:18 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Solar System Targets

#	Name	Level 1	Level 2	Level 3	Window
(12)	2000EC98-CORRECTION	TYPE=COMET,Q=5.844212514611897,E=0.45567585250106,I=4.34147318056047,O=173.3222006610484,W=162.818113713857,T=06-MAY-2015:03:56:57,EQUINOX=J2000,EPOCH=30-MAR-2002:00:00:00			

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	EC98-F435W-EX41	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F435W				780.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
2	EC98-F555W-EX42	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F555W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
3	EC98-F625W-EX43	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F625W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	***[2]***
4	Ec98-FR388N-EX44	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC1-MRAMP	FR388N 3880.0 A	CR-SPLIT=4			1540.0 Secs	
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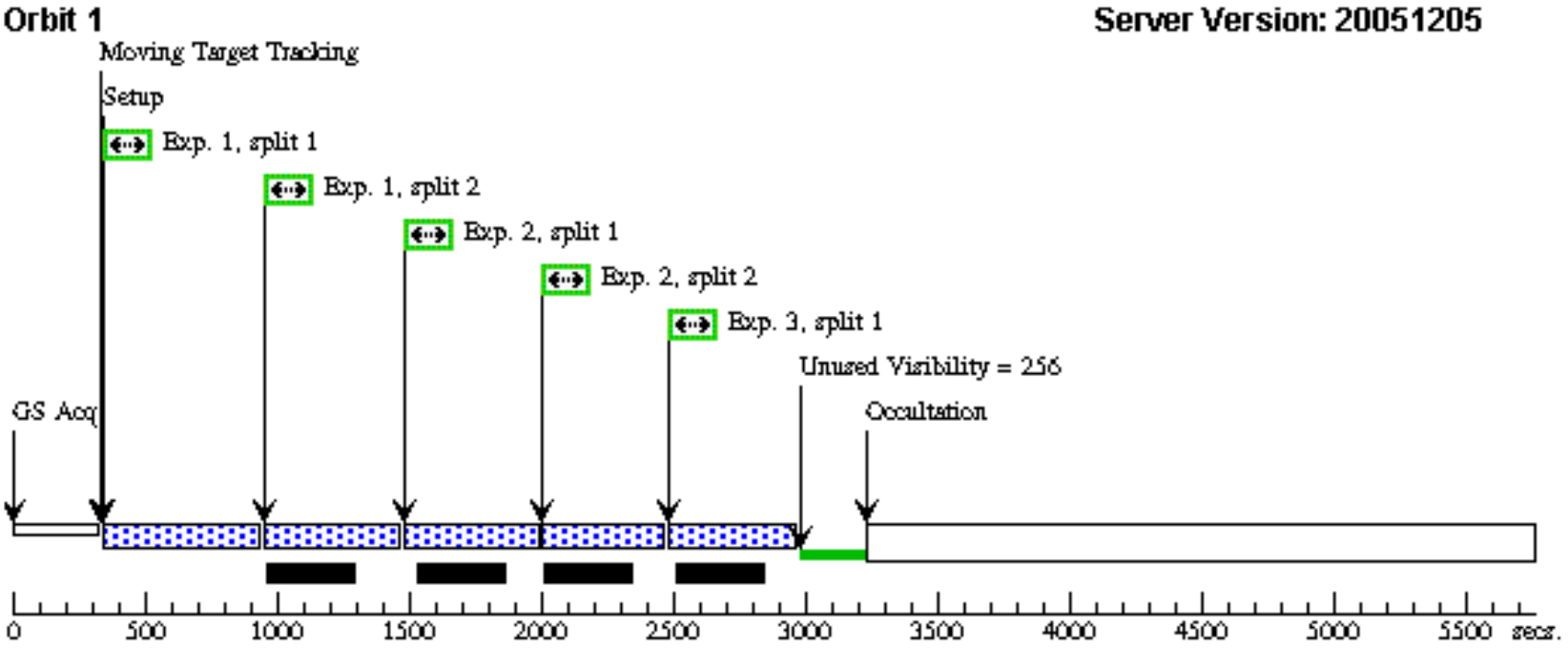
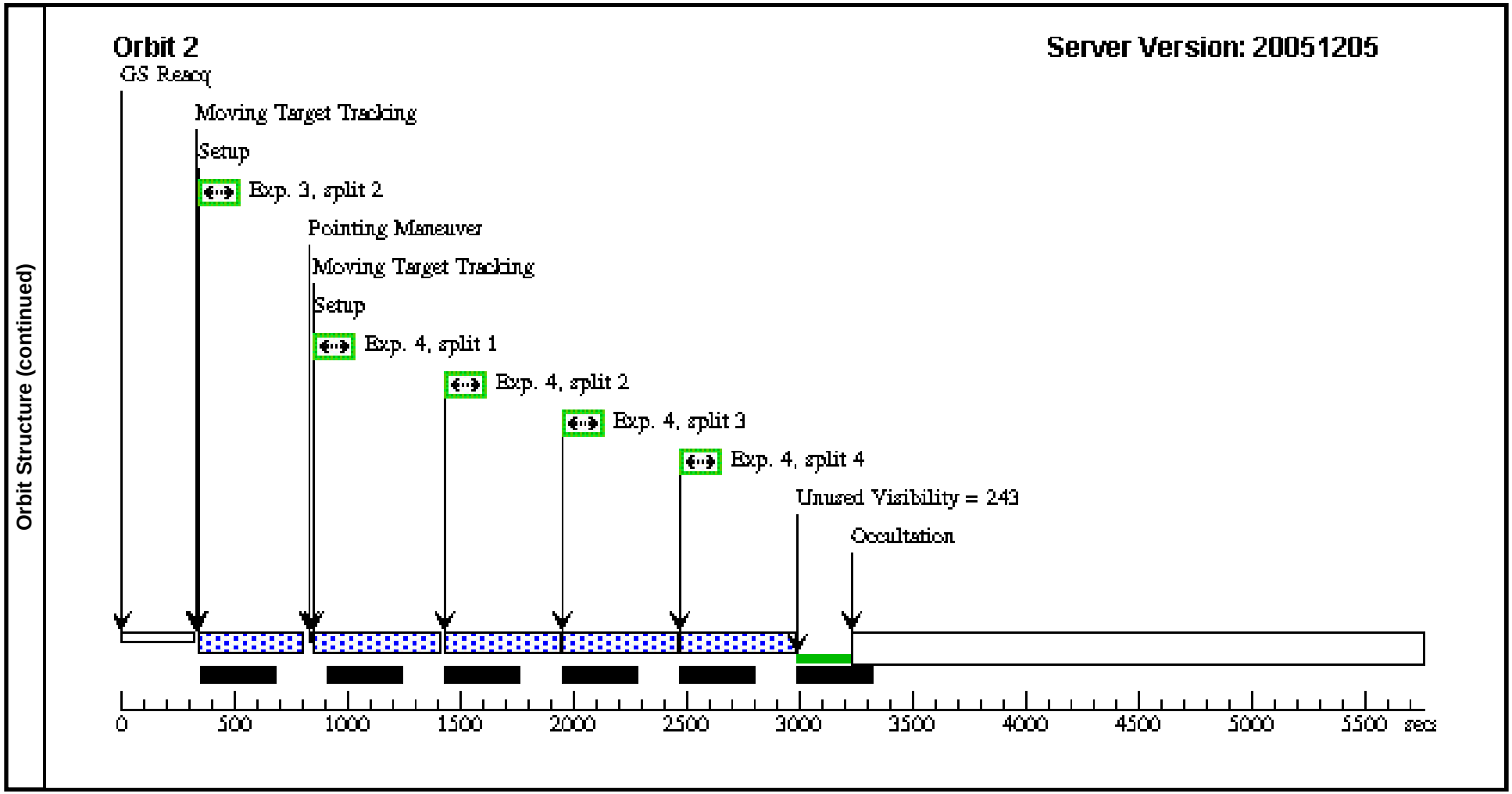
								[==>(Split 2)]	
								[==>(Split 3)]	
								[==>(Split 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20051205
GS Reacq
Moving Target Tracking
Setup
Exp. 3, split 2
Pointing Maneuver
Moving Target Tracking
Setup
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Unused Visibility = 243
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10781, Visit 70 Fri Mar 17 04:31:18 GMT 2006

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

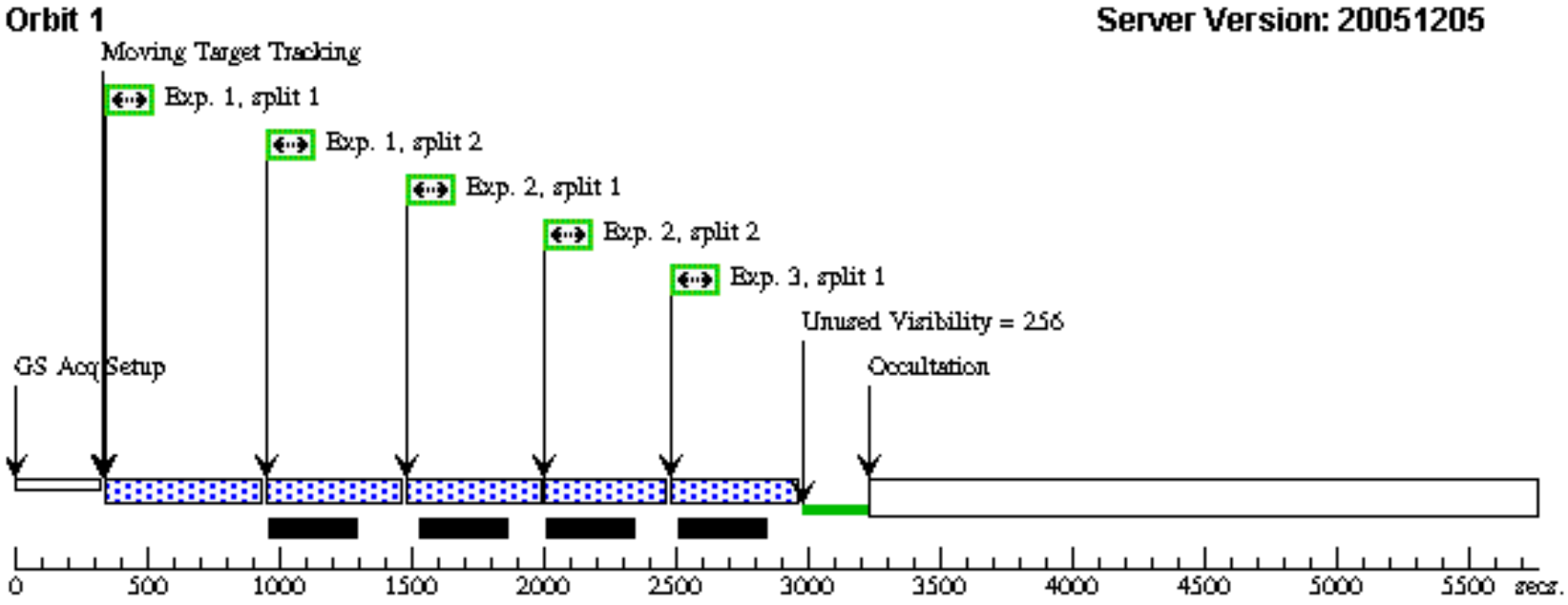
Solar System Targets

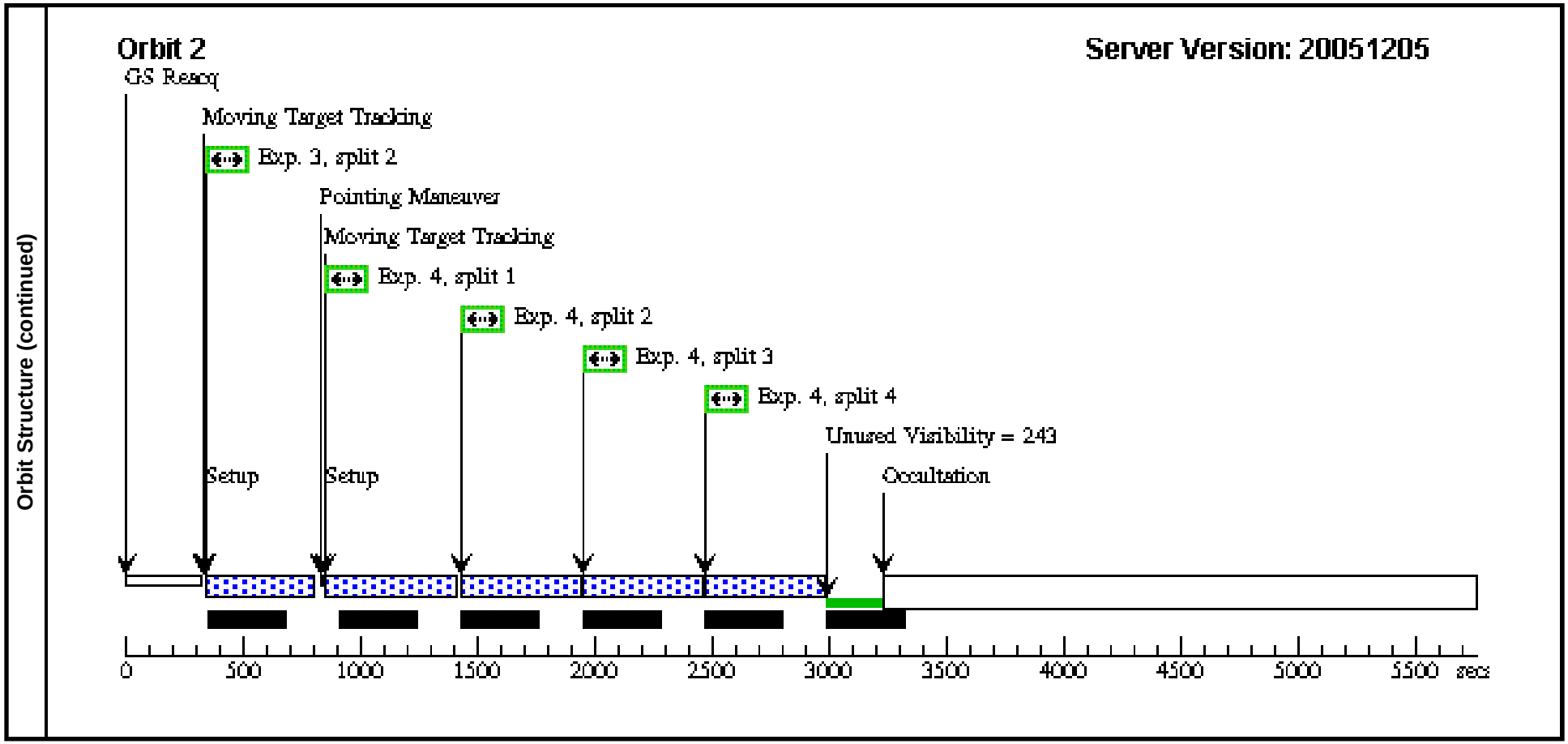
#	Name	Level 1	Level 2	Level 3	Window
(12)	2000EC98-CORRECTION	TYPE=COMET,Q=5.844212514611897,E=0.45567585250106,I=4.34147318056047,O=173.3222006610484,W=162.818113713857,T=06-MAY-2015:03:56:57,EQUINOX=J2000,EPOCH=30-MAR-2002:00:00:00			

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	EC98-F435W-EX51	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F435W				780.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
2	EC98-F555W-EX52	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F555W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	
3	EC98-F625W-EX53	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC	F625W				680.0 Secs	
								[==>(Split 1)]	***[1]***
								[==>(Split 2)]	***[2]***
4	Ec98-FR388N-EX54	(12) 2000EC98-CORRECTION	ACS/WFC, ACCUM, WFC1-MRAMP	FR388N 3880.0 A	CR-SPLIT=4			1540.0 Secs	
								[==>(Split 1)]	***[2]***
								[==>(Split 2)]	
								[==>(Split 3)]	
								[==>(Split 4)]	

Orbit Structure




Orbit Structure (continued)
Orbit 2
Server Version: 20051205
GS Reacq
Moving Target Tracking
Exp. 3, split 2
Pointing Maneuver
Moving Target Tracking
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Exp. 4, split 4
Unused Visibility = 243
Setup
Setup
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec