12482 - Relative atmospheric compositions and metallicities of a multi-planet system

Cycle: 19, Proposal Category: GO

(Availability Mode: AVAILABLE)

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) 2MASS-J19021775+3824032	WFC3/IR	5	07-Nov-2012 21:18:16.0	yes
02	(1) 2MASS-J19021775+3824032	WFC3/IR	5	07-Nov-2012 21:41:01.0	yes
03	(1) 2MASS-J19021775+3824032	WFC3/IR	5	07-Nov-2012 22:00:47.0	yes
04	(1) 2MASS-J19021775+3824032	WFC3/IR	5	07-Nov-2012 22:21:30.0	yes

20 Total Orbits Used

ABSTRACT

The Kepler mission has detected an amazingly rich diversity of extra-solar planet candiates. A large amount of them are grouped in multiple system, orbiting the same host star.

We have now the opportunity to characterize and compare the diversity of exoplanetary worlds within one multiple system, and with planets from

other systems, thus opening a new window to the field of comparative exoplanetology.

We propose to observe the atmospheres of the two confirmed Saturn-like planets which orbit the same host star, Kepler-9b and Kepler-9c. The planetary atmospheres will be probed using transmission spectroscopy observations from 1.1 to 1.7 microns with HST/WFC3. When combined with results from Kepler, the WFC3 data will reveal the presence of water and methane absorption features for each planet. These molecules are expected to be present in gas phase in the warm atmopsheres of these objects. Comparing these observations to giant planet atmospheric models, the molecular abundances and the overall envelope metallicities can be retrieved since models are locked down to the Kepler measurements. Furthermore, the relative metallicity between these two planets can be derived. Such measurements help to constrain planetary formation and evolution theories.

The presence of water in the earth atmosphere precludes such observations from the ground at the required precision since we intend to detect water absorption in the gas layer surrounding extrasolar planets.

Only HST that can be used for this investigation.

OBSERVING DESCRIPTION

We propose four separate visits, each consisting of five orbits, to obtain spectra of exoplanetary transits.

Each visit starts with a direct image in IRSUB512/F139M.

Every orbit consists of a sequence of GRISM128/G141 exposures.

The field is crowded (in particular a bright star stands at 30 arcsecs from Kepler-9), so we apply Orientation constraints to avoid order overlaps in the spectrum of interrest.

No dithering will be employed on any of these observations. Lacking flat fields accurate to the necessary precision, we need to keep the target in the same position on the detector for this differential measurement.

REAL TIME JUSTIFICATION

As the transmission spectroscopy signal we aim to measure is only present when the planet is in front of the star, we require strict scheduling constraints to ensure the scientific return of the project. Each visit, we require 2 orbits overlaps with the transit. If such phase constraints prove unscheduable, they could be relaxed slightly but with an associated loss of observational efficiency.

ADDITIONAL COMMENTS

We plan to submit a new Phase-II with better planetary ephemeris.

The two planet exhibit Transit Timing Variations (TTVs) and better predictions will be made as soon as we will have new data from the Kepler

mission.

Visit

Proposal 12482, Visit 01, completed Thu Nov 08 03:21:57 GMT 2012

Diagnostic Status: Warning

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; ORIENT 65D TO 70 D; ORIENT 90D TO 225 D; ORIENT 245D TO 250 D; ORIENT 270D TO 45 D

Comments: Transit-1 Kepler-9b

Timing constraints for the first exposures of each visit.

Diagnostics

(Visit 01) Warning (Orbit Planner): EXPOSURE WITH SAA CONTOUR 11 WILL EXECUTE ON GYRO

(Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	2MASS-J19021775+3824032	RA: 19 02 17.7560 (285.5739833d) Dec: +38 24 3.18 (38.40088d) Equinox: J2000	Proper Motion RA: 5.6 mas/yr Proper Motion Dec: -12.5 mas/yr Epoch of Position: 2000	V=13.9	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/[Actual Dur.]	Orbit
1		(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, IRSUB512	F139M	SAMP-SEQ=RAPID ; NSAMP=7	POS TARG 0,0		*[==>]*	***[1]***

Comments: This exposure has phase constraints. It should start between 0.99023357 and 0.99073357 (1 correspond to mid-transit). This allows to have two orbits during transit.

Timing Constraint : First exposition should start between:

UT : YR MON DAY HR MIN

2012	*5*	*26*	*20*	*17*	*and*	*2012*	*5*	*26*	*20*	*31*
2012	*6*	*15*	*1*	*32*	*and*	*2012*	*6*	*15*	*1*	*46*
2012	*7*	*4*	*6*	*47*	*and*	*2012*	*7*	*4*	*7*	*1*
2012	*7*	*23*	*12*	*2*	*and*	*2012*	*7*	*23*	*12*	*16*
2012	*8*	*11*	*17*	*18*	*and*	*2012*	*8*	*11*	*17*	*32*
2012	*8*	*30*	*22*	*34*	*and*	*2012*	*8*	*30*	*22*	*48*
2012	*9*	*19*	*3*	*51*	*and*	*2012*	*9*	*19*	*4*	*4*
2012	*10*	*8*	*9*	*7*	*and*	*2012*	*10*	*8*	*9*	*21*
2012	*10*	*27*	*14*	*25*	*and*	*2012*	*10*	*27*	*14*	*39*
2012	*11*	*15*	*19*	*41*	*and*	*2012*	*11*	*15*	*19*	*55*
2012	*12*	*5*	*1*	*0*	*and*	*2012*	*12*	*5*	*1*	*13*
2012	*12*	*24*	*6*	*17*	*and*	*2012*	*12*	*24*	*6*	*31*

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
2		(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11	POS TARG 0,null		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]*	***[1]***

	3	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]*	***[2]***

	4	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]*	***[3]***

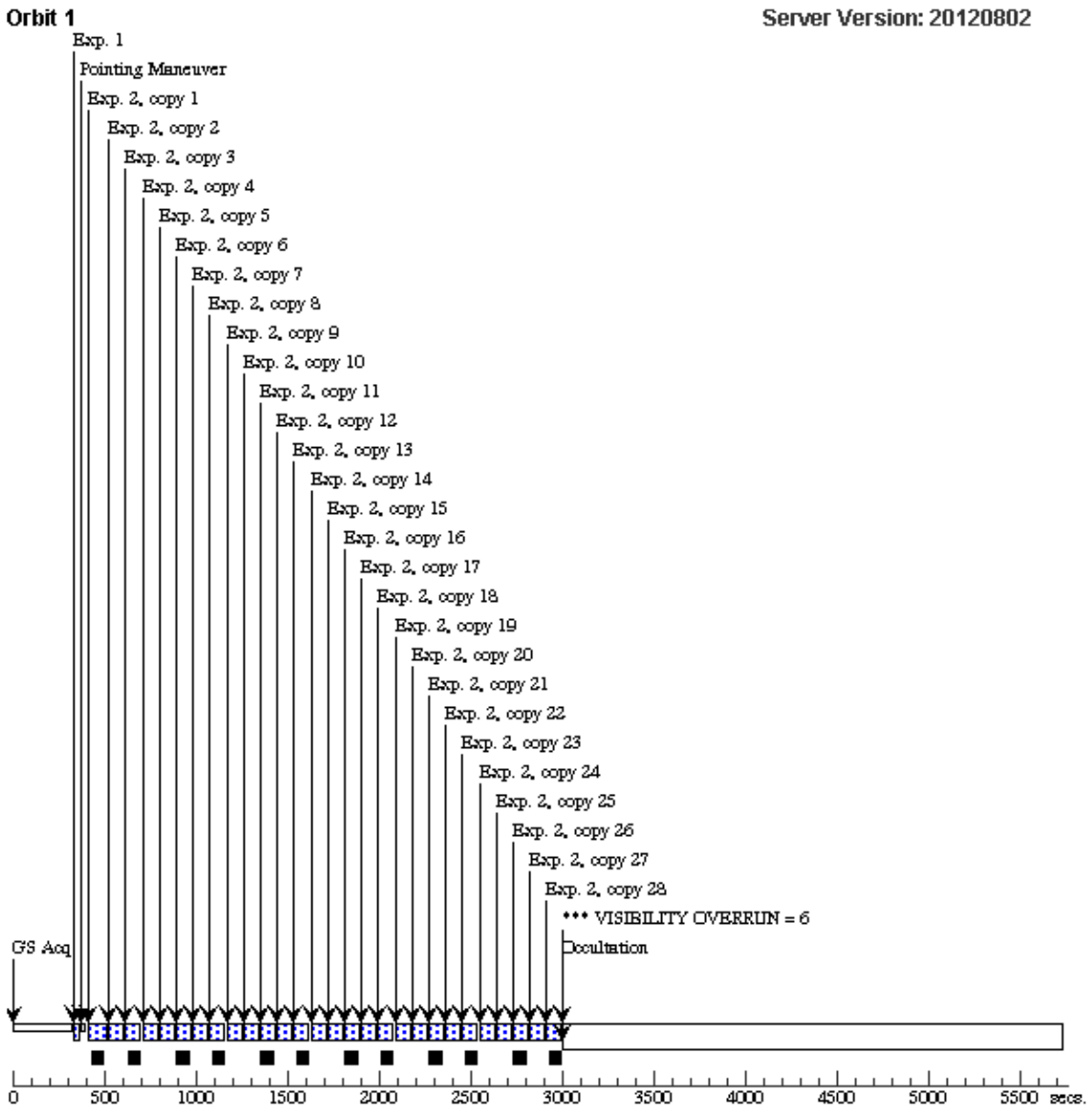
5	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS10; NSAMP=11	POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]*	***[4]***
6	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS10; NSAMP=11	POS TARG 0,null; SAA CONTOUR 02	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]*	***[4]***

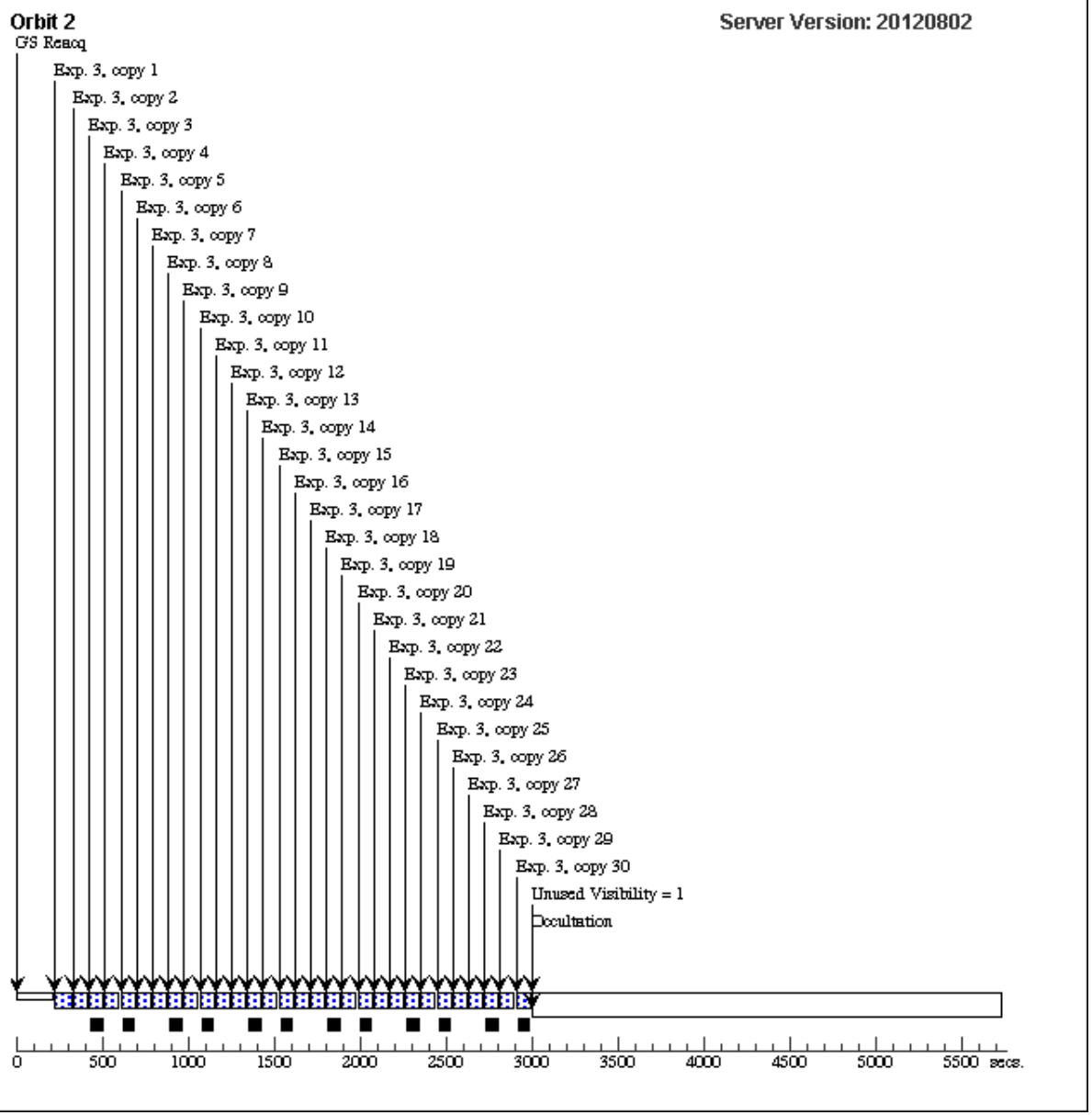
Comments: This exposure will execute during SAA passage on orbit 4.

	7	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS10; NSAMP=11	POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]*	***[5]***
	8	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS10; NSAMP=11	POS TARG 0,null; SAA CONTOUR 11; EXP PCS MODE GYRO	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]*	***[5]***

Comments: This exposure will execute during SAA passage on orbit 5.

Orbit Structure

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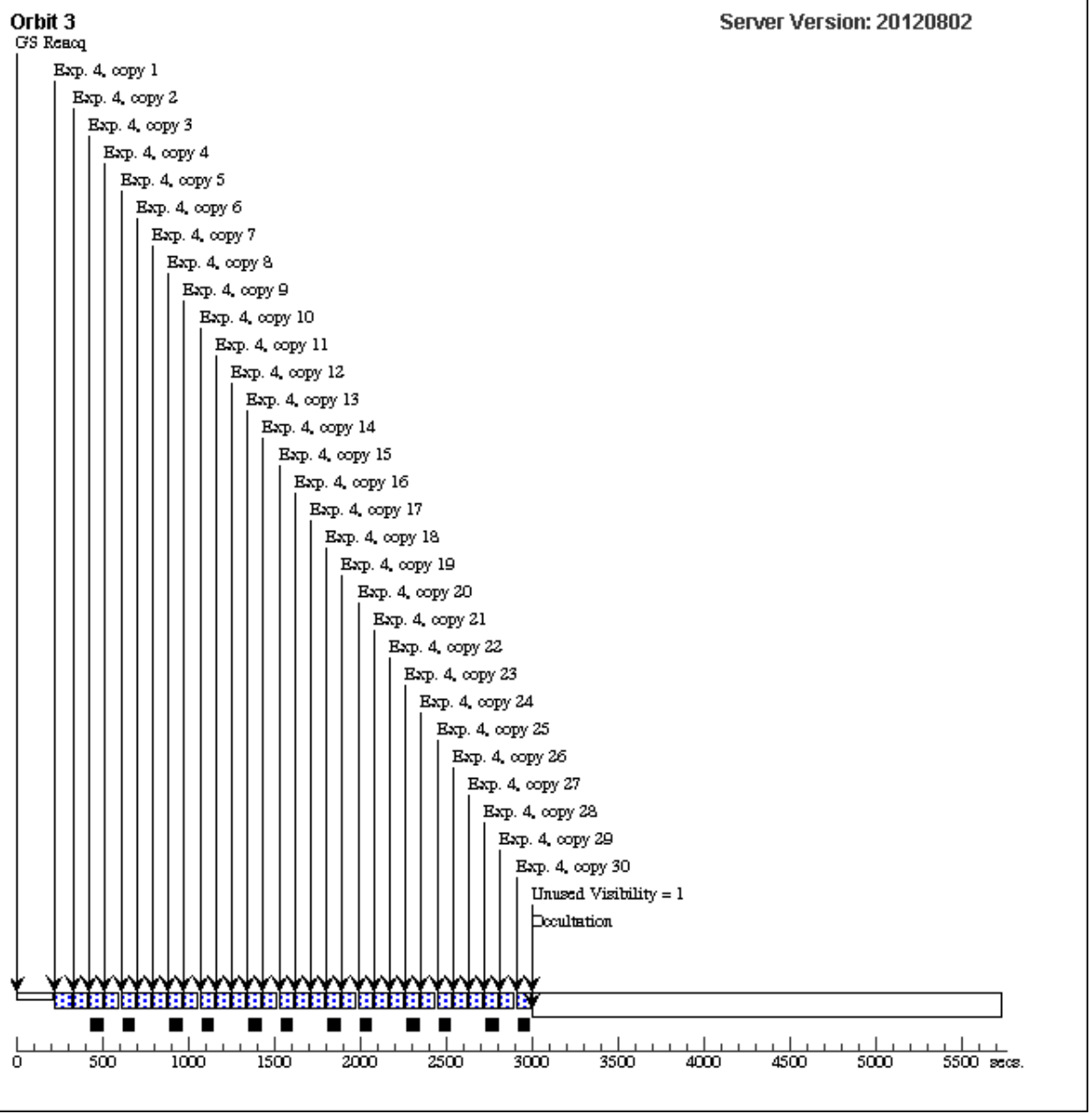
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Exp. 4, copy 24
Exp. 4, copy 25
Exp. 4, copy 26
Exp. 4, copy 27
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Exp. 4, copy 30
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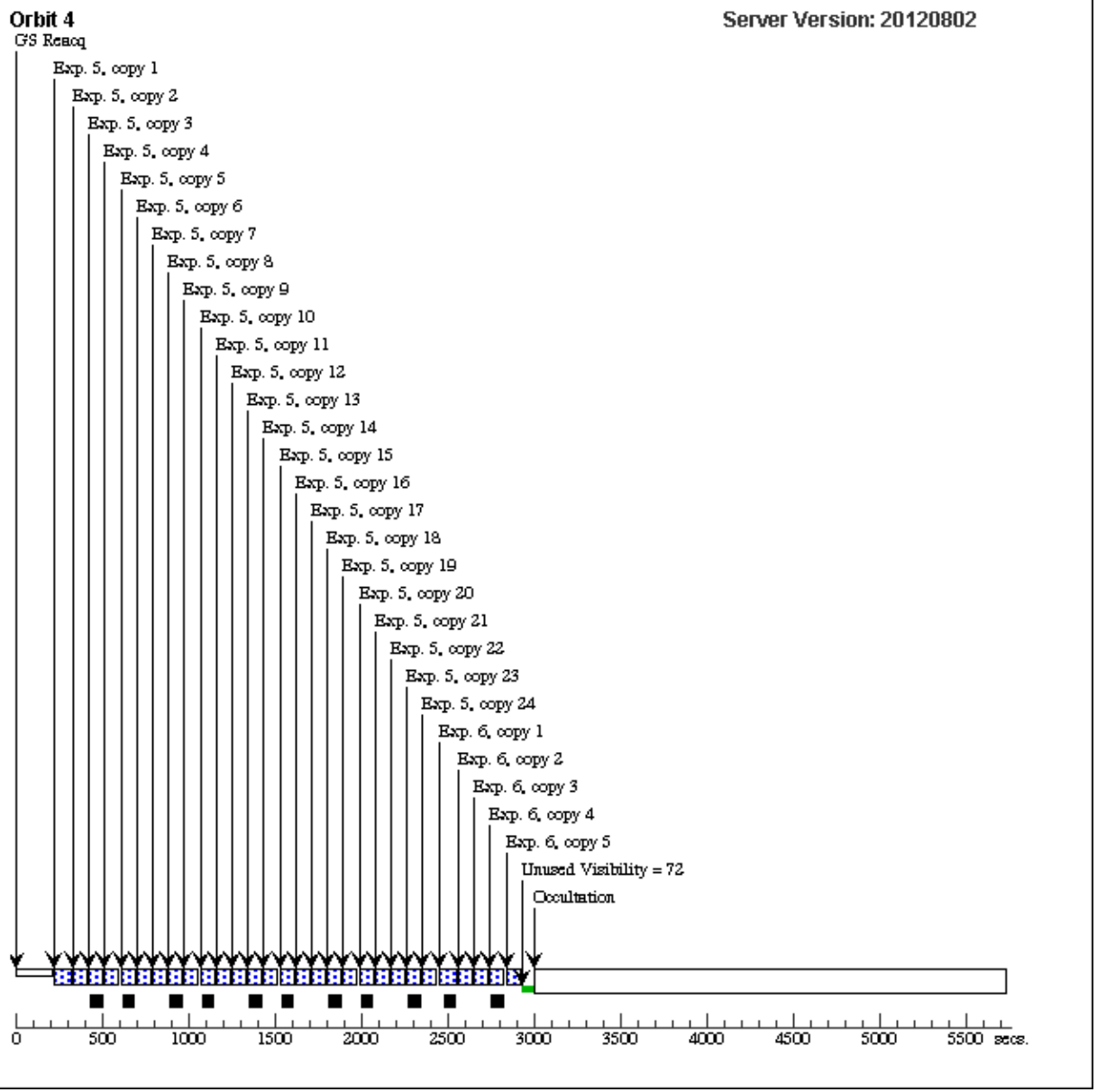
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Server Version: 20120802
GS Reacq
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Exp. 5, copy 18
Exp. 5, copy 19
Exp. 5, copy 20
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Exp. 5, copy 24
Exp. 6, copy 1
Exp. 6, copy 2
Exp. 6, copy 3
Exp. 6, copy 4
Exp. 6, copy 5
Unused Visibility = 72
Occultation
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1000
1500
2000
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3000
3500
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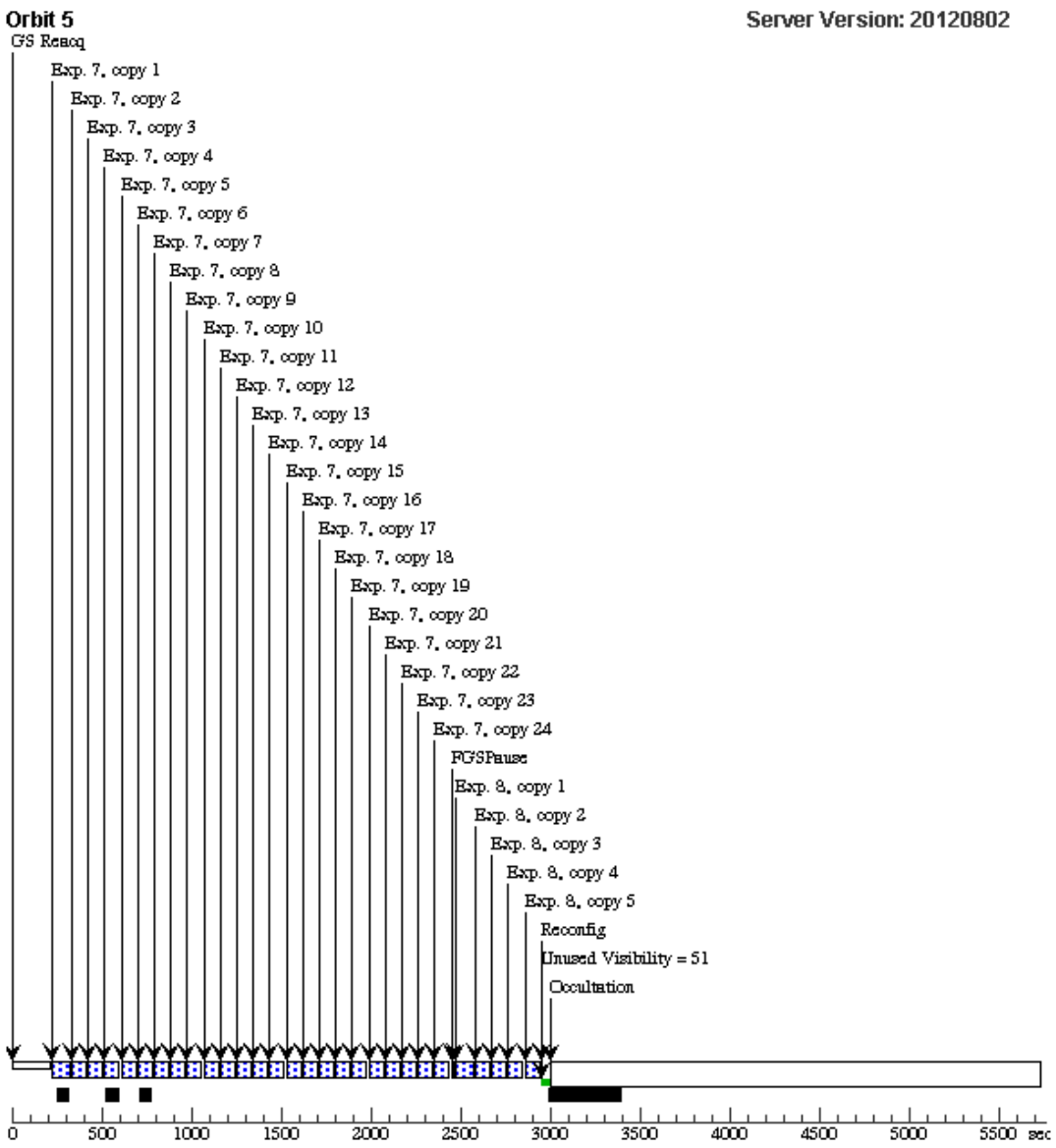
5000
5500
secs.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Exp. 7. copy 12
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Exp. 7. copy 18
Exp. 7. copy 19
Exp. 7. copy 20
Exp. 7. copy 21
Exp. 7. copy 22
Exp. 7. copy 23
Exp. 7. copy 24
FGSPause
Exp. 8. copy 1
Exp. 8. copy 2
Exp. 8. copy 3
Exp. 8. copy 4
Exp. 8. copy 5
Reconfig
Unused Visibility = 51
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12482, Visit 02, completed Thu Nov 08 03:22:06 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 65D TO 70 D; ORIENT 90D TO 225 D; ORIENT 245D TO 250 D; ORIENT 270D TO 45 D

Comments: Transit-2 Kepler-9b

Timing constraints for the first exposures of each visit.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	2MASS-J19021775+3824032	RA: 19 02 17.7560 (285.5739833d) Dec: +38 24 3.18 (38.40088d) Equinox: J2000	Proper Motion RA: 5.6 mas/yr Proper Motion Dec: -12.5 mas/yr Epoch of Position: 2000	V=13.9	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/[Actual Dur.]	Orbit
1		(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, IRSUB512	F139M	SAMP-SEQ=RAPID ; NSAMP=7	POS TARG 0,0		*[==>]*	***[1]***

Comments: This exposure has phase constraints. It should start between 0.99023357 and 0.99073357 (1 correspond to mid-transit). This allows to have two orbits during transit.

Timing Constraint : First exposition should start between:

UT : YR MON DAY HR MIN

2012	*5*	*26*	*20*	*17*	*and*	*2012*	*5*	*26*	*20*	*31*
2012	*6*	*15*	*1*	*32*	*and*	*2012*	*6*	*15*	*1*	*46*
2012	*7*	*4*	*6*	*47*	*and*	*2012*	*7*	*4*	*7*	*1*
2012	*7*	*23*	*12*	*2*	*and*	*2012*	*7*	*23*	*12*	*16*
2012	*8*	*11*	*17*	*18*	*and*	*2012*	*8*	*11*	*17*	*32*
2012	*8*	*30*	*22*	*34*	*and*	*2012*	*8*	*30*	*22*	*48*
2012	*9*	*19*	*3*	*51*	*and*	*2012*	*9*	*19*	*4*	*4*
2012	*10*	*8*	*9*	*7*	*and*	*2012*	*10*	*8*	*9*	*21*
2012	*10*	*27*	*14*	*25*	*and*	*2012*	*10*	*27*	*14*	*39*
2012	*11*	*15*	*19*	*41*	*and*	*2012*	*11*	*15*	*19*	*55*
2012	*12*	*5*	*1*	*0*	*and*	*2012*	*12*	*5*	*1*	*13*
2012	*12*	*24*	*6*	*17*	*and*	*2012*	*12*	*24*	*6*	*31*

	2	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]*	***[1]***

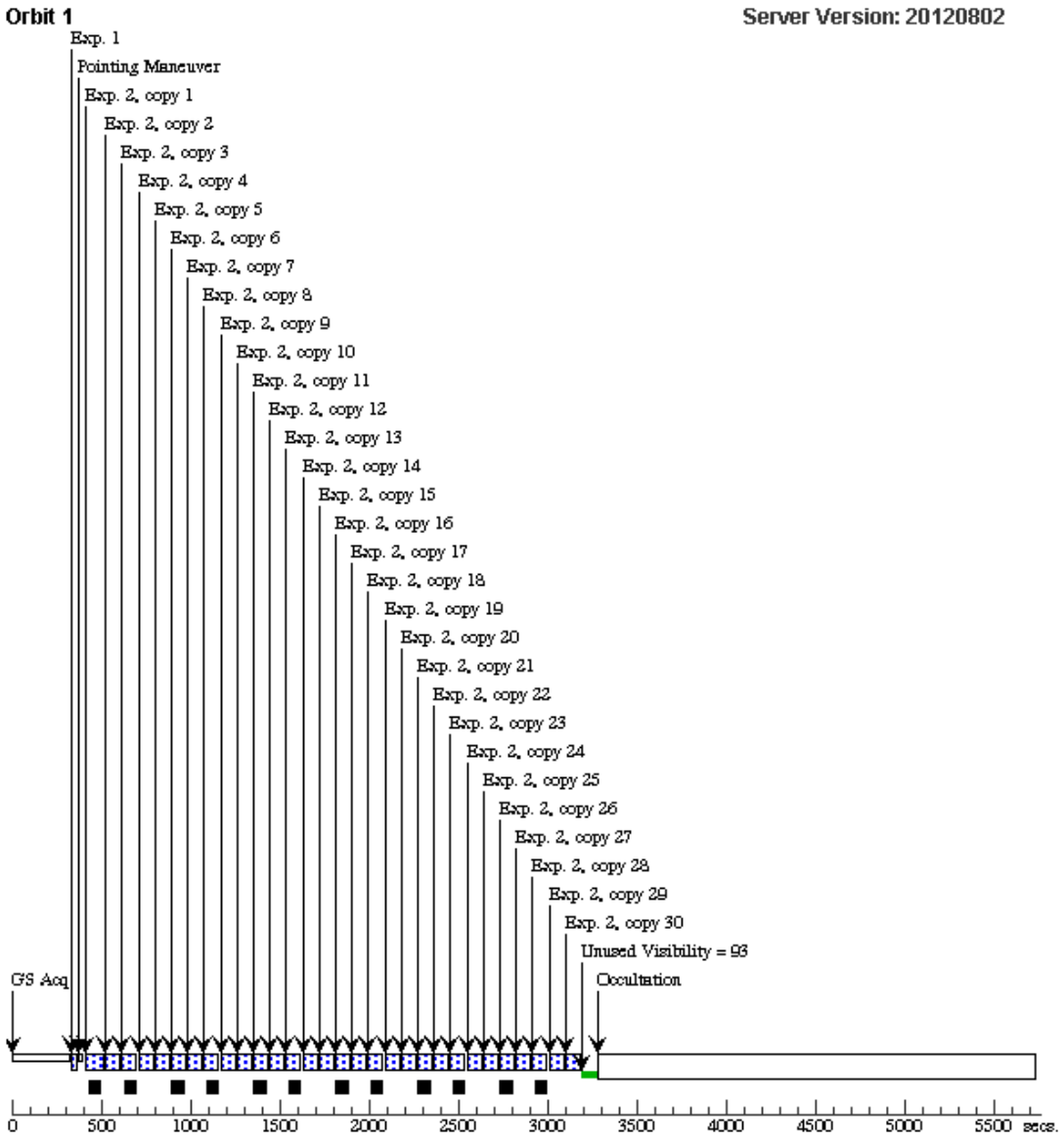
	3	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]*	***[2]***

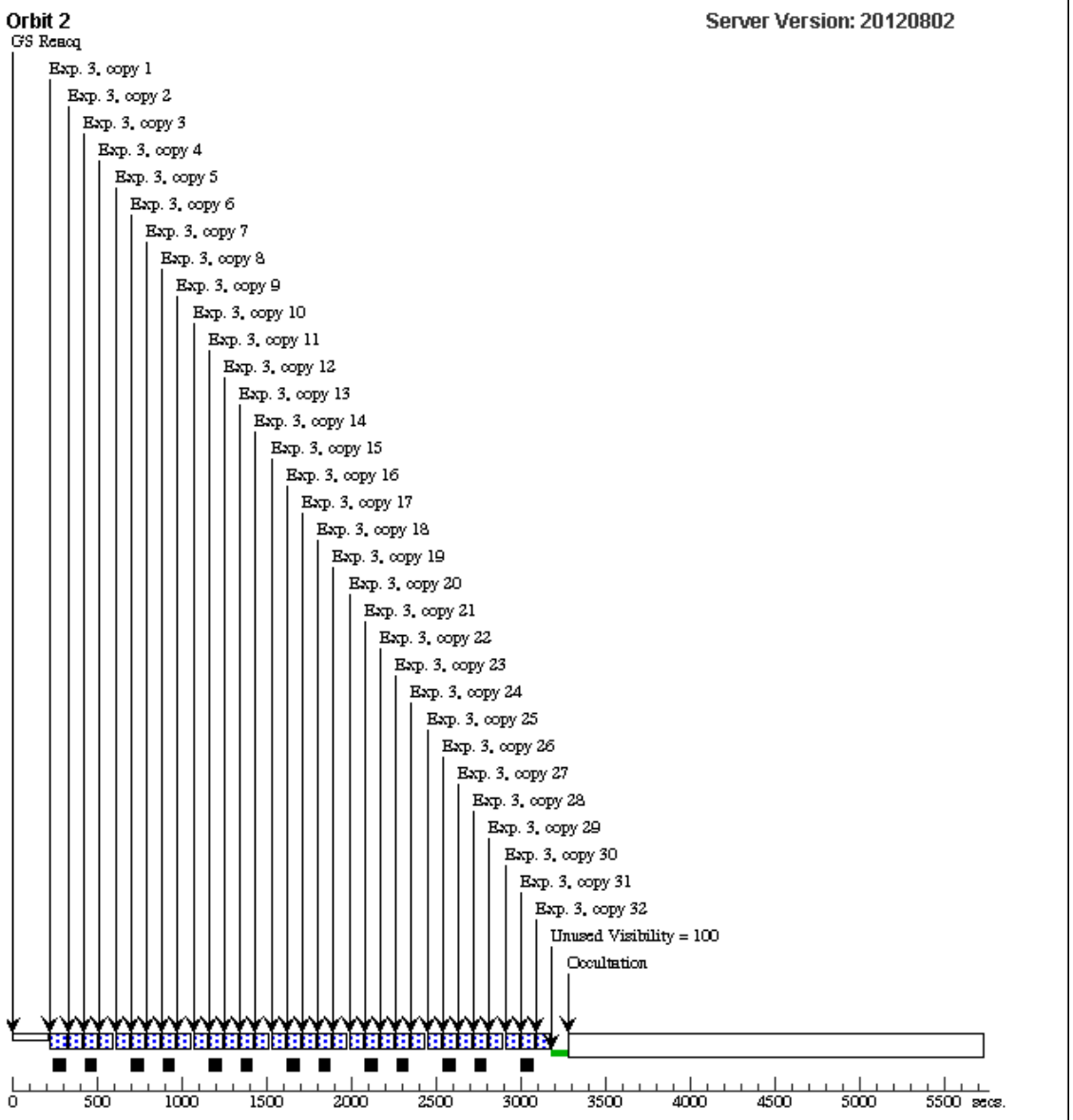
	4	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]*	***[3]***

	5	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]*	***[4]***

	6	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]*	***[5]***

Orbit Structure

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Exp. 3, copy 27
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Exp. 3, copy 31
Exp. 3, copy 32
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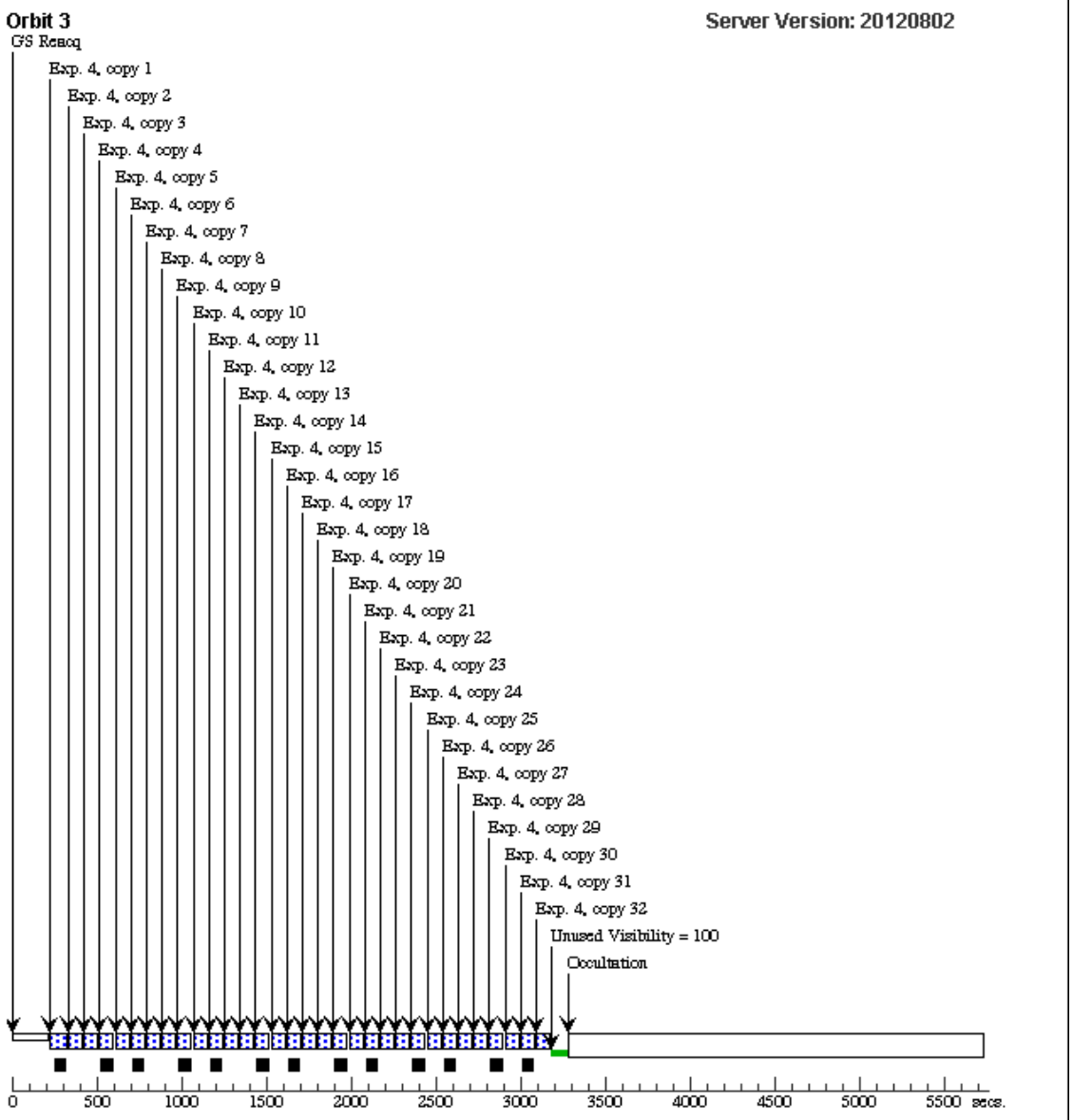
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Exp. 4, copy 31
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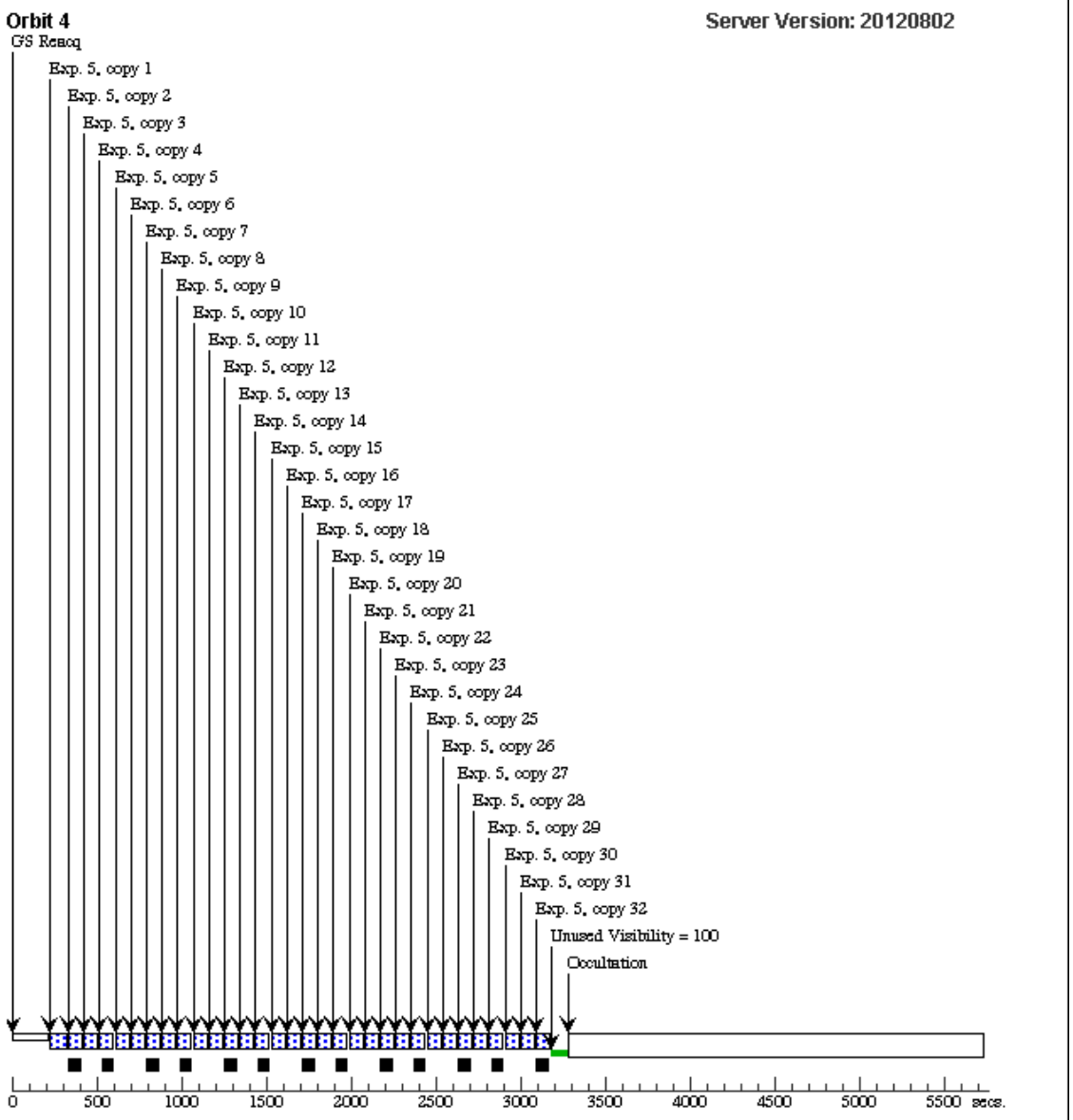
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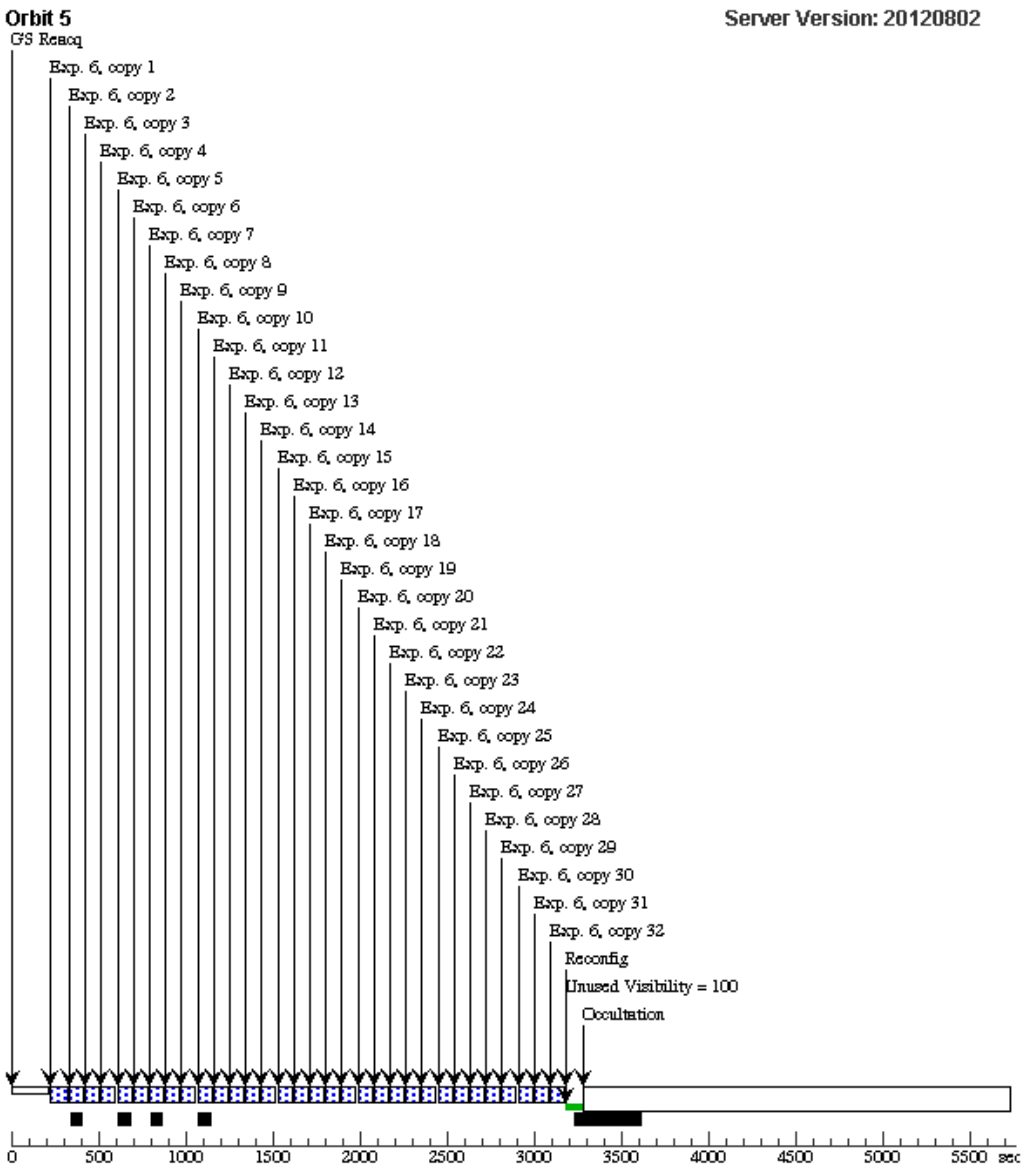
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Reconfig
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Occultation
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1000
1500
2000
2500
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3500
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4500
5000
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sec

Visit

Proposal 12482, Visit 03, completed Thu Nov 08 03:22:15 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 65D TO 70 D; ORIENT 90D TO 225 D; ORIENT 245D TO 250 D; ORIENT 270D TO 45 D

Comments: Transit-1 Kepler-9c

Timing constraints for the first exposures of each visit.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	2MASS-J19021775+3824032	RA: 19 02 17.7560 (285.5739833d) Dec: +38 24 3.18 (38.40088d) Equinox: J2000	Proper Motion RA: 5.6 mas/yr Proper Motion Dec: -12.5 mas/yr Epoch of Position: 2000	V=13.9	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/[Actual Dur.]	Orbit
1		(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, IRSUB512	F139M	SAMP-SEQ=RAPID; NSAMP=7	POS TARG 0,0		*[==>]*	***[1]***

Comments: This exposure has phase constraints. It should start between 0.99506590 and 0.99546590 (1 correspond to mid-transit). This allows to have two orbits during transit.

Timing Constraints : First exposition should start between:

UT : YR MON DAY HR MN

2012 5 11 15 34 and 2012 5 11 15 57
2012 6 19 17 25 and 2012 6 19 17 48
2012 7 28 19 17 and 2012 7 28 19 40
2012 9 5 21 9 and 2012 9 5 21 31
2012 10 14 22 59 and 2012 10 14 23 22
2012 11 23 0 49 and 2012 11 23 1 11

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
2		(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS10; NSAMP=11	POS TARG 0,null		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]*	***[1]***

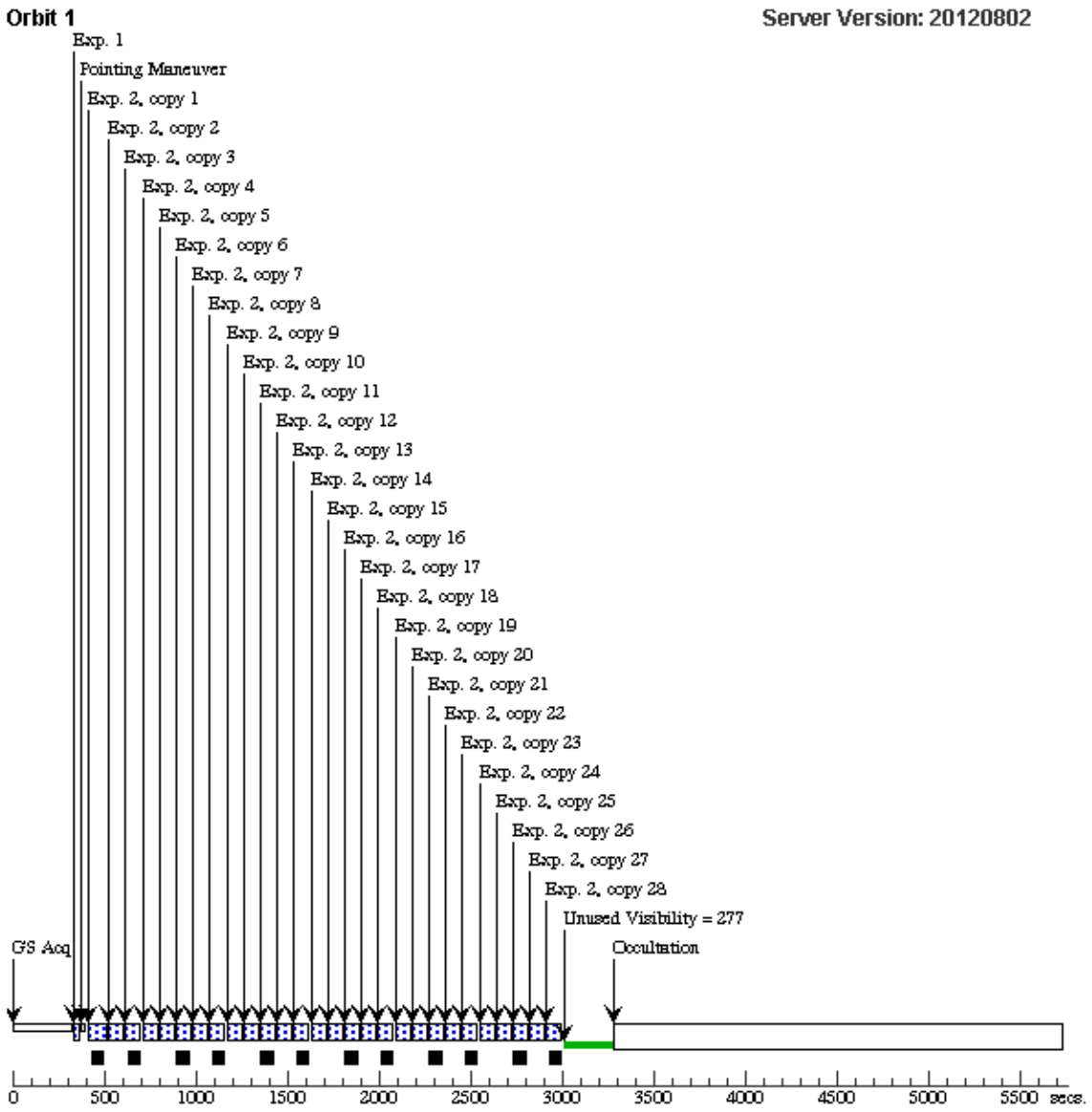
	3	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]*	***[2]***

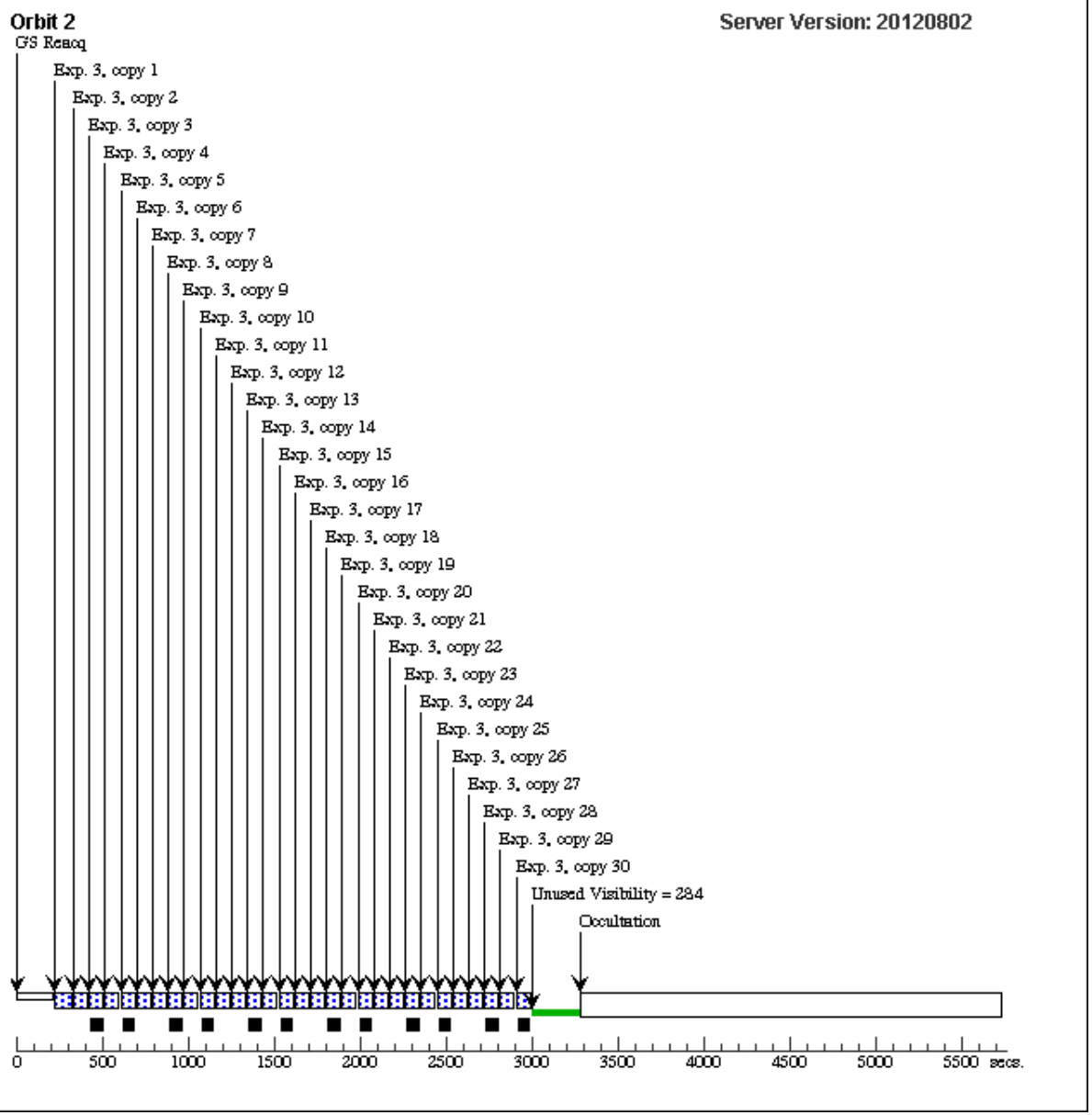
	4	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]*	***[3]***

	5	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]*	***[4]***

	6	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]*	***[5]***

Orbit Structure

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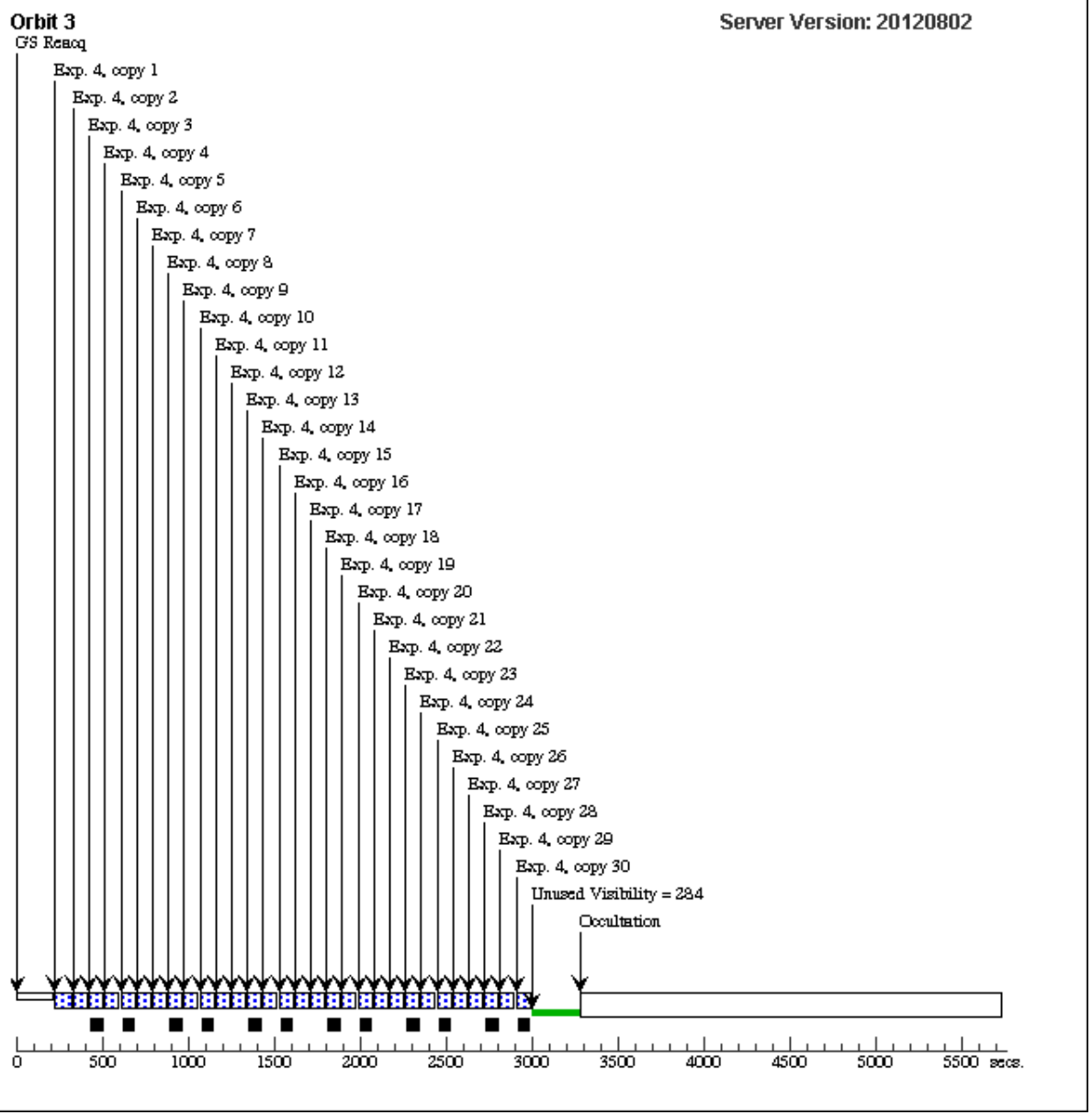
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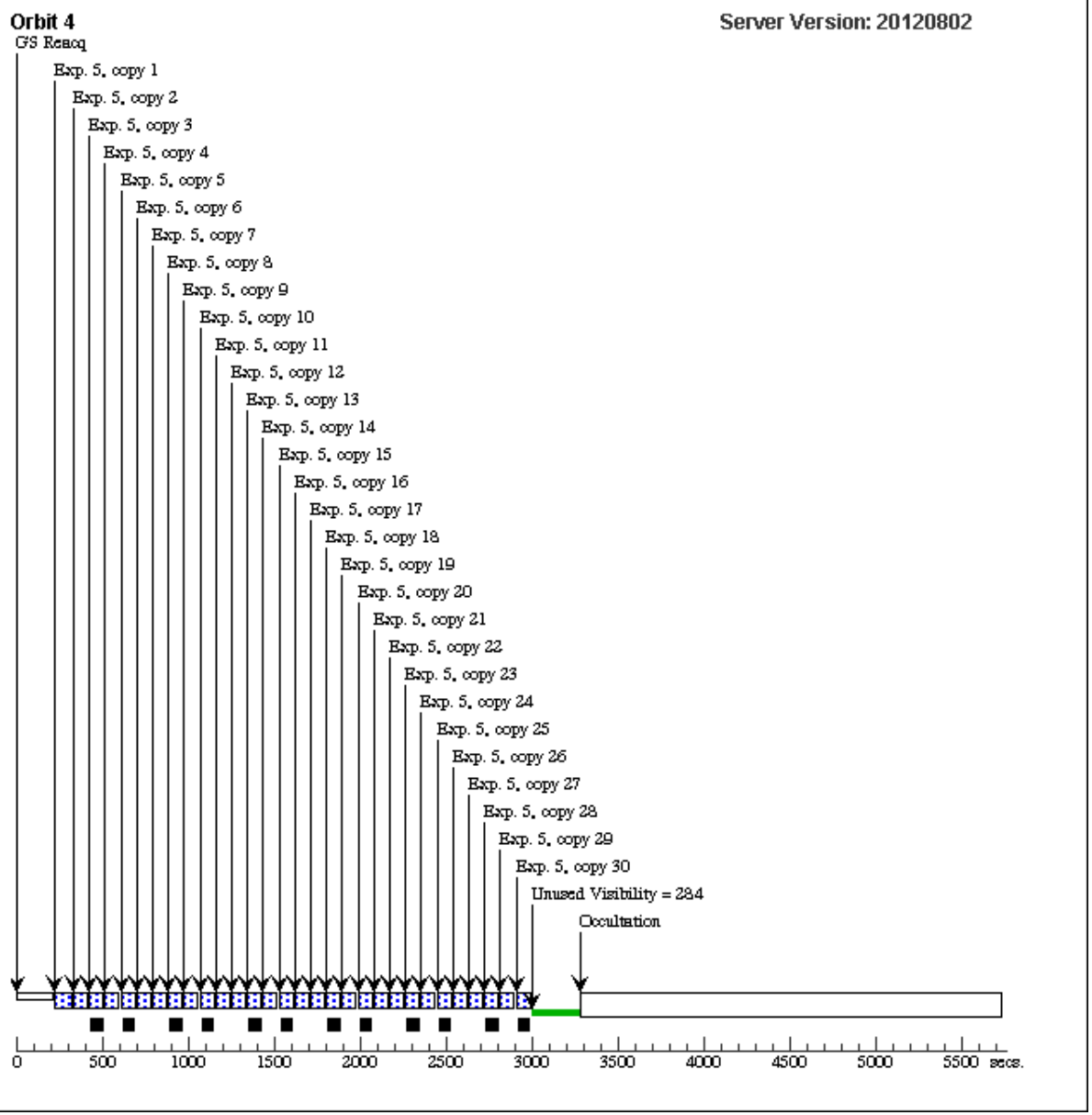
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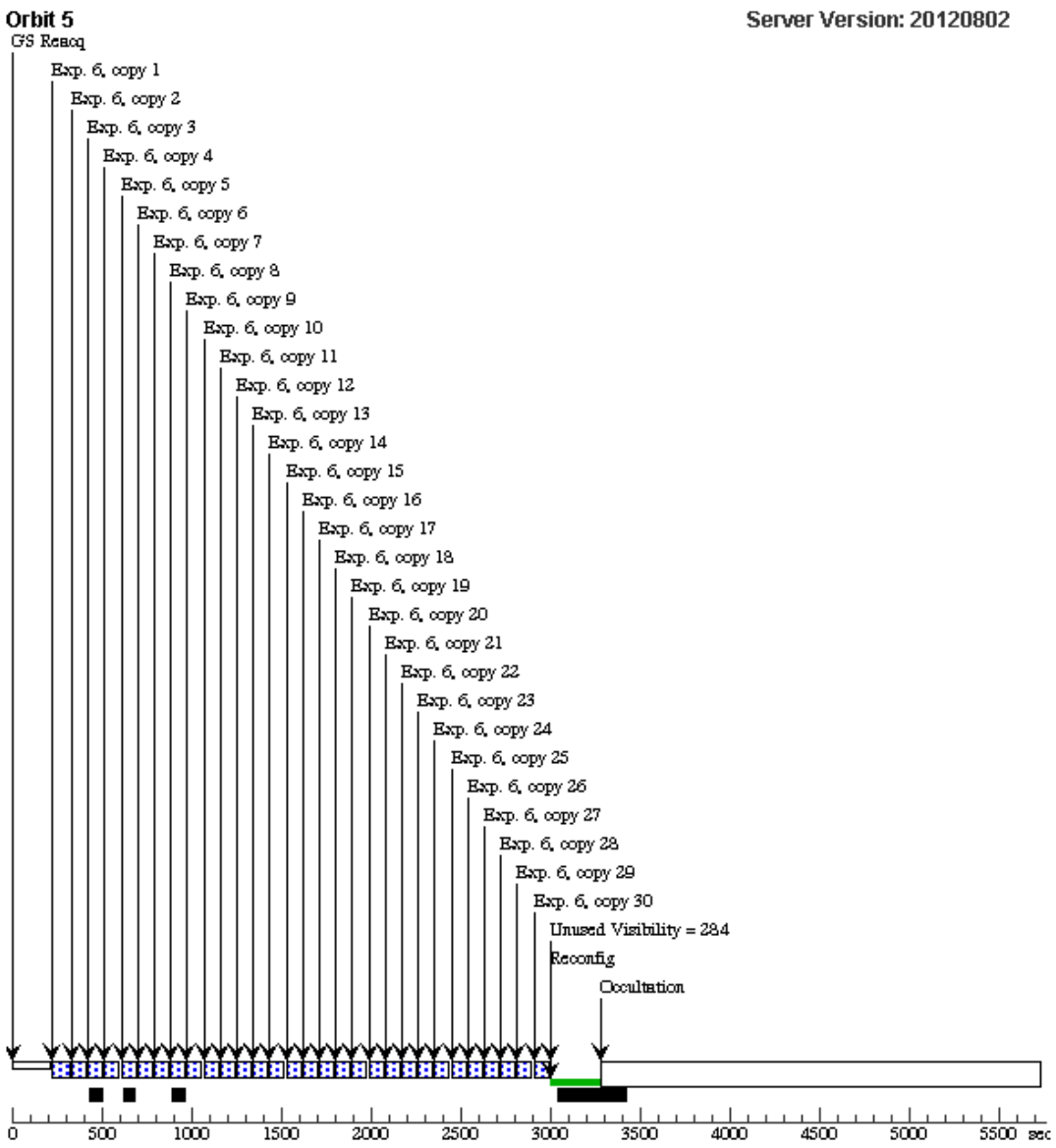
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Exp. 6, copy 30
Unused Visibility = 284
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sec

Visit

Proposal 12482, Visit 04, implementation Thu Nov 08 03:22:22 GMT 2012

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 65D TO 70 D; ORIENT 90D TO 225 D; ORIENT 245D TO 250 D; ORIENT 270D TO 45 D

Comments: Transit-2 Kepler-9c

Please note the timing constraints for the first exposures of each visit.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	2MASS-J19021775+3824032	RA: 19 02 17.7560 (285.5739833d) Dec: +38 24 3.18 (38.40088d) Equinox: J2000	Proper Motion RA: 5.6 mas/yr Proper Motion Dec: -12.5 mas/yr Epoch of Position: 2000	V=13.9	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/[Actual Dur.]	Orbit
1		(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, IRSUB512	F139M	SAMP-SEQ=RAPID; NSAMP=7	POS TARG -15.173, 1.158		*[==>]*	***[1]***

Comments: This exposure has phase constraints. It should start between 0.99506590 and 0.99546590 (1 correspond to mid-transit). This allows to have two orbits during transit.

Timing Constraints : First exposition should start between:

UT : YR MON DAY HR MN

2012	*5*	*11*	*15*	*34*	*and*	*2012*	*5*	*11*	*15*	*57*
2012	*6*	*19*	*17*	*25*	*and*	*2012*	*6*	*19*	*17*	*48*
2012	*7*	*28*	*19*	*17*	*and*	*2012*	*7*	*28*	*19*	*40*
2012	*9*	*5*	*21*	*9*	*and*	*2012*	*9*	*5*	*21*	*31*
2012	*10*	*14*	*22*	*59*	*and*	*2012*	*10*	*14*	*23*	*22*
2012	*11*	*23*	*0*	*49*	*and*	*2012*	*11*	*23*	*1*	*11*

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
2		(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS10; NSAMP=11	POS TARG 0,null		*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]*	***[1]***

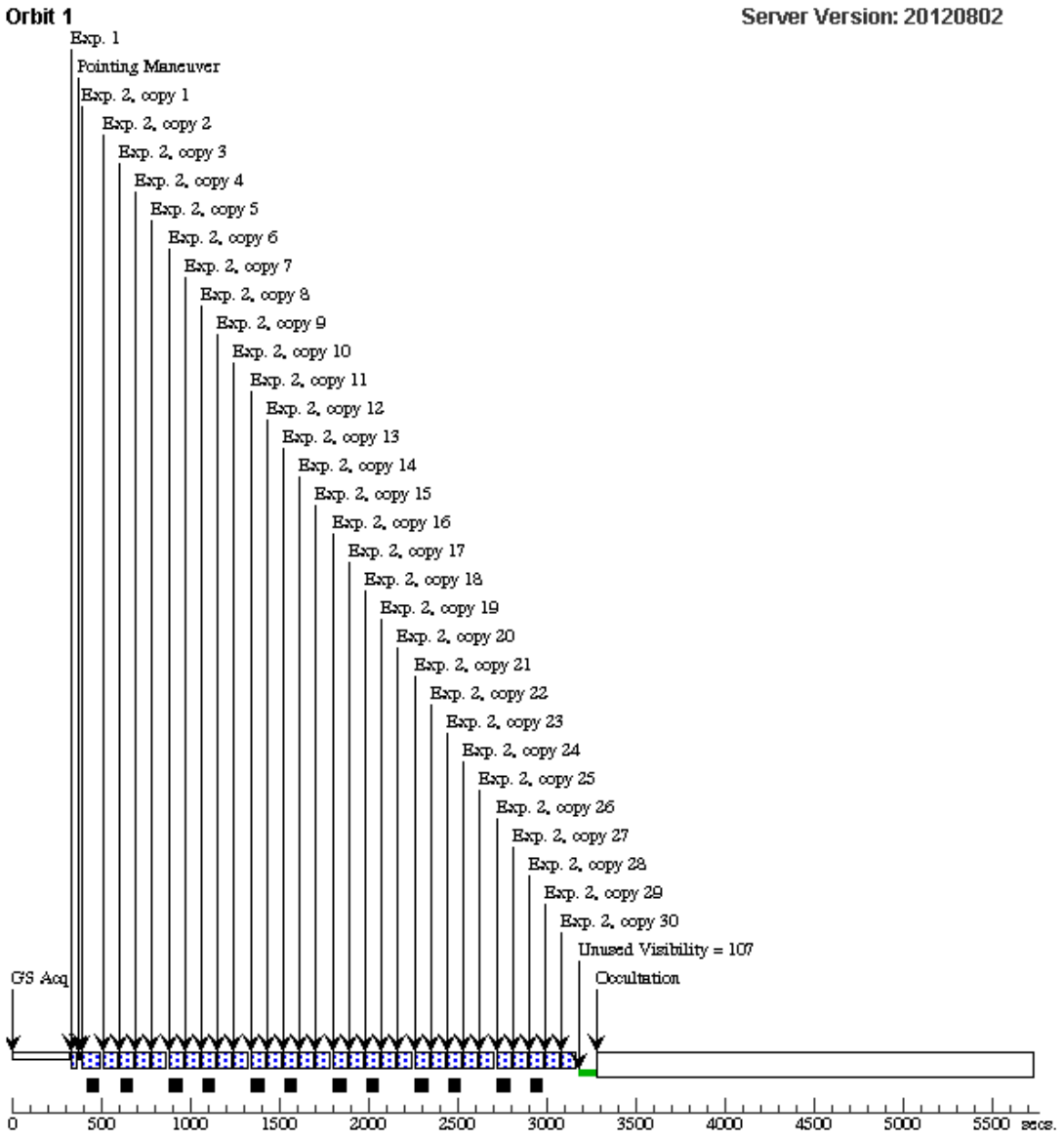
	3	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]*	***[2]***

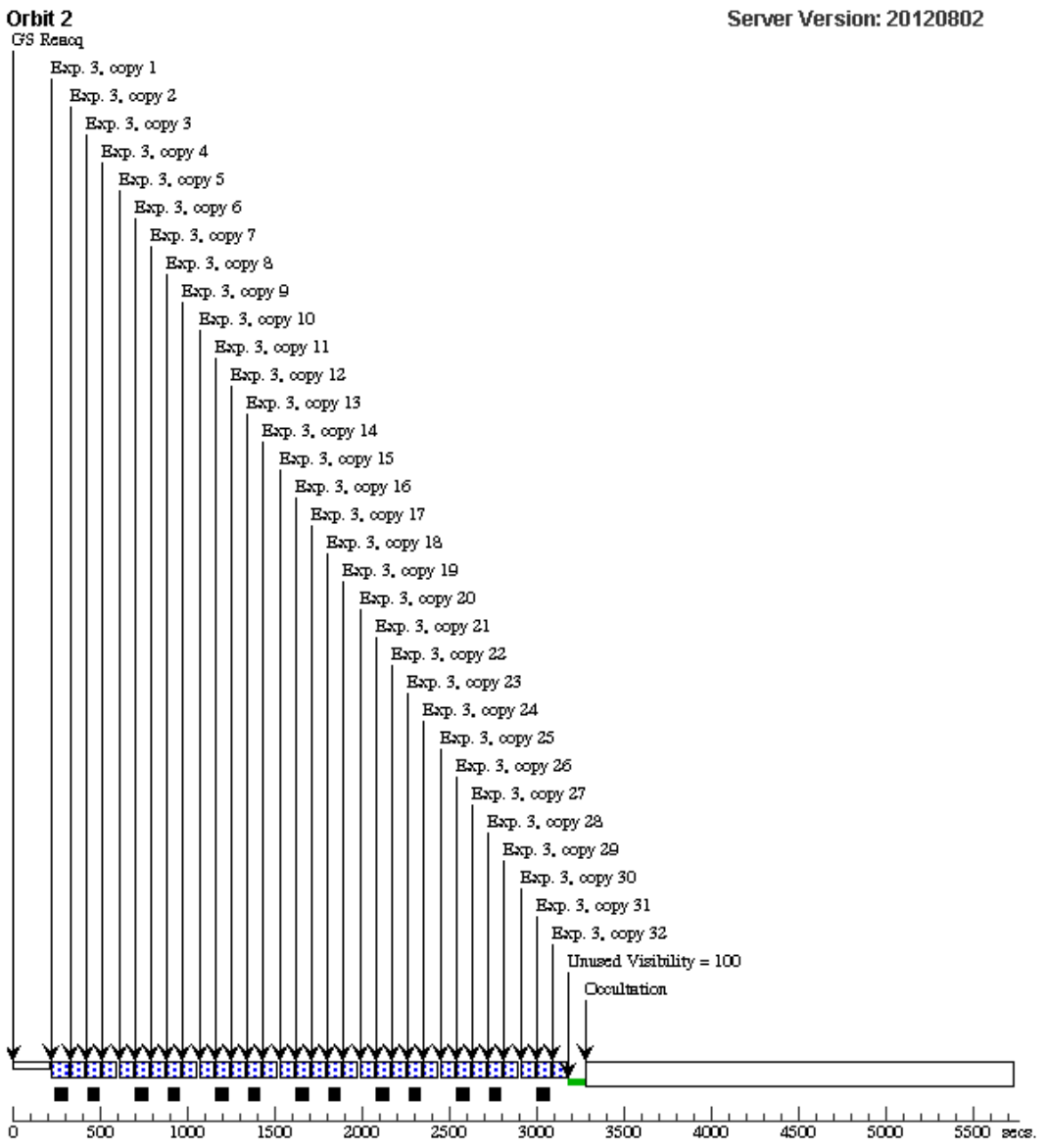
	4	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]* *[==>(Copy 31)]* *[==>(Copy 32)]*	***[3]***

	5	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]* *[==>(Copy 29)]* *[==>(Copy 30)]*	***[4]***

	6	(1) 2MASS-J19021775+3824032	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=11 POS TARG 0,null	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]* *[==>(Copy 12)]* *[==>(Copy 13)]* *[==>(Copy 14)]* *[==>(Copy 15)]* *[==>(Copy 16)]* *[==>(Copy 17)]* *[==>(Copy 18)]* *[==>(Copy 19)]* *[==>(Copy 20)]* *[==>(Copy 21)]* *[==>(Copy 22)]* *[==>(Copy 23)]* *[==>(Copy 24)]* *[==>(Copy 25)]* *[==>(Copy 26)]* *[==>(Copy 27)]* *[==>(Copy 28)]*	***[5]***

Orbit Structure




Orbit 2
Server Version: 20120802
GS Reacq
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Exp. 3, copy 2
Exp. 3, copy 3
Exp. 3, copy 4
Exp. 3, copy 5
Exp. 3, copy 6
Exp. 3, copy 7
Exp. 3, copy 8
Exp. 3, copy 9
Exp. 3, copy 10
Exp. 3, copy 11
Exp. 3, copy 12
Exp. 3, copy 13
Exp. 3, copy 14
Exp. 3, copy 15
Exp. 3, copy 16
Exp. 3, copy 17
Exp. 3, copy 18
Exp. 3, copy 19
Exp. 3, copy 20
Exp. 3, copy 21
Exp. 3, copy 22
Exp. 3, copy 23
Exp. 3, copy 24
Exp. 3, copy 25
Exp. 3, copy 26
Exp. 3, copy 27
Exp. 3, copy 28
Exp. 3, copy 29
Exp. 3, copy 30
Exp. 3, copy 31
Exp. 3, copy 32
Unused Visibility = 100
Occultation
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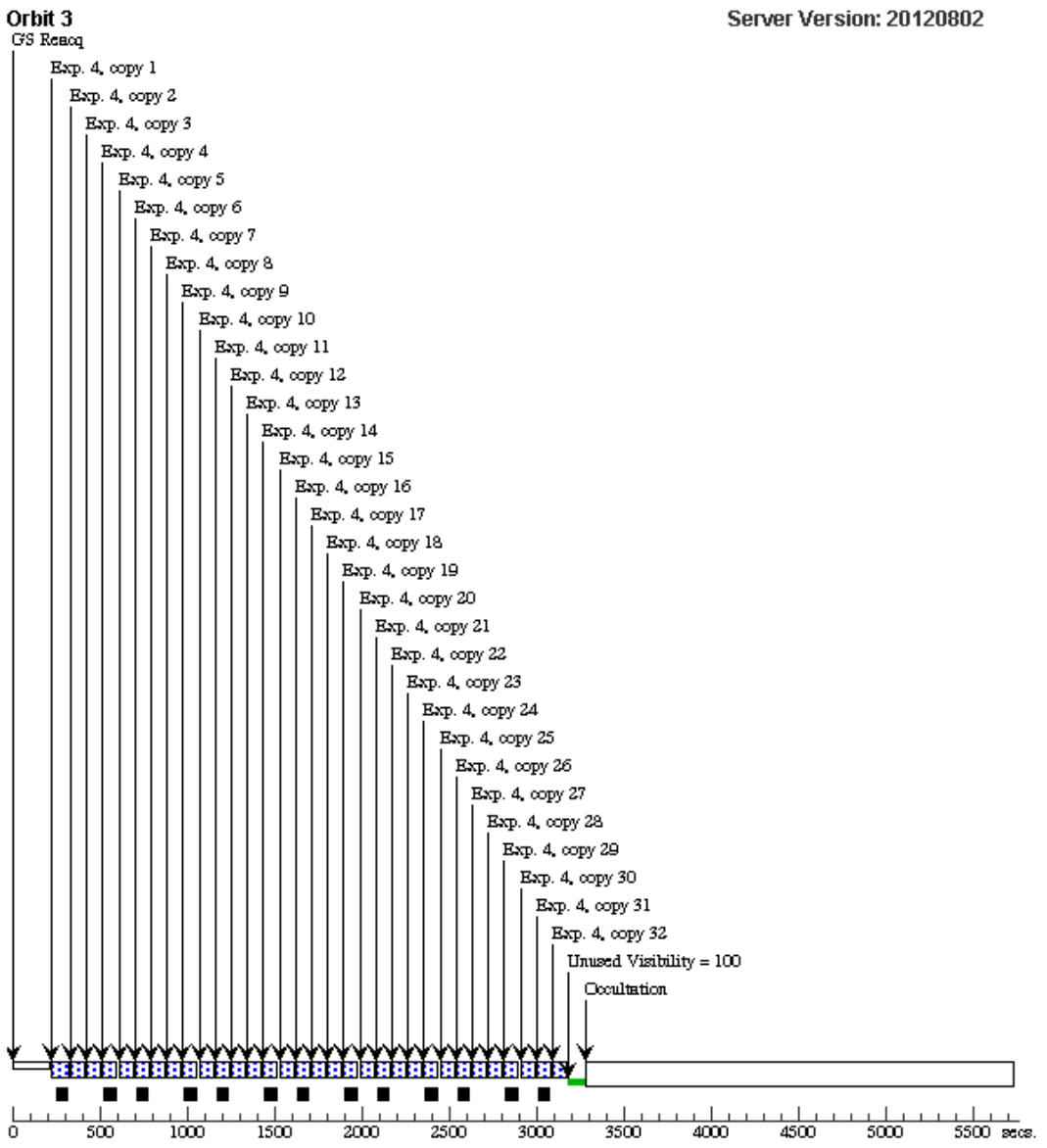
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.


Orbit 3
Server Version: 20120802
GS Reacq
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Exp. 4, copy 3
Exp. 4, copy 4
Exp. 4, copy 5
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Exp. 4, copy 17
Exp. 4, copy 18
Exp. 4, copy 19
Exp. 4, copy 20
Exp. 4, copy 21
Exp. 4, copy 22
Exp. 4, copy 23
Exp. 4, copy 24
Exp. 4, copy 25
Exp. 4, copy 26
Exp. 4, copy 27
Exp. 4, copy 28
Exp. 4, copy 29
Exp. 4, copy 30
Exp. 4, copy 31
Exp. 4, copy 32
Unused Visibility = 100
Occultation
0
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1000
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2000
2500
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3500
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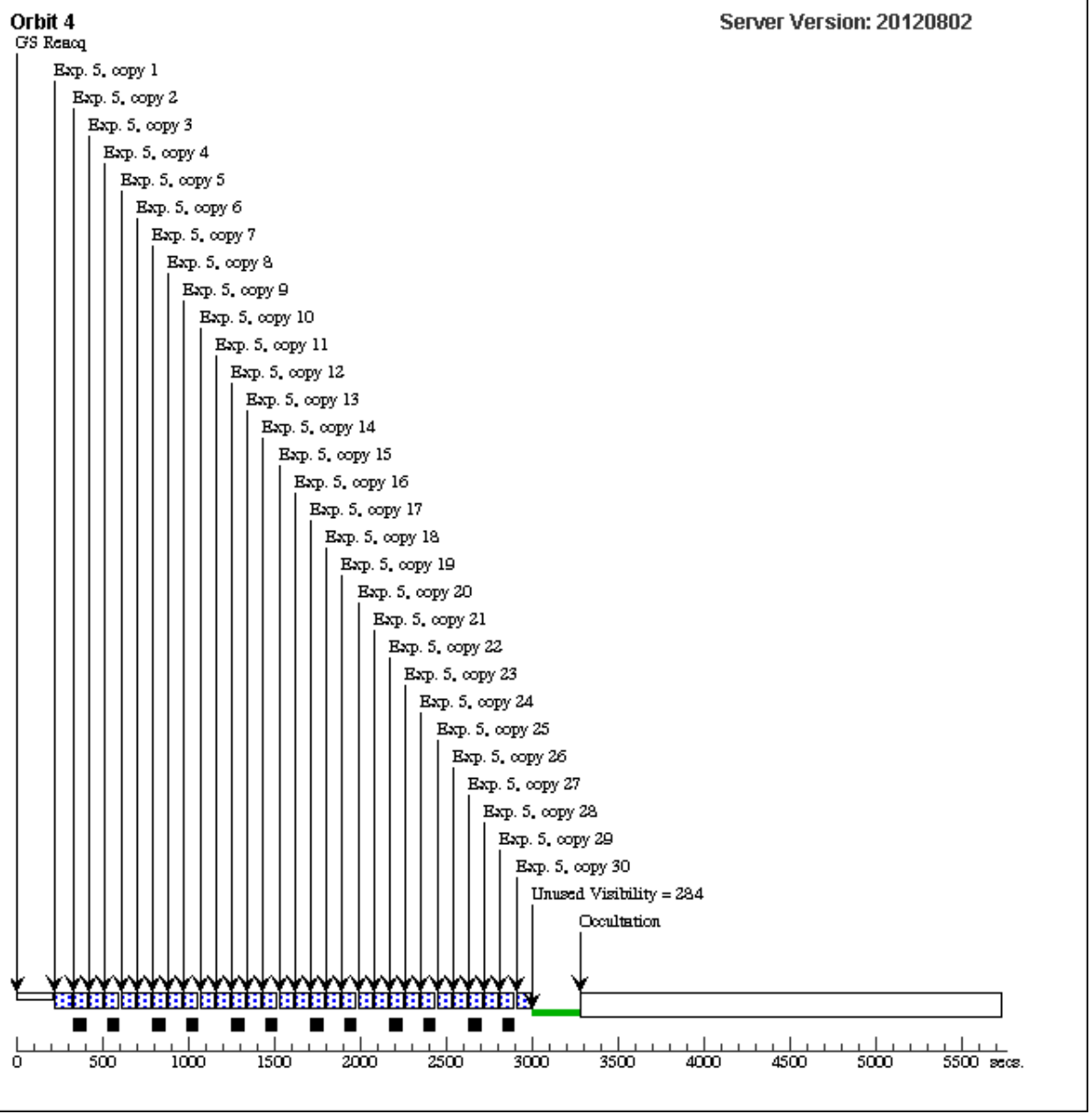
secs.


Orbit 4
Server Version: 20120802
GS Reacq
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Exp. 5, copy 3
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Exp. 5, copy 5
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Exp. 5, copy 11
Exp. 5, copy 12
Exp. 5, copy 13
Exp. 5, copy 14
Exp. 5, copy 15
Exp. 5, copy 16
Exp. 5, copy 17
Exp. 5, copy 18
Exp. 5, copy 19
Exp. 5, copy 20
Exp. 5, copy 21
Exp. 5, copy 22
Exp. 5, copy 23
Exp. 5, copy 24
Exp. 5, copy 25
Exp. 5, copy 26
Exp. 5, copy 27
Exp. 5, copy 28
Exp. 5, copy 29
Exp. 5, copy 30
Unused Visibility = 284
Occultation
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3500
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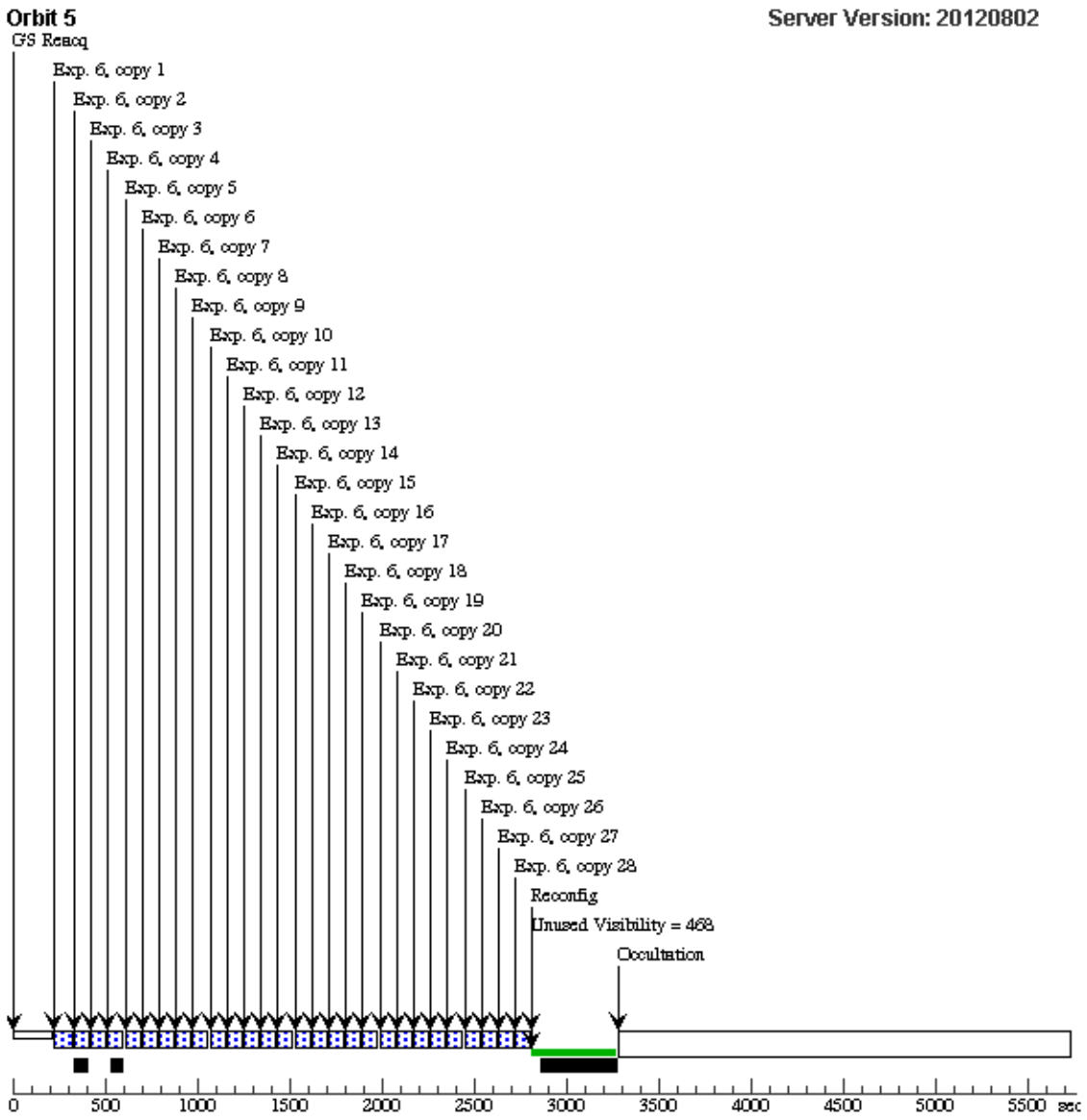
5000
5500
secs.


Orbit 5
Server Version: 20120802
GS Reacq
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Exp. 6, copy 3
Exp. 6, copy 4
Exp. 6, copy 5
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Exp. 6, copy 10
Exp. 6, copy 11
Exp. 6, copy 12
Exp. 6, copy 13
Exp. 6, copy 14
Exp. 6, copy 15
Exp. 6, copy 16
Exp. 6, copy 17
Exp. 6, copy 18
Exp. 6, copy 19
Exp. 6, copy 20
Exp. 6, copy 21
Exp. 6, copy 22
Exp. 6, copy 23
Exp. 6, copy 24
Exp. 6, copy 25
Exp. 6, copy 26
Exp. 6, copy 27
Exp. 6, copy 28
Reconfig
Unused Visibility = 468
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec