15288 - How small and how high? Enabling UV exoplanet cloud and exosphere science with WFC3/UVIS

Cycle: 25, Proposal Category: GO

(UV Initiative, JWST Initative)

(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) HAT-P-41B BIAS	WFC3/UVIS	8	13-Sep-2017 14:05:07.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
02	(1) HAT-P-41B BIAS	WFC3/UVIS	8	13-Sep-2017 14:05:13.0	yes

16 Total Orbits Used

ABSTRACT

Progress on addressing two important exoplanet science topics can be made in the near-UV, where transit spectroscopy can measure aerosol scattering from the lower atmosphere, while large atmospheric escape signatures can be detectable in narrow-bands centred around strong Mg and Fe lines. WFC3/UVIS has never been used nor verified for high photometric precision transit observations, though it has the highest throughput among all HST near-UV instruments, making it an important instrument to develop for UV exoplanet science.

This program targets the ultra-hot Jupiter HAT-P-41b to measure both the broadband near-UV transmission spectra, and the narrowband escaping atmosphere signatures of Mg. Recent WFC3/IR observations show strong evidence for aerosol haze in HAT-P-41b covering a near-IR H2O feature, making it an ideal target to study near-UV aerosol properties at high altitude. By measuring how high in the atmosphere near-UV scattering signatures can be seen, important constraints can be made on both cloud aerosol sizes and atmospheric vertical mixing rates; both critical parameters needed to explain how exoplanet clouds are suspended to high altitudes. In addition, the strong estimated atmospheric escape rates in HAT-P-41b also make it an ideal target to detect hydrodynamical escape signatures of Mg. Our pilot program will demonstrate the exoplanet capabilities of WFC3/UVIS, expanding Hubble's unique UV access with a potential to probe hundreds of exoplanets.

OBSERVING DESCRIPTION

We will use the WFC3 G280 grism to obtain spectra covering 2004 to 4000 Ang (the grim spectra longwords of 4000 Ang contains overlapping spectral orders and will not be used for our primary science objectives). We have estimated the exposure times using the STScI ETC, and will adopt 190 second exposures, which exposes the detector to 2/3 well- depth, resulting in a signal-to-noise per spectra of 300 to 500. As buffer dumps are an important issue with UVIS, we will use sub-arrays to increase duty cycle. Sub-array sizes of 800x2100 limits the overheads between exposures, and contains the entire useable spectra. Using APT, we find 11 exposures-per-orbit can be obtained, and will require 5-orbit long visits to measure both the transit and have sufficient baseline flux out of transit to characterize potential detector systematics.

Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of chip 2.

SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray at the vertical center of chip 2. These parameters are based upon similar observations obtained successfully in proposal 13574.

Visit

Proposal 15288, Visit 01, implementation Wed Sep 13 18:05:16 GMT 2017

Diagnostic Status: Error

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 109D TO 136 D; ORIENT 289D TO 316 D; Period 2.694047 D AND ZERO-PHASE HJD2454983.86167

Comments: Exposures of HAT-P-41 with F300X, and G280. The two visits consist of 5 orbits each with repeated exopsures on the same target and in the same position for each orbit. The first orbit of each visit contains the F300X direct image for wavelength calibration. Field positions are set to the center of the second CCD chip (chip 2). As the only aperture allowed to be used with the G280 is the "UVIS", we must use POSTARGS to move the target to the chip center position. The nominal "UVIS" aperture puts the target 10" above the chip gap on chip 1. A Y-POSTARG of about 30" will put the target near the center of chip 1 and a Y-postarg of about -50" will put it near the center of chip 2 with a pixel position of (2048, 1026).

The optional parameters SIZEAXIS1=2100 and SIZEAXIS2=800 are used for all exposures to minimize the data volume and hence time lost to buffer dumps. This is fine for the data that needs to be obtained because the spectum of HAT-P-41 will occupy only a narrow swath of pixel rows within the field. This also requires the use of optional parameter CENTERAXIS2 in order to "steer" the location of the subarray readout so that it is centered on the target location. If we were positioning on chip 1 we could set CENTERAXIS2=TARGET. However, for the field center (nominal "UVIS" aperture) location on chip 2, we cannot center the subarray on the target because this would cause the subarray to extend into the chip gap, so we hardwire CENTERAXIS2=1026, which puts the vertical center of the subarray at the vertical center of chip 2.

Chip 2 biases are taken at the end of the visit because the grism exposures use custom subarrays, which will not have matching biases from the WFC3 bias calibration program.

For each visit we have phase constraints around the event of the planetary transit, both the orbital period of the planet and the phasing needed are placed on the first exposure in the sequence for each visit.
As this target has a number of potential contamination sources we have placed Orient Ranges for the observatoins to reach the science and technology test goals stated.

Diagnostics

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): AMP is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): CENTERAXIS1 is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): CENTERAXIS2 is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): SIZEAXIS1 is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): SIZEAXIS2 is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP.
The combination of attributes chosen is illegal.

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP=D.
The combination of attributes chosen is illegal.

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS1.
The combination of attributes chosen is illegal.

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS1=2048.
The combination of attributes chosen is illegal.

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS2.
The combination of attributes chosen is illegal.

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The combination of attributes chosen is illegal.

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1.
The combination of attributes chosen is illegal.

(G280 reference image (F300X) subarray on chip2, phase constrained (01.001)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1=2100.
The combination of attributes chosen is illegal.

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(G280 image, chip2 (01.002)) Error (Form): AMP is not a valid selection

(G280 image, chip2 (01.002)) Error (Form): CENTERAXIS1 is not a valid selection

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(G280 image, chip2 (01.002)) Error (Form): SIZEAXIS2 is not a valid selection

(G280 image, chip2 (01.002)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP.
The combination of attributes chosen is illegal.

(G280 image, chip2 (01.002)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP=D.
The combination of attributes chosen is illegal.

(G280 image, chip2 (01.002)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS1.
The combination of attributes chosen is illegal.

(G280 image, chip2 (01.002)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS1=2048.
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(G280 image, chip2 (01.002)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1=2100.
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(G280 image, chip2 (01.003)) Error (Form): CENTERAXIS2 is not a valid selection

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(G280 image, chip2 (01.003)) Error (Form): SIZEAXIS2 is not a valid selection

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(G280 image, chip2 (01.004)) Error (Form): CENTERAXIS2 is not a valid selection

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The combination of attributes chosen is illegal.

(Bias (01.007)) Error (Form): AMP is not a valid selection

(Bias (01.007)) Error (Form): CENTERAXIS1 is not a valid selection

(Bias (01.007)) Error (Form): CENTERAXIS2 is not a valid selection

(Bias (01.007)) Error (Form): Illegal selection: DEF.

(Bias (01.007)) Error (Form): SIZEAXIS1 is not a valid selection

(Bias (01.007)) Error (Form): SIZEAXIS2 is not a valid selection

(Bias (01.007)) Error (Form): Target BIAS is no longer a valid selection

(Bias (01.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP.
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(Bias (01.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1.
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(Bias (01.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1=2100.
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(Bias (01.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS2.
The combination of attributes chosen is illegal.

(Bias (01.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS2=800.
The combination of attributes chosen is illegal.

(Bias (01.007)) Error (Form): This attribute cannot have this value due to other choices: Spectral_Element=DEF.
This value is by default illegal.

(Bias (01.007)) Error (Form): This attribute is not allowed to have this value: Calibration_Target = BIAS
It is an Available option and cannot normally be used in a GO proposal.

(Visit 01) Warning (Orbit Planner): EXPOSURE NOT IN REQUESTED ORBIT

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HAT-P-41B	RA: 19 49 17.4387 (297.3226612d)	Proper Motion RA: -7.6 mas/yr	V=11.36	Reference Frame: SIMBAD
	Alt Name1: TYC-488-2442-1	Dec: +04 40 20.72 (4.67242d)	Proper Motion Dec: -11.7 mas/yr		
		Equinox: J2000	Epoch of Position: 2000		

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	G280 reference image (F300X) subarray on chip 2, phase constrained (WFC3UVIS.im.1010996)	(1) HAT-P-41B	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=12; SIZEAXIS2=800; CENTERAXIS2=1026; SIZEAXIS1=2100; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0; PHASE 0.93 TO 0.942	Sequence 1-2 Non-Int in Visit 01	3 Secs (3 Secs) *[==>]*	***[1]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. We use FLASH=12 to meet the nominal count level. These parameters are based upon similar observations obtained successfully in proposal 13574.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	G280 image, chip2 (WFC3UVIS.sp.1011023)	(1) HAT-P-41B	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; CENTERAXIS2=1026; SIZEAXIS1=2100; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 1-2 Non-Int in Visit 01	190 Secs X 10 (1900 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]*	***[1]***
								[==>(Copy 9)] *[==>(Copy 10)]*	***[2]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	G280 image, chip2 (WFC3UVIS.sp.1011023)	(1) HAT-P-41B	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; SIZEAXIS1=2100; CENTERAXIS2=1026; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 3-3 Non-Int in Visit 01	190 Secs X 11 (2090 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]*	***[2]***
								[==>(Copy 7)] *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]*	***[3]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.

4	G280 image, (1) HAT-P-41B chip2 (WFC3UVIS.sp.1011023)	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; SIZEAXIS1=2100; CENTERAXIS2=1026; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 4-4 Non-Int in Visit 01	190 Secs X 11 (2090 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]*	***[4]*** ***[5]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.

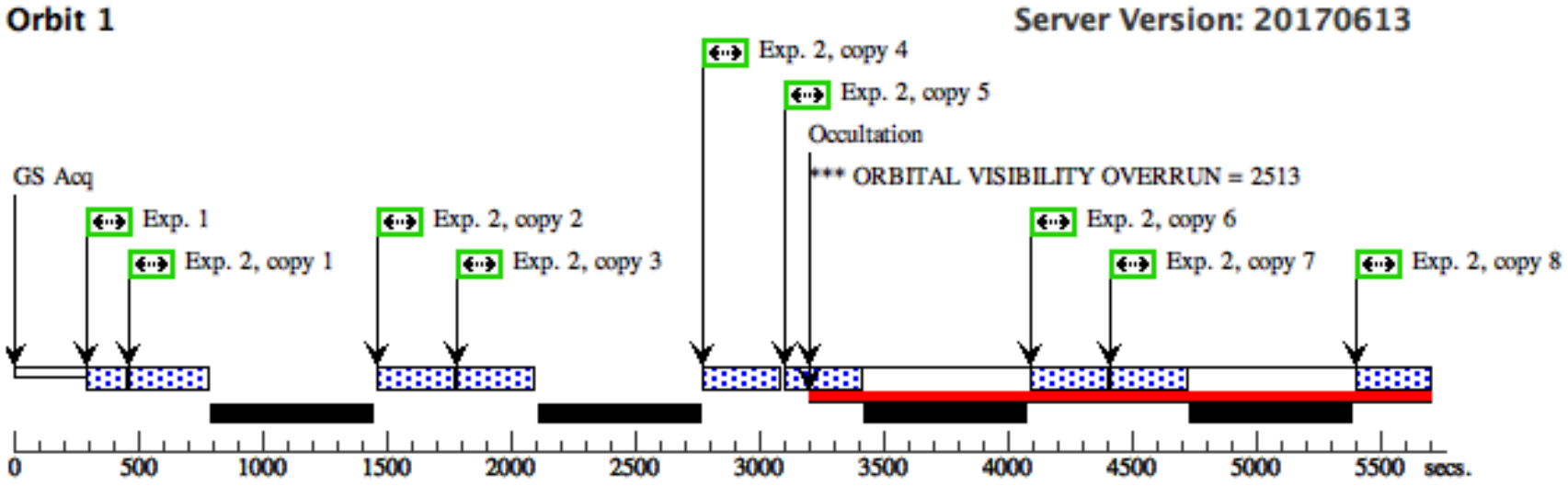
5	G280 image, (1) HAT-P-41B chip2 (WFC3UVIS.sp.1011023)	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; SIZEAXIS1=2100; CENTERAXIS2=1026; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 5-5 Non-Int in Visit 01	190 Secs X 11 (2090 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]*	***[5]*** ***[6]***

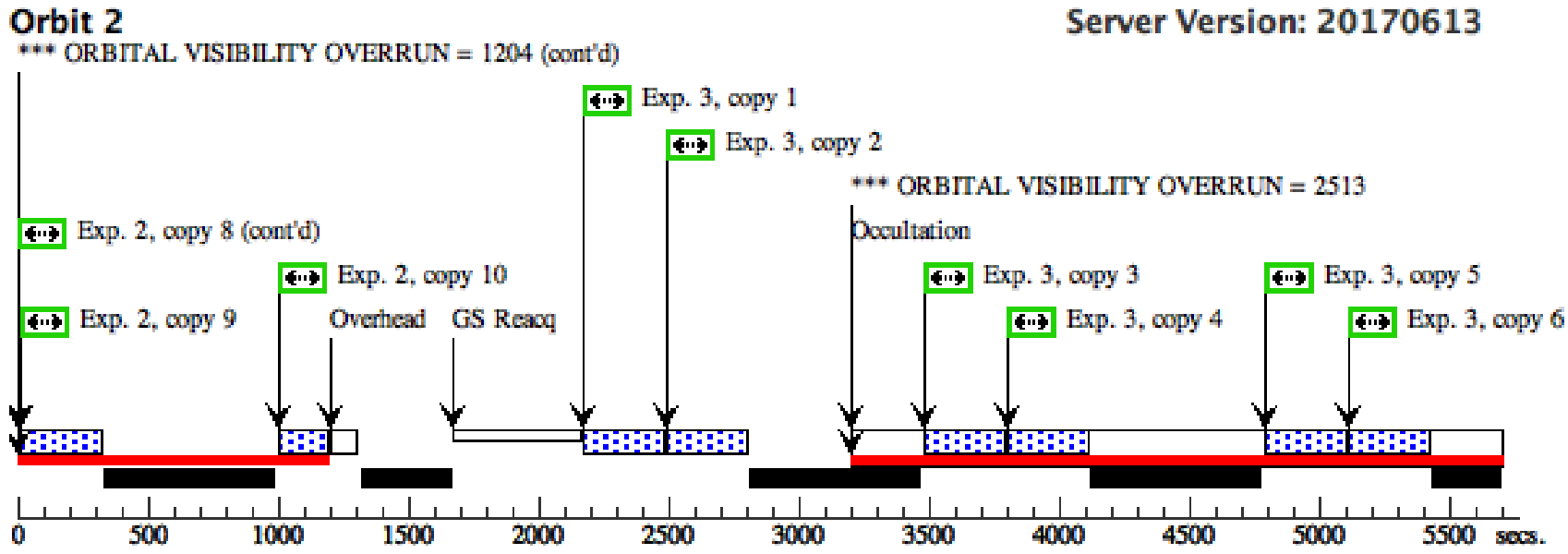
Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

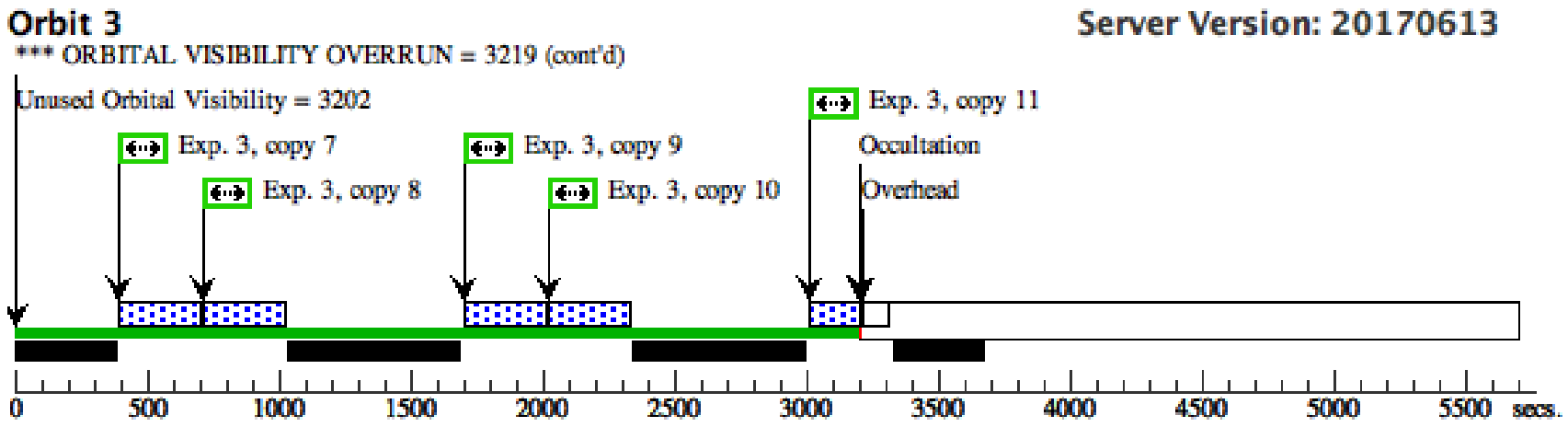
SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.

	6	G280 image, chip2 (WFC3UVIS.sp.1011023)	(1) HAT-P-41B	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; SIZEAXIS1=2100; CENTERAXIS2=1026; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 6-7 Non-Int in Visit 01	190 Secs X 11 (2090 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]*	***[7]*** ***[8]***
	Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2. *SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.*									
	7	Bias	BIAS	WFC3/UVIS, ACCUM, UVIS	DEF	AMP=D; SIZEAXIS1=2100; SIZEAXIS2=800; CENTERAXIS1=2048; CENTERAXIS2=1026		Sequence 6-7 Non-Int in Visit 01	0.0 Secs X 2 (0 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[8]***
	Comments: We set up the bias frames based on previously sucessful program 11934 and are using the same Aperture and subarray size and position as the observations for direct calibration.									

Orbit Structure



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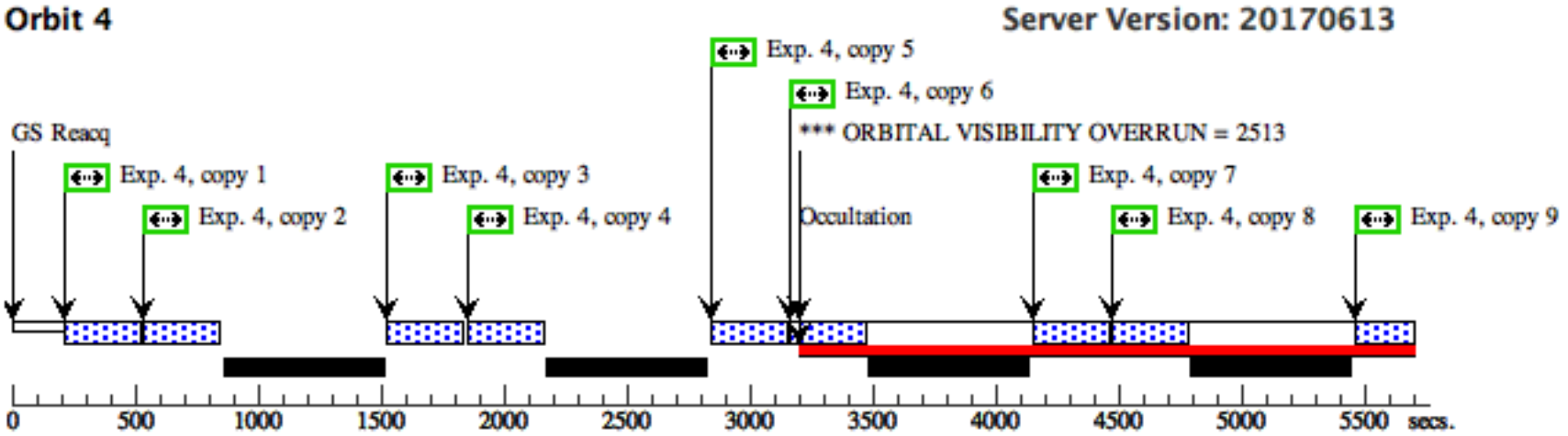
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Exp. 4, copy 4
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Exp. 4, copy 6
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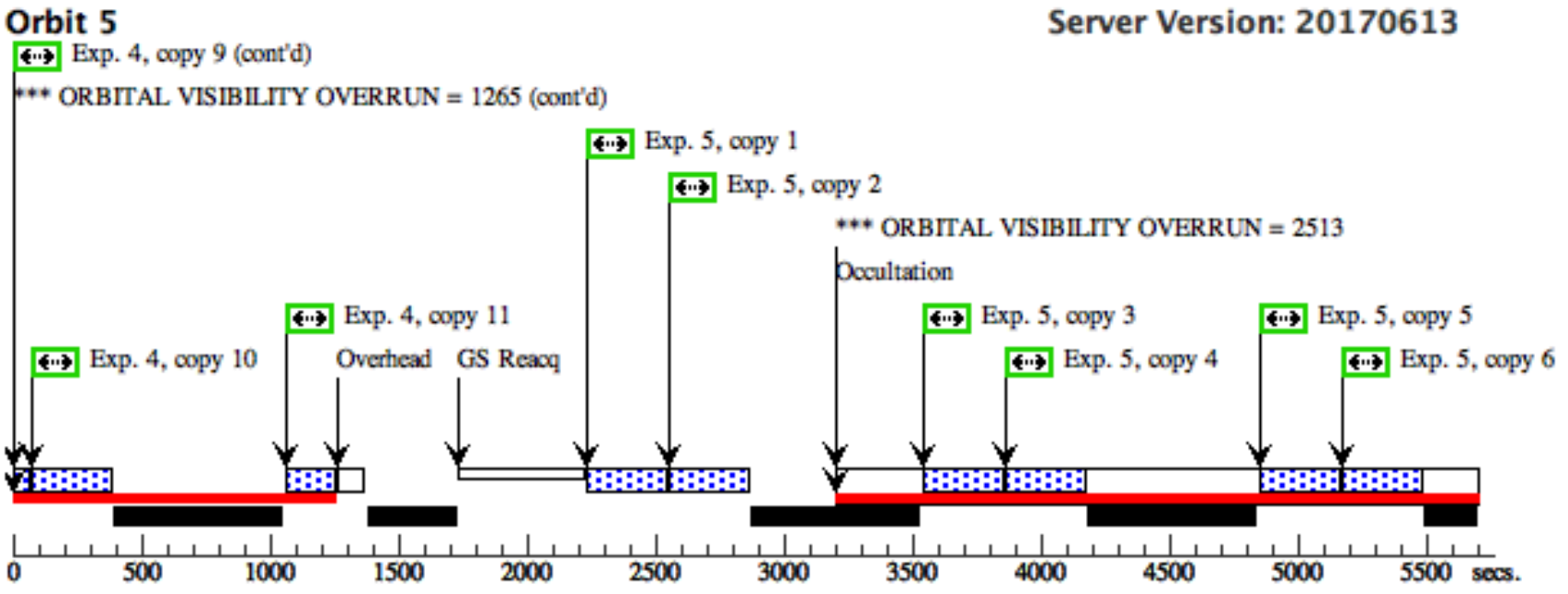
5500
secs.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Occultation
Exp. 4, copy 11
Exp. 5, copy 3
Exp. 5, copy 5
Exp. 4, copy 10
Overhead
GS Reacq
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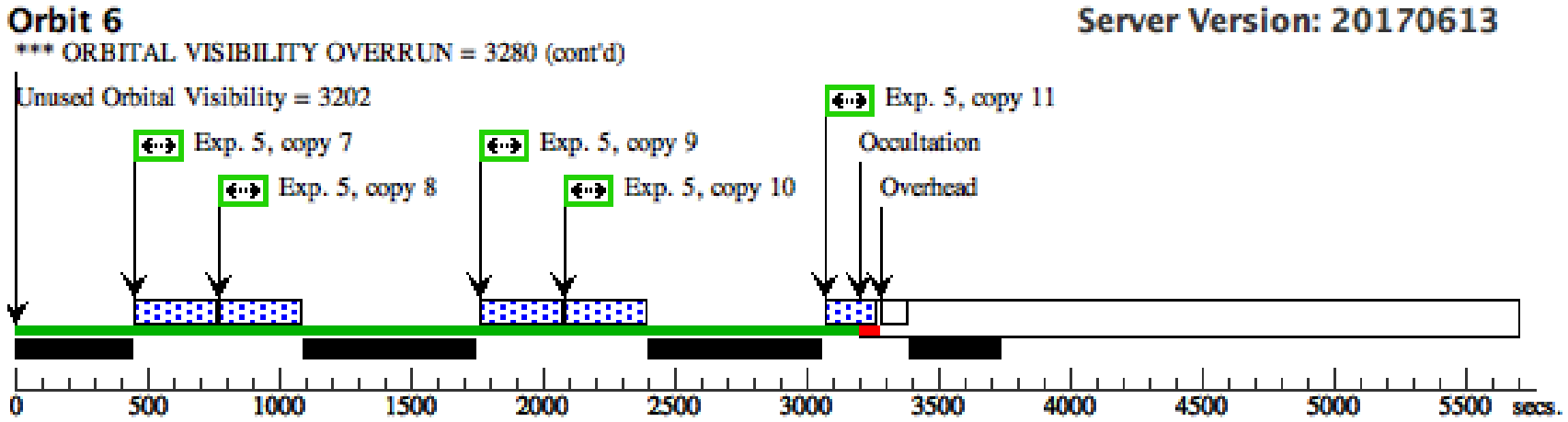
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Server Version: 20170613
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Exp. 5, copy 9
Occultation
Exp. 5, copy 8
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5000
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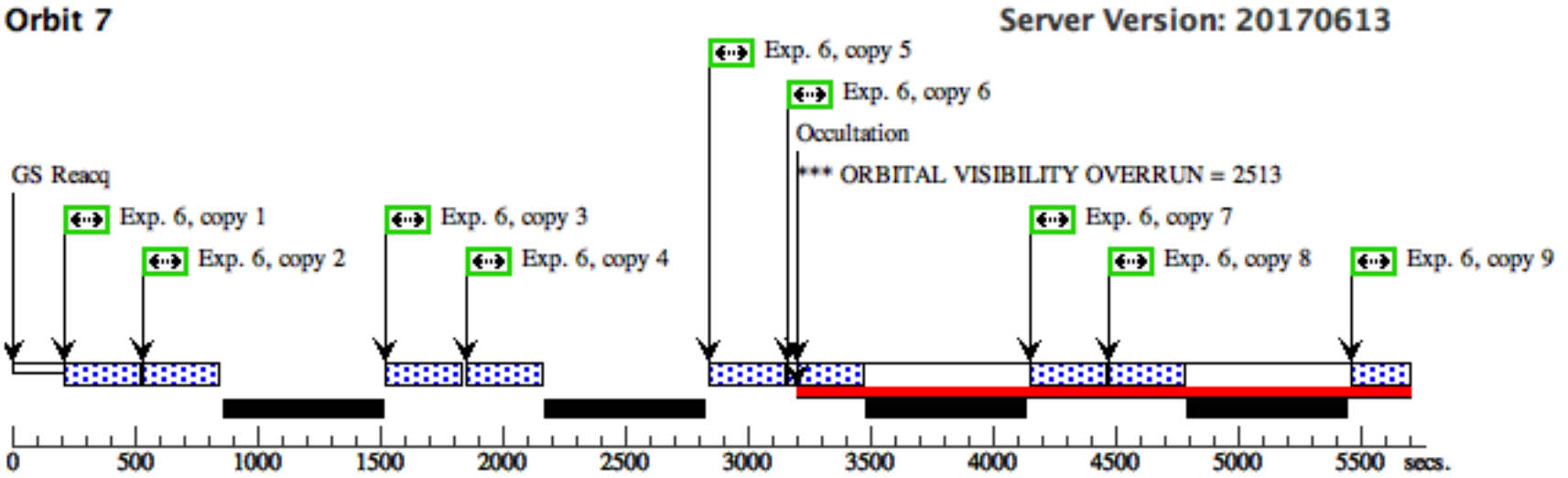
secs.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Server Version: 20170613
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Exp. 6, copy 6
Occultation
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Exp. 6, copy 3
Exp. 6, copy 4
Exp. 6, copy 7
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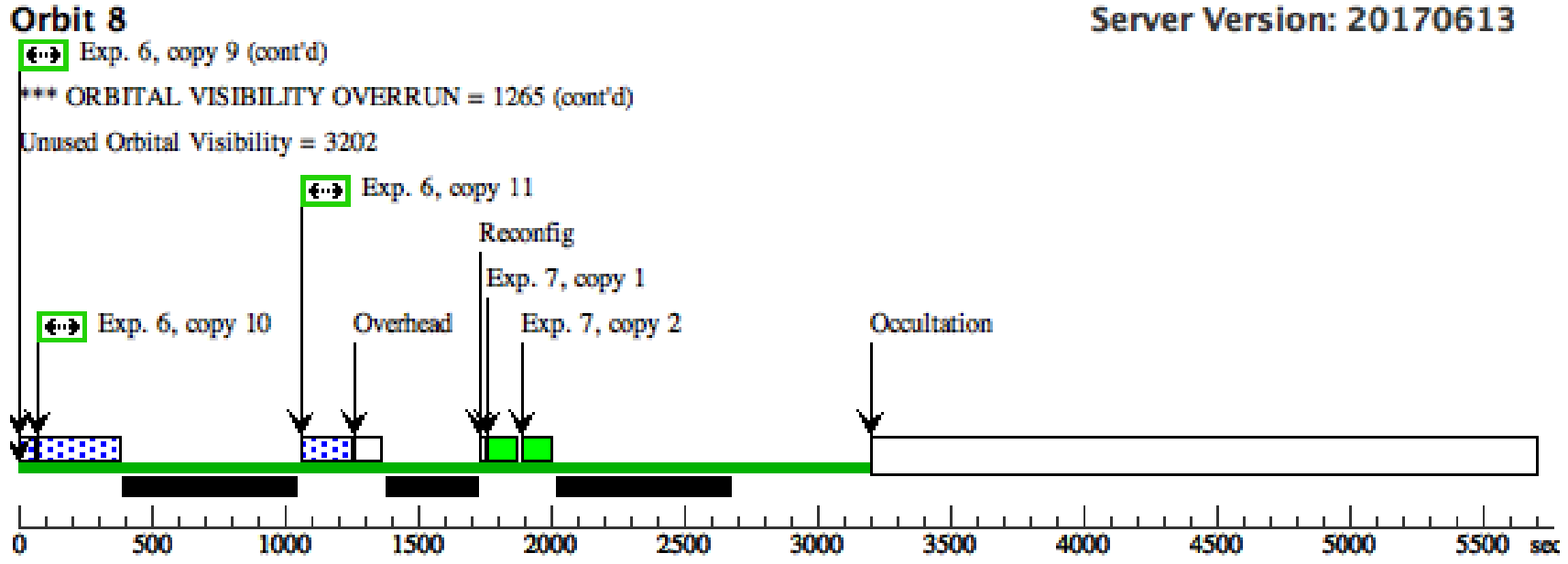
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Server Version: 20170613
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Unused Orbital Visibility = 3202
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Exp. 7, copy 1
Exp. 6, copy 10
Overhead
Exp. 7, copy 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 15288, Visit 02, implementation Wed Sep 13 18:05:17 GMT 2017

Diagnostic Status: Error

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 109D TO 136 D; ORIENT 289D TO 316 D; Period 2.694047 D AND ZERO-PHASE HJD2454983.86167

Comments: Exposures of HAT-P-41 with F300X, and G280. The two visits consist of 5 orbits each with repeated exopsures on the same target and in the same position for each orbit. The first orbit of each visit contains the F300X direct image for wavelength calibration. Field positions are set to the center of the second CCD chip (chip 2). As the only aperture allowed to be used with the G280 is the "UVIS", we must use POSTARGS to move the target to the chip center position. The nominal "UVIS" aperture puts the target 10" above the chip gap on chip 1. A Y-POSTARG of about 30" will put the target near the center of chip 1 and a Y-postarg of about -50" will put it near the center of chip 2 with a pixel position of (2048, 1026).

The optional parameters SIZEAXIS1=2100 and SIZEAXIS2=800 are used for all exposures to minimize the data volume and hence time lost to buffer dumps. This is fine for the data that needs to be obtained because the spectum of HAT-P-41 will occupy only a narrow swath of pixel rows within the field. This also requires the use of optional parameter CENTERAXIS2 in order to "steer" the location of the subarray readout so that it is centered on the target location. If we were positioning on chip 1 we could set CENTERAXIS2=TARGET. However, for the field center (nominal "UVIS" aperture) location on chip 2, we cannot center the subarray on the target because this would cause the subarray to extend into the chip gap, so we hardwire CENTERAXIS2=1026, which puts the vertical center of the subarray at the vertical center of chip 2.

Chip 2 biases are taken at the end of the visit because the grism exposures use custom subarrays, which will not have matching biases from the WFC3 bias calibration program.

For each visit we have phase constraints around the event of the planetary transit, both the orbital period of the planet and the phasing needed are placed on the first exposure in the sequence for each visit. As this target has a number of potential contamination sources we have placed Orient Ranges for the observatoins to reach the science and technology test goals stated.

Diagnostics

(G280 reference image (F300X) subarray on chip2, phase constrained (02.001)) Error (Form): AMP is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (02.001)) Error (Form): CENTERAXIS1 is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (02.001)) Error (Form): CENTERAXIS2 is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (02.001)) Error (Form): SIZEAXIS1 is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (02.001)) Error (Form): SIZEAXIS2 is not a valid selection

(G280 reference image (F300X) subarray on chip2, phase constrained (02.001)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP.
The combination of attributes chosen is illegal.

(G280 reference image (F300X) subarray on chip2, phase constrained (02.001)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP=D.
The combination of attributes chosen is illegal.

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The combination of attributes chosen is illegal.

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The combination of attributes chosen is illegal.

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The combination of attributes chosen is illegal.

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The combination of attributes chosen is illegal.

(G280 image, chip2 (02.002)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP=D.
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(G280 image, chip2 (02.005)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS2=1026.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.005)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.005)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1=2100.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.005)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS2.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.005)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS2=800.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): AMP is not a valid selection

(G280 image, chip2 (02.006)) Error (Form): CENTERAXIS1 is not a valid selection

(G280 image, chip2 (02.006)) Error (Form): CENTERAXIS2 is not a valid selection

(G280 image, chip2 (02.006)) Error (Form): SIZEAXIS1 is not a valid selection

(G280 image, chip2 (02.006)) Error (Form): SIZEAXIS2 is not a valid selection

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP=D.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS1.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS1=2048.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS2.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS2=1026.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1=2100.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS2.
The combination of attributes chosen is illegal.

(G280 image, chip2 (02.006)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS2=800.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): AMP is not a valid selection

(Bias (02.007)) Error (Form): CENTERAXIS1 is not a valid selection

(Bias (02.007)) Error (Form): CENTERAXIS2 is not a valid selection

(Bias (02.007)) Error (Form): Illegal selection: DEF.

(Bias (02.007)) Error (Form): SIZEAXIS1 is not a valid selection

(Bias (02.007)) Error (Form): SIZEAXIS2 is not a valid selection

(Bias (02.007)) Error (Form): Target BIAS is no longer a valid selection

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=AMP=D.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS1.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS1=2048.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS2.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=CENTERAXIS2=1026.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS1=2100.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS2.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Optional_Parameter=SIZEAXIS2=800.
The combination of attributes chosen is illegal.

(Bias (02.007)) Error (Form): This attribute cannot have this value due to other choices: Spectral_Element=DEF.
This value is by default illegal.

(Bias (02.007)) Error (Form): This attribute is not allowed to have this value: Calibration_Target = BIAS
It is an Available option and cannot normally be used in a GO proposal.

(Visit 02) Warning (Orbit Planner): EXPOSURE NOT IN REQUESTED ORBIT

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(Visit 02) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN
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(Visit 02) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HAT-P-41B	RA: 19 49 17.4387 (297.3226612d)	Proper Motion RA: -7.6 mas/yr	V=11.36	Reference Frame: SIMBAD
	Alt Name1: TYC-488-2442-1	Dec: +04 40 20.72 (4.67242d)	Proper Motion Dec: -11.7 mas/yr		
		Equinox: J2000	Epoch of Position: 2000		

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	G280 reference image (F300X) subarray on chip 2, phase constrained (WFC3UVIS.im.1010996)	(1) HAT-P-41B	WFC3/UVIS, ACCUM, G280-REF	F300X	FLASH=12; SIZEAXIS2=800; CENTERAXIS2=1026; SIZEAXIS1=2100; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0; PHASE 0.93 TO 0.942	Sequence 1-2 Non-Int in Visit 02	3 Secs (3 Secs) *[==>]*	***[1]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. We use FLASH=12 to meet the nominal count level. These parameters are based upon similar observations obtained successfully in proposal 13574.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	G280 image, chip2 (WFC3UVIS.sp.1011023)	(1) HAT-P-41B	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; CENTERAXIS2=1026; SIZEAXIS1=2100; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 1-2 Non-Int in Visit 02	190 Secs X 10 (1900 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]*	***[1]***
								[==>(Copy 9)] *[==>(Copy 10)]*	***[2]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	G280 image, chip2 (WFC3UVIS.sp.1011023)	(1) HAT-P-41B	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; SIZEAXIS1=2100; CENTERAXIS2=1026; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 3-3 Non-Int in Visit 02	190 Secs X 11 (2090 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]*	***[2]***
								[==>(Copy 7)] *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]*	***[3]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.

4	G280 image, (1) HAT-P-41B chip2 (WFC3UVIS.sp.1011023)	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; SIZEAXIS1=2100; CENTERAXIS2=1026; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 4-4 Non-Int in Visit 02	190 Secs X 11 (2090 Secs)	
							[==>(Copy 1)] *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[4]***
							[==>(Copy 10)] *[==>(Copy 11)]*	***[5]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.

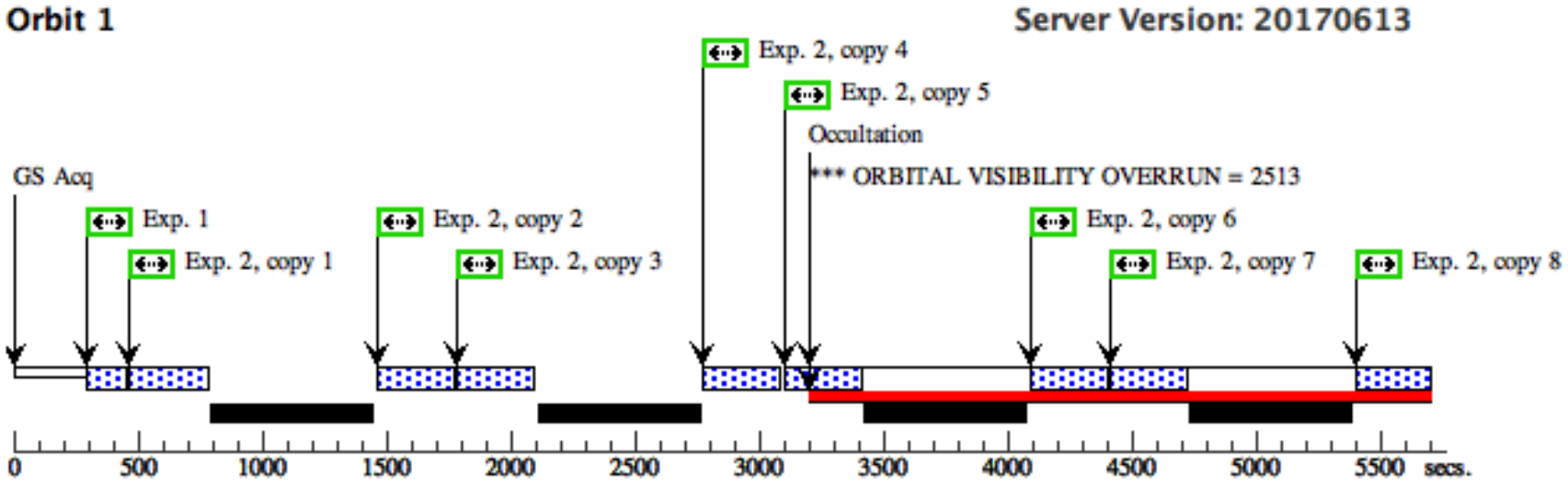
5	G280 image, (1) HAT-P-41B chip2 (WFC3UVIS.sp.1011023)	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; SIZEAXIS1=2100; CENTERAXIS2=1026; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 5-5 Non-Int in Visit 02	190 Secs X 11 (2090 Secs)	
							[==>(Copy 1)] *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]*	***[5]***
							[==>(Copy 7)] *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]*	***[6]***

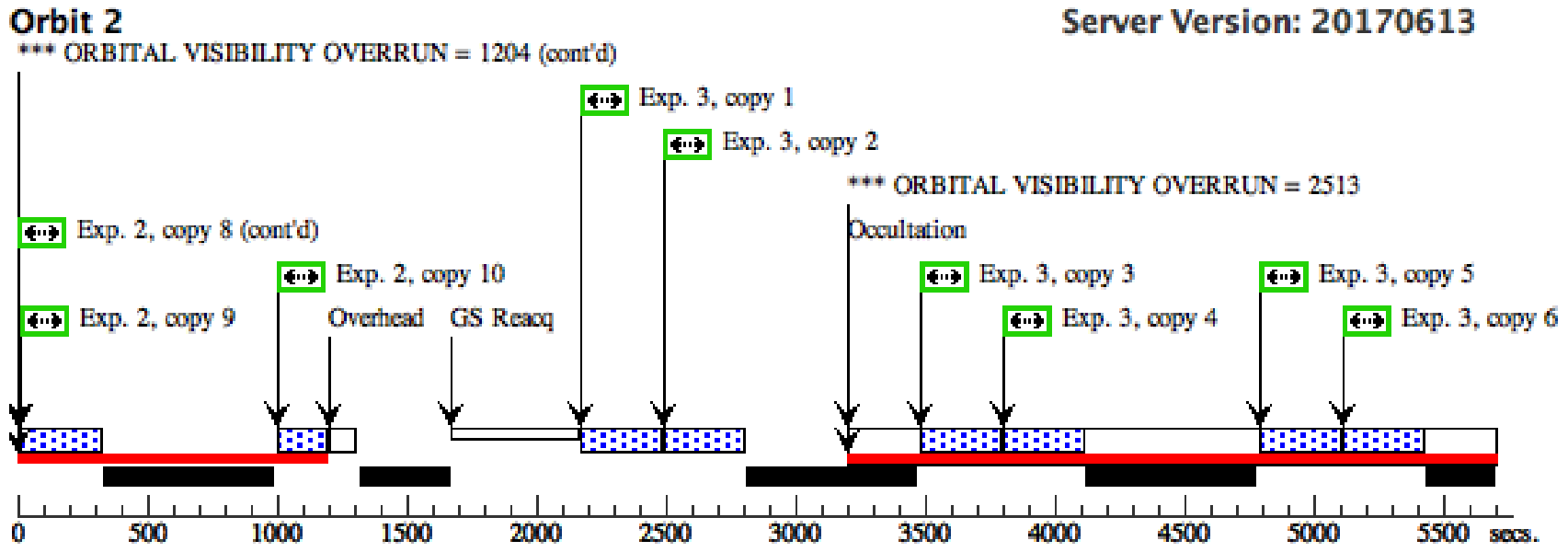
Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

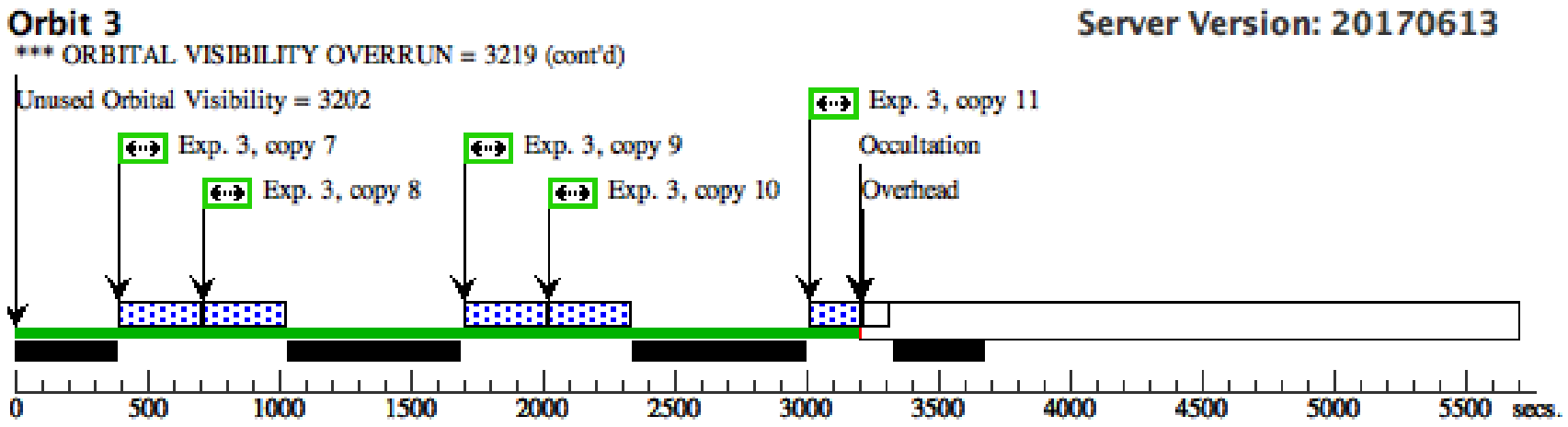
SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.

	6	G280 image, chip2 (WFC3UVIS.sp.1011023)	(1) HAT-P-41B	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=800; SIZEAXIS1=2100; CENTERAXIS2=1026; CENTERAXIS1=2048; AMP=D	POS TARG 0.0,-50.0	Sequence 6-7 Non-Int in Visit 02	190 Secs X 11 (2090 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]* *[==>(Copy 11)]*	***[7]*** ***[8]***
	Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2. *SIZEAXIS1=2100 and SIZEAXIS2=800 are used to minimize data volume, while CENTERAXIS2 is used to center the subarray readout on the target location. The latter is set to 1026, to place the vertical center of the subarray on chip 2 where the target is positioned at (2048,1026) -50" in y below the nominal aperture (assuming each pixel = 0.04"). We set the AMP to D as in previous-sucessful campaigns. These parameters are based upon similar observations obtained successfully in proposal 13574.*									
	7	Bias	BIAS	WFC3/UVIS, ACCUM, UVIS	DEF	AMP=D; CENTERAXIS1=2048; SIZEAXIS1=2100; SIZEAXIS2=800; CENTERAXIS2=1026		Sequence 6-7 Non-Int in Visit 02	0.0 Secs X 2 (0 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]*	***[8]***
	Comments: We set up the bias frames based on previously sucessful program 11934 and are using the same Aperture and subarray size and position as the observations for direct calibration.									

Orbit Structure



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Exp. 3, copy 8
Exp. 3, copy 9
Exp. 3, copy 10
Exp. 3, copy 11
Occultation
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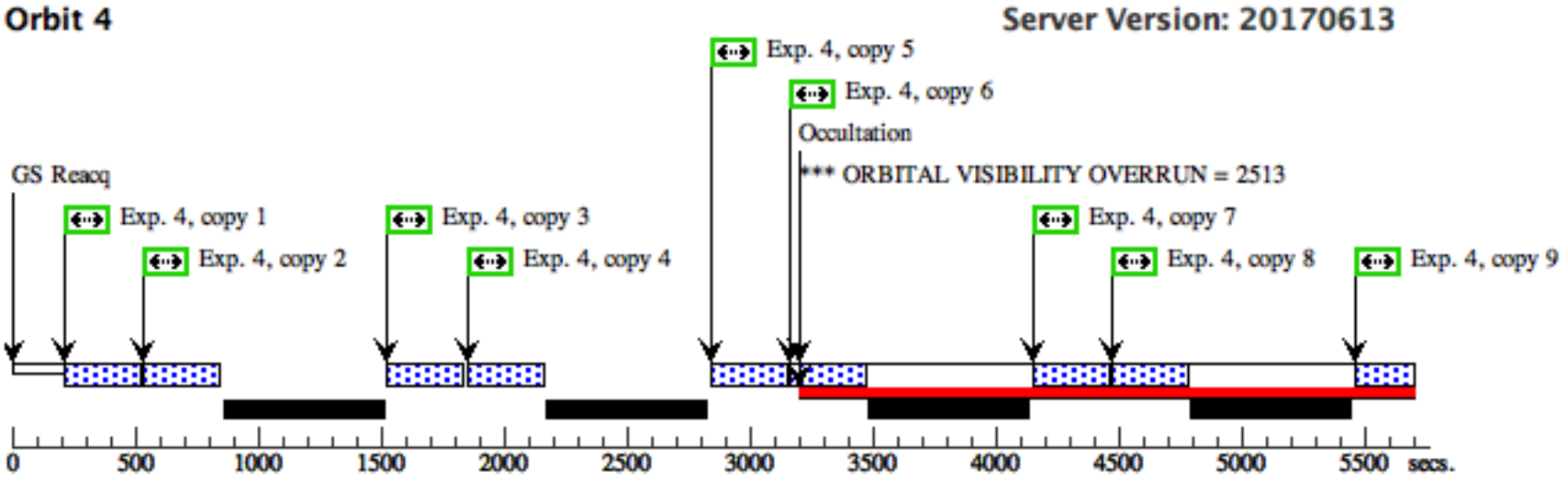
5000
5500
secs.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Occultation
*** ORBITAL VISIBILITY OVERRUN = 2513
Exp. 4, copy 7
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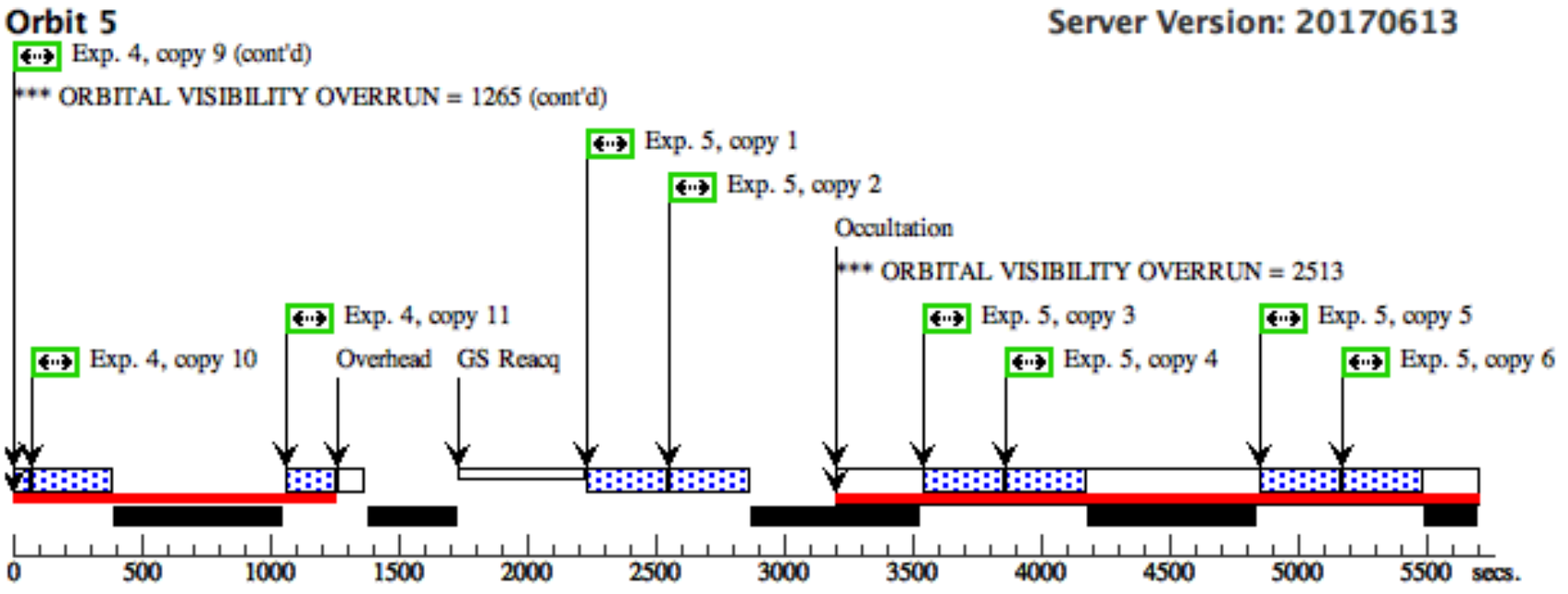
secs.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Occultation
*** ORBITAL VISIBILITY OVERRUN = 2513
Exp. 4, copy 11
Exp. 5, copy 3
Exp. 5, copy 5
Exp. 4, copy 10
Overhead
GS Reacq
Exp. 5, copy 4
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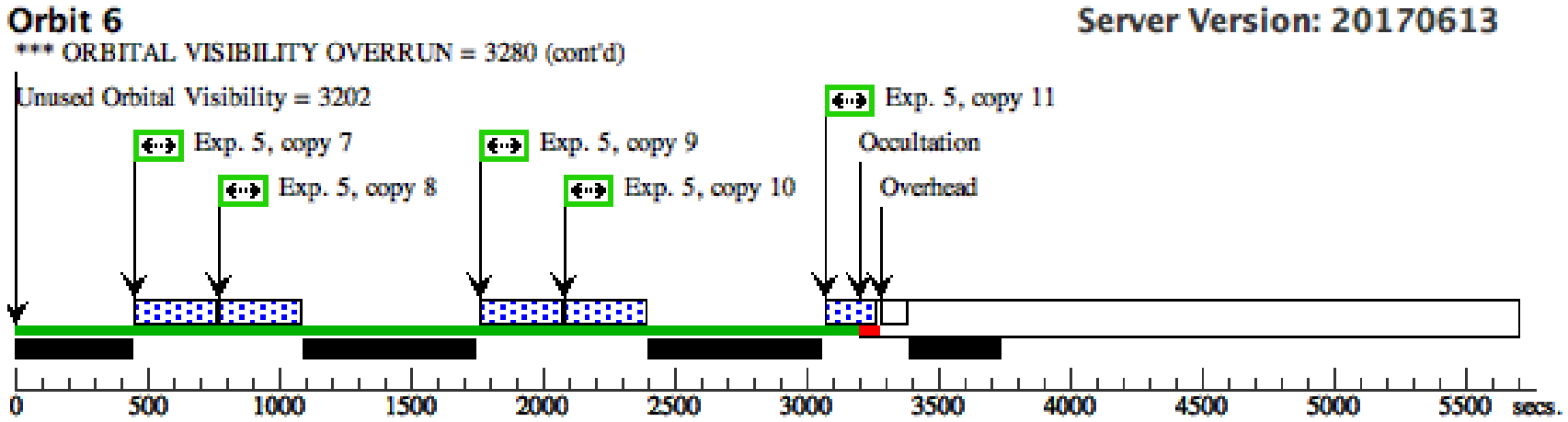
secs.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Unused Orbital Visibility = 3202
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Exp. 5, copy 7
Exp. 5, copy 9
Occultation
Exp. 5, copy 8
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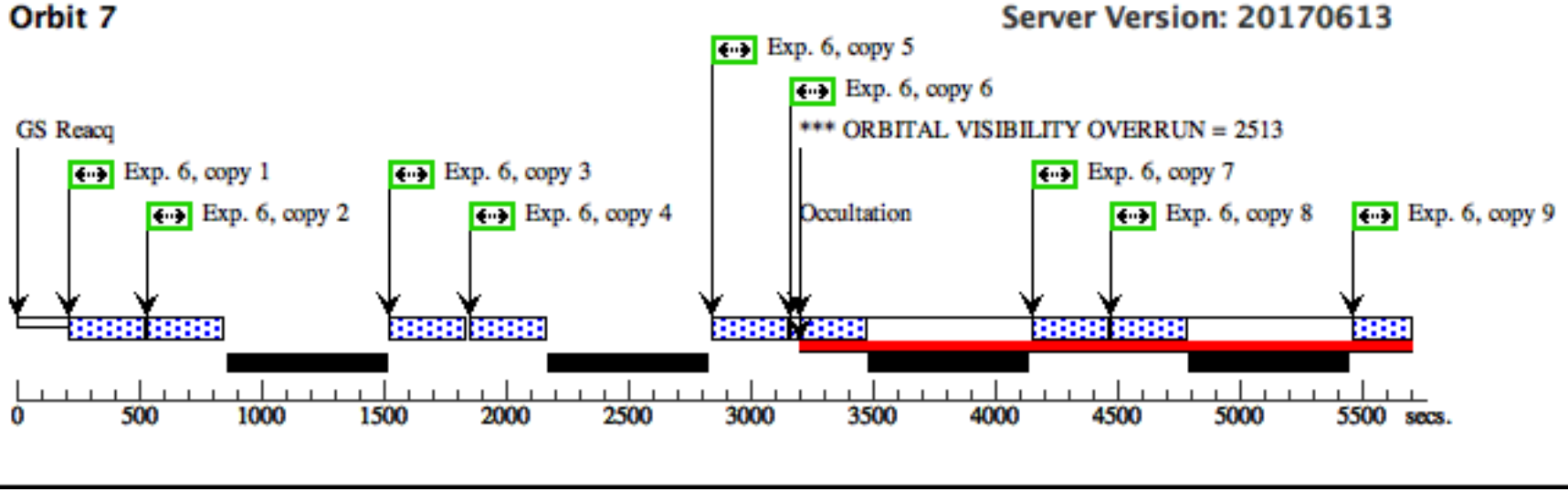
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Occultation
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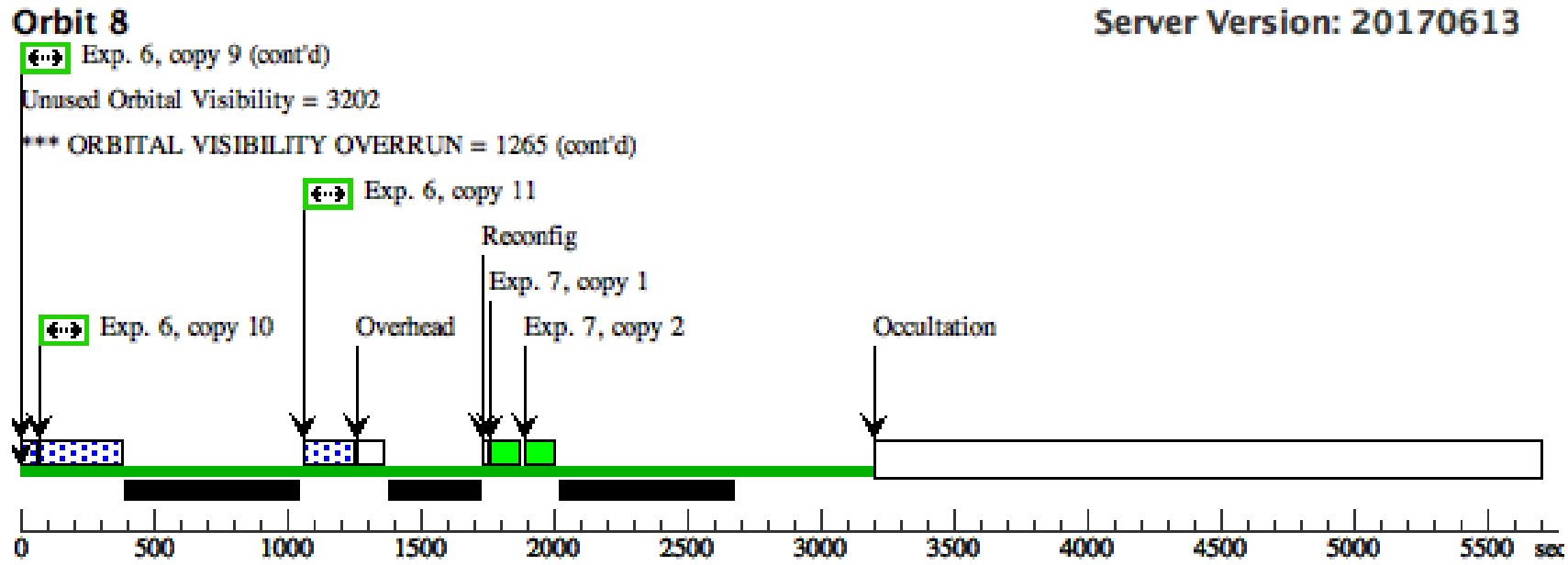
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Exp. 6, copy 11
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Exp. 6, copy 10
Overhead
Exp. 7, copy 2
Occultation
0
500
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