



17676 - WFC3 UVIS CTE Internal Monitor

Cycle: 32, Proposal Category: CAL/WFC3

(Availability Mode: RESTRICTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
Dr. Jay Anderson (PI) (Contact)	Space Telescope Science Institute

VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:16.0	yes
02	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:17.0	yes
03	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:17.0	yes
04	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:18.0	yes
05	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:18.0	yes
06	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:18.0	yes
07	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:19.0	yes
08	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:19.0	yes
09	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:19.0	yes
10	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:20.0	yes
11	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:20.0	yes
12	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:20.0	yes
13	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:21.0	yes
14	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:21.0	yes

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
15	DARK	WFC3/UVIS	1	06-Aug-2024 09:00:21.0	yes

15 Total Orbits Used

ABSTRACT

The goal of this yearly monitor program is to provide a supplemental way to monitor and re-pin the pixel-based CTE model. The program will take a set of ~500s dark exposures with a variety of post-flash levels -- from 0e to 30,000e (the maximum possible). By design, each exposure should have the same distribution WPs (warm pixels) before readout (thanks to the identical darktimes). As the detector is read out, though, the different backgrounds will result in different CTE losses for each WP in each exposure. By studying the survival-to-readout of the electrons in each WP, we can compare the pixel-based CTE model's predictions for losses-vs-WP intensity-vs-background against the results seen in the actual detector. Previous programs have taken sets of short darks and long darks, but there were not always enough WPs in the short darks to explore all issues. This was particularly the case at higher background levels where fainter WPs cannot be reliably measured on account of the noise in the background itself. The longer darks employed in the current regular monitor program should alleviate these concerns. Cycle 30's CAL-17259 was the first formal pilot program of this monitor program. Cycle 31 had CAL-17356. This is the third year for the data.

OBSERVING DESCRIPTION

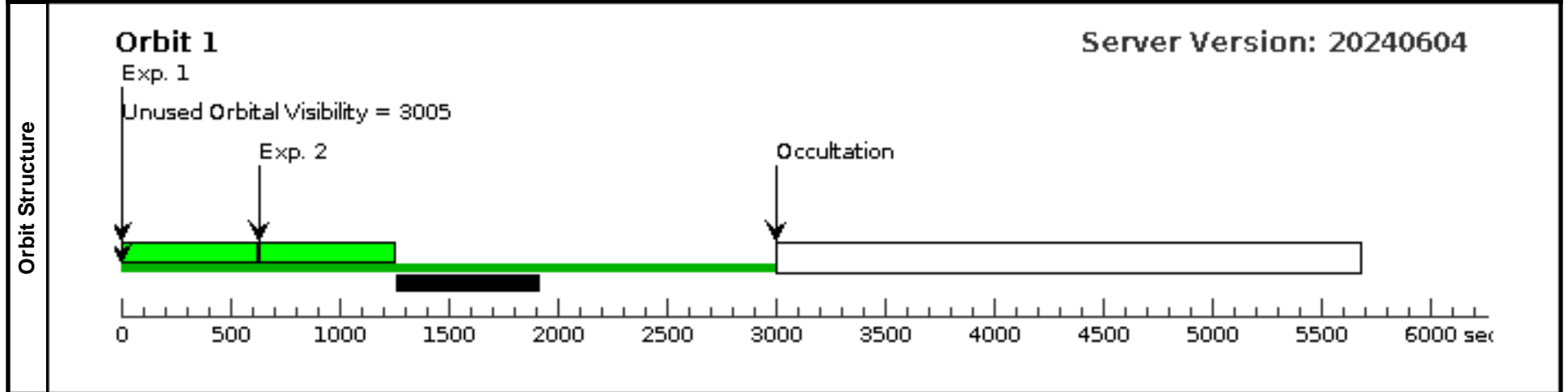
We take a uniform set of darks with a range of post-flash levels. The goal is to have each dark exposure be ~500s. In practice, the actual achieved darktime will probably be ~503s on account of overheads, but the important thing is that the effective dark time be the same for all exposures.

This program involves 15 internal orbits. In each orbit we can take two 500s darks with different background levels via postflash. The levels we will probe are: 0e, 1e, 2e, 4e, 7e, 10e, 15e, 20e, 25e, 30e, 40e, 50e, 65e, 80e, 100e, 120e, 150e, 200e, 300e, 500e, 750e, 1000e, 1500e, 2500e, 4000e, 7500e, 10000e, 15000e, 20000e, and, 30000e. The first 22 PF levels can be explored with the standard FLASH requirement, which imparts about 2.5e per second of post-flash, up to a maximum background of 1000e. The remaining 8 PF levels have to be explored with MED current, which imparts 75e per second and can achieve a background of 30,000. Backgrounds above that would require a PF of longer than 500s, which would increase the darktime above that of the other exposures. In principle, we could use tungsten lamps to get higher than 30,000 counts but thus far it does not seem critical to have an extra PF level beyond 30,000e.

Visit	Proposal 17676, Visit 01 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 09-DEC-2024 AND 25-DEC-2024; BETWEEN 06-JAN-2025 AND 23-JAN-2025
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Diagnostics	(Visit 01) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
	(Visit 01) Warning (Orbit Planner): WFC3 EXPOSURE TIME ADJUSTED

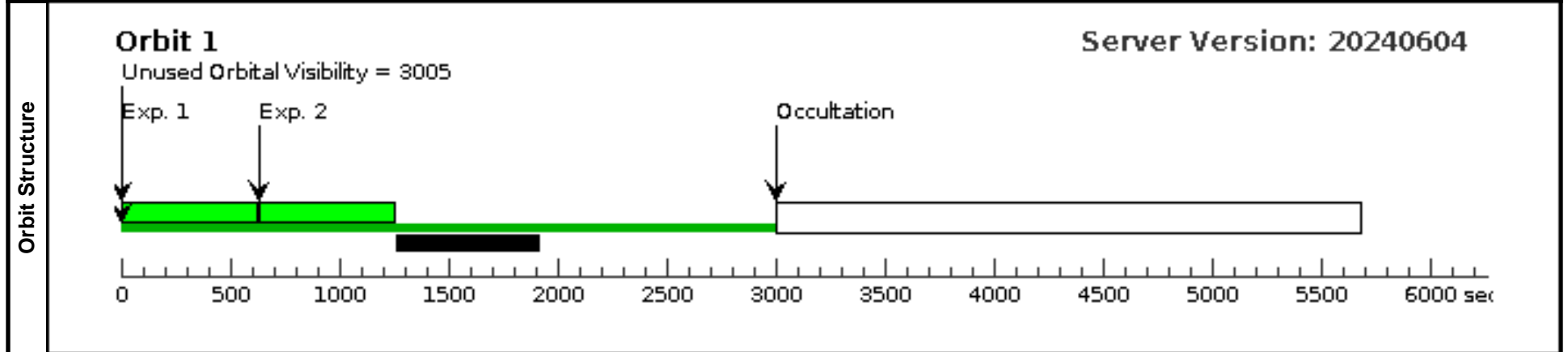
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	0e (use 0.1s current to equalize darktimes)	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=0.1				499.9 Secs (499.9 Secs) [==>]
2	1e = 0.4s L OW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=0.4				499.6 Secs (499.6 Secs) [==>]	[1]



Visit	<p>Proposal 17676, Visit 02</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: WFC3/UVIS</p> <p>Special Requirements: AFTER 01 BY 0 D TO 5 D</p>
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Diagnostics	<p>(Visit 02) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT</p> <p>(Visit 02) Warning (Orbit Planner): WFC3 EXPOSURE TIME ADJUSTED</p> <p>(Visit 02) Warning (Orbit Planner): WFC3 EXPOSURE TIME ADJUSTED</p>
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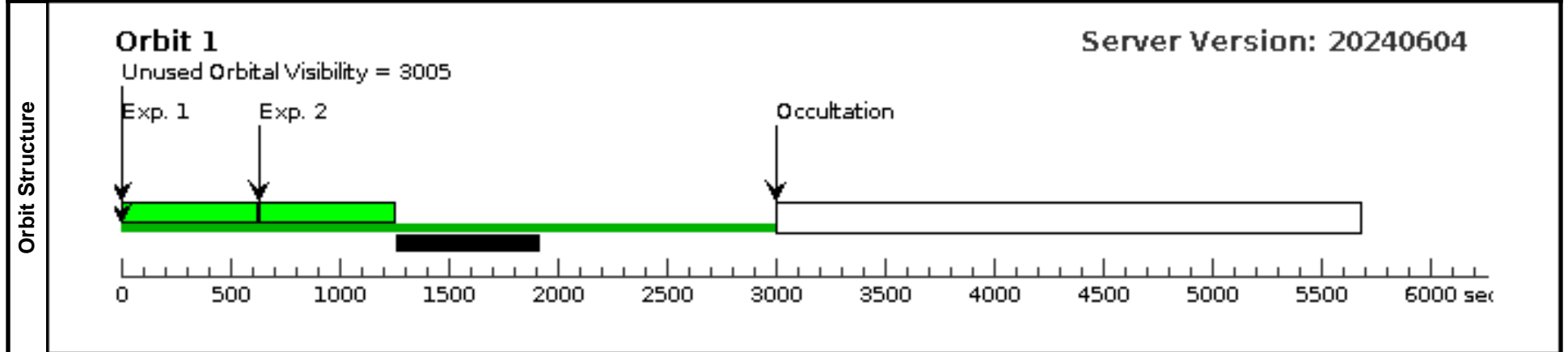
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	2e = 0.8s L OW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=0.8				499.2 Secs (499.2 Secs)	[1]
									[==>]	
2	4e = 1.6s L OW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=1.6				498.4 Secs (498.4 Secs)	[1]
									[==>]	



Visit	Proposal 17676, Visit 03 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D
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Diagnostics	(Visit 03) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT (Visit 03) Warning (Orbit Planner): WFC3 EXPOSURE TIME ADJUSTED
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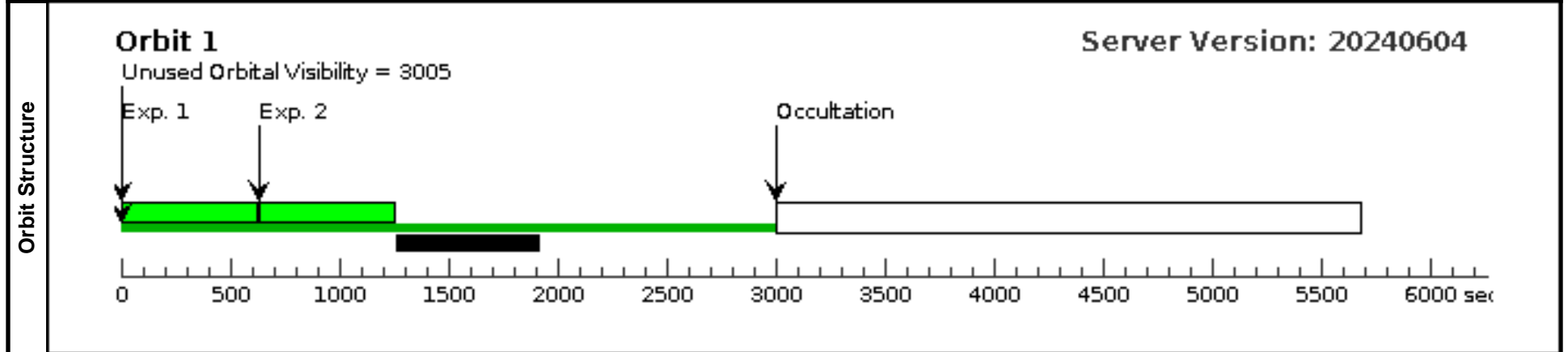
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	7e = 2.8s L OW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=2.8			497.2 Secs (497.2 Secs) [==>]	[1]
2	10e = 4s LO W	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=4.0			496.0 Secs (496 Secs) [==>]	[1]



Visit	Proposal 17676, Visit 04 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D
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Diagnostics	(Visit 04) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
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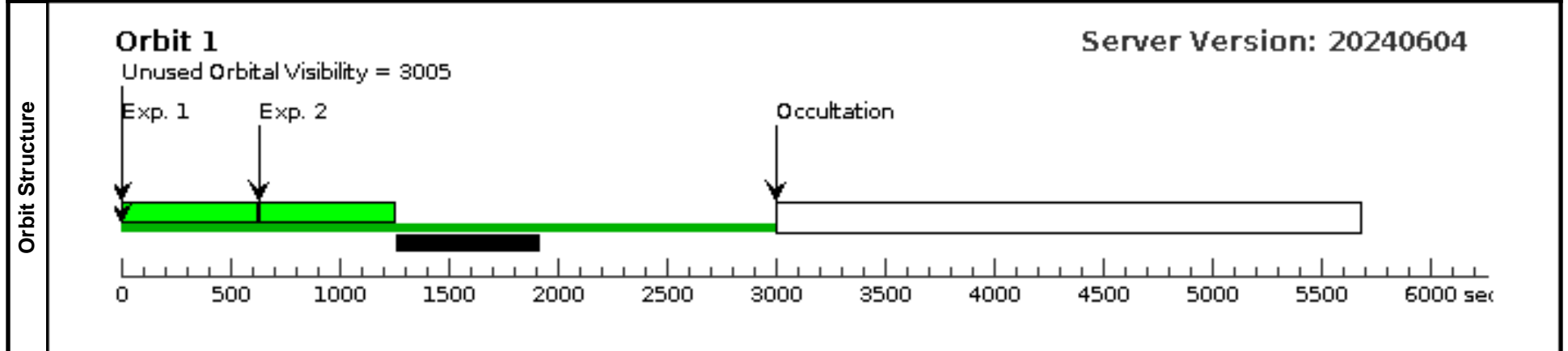
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	15e = 6s LO W	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=6.0			494.0 Secs (494 Secs)	[1]
									[==>]	
	2	20e = 8s LO W	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=8.0			492.0 Secs (492 Secs)	[1]
									[==>]	



Visit	Proposal 17676, Visit 05 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D
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Diagnostics	(Visit 05) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
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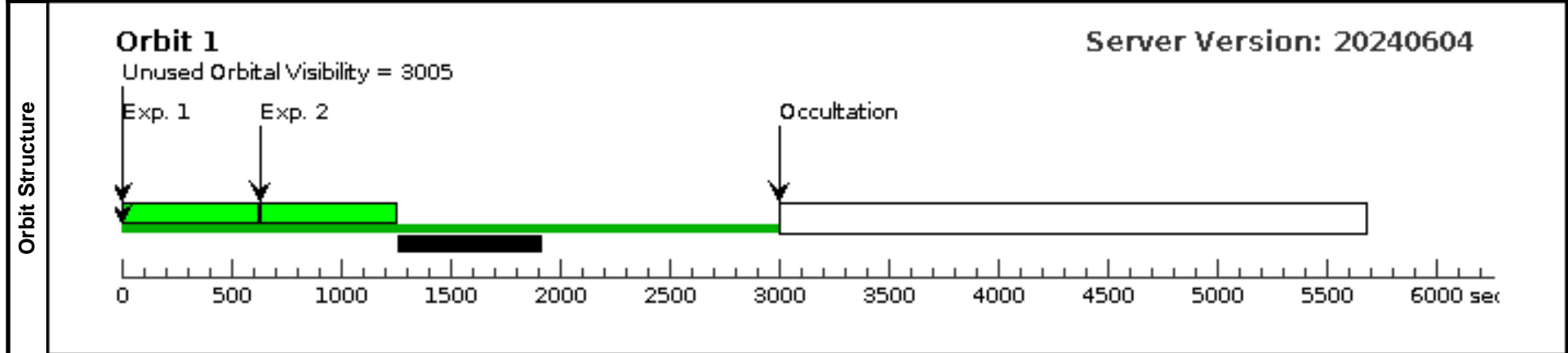
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	25e = 10.0s LOW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=10.0			490.0 Secs (490 Secs) [==>]	[1]
2	30e = 12s L OW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=12.0			488.0 Secs (488 Secs) [==>]	[1]



Visit	Proposal 17676, Visit 06 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D
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Diagnostics	(Visit 06) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
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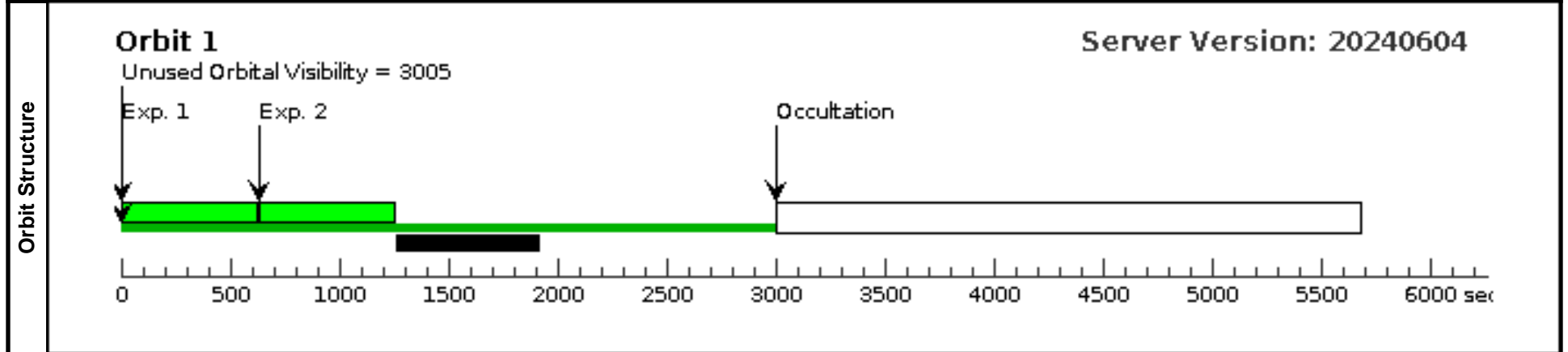
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	40e = 16s L OW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=16.0			484.0 Secs (484 Secs) [==>]	[1]
2	50e = 20s L OW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=20.0			480.0 Secs (480 Secs) [==>]	[1]



Visit	Proposal 17676, Visit 07 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D
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Diagnostics	(Visit 07) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	65e = 26s L OW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=26.0			474.0 Secs (474 Secs) [==>]	[1]
	2	80e = 32s L OW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=32.0			468.0 Secs (468 Secs) [==>]	[1]

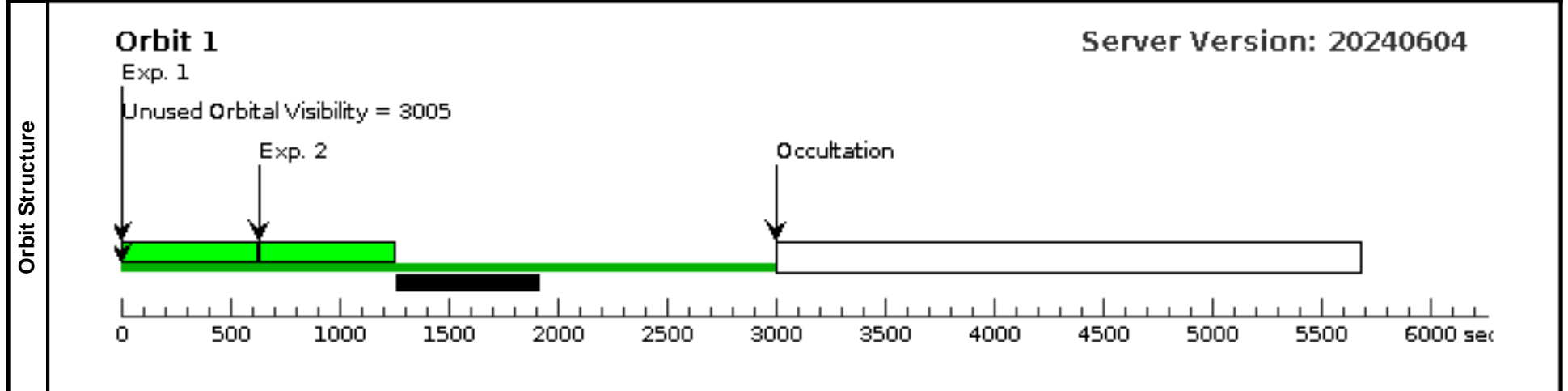


Visit	Proposal 17676, Visit 08	
	Diagnostic Status: Warning	
	Scientific Instruments: WFC3/UVIS	

Special Requirements: AFTER 01 BY 0 D TO 5 D

Diagnostics	(Visit 08) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
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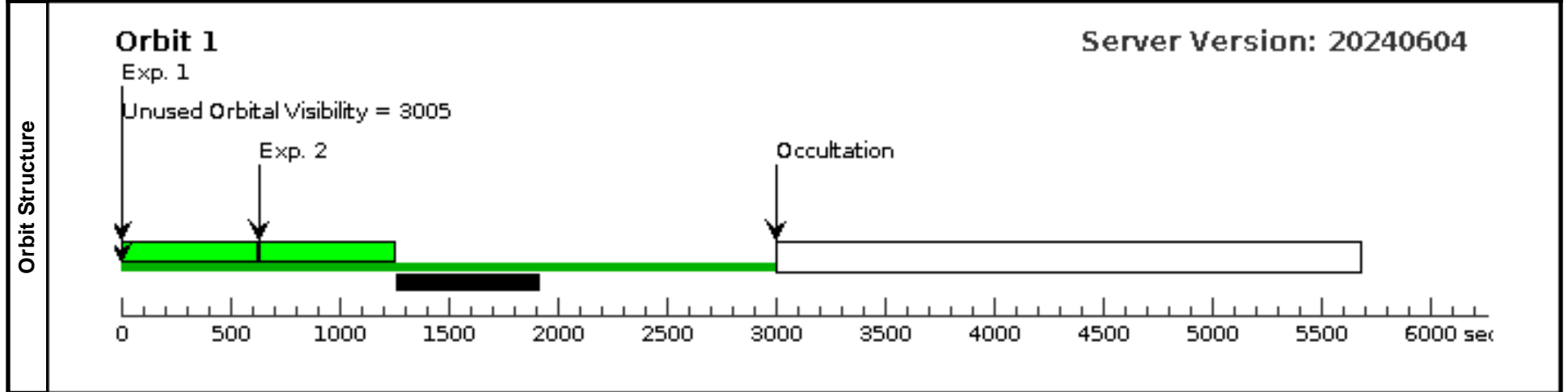
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	100e = 40s LOW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=40.0				460.0 Secs (460 Secs) [==>]
2	120e = 48s LOW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=48.0				452.0 Secs (452 Secs) [==>]	[1]



Visit	Proposal 17676, Visit 09	
	Diagnostic Status: Warning	
	Scientific Instruments: WFC3/UVIS	

Diagnostics	(Visit 09) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
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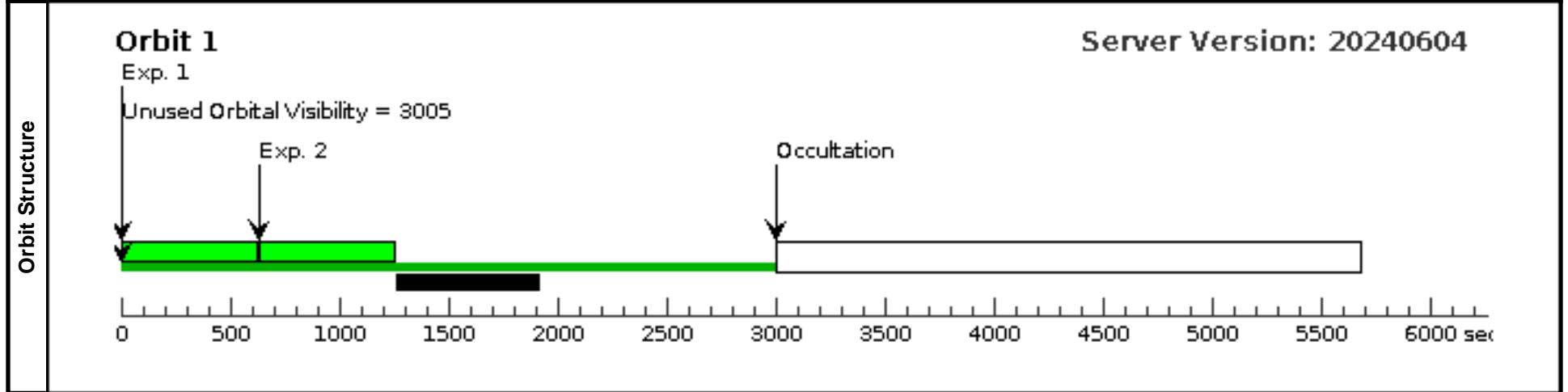
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	150e = 60s LOW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=60.0				440.0 Secs (440 Secs) [==>]
2	200e = 80s LOW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=80.0				420.0 Secs (420 Secs) [==>]	[1]



Visit	Proposal 17676, Visit 10 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D
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Diagnostics	(Visit 10) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
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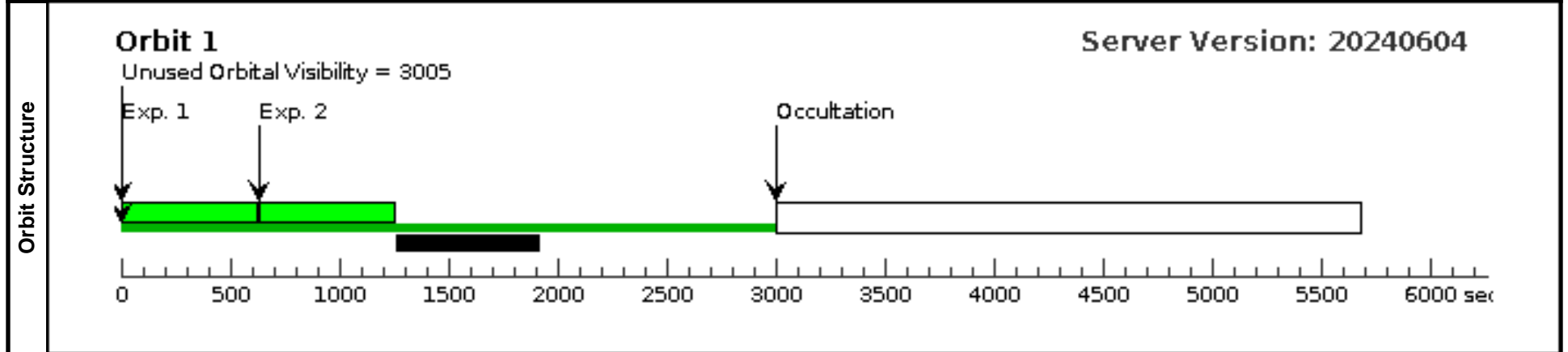
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	300e = 120s LOW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=120.0			380.0 Secs (380 Secs) [==>]	[1]
	2	500e = 200s LOW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=200.0			300.0 Secs (300 Secs) [==>]	[1]



Visit	Proposal 17676, Visit 11 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D
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Diagnostics	(Visit 11) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	750e = 300s LOW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=300.0			200.0 Secs (200 Secs) [==>]	[1]
	2	1000e = 400s s LOW	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=400.0			100.0 Secs (100 Secs) [==>]	[1]



Visit	Proposal 17676, Visit 12 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D									
	(Visit 12) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT (Visit 12) Warning (Orbit Planner): WFC3 EXPOSURE TIME ADJUSTED									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	1500e = 20s MED	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=MEDIUM; FLASHEXP=20.0			480.0 Secs (480 Secs) [==>]	[1]
2	2500e = 33.3s MED	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=MEDIUM; FLASHEXP=33.3			466.7 Secs (466.7 Secs) [==>]	[1]	
Orbit Structure	<p>Orbit 1 Server Version: 20240604</p> <p>Unused Orbital Visibility = 3005</p> <p>The diagram shows a horizontal timeline from 0 to 6000 seconds. A green bar represents the total exposure time, starting at 0 and ending at approximately 3000 seconds. Two vertical arrows labeled 'Exp. 1' and 'Exp. 2' point to the start of the green bar at approximately 0 and 600 seconds, respectively. A black bar below the green bar indicates a period of occultation from approximately 1200 to 1900 seconds. A vertical arrow labeled 'Occultation' points to the end of the green bar at approximately 3000 seconds. The x-axis is labeled '0', '500', '1000', '1500', '2000', '2500', '3000', '3500', '4000', '4500', '5000', '5500', '6000 sec'.</p>									

Visit	Proposal 17676, Visit 13 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D									
	(Visit 13) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT (Visit 13) Warning (Orbit Planner): WFC3 EXPOSURE TIME ADJUSTED									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	4000e = 53. 3s MED	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=MEDI UM; FLASHEXP=53.3			446.7 Secs (446.7 Secs) [==>]	[1]
2	7500e = 100 .0s MED	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=MEDI UM; FLASHEXP=100.0			400.0 Secs (400 Secs) [==>]	[1]	
Orbit Structure	<p>Orbit 1 Server Version: 20240604</p> <p>Unused Orbital Visibility = 3005</p> <p>Timeline labels: Exp. 1, Exp. 2, Occultation</p> <p>X-axis: 0, 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500, 6000 sec</p>									

Visit	Proposal 17676, Visit 14 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D									
	(Visit 14) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT (Visit 14) Warning (Orbit Planner): WFC3 EXPOSURE TIME ADJUSTED									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	10,000e = 1 33.3s MED	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=MEDI UM; FLASHEXP=133.3			366.7 Secs (366.7 Secs) [==>]	[1]
2	15,000e = 2 00s MED	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=MEDI UM; FLASHEXP=200.0			300.0 Secs (300 Secs) [==>]	[1]	
Orbit Structure	<p>Orbit 1 Server Version: 20240604</p> <p>Exp. 1 Unused Orbital Visibility = 3005</p> <p>Exp. 2</p> <p>Occultation</p> <p>0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 sec</p>									
	This row is implicitly filled by the content of the previous row's cell									

Visit	Proposal 17676, Visit 15 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 0 D TO 5 D
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Diagnostics	(Visit 15) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	20,000e = 2 66.7s MED	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=MEDI UM; FLASHEXP=266.7			233.3 Secs (233.3 Secs) [==>]	[1]
2	30,000e = 4 00s MED	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=MEDI UM; FLASHEXP=400.0			100.0 Secs (100 Secs) [==>]	[1]

