



16472 - COS/FUV Gain Map and Aperture Placement at LP6

Cycle: 28, Proposal Category: CAL/COS

(Availability Mode: RESTRICTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dzhuliya "Julia" Dashtamirova (PI) (Contact)	Space Telescope Science Institute	dashtamirova@stsci.edu
Dr. David J. Sahnou (CoI)	Space Telescope Science Institute	sahnou@stsci.edu
Dr. Bethan Lesley James (CoI) (ESA Member)	Space Telescope Science Institute - ESA	bjames@stsci.edu
Dr. Marc Rafelski (CoI)	Space Telescope Science Institute	mrafelski@stsci.edu
Dr. Julia Christine Roman-Duval (CoI)	Space Telescope Science Institute	duval@stsci.edu

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	(2) WD0308-565 DARK NONE	COS COS/FUV COS/NUV S/C	3	02-Mar-2021 13:00:20.0	yes
02	(2) WD0308-565 DARK NONE	COS COS/FUV COS/NUV S/C	3	02-Mar-2021 13:00:24.0	yes
52	(2) WD0308-565 DARK NONE	COS COS/FUV COS/NUV S/C	2	02-Mar-2021 13:00:28.0	yes

8 Total Orbits Used

ABSTRACT

This program obtains exposures of WD0308-565 with G130M/1222 and G160M/1623 in place of the deuterium lamp to illuminate the top of the FUV detector. The data obtained will be used to create gain maps of the top portion of the FUV detector and determine placement of Lifetime Position 6.

OBSERVING DESCRIPTION

Updates made 3/2/2021 (see bottom of proposal description)

Data will by-pass calibration

Wavecals will be turned off to avoid the light leak through the FCA when taking exposures at $\sim +5.5''$.

External target WD0308-565 will be used to illuminate the detector to reach a threshold of ~ 35 counts per 2×8 binned pixel. This data will be used to create gain maps of the upper portion of the FUV detector and help determine future LP placement. To ensure full coverage needed for gain mapping, we will be obtaining four 2 FP-POS x 200s G130M/1222 exposures. Each of the four sets of exposures will be placed ~ 22 YCORR pixels higher than the preceding exposure set. We will also be obtaining eleven 2 FP-POS x 200s G160M/1623 exposures with each of the 11 exposure sets placed ~ 9 YCORR pixels higher than the preceding exposure set. The G130M/1222 and G160M/1623 exposure sets combined will provide us with the counts and coverage necessary for creating gain maps of the top portion of the FUV detector. The exposure sets separately will provide a SNR > 10 (per resel) for analysis of aperture placement.

This program will be split in half between 2 visits and the data will be analyzed between visits to confirm the plate scale and ensure that the target remains centered as expected. The observation consists of a total of 6 orbits.

A plate scale of 0.086 arcsec/pixel is used to calculate the proper XAPER position based on a scale of 21 XAPER steps per arcsec.

XAPER Step movement = $(0.086 \text{ arcsec/pix} * [\# \text{ of pix to move up}] * 21 \text{ XAPER Steps/''})$

LP5 here is defined as LP2 + -40 XAPER steps

+9 pixels from LP5 would be $0.086 \text{ arcsec/pix} * 9 \text{ pix} * 21 \text{ XAPER steps/arcsec} = 16.254 \text{ XAPER from LP5 (round to 16)}$

which is equal to $-40 \text{ XAPER} + -16 \text{ XAPER} = -56 \text{ XAPER steps from LP2}$

(continue adding 16 XAPER steps to move an additional ~9 pixels)

+22 pixels from LP5 would be $0.086 \text{ arcsec/pix} * 22 \text{ pix} * 21 \text{ XAPER steps/arcsec} = 39.732 \text{ XAPER from LP5 (round to 40)}$

which is equal to $-40 \text{ XAPER} + -40 \text{ XAPER} = -80 \text{ XAPER steps from LP2}$

(continue adding 40 XAPER steps to move an additional ~22 pixels)

In addition to using XAPER steps to command aperture movement, we will also be using QESIPARM XSTEPS to command between movements.

Special Requirement is necessary to move the aperture to the correct location.

$\text{QESIPARM XSTEPS} = \text{XAPER}(\text{Current}) - \text{XAPER}(\text{Previous})$

LAPXSTP at LP2 is +53. The furthest movement of the aperture is to LAPXSTP=-163 which is well within the soft stop at +/-250.

Program Layout:

Visit 01

1. ACQ/IMAGE #1
2. G130M/1222 Initialization exposure at LP2
3. Set HV to 167/169
4. Move aperture 80 steps from LP2 (40 steps to get to LP5, 40 steps to get to 22 pixels above LP5)
5. G130M/1222 exposures, FP-POS=1, 3
6. Move aperture an additional 40 XAPER steps to LP5+44 pix ($0.086 \text{ arcsec/pix} * 22 \text{ pixels} * 21 \text{ steps/arcsec} = \text{move up } \sim 40 \text{ steps}$)
7. G130M/1222 exposures, FP-POS=1,3
8. Move aperture back to LP2
9. G160M/1623 initialization exposure at LP2
10. Move aper 56 XAPER steps to LP5+9 pix (40 steps to get to LP5, 16 steps to get to 9 pixels above LP5)
11. G160M/1623 exposures, FP-POS=2, 4
12. Move aper additional 16 XAPER steps
13. G160M/1623 exposures, FP-POS=2, 4

14. repeat 12 & 13 four more times

1222 Aperture positions

Step	XAPER	POSTARG	QESIPARM	XSTEPS	LAPXSTP
LP2 (+3.5")	0	0"	NA	+53	
1	-80	+3.81"	-80	-27	
2	-120	+5.71"	-40	-67	

end of 1222 exposures for Visit 01

1623 Aperture positions

Step	XAPER	POSTARG	QESIPARM	XSTEPS	LAPXSTP
LP2	0	0"	(0- (-120))= 120	+53	
1	-56	+2.67"	-56	-3	
2	-72	+3.42"	-16	-19	
3	-88	+4.19"	-16	-35	
4	-104	+4.95"	-16	-51	
5	-120	+5.71"	-16	-67	
6	-136	+6.48"	-16	-83	

end visit 01

Visit 02

1. ACQ/IMAGE #1
2. G130M/1222 Initialization exposure at LP2
3. Set HV to 167/169
4. Move aperture to +66 pixels above LP5 (last visit left off at +44 pixels = -120 XAPER, move additional 40 steps to XAPER=-160)
5. G130M/1222 exposures, FP-POS=1, 3
6. Move aperture additional 40 XAPER steps to LP5+88 pix

Proposal 16472 (STScI Edit Number: 1, Created: Tuesday, March 2, 2021 at 1:00:29 PM Eastern Standard Time) - Overview

7. G130M/1222 exposures, FP-POS=1,3
8. Move aperture back to LP2
9. G160M/1623 initialization exposure at LP2
10. Move aperture to +63 pixels above LP5 (last visit left off at +54 pixels = -136 XAPER, move additional 16 steps to XAPER=-152)
11. G160M/1623 exposures, FP-POS=2, 4
12. Move aper additional 16 XAPER steps
13. G160M/1623 exposures, FP-POS=2, 4
14. repeat 12 & 13 three more times

1222 Aperture positions

Step	XAPER	POSTARG	QESIPARM	XSTEPS	LAPXSTP
LP2 (+3.5")	0	0"	NA	+53	
1	-160	+7.62"	-160	-107	
2	-200	+9.52"	-40	-147	

end of 1222 exposures for Visit 02

1623 Aperture positions

Step	XAPER	POSTARG	QESIPARM	XSTEPS	LAPXSTP
LP2	0	0"	(0-(-200))=200	+53	
1	-152	+7.24"	-152	-99	
2	-168	+8.00"	-16	-115	
3	-184	+8.76"	-16	-131	
4	-200	+9.52"	-16	-147	
5	-216	+10.29"	-16	-163	

end visit 02

----Updates made 3/2/2021 for HOPR----

Visit 02 was a partial failure. Visit 52 will be the repeat of the failed observations.

Visit 02 failed after the G130M/1222 exposures at +66 pix from LP5. Visit 52 will redo the ACQ/IMAGE then begin the observations at LP5 + 88pix

Proposal 16472 (STScI Edit Number: 1, Created: Tuesday, March 2, 2021 at 1:00:29 PM Eastern Standard Time) - Overview
for the first G130M/1222 exposure. The QESIPARM keyword has been adjusted for +88pix now that it is the first science exposure in the visit instead of second. All subsequent exposures in Visit 52 have not been changed from Visit 02.

----SPECIAL REQUESTS:-----

1. Please turn off calibration for the COS/FUV exposures

(SQL to modify qexposure.control_id). See G. Chapman/M. Reinhart.

Proposal 16472 - Visit 01 - COS/FUV Gain Map and Aperture Placement at LP6

Visit	<p>Proposal 16472, Visit 01, completed</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: S/C, COS, COS/FUV, COS/NUV</p> <p>Special Requirements: (none)</p> <p><i>Comments: Data from visit 01 must be analyzed before proceeding with visit 02.</i></p> <p><i>SQL needed to turn off calibration for the COS/FUV exposures.</i></p>
	Diagnostics

Proposal 16472 - Visit 01 - COS/FUV Gain Map and Aperture Placement at LP6

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	WD0308-565 Alt Name1: GSC08495-00951 Alt Name2: 3UC068-006526	RA: 03 09 47.9200 (47.4496667d) Dec: -56 23 49.41 (-56.39706d) Equinox: J2000	Proper Motion RA: 150.6 mas/yr Proper Motion Dec: 64.3 mas/yr Epoch of Position: 2000 Radial Velocity: -68 km/sec	V=14.07+/-0.02	Reference Frame: ICRS
<p><i>Comments: Position and proper motions from the Third U.S. Naval Observatory CCD Astrograph Catalog (UCAC3) Zacharias et al. 2009</i></p> <p>Category=STAR Description=[DB] Extended=NO</p>						

Proposal 16472 - Visit 01 - COS/FUV Gain Map and Aperture Placement at LP6

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/IMAG E #1 (COS.ta.140 7046)	(2) WD0308-565	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				42 Secs (42 Secs) [==>]	[1]
2	Initialize G1 30M/1222 at LP2 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO			12 Secs (12 Secs) [==>]	[1]
<i>Comments: Take an initial exposure at LP2 in order to set the zero point of the aperture moves</i>									
3	Set HV to 1 67/169	DARK	S/C, DATA, NONE			SAA CONTOUR 31; SPEC COM INSTR ELHVADJPROP; QESIPARM ENDC TSB 169; QESIPARM ENDC TSA 167		39 Secs (39 Secs) [==>]	[1]
<i>Comments: Set HV to 167/169</i>									
<i>Exp time = 39 + ceiling (max_upward_count_delta * 1.1)</i>									
<i>Notes: Special observation requirement SAA = 31 needed whenever executing special commands (SAA = 31 is implicitly assumed for all standard COS commands).</i>									
4	Move Aper LP5+22pix (0)	NONE	COS, ALIGN/APER		XAPER=-80; YAPER=0	QESIPARM XSTEP S -80		0.0 Secs (0 Secs) [==>]	[1]
<i>Comments: Scale is -21 motor steps/" for XAPER (Cross-dispersion) and Plate scale is ~0.086 arcsec/pix LP2 to LP5 is XAPER=-40 Move +22 Y pixels from LP5 = 22pix * 0.086 "/pix * 21 steps/" = 39.732 XAPER steps rounded to 40 steps XAPER = -40 + -40 = -80</i>									
<i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i>									
5	G130M/122 2 FP=1 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,3.81		200 Secs (200 Secs) [==>]	[1]
6	G130M/122 2 FP=3 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,3.81		200 Secs (200 Secs) [==>]	[1]

Exposures

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7	Move Aper LP5+44 pix (0)	NONE	COS, ALIGN/APER		XAPER=-120; YAPER=0	QESIPARM XSTEP S -40	0.0 Secs (0 Secs) [==>]	[1]
<p><i>Comments: Scale is - 21 motor steps/" for XAPER (Cross-dispersion) Move +22 Y Pix from last exposure = -40 XAPER XAPER = -80 + -40 = -120</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
8	G130M/122 2 FP=1 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,5.71	200 Secs (200 Secs) [==>]	[1]
9	G130M/122 2 FP=3 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,5.71	200 Secs (200 Secs) [==>]	[1]
10	Move Apert ure back to LP2 (0)	NONE	COS, ALIGN/APER		XAPER=0; YAPER=0	QESIPARM XSTEP S 120	0.0 Secs (0 Secs) [==>]	[1]
<p><i>Comments: Previous exposure was -120 XAPER steps from LP2 so to return to LP2 we set QESIPARM XSTEPS = 120</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
11	Initialize G1 60M/1623 at LP2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO		12 Secs (12 Secs) [==>]	[1]
<p><i>Comments: Take an initial exposure at LP2 in order to set the zero point of the aperture moves</i></p>								
12	Move Aper LP5+9pix (0)	NONE	COS, ALIGN/APER		XAPER=-56; YAPER=0	QESIPARM XSTEP S -56	0.0 Secs (0 Secs) [==>]	[1]
<p><i>Comments: Scale is - 21 motor steps/" for XAPER (Cross-dispersion) LP2 to LP5 is XAPER=-40 Move + 9 pixels from LP5 0.086 arcsec/pix * 9 pixels * 21 steps/arcsec = move up 16.254 steps rounded to 16 steps XAPER = -40 + -16 = -56</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
13	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,2.67	200 Secs (200 Secs) [==>]	[1]

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14	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,2.67	200 Secs (200 Secs) [==>]	[2]
15	Move Aper LP5+18pix (0)	NONE	COS, ALIGN/APER		XAPER=-72; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[2]
<p><i>Comments: Scale is - 21 motor steps/" for XAPER (Cross-dispersion) Move +9 Y Pix from last exposure = -16 XAPER XAPER = -56 + -16 = -72</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
16	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,3.43	200 Secs (200 Secs) [==>]	[2]
17	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,3.43	200 Secs (200 Secs) [==>]	[2]
18	Move Aper LP5+27pix (0)	NONE	COS, ALIGN/APER		XAPER=-88; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[2]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -72 + -16 = -88</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
19	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,4.19	200 Secs (200 Secs) [==>]	[2]
20	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,4.19	200 Secs (200 Secs) [==>]	[2]

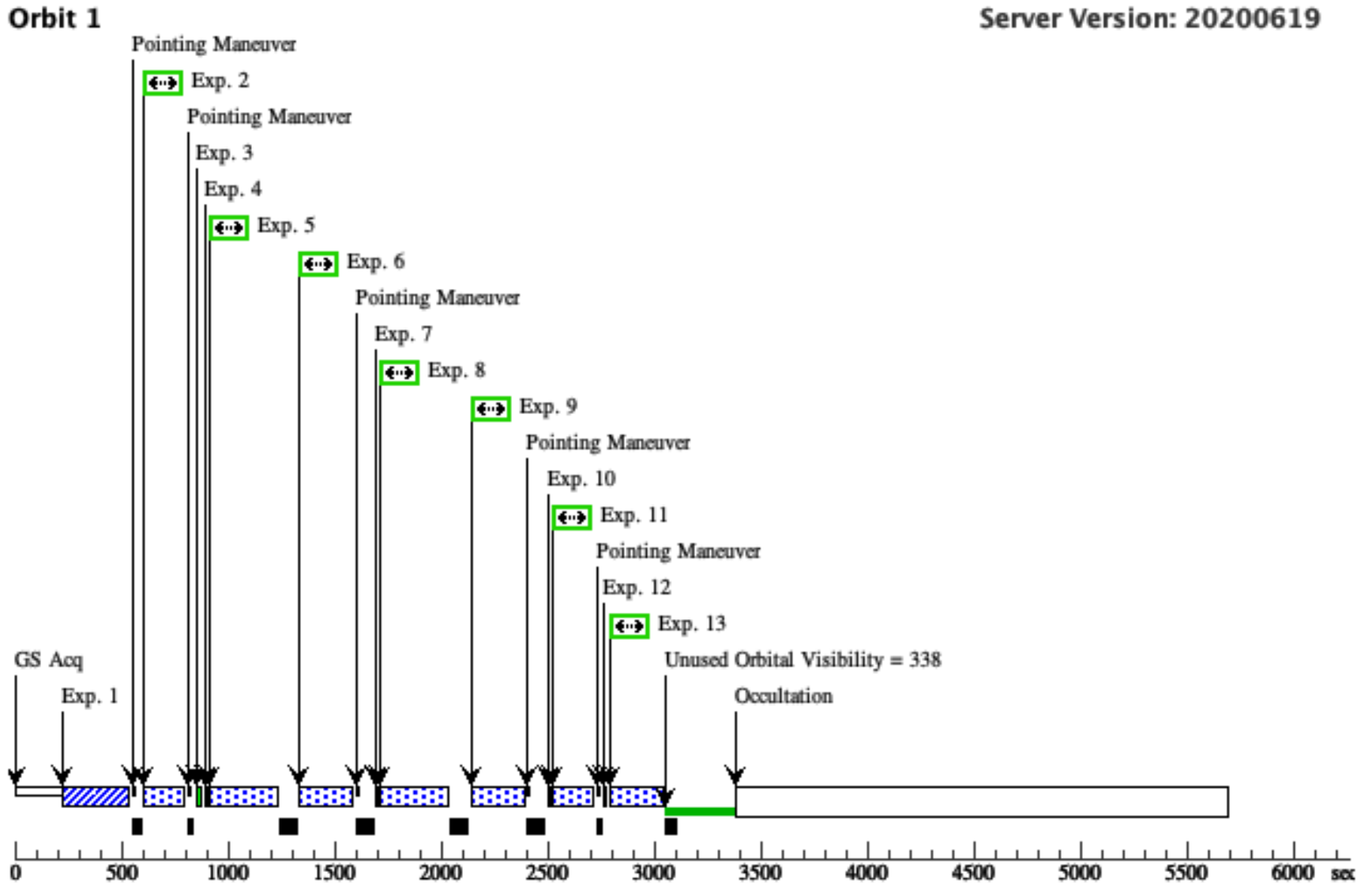
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21	Move Aper LP5+36pix (0)	NONE	COS, ALIGN/APER		XAPER=-104; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[2]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -88 + -16 = -104</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
22	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,4.95	200 Secs (200 Secs) [==>]	[2]
23	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,4.95	200 Secs (200 Secs) [==>]	[3]
24	Move Aper LP5+45pix (0)	NONE	COS, ALIGN/APER		XAPER=-120; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[3]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -104 + -16 = -120</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
25	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,5.71	200 Secs (200 Secs) [==>]	[3]
26	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,5.71	200 Secs (200 Secs) [==>]	[3]
27	Move Aper LP5+54pix (0)	NONE	COS, ALIGN/APER		XAPER=-136; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[3]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -120 + -16 = -136</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								

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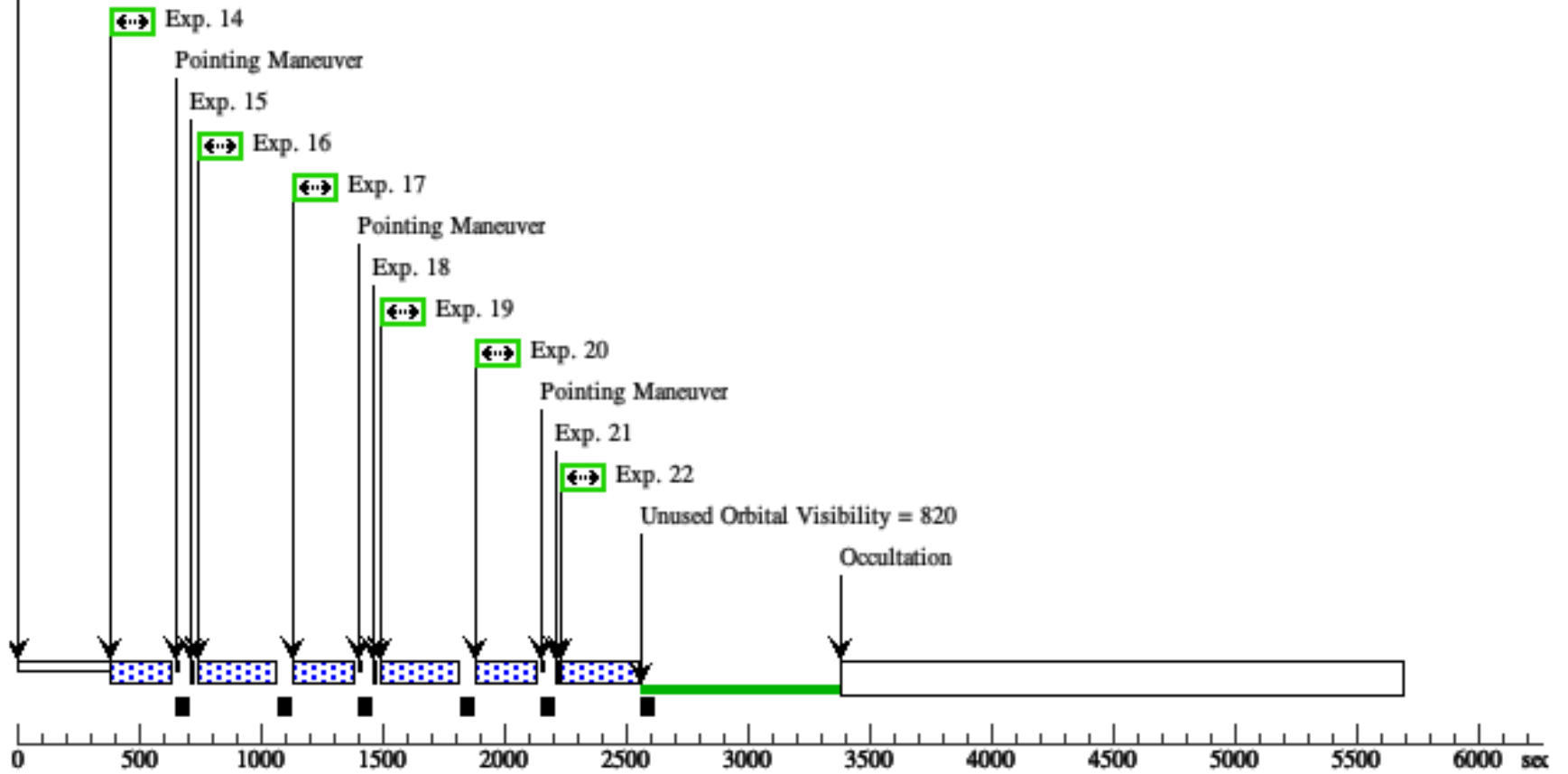
28	G160M/162 (2) WD0308-565 3 FP=2 (COS.sp.147 0389)	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; POS TARG 0,6.48 BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	200 Secs (200 Secs) [==>]	[3]
29	G160M/162 (2) WD0308-565 3 FP=4 (COS.sp.147 0389)	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; POS TARG 0,6.48 BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	200 Secs (200 Secs) [==>]	[3]

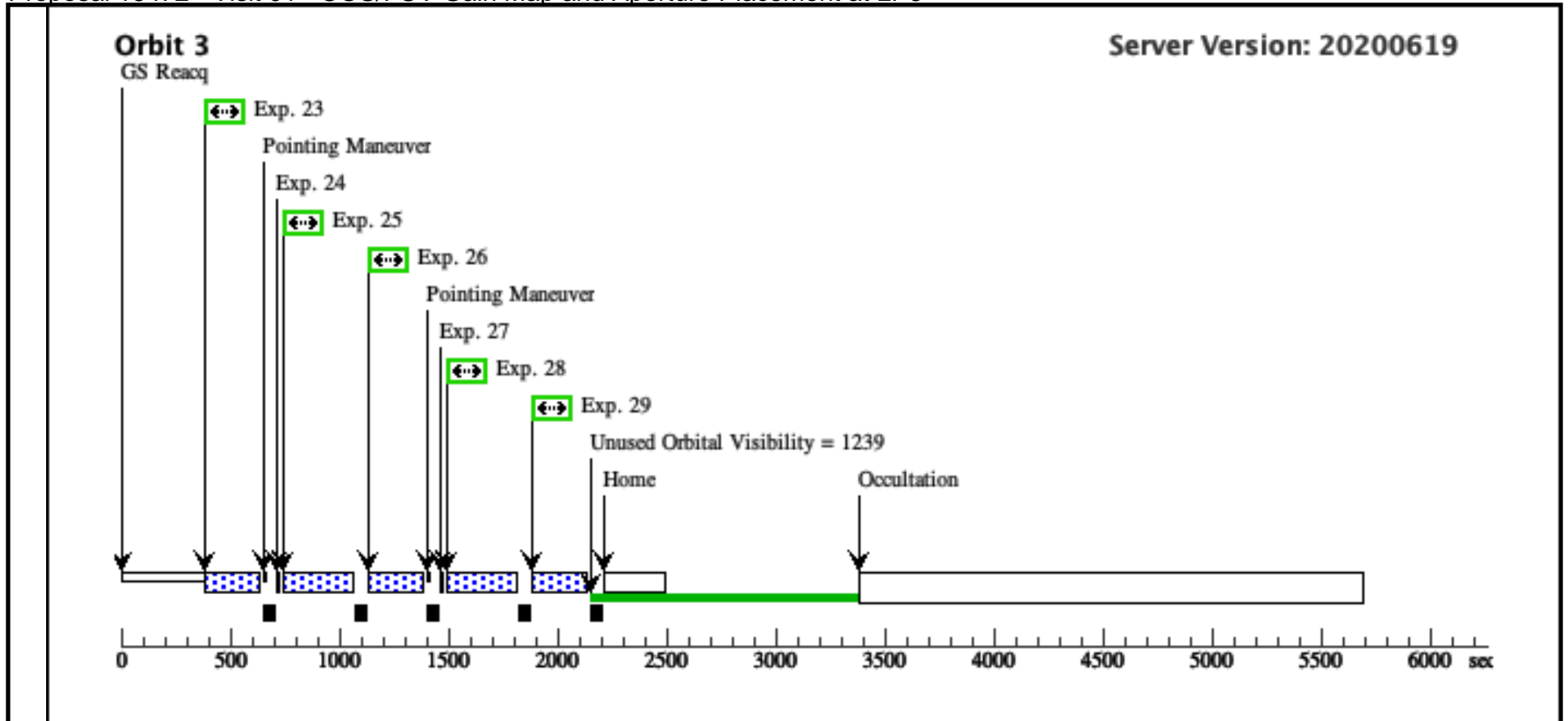
Orbit Structure



Orbit 2

GS Reacq





Proposal 16472 - Visit 02 - COS/FUV Gain Map and Aperture Placement at LP6

Tue Mar 02 18:00:30 GMT 2021

Visit	<p>Proposal 16472, Visit 02, failed</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: S/C, COS, COS/FUV, COS/NUV</p> <p>Special Requirements: (none)</p> <p><i>Comments: Visit 02 should not be scheduled until data from visit 01 is analyzed (i.e. v02 after v01 by approximately. 4 weeks)</i></p> <p><i>SQL needed to turn off calibration for the COS/FUV exposures.</i></p>																																		
	Diagnostics	<p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p> <p>(Visit 02) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT</p>																																	
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Proposal 16472 - Visit 02 - COS/FUV Gain Map and Aperture Placement at LP6

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/IMAG E #1 (COS.ta.140 7046)	(2) WD0308-565	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				42 Secs (42 Secs) [==>]	[1]
2	Initialize G1 30M/1222 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO			12 Secs (12 Secs) [==>]	[1]
<i>Comments: Take an initial exposure at LP2 in order to set the zero point of the aperture moves</i>									
3	Set HV to 1 67/169	DARK	S/C, DATA, NONE			SAA CONTOUR 31; SPEC COM INSTR ELHVADJPROP; QESIPARM ENDC TSB 169; QESIPARM ENDC TSA 167		39 Secs (39 Secs) [==>]	[1]
<i>Comments: Set HV to 169/169</i>									
<i>Exp time = 39 + ceiling (max_upward_count_delta * 1.1)</i>									
<i>Notes: Special observation requirement SAA = 31 needed whenever executing special commands (SAA = 31 is implicitly assumed for all standard COS commands).</i>									
4	Move Aper LP5+66pix (0)	NONE	COS, ALIGN/APER		XAPER=-160; YAPER=0	QESIPARM XSTEP S -160		0.0 Secs (0 Secs) [==>]	[1]
<i>Comments: Scale is - 21 motor steps/" for XAPER (Cross-dispersion) Start exposure at +66 pixels from LP5 LP2 to LP5 = -40 XAPER +44 pixels was at XAPER = -120 to move additional +22 y pix = -40 XAPER XAPER = -120 + -40 = -160</i>									
<i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i>									
5	G130M/122 2 FP=1 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,7.62		200 Secs (200 Secs) [==>]	[1]
6	G130M/122 2 FP=3 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,7.62		200 Secs (200 Secs) [==>]	[1]

Proposal 16472 - Visit 02 - COS/FUV Gain Map and Aperture Placement at LP6

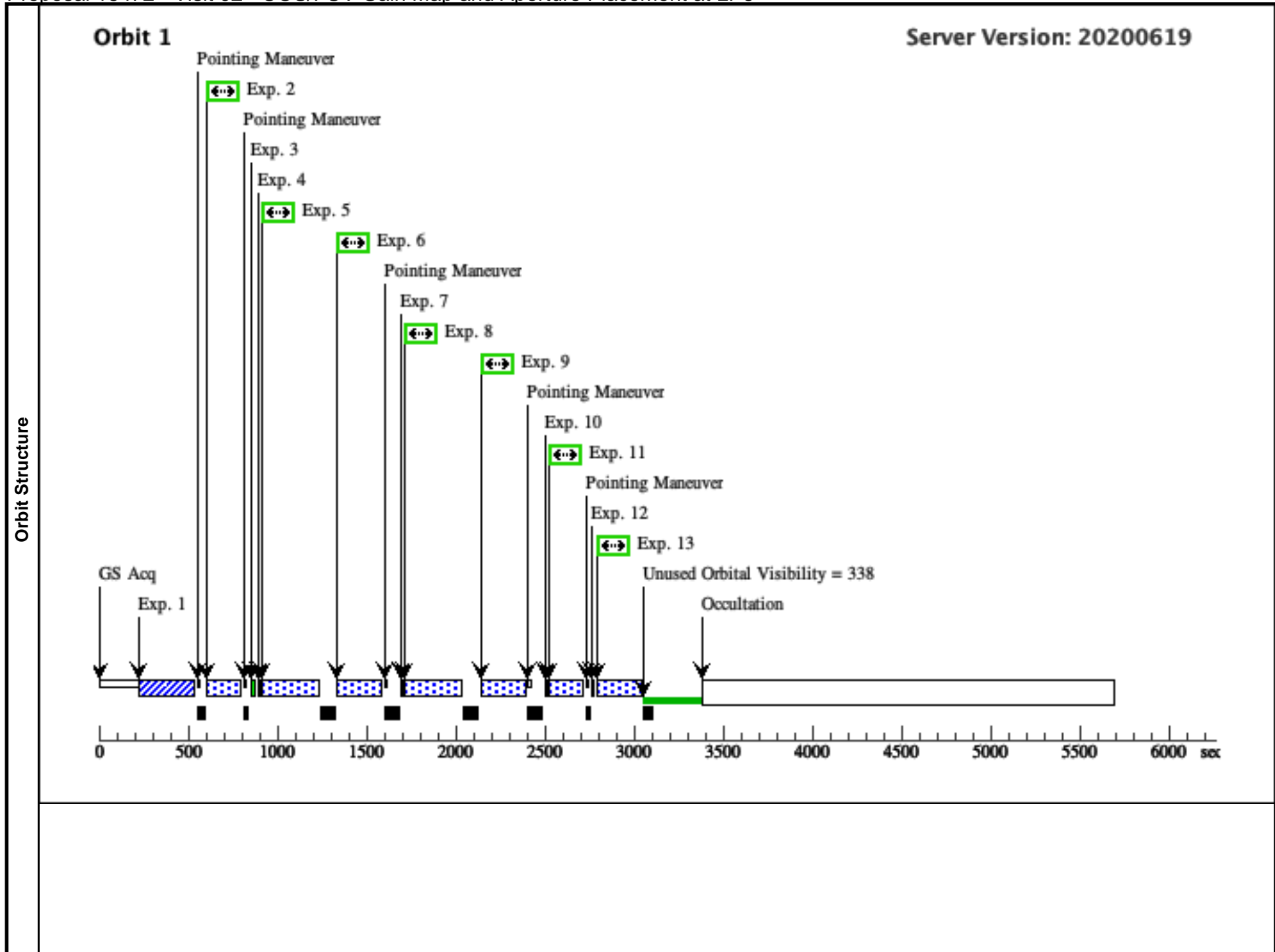
7	Move Aper LP5+88 pix (0)	NONE	COS, ALIGN/APER		XAPER=-200; YAPER=0	QESIPARM XSTEP S -40	0.0 Secs (0 Secs) [==>]	[1]
<p><i>Comments: Move +22 Y Pix from last exposure = -40 XAPER XAPER = -160 + -40 = -200</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
8	G130M/122 2 FP=1 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,9.52	200 Secs (200 Secs) [==>]	[1]
9	G130M/122 2 FP=3 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,9.52	200 Secs (200 Secs) [==>]	[1]
10	Move Apert ure back to LP2 (0)	NONE	COS, ALIGN/APER		XAPER=0; YAPER=0	QESIPARM XSTEP S 200	0.0 Secs (0 Secs) [==>]	[1]
<p><i>Comments: Scale is - 21 motor steps/" for XAPER (Cross-dispersion) Previous exposures were taken at XAPER = -200 (relative to LP2) To return to LP2 we set XAPER = 0 and QESIPARM XSTEPS = 200</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
11	Initialize G1 60M/1623 at LP2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO		12 Secs (12 Secs) [==>]	[1]
<p><i>Comments: Take an initial exposure at LP2 in order to set the zero point of the aperture moves</i></p>								
12	Move Aper LP5+63pix (0)	NONE	COS, ALIGN/APER		XAPER=-152; YAPER=0	QESIPARM XSTEP S -152	0.0 Secs (0 Secs) [==>]	[1]
<p><i>Comments: Scale is - 21 motor steps/" for XAPER (Cross-dispersion) LP2 to LP5 is XAPER=-40 Move + 63 pixels from LP5 +54 pixels from LP5 was at XAPER = -136 to move additional +9 pixels = -16 XAPER XAPER = -136 + -16 = -152</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								

Proposal 16472 - Visit 02 - COS/FUV Gain Map and Aperture Placement at LP6

13	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,7.29	200 Secs (200 Secs) [==>]	[1]
14	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,7.29	200 Secs (200 Secs) [==>]	[2]
15	Move Aper LP5+72pix (0)	NONE	COS, ALIGN/APER		XAPER=-168; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[2]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -152 + -16 = -168</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
16	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,8.10	200 Secs (200 Secs) [==>]	[2]
17	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,8.10	200 Secs (200 Secs) [==>]	[2]
18	Move Aper LP5+81pix (0)	NONE	COS, ALIGN/APER		XAPER=-184; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[2]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -168 + -16 = -184</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
19	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,8.86	200 Secs (200 Secs) [==>]	[2]

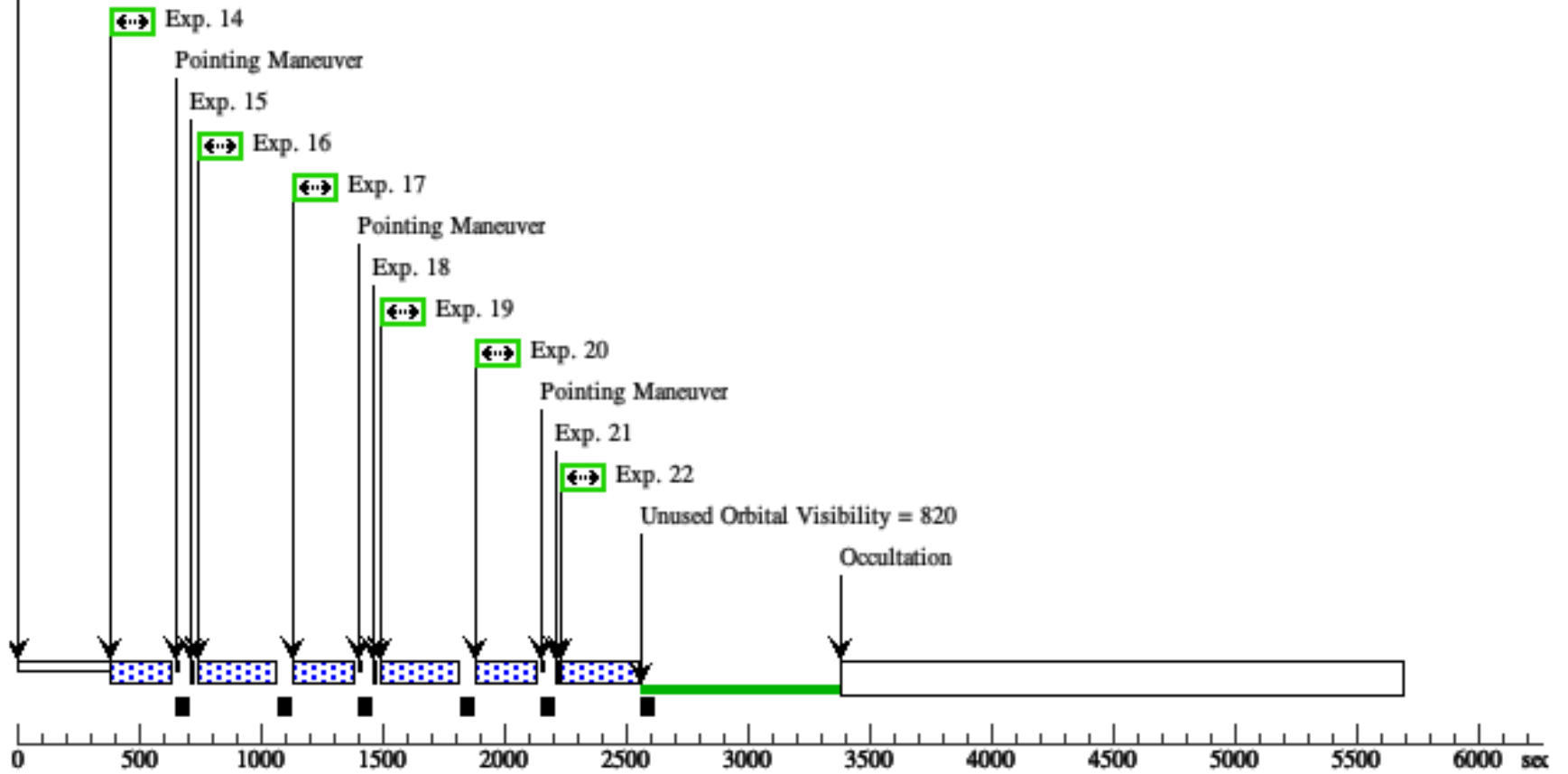
Proposal 16472 - Visit 02 - COS/FUV Gain Map and Aperture Placement at LP6

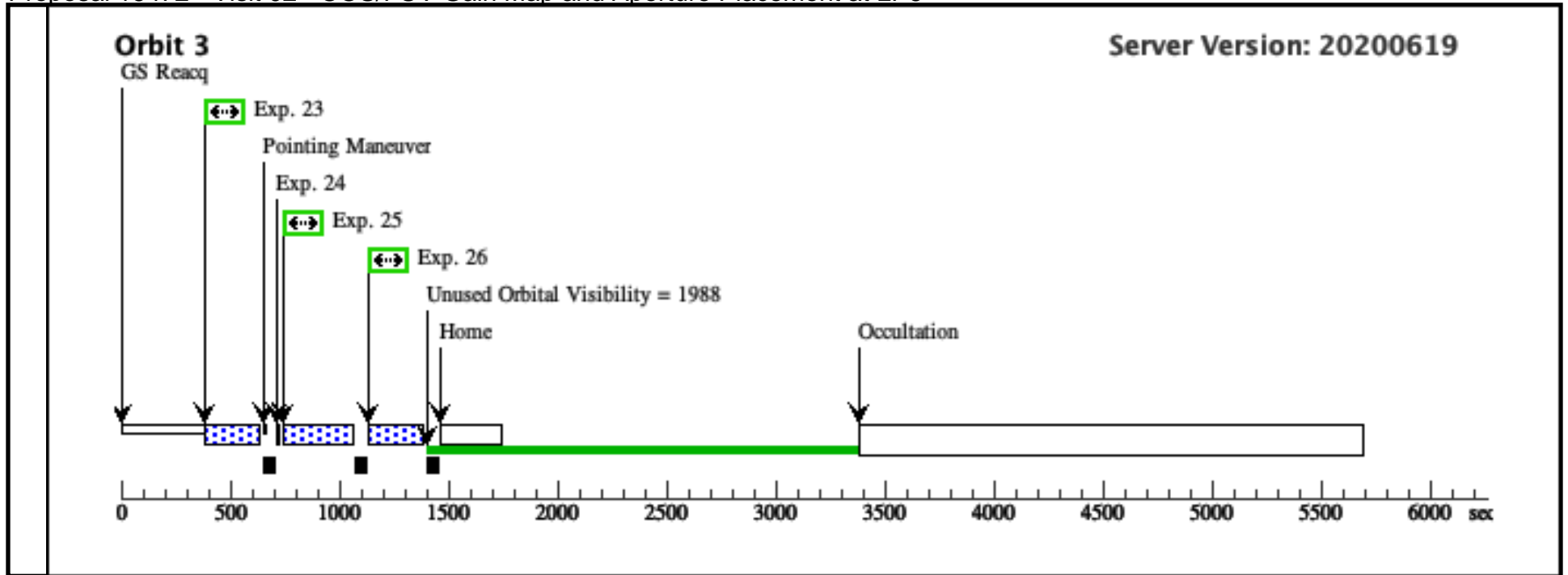
20	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,8.86	200 Secs (200 Secs) [==>]	[2]
21	Move Aper LP5+90pix (0)	NONE	COS, ALIGN/APER		XAPER=-200; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[2]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -184 + -16 = -200</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
22	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,9.62	200 Secs (200 Secs) [==>]	[2]
23	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,9.62	200 Secs (200 Secs) [==>]	[3]
24	Move Aper LP5+99pix (0)	NONE	COS, ALIGN/APER		XAPER=-216; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[3]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -200 + -16 = -216</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
25	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,10.38	200 Secs (200 Secs) [==>]	[3]
26	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,10.38	200 Secs (200 Secs) [==>]	[3]



Orbit 2

GS Reacq





Proposal 16472 - Visit 52 - COS/FUV Gain Map and Aperture Placement at LP6

Tue Mar 02 18:00:30 GMT 2021

Visit	<p>Proposal 16472, Visit 52</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: S/C, COS, COS/FUV, COS/NUV</p> <p>Special Requirements: (none)</p> <p><i>Comments: Visit 02 should not be scheduled until data from visit 01 is analyzed (i.e. v02 after v01 by approximately. 4 weeks)</i></p> <p><i>SQL needed to turn off calibration for the COS/FUV exposures.</i></p> <p><i>HOPR repeat of visit 02.</i></p>																																			
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			Radial Velocity: -68 km/sec																																	

Proposal 16472 - Visit 52 - COS/FUV Gain Map and Aperture Placement at LP6

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/IMAG E #1 (COS.ta.140 7046)	(2) WD0308-565	COS/NUV, ACQ/IMAGE, BOA	MIRRORA				42 Secs (42 Secs) [==>]	[1]
2	Initialize G1 30M/1222 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO			12 Secs (12 Secs) [==>]	[1]
<i>Comments: Take an initial exposure at LP2 in order to set the zero point of the aperture moves</i>									
3	Set HV to 1 67/169	DARK	S/C, DATA, NONE			SAA CONTOUR 31; SPEC COM INSTR ELHVADJPROP; QESIPARM ENDC TSB 169; QESIPARM ENDC TSA 167		39 Secs (39 Secs) [==>]	[1]
<i>Comments: Set HV to 169/169</i>									
<i>Exp time = 39 + ceiling (max_upward_count_delta * 1.1)</i>									
<i>Notes: Special observation requirement SAA = 31 needed whenever executing special commands (SAA = 31 is implicitly assumed for all standard COS commands).</i>									
4	Move Aper LP5+88 pix (0)	NONE	COS, ALIGN/APER		XAPER=-200; YAPER=0	QESIPARM XSTEP S -200		0.0 Secs (0 Secs) [==>]	[1]
<i>Comments: Scale is - 21 motor steps/" for XAPER (Cross-dispersion) Start exposure at +88 pixels from LP5 +66 pixels was at XAPER = -160 Move +22 Y Pix from last exposure = -40 XAPER XAPER = -160 + -40 = -200</i>									
<i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i>									
5	G130M/122 2 FP=1 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=1; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,9.52		200 Secs (200 Secs) [==>]	[1]
6	G130M/122 2 FP=3 (COS.sp.147 0375)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=3; BUFFER-TIME=26 1; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,9.52		200 Secs (200 Secs) [==>]	[1]

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7	Move Aper ure back to LP2 (0)	NONE	COS, ALIGN/APER		XAPER=0; YAPER=0	QESIPARM XSTEP S 200	0.0 Secs (0 Secs) [==>]	[1]
<p><i>Comments: Scale is - 21 motor steps/" for XAPER (Cross-dispersion) Previous exposures were taken at XAPER = -200 (relative to LP2) To return to LP2 we set XAPER = 0 and QESIPARM XSTEPS = 200</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
8	Initialize G1 60M/1623 at LP2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO		12 Secs (12 Secs) [==>]	[1]
<p><i>Comments: Take an initial exposure at LP2 in order to set the zero point of the aperture moves</i></p>								
9	Move Aper LP5+63pix (0)	NONE	COS, ALIGN/APER		XAPER=-152; YAPER=0	QESIPARM XSTEP S -152	0.0 Secs (0 Secs) [==>]	[1]
<p><i>Comments: Scale is - 21 motor steps/" for XAPER (Cross-dispersion) LP2 to LP5 is XAPER=-40 Move + 63 pixels from LP5 +54 pixels from LP5 was at XAPER = -136 to move additional +9 pixels = -16 XAPER XAPER = -136 + -16 = -152</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
10	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,7.29	200 Secs (200 Secs) [==>]	[1]
11	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,7.29	200 Secs (200 Secs) [==>]	[1]
12	Move Aper LP5+72pix (0)	NONE	COS, ALIGN/APER		XAPER=-168; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[1]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -152 + -16 = -168</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								

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13	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,8.10	200 Secs (200 Secs) [==>]	[1]
14	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,8.10	200 Secs (200 Secs) [==>]	[1]
15	Move Aper LP5+81pix (0)	NONE	COS, ALIGN/APER		XAPER=-184; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[2]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -168 + -16 = -184</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
16	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,8.86	200 Secs (200 Secs) [==>]	[2]
17	G160M/162 3 FP=4 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,8.86	200 Secs (200 Secs) [==>]	[2]
18	Move Aper LP5+90pix (0)	NONE	COS, ALIGN/APER		XAPER=-200; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[2]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -184 + -16 = -200</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>								
19	G160M/162 3 FP=2 (COS.sp.147 0389)	(2) WD0308-565	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,9.62	200 Secs (200 Secs) [==>]	[2]

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20	G160M/162 (2) WD0308-565 3 FP=4 (COS.sp.147 0389)	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,9.62	200 Secs (200 Secs) [==>]	[2]
21	Move Aper NONE LP5+99pix (0)	COS, ALIGN/APER		XAPER=-216; YAPER=0	QESIPARM XSTEP S -16	0.0 Secs (0 Secs) [==>]	[2]
<p><i>Comments: Move +9 Y Pix from last exposure = -16 XAPER XAPER = -200 + -16 = -216</i></p> <p><i>Note: once the APM is moved it will not be reset as long as the config (COS/FUV), aperture, FP-POS, and LP are not changed</i></p>							
22	G160M/162 (2) WD0308-565 3 FP=2 (COS.sp.147 0389)	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=2; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,10.38	200 Secs (200 Secs) [==>]	[2]
23	G160M/162 (2) WD0308-565 3 FP=4 (COS.sp.147 0389)	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FP-POS=4; BUFFER-TIME=50 6; LIFETIME-POS=L P2; FLASH=NO; WAVECAL=NO	POS TARG 0,10.38	200 Secs (200 Secs) [==>]	[2]

Orbit Structure

