13195 - COS Side 2 Internal FUV Wavelength Verification

Cycle: 32, Proposal Category: CAL/COS

(Availability Mode: RESTRICTED)

INVESTIGATORS

Name	*Institution*
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Dr. David J. Sahnow (CoI) (Contact)	Space Telescope Science Institute
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Dr. Svea S Hernandez (CoI) (ESA Member) (Contact)	Space Telescope Science Institute - ESA - JWST

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	WAVE	COS/FUV	1	16-Dec-2024 11:00:31.0	yes
02	WAVE	COS/FUV	1	16-Dec-2024 11:00:32.0	yes
03	DARK DEUTERIUM NONE	COS COS/FUV S/C	1	16-Dec-2024 11:00:33.0	yes

3 Total Orbits Used

ABSTRACT

Test that the OSM1 coarse resolver goes to the proper location at blue mode and all FUV extreme central wavelength settings using the side-2 electronics.
Also test deuterium lamp #1 functionality at side-2.

OBSERVING DESCRIPTION

COS SIDE-2 ACTIVITY TITLE: COS Side 2 Internal FUV Wavelength Verification

DESCRIPTION:
Visit 01 (internal) - Take lampflash data at G130M central wavelengths [1055, 1096, 1291, 1222, 1327].
Visit 02 (internal) - Take lampflash data at G160M central wavelengths [1533, 1577, 1623] and G140L [1280, 800, 1105].
Visit 03 (internal) - Take deuterium lamp #1 exposure to test its functionality with side-2 electronics.

This entire activity will be conducted as a series of internal exposures

DEPENDENCIES:

DURATION: 3 orbits (internal)

--------- Additional Comments ----------

SCHEDULING CONSTRAINTS:
** Following a success oriented approach the constraints in this program were modified: This program should
only execute after program 13190 (COS Side 2 FUV Detector Recovery After MEB Side Switch) completes - C. Oliveira Aug 28 2013 **

ANALYSES & EXPECTED RESULTS:
Wavecal data will be run through CALCOS in order to determine the SHIFT1A and SHIFT1B keywords, the cross-correlation AD offset from the LAMPTAB template taken with side-1 electronics.
Shifts should be no greater than 1/2 FP-POS.

Special software needs: None

FTEs (days/weeks) needed for analysis: 1 FTE day

All comments above here are from the original submission by Sean Lockwood

2017-10-23:
PI switched to Nick Indriolo and CO-Is no longer on the COS team removed
"Optional" keywords have been added as required by the COS2025 changes to APT
All observations of the Pt-Ne lamp have been set to execute at LP1
Segment usage has been explicitly defined
The deuterium flat has been set to execute at LP4 (since the LP1 PSA region is severely gain-sagged)

2019-05-14:
PI is Will Fischer, following Nick Indriolo's departure from the Institute.
Dave Sahnow remarks that this program will also give us a quick check of the gain measured while using the Side 2 electronics. To facilitate comparison with deuterium data taken within the previous six months (PID 15534), Visit 03 is being replaced with an exact copy of 15534, visit 4A.

2022-08-09:
Co-Is updated to remove those no longer on the COS team and add the current COS calibration lead and deputy
Cenwaves 800, 1533 added to Visit 02
Cenwaves 1055, 1096 moved to LP2
All other cenwaves moved to LP4
To facilitate comparison with deuterium data taken within the previous six months (PID 16829), Visit 03 is being replaced with an exact copy of 16829, visit 4C

2023-10-02:

PI is now David French.

Changing wavecal LPs in Visits 1 & 2 to DEFAULT as home position is no longer at LP4.

Proposal 13195 - Visit 01 - COS Side 2 Internal FUV Wavelength Verification

Visit

Proposal 13195, Visit 01, implementation Mon Dec 16 16:00:33 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV

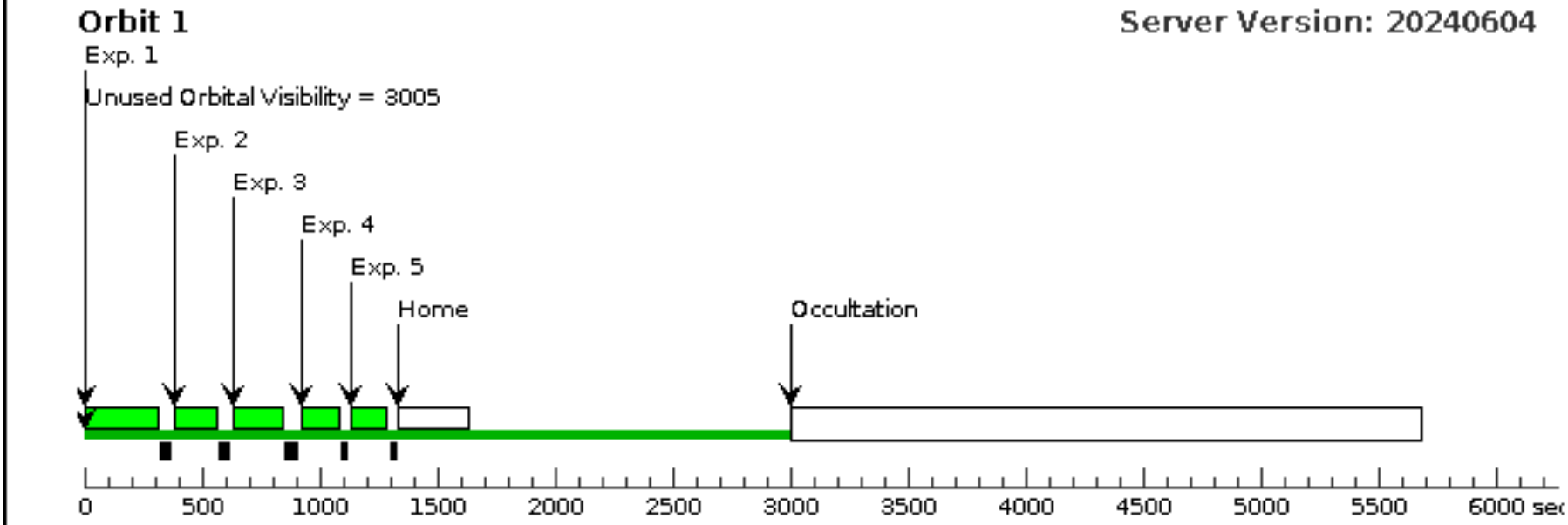
Special Requirements: (none)

Comments: G130M wavecal exposures for side-2 electronics switch.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		WAVE	COS/FUV, TIME-TAG, WCA	G130M 1055 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=BOTH			*[==>]*	***[1]***
2		WAVE	COS/FUV, TIME-TAG, WCA	G130M 1096 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=BOTH			*[==>]*	***[1]***
3		WAVE	COS/FUV, TIME-TAG, WCA	G130M 1222 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=BOTH			*[==>]*	***[1]***
4		WAVE	COS/FUV, TIME-TAG, WCA	G130M 1291 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=BOTH			*[==>]*	***[1]***
5		WAVE	COS/FUV, TIME-TAG, WCA	G130M 1327 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=BOTH			*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 13195, Visit 02, implementation Mon Dec 16 16:00:34 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: (none)

Comments: G160M and G140L wavecal exposures for side-2 electronics switch.

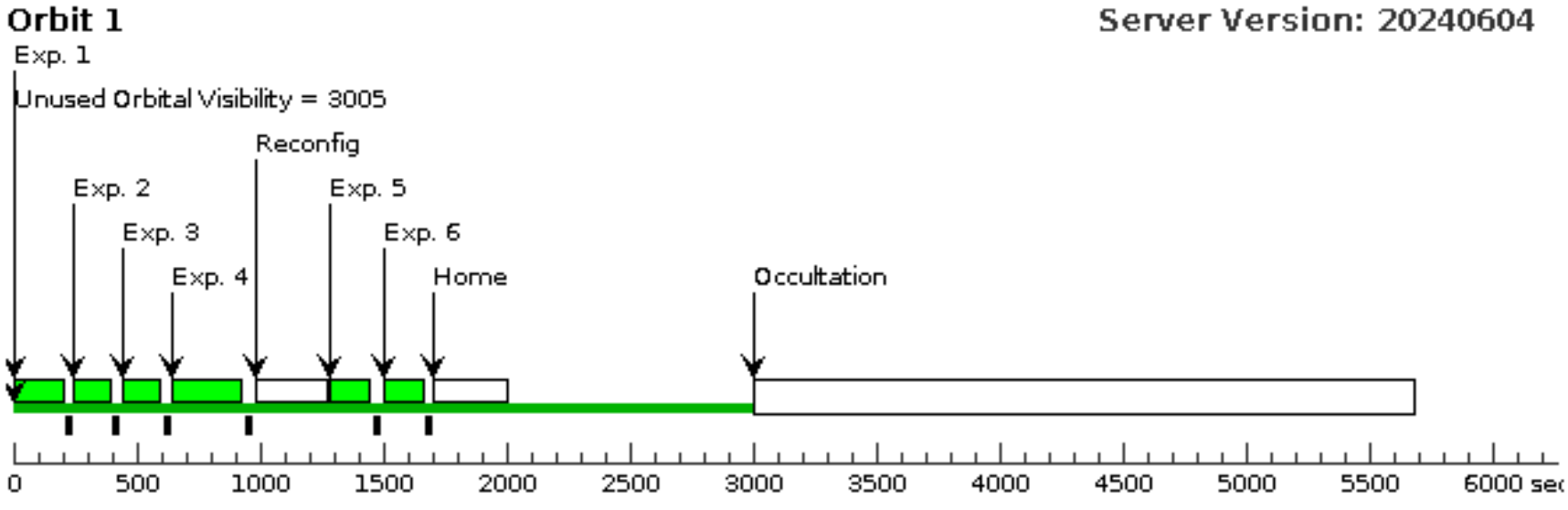
Diagnostics

(Visit 02) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		WAVE	COS/FUV, TIME-TAG, WCA	G160M 1533 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=BOTH			*[==>]*	***[1]***
2		WAVE	COS/FUV, TIME-TAG, WCA	G160M 1577 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=BOTH			*[==>]*	***[1]***
3		WAVE	COS/FUV, TIME-TAG, WCA	G160M 1623 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=BOTH			*[==>]*	***[1]***
4		WAVE	COS/FUV, TIME-TAG, WCA	G140L 1280 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=BOTH			*[==>]*	***[1]***
5		WAVE	COS/FUV, TIME-TAG, WCA	G140L 800 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=A			*[==>]*	***[1]***
6		WAVE	COS/FUV, TIME-TAG, WCA	G140L 1105 A	FP-POS=3; LIFETIME-POS=DEF; SEGMENT=A			*[==>]*	***[1]***

Orbit Structure



Proposal 13195 - Visit 03 - COS Side 2 Internal FUV Wavelength Verification

Visit	**Proposal 13195, Visit 03, implementation** Mon Dec 16 16:00:34 GMT 2024 **Diagnostic Status: Warning** Scientific Instruments: S/C, COS, COS/FUV Special Requirements: PARALLEL *Comments: This visit collects data at LP4. It uses the HV values appropriate for LP4 (173/175).*
Diagnostics	(Visit 03) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB VISIT

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	G160M/1600 Deuterium Exposure - Set up at LP1	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G160M 1600 A	CURRENT=MEDIUM; BUFFER-TIME=196; FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=LP1			125 Secs (125 Secs) *[==>]*	***[1]***
	Comments: Short exposure to set aperture to LP1, which is near the center of the aperture range used in this program. It also sets the HV to the LP1 values.								
2	Adjust HV to LP4 values	DARK	S/C, DATA, NONE			SAA CONTOUR 31; SPEC COM INSTR ELHVADJPROP; QASISTATES COS FUV HVNOM HVNOM; QESIPARM ENDCTSA 173; QESIPARM ENDCTSB 175; QESIPARM SEGMENT AB		39 Secs (39 Secs) *[==>]*	***[1]***
	Comments: Adjust the HV to LP4 values. *Since the HV is not increasing, exposure time = 39 seconds*								
3	Aperture Adjustment 1 for Segment A	NONE	COS, ALIGN/APER		XAPER=121			0.0 Secs (0 Secs) *[==>]*	***[1]***
	Comments: Put the aperture in the appropriate position to illuminate a portion of the LP4 region of the detector when illuminating Segment A with G130M/1309. *FCA LAPXSTP value at LP1 is -153* *Desired LAPXSTP value for FCA to illuminate Segment A with G130M/1309 at Position 1 for LP4 is -32* *Therefore, XAPER is set to -32 - -153 = +121*								
4	G130M/1309 Deuterium Exposure 1	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G130M 1309 A	CURRENT=MEDIUM; BUFFER-TIME=165; FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=LP1			440 Secs (440 Secs) *[==>]*	***[1]***
	Comments: Deuterium exposure optimized for Segment A. FP-POS=1 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.								
5	Aperture Adjustment 2 for Segment A	NONE	COS, ALIGN/APER		XAPER=67	QESIPARM XSTEPS -54		0.0 Secs (0 Secs) *[==>]*	***[1]***
	Comments: Put the aperture in the appropriate position to illuminate a portion of the LP4 region of the detector when illuminating Segment A with G130M/1309. *FCA LAPXSTP value at LP1 is -153* *Desired LAPXSTP value for FCA to illuminate Segment A with G130M/1309 at Position 2 for LP4 is -86* *Therefore, XAPER is set to -86 - -153 = +67. *HOWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS -54" [(+67 - +121) = -54] Special Requirement is necessary to move the aperture to the correct location.*								

6	G130M/1309 Deuterium Exposure 2	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G130M 1309 A	CURRENT=MEDIUM; BUFFER-TIME=165; FP-POS=1; SEGMENT=BOTH; LIFETIME-POS=LP1		440 Secs (440 Secs) *[==>]*	***[1]***

Comments: Deuterium exposure optimized for Segment A. FP-POS=1 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.

7	Aperture Adjustment 1 for Segment B	NONE	COS, ALIGN/APER		XAPER=112	QESIPARM XSTEPS 45	0.0 Secs (0 Secs) *[==>]*	***[1]***

Comments: Put the aperture in the appropriate position to illuminate a portion of the LP4 region of the detector when illuminating Segment B with G160M/1600.

FCA LAPXSTP value at LP1 is -153
Desired LAPXSTP value for FCA to illuminate Segment B with G160M/1600 at Position 1 for LP4 is -41

*Therefore, XAPER is set to -41 - -153 = +112. *HOWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS 45" [(+112 - +67) = +45] Special Requirement is necessary to move the aperture to the correct location.*

8	G160M/1600 Deuterium Exposure 1	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G160M 1600 A	CURRENT=MEDIUM; BUFFER-TIME=165; FP-POS=4; SEGMENT=BOTH; LIFETIME-POS=LP1		440 Secs (440 Secs) *[==>]*	***[1]***

Comments: Deuterium exposure optimmized for Segment B. FP-POS=4 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.

9	Aperture Adjustment 2 for Segment B	NONE	COS, ALIGN/APER		XAPER=58	QESIPARM XSTEPS -54	0.0 Secs (0 Secs) *[==>]*	***[1]***

Comments: Put the aperture in the appropriate position to illuminate a portion of the LP4 region of the detector when illuminating Segment B with G160M/1600.

FCA LAPXSTP value at LP1 is -153
Desired LAPXSTP value for FCA to illuminate Segment B with G160M/1600 at Position 2 for LP4 is -95.

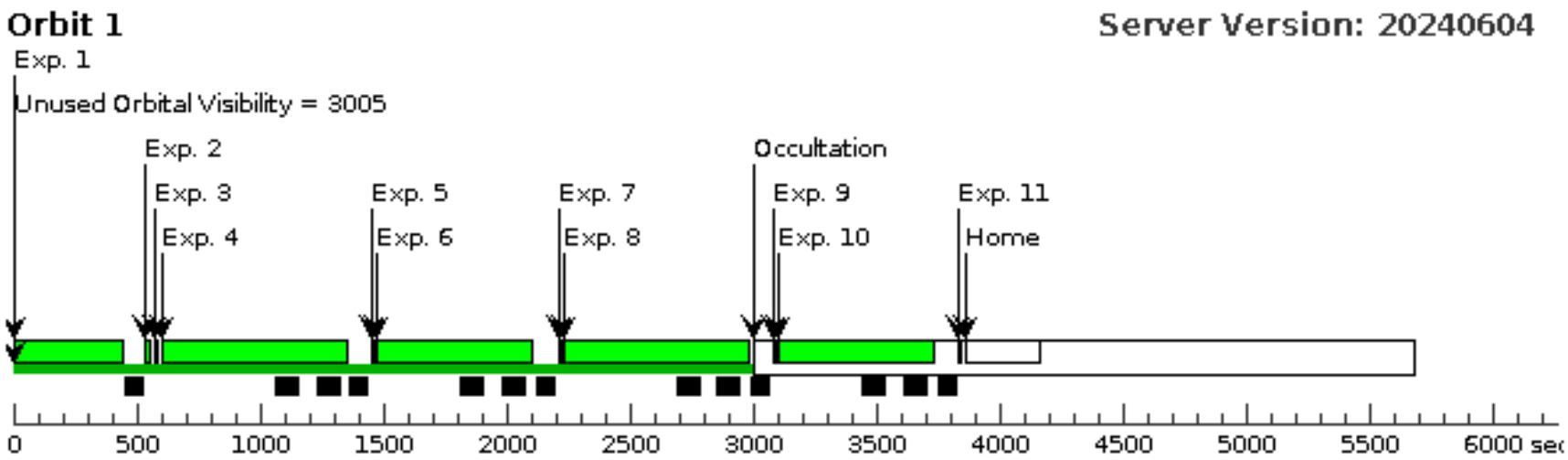
*Therefore, XAPER is set to -95 - -153 = +58. *HOWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS -54" [(+58 - +112) = -54] Special Requirement is necessary to move the aperture to the correct location.*

10	G160M/1600 Deuterium Exposure 2	DEUTERIUM	COS/FUV, TIME-TAG, FCA	G160M 1600 A	CURRENT=MEDIUM; BUFFER-TIME=165; FP-POS=4; SEGMENT=BOTH; LIFETIME-POS=LP1		440 Secs (440 Secs) *[==>]*	***[1]***

Comments: Deuterium exposure optimmized for Segment B. FP-POS=4 was chosen because previous observations show that it has slightly more counts than the other FP-POS values.

11	Return Aperture to Nominal Position	NONE	COS, ALIGN/APER		XAPER=0	QESIPARM XSTEPS -58	0 Secs (0 Secs) *[==>]*	***[1]***

Comments: Return aperture to nominal position by setting XAPER=0

**HOWEVER*, because of the TRANS rules, the "QESIPARM XSTEPS -58" [(0 - 58) = -58] Special Requirement is necessary to move the aperture to its correct location.*

Orbit Structure