16942 - Cycle 30 COS FUV Target Acquisition Monitor

Cycle: 30, Proposal Category: CAL/COS

(Calibration)

(Availability Mode: RESTRICTED)

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) WD-1657+343	COS/FUV COS/NUV	1	20-Oct-2022 08:00:15.0	yes
02	(1) WD-1657+343	COS/FUV COS/NUV	2	20-Oct-2022 08:00:19.0	yes
03	(2) WDG-1 (3) WDG-1-OFFSET+0.7XD (4) WDG-1-OFFSET+0.3XD	COS/FUV COS/NUV	1	20-Oct-2022 08:00:22.0	yes

4 Total Orbits Used

ABSTRACT

This program verifies that FUV spectroscopic target acquisitions are working nominally for the Cycle 30 modes: G130M at LP5, G140L at LP4, G160M at LP4, and G160M at LP6. This program is therefore unchanging from Cycle 29 (16831). For each grating the cenwave with the widest cross dispersion profile in which acquisitions are done is used, yielding the combinations G130M/1291, G140L/1280, and G160M/1600. After the

standard target WD 1657+343 is centered using ACQ/IMAGE we take spectra at the NUM-POS positions used by the PEAKXD and PEAKD algorithms to inspect those regions of the detector and check the vignetted flux. We then perform a PEAKXD and/or PEAKD acquisition and take a spectrum to verify centering. We test PEAKXD with NUM-POS=3 (default) and 5, and PEAKD with NUM-POS=5 (default). A detailed description of the observations is given in the visit level comments.

Originally G160M at LP6 (visit 03) was not included here because this mode had been tested by program 16851 LP6 TA enabling. But because that program found an offset of about 0.1" in the XD direction that visit is being repeated here. Other than the ORIENT constraints and virtual target definitions the visit is identical to vist 03 of 16851.

OBSERVING DESCRIPTION

This program consists of three orbits, each with a non-interrupt sequence. The program is divided into two visits to allows the last two orbits to have schedulability 100, whereas the first orbit needs schedulability 80. The two orbit visit may also be separated into two visits if that facilitates scheduling.

We request that this program execute in January of 2023 (via a BETWEEN), and within 30 days of Visit PB of Program 16939 (via a visit-level comment).

The program is divided into 3 parts, one for each FUV grating. The central wavelengths tested are G130M/1291 at LP5, G140L/1280 at LP4, and G160M/1600 at LP4. These cenwaves were chosen because they provide the widest cross-dispersion profile allowed for acquisitions.

For each grating, we first acquire the target using ACQ/IMAGE, take a spectrum to verify the ACQ/IMAGE centering, take off-centered spectra using POSTARG, and then run an acquisition sequence. The visit level comments contain a detailed description of the observations.

Comments for each exposure give the Buffer Time calculations. However, in most cases we use slighter shorter buffer times in case the targets are brighter than expected. The logic being that if any of the PEAKXDs are not exactly perfect, the followup POS-TARGs may be off and give different count rates than expected.

Visit 03 is a copy of visit 03 of 16851 LP6 TA enabling, with new ORIENT constraints and therefore new virtual target definitions.

Visit

Proposal 16942, PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01), implementation

Thu Oct 20 12:00:23 GMT 2022

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 80%; BETWEEN 01-JAN-2023:00:00:00 AND 31-JAN-2023:00:00:00

Comments: This visit is separated from visit 2 because this visit needs schedulability 80, whereas visit 2 can use 100.
This visit has the following timing requirement:
** It should execute between 1/1/23 and 1/31/23*
** It should execute within 30 days of visit PB of program 16939*

This visit tests spectroscopic target acquisition using FUV G130M/1291. The sequence of events is as follows
01.001 - NUV ACQ/IMAGE
01.002 - NUV Image with WCA lamps, to check alignment later on.
01.003 - G130M/1291 spectrum to establish center position after ACQ/IMAGE
01.004, 01.005 - +/-1.3" XD POSTARGS to simmulate NUM-POS=3 PEAKXD
01.006 - PEAKXD with NUM-POS=3
01.007 - Verification spectrum
01.008 to 01.011 - Simulates PEAKXD with NUM-POS=5, STEP-SIZE=0.9
01.012 - PEAKXD with NUM-POS=5
01.013 - Verification spectrum
01.014 - PEAKD
01.015 - Verification spectrum

Diagnostics

(PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions when observing at a given COS cenwave. See the COS Instrument Handbook for exceptions that may apply to observations with G130M/1291 or G160M.

(PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

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(PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WD-1657+343	RA: 16 58 51.1202 (254.7130008d)	Proper Motion RA: 11 mas/yr	V=16.1	Reference Frame: ICRS
		Dec: +34 18 53.29 (34.31480d)	Proper Motion Dec: -31 mas/yr		
		Equinox: J2000	Epoch of Position: 2000		
			Radial Velocity: 78 km/sec		

Comments: COS.ta.1032496 indicates S/N = 40 in 5.2s. SIMBAD cordinates are 16 58 51.1202 +34 18 53.293
Proper Motion from SIMBAD is Proper motions mas/yr : 11 -31 [3 3 133] C 2011MNRAS.417.1210G, RV=78

B 16.12 [~] D ~
u (AB) 15.749 [0.005] B 2013yCat.5139....0A
g (AB) 16.139 [0.003] B 2013yCat.5139....0A
r (AB) 16.691 [0.004] B 2013yCat.5139....0A
i (AB) 17.054 [0.005] B 2013yCat.5139....0A
z (AB) 17.388 [0.015] C 2013yCat.5139....0A
Category=STAR
Description=[DA]
Extended=NO

Exposures

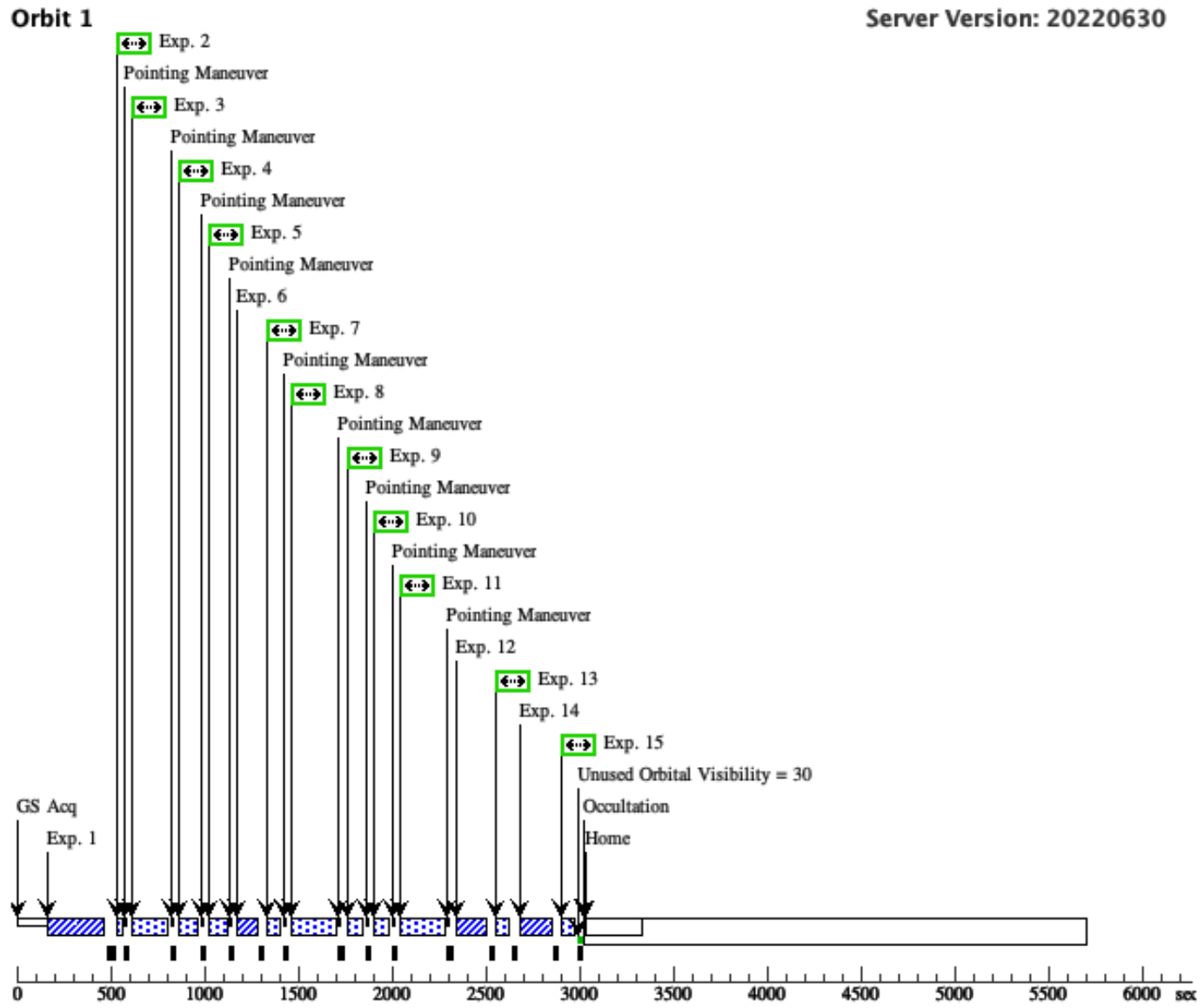
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	PSA/MIRRORB ACQ/IMAGE (COS.ta.1540223)	(1) WD-1657+343	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	7 Secs (7 Secs) *[==>]*	***[1]***
2	PSA/MIRRORB LAMP+TARGET IMAGE (P2/MEDIUM) (COS.im.1540224)	(1) WD-1657+343	COS/NUV, TIME-TAG, PSA	MIRRORB	BUFFER-TIME=150; FLASH=S0060D015; CURRENT=MEDIUM	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	15.0 Secs (15 Secs) *[==>]*	***[1]***
	Comments: PSA/MIRRORB/P2/MED current, see above for expected count rates. To get PtNe Lamp 2, there are 2 QESIPARMs set: *USELAMP = LINE2* *CURRENT = MEDIUM* *This target was used in Visit BA of 14857 (ldozbadhq). Bck subtracted counts in second image = 5430 ; S/N = 73.69, ET=13s* *For the Lamp, LAMP/CURRENT USED = P2/Medium, LAMP EXPTIME = 12.000 s* *Reported Lamp Events = 3316 counts : Rate = 276.33334 counts/s* *Lamp Background events in 50x300 TA BOX for lampflash time (12s) = 112 cts : Rate = 9.308 counts/s* *Actual Lamp Events = 3204 counts : Rate = 267.026 counts/s*								
3	PSA/C1291/3 - CENTER (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=300; LIFETIME-POS=DEF	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	25 Secs (25 Secs) *[==>]*	***[1]***
	Comments: HST Standard Star, S/N ~ 5 in 25s								
4	PSA/C1291/3 +1.3arcseconds in XD (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=500; LIFETIME-POS=DEF	POS TARG null,1.3; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	55 Secs (55 Secs) *[==>]*	***[1]***
	Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need to increase the exposure time to 55s.								
5	PSA/C1291/3 -1.3arcseconds in XD (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=500; LIFETIME-POS=DEF	POS TARG null,-1.3; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	55 Secs (55 Secs) *[==>]*	***[1]***
	Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need to increase the exposure time to 55s.								
6	PSA/C1291/PEAKXD/NP=3/DEF (COS.sa.1540226)	(1) WD-1657+343	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	LIFETIME-POS=DEF	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	2 Secs (2 Secs) *[==>]*	***[1]***
	Comments: The NUM_POS and STEP_SIZE are not included to make sure that the correct DEFAULTS of NUM_POS=3 and STEP_SIZE=1.3", and CENTER = FLUX-WT are still inserted. *Target is the HST Standard Star:WD-1657+343* *Requested Signal/Noise Ratio = 40.000 for Segment A and Segment B combined* *gives: Time = 0.4205 seconds* *Time Required for Requested SNR in Segment A only: 1.2676* *Time Required for Requested SNR in Segment B only: 0.6292*								

7	PSA/C1291/3 - After NUM_POS=3 PEAKXD (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=3000; LIFETIME-POS=DEF	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	25 Secs (25 Secs) *[==>]*		***[1]***
8	PSA/C1291/3 +1.8arcseconds in XD (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=1000; LIFETIME-POS=DEF	POS TARG null,1.8; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	192 Secs (192 Secs) *[==>]*		***[1]***
Comments: At R=1.8", the throughput is ~13%. To get the same counts, we need to increase the exposure time.										
9	PSA/C1291/3 +0.9arcseconds in XD (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=4000; LIFETIME-POS=DEF	POS TARG null,0.9; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	35 Secs (35 Secs) *[==>]*		***[1]***
Comments: At R=0.9", the throughput is ~71%. To get the same counts, we need to increase the exposure time.										
10	PSA/C1291/3 -0.9arcseconds in XD (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=4000; LIFETIME-POS=DEF	POS TARG null,-0.9; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	35 Secs (35 Secs) *[==>]*		***[1]***
Comments: At R=0.9", the throughput is ~71%. To get the same counts, we need to increase the exposure time.										
11	PSA/C1291/3 -1.8arcseconds in XD (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; BUFFER-TIME=1000; LIFETIME-POS=DEF	POS TARG null,-1.8; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	192 Secs (192 Secs) *[==>]*		***[1]***
Comments: At R=1.8", the throughput is ~13%. To get the same counts, we need to increase the exposure time.										
12	PSA/C1291/PEAKXD/NP=5/DEF (COS.sa.1540226)	(1) WD-1657+343	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	LIFETIME-POS=DEF; NUM-POS=5; STEP-SIZE=0.9	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	2 Secs (2 Secs) *[==>]*		***[1]***
Comments: The default STEP-SIZE is 1.0", but at +/- 2", the POS_TARGS would not create enough counts to track the operation of the NUM_POS=5 PEAKXD. 5x0.9" is used instead. Double check that the DEFAULT CENTER=FLUX-WT-FLR is used. It is left unspecified to test that the default APT logic is still correctly choosing the correct CENTER algorithm.										
13	PSA/C1291/3 - After NUM_POS=5 PEAKXD (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=3000; LIFETIME-POS=DEF	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	25 Secs (25 Secs) *[==>]*		***[1]***
Comments: HST Standard Star, S/N ~ 5 in 25s										
14	PSA/C1291/PEAKD/NP=5/DEF (COS.sa.1540226)	(1) WD-1657+343	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	LIFETIME-POS=DEF; NUM-POS=5; STEP-SIZE=0.9	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	3 Secs (3 Secs) *[==>]*		***[1]***
Comments: We want to check the AD NUV to FUV SIAF alignment, so perform a good PEAKD. Double check that the DEFAULT CENTER=FLUX-WT-FLR is used. It is left unspecified to test that the default APT logic is still correctly choosing the correct CENTER algorithm.										

15	PSA/C1291/3 - After PEAKD (COS.sp.1540225)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; BUFFER-TIME=300; LIFETIME-POS=DEF	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G130M FUV TA Monitoring (01)	25 Secs (25 Secs) [==>]	[1]

Comments: HST Standard Star, S/N ~ 5 in 25s.

Orbit Structure



Visit

Proposal 16942, PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02), implementation Thu Oct 20 12:00:23 GMT 2022

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; BETWEEN 01-JAN-2023:00:00:00 AND 31-JAN-2023:00:00:00

Comments: These two orbits are in a different visit because they can use schedulability 100. The orbit in visit 1 requires schedulability 80. The 2 orbits in this visit may also be placed into individual visits if it helps with scheduling, so long as the non-interrupt sequences and the BETWEEN are respected.

Unlike the previous cycle, all dwell points use the same exposure time when taking spectra for manual centroiding because that is what the FSW does. the goal should not be to obtain the same SN when the target gets vighnetted. This unofrm exposure time is much longer than the actual acquisition dwell time, and can be truncated during analysis if desired.

This visit has the following timing requirement:
** It should execute between 1/1/23 and 1/31/23*
** It should execute within 30 days of visit PB of program 16939*
This visit has two orbits, each with a non-interrupt sequence. Each orbit is structured as follows

First orbit, tests FUV G140L/1280 spectroscopic acquisition

Note on exposure times: COS.sp.1540229 shows that it takes 20 seconds to obtain SN~10 per resel for a centered spectrum. COS.sa.1540230 shows that it takes only 1.7 seconds per dwell point to obtain the SN=40 needed for a FUV acquisition. As we did in the past, we use 3 seconds to be safe. Exposures 02.004 through 02.006 and 02.009 through 09.013 simulate the acquisition centroiding algorithm and provide the counts needed to manually centroid the target as a verification of what the FSW is doing. In the past we adapted the exposure times to compensate for vignetting as the target is offset so as to get the same SN in all positions through an acquisition sweep. However, that is not what the flight software does. If the exposure time for a spectroscopic acquisition is set to X seconds in APT then every dwell point in that acqwuisition will be exposed for X seconds, regardless of offset. So long as we reach the SN requirement for the acquisitions (40 in this case), there is no need to expose longer at vignetted offsets. Here we still expose all dwell points for 20 seconds, which is about 10 times more than the required acquisition exposure time in COS.sa.1540230. The additional exposure time would allow us to better detect any anomalous detector features, while still fitting within the orbit.

02.001 - ACQ/IMAGE
02.002 - NUV image with WCA lamps to verify alignment
02.003 - Spectrum centered after ACQ/IMAGE, for comparison, at LP3 (default) See note below
02.004 - Spectrum centered at LP4 for detector mapping and centroiding See note below
02.005, 02.006 - simulate PEAKXD with NUM-POS=3 at LP4 for detector mapping and centroiding
02.007 - PEAKXD with NUM-POS=3 (at LP4, default)
02.008 - Verification spectrum at LP3 (default)
02.009 - spectrum centered at LP4 for detector mapping and centroiding
02.010 to 02.013 - Simulate PEAKXD with NUM-POS=5 at LP4 for detector mapping and centroiding
02.014 - PEAKXD with NUM-POS=5 (at LP4, default)
02.015 - Verification spectrum (at LP3, default)

Note on 02.003 and 02.004: The centered exposure serves two purposes. first, it allows for a determination of the location of the spectrum, which is a test of acquisition accuracy. Second, it gives us the flux at the central position, which is needed to simulate the flux centroiding done in the FUV acquisition. If FUV acquisition and science were done in the same LP then only one of these exposures would be needed. However for G140L the acquisition is done at LP4 and the science is done at LP3. We therefore need to take two exposures, one at each LP. 02.003 tells us the location of the final science spectrum at LP3. 02.004 is used to manually calculate the centroid at LP4.

Orbit 2, tests FUV G160M/1600 spectroscopic acquisition
02.016 - ACQ/IMAGE
02.017 - NUV image with WCA lamps to verify alignment
02.018 - spectrum centered after ACQ/IMAGE
02.019, 02.020 - simulate PEAKXD with NUM-POS=3
02.021 - PEAKXD with NUM-POS=3
02.022 - verification spectrum
02.023 - PEAKD with NUM-POS=5
02.024 - verification spectrum

Diagnostics

(PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions when observing at a given COS cenwave. See the COS Instrument Handbook for exceptions that may apply to observations with G130M/1291 or G160M.

(PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

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(PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

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(PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	WD-1657+343	RA: 16 58 51.1202 (254.7130008d)	Proper Motion RA: 11 mas/yr	V=16.1	Reference Frame: ICRS
		Dec: +34 18 53.29 (34.31480d)	Proper Motion Dec: -31 mas/yr		
		Equinox: J2000	Epoch of Position: 2000		
			Radial Velocity: 78 km/sec		

Comments: COS.ta.1032496 indicates S/N = 40 in 5.2s. SIMBAD cordinates are 16 58 51.1202 +34 18 53.293
Proper Motion from SIMBAD is Proper motions mas/yr : 11 -31 [3 3 133] C 2011MNRAS.417.1210G, RV=78

B 16.12 [~] D ~
u (AB) 15.749 [0.005] B 2013yCat.5139....0A
g (AB) 16.139 [0.003] B 2013yCat.5139....0A
r (AB) 16.691 [0.004] B 2013yCat.5139....0A
i (AB) 17.054 [0.005] B 2013yCat.5139....0A
z (AB) 17.388 [0.015] C 2013yCat.5139....0A
Category=STAR
Description=[DA]
Extended=NO

Exposures

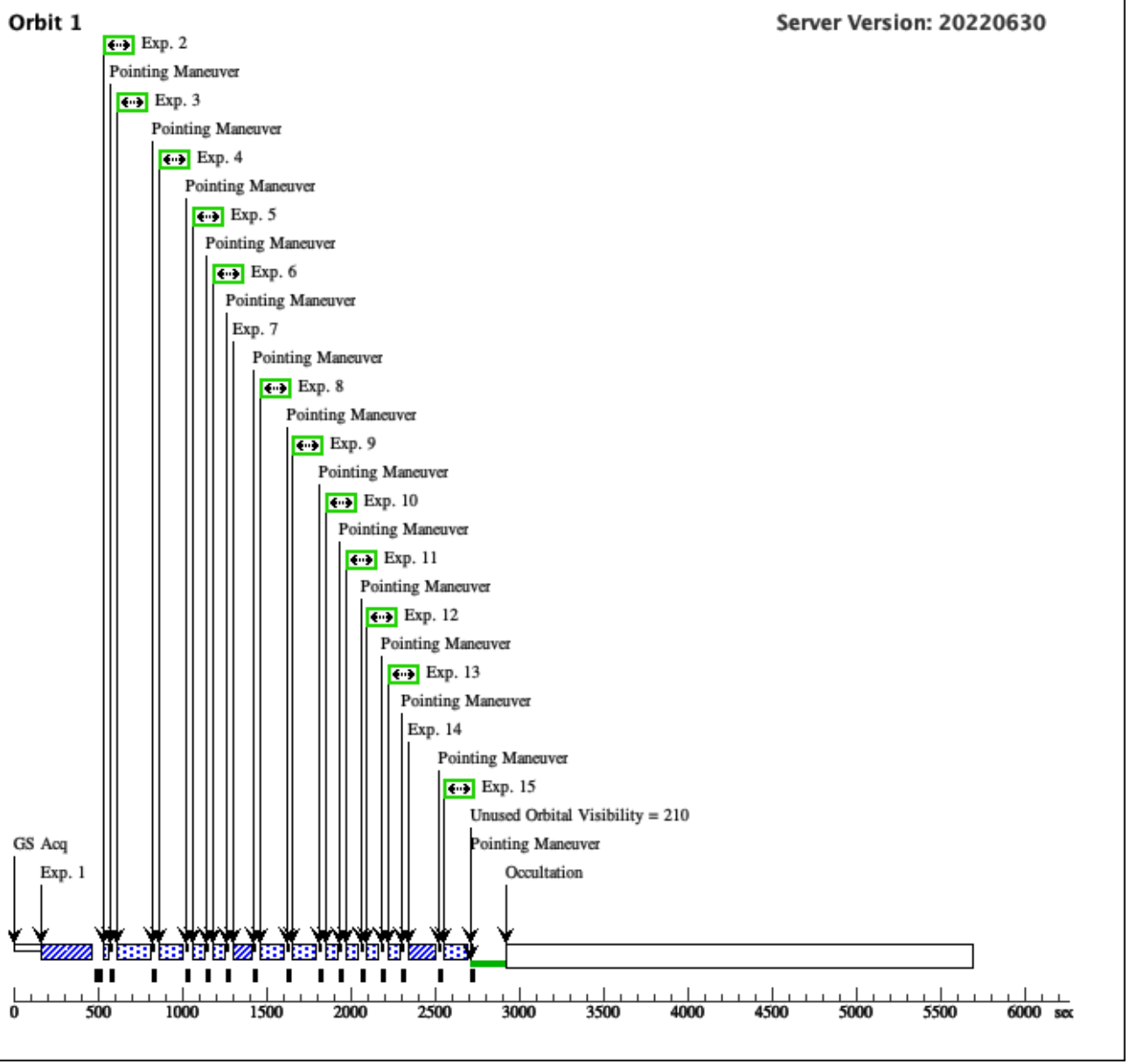
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	PSA/MIRRORB ACQ/IMAGE (COS.ta.1540223)	(1) WD-1657+343	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	7 Secs (7 Secs) *[==>]*	***[1]***
2	PSA/MIRRORB LAMP+TARGET IMAGE (P2/MEDIUM) (COS.im.1540224)	(1) WD-1657+343	COS/NUV, TIME-TAG, PSA	MIRRORB	BUFFER-TIME=150; FLASH=S0060D015; CURRENT=MEDIUM	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	15.0 Secs (15 Secs) *[==>]*	***[1]***
	Comments: Identical to 01.002 PSA/MIRRORB/P2/ME. To get PtNe Lamp 2, there are 2 QESIPARMs set: USELAMP = LINE2 CURRENT = MEDIUM								
3	PSA/G140L/1280/3 - CENTER at LP 3 (default) (COS.sp.1540229)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=400; LIFETIME-POS=DEF	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*	***[1]***
	Comments: COS.sp.1540229 S/N Ratio = 10 at wavelength 1310. (per RE) : Time = 20 sec.								
4	PSA/G140L/1280/3 - CENTER at LP 4 for detector mapping and centroiding (COS.sp.1540229)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=400; LIFETIME-POS=LP4	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*	***[1]***
	Comments: See also COS.sa.1540230, since we are replicating a spectroscopic acquisition. See visit level note on exposure times.								
5	PSA/G140L/1280/3 +1.3 arcseconds in XD at LP4 for detector mapping and centroiding (COS.sp.1540229)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=800; LIFETIME-POS=LP4	POS TARG null,1.3; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*	***[1]***
	Comments: At R=1.3", the throughput is ~45%. See also COS.sa.1540230, since we are replicating a spectroscopic acquisition. See visit level note on exposure times.								
6	PSA/G140L/1280/3 -1.3 arcseconds in XD at LP4 for detector mapping and centroiding (COS.sp.1540229)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=800; LIFETIME-POS=LP4	POS TARG null,-1.3; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*	***[1]***
	Comments: At R=1.3", the throughput is ~45%. See also COS.sa.1540230, since we are replicating a spectroscopic acquisition. See visit level note on exposure times.								

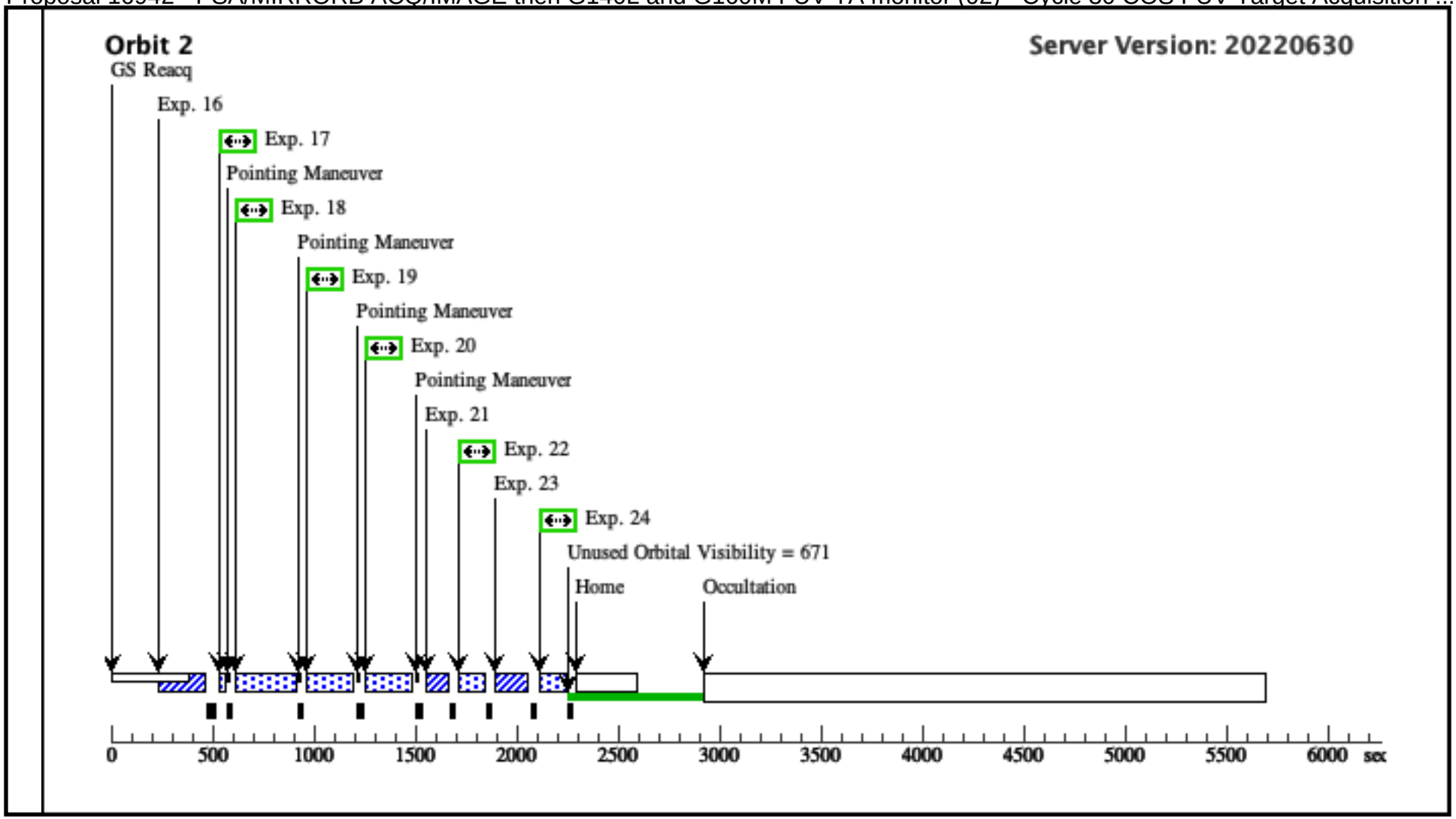
7	PSA/G140L /PEAKXD/ NP=3/DEF (default, don e at LP4 the n move to L P3) (COS.sa.154 0230)	(1) WD-1657+343	COS/FUV, ACQ/PEAKXD, PSA	G140L 1280 A	LIFETIME-POS=D EF; NUM-POS=3; STEP-SIZE=1.3	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-15 Non-I nt in PSA/MIRROR B ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	3 Secs (3 Secs) *[==>]*		***[1]***
Comments: COS.sa.1540230 Requested Signal/Noise Ratio = 40.000 for Segment A and Segment B combined gives: Time = 1.7369 seconds. We use 3 to be safe. Time Required for Requested SNR in Segment A only: 1.7369 (only A is used)										
8	PSA/G140L /1280/3 CE NTER at LP 3 (default) (COS.sp.103 2431)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=40 0; LIFETIME-POS=D EF	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-15 Non-I nt in PSA/MIRROR B ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*		***[1]***
9	PSA/G140L /1280/3 CE NTER at LP 4 for detecto r mapping a nd centroidi ng (COS.sp.103 2431)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=40 0; LIFETIME-POS=L P4	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-15 Non-I nt in PSA/MIRROR B ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*		***[1]***
Comments: See also COS.sa.1540230, since we are replicating a spectroscopic acquisition. See visit level note on exposure times.										
10	PSA/G140L /1280/3 +1.8 arcseconds i n XD at LP4 for detector mapping and centroiding (COS.sp.154 0229)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=40 0; LIFETIME-POS=L P4	POS TARG null,1.8; QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-15 Non-I nt in PSA/MIRROR B ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*		***[1]***
Comments: See also COS.sa.1540230, since we are replicating a spectroscopic acquisition. See visit level note on exposure times.										
11	PSA/G140L /1280/3 +0.9 arcseconds i n XD at LP4 for detector mapping and centroiding (COS.sp.154 0229)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=40 0; LIFETIME-POS=L P4	POS TARG null,0.9; QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-15 Non-I nt in PSA/MIRROR B ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*		***[1]***
Comments: See also COS.sa.1540230, since we are replicating a spectroscopic acquisition. See visit level note on exposure times.										
12	PSA/G140L /1280/3 -0.9 arcseconds i n XD at LP4 for detector mapping and centroiding (COS.sp.154 0229)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=40 0; LIFETIME-POS=L P4	POS TARG null,-0.9 ; QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-15 Non-I nt in PSA/MIRROR B ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*		***[1]***
Comments: See also COS.sa.1540230, since we are replicating a spectroscopic acquisition. See visit level note on exposure times.										

13	PSA/G140L /1280/3 -1.8 arcseconds in XD at LP4 for detector mapping and centroiding (COS.sp.1032431)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=400; LIFETIME-POS=LP4	POS TARG null,-1.8; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*		***[1]***
Comments: See also COS.sa.1540230, since we are replicating a spectroscopic acquisition. See visit level note on exposure times.										
14	PSA/G140L /PEAKXD/ NP=5/DEF (COS.sa.1540230)	(1) WD-1657+343	COS/FUV, ACQ/PEAKXD, PSA	G140L 1280 A	LIFETIME-POS=DEF; NUM-POS=5; STEP-SIZE=0.9	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	3 Secs (3 Secs) *[==>]*		***[1]***
Comments: COS.sa.1032455 Requested Signal/Noise Ratio = 40.000 for Segment A and Segment B combined gives: Time = 1.6519 seconds Time Required for Requested SNR in Segment A only: 1.6519										
15	PSA/G140L /1280/3 (COS.sp.1032431)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=400; LIFETIME-POS=DEF	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	20 Secs (20 Secs) *[==>]*		***[1]***
16	PSA/MIRRORB ACQ/IMAGE (COS.ta.1540223)	(1) WD-1657+343	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Sequence 16-24 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	7 Secs (7 Secs) *[==>]*		***[2]***
17	PSA/MIRRORB LAMP +TARGET IMAGE (P2/MEDIUM) (COS.im.1540224)	(1) WD-1657+343	COS/NUV, TIME-TAG, PSA	MIRRORB	BUFFER-TIME=150; FLASH=S0060D015; CURRENT=MEDIUM	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 16-24 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	15.0 Secs (15 Secs) *[==>]*		***[2]***
Comments: Identical to 02.002 and 01.002 PSA/MIRRORB/P2/MED current. To get PtNe Lamp 2, there are 2 QESIPARMs set: USELAMP = LINE2 CURRENT = MEDIUM										
18	PSA/G160M/1600/3 -CENTER (COS.sp.1540231)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; BUFFER-TIME=800; LIFETIME-POS=LP4	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 16-24 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	82 Secs (82 Secs) *[==>]*		***[2]***
Comments: Exposure time (seconds) = 82.0000 at wavelength 1602.00 gives: SNR = 3.9389 (per resolution element)										
19	PSA/G160M/1600/3 + 1.3arcseconds in XD (COS.sp.1540231)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; BUFFER-TIME=1000; LIFETIME-POS=LP4	POS TARG null,1.3; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 16-24 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	182 Secs (182 Secs) *[==>]*		***[2]***
Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need to increase the exposure time.										

	20	PSA/G160M/1600/3 -1.3arcseconds in XD (COS.sp.1540231)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; FLASH=YES; BUFFER-TIME=1000; LIFETIME-POS=LP4	POS TARG null,-1.3; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 16-24 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	182 Secs (182 Secs) *[==>]*	***[2]***
	Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need to increase the exposure time.									
	21	PSA/G160M/PEAKXD/NP=3/DEF (COS.sa.1540232)	(1) WD-1657+343	COS/FUV, ACQ/PEAKXD, PSA	G160M 1600 A	LIFETIME-POS=LP4; NUM-POS=3; STEP-SIZE=1.3	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 16-24 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	3 Secs (3 Secs) *[==>]*	***[2]***
	Comments: Requested Signal/Noise Ratio = 40.000 for Segment A and Segment B combined gives: Time = 1.0474 seconds *Time Required for Requested SNR in Segment A only: 5.7791* *Time Required for Requested SNR in Segment B only: 1.2792*									
	22	PSA/G160M/1600/3 (COS.sp.1540231)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; BUFFER-TIME=800; LIFETIME-POS=LP4	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 16-24 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	82 Secs (82 Secs) *[==>]*	***[2]***
	23	PSA/G160M/1600/PEAKD/NP=5/DEF (COS.sa.1540232)	(1) WD-1657+343	COS/FUV, ACQ/PEAKD, PSA	G160M 1600 A	LIFETIME-POS=LP4; NUM-POS=5; STEP-SIZE=0.9		Sequence 16-24 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	3 Secs (3 Secs) *[==>]*	***[2]***
	Comments: Analogous to exposure 01.014 carried over from previous cycles, but this time to test PEAKD at LP4.									
	24	PSA/G160M/1600/3 (COS.sp.1540231)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; BUFFER-TIME=800; LIFETIME-POS=LP4	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 16-24 Non-Int in PSA/MIRRORB ACQ/IMAGE then G140L and G160M FUV TA monitor (02)	82 Secs (82 Secs) *[==>]*	***[2]***

Orbit Structure




Orbit 2
Server Version: 20220630
GS Reacq
Exp. 16
Exp. 17
Pointing Maneuver
Exp. 18
Pointing Maneuver
Exp. 19
Pointing Maneuver
Exp. 20
Pointing Maneuver
Exp. 21
Exp. 22
Exp. 23
Exp. 24
Unused Orbital Visibility = 671
Home
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16942, ACQ/PEAKXD LP6 enabling repeat test (03), implementation Thu Oct 20 12:00:23 GMT 2022

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 90%; ORIENT 97.5D TO 98.5 D; BETWEEN 22-JAN-2023:00:00:00 AND 01-FEB-2023:00:00:00

Comments: Visit 03 of the LP6 TA enabling program (16851) ran in June of 2022 and found that LP6 PEAKXD was slightly off-center by about 0.1". At that time it was decided that the only necessary action would be to monitor the condition frequently. That visit is therefore repeated here six months after the original enabling program. there are only two changes:
1 - ORIENT constraint was changed to reflect new time of the year, and consequently the offsets defining the virtual targets changed.
2 - LP-POS is now changed from LP6 to DEF.

This visit tests PEAKXD. It is a copy of vist 02 of 16851, PEAKD test, with X and Y displacements inverted. The process is entirely symmetrical.
First we perform an ACQ/IMAGE and take a G160M/1577 high SN spectrum and use it as the baseline for comparing the position of the other spectra.

****
CHANGE THIS ONCE ORIENTS ARE KNOWN
The Between for this visit is 22 January 2023 to 01 February 2023.
The virtual targets are set for orient=98. Any ORIENT is possible, but if the ORIENT changes then the PI will have to change the offsets for the virtual targets (not hard to do).
****

We simulate a 5x0.8" ACQ/PEAXKD taking short spectra. We start with the centered (0) position then go to -1.6" in Y and proceed in steps of 0.8" out to +1.6" Y. These exposures serve two purposes. First, they inspect the detector for anomalies. Second, the flux weighted centroid of all 5 exposures should provide the same result as the acquisition.
We then perform an actual 5x0.8" (NUM-POS=5, STEP-SIZE=0.8") ACQ/PEAKXD on the centered target and take a spectrum. The position of this spectrum should be centered to the same specifications as the flux weighted centroiding in the previous step.
We then use virtual targets to perform 5x0.9" ACQ/PEAKXD starting from offsets of -0.7" XD and +0.7" XD. We then repeat the process for a 3x1.3 ACQ/PEAKD for offsets of -0.3" XD and +0.3" XD.

Default is NUM-POS=3, CENTER=FLUX-WT, STEP-SIZE=1.3
If using NUM-POS=5 then CENTER=FLUX-WT-FLR, STEP-SIZE=0.9

Diagnostics

(ACQ/PEAKXD LP6 enabling repeat test (03)) Warning (Form): COS ACQ/PEAKXD exposure should be followed by an ACQ/PEAKD exposure in the Visit.

(ACQ/PEAKXD LP6 enabling repeat test (03)) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions when observing at a given COS cenwave. See the COS Instrument Handbook for exceptions that may apply to observations with G130M/1291 or G160M.

(ACQ/PEAKXD LP6 enabling repeat test (03)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(ACQ/PEAKXD LP6 enabling repeat test (03)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	WDG-1 Alt Name1: SK191	RA: 01 41 42.0729 (25.4253038d) Dec: -73 50 38.21 (-73.84395d) Equinox: J2000	Proper Motion RA: 2.6618321082955913E-4 sec of time/yr Proper Motion Dec: -0.0013640000361192506 arcsec/yr Epoch of Position: 2015.5	V=11.84	Reference Frame: ICRS
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Blue supergiant in periphery of SMC.* *Has previous COS spectrum.* *Decimal degree coordinates: 025.4252866734441 -73.8439408698315* *SIMBAD: http://simbad.u-strasbg.fr/simbad/sim-id?Ident=WDG+1&NbIdent=1&Radius=2&Radius.unit=arcmin&submit=submit+id* *B 11.86 [~] E ~* *V 11.84 [~] E ~* *G 11.8193 [0.0015] C 2018yCat.1345....0G* *J 11.904 [0.024] C 2003yCat.2246....0C* *H 11.957 [0.025] C 2003yCat.2246....0C* *K 11.906 [0.023] C 2003yCat.2246....0C* *Category=STAR* *Description=[B0-B2 III-I]* *Extended=NO*				
(3)	WDG-1-OFFSET+0.7XD	Offset from WDG-1 RA Offset: -4.2044879E-4 Degrees Dec Offset: 0.55904486 Arcsec		V=11.8	Offset Position (WDG-1-OFFSET+0.7XD)
	Comments: From the geometry of COS, going from offsets in AD and XD to offsets in ra and dec: *Delta(dec) = Delta(AD)*cos(ORIENT - 45) + Delta(XD)*cos(ORIENT - 135) will yield the result in arcseconds, which is what APT wants.* *Delta(RA) = (Delta(AD)*sin(ORIENT - 45) + Delta(XD)*sin(ORIENT - 135))/(3600. * cos(dec)) will yield the result in decimal degrees of RA, which is what APT wants.* *See Phase II instructions, section 6.2.2. Use the IDL procedure cosvirtualtarget.pro* *Category=STAR* *Description=[B0-B2 III-I]* *Extended=NO*				
(4)	WDG-1-OFFSET+0.3XD	Offset from WDG-1 RA Offset: -1.8019235E-4 Degrees Dec Offset: 0.23959067 Arcsec		V=11.8	Offset Position (WDG-1-OFFSET+0.3XD)
	Comments: From the geometry of COS, going from offsets in AD and XD to offsets in ra and dec: *Delta(dec) = Delta(AD)*cos(ORIENT - 45) + Delta(XD)*cos(ORIENT - 135) will yield the result in arcseconds, which is what APT wants.* *Delta(RA) = (Delta(AD)*sin(ORIENT - 45) + Delta(XD)*sin(ORIENT - 135))/(3600. * cos(dec)) will yield the result in decimal degrees of RA, which is what APT wants.* *See Phase II instructions, section 6.2.2. Use the IDL procedure cosvirtualtarget.pro* *Category=STAR* *Description=[B0-B2 III-I]* *Extended=NO*				

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	NUV ACQ/IMAGE (COS.ta.1540336)	(2) WDG-1	COS/NUV, ACQ/IMAGE, BOA	MIRRORB			Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	32 Secs (32 Secs) *[==>]*	***[1]***
	Comments: ACQ/IMAGE to determine center. Identical to exposure 01.001. See comments there.								
2	Baseline spectrum (COS.sp.1541218)	(2) WDG-1	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2300; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=DEF		Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	25 Secs (20 Secs) *[==>20.0 Secs]*	***[1]***
	Comments: Spectrum to determine location after ACQ/IMAGE centering. Need high SN for determining position of other spectra. exposure time 100s yields SN~7 per resel.								
3	ACQ/PEAKXD (COS.sa.1541209)	(2) WDG-1	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	LIFETIME-POS=DEF; NUM-POS=5; STEP-SIZE=0.8; CENTER=FLUX-WT-FLR		Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	2 Secs (2 Secs) *[==>]*	***[1]***
	Comments: ACQ/PEAKXD of a centered target on the same 5x0.8"" pattern. *This ACQ/PEAKXD goes through the same positions that exposures 03.002 through 03.006 did. The flux weighted centroid of those exposures should yield the same center as this PEAKXD. Here we do not use the default STEP-SIZE because we would like to replicate the mapping done in exposures 03.002 to 03.006. Using STEP-SIZE=0.9 there would have yielded too low a flux to inspect the detector.* *From COS.sa.1541209, we use 2 seconds.* *Requested Signal/Noise Ratio = 40.000 for Segment A and Segment B combined gives: Time = 0.1885 seconds* *Time Required for Requested SNR in Segment A only: 0.7998* *Time Required for Requested SNR in Segment B only: 0.2466*								
4	Verification spectrum (COS.sp.1541218)	(2) WDG-1	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2300; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=DEF		Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	25 Secs (20 Secs) *[==>20.0 Secs]*	***[1]***
	Comments: Spectrum to determine location after ACQ/PEAKXD.								
5	POSTARG + SPECTRUM1 (-1.6) (COS.sp.1541205)	(2) WDG-1	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2300; FP-POS=3; FLASH=NO; LIFETIME-POS=DEF; WAVECAL=NO	POS TARG 0,-1.6	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	92 Secs (87 Secs) *[==>87.0 Secs]*	***[1]***
	Comments: POSTARG to simulate 5x0.8" (NUM-POS=5, STEP-SIZE=0.8") ACQ/PEAKXD. This is the y= -1.6 " position. Here we strive for SN~5.5 per resel. If the beam was not vignetted that would happen in a 25s exposure. But vignetting at y=-1.6" is 73%. 25s / (1-0.73)=92s. While the default STEP-SIZE for NUM-POS=5 is 0.9", that would not allow enough light through to inspect the detector, so we use STEP-SIZE=0.8"								

6	POSTARG + SPECTRUM3 (-0.8) (COS.sp.1541205)	(2) WDG-1	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2300; FP-POS=3; FLASH=NO; LIFETIME-POS=DEF; WAVECAL=NO	POS TARG 0,-0.8	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	31 Secs (26 Secs)	*[==>26.0 Secs]*	***[1]***
Comments: POSTARG to simulate 5x0.8" (NUM-POS=5, STEP-SIZE=0.8") ACQ/PEAKXD. This is the y= -0.8 " position. Here we strive for SN~5.5 per resel. If the beam was not vignetted that would happen in a 25s exposure. But vignetting at y=-0.8" is 20%. 25s/(1-0.20)=31s. While the default STEP-SIZE for NUM-POS=5 is 0.9", that would not allow enough light through to inspect the detector, so we use STEP-SIZE=0.8"										
7	POSTARG + SPECTRUM3 (+0.8) (COS.sp.1541205)	(2) WDG-1	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2300; FP-POS=3; FLASH=NO; LIFETIME-POS=DEF; WAVECAL=NO	POS TARG 0,0.8	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	31 Secs (26 Secs)	*[==>26.0 Secs]*	***[1]***
Comments: POSTARG to simulate 5x0.8" (NUM-POS=5, STEP-SIZE=0.8") ACQ/PEAKXD. This is the y= +0.8 " position. Here we strive for SN~5.5 per resel. If the beam was not vignetted that would happen in a 25 s exposure. But vignetting at y=+0.8" is 20%. 25s/(1-0.20)=31s. While the default STEP-SIZE for NUM-POS=5 is 0.9", that would not allow enough light through to inspect the detector, so we use STEP-SIZE=0.8". This exposure is symmetric to 02.004										
8	POSTARG + SPECTRUM1 (+1.6) (COS.sp.1541205)	(2) WDG-1	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2300; FP-POS=3; FLASH=NO; LIFETIME-POS=DEF; WAVECAL=NO	POS TARG 0,1.6	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	92 Secs (87 Secs)	*[==>87.0 Secs]*	***[1]***
Comments: POSTARG to simulate 5x0.8" (NUM-POS=5, STEP-SIZE=0.8") ACQ/PEAKXD. This is the y= +1.6 " position. Here we strive for SN~5.5 per resel. If the beam was not vignetted that would happen in a 25 s exposure. But vignetting at y=+1.6" is 73%. 25s / (1-0.73)=92s. While the default STEP-SIZE for NUM-POS=5 is 0.9", that would not allow enough light through to inspect the detector, so we use STEP-SIZE=0.8". This exposure is symmetric to 02.003										
9	ACQ/PEAKXD on offset -0.7 XD (COS.sa.1541209)	(3) WDG-1-OFFSET +0.7XD	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	LIFETIME-POS=DEF; CENTER=FLUX-WT-FLR; NUM-POS=5; STEP-SIZE=0.9		Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	2 Secs (2 Secs)	*[==>]*	***[1]***
Comments: 5x0.9" ACQ/PEAKXD on an off centered target. The virtual target is defined as being at a +0.7" offset from the real target. So at the beginning of acquisition the real target is offset -0.7" from the center of the field of view.										
10	Verification spectrum (COS.sp.1541218)	(3) WDG-1-OFFSET +0.7XD	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=2300; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=DEF		Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	25 Secs (20 Secs)	*[==>20.0 Secs]*	***[1]***
Comments: Spectrum to determine location after ACQ/PEAKD. This exposure is identical to 03.008, except the telescope thinks that it's at target 31. But really it centered on the real target.										

11	ACQ/PEAKXD on offset +0.7 AD (COS.sa.1541209)	(2) WDG-1	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	LIFETIME-POS=DEF; CENTER=FLUX-WT-FLR; NUM-POS=5; STEP-SIZE=0.9	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	2 Secs (2 Secs) *[==>]*	***[1]***
Comments: 5x0.9" ACQ/PEAKXD on an off centered target. From the previous acquisition, the telescope thinks it's at +0.7XD from the real target, but the real target is actually centered in the field of view. Now we ask the telescope to go back to the coordinates of the real target. That moves the telescope -0.7"XD. So now the real target is at +0.7"XD.								
12	Verification spectrum (COS.sp.1541218)	(2) WDG-1	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=230; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=DEF	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	25 Secs (20 Secs) *[==>20.0 Secs]*	***[1]***
Comments: Spectrum to determine location after ACQ/PEAKXD. This exposure is identical to 03.008								
13	ACQ/PEAKXD on offset -0.3 AD (COS.sa.1541209)	(4) WDG-1-OFFSET +0.3XD	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	LIFETIME-POS=DEF; CENTER=FLUX-WT; NUM-POS=3; STEP-SIZE=1.3	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	2 Secs (2 Secs) *[==>]*	***[1]***
Comments: 3x1.3" ACQ/PEAKXD on an off centered target. From the previous acquisition, the telescope is centered on the real target and also thinks that it is centered on the real target. We now command the telescope to move to a virtual target at +0.3"XD from the real target. That places the real target at -0.3"XD in the filed of view.								
14	Verification spectrum (COS.sp.1541218)	(4) WDG-1-OFFSET +0.3XD	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=230; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=DEF	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	25 Secs (20 Secs) *[==>20.0 Secs]*	***[1]***
Comments: Spectrum to determine location after ACQ/PEAKXD. This exposure is identical to 03.008, except the telescope thinks it's at target 32. It's actually centered on the real target.								
15	ACQ/PEAKXD on offset +0.3 AD (COS.sa.1541209)	(2) WDG-1	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	LIFETIME-POS=DEF; CENTER=FLUX-WT; NUM-POS=3; STEP-SIZE=1.3	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	2 Secs (2 Secs) *[==>]*	***[1]***
Comments: 3x1.3" ACQ/PEAXKD on an off centered target. From the previous acquisition, the telescope thinks it's at +0.3XD from the real target, but the real target is actually centered in the field of view. Now we ask the telescope to go back to the coordinates of the real target. That moves the telescope -0.3"XD. So now the real target is at +0.3"XD.								
16	Verification spectrum (COS.sp.1541218)	(2) WDG-1	COS/FUV, TIME-TAG, PSA	G160M 1577 A	BUFFER-TIME=230; FP-POS=3; FLASH=NO; WAVECAL=NO; LIFETIME-POS=DEF	Sequence 1-16 Non-Int in ACQ/PEAKXD LP6 enabling repeat test (03)	25 Secs (20 Secs) *[==>20.0 Secs]*	***[1]***
Comments: Spectrum to determine location after ACQ/PEAKXD. This exposure is identical to 03.008								

Orbit Structure