15775 - Cycle 27 COS FUV Target Acquisition Monitor

Cycle: 27, Proposal Category: CAL/COS

(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?
25	(1) WD-1657+343	COS/FUV COS/NUV	2	31-Jul-2019 13:00:46.0	yes

2 Total Orbits Used

ABSTRACT

Starting in Cycle 25, the COS Target Acquisition (TA) monitor was divided into two pieces, NUV and FUV. This program is the FUV portion and is designed specifically for FUV LP4. FUV LP4 uses NUM_POS > 1 PEAKXDs for cross-dispersion TA. All previous LPs used NUM_POS=1 PEAKXDs. The NUM_POS=1 PEAKXDs required the routine monitoring of the grating-dependent WCA-to-PSA offsets. The NUM_POS >1 PEAKXDs do not use these flight software (FSW) patchable constants as they use the LTAPKD FSW macro used in ACQ/PEAKD, but re-purposed for use in the cross-dispersion (XD).

This program uses the HST standard star WD1657+343. This target was used previously in the COS TA Monitor programs, 13124 (C20), 13526 (C21), 13972 (C22), 14440 (C23), 14857 (C24), 15386 (C25) and 15537 (C26). We re-use this target here as it is safe with PSA/MIRRORA and visible almost year-round.

OBSERVING DESCRIPTION

This program contains a single two-visit annual visit on a target with year-round visibility (WD1657+343). We request that this program execute in early 2020 (via a BETWEEN), and within 30 days of Visit PB of Program 15780 (via a visit-level comment).

The program is divided into 3 parts, one for each FUV grating, at LP4. The central wavelengths tested are C1291, C1280, and C1600. Each non-interruptable sequence follows the same initial steps.

1) Center the target with a PSA/MIRRORA ACQ/IMAGE
2) Take a picture of the target and the lamp to verify target centering
3) Take a low S/N spectrum (~5/RE) before any FUV tests - CENTERED in XD
4) Take a low S/N spectrum before any FUV tests at +1.3" in XD (ET adjusted to obtain ~ same S/N as CENTERED)
5) Take a low S/N spectrum before any FUV tests at -1.3" in XD (ET adjusted to obtain ~ same S/N as CENTERED)
6) Perform a NUM_POS=3, STEP_SIZE=1.3, CENTER=FLUX-WT PEAKXD at LP4
7) Take a confirmation low S/N spectrum - CENTERED in XD, after the PEAKXD

For G130M only (C1291) this series is extended to compare NUM_POS=5 PEAKXDs to NUM_POS=3 PEAKXDs, and to monitor PEAKD with the following exposures:
8)Take a low S/N spectrum at +1.8" in XD (ET adjusted to obtain ~ same S/N as CENTERED)
9) Take a low S/N spectrum at +0.9" in XD (ET adjusted to obtain ~ same S/N as CENTERED)
10) Take a low S/N spectrum at -0.9" in XD (ET adjusted to obtain ~ same S/N as CENTERED)
11) Take a low S/N spectrum at -1.8" in XD (ET adjusted to obtain ~ same S/N as CENTERED)
12) Perform a NUM_POS=5, STEP_SIZE=0.9, CENTER=FLUX-WT-FLR PEAKXD at LP4
13) Take a low S/N spectrum - CENTERED in XD, after the PEAKXD
14) Perform a NUM_POS=5, STEP_SIZE=0.9, CENTER=FLUX-WT-FLR PEAKD at LP4
15) Take a final low S/N spectrum - CENTERED in XD, after the PEAKD

Offsets achieved by "Y" POS_TARGs in the offset spectra.

Proposal 15775 (STScI Edit Number: 1, Created: Wednesday, July 31, 2019 at 12:00:47 PM Eastern Standard Time) - Overview

All of the G130M exposures are in the first orbit, all the G140L and G160M are in the second orbit.

Other Notes:

* The default PEAKXD STEP-SIZE is 1.0" when NUM_POS=5. However, 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.

* 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 will may be off and give different count rates than expected.

Visit	**Proposal 15775, PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)**	Wed Jul 31 17:00:47 GMT 2019

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 100%; BETWEEN 01-JAN-2020:00:00:00 AND 31-JAN-2020:00:00:00

Comments: This visit has the following timing requirement:
* It should execute between 1/1/20 and 1/31/20
* It should execute within 30 days of visit PB of program 15780

Note that there are 8 exposures with "Y" POS_TARGs to intentionally offset the target in XD by +/- 1.3" all gratings, and then +/- 0.9 and +/- 1.8 in a different sequence for G130M.

Diagnostics

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT

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(PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)) 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

	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
Exposures	1	PSA/MIRRORB ACQ/IMAGE (COS.ta.1032496)	(1) WD-1657+343	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	13 Secs (13 Secs) [==>]	[1]
		Comments: 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								
	2	PSA/MIRRORB LAMP+TARGET IMAGE (P2/MEDIUM) (COS.ta.1032496)	(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 FUV TA Monitoring (25)	15.0 Secs (15 Secs) [==>]	[1]
		Comments: PSA/MIRRORB/P2/MED current, see 25.001 for expected count rates. To get PtNe Lamp 2, there are 2 QESIPARMs set:								
		USELAMP = LINE2								
		CURRENT = MEDIUM								
	3	PSA/C1291/3 - CENTER (COS.sp.1032420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; BUFFER-TIME=300; LIFETIME-POS=LP4	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	25 Secs (25 Secs) [==>]	[1]
		Comments: HST Standard Star, S/N ~ 5 in 25s.The BT should be < 2/3 * 486 = 326. Any BT less that 326 s is a good BT, we use 300s in case the target is brighter than expected.								
		Brightest Pixel (single exposure) (at 1216.21) 0.106 2.64								
		Brightest Pixel in Segment A (at 1301.46) 0.030								
		Brightest Pixel in Segment B (at 1216.21) 0.106								
		Count rate entire detector 4,851.724								
		Count rate Segment A 1,834.935								
		Count rate Segment B 3,016.789								
	4	PSA/C1291/3 + 1.3arcseconds in XD (COS.sp.1032420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; BUFFER-TIME=500; 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 FUV TA Monitoring (25)	55 Secs (55 Secs) [==>]	[1]
		Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need an exposure time of 25/0.45 = 55s. BT < 326/0.45 = 725. Anything BT less that 725s is a good BT, we use 500s in case the target is brighter than expected.								
	5	PSA/C1291/3 - 1.3arcseconds in XD (COS.sp.1032420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; BUFFER-TIME=500; 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 FUV TA Monitoring (25)	55 Secs (55 Secs) [==>]	[1]
		Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need an exposure time of 25/0.45 = 55s								

6	PSA/C1291/ PEAKXD/N P=3/DEF (COS.sa.103 2423)	(1) WD-1657+343	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	LIFETIME-POS=LP 4	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-15 Non-I nt in PSA/MIRROR B ACQ/IMAGE then FUV TA Monitoring (25)	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 = 0.4206 seconds
    Time Required for Requested SNR in Segment A only: 1.2717
    Time Required for Requested SNR in Segment B only: 0.6284

Brightest Pixel (single exposure) (at 1216.21) 0.106 0.04
  Brightest Pixel in Segment A (at 1301.46) 0.030
  Brightest Pixel in Segment B (at 1216.21) 0.106
Count rate entire detector 4,898.533
  Count rate Segment A 1,856.745
  Count rate Segment B 3,041.787

7	PSA/C1291/ 3 - After NU M_POS=3 P EAKXD (COS.sp.103 2420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; BUFFER-TIME=30 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 FUV TA Monitoring (25)	25 Secs (25 Secs) [==>] [1]

Comments: See comment in 25.003

8	PSA/C1291/ 3 + 1.8arcse conds in XD (COS.sp.103 2420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; BUFFER-TIME=10 00; 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 FUV TA Monitoring (25)	182 Secs (182 Secs) [==>] [1]

Comments: At R=1.8", the throughput is ~13%. To get the same counts, we need an exposure time of 25/0.13 = 194s. BT < 320 / 0.13 = 2500. Any BT less that 2500s is a good BT, we use 1000s in case the target is brighter than expected.

For Cycle 27, the exposure time was decreased to 182 seconds in order to avoid a visibility overrun.

9	PSA/C1291/ 3 + 0.9arcse conds in XD (COS.sp.103 2420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; 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 FUV TA Monitoring (25)	35 Secs (35 Secs) [==>] [1]

Comments: At R=0.9", the throughput is ~71%. To get the same counts, we need an exposure time of 25/0.71 = 35s. BT < 320 / 0.71 = 450. Any BT less that 450s is a good BT, we use 400s in case the target is brighter than expected.

10	PSA/C1291/ 3 - 0.9arcsec onds in XD (COS.sp.103 2420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; 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 FUV TA Monitoring (25)	35 Secs (35 Secs) [==>] [1]

Comments: At R=0.9", the throughput is ~71%. To get the same counts, we need an exposure time of 25/0.71 = 35s. BT < 320 / 0.71 = 450s. Any BT less that 450s is a good BT, we use 400s in case the target is brighte r than expected.

11	PSA/C1291/3 - 1.8arcseconds in XD (COS.sp.1032420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; BUFFER-TIME=1000; 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 FUV TA Monitoring (25)	182 Secs (182 Secs) *[==>]*		*[1]*

Comments: At R=1.8", the throughput is ~13%. To get the same counts, we need an exposure time of 25/0.13 = 194s. Any BT less that 2500s is a good BT, we use 1000s in case the target is brighter than expected.

For Cycle 27, the exposure time was decreased to 182 seconds in order to avoid a visibility overrun.

12	PSA/C1291/PEAKXD/NP=5/DEF (COS.sa.1032423)	(1) WD-1657+343	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	LIFETIME-POS=LP4; NUM-POS=5; STEP-SIZE=0.9	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	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.1032420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; BUFFER-TIME=300; LIFETIME-POS=LP4	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	25 Secs (25 Secs) *[==>]*		*[1]*

Comments: HST Standard Star, S/N ~ 5 in 25s. See comment in 25.003

14	PSA/C1291/PEAKD/NP=5/DEF (COS.sa.1032423)	(1) WD-1657+343	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	LIFETIME-POS=LP4; NUM-POS=5; STEP-SIZE=0.9	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	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.1032420)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=3; FLASH=YES; BUFFER-TIME=300; LIFETIME-POS=LP4	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-15 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	25 Secs (25 Secs) *[==>]*		*[1]*

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

16	PSA/MIRRORB ACQ/IMAGE (COS.ta.1032496)	(1) WD-1657+343	COS/NUV, ACQ/IMAGE, PSA	MIRRORB		GS ACQ SCENARIO BASE1B3	Sequence 16-22 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	13 Secs (13 Secs) *[==>]*		*[2]*

Comments: See comment in 25.001

17	PSA/MIRRORB LAMP+TARGET IMAGE (P2/MEDIUM) (COS.ta.1032496)	(1) WD-1657+343	COS/NUV, TIME-TAG, PSA	MIRRORB	BUFFER-TIME=150; FLASH=S0060D015; CURRENT=MEDIUM	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 16-22 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	15.0 Secs (15 Secs) *[==>]*		*[2]*

Comments: PSA/MIRRORB/P2/MED current, see 25.001 for expected count rates. To get PtNe Lamp 2, there are 2 QESIPARMs set:
USELAMP = LINE2
CURRENT = MEDIUM

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| 18 | PSA/G140L /1280/3 - CENTER (COS.sp.1032431) | (1) WD-1657+343 | COS/FUV, TIME-TAG, PSA | G140L 1280 A | FP-POS=3; FLASH=YES; BUFFER-TIME=400; LIFETIME-POS=LP4 | QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM | Sequence 16-22 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25) | 20 Secs (20 Secs) [==>] | [2] |

Comments: *COS.sp.1032431 S/N Ratio = 10 at wavelength 1310. (per RE) : Time = 18.5567 sec. BT 2/3 * 725 = 500s. Any BT less that 500s is a good BT, we use 400s in case the target is brighter than expected.*

Brightest Pixel (single exposure) (at 1281.07) 0.162 3.00
Brightest Pixel in Segment A (at 1281.07) 0.162
Brightest Pixel in Segment B (at 1180.98) 0.109
Count rate entire detector 3,165.106
Count rate Segment A 2,114.082
Count rate Segment B 1,051.024

| 19 | PSA/G140L /1280/3 +1.3 arcseconds in XD (COS.sp.1032431) | (1) WD-1657+343 | COS/FUV, TIME-TAG, PSA | G140L 1280 A | FP-POS=3; FLASH=YES; BUFFER-TIME=800; LIFETIME-POS=LP4 | POS TARG null,1.3; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM | Sequence 16-22 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25) | 44 Secs (44 Secs) [==>] | [2] |

Comments: *At R=1.3", the throughput is ~45%. To get the same counts, we need an exposure time of 20/0.45 = 44s. BT < 500/0.45 = 1100s. Any BT less that 1100s is a good BT, we use 800s in case the target is brighter than expected.*

| 20 | PSA/G140L /1280/3 -1.3 arcseconds in XD (COS.sp.1032431) | (1) WD-1657+343 | COS/FUV, TIME-TAG, PSA | G140L 1280 A | FP-POS=3; FLASH=YES; BUFFER-TIME=800; LIFETIME-POS=LP4 | POS TARG null,-1.3; QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM | Sequence 16-22 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25) | 44 Secs (44 Secs) [==>] | [2] |

Comments: *At R=1.3", the throughput is ~45%. To get the same counts, we need an exposure time of 20/0.45 = 44s. Any BT less that 1100s is a good BT, we use 800s in case the target is brighter than expected.*

| 21 | PSA/G140L /PEAKXD/ NP=3/DEF (COS.sa.1032455) | (1) WD-1657+343 | COS/FUV, ACQ/PEAKXD, PSA | G140L 1280 A | LIFETIME-POS=LP4; NUM-POS=3; STEP-SIZE=1.3 | QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM | Sequence 16-22 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25) | 3 Secs (3 Secs) [==>] | [2] |

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

Brightest Pixel (single exposure) (at 1281.07) 0.162 0.27
Brightest Pixel in Segment A (at 1281.07) 0.162
Brightest Pixel in Segment B (at 1180.98) 0.109
Count rate entire detector 3,211.915
Count rate Segment A 2,135.893
Count rate Segment B 1,076.022

| 22 | PSA/G140L /1280/3 (COS.sp.1032431) | (1) WD-1657+343 | COS/FUV, TIME-TAG, PSA | G140L 1280 A | FP-POS=3; FLASH=YES; BUFFER-TIME=400; LIFETIME-POS=LP4 | QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM | Sequence 16-22 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25) | 20 Secs (20 Secs) [==>] | [2] |

Comments: *See comment in 25.018*

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#	Target		Target Name	Config, Mode, Aperture	Spectral Element	Optional Parameters	Special Requirements	Orbit Info	Time	
23	PSA/MIRRORB ACQ/IMAGE (COS.ta.1032496)	(1)	WD-1657+343	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Sequence 23-29 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	13 Secs (13 Secs) [==>]	[2]
Comments: See comment in 25.001										
24	PSA/MIRRORB LAMP+TARGET IMAGE (P2/MEDIUM) (COS.ta.1032496)	(1)	WD-1657+343	COS/NUV, TIME-TAG, PSA	MIRRORB	BUFFER-TIME=150; FLASH=S0060D015; CURRENT=MEDIUM	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 23-29 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	15.0 Secs (15 Secs) [==>]	[2]
Comments: PSA/MIRRORB/P2/MED current, see 25.001 for expected count rates. To get PtNe Lamp 2, there are 2 QESIPARMs set: USELAMP = LINE2 CURRENT = MEDIUM										
25	PSA/G160M/1600/3 - CENTER (COS.sp.1032449)	(1)	WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; FLASH=YES; BUFFER-TIME=800; LIFETIME-POS=LP4	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 23-29 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	82 Secs (82 Secs) [==>]	[2]

Comments: S/N Ratio = 4 at wavelength 1610.00 (per RE) gives: Time = 81.8415 seconds. BT < 2/3 * 1,463 = ~1000s. Any BT less that 1000s is a good BT, we use 800s in case the target is brighter than expected.
 	
 Brightest Pixel (single exposure) (at 1410.02) 0.021 1.69
   Brightest Pixel in Segment A (at 1601.01) 0.005
   Brightest Pixel in Segment B (at 1410.02) 0.021
 Count rate entire detector 1,611.740
    Count rate Segment A 313.782
    Count rate Segment B 1,297.958
 Buffer Time (sec) 1,463										

26	PSA/G160M/1600/3 + 1.3arcseconds in XD (COS.sp.1032449)	(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 23-29 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	153 Secs (153 Secs) [==>]	[2]
Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need an exposure time of 82/0.45 = 182s. BT < 1000 /0.45 = 2222. Any BT less that 2222s is a good BT, we use 1000s in case the target is brighter than expected. For Cycle 27, the exposure time was decreased to 153 seconds in order to avoid a visibility overrun.										
27	PSA/G160M/1600/3 -1.3arcseconds in XD (COS.sp.1032449)	(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 23-29 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	153 Secs (153 Secs) [==>]	[2]
Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need an exposure time of 82/0.45 = 182s. BT < 1000/0.45 = 2222s. Any BT less that 2222s is a good BT, we use 1000s in case the target is brighter than expected. For Cycle 27, the exposure time was decreased to 153 seconds in order to avoid a visibility overrun.										

28	PSA/G160M/PEAKXD/NP=3/DEF (COS.sa.1032454)	(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 23-29 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	3 Secs (3 Secs) [==>]	[2]
	Comments: COS.sa.1032454 Requested Signal/Noise Ratio = 40.000 for Segment A and Segment B combined gives: Time = 1.0545 seconds *Time Required for Requested SNR in Segment A only: 5.8385* *Time Required for Requested SNR in Segment B only: 1.2868*								
29	PSA/G160M/1600/3 (COS.sp.1032449)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; FLASH=YES; BUFFER-TIME=800; LIFETIME-POS=LP4	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 23-29 Non-Int in PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25)	82 Secs (82 Secs) [==>]	[2]
	Comments: See comment in 25.025								