16326 - Cycle 28 COS FUV Target Acquisition Monitor

Cycle: 28, Proposal Category: CAL/COS

(Availability Mode: RESTRICTED)

INVESTIGATORS

Name	Institution	E-Mail
Dr. David J. Sahnow (PI) (Contact)	**Space Telescope Science Institute**	**sahnow@stsci.edu**
Elaine M Frazer (CoI) (Contact)	Space Telescope Science Institute	efrazer@stsci.edu
Kate Rowlands (CoI) (Contact)	Space Telescope Science Institute	krowlands@stsci.edu

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	16-Dec-2020 12:00:19.0	yes

2 Total Orbits Used

ABSTRACT

The COS Target Acquisition (TA) monitor is 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), 15537 (C26) and 15775 (C27). 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 2021 (via a BETWEEN), and within 30 days of Visit PB of Program 16331 (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 an NUV image 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 (exposure time adjusted to obtain similar S/N as CENTERED)

5) Take a low S/N spectrum before any FUV tests at -1.3" in XD (exposure time adjusted to obtain similar 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 (exposure time adjusted to obtain similar S/N as CENTERED)

9) Take a low S/N spectrum at +0.9" in XD (exposure time adjusted to obtain similar S/N as CENTERED)

10) Take a low S/N spectrum at -0.9" in XD (exposure time adjusted to obtain similar S/N as CENTERED)

11) Take a low S/N spectrum at -1.8" in XD (exposure time adjusted to obtain similar 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.

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 may be off and give different count rates than expected.

Visit	**Proposal 16326, PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25), implementation**

Proposal 16326, PSA/MIRRORB ACQ/IMAGE then FUV TA Monitoring (25), implementation Wed Dec 16 17:00:21 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV, COS/NUV

Special Requirements: SCHED 80%; BETWEEN 01-JAN-2021:00:00:00 AND 31-JAN-2021:00:00:00

Comments: This visit has the following timing requirement:
* It should execute between 1/1/21 and 1/31/21
* It should execute within 30 days of visit PB of program 16331

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

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(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

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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.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

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
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 above for expected count rates. To get PtNe Lamp 2, there are 2 QESIPARMs set:
USELAMP = LINE2
CURRENT = MEDIUM

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
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

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
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 to increase the exposure time.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
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 to increase the exposure time.

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

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]
8	PSA/C1291/ 3 +1.8arcsec 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=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 to increase the exposure time.

9	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 to increase the exposure time.

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 to increase the exposure time.

11	PSA/C1291/ 3 -1.8arcsec 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=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 to increase the exposure time.

12	PSA/C1291/ PEAKXD/N P=5/DEF (COS.sa.103 2423)	(1) WD-1657+343	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	LIFETIME-POS=LP 4; NUM-POS=5; STEP-SIZE=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)	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 DEFAUL*
T 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 NU M_POS=5 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: *HST Standard Star, S/N ~ 5 in 25s*

14	PSA/C1291/ PEAKD/NP =5/DEF (COS.sa.103 2423)	(1) WD-1657+343	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	LIFETIME-POS=LP 4; NUM-POS=5; STEP-SIZE=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)	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 log*
ic is still correctly choosing the correct CENTER algorithm.

15	PSA/C1291/ 3 - After PE AKD (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: *HST Standard Star, S/N ~ 5 in 25s.*

16	PSA/MIRR ORB ACQ/I MAGE (COS.ta.103 2496)	(1) WD-1657+343	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Sequence 16-22 Non -Int in PSA/MIRRO RB ACQ/IMAGE th en FUV TA Monitori ng (25)	13 Secs (13 Secs)	*[==>]*	*[2]*

17	PSA/MIRR ORB LAMP +TARGET I MAGE (P2/ MEDIUM) (COS.ta.103 2496)	(1) WD-1657+343	COS/NUV, TIME-TAG, PSA	MIRRORB	BUFFER-TIME=15 0; FLASH=S0060D01 5; CURRENT=MEDI UM	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 16-22 Non -Int in PSA/MIRRO RB ACQ/IMAGE th en FUV TA Monitori ng (25)	15.0 Secs (15 Secs)	*[==>]*	*[2]*

Comments: *PSA/MIRRORB/P2/ME. To get PtNe Lamp 2, there are 2 QESIPARMs set:*
USELAMP = LINE2
CURRENT = MEDIUM

18	PSA/G140L /1280/3 - CE NTER (COS.sp.103 2431)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; FLASH=YES; BUFFER-TIME=40 0; LIFETIME-POS=L P4	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 16-22 Non -Int in PSA/MIRRO RB ACQ/IMAGE th en FUV TA Monitori ng (25)	20 Secs (20 Secs)	*[==>]*	*[2]*

Comments: *COS.sp.1032431 S/N Ratio = 10 at wavelength 1310. (per RE) : Time = 18.5567 sec.*

19	PSA/G140L /1280/3 +1.3 arcseconds in XD (COS.sp.103 2431)	(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 to increase the exposure time.							
20	PSA/G140L /1280/3 -1.3 arcseconds in XD (COS.sp.103 2431)	(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 to increase the exposure time.							
21	PSA/G140L /PEAKXD/ NP=3/DEF (COS.sa.103 2455)	(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							
22	PSA/G140L /1280/3 (COS.sp.103 2431)	(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]**
23	PSA/MIRRORB ACQ/IMAGE (COS.ta.103 2496)	(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]**
24	PSA/MIRRORB LAMP +TARGET IMAGE (P2/ MEDIUM) (COS.ta.103 2496)	(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. To get PtNe Lamp 2, there are 2 QESIPARMs set: USELAMP = LINE2 CURRENT = MEDIUM							
25	PSA/G160 M/1600/3 - CENTER (COS.sp.103 2449)	(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.							

26	PSA/G160 M/1600/3 + 1.3arcsecon ds in XD (COS.sp.103 2449)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; FLASH=YES; BUFFER-TIME=10 00; LIFETIME-POS=L P4	POS TARG null,1.3; QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 23-29 Non -Int in PSA/MIRRO RB ACQ/IMAGE th en FUV TA Monitori ng (25)	153 Secs (153 Secs) [==>]	*[2]*
	Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need to increase the exposure time.								
27	PSA/G160 M/1600/3 -1 .3arcseconds in XD (COS.sp.103 2449)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; FLASH=YES; BUFFER-TIME=10 00; LIFETIME-POS=L P4	POS TARG null,-1.3 ; QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 23-29 Non -Int in PSA/MIRRO RB ACQ/IMAGE th en FUV TA Monitori ng (25)	153 Secs (153 Secs) [==>]	*[2]*
	Comments: At R=1.3", the throughput is ~45%. To get the same counts, we need to increase the exposure time.								
28	PSA/G160 M/PEAKX D/NP=3/DE F (COS.sa.103 2454)	(1) WD-1657+343	COS/FUV, ACQ/PEAKXD, PSA	G160M 1600 A	LIFETIME-POS=LP 4; NUM-POS=3; STEP-SIZE=1.3	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 23-29 Non -Int in PSA/MIRRO RB ACQ/IMAGE th en FUV TA Monitori ng (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/G160 M/1600/3 (COS.sp.103 2449)	(1) WD-1657+343	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; FLASH=YES; BUFFER-TIME=80 0; LIFETIME-POS=L P4	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 23-29 Non -Int in PSA/MIRRO RB ACQ/IMAGE th en FUV TA Monitori ng (25)	82 Secs (82 Secs) [==>]	*[2]*