



14857 - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

Cycle: 24, Proposal Category: CAL/COS

(Availability Mode: RESTRICTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
PB	(1) 206W3	COS/NUV	1	14-Aug-2017 16:00:15.0	yes
BA	(2) WD-1657+343 WAVE	COS/FUV COS/NUV	1	14-Aug-2017 16:00:18.0	yes
BB	(3) HIP66578 WAVE	COS/FUV COS/NUV	1	14-Aug-2017 16:00:21.0	yes

3 Total Orbits Used

ABSTRACT

Visits PA, BA, & BB of this program verify all ACQ/IMAGE mode co-alignments by bootstrapping from PSA+MIRRORA. The assumption, which should be tested at some point, is that the PSA+MIRRORA WCA-to-PSA FSW offsets are still as accurate in defining the center of the PSA relative to the WCA as there were in SMOV. The details of the observations are given in the observing section.

Visit PB was an on-hold contingency visit in case, for whatever reason, visit 2A of 14452, did not execute as planned in the fall of 2017. This program was replaced with a better program for aligning the FGGs so we needed to activate this visit to obtain the PSA/MIRRORA to

PSA/MIRRORB ACQ/IMAGE alignment.

Visit BA of this program takes back-to-back PSA/MIRRORB & BOA/MIRRORA ACQ/Images and images (with flashes) and also takes G230L, G285M as well as FUV LP3 G130M and G140L spectra to test the WCA-to-PSA offsets.

Visit BB of this program takes back-to-back BOA/MIRRORA & BOA/MIRRORB ACQ/Images and images (with flashes) and also takes G225M, G185M, and FUV LP3 G160M spectra to test the WCA-to-PSA offsets. To test Ywalk, we also take G160M/1600 exposures at +/- 0.7"

Visit BA of this program bootstraps off Visit PB to co-align the PSA+MIRRORB ACQ/IMAGE mode to the BOA+MIRRORA.

Visit BB of this program follows the style of Visit BA and bootstraps from the BOA+MIRRORA mode to the BOA+MIRRORB TA imaging mode.

In all visits, lamp+target images are taken before and after the TA imaging mode that is being co-aligned (the second ACQ/IMAGE of the program.)

All visits in this program are single orbit visits, this program is very similar to the C23 version (14440). Due to the change in OSM2 Home position, some NUV spectra have been re-ordered for efficiency AND some NUV cenwaves were changed to those that are known to have good stripe B WCA spectra. This program differs from the Cycle 23 version in that Visit PB (the old Visit 03) has been permanently upgraded from contingency to operational status. Visits 01 and 02 of program 14440 have been renamed BA and BB to indicate the configuration being co-aligned (e.g., BB = BOA/MIRRORB).

NOTE: Beginning with Cycle 25. ALL FUV exposures in this program will be moved to a separate monitoring program. This program will sequentially test the XD accuracy of FUV LP4 spectra. As needed, NUV ACQ/IMAGES will reset the centering between grating tests.

OBSERVING DESCRIPTION

Each visit begins with a comparison of the ACQ/IMAGE centering of two ACQ/IMAGE modes out of the possible four (PSA or BOA) x (MIRRORA or MIRRORB). This will involve not only the ACO/images, but NUV detector images of the WCA lamp image and, if possible, coeval target images. These direct comparisons are only available for the PSA modes. For the BOA modes, the WCA lamp images and target images are taken consecutively. The assumption is that the PSA/MIRRORA ACQ/IMAGE centering has not changed since SMOV (questionable). Each of the other science aperture (SA) and MIRRORA/B ACO/IMAGE combinations were co-aligned during SMOV and rely upon the flight software

Proposal 14857 (STScI Edit Number: 2, Created: Monday, August 14, 2017 3:00:23 PM EST) - Overview

(FSW) WCA-to-SA along-dispersion (AD) and cross-dispersion (XD) offsets.

This back-to-back ACQ/IMAGE process allows us to test that TA modes are centering the target to the same point in the aperture. The Lamp+target exposures are interleaved throughout the visit to measure and verify the imaging WCA-to-SA offsets are still accurate for the remainder of the current HST Cycle. Images will usually use the PtNe#2 (P2) lamp, as it is the primary TA lamp, but some images will use PtNe#1 (P1) to monitor the lamps in imaging mode.

Visit PB was an on-hold contingency visit in case, for whatever reason, visit 2A of 14452, did not execute as planned in the fall of 2017. This program was replaced with a better program for aligning the FGGs so we needed to activate this visit to obtain the PSA/MIRRORA to PSA/MIRRORB ACQ/IMAGE alignment.

Visit BA of this program takes back-to-back PSA/MIRRORB & BOA/MIRRORA ACQ/Images and images (with flashes) and also takes G230L, G285M as well as FUV LP3 G130M and G140L spectra to test the WCA-to-PSA offsets.

Visit BB of this program takes back-to-back BOA/MIRRORA & BOA/MIRRORB ACQ/Images and images (with flashes) and also takes G225M, G185M, and FUV LP3 G160M spectra to test the WCA-to-PSA offsets. To test Ywalk, we also take G160M/1600 exposures at +/- 0.7"

Visit BB of this program also takes a "family portrait" of all the P1/P2 MIRRORA/B WCA lamp images to track any drifting of the centroids, or changes in the lamps.

All lamp+target images now use the QESIPARMS USECURRENT and CURRENT to specifically set the lamp and current values.

See the comment of the first exposure of Visit PB for a description of the expected count rates, exposure times, & buffer times (for the lamps).

NOTE: Beginning with Cycle 25. ALL FUV exposures in this program will be moved to a separate monitoring program. This program will sequentially test the XD accuracy of FUV LP4 spectra. As needed, NUV ACQ/IMAGEs will reset the centering between grating tests.

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

Proposal 14857 (STScI Edit Number: 2, Created: Monday, August 14, 2017 3:00:23 PM EST) - Overview

Must be performed on 2 Guidestar fine-lock and must not use FGS2. Guidestar pair must be reviewed by the PC.

Proposal 14857 - PSA/A & PSA/B (PB) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

Mon Aug 14 20:00:23 GMT 2017

Visit	Proposal 14857, PSA/A & PSA/B (PB), implementation Diagnostic Status: No Diagnostics Scientific Instruments: COS/NUV Special Requirements: SCHED 100%; BEFORE 02-OCT-2017:00:00:00; GROUP PB,BA,BB WITHIN 30D <i>Comments: This visit (PB, for PSA/MIRRORBA) performs the PSA/A vs PSA/B comparison. This visit was promoted from contingency in 14440 to active in this program.</i>																								
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>206W3</td> <td>RA: 06 08 55.4600 (92.2310833d)</td> <td>Proper Motion RA: 0.5 mas/yr</td> <td>V=14.53+/-0.1</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td></td> <td>Alt Name1: MCNAM209</td> <td>Dec: +24 15 39.59 (24.26100d)</td> <td>Proper Motion Dec: -2.2 mas/yr</td> <td>J=13.441,</td> <td></td> </tr> <tr> <td></td> <td>Alt Name2: J060855.46+241539.7</td> <td>Equinox: J2000</td> <td>Epoch of Position: 2012.7</td> <td>B=14.930</td> <td></td> </tr> </tbody> </table> <p><i>Comments: Target previously observed in Visit 2 of 12781. According to Colin, the target coordinates given here have been adjusted to ~2012.7. I include the UCAC3 PM in case this visit is used again at a later date. The PSA/MIRRORA had 21,063 counts in 60s (351 ct/s). Max pixel = 1965/60 = 32.75 ct/s. The PSA/MIRRORB had 12,570 counts in 300s (41.9 ct/s). Max pixel = 238/300 = 0.8 ct/s. So, PSA MirrorA/MirrorB = 351.0/41.9 = 8.4 (for this target). This target is N8CV022007 in GSC2.3.2</i></p> <p><i>From SIMBAD:</i></p> <p><i>Basic data :</i> Cl* NGC 2168 M 178 -- Star in Cluster Other object types: *IC (Cl*), IR (2MASS) ICRS coord. (ep=J2000) : 06 08 55.46 +24 15 39.8 (Infrared) [70 60 0] B 2003yCat.2246....0C FK5 coord. (ep=J2000 eq=2000) : 06 08 55.46 +24 15 39.8 [70 60 0] FK4 coord. (ep=B1950 eq=1950) : 06 05 51.62 +24 16 12.1 [70 60 0] Gal coord. (ep=J2000) : 186.6569 +02.1612 [70 60 0] Fluxes (6) : B 14.930 [~] D ~ V 14.481 [~] D ~ R 14.600 [~] E 2003yCat.2246....0C J 13.441 [0.023] C 2003yCat.2246....0C H 13.354 [0.022] C 2003yCat.2246....0C K 13.227 [0.026] C 2003yCat.2246....0C Extended=NO</p>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	206W3	RA: 06 08 55.4600 (92.2310833d)	Proper Motion RA: 0.5 mas/yr	V=14.53+/-0.1	Reference Frame: ICRS		Alt Name1: MCNAM209	Dec: +24 15 39.59 (24.26100d)	Proper Motion Dec: -2.2 mas/yr	J=13.441,			Alt Name2: J060855.46+241539.7	Equinox: J2000	Epoch of Position: 2012.7	B=14.930
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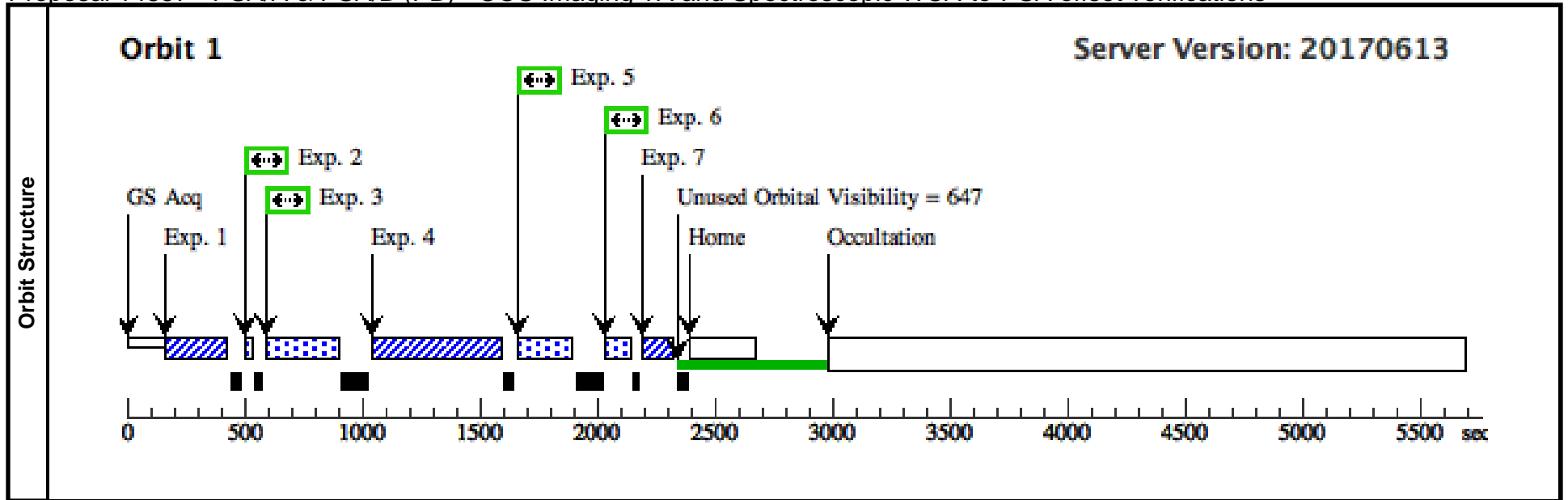
Proposal 14857 - PSA/A & PSA/B (PB) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	PSA/MIRR ORA ACQ/I MAGE (P2/ LOW) (COS.ta.634 846)	(1) 206W3	COS/NUV, ACQ/IMAGE, PSA	MIRRORA		GS ACQ SCENARI O BASE1B3	Sequence 1-7 Non-Int in PSA/A & PSA/B (PB)	20 Secs (20 Secs) [=>]	[1]
<p><i>Comments: This target has previously been observed in 13171.</i></p> <p><i>The measured direct count rates are (S/N are just photon statistics of the lamp or target)</i> PSA/MIRRORA = 245 count/s (S/N = 40 in 7s, 60 in 15s) PSA/MIRRORB = 15.6 count/s (S/N = 40 in 102s, 50 in 160, 60 in 230s) A/B = 15.7 for this target</p> <p><i>WCA/P2/MIRRORA@LOW = 7s produced 2900 counts(S/N = 54)</i> <i>WCA/P2/MIRRORB@LOW = 30s produced 420 counts (S/N = 21)</i> <i>WCA/P2/MIRRORB@MED = 10s is estimated to produce ~4000 counts (S/N = 52 in the primary spot)</i> <i>WCA/P1/MIRRORB@LOW = 82 hz, so S/N = 50 in 30s</i> <i>WCA/A(LOW)/B(LOW) = 25-30</i> <i>WCA/B(MED)/B(LOW) is estimated to be 15-20</i></p> <p><i>To get everything at S/N = 50 we need at least the following exposure times</i> PSA(target)/A = 10s PSA(target)/B = 160s WCA/P2/LOW/A = 6s WCA/P2/LOW/B = 180s (low current), S/N = 47 in 160s WCA/P1/LOW/B is 5x brighter than lamp#2, so at least 36s WCA/P2/MED/B is unknown, but we estimate it to be 15-20x the 2/LOW rate, so at least 12s</p> <p><i>For each target image, we will use the 9x9 checkbox method, so the background for PSA exposures is $9 \times 9 \times (500 / (50 \times 300) / 30s)$ based upon 500 counts in 30s in the WCA 50x300 box. This is 1 count in 10s, so we ignore this for the PSA.</i></p> <p><i>For the WCA images, we will be working a 50x300 box, so the rate here is 18 hz, but we are using a median to find the center, so it is not a straightforward S/N situation. We are interested in measuring the centroid in presence of the noise and 2500 lamp counts are sufficient for our needs for WCA/P2/LOW/B. Since, we are defining the WCA-to-PSA offset for WCA/P1/LOW/B and WCA/P2/MED/B, we will shoot for 3000 lamp counts.</i></p> <p><i>For the Buffer Time, we are shooting for S/N = 50. in both the target and the lamp. Lets overshoot to S/N of 60, that's 7200 counts -> $BT = 2/3 * 326 = 217$. We'll be extra conservative and stay short of this.</i></p> <p><i>For PSA/MIRRORA: (COS.ta.634846) We Simulated in ETC as G5, V=13.5 (lit says 14.5), S/N = 60 gives: Time = 13 seconds. Target count rate = 275 cts/s Brightest Pixel 38 cps</i> <i>PSA/MIRRORB: (COS.ta.634849) We Simulated in ETC as G5, V=13.5 (lit says 14.5), S/N = 50 gives: Time = 217 seconds. Target count rate = 11.6 cts/s Brightest Pixel 1.6 cps</i></p> <p><i>This target was also previously observed in Visit A2 of 12781, with the following REAL count rates (imaging mode)</i></p> <p><i>The PSA/A had 21,063 total counts in 60s (Target = 206W3), after background subtraction = 20,100 = 335 cts/s. PSA/A Brightest Pixel = 32.8 counts/s</i> <i>The PSA/MIRRORB had 12,570 total counts in 300s, after background subtraction=7150 = 23.8 cts/s. PSA/B Brightest Pixel = 0.8 counts/s</i></p> <p><i>PSA A/B = 14x (lbx1a2ffq/lbx1a2fhq) & PSA A/B (BP) = 41x</i></p> <p><i>Remember that the SED of the target is important in this ratio as the two modes have different responses.</i></p> <p><i>For PSA/A We get S/N = 60 in 3600/335 = 11s</i> <i>For PSA/B, We get S/N = 60 in 3600/23.8 = 151s</i></p> <p><i>In Oct 2016, this target was observed as part of 14452 Visit A2, with the following count rates:</i></p> <p><i>The PSA/A had 21,063 total counts in 60s (Target = 206W3), after background subtraction = 20,229 = 337 cts/s, Brightest Pixel = 23.1 counts/s</i> <i>The PSA/B had 14,627 total counts in 300s, after background subtraction=7655 = 25.5 cts/s. PSA/B Brightest Pixel = 1.3 counts/s</i></p>									

Exposures

Proposal 14857 - PSA/A & PSA/B (PB) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

2	PSA/MIRRA ORA IMAG E (P2/LOW) (COS.ta.634 846)	(1) 206W3	COS/NUV, TIME-TAG, PSA	MIRRORA	BUFFER-TIME=15 0; FLASH=S0060D02 0; CURRENT=LOW	QESIPARM USELA MP LINE2; QESIPARM CURR ENT LOW	Sequence 1-7 Non-Int in PSA/A & PSA/B (PB)	20 Secs (20 Secs) [==>]	[1]
<p><i>Comments: Lamp and target image to measure the WCA-to-PSA offset for PSA/MIRRA/P2/LOW current. Expect 416 counts/s from lamp, about the same from the target. We take 20s of each. Note that CURRENT=LOW and LAMP=LINE2 are set as QESIPARMS</i></p>									
3	PSA/MIRRO ORB IMAG E (P2/MED) (OS.ta.6348 49)	(1) 206W3	COS/NUV, TIME-TAG, PSA	MIRROB	BUFFER-TIME=20 0; FLASH=S0120D02 0; CURRENT=MEDI UM	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-7 Non-Int in PSA/A & PSA/B (PB)	220 Secs (220 Secs) [==>]	[1]
<p><i>Comments: Lamp and target image to measure the WCA-to-PSA offset for PSA/MIRROB/P2/MED current. Expect ~400 counts/s from the lamp. We need >k160s of target time, and at least 12s of lamp time. We'll get 200s of target and 2x20 to get a good measurement. Note that CURRENT=MED and LAMP=LINE2 are set as QESIPARMS</i></p>									
4	PSA/MIRRO ORB ACQ/I MAGE (P2/ MED) (OS.ta.6348 49)	(1) 206W3	COS/NUV, ACQ/IMAGE, PSA	MIRROB			Sequence 1-7 Non-Int in PSA/A & PSA/B (PB)	220 Secs (220 Secs) [==>]	[1]
<p><i>Comments: PSA/MIRROB ACQ/Image using P2/MED current.</i></p>									
5	PSA/MIRRO ORB IMAG E2 (P2/MED) D) (OS.ta.6348 49)	(1) 206W3	COS/NUV, TIME-TAG, PSA	MIRROB	BUFFER-TIME=20 0; FLASH=S0120D02 0; CURRENT=MEDI UM	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-7 Non-Int in PSA/A & PSA/B (PB)	220 Secs (220 Secs) [==>]	[1]
<p><i>Comments: Lamp and target image to re-measure the WCA-to-PSA offset for PSA/MIRROB/P2/MED current. Expect 225-400 counts/s from the lamp. We need > 160s of target time, and at least 12s of lamp time. We'll get 200s of target and 2x20 of lamp to get a good measurement. Note that CURRENT=MED and LAMP=LINE2 are set as QESIPARMS</i></p>									
6	PSA/MIRRA ORA IMAG E2 (P2/LOW) W) (COS.ta.634 846)	(1) 206W3	COS/NUV, TIME-TAG, PSA	MIRRORA	BUFFER-TIME=20 0; FLASH=S0060D02 0; CURRENT=LOW	QESIPARM USELA MP LINE2; QESIPARM CURR ENT LOW	Sequence 1-7 Non-Int in PSA/A & PSA/B (PB)	20 Secs (20 Secs) [==>]	[1]
<p><i>Comments: Lamp and target image to re-measure the WCA-to-PSA offset for PSA/MIRRA/Lamp2/LOW current. Expect 416 counts/s from lamp, about the same from the target. We need at least >12s of each, we get 20s for a good measurement. Note that CURRENT=LOW and LAMP=LINE2 are set as QESIPARMS</i></p>									
7	PSA/MIRRA ORA ACQ/I MAGE2 (COS.ta.634 846)	(1) 206W3	COS/NUV, ACQ/IMAGE, PSA	MIRRORA			Sequence 1-7 Non-Int in PSA/A & PSA/B (PB)	20 Secs (20 Secs) [==>]	[1]
<p><i>Comments: Confirmation PSA/A ACQ/image, see first exposure of this visit for complete comment.</i></p>									



Proposal 14857 - PSA/B & BOA/A (BA) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

Mon Aug 14 20:00:23 GMT 2017

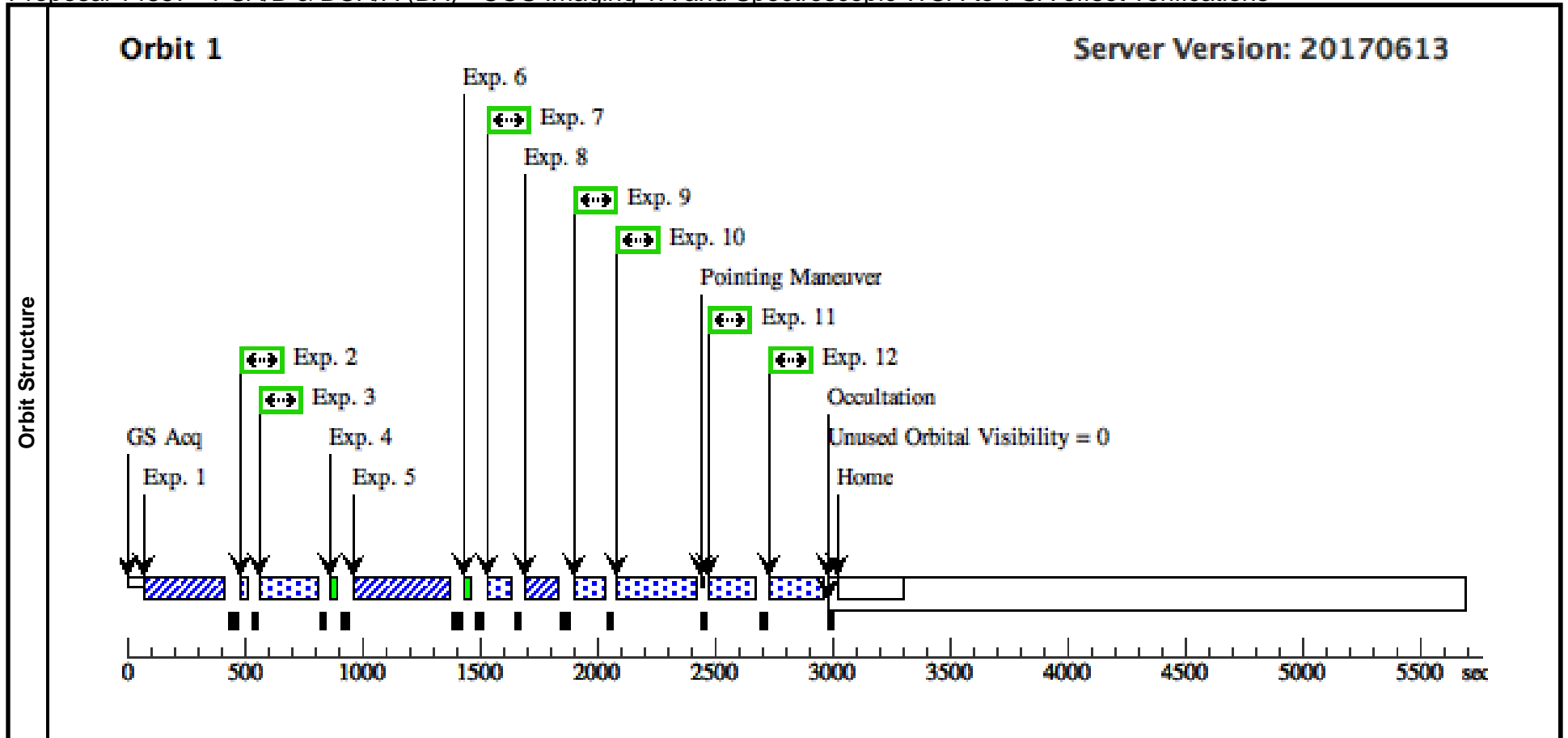
Visit	<p>Proposal 14857, PSA/B & BOA/A (BA), scheduling</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: COS/FUV, COS/NUV</p> <p>Special Requirements: SCHED 100%; BEFORE 02-OCT-2017:00:00:00; GROUP BA, BB, PB WITHIN 30D</p> <p><i>Comments: Visit BA compares the centering of PSA/MIRRORB to BOA/MIRRORA. The target will be the standard star WD1657+343. 100% Schedubility. This Visit (BA) should be executed within 30 days of the other visits in this program, but in no particular order. The closer in time that they can all be executed, the better. We also take some G230L, G285M, and FUV LP3 G130M & G140L spectra to test the WCA-to-PSA offsets.</i></p>																	
	<p>Diagnosics</p> <p>(PSA/B & BOA/A (BA)) Warning (Form): For the best data quality, it is strongly recommended that the maximum number of allowed FP-POS positions is used when observing at a given COS CENWAVE setting. See full description for details.</p>																	
Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(2)</td> <td>WD-1657+343</td> <td>RA: 16 58 51.1200 (254.7130000d) Dec: +34 18 53.30 (34.31481d) Equinox: J2000</td> <td></td> <td>V=16.1</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table>						#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(2)	WD-1657+343	RA: 16 58 51.1200 (254.7130000d) Dec: +34 18 53.30 (34.31481d) Equinox: J2000		V=16.1	Reference Frame: ICRS
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(2)	WD-1657+343	RA: 16 58 51.1200 (254.7130000d) Dec: +34 18 53.30 (34.31481d) Equinox: J2000		V=16.1	Reference Frame: ICRS													
<p><i>Comments: COS.ta.432603 indicates this is a good PSA/MIRB to BOA/MIRA target PSA/MIRB counts = S/N=60 in 11.6s (S/N = 40 in 5.2s); COS.ta.432604 gives S/N=60 in 150.7s for BOA/MIRA Extended=NO</i></p>																		

Proposal 14857 - PSA/B & BOA/A (BA) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/IMAG E (PSA/MIRRORB/P2/MED) (COS.ta.433 946)	(2) WD-1657+343	COS/NUV, ACQ/IMAGE, PSA	MIRRORB		GS ACQ SCENARIO BASE1B3	Sequence 1-12 Non-Int in PSA/B & BOA/A (BA)	13 Secs (13 Secs) [==>]	[1]
<p><i>Comments: COS.ta.433946 gives S/N=60 in 11.65s. BP = 43 cps. We observed this target in 13124 and the target count rate was 400 cts/s, total cts = 4800 total , BP=24 cts/s That's sqrt(2/3 * 4800) = 56 (S/N)</i></p>									
2	PSA/MIRRORB/P2/MED + Target (COS.ta.433 946)	(2) WD-1657+343	COS/NUV, TIME-TAG, PSA	MIRRORB	FLASH=S0040D016 ; BUFFER-TIME=500	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-12 Non-Int in PSA/B & BOA/A (BA)	16 Secs (16 Secs) [==>]	[1]
<p><i>Comments: COS.ta.433946 gives S/N=60 in 11.65s. BP = 42 cps.</i></p> <p><i>A previous exposure of this target (lcgq01q7q) yielded a total (lamp+target+background) count rate of 24617 counts in 16s (1538 cps). So buffer time should be < 0.67 *(2.35E6/1538.) = 1024. Just be safe, we go with 500s.</i></p> <p><i>We insert a 16s lamp flash to make sure we get enough counts in the lamp image</i></p>									
3	BOA/MIRRORA/Target (no lamp) (COS.ta.433 949)	(2) WD-1657+343	COS/NUV, TIME-TAG, BOA	MIRRORA	BUFFER-TIME=2000		Sequence 1-12 Non-Int in PSA/B & BOA/A (BA)	150 Secs (150 Secs) [==>]	[1]
<p><i>Comments: COS.ta.433949 gives S/N=60 in 150s, followed by a wavecal. The exposure time is driven by the target. We observed this target in 13124, the target count rate was 18.2 cps (2736 counts in 150s : ~312 background in 150s over a 50x50 box). This is a BOA image, so we need to add a WAVE image after this exposure. The WAVECAL=YES parameter does not trigger a separate lamp image. Buffer should be < 0.67 *(2.35E6/20.) or < 7800. We use 2000 just to be safe.</i></p>									
4	WCA/MIRRORA/P2/LOW (no target)	WAVE	COS/NUV, TIME-TAG, WCA	MIRRORA		QESIPARM USELAMP LINE2; QESIPARM CURRENT LOW	Sequence 1-12 Non-Int in PSA/B & BOA/A (BA)	9 Secs (9 Secs) [==>]	[1]
<p><i>Comments: For P2/LOW/MIRRORA we get 2900 counts in 7s. Buffer Time is calculated automatically.</i></p>									
5	ACQ/IMAG E (BOA/MIRRORA/P2/LOW) (COS.ta.433 949)	(2) WD-1657+343	COS/NUV, ACQ/IMAGE, BOA	MIRRORA			Sequence 1-12 Non-Int in PSA/B & BOA/A (BA)	150 Secs (150 Secs) [==>]	[1]
<p><i>Comments: COS.ta.433949 gives S/N=60 in 150s</i></p>									
6	WCA/MIRRORA/P2/LOW (no target)	WAVE	COS/NUV, TIME-TAG, WCA	MIRRORA		QESIPARM USELAMP LINE2; QESIPARM CURRENT LOW	Sequence 1-12 Non-Int in PSA/B & BOA/A (BA)	10 Secs (10 Secs) [==>]	[1]
<p><i>Comments: For P2/LOW/MIRRORA we get 2900 counts in 7s</i></p>									
7	PSA/MIRRORB/P2/MED + Target (COS.ta.433 946)	(2) WD-1657+343	COS/NUV, TIME-TAG, PSA	MIRRORB	FLASH=S0040D016 ; BUFFER-TIME=500	QESIPARM USELAMP LINE2; QESIPARM CURRENT MEDIUM	Sequence 1-12 Non-Int in PSA/B & BOA/A (BA)	16 Secs (16 Secs) [==>]	[1]
<p><i>Comments: COS.ta.433946 gives S/N=60 in 11.65s. BP = 42 cps.</i></p> <p><i>A previous exposure of this target (lcgq01q7q) yielded a total (lamp+target+background) count rate of 24617 counts in 16s (1538 cps). So buffer time should be < 0.67 *(2.35E6/1538.) = 1024. Just be safe, we go with 500s.</i></p> <p><i>We insert a 16s lamp flash to make sure we get enough counts in the lamp image</i></p>									

Proposal 14857 - PSA/B & BOA/A (BA) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

8	ACQ/IMAG E (PSA/MIR RORB/P2/ MED) (COS.ta.433 946)	(2) WD-1657+343	COS/NUV, ACQ/IMAGE, PSA	MIRRORB			Sequence 1-12 Non-I nt in PSA/B & BOA/ A (BA)	13 Secs (13 Secs) [==>]	[1]
<p>Comments: COS.ta.433946 gives S/N=60 in 11.65s. BP = 43 cps. We observed this target in 13124 and the target count rate was 400 cts/s, total cts = 4800, BP=24 cts/s That's sqrt(2/3 * 4800) = 56 (S/N)</p>									
9	PSA/G230L /3000 (COS.sa.433 964)	(2) WD-1657+343	COS/NUV, TIME-TAG, PSA	G230L 3000 A	BUFFER-TIME=70 0; FP-POS=3; FLASH=S0100D02 1	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-12 Non-I nt in PSA/B & BOA/ A (BA)	23 Secs (23 Secs) [==>]	[1]
<p>Comments: COS.sa.433964 gives S/N=40 in 2 s, we go for 21s. BT=2/3*1270 = 800 (we use 700 just to be safe) Based upon the data from 13124, we expect 3800 counts in 30s in the B-stripe. We set the lamp to the exposure time to get more counts. Note that previous version of this program had a typo in the label (it said 2950 not 3000). G230L/3000 is one of the 'approved' NUV cenwaves for TA.</p>									
10	PSA/G285 M/2676 (COS.sp.744 073)	(2) WD-1657+343	COS/NUV, TIME-TAG, PSA	G285M 2676 A	BUFFER-TIME=14 00; FP-POS=3; FLASH=S0100D05 0	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-12 Non-I nt in PSA/B & BOA/ A (BA)	151 Secs (151 Secs) [==>]	[1]
<p>Comments: COS.sp.744073 gives S/N=30 in the XD (per stripe) in 151 seconds, BT=2/3 * 2470 = ~1600. Normal Tagflashing is not sufficient for our WCA needs, so we go for 100s. To allow for lamp counts, we drop the BT down to 1400. G285M/2676 is one of the 'approved' NUV cenwaves for TA.</p>									
11	PSA/G130 M/1309/3 (COS.sp.433 966)	(2) WD-1657+343	COS/FUV, TIME-TAG, PSA	G130M 1309 A	FP-POS=3; BUFFER-TIME=22 0; FLASH=S0060D02 5; SEGMENT=BOTH; LIFETIME-POS=L P3	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-12 Non-I nt in PSA/B & BOA/ A (BA)	25 Secs (25 Secs) [==>]	[1]
<p>Comments: COS.sp.433966, BT=2/3*442=295, We use 220 just to be safe. We previously used a 30s lamp flash and got 4750 counts. We have reduced that to match the exposure time (25s). This should give us ~4000 counts, which is plenty for our purposes</p>									
12	PSA/G140L /1280/3 (COS.sp.433 967)	(2) WD-1657+343	COS/FUV, TIME-TAG, PSA	G140L 1280 A	FP-POS=3; BUFFER-TIME=40 0; FLASH=YES; LIFETIME-POS=L P3	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-12 Non-I nt in PSA/B & BOA/ A (BA)	10 Secs (10 Secs) [==>]	[1]
<p>Comments: COS.sp.433967, BT=2/3*647<430 ET=17s, Normal TAGFLASH. In 13124, we got 71K in 30s, we need <10K to get an excellent centroid, so we are taking this exposure time down to 10s, The lamp duration is 7s (2700 counts).</p>									



Proposal 14857 - BOA/A & BOA/B (BB) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

Mon Aug 14 20:00:23 GMT 2017

Visit	<p>Proposal 14857, BOA/A & BOA/B (BB), scheduling</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: COS/FUV, COS/NUV</p> <p>Special Requirements: SCHED 100%; BEFORE 02-OCT-2017:00:00:00; GROUP BB,BA,PB WITHIN 30D</p> <p><i>Comments: Visit BB compares the centering of BOA/MIRRORA to BOA/MIRRORB. 100% Schedubility. This Visit (BB for BOA/MIRRORB) should be executed with 30 days of the other visits inthis program, in no particular order. The closer in time that they can all be executed, the better. We also take G185M, G225M, and FUV LP3 G160M spectra to test the WCA-to-PSA offsets. To test Ywalk, we also take LP3 G160M/1600 exposures at +/- 0.7". This Visit used to have an orient, but this has been determined to be unnecessary and has been removed.</i></p>																																								
	Diagnostics	<p>(BOA/A & BOA/B (BB)) Warning (Form): For the best data quality, it is strongly recommended that the maximum number of allowed FP-POS positions is used when observing at a given COS CENWAVE setting. See full description for details.</p>																																							
Fixed Targets		<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(3)</td> <td>HIP66578</td> <td>RA: 13 38 50.4757 (204.7103154d)</td> <td>Proper Motion RA: -403.65 mas/yr</td> <td>V=12.773+/-0.024</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td></td> <td>Alt Name1: PG1337+705</td> <td>Dec: +70 17 7.66 (70.28546d)</td> <td>Proper Motion Dec: -22.0 mas/yr</td> <td>F(1300)=1.3E-12,</td> <td></td> </tr> <tr> <td></td> <td>Alt Name2: GRW+70.5824</td> <td>Equinox: J2000</td> <td>Parallax: 0.03829"</td> <td>F(1800)=5.2E-13</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>Epoch of Position: 2000</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>Radial Velocity: 26 km/sec</td> <td></td> <td></td> </tr> </tbody> </table> <p><i>Comments: COS.ta.432623 S/N=60 in 12s BOA/MIRRORA, BOA/MIRROB (COS.ta.432624) in 175s</i> <i>Extended=NO</i></p>					#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(3)	HIP66578	RA: 13 38 50.4757 (204.7103154d)	Proper Motion RA: -403.65 mas/yr	V=12.773+/-0.024	Reference Frame: ICRS		Alt Name1: PG1337+705	Dec: +70 17 7.66 (70.28546d)	Proper Motion Dec: -22.0 mas/yr	F(1300)=1.3E-12,			Alt Name2: GRW+70.5824	Equinox: J2000	Parallax: 0.03829"	F(1800)=5.2E-13					Epoch of Position: 2000						Radial Velocity: 26 km/sec	
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Proposal 14857 - BOA/A & BOA/B (BB) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/IMAG E (BOA/MIR RORA/P2/ LOW) (COS.ta.432 623)	(3) HIP66578	COS/NUV, ACQ/IMAGE, BOA	MIRRORA		GS ACQ SCENARI O BASE1B3	Sequence 1-13 Non-I nt in BOA/A & BOA /B (BB)	16 Secs (16 Secs) [==>]	[1]
<p><i>Comments: Using the standard star HIP66578 to compare the centerings between the BOA/MIRRORA and BOA/MIRRORB ACQ/IMAGE centering options. The ETC gives 12 seconds to reach S/N=60 with this target in the BOA/MIRRORA mode. We observed this target in 13124, with 2961 counts in 12s (target +background in 50x50 box). We will need to follow this with a P2/LOW/WCA/A image.</i></p>									
2	WCA/MIR RORA/P2/LO W (no target)	WAVE	COS/NUV, TIME-TAG, WCA	MIRRORA	BUFFER-TIME=27 0	QESIPARM USELA MP LINE2; QESIPARM CURR ENT LOW	Sequence 1-13 Non-I nt in BOA/A & BOA /B (BB)	14 Secs (14 Secs) [==>]	[1]
<p><i>Comments: For P2/LOW/MIRRORA we get 2900 counts in 7s. The BT for this must be $< 0.37*(2.35E6/4800)$ or < 270</i></p>									
3	BOA/MIR RORB/Target (no lamp) (COS.ta.432 624)	(3) HIP66578	COS/NUV, TIME-TAG, BOA	MIRRORB	BUFFER-TIME=10 00		Sequence 1-13 Non-I nt in BOA/A & BOA /B (BB)	183 Secs (183 Secs) [==>]	[1]
<p><i>Comments: Followup BOA/MIRRORB calibration IMAGE with a wavecal to verify proper initial centering (The ETC gives 175 seconds to reach S/N=60 with this target in the BOA/MIRRORA mode.) The BT is $\sim 0.67*2.35E6/(1000) < 1575$. as we are only getting about 20 cps from the source, most of the counts are noise. This is a BOA image, so we need to add a WAVE image after this exposure. The WAVECAL=YES parameter does not trigger a separate lamp image</i></p>									
4	WCA/MIR RORB/P2/MED (no target)	WAVE	COS/NUV, TIME-TAG, WCA	MIRRORB	BUFFER-TIME=20 00	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-13 Non-I nt in BOA/A & BOA /B (BB)	24 Secs (24 Secs) [==>]	[1]
<p><i>Comments: For P2/MED, we expect 300-460 cps, with a Brightest Pixel = 9 cts/s. So BT $< 0.67*(2.35E6/460) < 3400$.</i></p>									
5	ACQ/IMAG E (BOA/MIR RORB/P2/ MED) (COS.ta.432 624)	(3) HIP66578	COS/NUV, ACQ/IMAGE, BOA	MIRRORB			Sequence 1-13 Non-I nt in BOA/A & BOA /B (BB)	183 Secs (183 Secs) [==>]	[1]
<p><i>Comments: Compare the centerings between the BOA/MIRRORA and BOA/MIRRORB ACQ/IMAGE centering options. The ETC gives 175 seconds to reach S/N=60 with this target in the BOA/MIRRORB mode.</i></p>									
6	WCA/MIR RORB/P2/MED (no target)	WAVE	COS/NUV, TIME-TAG, WCA	MIRRORB	BUFFER-TIME=20 00	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-13 Non-I nt in BOA/A & BOA /B (BB)	24 Secs (24 Secs) [==>]	[1]
<p><i>Comments: For P2/MED, we expect 300-460 cps, with a Brightest Pixel = 9 cts/s. So BT $< 0.67*(2.35E6/460) < 3400$.</i></p>									
7	WCA/MIR RORA/P2/LO W (no target)	WAVE	COS/NUV, TIME-TAG, WCA	MIRRORA	BUFFER-TIME=27 0	QESIPARM USELA MP LINE2; QESIPARM CURR ENT LOW	Sequence 1-13 Non-I nt in BOA/A & BOA /B (BB)	14 Secs (14 Secs) [==>]	[1]
<p><i>Comments: For P2/LOW/MIRRORA we get 2900 counts in 7s. The BT for this must be $< 0.37*(2.35E6/4800)$ or < 270</i></p>									
8	ACQ/IMAG E (BOA/MIR RORA/P2/ LOW) (COS.ta.432 623)	(3) HIP66578	COS/NUV, ACQ/IMAGE, BOA	MIRRORA			Sequence 1-13 Non-I nt in BOA/A & BOA /B (BB)	16 Secs (16 Secs) [==>]	[1]
<p><i>Comments: Using the standard star HIP66578 to compare the centerings between the BOA/MIRRORA and BOA/MIRRORB ACQ/IMAGE centering options. The ETC gives 12 seconds to reach S/N=60 with this target in the BOA/MIRRORA mode. We observed this target in 13124, with 2961 counts in 12s (target +background in 50x50 box). We will need to follow this with a P2/LOW/WCA/A image.</i></p>									

Exposures

Proposal 14857 - BOA/A & BOA/B (BB) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

9	PSA/G225 M/2306 (COS.sp.433 936)	(3) HIP66578	COS/NUV, TIME-TAG, PSA	G225M 2306 A	BUFFER-TIME=54 0; FLASH=S0200D03 5; FP-POS=3	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-13 Non-Int in BOA/A & BOA/B (BB)	53 Secs (53 Secs) [==>]	[1]
<p>Comments: COS.sp.433936 gives s/n/re =10 in 53 seconds. BT=2/3 * 851 < 567. We want to get a good lamp flash, so 35s should be ok. FPPOS=3. G225M/2306 is one of the 'approved' NUV cenwaves for TA.</p>									
10	PSA/G185 M/1913 (COS.sp.744 079)	(3) HIP66578	COS/NUV, TIME-TAG, PSA	G185M 1913 A	BUFFER-TIME=39 0; FLASH=S0070D03 5; FP-POS=3	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-13 Non-Int in BOA/A & BOA/B (BB)	40 Secs (40 Secs) [==>]	[1]
<p>Comments: COS.sp.744079 gives s/n/re =10.7 in 40 seconds. BT=2/3 * 612 < 408. We want to get a good lamp flash, so 35s should be ok. FPPOS=3. G2185M/1913 is one of the 'approved' NUV cenwaves for TA.</p>									
11	PSA/G160 M/1600/3-0.0 (COS.sp.615 394)	(3) HIP66578	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; BUFFER-TIME=20 0; FLASH=S0100D02 2; SEGMENT=A; LIFETIME-POS=L P3	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-13 Non-Int in BOA/A & BOA/B (BB)	22 Secs (22 Secs) [==>]	[1]
<p>Comments: COS.sp.615394 gives us 4200 counts/s (seg A only). We set the lamp flash to be ET - 1 s. Buffer time set to min. The actual BT calculation gives $0.67 * (2.35E6/4200) < 374$, to be safe we'll use 200. Segment B is too bright and must be turned off.</p>									
12	PSA/G160 M/1600/3+0.7 (COS.sp.615 394)	(3) HIP66578	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; BUFFER-TIME=20 0; FLASH=S0100D02 5; SEGMENT=A; LIFETIME-POS=L P3	POS TARG null,+0.7; QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-13 Non-Int in BOA/A & BOA/B (BB)	27 Secs (27 Secs) [==>]	[1]
<p>Comments: COS.sp.615394 gives us 4200 counts/s (seg A only). We set the lamp flash to be the same as the 0" position flash (24s). At 0.7", the target should be vignettted 13% (87% original). We want the same # of counts here on SEGA, so the exposures time is $22/0.87 = 25$ s, which gives ET = 137s. The BT could be as large as $2/3 * 120/0.87 = 535$s, We'll just use 200 to be safe. Segment B is too bright and must be turned off.</p>									
13	PSA/G160 M/1600/3-0.7 (COS.sp.615 394)	(3) HIP66578	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FP-POS=3; BUFFER-TIME=20 0; FLASH=S0100D02 5; SEGMENT=A; LIFETIME-POS=L P3	POS TARG null,-0.7 ; QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 1-13 Non-Int in BOA/A & BOA/B (BB)	27 Secs (27 Secs) [==>]	[1]
<p>Comments: COS.sp.615394 gives us 4200 counts/s (seg A only). We set the lamp flash to be the same as the 0" position flash (24s). At -0.7", the target should be vignettted 13% (87% original). We want the same # of counts here on SEGA, so the exposures time is $22/0.87 = 25$ s, which gives ET = 137s. The BT could be as large as $2/3 * 2.35E6/4200 = 535$s, We'll just use 200 to be safe. Segment B is too bright and must be turned off.</p>									
14	WCA/MIRR WAVE ORA/P1/LOW (no target)		COS/NUV, TIME-TAG, WCA	MIRRORA		QESIPARM USELA MP LINE1; QESIPARM CURR ENT LOW	Sequence 14-17 Non-Int in BOA/A & BOA/B (BB)	16 Secs (16 Secs) [==>]	[1]
<p>Comments: For P1/LOW/A, we expect 2620 counts/s. BP = 45 cp/s. This is derived from data in program 13124.</p>									

Proposal 14857 - BOA/A & BOA/B (BB) - COS Imaging TA and Spectroscopic WCA-to-PSA offset verifications

15	WCA/MIRR WAVE ORA/P2/LO W (no target)	COS/NUV, TIME-TAG, WCA	MIRRORA	QESIPARM USELA MP LINE2; QESIPARM CURR ENT LOW	Sequence 14-17 Non -Int in BOA/A & BO A/B (BB)	26 Secs (26 Secs) [==>]	[1]
<i>Comments: For P2/LOW/MIRRORA we get 2900 counts in 7s</i>							
16	WCA/MIRR WAVE ORB/P1/LO W (no target)	COS/NUV, TIME-TAG, WCA	MIRRORB	QESIPARM USELA MP LINE1; QESIPARM CURR ENT LOW	Sequence 14-17 Non -Int in BOA/A & BO A/B (BB)	32 Secs (32 Secs) [==>]	[1]
<i>Comments: For P1/LOW, we expect 82 cts/s, to get 1600 counts in the primary spot, we need 2400 counts. 2400./82 = 30 seconds</i>							
17	WCA/MIRR WAVE ORB/P2/ME D (no target)	COS/NUV, TIME-TAG, WCA	MIRRORB	QESIPARM USELA MP LINE2; QESIPARM CURR ENT MEDIUM	Sequence 14-17 Non -Int in BOA/A & BO A/B (BB)	26 Secs (26 Secs) [==>]	[1]
<i>Comments: For P2/MED, we expect 300-460 cps, with a Brightest Pixel = 9 cts/s</i>							

