



17331 - ACS CCD Stability Monitor

Cycle: 31, Proposal Category: CAL/ACS

(Calibration)

(Availability Mode: RESTRICTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
Dr. Nimish P. Hathi (PI) (Contact)	Space Telescope Science Institute
Dr. Jay Anderson (CoI)	Space Telescope Science Institute
Roberto Avila (CoI)	Space Telescope Science Institute
Yotam Cohen (CoI)	Space Telescope Science Institute
Dr. Norman Grogin (CoI)	Space Telescope Science Institute

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>
01	(1) NGC104-WFC	ACS/WFC	2	10-Jul-2024 18:00:18.0	yes
51	(1) NGC104-WFC	ACS/WFC	1	10-Jul-2024 18:00:19.0	yes
02	(2) NGC5139-WFC	ACS/WFC	1	10-Jul-2024 18:00:20.0	yes
03	(1) NGC104-WFC	ACS/WFC	1	10-Jul-2024 18:00:21.0	yes
04	(2) NGC5139-WFC	ACS/WFC	3	10-Jul-2024 18:00:22.0	yes

8 Total Orbits Used

ABSTRACT

Every year, beginning with the SMOV, ACS/WFC has obtained multiband imaging of a moderately crowded stellar field in the globular cluster 47 Tuc (about 6' west of the core). Measured stellar positions and magnitudes are used to monitor local- and large-scale variations in the plate scale and

Proposal 17331 (STScI Edit Number: 2, Created: Wednesday, July 10, 2024 at 5:00:22 PM Eastern Standard Time) - Overview

the sensitivity of the detectors. Single exposures in each WFC subarray mode (512, 1K, 2K) allow us to verify that photometry obtained in full-frame and in subarray modes are repeatable to better than 1%.

These observations will help validate and monitor the Cycle 24 redefined ACS subarray readouts, which now include all pixel columns for consistent timings. Although the new 512, 1K and 2K subarrays are defined for all 4 readout amplifiers, the B amplifier subarrays are the current default for subarray requests and the default for the WFC polarizers. This program will obtain only B-amplifier subarray exposures.

Cycle 31 will be the fifth year of consecutive Omega Centauri globular cluster observations with standard ACS/WFC filters (in the same way as 47 Tuc). This cluster is a WFC3/UVIS calibration target. These ACS observations will be used for comparison of L-flat and filter-dependent distortion for ACS/WFC and WFC3/UVIS.

OBSERVING DESCRIPTION

Resources Required:

Observation. Total = 6 external orbits.

Both clusters will be observed two times during the cycle (in ~5-6 month intervals):

Visit 1 (2 orbits, 47 Tuc): Nov 2023;

Visit 2 (1 orbit, Omega Cen): Feb 2024;

Visit 3 (1 orbit, 47 Tuc): Apr-Jun 2024;

Visit 4 (2 orbits, Omega Cen): Jul-Sep 2024;

Visit 1 (2 orbits, 47 Tuc):

6 most common broad filters (F435W, F475W, F606W, F775W, F814W, F850LP).

6 remaining filters (F502N, F550M, F555W, F625W, F658N, F660N).

3 short exposures: Subarrays (512, 1K, 2K - all with the primary use-case: B-amplifier).

Visits 2 and 3 (1 orbit each, both fields):

6 most common broad filters (F435W, F475W, F606W, F775W, F814W, F850LP).

Visit 4 (2 orbits, Omega Cen):

6 most common broad filters (F435W, F475W, F606W, F775W, F814W, F850LP).

6 remaining filters (F502N, F550M, F555W, F625W, F658N, F660N).

Resources Required:

Analysis. Approximately 0.1 FTE.

Products: Updates to the relative sensitivity as a function of position on the detector will be provided via updated flat field reference files. Any changes in the absolute sensitivity of the detectors as a function of time will be used to update the CCD QE curves used by the pipeline. Updates to the multi-wavelength geometric distortion and its time dependency will be implemented in the DrizzlePac and HST pipeline.

Accuracy Goals: Variations with respect to previous observations allow us to create flat-field reference files that are accurate to 1% over the detector field of view. No absolute photometric calibration is provided by this program, although drifts in time of the sensitivity are tracked to ~0.1% per year. Multi-wavelength geometric-distortion solutions are accurate to ~0.02 pixels across the detector for calibrated filters when time-dependent corrections are included (ACS ISR 2015-06, Kozhurina-Platais et al.).

Scheduling and Special Requirements: Rather stringent because of guide-star availability constraints and the need for a regular cadence that closely matches the ORIENTs of prior years' monitoring, but we are planning our observations to be compatible with single-gyro mode scheduling.

Please also indicate whether this is a

New program: NO

Routine program: YES

If routine program please state whether there are any differences compared to the previous cycle(s): SAME AS Cy30

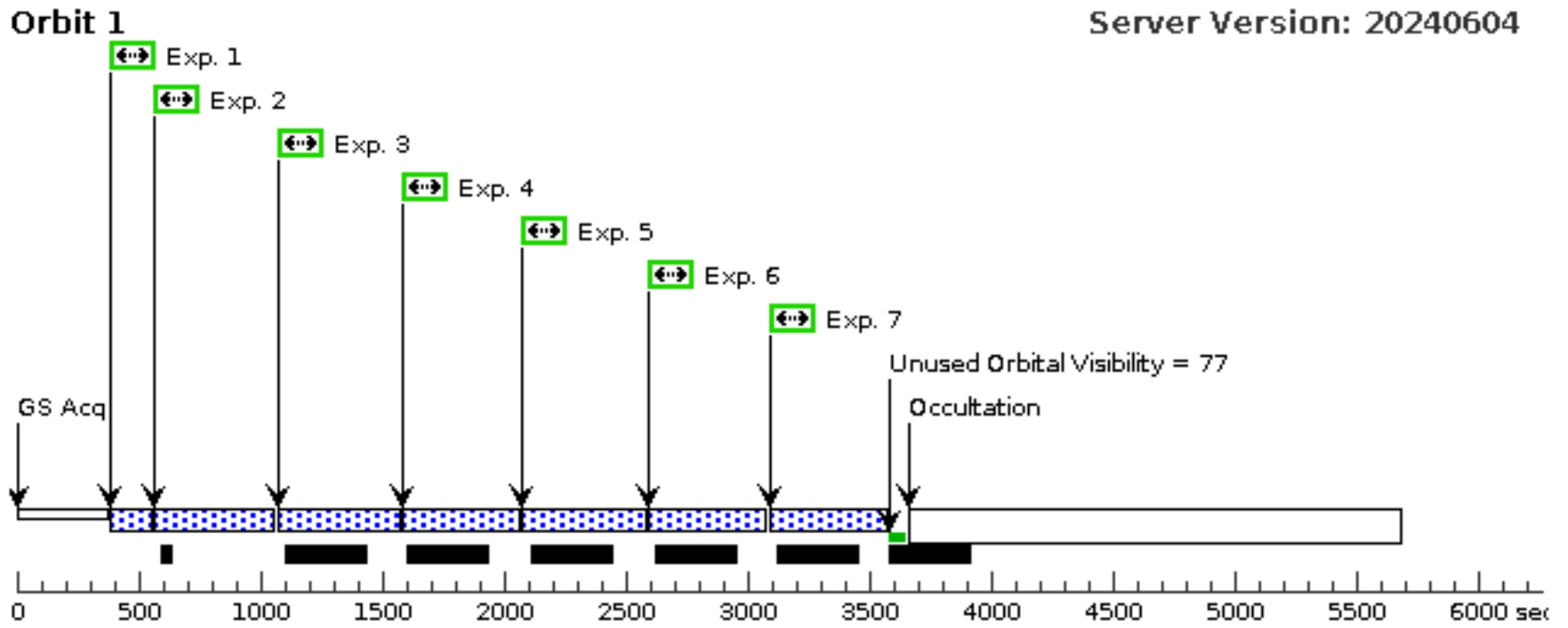
Proposal 17331 - Visit 01 - ACS CCD Stability Monitor

Visit	Proposal 17331, Visit 01, failed Wed Jul 10 22:00:22 GMT 2024 Diagnostic Status: Warning Scientific Instruments: ACS/WFC Special Requirements: GYRO MODE 3GOBAD; BETWEEN 01-NOV-2023:00:00:00 AND 31-JAN-2024:00:00:00; VISIBILITY INTERVAL 3665 S																						
	Diagnostics	(Visit 01) Warning (Form): Gyro Mode overrides default value of 1G. (Visit 01) Warning (Orbit Planner): SAME POS MAY NOT BE APPROPRIATE (Visit 01) Warning (Orbit Planner): SAME POS MAY NOT BE APPROPRIATE (Visit 01) Warning (Orbit Planner): SAME POS MAY NOT BE APPROPRIATE																					
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Proposal 17331 - Visit 01 - ACS CCD Stability Monitor

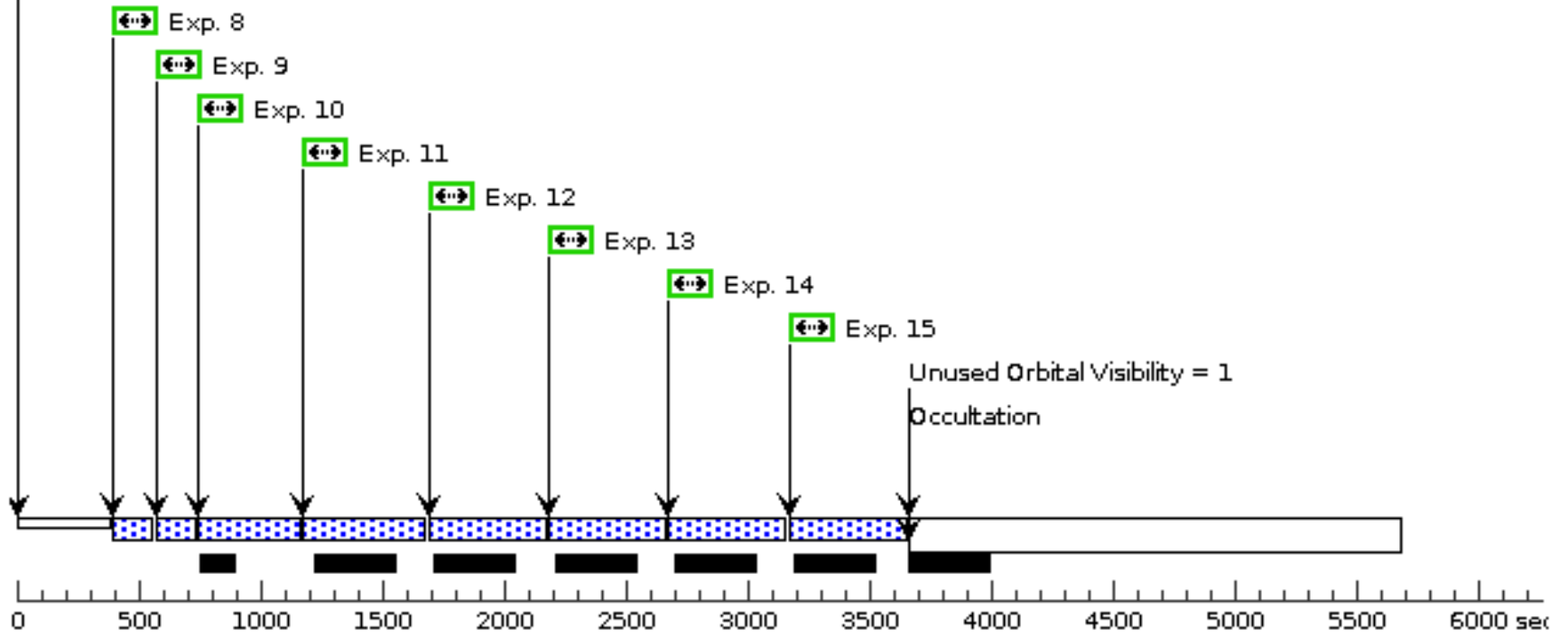
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	WFC1B-512	(1) NGC104-WFC	ACS/WFC, ACCUM, WFC1B-512	F606W		SAME POS AS 10; GS ACQ SCENARI O BASE1B3		30.0 Secs (30 Secs) [==>]	[1]
	2	F502N	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F502N				350 Secs (350 Secs) [==>]	[1]
	3	F658N	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F658N				350 Secs (350 Secs) [==>]	[1]
	4	F475W	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F475W				337.0 Secs (337 Secs) [==>]	[1]
	5	F660N	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F660N				350 Secs (350 Secs) [==>]	[1]
	6	F814W	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F814W				337.0 Secs (337 Secs) [==>]	[1]
	7	F435W	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F435W				337.0 Secs (337 Secs) [==>]	[1]
	8	WFC1B-1K	(1) NGC104-WFC	ACS/WFC, ACCUM, WFC1B-1K	F606W		SAME POS AS 10		30.0 Secs (30 Secs) [==>]	[2]
	9	WFC1B-2K	(1) NGC104-WFC	ACS/WFC, ACCUM, WFC1B-2K	F606W		SAME POS AS 10		30.0 Secs (30 Secs) [==>]	[2]
	10	F606W	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F606W				297.0 Secs (297 Secs) [==>]	[2]
	11	F555W	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F555W				337.0 Secs (337 Secs) [==>]	[2]
	12	F775W	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F775W				337.0 Secs (337 Secs) [==>]	[2]
	13	F625W	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F625W				337.0 Secs (337 Secs) [==>]	[2]
	14	F550M	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F550M				337.0 Secs (337 Secs) [==>]	[2]
15	F850LP	(1) NGC104-WFC	ACS/WFC, ACCUM, WFCENTER	F850LP				337.0 Secs (337 Secs) [==>]	[2]	

Orbit Structure



Orbit 2

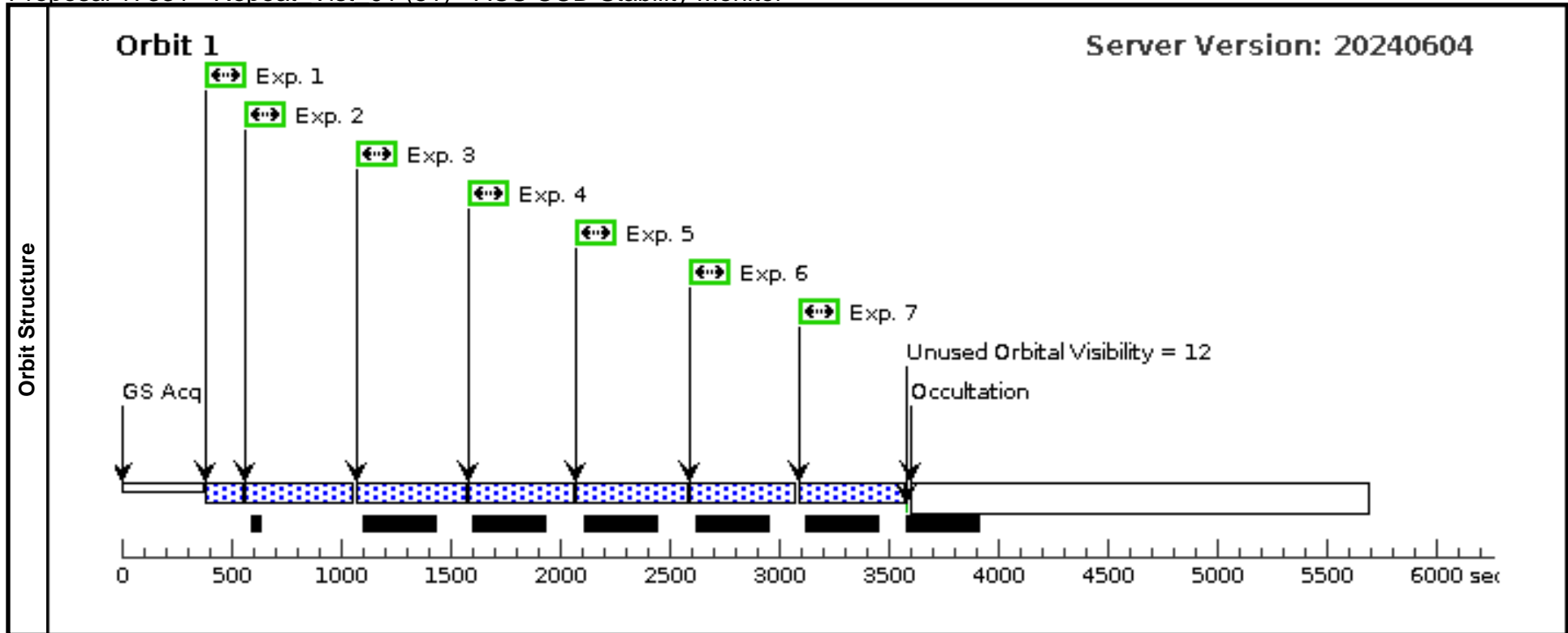
GS Reacq



Proposal 17331 - Repeat_Vist_01 (51) - ACS CCD Stability Monitor

Wed Jul 10 22:00:22 GMT 2024

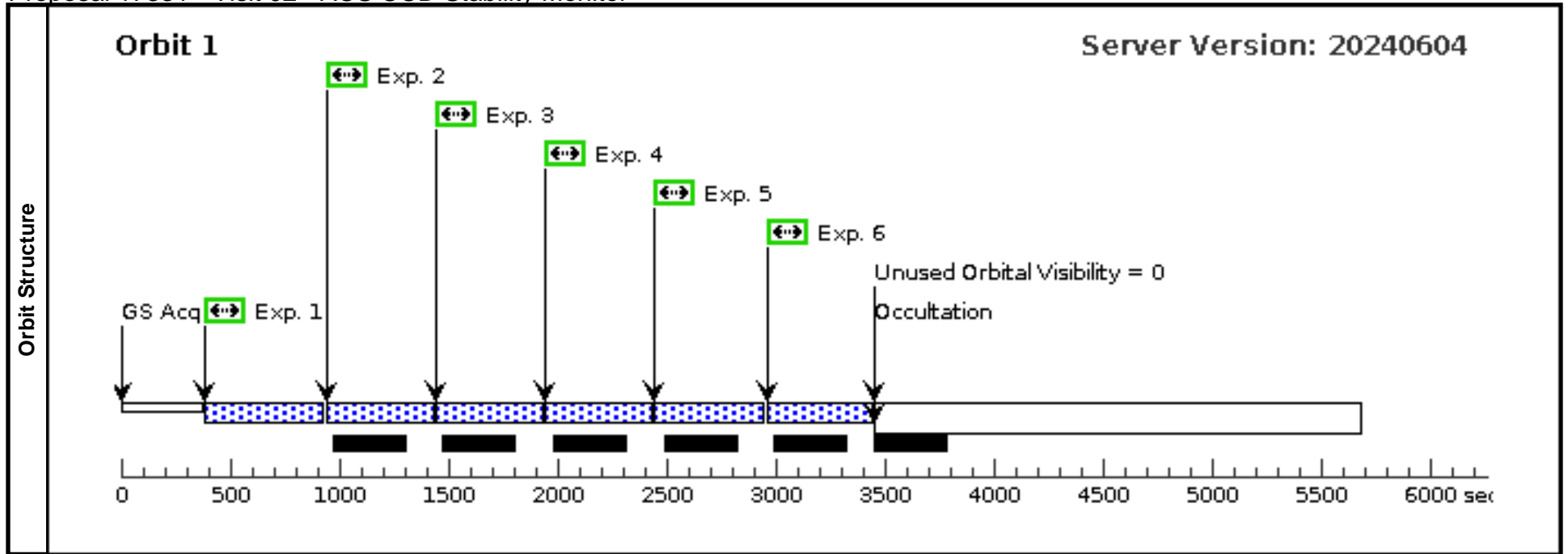
Visit	Proposal 17331, Repeat_Vist_01 (51), completed Diagnostic Status: Warning Scientific Instruments: ACS/WFC Special Requirements: GYRO MODE 3GOBAD; BETWEEN 01-NOV-2023:00:00:00 AND 31-JAN-2024:00:00:00; VISIBILITY INTERVAL 3600 S <i>Comments: Repeat of the failed Visit 1 (orbit 1)</i>																																																																																				
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Proposal 17331 - Visit 02 - ACS CCD Stability Monitor

Wed Jul 10 22:00:23 GMT 2024

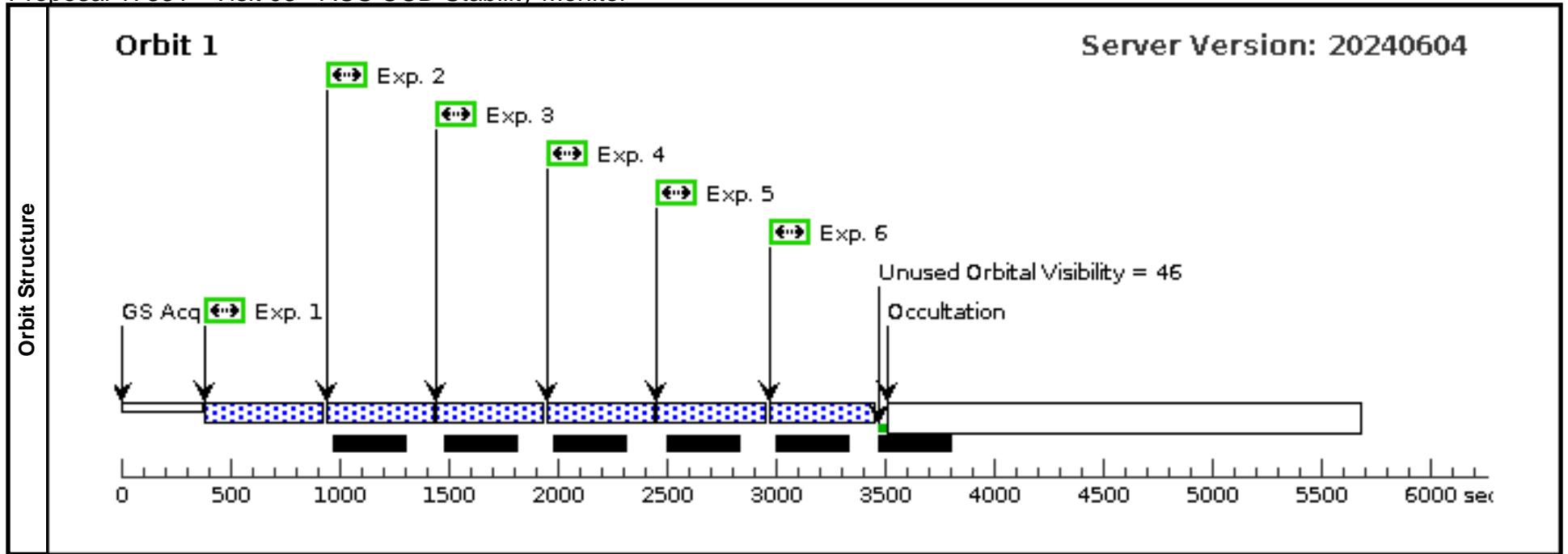
Visit	Proposal 17331, Visit 02, completed Diagnostic Status: Warning Scientific Instruments: ACS/WFC Special Requirements: GYRO MODE 3GOBAD; BETWEEN 01-JAN-2024:00:00 AND 30-APR-2024:00:00:00; VISIBILITY INTERVAL 3459 S									
	(Visit 02) Warning (Form): Gyro Mode overrides default value of 1G.									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	NGC5139-WFC	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000	Proper Motion RA: -5.928302449291017E-4 sec of time/yr Proper Motion Dec: -0.005019999980504508 arcsec/yr Epoch of Position: 2015.5	V=5.33	Reference Frame: SIMBAD				
<i>Comments: These coordinates are taken from PID 15594 AKA Omega Centauri Category=STELLAR CLUSTER Description=[GLOBULAR CLUSTER]</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F775W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F775W				337 Secs (337 Secs)	
									[==>]	[1]
	2	F850LP	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F850LP				337 Secs (337 Secs)	
									[==>]	[1]
	3	F606W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F606W				337 Secs (337 Secs)	
									[==>]	[1]
	4	F475W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F475W				337 Secs (337 Secs)	
								[==>]	[1]	
5	F814W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F814W				337 Secs (337 Secs)		
								[==>]	[1]	
6	F435W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F435W				337 Secs (337 Secs)		
								[==>]	[1]	



Proposal 17331 - Visit 03 - ACS CCD Stability Monitor

Wed Jul 10 22:00:23 GMT 2024

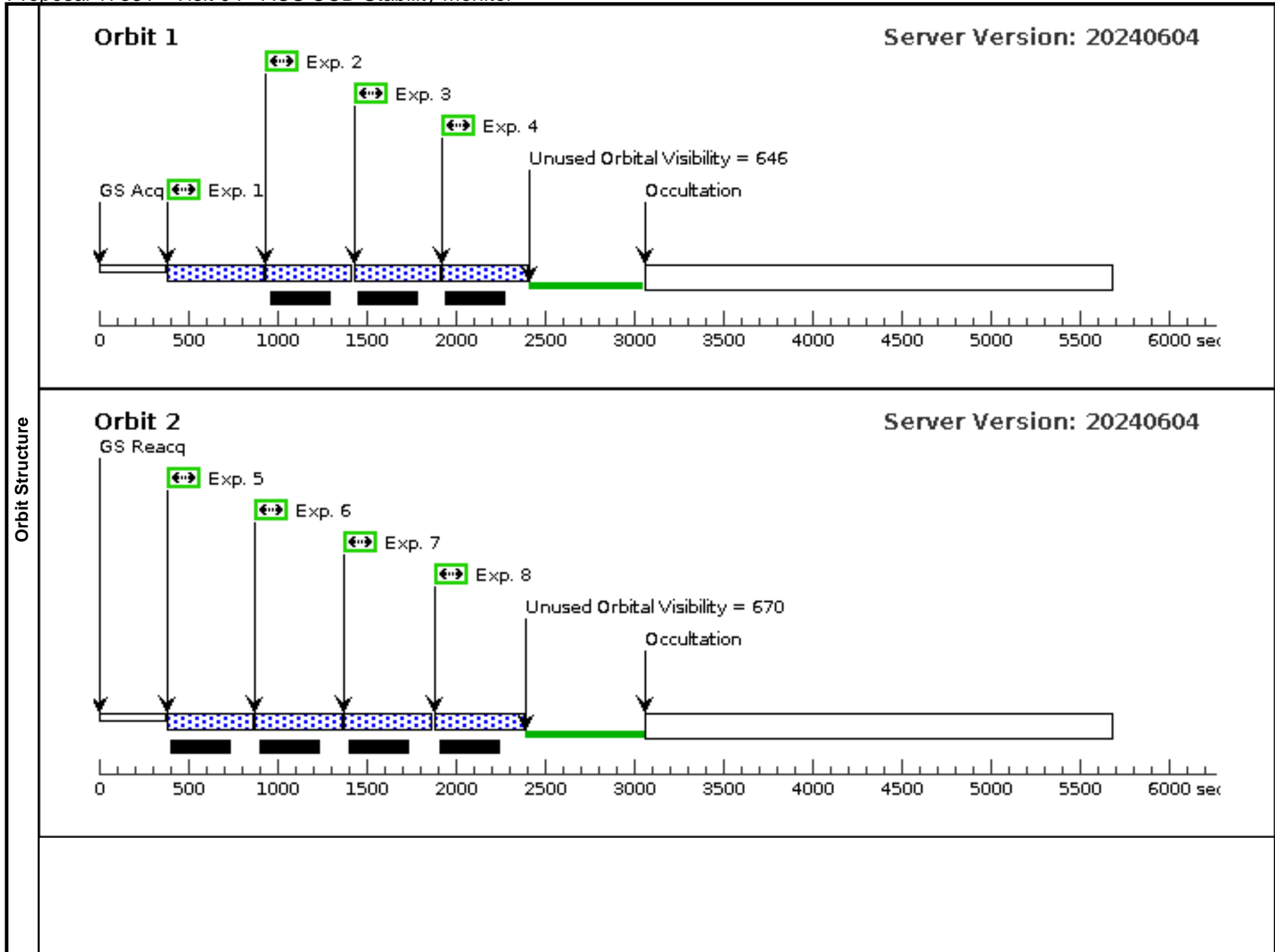
Visit	Proposal 17331, Visit 03, completed Diagnostic Status: Warning Scientific Instruments: ACS/WFC Special Requirements: GYRO MODE 3GOBAD; BETWEEN 01-APR-2024:00:00 AND 31-JUL-2024:00:00									
	(Visit 03) Warning (Form): Gyro Mode overrides default value of 1G.									
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Fixed Targets	# Name Target Coordinates Targ. Coord. Corrections Fluxes Miscellaneous									
	(1) NGC104-WFC RA: 00 22 38.5000 (5.6604167d) Dec: -72 04 4.00 (-72.06778d) Equinox: J2000 Comments: Magnitude of main-sequence turn-off stars. Field 6' W of cluster centre. AKA 47 Tucanae Category=STELLAR CLUSTER Description=[GLOBULAR CLUSTER]									
Exposures	# Label Target Config,Mode,Aperture Spectral Els. Opt. Params. Special Reqs. Groups Exp. Time (Total)/[Actual Dur.] Orbit									
	1 F775W (1) NGC104-WFC ACS/WFC, ACCUM, WFCENTER F775W									
									339 Secs (339 Secs)	
									[==>]	[1]
	2 F850LP (1) NGC104-WFC ACS/WFC, ACCUM, WFCENTER F850LP									
									339 Secs (339 Secs)	
									[==>]	[1]
	3 F606W (1) NGC104-WFC ACS/WFC, ACCUM, WFCENTER F606W									
								339 Secs (339 Secs)		
								[==>]	[1]	
4 F475W (1) NGC104-WFC ACS/WFC, ACCUM, WFCENTER F475W										
								339 Secs (339 Secs)		
								[==>]	[1]	
5 F814W (1) NGC104-WFC ACS/WFC, ACCUM, WFCENTER F814W										
								339 Secs (339 Secs)		
								[==>]	[1]	
6 F435W (1) NGC104-WFC ACS/WFC, ACCUM, WFCENTER F435W										
								339 Secs (339 Secs)		
								[==>]	[1]	



Proposal 17331 - Visit 04 - ACS CCD Stability Monitor

Wed Jul 10 22:00:23 GMT 2024

Visit	Proposal 17331, Visit 04, implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: BETWEEN 01-JUL-2024:00:00 AND 31-OCT-2024:00:00:00																
	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>NGC5139-WFC</td> <td>RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000</td> <td>Proper Motion RA: -5.928302449291017E-4 sec of time/yr Proper Motion Dec: -0.005019999980504508 arcsec/yr Epoch of Position: 2015.5</td> <td>V=5.33</td> <td>Reference Frame: SIMBAD</td> </tr> </tbody> </table> <p><i>Comments: These coordinates are taken from PID 15594 AKA Omega Centauri Category=STELLAR CLUSTER Description=[GLOBULAR CLUSTER]</i></p>					#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(2)	NGC5139-WFC	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000	Proper Motion RA: -5.928302449291017E-4 sec of time/yr Proper Motion Dec: -0.005019999980504508 arcsec/yr Epoch of Position: 2015.5	V=5.33
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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit							
	1	F555W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F555W					337.0 Secs (337 Secs)							
									[==>]	[1]							
	2	F775W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F775W					337.0 Secs (337 Secs)							
									[==>]	[1]							
	3	F625W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F625W					337.0 Secs (337 Secs)							
									[==>]	[1]							
	4	F550M	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F550M					337.0 Secs (337 Secs)							
									[==>]	[1]							
	5	F850LP	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F850LP					337.0 Secs (337 Secs)							
									[==>]	[2]							
	6	F606W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F606W					337.0 Secs (337 Secs)							
									[==>]	[2]							
7	F502N	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F502N					350.0 Secs (350 Secs)								
								[==>]	[2]								
8	F658N	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F658N					350.0 Secs (350 Secs)								
								[==>]	[2]								
9	F475W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F475W					337.0 Secs (337 Secs)								
								[==>]	[3]								
10	F660N	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F660N					350.0 Secs (350 Secs)								
								[==>]	[3]								
11	F814W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F814W					337.0 Secs (337 Secs)								
								[==>]	[3]								
12	F435W	(2) NGC5139-WFC	ACS/WFC, ACCUM, WFCENTER	F435W					337.0 Secs (337 Secs)								
								[==>]	[3]								



Orbit 3

GS Reacq

