16746 - Reconstructing Andromeda's accretion history with remote globular clusters: a pilot proper motion study

Cycle: 29, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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Dougal Mackey (PI) (Contact)	**Unaffiliated**
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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) PANDAS-02	ACS/WFC	2	25-Jun-2024 15:00:33.0	yes
02	(1) PANDAS-02	ACS/WFC	2	25-Jun-2024 15:00:34.0	yes
03	(3) HEC12	ACS/WFC	2	25-Jun-2024 15:00:35.0	yes
04	(3) HEC12	ACS/WFC	2	25-Jun-2024 15:00:36.0	yes
05	(4) PANDAS-53+54	ACS/WFC	2	25-Jun-2024 15:00:36.0	yes
06	(4) PANDAS-53+54	ACS/WFC	2	25-Jun-2024 15:00:37.0	yes
07	(2) B514	ACS/WFC	2	25-Jun-2024 15:00:38.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
08	(2) B514	ACS/WFC	2	25-Jun-2024 15:00:39.0	yes
09	(4) PANDAS-53+54	ACS/WFC	2	25-Jun-2024 15:00:39.0	yes
11	(4) PANDAS-53+54	ACS/WFC	2	25-Jun-2024 15:00:40.0	yes
10	(4) PANDAS-53+54	ACS/WFC	2	25-Jun-2024 15:00:41.0	yes

22 Total Orbits Used

ABSTRACT

Resolved observations of the stellar halos of nearby galaxies yield critical insight into the mass assembly history in these systems, allowing the predictions of cosmological models to be directly confronted with experimental data. Andromeda (M31) is a key location for this endeavour, offering a second data point, and exhibiting strikingly different halo properties, to the Milky Way. Here we propose to take the first step towards obtaining full 6D orbital phase-space information for stellar substructures in the M31 halo, by undertaking a pilot survey to measure proper motions for a small set of globular clusters with first-epoch ACS/WFC imaging taken 11-17 years ago. By comparison with recent HST proper motion studies of larger stellar systems out to the distance of M31, we expect to achieve a precision of ~0.010-0.015 mas/yr with these baselines. This compares favourably with the observed 1D (line-of-sight) kinematics of M31's outer globular cluster system, which exhibit a velocity dispersion of ~100 km/s (0.027 mas/yr) plus coherent rotation of comparable amplitude. These pilot measurements will provide the first 6D phase-space information for any extragalactic stellar stream, and enable a new, independent estimate of the shape and mass of the M31 dark halo at very large radii (50-120 kpc). By demonstrating feasibility and optimising our methodology with this data set, we ultimately aim to extend similar measurements to a much larger cluster sample in future, facilitating detailed orbital modelling that will accurately reconstruct the main events in M31's accretion history.

OBSERVING DESCRIPTION

This is a pilot study aimed at measuring proper motions for five globular clusters in the halo of Andromeda (M31) using ACS/WFC. The first-epoch data were obtained in the programs listed below, between ~11-16 years ago. This program will obtain second-epoch data, and measure the motions of the stars in the clusters by comparing their change in positions relative to compact background galaxies.

Of our five targets, PAndAS-02 was observed in program GO-12515; B514 was observed in programs GO-10394 and GO-10565; HEC12 was observed in program GO-10394; and PAndAS-53 and 54 were observed in program GO-12515 and share the same ACS/WFC field.

As explained in our Phase I, most of the first-epoch imaging consists of 3 exposures in F606W and 3 exposures in F814W. We would like to use all of these images, to maximise the number of frames that can be used to estimate the proper motion. However none of the first-epoch data were designed for astrometry. We will use the second-epoch images from the present program to construct reference images in both F606W and F814W, with dithers, etc, optimised for astrometry. The exception to this is target B514, for which two sets of first-epoch data exist. For this target we will therefore obtain second-epoch imaging using only F606W, which provides the best astrometric handle on the background galaxies.

To minimise systematics, our observations require the exact same field configurations (pointing, aperture, and telescope orientation) as the first-epoch observations. In particular, the strict orientation constraints limit the available observing windows and it may be necessary to find a tradeoff between the available time per orbit (via the "schedulability" parameter) and the duration of the possible observing windows.

Observations for a given target and filter occupy one visit and are split into four long exposures (~1100-1200s each) over two orbits. Ideally these integrations need to be as long as possible to maximise the S/N for both faint stars and the background galaxies. We use customised dither patterns (via POS-TARGs) to optimise the pixel phase coverage (e.g., as in program GO-14734). We add one short (60s) exposure per visit to avoid saturating stars at V~17-18th magnitude that could be used to tie our astrometry to the Gaia reference frame in future.

Visit

Proposal 16746, PA02 F606W (01), completed Tue Jun 25 19:00:41 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 98.927D TO 98.927 D

Comments: Second epoch imaging in F606W - same ORIENT, APERTURE, and COORDs as first epoch, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(PA02 F606W (01)) Warning (Orbit Planner): GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE

(PA02 F606W (01)) Warning (Orbit Planner): INVALID GS ACQ SCENARIO SPECIAL REQUIREMENT

(PA02 F606W (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(PA02 F606W (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Exposure 1 (PA02 F606W (01)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 2 (PA02 F606W (01)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 3 (PA02 F606W (01)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 4 (PA02 F606W (01)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 5 (PA02 F606W (01)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

Fixed Targets

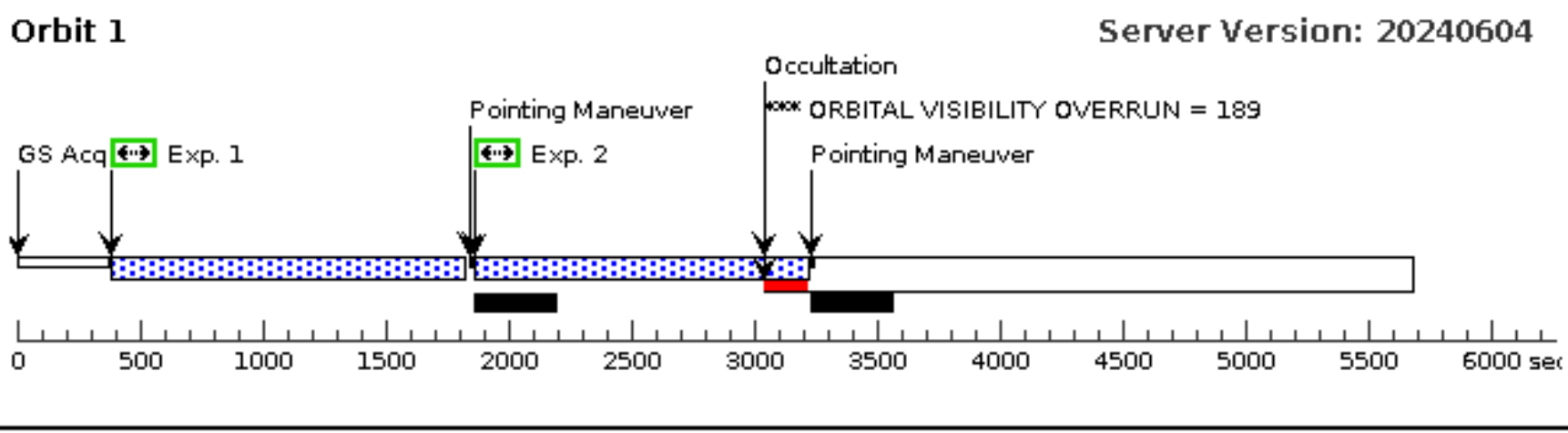
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	PANDAS-02	RA: 23 57 55.4324 (359.4809683d) Dec: +41 46 49.52 (41.78042d) Equinox: J2000		V=17.7+/-0.1	Reference Frame: ICRS

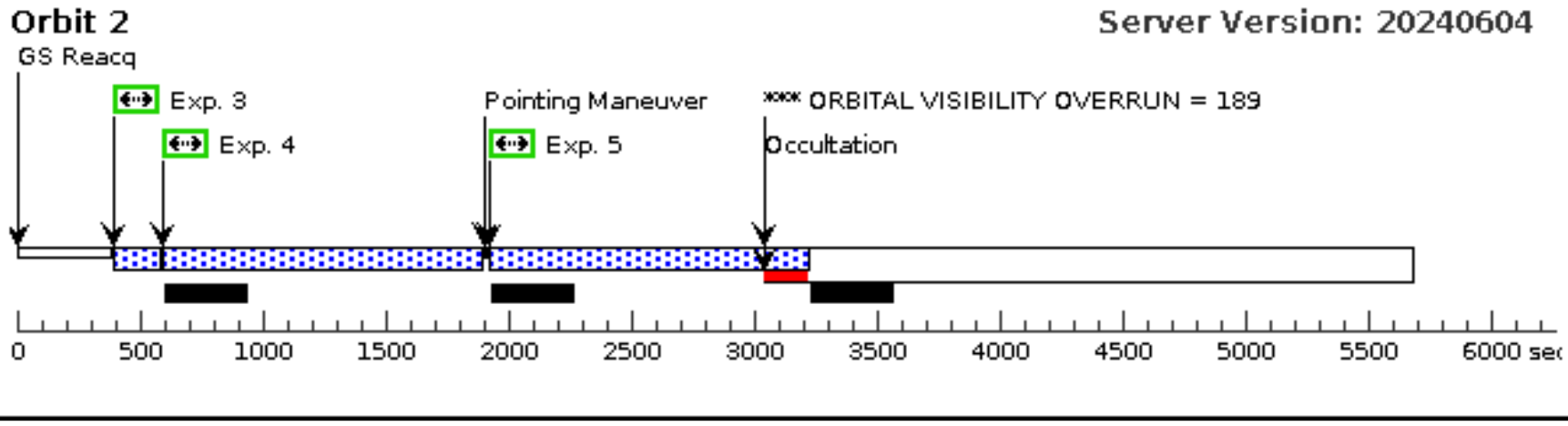
Comments: First epoch from GO-12515, 3x F606W and 3x F814W. Aperture WFC1. Line dither. Central point of dither at 359.4809683683 +41.78042220476 with PA_V3 = 278.927.
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.0,0.0; GS ACQ SCENARIO BASE1B3		1238 Secs (1238 Secs) *[==>]*	***[1]***
2		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.148,0.086; GS ACQ SCENARIO BASE1B3		1239 Secs (1239 Secs) *[==>]*	***[1]***
3		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		60 Secs (60 Secs) *[==>]*	***[2]***
4		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		1174 Secs (1174 Secs) *[==>]*	***[2]***
5		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.074,0.154; GS ACQ SCENARIO BASE1B3		1174 Secs (1174 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16746, PA02 F814W (02), completed Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 98.927D TO 98.927 D

Comments: Second epoch imaging in F814W - same ORIENT, APERTURE, and COORDs as first epoch, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(PA02 F814W (02)) Warning (Orbit Planner): GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE

(PA02 F814W (02)) Warning (Orbit Planner): INVALID GS ACQ SCENARIO SPECIAL REQUIREMENT

(PA02 F814W (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(PA02 F814W (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Exposure 1 (PA02 F814W (02)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 2 (PA02 F814W (02)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 3 (PA02 F814W (02)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 4 (PA02 F814W (02)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 5 (PA02 F814W (02)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

Fixed Targets

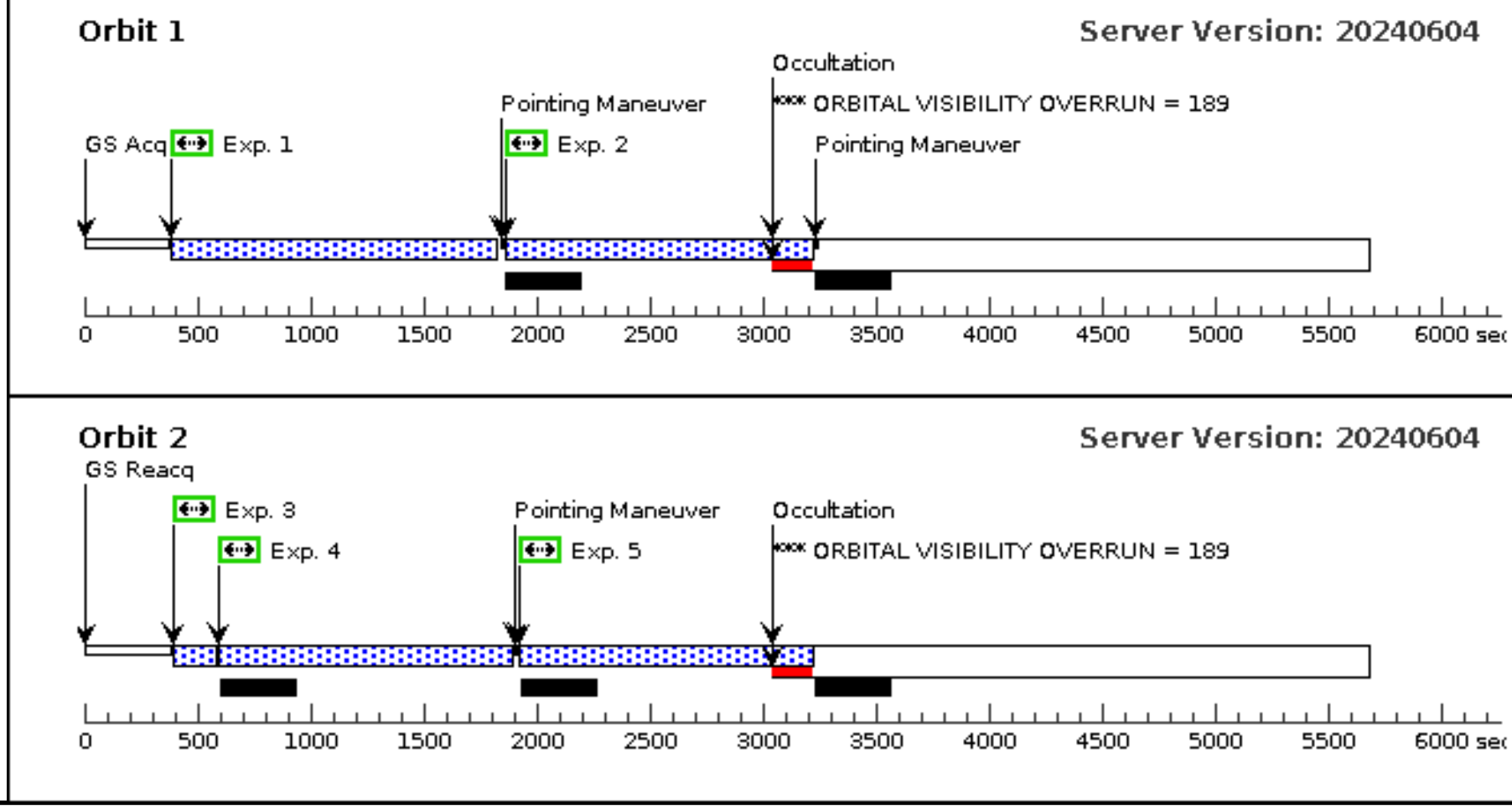
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	PANDAS-02	RA: 23 57 55.4324 (359.4809683d) Dec: +41 46 49.52 (41.78042d) Equinox: J2000		V=17.7+/-0.1	Reference Frame: ICRS

Comments: First epoch from GO-12515, 3x F606W and 3x F814W. Aperture WFC1. Line dither. Central point of dither at 359.4809683683 +41.78042220476 with PA_V3 = 278.927.
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		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.0,0.0; GS ACQ SCENARIO BASE1B3		1238 Secs (1238 Secs) *[==>]*	***[1]***
2		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.148,0.086; GS ACQ SCENARIO BASE1B3		1239 Secs (1239 Secs) *[==>]*	***[1]***
3		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		60 Secs (60 Secs) *[==>]*	***[2]***
4		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		1174 Secs (1174 Secs) *[==>]*	***[2]***
5		(1) PANDAS-02	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.074,0.154; GS ACQ SCENARIO BASE1B3		1174 Secs (1174 Secs) *[==>]*	***[2]***

Orbit Structure



Visit

Proposal 16746, HEC12 F606W (03), completed Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 243.769D TO 243.769 D

Comments: Second epoch imaging in F606W - same ORIENT, APERTURE, and COORDs as first epoch, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(HEC12 F606W (03)) Warning (Orbit Planner): GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE

(HEC12 F606W (03)) Warning (Orbit Planner): INVALID GS ACQ SCENARIO SPECIAL REQUIREMENT

(HEC12 F606W (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(HEC12 F606W (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Exposure 1 (HEC12 F606W (03)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 2 (HEC12 F606W (03)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 3 (HEC12 F606W (03)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 4 (HEC12 F606W (03)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 5 (HEC12 F606W (03)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

Fixed Targets

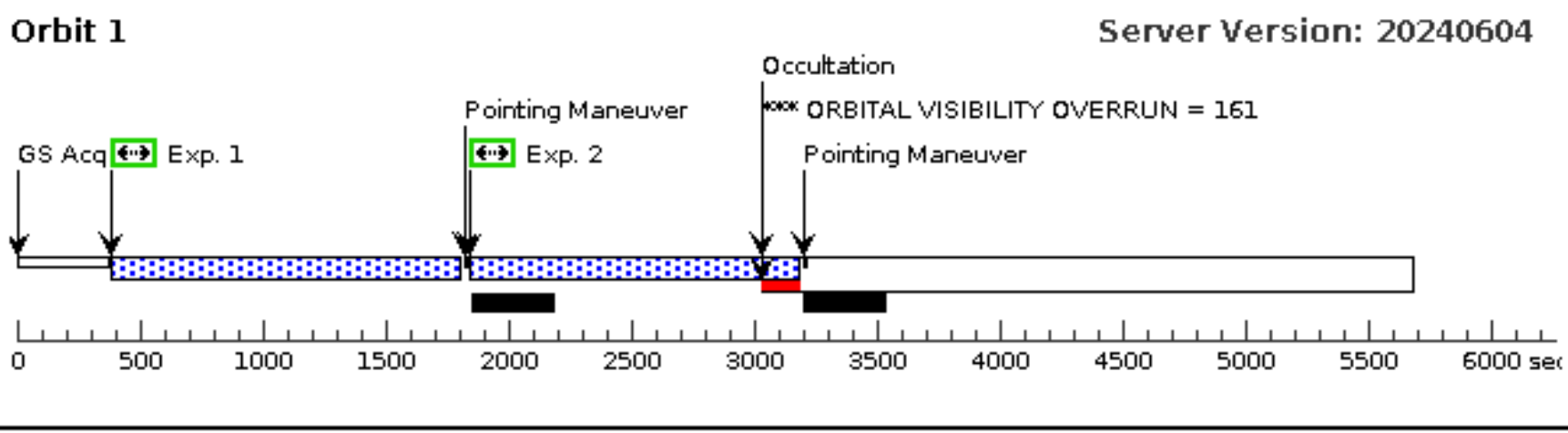
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HEC12	RA: 00 58 15.4297 (14.5642904d) Dec: +38 02 40.35 (38.04454d) Equinox: J2000		V=18.3+/-0.1	Reference Frame: ICRS

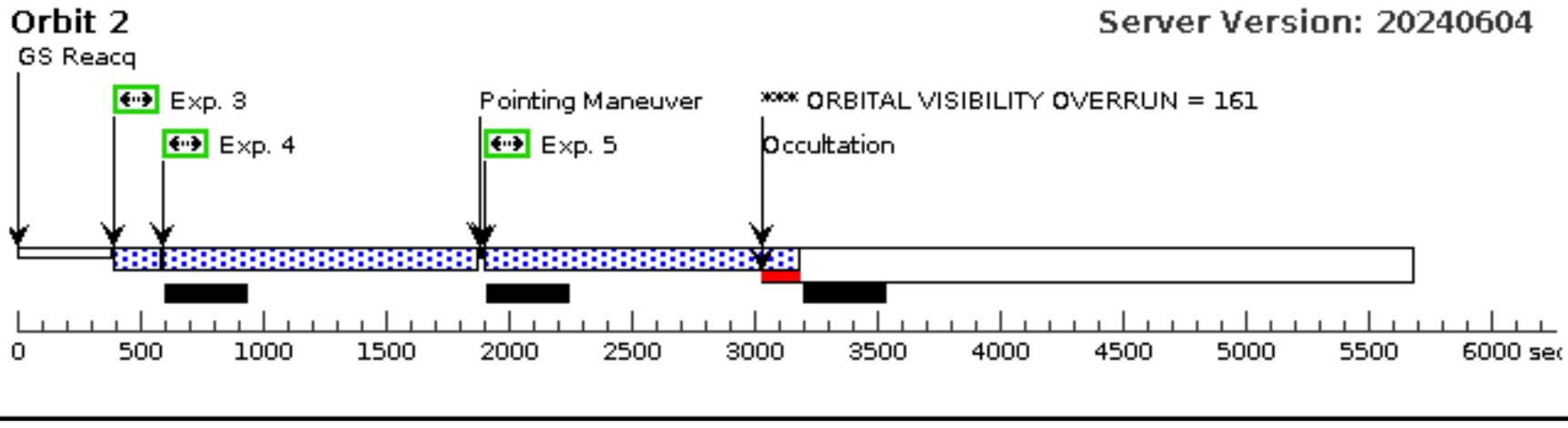
Comments: First epoch from GO-10396, 3x F606W and 4x F814W. Aperture WFC1. Line dither. Central point of dither at 14.56429054236 +38.04454067485 with PA_V3 = 63.769.
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) HEC12	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.0,0.0; GS ACQ SCENARIO BASE1B3		1219 Secs (1219 Secs) *[==>]*	***[1]***
2		(3) HEC12	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.148,0.086; GS ACQ SCENARIO BASE1B3		1220 Secs (1220 Secs) *[==>]*	***[1]***
3		(3) HEC12	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		60 Secs (60 Secs) *[==>]*	***[2]***
4		(3) HEC12	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		1155 Secs (1155 Secs) *[==>]*	***[2]***
5		(3) HEC12	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.074,0.154; GS ACQ SCENARIO BASE1B3		1155 Secs (1155 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16746, HEC12 F814W (04), completed Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 243.769D TO 243.769 D

Comments: Second epoch imaging in F814W - same ORIENT, APERTURE, and COORDs as first epoch, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(HEC12 F814W (04)) Warning (Orbit Planner): GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE

(HEC12 F814W (04)) Warning (Orbit Planner): INVALID GS ACQ SCENARIO SPECIAL REQUIREMENT

(HEC12 F814W (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(HEC12 F814W (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Exposure 1 (HEC12 F814W (04)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 2 (HEC12 F814W (04)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 3 (HEC12 F814W (04)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 4 (HEC12 F814W (04)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 5 (HEC12 F814W (04)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

Fixed Targets

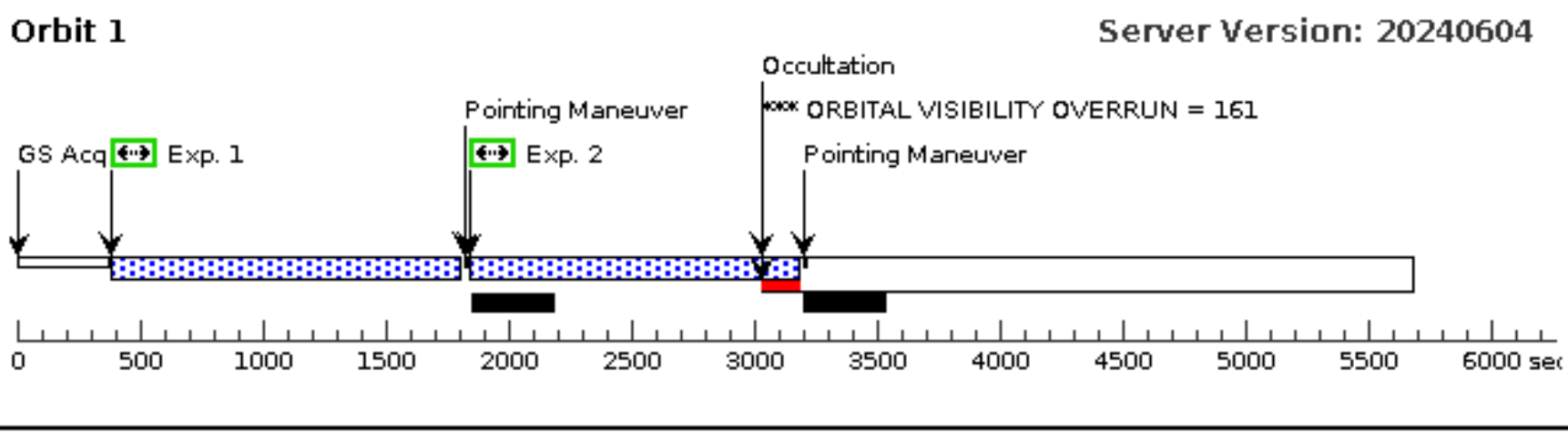
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HEC12	RA: 00 58 15.4297 (14.5642904d) Dec: +38 02 40.35 (38.04454d) Equinox: J2000		V=18.3+/-0.1	Reference Frame: ICRS

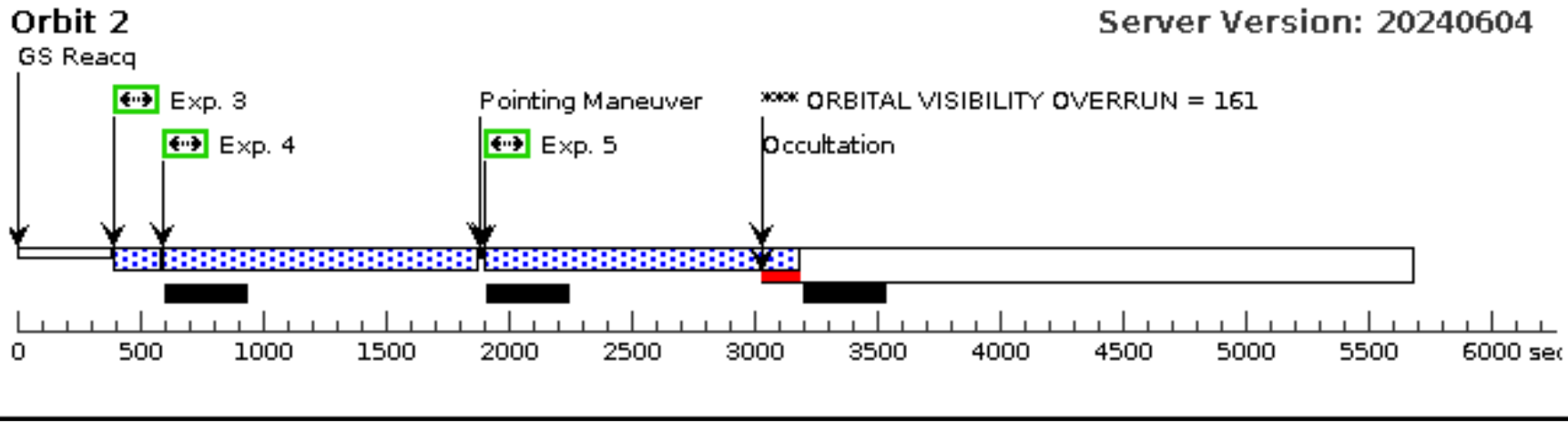
Comments: First epoch from GO-10396, 3x F606W and 4x F814W. Aperture WFC1. Line dither. Central point of dither at 14.56429054236 +38.04454067485 with PA_V3 = 63.769.
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) HEC12	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.0,0.0; GS ACQ SCENARIO BASE1B3		1219 Secs (1219 Secs) *[==>]*	***[1]***
2		(3) HEC12	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.148,0.086; GS ACQ SCENARIO BASE1B3		1220 Secs (1220 Secs) *[==>]*	***[1]***
3		(3) HEC12	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		60 Secs (60 Secs) *[==>]*	***[2]***
4		(3) HEC12	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		1155 Secs (1155 Secs) *[==>]*	***[2]***
5		(3) HEC12	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.074,0.154; GS ACQ SCENARIO BASE1B3		1155 Secs (1155 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16746, PA53-54 F606W (05), failed Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 151.271D TO 151.271 D

Comments: Second epoch imaging in F606W - same ORIENT, APERTURE, and COORDs as first epoch, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(PA53-54 F606W (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(PA53-54 F606W (05)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

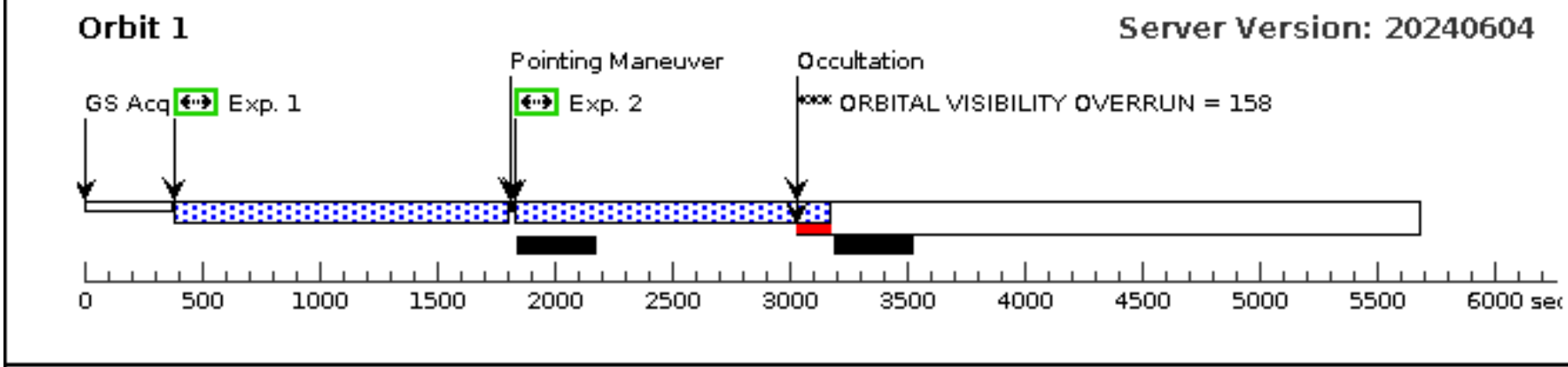
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	PANDAS-53+54	RA: 01 17 59.0980 (19.4962417d) Dec: +39 15 58.44 (39.26623d) Equinox: J2000		V=15.4+/-0.1	Reference Frame: ICRS

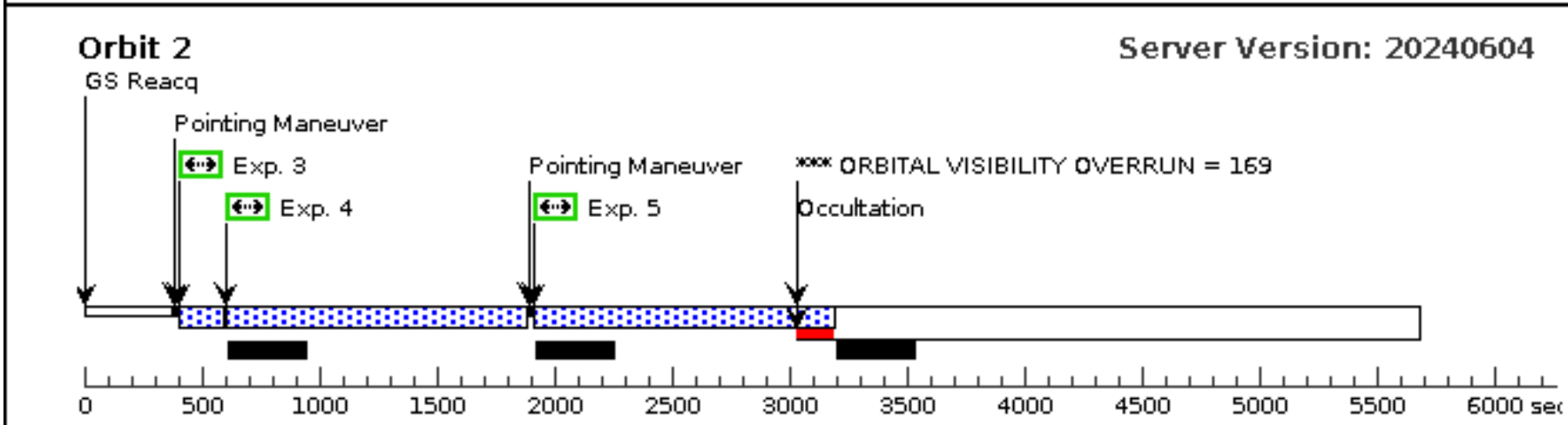
Comments: First epoch from GO-12515, 3x F606W and 3x F814W. Aperture WFCENTER. Line dither. Central point of dither at 19.49624159651 +39.2662330971 with PA_V3 = 331.271.
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.0,0.0		1219 Secs (1219 Secs)	
								[==>]	***[1]***
2		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.148,0.086		1220 Secs (1220 Secs)	
								[==>]	***[1]***
3		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.222,0.240		60 Secs (60 Secs)	
								[==>]	***[2]***
4		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.222,0.240		1155 Secs (1155 Secs)	
								[==>]	***[2]***
5		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.074,0.154		1155 Secs (1155 Secs)	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 16746, PA53-54 F814W (06), failed Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 151.271D TO 151.271 D

Comments: Second epoch imaging in F814W - same ORIENT, APERTURE, and COORDs as first epoch, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(PA53-54 F814W (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(PA53-54 F814W (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

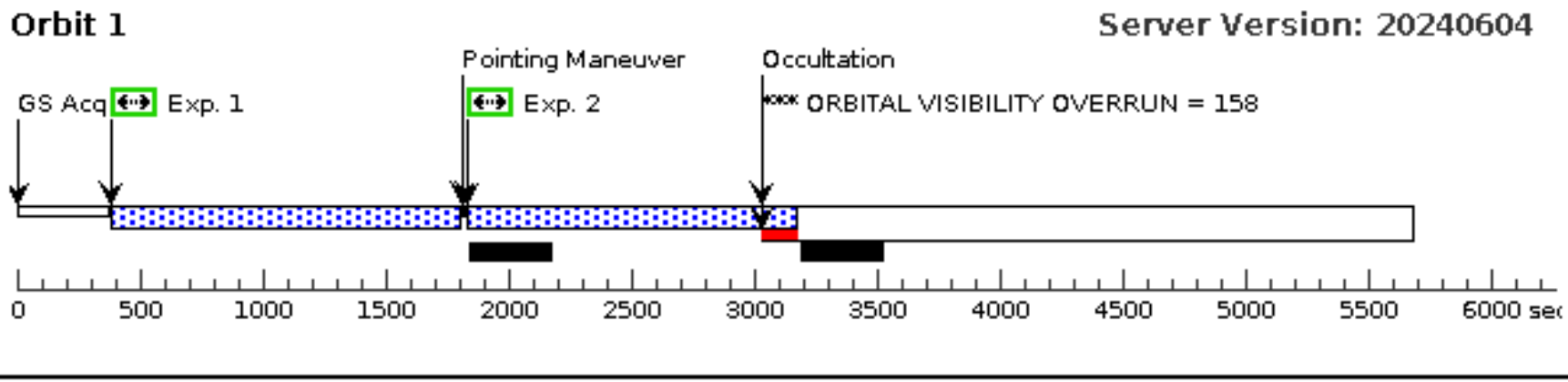
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	PANDAS-53+54	RA: 01 17 59.0980 (19.4962417d) Dec: +39 15 58.44 (39.26623d) Equinox: J2000		V=15.4+/-0.1	Reference Frame: ICRS

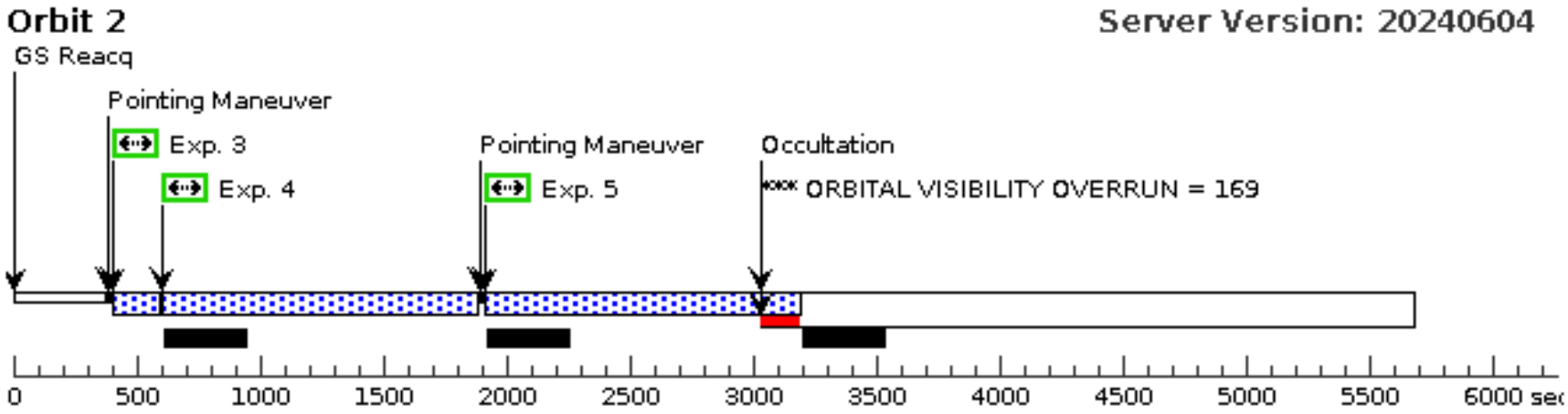
Comments: First epoch from GO-12515, 3x F606W and 3x F814W. Aperture WFCENTER. Line dither. Central point of dither at 19.49624159651 +39.2662330971 with PA_V3 = 331.271.
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.0,0.0		1219 Secs (1219 Secs)	
								[==>]	***[1]***
2		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.148,0.086		1220 Secs (1220 Secs)	
								[==>]	***[1]***
3		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.222,0.240		60 Secs (60 Secs)	
								[==>]	***[2]***
4		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.222,0.240		1155 Secs (1155 Secs)	
								[==>]	***[2]***
5		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.074,0.154		1155 Secs (1155 Secs)	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 16746, B514 F606W V1 (07), completed Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 240.533D TO 240.533 D

Comments: Second epoch imaging in F606W - same ORIENT, APERTURE, and COORDs as first epoch GO-10394, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(B514 F606W V1 (07)) Warning (Orbit Planner): GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE

(B514 F606W V1 (07)) Warning (Orbit Planner): INVALID GS ACQ SCENARIO SPECIAL REQUIREMENT

(B514 F606W V1 (07)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(B514 F606W V1 (07)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Exposure 1 (B514 F606W V1 (07)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 2 (B514 F606W V1 (07)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 3 (B514 F606W V1 (07)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 4 (B514 F606W V1 (07)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 5 (B514 F606W V1 (07)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

Fixed Targets

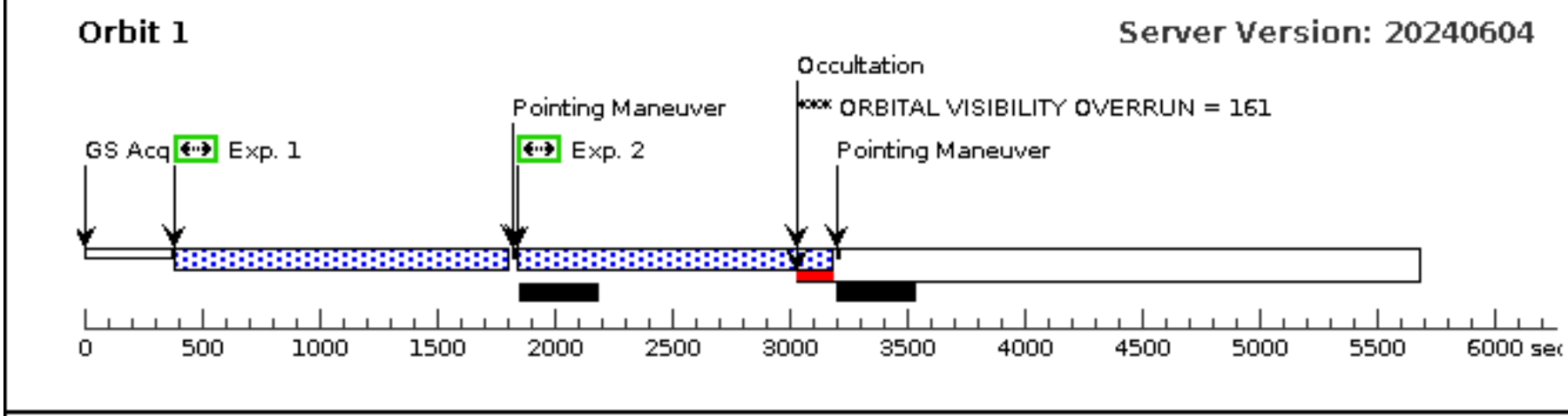
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	B514	RA: 00 31 9.8550 (7.7910625d) Dec: +37 54 0.25 (37.90007d) Equinox: J2000		V=15.6+/-0.1	Reference Frame: ICRS

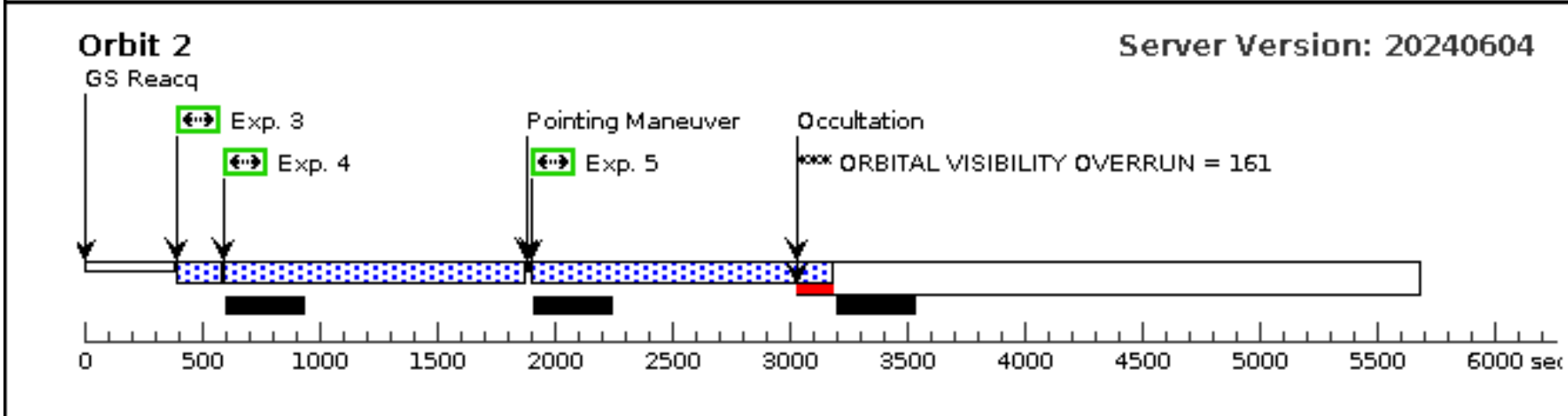
Comments: First epoch from GO-10394, 3x F606W. Aperture WFC1. Line dither. Central point of dither at 7.791116850289 +37.90020898981 with PA_V3 = 60.533.
First epoch from GO-10565, 3x F606W. Aperture WFC1. Line dither. Central point of dither at 7.791007884871 +37.89992743316 with PA_V3 = 81.922.
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.0,0.0; GS ACQ SCENARIO BASE1B3		1219 Secs (1219 Secs) *[==>]*	***[1]***
2		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.148,0.086; GS ACQ SCENARIO BASE1B3		1220 Secs (1220 Secs) *[==>]*	***[1]***
3		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		60 Secs (60 Secs) *[==>]*	***[2]***
4		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		1155 Secs (1155 Secs) *[==>]*	***[2]***
5		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.074,0.154; GS ACQ SCENARIO BASE1B3		1155 Secs (1155 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16746, B514 F606W V2 (08), completed Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 261.922D TO 261.922 D

Comments: Second epoch imaging in F606W - same ORIENT, APERTURE, and COORDs as first epoch GO-10565, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(B514 F606W V2 (08)) Warning (Orbit Planner): GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE

(B514 F606W V2 (08)) Warning (Orbit Planner): INVALID GS ACQ SCENARIO SPECIAL REQUIREMENT

(B514 F606W V2 (08)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(B514 F606W V2 (08)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Exposure 1 (B514 F606W V2 (08)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 2 (B514 F606W V2 (08)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 3 (B514 F606W V2 (08)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 4 (B514 F606W V2 (08)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

(Exposure 5 (B514 F606W V2 (08)) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.

Fixed Targets

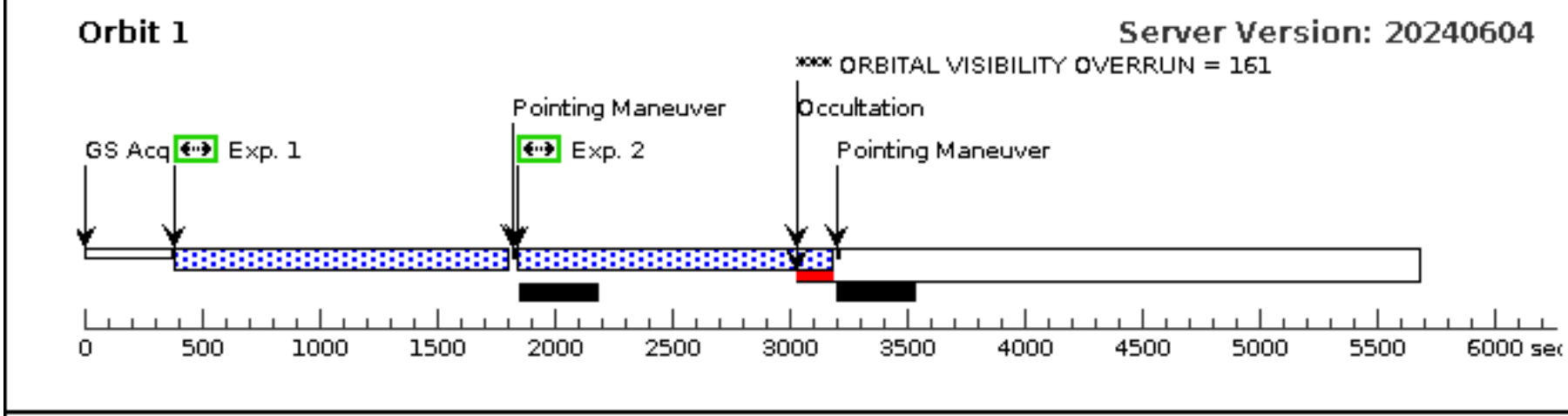
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	B514	RA: 00 31 9.8550 (7.7910625d) Dec: +37 54 0.25 (37.90007d) Equinox: J2000		V=15.6+/-0.1	Reference Frame: ICRS

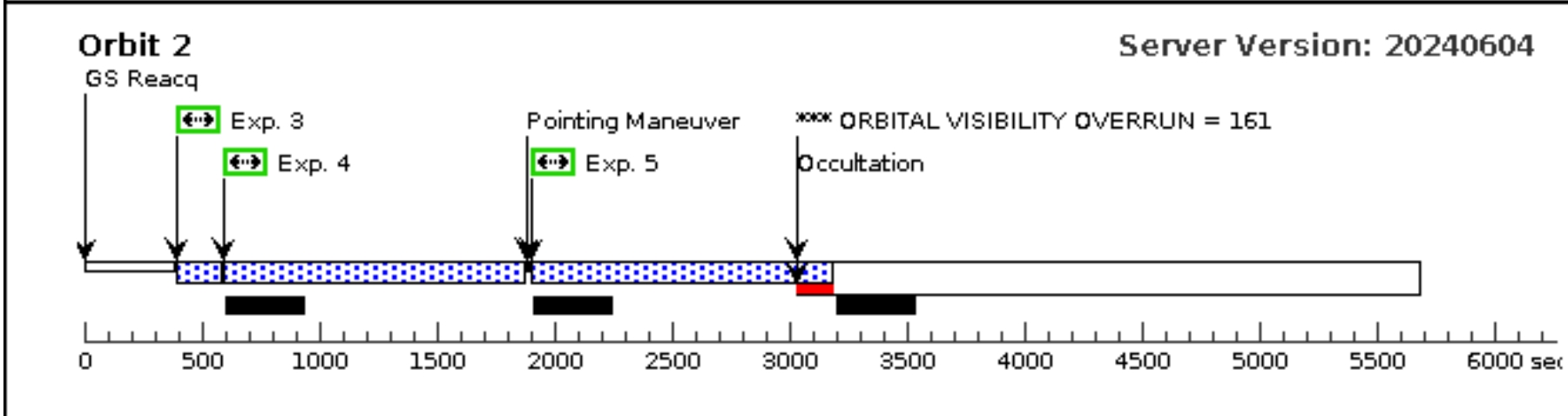
Comments: First epoch from GO-10394, 3x F606W. Aperture WFC1. Line dither. Central point of dither at 7.791116850289 +37.90020898981 with PA_V3 = 60.533.
First epoch from GO-10565, 3x F606W. Aperture WFC1. Line dither. Central point of dither at 7.791007884871 +37.89992743316 with PA_V3 = 81.922.
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.0,0.0; GS ACQ SCENARIO BASE1B3		1219 Secs (1219 Secs) *[==>]*	***[1]***
2		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.148,0.086; GS ACQ SCENARIO BASE1B3		1220 Secs (1220 Secs) *[==>]*	***[1]***
3		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		60 Secs (60 Secs) *[==>]*	***[2]***
4		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.222,0.240; GS ACQ SCENARIO BASE1B3		1155 Secs (1155 Secs) *[==>]*	***[2]***
5		(2) B514	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.074,0.154; GS ACQ SCENARIO BASE1B3		1155 Secs (1155 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 16746, Visit 05 Repeat - PA53-54 F606W (09), failed Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 151.271D TO 151.271 D

Comments: Second epoch imaging in F606W - same ORIENT, APERTURE, and COORDs as first epoch, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(Visit 05 Repeat - PA53-54 F606W (09)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Visit 05 Repeat - PA53-54 F606W (09)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

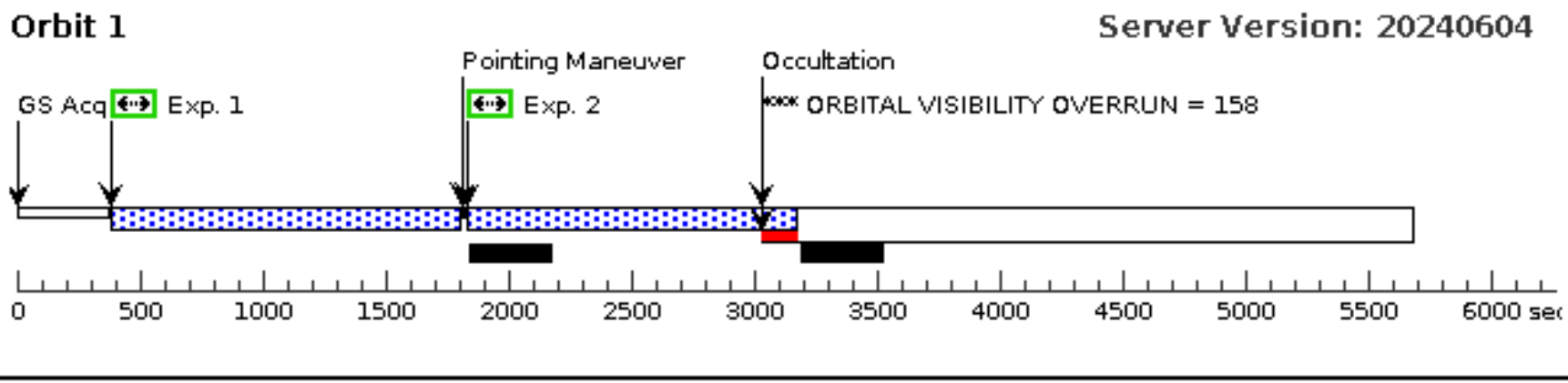
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	PANDAS-53+54	RA: 01 17 59.0980 (19.4962417d) Dec: +39 15 58.44 (39.26623d) Equinox: J2000		V=15.4+/-0.1	Reference Frame: ICRS

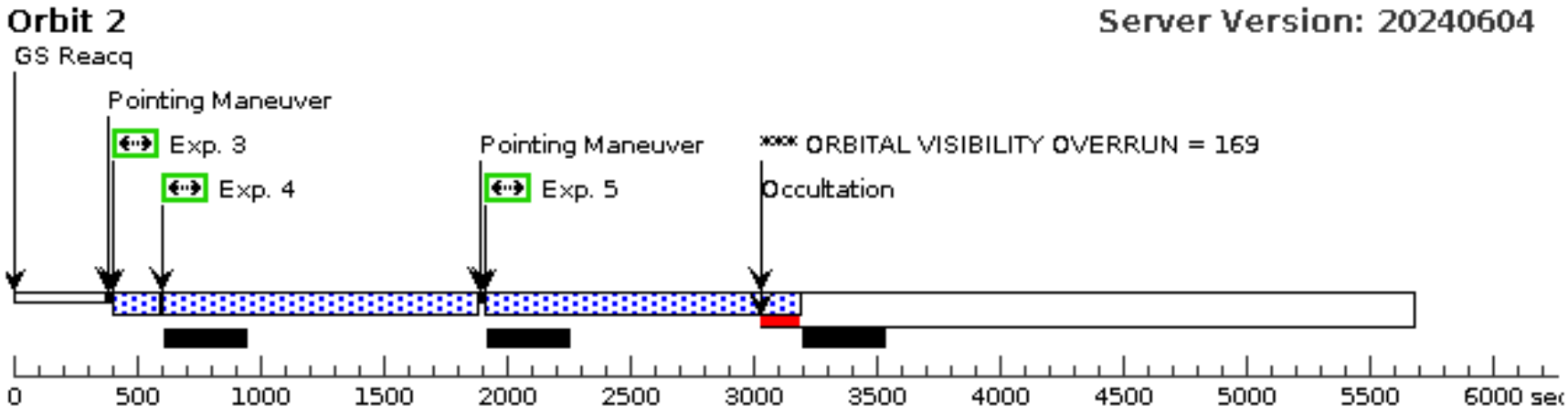
Comments: First epoch from GO-12515, 3x F606W and 3x F814W. Aperture WFCENTER. Line dither. Central point of dither at 19.49624159651 +39.2662330971 with PA_V3 = 331.271.
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.0,0.0		1219 Secs (1219 Secs)	
								[==>]	***[1]***
2		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.148,0.086		1220 Secs (1220 Secs)	
								[==>]	***[1]***
3		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.222,0.240		60 Secs (60 Secs)	
								[==>]	***[2]***
4		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.222,0.240		1155 Secs (1155 Secs)	
								[==>]	***[2]***
5		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.074,0.154		1155 Secs (1155 Secs)	
								[==>]	***[2]***

Orbit Structure





Visit

Proposal 16746, Visit 09 Repeat - PA53-54 F606W (11), implementation Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Comments: Second epoch imaging in F606W - same ORIENT, APERTURE, and COORDs as first epoch, with 4-pt dither optimised for astrometry plus one short exposure.

Fixed Targets

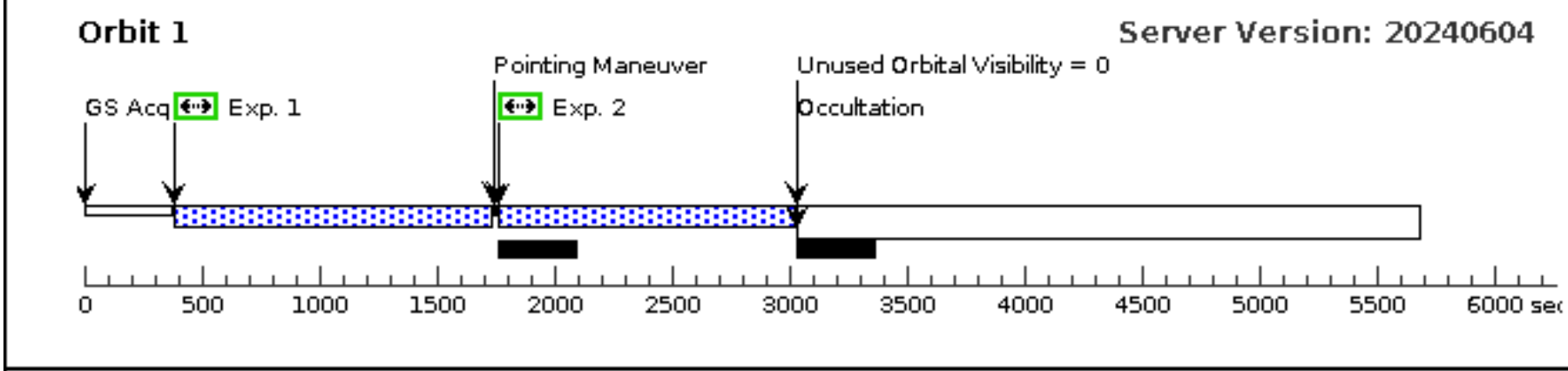
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	PANDAS-53+54	RA: 01 17 59.0980 (19.4962417d) Dec: +39 15 58.44 (39.26623d) Equinox: J2000		V=15.4+/-0.1	Reference Frame: ICRS

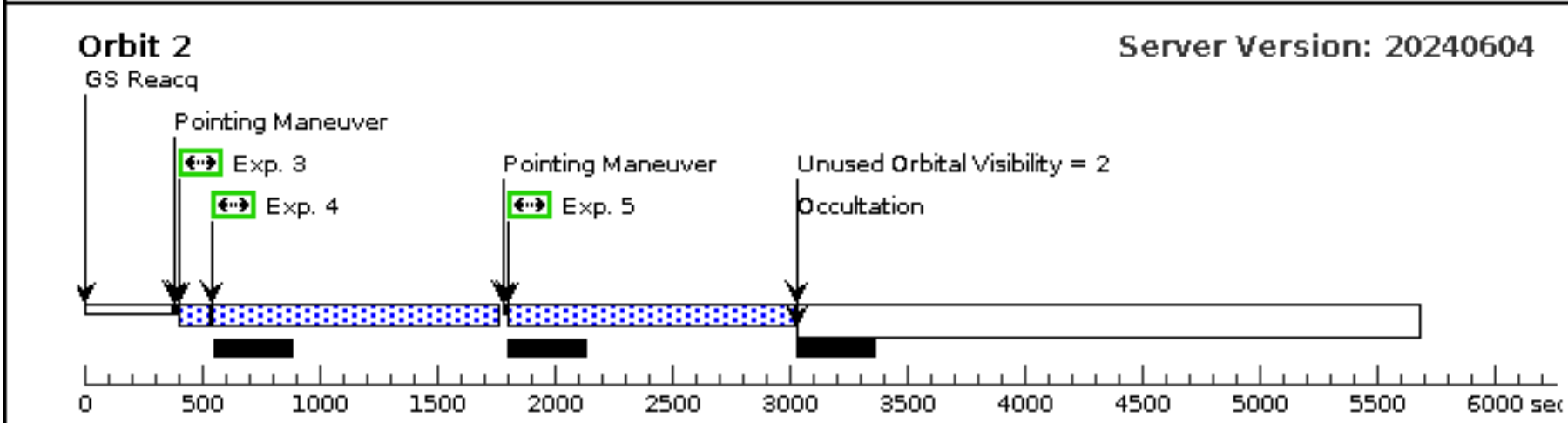
Comments: First epoch from GO-12515, 3x F606W and 3x F814W. Aperture WFCENTER. Line dither. Central point of dither at 19.49624159651 +39.2662330971 with PA_V3 = 331.271.
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.0,0.0		1219 Secs (1140 Secs)	
								[==>1140.0 Secs]	***[1]***
2		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.148,0.086		1220 Secs (1141 Secs)	
								[==>1141.0 Secs]	***[1]***
3		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.222,0.240		60 Secs (3 Secs)	
								[==>3.0 Secs]	***[2]***
4		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.222,0.240		1155 Secs (1098 Secs)	
								[==>1098.0 Secs]	***[2]***
5		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F606W		POS TARG 0.074,0.154		1155 Secs (1098 Secs)	
								[==>1098.0 Secs]	***[2]***

Orbit Structure





Visit

Proposal 16746, Visit 06 Repeat - PA53-54 F814W (10), completed Tue Jun 25 19:00:42 GMT 2024

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 151.271D TO 151.271 D

Comments: Second epoch imaging in F814W - same ORIENT, APERTURE, and COORDs as first epoch, with 4-pt dither optimised for astrometry plus one short exposure.

Diagnostics

(Visit 06 Repeat - PA53-54 F814W (10)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Visit 06 Repeat - PA53-54 F814W (10)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	PANDAS-53+54	RA: 01 17 59.0980 (19.4962417d) Dec: +39 15 58.44 (39.26623d) Equinox: J2000		V=15.4+/-0.1	Reference Frame: ICRS

Comments: First epoch from GO-12515, 3x F606W and 3x F814W. Aperture WFCENTER. Line dither. Central point of dither at 19.49624159651 +39.2662330971 with PA_V3 = 331.271.
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		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.0,0.0		1219 Secs (1219 Secs)	
								[==>]	***[1]***
2		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.148,0.086		1220 Secs (1220 Secs)	
								[==>]	***[1]***
3		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.222,0.240		60 Secs (60 Secs)	
								[==>]	***[2]***
4		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.222,0.240		1155 Secs (1155 Secs)	
								[==>]	***[2]***
5		(4) PANDAS-53+54	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.074,0.154		1155 Secs (1155 Secs)	
								[==>]	***[2]***

Orbit Structure