16039 - Characterizing the outstanding super-Earth LTT 1445Ab

Cycle: 27, Proposal Category: GO

(UV Initiative)

(Availability Mode: AVAILABLE)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) LTT-1445A	WFC3/IR	1	30-Jan-2023 12:00:18.0	yes
02	(1) LTT-1445A	WFC3/IR	1	30-Jan-2023 12:00:24.0	yes
03	(1) LTT-1445A	WFC3/IR	1	30-Jan-2023 12:00:30.0	yes
04	(1) LTT-1445A	WFC3/IR	1	30-Jan-2023 12:00:36.0	yes
05	(1) LTT-1445A	WFC3/IR	1	30-Jan-2023 12:00:41.0	yes
06	(1) LTT-1445A	WFC3/IR	1	30-Jan-2023 12:00:45.0	yes
07	(1) LTT-1445A	WFC3/IR	1	30-Jan-2023 12:00:50.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
08	(1) LTT-1445A	WFC3/IR	1	30-Jan-2023 12:00:54.0	yes
09	(1) LTT-1445A BIAS	WFC3/UVIS	3	30-Jan-2023 12:00:57.0	yes
10	(1) LTT-1445A BIAS	WFC3/UVIS	3	30-Jan-2023 12:00:58.0	yes
59	(1) LTT-1445A BIAS	WFC3/UVIS	4	30-Jan-2023 12:01:01.0	yes

18 Total Orbits Used

ABSTRACT

TESS has recently discovered LTT 1445Ab, a small transiting exoplanet with a radius of only slightly larger than Earth. The planet orbits a mid-type M-dwarf star every 5.35 days, giving it a relatively cool equilibrium temperature of 433 K. The planet is very close to Earth, at a distance of only 6.9 pc, which makes it an extremely good target for atmospheric characterization due to the brightness of its host star and relatively large atmospheric signal. The planet is so close that it is likely the closest transiting planet that will ever be found around a mid-type M-dwarf, making it a rare case where a near-Earth size exoplanet can be characterized. Recent discoveries of water in the atmospheres around two similar planets in M-dwarf systems indicate many of these small transiting planets have hydrogen-rich atmospheres detectable with HST. Our program will measure HST/WFC3 spectroscopy of LTT 1445Ab to measure its broadband transmission spectrum from 0.3 to 1.7 microns. We will use the atmospheric information to help distinguish the exoplanet as a super-Earth with a compact secondary atmosphere from a hydrogen-rich sub-Neptune. With all three WFC3 grisms, a continuous transmission spectrum can be measured where Rayleigh scattering, CH4, and H2O can be constrained. The new, extraordinary planet LTT 1445Ab offers a rare chance to study a nearly Earth-sized exoplanet across the full optical to infrared spectrum, pushing these measurements to a largely unexplored regime of smaller, cooler exoplanets.

OBSERVING DESCRIPTION

This program uses all three UVIS and IR WFC3 slitless spectrographs to obtain an exoplanet transmission spectrum of LTT1445A covering 0.2 to 1.7 microns. Four transits observations are required, which consist of three or four consecutive HST orbits each. Phase constraints have been set in the aquisition image of each visit to observe the transit near the middle of the visits. A companion binary LTT1445BC is located 7" distant, and roll restrictions have been added such that the spectra will not overlap.

We will use the WFC3 G280 grism to obtain spectra covering 0.2 to 1 micron. We have estimated the exposure times using the STScI ETC, and will adopt 190 second exposures. As buffer dumps are an important issue with UVIS, we will use sub-arrays to increase duty cycle. Sub-array sizes of 590x2250 limits the overheads between exposures, and contains the entire useable spectrum as well as the binary BC pair. Using APT, we found 11 exposures-per-orbit can be obtained, and we will require 3-orbit long visits to measure both the transit and have sufficient baseline flux out of transit to characterize potential detector systematics.

The WFC3 IR uses spatial scanning to increase the SNR. The G141 uses a 5.1" scan at 0.53 arcsec/sec, with roll restrictions such that the LTT1445BC pair does not overlap the scan of target LTT1445A. The G102 uses a 6" scan at 0.2691 arcsec/sec, also with roll restrictions. The G102 was divided into four consecutive HST visits in order to force buffer dumps at the end of each orbit. For these four visits, timing requiremnts have been put in place such that they are exectued consecutively.

Impact of reduced gyro operations. Our WFC3/IR observations use spacial scanning, however the scans of both visits are less than 5 arsec/sec so reduced gyro operaion should have no effect on the ability to spactially scan. Two strategies can be employed to increase scheduablity. For both the IR and UVIS, the phase constraintes can be loosened by an additional 10 to 15 minutes with only a modest loss to SNR. Secondly, the roll constraints can be relaxed. The current roll restrictions of all visits are set to optimally separate the binary star such that the spectra do not overlap. For the UVIS, loostening up the high angle phase contraint first would be preferable as the contaminating spectra would affect primarly the -1 order, which has lower throughput. In loostening the roll restrictions in the IR observations, the binary star spectra could still be separted from the primary if the scan was shortened, or if the exposure levels and scan length was changed such that each star could be well resolved in a single Nsamp subexposure. This would likely result in a modest loss to the SNR.

Visit

Proposal 16039, LTT1445A WFC3/G141 Orbit 1 (01), completed Mon Jan 30 17:01:02 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; ORIENT 53D TO 126 D; ORIENT 233D TO 306 D; Period 5.35882 D AND ZERO-PHASE HJD2458423.42629

Comments: WFC3/G141 time series transit observations consisiting of four consecutive HST orbits. Visits LTT1145A WFC3/G141 1, 2, 3 and 4 must be scheduled consecutively. The visits have been broken up in APT to force a buffer dump at the end of each orbit, which drastically increases the duty cycle, which is important for time-series observations.

-7" offset has been applied such that the target spatial scan is near the middle of the 256 subarray. This provides room for a companion star to appear either above or below the target, depending on the roll angle.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Acquisition (WFC3IR.im.1395644)	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	F132N	SAMP-SEQ=RAPID; NSAMP=2	POS TARG null,-7; PHASE 0.9700649272290043 TO 0.9739525990174454	Sequence 1-2 Non-Int in LTT1445A WFC3/G141 Orbit 1 (01)	0.55563 Secs (0.556 Secs) *[==>]*	***[1]***

Comments: Filter image to assist with wavelength calibration. Saturated, but the image is only used to find the reference detctor possition.

	2	Orbit 1 - Science Scans x 21 Round-trip (WFC3IR.ss.1395816)	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS5; NSAMP=5	POS TARG null,-7; SPATIAL SCAN 0.5 31317,90.0 Degrees, Round trip	Sequence 1-2 Non-Int in LTT1445A WFC3/G141 Orbit 1 (01)	9.67632 Secs X 23 (445.111 Secs)	

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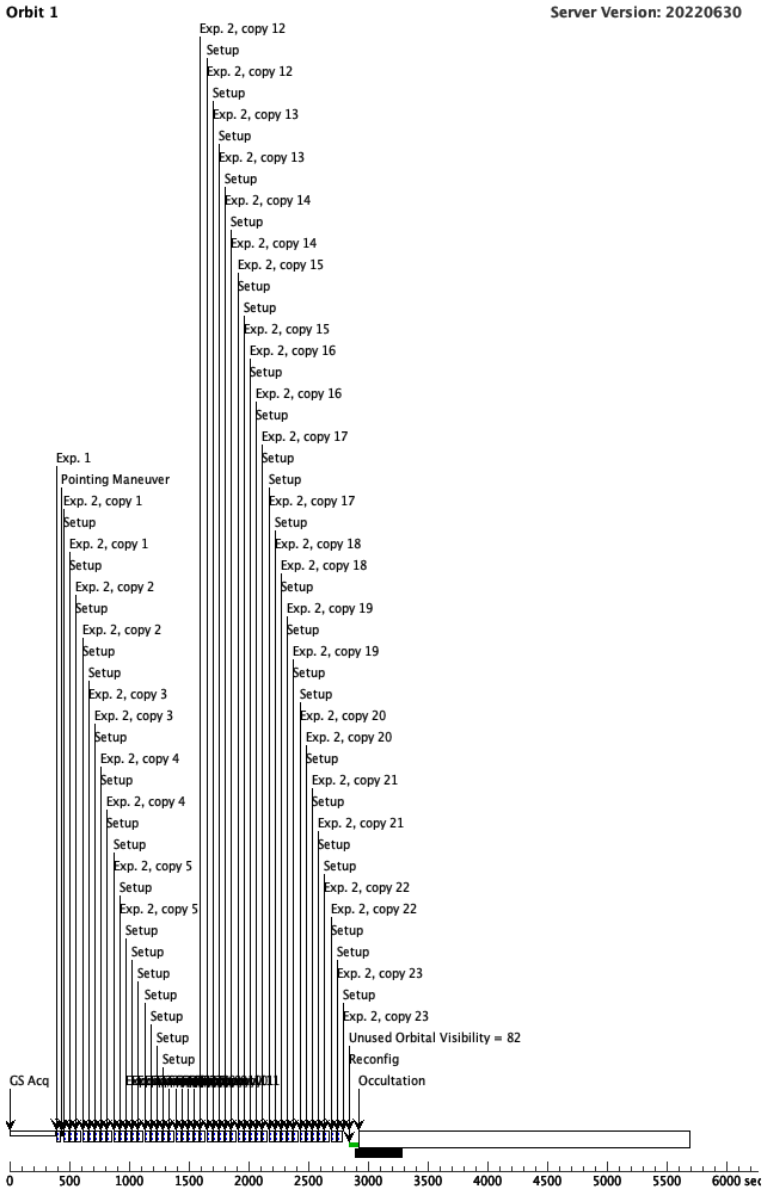
Orbit Structure



Visit

Proposal 16039, LTT1445A WFC3/G141 Orbit 2 (02), completed Mon Jan 30 17:01:02 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; SAME ORIENT AS 01; AFTER 01 BY 0.9 Orbits TO 1.1 Orbits

Comments: Second orbit of G102 transit. Must be scheduled directly after LTT1445A WFC3/G102 Orbit 1 (02).

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

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

	1	Orbit 3 - Science Scans x 22 Round-trip (WFC3IR.ss.1395816)	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS5; NSAMP=5	POS TARG null,-7; SPATIAL SCAN 0.5 31317,90.0 Degrees, Round trip	Sequence 1-1 Non-Int in LTT1445A WFC3/G141 Orbit 2 (02)	9.67632 Secs X 24 (464.463 Secs)	

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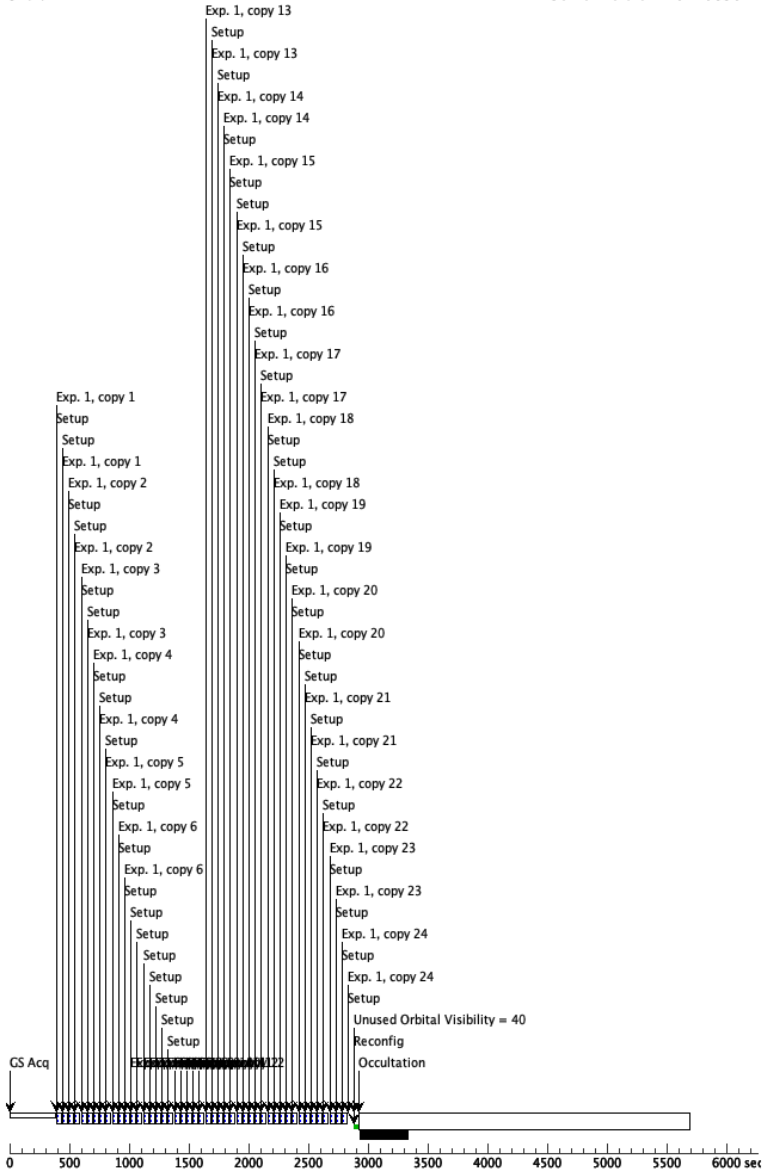
Orbit Structure



Visit

Proposal 16039, LTT1445A WFC3/G141 Orbit 3 (03), completed Mon Jan 30 17:01:02 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; SAME ORIENT AS 01; AFTER 02 BY 0.9 Orbits TO 1.1 Orbits

Comments: Third orbit of G102 transit. Must be scheduled directly after LTT1445A WFC3/G102 Orbit 2 (02).

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

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

	1	Orbit 3 - Science Scans x 22 Round-trip (WFC3IR.ss.1395816)	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS5; NSAMP=5	POS TARG null,-7; SPATIAL SCAN 0.5 31317,90.0 Degrees, Round trip	Sequence 1-1 Non-Int in LTT1445A WFC3/G141 Orbit 3 (03)	9.67632 Secs X 24 (464.463 Secs)	

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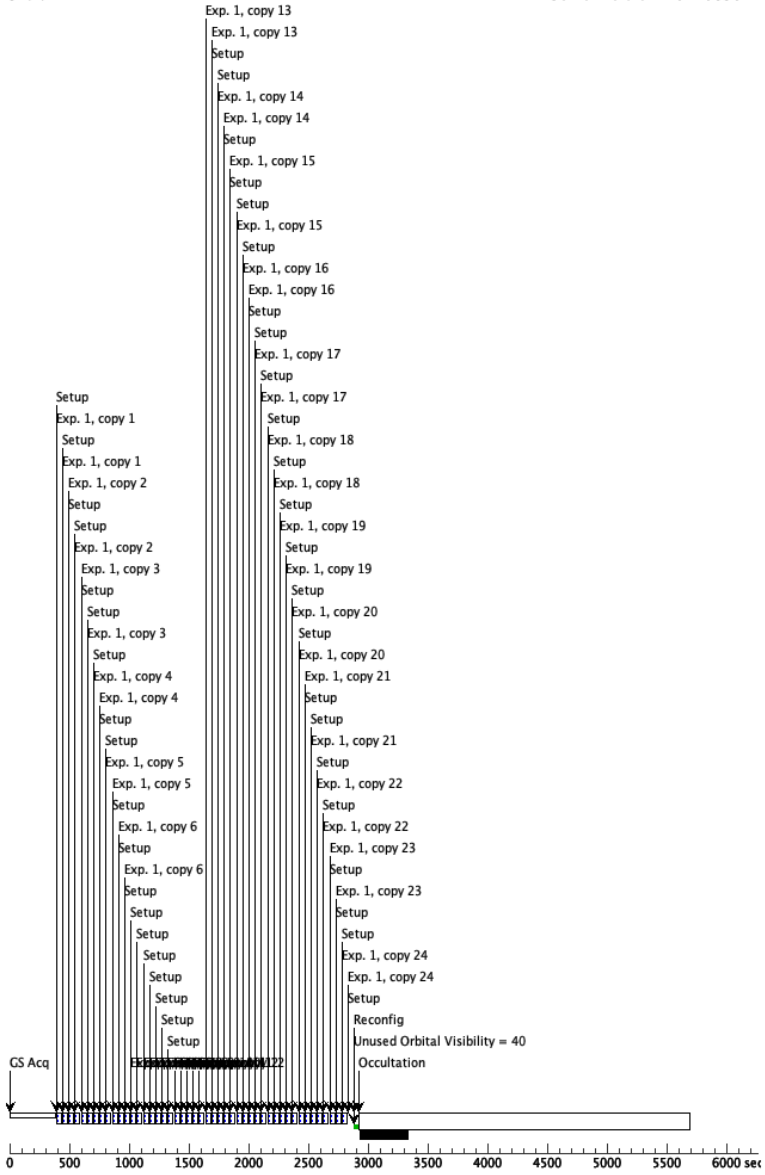
Orbit Structure



Visit

Proposal 16039, LTT1445A WFC3/G141 Orbit 4 (04), completed Mon Jan 30 17:01:02 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; SAME ORIENT AS 01; AFTER 03 BY 0.9 Orbits TO 1.1 Orbits

Comments: Fourth orbit of G102 transit. Must be scheduled directly after LTT1445A WFC3/G102 Orbit 3 (03).

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

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

	1	Orbit 4 - Science Scans x 22 Round-trip	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS5; NSAMP=5	POS TARG null,-7; SPATIAL SCAN 0.5 31317,90.0 Degrees, Round trip	Sequence 1-1 Non-Int in LTT1445A WFC3/G141 Orbit 4 (04)	9.67632 Secs X 24 (464.463 Secs)	

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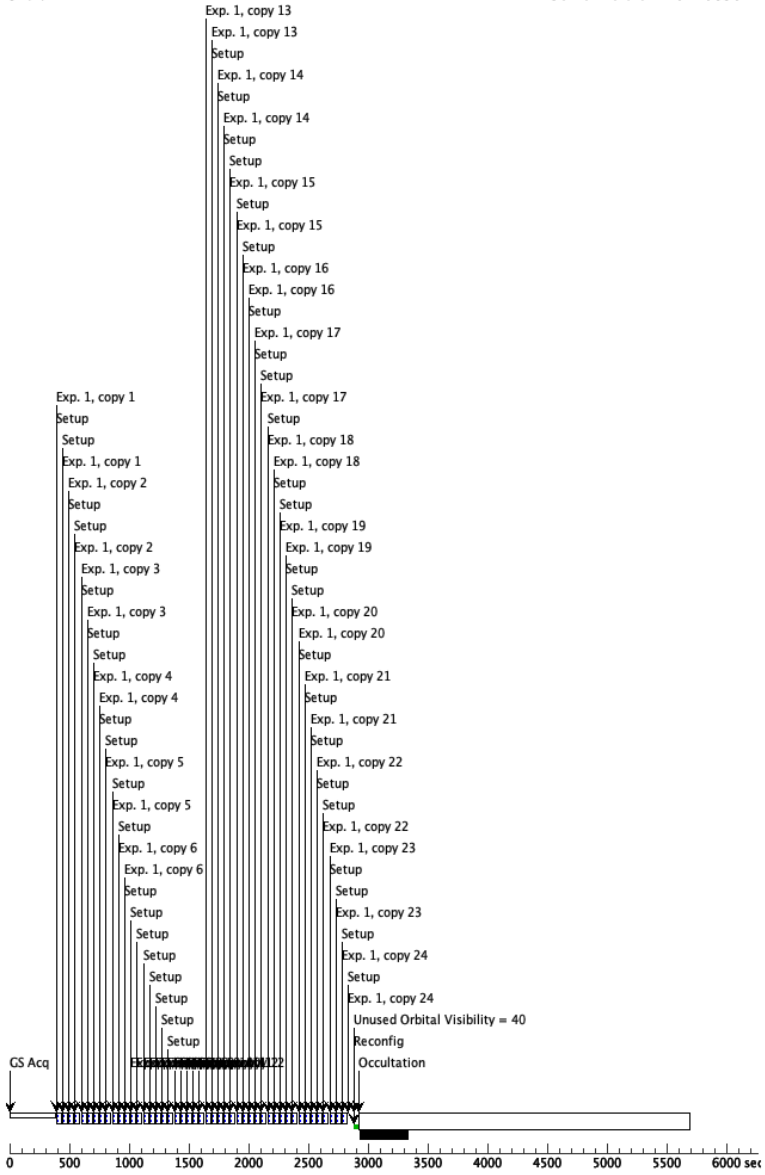
Orbit Structure



Visit

Proposal 16039, LTT1445A WFC3/G102 Orbit 1 (05), failed Mon Jan 30 17:01:02 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; ORIENT 68D TO 112 D; ORIENT 248D TO 292 D; Period 5.35882 D AND ZERO-PHASE HJD2458423.42629

Comments: WFC3/G102 time series transit observations consisiting of four consecutive HST orbits. Visits LTT1145A WFC3/G102 5, 6, 7 and 8 must be scheduled consecutively. The visits have been broken up in APT to force a buffer dump at the end of each orbit, which drastically increases the duty cycle, which is important for time-series observations.

-7" offset has been applied such that the target spatial scan is near the middle of the 256 subarray. This provides room for a companion star to appear either above or below the target, depending on the roll angle.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

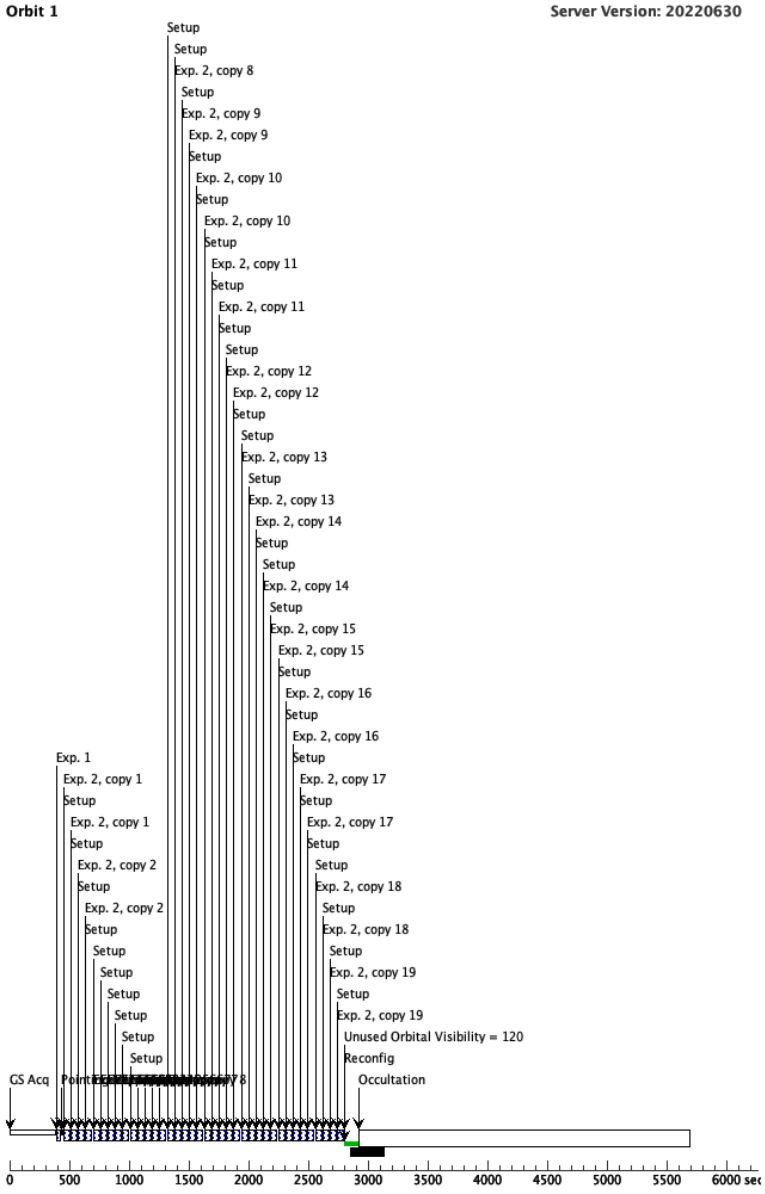
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Acquisition (WFC3IR.im.1395644)	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	F132N	SAMP-SEQ=RAPID; NSAMP=2	POS TARG null,-7; PHASE 0.9700649272290043 TO 0.9739525990174454	Sequence 1-2 Non-Int in LTT1445A WFC3/G102 Orbit 1 (05)	0.55563 Secs (0.556 Secs) *[==>]*	***[1]***

Comments: Filter image to assist with wavelength calibration. Saturated, but the image is only used to find the reference detctor possition.

	2	Orbit 1 - Science Scans x 21 Round-trip (WFC3IR.ss.1395654)	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	G102	SAMP-SEQ=SPARS10; NSAMP=4	POS TARG null,-7; SPATIAL SCAN 0.2691,90.0 Degrees,Round trip	Sequence 1-2 Non-Int in LTT1445A WFC3/G102 Orbit 1 (05)	22.317276 Secs X 19 (848.056 Secs) *[==>(Copy 1, Forward)]* *[==>(Copy 1, Reverse)]* *[==>(Copy 2, Forward)]* *[==>(Copy 2, Reverse)]* *[==>(Copy 3, Forward)]* *[==>(Copy 3, Reverse)]* *[==>(Copy 4, Forward)]* *[==>(Copy 4, Reverse)]* *[==>(Copy 5, Forward)]* *[==>(Copy 5, Reverse)]* *[==>(Copy 6, Forward)]* *[==>(Copy 6, Reverse)]* *[==>(Copy 7, Forward)]* *[==>(Copy 7, Reverse)]* *[==>(Copy 8, Forward)]* *[==>(Copy 8, Reverse)]* *[==>(Copy 9, Forward)]* *[==>(Copy 9, Reverse)]* *[==>(Copy 10, Forward)]* *[==>(Copy 10, Reverse)]* *[==>(Copy 11, Forward)]* *[==>(Copy 11, Reverse)]* *[==>(Copy 12, Forward)]* *[==>(Copy 12, Reverse)]* *[==>(Copy 13, Forward)]* *[==>(Copy 13, Reverse)]* *[==>(Copy 14, Forward)]* *[==>(Copy 14, Reverse)]* *[==>(Copy 15, Forward)]* *[==>(Copy 15, Reverse)]* *[==>(Copy 16, Forward)]* *[==>(Copy 16, Reverse)]* *[==>(Copy 17, Forward)]* *[==>(Copy 17, Reverse)]* *[==>(Copy 18, Forward)]* *[==>(Copy 18, Reverse)]* *[==>(Copy 19, Forward)]* *[==>(Copy 19, Reverse)]*	***[1]***
	Comments: For the target star, the Brightest Pixel (single exposure) is at 1.09 um with 50,192.06. BC binary pair together is slightly dimmer at G102 wavelengths, so the max counts will be slightly less. The scan of 6 " will provide									

Orbit Structure



Visit

Proposal 16039, LTT1445A WFC3/G102 Orbit 2 (06), failed Mon Jan 30 17:01:03 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; SAME ORIENT AS 05; AFTER 05 BY 0.9 Orbits TO 1.1 Orbits

Comments: Second orbit of G102 transit. Must be scheduled directly after LTT1445A WFC3/G102 Orbit 1 (05).

Fixed Targets

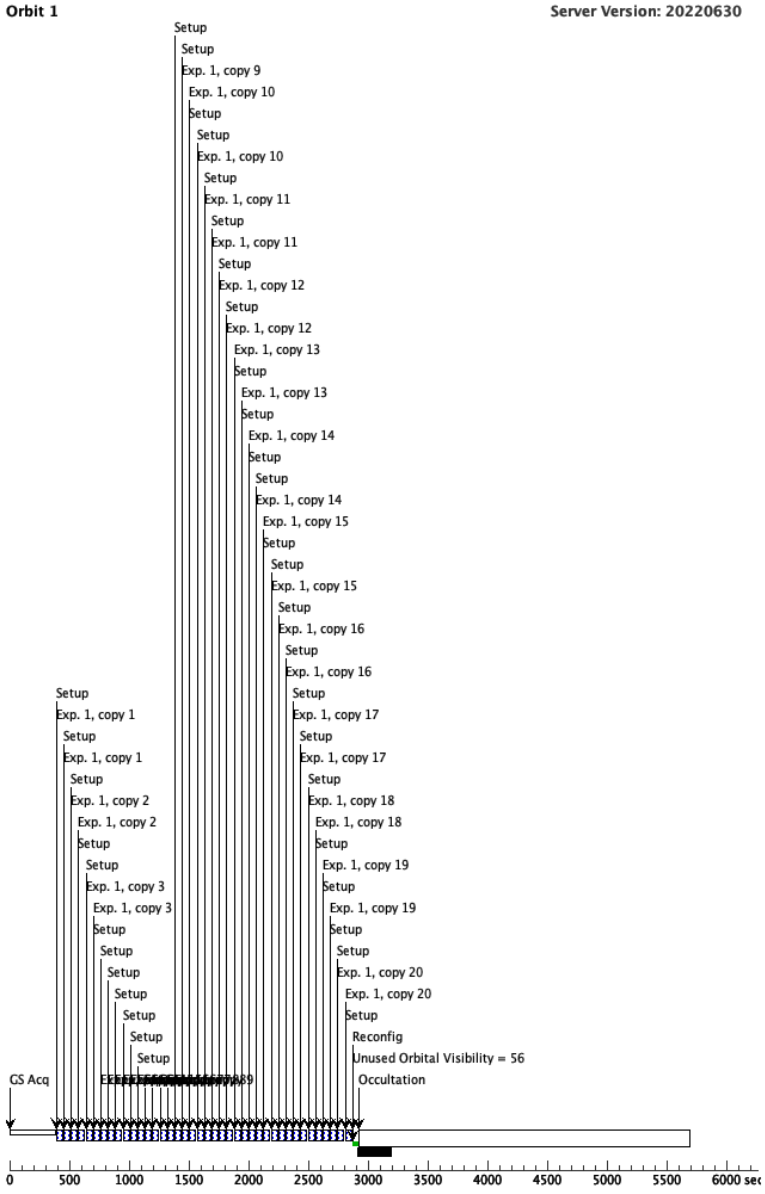
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Orbit 3 - Science Scans x 22 Round-trip (WFC3IR.ss.1395654)	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	G102	SAMP-SEQ=SPARS10; NSAMP=4	POS TARG null,-7; SPATIAL SCAN 0.2691,90.0 Degrees,Round trip	Sequence 1-1 Non-Int in LTT1445A WFC3/G102 Orbit 2 (06)	22.317276 Secs X 20 (892.691 Secs) *[==>(Copy 1, Forward)]* *[==>(Copy 1, Reverse)]* *[==>(Copy 2, Forward)]* *[==>(Copy 2, Reverse)]* *[==>(Copy 3, Forward)]* *[==>(Copy 3, Reverse)]* *[==>(Copy 4, Forward)]* *[==>(Copy 4, Reverse)]* *[==>(Copy 5, Forward)]* *[==>(Copy 5, Reverse)]* *[==>(Copy 6, Forward)]* *[==>(Copy 6, Reverse)]* *[==>(Copy 7, Forward)]* *[==>(Copy 7, Reverse)]* *[==>(Copy 8, Forward)]* *[==>(Copy 8, Reverse)]* *[==>(Copy 9, Forward)]* *[==>(Copy 9, Reverse)]* *[==>(Copy 10, Forward)]* *[==>(Copy 10, Reverse)]* *[==>(Copy 11, Forward)]* *[==>(Copy 11, Reverse)]* *[==>(Copy 12, Forward)]* *[==>(Copy 12, Reverse)]* *[==>(Copy 13, Forward)]* *[==>(Copy 13, Reverse)]* *[==>(Copy 14, Forward)]* *[==>(Copy 14, Reverse)]* *[==>(Copy 15, Forward)]* *[==>(Copy 15, Reverse)]* *[==>(Copy 16, Forward)]* *[==>(Copy 16, Reverse)]* *[==>(Copy 17, Forward)]* *[==>(Copy 17, Reverse)]* *[==>(Copy 18, Forward)]* *[==>(Copy 18, Reverse)]* *[==>(Copy 19, Forward)]* *[==>(Copy 19, Reverse)]* *[==>(Copy 20, Forward)]* *[==>(Copy 20, Reverse)]*	***[1]***

Orbit Structure



Visit

Proposal 16039, LTT1445A WFC3/G102 Orbit 3 (07), failed Mon Jan 30 17:01:03 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; SAME ORIENT AS 05; AFTER 06 BY 0.9 Orbits TO 1.1 Orbits

Comments: Third orbit of G102 transit. Must be scheduled directly after LTT1445A WFC3/G102 Orbit 2 (06).

Fixed Targets

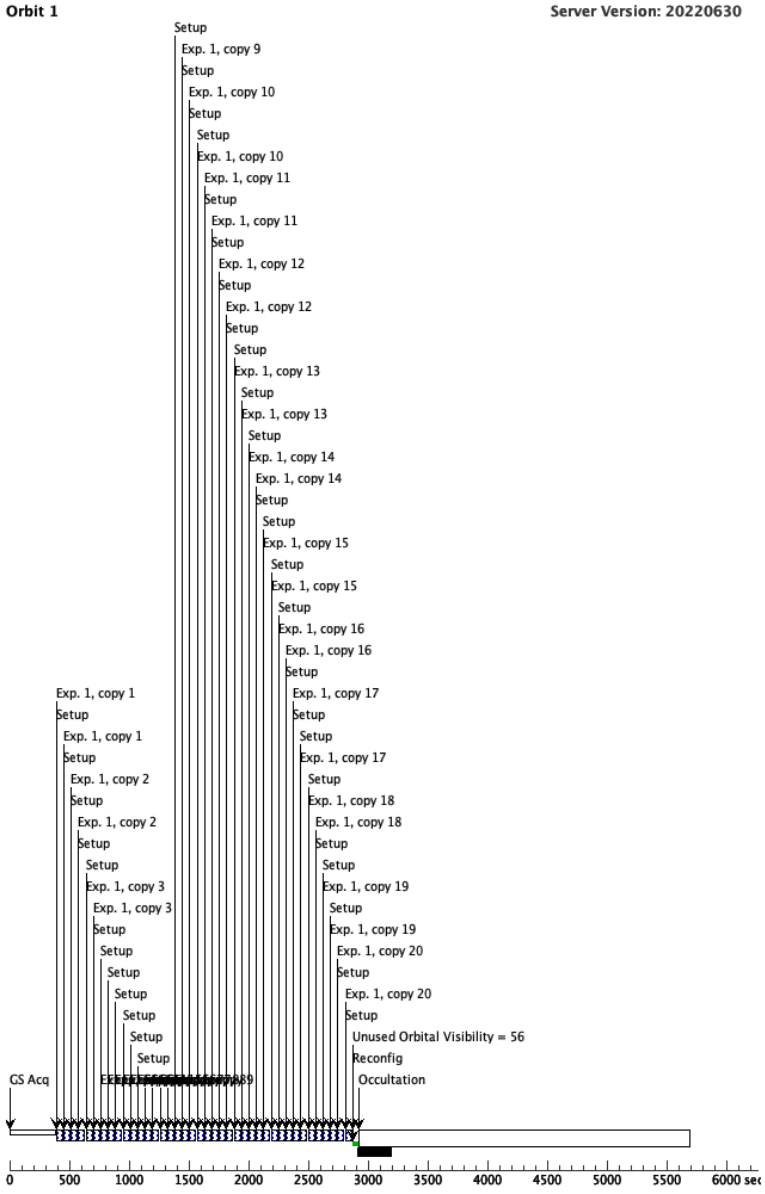
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Orbit 3 - Science Scans x 22 Round-trip (WFC3IR.ss.1395654)	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	G102	SAMP-SEQ=SPARS10; NSAMP=4	POS TARG null,-7; SPATIAL SCAN 0.2691,90.0 Degrees,Round trip	Sequence 1-1 Non-Int in LTT1445A WFC3/G102 Orbit 3 (07)	22.317276 Secs X 20 (892.691 Secs) *[==>(Copy 1, Forward)]* *[==>(Copy 1, Reverse)]* *[==>(Copy 2, Forward)]* *[==>(Copy 2, Reverse)]* *[==>(Copy 3, Forward)]* *[==>(Copy 3, Reverse)]* *[==>(Copy 4, Forward)]* *[==>(Copy 4, Reverse)]* *[==>(Copy 5, Forward)]* *[==>(Copy 5, Reverse)]* *[==>(Copy 6, Forward)]* *[==>(Copy 6, Reverse)]* *[==>(Copy 7, Forward)]* *[==>(Copy 7, Reverse)]* *[==>(Copy 8, Forward)]* *[==>(Copy 8, Reverse)]* *[==>(Copy 9, Forward)]* *[==>(Copy 9, Reverse)]* *[==>(Copy 10, Forward)]* *[==>(Copy 10, Reverse)]* *[==>(Copy 11, Forward)]* *[==>(Copy 11, Reverse)]* *[==>(Copy 12, Forward)]* *[==>(Copy 12, Reverse)]* *[==>(Copy 13, Forward)]* *[==>(Copy 13, Reverse)]* *[==>(Copy 14, Forward)]* *[==>(Copy 14, Reverse)]* *[==>(Copy 15, Forward)]* *[==>(Copy 15, Reverse)]* *[==>(Copy 16, Forward)]* *[==>(Copy 16, Reverse)]* *[==>(Copy 17, Forward)]* *[==>(Copy 17, Reverse)]* *[==>(Copy 18, Forward)]* *[==>(Copy 18, Reverse)]* *[==>(Copy 19, Forward)]* *[==>(Copy 19, Reverse)]* *[==>(Copy 20, Forward)]* *[==>(Copy 20, Reverse)]*	***[1]***

Orbit Structure



Visit

Proposal 16039, LTT1445A WFC3/G102 Orbit 4 (08), failed Mon Jan 30 17:01:03 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: SCHED 100%; SAME ORIENT AS 05; AFTER 07 BY 0.9 Orbits TO 1.1 Orbits

Comments: Fourth orbit of G102 transit. Must be scheduled directly after LTT1445A WFC3/G102 Orbit 3 (07).

Fixed Targets

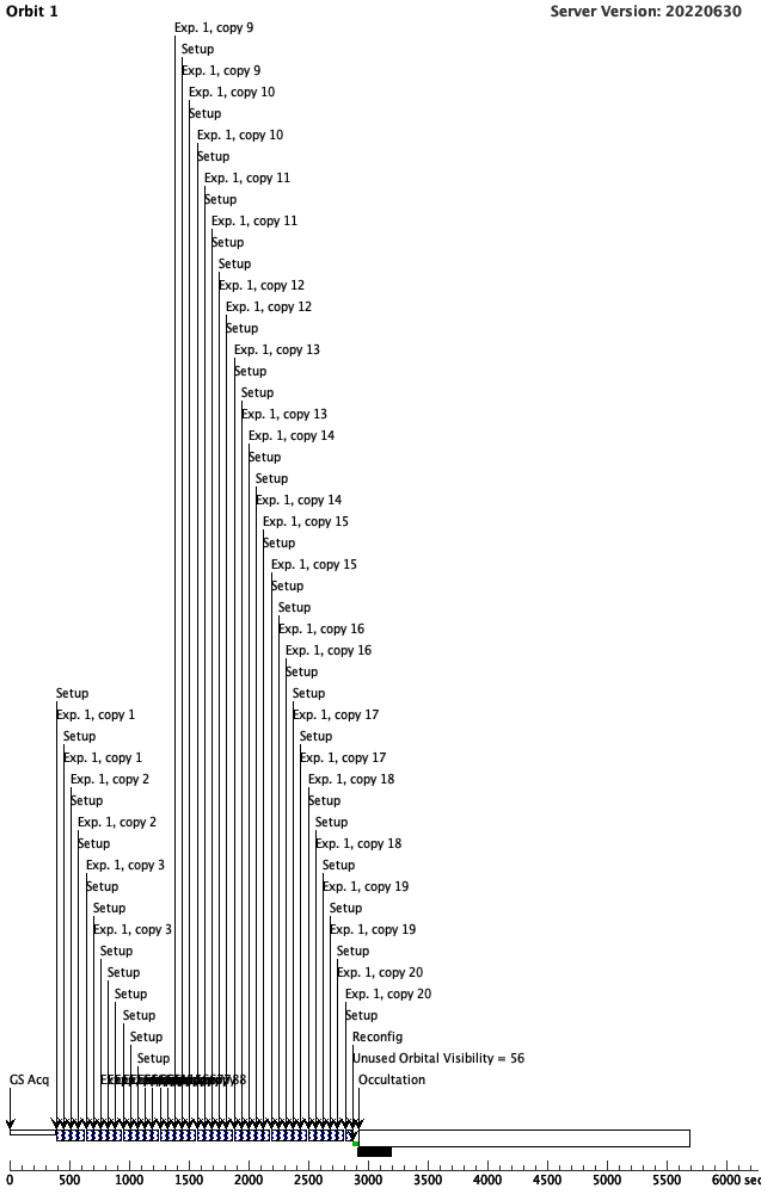
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Orbit 4 - Science Scans x 22 Round-trip (WFC3IR.ss.1395654)	(1) LTT-1445A	WFC3/IR, MULTIACCUM, GRISM256	G102	SAMP-SEQ=SPARS10; NSAMP=4	POS TARG null,-7; SPATIAL SCAN 0.2691,90.0 Degrees,Round trip	Sequence 1-1 Non-Int in LTT1445A WFC3/G102 Orbit 4 (08)	22.317276 Secs X 20 (892.691 Secs) *[==>(Copy 1, Forward)]* *[==>(Copy 1, Reverse)]* *[==>(Copy 2, Forward)]* *[==>(Copy 2, Reverse)]* *[==>(Copy 3, Forward)]* *[==>(Copy 3, Reverse)]* *[==>(Copy 4, Forward)]* *[==>(Copy 4, Reverse)]* *[==>(Copy 5, Forward)]* *[==>(Copy 5, Reverse)]* *[==>(Copy 6, Forward)]* *[==>(Copy 6, Reverse)]* *[==>(Copy 7, Forward)]* *[==>(Copy 7, Reverse)]* *[==>(Copy 8, Forward)]* *[==>(Copy 8, Reverse)]* *[==>(Copy 9, Forward)]* *[==>(Copy 9, Reverse)]* *[==>(Copy 10, Forward)]* *[==>(Copy 10, Reverse)]* *[==>(Copy 11, Forward)]* *[==>(Copy 11, Reverse)]* *[==>(Copy 12, Forward)]* *[==>(Copy 12, Reverse)]* *[==>(Copy 13, Forward)]* *[==>(Copy 13, Reverse)]* *[==>(Copy 14, Forward)]* *[==>(Copy 14, Reverse)]* *[==>(Copy 15, Forward)]* *[==>(Copy 15, Reverse)]* *[==>(Copy 16, Forward)]* *[==>(Copy 16, Reverse)]* *[==>(Copy 17, Forward)]* *[==>(Copy 17, Reverse)]* *[==>(Copy 18, Forward)]* *[==>(Copy 18, Reverse)]* *[==>(Copy 19, Forward)]* *[==>(Copy 19, Reverse)]* *[==>(Copy 20, Forward)]* *[==>(Copy 20, Reverse)]*	***[1]***

Orbit Structure



Visit

Proposal 16039, LTT1445A WFC3/UVIS G280 Visit 3 (09), completed Mon Jan 30 17:01:03 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; ORIENT 38D TO 148 D; ORIENT 218D TO 328 D; BEFORE 24-NOV-2022:00:00:00; Period 5.35882 D AND ZERO-PHASE HJD2458423.42629

Comments: The optional parameters SIZEAXIS1=2250 and SIZEAXIS2=590 are used for all exposures to minimize the data volume and hence time lost to buffer dumps. This is fine for the data that needs to be obtained because the spectum of LTT1445A will occupy only a narrow swath of pixel rows within the field. This also requires the use of optional parameters CENTERAXIS1 and CENTERAXIS2 in order to "steer" the location of the subarray readout so that it is centered on the target spectrum. If we were positioning on chip 1 we could set CENTERAXIS2=TARGET. However, for the field center (nominal "UVIS" aperture) location on chip 2, we cannot center the subarray on the target because this would cause the subarray to extend into the chip gap, so we hardwire CENTERAXIS1=2136 and CENTERAXIS2=1216, which is intende to put the vertical center of the subarray on the zeroth order of the target spectrum.

Chip 2 biases are taken at the end of the visit because the grism exposures use custom subarrays, which will not have matching biases from the WFC3 bias calibration program.

For each visit we have phase constraints around the event of the planetary transit, both the orbital period of the planet and the phasing needed are placed on the first exposure in the sequence for each visit. As this target has a potential binary star companion 7" away which can contaminate the spectra, we have placed Orient Ranges for the observations to reach our science goals.

Diagnostics

(LTT1445A WFC3/UVIS G280 Visit 3 (09)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(LTT1445A WFC3/UVIS G280 Visit 3 (09)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Filter Acquisition (09.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 1 - G280 x10 (09.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 2 - G280 x11 (09.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 3 - G280 x11 (09.004)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Filter Acquisition (WFC3UVIS.im.1395707)	(1) LTT-1445A	WFC3/UVIS, ACCUM, G280-REF	F467M	FLASH=12; SIZEAXIS2=590; CENTERAXIS2=1216; SIZEAXIS1=2250; CENTERAXIS1=2136	POS TARG null,-50.0; PHASE 0.9700 TO 0.97395	Sequence 1-2 Non-Int in LTT1445A WFC3/UVIS G280 Visit 3 (09)	4 Secs (4 Secs) *[==>]*	***[1]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

We use FLASH=12 to meet the nominal count level. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	Orbit 1 - G280 x10 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 1-2 Non-Int in LTT1445A WFC3/UVIS G280 Visit 3 (09)	195 Secs X 9 (1755 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recommended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	Orbit 2 - G280 x11 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 3-3 Non-Int in LTT1445A WFC3/UVIS G280 Visit 3 (09)	195 Secs X 10 (1950 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]*	***[2]***

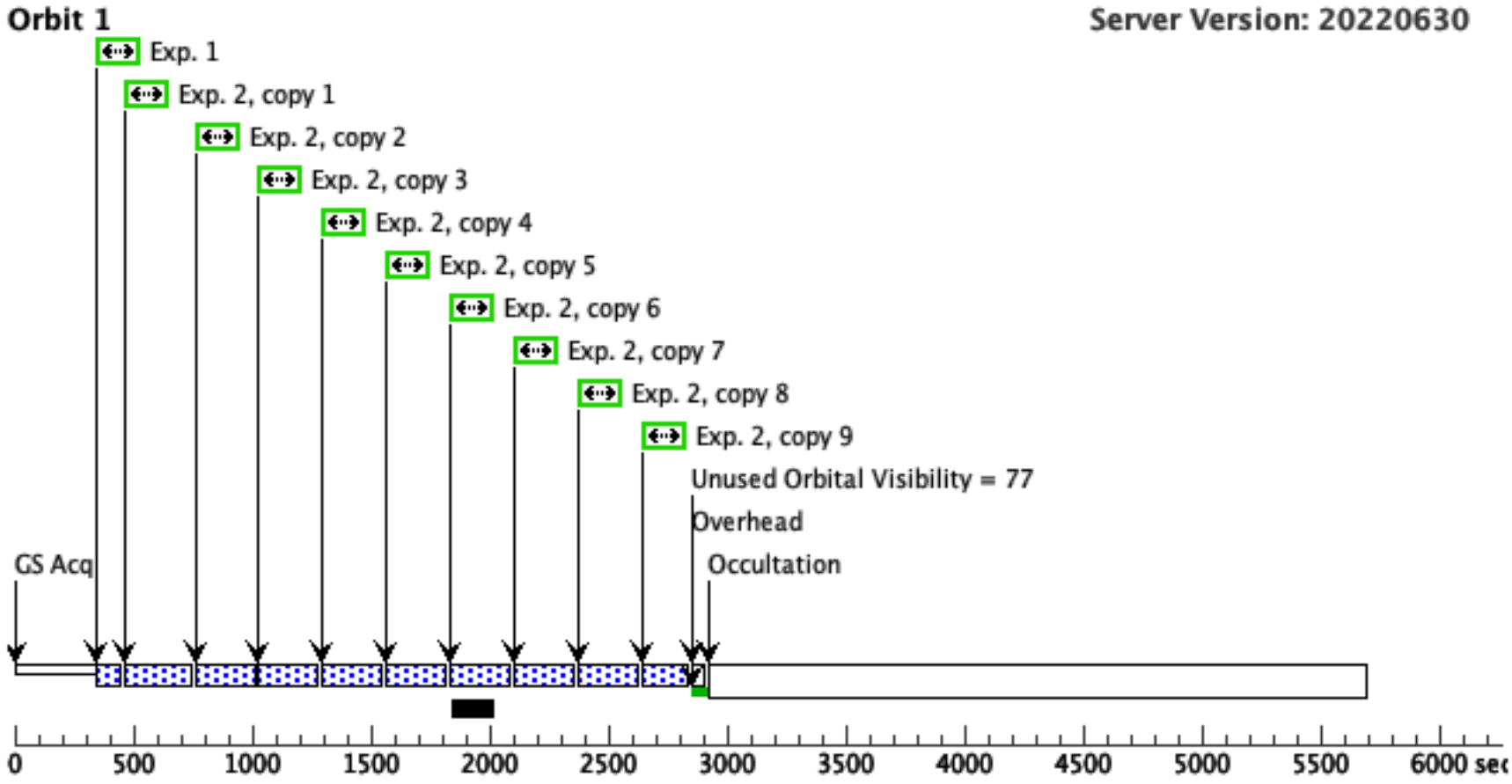
Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

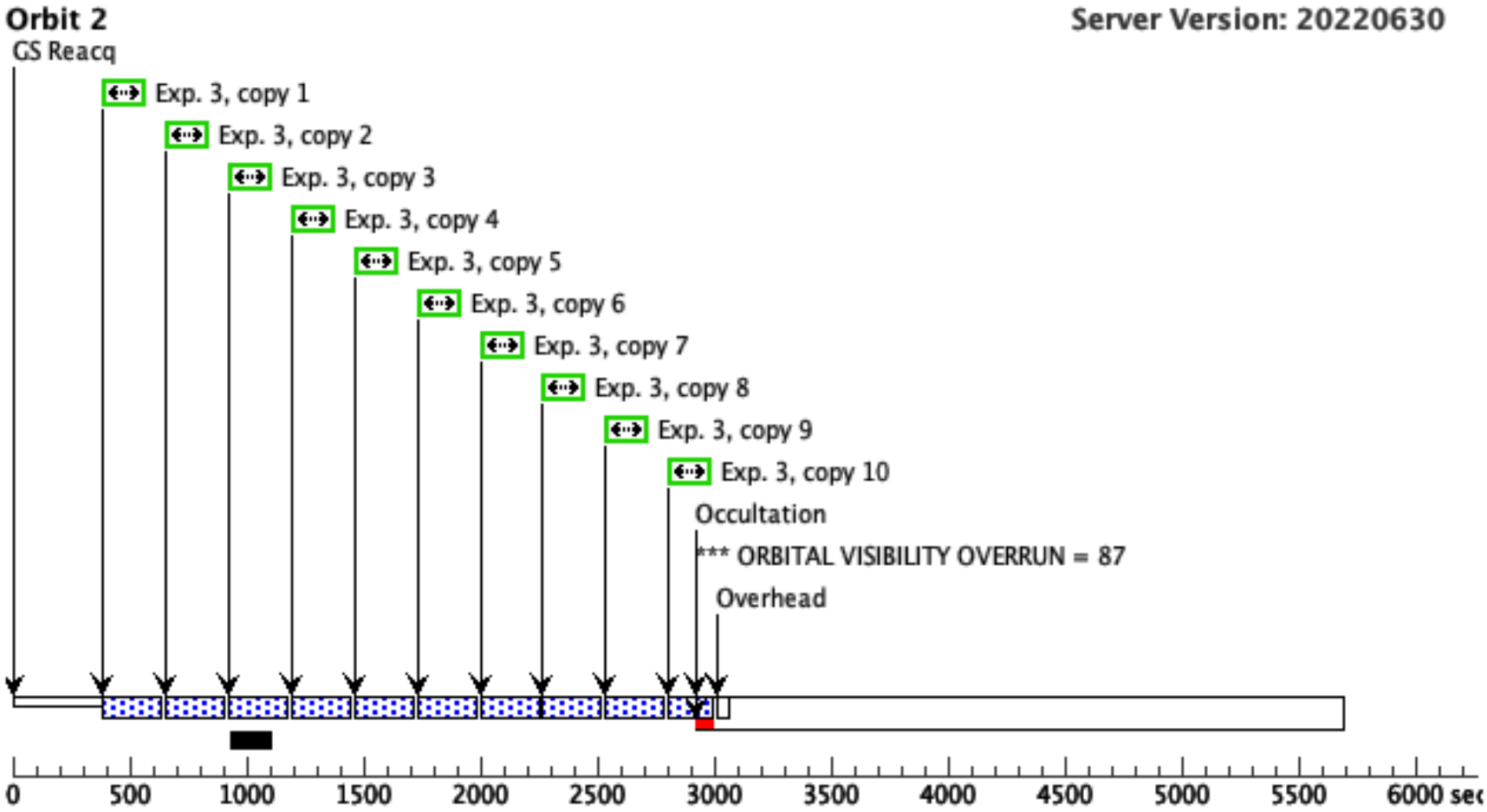
SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recommended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.

4	Orbit 3 - G280 x11 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 4-5 Non-Int in LTT1445A WFC3/UVIS G280 Visit 3 (09)	195 Secs X 10 (1950 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]*	***[3]***
Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2. *SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.* *Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recommended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.*									
5	Bias	BIAS	WFC3/UVIS, ACCUM, UVIS	DEF	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216		Sequence 4-5 Non-Int in LTT1445A WFC3/UVIS G280 Visit 3 (09)	0.0 Secs X 4 (0 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]*	***[3]***
Comments: We set up the bias frames based on previously sucessful program 11934 and are using the same Aperture and subarray size and position as the observations for direct calibration.									

Orbit Structure

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Exp. 3, copy 9
Exp. 3, copy 10
Occultation
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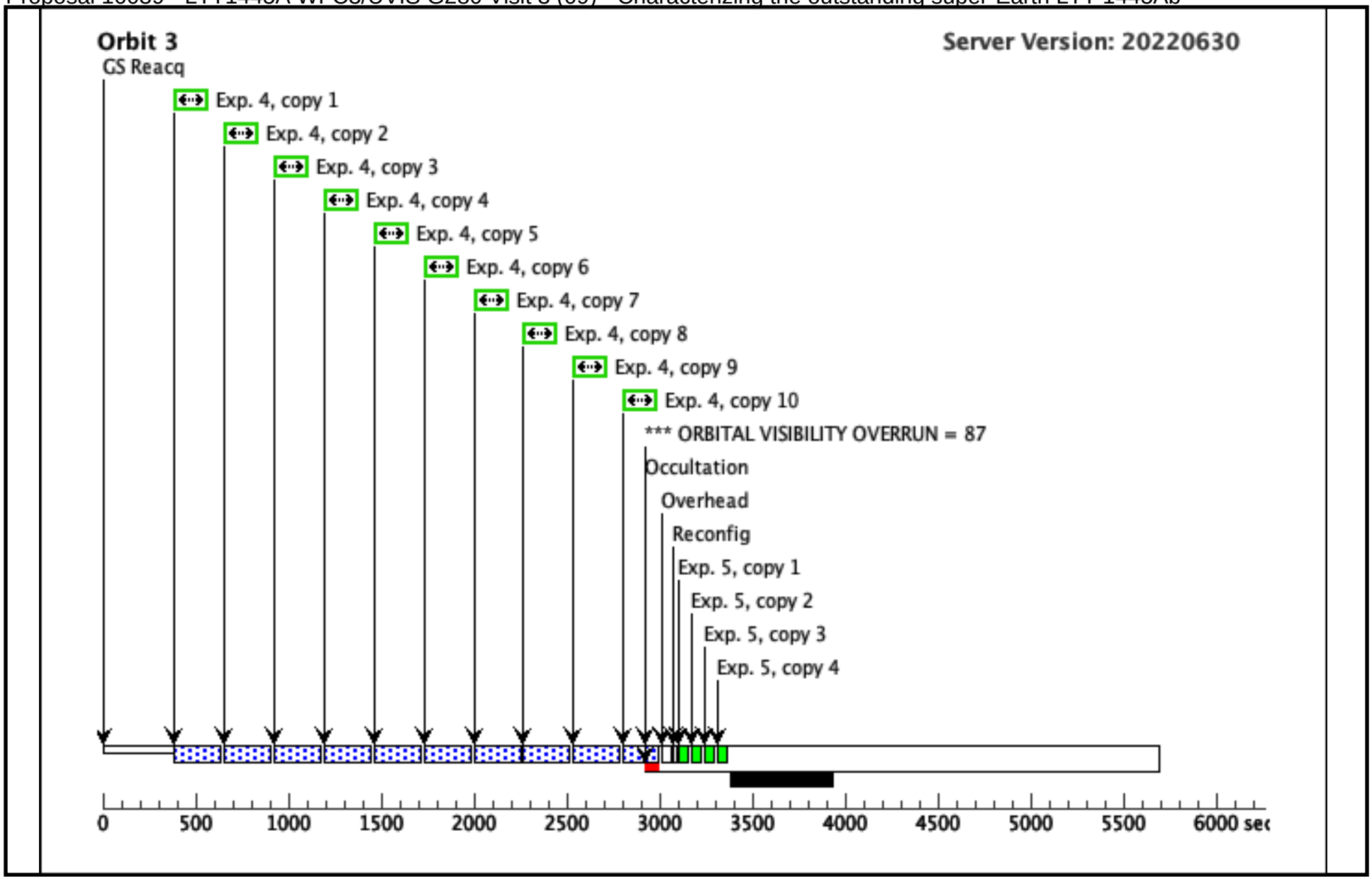
6000 sec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Server Version: 20220630
GS Reacq
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Exp. 4, copy 7
Exp. 4, copy 8
Exp. 4, copy 9
Exp. 4, copy 10
*** ORBITAL VISIBILITY OVERRUN = 87
Occultation
Overhead
Reconfig
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Exp. 5, copy 2
Exp. 5, copy 3
Exp. 5, copy 4
0
500
1000
1500
2000
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5500
6000 sec

Visit

Proposal 16039, LTT1445A WFC3/UVIS G280 Visit 4 (10), completed Mon Jan 30 17:01:03 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; ORIENT 38D TO 148 D; ORIENT 218D TO 328 D; BEFORE 24-NOV-2022:00:00:00; Period 5.35882 D AND ZERO-PHASE HJD2458423.42629

Comments: Idential to vist 3

Diagnostics

(LTT1445A WFC3/UVIS G280 Visit 4 (10)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(LTT1445A WFC3/UVIS G280 Visit 4 (10)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(Filter Acquisition (10.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 1 - G280 x11 (10.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 2 - G280 x11 (10.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 3 - G280 x11 (10.004)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Filter Acquisition (WFC3UVIS.im.1395707)	(1) LTT-1445A	WFC3/UVIS, ACCUM, G280-REF	F467M	FLASH=12; SIZEAXIS2=590; CENTERAXIS2=1216; SIZEAXIS1=2250; CENTERAXIS1=2136	POS TARG null,-50.0; PHASE 0.98244058 TO 0.98639058	Sequence 1-2 Non-Int in LTT1445A WFC3/UVIS G280 Visit 4 (10)	4 Secs (4 Secs) *[==>]*	***[1]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

We use FLASH=12 to meet the nominal count level. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	Orbit 1 - G280 x11 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 1-2 Non-Int in LTT1445A WFC3/UVIS G280 Visit 4 (10)	195 Secs X 9 (1755 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recommended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	Orbit 2 - G280 x11 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 3-3 Non-Int in LTT1445A WFC3/UVIS G280 Visit 4 (10)	195 Secs X 10 (1950 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]*	***[2]***

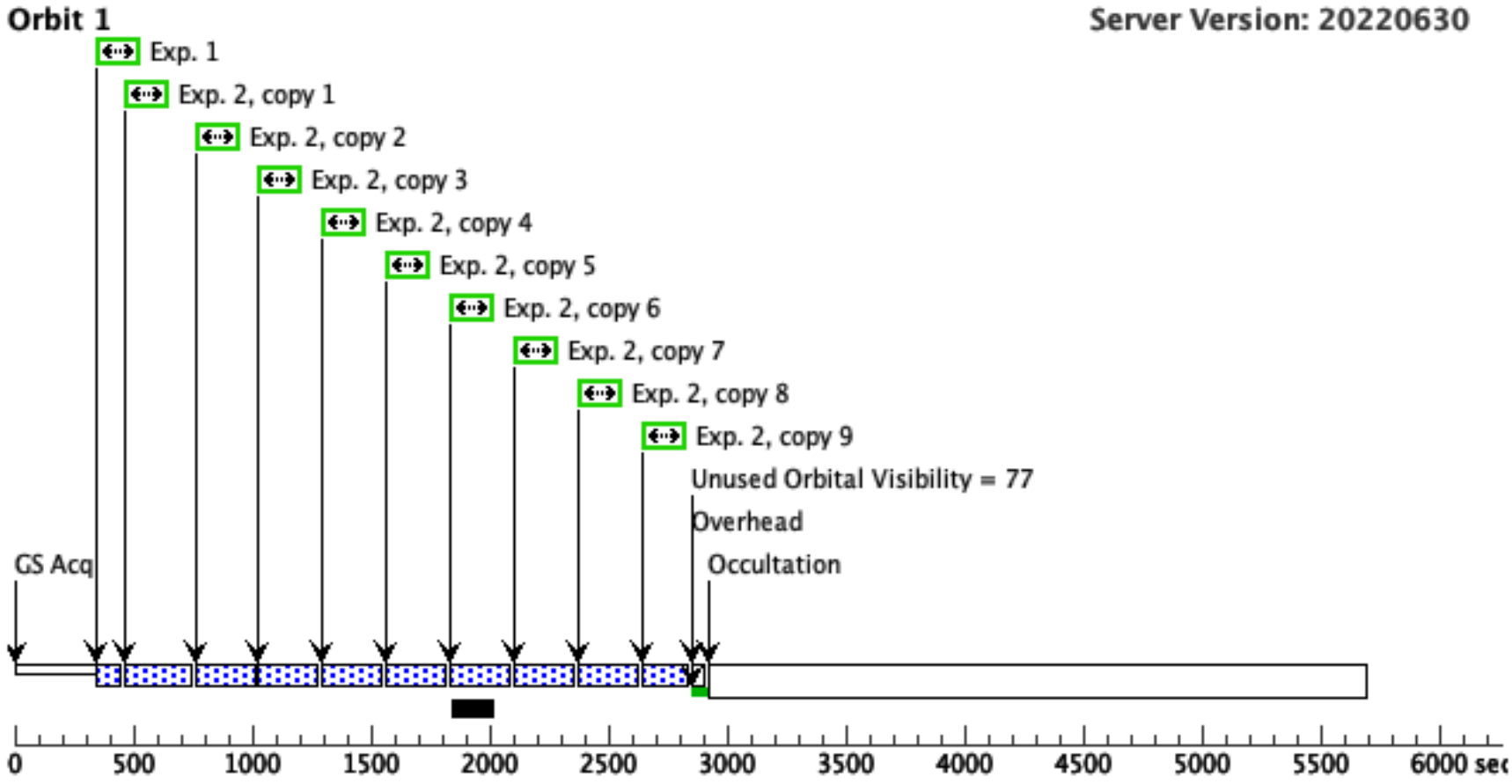
Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

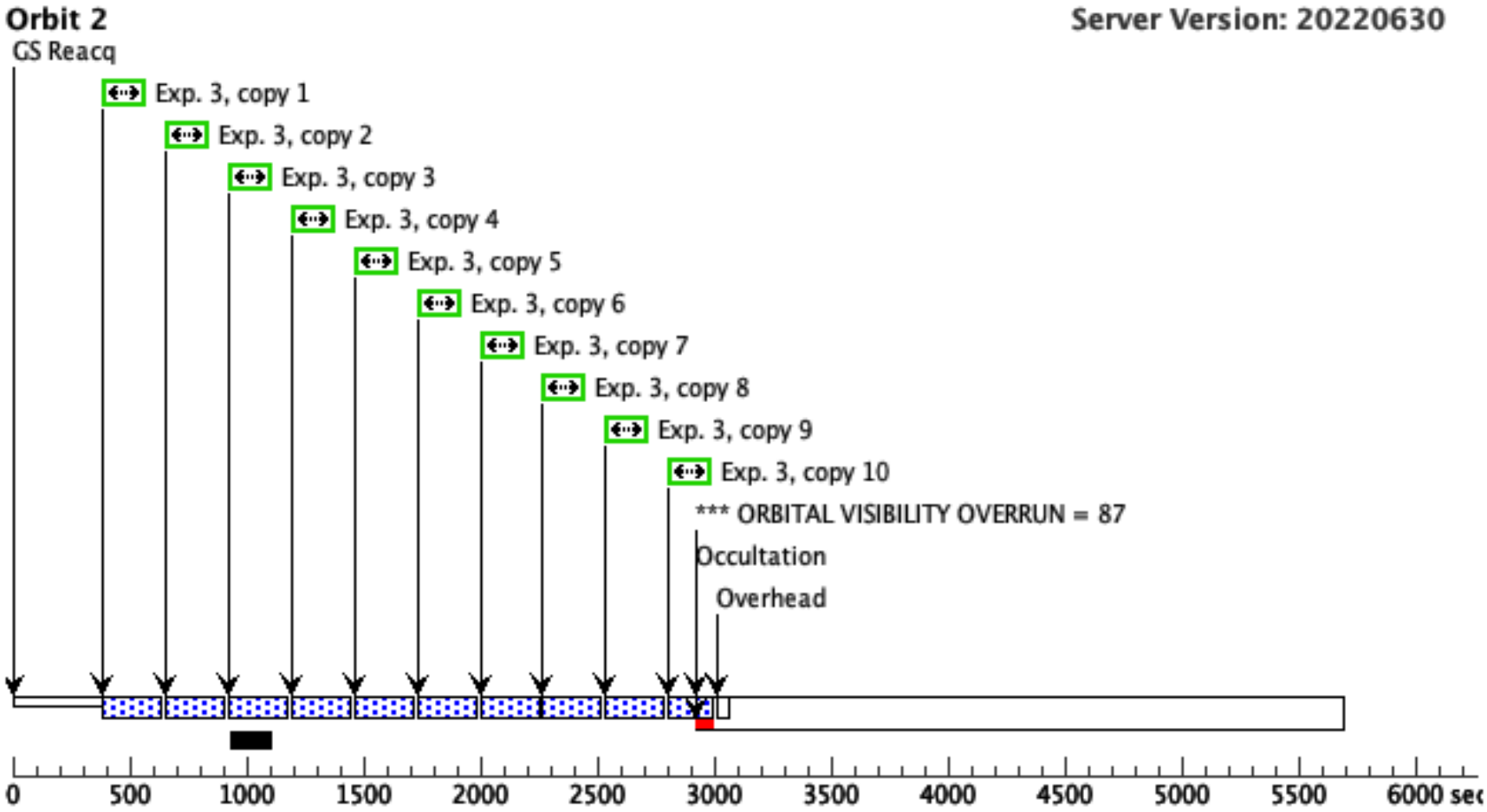
SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recommended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.

	4	Orbit 3 - G280 x11 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 4-5 Non-Int in LTT1445A WFC3/UVIS G280 Visit 4 (10)	195 Secs X 10 (1950 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]*	***[3]***
	Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2. *SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.* *Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recomended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.*									
	5	Bias	BIAS	WFC3/UVIS, ACCUM, UVIS	DEF	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216		Sequence 4-5 Non-Int in LTT1445A WFC3/UVIS G280 Visit 4 (10)	0.0 Secs X 4 (0 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]*	***[3]***
	Comments: We set up the bias frames based on previously sucessful program 11934 and are using the same Aperture and subarray size and position as the observations for direct calibration.									

Orbit Structure

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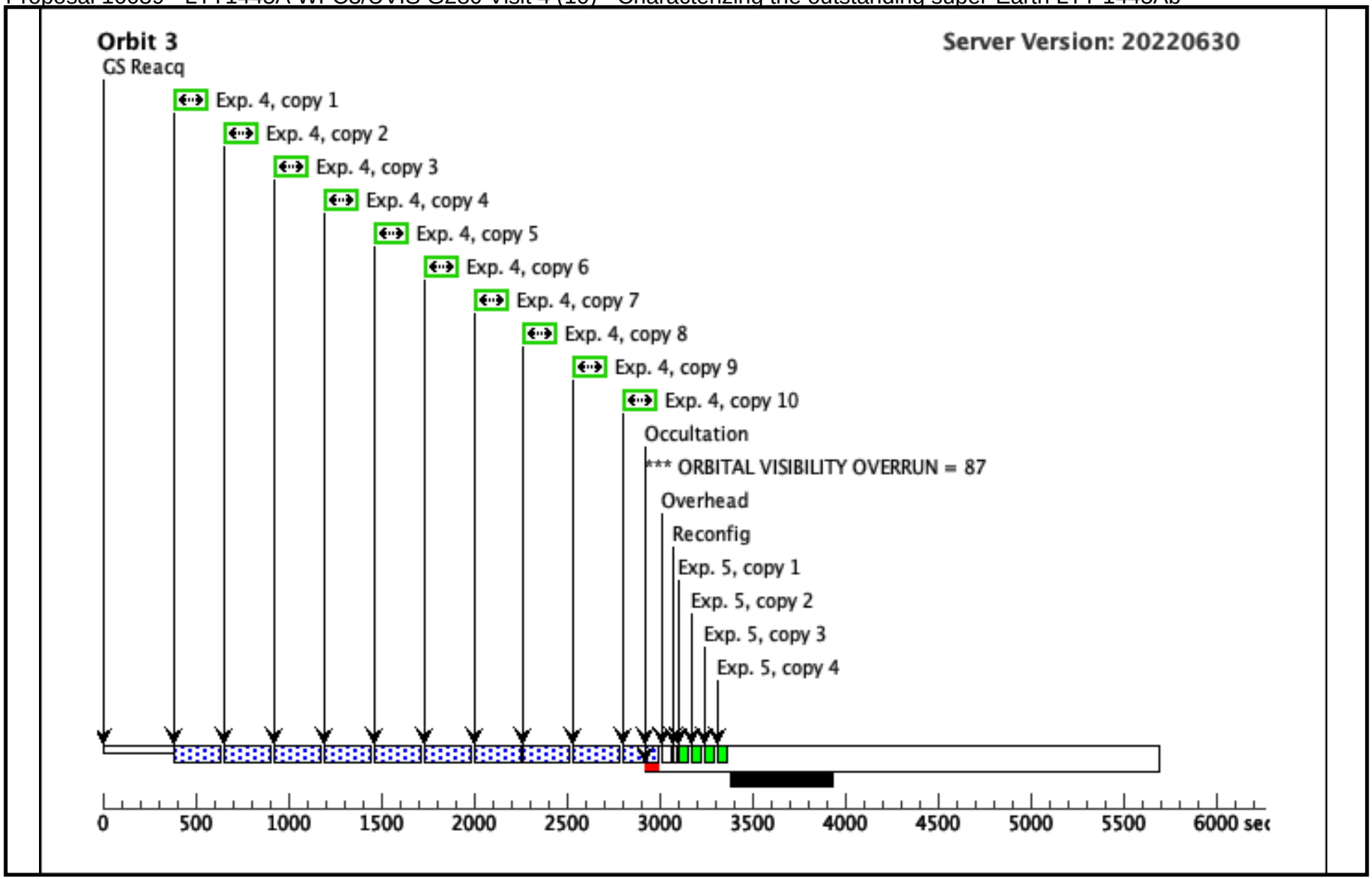
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Occultation
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4500
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5500
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Visit

Proposal 16039, LTT1445A WFC3/UVIS G280 Visit 55-58 (59), implementation Mon Jan 30 17:01:03 GMT 2023

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; ORIENT 38D TO 148 D; ORIENT 218D TO 328 D; Period 5.35882 D AND ZERO-PHASE HJD2458423.42629

Comments: Copied from Visit 3, replaces G102 visits 55-58

Diagnostics

(Filter Acquisition (59.001)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 1 - G280 x9 (59.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 2 - G280 x10 (59.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 3 - G280 x10 (59.004)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

(Orbit 4 - G280 x10 (59.005)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	LTT-1445A	RA: 03 01 51.3900 (45.4641250d)	Proper Motion RA: -369.07 mas/yr	V=11.22	Reference Frame: SIMBAD
		Dec: -16 35 36.02 (-16.59334d)	Proper Motion Dec: -268.15 mas/yr	Ic = 8.66	
		Equinox: J2000	Epoch of Position: 2015.5		

Comments: Winters et al 2019 and Gaia DR2
Category=EXT-STAR
Description=[EXTRA-SOLAR PLANETARY SYSTEM, M V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Filter Acquisition (WFC3UVIS.im.1395707)	(1) LTT-1445A	WFC3/UVIS, ACCUM, G280-REF	F467M	FLASH=12; SIZEAXIS2=590; CENTERAXIS2=1216; SIZEAXIS1=2250; CENTERAXIS1=2136	POS TARG null,-50.0; PHASE 0.9700649272290043 TO 0.9739525990174454	Sequence 1-2 Non-Int in LTT1445A WFC3/UVIS G280 Visit 55-58 (59)	4 Secs (4 Secs) *[==>]*	***[1]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

We use FLASH=12 to meet the nominal count level. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
2	Orbit 1 - G280 x9 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 1-2 Non-Int in LTT1445A WFC3/UVIS G280 Visit 55-58 (59)	185.5 Secs X 9 (1669.5 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]*	***[1]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recommended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
3	Orbit 2 - G280 x10 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 3-3 Non-Int in LTT1445A WFC3/UVIS G280 Visit 55-58 (59)	185.5 Secs X 10 (1855 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]*	***[2]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recommended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.

4	Orbit 3 - G280 x10 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 4-4 Non-In t in LTT1445A WFC 3/UVIS G280 Visit 55-58 (59)	185.5 Secs X 10 (1855 Secs)	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]*	***[3]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recommended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.

5	Orbit 4 - G280 x10 (WFC3UVIS.sp.1395813)	(1) LTT-1445A	WFC3/UVIS, ACCUM, UVIS	G280	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216	POS TARG null,-50.0	Sequence 5-6 Non-In t in LTT1445A WFC 3/UVIS G280 Visit 55-58 (59)	185.5 Secs X 10 (1855 Secs)	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]* *[==>(Copy 7)]* *[==>(Copy 8)]* *[==>(Copy 9)]* *[==>(Copy 10)]*	***[4]***

Comments: Nominal "UVIS" aperture is ~10" above the chip gap on chip 1; a Y-postarg of about -50" places the target near the center of subarray on chip 2.

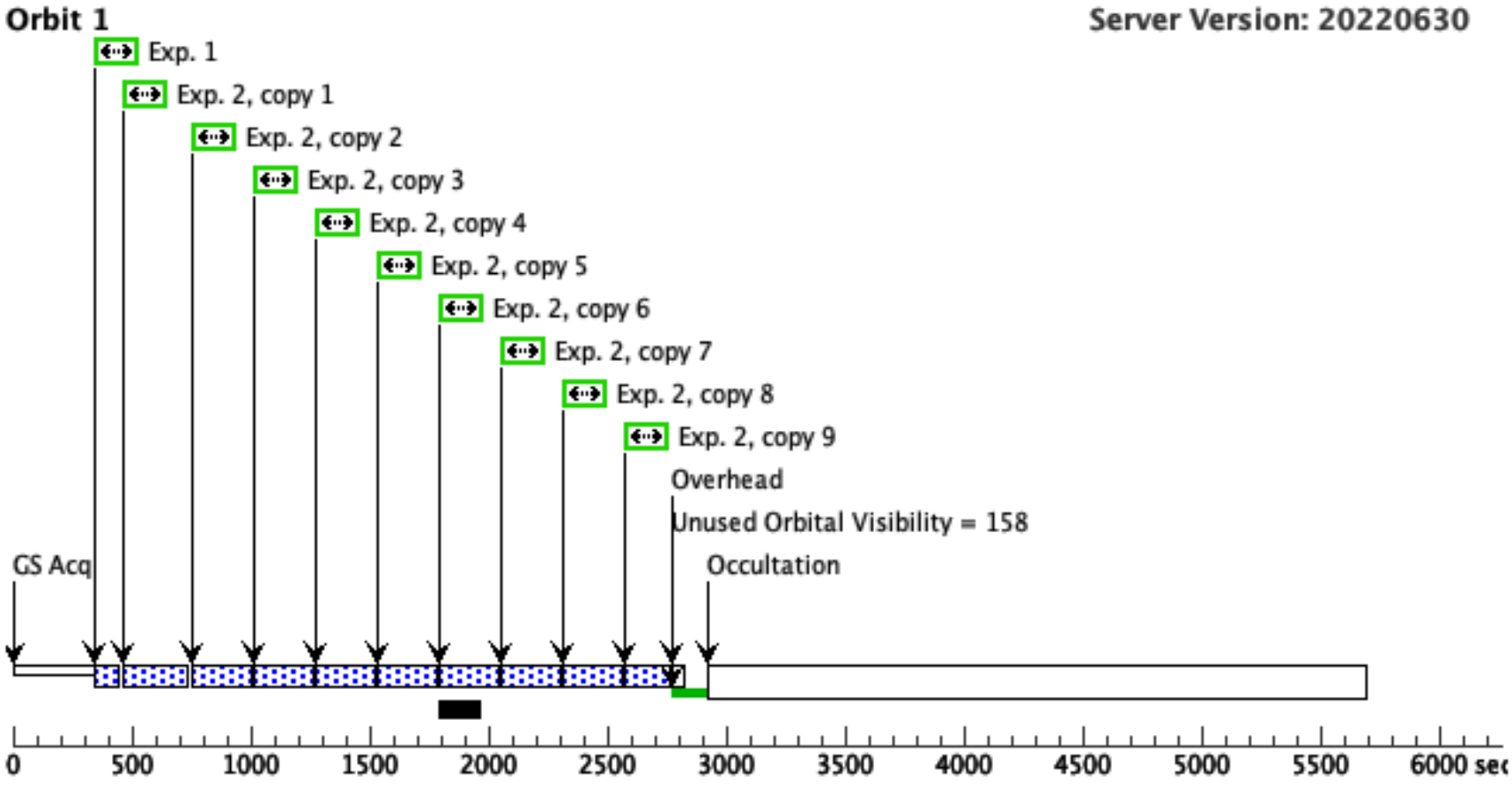
SIZEAXIS1=2250 and SIZEAXIS2=590 are used to minimize data volume, while CENTERAXIS1 and CENTERAXIS2 are used to center the subarray readout on the zeroth order of G280 spectrum. These parameters are based upon similar observations obtained successfully in GOs 13574 & 15288 but have been adjusted to better center the zeroth order spectrum on the sub-array.

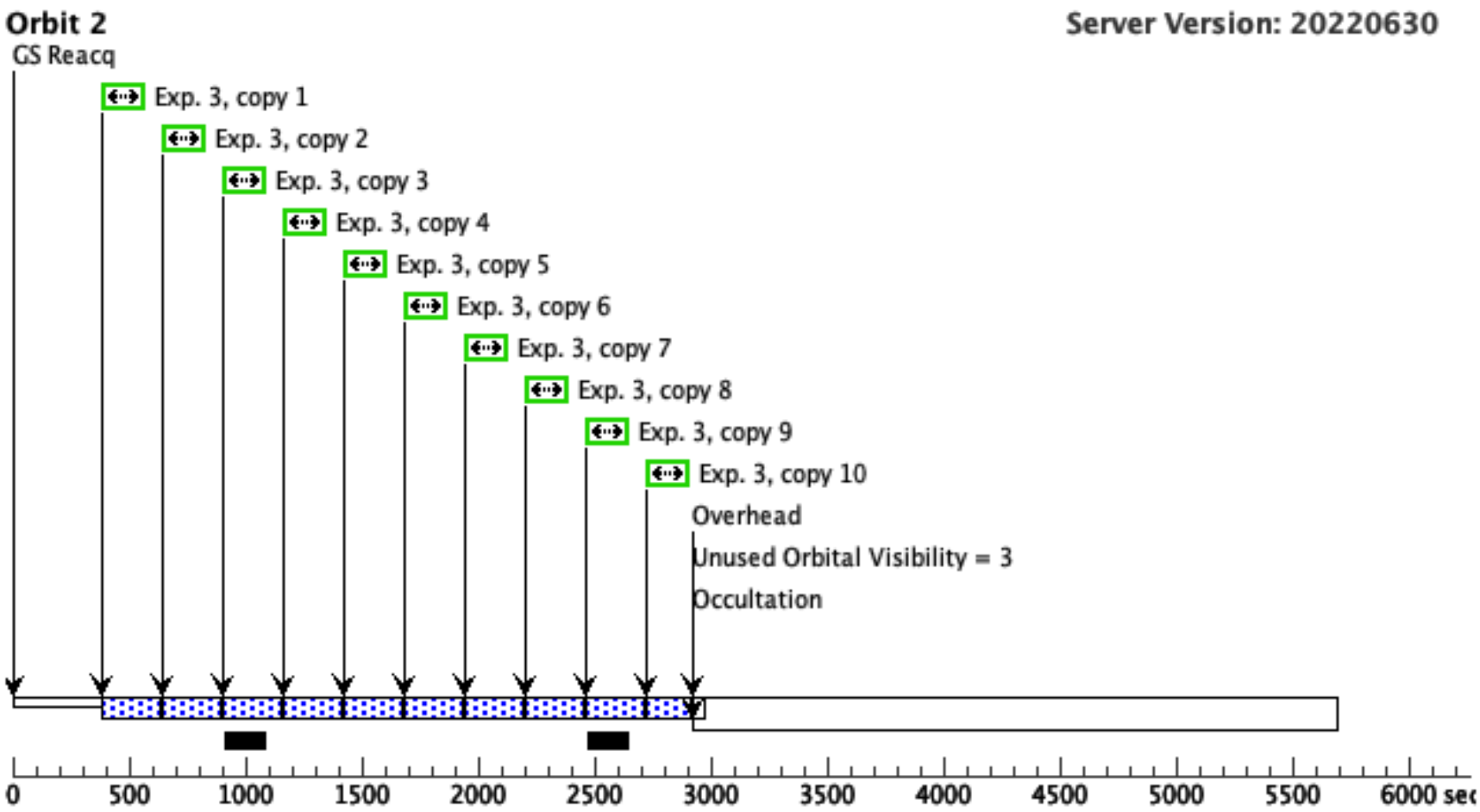
Exposure times of 191 seconds have been chosen to expose the region of interest (0.2 to 0.7 microns) to ~2/3 well depth. The ETC predicts that the star will saturate over four or five pixels of the spectra near 0.74 microns. As linearity for photometry holds to levels better than 1% generally for UVIS2 to well beyond saturation, we will simply sum over the few pixels that have been bled into as a result of over-saturation, as recommended in ISR-WFC3-2010-10. These longer integration times are prefereable over shorter exposure times, as the overall duty cycle and final SNR levels are higher.

6	Bias	BIAS	WFC3/UVIS, ACCUM, UVIS	DEF	SIZEAXIS2=590; SIZEAXIS1=2250; CENTERAXIS1=2136; CENTERAXIS2=1216		Sequence 5-6 Non-In t in LTT1445A WFC 3/UVIS G280 Visit 55-58 (59)	0.0 Secs X 4 (0 Secs)	*[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]*	***[4]***

Comments: We set up the bias frames based on previously sucessful program 11934 and are using the same Aperture and subarray size and position as the observations for direct calibration.

Orbit Structure

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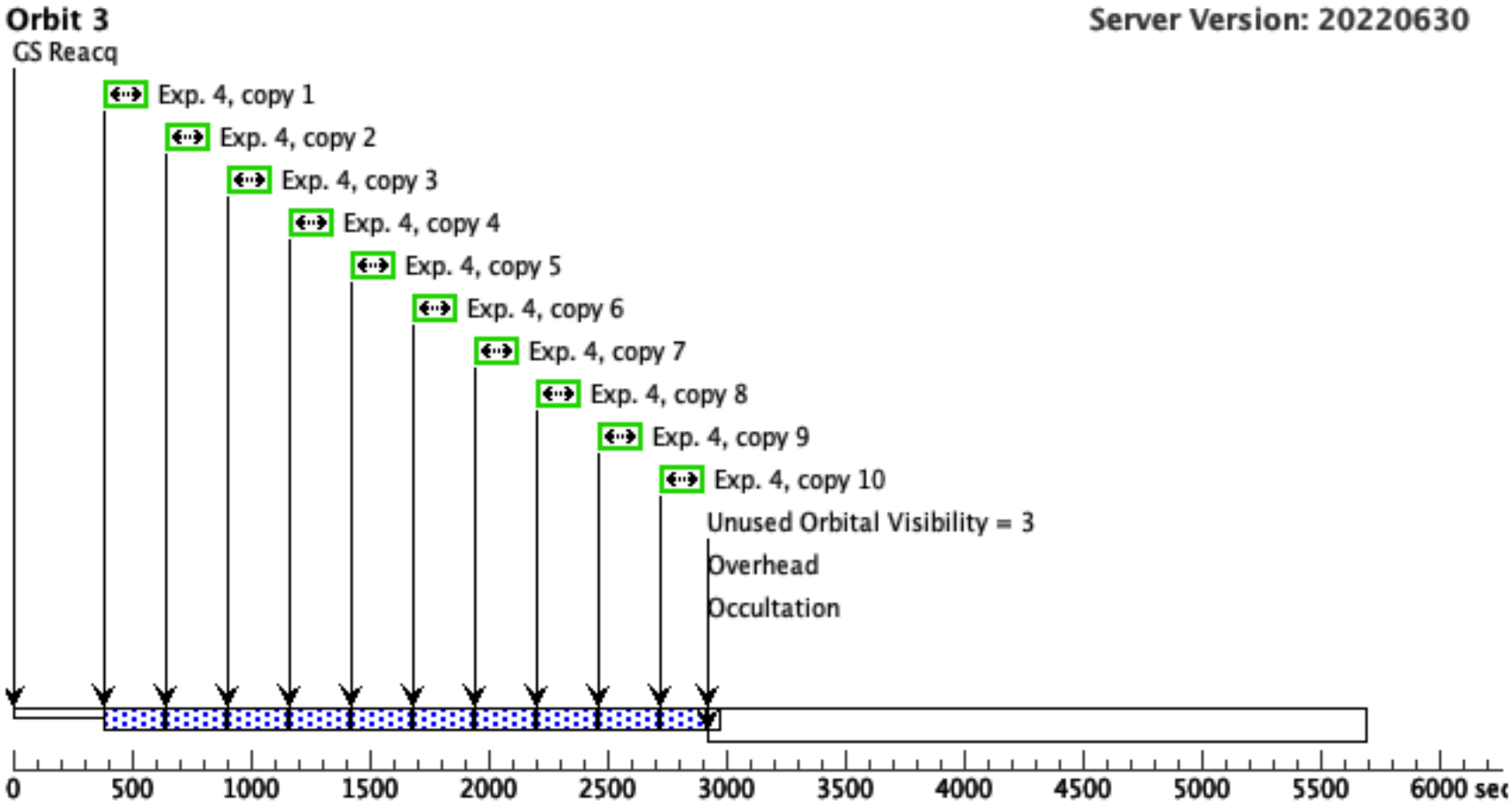
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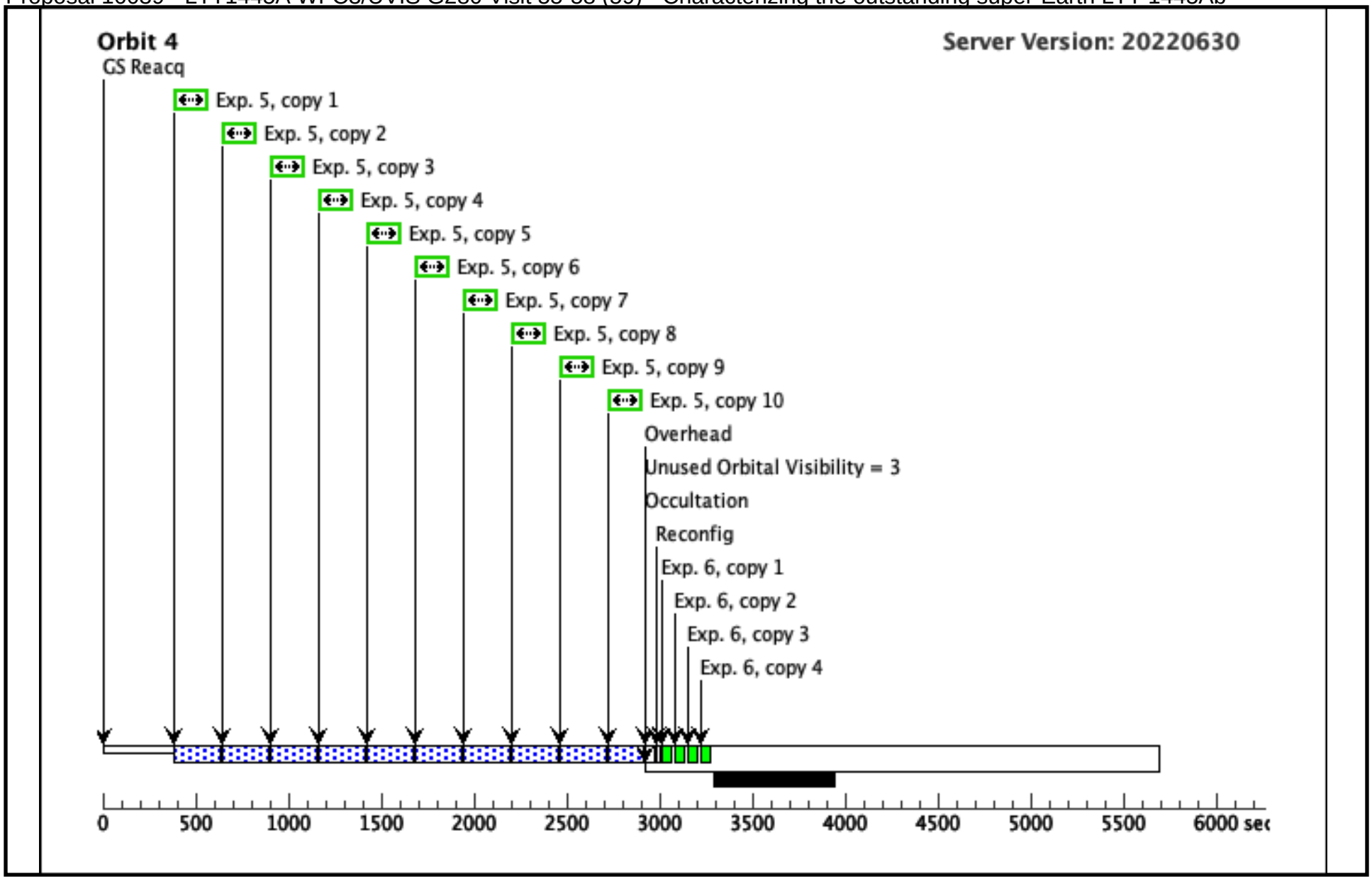
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