17191 - Tripling the sample of late-time Type Ia supernovae

Cycle: 30, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
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Dr. Yi Yang (CoI)	University of California - Berkeley

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SN2021J	WFC3/UVIS	1	14-Aug-2023 16:00:37.0	yes
02	(1) SN2021J	WFC3/UVIS	1	14-Aug-2023 16:00:38.0	yes
28	(1) SN2021J	WFC3/UVIS	1	14-Aug-2023 16:00:38.0	yes
03	(1) SN2021J	WFC3/UVIS	1	14-Aug-2023 16:00:39.0	yes
04	(2) SN2021HIZ	WFC3/UVIS	1	14-Aug-2023 16:00:39.0	yes
05	(2) SN2021HIZ	WFC3/UVIS	1	14-Aug-2023 16:00:40.0	yes
06	(3) SN2021HPR	WFC3/UVIS	1	14-Aug-2023 16:00:41.0	yes
07	(3) SN2021HPR	WFC3/UVIS	1	14-Aug-2023 16:00:41.0	yes
08	(3) SN2021HPR	WFC3/UVIS	1	14-Aug-2023 16:00:42.0	yes
09	(4) SN2021JAD	WFC3/UVIS	1	14-Aug-2023 16:00:42.0	yes
10	(4) SN2021JAD	WFC3/UVIS	1	14-Aug-2023 16:00:43.0	yes
11	(4) SN2021JAD	WFC3/UVIS	1	14-Aug-2023 16:00:43.0	yes
12	(5) SN2021PFS	WFC3/UVIS	1	14-Aug-2023 16:00:44.0	yes
13	(5) SN2021PFS	WFC3/UVIS	1	14-Aug-2023 16:00:44.0	yes
14	(6) SN2021PIT	WFC3/UVIS	1	14-Aug-2023 16:00:45.0	yes
15	(6) SN2021PIT	WFC3/UVIS	1	14-Aug-2023 16:00:45.0	yes
16	(7) SN2021RHU	WFC3/UVIS	1	14-Aug-2023 16:00:46.0	yes
17	(7) SN2021RHU	WFC3/UVIS	1	14-Aug-2023 16:00:47.0	yes
18	(7) SN2021RHU	WFC3/UVIS	1	14-Aug-2023 16:00:47.0	yes
19	(8) SN2021SMJ	WFC3/UVIS	1	14-Aug-2023 16:00:48.0	yes
20	(8) SN2021SMJ	WFC3/UVIS	1	14-Aug-2023 16:00:48.0	yes
21	(9) SN2021TKM	WFC3/UVIS	1	14-Aug-2023 16:00:49.0	yes
22	(9) SN2021TKM	WFC3/UVIS	1	14-Aug-2023 16:00:49.0	yes
23	(9) SN2021TKM	WFC3/UVIS	1	14-Aug-2023 16:00:50.0	yes
24	(10) SN2021WUF	WFC3/UVIS	1	14-Aug-2023 16:00:50.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
29	(10) SN2021WUF	WFC3/UVIS	1	14-Aug-2023 16:00:51.0	yes
25	(10) SN2021WUF	WFC3/UVIS	1	14-Aug-2023 16:00:51.0	yes
30	(10) SN2021WUF	WFC3/UVIS	1	14-Aug-2023 16:00:52.0	yes
26	(11) SN2021XJU	WFC3/UVIS	1	14-Aug-2023 16:00:52.0	yes
27	(12) SN2021AEFX	WFC3/UVIS	1	14-Aug-2023 16:00:53.0	yes

30 Total Orbits Used

ABSTRACT

Type Ia supernovae (SNe Ia) have long been used as standard candles to measure extragalactic distances and cosmological parameters. SNe Ia are portrayed as a homogeneous class, but there are actually several subtypes. Even the "normal" SNe Ia used for cosmology may not be homogeneous. Recently, the optical light curves of SNe Ia have been shown to slow down, relative to their earlier decline rate, at >800 days after explosion. Moreover, more luminous SNe Ia may slow down faster than less luminous objects. This correlation, which recalls the peak-light stretch-luminosity relation used to standardize SNe Ia, also hints at the existence of several production channels for normal SNe Ia, as no single explosion model can produce the full range of late-time light curves. But this new correlation is based on just 6 objects. We ask for 67 WFC3/UVIS orbits (with the F438W, F555W, and F814W filters) spread over Cycles 30-32 to observe 12 SNe Ia when they are 600-1200 days old. By tripling the sample of late-time SNe Ia, we will prove the existence of the new stretch-luminosity correlation at a significance of >5-sigma. The impact on SN cosmology will be twofold. First, a new stretch-luminosity correlation could further standardize SNe Ia and reduce systematic uncertainties. Second, strong evidence for the existence of multiple production channels for normal SNe Ia would force cosmologists to revisit their use of SNe Ia as a monolithic class. This experiment is time critical. Every year, on average, <5 SNe Ia can be used for this experiment. We are lucky to have 12 targets to work with this year; this chance may not come again during HST's remaining lifetime.

OBSERVING DESCRIPTION

In this program, we will observe the late-time decline of 12 Type Ia supernovae at late times (600 < t < 1200 days after explosion). Each target will be visited at least 5 times. Some targets will be visited a 6th time, long after they have faded below the detection limit of our observations, to obtain template images for subtractions. Each visit will be 1 orbit long and will always include the F555W filter. The first two visits, while the targets are brightest, will also include the F438W and F625W filters, respectively. We will continue to use these additional filters in subsequent visits so long as

the targets are bright enough. We will download and reduce the data for each visit immediately after they are taken to determine whether the targets are still bright enough or whether we need to drop the additional filters and devote the next orbits wholly to F555W. The cadence of our observations (100-150) days is long enough that we will have enough time to alter our phase II proposal in time for the next set of observations for any specific target.

To ensure high-quality images for PSF-fitting photometry, we will use the WFC3-UVIS-3PT-LINE dither pattern. This means that, to fit in two filters, we will sometimes need to use a smaller field-of-view. Hence, we alternate between a full UVIS field of view (using UVIS, UVIS1 or UVIS2 to cover as much of the host galaxy as possible, depending on the target) and the UVIS2-C1K1C-SUB aperture. Once a given filter has been imaged once with the full aperture, we switch to the smaller one. F555W is an exception, as future visits will be devoted wholly to it, at which point we will switch from the smaller aperture to a full one.

The timing of our observations is important, as we want to catch our targets at specific phases. To that end, we use BETWEEN timing constraints for each visit. Where possible, we use a ~10-day window for schduleability.

This is a multi-cycle proposal, with 29 orbits in the first cycle, 29 in the second, and 9 in the last.

Visit

Proposal 17191, SN 2021J - 660 days (01), completed Mon Aug 14 20:00:53 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 02-NOV-2022:00:00:00 AND 12-NOV-2022:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

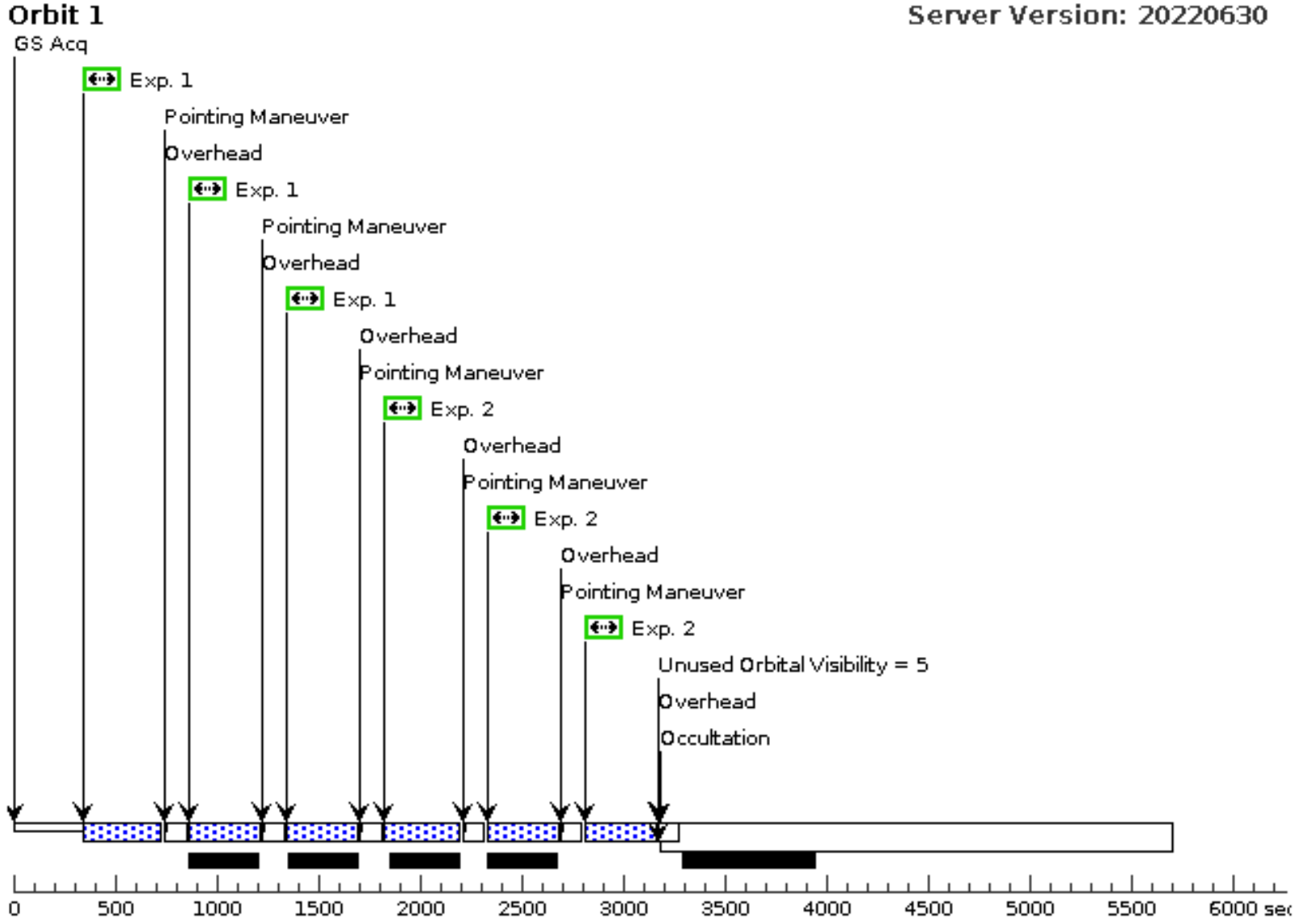
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN2021J	RA: 12 26 27.0100 (186.6125417d) Dec: +31 13 20.57 (31.22238d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SN2021J	WFC3/UVIS, ACCUM, UVIS	F555W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021J - 660 days (01) (1)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***
2		(1) SN2021J	WFC3/UVIS, ACCUM, UVIS	F438W	FLASH=14		Pattern 1, Exps 2-2 in SN 2021J - 660 days (01) (1)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021J - 810 days (02), failed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 05-APR-2023:00:00:00 AND 12-APR-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

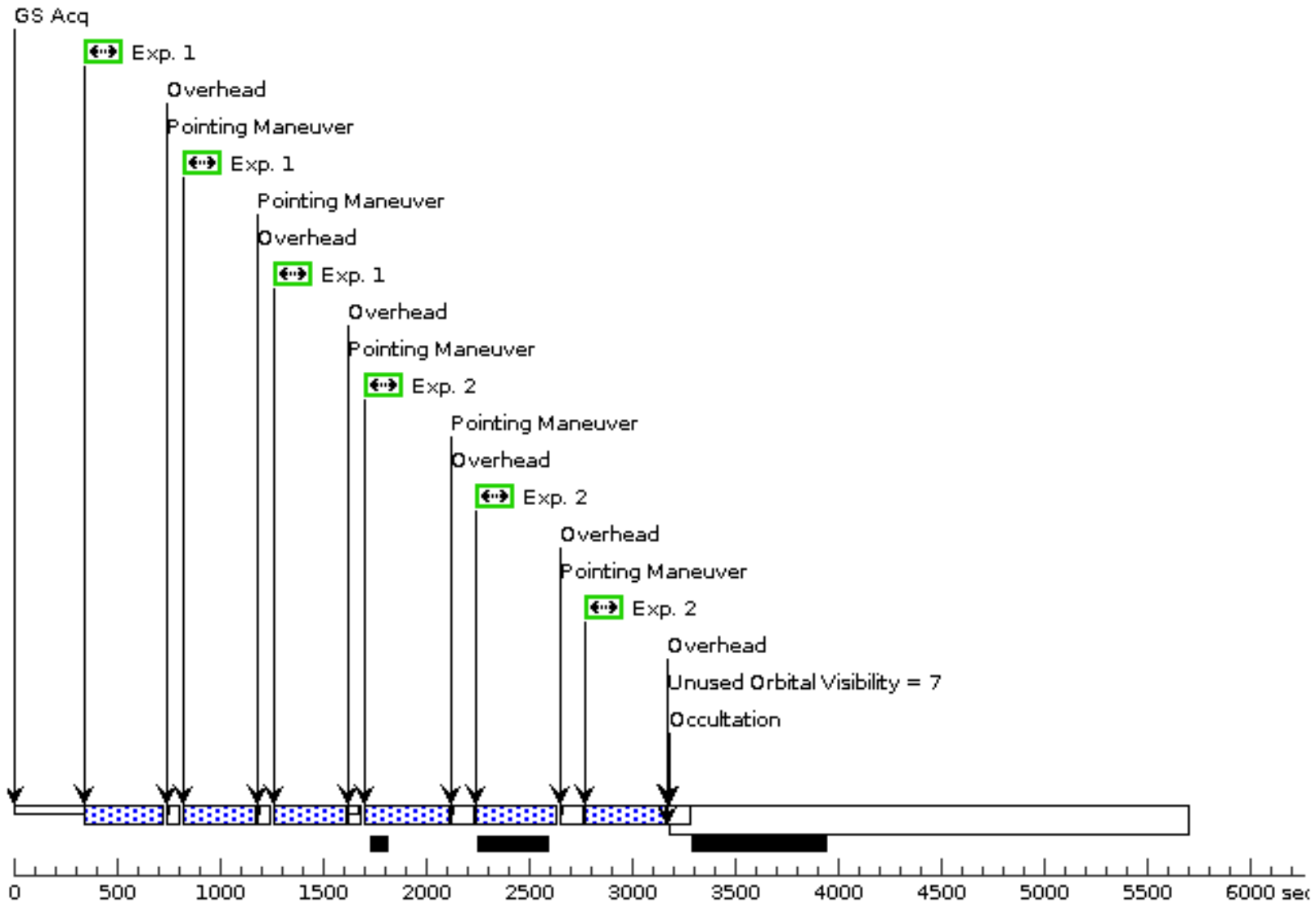
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN2021J	RA: 12 26 27.0100 (186.6125417d) Dec: +31 13 20.57 (31.22238d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SN2021J	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021J - 810 days (02) (1)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***
2		(1) SN2021J	WFC3/UVIS, ACCUM, UVIS	F625W	FLASH=6		Pattern 1, Exps 2-2 in SN 2021J - 810 days (02) (1)	390 Secs (1170 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021J - 810 days - redo (28), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 12-MAY-2023:00:00:00 AND 21-MAY-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

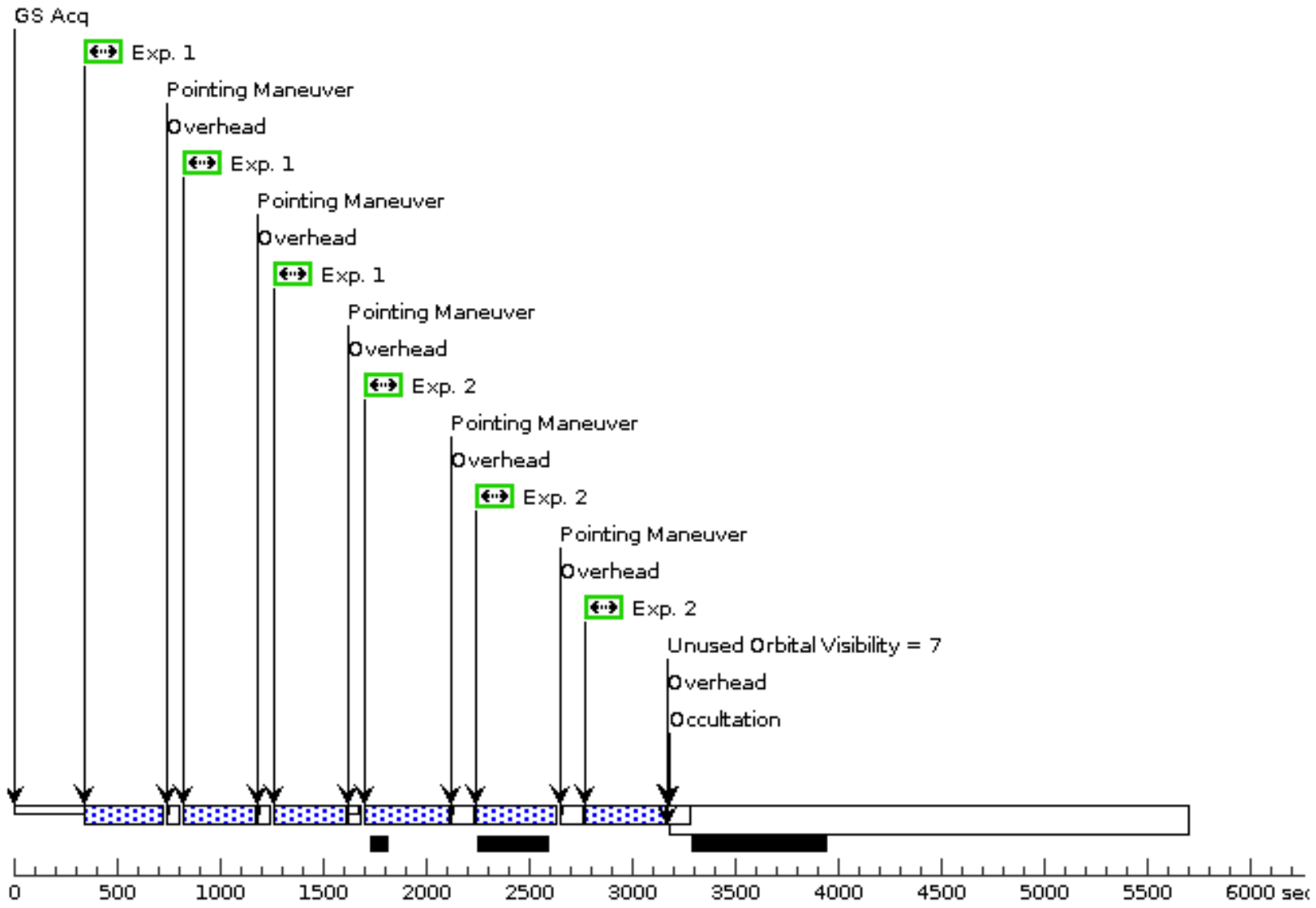
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN2021J	RA: 12 26 27.0100 (186.6125417d) Dec: +31 13 20.57 (31.22238d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SN2021J	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021J - 810 days - redo (28) (1)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(1) SN2021J	WFC3/UVIS, ACCUM, UVIS	F625W	FLASH=6		Pattern 1, Exps 2-2 in SN 2021J - 810 days - redo (28) (1)	390 Secs (1170 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021J - 915 days (03), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 18-JUL-2023:00:00:00 AND 28-JUL-2023:00:00:00

Comments: We may drop the F438W filter if, based on the first two visits, we decide the target is too faint. If that is the case, the cadence of 100-150 days between each visit is long enough to resubmit the phase II plan in time for the next visit.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

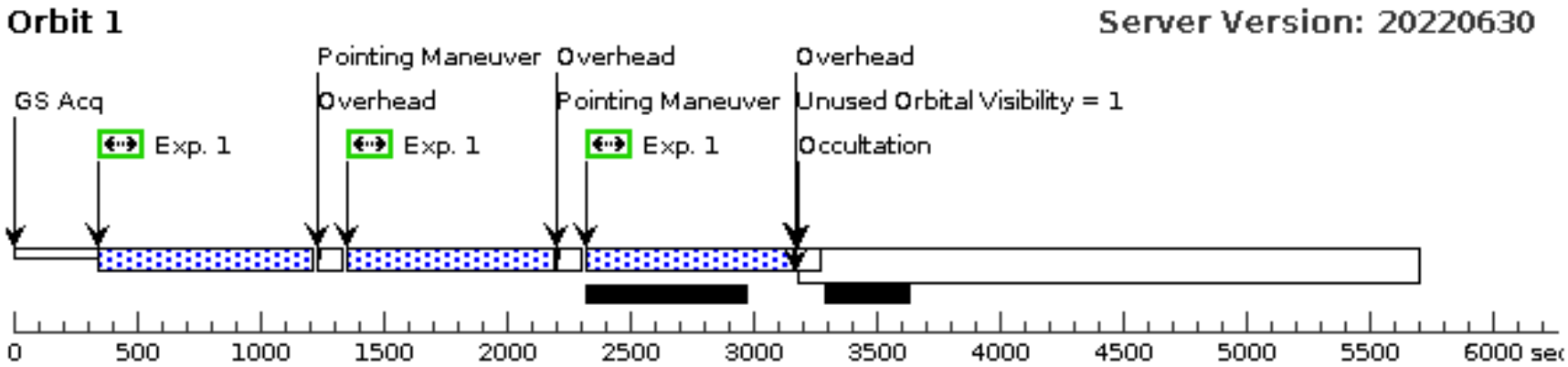
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN2021J	RA: 12 26 27.0100 (186.6125417d) Dec: +31 13 20.57 (31.22238d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SN2021J	WFC3/UVIS, ACCUM, UVIS2	F555W			Pattern 1, Exps 1-1 in SN 2021J - 915 days (03) (1)	844 Secs (2532 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021hiz - 615 days (04), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 22-DEC-2022:00:00:00 AND 28-DEC-2022:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

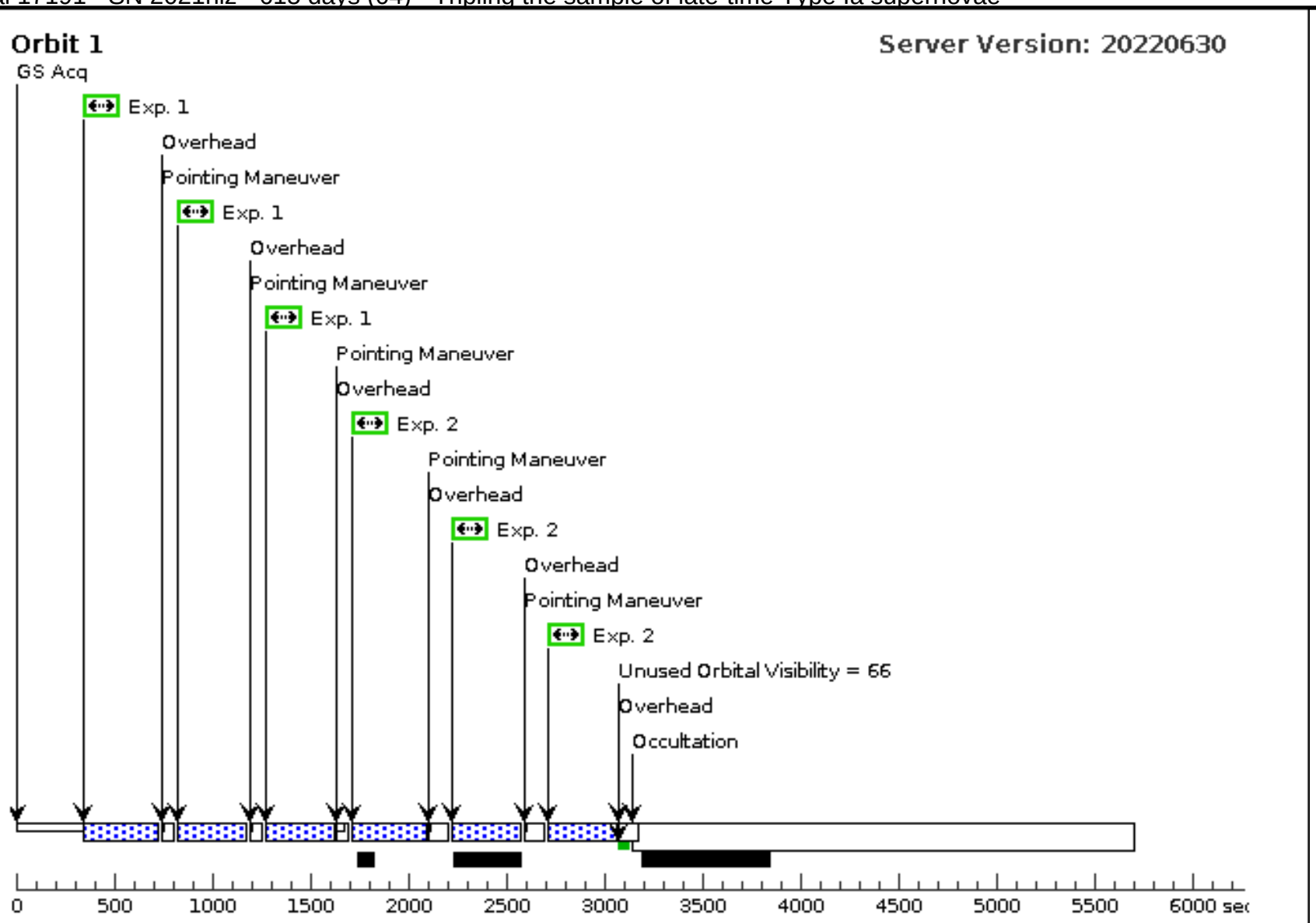
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SN2021HIZ	RA: 12 25 41.6800 (186.4236667d) Dec: +07 13 42.20 (7.22839d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) SN2021HIZ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021hiz - 615 days (04) (1)	355 Secs (1065 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(2) SN2021HIZ	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=14		Pattern 1, Exps 2-2 in SN 2021hiz - 615 days (04) (1)	355 Secs (1065 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021hiz - 750 days (05), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 05-MAY-2023:00:00:00 AND 15-MAY-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

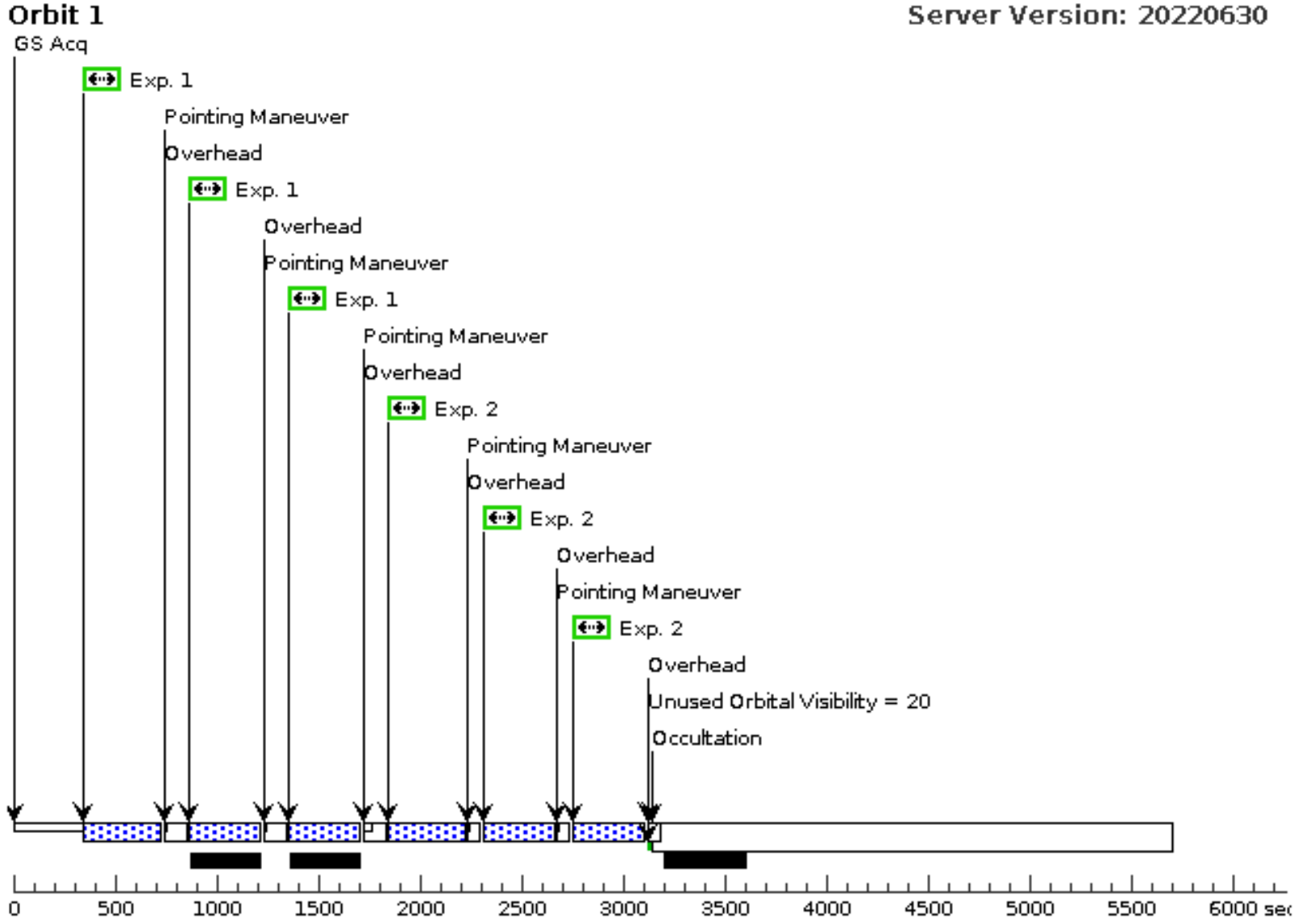
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	SN2021HIZ	RA: 12 25 41.6800 (186.4236667d) Dec: +07 13 42.20 (7.22839d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) SN2021HIZ	WFC3/UVIS, ACCUM, UVIS2	F625W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021hiz - 750 days (05) (1)	355 Secs (1065 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(2) SN2021HIZ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021hiz - 750 days (05) (1)	355 Secs (1065 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021hpr - 580 days (06), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 14-NOV-2022:00:00:00 AND 24-NOV-2022:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

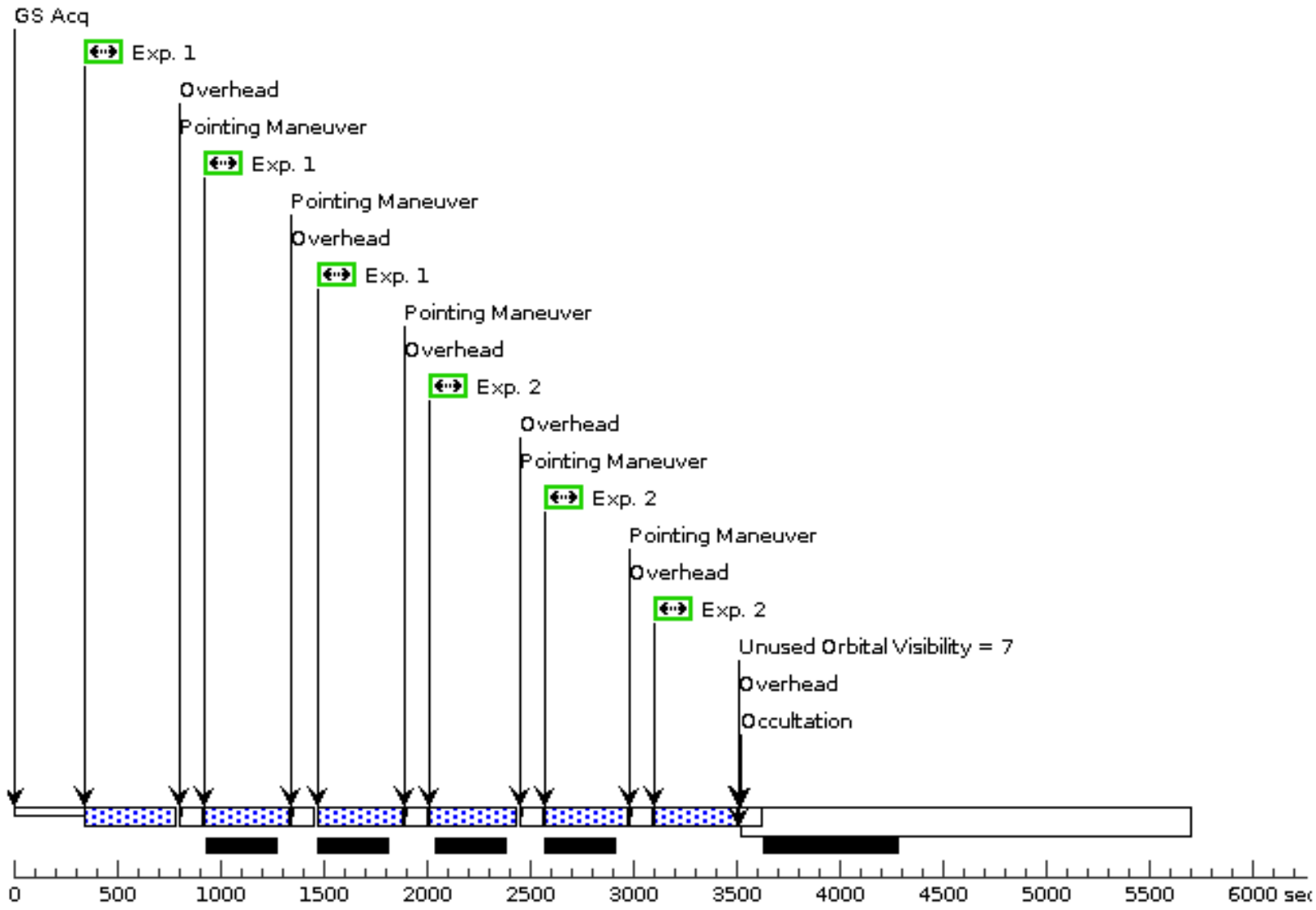
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SN2021HPR	RA: 10 16 38.6800 (154.1611667d) Dec: +73 24 1.80 (73.40050d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) SN2021HPR	WFC3/UVIS, ACCUM, UVIS1	F438W	FLASH=13		Pattern 1, Exps 1-1 in SN 2021hpr - 580 days (06) (1)	410 Secs (1230 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(3) SN2021HPR	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=6		Pattern 1, Exps 2-2 in SN 2021hpr - 580 days (06) (1)	400 Secs (1200 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021hpr - 730 days (07), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 12-APR-2023:00:00:00 AND 21-APR-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

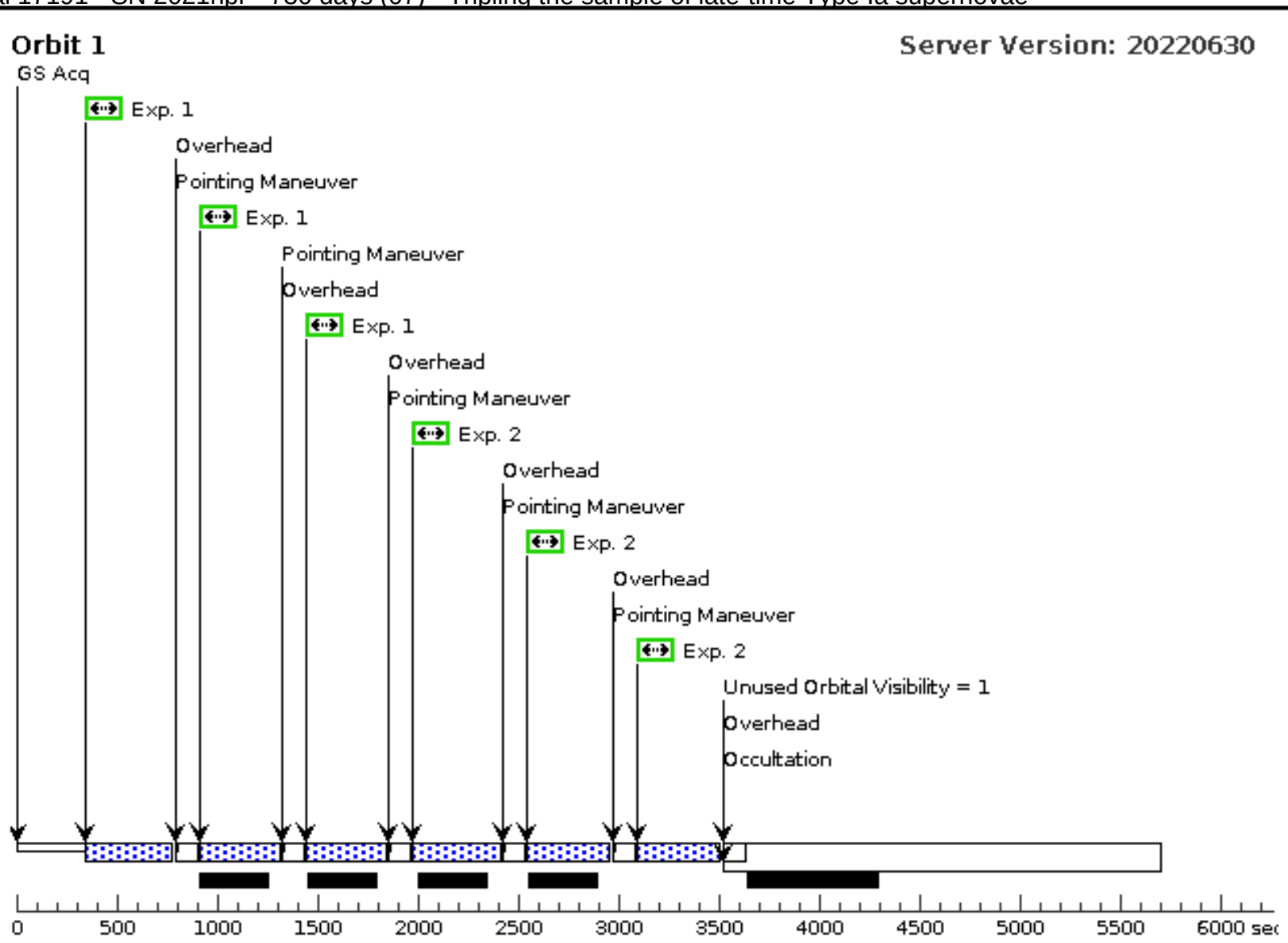
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SN2021HPR	RA: 10 16 38.6800 (154.1611667d) Dec: +73 24 1.80 (73.40050d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) SN2021HPR	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=6		Pattern 1, Exps 1-1 in SN 2021hpr - 730 days (07) (1)	400 Secs (1200 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(3) SN2021HPR	WFC3/UVIS, ACCUM, UVIS1	F625W	FLASH=6		Pattern 1, Exps 2-2 in SN 2021hpr - 730 days (07) (1)	415 Secs (1245 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021hpr - 860 days (08), scheduled Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 19-AUG-2023:00:00:00 AND 28-AUG-2023:00:00:00

Comments: We may drop the F438W filter if, based on the first two visits, we decide the target is too faint. If that is the case, the cadence of 100-150 days between each visit is long enough to resubmit the phase II plan in time for the next visit.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

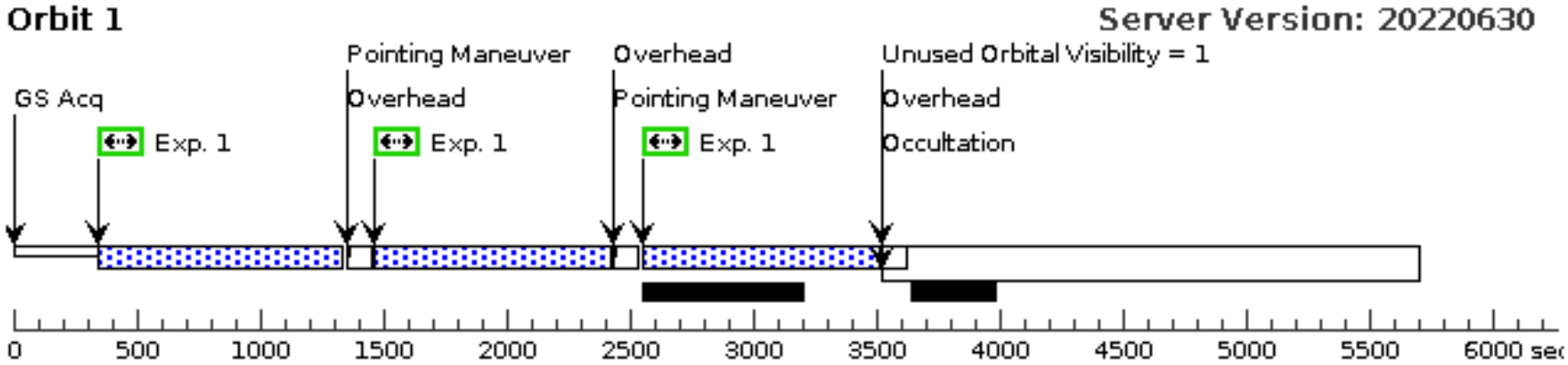
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	SN2021HPR	RA: 10 16 38.6800 (154.1611667d) Dec: +73 24 1.80 (73.40050d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) SN2021HPR	WFC3/UVIS, ACCUM, UVIS1	F555W			Pattern 1, Exps 1-1 in SN 2021hpr - 860 days (08) (1)	959 Secs (2877 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021jad - 600 days (09), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 09-DEC-2022:00:00:00 AND 13-DEC-2022:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

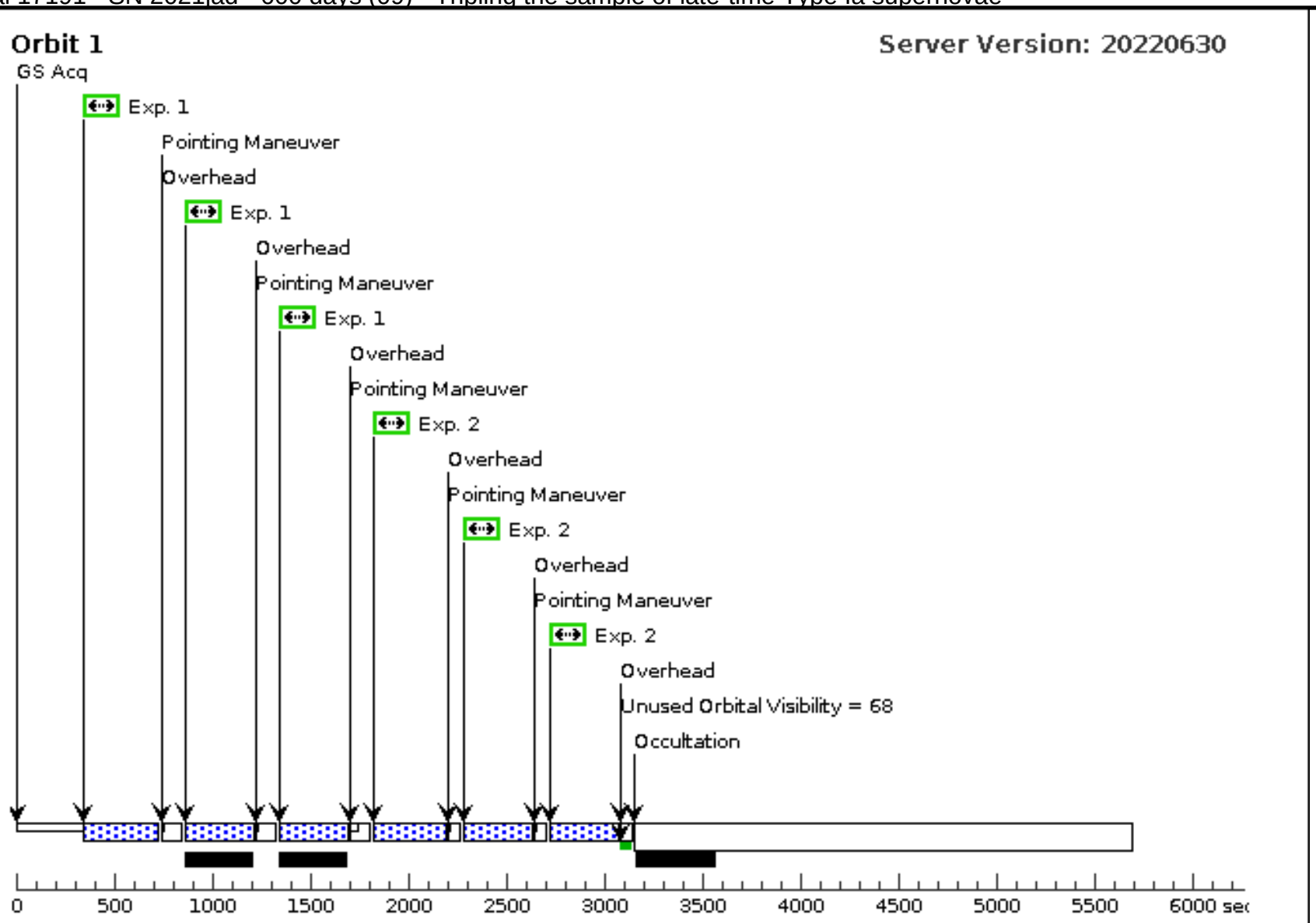
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SN2021JAD	RA: 05 33 22.1800 (83.3424167d) Dec: -21 57 6.50 (-21.95181d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) SN2021JAD	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=14		Pattern 1, Exps 1-1 in SN 2021jad - 600 days (09) (1)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(4) SN2021JAD	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021jad - 600 days (09) (1)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021jad - 750 days (10), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 28-APR-2023:00:00:00 AND 07-MAY-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

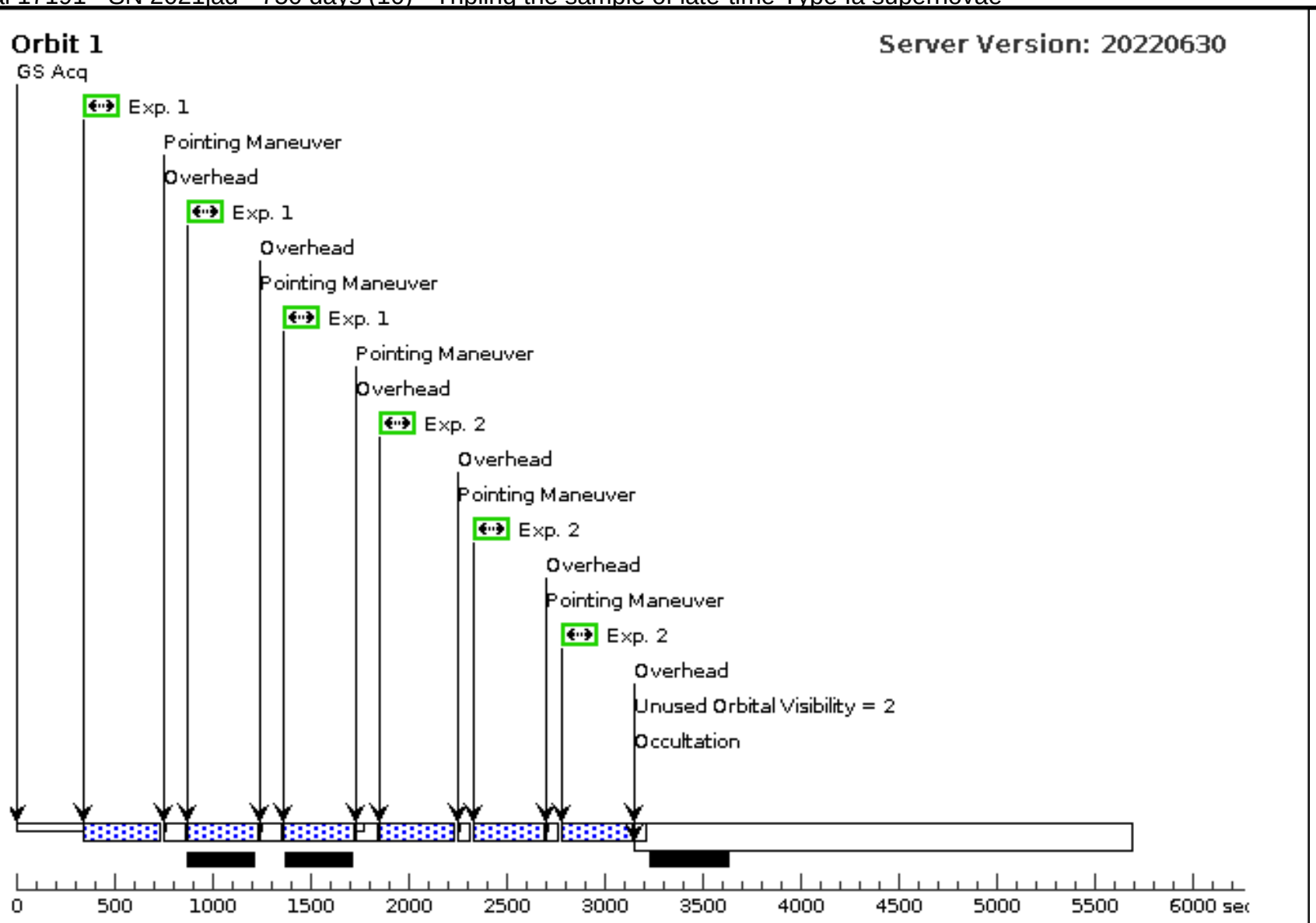
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SN2021JAD	RA: 05 33 22.1800 (83.3424167d) Dec: -21 57 6.50 (-21.95181d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) SN2021JAD	WFC3/UVIS, ACCUM, UVIS2	F625W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021jad - 750 days (10) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(4) SN2021JAD	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021jad - 750 days (10) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021jad - 890 days (11), scheduling Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 20-SEP-2023:00:00:00 AND 30-SEP-2023:00:00:00

Comments: We may drop the F438W filter if, based on the first two visits, we decide the target is too faint. If that is the case, the cadence of 100-150 days between each visit is long enough to resubmit the phase II plan in time for the next visit.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

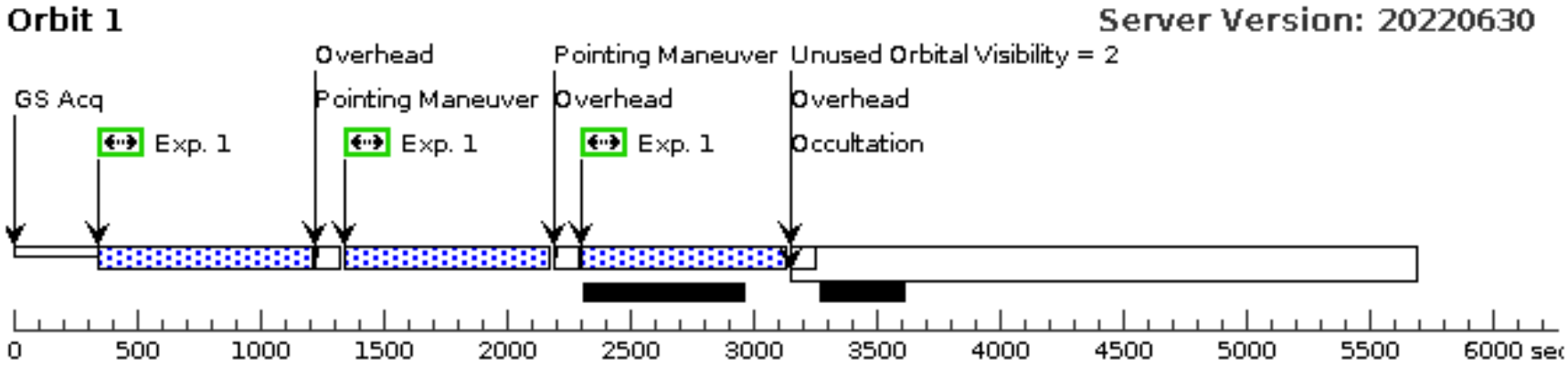
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	SN2021JAD	RA: 05 33 22.1800 (83.3424167d) Dec: -21 57 6.50 (-21.95181d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) SN2021JAD	WFC3/UVIS, ACCUM, UVIS2	F555W			Pattern 1, Exps 1-1 in SN 2021jad - 890 days (11) (1)	848 Secs (2508 Secs) *[==>836.0 Secs (Pattern 1)]* *[==>836.0 Secs (Pattern 2)]* *[==>836.0 Secs (Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021pfs - 600 days (12), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 12-FEB-2023:00:00:00 AND 22-FEB-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

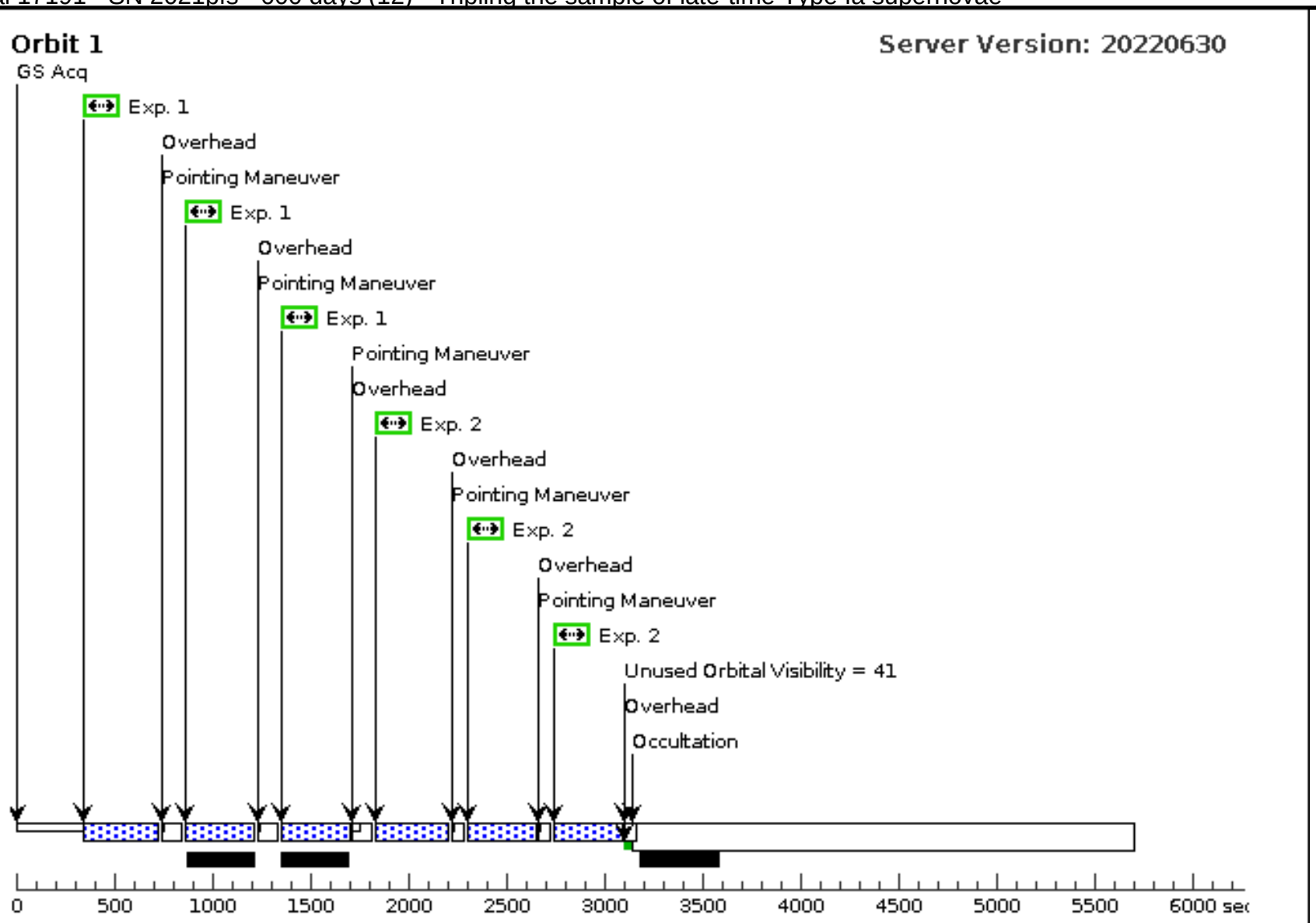
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	SN2021PFS	RA: 14 03 23.5900 (210.8482917d) Dec: -06 01 53.80 (-6.03161d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) SN2021PFS	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=14		Pattern 1, Exps 1-1 in SN 2021pfs - 600 days (12) (1)	355 Secs (1065 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(5) SN2021PFS	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021pfs - 600 days (12) (1)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021pfs - 750 days (13), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 12-JUL-2023:00:00:00 AND 22-JUL-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

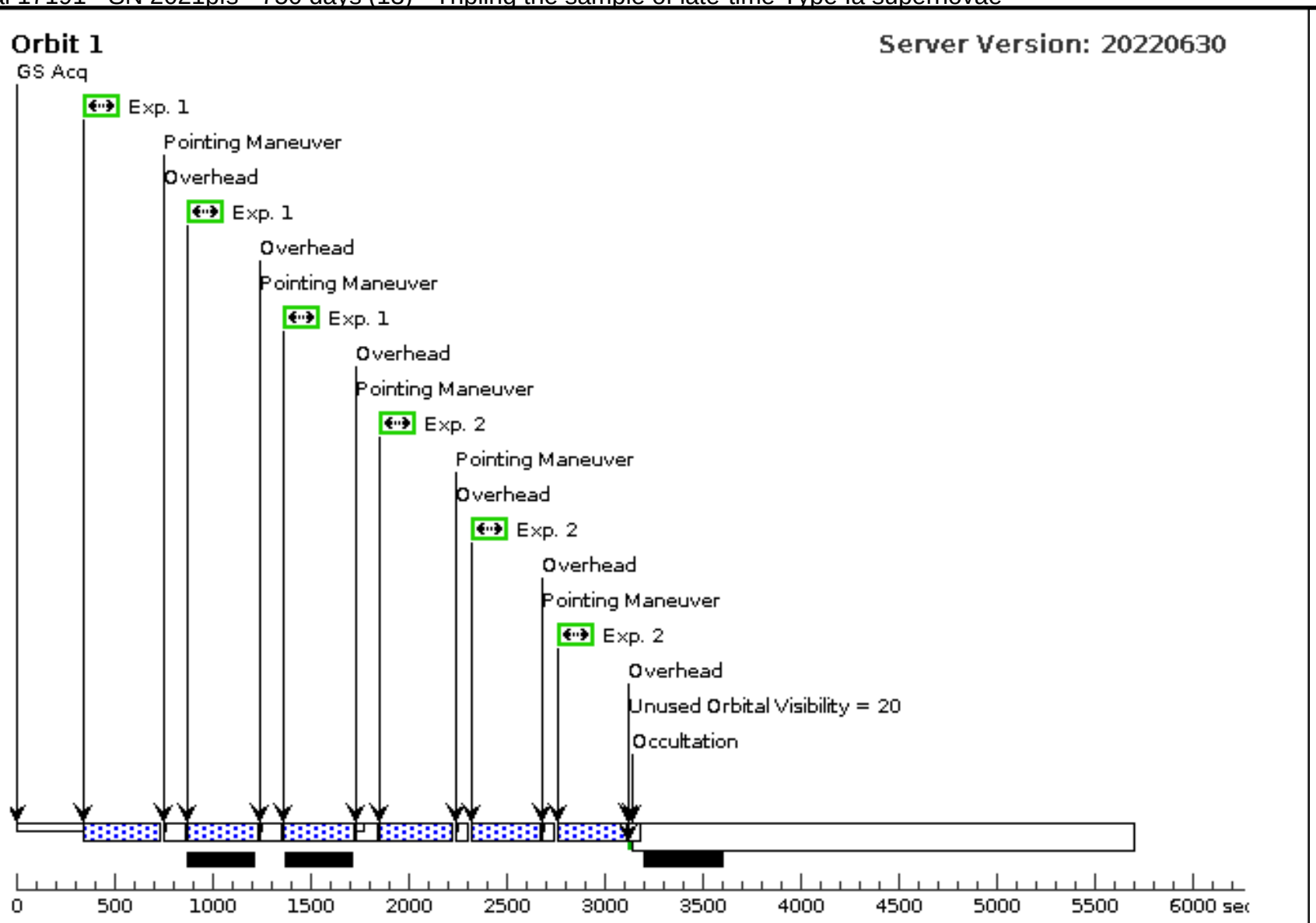
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	SN2021PFS	RA: 14 03 23.5900 (210.8482917d) Dec: -06 01 53.80 (-6.03161d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) SN2021PFS	WFC3/UVIS, ACCUM, UVIS2	F625W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021pfs - 750 days (13) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(5) SN2021PFS	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021pfs - 750 days (13) (1)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021pit - 540 days (14), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 04-DEC-2022:00:00:00 AND 13-DEC-2022:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

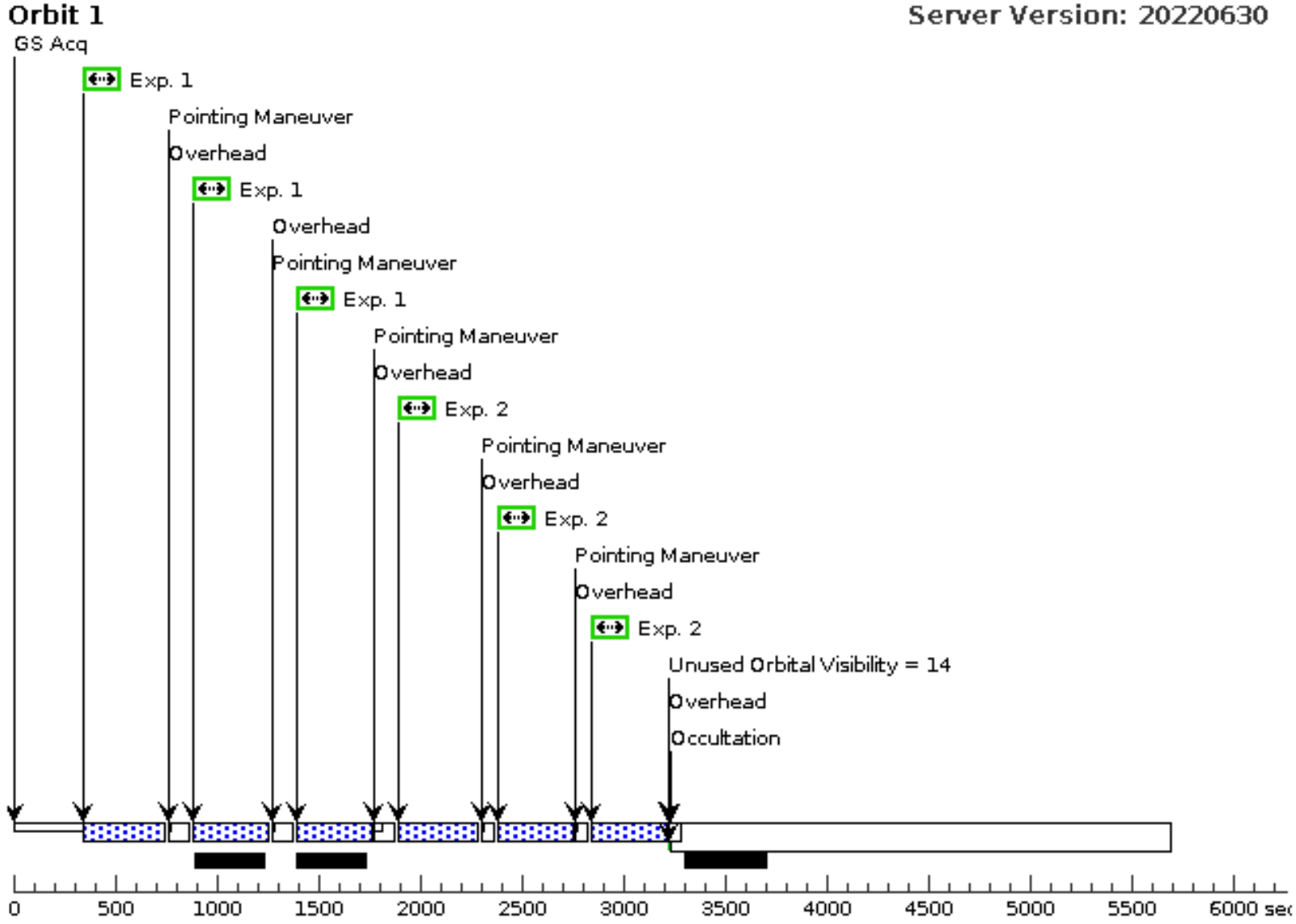
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	SN2021PIT	RA: 03 44 30.1700 (56.1257083d) Dec: -44 37 57.10 (-44.63253d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(6) SN2021PIT	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=14		Pattern 1, Exps 1-1 in SN 2021pit - 540 days (14) (1)	375 Secs (1125 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***
2		(6) SN2021PIT	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021pit - 540 days (14) (1)	370 Secs (1110 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021pit - 765 days (15), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 21-JUL-2023:00:00:00 AND 31-JUL-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

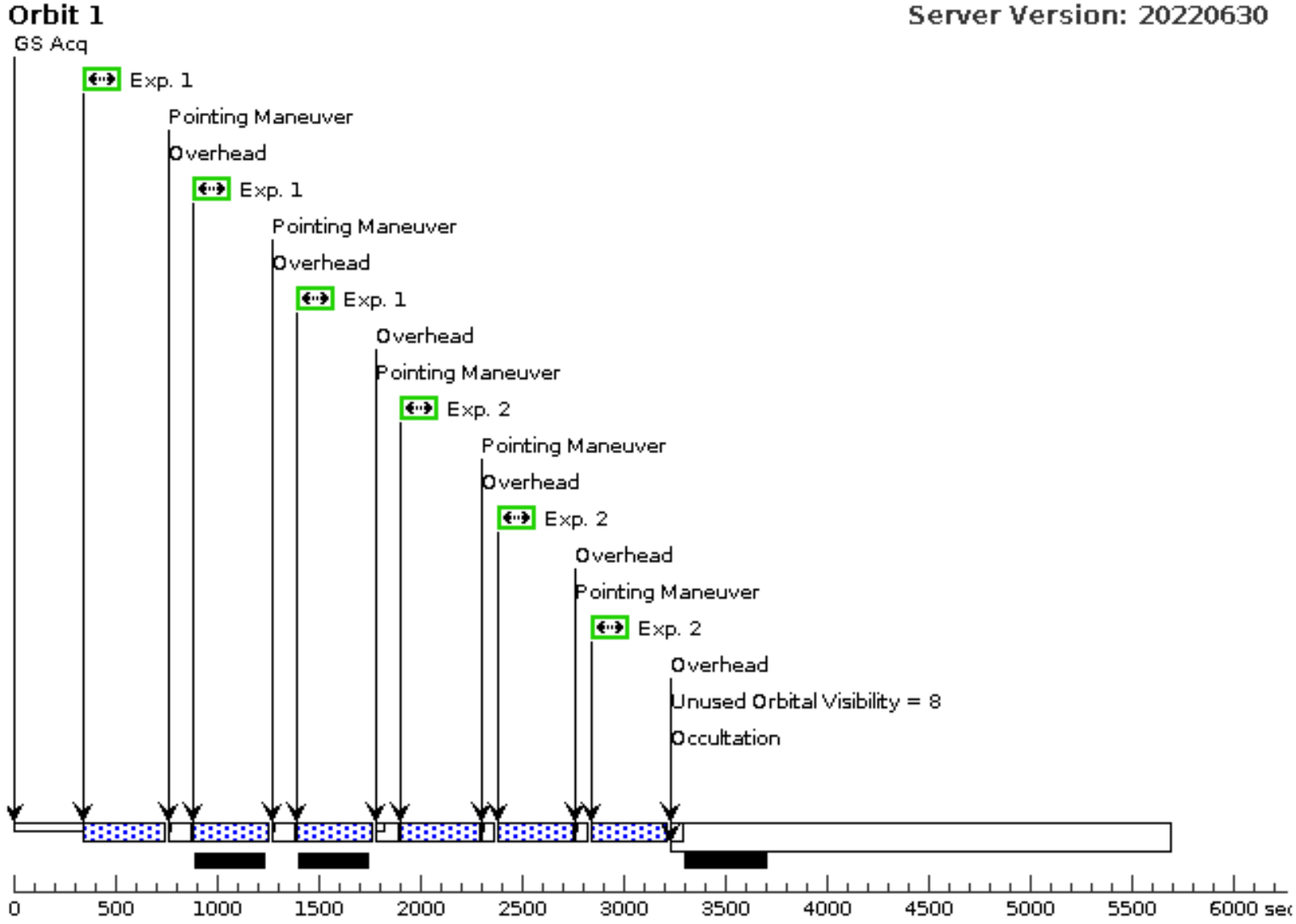
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	SN2021PIT	RA: 03 44 30.1700 (56.1257083d) Dec: -44 37 57.10 (-44.63253d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(6) SN2021PIT	WFC3/UVIS, ACCUM, UVIS2	F625W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021pit - 765 days (15) (1)	375 Secs (1125 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(6) SN2021PIT	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021pit - 765 days (15) (1)	370 Secs (1110 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021rhu - 560 days (16), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 21-JAN-2023:00:00:00 AND 31-JAN-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

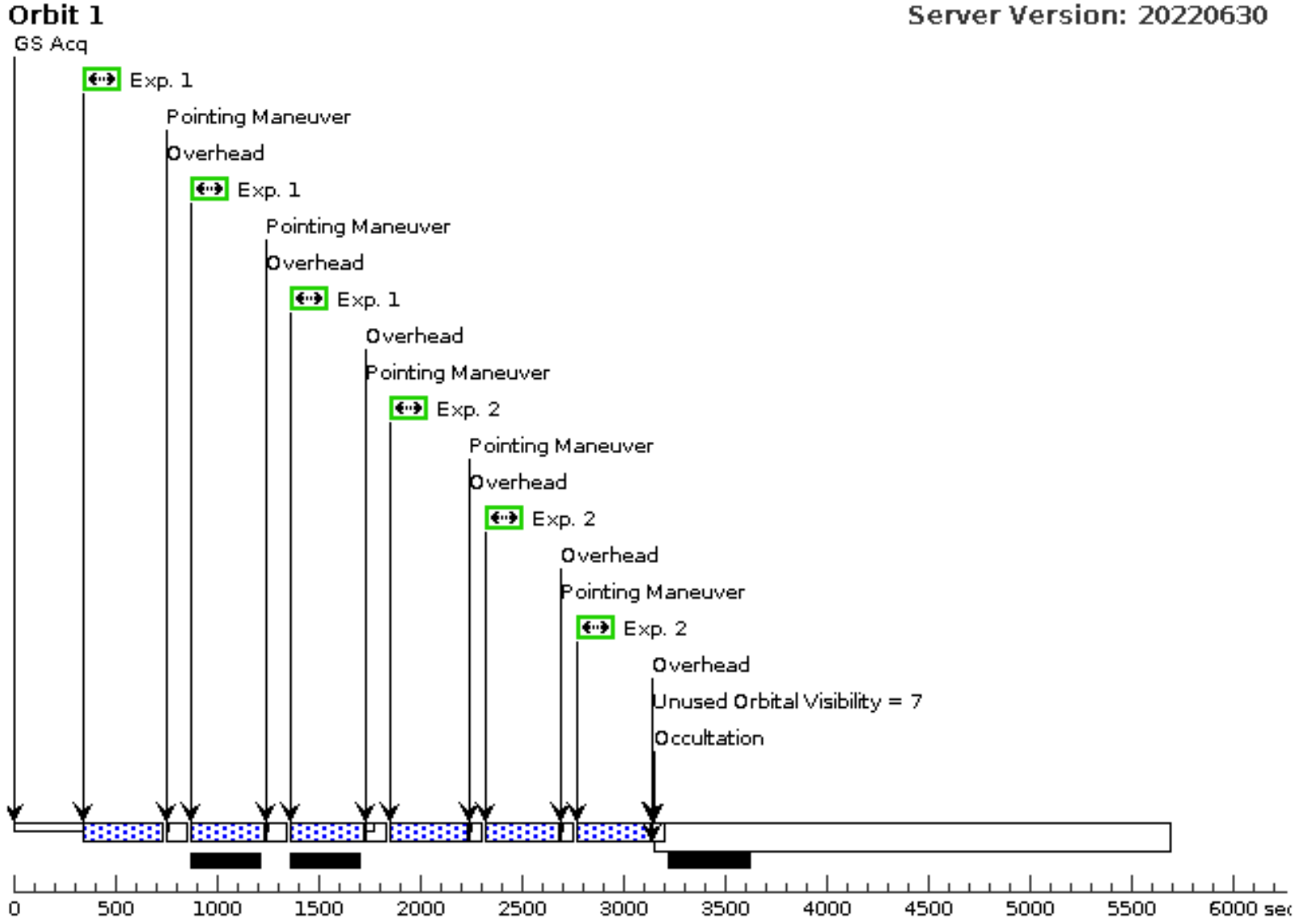
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	SN2021RHU	RA: 00 03 15.4300 (.8142917d) Dec: +16 08 44.50 (16.14569d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(7) SN2021RHU	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=14		Pattern 1, Exps 1-1 in SN 2021rhu - 560 days (16) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(7) SN2021RHU	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021rhu - 560 days (16) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021rhu - 680 days (17), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 22-MAY-2023:00:00:00 AND 31-MAY-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

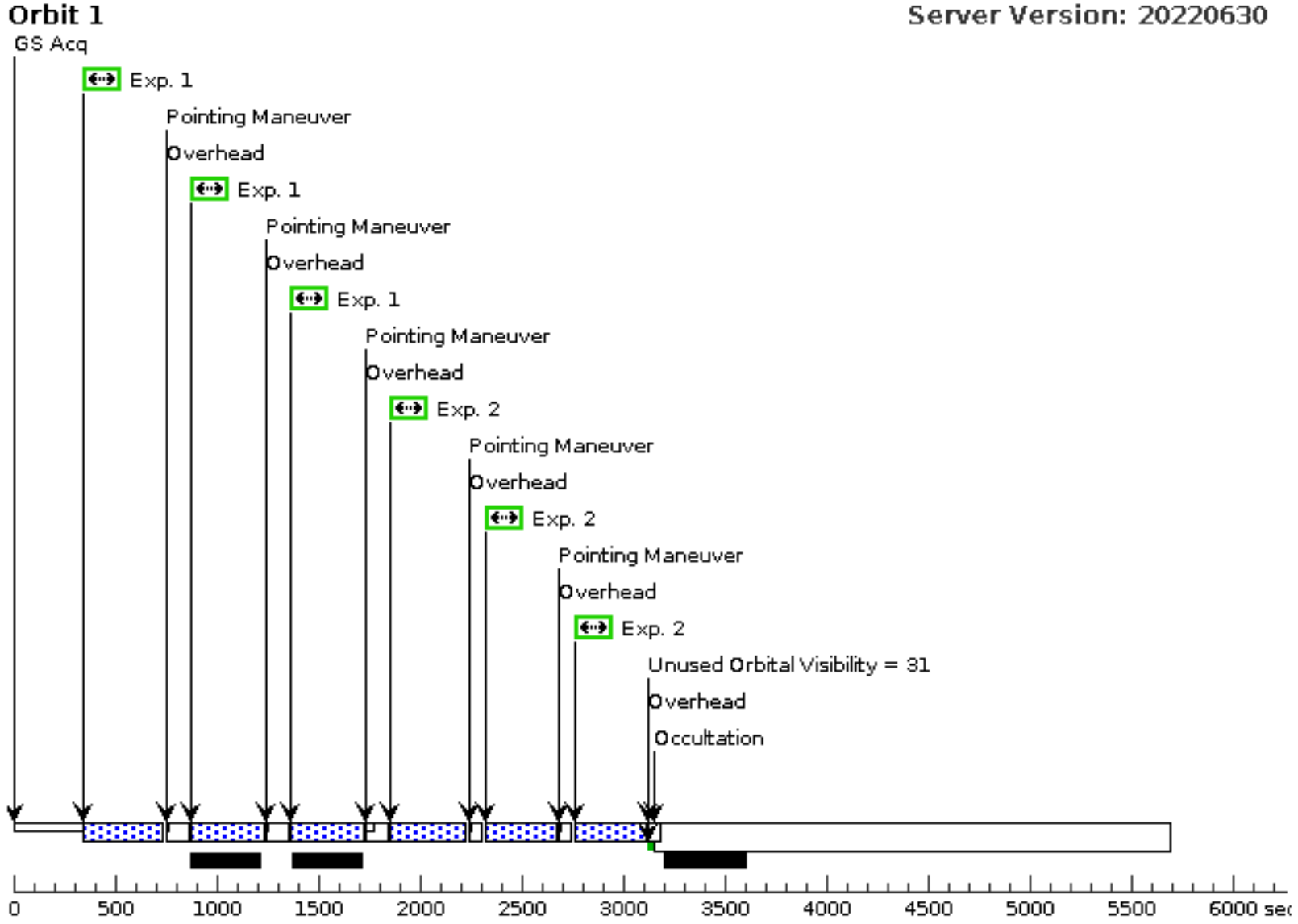
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	SN2021RHU	RA: 00 03 15.4300 (.8142917d) Dec: +16 08 44.50 (16.14569d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(7) SN2021RHU	WFC3/UVIS, ACCUM, UVIS2	F625W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021rhu - 680 days (17) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(7) SN2021RHU	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021rhu - 680 days (17) (1)	350 Secs (1050 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021rhu - 790 days (18), scheduling Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 04-SEP-2023:00:00:00 AND 13-SEP-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

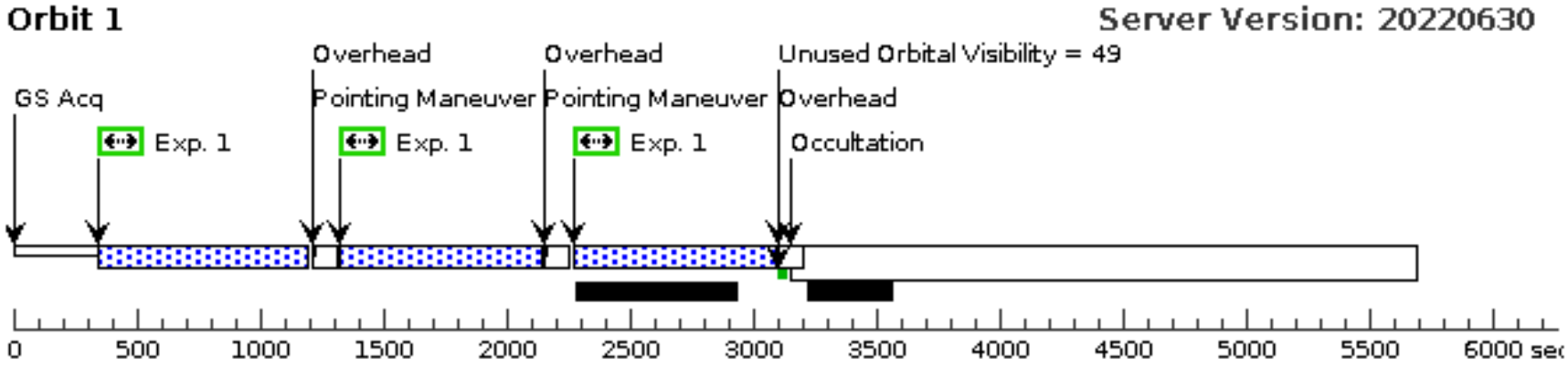
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(7)	SN2021RHU	RA: 00 03 15.4300 (.8142917d) Dec: +16 08 44.50 (16.14569d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(7) SN2021RHU	WFC3/UVIS, ACCUM, UVIS2	F555W			Pattern 1, Exps 1-1 in SN 2021rhu - 790 days (18) (1)	820 Secs (2460 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021smj - 580 days (19), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 23-FEB-2023:00:00:00 AND 05-MAR-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

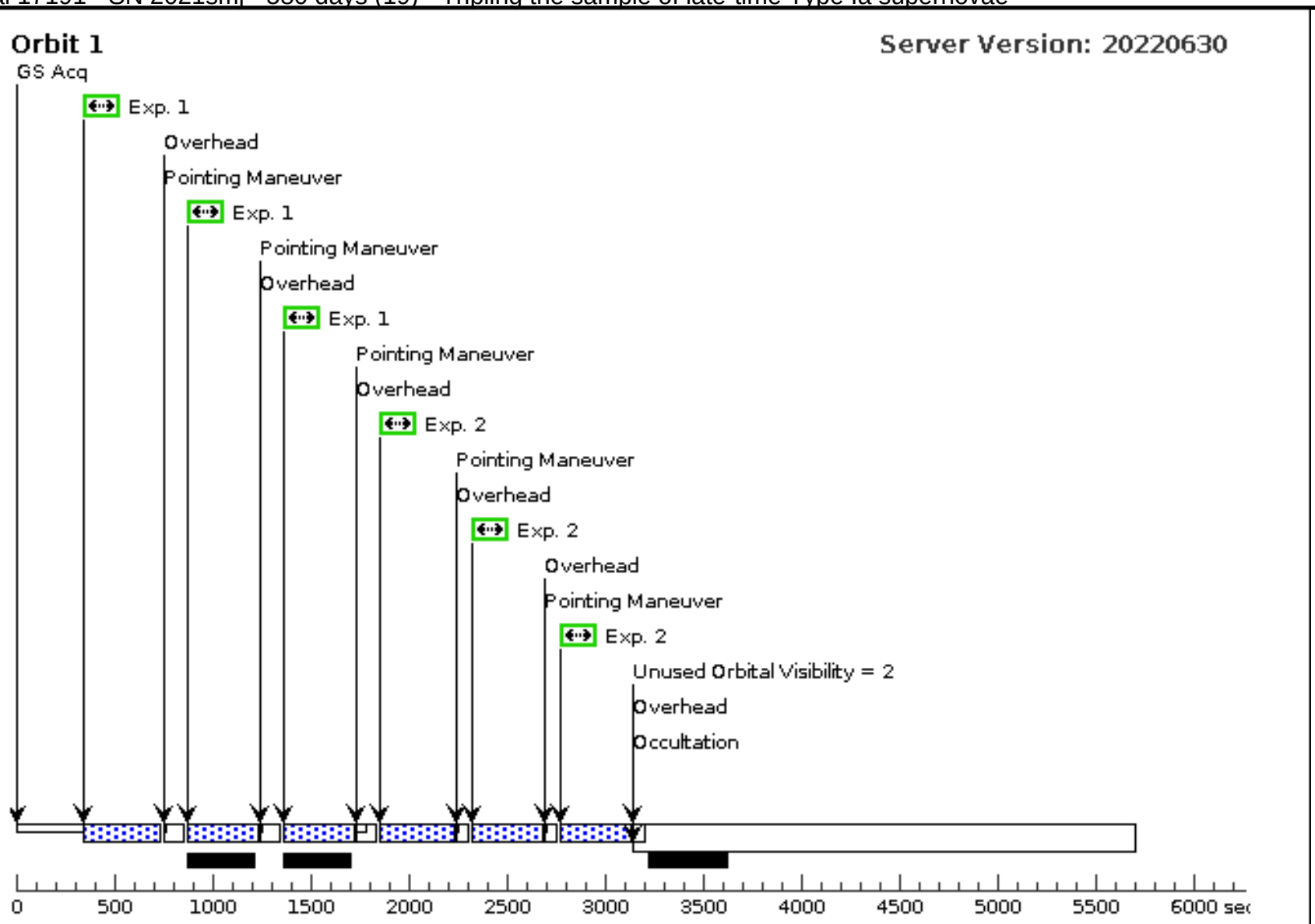
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	SN2021SMJ	RA: 12 26 46.5500 (186.6939583d) Dec: +08 52 57.70 (8.88269d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(8) SN2021SMJ	WFC3/UVIS, ACCUM, UVIS1	F438W	FLASH=14		Pattern 1, Exps 1-1 in SN 2021smj - 580 days (19) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(8) SN2021SMJ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021smj - 580 days (19) (1)	358 Secs (1074 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021smj - 730 days (20), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 21-JUL-2023:00:00:00 AND 01-AUG-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

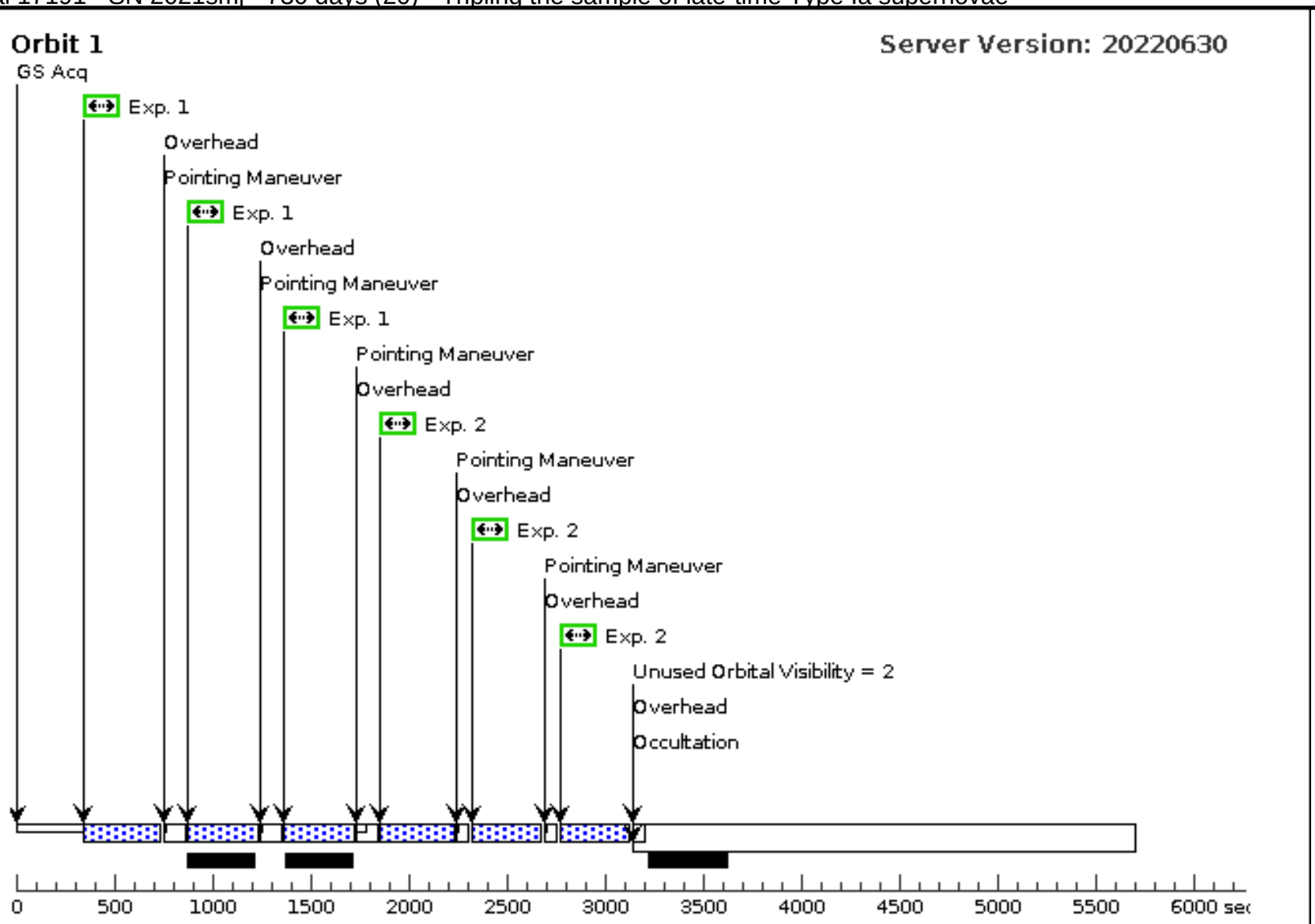
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(8)	SN2021SMJ	RA: 12 26 46.5500 (186.6939583d) Dec: +08 52 57.70 (8.88269d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(8) SN2021SMJ	WFC3/UVIS, ACCUM, UVIS1	F625W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021smj - 730 days (20) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(8) SN2021SMJ	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021smj - 730 days (20) (1)	356 Secs (1068 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021tkm - 600 days (21), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 20-MAR-2023:00:00:00 AND 30-MAR-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

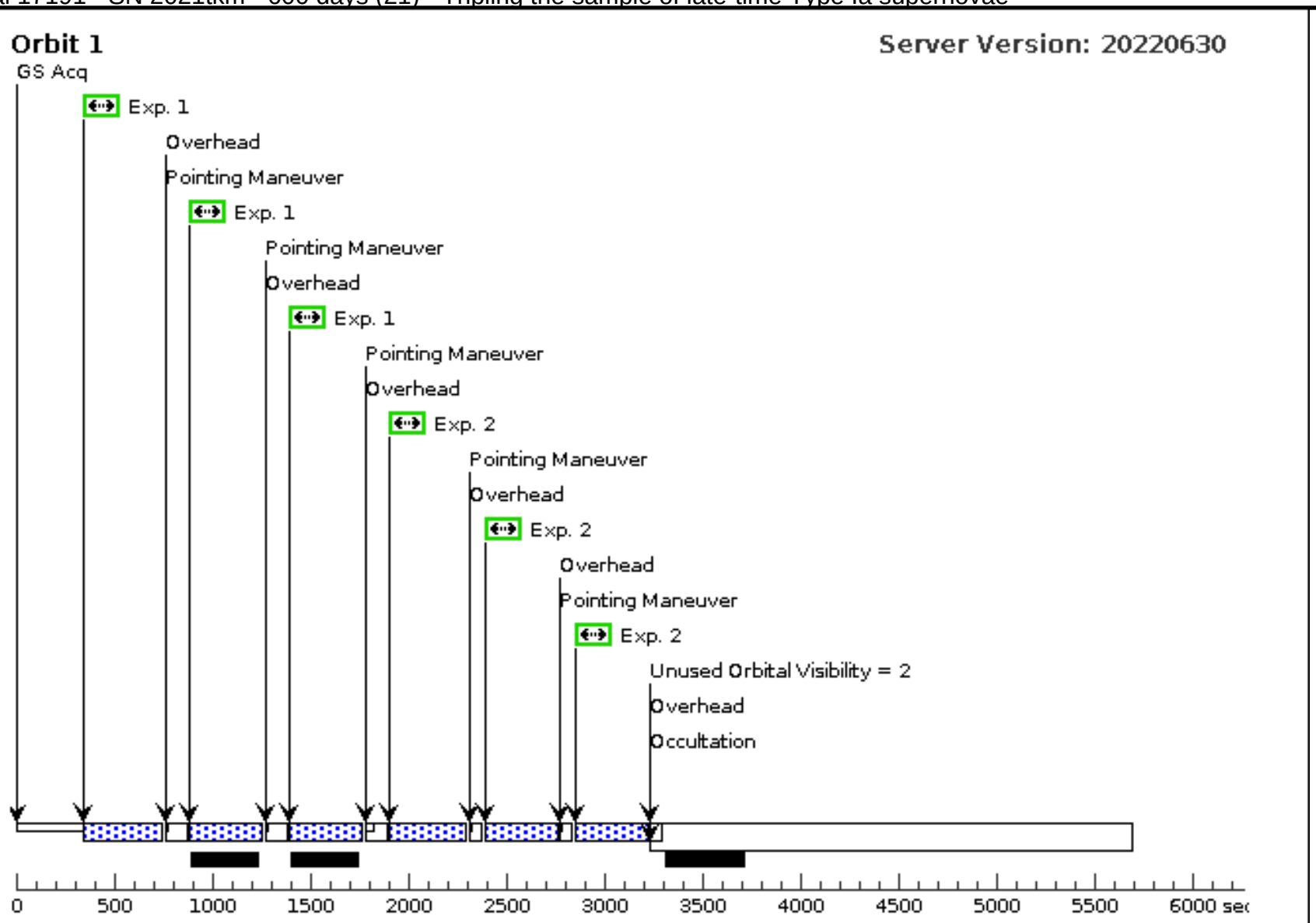
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	SN2021TKM	RA: 14 31 41.5500 (217.9231250d) Dec: -43 24 53.00 (-43.41472d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(9) SN2021TKM	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=13		Pattern 1, Exps 1-1 in SN 2021tkm - 600 days (21) (1)	374 Secs (1122 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(9) SN2021TKM	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021tkm - 600 days (21) (1)	370 Secs (1110 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021tkm - 700 days (22), completed Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 24-JUN-2023:00:00:00 AND 05-JUL-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

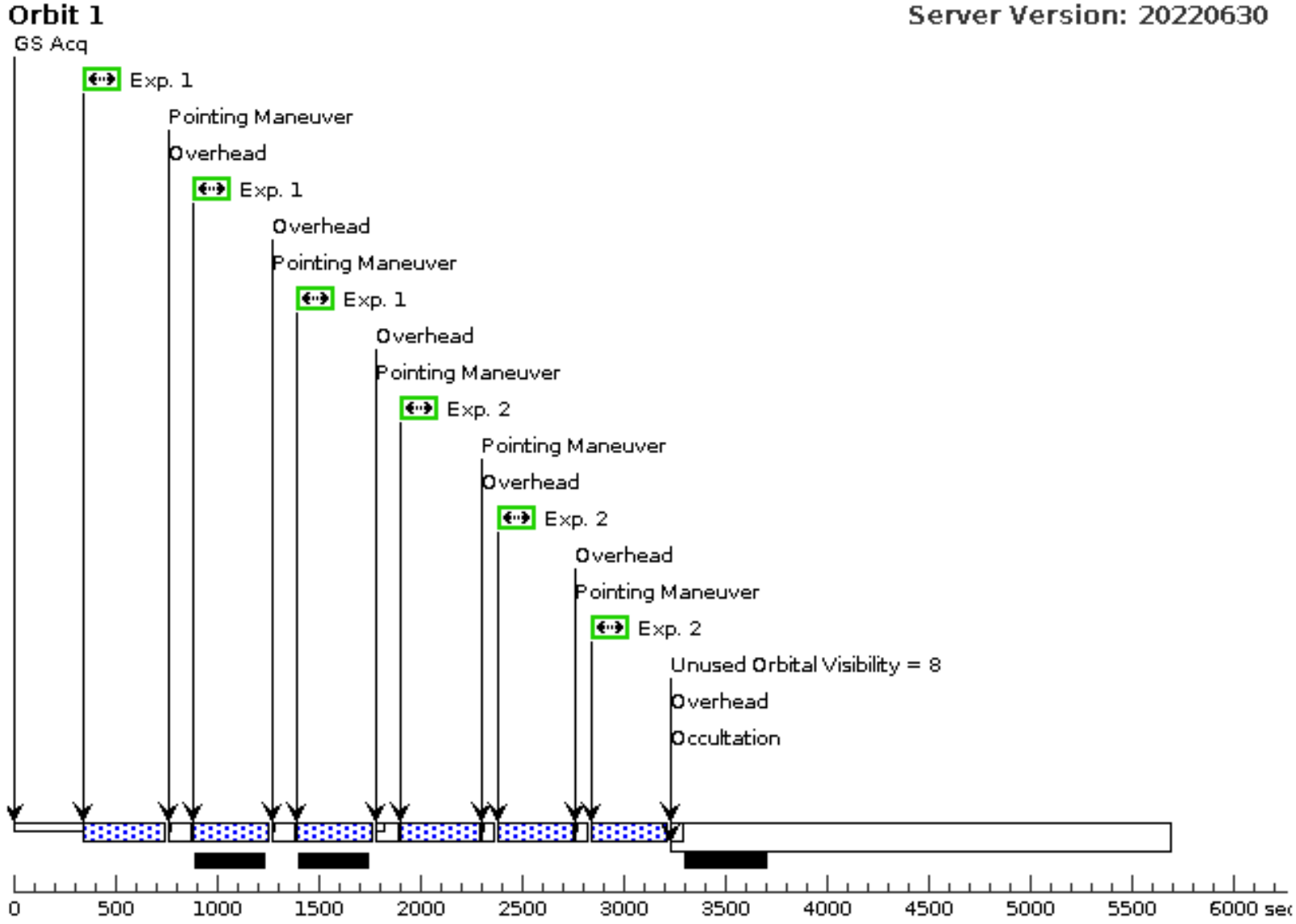
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	SN2021TKM	RA: 14 31 41.5500 (217.9231250d) Dec: -43 24 53.00 (-43.41472d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(9) SN2021TKM	WFC3/UVIS, ACCUM, UVIS2	F625W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021tkm - 700 days (22) (1)	375 Secs (1125 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(9) SN2021TKM	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021tkm - 700 days (22) (1)	370 Secs (1110 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021tkm - 785 days (23), scheduling Mon Aug 14 20:00:54 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 14-SEP-2023:00:00:00 AND 24-SEP-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1)

Fixed Targets

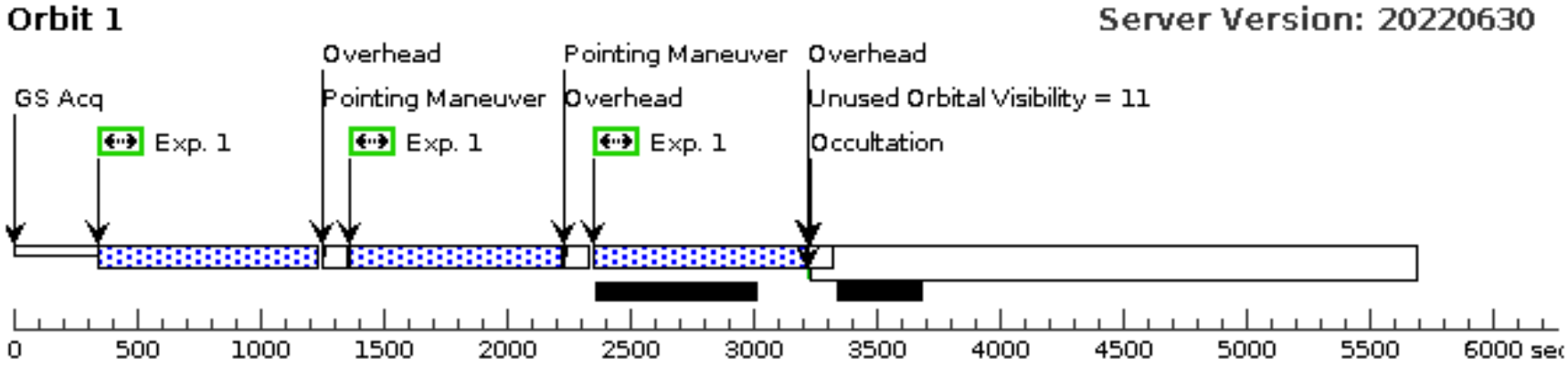
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	SN2021TKM	RA: 14 31 41.5500 (217.9231250d) Dec: -43 24 53.00 (-43.41472d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(9) SN2021TKM	WFC3/UVIS, ACCUM, UVIS2	F555W			Pattern 1, Exps 1-1 in SN 2021tkm - 785 days (23) (1)	860 Secs (2580 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021wuf - 585 days (24), failed Mon Aug 14 20:00:55 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 08-APR-2023:00:00:00 AND 18-APR-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

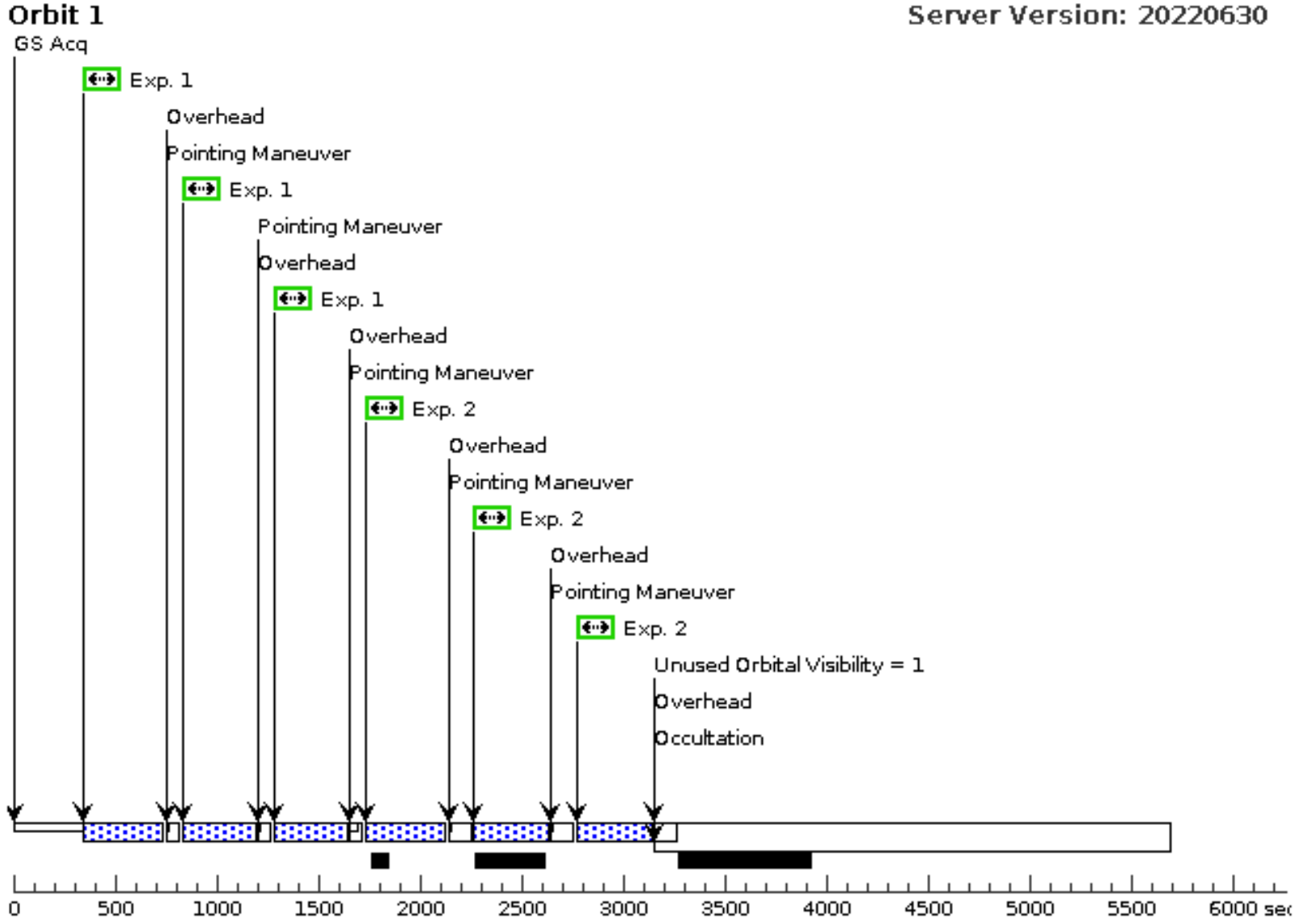
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SN2021WUF	RA: 17 56 2.5100 (269.0104583d) Dec: +18 21 14.10 (18.35392d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(10) SN2021WUF	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021wuf - 585 days (24) (1)	362 Secs (1086 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***
2		(10) SN2021WUF	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=13		Pattern 1, Exps 2-2 in SN 2021wuf - 585 days (24) (1)	370 Secs (1110 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021wuf - 585 days - redo (29), completed Mon Aug 14 20:00:55 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 07-JUN-2023:00:00:00 AND 12-JUN-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

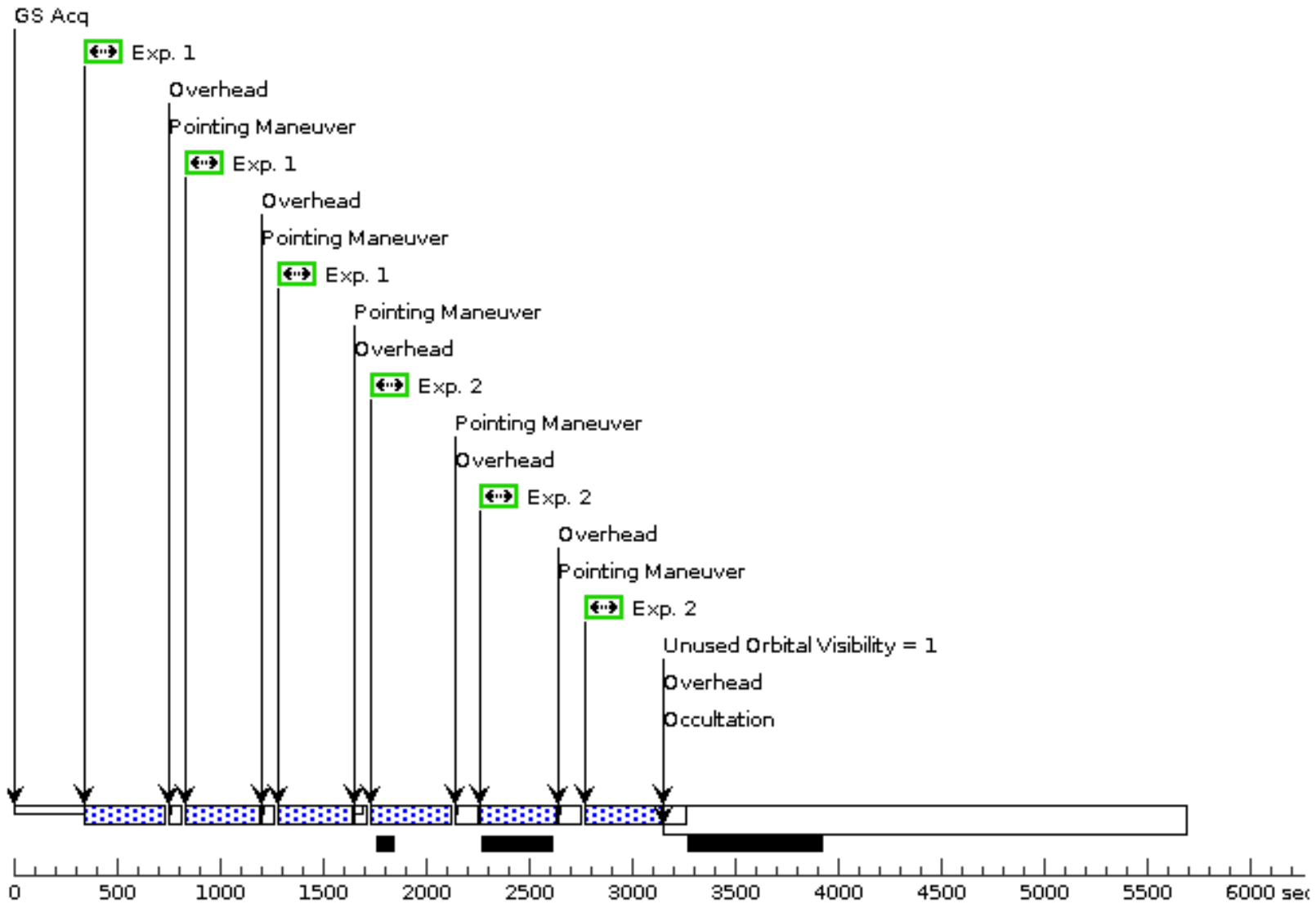
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SN2021WUF	RA: 17 56 2.5100 (269.0104583d) Dec: +18 21 14.10 (18.35392d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(10) SN2021WUF	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021wuf - 585 days - redo (29) (1)	362 Secs (1086 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***
2		(10) SN2021WUF	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=13		Pattern 1, Exps 2-2 in SN 2021wuf - 585 days - redo (29) (1)	370 Secs (1110 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021wuf - 700 days (25), failed Mon Aug 14 20:00:55 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 04-AUG-2023:00:00:00 AND 14-AUG-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

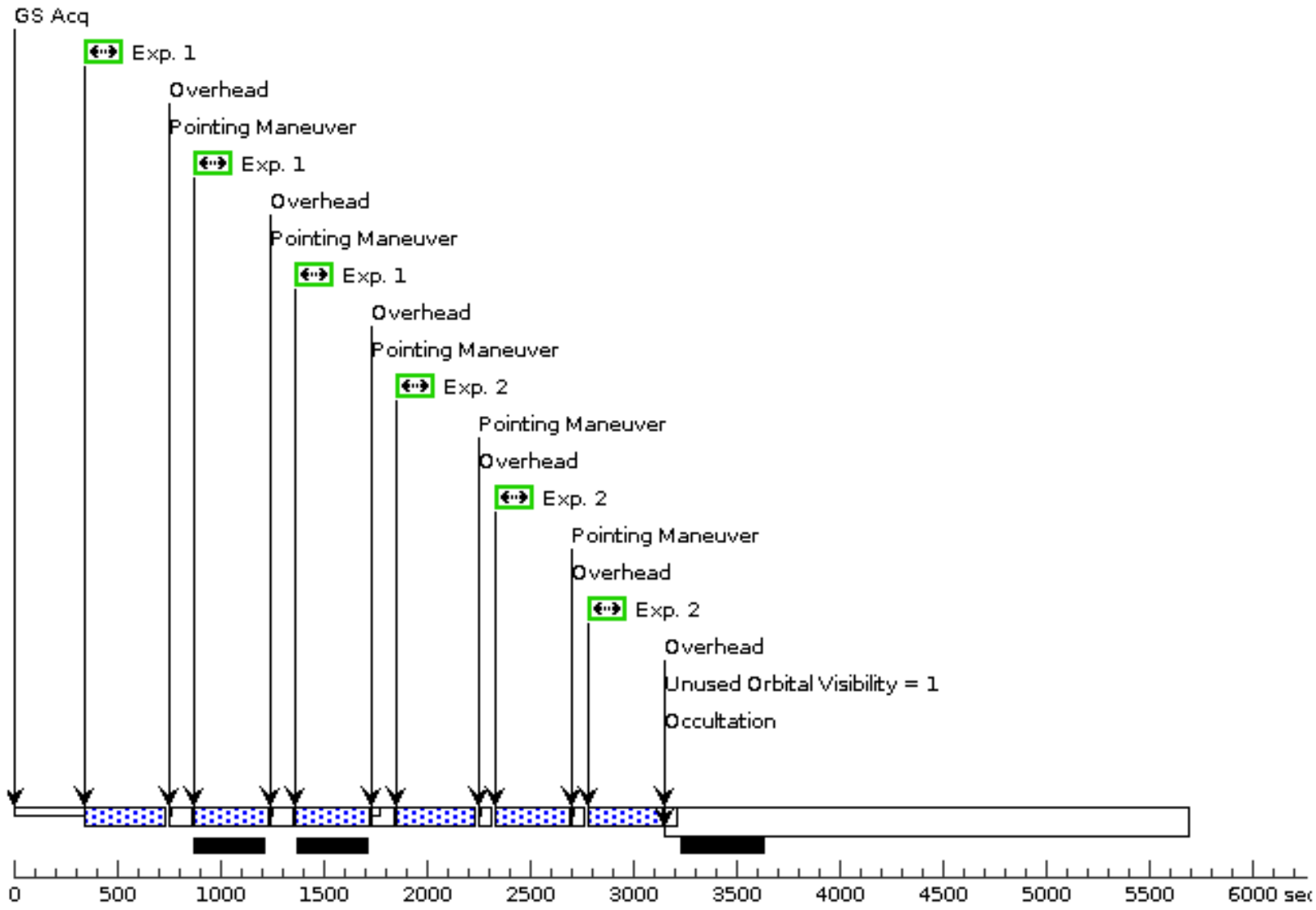
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SN2021WUF	RA: 17 56 2.5100 (269.0104583d) Dec: +18 21 14.10 (18.35392d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(10) SN2021WUF	WFC3/UVIS, ACCUM, UVIS2	F625W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021wuf - 700 days (25) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***
2		(10) SN2021WUF	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021wuf - 700 days (25) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	 ***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021wuf - 750 days (30) Mon Aug 14 20:00:55 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 29-SEP-2023:00:00:00 AND 11-OCT-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

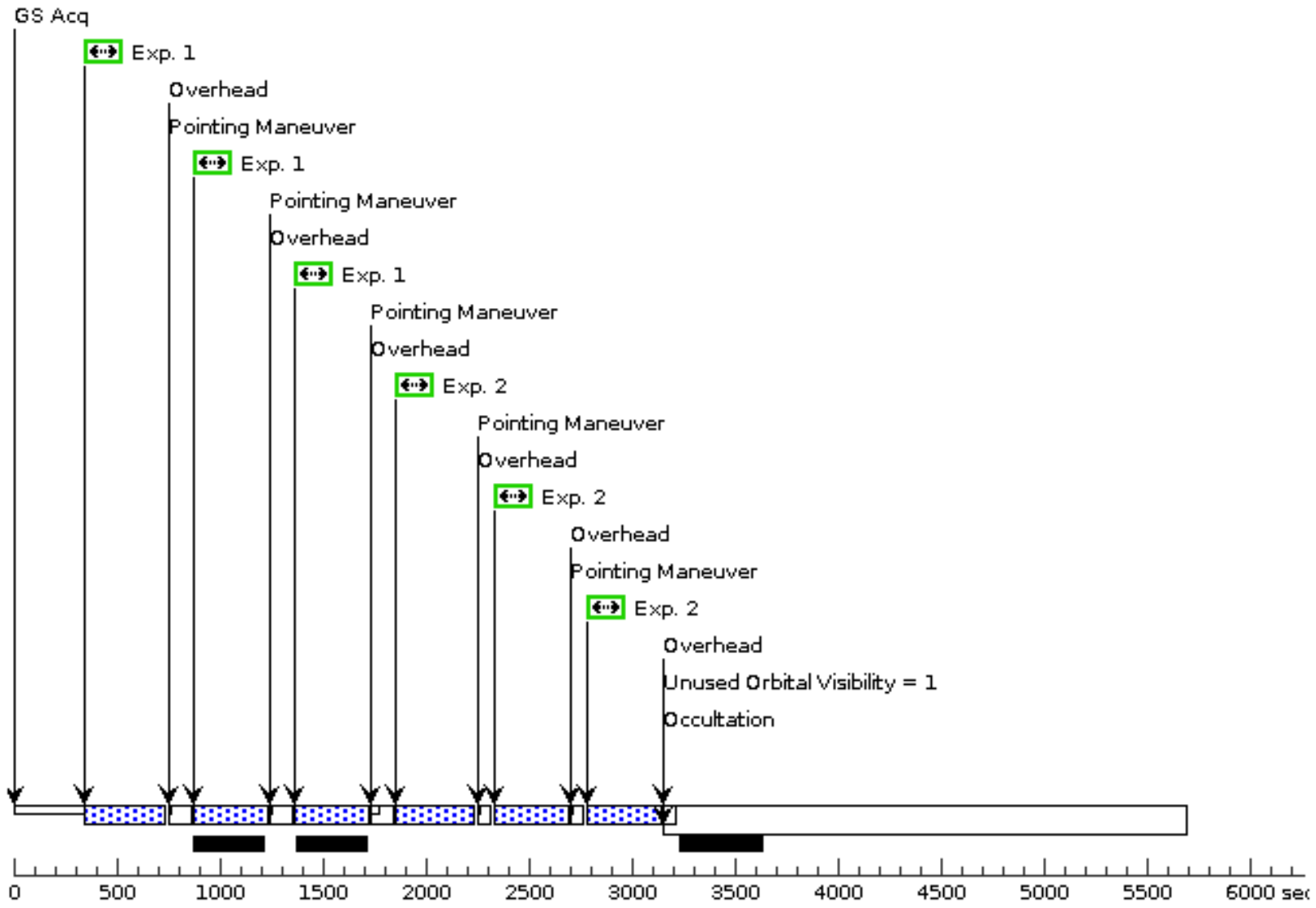
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	SN2021WUF	RA: 17 56 2.5100 (269.0104583d) Dec: +18 21 14.10 (18.35392d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(10) SN2021WUF	WFC3/UVIS, ACCUM, UVIS2	F625W	FLASH=7		Pattern 1, Exps 1-1 in SN 2021wuf - 750 days (30) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(10) SN2021WUF	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021wuf - 750 days (30) (1)	360 Secs (1080 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021xju - 600 days (26), completed Mon Aug 14 20:00:55 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 01-MAY-2023:00:00:00 AND 11-MAY-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

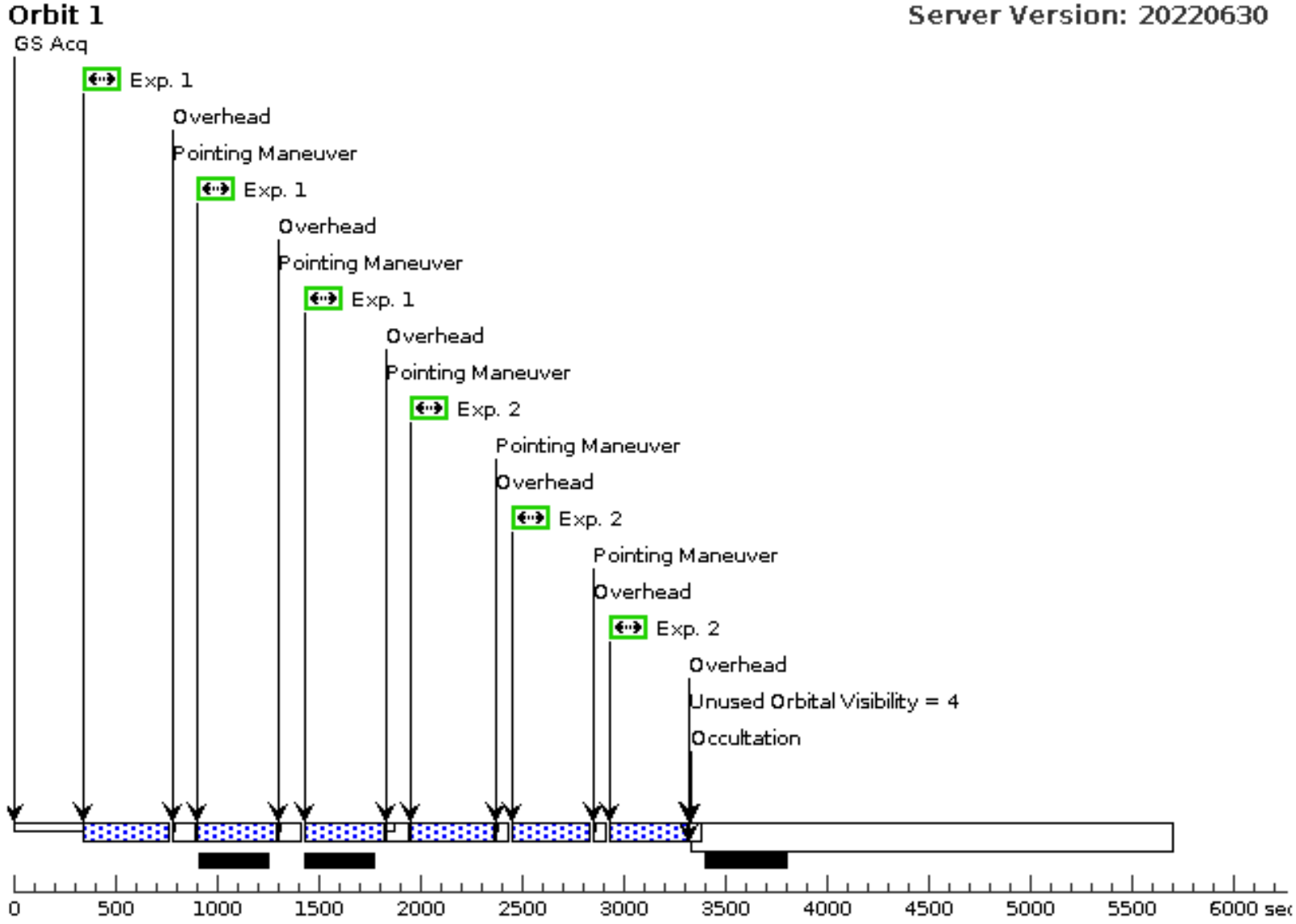
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(11)	SN2021XJU	RA: 20 22 30.9600 (305.6290000d) Dec: -53 16 44.20 (-53.27894d) Equinox: J2000		V=25	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(11) SN2021XJU	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=13		Pattern 1, Exps 1-1 in SN 2021xju - 600 days (26) (1)	390 Secs (1170 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(11) SN2021XJU	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=6		Pattern 1, Exps 2-2 in SN 2021xju - 600 days (26) (1)	385 Secs (1155 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure



Visit

Proposal 17191, SN 2021aefx - 600 days (27), completed Mon Aug 14 20:00:55 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 19-JUL-2023:00:00:00 AND 29-JUL-2023:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(12)	SN2021AEFX	RA: 04 19 53.3400 (64.9722500d) Dec: -54 56 52.60 (-54.94794d) Equinox: J2000		V=25+/-1	Reference Frame: ICRS

Comments:
Category=EXT-STAR
Description=[SUPERNOVA TYPE IA]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(12) SN2021AEFX	WFC3/UVIS, ACCUM, UVIS1	F438W	FLASH=13		Pattern 1, Exps 1-1 in SN 2021aefx - 600 days (27) (1)	370 Secs (1110 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(12) SN2021AEFX	WFC3/UVIS, ACCUM, UVIS1	F555W	FLASH=7		Pattern 1, Exps 2-2 in SN 2021aefx - 600 days (27) (1)	370 Secs (1110 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***

Orbit Structure