



## 11424 - WFC3 UVIS Initial Alignment

Cycle: 17, Proposal Category: SM4/WFC3

(Availability Mode: RESTRICTED)

### INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. George Hartig (PI)	Space Telescope Science Institute	hartig@stsci.edu

### VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) NGC188-58 NONE	WFC3/UVIS	2	18-Feb-2009 21:02:55.0	yes
02	(1) NGC188-58 NONE	WFC3/UVIS	3	18-Feb-2009 21:03:06.0	yes
03	(1) NGC188-58 NONE	WFC3/UVIS	3	18-Feb-2009 21:03:18.0	yes
04	NONE	WFC3/UVIS	1	18-Feb-2009 21:03:21.0	yes

9 Total Orbits Used

### ABSTRACT

The corrector mechanism will be used to iteratively bring the UVIS channel of WFC3 into alignment with the OTA using phase retrieval of focus diverse star images over the field. Three visits are required; corrector offsets will be uplinked after each visit via realtime command.

This proposal is activity id WFC3-11

### **OBSERVING DESCRIPTION**

The UVIS corrector mechanism will be used to bring the instrument into alignment with the OTA using phase retrieval (PR) of focus diverse star images over the field. Corrector mirror tip/tilt (inner/outer cylinders) will be adjusted to align the OTA and UVIS pupils, and the focus drive will be used to obtain the PR images and optimize image focus. The observed field must be sufficiently dense to provide good sampling over the FOV while providing enough isolated stars to permit accurate PSF measurement. If the field is astrometric and astrometric guide stars are used, the plate scale and image orientation may also be determined. NGC-188 star 58 meets these requirements, is available year-round and was used previously for ACS alignment. The F410M filter will be used to limit the passband at relatively short wavelength for improved PR accuracy. Full frame CR-split images will be obtained at 5 focus positions. Three visits are required; corrector offsets will be uplinked after each visit via realtime command, no sooner than 24 hrs after receipt of full data set. A fourth visit is used for the final realtime uplink.

### **REAL TIME JUSTIFICATION**

Realtime uplinks of the UVIS corrector settings needed to improve image quality are required after each visit and prior to the following alignment measurements, in order to iteratively progress to the optimized alignment. Uplinks should be scheduled no sooner than 24 hrs after receipt of data; requested corrector moves will be specified within 12 hrs after data receipt. Data should be fast-tracked through OPUS to permit timely analysis.

### **CALIBRATION JUSTIFICATION**

The image quality of all WFC3 UVIS science data relies on these alignment adjustments.

### **ADDITIONAL COMMENTS**

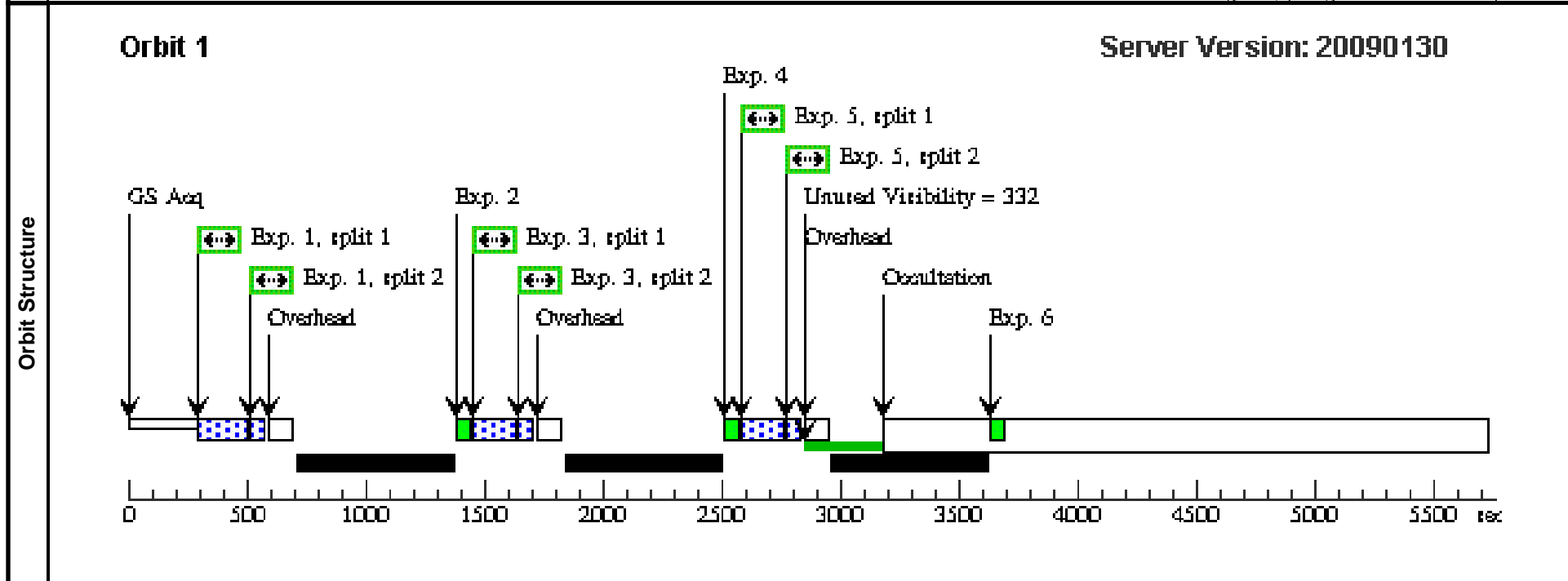
APT does not handle the realtime uplinks properly, including them in the visibility period. When properly scheduled, this proposal will fit within the allotted 6 orbits.

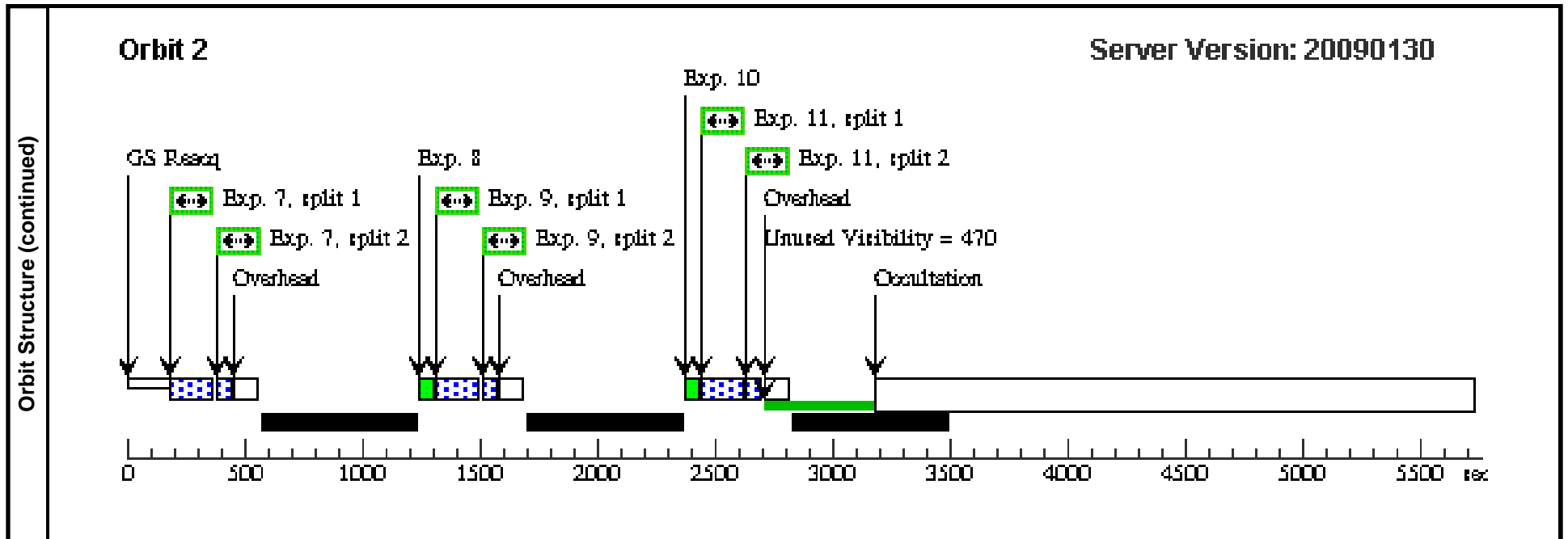
Proposal 11424 - Visit 01 - WFC3 UVIS Initial Alignment

Thu Feb 19 02:03:24 GMT 2009

<b>Visit</b>	<b>Proposal 11424, Visit 01, implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: (none) <i>Comments: Schedule after WF06 UVIS Detector Functional, prop 11419</i>																																																																																															
	<b>Diagnosics</b> (Exposure 1 (Visit 01) special requirements) Warning (Form): The specified GS Acq Scenario is not in the current list of valid scenarios.																																																																																															
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Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	9		(1) NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]
10		NONE	WFC3/UVIS, ALIGN			FOCUS=0			10 Secs [==>]	[2]
<i>Comments: Return to original focus setting</i>										
11		(1) NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[2]





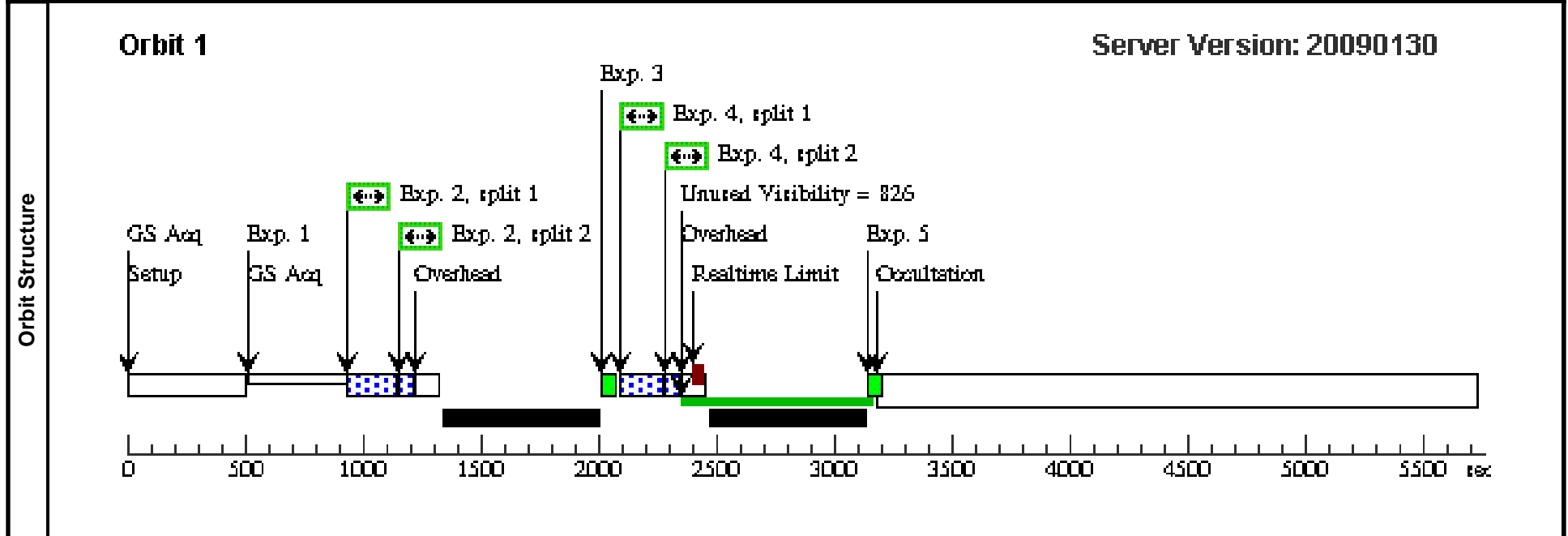
Proposal 11424 - Visit 02 - WFC3 UVIS Initial Alignment

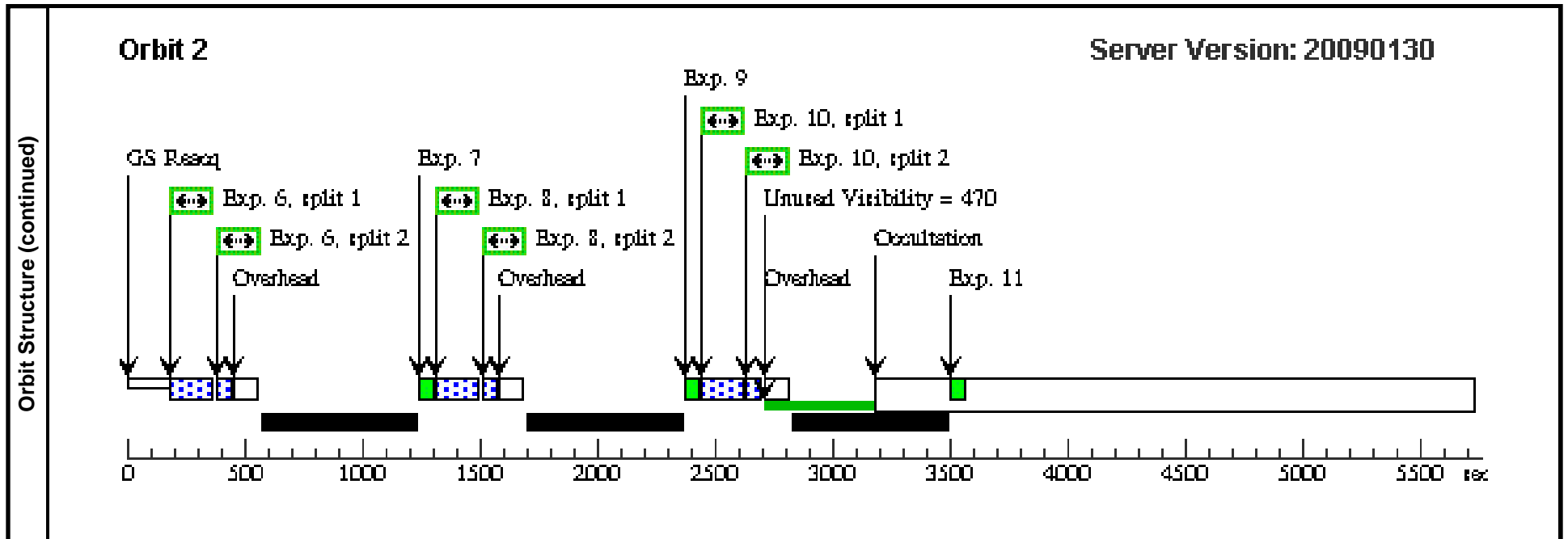
Thu Feb 19 02:03:25 GMT 2009

Visit	<b>Proposal 11424, Visit 02, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 01 BY 48 H TO 96 H										
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NGC188-58	RA: 00 47 4.4540 (11.7685583d) Dec: +85 16 32.70 (85.27575d) Equinox: J2000 Plate Id: ZZZZ	Proper Motion RA: -0.00257s/yr Proper Motion Dec: -0.0112"/yr Parallax: 0.0" Epoch of Position: 2000	V=14.65+/-0.05	Reference Frame: GSC1					
	<i>Comments: Use guide stars from the NGC188 Astrometric Catalog (Plate-ID ZZZZ)</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	
	1		NONE	WFC3/UVIS, ALIGN			REQ UPLINK		0 Secs [==>]	[1]	
	<i>Comments: Begin with uplink to set focus and cylinder positions of UVIS corrector with up to three ICORREL commands.</i>										
	2	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[1]
	3		NONE	WFC3/UVIS, ALIGN			FOCUS=-1000			10 Secs [==>]	[1]
	4	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[1]
	5		NONE	WFC3/UVIS, ALIGN			FOCUS=-500			10 Secs [==>]	[1]
	6	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[2]
	7		NONE	WFC3/UVIS, ALIGN			FOCUS=500			10 Secs [==>]	[2]
	8	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[2]
9		NONE	WFC3/UVIS, ALIGN			FOCUS=1000			10 Secs [==>]	[2]	
10	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[2]	

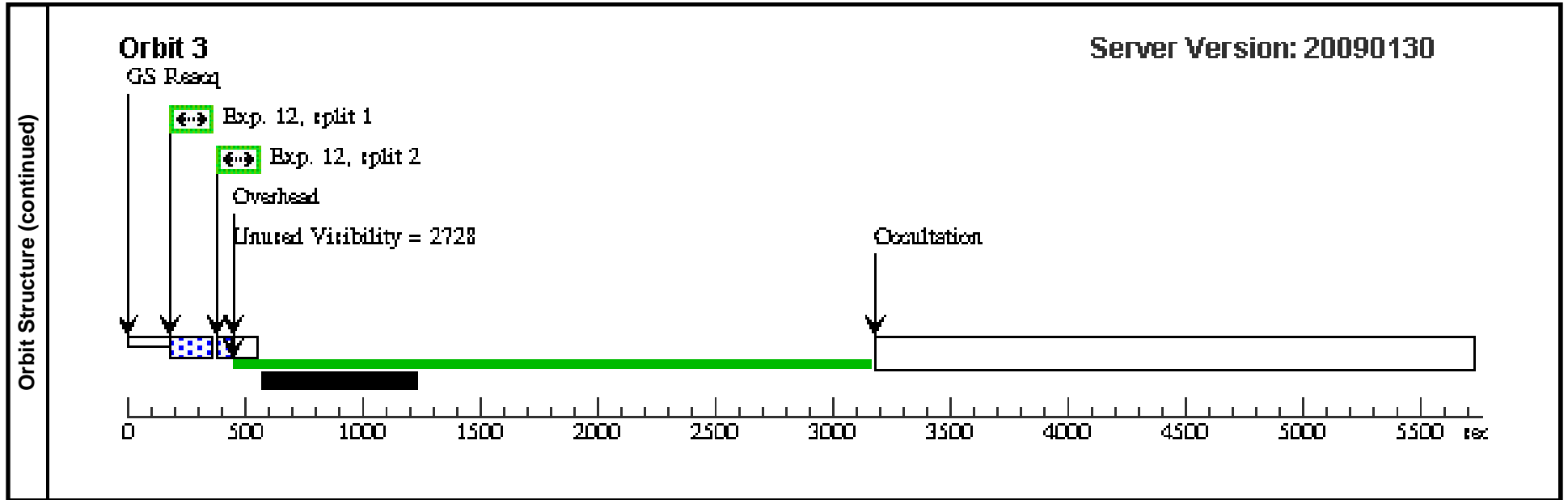
Proposal 11424 - Visit 02 - WFC3 UVIS Initial Alignment

Exposures (continued)	#	Label	Target	Config, Mode, Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
		11		NONE	WFC3/UVIS, ALIGN		FOCUS=0			10 Secs [==>]
<i>Comments: Return to original focus setting</i>										
	12		(1) NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2			120 Secs [==>(Split 1)] [==>(Split 2)]	[3]









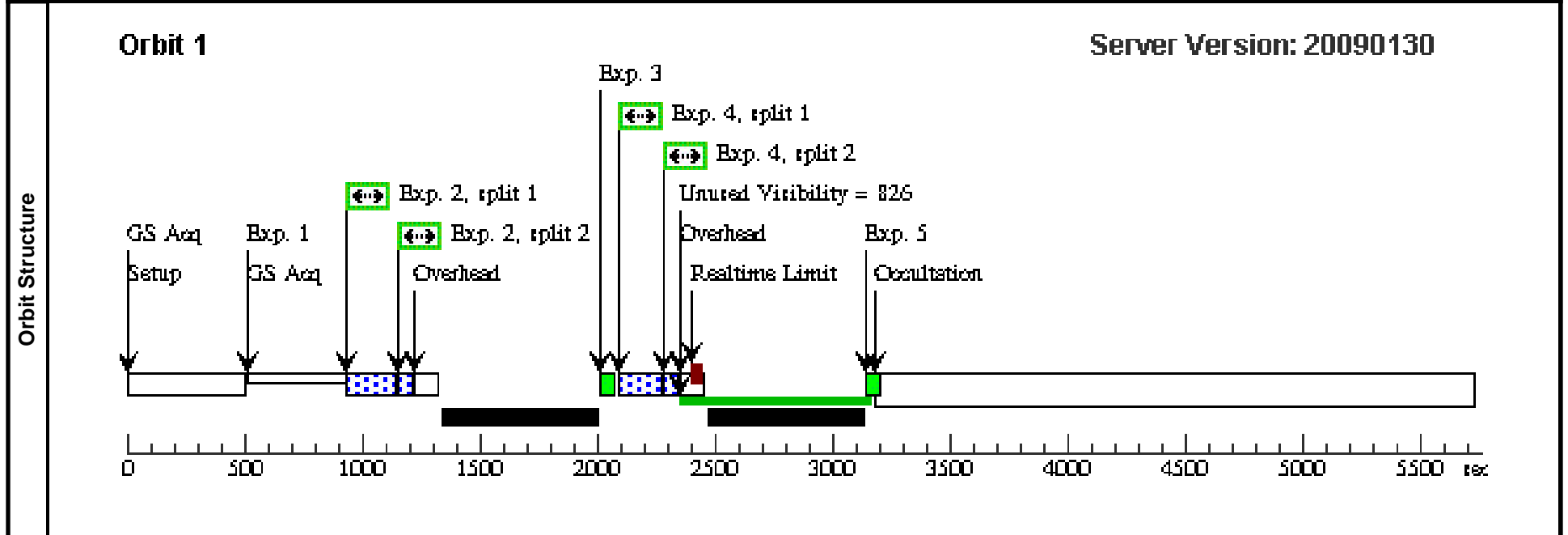
Proposal 11424 - Visit 03 - WFC3 UVIS Initial Alignment

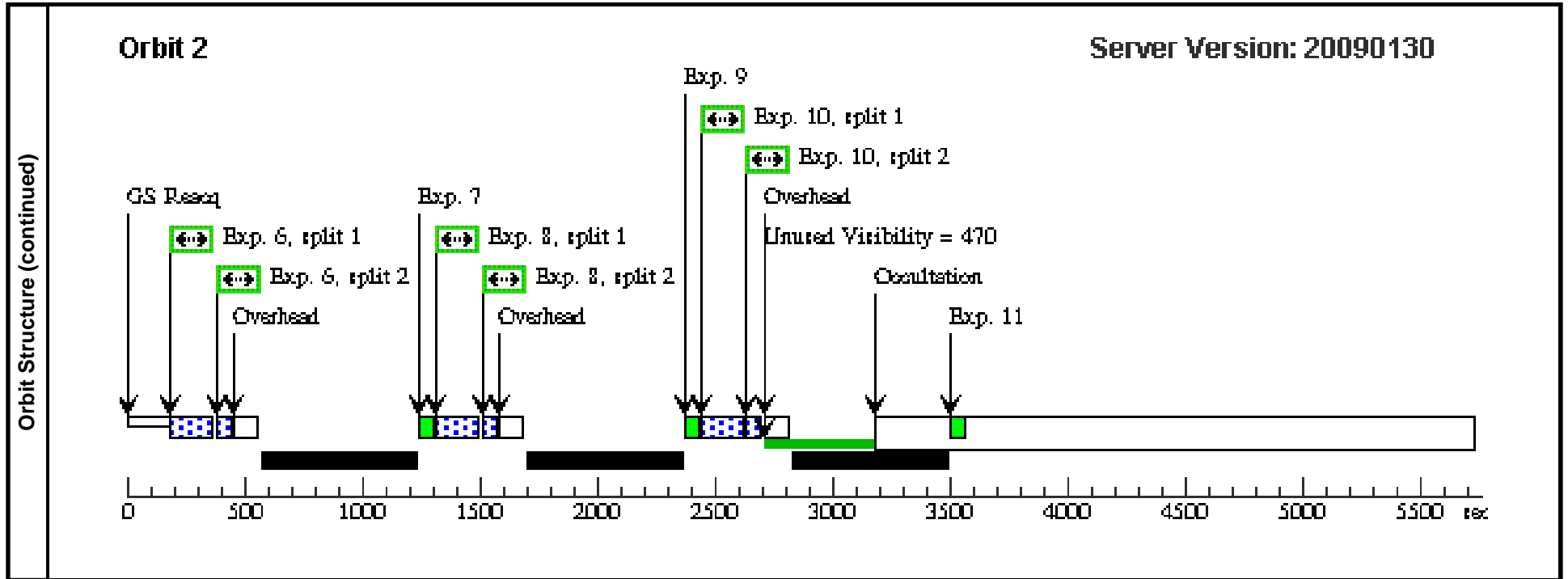
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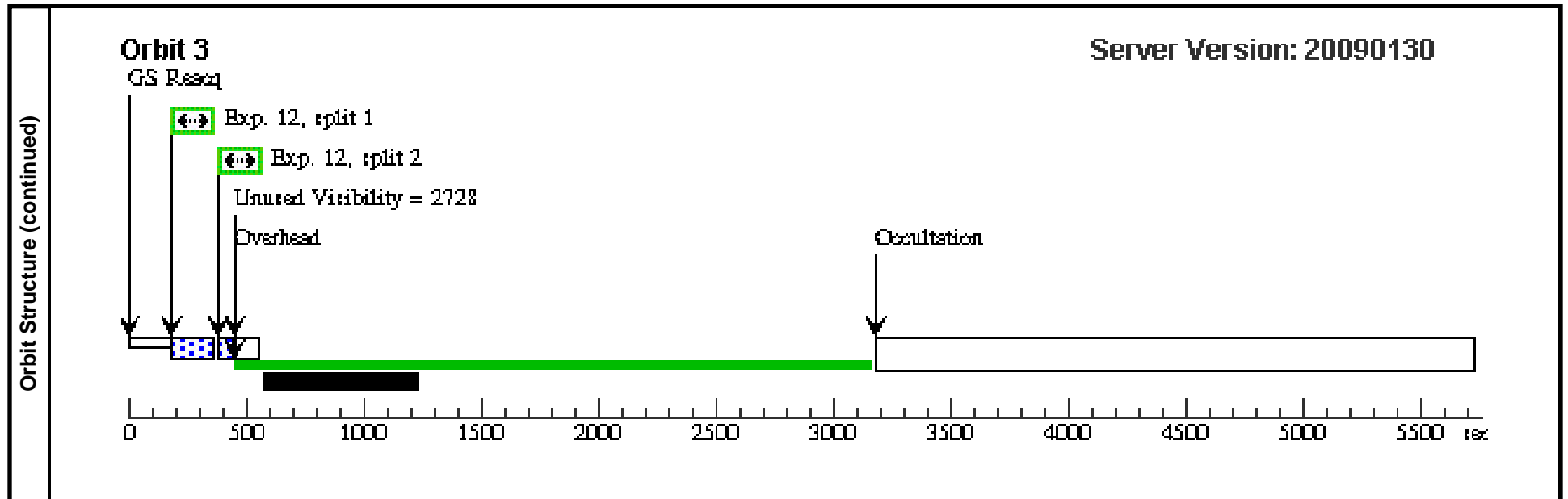
Visit	<b>Proposal 11424, Visit 03, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 02 BY 48 H TO 96 H										
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NGC188-58	RA: 00 47 4.4540 (11.7685583d) Dec: +85 16 32.70 (85.27575d) Equinox: J2000 Plate Id: ZZZZ	Proper Motion RA: -0.00257s/yr Proper Motion Dec: -0.0112"/yr Parallax: 0.0" Epoch of Position: 2000	V=14.65+/-0.05	Reference Frame: GSC1					
	<i>Comments: Use guide stars from the NGC188 Astrometric Catalog (Plate-ID ZZZZ)</i>										
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	1		NONE	WFC3/UVIS, ALIGN			REQ UPLINK		0 Secs [==>]	[1]	
	<i>Comments: Begin with uplink to set focus and cylinder positions of UVIS corrector with up to three ICORREL commands.</i>										
	2	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[1]
	3		NONE	WFC3/UVIS, ALIGN			FOCUS=-1000			10 Secs [==>]	[1]
	4	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[1]
	5		NONE	WFC3/UVIS, ALIGN			FOCUS=-500			10 Secs [==>]	[1]
	6	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[2]
	7		NONE	WFC3/UVIS, ALIGN			FOCUS=500			10 Secs [==>]	[2]
	8	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[2]
9		NONE	WFC3/UVIS, ALIGN			FOCUS=1000			10 Secs [==>]	[2]	
10	(1)	NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2				120 Secs [==>(Split 1)] [==>(Split 2)]	[2]	

Proposal 11424 - Visit 03 - WFC3 UVIS Initial Alignment

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
		11		NONE	WFC3/UVIS, ALIGN		FOCUS=0			10 Secs [==>]
<i>Comments: Return to original focus setting</i>										
	12		(1) NGC188-58	WFC3/UVIS, ACCUM, UVIS	F410M	CR-SPLIT=2			120 Secs [==>(Split 1)] [==>(Split 2)]	[3]







<b>Visit</b>	Proposal 11424, Visit 04, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: AFTER 03 BY 48 H TO 96 H									
<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		NONE	WFC3/UVIS, ALIGN			REQ UPLINK		0 Secs [==>]	[1]
Comments: Uplink offsets to UVIS focus and cylinder settings with up to three ICORREL commands.										
<b>Orbit Structure</b>	Orbit 1 <span style="float: right;">Server Version: 20090130</span> GS Acq Setup Unused Visibility = 3025 Exp. 1 Realtime Limit Occultation									
	<p>The diagram shows a timeline for Orbit 1. The x-axis represents time in seconds, ranging from 0 to 5500 with major ticks every 500 seconds. The timeline starts at 0 with 'GS Acq' and 'Setup' phases. A green bar indicates the 'Exp. 1' phase from approximately 0 to 3000 seconds. A red bar indicates the 'Realtime Limit' at approximately 2400 seconds. A white bar indicates the 'Occultation' phase from approximately 3000 to 5500 seconds. The text 'Unused Visibility = 3025' is also present.</p>									