# 10493 - A Survey for Supernovae in Massive High-Redshift Clusters

Cycle: 14, Proposal Category: GO

(Availability Mode: SUPPORTED)

**INVESTIGATORS**



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| Dr. Mark M. Phillips (CoI) | Carnegie Institution of Washington | |
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| Dr. Richard S. Ellis (CoI) | California Institute of Technology | |
| Dr. Harald Ebeling (CoI) | University of Hawaii | |



**VISITS**

| *Visit* | *Targets used in Visit* | *Configurations used in Visit* | *Orbits Used* | *Last Orbit Planner Run* | *OP Current with Visit?* |
|---|---|---|---|---|---|
| 01 | (1) MACSJ0025-1222 | ACS/WFC | 1 | 17-Nov-2006 21:01:37.0 | yes |

| *Visit* | *Targets used in Visit* | *Configurations used in Visit* | *Orbits Used* | *Last Orbit Planner Run* | *OP Current with Visit?* |
|---|---|---|---|---|---|
| 02 | (2) MACSJ0257-2325 | ACS/WFC | 1 | 17-Nov-2006 21:01:48.0 | yes |
| 03 | (3) MACSJ0647+7015 | ACS/WFC | 1 | 17-Nov-2006 21:01:56.0 | yes |
| 04 | (4) MACSJ0717+3745 | ACS/WFC | 1 | 17-Nov-2006 21:02:03.0 | yes |
| 05 | (5) MACSJ0744+3927 | ACS/WFC | 1 | 17-Nov-2006 21:02:10.0 | yes |
| 06 | (6) MACSJ0911+1746 | ACS/WFC | 1 | 17-Nov-2006 21:02:17.0 | yes |
| 07 | (7) MACSJ1149+2223 | ACS/WFC | 1 | 17-Nov-2006 21:02:23.0 | yes |
| 08 | (8) MACSJ1423+2404 | ACS/WFC | 1 | 17-Nov-2006 21:02:30.0 | yes |
| 09 | (9) MACSJ2129-0741 | ACS/WFC | 1 | 17-Nov-2006 21:02:36.0 | yes |
| 10 | (10) MACSJ2214-1359 | ACS/WFC | 1 | 17-Nov-2006 21:02:43.0 | yes |
| 11 | (11) CLJ1226.9+3332 | ACS/WFC | 1 | 17-Nov-2006 21:02:50.0 | yes |
| 12 | (12) MS1054.4-0321 | ACS/WFC | 1 | 17-Nov-2006 21:02:56.0 | yes |
| 13 | (13) MS0016.5+1654 | ACS/WFC | 1 | 17-Nov-2006 21:03:03.0 | yes |
| 14 | (14) MS0451.6-0305 | ACS/WFC | 1 | 17-Nov-2006 21:03:09.0 | yes |
| 15 | (15) CL0152-1357 | ACS/WFC | 1 | 17-Nov-2006 21:03:15.0 | yes |

15 Total Orbits Used

**ABSTRACT**

We propose to measure, to an unprecedented 30% accuracy, the SN-Ia rate in a sample of massive z=0.5-0.9 galaxy clusters. The SN-Ia rate is a poorly known observable, especially at high z, and in cluster environments. The SN rate and its redshift dependence can serve as powerful discrimiminants for a number of key issues in astrophysics and cosmology. Our observations will: 1. Put clear constraints on the characteristic SN-Ia "delay time," the typical time between the formation of a stellar population and the explosion of some of its members as SNe-Ia. Such constraints can exclude entire categories of SN-Ia progenitor models, since different models predict different delays. 2. Help resolve the question of the dominant

source of the high metallicity in the intracluster medium (ICM) - SNe-Ia, or core-collapse SNe from an early stellar population with a top-heavy IMF, perhaps those population III stars responsible for the early re-ionization of the Universe. Since clusters are excellent laboratories for studying enrichment (they generally have a simple star-formation history, and matter cannot leave their deep potentials), the results will be relevant for understanding metal enrichment in general, and the possible role of first generation stars in early Universal enrichment. 3. Reveal, via nuclear variability, the AGN fraction in clusters at this redshift, to be compared with the field AGN fraction. This will be valuable input for understanding black-hole demographics, AGN evolution, and ICM energetics. 4. Potentially discover intergalactic cluster SNe, which can trace the stripped stellar population at high z.

**OBSERVING DESCRIPTION**

We intend to visit each target once. The length of each visit will be 1 orbit, and we will obtain 4 dithered exposures in a single filter, F814W or F775W.

**ADDITIONAL COMMENTS**

All targets are duplicates of previous observations, by design, since we wish to compare new images with older rederence ones and find SNe and other variable or transient objects. This has been approved in phase I. We also require the orientation to be similar to that of the previous archival visits, up to field rotations of 90, 180 or 270 degrees, to allow schedulability. We used a margin of +/- 3 degrees in our orientation specification, except for two cases (visits 5 and 15) where a larger margin (15 and 5 degrees, respectively) was required for schedulability.

## Visit

**Proposal 10493, Visit 01, implementation** Sat Nov 18 02:03:19 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 32.0D TO 32.0 D; ORIENT 122.0D TO 122.0 D; ORIENT 212.0D TO 212.0 D; ORIENT 302.0D TO 302.0 D; AFTER 01-SEP-2007:00:00:00

*Comments: Visit is to execute ~ one year after visit 1070351. wj*

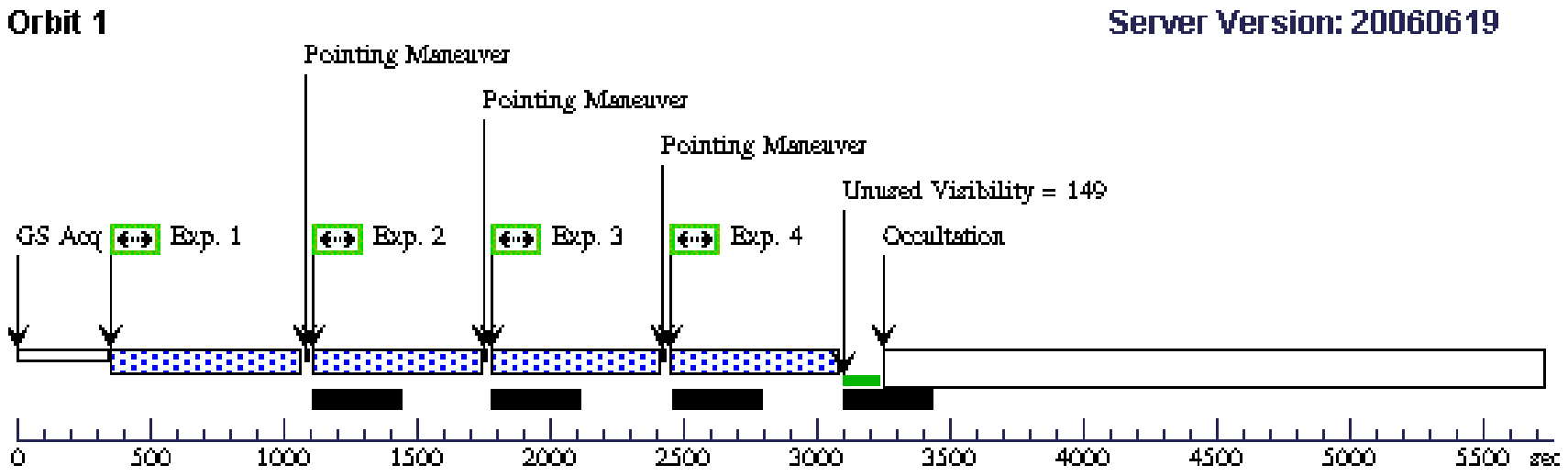
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | MACSJ0025-1222 | RA: 00 25 30.2300 (6.3759583d)<br>Dec: -12 22 43.00 (-12.37861d)<br>Equinox: J2000 | | V=25.0+/-2.0<br>z=0.584 | Coordinate Source:<br>GROUND BASED IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (1) MACSJ0025-1222 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 510.0 Secs | |
| | | | | | | | | *[==>]* | ***[1]*** |
| 2 | exposure 2 | (1) MACSJ0025-1222 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 510.0 Secs | |
| | | | | | | | | *[==>]* | ***[1]*** |
| 3 | exposure 3 | (1) MACSJ0025-1222 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 510.0 Secs | |
| | | | | | | | | *[==>]* | ***[1]*** |
| 4 | exposure 4 | (1) MACSJ0025-1222 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 510.0 Secs | |
| | | | | | | | | *[==>]* | ***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 02, completed** Sat Nov 18 02:03:21 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 61.0D TO 67.0 D; ORIENT 151.0D TO 157.0 D; ORIENT 241.0D TO 247.0 D; ORIENT 331.0D TO 337.0 D

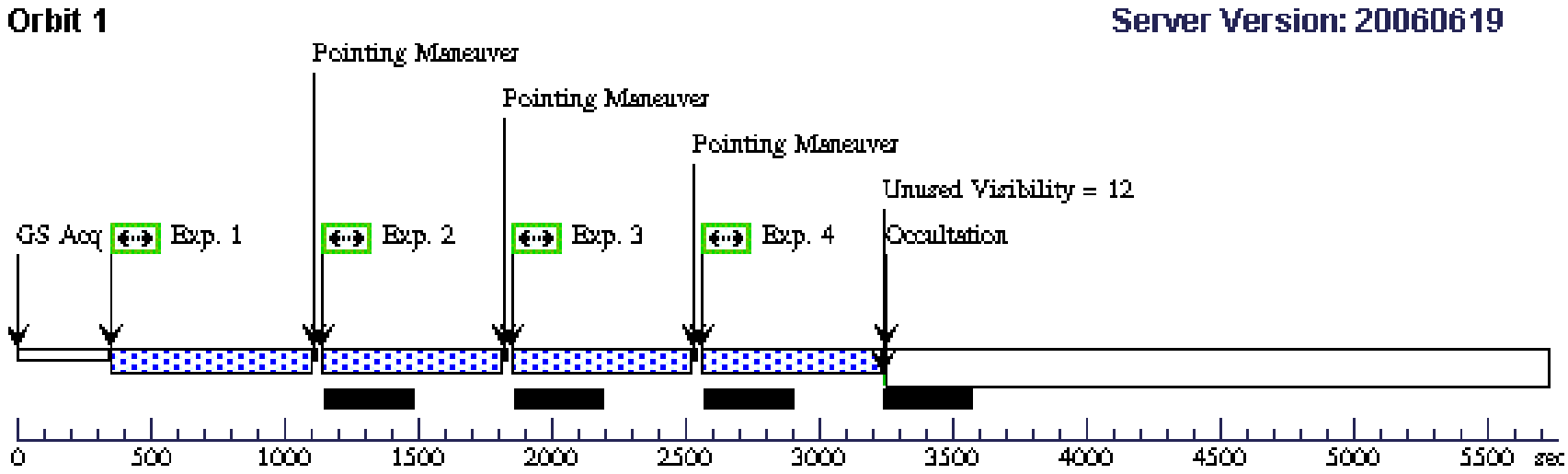
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (2) | MACSJ0257-2325 | RA: 02 57 8.8300 (44.2867917d)<br>Dec: -23 26 3.30 (-23.43425d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.506 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (2) MACSJ0257-2325 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (2) MACSJ0257-2325 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (2) MACSJ0257-2325 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (2) MACSJ0257-2325 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 03, completed** Sat Nov 18 02:03:22 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 232.0D TO 238.0 D; ORIENT 142.0D TO 148.0 D; ORIENT 52.0D TO 58.0 D; ORIENT 322.0D TO 328.0 D

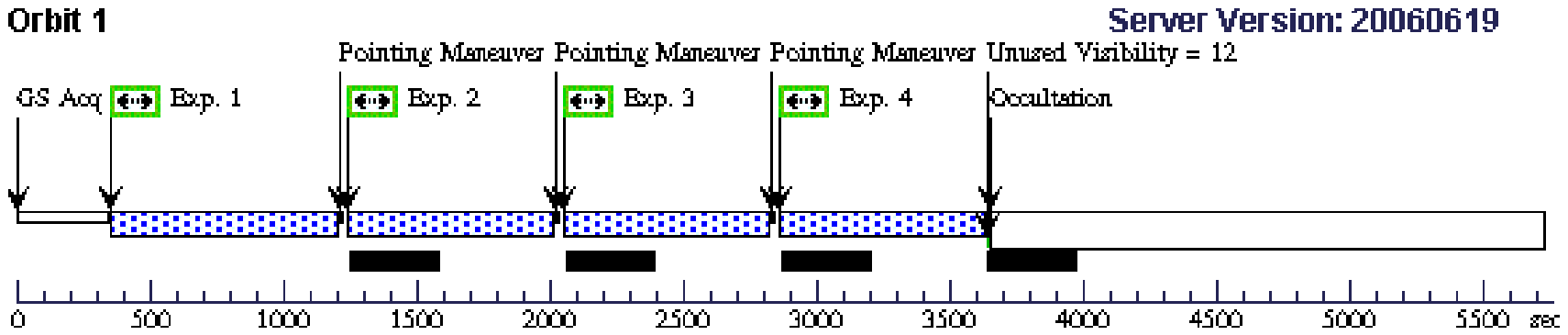
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (3) | MACSJ0647+7015 | RA: 06 47 49.7800 (101.9574167d)<br>Dec: +70 14 56.40 (70.24900d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.584 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (3) MACSJ0647+7015 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 646.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (3) MACSJ0647+7015 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 646.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (3) MACSJ0647+7015 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 646.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (3) MACSJ0647+7015 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 646.0 Secs<br>*[==>]* | <br>***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 04, completed** Sat Nov 18 02:03:22 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 81.0D TO 87.0 D; ORIENT 171.0D TO 177.0 D; ORIENT 261.0D TO 267.0 D; ORIENT 351.0D TO 357.0 D

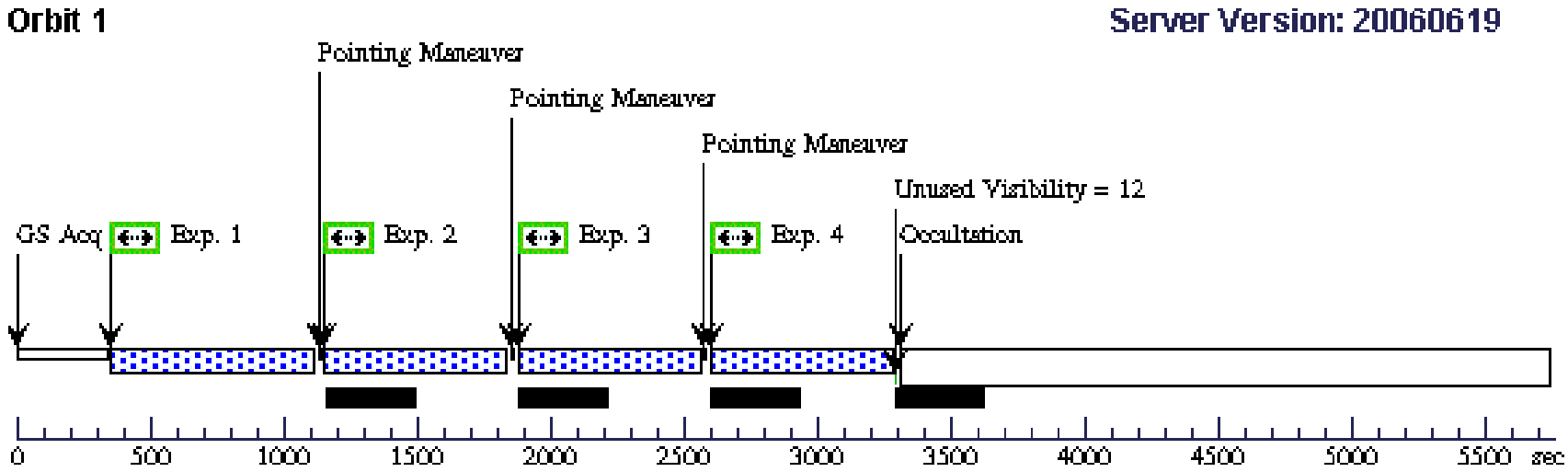
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (4) | MACSJ0717+3745 | RA: 07 17 32.9300 (109.3872083d)<br>Dec: +37 45 5.40 (37.75150d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.548 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (4) MACSJ0717+3745 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 559.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (4) MACSJ0717+3745 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 559.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (4) MACSJ0717+3745 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 559.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (4) MACSJ0717+3745 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 559.0 Secs<br>*[==>]* | <br>***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 05, completed** Sat Nov 18 02:03:23 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 29.0D TO 59.0 D; ORIENT 119.0D TO 149.0 D; ORIENT 209.0D TO 239.0 D; ORIENT 299.0D TO 329.0 D

*Comments: Orient requirements relaxed from +/-3 degrees to +/-15 degrees to allow schedulability.*

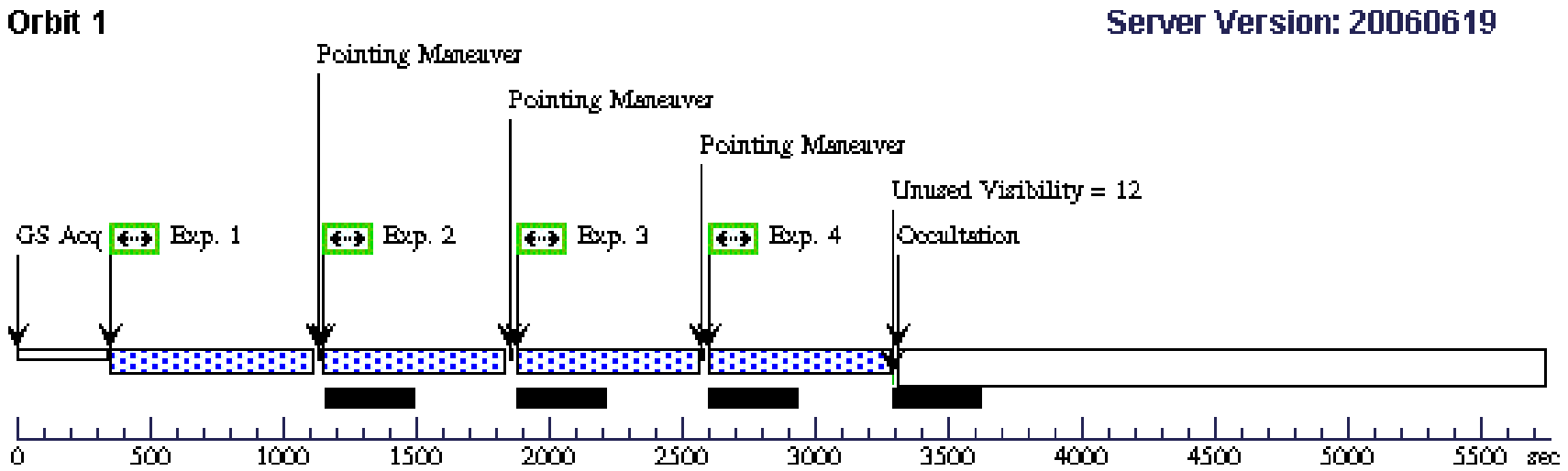
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (5) | MACSJ0744+3927 | RA: 07 44 52.5800 (116.2190833d)<br>Dec: +39 27 26.70 (39.45742d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.686 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (5) MACSJ0744+3927 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 559.0 Secs | |
| | | | | | | | | *[==>]* | ***[1]*** |
| 2 | exposure 2 | (5) MACSJ0744+3927 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 559.0 Secs | |
| | | | | | | | | *[==>]* | ***[1]*** |
| 3 | exposure 3 | (5) MACSJ0744+3927 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 559.0 Secs | |
| | | | | | | | | *[==>]* | ***[1]*** |
| 4 | exposure 4 | (5) MACSJ0744+3927 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 559.0 Secs | |
| | | | | | | | | *[==>]* | ***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 06, completed** Sat Nov 18 02:03:24 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 15.0D TO 21.0 D; ORIENT 105.0D TO 111.0 D; ORIENT 195.0D TO 201.0 D; ORIENT 285.0D TO 291.0 D

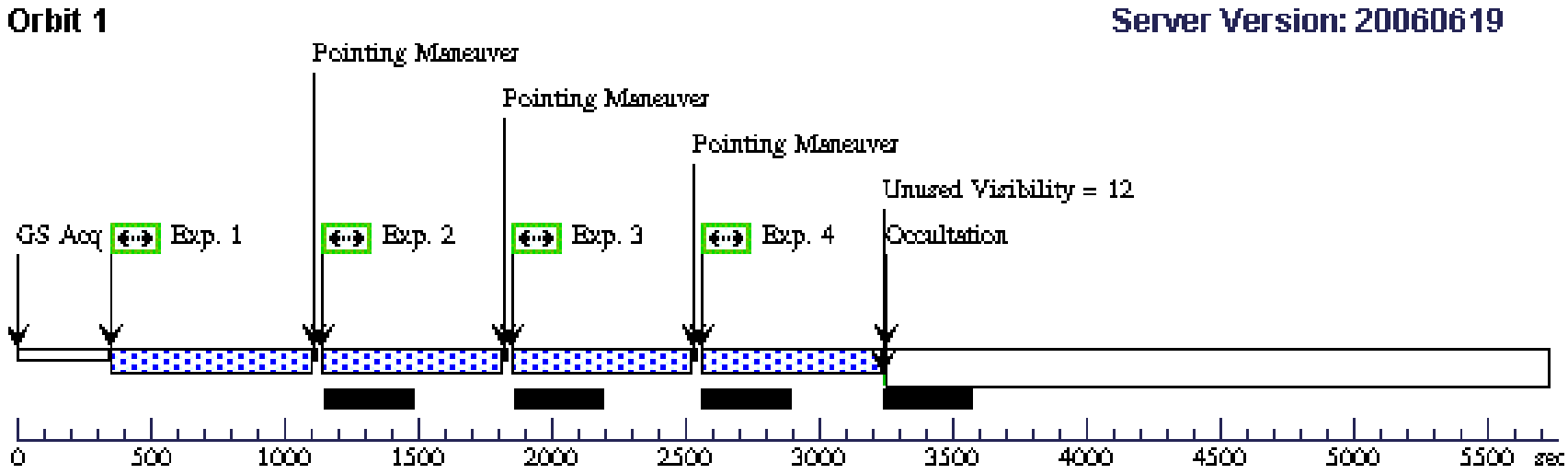
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (6) | MACSJ0911+1746 | RA: 09 11 11.1800 (137.7965833d)<br>Dec: +17 46 34.80 (17.77633d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.504 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (6) MACSJ0911+1746 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 545.0 Secs<br>*[==>]* | *[1]* |
| 2 | exposure 2 | (6) MACSJ0911+1746 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | *[1]* |
| 3 | exposure 3 | (6) MACSJ0911+1746 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | *[1]* |
| 4 | exposure 4 | (6) MACSJ0911+1746 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | *[1]* |

## Orbit Structure



## Visit

**Proposal 10493, Visit 07, completed** Sat Nov 18 02:03:25 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 40.0D TO 46.0 D; ORIENT 130.0D TO 136.0 D; ORIENT 220.0D TO 226.0 D; ORIENT 310.0D TO 316.0 D

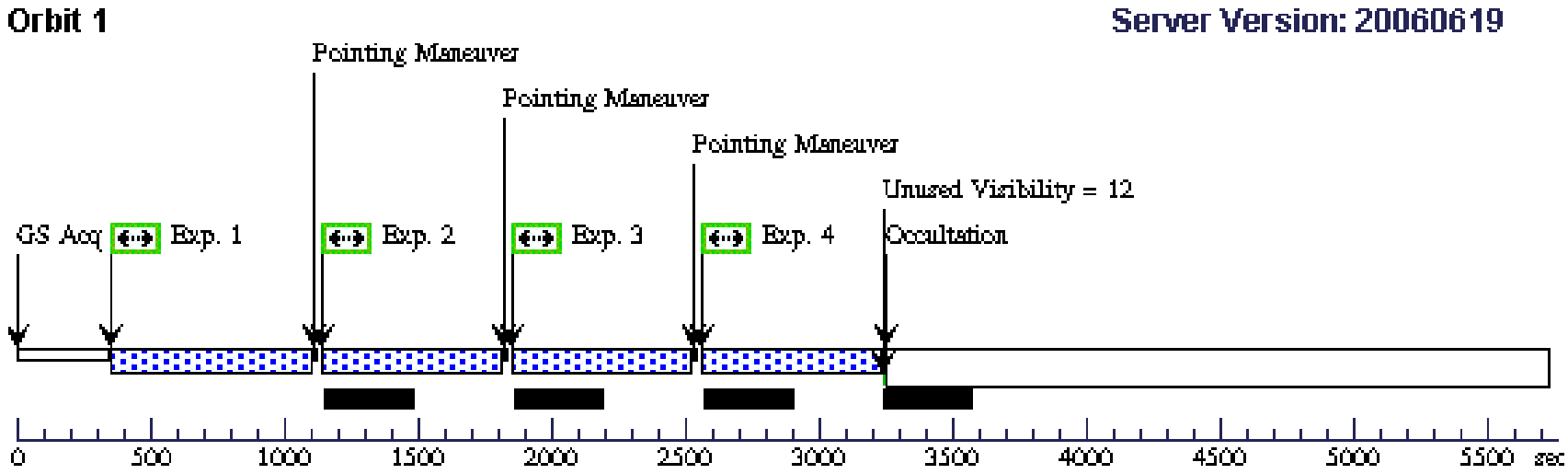
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (7) | MACSJ1149+2223 | RA: 11 49 35.5100 (177.3979583d)<br>Dec: +22 24 4.20 (22.40117d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.544 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (7) MACSJ1149+2223 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (7) MACSJ1149+2223 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (7) MACSJ1149+2223 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (7) MACSJ1149+2223 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 08, completed** Sat Nov 18 02:03:26 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 42.0D TO 48.0 D; ORIENT 132.0D TO 138.0 D; ORIENT 222.0D TO 228.0 D; ORIENT 312.0D TO 318.0 D

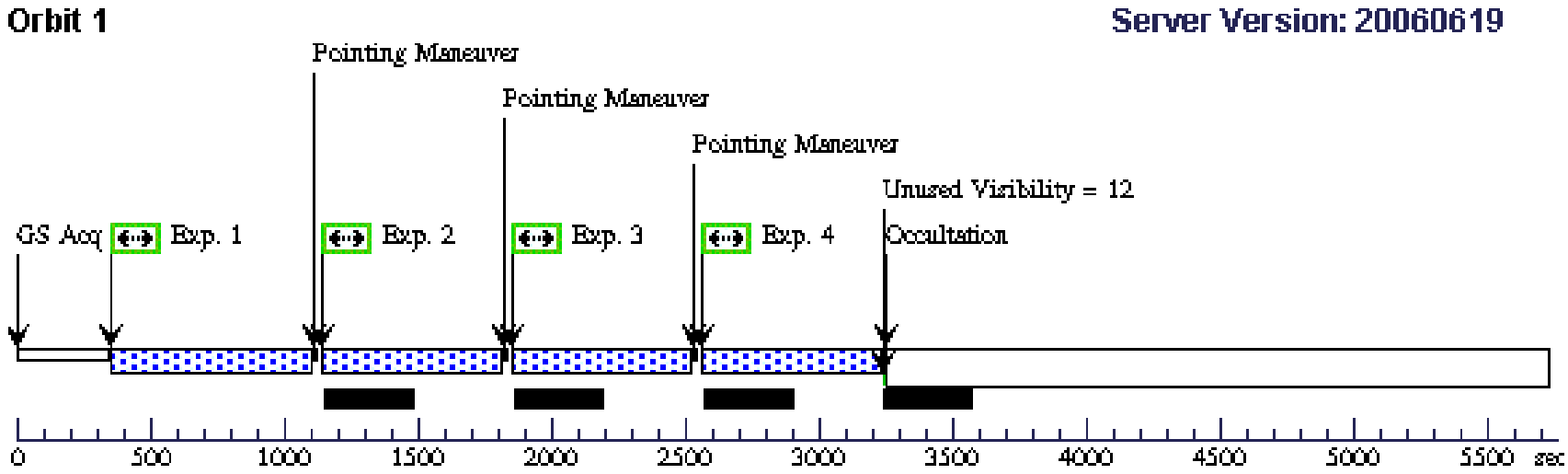
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (8) | MACSJ1423+2404 | RA: 14 23 48.6000 (215.9525000d)<br>Dec: +24 04 49.10 (24.08031d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.545 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (8) MACSJ1423+2404 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (8) MACSJ1423+2404 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (8) MACSJ1423+2404 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (8) MACSJ1423+2404 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 09, completed** Sat Nov 18 02:03:27 GMT 2006

**Diagnostic Status: Warning**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 357.0D TO 3.0 D; ORIENT 87.0D TO 93.0 D; ORIENT 177.0D TO 183.0 D; ORIENT 267.0D TO 273.0 D

## Diagnostics

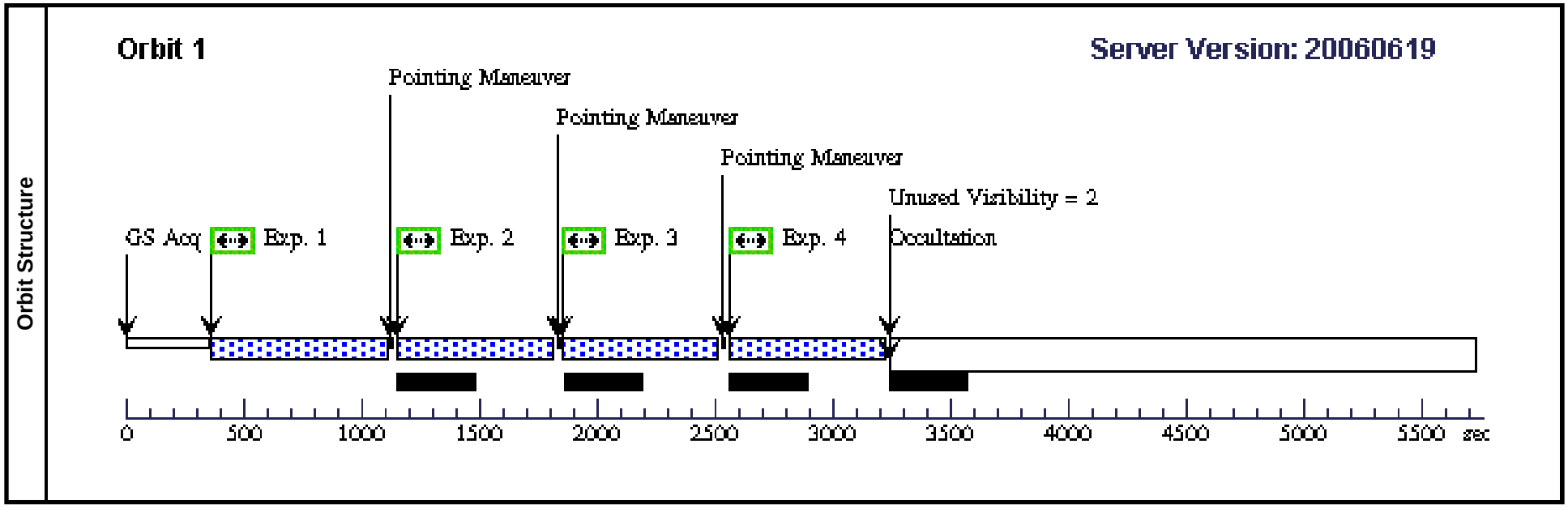
(Visit 09) Warning: GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (9) | MACSJ2129-0741 | RA: 21 29 26.3000 (322.3595833d)<br>Dec: -07 41 26.20 (-7.69061d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.570 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (9) MACSJ2129-0741 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0;<br>GS ACQ SCENARIO BASE13GO | Sequence 1-4 Non-Int | 542.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (9) MACSJ2129-0741 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 542.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (9) MACSJ2129-0741 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 542.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (9) MACSJ2129-0741 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 542.0 Secs<br>*[==>]* | <br>***[1]*** |


Orbit Structure
Orbit 1
Server Version: 20060619
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 2
GS Acq
Exp. 1
Exp. 2
Exp. 3
Exp. 4
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

## Visit

**Proposal 10493, Visit 10, completed** Sat Nov 18 02:03:28 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 65.0D TO 71.0 D; ORIENT 155.0D TO 161.0 D; ORIENT 245.0D TO 251.0 D; ORIENT 335.0D TO 341.0 D

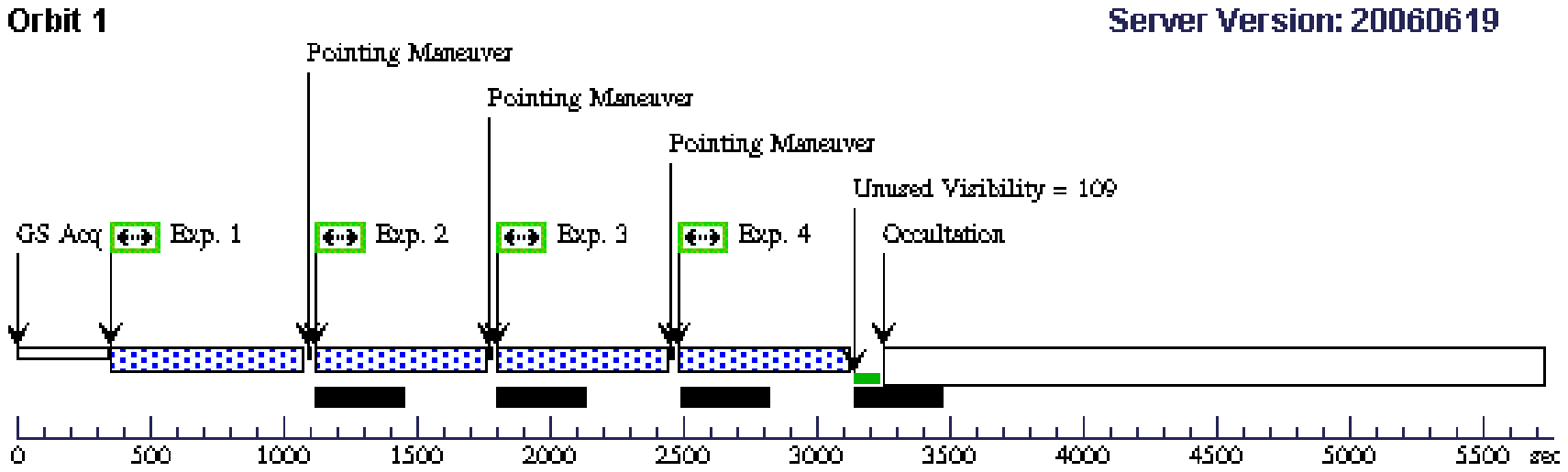
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (10) | MACSJ2214-1359 | RA: 22 14 57.3400 (333.7389167d)<br>Dec: -14 00 12.20 (-14.00339d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.504 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (10) MACSJ2214-1359 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 520.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (10) MACSJ2214-1359 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 520.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (10) MACSJ2214-1359 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 520.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (10) MACSJ2214-1359 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 520.0 Secs<br>*[==>]* | <br>***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 11, completed** Sat Nov 18 02:03:29 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 71.0D TO 77.0 D; ORIENT 161.0D TO 167.0 D; ORIENT 251.0D TO 257.0 D; ORIENT 341.0D TO 347.0 D

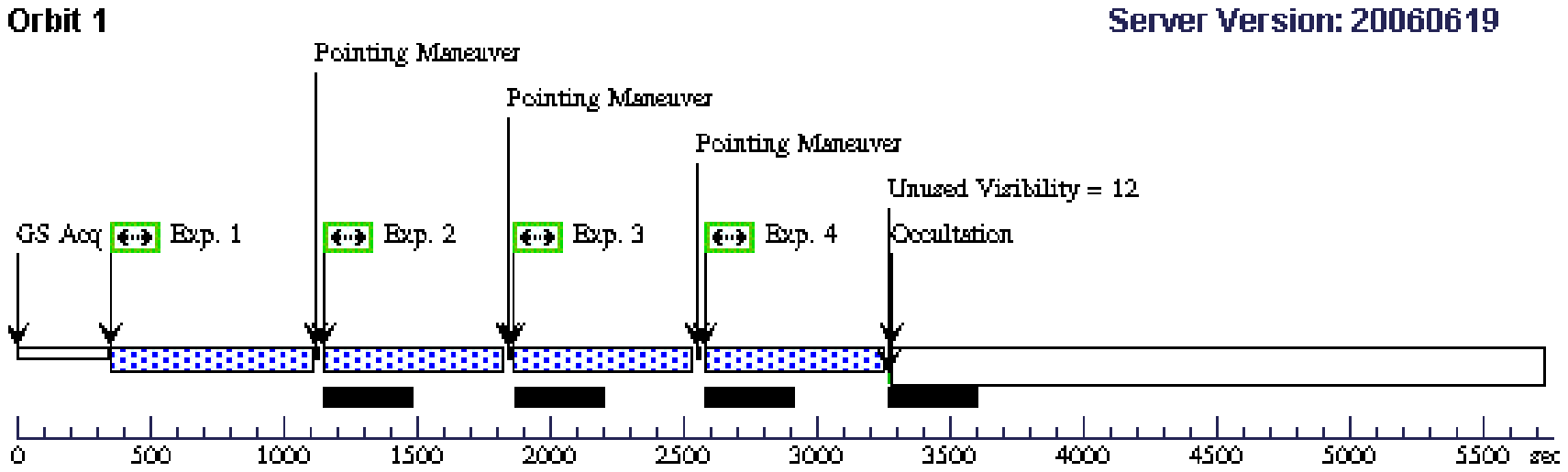
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (11) | CLJ1226.9+3332 | RA: 12 26 58.2100 (186.7425417d)<br>Dec: +33 32 49.40 (33.54706d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.888 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (11) CLJ1226.9+3332 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 553.0 Secs<br>*[==>]* | *[1]* |
| 2 | exposure 2 | (11) CLJ1226.9+3332 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 552.0 Secs<br>*[==>]* | *[1]* |
| 3 | exposure 3 | (11) CLJ1226.9+3332 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 552.0 Secs<br>*[==>]* | *[1]* |
| 4 | exposure 4 | (11) CLJ1226.9+3332 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 552.0 Secs<br>*[==>]* | *[1]* |

## Orbit Structure



## Visit

**Proposal 10493, Visit 12, completed** Sat Nov 18 02:03:30 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 35.0D TO 41.0 D; ORIENT 125.0D TO 131.0 D; ORIENT 215.0D TO 221.0 D; ORIENT 305.0D TO 311.0 D

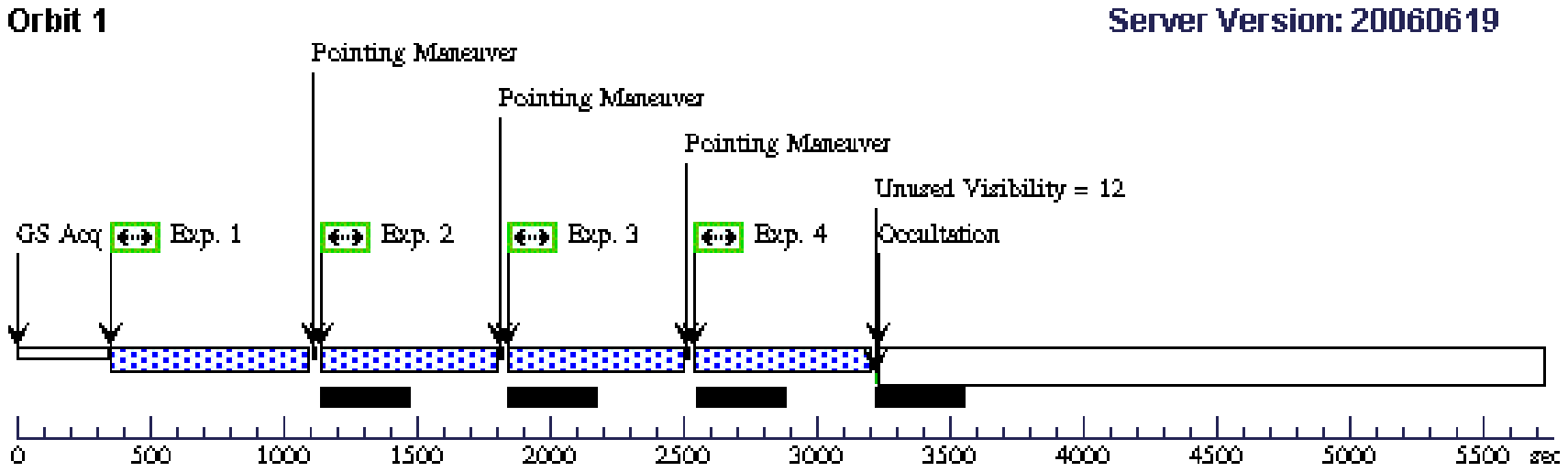
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (12) | MS1054.4-0321 | RA: 10 57 0.2000 (164.2508333d)<br>Dec: -03 37 27.00 (-3.62417d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.83 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (12) MS1054.4-0321 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 540.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (12) MS1054.4-0321 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 540.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (12) MS1054.4-0321 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 540.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (12) MS1054.4-0321 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 542.0 Secs<br>*[==>]* | <br>***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 13, completed** Sat Nov 18 02:03:31 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 65.0D TO 71.0 D; ORIENT 155.0D TO 161.0 D; ORIENT 245.0D TO 251.0 D; ORIENT 335.0D TO 341.0 D

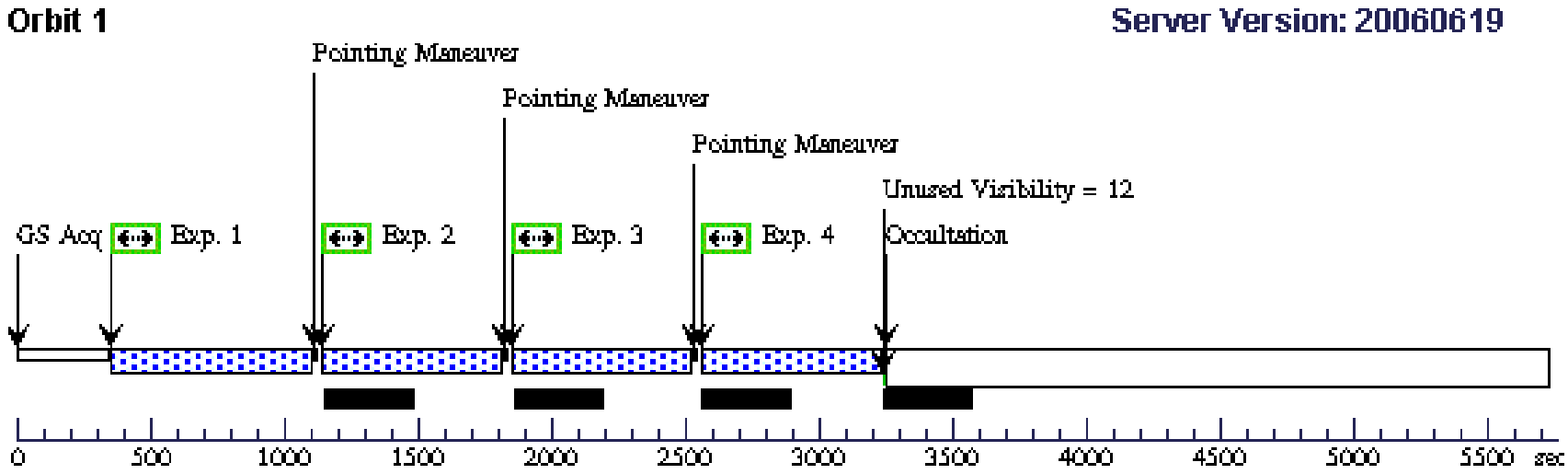
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (13) | MS0016.5+1654 | RA: 00 18 32.8000 (4.6366667d)<br>Dec: +16 26 6.90 (16.43525d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.54 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (13) MS0016.5+1654 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 545.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (13) MS0016.5+1654 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (13) MS0016.5+1654 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (13) MS0016.5+1654 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 14, completed** Sat Nov 18 02:03:31 GMT 2006

**Diagnostic Status: No Diagnostics**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 58.0D TO 63.0 D; ORIENT 148.0D TO 153.0 D; ORIENT 238.0D TO 243.0 D; ORIENT 328.0D TO 333.0 D

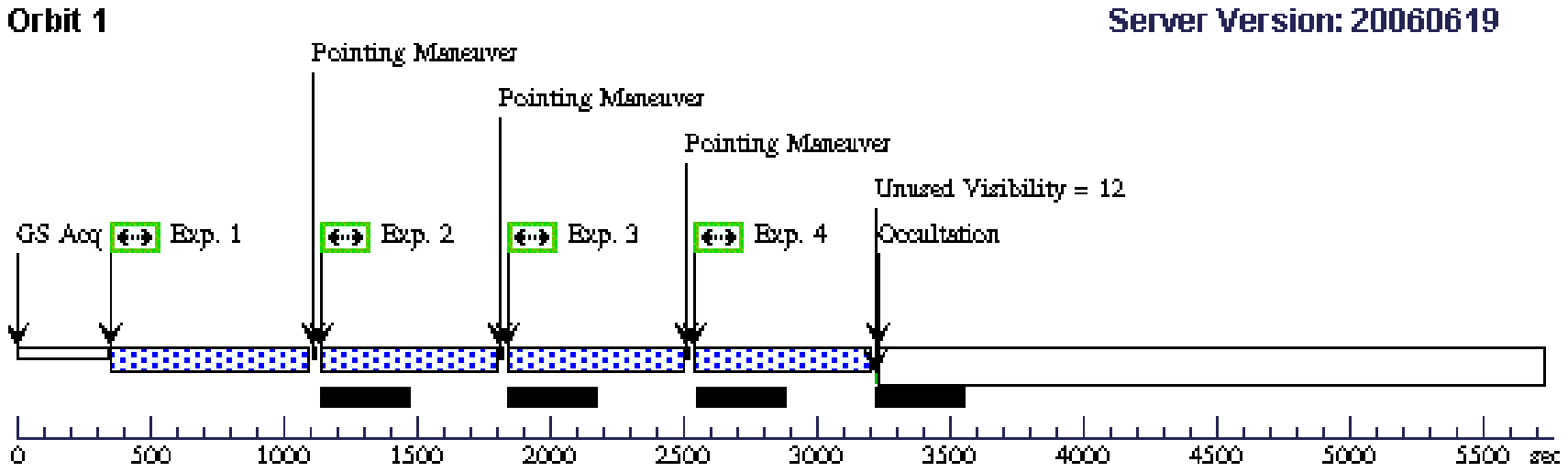
## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (14) | MS0451.6-0305 | RA: 04 54 10.4800 (73.5436667d)<br>Dec: -03 01 38.50 (-3.02736d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0+/-2.0<br>z=0.55 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (14) MS0451.6-0305 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 0,0 | Sequence 1-4 Non-Int | 540.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (14) MS0451.6-0305 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 540.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (14) MS0451.6-0305 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 540.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (14) MS0451.6-0305 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 542.0 Secs<br>*[==>]* | <br>***[1]*** |

## Orbit Structure



## Visit

**Proposal 10493, Visit 15, completed** Sat Nov 18 02:03:32 GMT 2006

**Diagnostic Status: Warning**

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 40.0D TO 50.0 D; ORIENT 130.0D TO 140.0 D; ORIENT 220.0D TO 230.0 D; ORIENT 310.0D TO 320.0 D

*Comments: Orient requirements relaxed from +/-3 degrees to +/- 5 degrees to allow schedulability.*

## Diagnostics

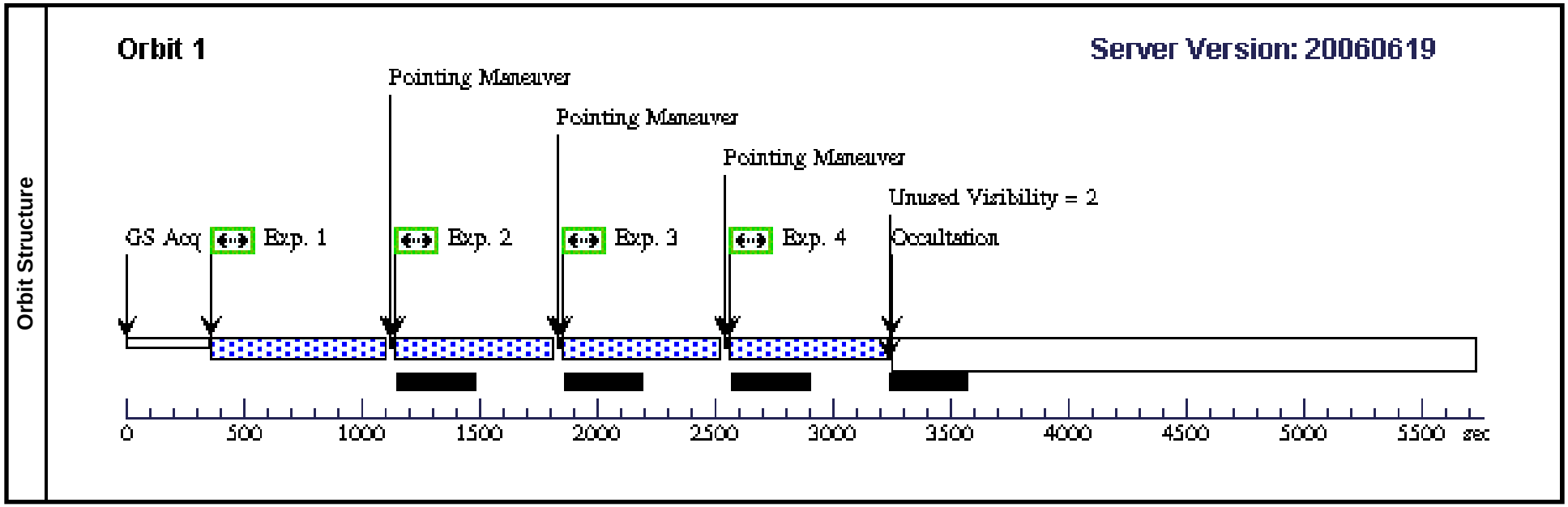
(Visit 15) Warning: GS ACQ SCENARIO REQUESTED INCONSISTENT WITH VISIT GYRO MODE

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (15) | CL0152-1357 | RA: 01 52 43.0000 (28.1791667d)<br>Dec: -13 57 20.00 (-13.95556d)<br>Equinox: J2000<br>Plate Id: (?) | | V=25.0<br>z=0.831 | Coordinate Source: HST_IMAGE |

## Exposures

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Exposure 1 | (15) CL0152-1357 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 0,0;<br>GS ACQ SCENARIO BASE13GO | Sequence 1-4 Non-Int | 539.0 Secs<br>*[==>]* | <br>***[1]*** |
| 2 | exposure 2 | (15) CL0152-1357 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 3.76,3.71 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 3 | exposure 3 | (15) CL0152-1357 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 7.495,7.47 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |
| 4 | exposure 4 | (15) CL0152-1357 | ACS/WFC, ACCUM, WFC | F775W | CR-SPLIT=NO | POS TARG 11.255,11.18 | Sequence 1-4 Non-Int | 546.0 Secs<br>*[==>]* | <br>***[1]*** |


Orbit Structure
Orbit 1
Server Version: 20060619
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 2
GS Acq
Exp. 1
Exp. 2
Exp. 3
Exp. 4
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec