# 15131 - The first near-infrared reflectance spectrum of an exoplanet

Cycle: 25, Proposal Category: GO

(Availability Mode: SUPPORTED)

**INVESTIGATORS**



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|---|---|---|
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**VISITS**

| *Visit* | *Targets used in Visit* | *Configurations used in Visit* | *Orbits Used* | *Last Orbit Planner Run* | *OP Current with Visit?* |
|---|---|---|---|---|---|
| 01 | (1) TYC-5165-481-1 | WFC3/IR | 4 | 17-May-2019 08:00:37.0 | yes |
| 02 | (1) TYC-5165-481-1 | WFC3/IR | 4 | 17-May-2019 08:00:58.0 | yes |
| 03 | (1) TYC-5165-481-1 | WFC3/IR | 4 | 17-May-2019 08:01:20.0 | yes |
| 04 | (1) TYC-5165-481-1 | WFC3/IR | 4 | 17-May-2019 08:01:40.0 | yes |

| *Visit* | *Targets used in Visit* | *Configurations used in Visit* | *Orbits Used* | *Last Orbit Planner Run* | *OP Current with Visit?* |
|---|---|---|---|---|---|
| 05 | (1) TYC-5165-481-1 | WFC3/IR | 4 | 17-May-2019 08:02:01.0 | yes |

20 Total Orbits Used

**ABSTRACT**

Amongst the important results that came out in the field of exoplanetology is that clouds and hazes in exoplanet atmospheres seem to be ubiquitous. Their presence provides important information on the chemistry and composition of atmospheres, and have major impact on planets' energy budgets and evolutions. Aerosols are also important observationally because they prevent probing deeper atmospheric composition, and they have been the common interpretation in a long list of published featureless transmission spectra. However, none of these indirect detections can definitely confirm or deny the presence of aerosols; thus, we propose a program that will change our view on aerosols by looking at their reflectivity.

Theoretical models and laboratory experiments have long speculated on the origins and properties of aerosols in exoplanet atmospheres. More recent studies have shown that photochemical hazes can be very reflective in the near-Infrared (NIR) for planets cooler than 900 K. We propose to tackle this revolutionizing idea by pioneering an observational program that will both test these new models and provide a novel way to study atmospheres of exoplanets.

We will look for reflective hazes in the NIR with WFC3 and deliver the first geometric albedo spectrum (Ag) of an exoplanet: WASP-80b. We will measure expected reflectivity (Ag=0.5) at high level of confidence (7-Sigma), and put stringent limits on haze models. This program will provide a pathway towards the study of exoplanets around low mass-stars through their reflectivity, which is urgent since these will be the golden targets for JWST. Only HST can provide the required precision for such an experiment.

**OBSERVING DESCRIPTION**

We propose to obtain time-series spectroscopy of the  planet Wasp-80b (Hmag=8.5) during secondary eclipse using HST/WFC3, in order to measure its wavelength dependent spectrum of the planet.

We will observe five secondary eclipses of the planet (5 visits), containing each 4 consecutive HST orbits,

We will use the WFC3/IR instrument with the G141 grism to measure the spectrum of the planet from 1.1-1.7~\micron. We will use the 256 x 256 subarray with SAMP-SEQ=SPARS10, NSAMP=15 (total time per exposure of 103 s) and the spatial scan mode with bi-directional scans to maximize the duty cycle (expected to be 73\%). We will use a scan rate of 0.22"/s, which will give peak counts of roughly 22~ke$^{-}$/pixel and a

scan height of about 190 pixels. The scan will fit comfortably in the 256 subarray and leave plenty of empty detector space to estimate the background.

A total of 19 exposures will be obtained in each orbit (18 for the first orbit of each visit, allowing for a F139M direct image for the wavelength calibration), and one orbit during each visit will occur during the secondary eclipse, and the remaining 3 orbits will be outside eclipse and used for normalization of the light curve.

**Visit**

**Proposal 15131, WASP-80 (01), implementation** Fri May 17 12:02:03 GMT 2019

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR

Special Requirements: GUID TOL 0.05"; SCHED 90%; ORIENT 330D TO 45 D; ORIENT 150D TO 220 D; Period 3.06785234 D AND ZERO-PHASE HJD2456487.425006

**Fixed Targets**

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | TYC-5165-481-1 | RA: 20 12 40.1656 (303.1673567d)<br>Dec: -02 08 39.19 (-2.14422d)<br>Equinox: J2000 | | V=11.939 | Reference Frame: SIMBAD |

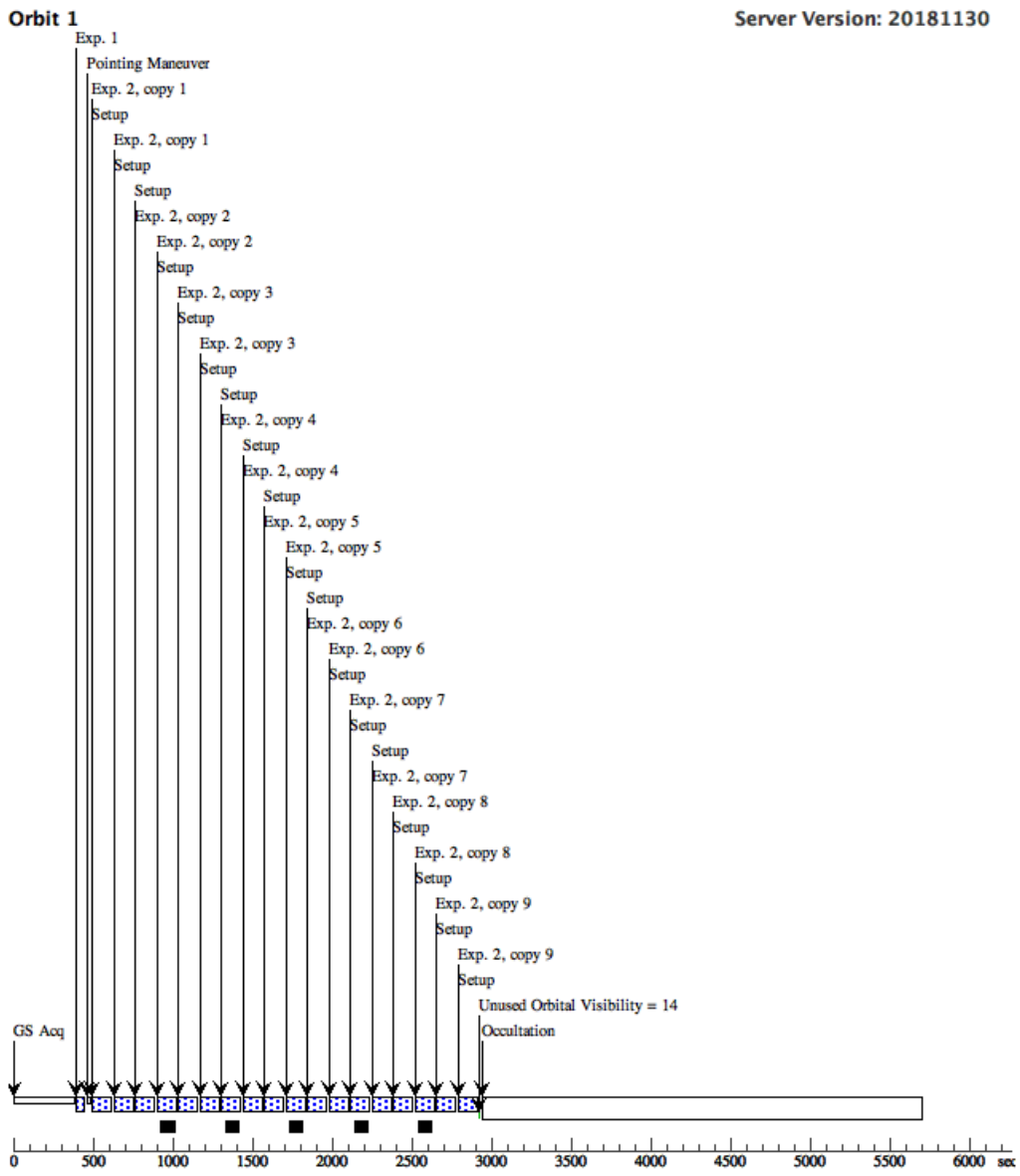
*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=STAR*
*Description=[EXTRA-SOLAR PLANET]*

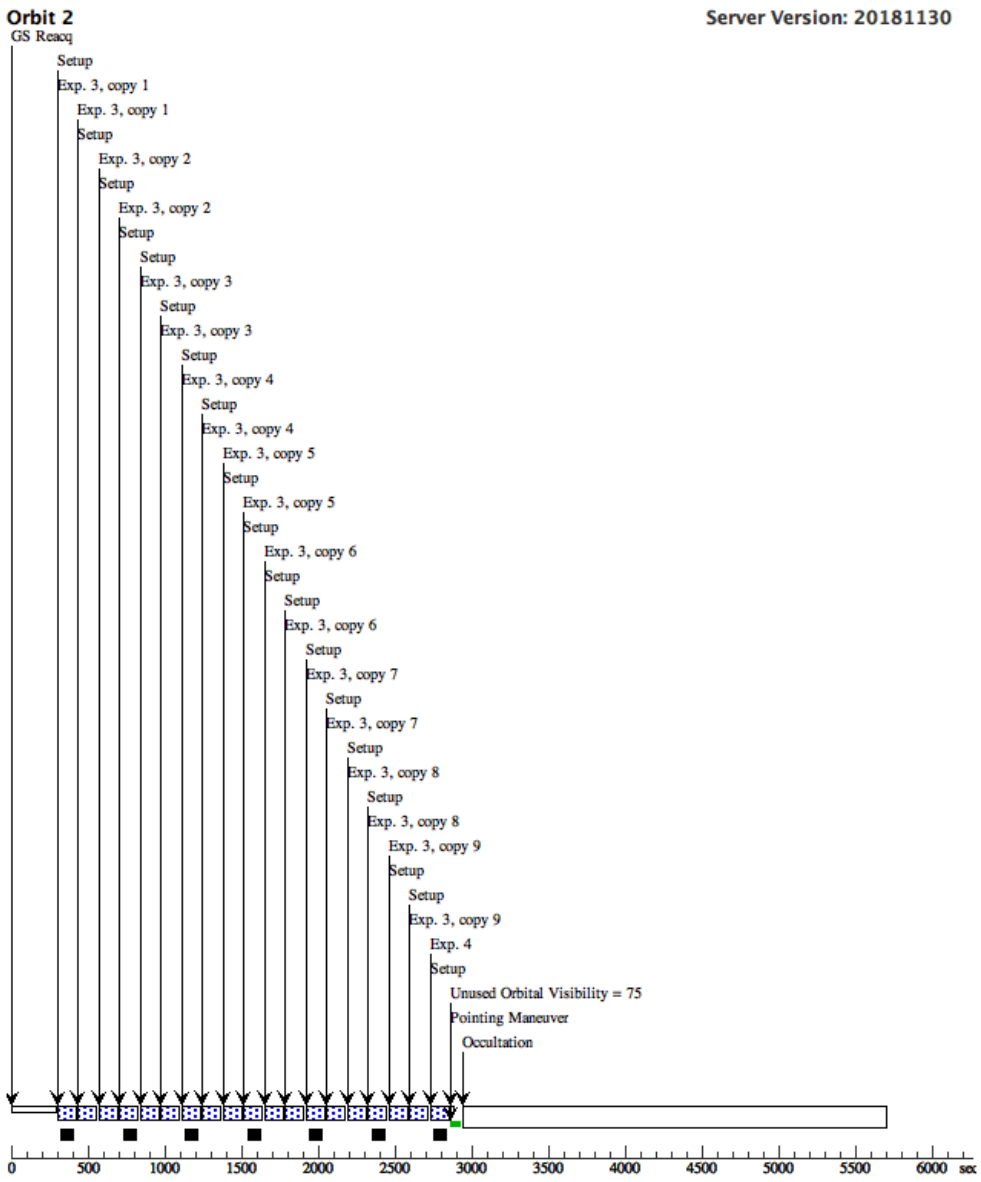
## Exposures

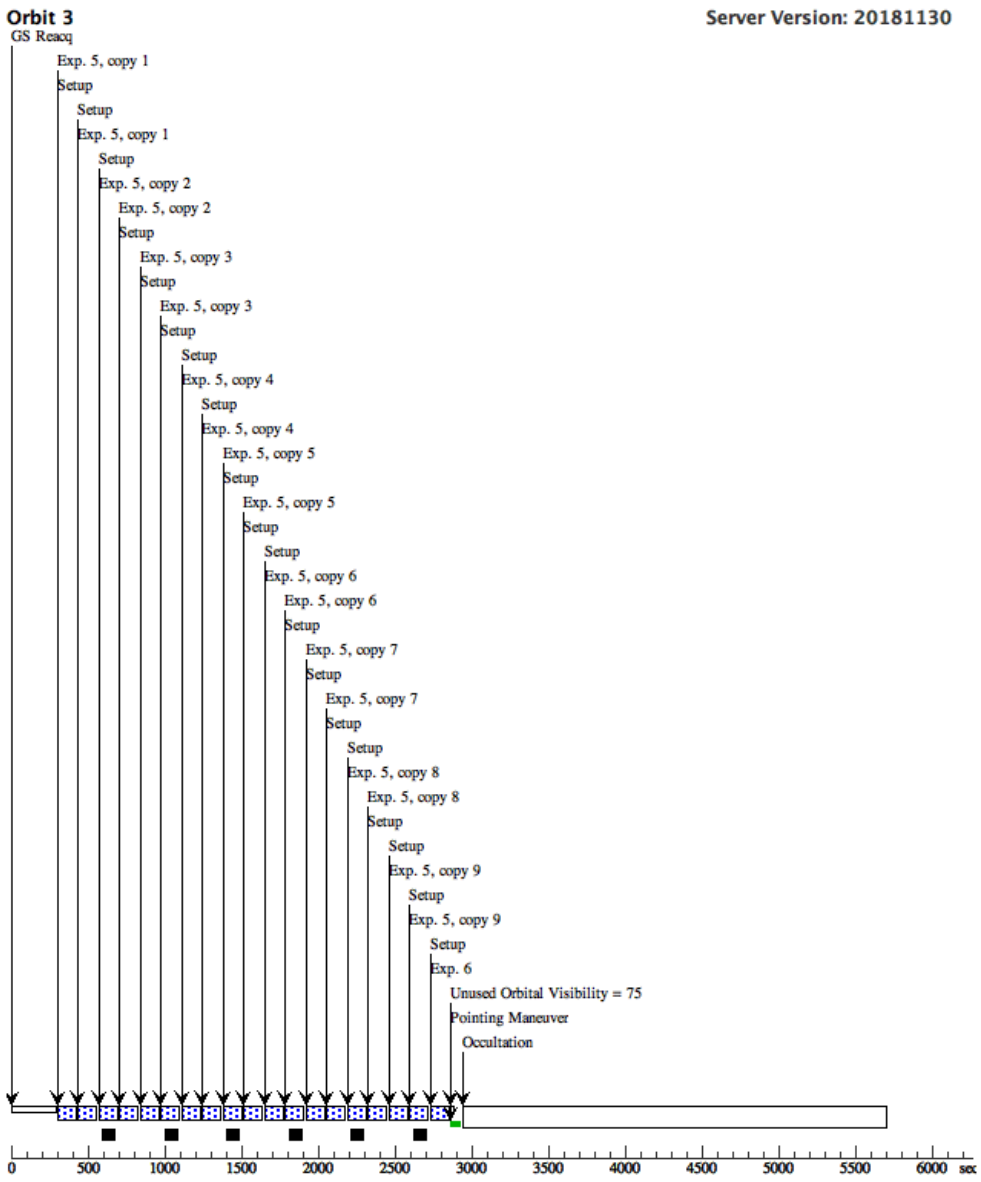
| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, IRSUB256 | F139M | SAMP-SEQ=SPARS10; NSAMP=5 | POS TARG 0.0,0.0; PHASE 0.448 TO 0.46 | Sequence 1-2 Non-Int in WASP-80 (01) | 29.663763 Secs (29.664 Secs)<br>*[==>]* | ***[1]*** |
| 2 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=14 | POS TARG 0,-14; SPATIAL SCAN 0.22,90.0 Degrees,Round trip | Sequence 1-2 Non-Int in WASP-80 (01) | 95.782146 Secs X 9 (1724.079 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[1]*** |
| 3 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=14 | POS TARG 0,-14; SPATIAL SCAN 0.22,90.0 Degrees,Round trip | Sequence 3-4 Non-Int in WASP-80 (01) | 95.782146 Secs X 9 (1724.079 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[2]*** |
| 4 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=14 | POS TARG 0,-14; SPATIAL SCAN 0.22,90.0 Degrees,Forward | Sequence 3-4 Non-Int in WASP-80 (01) | 95.782146 Secs (95.782 Secs)<br>*[==>]* | ***[2]*** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 5 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 5-6 Non-Int in WASP-80 (01) | 95.782146 Secs X 9 (1724.079 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[3]*** |
| | 6 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Forward | Sequence 5-6 Non-Int in WASP-80 (01) | 95.782146 Secs (95.782 Secs)<br>*[==>]* | ***[3]*** |
| | 7 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 7-8 Non-Int in WASP-80 (01) | 95.782146 Secs X 9 (1724.079 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[4]*** |
| | 8 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Forward | Sequence 7-8 Non-Int in WASP-80 (01) | 95.782146 Secs (95.782 Secs)<br>*[==>]* | ***[4]*** |

**Orbit Structure**




Orbit 2
Server Version: 20181130
GS Reacq
Setup
Exp. 3, copy 1
Exp. 3, copy 1
Setup
Exp. 3, copy 2
Setup
Exp. 3, copy 2
Setup
Setup
Exp. 3, copy 3
Setup
Exp. 3, copy 3
Setup
Exp. 3, copy 4
Setup
Exp. 3, copy 4
Exp. 3, copy 5
Setup
Exp. 3, copy 5
Setup
Exp. 3, copy 6
Setup
Setup
Exp. 3, copy 6
Setup
Exp. 3, copy 7
Setup
Exp. 3, copy 7
Setup
Exp. 3, copy 8
Setup
Exp. 3, copy 8
Exp. 3, copy 9
Setup
Setup
Exp. 3, copy 9
Exp. 4
Setup
Unused Orbital Visibility = 75
Pointing Maneuver
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec


Orbit 3
Server Version: 20181130
GS Reacq
Exp. 5, copy 1
Setup
Setup
Exp. 5, copy 1
Setup
Exp. 5, copy 2
Exp. 5, copy 2
Setup
Exp. 5, copy 3
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Exp. 5, copy 3
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Setup
Exp. 5, copy 4
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Exp. 5, copy 4
Exp. 5, copy 5
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Exp. 5, copy 5
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Exp. 5, copy 6
Exp. 5, copy 6
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Exp. 5, copy 7
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Exp. 5, copy 7
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Setup
Exp. 5, copy 8
Exp. 5, copy 8
Setup
Setup
Exp. 5, copy 9
Setup
Exp. 5, copy 9
Setup
Exp. 6
Unused Orbital Visibility = 75
Pointing Maneuver
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec


Orbit 4
Server Version: 20181130
GS Reacq
Exp. 7, copy 1
Setup
Exp. 7, copy 1
Setup
Exp. 7, copy 2
Setup
Exp. 7, copy 2
Setup
Setup
Exp. 7, copy 3
Exp. 7, copy 3
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Exp. 7, copy 4
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Exp. 7, copy 5
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Exp. 7, copy 6
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Setup
Exp. 7, copy 6
Exp. 7, copy 7
Setup
Exp. 7, copy 7
Setup
Exp. 7, copy 8
Setup
Exp. 7, copy 8
Setup
Setup
Exp. 7, copy 9
Setup
Exp. 7, copy 9
Exp. 8
Setup
Reconfig
Unused Orbital Visibility = 75
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

**Visit**

**Proposal 15131, WASP-80 (02), implementation** Fri May 17 12:02:04 GMT 2019

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR

Special Requirements: GUID TOL 0.05"; SCHED 90%; ORIENT 330D TO 45 D; ORIENT 150D TO 220 D; Period 3.06785234 D AND ZERO-PHASE HJD2456487.425006

**Fixed Targets**

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
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**Exposures**

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
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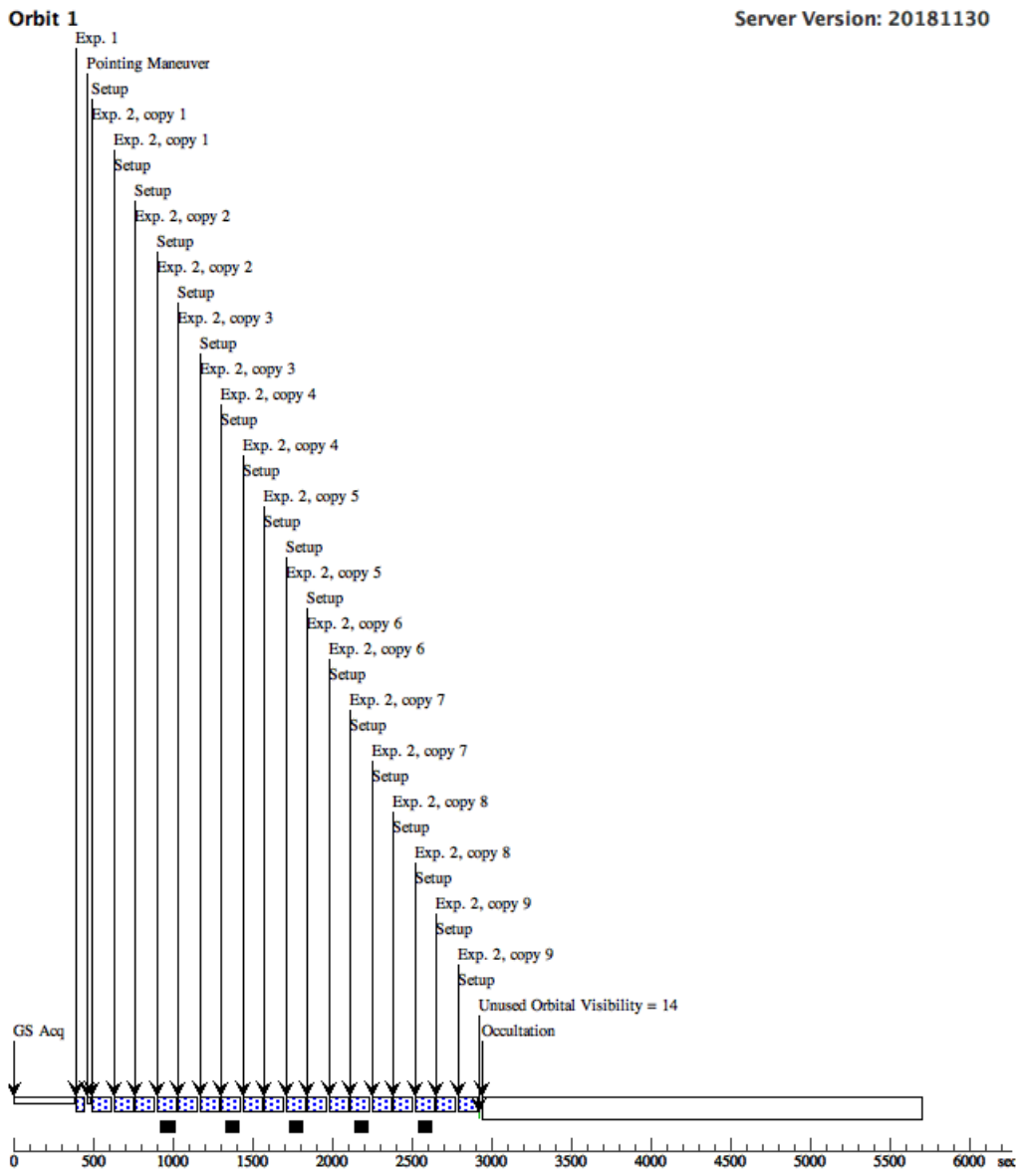
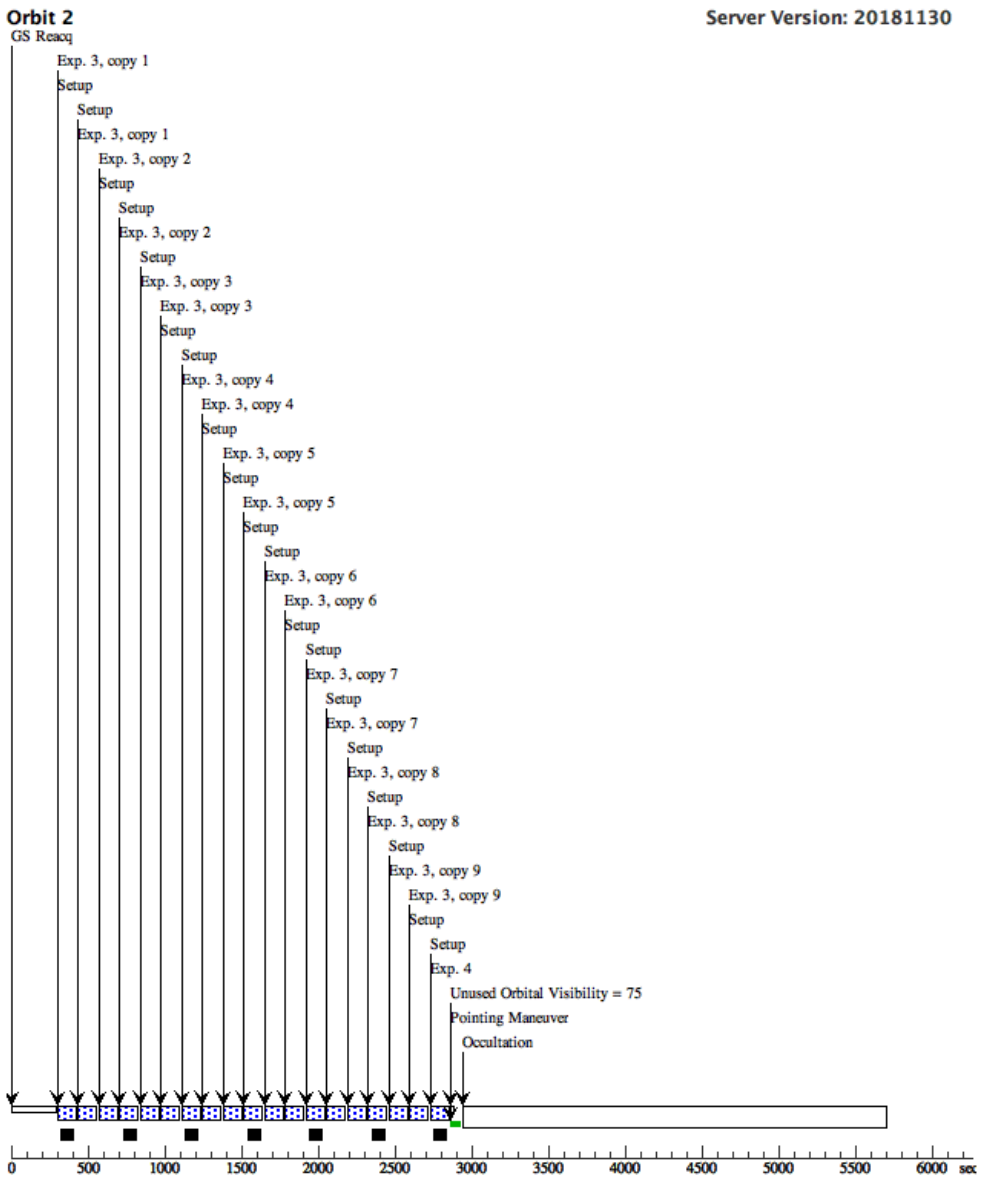
| 3 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Round trip | Sequence 3-4 Non-Int in WASP-80 (02) | 95.782146 Secs X 9 (1724.079 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | <br>***[2]*** |
| 4 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Forward | Sequence 3-4 Non-Int in WASP-80 (02) | 95.782146 Secs (95.782 Secs)<br>*[==>]* | <br>***[2]*** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 5 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Round trip | Sequence 5-6 Non-Int in WASP-80 (02) | 95.782146 Secs X 9 (1724.079 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[3]*** |
| | 6 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Forward | Sequence 5-6 Non-Int in WASP-80 (02) | 95.782146 Secs (95.782 Secs)<br>*[==>]* | ***[3]*** |
| | 7 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Round trip | Sequence 7-8 Non-Int in WASP-80 (02) | 95.782146 Secs X 9 (1724.079 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[4]*** |
| | 8 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=14 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Forward | Sequence 7-8 Non-Int in WASP-80 (02) | 95.782146 Secs (95.782 Secs)<br>*[==>]* | ***[4]*** |

**Orbit Structure**

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Exp. 3, copy 2
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Exp. 3, copy 4
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Exp. 3, copy 5
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Exp. 3, copy 5
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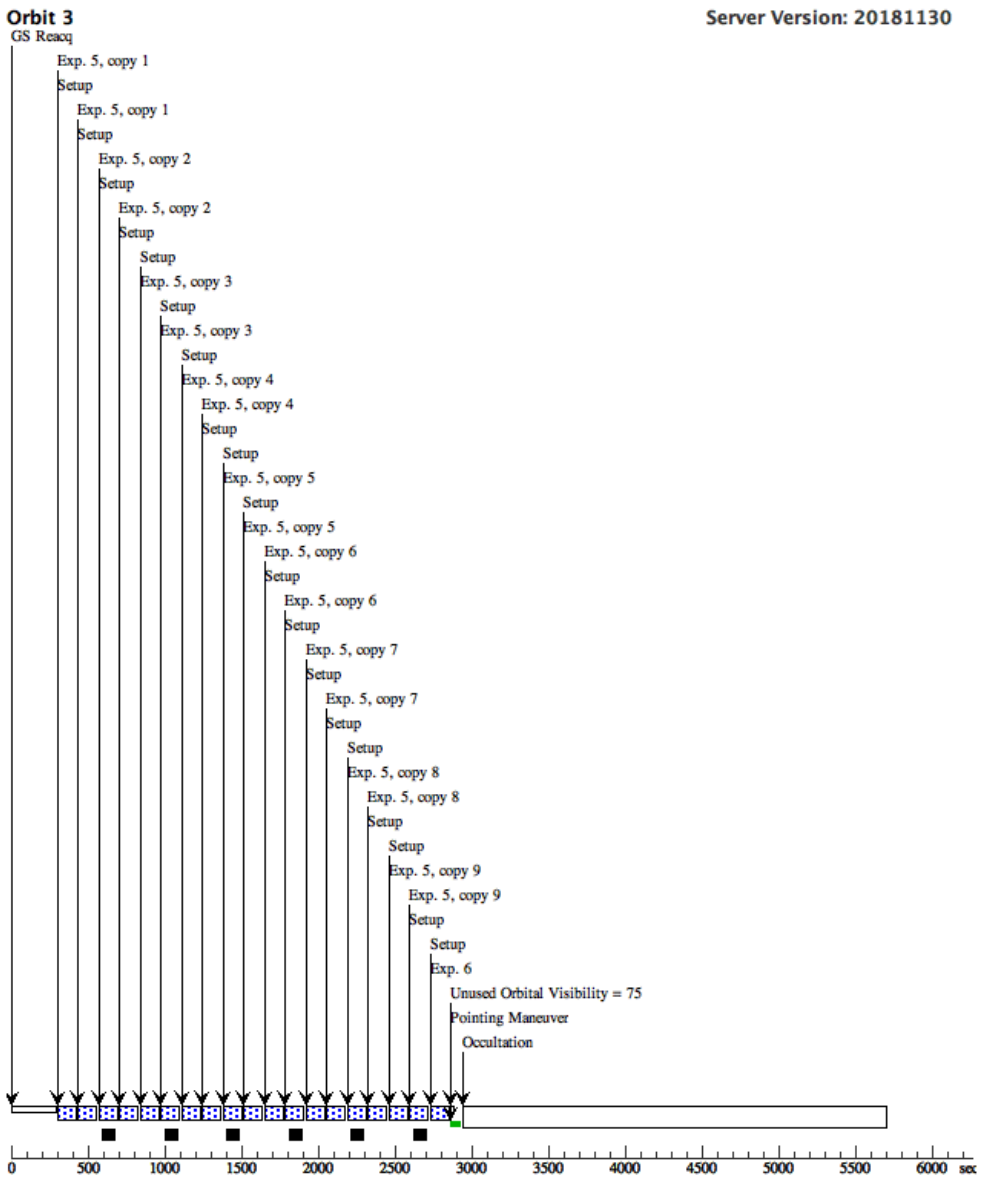
Exp. 3, copy 6
Exp. 3, copy 6
Setup
Setup
Exp. 3, copy 7
Setup
Exp. 3, copy 7
Setup
Exp. 3, copy 8
Setup
Exp. 3, copy 8
Setup
Exp. 3, copy 9
Exp. 3, copy 9
Setup
Setup
Exp. 4
Unused Orbital Visibility = 75
Pointing Maneuver
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec


Orbit 3
Server Version: 20181130
GS Reacq
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Exp. 5, copy 2
Setup
Setup
Exp. 5, copy 3
Setup
Exp. 5, copy 3
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Exp. 5, copy 4
Exp. 5, copy 4
Setup
Setup
Exp. 5, copy 5
Setup
Exp. 5, copy 5
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Exp. 5, copy 7
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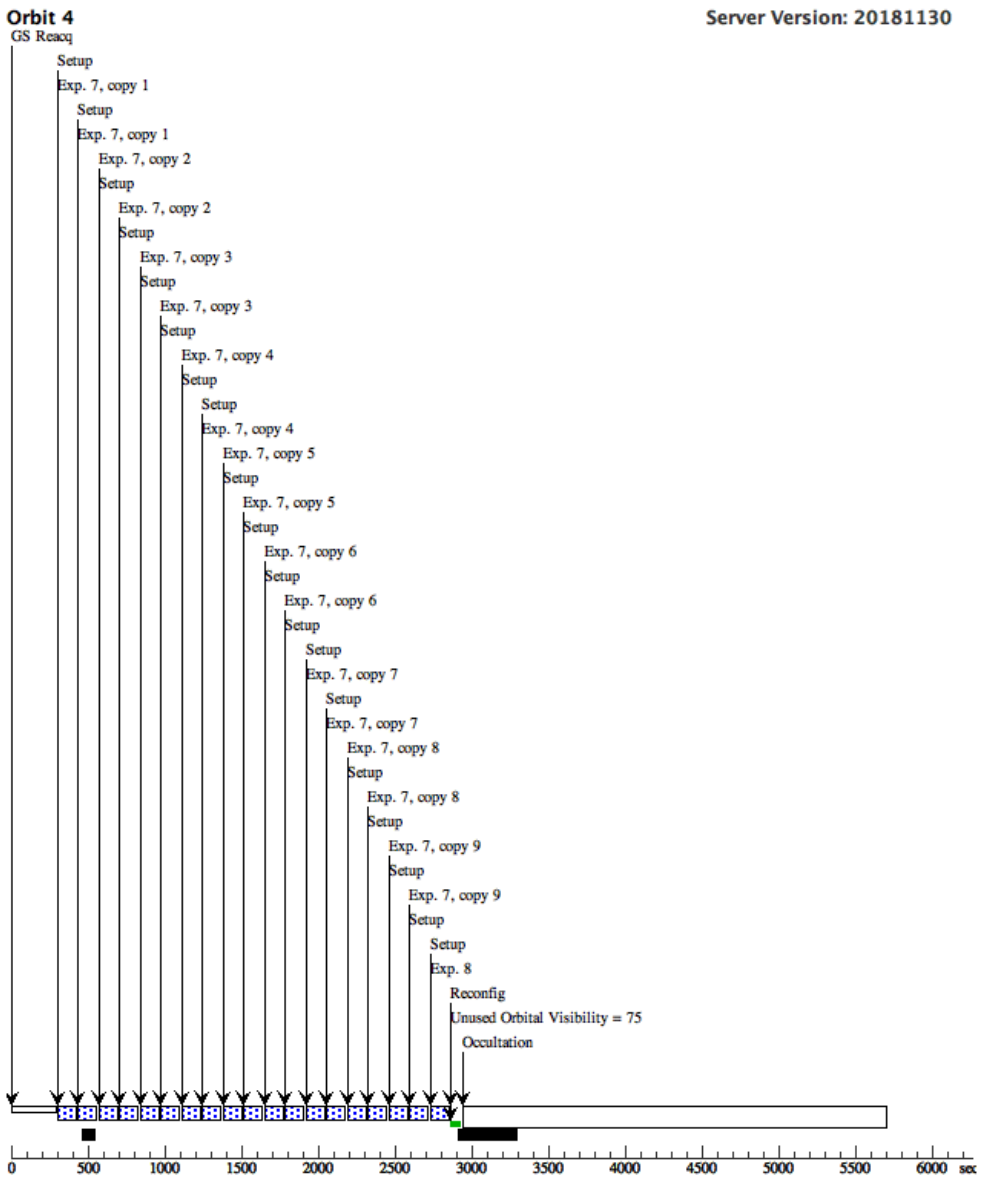
Setup
Exp. 5, copy 8
Exp. 5, copy 8
Setup
Setup
Exp. 5, copy 9
Exp. 5, copy 9
Setup
Setup
Exp. 6
Unused Orbital Visibility = 75
Pointing Maneuver
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec


Orbit 4
Server Version: 20181130
GS Reacq
Setup
Exp. 7, copy 1
Setup
Exp. 7, copy 1
Exp. 7, copy 2
Setup
Exp. 7, copy 2
Setup
Exp. 7, copy 3
Setup
Exp. 7, copy 3
Setup
Exp. 7, copy 4
Setup
Setup
Exp. 7, copy 4
Exp. 7, copy 5
Setup
Exp. 7, copy 5
Setup
Exp. 7, copy 6
Setup
Exp. 7, copy 6
Setup
Setup
Exp. 7, copy 7
Setup
Exp. 7, copy 7
Exp. 7, copy 8
Setup
Exp. 7, copy 8
Setup
Exp. 7, copy 9
Setup
Exp. 7, copy 9
Setup
Setup
Exp. 8
Reconfig
Unused Orbital Visibility = 75
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

**Visit**

**Proposal 15131, WASP-80 (03), implementation** Fri May 17 12:02:04 GMT 2019

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR

Special Requirements: GUID TOL 0.05"; SCHED 100%; ORIENT 330D TO 45 D; ORIENT 150D TO 220 D; Period 3.06785234 D AND ZERO-PHASE HJD2456487.425006

**Fixed Targets**

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | TYC-5165-481-1 | RA: 20 12 40.1656 (303.1673567d)<br>Dec: -02 08 39.19 (-2.14422d)<br>Equinox: J2000 | | V=11.939 | Reference Frame: SIMBAD |

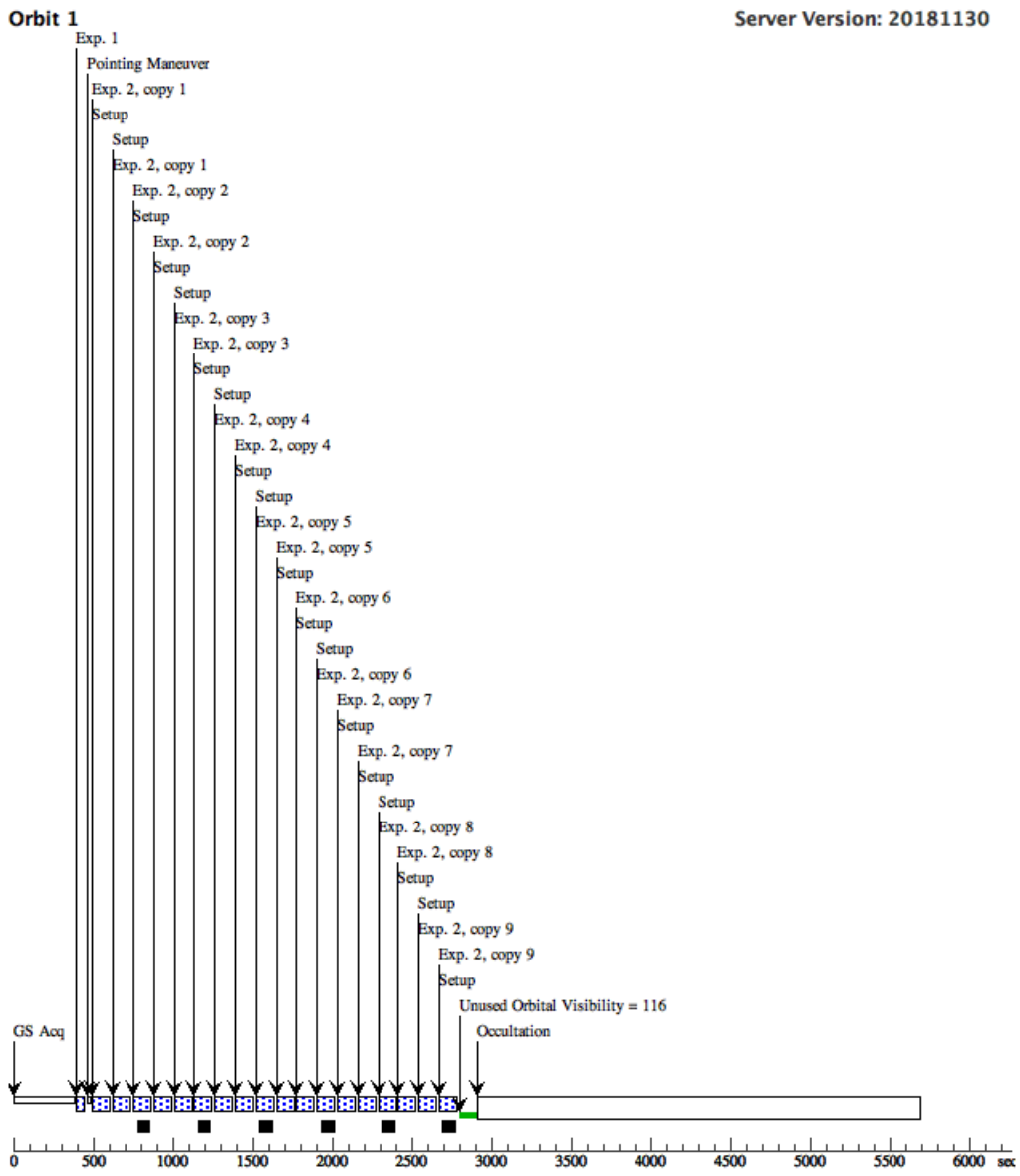
*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=STAR*
*Description=[EXTRA-SOLAR PLANET]*

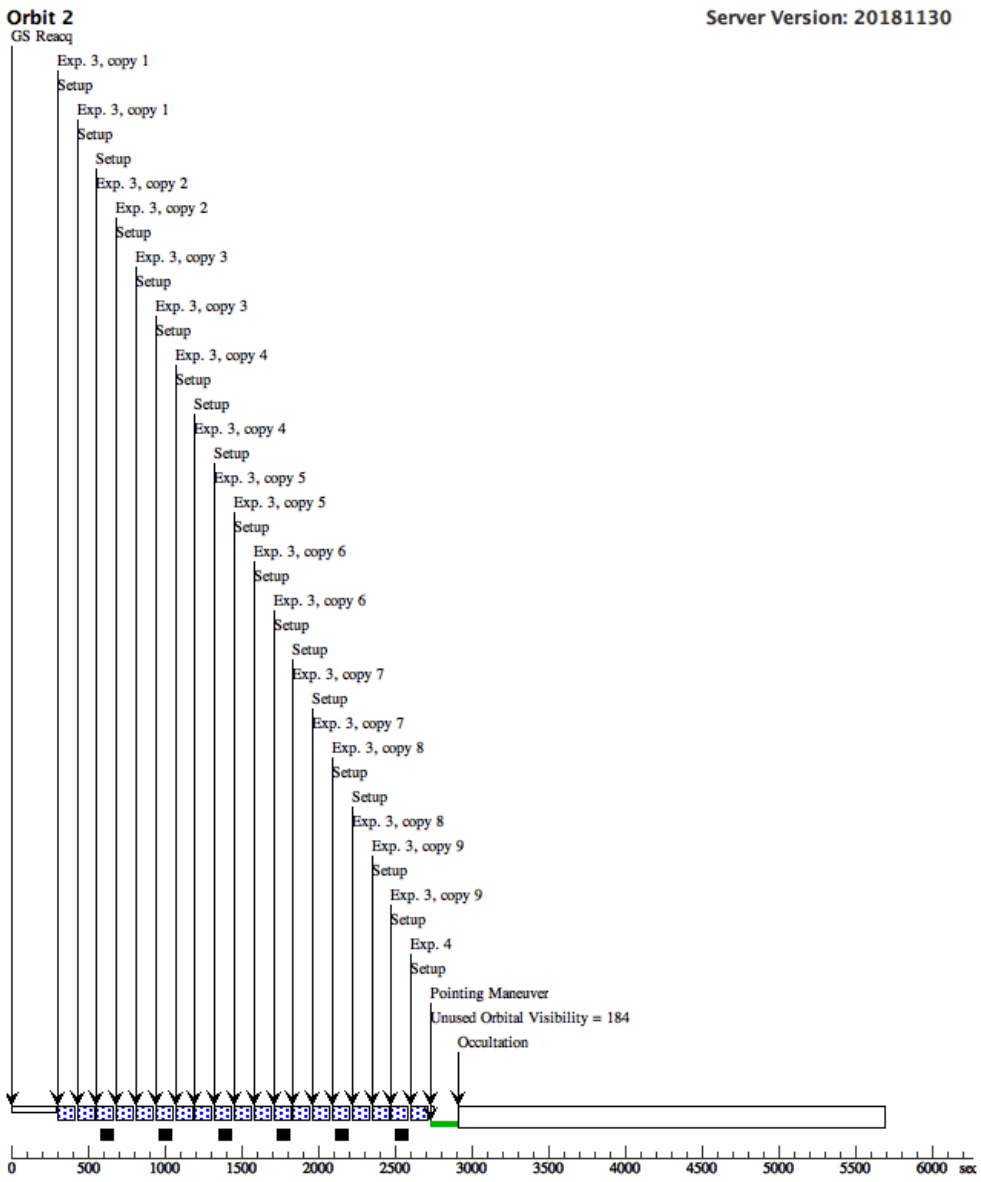
**Exposures**

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, IRSUB256 | F139M | SAMP-SEQ=SPARS10; NSAMP=5 | POS TARG 0.0,0.0; PHASE 0.447 TO 0.461 | Sequence 1-2 Non-Int in WASP-80 (03) | 29.663763 Secs (29.664 Secs)<br>*[==>]* | ***[1]*** |
| 2 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=13 | POS TARG 0,-14; SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 1-2 Non-Int in WASP-80 (03) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[1]*** |
| 3 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=13 | POS TARG 0,-14; SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 3-4 Non-Int in WASP-80 (03) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[2]*** |
| 4 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=13 | POS TARG 0,-14; SPATIAL SCAN 0.2 2,90.0 Degrees,Forward | Sequence 3-4 Non-Int in WASP-80 (03) | 88.435659 Secs (88.436 Secs)<br>*[==>]* | ***[2]*** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 5 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 5-6 Non-Int in WASP-80 (03) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[3]*** |
| | 6 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Forward | Sequence 5-6 Non-Int in WASP-80 (03) | 88.435659 Secs (88.436 Secs)<br>*[==>]* | ***[3]*** |
| | 7 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 7-8 Non-Int in WASP-80 (03) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[4]*** |
| | 8 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Forward | Sequence 7-8 Non-Int in WASP-80 (03) | 88.435659 Secs (88.436 Secs)<br>*[==>]* | ***[4]*** |

**Orbit Structure**

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Server Version: 20181130
GS Reacq
Exp. 3, copy 1
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Exp. 3, copy 1
Setup
Setup
Exp. 3, copy 2
Exp. 3, copy 2
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Setup
Exp. 3, copy 3
Setup
Exp. 3, copy 4
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Setup
Exp. 3, copy 4
Setup
Exp. 3, copy 5
Exp. 3, copy 5
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Exp. 3, copy 6
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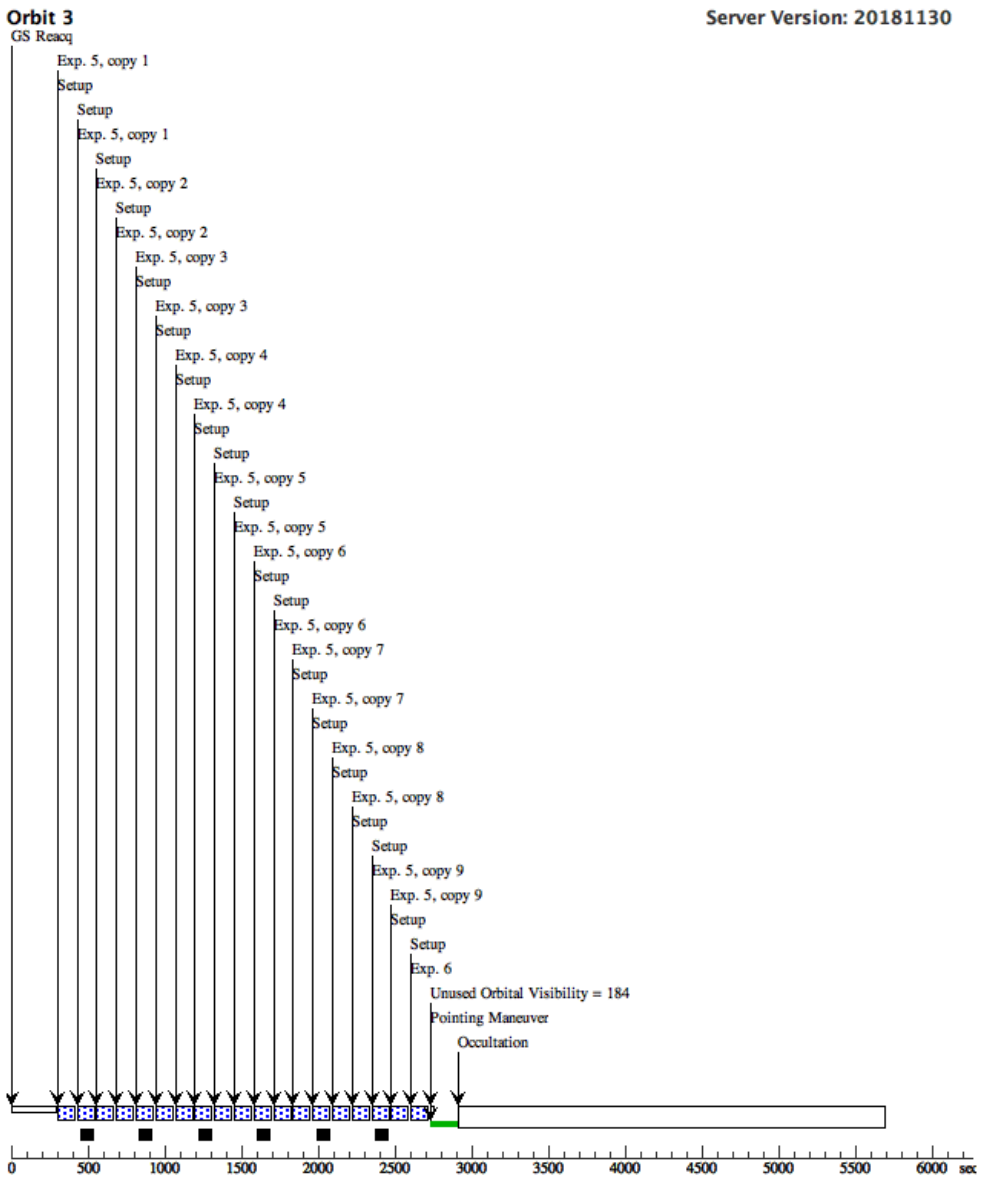
Exp. 3, copy 6
Setup
Setup
Exp. 3, copy 7
Setup
Exp. 3, copy 7
Exp. 3, copy 8
Setup
Setup
Exp. 3, copy 8
Exp. 3, copy 9
Setup
Exp. 3, copy 9
Setup
Exp. 4
Setup
Pointing Maneuver
Unused Orbital Visibility = 184
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec


Orbit 3
Server Version: 20181130
GS Reacq
Exp. 5, copy 1
Setup
Setup
Exp. 5, copy 1
Setup
Exp. 5, copy 2
Setup
Exp. 5, copy 2
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Exp. 5, copy 3
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Exp. 5, copy 4
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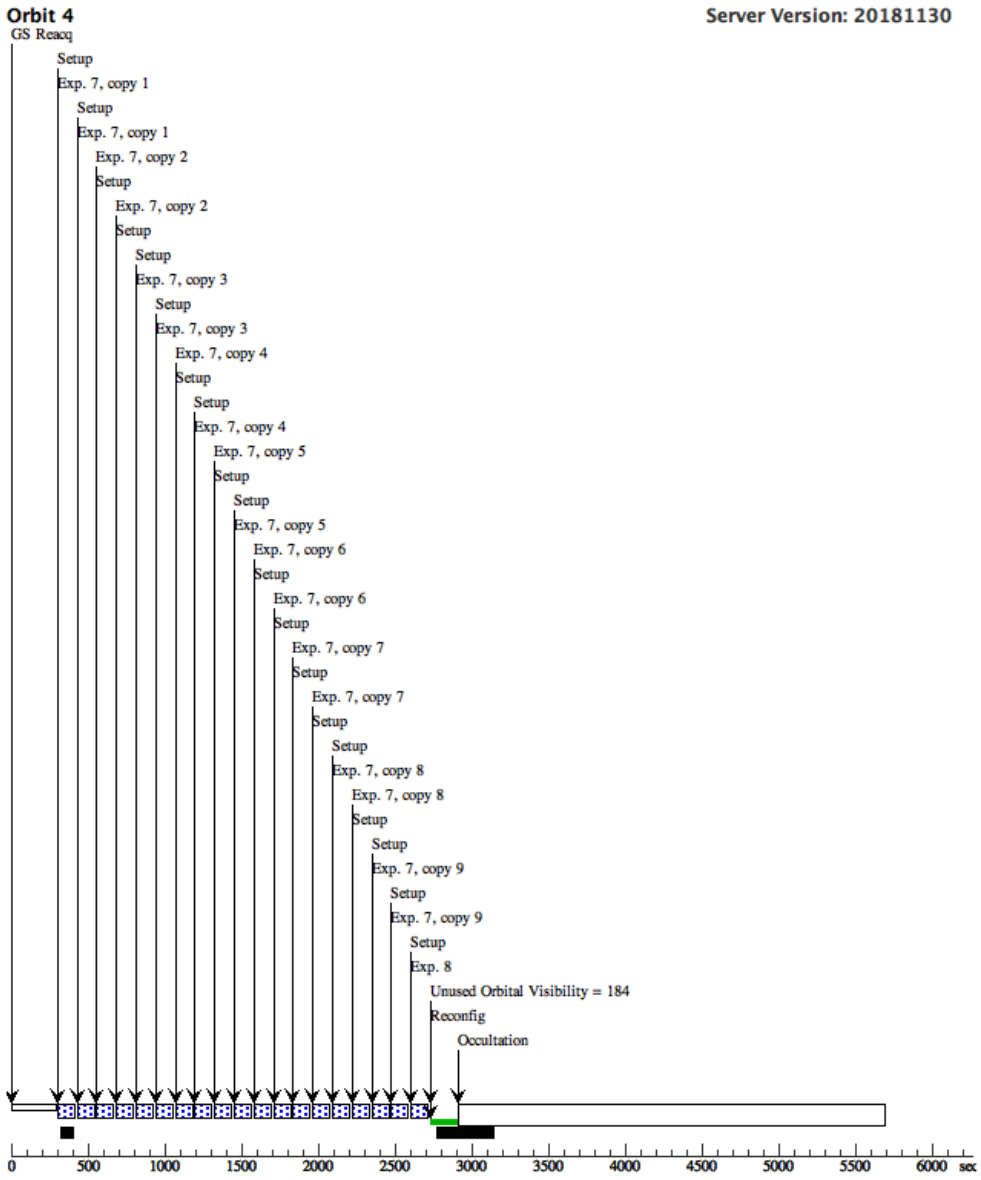
Exp. 5, copy 4
Setup
Setup
Exp. 5, copy 5
Setup
Exp. 5, copy 5
Exp. 5, copy 6
Setup
Setup
Exp. 5, copy 6
Exp. 5, copy 7
Setup
Exp. 5, copy 7
Setup
Exp. 5, copy 8
Setup
Exp. 5, copy 8
Setup
Setup
Exp. 5, copy 9
Exp. 5, copy 9
Setup
Setup
Exp. 6
Unused Orbital Visibility = 184
Pointing Maneuver
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec


Orbit 4
Server Version: 20181130
GS Reacq
Setup
Exp. 7, copy 1
Setup
Exp. 7, copy 1
Exp. 7, copy 2
Setup
Exp. 7, copy 2
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Exp. 7, copy 3
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Exp. 7, copy 3
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Setup
Exp. 7, copy 4
Exp. 7, copy 5
Setup
Setup
Exp. 7, copy 5
Exp. 7, copy 6
Setup
Exp. 7, copy 6
Setup
Exp. 7, copy 7
Setup
Exp. 7, copy 7
Setup
Setup
Exp. 7, copy 8
Exp. 7, copy 8
Setup
Setup
Exp. 7, copy 9
Setup
Exp. 7, copy 9
Setup
Exp. 8
Unused Orbital Visibility = 184
Reconfig
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

**Visit**

**Proposal 15131, WASP-80 (04), implementation** Fri May 17 12:02:04 GMT 2019

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR

Special Requirements: GUID TOL 0.05"; SCHED 100%; ORIENT 330D TO 45 D; ORIENT 150D TO 220 D; Period 3.06785234 D AND ZERO-PHASE HJD2456487.425006

**Fixed Targets**

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | TYC-5165-481-1 | RA: 20 12 40.1656 (303.1673567d)<br>Dec: -02 08 39.19 (-2.14422d)<br>Equinox: J2000 | | V=11.939 | Reference Frame: SIMBAD |

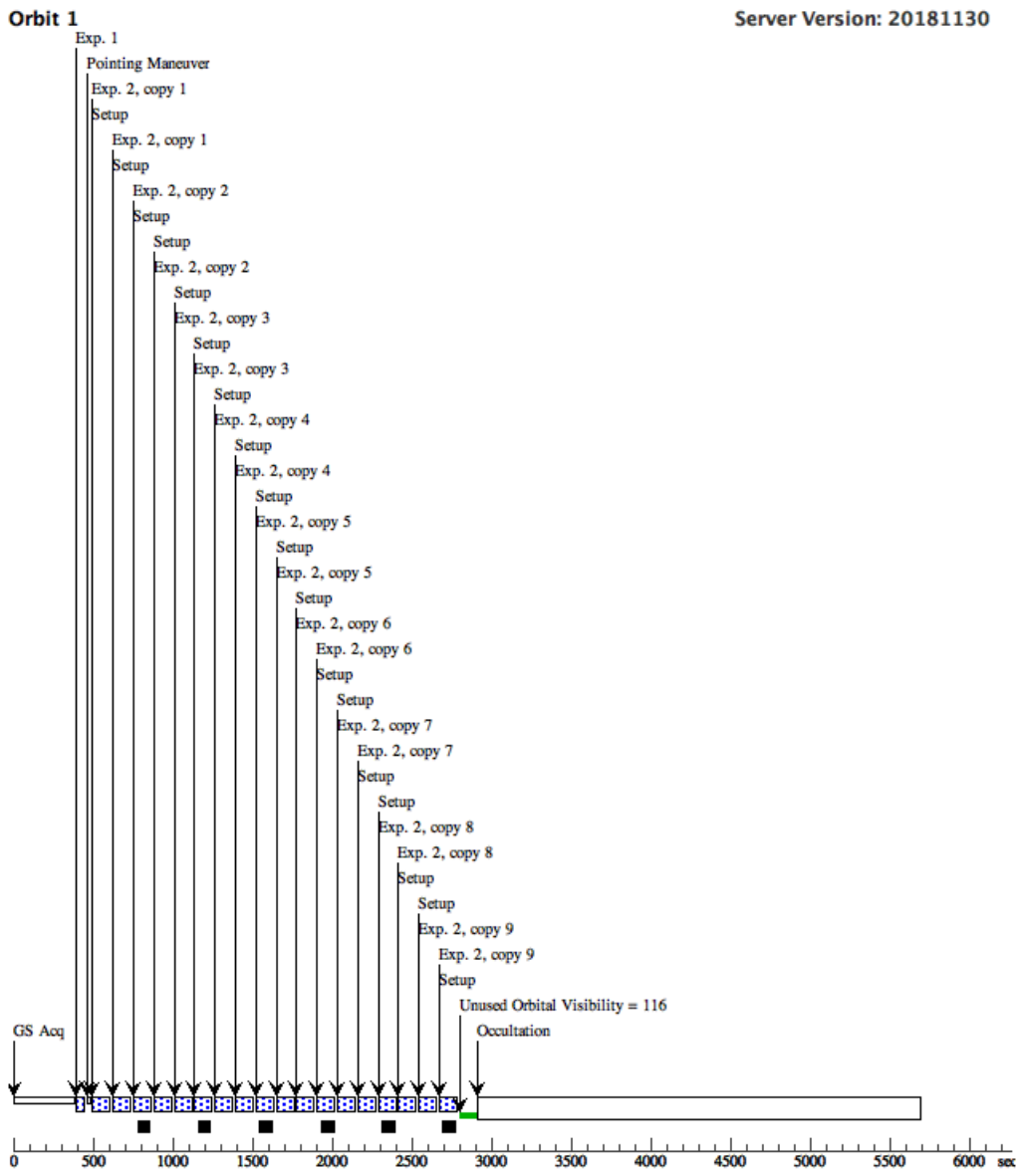
*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=STAR*
*Description=[EXTRA-SOLAR PLANET]*

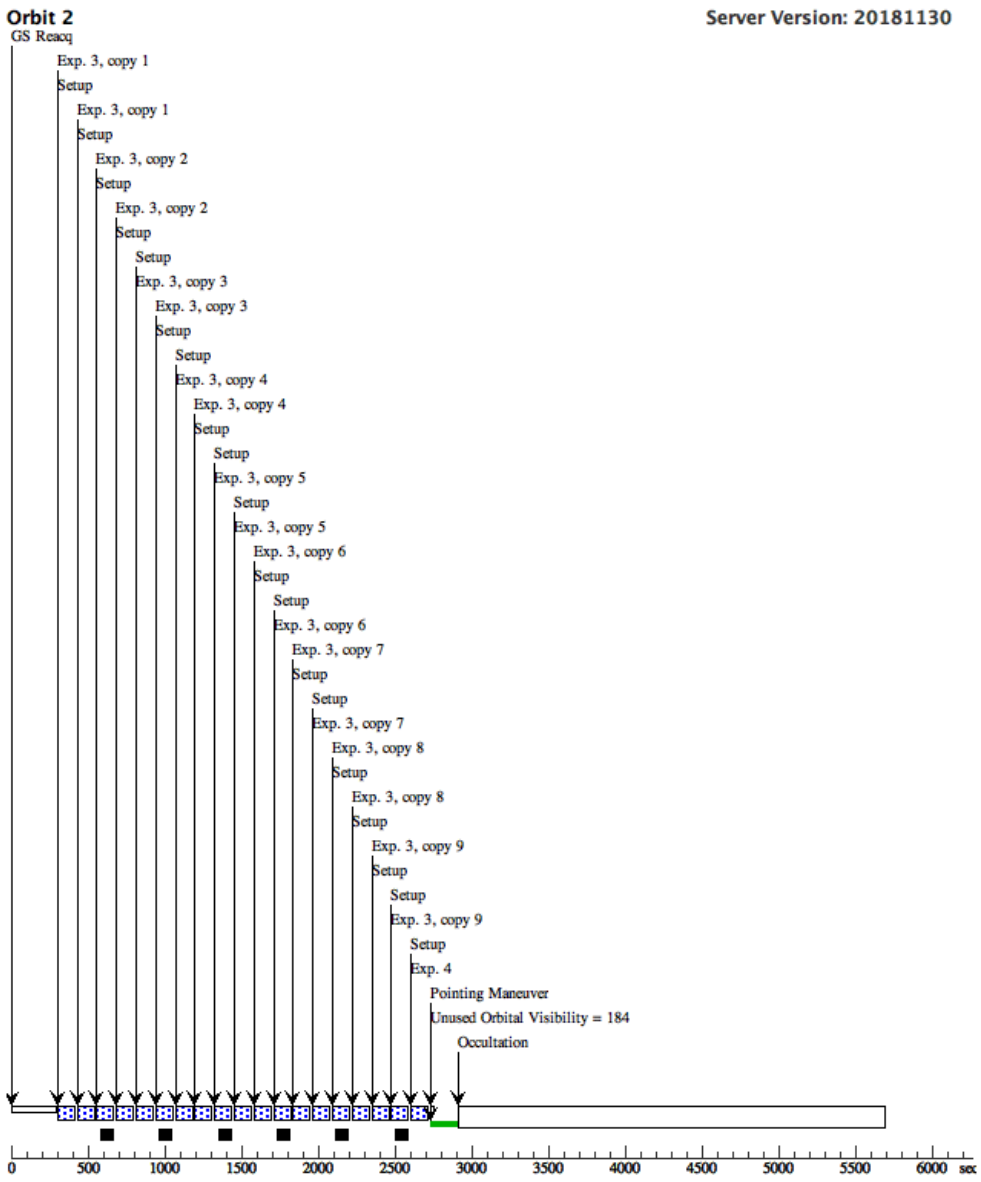
**Exposures**

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, IRSUB256 | F139M | SAMP-SEQ=SPARS10; NSAMP=5 | POS TARG 0.0,0.0; PHASE 0.447 TO 0.461 | Sequence 1-2 Non-Int in WASP-80 (04) | 29.663763 Secs (29.664 Secs)<br>*[==>]* | ***[1]*** |
| 2 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=13 | POS TARG 0,-14; SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 1-2 Non-Int in WASP-80 (04) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[1]*** |
| 3 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=13 | POS TARG 0,-14; SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 3-4 Non-Int in WASP-80 (04) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[2]*** |
| 4 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=13 | POS TARG 0,-14; SPATIAL SCAN 0.2 2,90.0 Degrees,Forward | Sequence 3-4 Non-Int in WASP-80 (04) | 88.435659 Secs (88.436 Secs)<br>*[==>]* | ***[2]*** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 5 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Round trip | Sequence 5-6 Non-Int in WASP-80 (04) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[3]*** |
| | 6 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Forward | Sequence 5-6 Non-Int in WASP-80 (04) | 88.435659 Secs (88.436 Secs)<br>*[==>]* | ***[3]*** |
| | 7 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Round trip | Sequence 7-8 Non-Int in WASP-80 (04) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[4]*** |
| | 8 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.22,90.0 Degrees,Forward | Sequence 7-8 Non-Int in WASP-80 (04) | 88.435659 Secs (88.436 Secs)<br>*[==>]* | ***[4]*** |

**Orbit Structure**

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Server Version: 20181130
GS Reacq
Exp. 3, copy 1
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Exp. 3, copy 1
Setup
Exp. 3, copy 2
Setup
Exp. 3, copy 2
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Exp. 3, copy 5
Exp. 3, copy 6
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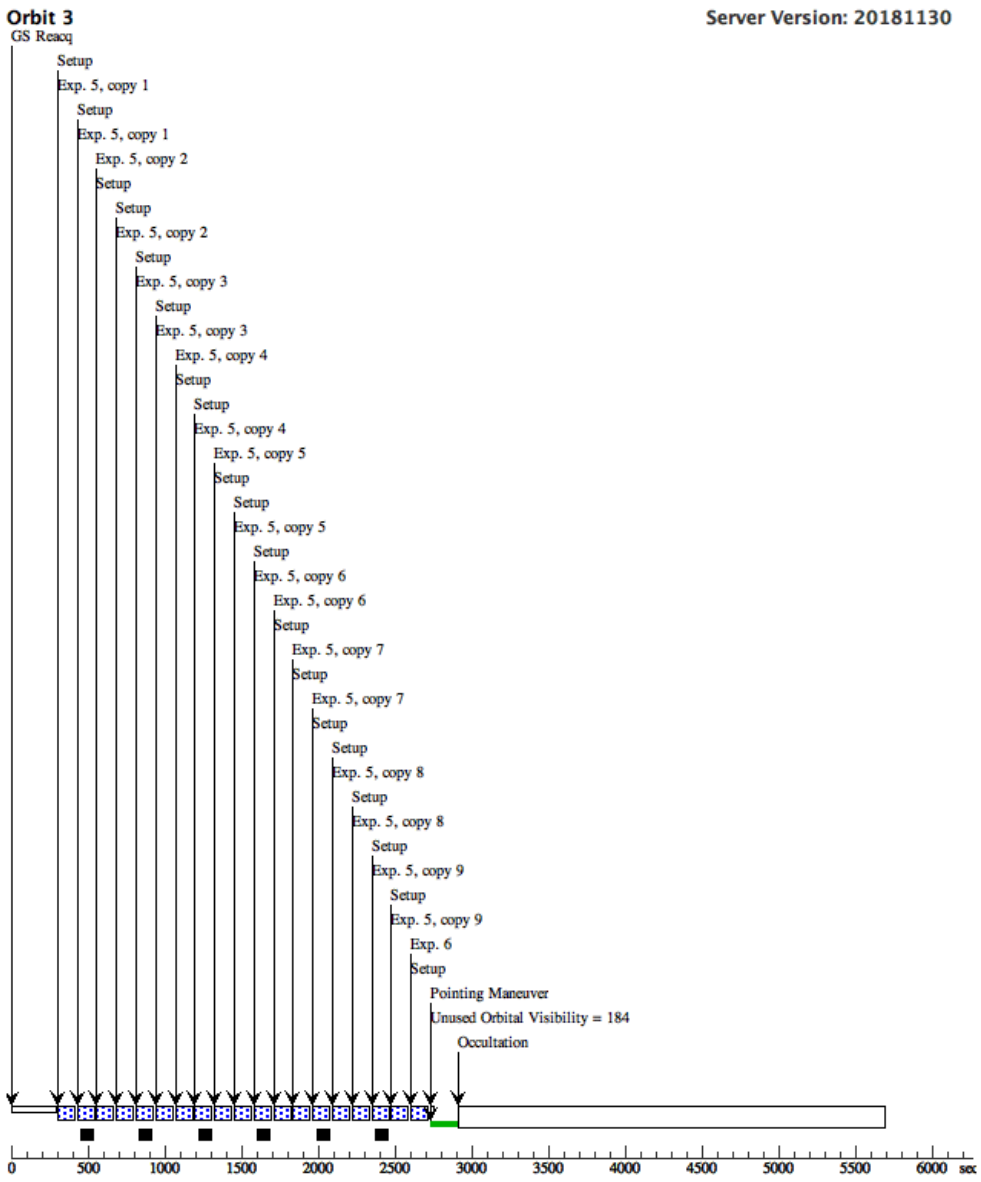
Setup
Exp. 3, copy 6
Exp. 3, copy 7
Setup
Setup
Exp. 3, copy 7
Exp. 3, copy 8
Setup
Exp. 3, copy 8
Setup
Exp. 3, copy 9
Setup
Setup
Exp. 3, copy 9
Setup
Exp. 4
Pointing Maneuver
Unused Orbital Visibility = 184
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec


Orbit 3
Server Version: 20181130
GS Reacq
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Exp. 5, copy 1
Exp. 5, copy 2
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Setup
Exp. 5, copy 2
Setup
Exp. 5, copy 3
Setup
Exp. 5, copy 3
Exp. 5, copy 4
Setup
Setup
Exp. 5, copy 4
Exp. 5, copy 5
Setup
Setup
Exp. 5, copy 5
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Exp. 5, copy 7
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Setup
Setup
Exp. 5, copy 8
Setup
Exp. 5, copy 8
Setup
Exp. 5, copy 9
Setup
Exp. 5, copy 9
Exp. 6
Setup
Pointing Maneuver
Unused Orbital Visibility = 184
Occultation
0
500
1000
1500
2000
2500
3000
3500
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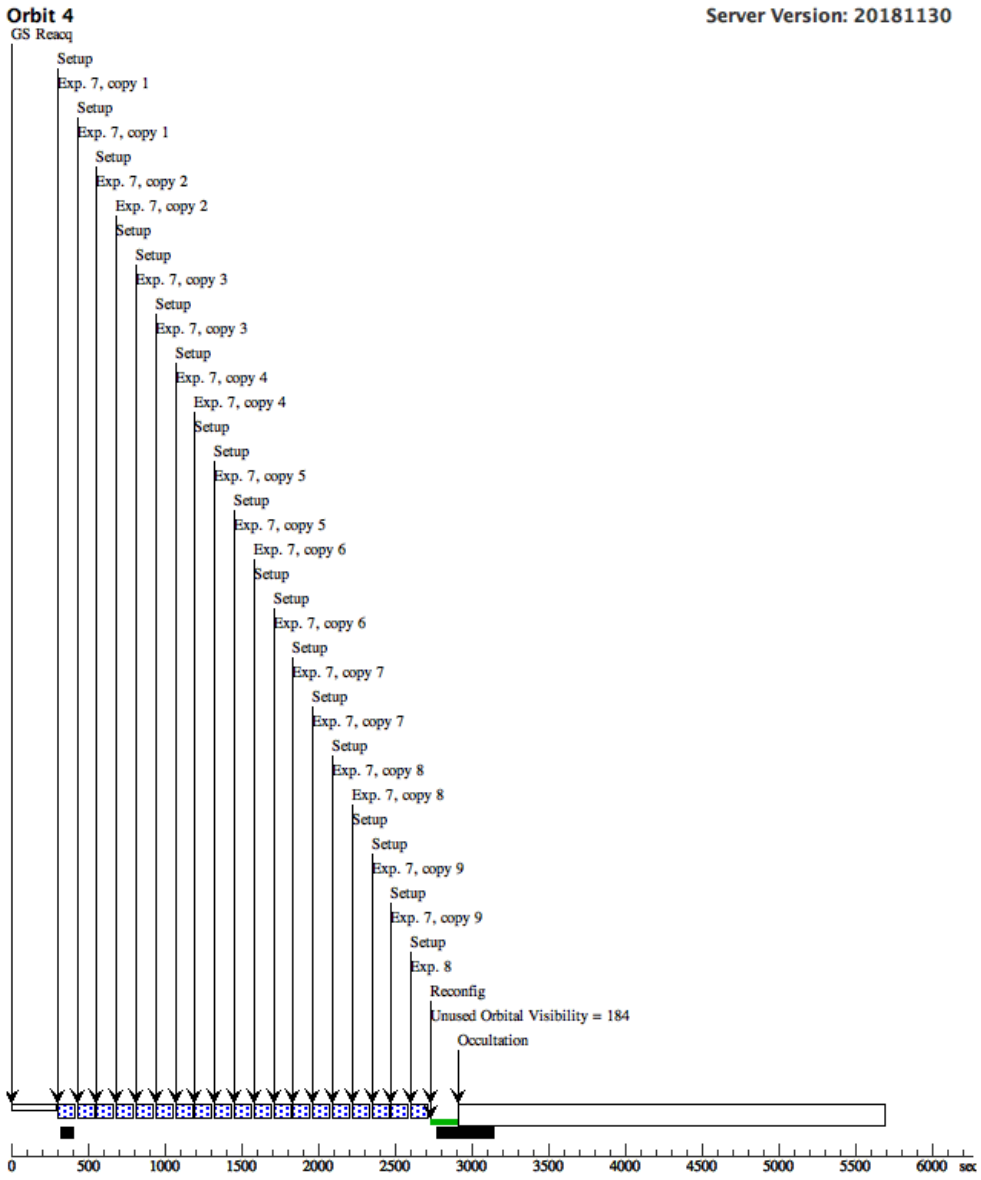
4500
5000
5500
6000
sec


Orbit 4
Server Version: 20181130
GS Reacq
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Exp. 7, copy 1
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Exp. 7, copy 2
Exp. 7, copy 2
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Exp. 7, copy 4
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Exp. 7, copy 5
Exp. 7, copy 6
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Setup
Exp. 7, copy 6
Setup
Exp. 7, copy 7
Setup
Exp. 7, copy 7
Setup
Exp. 7, copy 8
Exp. 7, copy 8
Setup
Setup
Exp. 7, copy 9
Setup
Exp. 7, copy 9
Setup
Exp. 8
Reconfig
Unused Orbital Visibility = 184
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

**Visit**

**Proposal 15131, WASP-80 (05), implementation** Fri May 17 12:02:04 GMT 2019

**Diagnostic Status: No Diagnostics**

Scientific Instruments: WFC3/IR

Special Requirements: GUID TOL 0.05"; SCHED 100%; ORIENT 330D TO 45 D; ORIENT 150D TO 220 D; Period 3.06785234 D AND ZERO-PHASE HJD2456487.425006

**Fixed Targets**

| # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|---|---|---|---|---|---|
| (1) | TYC-5165-481-1 | RA: 20 12 40.1656 (303.1673567d)<br>Dec: -02 08 39.19 (-2.14422d)<br>Equinox: J2000 | | V=11.939 | Reference Frame: SIMBAD |

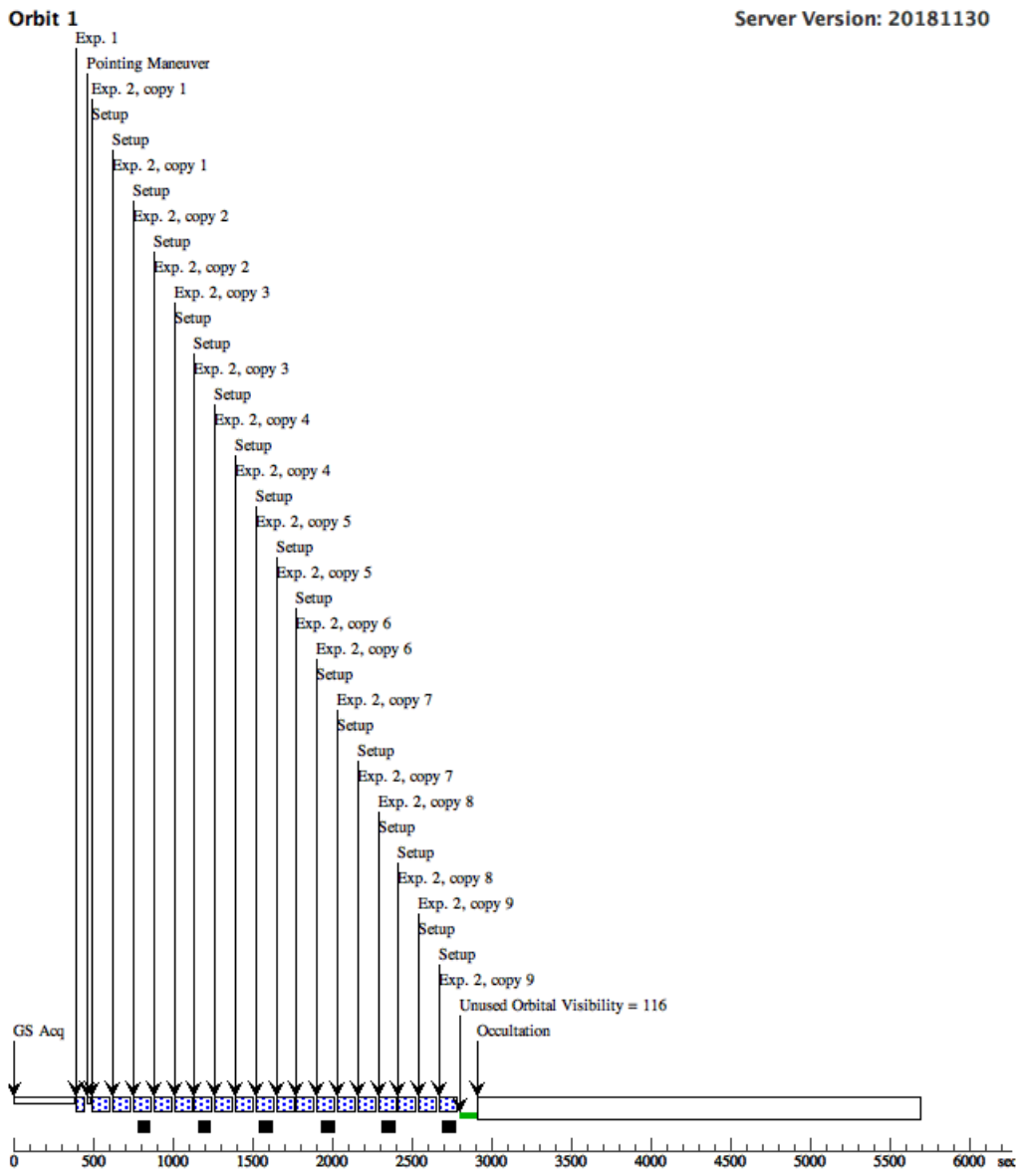
*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.This object was generated by the targetselector and retrieved from the SIMBAD database.*
*Category=STAR*
*Description=[EXTRA-SOLAR PLANET]*

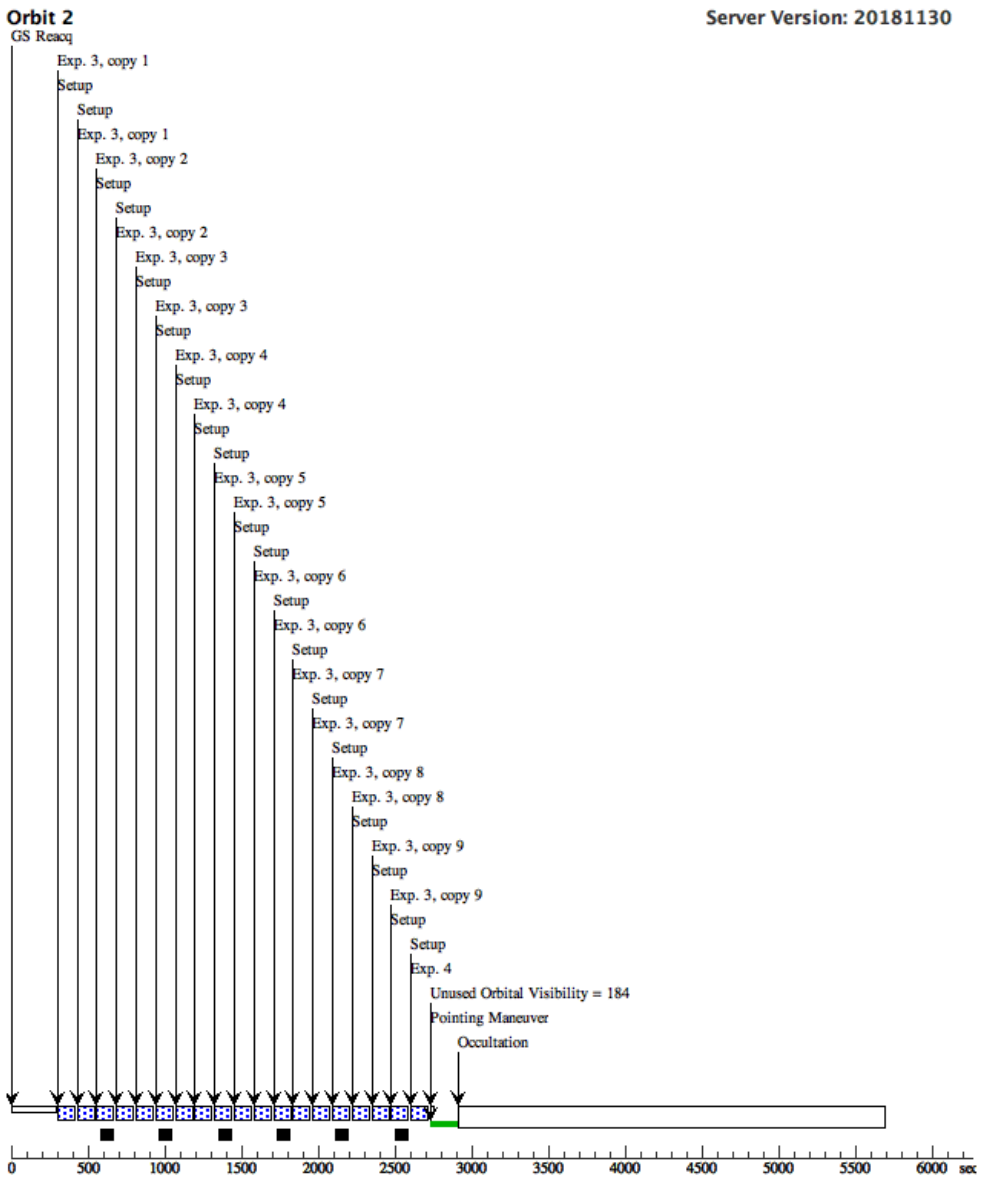
**Exposures**

| # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, IRSUB256 | F139M | SAMP-SEQ=SPARS10; NSAMP=5 | POS TARG 0.0,0.0; PHASE 0.447 TO 0.461 | Sequence 1-2 Non-Int in WASP-80 (05) | 29.663763 Secs (29.664 Secs)<br>*[==>]* | ***[1]*** |
| 2 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=13 | POS TARG 0,-14; SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 1-2 Non-Int in WASP-80 (05) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[1]*** |
| 3 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=13 | POS TARG 0,-14; SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 3-4 Non-Int in WASP-80 (05) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[2]*** |
| 4 | | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS10; NSAMP=13 | POS TARG 0,-14; SPATIAL SCAN 0.2 2,90.0 Degrees,Forward | Sequence 3-4 Non-Int in WASP-80 (05) | 88.435659 Secs (88.436 Secs)<br>*[==>]* | ***[2]*** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 5 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 5-6 Non-Int in WASP-80 (05) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[3]*** |
| | 6 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Forward | Sequence 5-6 Non-Int in WASP-80 (05) | 88.435659 Secs (88.436 Secs)<br>*[==>]* | ***[3]*** |
| | 7 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Round trip | Sequence 7-8 Non-Int in WASP-80 (05) | 88.435659 Secs X 9 (1591.842 Secs)<br>*[==>(Copy 1, Forward)]*<br>*[==>(Copy 1, Reverse)]*<br>*[==>(Copy 2, Forward)]*<br>*[==>(Copy 2, Reverse)]*<br>*[==>(Copy 3, Forward)]*<br>*[==>(Copy 3, Reverse)]*<br>*[==>(Copy 4, Forward)]*<br>*[==>(Copy 4, Reverse)]*<br>*[==>(Copy 5, Forward)]*<br>*[==>(Copy 5, Reverse)]*<br>*[==>(Copy 6, Forward)]*<br>*[==>(Copy 6, Reverse)]*<br>*[==>(Copy 7, Forward)]*<br>*[==>(Copy 7, Reverse)]*<br>*[==>(Copy 8, Forward)]*<br>*[==>(Copy 8, Reverse)]*<br>*[==>(Copy 9, Forward)]*<br>*[==>(Copy 9, Reverse)]* | ***[4]*** |
| | 8 | (1) TYC-5165-481-1 | WFC3/IR, MULTIACCUM, GRISM256 | G141 | SAMP-SEQ=SPARS 10;<br>NSAMP=13 | POS TARG 0,-14;<br>SPATIAL SCAN 0.2 2,90.0 Degrees,Forward | Sequence 7-8 Non-Int in WASP-80 (05) | 88.435659 Secs (88.436 Secs)<br>*[==>]* | ***[4]*** |

**Orbit Structure**

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Exp. 3, copy 3
Setup
Exp. 3, copy 4
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Exp. 3, copy 4
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Setup
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Exp. 3, copy 5
Setup
Setup
Exp. 3, copy 6
Setup
Exp. 3, copy 6
Setup
Exp. 3, copy 7
Setup
Exp. 3, copy 7
Setup
Exp. 3, copy 8
Exp. 3, copy 8
Setup
Exp. 3, copy 9
Setup
Exp. 3, copy 9
Setup
Setup
Exp. 4
Unused Orbital Visibility = 184
Pointing Maneuver
Occultation
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3500
4000
4500
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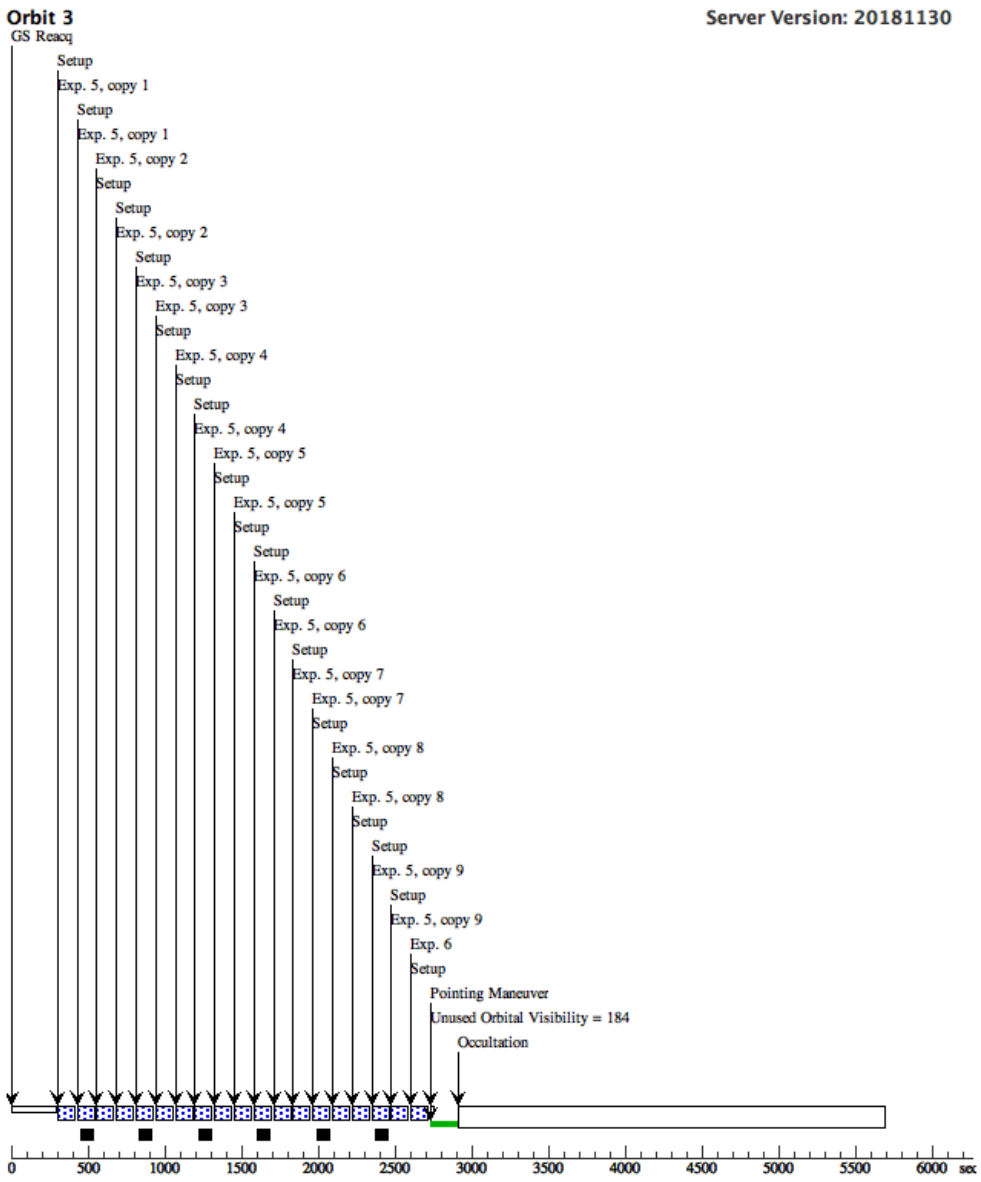
5500
6000
sec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GS Reacq
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Setup
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Exp. 5, copy 2
Setup
Exp. 5, copy 3
Exp. 5, copy 3
Setup
Exp. 5, copy 4
Setup
Setup
Exp. 5, copy 4
Exp. 5, copy 5
Setup
Exp. 5, copy 5
Setup
Setup
Exp. 5, copy 6
Setup
Exp. 5, copy 6
Setup
Exp. 5, copy 7
Exp. 5, copy 7
Setup
Exp. 5, copy 8
Setup
Exp. 5, copy 8
Setup
Setup
Exp. 5, copy 9
Setup
Exp. 5, copy 9
Exp. 6
Setup
Pointing Maneuver
Unused Orbital Visibility = 184
Occultation
0
500
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1500
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2500
3000
3500
4000
4500
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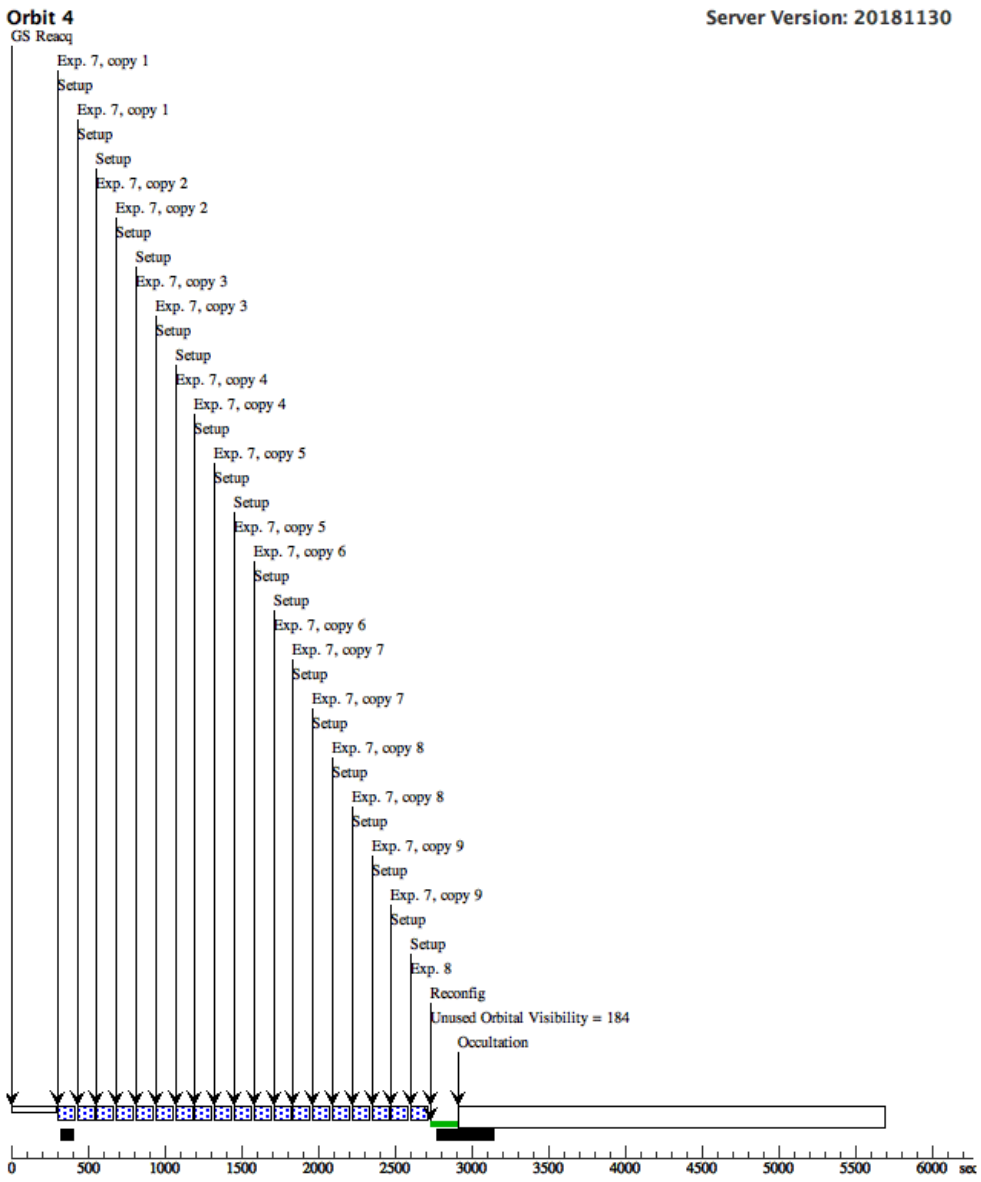
5500
6000
sec


Orbit 4
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GS Reacq
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Setup
Exp. 7, copy 7
Setup
Exp. 7, copy 8
Setup
Exp. 7, copy 8
Setup
Exp. 7, copy 9
Setup
Exp. 7, copy 9
Setup
Setup
Exp. 8
Reconfig
Unused Orbital Visibility = 184
Occultation
0
500
1000
1500
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2500
3000
3500
4000
4500
5000
5500
6000
sec