



10481 - HST Observations of Astrophysically Important Visual Binaries

Cycle: 14, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets</i>	<i>Configurations</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) PROCYON	WFPC2	1	22-Feb-2006 07:57:59.0	yes
02	(2) MU-CAS	WFPC2	1	22-Feb-2006 07:58:05.0	yes
03	(2) MU-CAS	WFPC2	1	22-Feb-2006 07:58:10.0	yes
04	(12) G107-70-REF9 (4) G107-69 (11) G107-70-REF7 (3) G107-70 (10) G107-70-REF6 (6) G107-70-REF2	FGS	1	22-Feb-2006 07:58:15.0	yes

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<i>Visit</i>	<i>Targets</i>	<i>Configurations</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
05	(12) G107-70-REF9 (4) G107-69 (11) G107-70-REF7 (3) G107-70 (10) G107-70-REF6 (6) G107-70-REF2	FGS	1	22-Feb-2006 07:58:23.0	yes

5 Total Orbits Used

ABSTRACT

This is a continuation of a project begun in Cycle 7 and continued up through Cycle 11. The program consists of annual or biannual WFPC2 or FGS observations of three visual binary stars that will ultimately yield fundamental astrophysical results, once their orbits and masses are determined.

Our targets are the following: (1) Procyon ($P = 41$ yr), for which our first WFPC2 images yielded an extremely accurate angular separation of the bright F star and its much fainter white-dwarf companion. Combined with ground-based astrometry of the bright star, our observation significantly revised downward the derived masses, and brought Procyon A into excellent agreement with theoretical evolutionary tracks for the first time. With the continued monitoring proposed here, we will obtain masses to an accuracy of better than 1%, providing a testbed for theories of both Sun-like stars and white dwarfs. (2) G 107-70, a close double white dwarf ($P = 19$ yr) that promises to add two accurate masses to the tiny handful of white-dwarf masses that are directly known from dynamical measurements. (3) Mu Cas ($P = 21$ yr), a famous metal-deficient G dwarf for which accurate masses will lead to the stars' helium contents, with cosmological implications.

OBSERVING DESCRIPTION

We will obtain direct images with WFPC2 of Procyon and Mu Cas, and astrometry with FGS of G~107-70 and surrounding reference stars. Each binary will be observed once or twice per year for the next three years (and we would expect to continue to observe them through the lifetime of HST), in order to obtain very accurate masses for the stellar components. The WFPC2 filters have

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been chosen appropriately for each target. Unfortunately, Procyon~A is far too bright for the High Resolution Channel of ACS, (which has a 0.1~sec minimum exposure time, high sensitivity [a disadvantage for this program!], and lack of suitably narrow filters). Even 5th-mag Mu Cas~A would reach $\sim 2/3$ of saturation in 0.1~sec, in the narrowest near-IR filter, making a switch from WFPC2 to ACS/HRC too risky. Fortunately, WFC3 will have suitable filters for use after WFPC2 is removed during Servicing Mission~4, so that the program can be continued. The FGS cannot be used for Procyon, because it is too bright, and for Mu Cas, the Δ mag in the optical band is too large for FGS.

The following table summarizes the program. Each observation requires just one orbit of HST time.

Star	delta	mag	sep (")	P (yr)	Visits/yr	Instrument
Procyon	9	4.7	41	1	WFPC2/F218W	
G 107-70	0.3	0.6	19	2	FGS/F583W	
Mu Cas	5	0.7	21	2	WFPC2/F953N	

REAL TIME JUSTIFICATION

The observation times are weakly time-critical, since we want them spaced roughly equally in time, at about yearly intervals for Procyon and biannually for the other two targets. G 107-70 has moreover to be observed at the times of

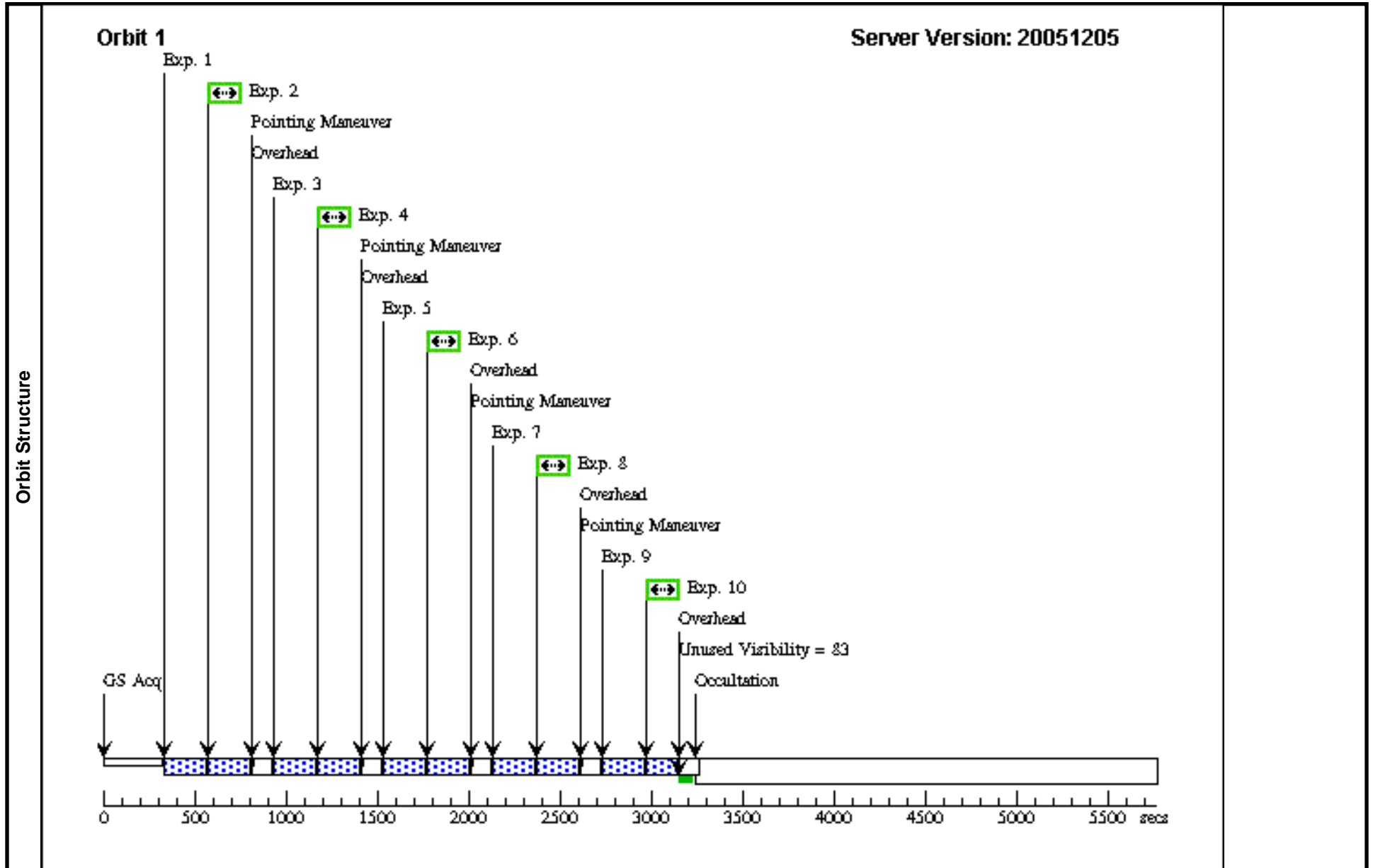
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maximum parallax factor, in April and October.

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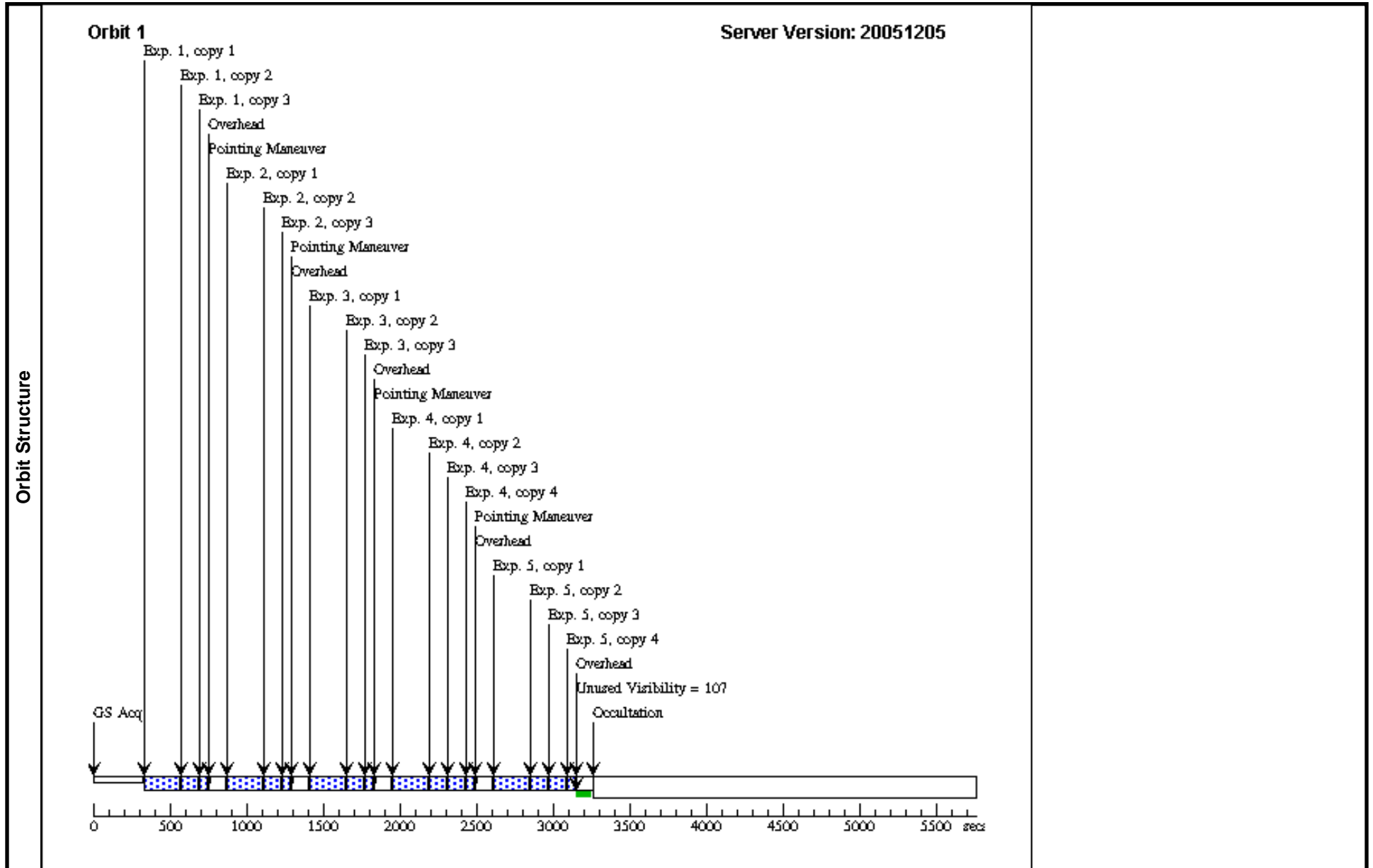
Visit	Proposal 10481, Visit 01									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: ORIENT 311.5D TO 28.5 D; BETWEEN 15-OCT-2005:00:00:00 AND 05-DEC-2005:00:00:00 Comments: <i>ORIENT requirement is done so that companion star will not lie near diffraction spikes or bleeding columns from the very bright primary star.</i>									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	PROCYON	RA: 07 39 18.3600 (114.8265000d) Alt Name1: ALPHA-CMI Dec: +05 13 35.60 (5.22656d) Alt Name2: HR2943 Equinox: J2000 Plate Id: (?)	Proper Motion RA: -0.04755s/yr Proper Motion Dec: -1.0229"/yr Parallax: 0.283" Epoch of Position: 1995.18	V=0.36+/-0.0 B-V = 0.42	Coordinate Source: Other_Source: previous successful HST observations				
Comments: <i>Coords are for center of gravity of binary. Accuracy confirmed by 2000 Nov 28 WFPC2 observations.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	10	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15	POS TARG 0,0		0.11 Secs [==>]	[1]
	2	20	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15; CLOCKS=YES	SAME POS AS 1		200.0 Secs [==>]	[1]
	3	30	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15	POS TARG -0.659,- 0.659		0.11 Secs [==>]	[1]
	4	40	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15; CLOCKS=YES	SAME POS AS 3		200.0 Secs [==>]	[1]
	5	50	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15	POS TARG -0.421,- 0.375		0.11 Secs [==>]	[1]
	6	60	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15; CLOCKS=YES	SAME POS AS 5		200.0 Secs [==>]	[1]
	7	70	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15	POS TARG -0.318,- 0.477		0.11 Secs [==>]	[1]
	8	80	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15; CLOCKS=YES	SAME POS AS 7		200.0 Secs [==>]	[1]
	9	90	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15	POS TARG -0.568,- 0.273		0.11 Secs [==>]	[1]
	10	100	(1) PROCYON	WFPC2, IMAGE, PC1	F218W	ATD-GAIN=15; CLOCKS=YES	SAME POS AS 9		160.0 Secs [==>]	[1]



Proposal 10481 - Visit 02 - HST Observations of Astrophysically Important Visual Binaries

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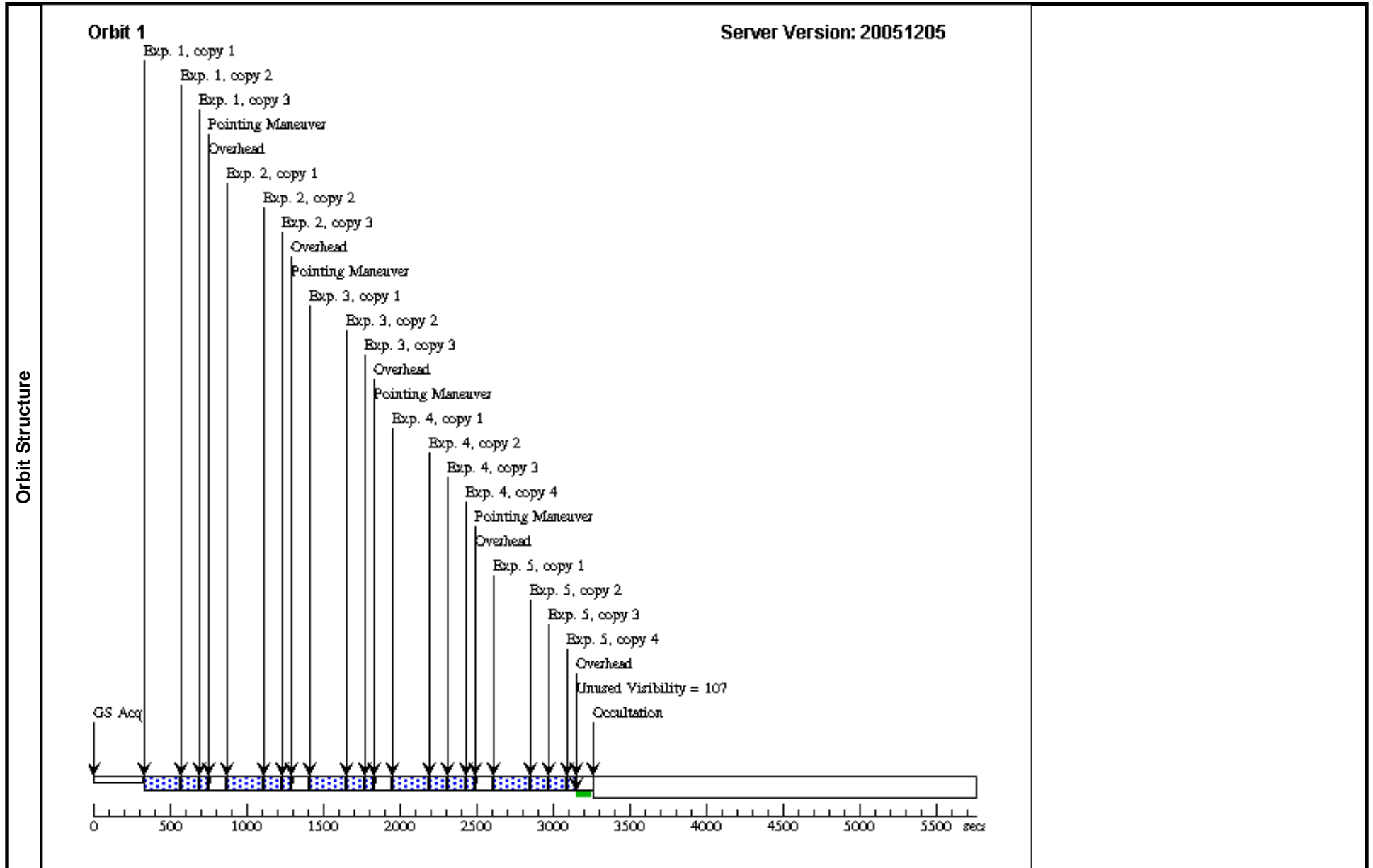
Visit	Proposal 10481, Visit 02									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: SCHED 60%; ORIENT 167.0D TO 227.0 D; ORIENT 257.0D TO 317.0 D; BETWEEN 08-JUL-2005:00:00:00 AND 30-AUG-2005:00:00:00 Comments: ORIENT requirement is done so that companion star will not lie near diffraction spikes of primary star.									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	MU-CAS Alt Name1: HR321 Alt Name2: HD6582	RA: 01 08 16.3800 (17.0682500d) Dec: +54 55 13.41 (54.92039d) Equinox: J2000 Plate Id: (?)	Proper Motion RA: 0.3972s/yr Proper Motion Dec: -1.596"/yr Parallax: 0.134" Epoch of Position: 2000.0	V=5.15+/-0.0 B-V = 0.70	Coordinate Source: Other_Source: previous successful HST observations				
Comments: Coordinate accuracy confirmed by 2000-01 WFPC2 observations.										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	1	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG 0,0		1.0 Secs X 3 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]
	2	2	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG -0.659,- 0.659		1.0 Secs X 3 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]
	3	3	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG -0.318,- 0.477		1.0 Secs X 3 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]
	4	4	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG -0.568,- 0.273		1.0 Secs X 4 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)]	[1]
	Comments: Here we take one extra exposure to use up the orbit									
5	5	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG -0.421,- 0.375		1.0 Secs X 4 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)]	[1]	
Comments: Here we take one extra exposure to use up the orbit										



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Visit	Proposal 10481, Visit 03									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: SCHED 60%; ORIENT 345.0D TO 45.0 D; ORIENT 75.0D TO 135.0 D; BETWEEN 10-JAN-2006:00:00:00 AND 06-MAR-2006:00:00:00 Comments: ORIENT requirement is done so that companion star will not lie near diffraction spikes of primary star.									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	MU-CAS Alt Name1: HR321 Alt Name2: HD6582	RA: 01 08 16.3800 (17.0682500d) Dec: +54 55 13.41 (54.92039d) Equinox: J2000 Plate Id: (?)	Proper Motion RA: 0.3972s/yr Proper Motion Dec: -1.596"/yr Parallax: 0.134" Epoch of Position: 2000.0	V=5.15+/-0.0 B-V = 0.70	Coordinate Source: Other_Source: previous successful HST observations				
Comments: Coordinate accuracy confirmed by 2000-01 WFPC2 observations.										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	1	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG 0,0		1.0 Secs X 3 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]
	2	2	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG -0.659,- 0.659		1.0 Secs X 3 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]
	3	3	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG -0.318,- 0.477		1.0 Secs X 3 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)]	[1]
	4	4	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG -0.568,- 0.273		1.0 Secs X 4 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)]	[1]
	Comments: Here we take one extra exposure to use up the orbit									
5	5	(2) MU-CAS	WFPC2, IMAGE, PC1	F953N	ATD-GAIN=15; CLOCKS=YES	POS TARG -0.421,- 0.375		1.0 Secs X 4 [==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)]	[1]	
Comments: Here we take one extra exposure to use up the orbit										



Proposal 10481 - Visit 04 - HST Observations of Astrophysically Important Visual Binaries

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Visit	Proposal 10481, Visit 04 Diagnostic Status: Warning Scientific Instruments: FGS Special Requirements: PCS MODE FINE; SCHED 70%; ORIENT 240.0D TO 242.0 D; BETWEEN 15-NOV-2005:00:00:00 AND 31-DEC-2005:00:00:00						
Diagnostics	(Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 04) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	
(3)	G107-70 Alt Name1: GSC3409.01958	RA: 07 30 47.2400 (112.6968333d) Dec: +48 10 26.00 (48.17389d) Equinox: J2000 Plate Id: (?)	Proper Motion RA: -0.0224s/yr Proper Motion Dec: -1.282"/yr Parallax: 0.09" Epoch of Position: 1999.75	V=15.0+/-0.0 B-V = 0.99	Coordinate Source: IMAGE_TIED_TO_GSC_FRAME		
	<i>Comments: Double Degenerate binary system</i>						
	(4)	G107-69 Alt Name1: GSC3409.00415	RA: 07 30 43.0900 (112.6795417d) Dec: +48 12 18.50 (48.20514d) Equinox: J2000 Plate Id: (?)	Proper Motion RA: -0.0119s/yr Proper Motion Dec: -1.292"/yr Parallax: 0.09" Epoch of Position: 1983.85	V=13.6+/-0.1	Coordinate Source: Other_Source: Common_PM_companion	
		<i>Comments: This is a common-proper-motion companion to G107-70</i>					
		(6)	G107-70-REF2 Alt Name1: GSC3409.01754	RA: 07 30 26.6900 (112.6112083d) Dec: +48 11 1.64 (48.18379d) Equinox: J2000 Plate Id: 02RT	Parallax: 0.0" Epoch of Position:	V=13.3+/-0.1	Coordinate Source: GUIDE_STAR_CATALOG
(10)	G107-70-REF6 Alt Name1: GSC3409.02253		RA: 07 30 34.9200 (112.6455000d) Dec: +48 10 31.22 (48.17534d) Equinox: J2000 Plate Id: 02RT	Parallax: 0.0" Epoch of Position:	V=14.3+/-0.1	Coordinate Source: GUIDE_STAR_CATALOG	
	(11)	G107-70-REF7 Alt Name1: GSC3409.01670	RA: 07 31 0.3100 (112.7512917d) Dec: +48 10 16.07 (48.17113d) Equinox: J2000 Plate Id: 02RT	Parallax: 0.0" Epoch of Position:	V=14.9+/-0.1	Coordinate Source: GUIDE_STAR_CATALOG	

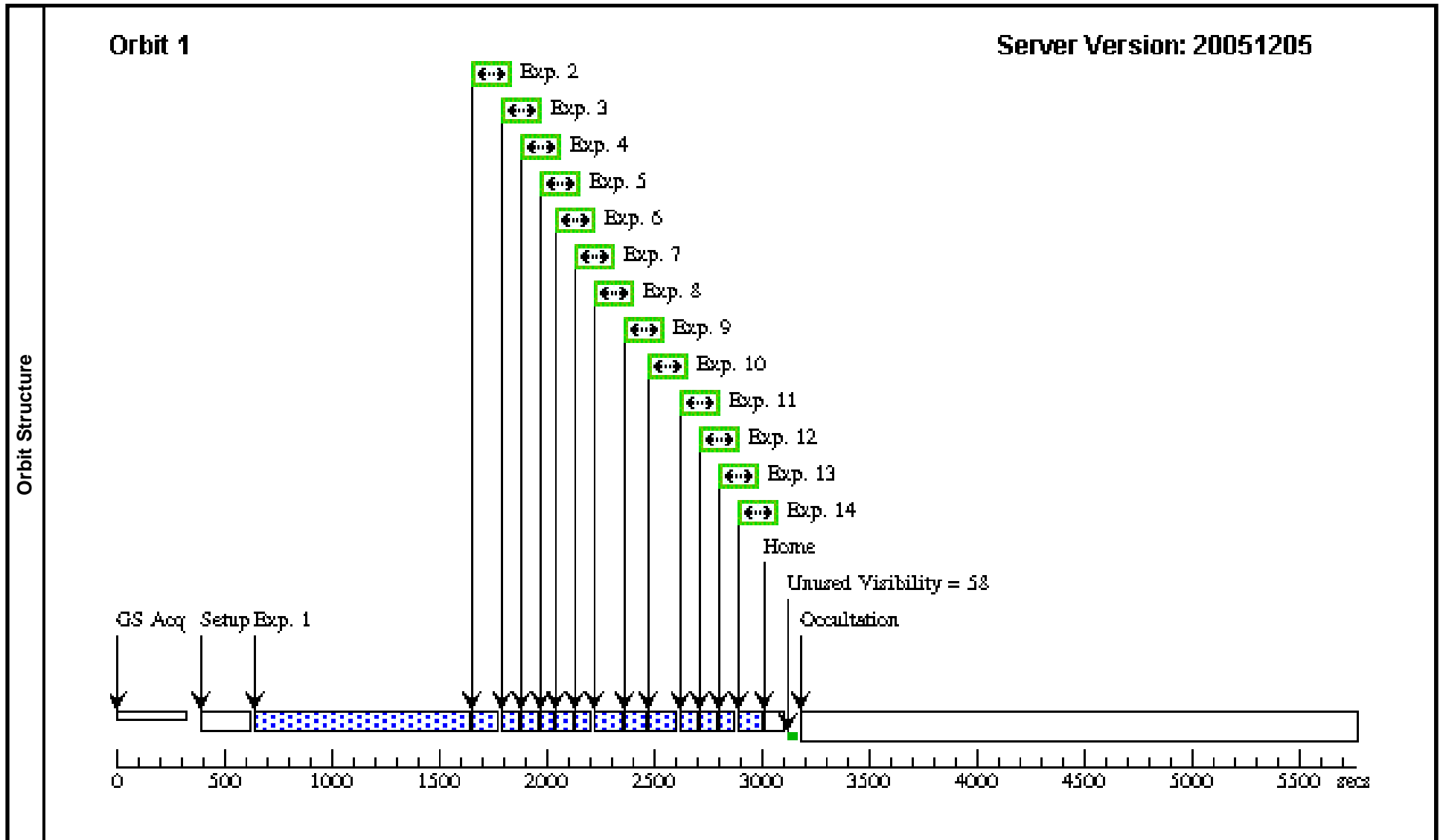
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Fixed Targets (continued)	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(12)	G107-70-REF9 Alt Name1: GSC3409.02395	RA: 07 30 15.0300 (112.5626250d) Dec: +48 10 19.67 (48.17213d) Equinox: J2000 Plate Id: 02RT	Parallax: 0.0" Epoch of Position:	V=12.9+/-0.1	Coordinate Source: GUIDE_STAR_CATALOG

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	10	(3) G107-70	FGS, TRANS, 1	F583W	SCANS=13; STEP-SIZE=0.5	POS TARG 0,10	Sequence 1-14 Non-Int	745.0 Secs [==>]	[1]
2	20	(3) G107-70	FGS, POS, 1	F583W	FES-TIME=0.4	SAME POS AS 1	Sequence 1-14 Non-Int	15.0 Secs [==>]	[1]	
3	30	(4) G107-69	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
4	40	(6) G107-70-REF2	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
5	50	(12) G107-70-REF9	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
6	60	(10) G107-70-REF6	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
7	70	(4) G107-69	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
8	80	(3) G107-70	FGS, POS, 1	F583W	FES-TIME=0.4	SAME POS AS 1	Sequence 1-14 Non-Int	15.0 Secs [==>]	[1]	
9	110	(11) G107-70-REF7	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
10	120	(3) G107-70	FGS, POS, 1	F583W	FES-TIME=0.4	SAME POS AS 1	Sequence 1-14 Non-Int	15.0 Secs [==>]	[1]	
11	130	(4) G107-69	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
12	140	(6) G107-70-REF2	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
13	150	(10) G107-70-REF6	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	

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Exposures (continued)	#	Label	Target	Config, Mode, Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	14		(11) G107-70-REF7	FGS, POS, 1	F583W	SAME POS AS 1	Sequence 1-14 Non-Int	10.0 Secs [==>]		[1]



Proposal 10481 - Visit 05 - HST Observations of Astrophysically Important Visual Binaries

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Visit	Proposal 10481, Visit 05 Diagnostic Status: Warning Scientific Instruments: FGS Special Requirements: PCS MODE FINE; SCHED 70%; ORIENT 242.0D TO 245.0 D; BETWEEN 01-NOV-2006:00:00:00 AND 15-DEC-2006:00:00:00					
Diagnostics	(Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 05) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	G107-70 Alt Name1: GSC3409.01958	RA: 07 30 47.2400 (112.6968333d) Dec: +48 10 26.00 (48.17389d) Equinox: J2000 Plate Id: (?)	Proper Motion RA: -0.0224s/yr Proper Motion Dec: -1.282"/yr Parallax: 0.09" Epoch of Position: 1999.75	V=15.0+/-0.0 B-V = 0.99	Coordinate Source: IMAGE_TIED_TO_GSC_FRAME	
	<i>Comments: Double Degenerate binary system</i>					
	(4)	G107-69 Alt Name1: GSC3409.00415	RA: 07 30 43.0900 (112.6795417d) Dec: +48 12 18.50 (48.20514d) Equinox: J2000 Plate Id: (?)	Proper Motion RA: -0.0119s/yr Proper Motion Dec: -1.292"/yr Parallax: 0.09" Epoch of Position: 1983.85	V=13.6+/-0.1	Coordinate Source: Other_Source: Common_PM_companion
		<i>Comments: This is a common-proper-motion companion to G107-70</i>				
	(6)	G107-70-REF2 Alt Name1: GSC3409.01754	RA: 07 30 26.6900 (112.6112083d) Dec: +48 11 1.64 (48.18379d) Equinox: J2000 Plate Id: 02RT	Parallax: 0.0" Epoch of Position:	V=13.3+/-0.1	Coordinate Source: GUIDE_STAR_CATALOG
(10)		G107-70-REF6 Alt Name1: GSC3409.02253	RA: 07 30 34.9200 (112.6455000d) Dec: +48 10 31.22 (48.17534d) Equinox: J2000 Plate Id: 02RT	Parallax: 0.0" Epoch of Position:	V=14.3+/-0.1	Coordinate Source: GUIDE_STAR_CATALOG
	(11)	G107-70-REF7 Alt Name1: GSC3409.01670	RA: 07 31 0.3100 (112.7512917d) Dec: +48 10 16.07 (48.17113d) Equinox: J2000 Plate Id: 02RT	Parallax: 0.0" Epoch of Position:	V=14.9+/-0.1	Coordinate Source: GUIDE_STAR_CATALOG

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Fixed Targets (continued)	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(12)	G107-70-REF9 Alt Name1: GSC3409.02395	RA: 07 30 15.0300 (112.5626250d) Dec: +48 10 19.67 (48.17213d) Equinox: J2000 Plate Id: 02RT	Parallax: 0.0" Epoch of Position:	V=12.9+/-0.1	Coordinate Source: GUIDE_STAR_CATALOG

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	10	(3) G107-70	FGS, TRANS, 1	F583W	SCANS=13; STEP-SIZE=0.5	POS TARG 0,10	Sequence 1-14 Non-Int	745.0 Secs [==>]	[1]
2	20	(3) G107-70	FGS, POS, 1	F583W	FES-TIME=0.4	SAME POS AS 1	Sequence 1-14 Non-Int	15.0 Secs [==>]	[1]	
3	30	(4) G107-69	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
4	40	(6) G107-70-REF2	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
5	50	(12) G107-70-REF9	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
6	60	(10) G107-70-REF6	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
7	70	(4) G107-69	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
8	80	(3) G107-70	FGS, POS, 1	F583W	FES-TIME=0.4	SAME POS AS 1	Sequence 1-14 Non-Int	15.0 Secs [==>]	[1]	
9	110	(11) G107-70-REF7	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
10	120	(3) G107-70	FGS, POS, 1	F583W	FES-TIME=0.4	SAME POS AS 1	Sequence 1-14 Non-Int	15.0 Secs [==>]	[1]	
11	130	(4) G107-69	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
12	140	(6) G107-70-REF2	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	
13	150	(10) G107-70-REF6	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-14 Non-Int	6.0 Secs [==>]	[1]	

Proposal 10481 - Visit 05 - HST Observations of Astrophysically Important Visual Binaries

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	14		(11) G107-70-REF7	FGS, POS, 1	F583W	SAME POS AS 1	Sequence 1-14 Non-Int	10.0 Secs [==>]		[1]

