15812 - ``Last Call!'' Eta Carinae's Spectroscopic Event in 2020

Cycle: 27, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Kris Davidson (PI) (Contact)	**University of Minnesota - Twin Cities**	**kd@astro.umn.edu**
Dr. Roberta M. Humphreys (CoI)	University of Minnesota - Twin Cities	roberta@umn.edu
Dr. John Carl Martin (CoI)	University of Illinois at Springfield	jmart5@uis.edu
Dr. Kazunori Ishibashi (CoI)	Nagoya University	bish@nagoya-u.jp

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) ETA-CAR-A WAVE	STIS/CCD	1	11-Mar-2020 23:00:38.0	yes
02	(1) ETA-CAR-A WAVE	STIS/CCD	1	11-Mar-2020 23:00:41.0	yes
03	(1) ETA-CAR-A WAVE	STIS/CCD	1	11-Mar-2020 23:00:44.0	yes
04	(1) ETA-CAR-A	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	1	11-Mar-2020 23:00:45.0	yes
05	(1) ETA-CAR-A WAVE	STIS/CCD	1	11-Mar-2020 23:00:47.0	yes
T5	(1) ETA-CAR-A WAVE	STIS/CCD	1	11-Mar-2020 23:00:50.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
06	(1) ETA-CAR-A WAVE	STIS/CCD	1	11-Mar-2020 23:00:53.0	yes
07	(1) ETA-CAR-A WAVE	STIS/CCD	1	11-Mar-2020 23:00:56.0	yes
08	(1) ETA-CAR-A WAVE	STIS/CCD	1	11-Mar-2020 23:00:58.0	yes

9 Total Orbits Used

ABSTRACT

Eta Car, the only giant eruption survivor that can be studied well, has been unsteady in recovering from the 1830-1870 explosion. About 20 years ago its spectroscopic and photometric trends dramatically accelerated -- signaling a rapid decrease in the primary mass loss rate. This is a novel clue to the stellar interior's thermal and rotational disequilibrium following the eruption.

Meanwhile, "spectroscopic events" occur at 5.54-year intervals marking the companion star's periastron. HST showed that the basic nature of these events changed between 2003 and 2014 --but we do not know whether this change was temporary, or permanent, or the precursor to something more extreme. Hence the next spectroscopic event, in early 2020, is crucial.

For reasons noted in the proposal, ground-based instruments have inadequate spatial resolution for this purpose, and can't observe the UV. 2020 will be our last opportunity for HST spectroscopy, and the star will be
irreversibly changed when suitable instruments become available sometime in the future. Therefore we propose an adequate set of STIS/CCD and STIS/MAMA observations. They will be valuable for a wide range of topics including stellar instabilities, colliding-wind physics, and abnormal emission-line processes as well as eta Car's recovery from a giant eruption.

OBSERVING DESCRIPTION

Eta Car's periastron spectroscopic event will occur mainly in January-April 2020. This program samples it with STIS-CCD in 7 one-orbit visits, plus a single orbit for STIS-MAMA near the middle of the event. Much later, 2 more orbits in Cycle 28 will show the post-event state of the object.

Each CCD visit includes several critical wavelength intervals. Approximately in decreasing order of spectroscopic priority, these are --

(1) Interval 4570-4840 A using grating G430M. This includes the exotic HeII 4687 flash, the EUV-excited N II 4600 multiplet, a significant He I feature, and useful low-excitation features.
(2) 6490-7040 A using G750M. The H-alpha line profile changes dramatically during an event, and so does He I 6680. This also provides photometry of the red continuum.
(3) 2760-2910 A using G230MB. This includes the bright Mg II emission feature, plus necessary UV continuum photometry.
(4) 3800-4070 A using G430M. This range includes a variety of diagnostics including high-order Balmer lines, Ca H & K, and He I.
In addition, we also use low-dispersion gratings G230LB and G430L for photometry across the broad wavelength range 1700-5500 A. A secondary purpose of the low-dispersion spectrum is to detect any major unexpected changes outside the main wavelength ranges listed above.

Incidentally, these slit spectra also provide useful information about ejecta located 0.2 to 4 arcsec from the star. (But the star is far more important for our goals.)

The STIS-CCD exposure times range from 0.2 to 150 seconds (totals of CR-SPLITS). For practical reasons they are not done in order of scientific priority. In order to obtain sufficient schedulability throughout the January-April time interval, the usable time in each orbit is reduced by several minutes.

In the MAMA visit, echelles E140M and E230M cover the entire attainable UV range 1300-3100 A,, using the FUV and NUV detectors respectively. Exposures of several hundred seconds give high S/N, so the combination fits well into one orbit. Regarding detector brightness limits, we apply a double test: specific count rates were found in earlier observations of the same type, and CCD visits 1 and 2 will give information about the current UV brightness level. See comments in Visit 4..

Concerning HST's gyro issue: 1-gyro operation would most likely cause a shortage of visibility windows during the 4-month event. In that case we would need to heavily revise the plan -- for instance, reducing the number of observations per visit might allow more time-windows, and/or we might need to accept sparser temporal sampling.. Meanwhile, depending on gyro performance and jitter amounts, we might need to use the 52x0.2 slit instead of 52x0.1. This would be acceptable for the main science goals.

Proposal 15812 - STIS-CCD-1 (01) - ``Last Call!'' Eta Carinae's Spectroscopic Event in 2020

Visit

Proposal 15812, STIS-CCD-1 (01), completed Thu Mar 12 03:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: BETWEEN 19-JAN-2020:00:00:00 AND 25-JAN-2020:00:00:00

Comments: The MOST DESIRABLE date for this visit is 22-JAN-2020. This is in the first obvious stage of eta Car's spectroscopic event. Dates near the beginning and end of the timing requirement are not as good as Jan 22.
In order to allow a scheduling window of several days, this one-orbit visit has about 6 minutes of unused orbital visibility. --
Phase in the 2023-day orbit cycle: 22 Jan 2020 = MJD 58870 has phase = -0.0178 = -36 days in the standard "Treasury Program" system. (Periastron is most likely t = -15 days +/- 10 days.)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ETA-CAR-A	RA: 10 45 3.5910 (161.2649625d)	Proper Motion RA: 0 sec of time/yr	V=5+/-0.5	Reference Frame: GSC1
		Dec: -59 41 4.26 (-59.68452d)	Proper Motion Dec: 0 arcsec/yr		
		Equinox: J2000	Parallax: 0.0004"		
		Plate Id: ZZZQ			

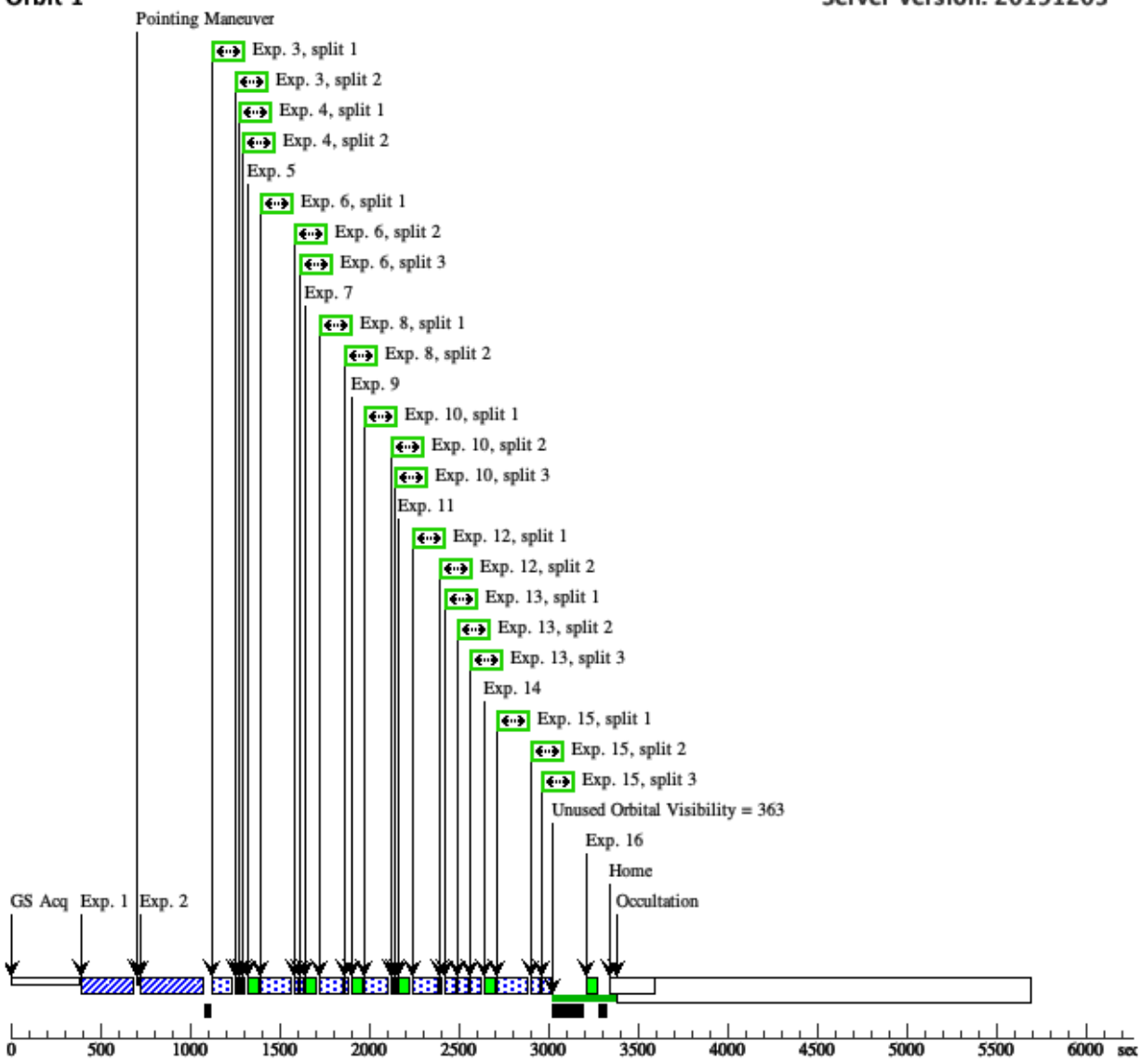
Comments: Special catalog ZZZQ was prepared in 1989 because the original HST GSC was very poor in this crowded nebular region. Later GSC, and especially GAIA, would _probably_ be OK for Eta Car acquisition. However, ZZZQ was used for nearly every successful Eta Car HST observation 1991--2018, and it never failed. Absolute position of Eta Car is still uncertain at the 0.2 arcsec level, even with GAIA, because this object has asymmetric structure at every size scale. The RA and dec listed here were used for successful programs in 2014 and 2018.
Category=STAR
Description=[ETA CARINAE STAR]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ1	(1) ETA-CAR-A	STIS/CCD, ACQ, F25ND3	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2	ACQ2	(1) ETA-CAR-A	STIS/CCD, ACQ/PEAK, 52X0.1	G750M				0.4 Secs (0.4 Secs)	
				7795 A				*[==>]*	***[1]***
Comments: We use wavelength interval 7795 because it is relatively free of narrow emission lines produced in blobs at r = 0.2 arcsec. Shorter wavelengths would be better in other respects, but they can be perturbed by the extraneous off-center emission lines.									
3	A6768a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			0.2 Secs (0.2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
Comments: Ultra-short exposure for bright H-alpha emission profile. WAVECAL=NO because we are explicitly managing the WCALs. Throughout this program we restrict SIZEAXIS2 to avoid buffer dump.									
4	A6768b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			2 Secs (2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					WAVECAL=NO;			*[==>(Split 2)]*	***[1]***
					SIZEAXIS2=200				
Comments: Some H-alpha pixels will be saturated in this exposure. WAVECAL=NO because we are explicitly managing the WCALs.									
5	WCAL6768	WAVE	STIS/CCD, ACCUM, 52X0.1	G750M				*[==>]*	***[1]***
				6768 A					
Comments: We use explicit WCALs for two reasons: (1) Some may be omitted if not needed for program goals, and (2) this might help to force a WCAL into the occultation period after last science exposure. (At least these were the reasons in earlier HST cycles.)									
6	A4706	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=3;			24 Secs (24 Secs)	
				4706 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
Comments: Extremely important wvl interval for He II 4687 and rad-exc N II features. WAVECAL=NO because we manage the WCALs explicitly.									
7	WCAL4706	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				4706 A					
8	A3936	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=2;			24 Secs (24 Secs)	
				3936 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
9	WCAL3936	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				3936 A					
10	LODISP4300	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430L	CR-SPLIT=3;			2.4 Secs (2.4 Secs)	
				4300 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
Comments: CR-SPLIT=3 because the long-wavelength end of this low-dispersion spectrum will be saturated. If we use 3 subexposures instead of 2, then useful data extends to slightly longer wavelength.									
11	WCAL4300	WAVE	STIS/CCD, ACCUM, 52X0.1	G430L				*[==>]*	***[1]***
				4300 A					
12	LODISP2375a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB	CR-SPLIT=2;			12 Secs (12 Secs)	
				2375 A	SIZEAXIS2=80;			*[==>(Split 1)]*	
					GAIN=4;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				

	13	LODISP2375b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=160; WAVECAL=NO	150 Secs (150 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	14	WCAL2375	WAVE	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A		*[==>]*	***[1]***
	15	A2836	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=80; WAVECAL=NO	120 Secs (120 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	16	WCAL2836	WAVE	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A		*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15812, STIS-CCD-2 (02), completed Thu Mar 12 03:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: BETWEEN 07-FEB-2020:00:00:00 AND 14-FEB-2020:00:00:00

Comments: The most desirable time for this visit is as early as possible after Feb 7. According to the Visit Planner, it is very difficult to schedule a visit in the days before Feb 8. Since we do not know exactly why this is true, this one-orbit visit uses an unusually short amount of time within the orbit. --
Phase in the 2023-day orbit cycle: 8 Feb 2020 = MJD 58887 has phase = -0.0094 = -19 days in the "Treasury Program" system.--

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ETA-CAR-A	RA: 10 45 3.5910 (161.2649625d)	Proper Motion RA: 0 sec of time/yr	V=5+/-0.5	Reference Frame: GSC1
		Dec: -59 41 4.26 (-59.68452d)	Proper Motion Dec: 0 arcsec/yr		
		Equinox: J2000	Parallax: 0.0004"		
		Plate Id: ZZZQ			

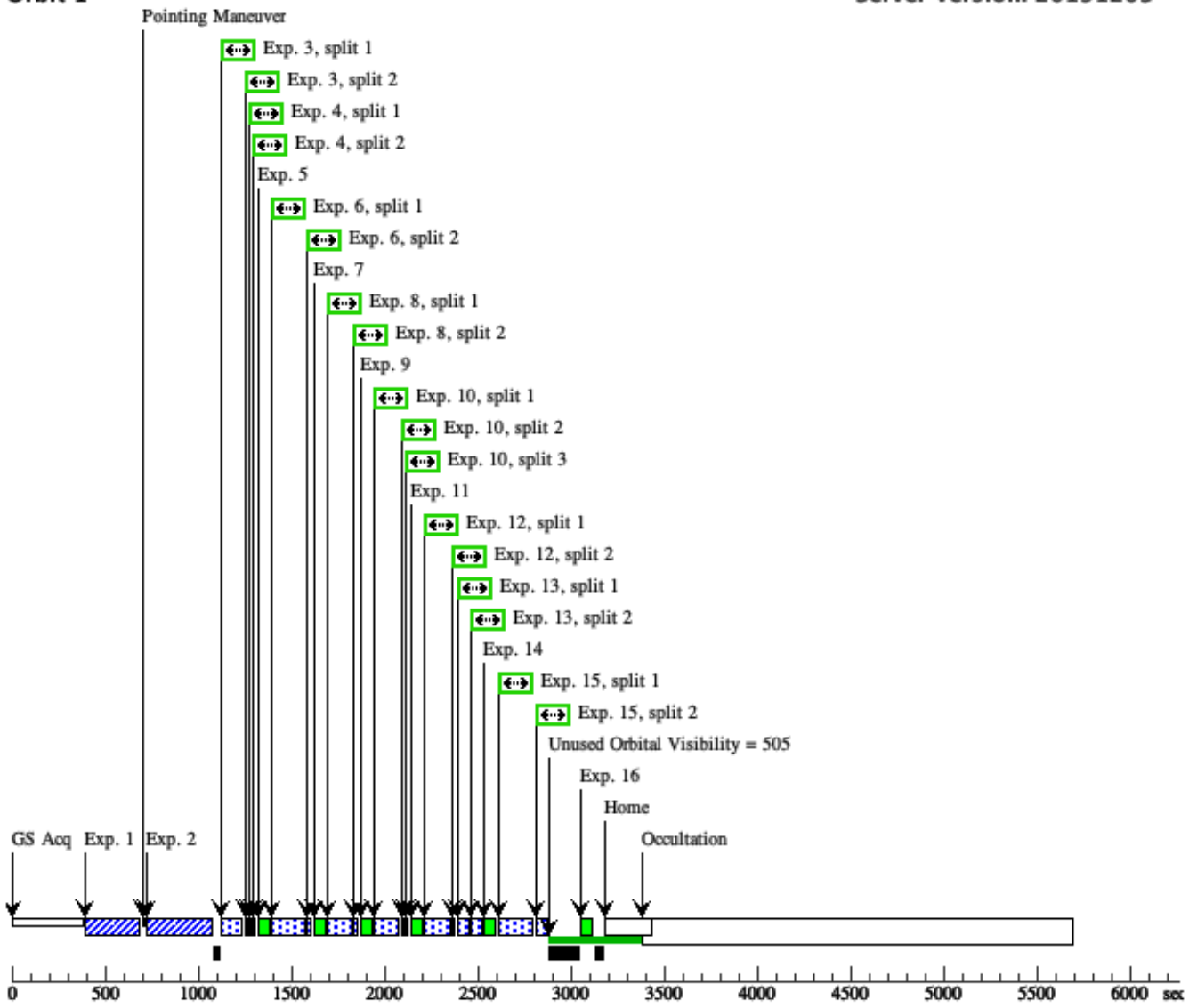
Comments: Special catalog ZZZQ was prepared in 1989 because the original HST GSC was very poor in this crowded nebular region. Later GSC, and especially GAIA, would _probably_ be OK for Eta Car acquisition. However, ZZZQ was used for nearly every successful Eta Car HST observation 1991--2018, and it never failed. Absolute position of Eta Car is still uncertain at the 0.2 arcsec level, even with GAIA, because this object has asymmetric structure at every size scale. The RA and dec listed here were used for successful programs in 2014 and 2018.
Category=STAR
Description=[ETA CARINAE STAR]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ1	(1) ETA-CAR-A	STIS/CCD, ACQ, F25ND3	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2	ACQ2	(1) ETA-CAR-A	STIS/CCD, ACQ/PEAK, 52X0.1	G750M				0.4 Secs (0.4 Secs)	
				7795 A				*[==>]*	***[1]***
Comments: We use wavelength interval 7795 because it is relatively free of narrow emission lines produced in blobs at r = 0.2 arcsec. Shorter wavelengths would be better in other respects, but they can be perturbed by the extraneous off-center emission lines.									
3	A6768a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			0.2 Secs (0.2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
Comments: Ultra-short exposure for bright H-alpha emission profile. WAVECAL=NO because we are explicitly managing the WCALs. Throughout this program we restrict SIZEAXIS2 to avoid buffer dump.									
4	A6768b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			2 Secs (2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					WAVECAL=NO;			*[==>(Split 2)]*	***[1]***
					SIZEAXIS2=160				
Comments: Some H-alpha pixels will be saturated in this exposure. WAVECAL=NO because we are explicitly managing the WCALs.									
5	WCAL6768	WAVE	STIS/CCD, ACCUM, 52X0.1	G750M				*[==>]*	***[1]***
				6768 A					
Comments: We use explicity WCALs for two reasons: (1) Some may be omitted if not needed for program goals, and (2) this may help to force a WCAL into the occultation period after last science exposure.									
6	A4706	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=2;			24 Secs (24 Secs)	
				4706 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=120;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
Comments: Extremely important wvl interval for He II 4687 and rad-exc N II features. WAVECAL=NO because we manage the WCALs explicitly.									
7	WCAL4706	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				4706 A					
8	A3936	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=2;			24 Secs (24 Secs)	
				3936 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=120;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
9	WCAL3936	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				3936 A					
10	LODISP4300	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430L	CR-SPLIT=3;			2.4 Secs (2.4 Secs)	
				4300 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
11	WCAL-LO DISP4300	WAVE	STIS/CCD, ACCUM, 52X0.1	G430L				*[==>]*	***[1]***
				4300 A					
Comments: WAVECA:L after orbit visibility time.									
12	LODISP2375a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB	CR-SPLIT=2;			12 Secs (12 Secs)	
				2375 A	SIZEAXIS2=80;			*[==>(Split 1)]*	
					GAIN=4;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				

	13	LODISP2375b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A	CR-SPLIT=2; GAIN=4; SIZEAXIS2=120; WAVECAL=NO	100 Secs (100 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***
	14	WCAL2375	WAVE	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A		*[==>]*	***[1]***
	15	A2836	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A	GAIN=4; SIZEAXIS2=80; WAVECAL=NO; CR-SPLIT=2	100 Secs (100 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***
	16	WCAL2836	WAVE	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A		*[==>]*	***[1]***

Orbit Structure



Proposal 15812 - STIS-CCD-3 (03) - ``Last Call!'' Eta Carinae's Spectroscopic Event in 2020

Visit

Proposal 15812, STIS-CCD-3 (03), completed Thu Mar 12 03:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: BETWEEN 19-FEB-2020:00:00:00 AND 25-FEB-2020:00:00:00

Comments: The most desirable date for this visit is 22-FEB-2020. This represents a particular stage in eta Car's spectroscopic event.. Dates near the beginning and end of the timing requirement are not as good as Feb 22.
In order to allow a scheduling window of several days, this one-orbit visit has about 6 minutes of unused orbital visibility. --
Phase in the 2023-day orbit cycle: 22 Feb 2020 = MJD 58901 has cycle phase = -0.0025 = -5 days.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ETA-CAR-A	RA: 10 45 3.5910 (161.2649625d)	Proper Motion RA: 0 sec of time/yr	V=5+/-0.5	Reference Frame: GSC1
		Dec: -59 41 4.26 (-59.68452d)	Proper Motion Dec: 0 arcsec/yr		
		Equinox: J2000	Parallax: 0.0004"		
		Plate Id: ZZZQ			

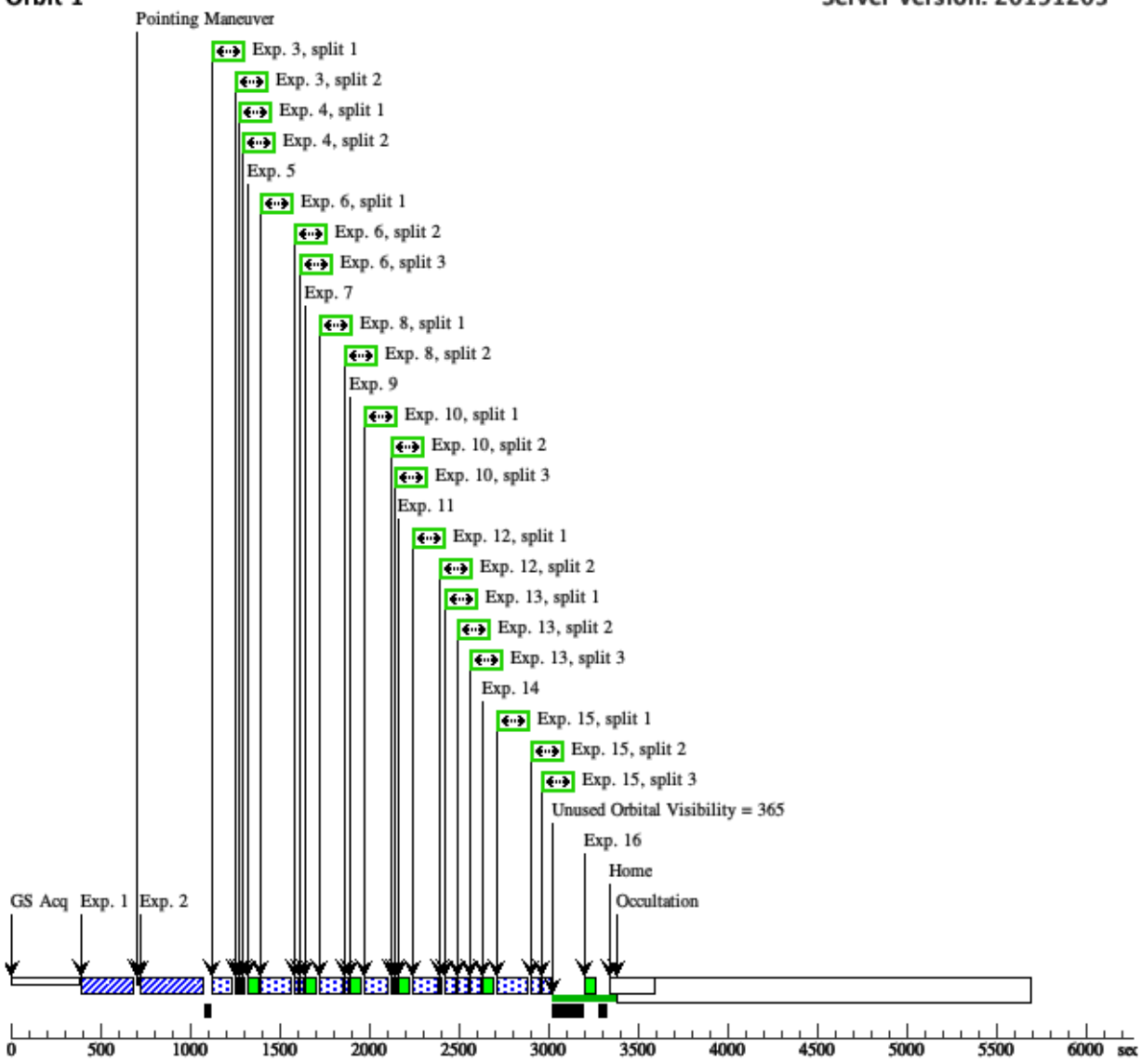
Comments: Special catalog ZZZQ was prepared in 1989 because the original HST GSC was very poor in this crowded nebular region. Later GSC, and especially GAIA, would _probably_ be OK for Eta Car acquisition. However, ZZZQ was used for nearly every successful Eta Car HST observation 1991--2018, and it never failed. Absolute position of Eta Car is still uncertain at the 0.2 arcsec level, even with GAIA, because this object has asymmetric structure at every size scale. The RA and dec listed here were used for successful programs in 2014 and 2018.
Category=STAR
Description=[ETA CARINAE STAR]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ1	(1) ETA-CAR-A	STIS/CCD, ACQ, F25ND3	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2	ACQ2	(1) ETA-CAR-A	STIS/CCD, ACQ/PEAK, 52X0.1	G750M				0.4 Secs (0.4 Secs)	
				7795 A				*[==>]*	***[1]***
Comments: We use wavelength interval 7795 because it is relatively free of narrow emission lines produced in blobs at r = 0.2 arcsec. Shorter wavelengths would be better in other respects, but they can be perturbed by the extraneous off-center emission lines.									
3	A6768a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			0.2 Secs (0.2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
Comments: Ultra-short exposure for bright H-alpha emission profile. WAVECAL=NO because we are explicitly managing the WCALs. Throughout this program we restrict SIZEAXIS2 to avoid buffer dump.									
4	A6768b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			2 Secs (2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					WAVECAL=NO;			*[==>(Split 2)]*	***[1]***
					SIZEAXIS2=160				
Comments: Some H-alpha pixels will be saturated in this exposure. WAVECAL=NO because we are explicitly managing the WCALs.									
5	WCAL6768	WAVE	STIS/CCD, ACCUM, 52X0.1	G750M				*[==>]*	***[1]***
				6768 A					
Comments: We use explicit WAVECALs for reasons noted in the Visit 1 comments.									
6	A4706	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=3;			24 Secs (24 Secs)	
				4706 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
Comments: Extremely important wvl interval for He II 4687 and rad-exc N II features. WAVECAL=NO because we manage the WCALs explicitly.									
7	WCAL4706	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				4706 A					
8	A3936	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=2;			24 Secs (24 Secs)	
				3936 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
9	WCAL3936	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				3936 A					
10	LODISP4300	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430L	CR-SPLIT=3;			2.4 Secs (2.4 Secs)	
				4300 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
11	WCAL4300	WAVE	STIS/CCD, ACCUM, 52X0.1	G430L				*[==>]*	***[1]***
				4300 A					
12	LODISP2375a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB	CR-SPLIT=2;			12 Secs (12 Secs)	
				2375 A	SIZEAXIS2=80;			*[==>(Split 1)]*	
					GAIN=4;			*[==>(Split 2)]*	
					WAVECAL=NO				***[1]***

	13	LODISP2375b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=160; WAVECAL=NO	150 Secs (150 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	14	WCAL2375	WAVE	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A		*[==>]*	***[1]***
	15	A2836	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=80; WAVECAL=NO	120 Secs (120 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	16	WCAL2836	WAVE	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A		*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15812, STIS-MAMA-1 (04), scheduled Thu Mar 12 03:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD, STIS/FUV-MAMA

Special Requirements: BETWEEN 03-MAR-2020:00:00:00 AND 13-MAR-2020:00:00:00

Comments: (1) Note about timing limits: The DESIRED time is close to 8 March, the middle of the specified timing requirements. Dates near the beginning or end of this interval are not as good. ---
(2) In order to allow a wide enough observing window (i.e., a large enough range of possible dates), this plan has 8 minutes of unused orbital visibility. ---
(3) MAMA brightness limits: This target is not suitable for an ETC run, but it has been observed with STIS/MAMA several times in the past. Also we can use preceding CCD visits to verify safety. See comments for the observations.
--
Phase in the 2023-day orbit cycle: 8 Mar 2020 = MJD 58916 has phase = +0.0049 = +10 days.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ETA-CAR-A	RA: 10 45 3.5910 (161.2649625d)	Proper Motion RA: 0 sec of time/yr	V=5+/-0.5	Reference Frame: GSC1
		Dec: -59 41 4.26 (-59.68452d)	Proper Motion Dec: 0 arcsec/yr		
		Equinox: J2000	Parallax: 0.0004"		
		Plate Id: ZZZQ			

Comments: Special catalog ZZZQ was prepared in 1989 because the original HST GSC was very poor in this crowded nebular region. Later GSC, and especially GAIA, would _probably_ be OK for Eta Car acquisition. However, ZZZQ was used for nearly every successful Eta Car HST observation 1991--2018, and it never failed. Absolute position of Eta Car is still uncertain at the 0.2 arcsec level, even with GAIA, because this object has asymmetric structure at every size scale. The RA and dec listed here were used for successful programs in 2014 and 2018.
Category=STAR
Description=[ETA CARINAE STAR]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ1	(1) ETA-CAR-A	STIS/CCD, ACQ, F25ND3	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***

Comments: This ACQ plan is copied from program 15067, done in 2018.

2	ACQ2	(1) ETA-CAR-A	STIS/CCD, ACQ/PEAK, 52X0.1	G750M				0.4 Secs (0.4 Secs)	
				7795 A				*[==>]*	***[1]***

Comments: This ACQ plan is copied from program 15067, done in 2018.

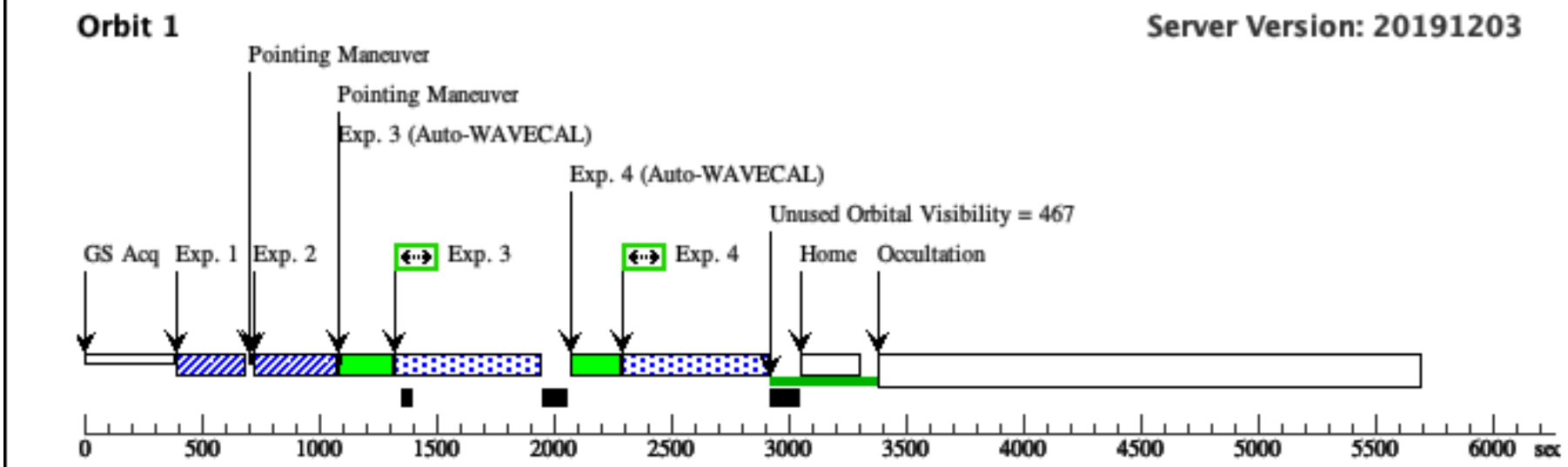
3	NUV1978A (1369103)	(1) ETA-CAR-A	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M				600 Secs (600 Secs)	
				1978 A				*[==>]*	***[1]***

Comments: Re. BRIGHTNESS LIMITS: ETC is only a rough guide for this object, because the spectrum is extremely complex and changes during the spectroscopic event. Real observed count rates are better. On 21 April 2018, E230M produced 6.6 cts/s in the maximum pixel, and 143,000 cts/s in the entire detector. On average, Eta Car is brightening about 12 percent per year in the UV -- EXCEPT that it has always become tem porarily fainter during each spectroscopic event.
--- In order to verify that Eta Car has not brightened by a dangerous amount, we will examine CCD-G230LB and CCD-G230MB data from visits 1 and 2.
--- Note that this object is not a strong irregular variable in the sense used for brightness limits. Absorption lines have caused rapid UV _decreases_ in previous spectroscopic events, but there have been no strong rap id increases in UV emission.

4	FUV1425A (1369096)	(1) ETA-CAR-A	STIS/FUV-MAMA, ACCUM, 0.2X0.2	E140M				600 Secs (600 Secs)	
				1425 A				*[==>]*	***[1]***

Comments: Re. BRIGHTNESS LIMITS: ETC is only a rough guide for this object, because the spectrum is extremely complex and changes during the spectroscopic event. Real observed count rates are better. On 21 April 2018, E140M produced 0.5 cts/s in the maximum pixel, and 75,000 cts/s in the entire detector. On average, Eta Car is brightening about 12 percent per year in the UV -- EXCEPT that it has always become temp orarily fainter during each spectroscopic event.
--- In order to verify that Eta Car has not brightened by a dangerous amount, we will examine CCD-G230LB and CCD-G230MB data from visits 1 and 2.
--- Note that this object is not a strong irregular variable in the sense used for brightness limits. Absorption lines have caused rapid UV _decreases_ in previous spectroscopic events, but there have been no strong rap id increases in UV emission.

Orbit Structure



Visit

Proposal 15812, STIS-CCD-4 (05), failed Thu Mar 12 03:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: BETWEEN 05-MAR-2020:00:00:00 AND 11-MAR-2020:00:00:00

Comments: The most desirable date for this visit is 08-MAR-2020. Dates near the beginning and end of the timing requirement are not as good as Mar 8.
In order to allow a scheduling window of several days, this one-orbit visit has about 6 minutes of unused orbital visibility. --
Phase in the 2023-day cycle:: 8 March 2020 = MJD 58916 has phase +0.0049 = +10 days.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ETA-CAR-A	RA: 10 45 3.5910 (161.2649625d)	Proper Motion RA: 0 sec of time/yr	V=5+/-0.5	Reference Frame: GSC1
		Dec: -59 41 4.26 (-59.68452d)	Proper Motion Dec: 0 arcsec/yr		
		Equinox: J2000	Parallax: 0.0004"		
		Plate Id: ZZZQ			

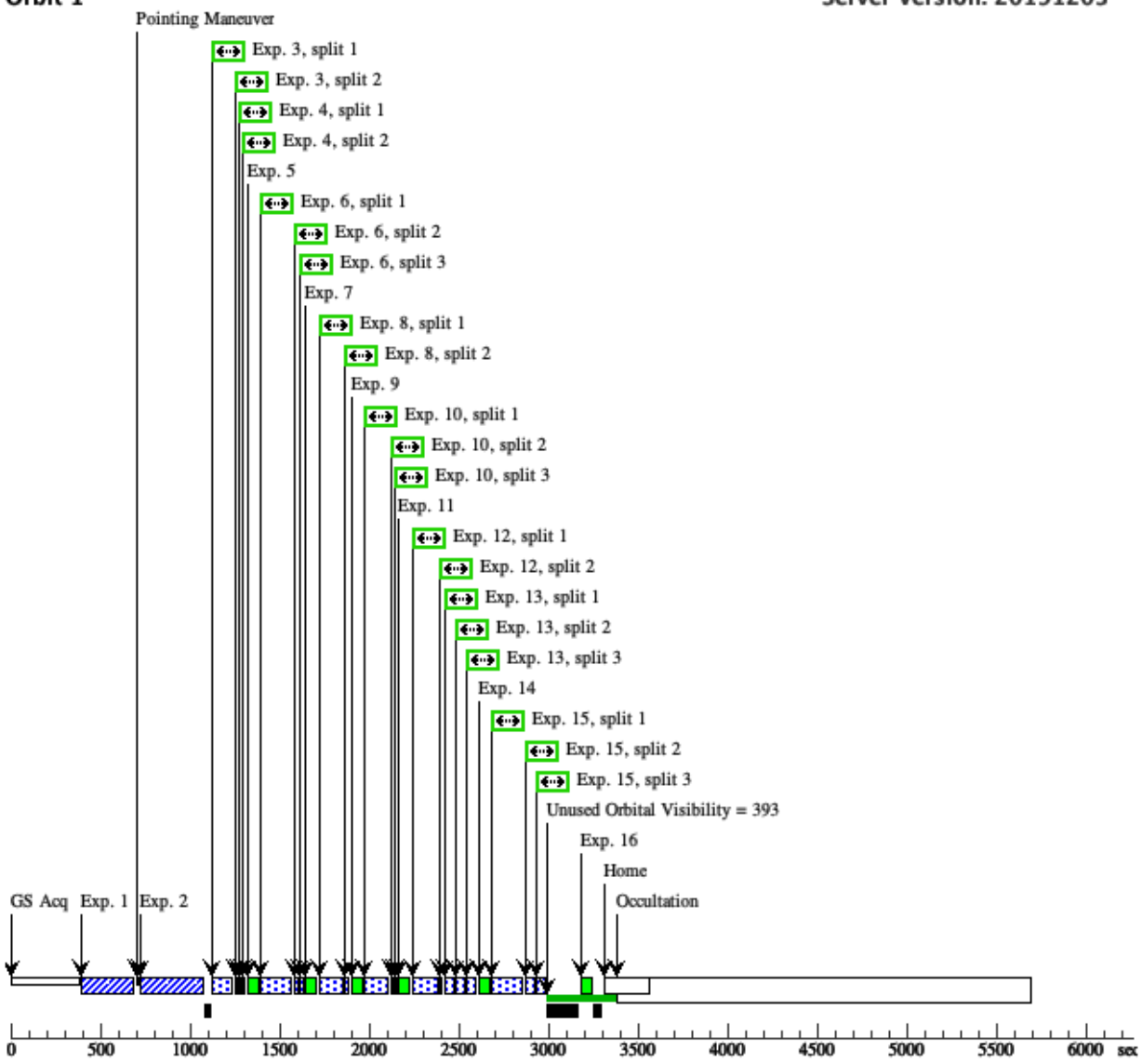
Comments: Special catalog ZZZQ was prepared in 1989 because the original HST GSC was very poor in this crowded nebular region. Later GSC, and especially GAIA, would _probably_ be OK for Eta Car acquisition. However, ZZZQ was used for nearly every successful Eta Car HST observation 1991--2018, and it never failed. Absolute position of Eta Car is still uncertain at the 0.2 arcsec level, even with GAIA, because this object has asymmetric structure at every size scale. The RA and dec listed here were used for successful programs in 2014 and 2018.
Category=STAR
Description=[ETA CARINAE STAR]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ1	(1) ETA-CAR-A	STIS/CCD, ACQ, F25ND3	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2	ACQ2	(1) ETA-CAR-A	STIS/CCD, ACQ/PEAK, 52X0.1	G750M				0.4 Secs (0.4 Secs)	
				7795 A				*[==>]*	***[1]***
Comments: We use wavelength interval 7795 because it is relatively free of narrow emission lines produced in blobs at r = 0.2 arcsec. Shorter wavelengths would be better in other respects, but they can be perturbed by the extraneous off-center emission lines.									
3	A6768a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			0.2 Secs (0.2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
Comments: Ultra-short exposure for bright H-alpha emission profile. WAVECAL=NO because we are explicitly managing the WCALs. Throughout this program we restrict SIZEAXIS2 to avoid buffer dump.									
4	A6768b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			2 Secs (2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					WAVECAL=NO;			*[==>(Split 2)]*	***[1]***
					SIZEAXIS2=200				
Comments: Some H-alpha pixels will be saturated in this exposure. WAVECAL=NO because we are explicitly managing the WCALs.									
5	WCAL6768	WAVE	STIS/CCD, ACCUM, 52X0.1	G750M				*[==>]*	***[1]***
				6768 A					
Comments: We use explicity WCALs for two reasons: (1) Some may be omitted if not needed for program goals, and (2) this may help to force a WCAL into the occultation period after last science exposure.									
6	A4706	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=3;			24 Secs (24 Secs)	
				4706 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
Comments: Extremely important wvl interval for He II 4687 and rad-exc N II features. WAVECAL=NO because we manage the WCALs explicitly.									
7	WCAL4706	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				4706 A					
8	A3936	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=2;			24 Secs (24 Secs)	
				3936 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
9	WCAL3936	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				3936 A					
10	LODISP4300	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430L	CR-SPLIT=3;			2.4 Secs (2.4 Secs)	
				4300 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
11	WCAL4300	WAVE	STIS/CCD, ACCUM, 52X0.1	G430L				*[==>]*	***[1]***
				4300 A					
12	LODISP2375a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB	CR-SPLIT=2;			12 Secs (12 Secs)	
				2375 A	SIZEAXIS2=80;			*[==>(Split 1)]*	
					GAIN=4;			*[==>(Split 2)]*	
					WAVECAL=NO				***[1]***

	13	LODISP2375b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=160; WAVECAL=NO	120 Secs (120 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	14	WCAL2375	WAVE	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A		*[==>]*	***[1]***
	15	A2836	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=80; WAVECAL=NO	120 Secs (120 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	16	WCAL2836	WAVE	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A		*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15812, STIS-CCD-4-HOPR (T5), implementation Thu Mar 12 03:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: (none)

Comments: The most desirable date for this visit is 08-MAR-2020. Dates near the beginning and end of the timing requirement are not as good as Mar 8.
In order to allow a scheduling window of several days, this one-orbit visit has about 6 minutes of unused orbital visibility. --
Phase in the 2023-day cycle:: 8 March 2020 = MJD 58916 has phase +0.0049 = +10 days.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ETA-CAR-A	RA: 10 45 3.5910 (161.2649625d)	Proper Motion RA: 0 sec of time/yr	V=5+/-0.5	Reference Frame: GSC1
		Dec: -59 41 4.26 (-59.68452d)	Proper Motion Dec: 0 arcsec/yr		
		Equinox: J2000	Parallax: 0.0004"		
		Plate Id: ZZZQ			

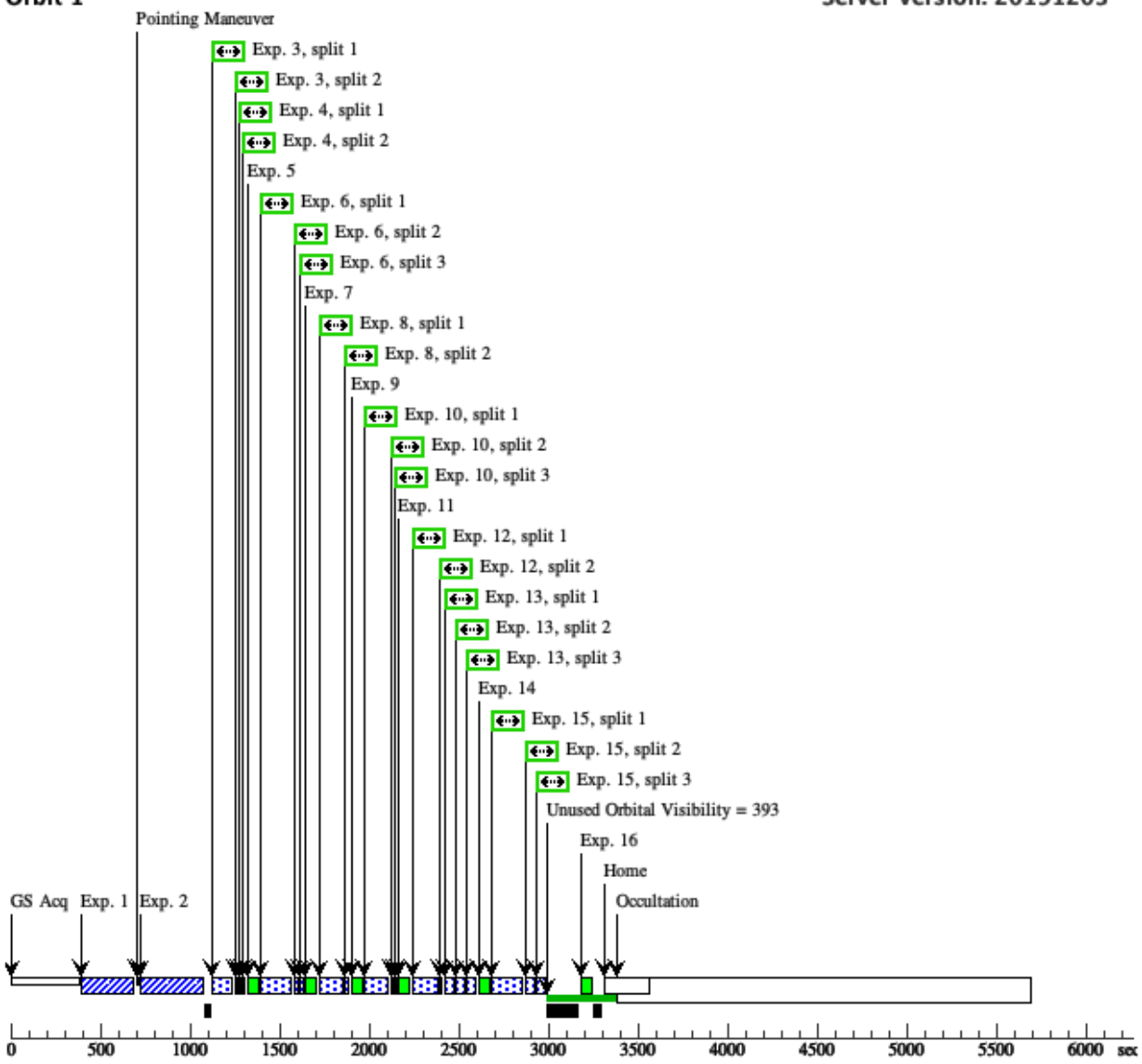
Comments: Special catalog ZZZQ was prepared in 1989 because the original HST GSC was very poor in this crowded nebular region. Later GSC, and especially GAIA, would _probably_ be OK for Eta Car acquisition. However, ZZZQ was used for nearly every successful Eta Car HST observation 1991--2018, and it never failed. Absolute position of Eta Car is still uncertain at the 0.2 arcsec level, even with GAIA, because this object has asymmetric structure at every size scale. The RA and dec listed here were used for successful programs in 2014 and 2018.
Category=STAR
Description=[ETA CARINAE STAR]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ1	(1) ETA-CAR-A	STIS/CCD, ACQ, F25ND3	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2	ACQ2	(1) ETA-CAR-A	STIS/CCD, ACQ/PEAK, 52X0.1	G750M				0.4 Secs (0.4 Secs)	
				7795 A				*[==>]*	***[1]***
Comments: We use wavelength interval 7795 because it is relatively free of narrow emission lines produced in blobs at r = 0.2 arcsec. Shorter wavelengths would be better in other respects, but they can be perturbed by the extraneous off-center emission lines.									
3	A6768a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			0.2 Secs (0.2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
Comments: Ultra-short exposure for bright H-alpha emission profile. WAVECAL=NO because we are explicitly managing the WCALs. Throughout this program we restrict SIZEAXIS2 to avoid buffer dump.									
4	A6768b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			2 Secs (2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					WAVECAL=NO;			*[==>(Split 2)]*	***[1]***
					SIZEAXIS2=200				
Comments: Some H-alpha pixels will be saturated in this exposure. WAVECAL=NO because we are explicitly managing the WCALs.									
5	WCAL6768	WAVE	STIS/CCD, ACCUM, 52X0.1	G750M				*[==>]*	***[1]***
				6768 A					
Comments: We use explicity WCALs for two reasons: (1) Some may be omitted if not needed for program goals, and (2) this may help to force a WCAL into the occultation period after last science exposure.									
6	A4706	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=3;			24 Secs (24 Secs)	
				4706 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
Comments: Extremely important wvl interval for He II 4687 and rad-exc N II features. WAVECAL=NO because we manage the WCALs explicitly.									
7	WCAL4706	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				4706 A					
8	A3936	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=2;			24 Secs (24 Secs)	
				3936 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
9	WCAL3936	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				3936 A					
10	LODISP4300	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430L	CR-SPLIT=3;			2.4 Secs (2.4 Secs)	
				4300 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
11	WCAL4300	WAVE	STIS/CCD, ACCUM, 52X0.1	G430L				*[==>]*	***[1]***
				4300 A					
12	LODISP2375a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB	CR-SPLIT=2;			12 Secs (12 Secs)	
				2375 A	SIZEAXIS2=80;			*[==>(Split 1)]*	
					GAIN=4;			*[==>(Split 2)]*	
					WAVECAL=NO				***[1]***

	13	LODISP2375b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=160; WAVECAL=NO	120 Secs (120 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	14	WCAL2375	WAVE	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A		*[==>]*	***[1]***
	15	A2836	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=80; WAVECAL=NO	120 Secs (120 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	16	WCAL2836	WAVE	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A		*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15812, STIS-CCD-5 (06), scheduled Thu Mar 12 03:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: BETWEEN 20-MAR-2020:00:00:00 AND 26-MAR-2020:00:00:00

Comments: The most desirable date for this visit is 23-MAR-2020. Dates near the beginning and end of the timing requirement are not as good as Mar 23.
In order to allow a scheduling window of several days, this one-orbit visit has about 6 minutes of unused orbital visibility. --
Phase in the 2023-day cycle: 23 Mar 2020 = MJD 58931 has phase = +0.0124 = +25 days.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ETA-CAR-A	RA: 10 45 3.5910 (161.2649625d)	Proper Motion RA: 0 sec of time/yr	V=5+/-0.5	Reference Frame: GSC1
		Dec: -59 41 4.26 (-59.68452d)	Proper Motion Dec: 0 arcsec/yr		
		Equinox: J2000	Parallax: 0.0004"		
		Plate Id: ZZZQ			

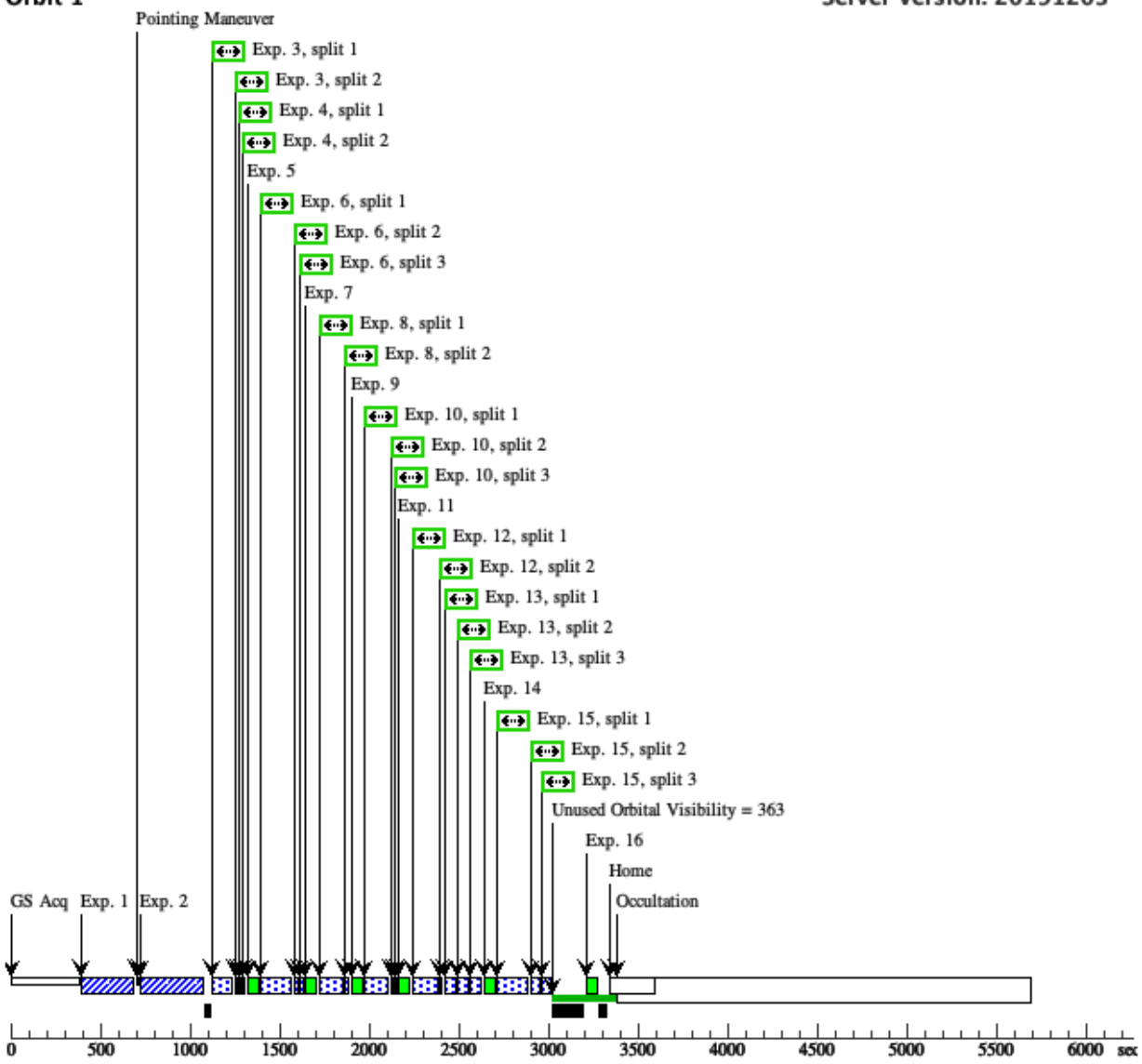
Comments: Special catalog ZZZQ was prepared in 1989 because the original HST GSC was very poor in this crowded nebular region. Later GSC, and especially GAIA, would _probably_ be OK for Eta Car acquisition. However, ZZZQ was used for nearly every successful Eta Car HST observation 1991--2018, and it never failed. Absolute position of Eta Car is still uncertain at the 0.2 arcsec level, even with GAIA, because this object has asymmetric structure at every size scale. The RA and dec listed here were used for successful programs in 2014 and 2018.
Category=STAR
Description=[ETA CARINAE STAR]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ1	(1) ETA-CAR-A	STIS/CCD, ACQ, F25ND3	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2	ACQ2	(1) ETA-CAR-A	STIS/CCD, ACQ/PEAK, 52X0.1	G750M				0.4 Secs (0.4 Secs)	
				7795 A				*[==>]*	***[1]***
Comments: We use wavelength interval 7795 because it is relatively free of narrow emission lines produced in blobs at r = 0.2 arcsec. Shorter wavelengths would be better in other respects, but they can be perturbed by the extraneous off-center emission lines.									
3	A6768a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			0.2 Secs (0.2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
Comments: Ultra-short exposure for bright H-alpha emission profile. WAVECAL=NO because we are explicitly managing the WCALs. Throughout this program we restrict SIZEAXIS2 to avoid buffer dump.									
4	A6768b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			2 Secs (2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					WAVECAL=NO;			*[==>(Split 2)]*	***[1]***
					SIZEAXIS2=200				
Comments: Some H-alpha pixels will be saturated in this exposure. WAVECAL=NO because we are explicitly managing the WCALs.									
5	WCAL6768	WAVE	STIS/CCD, ACCUM, 52X0.1	G750M				*[==>]*	***[1]***
				6768 A					
Comments: We use explicity WCALs for two reasons: (1) Some may be omitted if not needed for program goals, and (2) this may help to force a WCAL into the occultation period after last science exposure.									
6	A4706	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=3;			24 Secs (24 Secs)	
				4706 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
Comments: Extremely important wvl interval for He II 4687 and rad-exc N II features. WAVECAL=NO because we manage the WCALs explicitly.									
7	WCAL4706	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				4706 A					
8	A3936	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=2;			24 Secs (24 Secs)	
				3936 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
9	WCAL3936	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				3936 A					
10	LODISP4300	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430L	CR-SPLIT=3;			2.4 Secs (2.4 Secs)	
				4300 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
11	WCAL4300	WAVE	STIS/CCD, ACCUM, 52X0.1	G430L				*[==>]*	***[1]***
				4300 A					
12	LODISP2375a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB	CR-SPLIT=2;			12 Secs (12 Secs)	
				2375 A	SIZEAXIS2=80;			*[==>(Split 1)]*	
					GAIN=4;			*[==>(Split 2)]*	
					WAVECAL=NO				***[1]***

	13	LODISP2375b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=160; WAVECAL=NO	150 Secs (150 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	14	WCAL2375	WAVE	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A		*[==>]*	***[1]***
	15	A2836	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=80; WAVECAL=NO	120 Secs (120 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	16	WCAL2836	WAVE	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A		*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15812, STIS-CCD-6 (07), scheduling Thu Mar 12 03:01:00 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: BETWEEN 07-APR-2020:00:00:00 AND 13-APR-2020:00:00:00

Comments: The most desirable date for this visit is 10-APR-2020. Dates near the beginning and end of the timing requirement are not as good as Apr 10.
In order to allow a scheduling window of several days, this one-orbit visit has about 6 minutes of unused orbital visibility. --
Phase in the 2023-day cycle: 10 Apr 2020 = MJD 58949 has phase = +0.0213 = +43 days.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ETA-CAR-A	RA: 10 45 3.5910 (161.2649625d)	Proper Motion RA: 0 sec of time/yr	V=5+/-0.5	Reference Frame: GSC1
		Dec: -59 41 4.26 (-59.68452d)	Proper Motion Dec: 0 arcsec/yr		
		Equinox: J2000	Parallax: 0.0004"		
		Plate Id: ZZZQ			

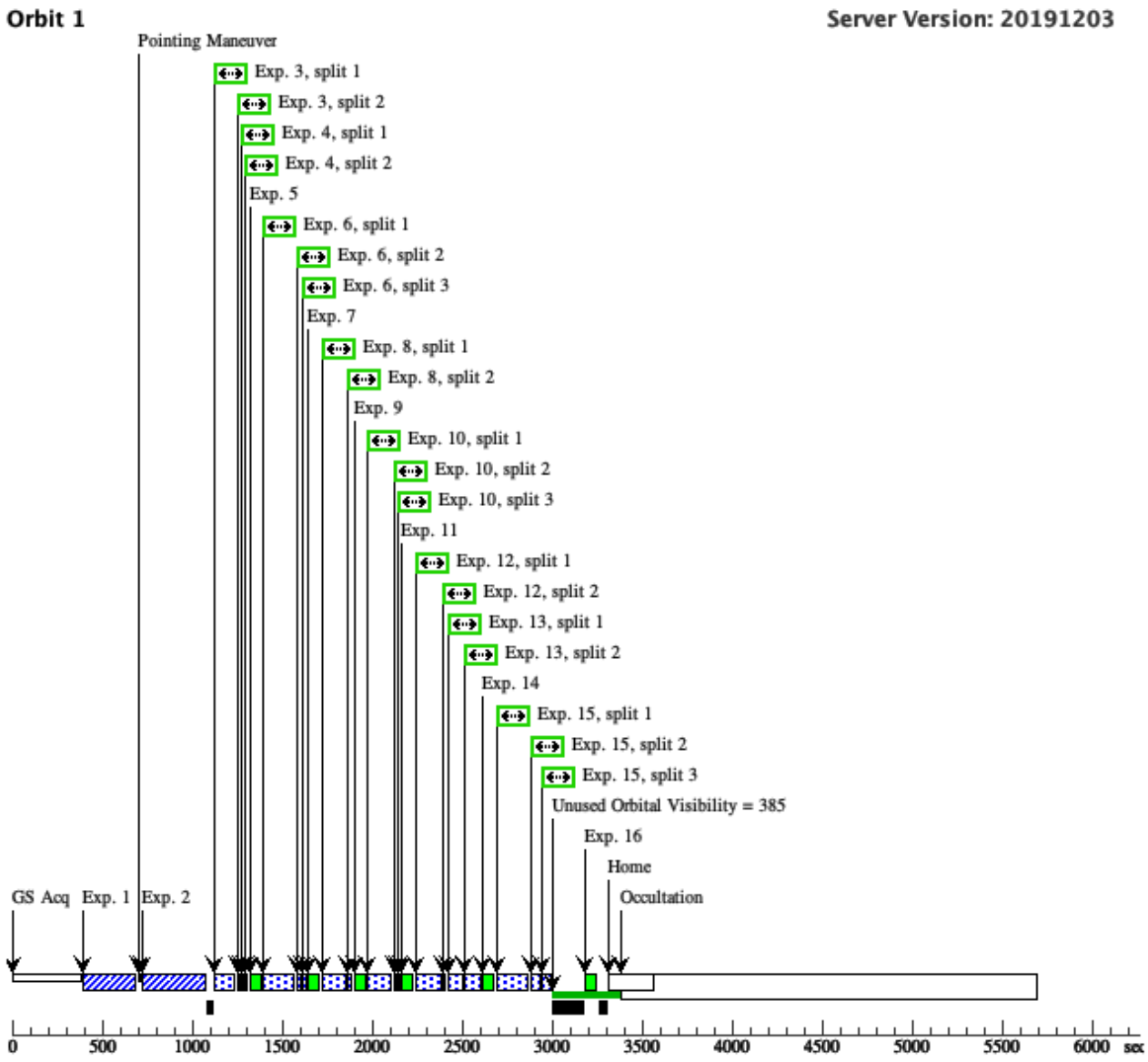
Comments: Special catalog ZZZQ was prepared in 1989 because the original HST GSC was very poor in this crowded nebular region. Later GSC, and especially GAIA, would _probably_ be OK for Eta Car acquisition. However, ZZZQ was used for nearly every successful Eta Car HST observation 1991--2018, and it never failed. Absolute position of Eta Car is still uncertain at the 0.2 arcsec level, even with GAIA, because this object has asymmetric structure at every size scale. The RA and dec listed here were used for successful programs in 2014 and 2018.
Category=STAR
Description=[ETA CARINAE STAR]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ1	(1) ETA-CAR-A	STIS/CCD, ACQ, F25ND3	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2	ACQ2	(1) ETA-CAR-A	STIS/CCD, ACQ/PEAK, 52X0.1	G750M				0.4 Secs (0.4 Secs)	
				7795 A				*[==>]*	***[1]***
Comments: We use wavelength interval 7795 because it is relatively free of narrow emission lines produced in blobs at r = 0.2 arcsec. Shorter wavelengths would be better in other respects, but they can be perturbed by the extraneous off-center emission lines.									
3	A6768a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			0.2 Secs (0.2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
Comments: Ultra-short exposure for bright H-alpha emission profile. WAVECAL=NO because we are explicitly managing the WCALs. Throughout this program we restrict SIZEAXIS2 to avoid buffer dump.									
4	A6768b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			2 Secs (2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					WAVECAL=NO;			*[==>(Split 2)]*	***[1]***
					SIZEAXIS2=200				
Comments: Some H-alpha pixels will be saturated in this exposure. WAVECAL=NO because we are explicitly managing the WCALs.									
5	WCAL6768	WAVE	STIS/CCD, ACCUM, 52X0.1	G750M				*[==>]*	***[1]***
				6768 A					
Comments: We use explicity WCALs for two reasons: (1) Some may be omitted if not needed for program goals, and (2) this may help to force a WCAL into the occultation period after last science exposure.									
6	A4706	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=3;			24 Secs (24 Secs)	
				4706 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
Comments: Extremely important wvl interval for He II 4687 and rad-exc N II features. WAVECAL=NO because we manage the WCALs explicitly.									
7	WCAL4706	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				4706 A					
8	A3936	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=2;			24 Secs (24 Secs)	
				3936 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
9	WCAL3936	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				3936 A					
10	LODISP4300	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430L	CR-SPLIT=3;			2.4 Secs (2.4 Secs)	
				4300 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
11	WCAL4300	WAVE	STIS/CCD, ACCUM, 52X0.1	G430L				*[==>]*	***[1]***
				4300 A					
12	LODISP2375a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB	CR-SPLIT=2;			12 Secs (12 Secs)	
				2375 A	SIZEAXIS2=80;			*[==>(Split 1)]*	
					GAIN=4;			*[==>(Split 2)]*	
					WAVECAL=NO				***[1]***

	13	LODISP2375b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A	CR-SPLIT=2; GAIN=4; SIZEAXIS2=160; WAVECAL=NO	150 Secs (150 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
	14	WCAL2375	WAVE	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A		*[==>]*	***[1]***
	15	A2836	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=80; WAVECAL=NO	120 Secs (120 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	16	WCAL2836	WAVE	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A		*[==>]*	***[1]***

Orbit Structure



Visit

Proposal 15812, STIS-CCD-7 (08), scheduling Thu Mar 12 03:01:01 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: BETWEEN 05-MAY-2020:00:00:00 AND 25-MAY-2020:00:00:00

Comments: Timing requirement is not as strict as the earlier visits. --
Phase in the 2023-day cycle: 15 May 2020 = MJD 58984 has phase = +0.0385 = +78 days.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ETA-CAR-A	RA: 10 45 3.5910 (161.2649625d)	Proper Motion RA: 0 sec of time/yr	V=5+/-0.5	Reference Frame: GSC1
		Dec: -59 41 4.26 (-59.68452d)	Proper Motion Dec: 0 arcsec/yr		
		Equinox: J2000	Parallax: 0.0004"		
		Plate Id: ZZZQ			

Comments: Special catalog ZZZQ was prepared in 1989 because the original HST GSC was very poor in this crowded nebular region. Later GSC, and especially GAIA, would _probably_ be OK for Eta Car acquisition. However, ZZZQ was used for nearly every successful Eta Car HST observation 1991--2018, and it never failed. Absolute position of Eta Car is still uncertain at the 0.2 arcsec level, even with GAIA, because this object has asymmetric structure at every size scale. The RA and dec listed here were used for successful programs in 2014 and 2018.
Category=STAR
Description=[ETA CARINAE STAR]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ1	(1) ETA-CAR-A	STIS/CCD, ACQ, F25ND3	MIRROR				0.3 Secs (0.3 Secs)	
								[==>]	***[1]***
2	ACQ2	(1) ETA-CAR-A	STIS/CCD, ACQ/PEAK, 52X0.1	G750M				0.4 Secs (0.4 Secs)	
				7795 A				*[==>]*	***[1]***
Comments: We use wavelength interval 7795 because it is relatively free of narrow emission lines produced in blobs at r = 0.2 arcsec. Shorter wavelengths would be better in other respects, but they can be perturbed by the extraneous off-center emission lines.									
3	A6768a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			0.2 Secs (0.2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
Comments: Ultra-short exposure for bright H-alpha emission profile. WAVECAL=NO because we are explicitly managing the WCALs. Throughout this program we restrict SIZEAXIS2 to avoid buffer dump.									
4	A6768b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G750M	CR-SPLIT=2;			2 Secs (2 Secs)	
				6768 A	GAIN=4;			*[==>(Split 1)]*	
					WAVECAL=NO;			*[==>(Split 2)]*	***[1]***
					SIZEAXIS2=200				
Comments: Some H-alpha pixels will be saturated in this exposure. WAVECAL=NO because we are explicitly managing the WCALs.									
5	WCAL6768	WAVE	STIS/CCD, ACCUM, 52X0.1	G750M				*[==>]*	***[1]***
				6768 A					
Comments: We use explicity WCALs for two reasons: (1) Some may be omitted if not needed for program goals, and (2) this may help to force a WCAL into the occultation period after last science exposure.									
6	A4706	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=3;			24 Secs (24 Secs)	
				4706 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
Comments: Extremely important wvl interval for He II 4687 and rad-exc N II features. WAVECAL=NO because we manage the WCALs explicitly.									
7	WCAL4706	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				4706 A					
8	A3936	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430M	CR-SPLIT=2;			24 Secs (24 Secs)	
				3936 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=160;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO				
9	WCAL3936	WAVE	STIS/CCD, ACCUM, 52X0.1	G430M				*[==>]*	***[1]***
				3936 A					
10	LODISP4300	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G430L	CR-SPLIT=3;			2.4 Secs (2.4 Secs)	
				4300 A	GAIN=4;			*[==>(Split 1)]*	
					SIZEAXIS2=80;			*[==>(Split 2)]*	***[1]***
					WAVECAL=NO			*[==>(Split 3)]*	
11	WCAL4300	WAVE	STIS/CCD, ACCUM, 52X0.1	G430L				*[==>]*	***[1]***
				4300 A					
12	LODISP2375a	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB	CR-SPLIT=2;			12 Secs (12 Secs)	
				2375 A	SIZEAXIS2=80;			*[==>(Split 1)]*	
					GAIN=4;			*[==>(Split 2)]*	
					WAVECAL=NO				***[1]***

	13	LODISP2375b	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A	CR-SPLIT=2; GAIN=4; SIZEAXIS2=160; WAVECAL=NO	150 Secs (150 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***
	14	WCAL2375	WAVE	STIS/CCD, ACCUM, 52X0.1	G230LB 2375 A		*[==>]*	***[1]***
	15	A2836	(1) ETA-CAR-A	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A	CR-SPLIT=3; GAIN=4; SIZEAXIS2=80; WAVECAL=NO	120 Secs (120 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	 ***[1]***
	16	WCAL2836	WAVE	STIS/CCD, ACCUM, 52X0.1	G230MB 2836 A		*[==>]*	***[1]***

Orbit Structure