

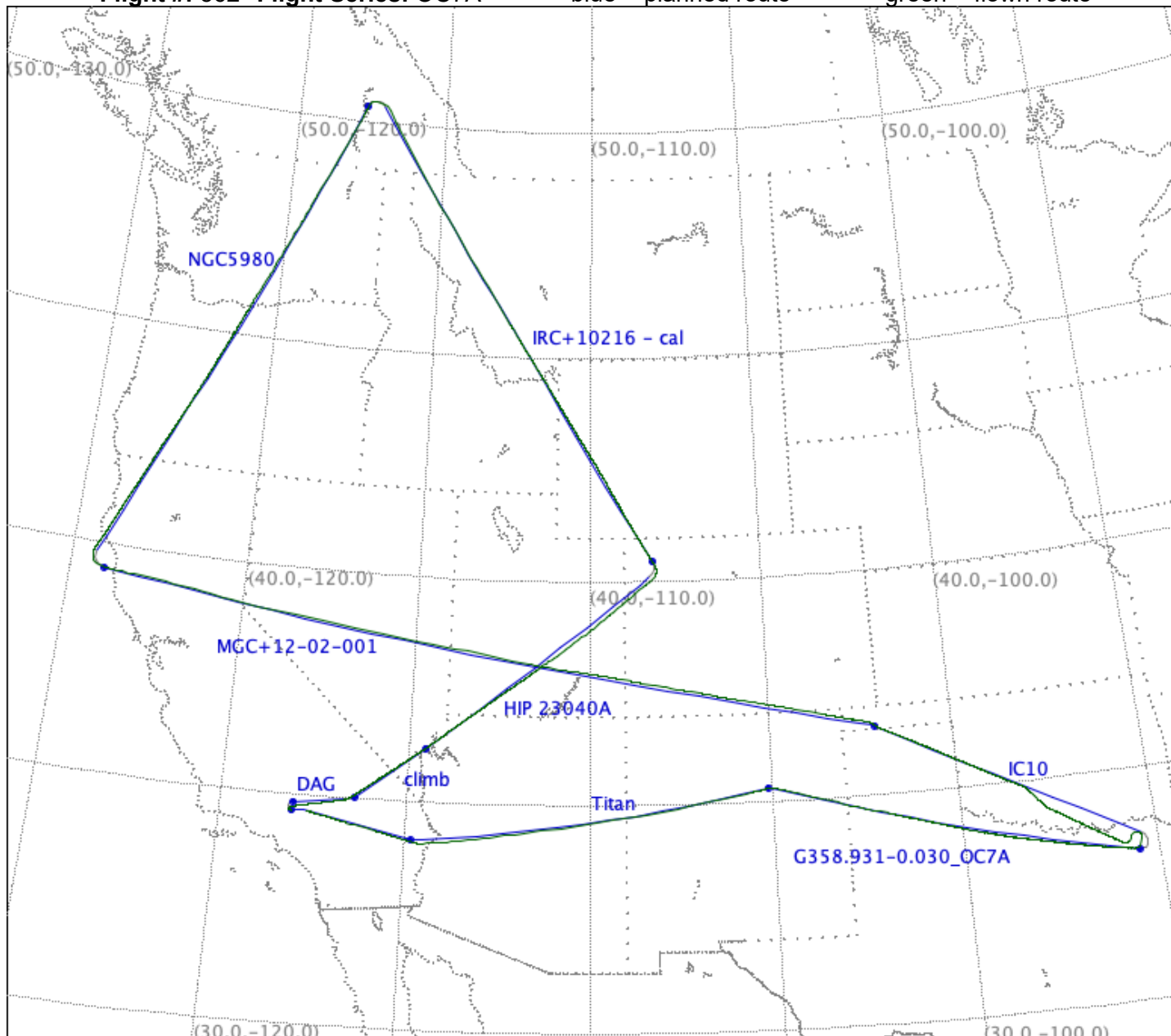
MISSION ID: 2019-05-01_FI_F562

Date: 2019-05-01 UT Instrument: FIFI-LS

Flight #: 562 Flight Series: OC7A

blue = planned route

green = flown route

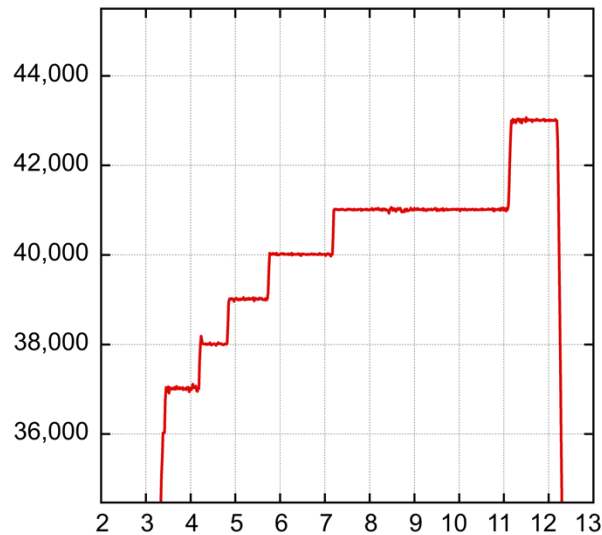


Flight notes:
Some time lost due to deviating around storms.

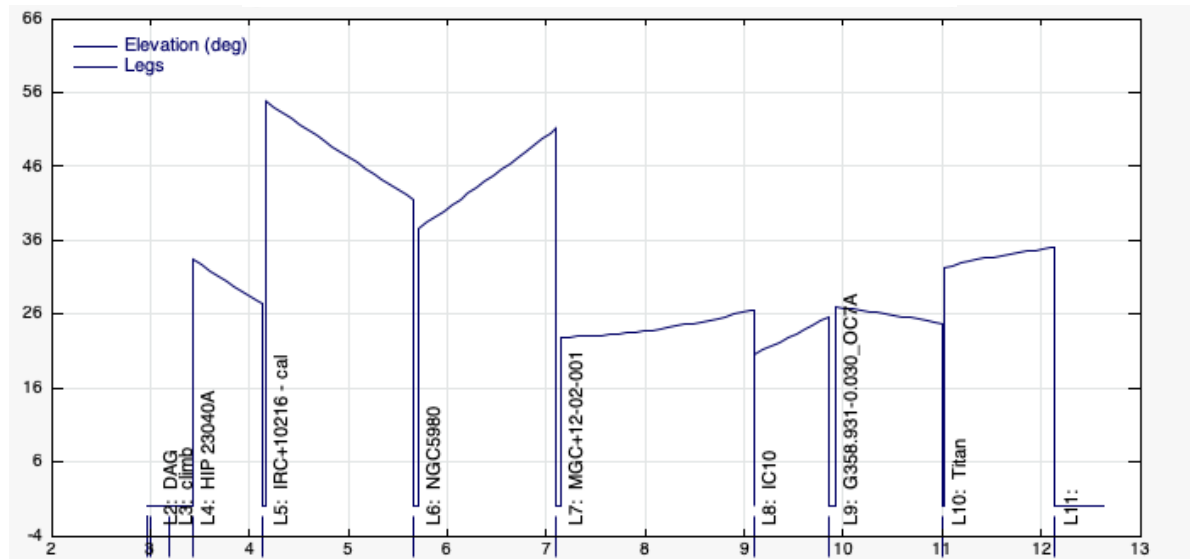
Flight 562 Mission ID 2019-05-01_FI_F562
 Palmdale to Palmdale Take off date UTC: 01-MAY-2019
 Departure UTC: 02:59 Arrival UTC: ~12:39

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 23040A	04h57m17.20s	53d45m07.6s	3:25	42	
5	90_0032	Calibration	IRC+10216	09h47m57.41s	13d16m43.6s	4:10	89	
6	76_0007	Yorke	NGC5980	15h41m30.40s	15d47m15.6s	5:42	83	
7	07_0209	Stacey	MGC+12-02-001	00h54m03.61s	73d05m11.8s	7:08	117	
8	70_0708	GTO	IC10	00h20m23.16s	59d17m34.7s	9:06	45	Lost 10min deviating around storms
9	75_0037	Discretionary	G358.931-0.030	17h43m10.02s	-29d51m45.8s	9:55	65	
10	07_0219	Miriam	Titan	19h27m32.62s	-21d32m15.5s	11:01	67	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



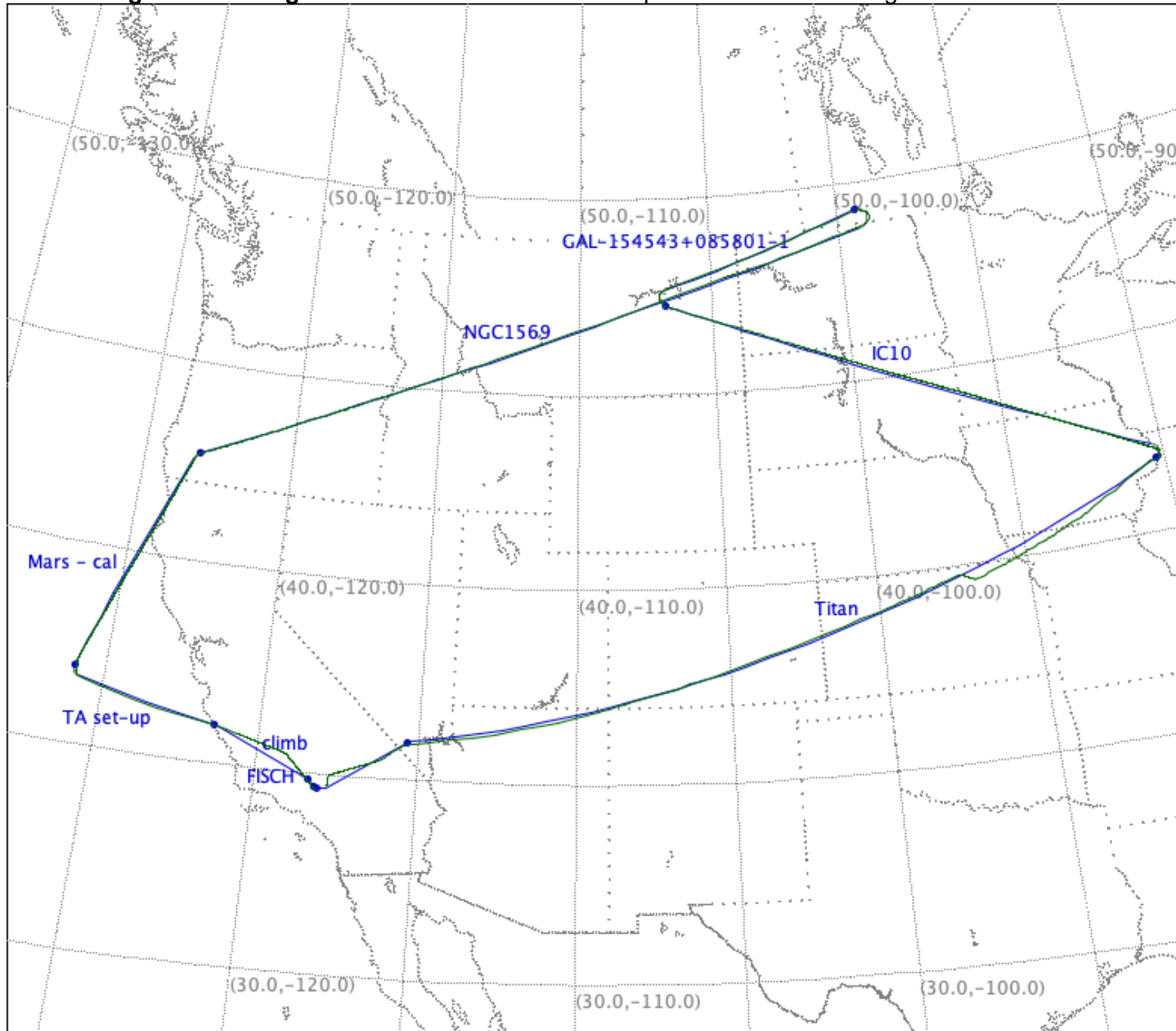
MISSION ID: 2019-05-02_FI_F563

Date: 2019-05-02 UT Instrument: FIFI-LS

Flight #: 563 Flight Series: OC7A

blue = planned route

green = flown route

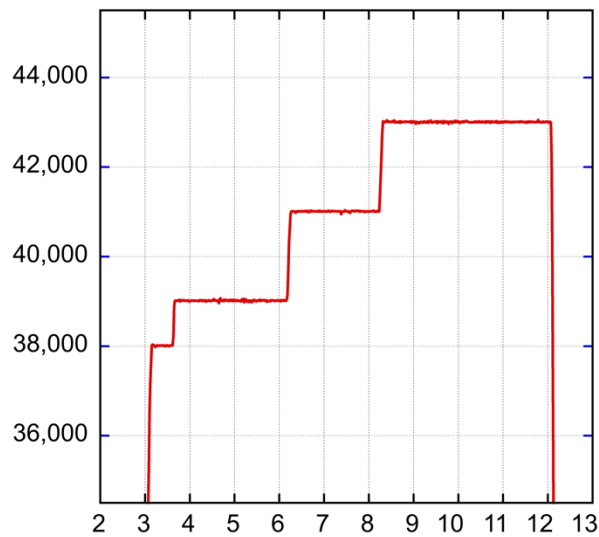


**Flight notes:
No irregularities.**

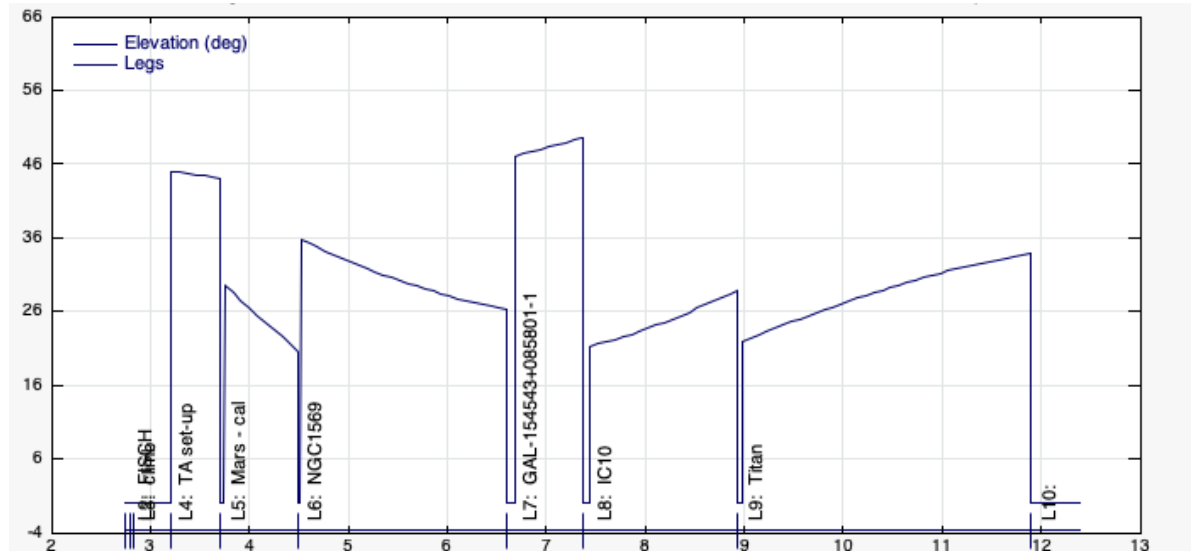
Flight 563 Mission ID 2019-05-02_FI_F563
 Palmdale to Palmdale Take off date UTC: 02-MAY-2019
 Departure UTC: 02:44 Arrival UTC: 12:28

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 46390	09h27m35.24s	-08d39m31.0s	3:12	30	
5	90_0033	Calibration	Mars	05h19m06.78s	24d11m05.2s	3:45	45	Started close to sunset; bright skies.
6	07_0048	Spilker	NGC1569	04h30m47.00s	64d51m02.0s	4:31	125	
7	07_0229	Malhotra	GAL-154543+085801	15h45m43.55s	08d58m01.3s	6:41	41	
8	70_0708	GTO	IC10	00h20m23.16s	59d17m34.7s	7:26	89	
9	07_0219	Miriam	Titan	19h27m29.18s	-21d32m33.7s	8:58	175	Winds blowing plane off ground track; minor course correction led to 10min loss of observing time.

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



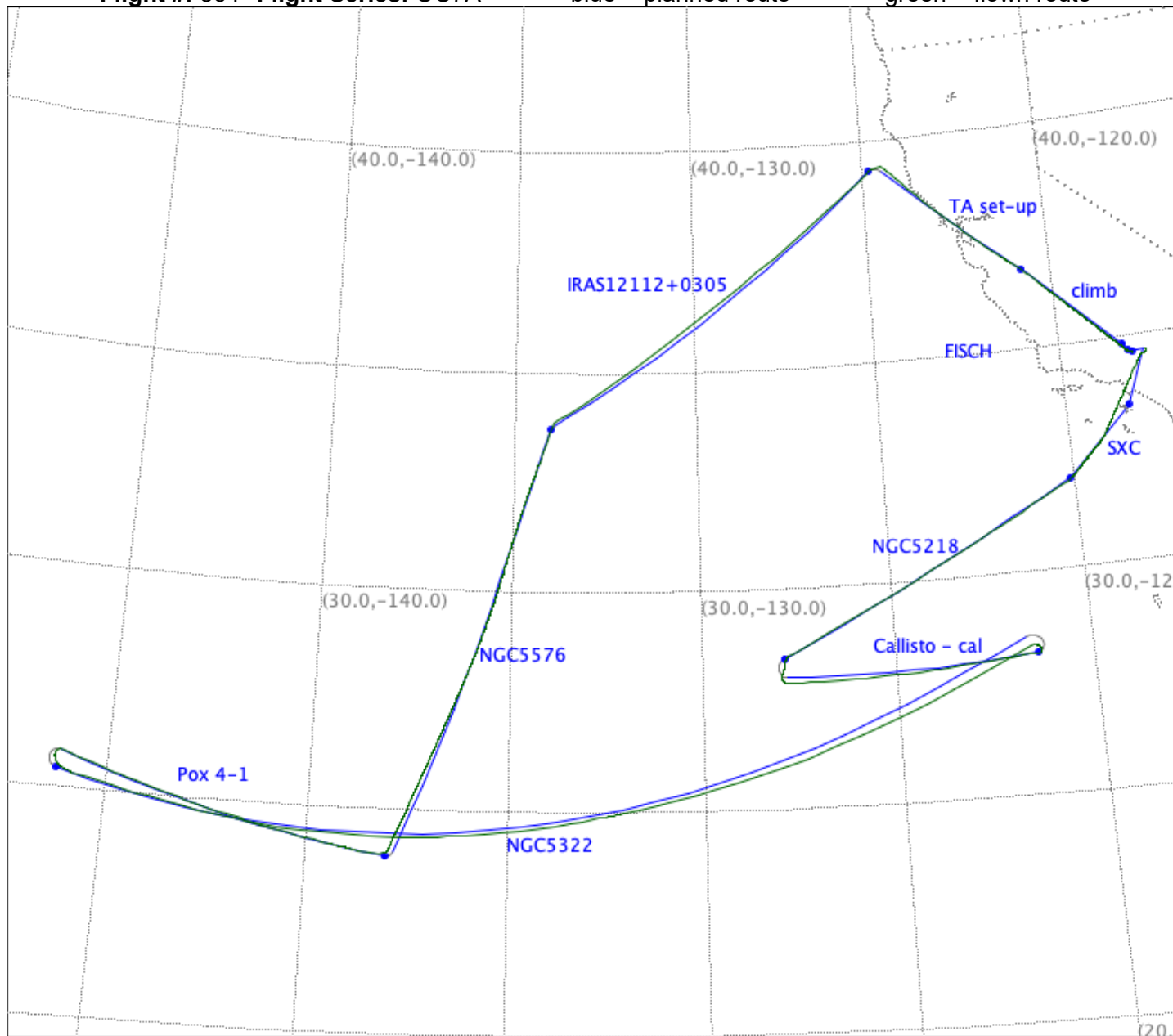
MISSION ID: 2019-05-03_FI_F564

Date: 2019-05-03 UT Instrument: FIFI-LS

Flight #: 564 Flight Series: OC7A

blue = planned route

green = flown route

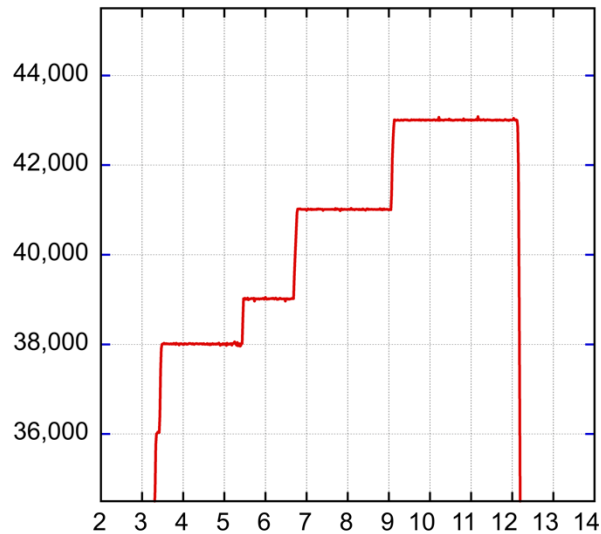


Flight notes: No irregularities.

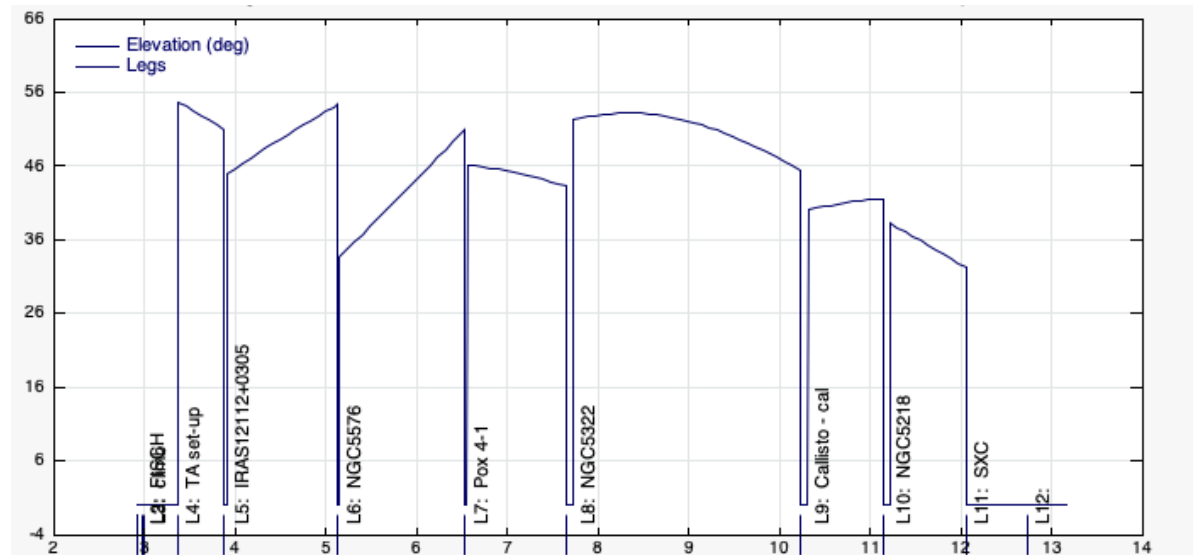
Flight 564 Mission ID 2019-05-03_FI_F564
 Palmdale to Palmdale Take off date UTC: 03-MAY-2019
 Departure UTC: 02:55 Arrival UTC: 12:36

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 43234	08h48m25.97s	05d50m16.1s	3:22	30	
5	07_0080	Smith	IRAS12112+0305	12h13m46.00s	02d48m38.0s	3:55	73	Low altitude (38k ft) at start of leg affecting data quality
6	07_0105	Temi	NGC5576	14h21m03.69s	03d16m15.8s	5:09	83	10min lost due to filter wheel spontaneously closing
7	07_0182	Jones	Pox 4	11h51m11.40s	-20d35m58.0s	6:34	65	
8	07_0105	Temi	NGC5322	13h49m15.24s	60d11m25.8s	7:43	150	Multiple instances of filter wheel spontaneously closing but no time lost
9	90_0033	Calibration	Callisto	17h30m21.74s	-22d37m37.8s	10:19	50	
10	76_0007	Yorke	NGC5218	13h32m10.38s	62d46m03.9s	11:13	50	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



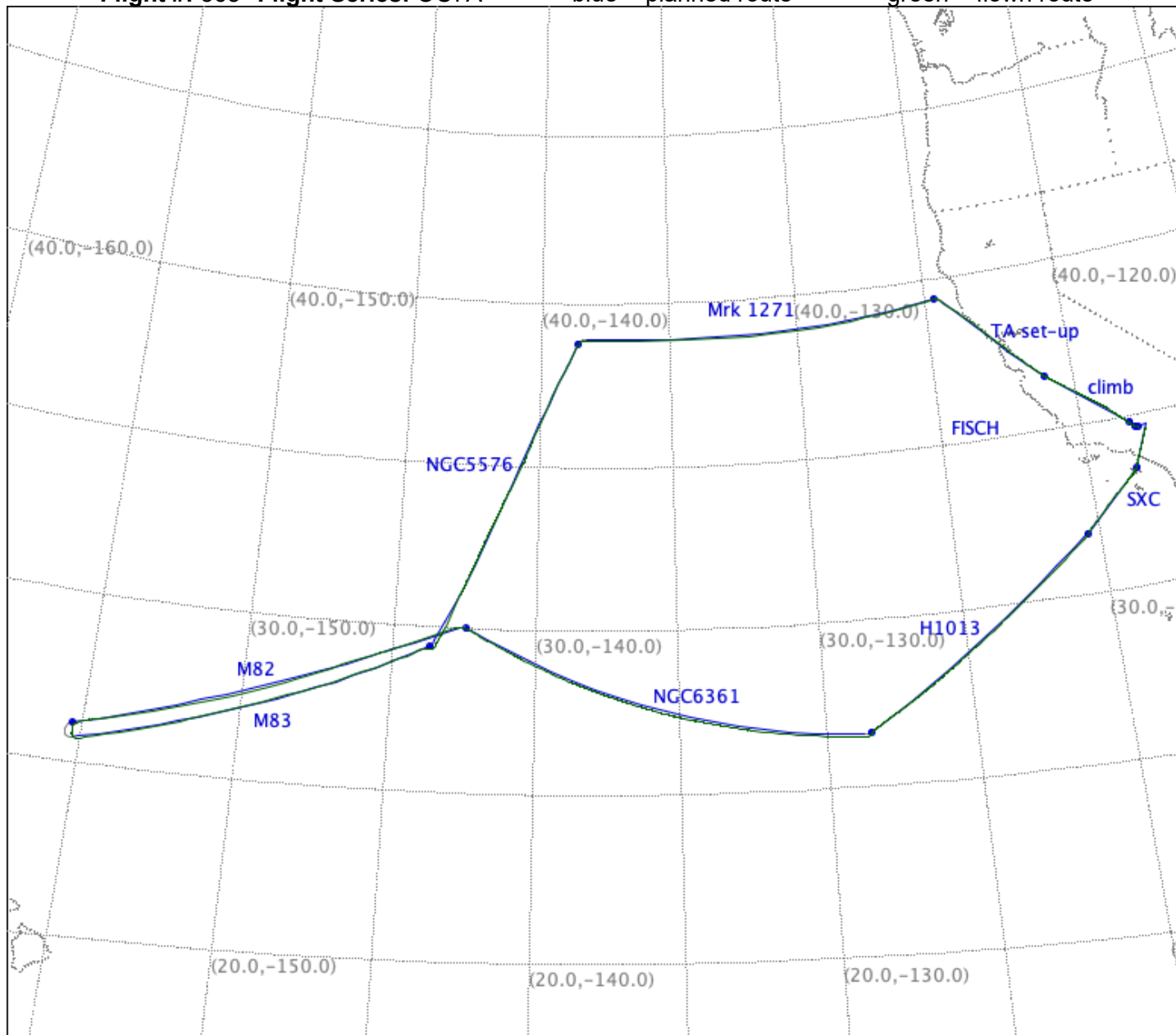
MISSION ID: 2019-05-04_FI_F565

Date: 2019-05-04 UT Instrument: FIFI-LS

Flight #: 565 Flight Series: OC7A

blue = planned route

green = flown route

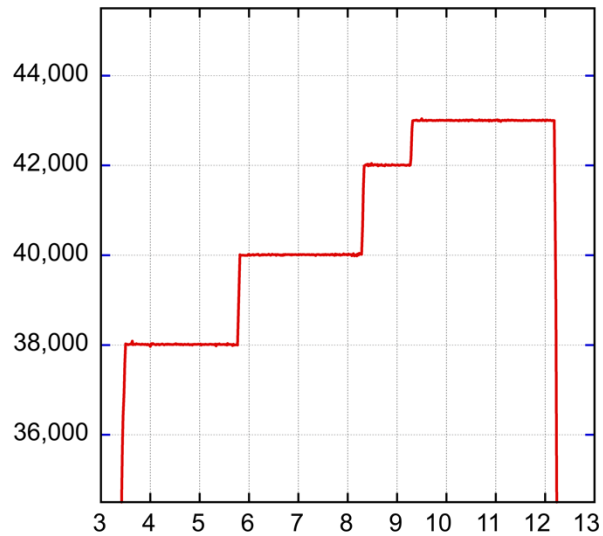


Flight notes: No irregularities.

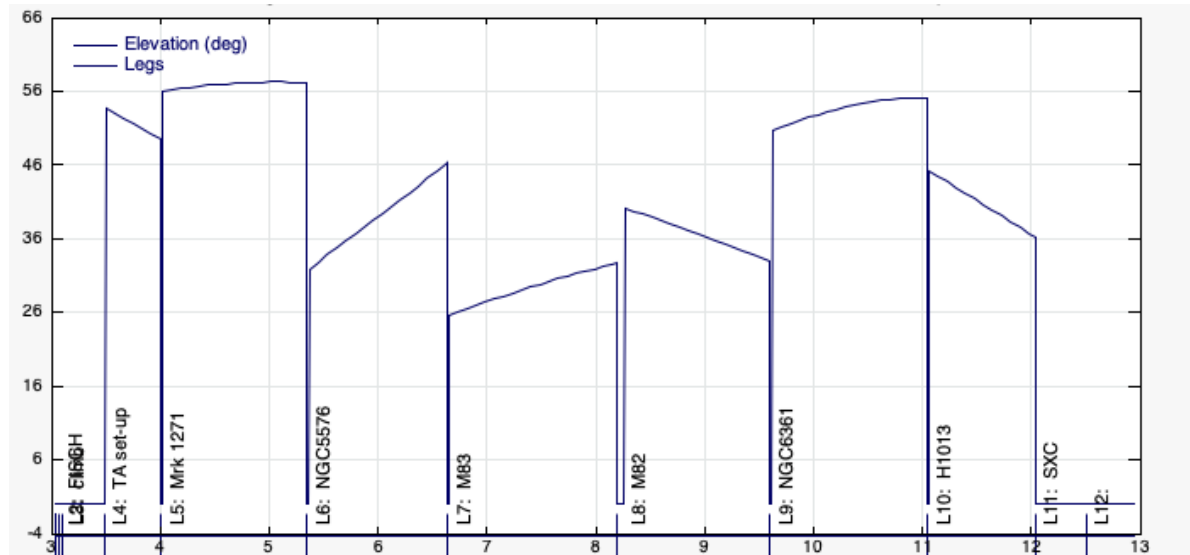
Flight 565 Mission ID 2019-05-04_FI_F565
 Palmdale to Palmdale Take off date UTC: 04-MAY-2019
 Departure UTC: 03:02 Arrival UTC: 12:34

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 43234	08h48m25.97s	05d50m16.1s	3:30	30	
5	07_0182	Jones	Mrk 1271	10h56m09.12s	06d10m22.4s	4:01	79	Low altitude (38k ft) throughout leg.
6	07_0105	Temi	NGC5576	14h21m03.69s	03d16m15.8s	5:22	76	Telescope door got stuck and telescope control failed; recovery took whole leg; no data.
7	07_0209	Stacey	M83	13h37m00.95s	-29d51m55.5s	6:39	92	
8	07_0150	Spilker	M82	09h55m52.43s	69d40m46.9s	8:16	80	
9	76_0007	Yorke	NGC6361	17h18m41.09s	60d36m29.4s	9:37	85	
10	07_0182	Jones	H1013	14h03m31.30s	54d21m15.0s	11:03	59	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



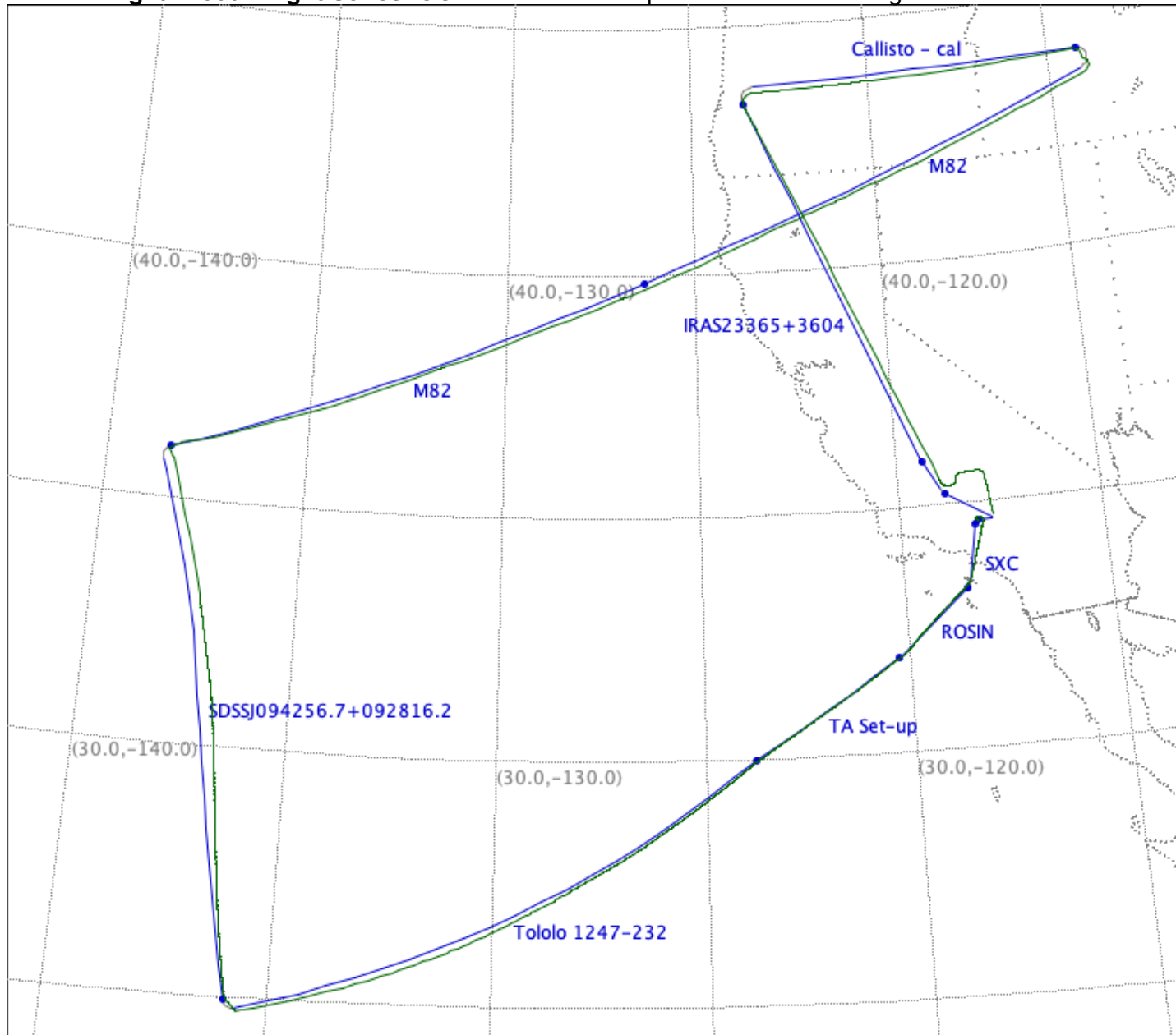
MISSION ID: 2019-05-07_FI_F566

Date: 2019-05-07 UT **Instrument:** FIFI-LS

Flight #: 566 **Flight Series:** OC7A

blue = planned route

green = flown route

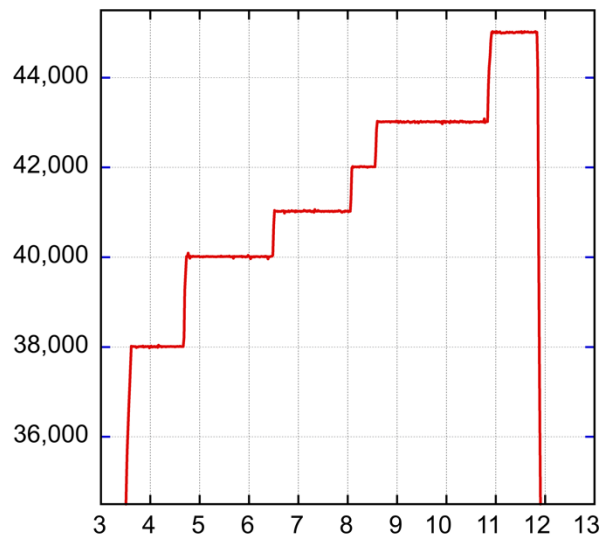


Flight notes: No irregularities.

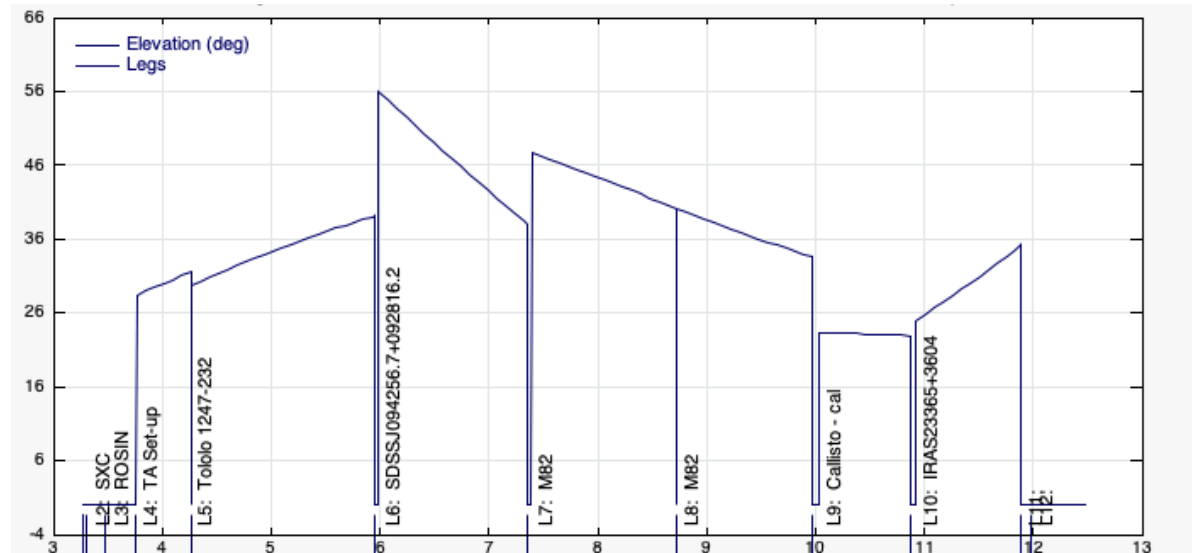
Flight 566 Mission ID 2019-05-07_FI_F566
 Palmdale to Palmdale Take off date UTC: 07-MAY-2019
 Departure UTC: 03:11 Arrival UTC: 12:18

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 61359	12h34m23.23s	-23d23m48.3s	3:45	30	
5	07_0108	Hashimoto	Tololo 1247-232	12h50m18.90s	-23d33m57.6s	4:15	101	At low altitude (38k ft) for first 30min of leg
6	07_0114	Weiner	SDSSJ094256.7+092816.2	09h42m56.74s	09d28m16.2s	5:58	82	
7	07_0150	Spilker	M82	09h55m52.43s	69d40m46.9s	7:22	80	
8	07_0217	Latzko	M82	09h55m52.43s	69d40m46.9s	8:42	74	
9	90_0033	Calibration	Callisto	17h29m07.41s	-22d37m26.0s	10:01	50	
10	07_0080	Smith	IRAS23365+3604	23h39m01.27s	36d21m08.3s	10:54	58	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



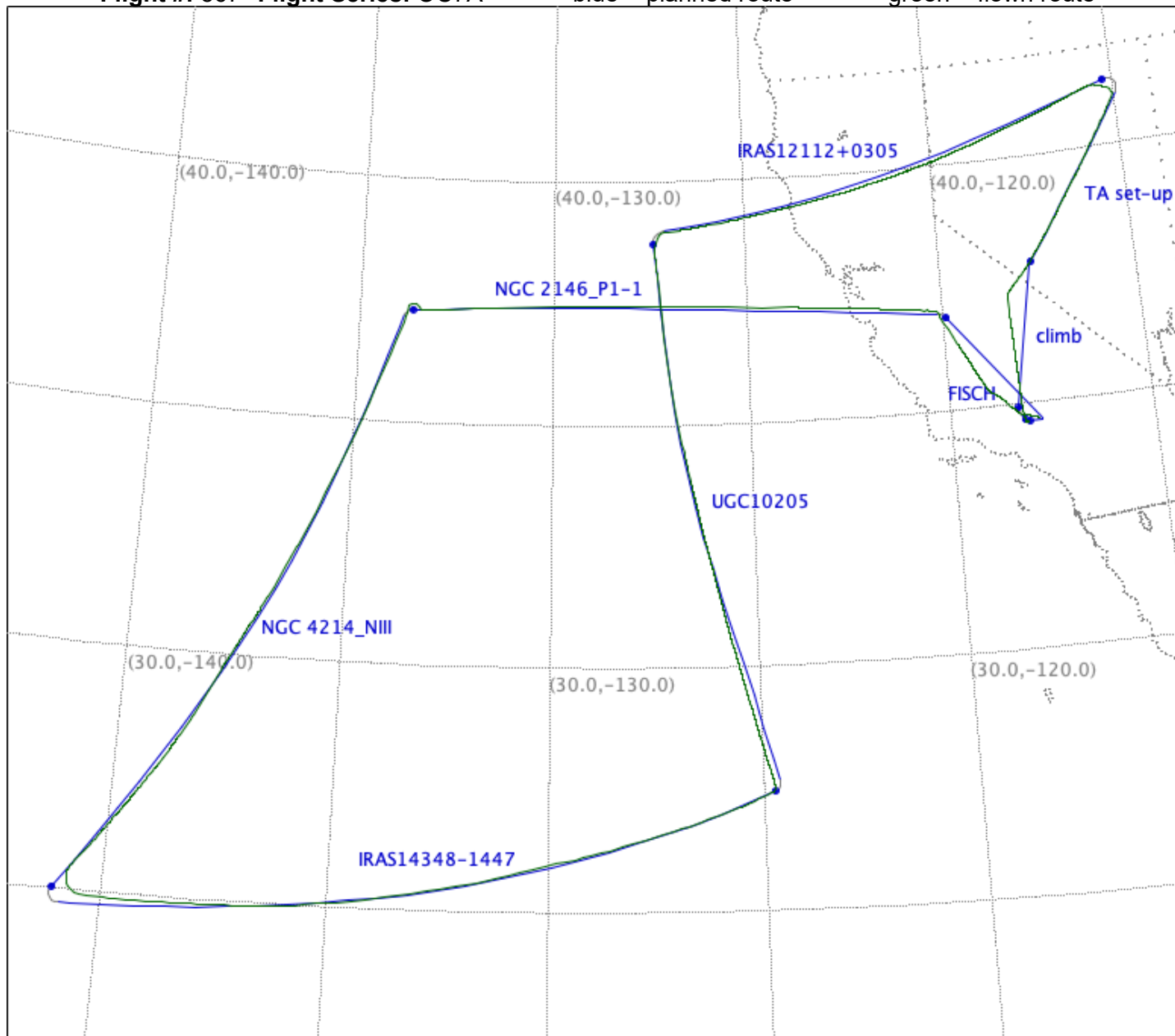
MISSION ID: 2019-05-08_FI_F567

Date: 2019-05-08 UT Instrument: FIFI-LS

Flight #: 567 Flight Series: OC7A

blue = planned route

green = flown route



Flight notes:

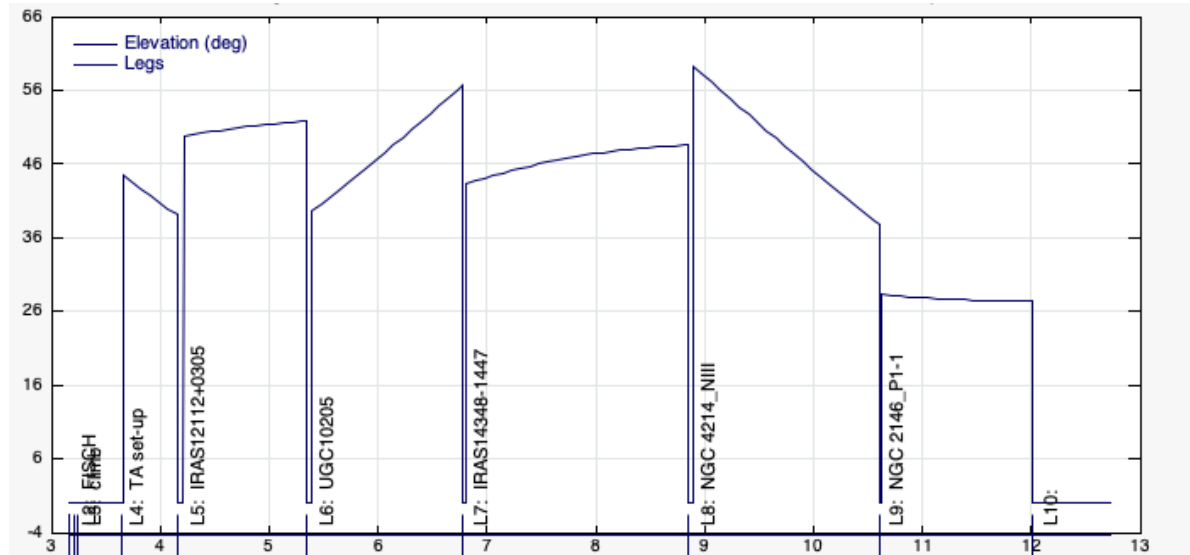
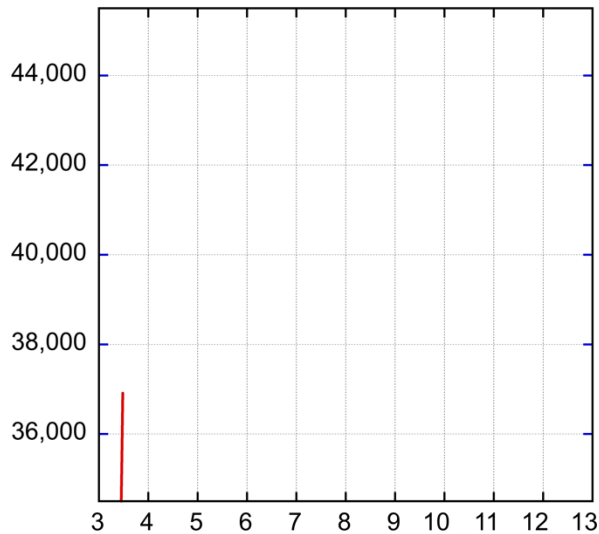
Altitude housekeeping data lost, but altitudes are in leg notes.

Flight 567 Mission ID 2019-05-08_FI_F567
 Palmdale to Palmdale Take off date UTC: 08-MAY-2019
 Departure UTC: 03:08 Arrival UTC: 12:33

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 32480	06h46m44.34s	43d34m38.7s	3:39	30	
5	07_0080	Smith	IRAS12112+0305	12h13m46.00s	02d48m38.0s	4:13	68	Low altitude at start of leg (38k ft); water vapor conditions are poor and could affect data quality
6	76_0007	Yorke	UGC10205	16h06m40.18s	30d05m56.7s	5:23	83	40k ft at start of leg; climbed to 41k ft 30min into leg.
7	07_0080	Smith	IRAS14348-1447	14h37m38.40s	-15d00m20.0s	6:48	122	At 42k ft at beginning of leg, climbed to 43k ft at 08:12
8	06_0225	Stacey	NGC 4214 NIII	12h15m39.17s	36d19m36.8s	8:54	102	At 43k ft whole leg. Telescope control software failure led to a loss of 30min
9	07_0106	Armus	NGC 2146 P1	06h18m37.43s	78d21m23.7s	10:37	83	At 43k ft whole leg.

Flown altitude (ft.) vs. time (UTC hrs.)

Planned target elevation (deg.) vs. time (UTC hrs.)



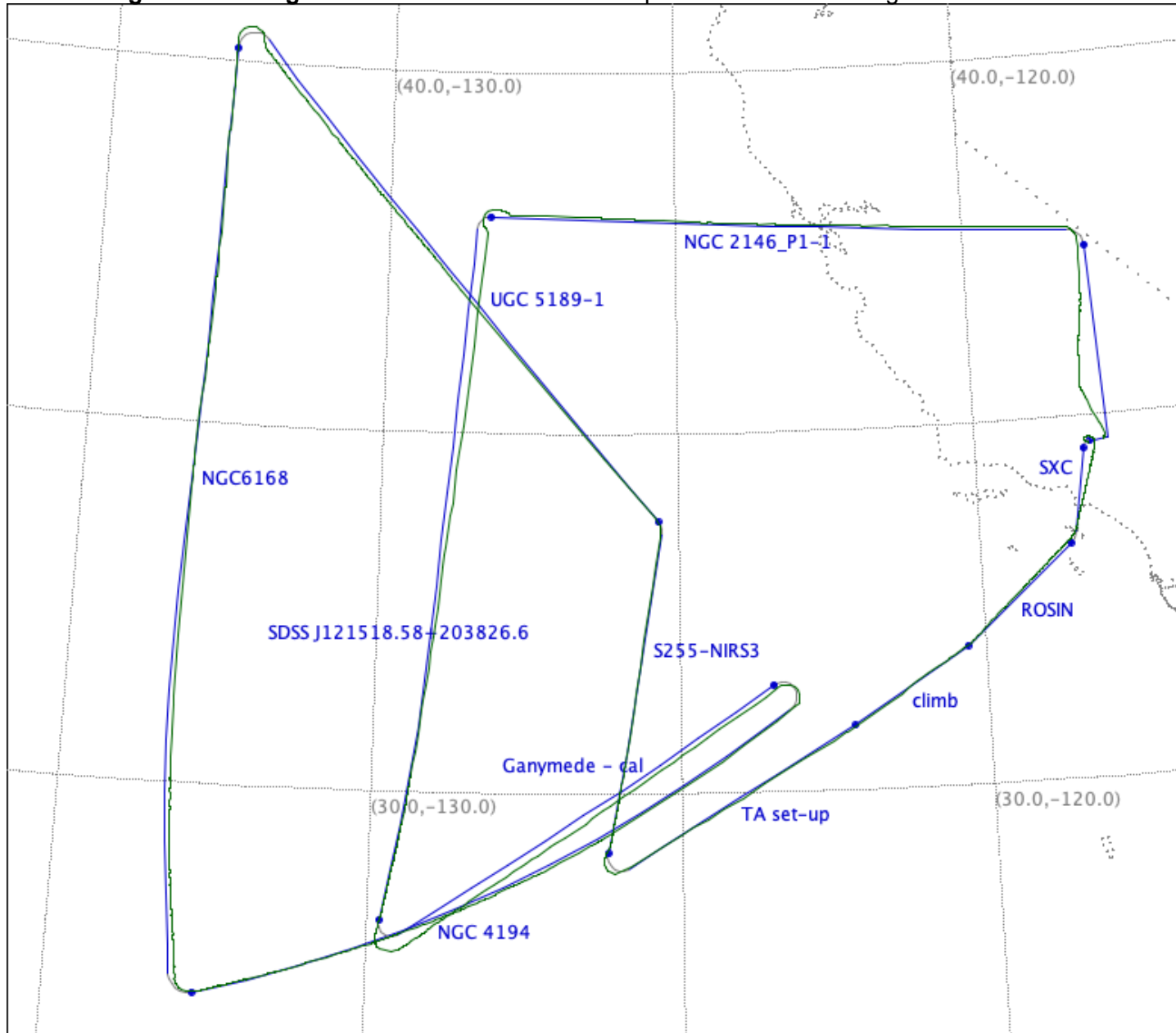
MISSION ID: 2019-05-09_FI_F568

Date: 2019-05-09 UT **Instrument:** FIFI-LS

Flight #: 568 Flight Series: OC7A

blue = planned route

green = flown route

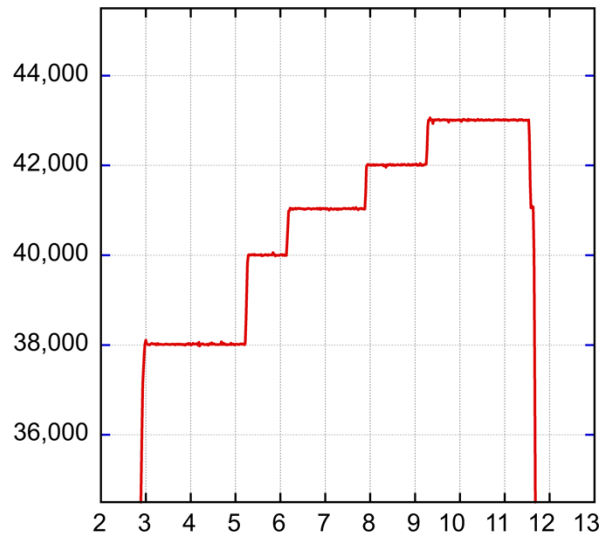


Flight notes: No irregularities.

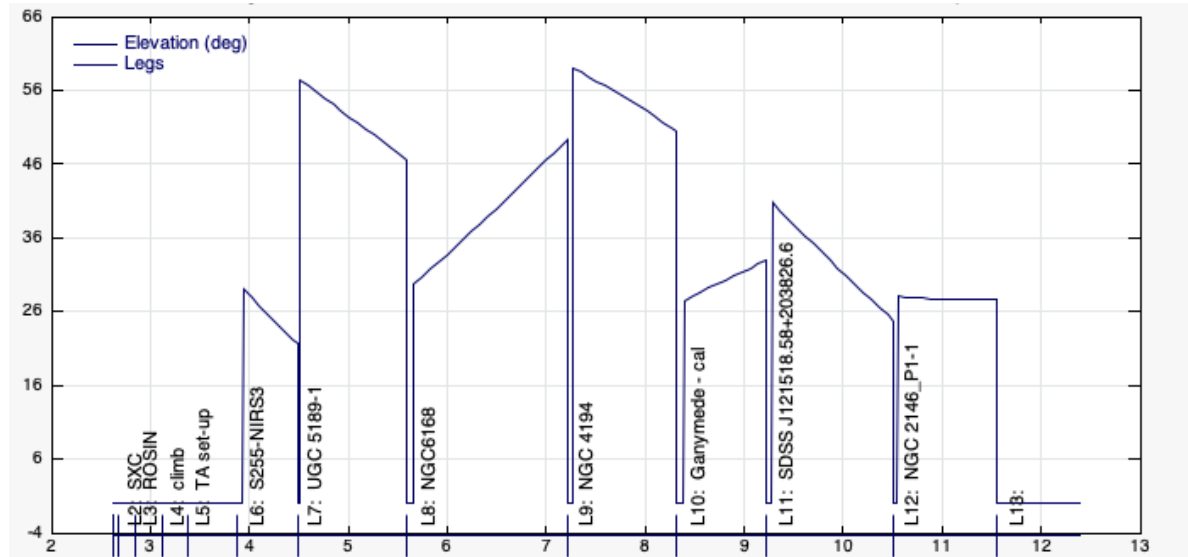
Flight 568 Mission ID 2019-05-09_FI_F568
 Palmdale to Palmdale Take off date UTC: 09-MAY-2019
 Departure UTC: 02:32 Arrival UTC: 12:07

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
6	06_0182	Stecklum	S255-NIRS3	06h12m54.01s	17d59m23.1s	3:55	33	Low altitude (38k ft).
7	07_0182	Jones	UGC 5189	09h42m56.74s	09d28m16.2s	4:30	65	Low altitude (38k ft) at beginning of leg caused low data quality.
8	76_0007	Yorke	NGC6168	16h31m21.30s	20d11m05.8s	5:39	93	
9	07_0209	Stacey	NGC 4194	12h14m09.47s	54d31m36.6s	7:15	63	
10	90_0033	Calibration	Ganymede	17h28m32.45s	-22d36m46.2s	8:22	50	Telescope acquisition issues; 20min lost
11	07_0114	Weiner	SDSS J121518.58+203826.6	12h15m18.60s	20d38m26.7s	9:16	74	
12	07_0106	Armus	NGC 2146	06h18m37.43s	78d21m23.7s	10:32	60	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



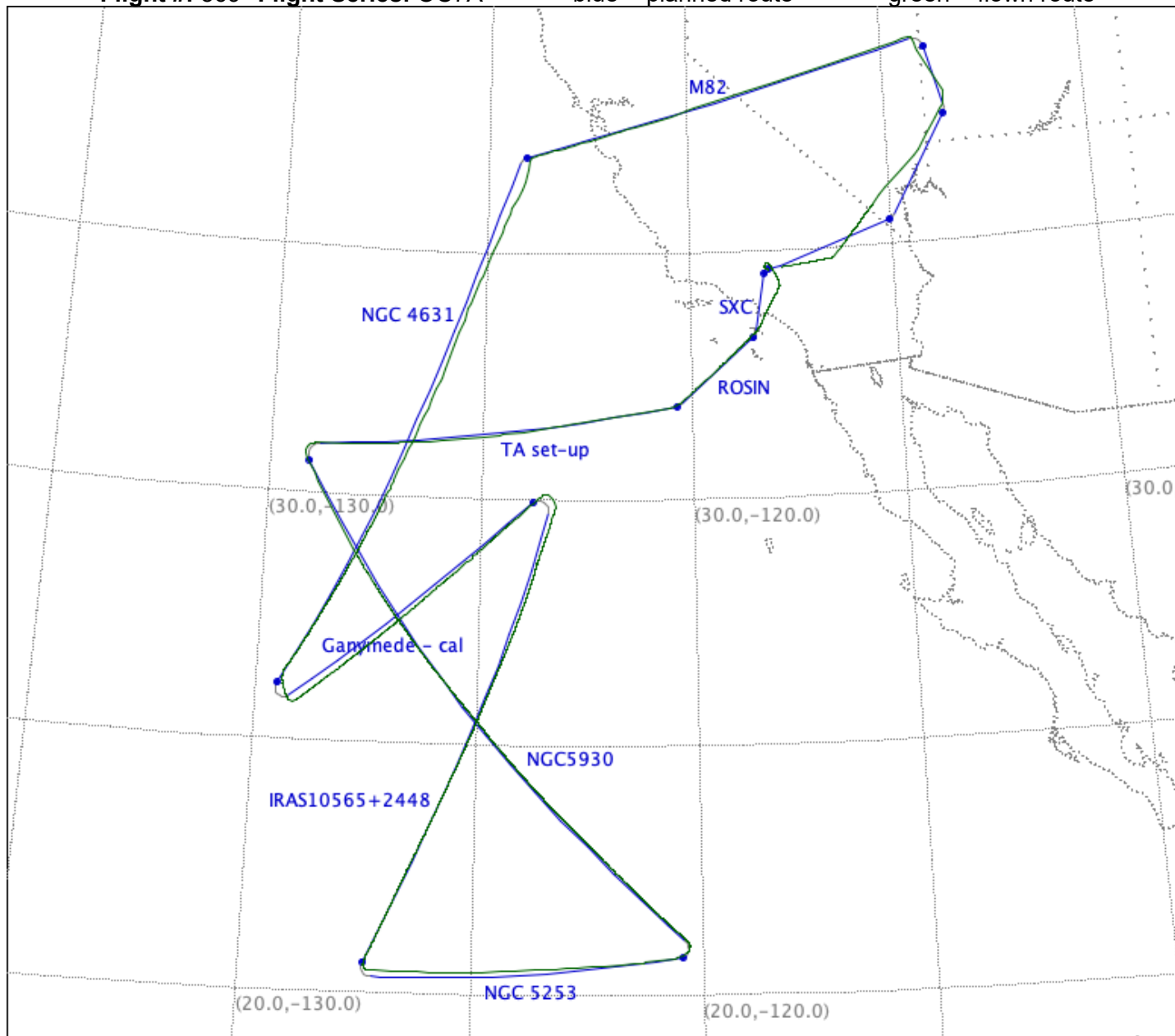
MISSION ID: 2019-05-10_FI_F569

Date: 2019-05-10 UT Instrument: FIFI-LS

Flight #: 569 Flight Series: OC7A

blue = planned route

green = flown route

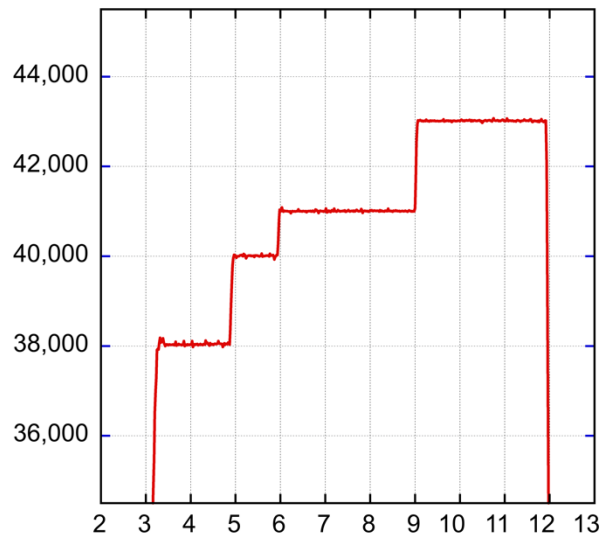


**Flight notes:
No irregularities.**

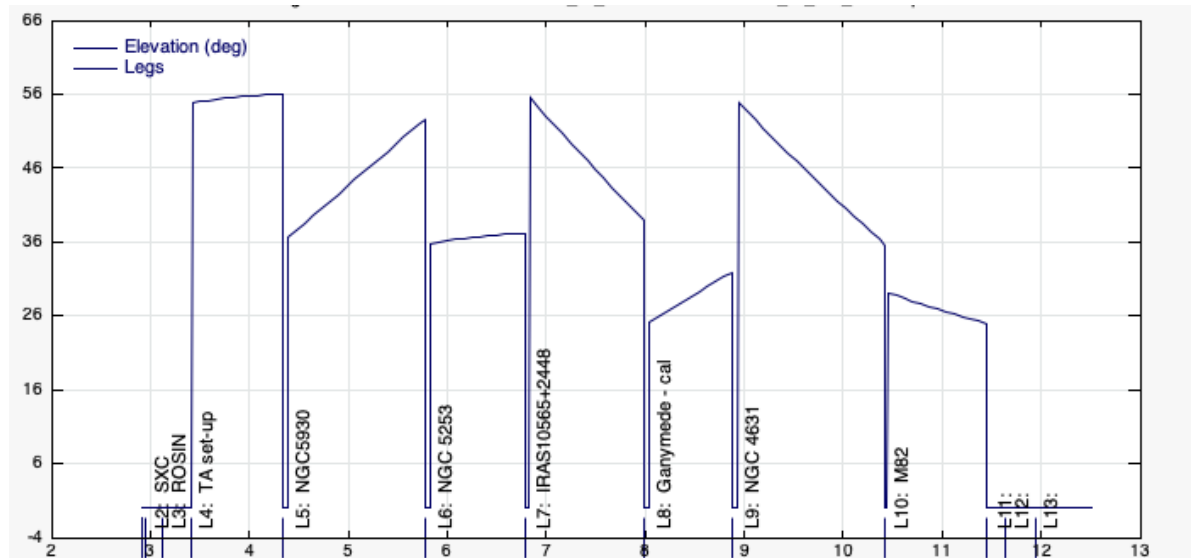
Flight 569 Mission ID 2019-05-10_FI_F569
 Palmdale to Palmdale Take off date UTC: 10-MAY-2019
 Departure UTC: 02:49 Arrival UTC: 12:27

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 53907	11h01m49.67s	-02d29m04.5s	3:24	55	
5	76_0007	Yorke	NGC5930	15h26m07.94s	41d40m33.8s	4:22	83	
6	07_0239	Malkan	NGC 5253	13h39m55.99s	-31d38m24.1s	5:48	57	
7	07_0080	Smith	IRAS10565+2448	10h59m18.12s	24d32m34.5s	6:48	69	
8	90_0033	Calibration	Ganymede	17h28m20.32s	-22d36m50.7s	8:01	50	
9	07_0239	Malkan	NGC 4631	12h42m08.01s	32d32m29.4s	8:55	89	
10	07_0217	Latzko	M82	09h55m52.43s	69d40m46.9s	10:26	60	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



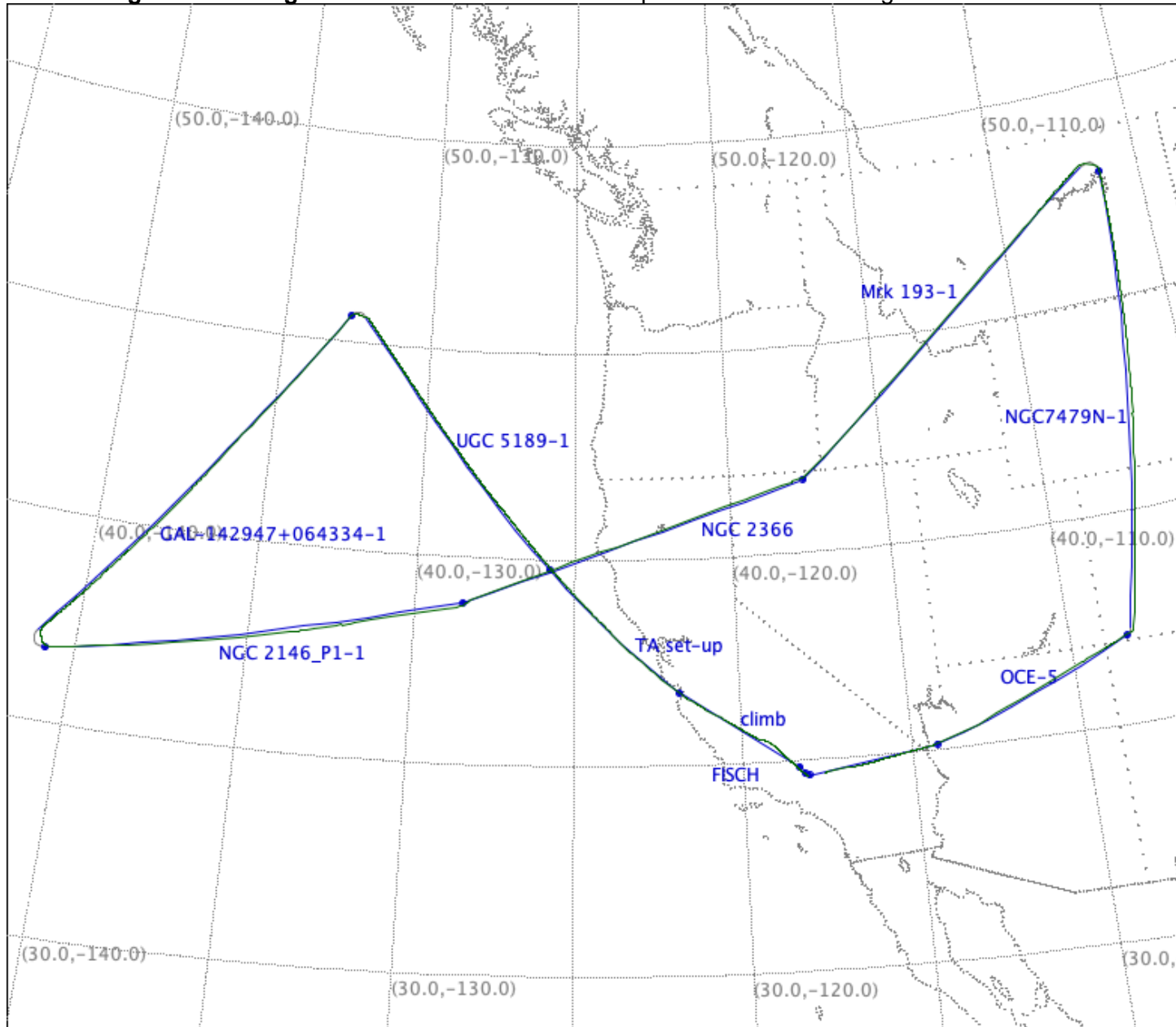
MISSION ID: 2019-05-14_FI_F570

Date: 2019-05-14 UT Instrument: FIFI-LS

Flight #: 570 Flight Series: OC7A

blue = planned route

green = flown route

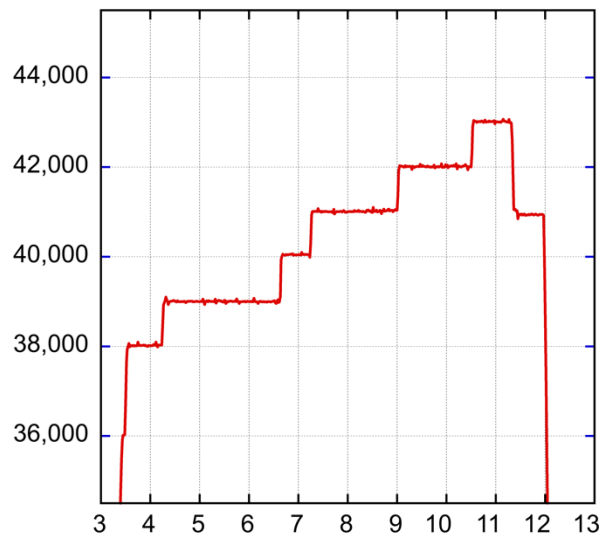


Flight notes: No irregularities.

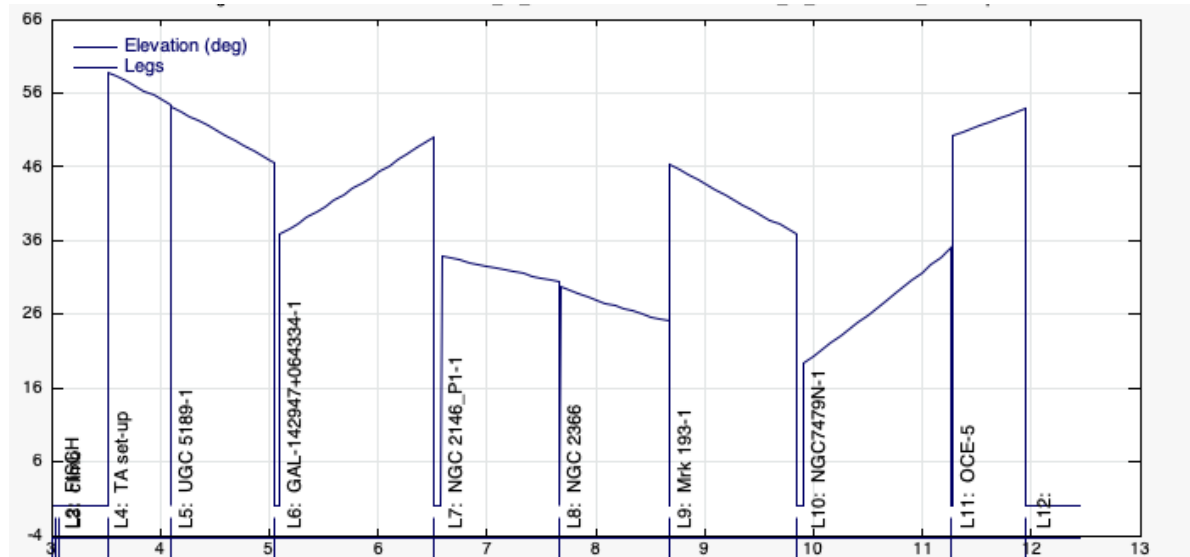
Flight 570 Mission ID 2019-05-14_FI_F570
 Palmdale to Palmdale Take off date UTC: 14-MAY-22019
 Departure UTC: 03:01 Arrival UTC: 12:34

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 47508	09h41m09.03s	09d53m32.3s	3:31	35	
5	07_0182	Jones	UGC 5189	09h42m56.74s	09d28m16.2s	4:06	57	Beginning 18 min of leg at 38k ft lost due to clouds; Climbed to 39k ft and over clouds to complete leg
6	07_0229	Malhotra	GAL-142947+064334	14h29m47.00s	06d43m34.9s	5:06	85	
7	07_0106	Armus	NGC 2146	06h18m37.43s	78d21m23.7s	6:35	65	
8	07_0239	Malkan	NGC 2366	07h28m42.28s	69d11m20.0s	7:40	60	
9	07_0182	Jones	Mrk 193	11h55m28.34s	57d39m52.0s	8:41	70	
10	07_0154	Appleton	NGC7479N	23h04m56.85s	12d19m27.3s	9:55	81	
11			HIP 101936	20h39m24.89s	-00d29m11.1s	11:17	40	Engineering leg (used for skydips).

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



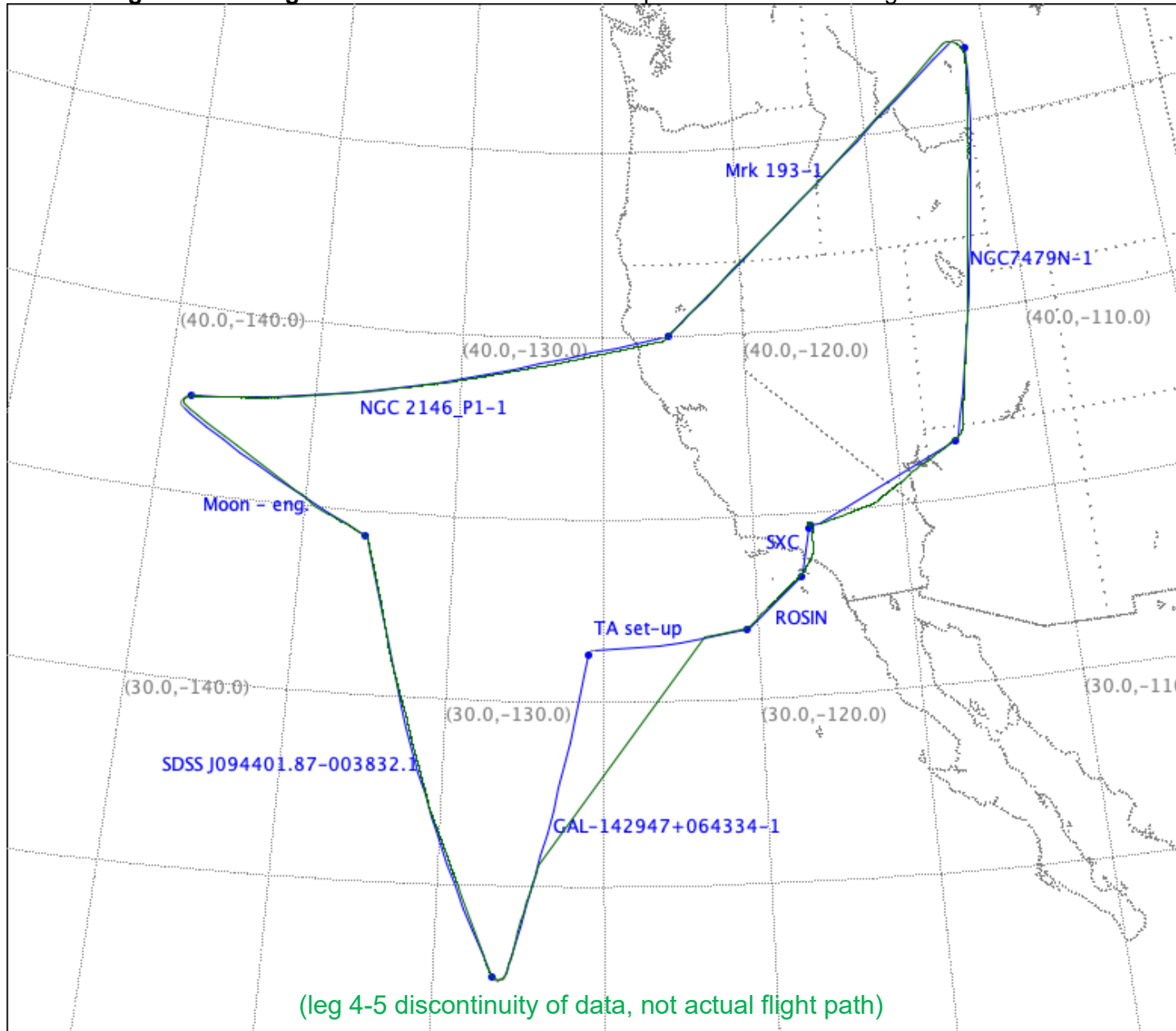
MISSION ID: 2019-05-15_FI_F571

Date: 2019-05-15 UT Instrument: FIFI-LS

Flight #: 571 Flight Series: OC7A

blue = planned route

green = flown route



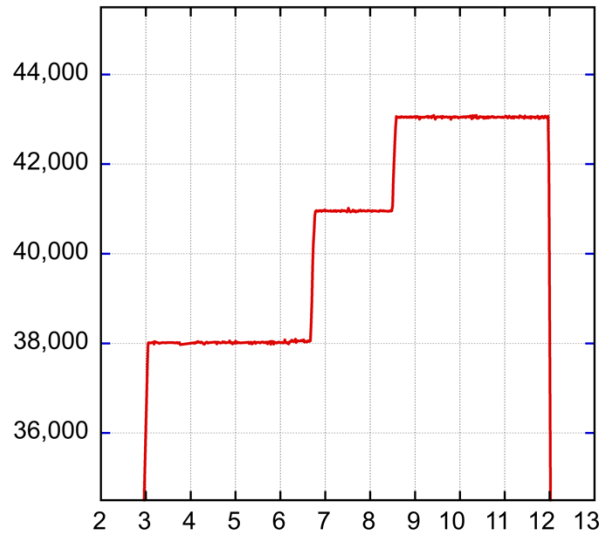
Flight notes:

Telescope control system failure led to loss of first 4hr of flight.

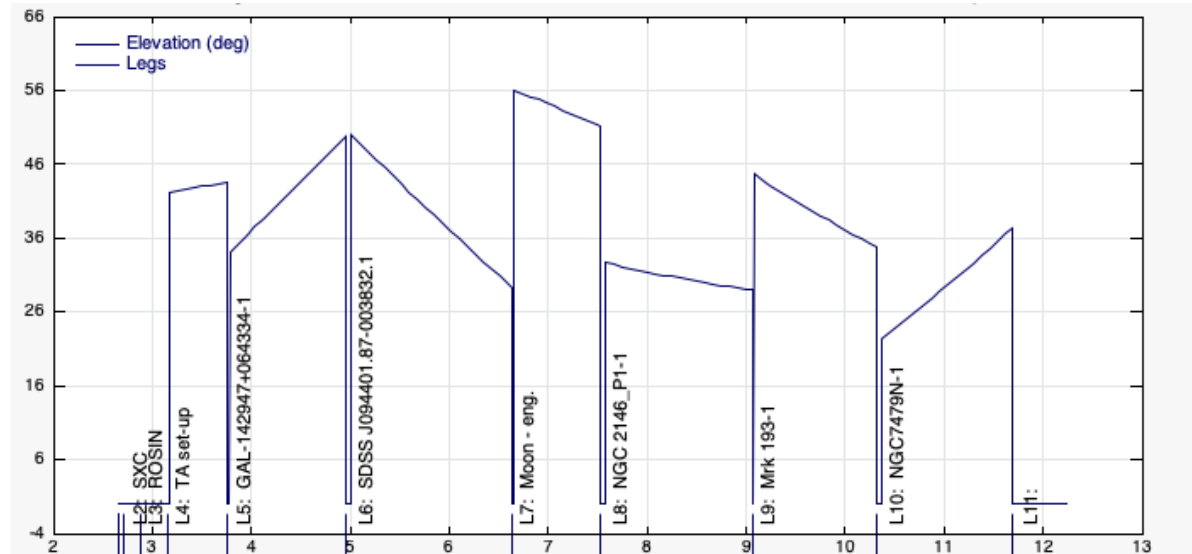
Flight 571 Mission ID 2019-05-15_FI_F571
 Palmdale to Palmdale Take off date UTC: 15-MAY-2019
 Departure UTC: 02:35 Arrival UTC: 12:32

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 55282	11h19m20.45s	-14d46m42.7s	3:10	35	
5	07_0229	Malhotra	GAL-142947+064334	14h29m47.00s	06d43m34.9s	3:47	70	Telescope control failure; no data collected.
6	07_0114	Weiner	SDSS J094401.87-003832.1	09h44m01.87s	-00d38m32.2s	5:00	97	Telescope control failure; no data collected.
7	71_0021	Engineering	Moon	12h33m28.42s	01d48m53.7s	6:39	52	Telescope control failure resolved at 07:20; data collected for only 25% of leg
8	07_0106	Armus	NGC 2146	06h18m37.43s	78d21m23.7s	7:34	89	
9	07_0182	Jones	Mrk 193	11h55m28.34s	57d39m52.0s	9:04	74	
10	07_0154	Appleton	NGC7479N	23h04m56.85s	12d19m27.3s	10:22	79	Loss of guiding on last few minutes of leg due to bright sky.

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



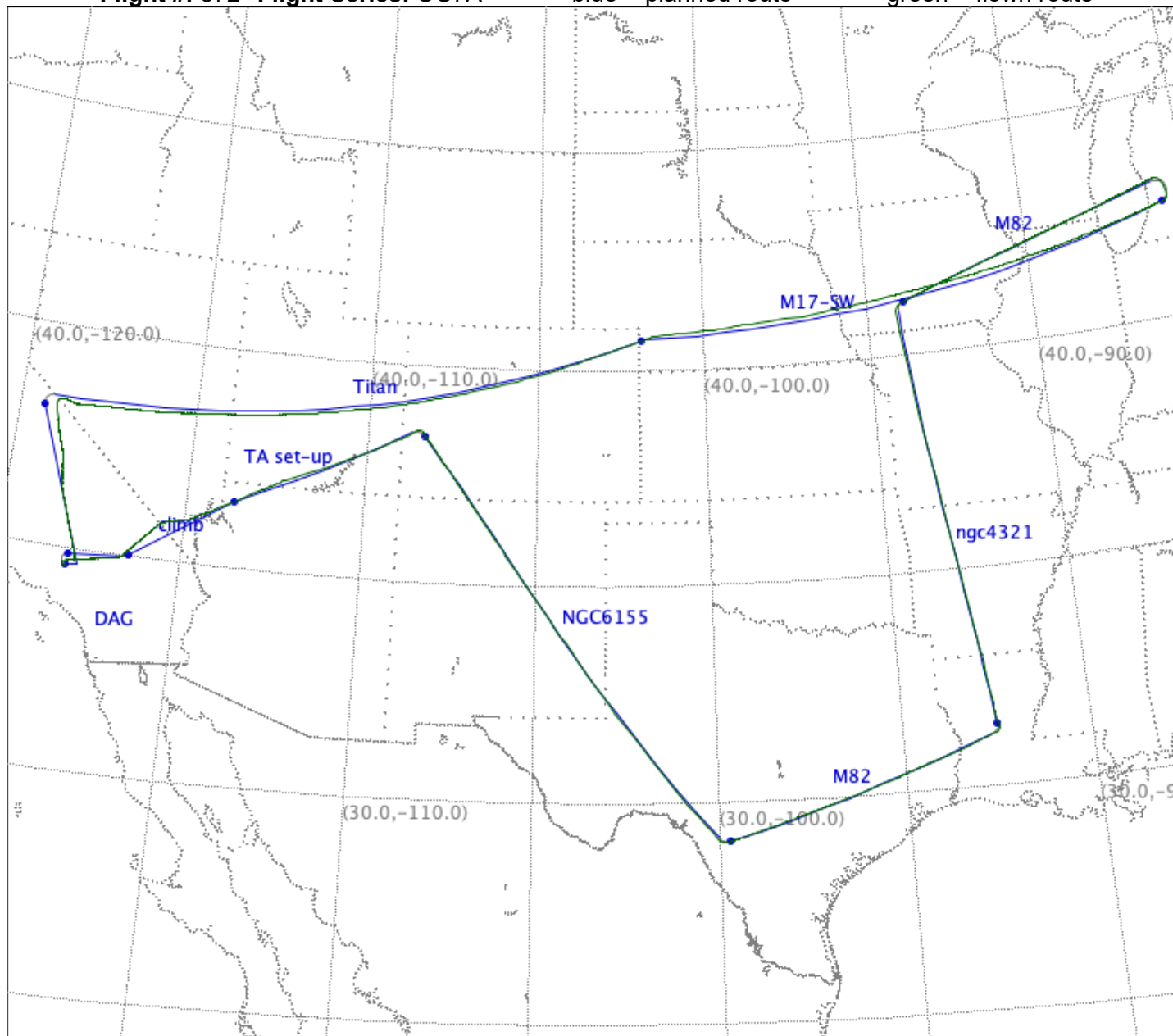
MISSION ID: 2019-05-16_FI_F572

Date: 2019-05-16 UT Instrument: FIFI-LS

Flight #: 572 Flight Series: OC7A

blue = planned route

green = flown route

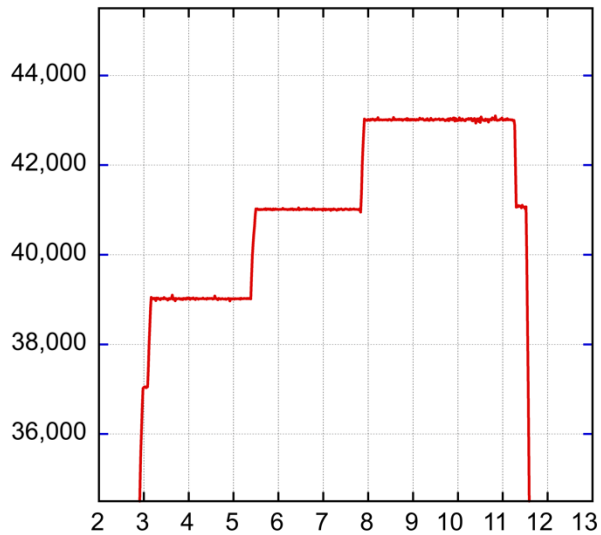


Flight notes: No irregularities.

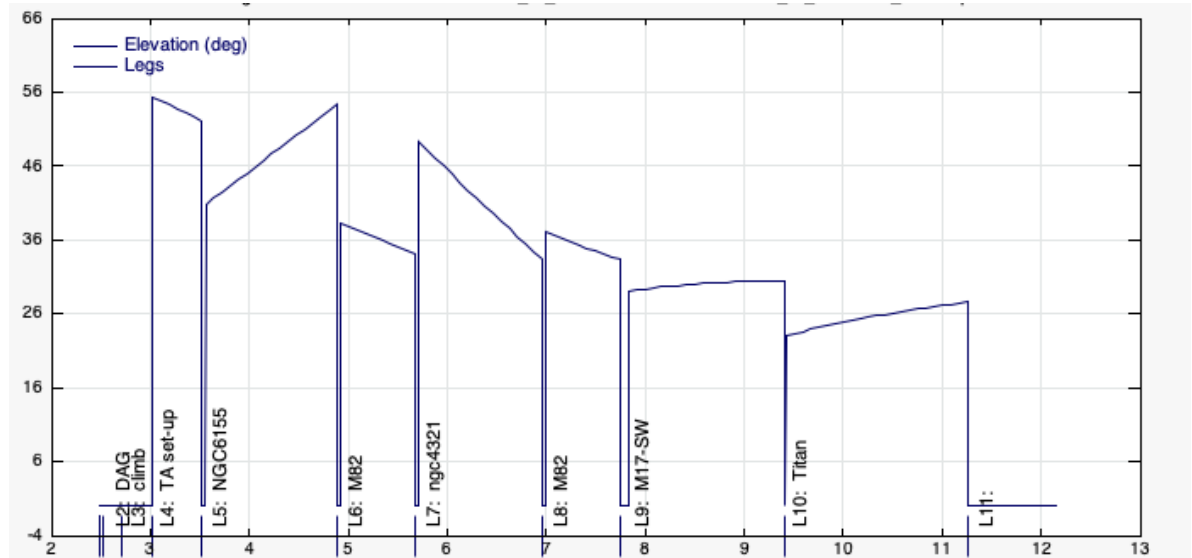
Flight 572 Mission ID 2019-05-16_FI_F572
 Palmdale to Palmdale Take off date UTC: 16-MAY-2019
 Departure UTC: 02:29 Arrival UTC: 12:01

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 42527	08h40m12.82s	64d19m40.6s	3:01	30	
5	76_0007	Yorke	NGC6155	16h26m08.34s	48d22m00.5s	3:33	80	
6	07_0217	Latzko	M82	09h55m52.43s	69d40m46.9s	4:55	45	
7	70_0708	GTO	ngc4321	12h22m54.93s	15d49m20.3s	5:42	75	Difficulty guiding due to nearby full Moon
8	07_0217	Latzko	M82	09h55m52.43s	69d40m46.9s	6:59	45	
9	04_0049	Klein	M17-SW	18h20m23.10s	-16d11m43.0s	7:49	95	
10	07_0219	Miriam	Titan	19h26m39.80s	-21d34m27.1s	9:25	110	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



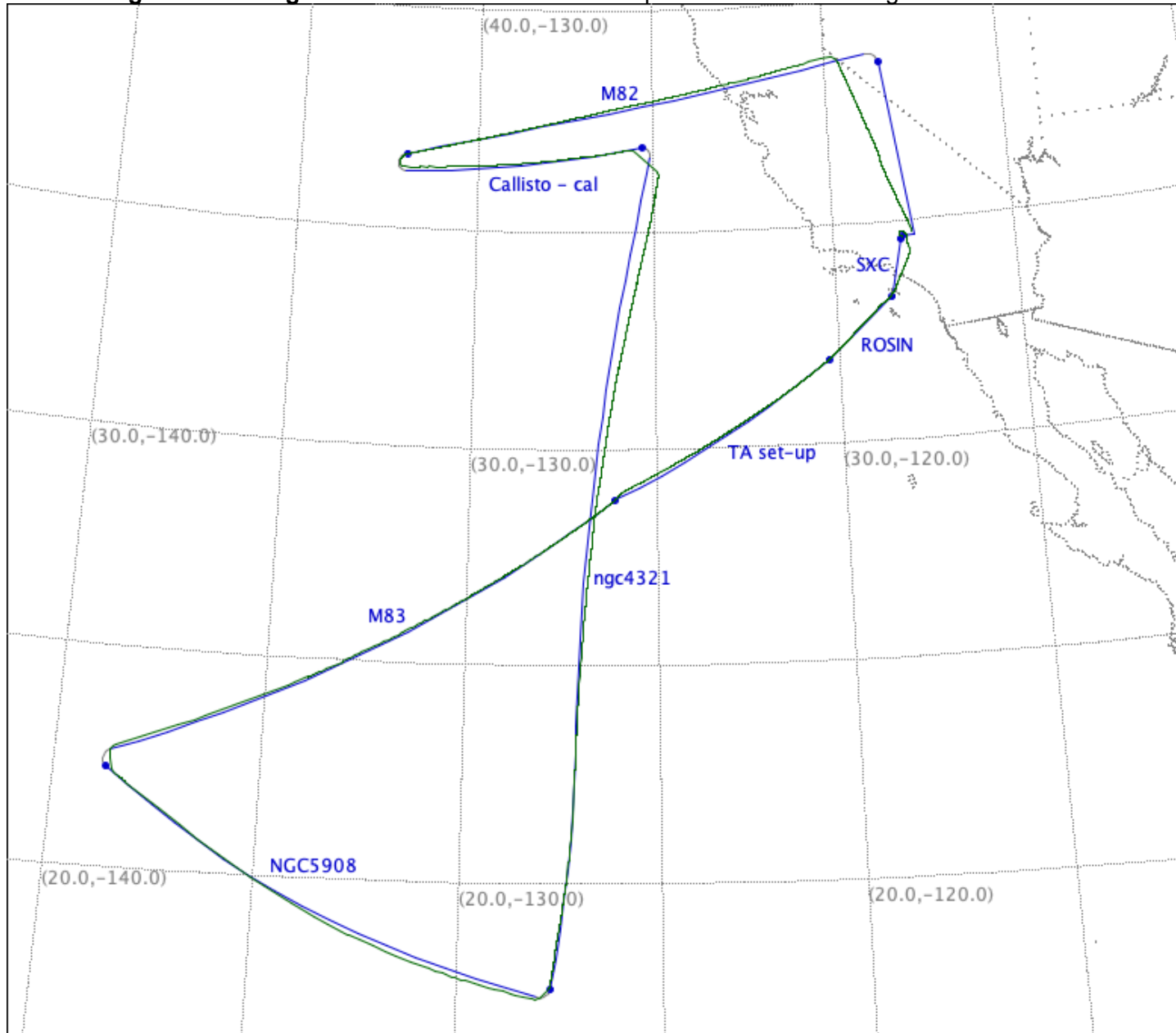
MISSION ID: 2019-05-17_FI_F573

Date: 2019-05-17 UT Instrument: FIFI-LS

Flight #: 573 Flight Series: OC7A

blue = planned route

green = flown route

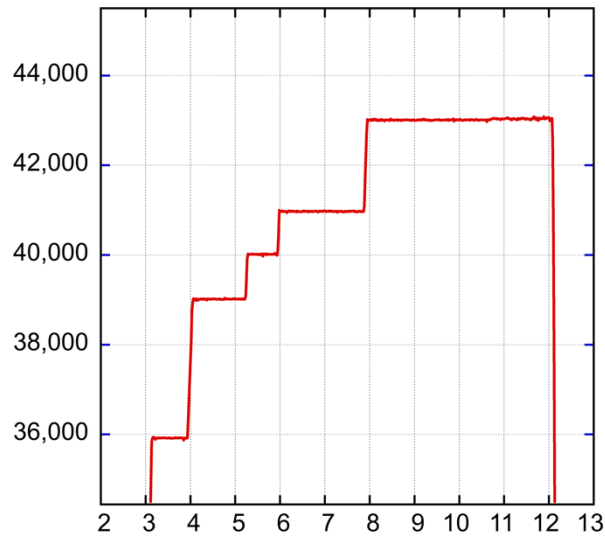


Flight notes: No irregularities.

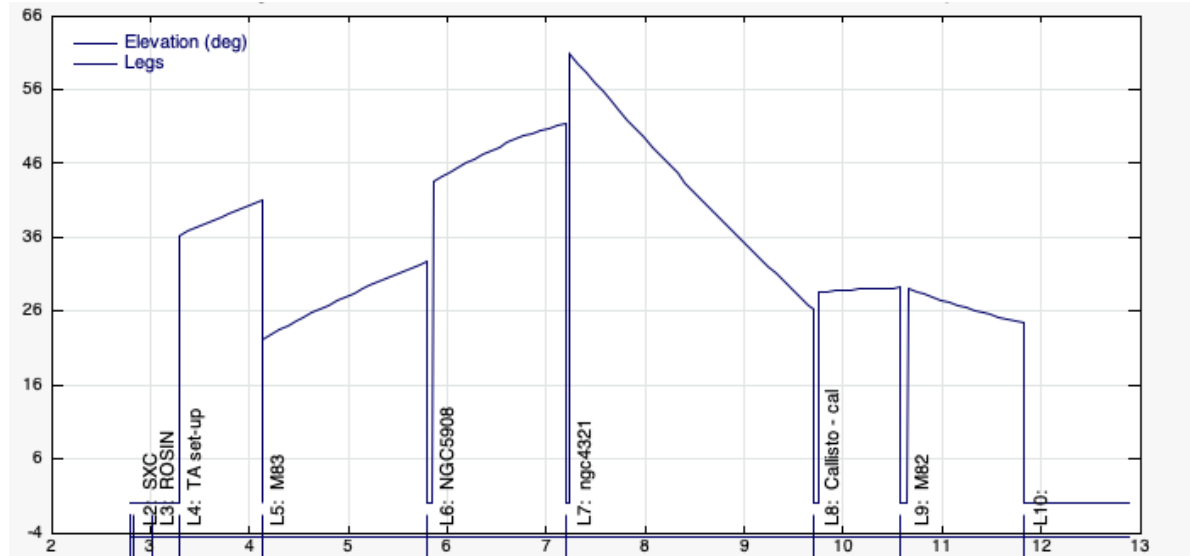
Flight 573 Mission ID 2019-05-17_FI_F573
 Palmdale to Palmdale Take off date UTC: 17-MAY-2019
 Departure UTC: 02:45 Arrival UTC: 12:26

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 60965	12h29m51.86s	-16d30m55.6s	3:18	50	
5	70_0708	GTO	M83	13h37m00.92s	-29d51m56.7s	4:09	100	Difficulties guiding due to nearby full Moon
6	76_0007	Yorke	NGC5908	15h16m43.22s	55d24m33.3s	5:52	80	
7	70_0708	GTO	ngc4321	12h22m54.93s	15d49m20.3s	7:15	148	
8	90_0033	Calibration	Callisto	17h25m47.37s	-22d34m30.0s	9:45	50	Scripting error; lost half of leg debugging
9	07_0217	Latzko	M82	09h55m52.43s	69d40m46.9s	10:40	70	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



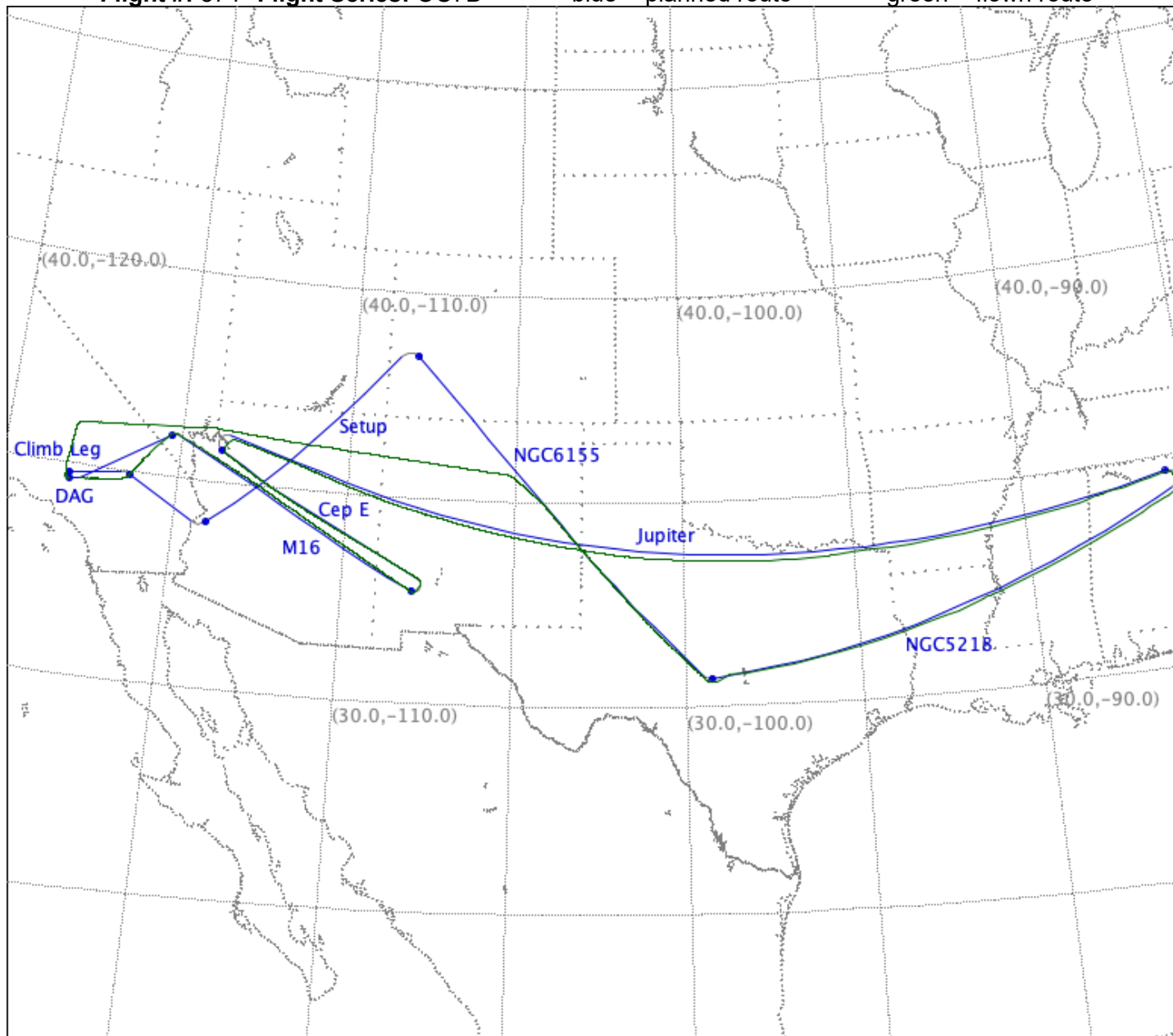
MISSION ID: 2019-05-23_GR_F574

Date: 2019-05-23 UT Instrument: GREAT

Flight #: 574 Flight Series: OC7B

blue = planned route

green = flown route

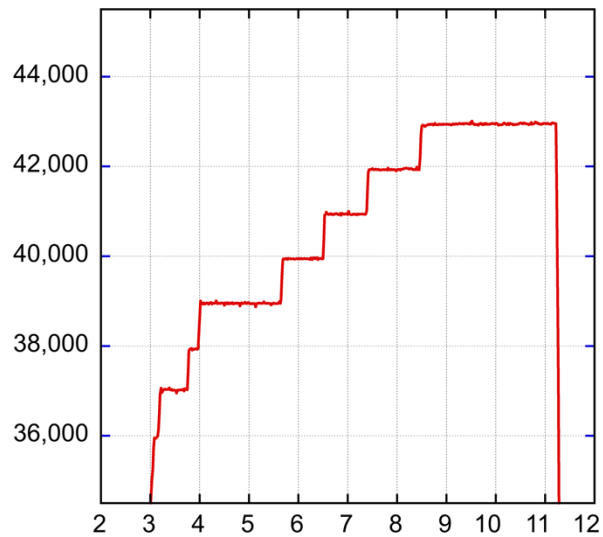


Flight notes:
Deviation by Air Traffic Control with no loss of data.

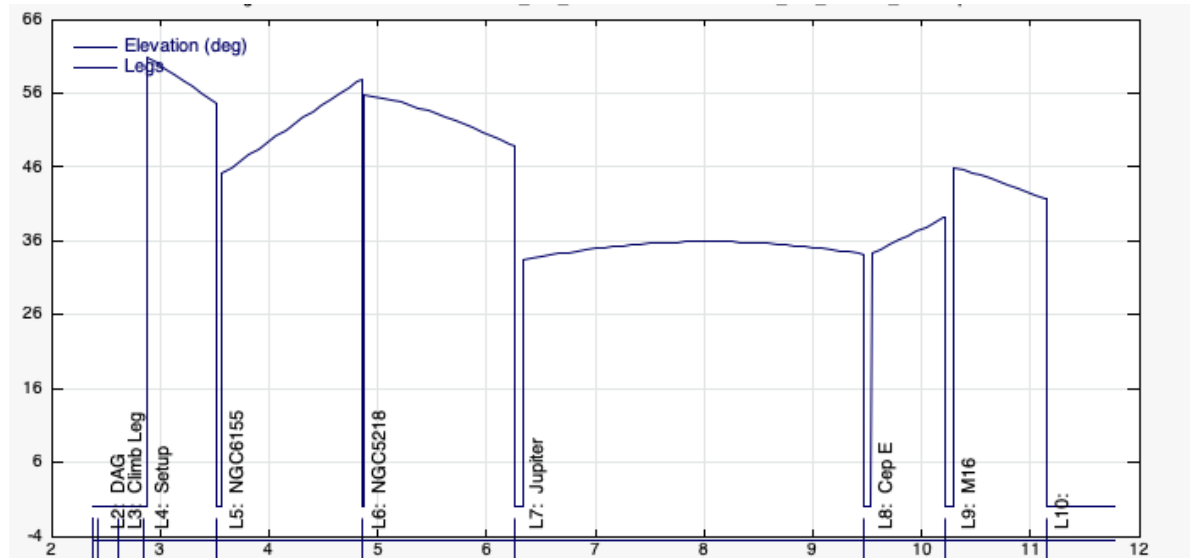
Flight 574 Mission ID 2019-05-23_GR_F574
 Palmdale to Palmdale Take off date UTC: 23-MAY-2019 Departure UTC: 02:36 Arrival UTC: 11:40 LFA/HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 44901	09h08m52.10s	51d36m16.4s	2:53	38	
5	07_0126	Bolatto	NGC6155	16h26m08.16s	48d22m00.5s	3:34	77	
6	07_0126	Bolatto	NGC5218	13h32m10.32s	62d46m03.7s	4:52	83	
7	90_0008	Calibration	Jupiter	17h22m58.06s	-22d32m56.2s	6:20	188	
8	07_0161	Gusdorf	Cep E	23h03m12.78s	61d42m25.8s	9:32	41	
9	07_0077	Tielens	M16	18h18m23.99s	-13d41m26.4s	10:17	51	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)

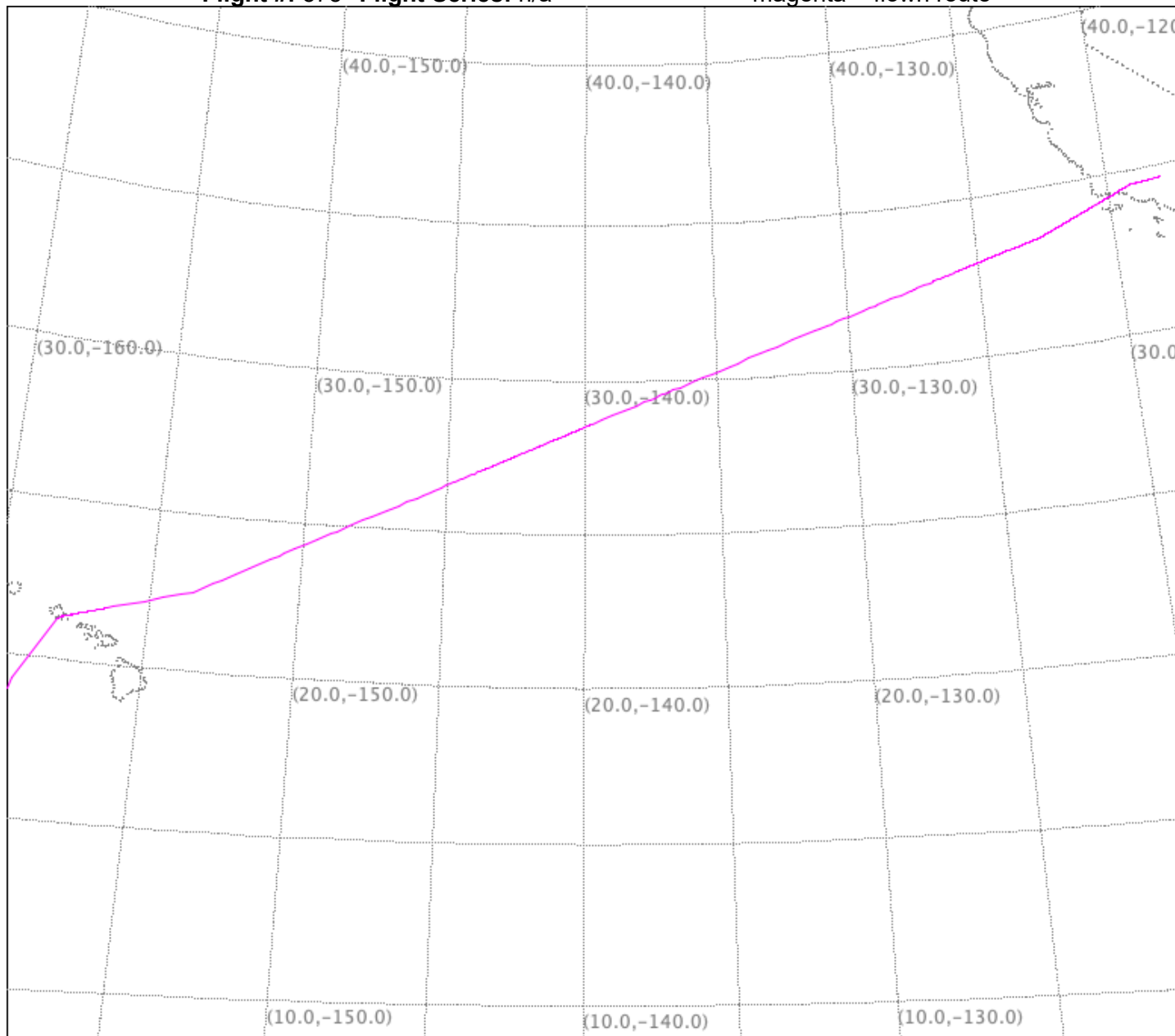


MISSION ID: 2019-05-30_GR_F575

Date: 2019-05-30UT Instrument: n/a

Flight #: 575 Flight Series: n/a

magenta = flown route



Flight notes:

Ferry Flight from Palmdale, CA to Honolulu, HI (no science planned)

Flight 575
Palmdale to
Honolulu

Mission ID 2019-05-30_GR_F575
Take off date UTC:
30-MAY-2019

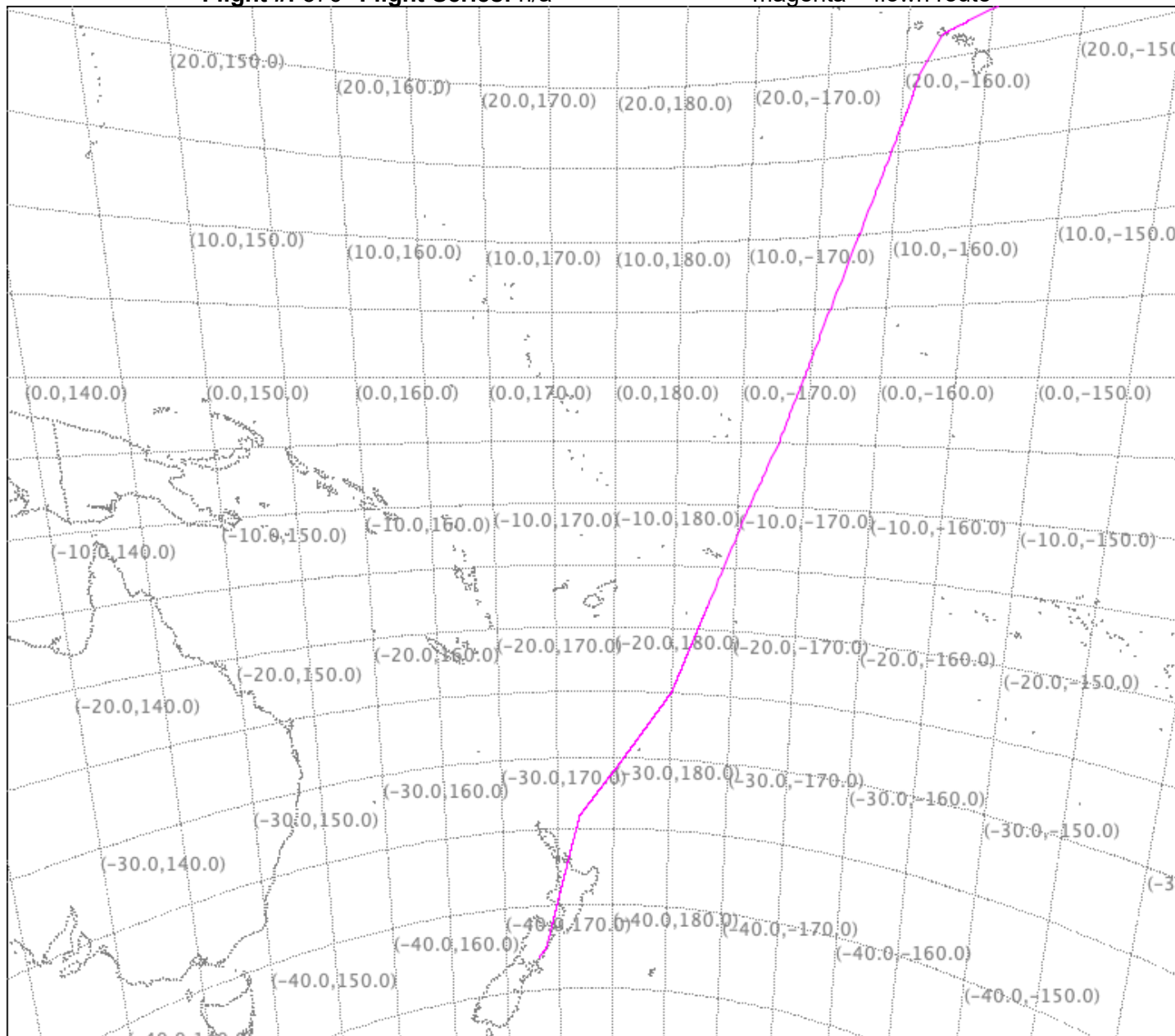
Departure UTC: 04:08
Arrival UTC: 09:07

MISSION ID: 2019-06-01_NO_F576

Date: 2019-06-01UT Instrument: n/a

Flight #: 576 Flight Series: n/a

magenta = flown route



Flight notes:

Ferry Flight from Honolulu, HI to Christchurch, New Zealand (no science planned)

Flight 576
Honolulu to
Christchurch

Mission ID 2019-06-01_NO_F576
Take off date UTC:
01-JUN-2019

Departure UTC: 12:05
Arrival UTC: 21:21

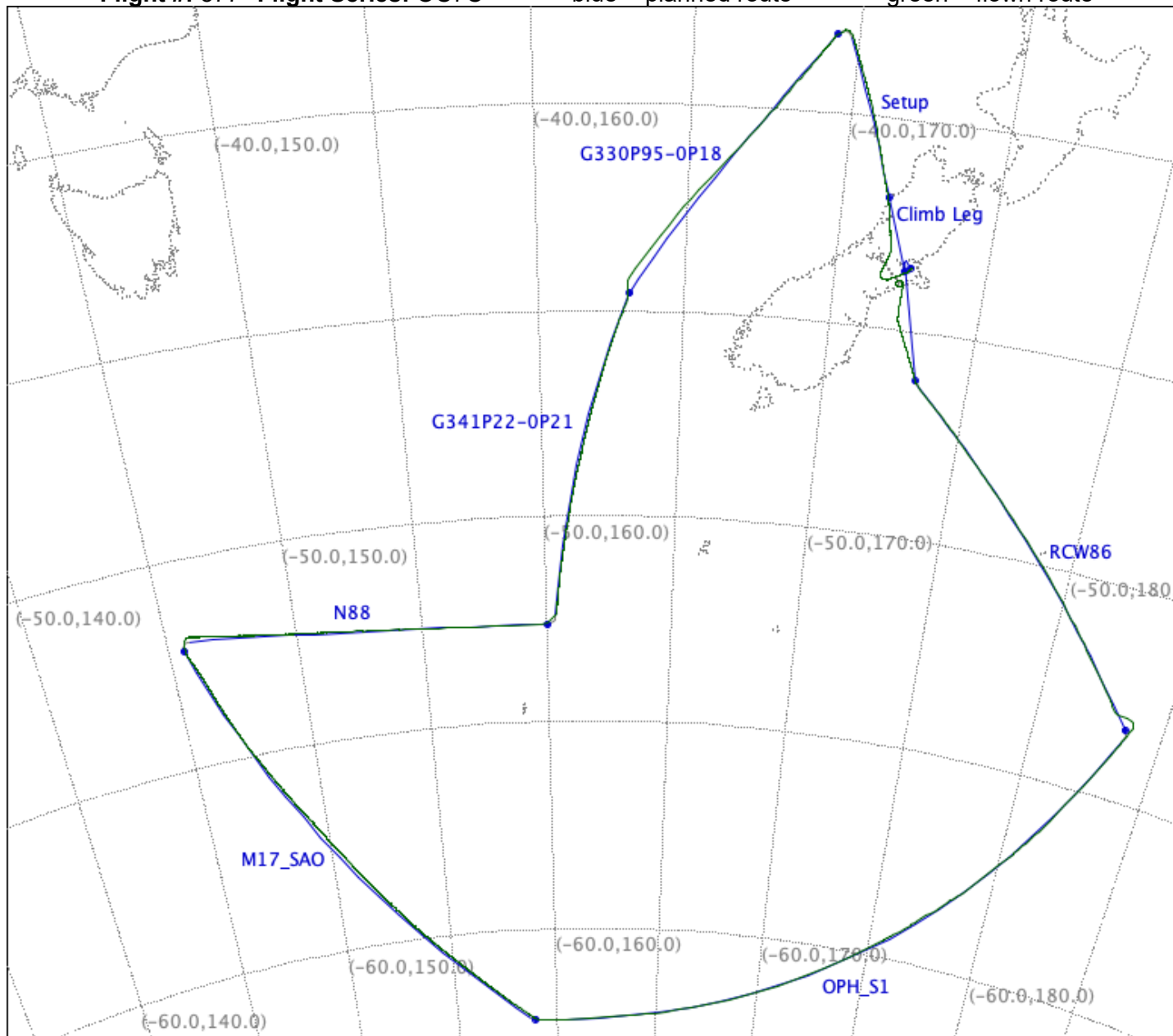
MISSION ID: 2019-06-05_GR_F577

Date: 2019-06-05 UT Instrument: GREAT

Flight #: 577 Flight Series: OC7C

blue = planned route

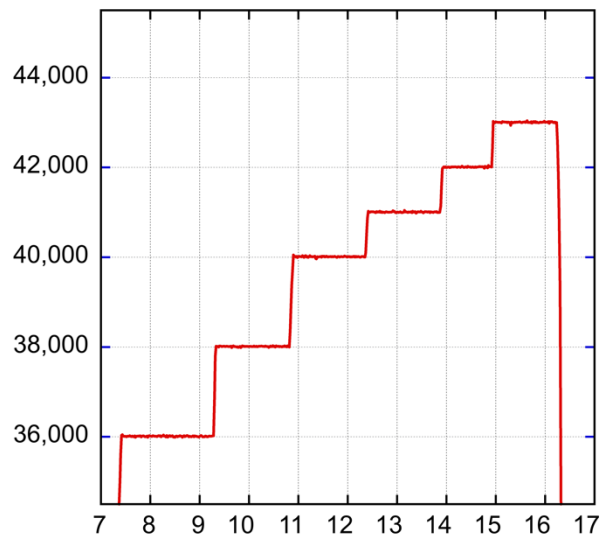
green = flown route



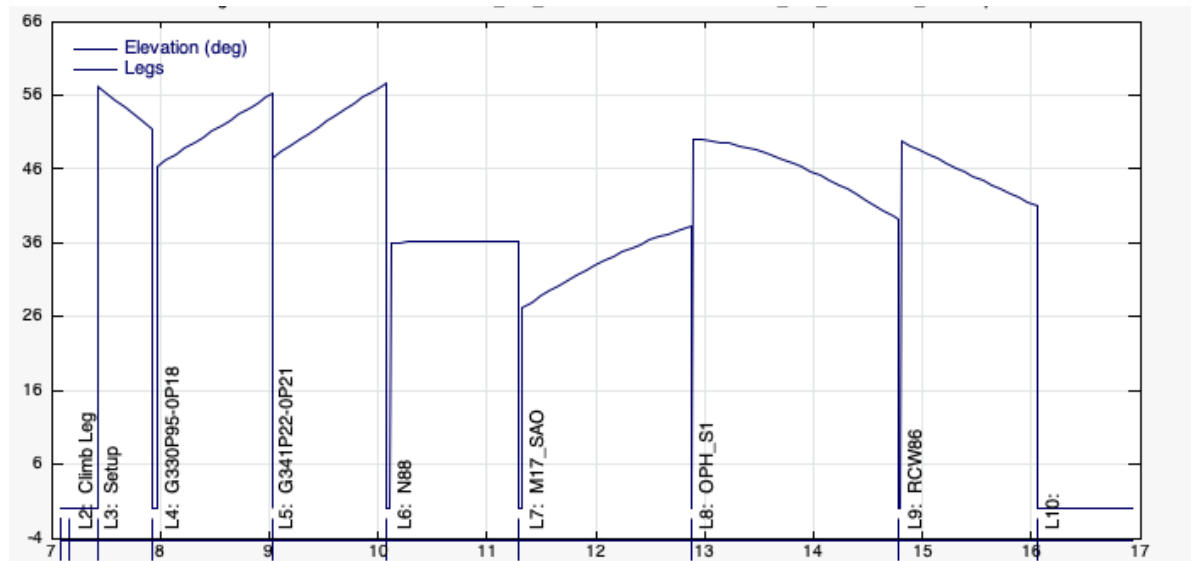
Flight notes:
No irregularities.

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 42570	08h40m37.57s	-46d38m55.5s	7:25	30	
4	83_0703	GREAT Consortium	G330P95-0P18	16h10m05.99s	-51d56m25.6s	7:58	63	Instrument issues led to loss of almost the entire leg
5	83_0703	GREAT Consortium	G341P22-0P21	16h52m16.49s	-44d30m18.9s	9:01	63	
6	83_0713	GREAT Consortium	N88	01h24m08.10s	-73d09m04.5s	10:07	70	
7	83_0702	GREAT Consortium	M17_SAO	18h20m27.60s	-16d12m00.9s	11:19	93	Turbulence.
8	83_0614	GREAT Consortium	OPH_S1	16h26m34.32s	-24d23m28.3s	12:53	113	
9	83_0709	GREAT Consortium	RCW86	14h43m22.18s	-62d28m59.2s	14:48	75	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



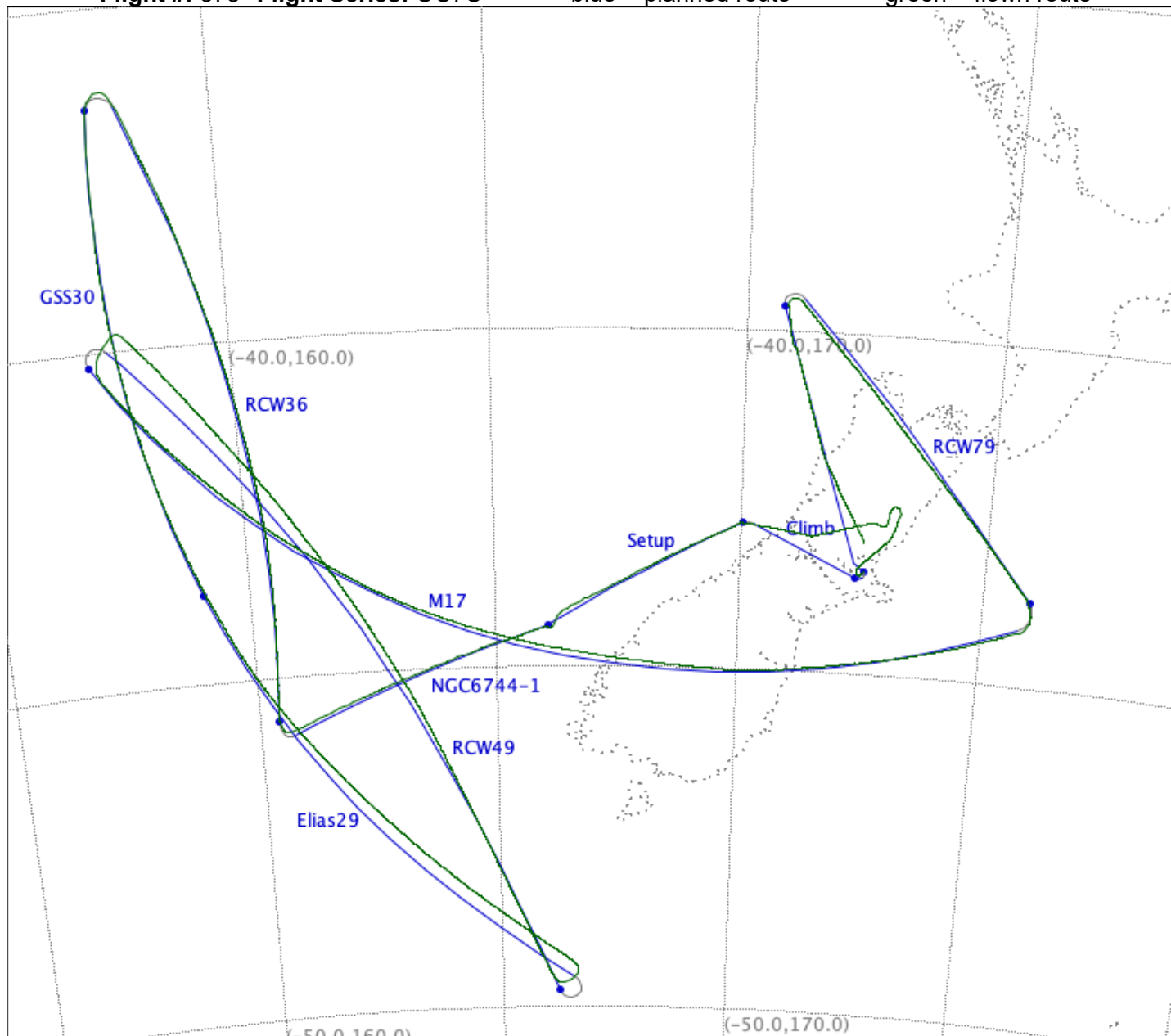
MISSION ID: 2019-06-07_GR_F578

Date: 2019-06-07 UT Instrument: GREAT

Flight #: 578 Flight Series: OC7C

blue = planned route

green = flown route



Flight notes:
No irregularities.

Flight 578 Mission ID
 Christchurch-Christchurch

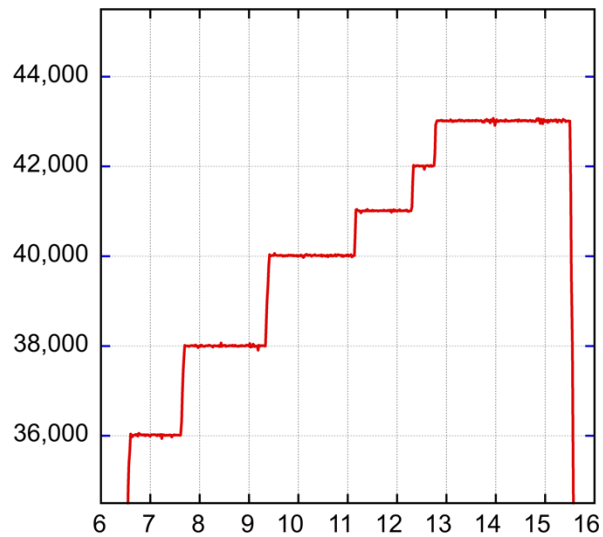
2019-06-07_GR_F578
 Take off date UTC:
 07-JUN-2019

Departure UTC: 06:04
 Arrival UTC: 15:59

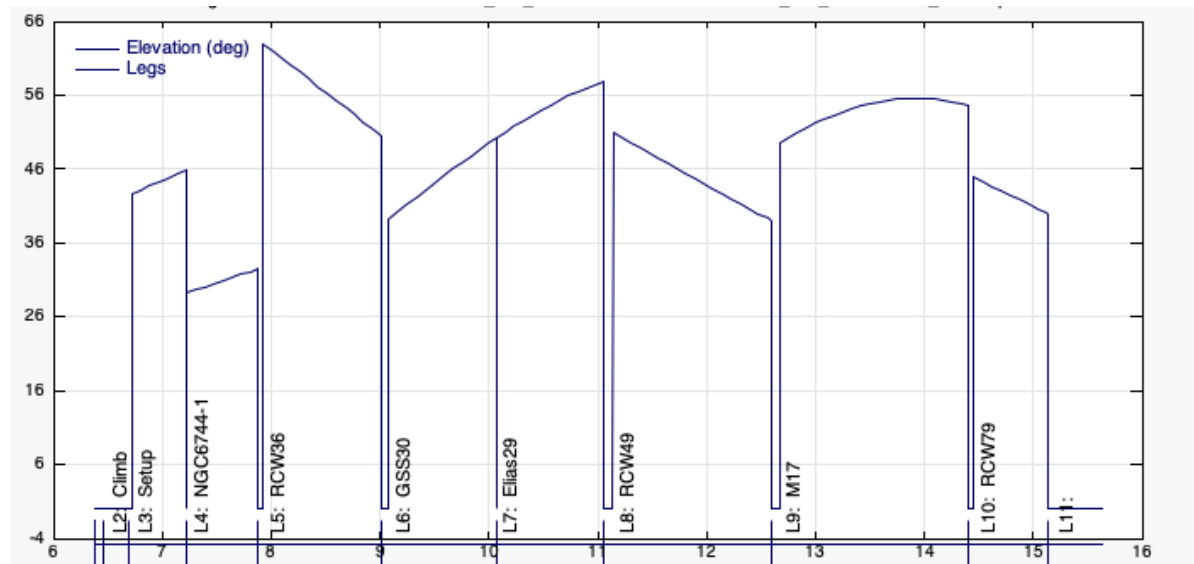
LFA/HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Obs time	Leg notes
3			HIP 79664	16h15m26.27s	-63d41m08.5s	6:43	30	
4	07_0126	Bolato	NGC6744	19h09m45.03s	-63d49m48.3s	7:13	39	
5	07_0077	Tielens	RCW36	08h59m14.67s	-43d46m29.5s	7:55	65	
6	06_0109	Yildiz	GSS30	16h26m21.40s	-24d23m04.0s	9:04	59	
7	06_0109	Yildiz	Elias29	16h27m09.40s	-24d37m19.6s	10:03	59	Turbulence.
8	07_0077	Tielens	RCW49	10h24m12.82s	-57d46m29.2s	11:07	87	
9	07_0077	Tielens	M17	18h20m28.32s	-16d09m56.0s	12:39	104	
10	07_0077	Tielens	RCW79	13h40m08.57s	-61d42m00.6s	14:26	41	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



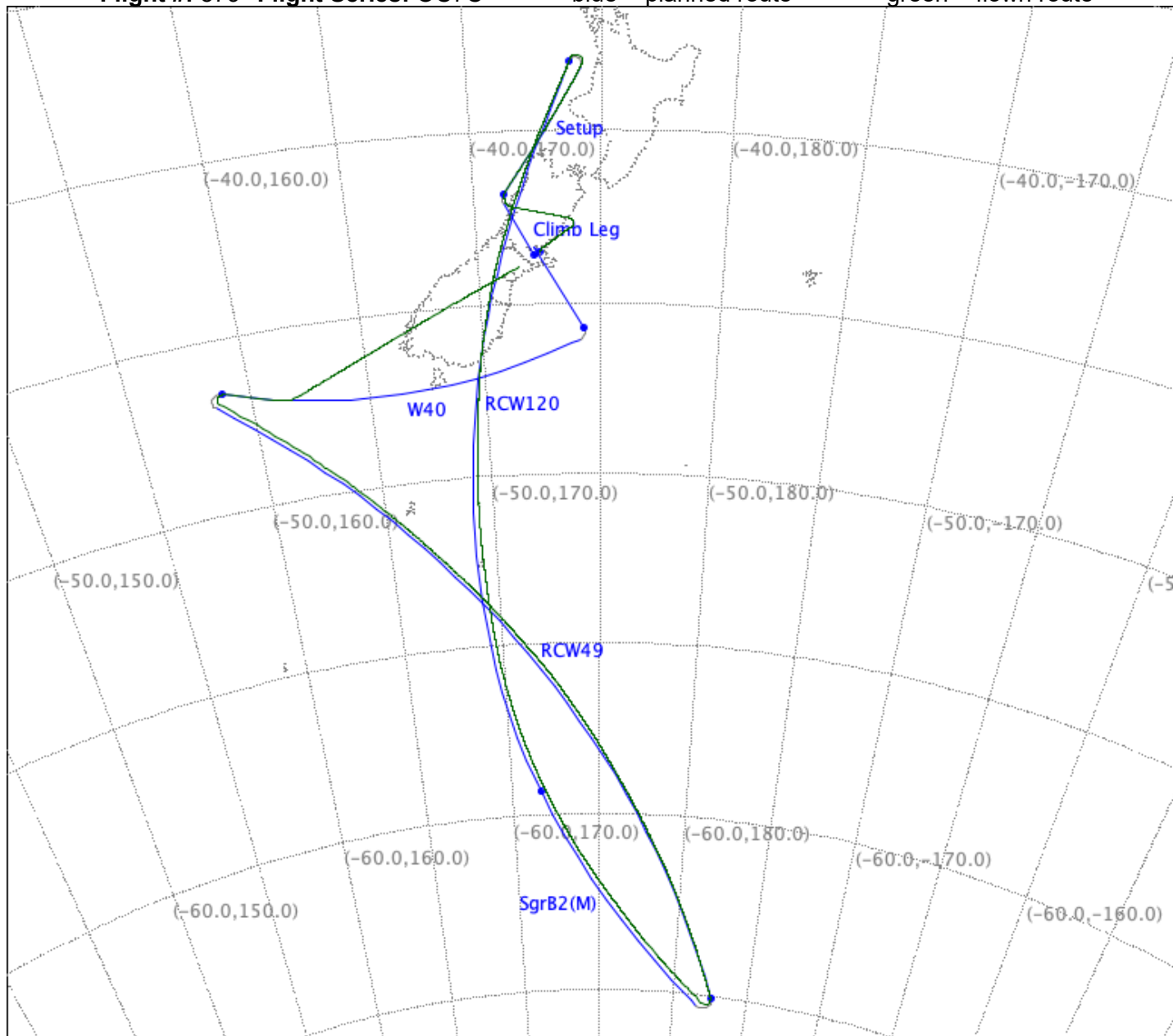
MISSION ID: 2019-06-10_GR_F579

Date: 2019-06-10 UT Instrument: GREAT

Flight #: 579 Flight Series: OC7C

blue = planned route

green = flown route

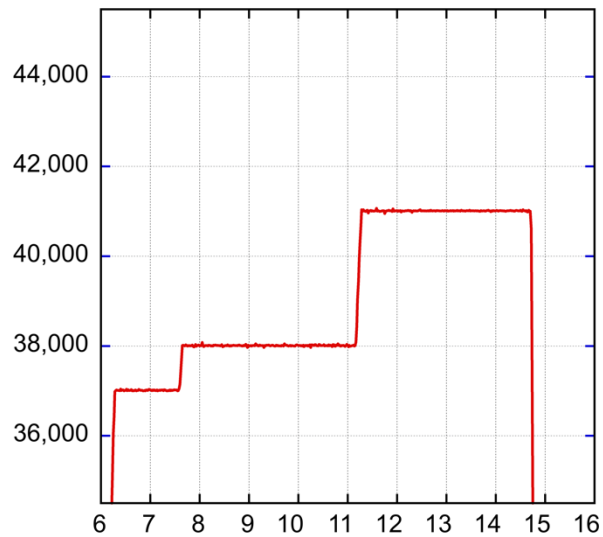


Flight notes:

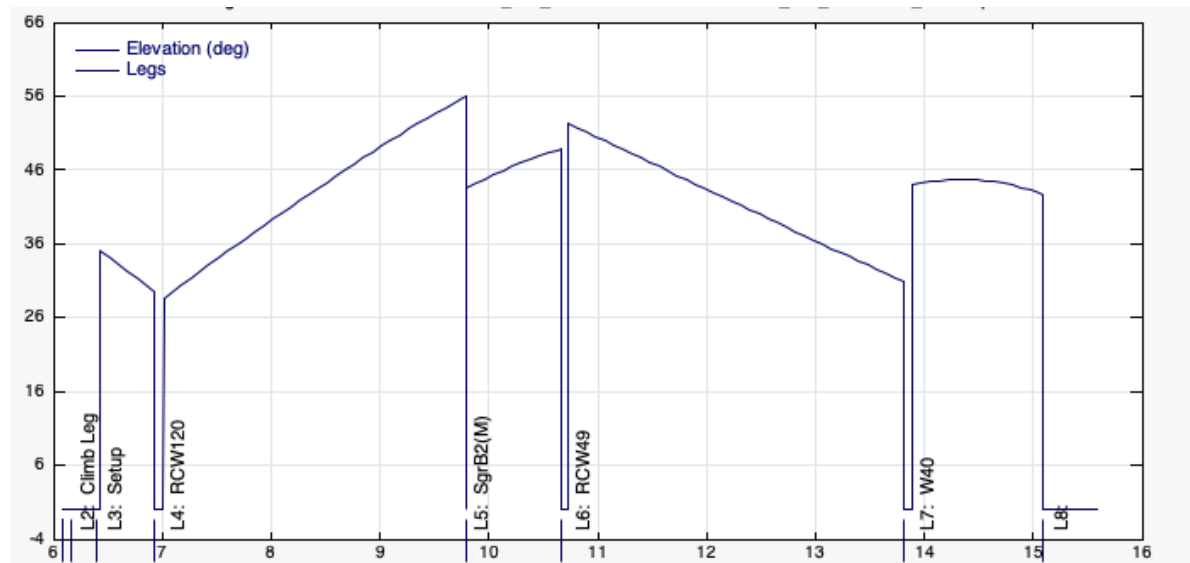
Fog risk at Christchurch landing site required early return to base.

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 39863	08h08m35.65s	-02d59m01.6s	6:26	30	
4	07_0077	Tielens	RCW120	17h11m59.16s	-38d27m57.1s	7:00	167	
5	07_0148	Jacob	SgrB2(M)	17h47m20.50s	-28d23m06.0s	9:47	51.6	
6	07_0077	Tielens	RCW49	10h24m12.82s	-57d46m29.2s	10:43	185	
7	07_0077	Tielens	W40	18h31m24.45s	-02d04m13.8s	13:53	72	Return to Christchurch Base – no data.

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



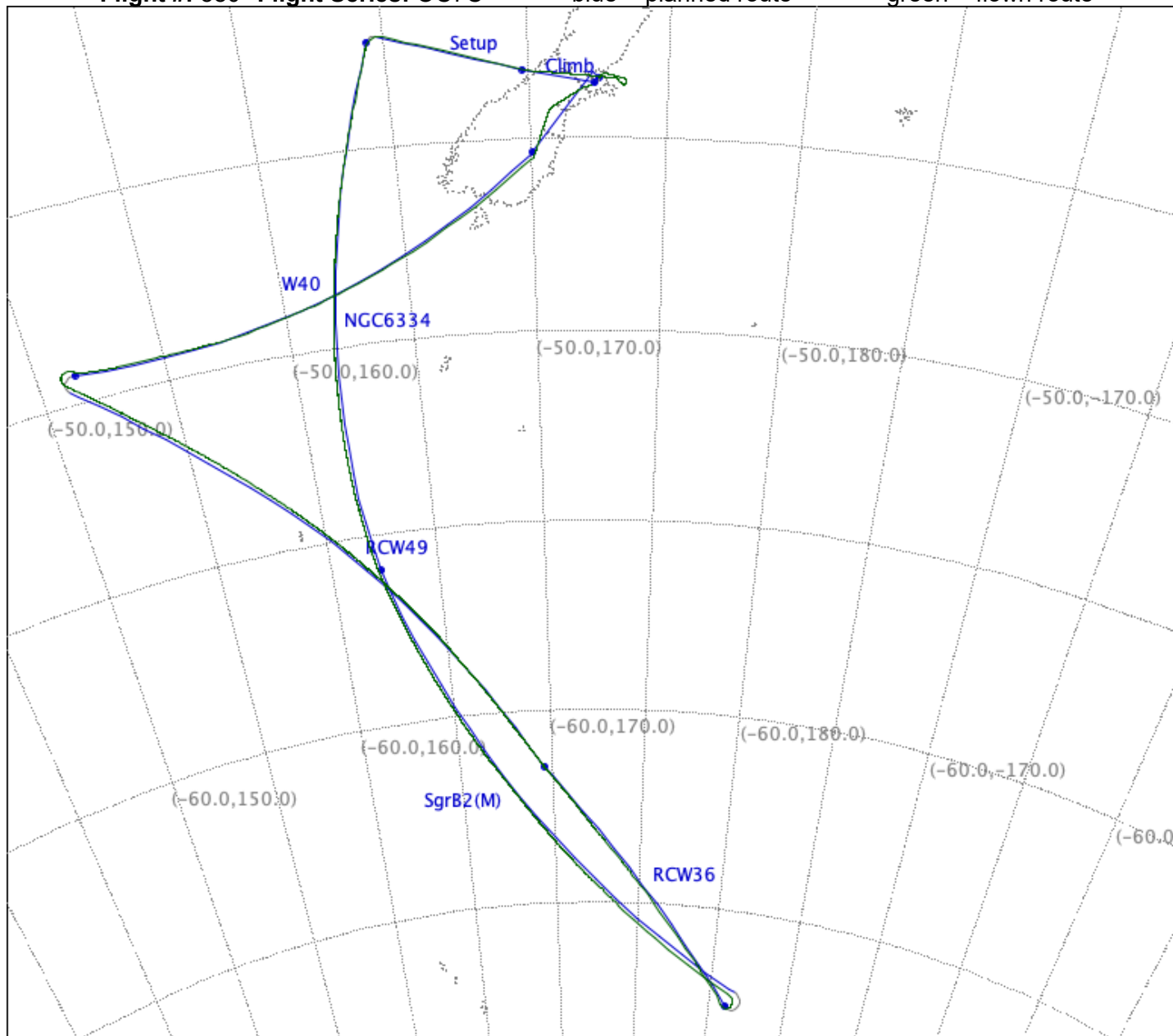
MISSION ID: 2019-06-11_GR_F580

Date: 2019-06-11 UT Instrument: GREAT

Flight #: 580 Flight Series: OC7C

blue = planned route

green = flown route



Flight notes:
No irregularities.

Flight 580 Mission ID
 Christchurch-Christchurch

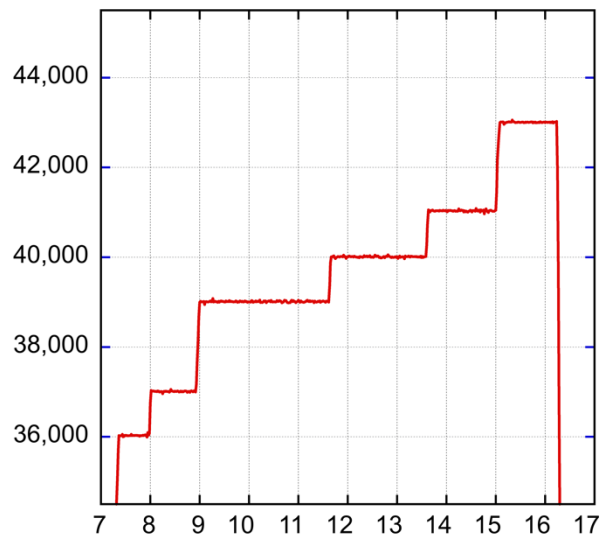
2019-06-11_GR_F580
 Take off date UTC:
 11-JUN-2019

Departure UTC: 06:52
 Arrival UTC: 16:36

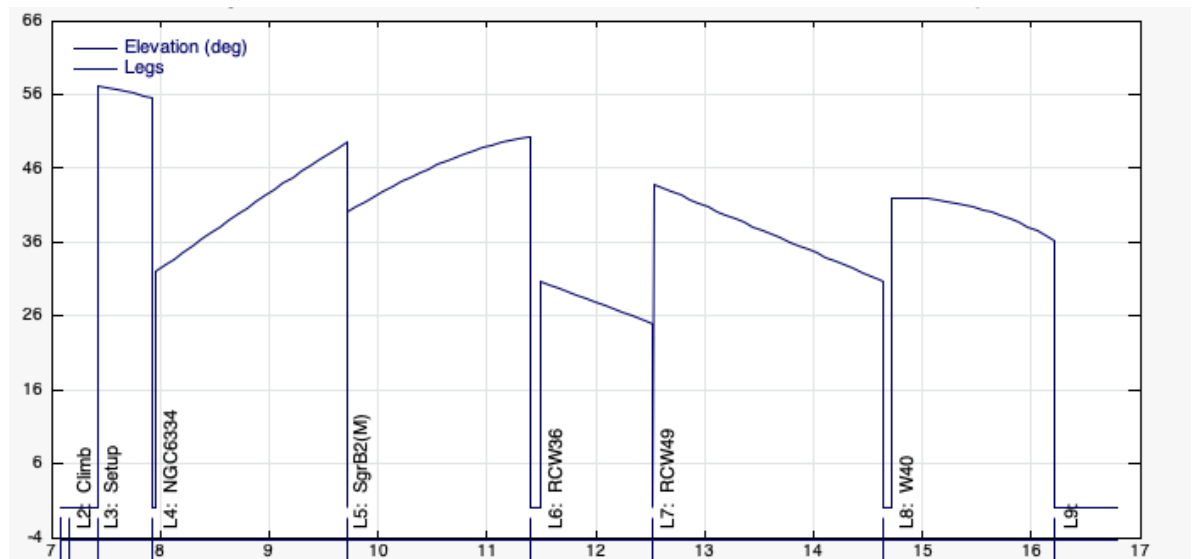
LFA/HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 50954	10h24m23.71s	-74d01m53.8s	7:25	30	
4	07_0077	Tielens	NGC6334	17h20m13.62s	-35d55m04.6s	7:57	105	
5	07_0148	Jacob	SgrB2(M)	17h47m20.50s	-28d23m06.0s	9:42	101	
6	07_0077	Tielens	RCW36	08h59m14.67s	-43d46m29.5s	11:29	62	
7	07_0077	Tielens	RCW49	10h24m12.82s	-57d46m29.2s	12:31	127	
8	07_0077	Tielens	W40	18h31m24.45s	-02d04m13.8s	14:43	90	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



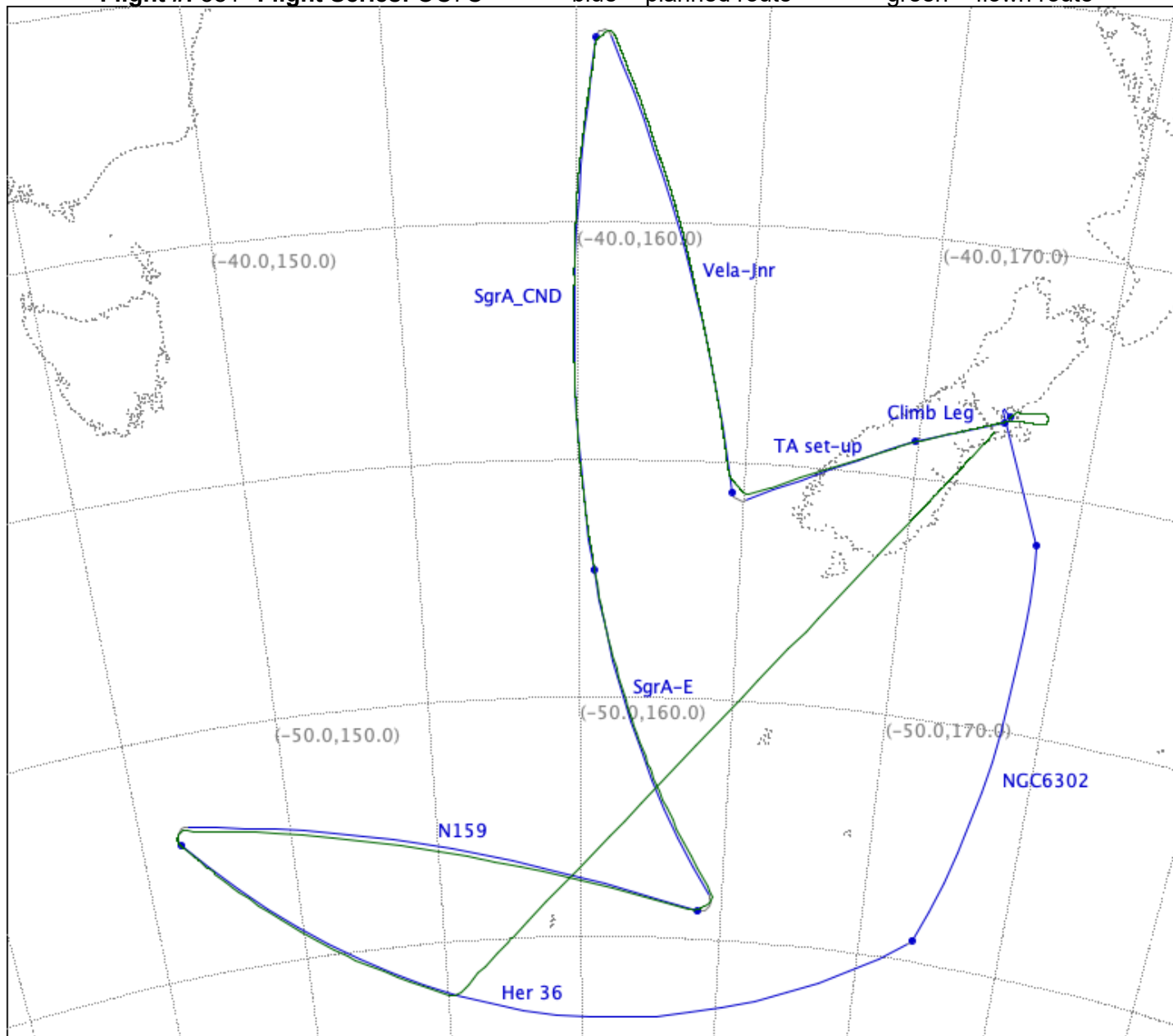
MISSION ID: 2019-06-16_GR_F581

Date: 2019-06-16 UT Instrument: GREAT

Flight #: 581 Flight Series: OC7C

blue = planned route

green = flown route

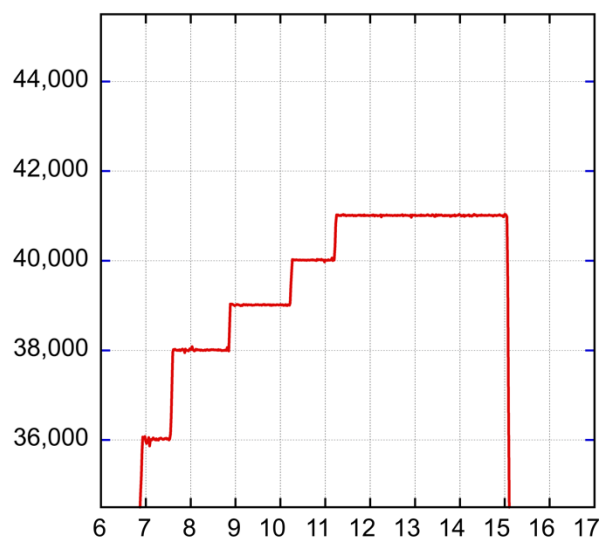


Flight notes:

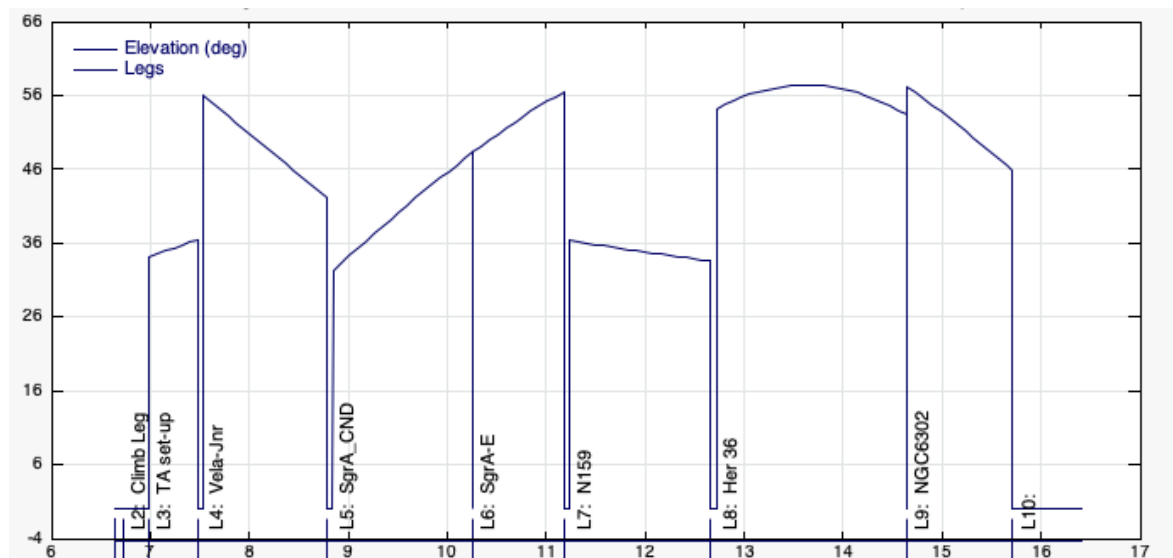
Rain forecast for original landing time at Christchurch base required early Return to Base.

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 94150	19h09m53.44s	-68d25m28.0s	6:59	30	
4	83_0709	GREAT Consortium	Vela-Jnr	08h50m12.76s	-45d35m33.6s	7:32	75	
5	83_0707	GREAT Consortium	SgrA_CND	17h45m40.04s	-29d00m28.1s	8:50	85	
6	83_0708	GREAT Consortium	SgrA-E	17h45m52.04s	-28d59m32.9s	10:15	55	
7	83_0712	GREAT Consortium	N159	05h39m51.10s	-69d45m12.9s	11:14	85	
8	83_0617	GREAT Consortium	Her 36	18h03m40.30s	-24d22m43.0s	12:43	115	Return to Base – partial data.
9	83_0707	GREAT Consortium	NGC6302	17h13m44.21s	-37d06m15.9s	14:39	63	Return to Base – no data.

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



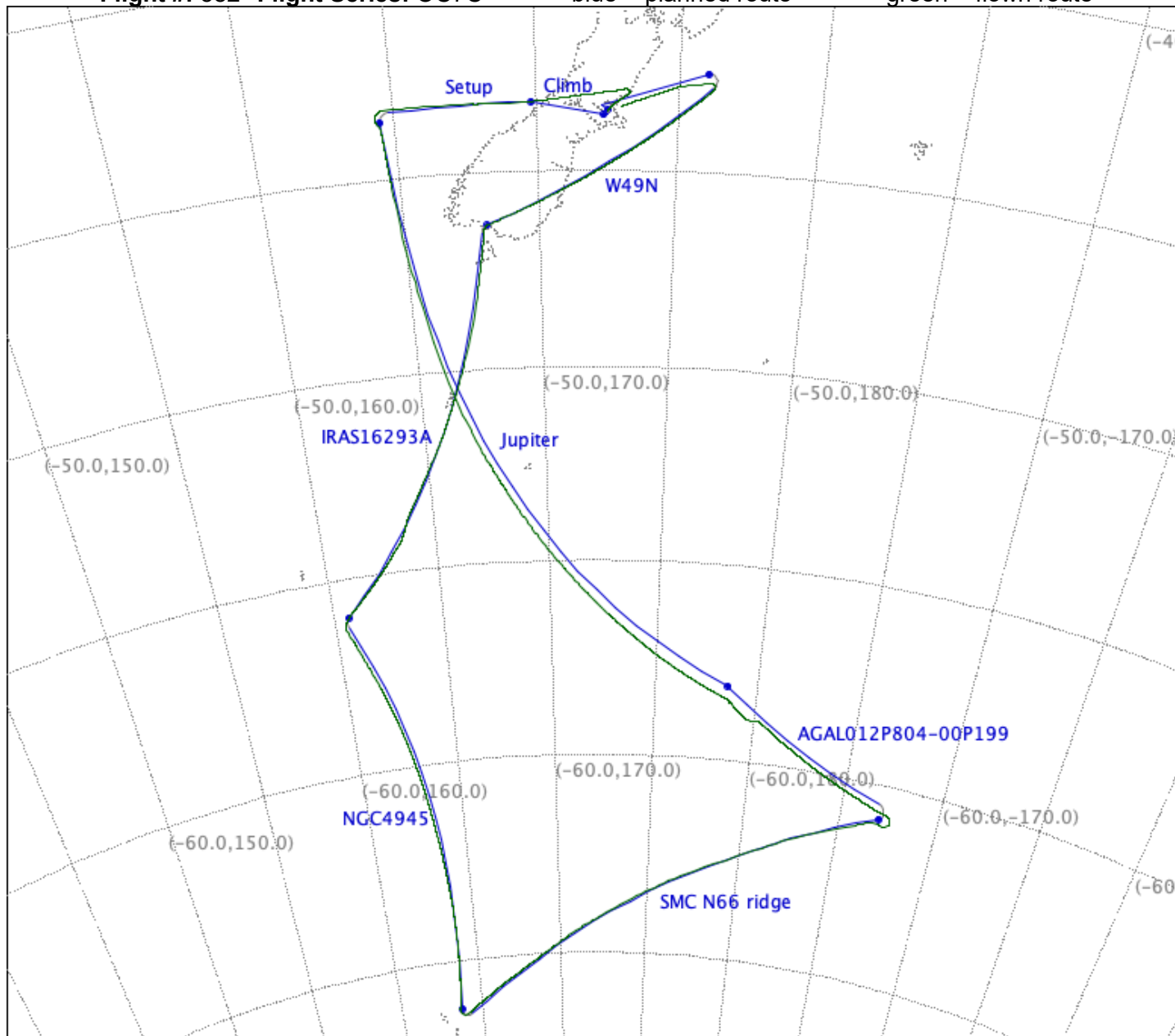
MISSION ID: 2019-06-20_GR_F582

Date: 2019-06-20 UT Instrument: GREAT

Flight #: 582 Flight Series: OC7C

blue = planned route

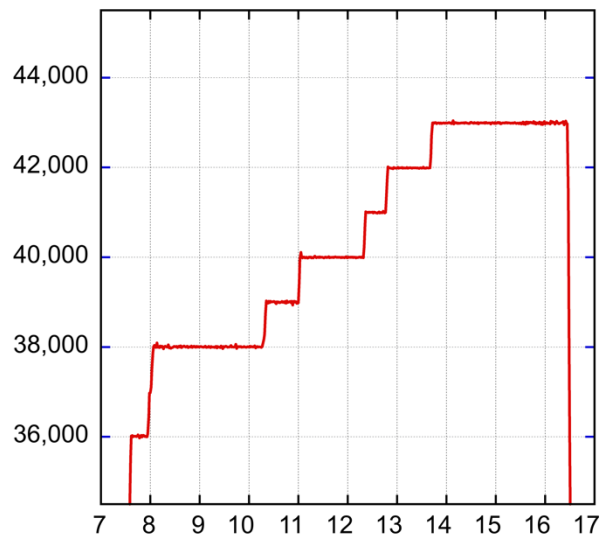
green = flown route



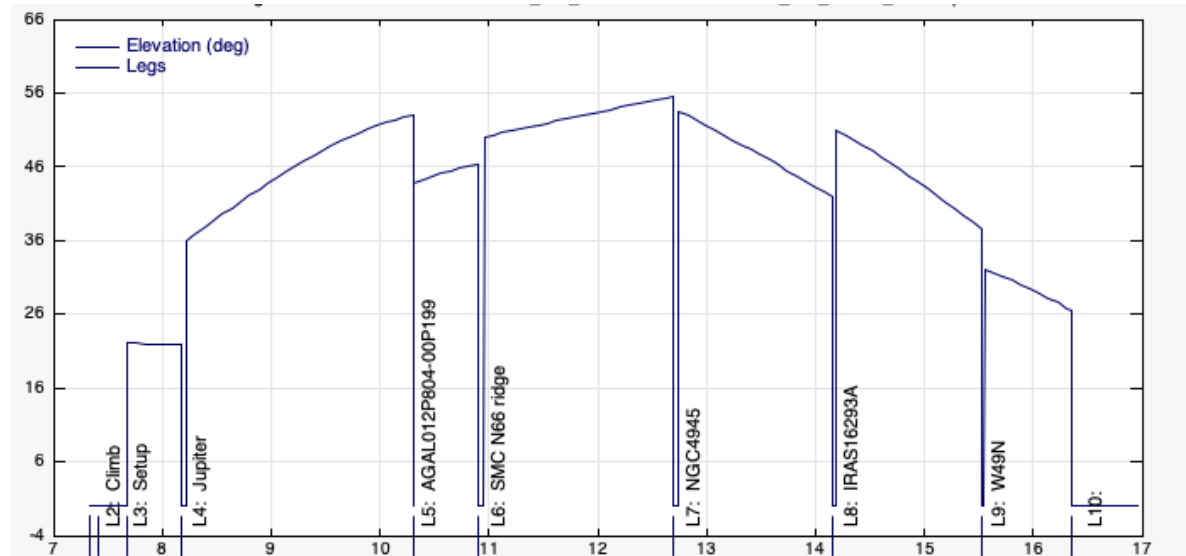
Flight notes: No irregularities.

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 5896	01h15m46.16s	-68d52m33.3s	7:40	30	
4	90_0008	Calibration	Jupiter	17h07m56.92s	-22d20m04.3s	8:13	125	
5	83_0711	GREAT Consortium	AGAL012P804-00P199	18h14m13.56s	-17d55m32.1s	10:18	35	
6	83_0415	GREAT Consortium	SMC N66 ridge	00h59m06.90s	-72d10m29.6s	10:57	104	
7	83_0706	GREAT Consortium	NGC4945	13h05m27.28s	-49d28m04.4s	12:44	85	
8	83_0520	GREAT Consortium	IRAS16293A	16h32m22.74s	-24d28m34.5s	14:11	80	Telescope control software failure; lost 16min recovering
9	83_0701	GREAT Consortium	W49N	19h10m13.20s	09d06m12.0s	15:33	48	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



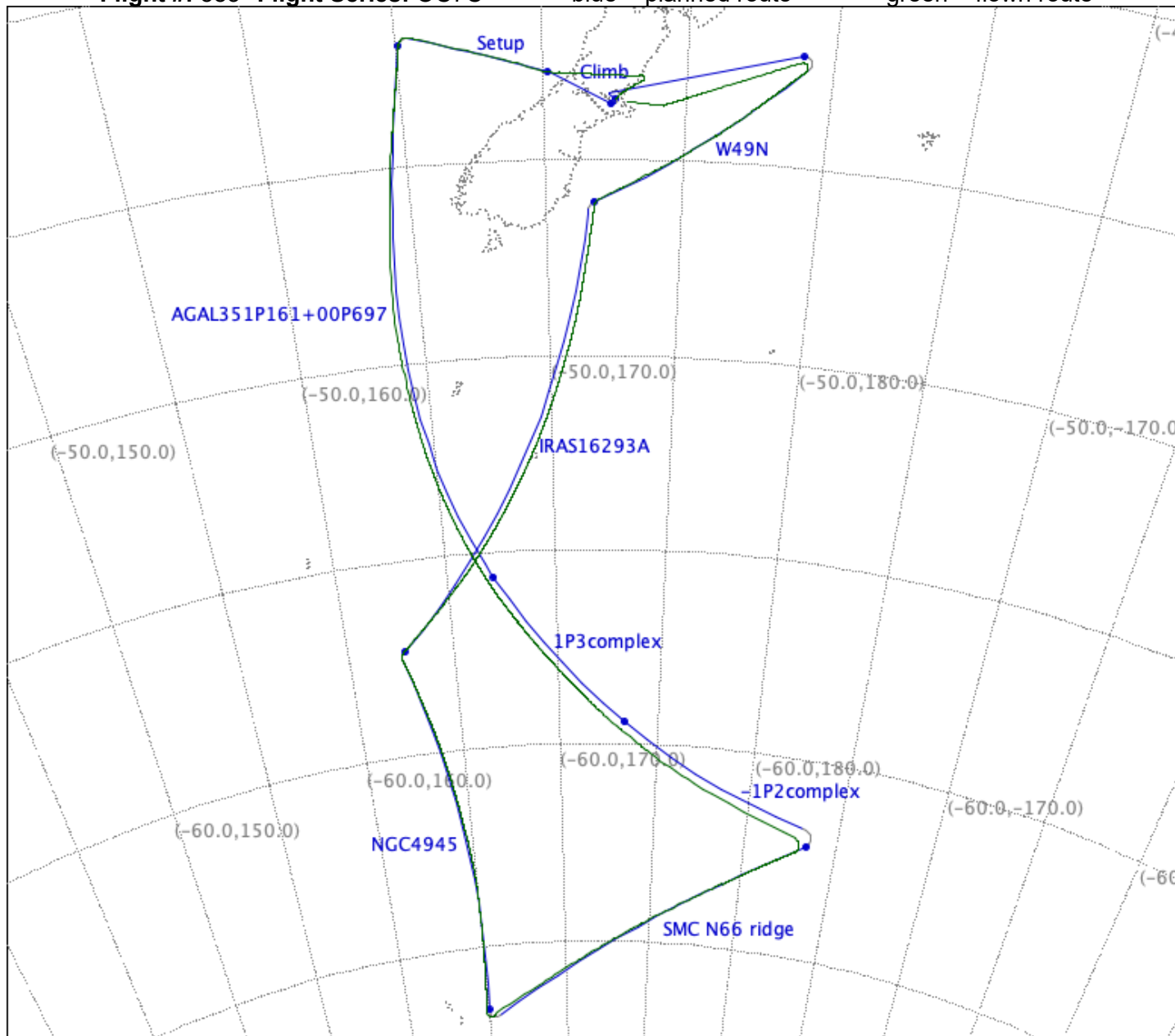
MISSION ID: 2019-06-21_GR_F583

Date: 2019-06-21 UT Instrument: GREAT

Flight #: 583 Flight Series: OC7C

blue = planned route

green = flown route

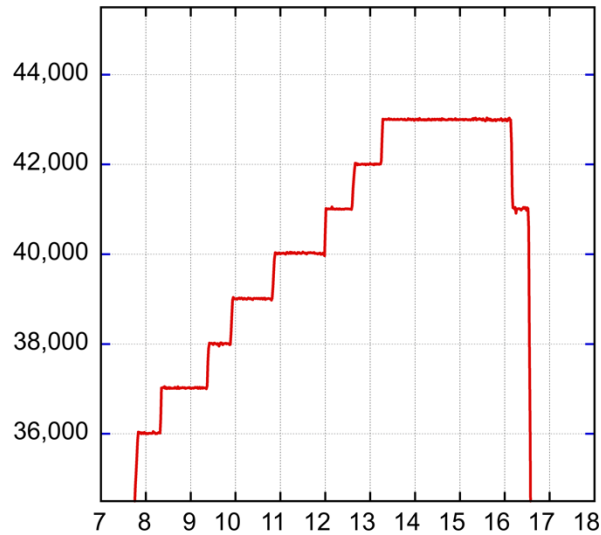


Flight notes: No irregularities.

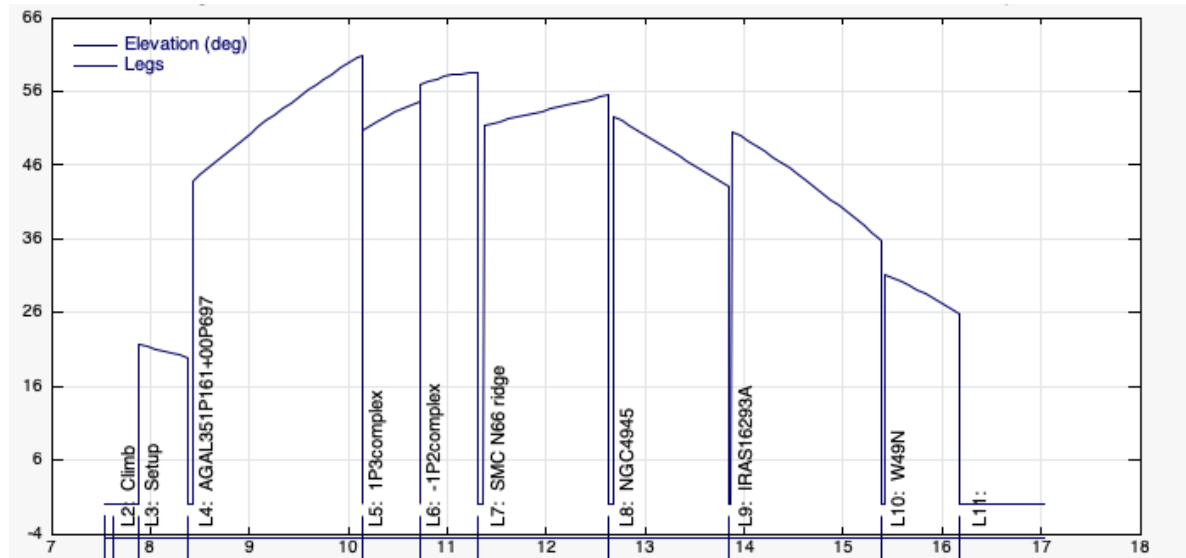
Flight 583 Mission ID 2019-06-21_GR_F583
 Christchurch-Christchurch Take off date UTC: 21-JUN-2019
 Departure UTC: 07:17 Arrival UTC: 17:04 Consortium flight 4G/HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 17440	03h44m11.98s	-64d48m24.8s	7:52	30	
4	83_0711	GREAT Consortium	AGAL351P161+00P697	17h20m03.26s	-35d56m56.4s	8:25	103	
5	83_0714	GREAT Consortium	1P3complex	17h48m37.21s	-27d50m33.5s	10:08	35	
6	83_0714	GREAT Consortium	-1P2complex	17h43m34.37s	-30d01m26.3s	10:43	35	
7	83_0415	GREAT Consortium	SMC N66 ridge	00h59m06.90s	-72d10m29.6s	11:22	75	
8	83_0706	GREAT Consortium	NGC4945	13h05m27.28s	-49d28m04.4s	12:40	70	
9	83_0520	GREAT Consortium	IRAS16293A	16h32m22.74s	-24d28m34.5s	13:52	91	
10	83_0701	GREAT Consortium	W49N	19h10m13.20s	09d06m12.0s	15:25	45	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



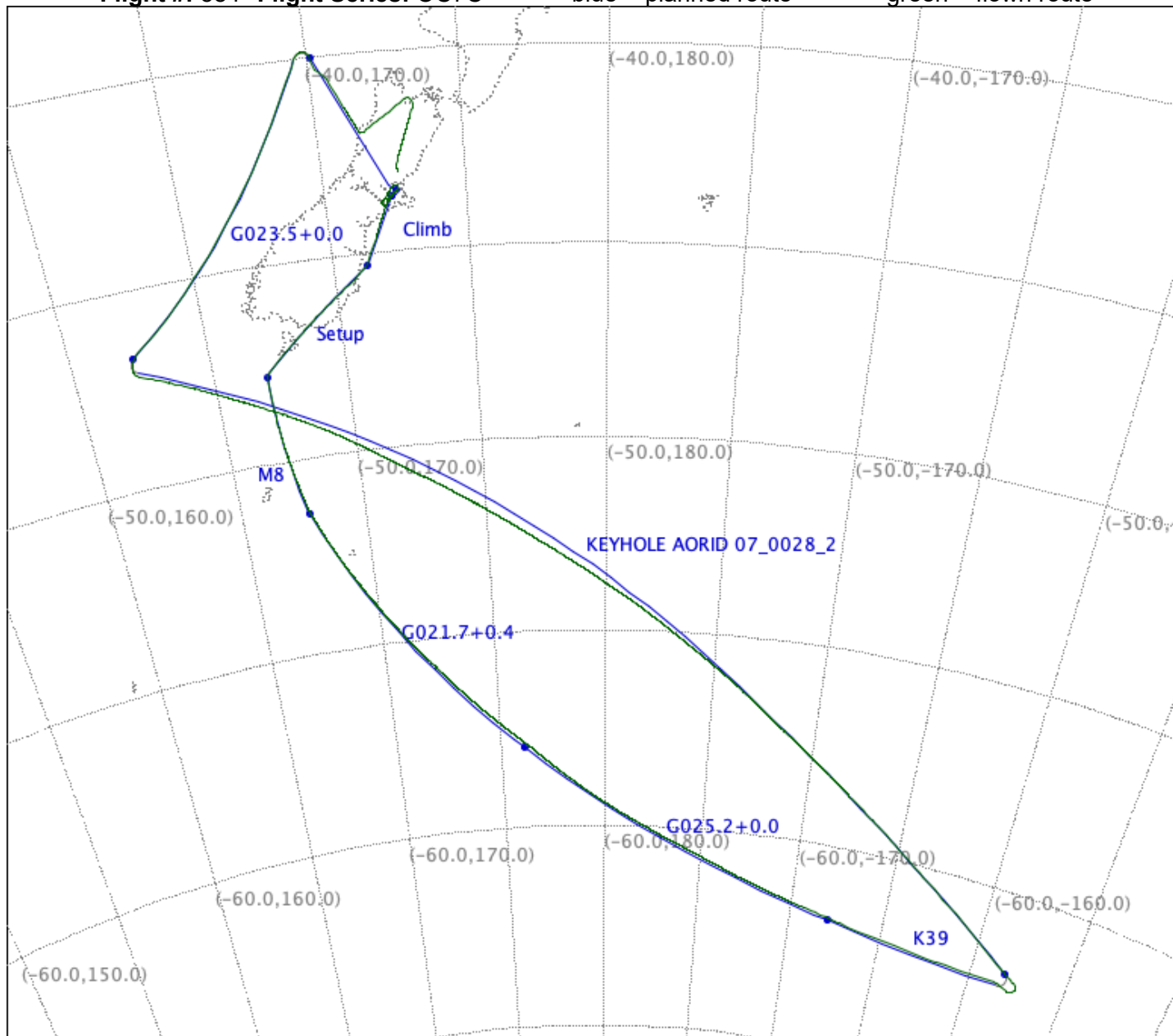
MISSION ID: 2019-06-24_GR_F584

Date: 2019-06-24 UT Instrument: GREAT

Flight #: 584 Flight Series: OC7C

blue = planned route

green = flown route



Flight notes:
No irregularities.

Flight 584 Mission ID
 Christchurch-Christchurch

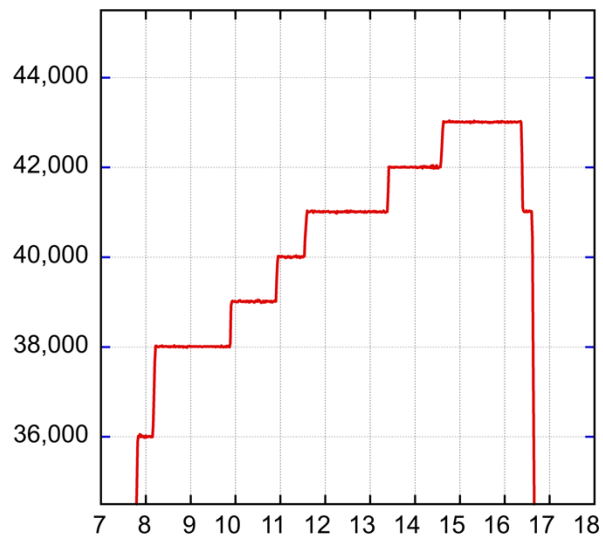
2019-06-24_GR_F584
 Take off date UTC:
 24-JUN-2019

Departure UTC: 07:22
 Arrival UTC: 17:28

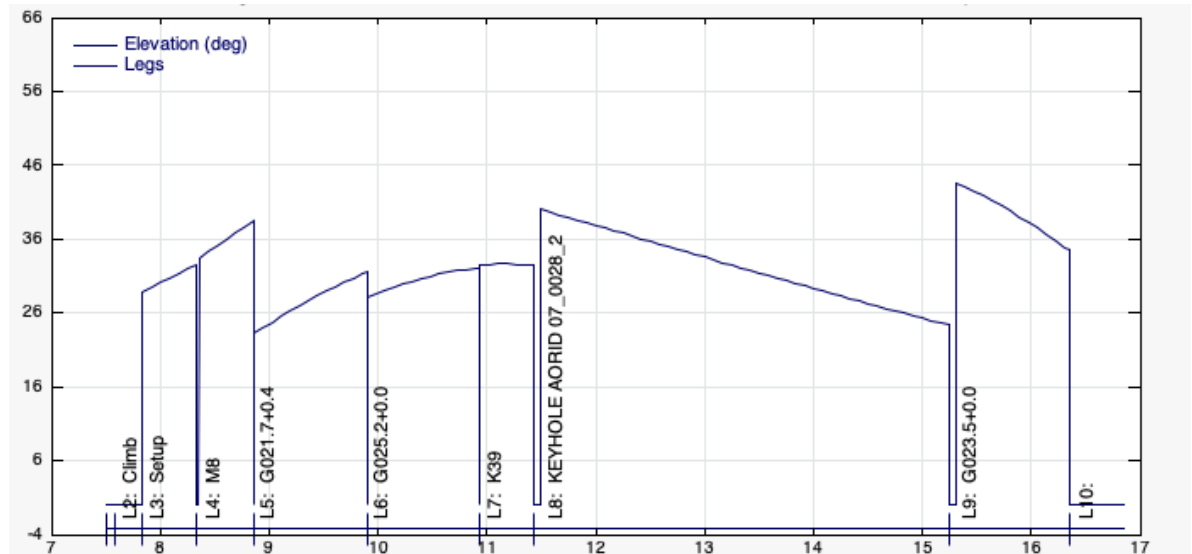
4G/HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 99120	20h07m23.16s	-52d52m50.9s	7:50	30	
4	07_0016	Goldsmith	M8	18h03m45.10s	-24d23m10.0s	8:21	30	
5	07_0009	Langer	G021.7+0.4	18h30m05.75s	-09d51m19.5s	8:51	62.3	
6	07_0009	Langer	G025.2+0.0	18h36m35.05s	-06d46m10.5s	9:54	62.3	
7	07_0016	Goldsmith	K39	18h36m12.10s	-07d10m52.1s	10:56	30	
8	07_0028	Goldsmith	KEYHOLE	10h44m52.60s	-59d39m25.5s	11:30	225	
9	07_0009	Langer	G023.5+0.0	18h33m21.15s	-08d18m48.0s	15:18	62.3	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



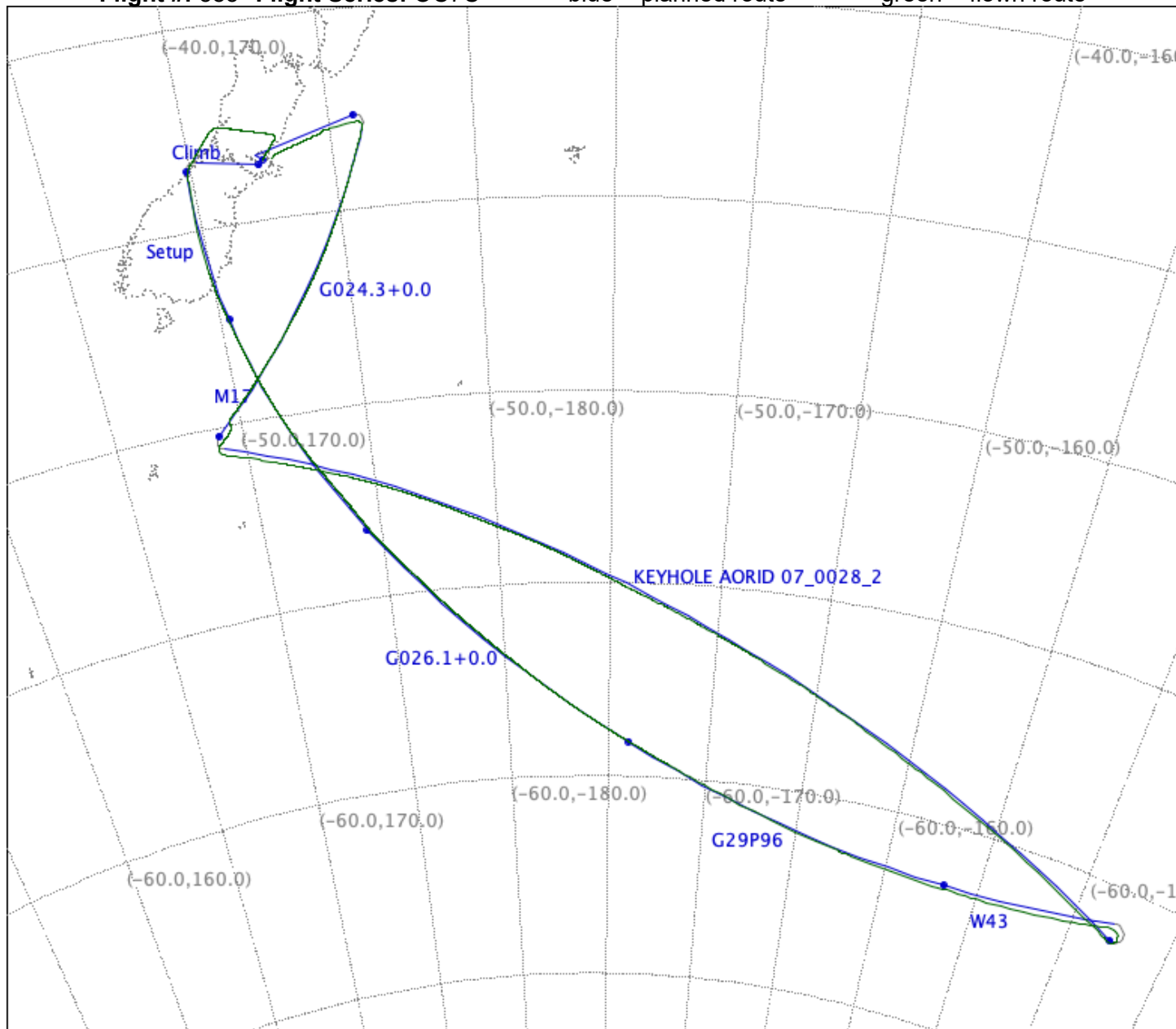
MISSION ID: 2019-06-25_GR_F585

Date: 2019-06-25 UT Instrument: GREAT

Flight #: 585 Flight Series: OC7C

blue = planned route

green = flown route

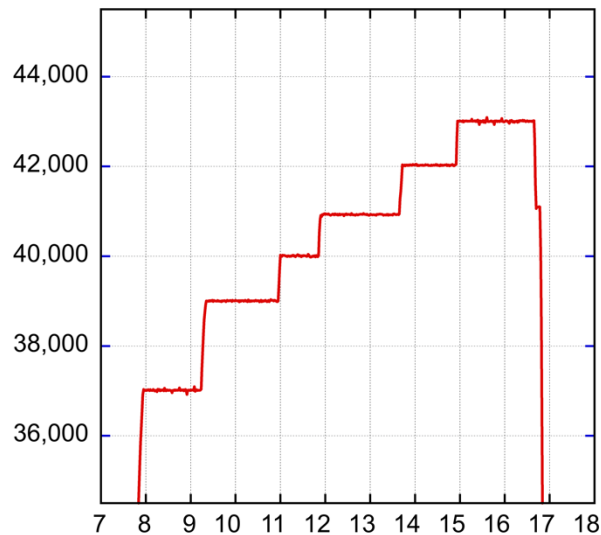


Flight notes:
No irregularities.

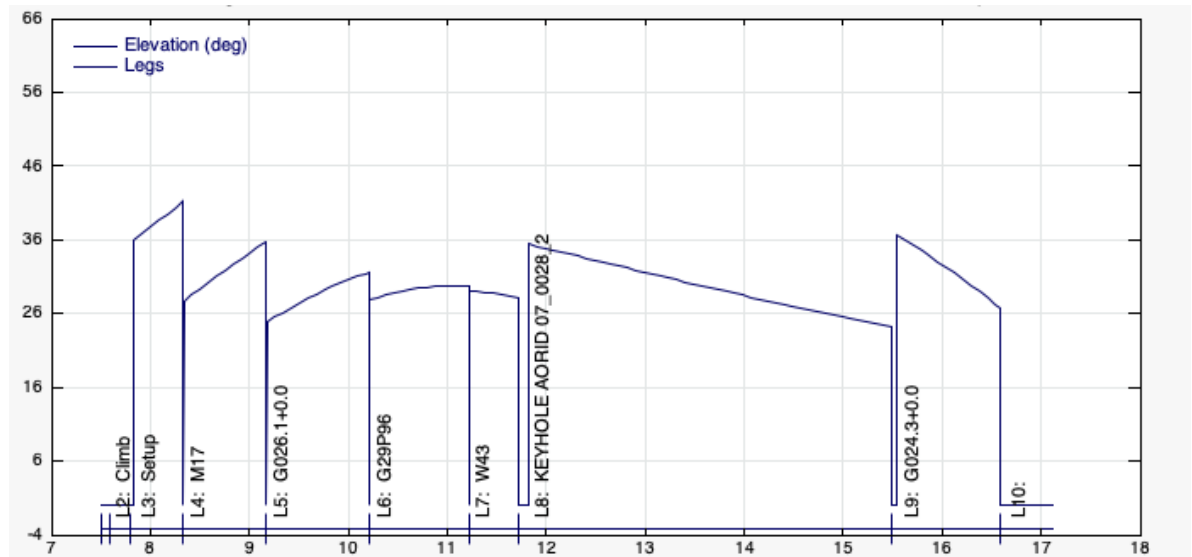
Flight 585 Mission ID 2019-06-25_GR_F585
 Christchurch-Christchurch Take off date UTC: 25-JUN-2019
 Departure UTC: 07:20 Arrival UTC: 17:18
 4G/HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 85755	17h31m24.95s	-23d57m45.5s	7:50	30	
4	07_0016	Goldsmith	M17	18h20m30.00s	-16d11m44.0s	8:20	50.3	
5	07_0009	Langer	G026.1+0.0	18h38m11.50s	-05d59m49.5s	9:10	62.3	
6	07_0070	Goldsmith	G29P96	18h46m03.80s	-02d39m22.0s	10:12	60	
7	07_0016	Goldsmith	W43	18h47m32.40s	-01d56m31.0s	11:12	30	
8	07_0028	Goldsmith	KEYHOLE	10h44m52.60s	-59d39m25.5s	11:49	220	
9	07_0009	Langer	G024.3+0.0	18h34m58.30s	-07d32m30.5s	15:32	62.3	Course correction required to stay on ground track; 10min lost

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



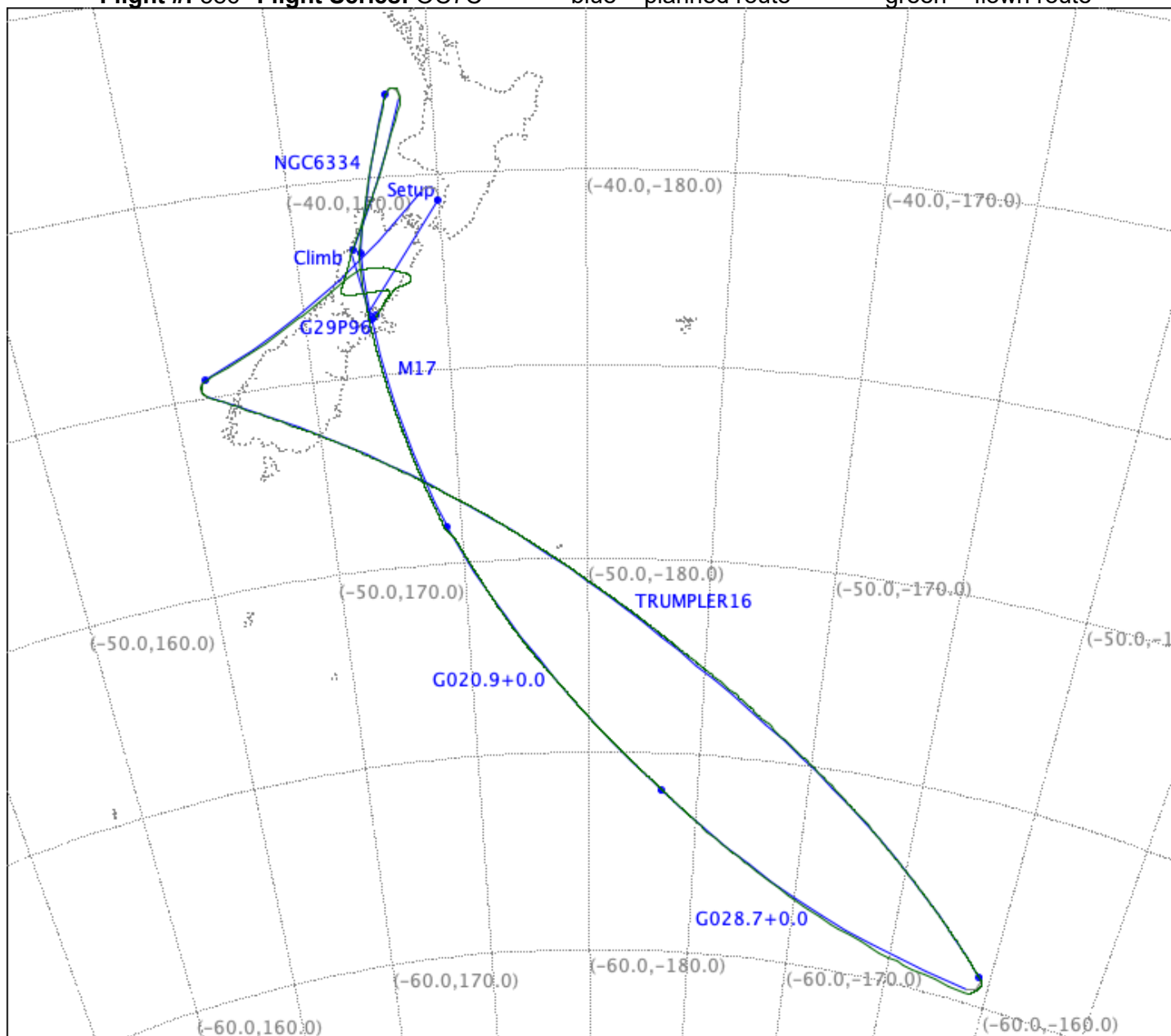
MISSION ID: 2019-06-26_GR_F586

Date: 2019-06-26 UT Instrument: GREAT

Flight #: 586 Flight Series: OC7C

blue = planned route

green = flown route

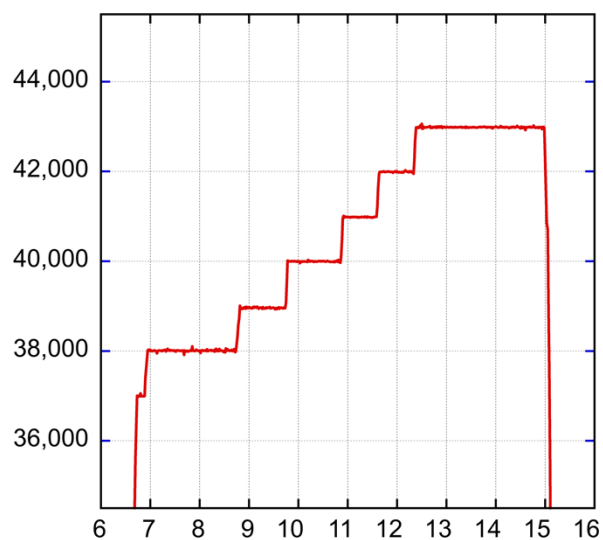


Flight notes:

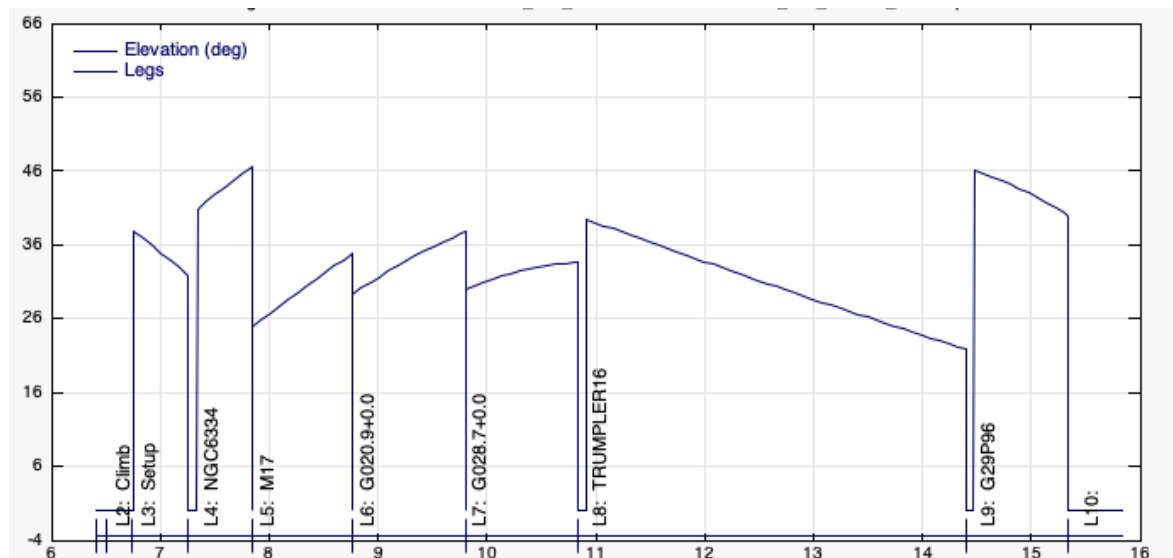
Fog forecast for original landing time at Christchurch base required early Return to Base.

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 45811	09h20m29.02s	-09d33m20.5s	6:45	30	
4	07_0016	Goldsmith	NGC6334	17h20m44.20s	-35d49m18.1s	7:20	30	
5	07_0016	Goldsmith	M17	18h20m30.00s	-16d11m44.0s	7:50	55	
6	07_0009	Langer	G020.9+0.0	18h28m27.35s	-10d37m32.5s	8:45	62.3	
7	07_0009	Langer	G028.7+0.0	18h42m59.25s	-03d40m41.0s	9:48	62.3	
8	75_0038	Discretionary	G287	10h45m24.26s	-59d54m24.0s	10:54	210	
9	07_0070	Goldsmith	G29P96	18h46m03.80s	-02d39m22.0s	14:28	52	Fog risk led to early return to Christchurch base; 25min lost

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



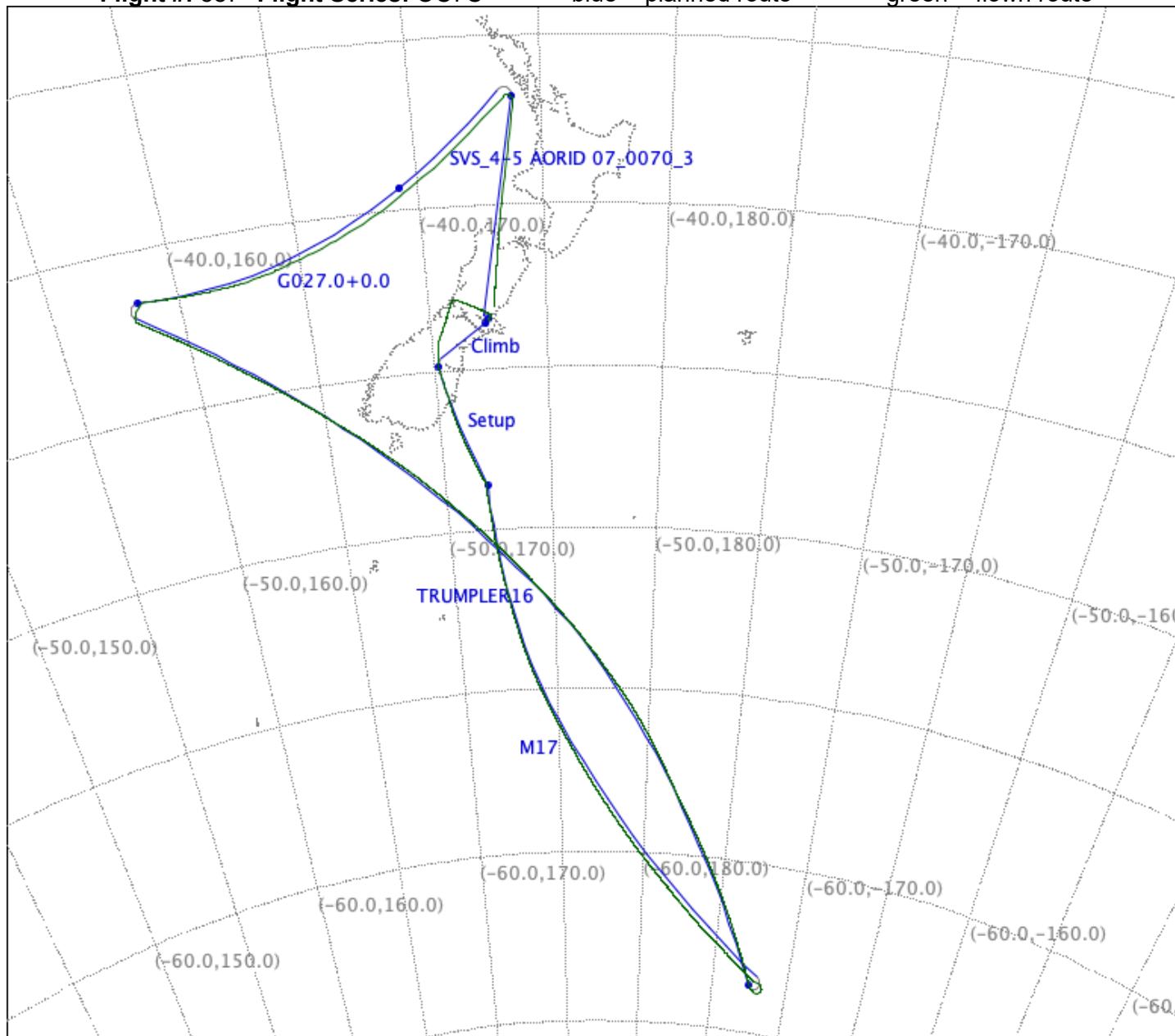
MISSION ID: 2019-06-27_GR_F587

Date: 2019-06-27 UT Instrument: GREAT

Flight #: 587 Flight Series: OC7C

blue = planned route

green = flown route



**Flight notes:
No irregularities.**

Flight 587 Mission ID
Christchurch-
Christchurch

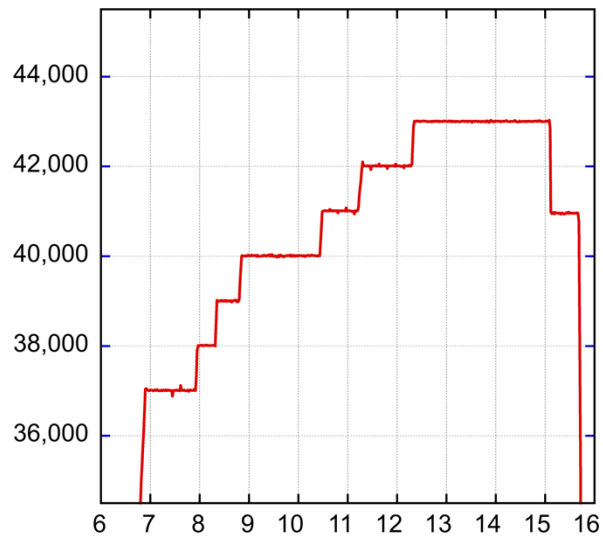
2019-06-27_GR_F587
Take off date UTC:
27-JUN-2019

Departure UTC: 06:17
Arrival UTC: 16:08

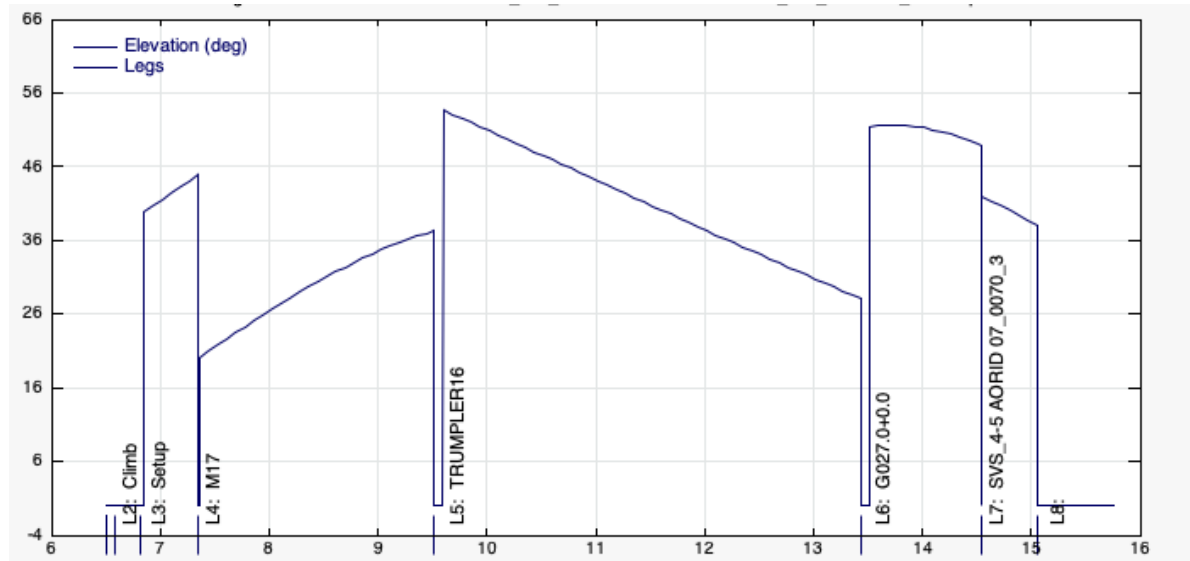
4G/HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 78933	16h06m48.43s	-20d40m09.1s	6:51	30	
4	07_0016	Goldsmith	M17	18h20m30.00s	-16d11m44.0s	7:21	129	Low altitude (37k ft) at start of leg.
5	75_0038	Discretionary	G287	10h45m24.26s	-59d54m24.0s	9:36	230	
6	07_0009	Langer	G027.0+0.0	18h39m47.65s	-05d13m28.0s	13:30	62.3	
7	07_0070	Goldsmith	SVS_4-5	18h29m57.60s	01d13m00.6s	14:32	30	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



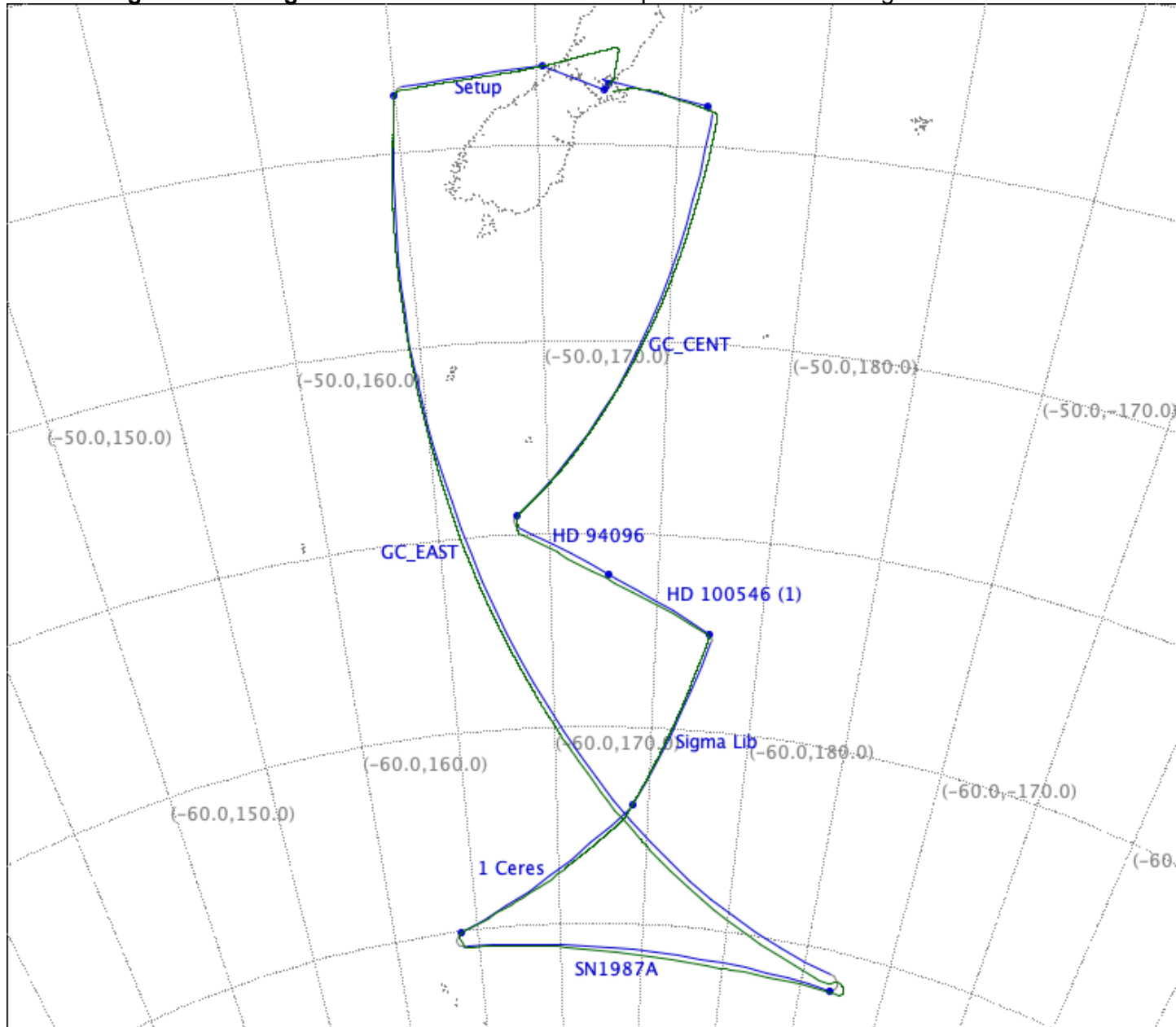
MISSION ID: 2019-07-01_FO_F588

Date: 2019-07-01 UT Instrument: FORCAST

Flight #: 588 Flight Series: OC7D

blue = planned route

green = flown route

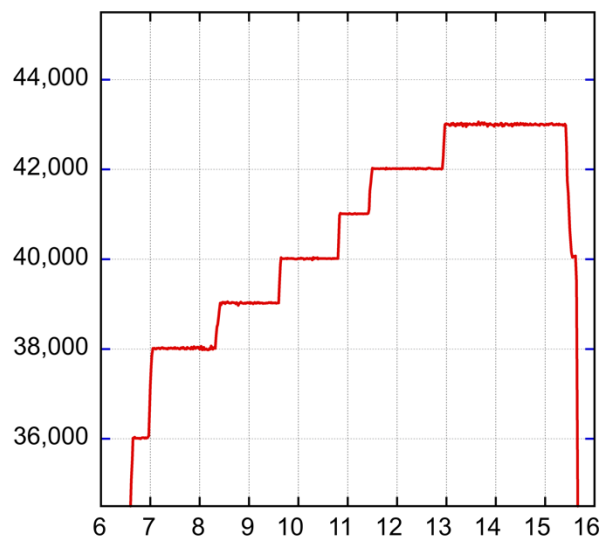


Flight notes: No irregularities.

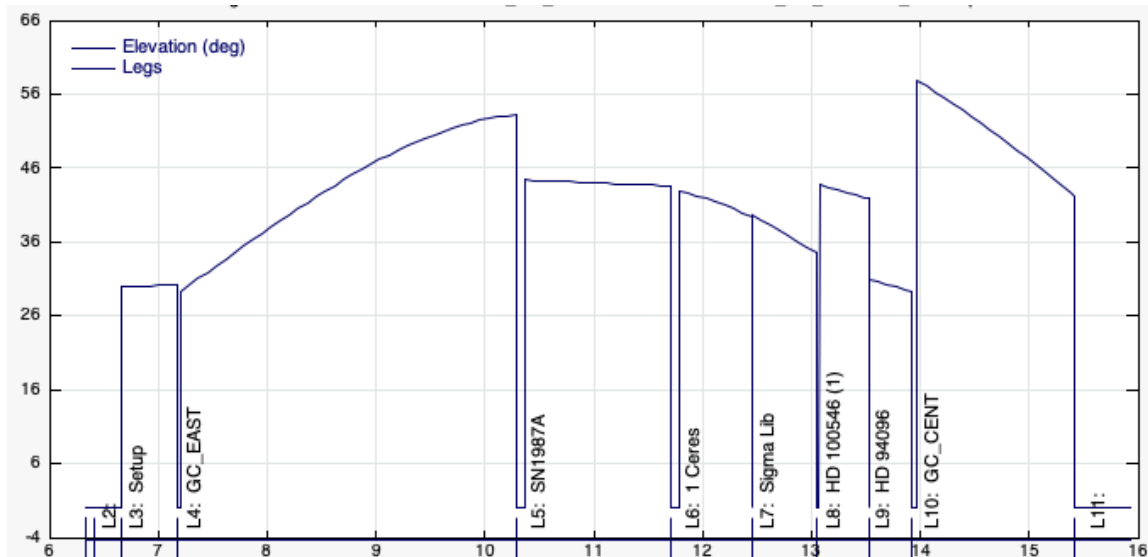
Flight 588 Mission ID 2019-07-01_FO_F588
 Christchurch-Christchurch Take off date UTC: 01-JUL-2019
 Departure UTC: 06:11 Arrival UTC: 16:03

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 122	00h01m35.70s	-77d03m56.6s	6:40	30	
4	07_0189	Hankins	Galactic Center	17h47m15.51s	-28d27m35.0s	7:12	185	Pointing looks off slightly
5	07_0064	Matsuura	SN1987A	05h35m28.02s	-69d16m11.1s	10:21	81	
6	90_0048	Calibration	1 Ceres	15h57m10.17s	-18d42m34.0s	11:46	40	Time spent corrected pointing; led to loss of spectral calibrators
7	90_0068	Calibration	Sigma Lib	15h04m04.22s	-25d16m55.1s	12:27	35	
8	07_0049	Shuping	HD 100546 (1)	11h33m25.40s	-70d11m41.0s	13:04	27	
9	07_0149	Levesque	HD 94096	10h50m26.30s	-59d58m56.6s	13:31	24	
10	07_0189	Hankins	Galactic Center	17h46m03.30s	-28d52m32.9s	13:58	87	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



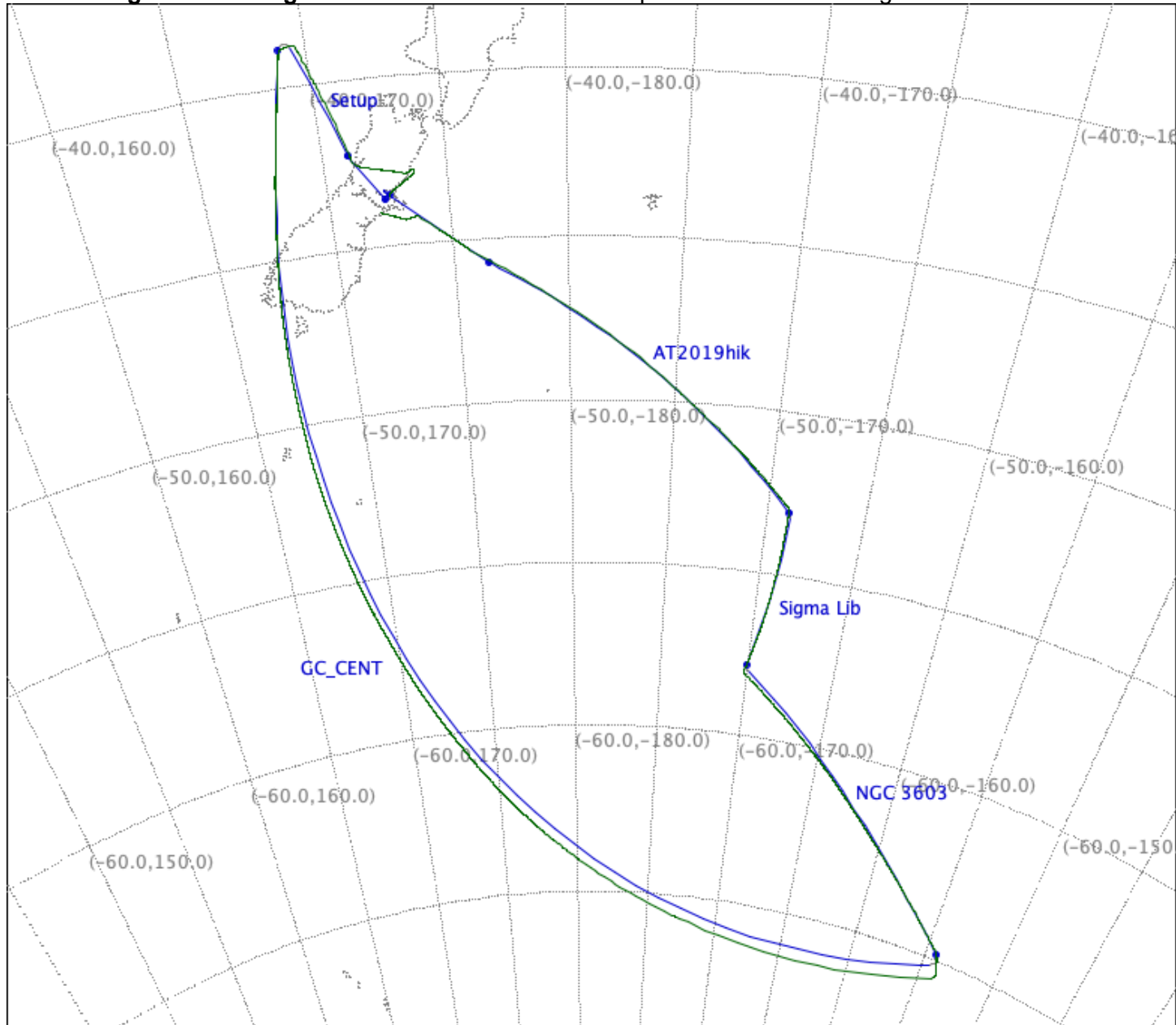
MISSION ID: 2019-07-02_FO_F589

Date: 2019-07-02 UT Instrument: FORCAST

Flight #: 589 Flight Series: OC7D

blue = planned route

green = flown route



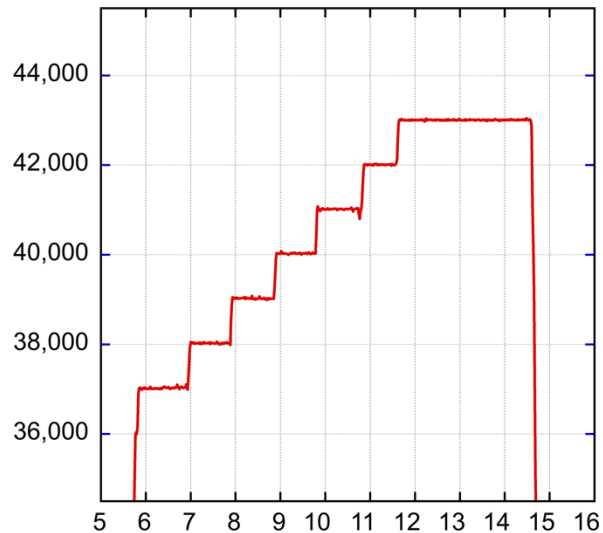
Flight notes:

Unknown issue creating elongated images for observations with large (>100") chop throws that could not be resolved.

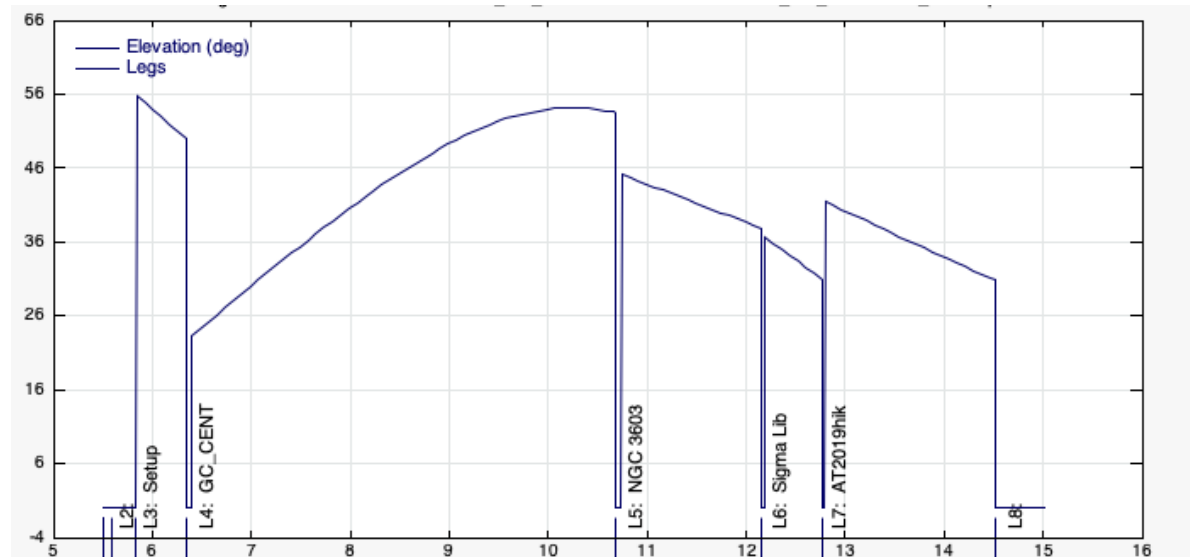
Flight 589 Mission ID 2019-07-02_FO_F589
 Christchurch-Christchurch Take off date UTC: 02-JUL-2019 Departure UTC: 05:18 Arrival UTC: 15:21

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 42570	08h40m37.57s	-46d38m55.5s	5:50	30	
4	07_0189	Hankins	Galactic Center	17h46m03.30s	-28d52m32.9s	6:24	257	Time spend trying to diagnose elongated image problem; 45min lost on leg
5	07_0155	Hora	NGC 3603	11h15m10.84s	-61d14m53.6s	10:44	85	Continuing to diagnose image elongation issue; 30min loss on leg; issue remains unresolved.
6	90_0068	Calibration	Sigma Lib	15h04m04.22s	-25d16m55.1s	12:10	35	
7	07_0005	Gehrz	AT2019hik	13h20m49.78s	-62d37m50.6s	12:47	103	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



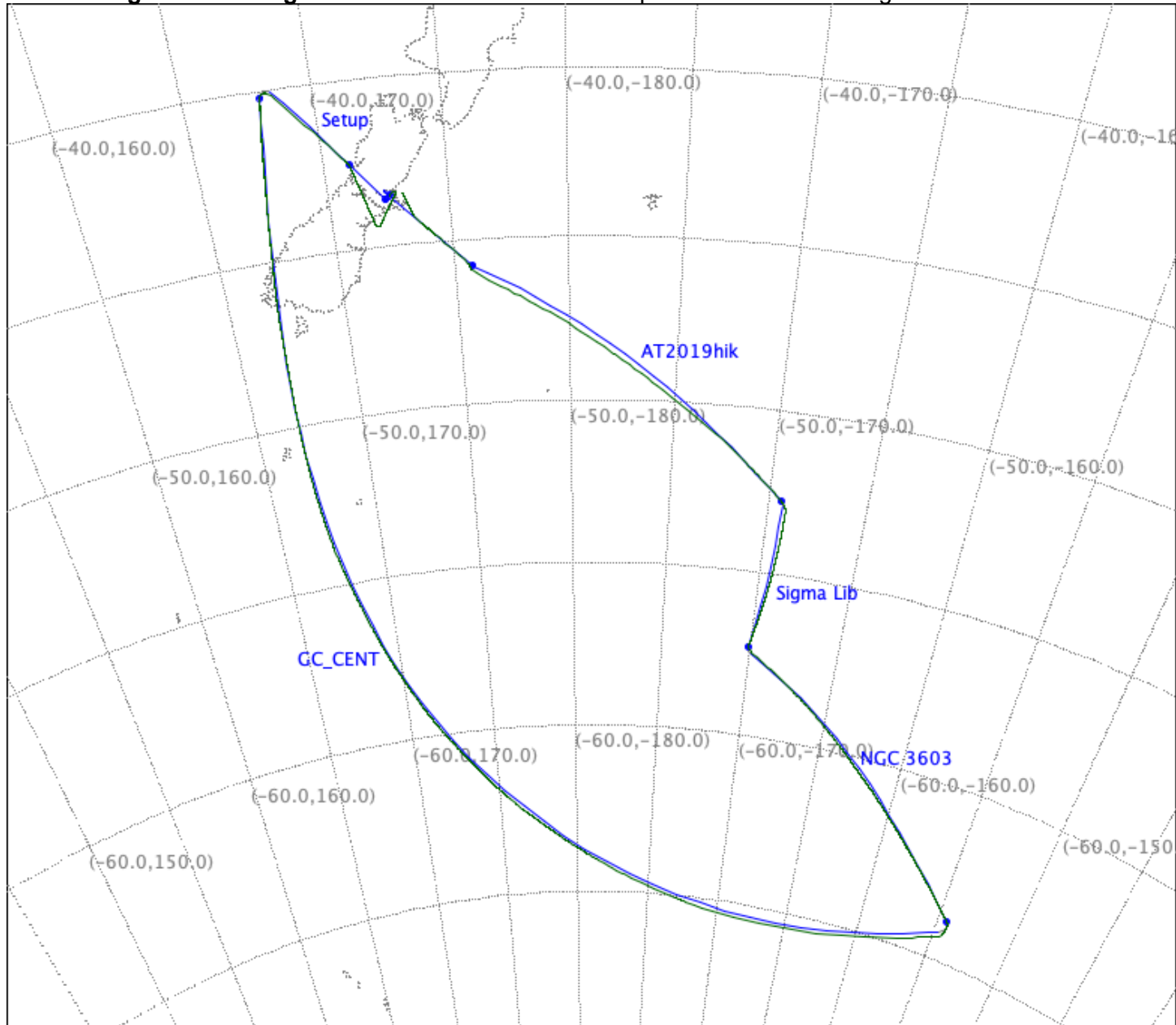
MISSION ID: 2019-07-03_FO_F590

Date: 2019-07-03 UT Instrument: FORCAST

Flight #: 590 Flight Series: OC7D

blue = planned route

green = flown route



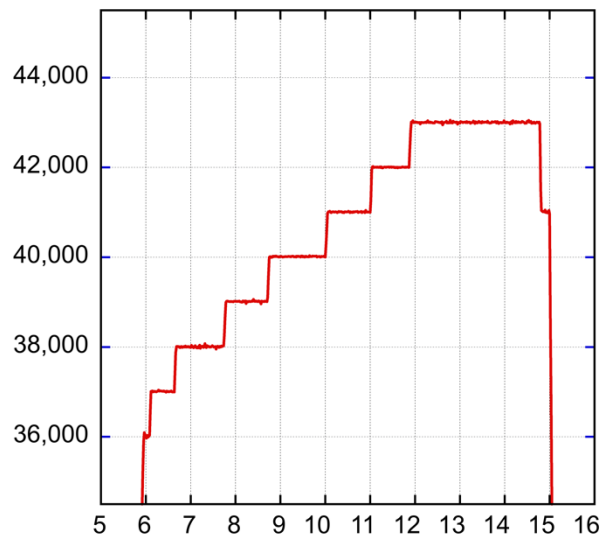
Flight notes:

Unknown issue creating elongated images for observations with large (>100") chop throws that could not be resolved.

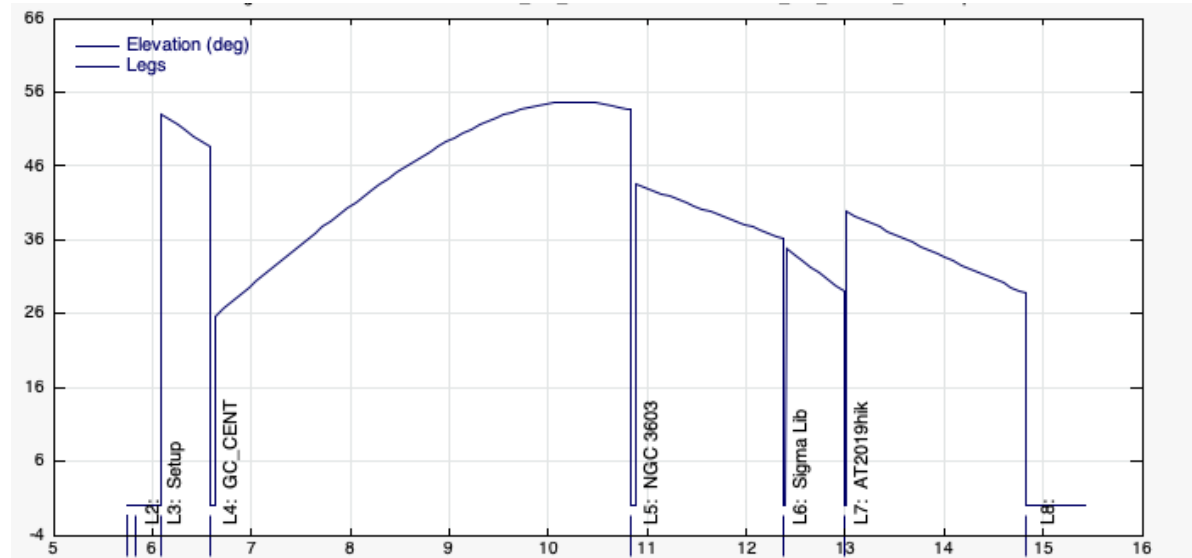
Flight 590 Mission ID 2019-07-03_FO_F590
 Christchurch-Christchurch Take off date UTC: 03-JUL-2019
 Departure UTC: 05:30 Arrival UTC: 15:32

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 42134	08h35m19.71s	-58d00m33.2s	6:04	30	
4	07_0189	Hankins	Galactic Center	17h46m03.30s	-28d52m32.9s	6:38	252	50min spent trying to diagnose image elongation issue; issue remains unresolved.
5	07_0155	Hora	NGC 3603	11h15m10.84s	-61d14m53.6s	10:53	89	
6	90_0068	Calibration	Sigma Lib	15h04m04.22s	-25d16m55.1s	12:24	35	
7	07_0005	Gehrz	AT2019hik	13h20m49.78s	-62d37m50.6s	13:00	109	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



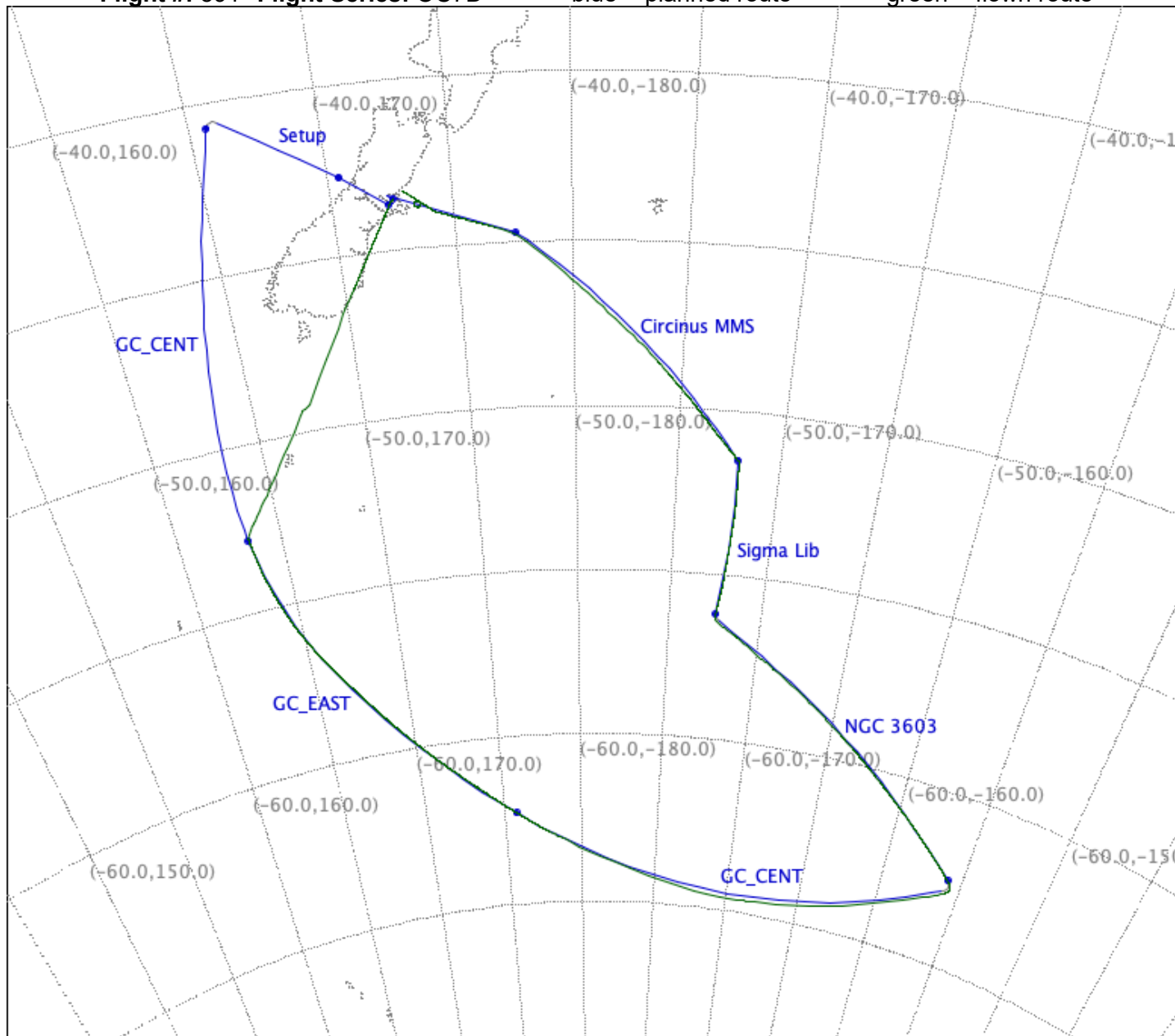
MISSION ID: 2019-07-04_FO_F591

Date: 2019-07-04 UT Instrument: FORCAST

Flight #: 591 Flight Series: OC7D

blue = planned route

green = flown route



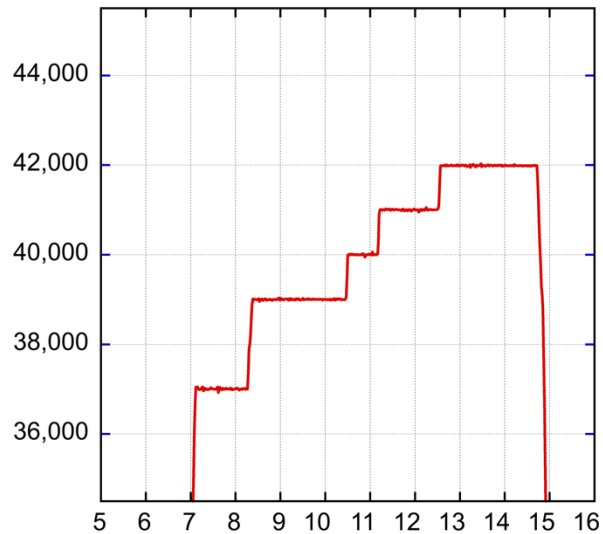
Flight notes:

Late departure led to loss of first science leg. Unknown issue creating elongated images for observations with large (>100") chop throws.

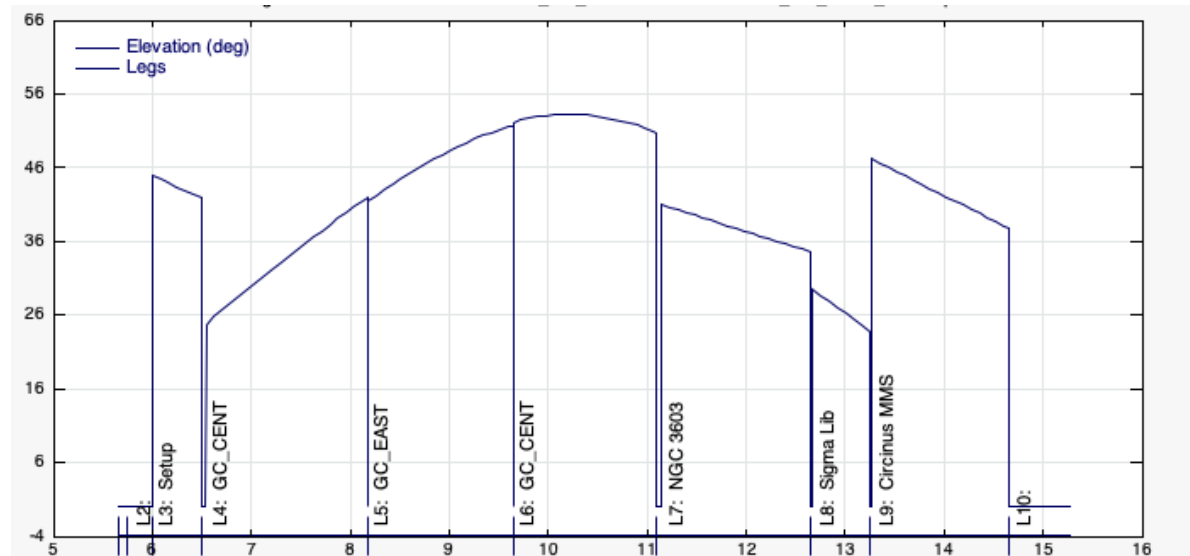
Flight 591 Mission ID 2019-07-04_FO_F591
 Christchurch-Christchurch Take off date UTC: 04-JUL-2019
 Departure UTC: 06:37 Arrival UTC: 15:28

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 35228	07h16m49.82s	-67d57m25.7s	5:59	30	
4	07_0189	Hankins	Galactic Center	17h46m03.30s	-28d52m32.9s	6:32	98	Late departure – no data.
5	07_0189	Hankins	Galactic Center	17h47m15.51s	-28d27m35.0s	8:10	88	
6	07_0189	Hankins	Galactic Center	17h46m03.30s	-28d52m32.9s	9:38	87	
7	07_0155	Hora	NGC 3603	11h15m10.84s	-61d14m53.6s	11:08	90	
8	90_0068	Calibration	Sigma Lib	15h04m04.22s	-25d16m55.1s	12:40	35	
9	07_0045	Reipurth	Circinus MMS	15h00m35.00s	-63d07m12.0s	13:16	83	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



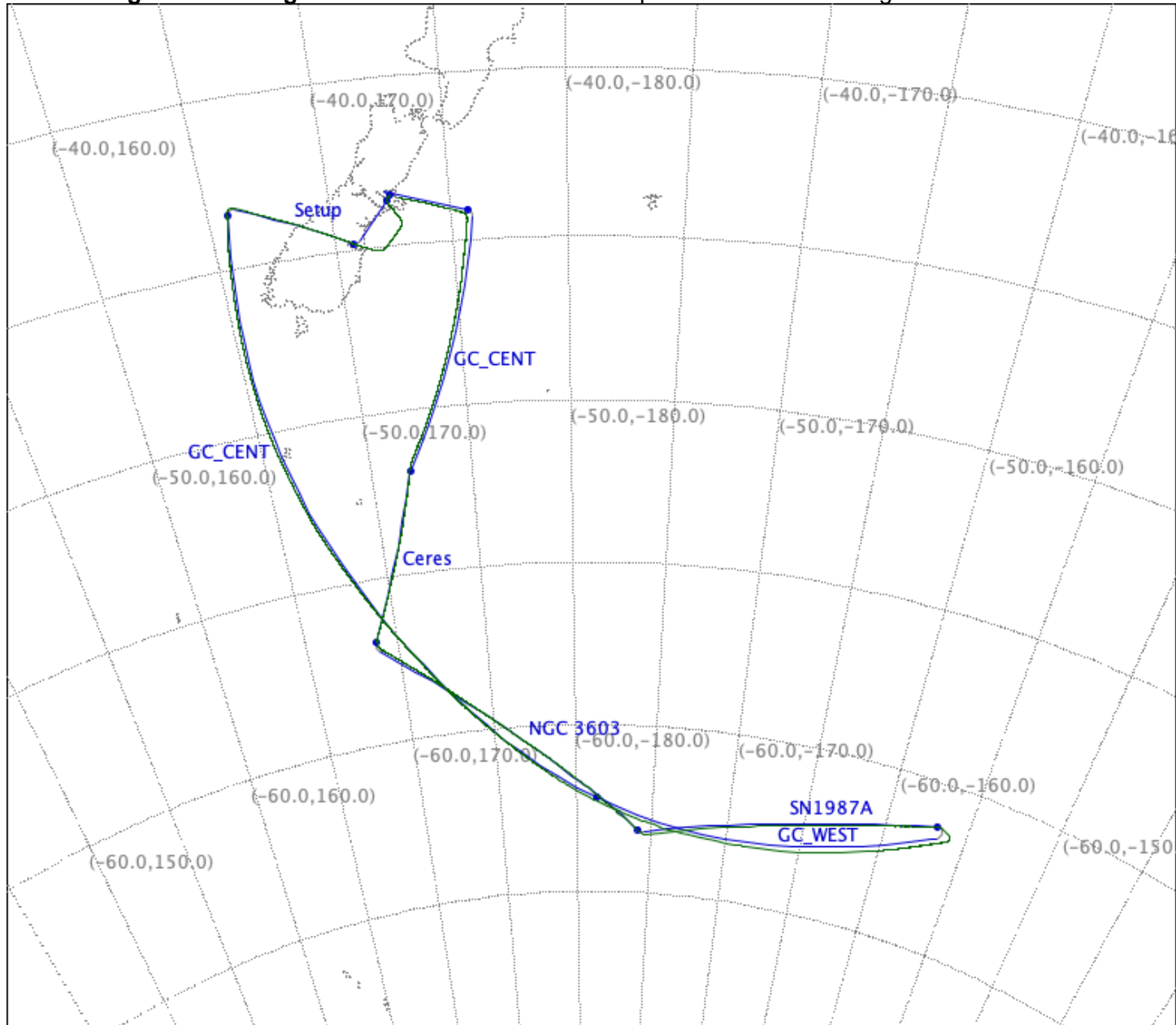
MISSION ID: 2019-07-08_FO_F592

Date: 2019-07-08 UT Instrument: FORCAST

Flight #: 592 Flight Series: OC7D

blue = planned route

green = flown route



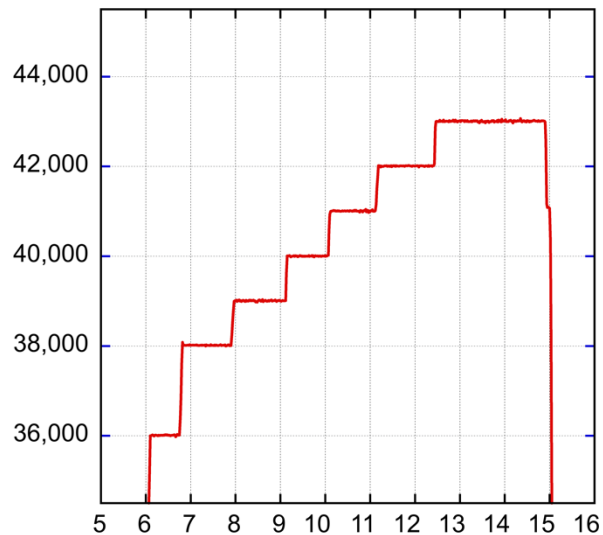
Flight notes:

Unknown issue creating elongated images for observations with large (>100") chop throws.

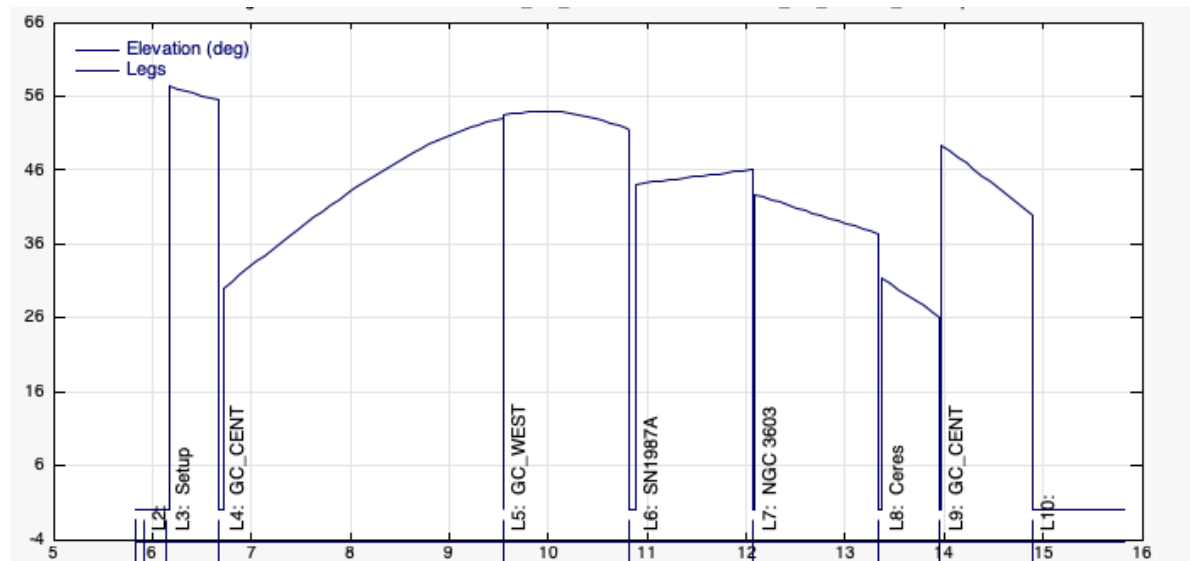
Flight 592 Mission ID 2019-07-08_FO_F592
 Christchurch-Christchurch Take off date UTC: 08-JUL-2019 Departure UTC: 05:40 Arrival UTC: 15:30

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 50954	10h24m23.71s	-74d01m53.8s	6:10	30	
4	07_0189	Hankins	Galactic Center	17h46m03.30s	-28d52m32.9s	6:42	170	
5	07_0189	Hankins	Galactic Center	17h44m48.64s	-29d19m34.7s	9:32	76	
6	07_0064	Matsuura	SN1987A	05h35m28.02s	-69d16m11.1s	10:53	71	
7	07_0155	Hora	NGC 3603	11h15m10.84s	-61d14m53.6s	12:05	75	
8	90_0072	Calibration	Ceres	15h54m29.18s	-19d01m22.6s	13:22	35	
9	07_0189	Hankins	Galactic Center	17h46m03.30s	-28d52m32.9s	13:58	55	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



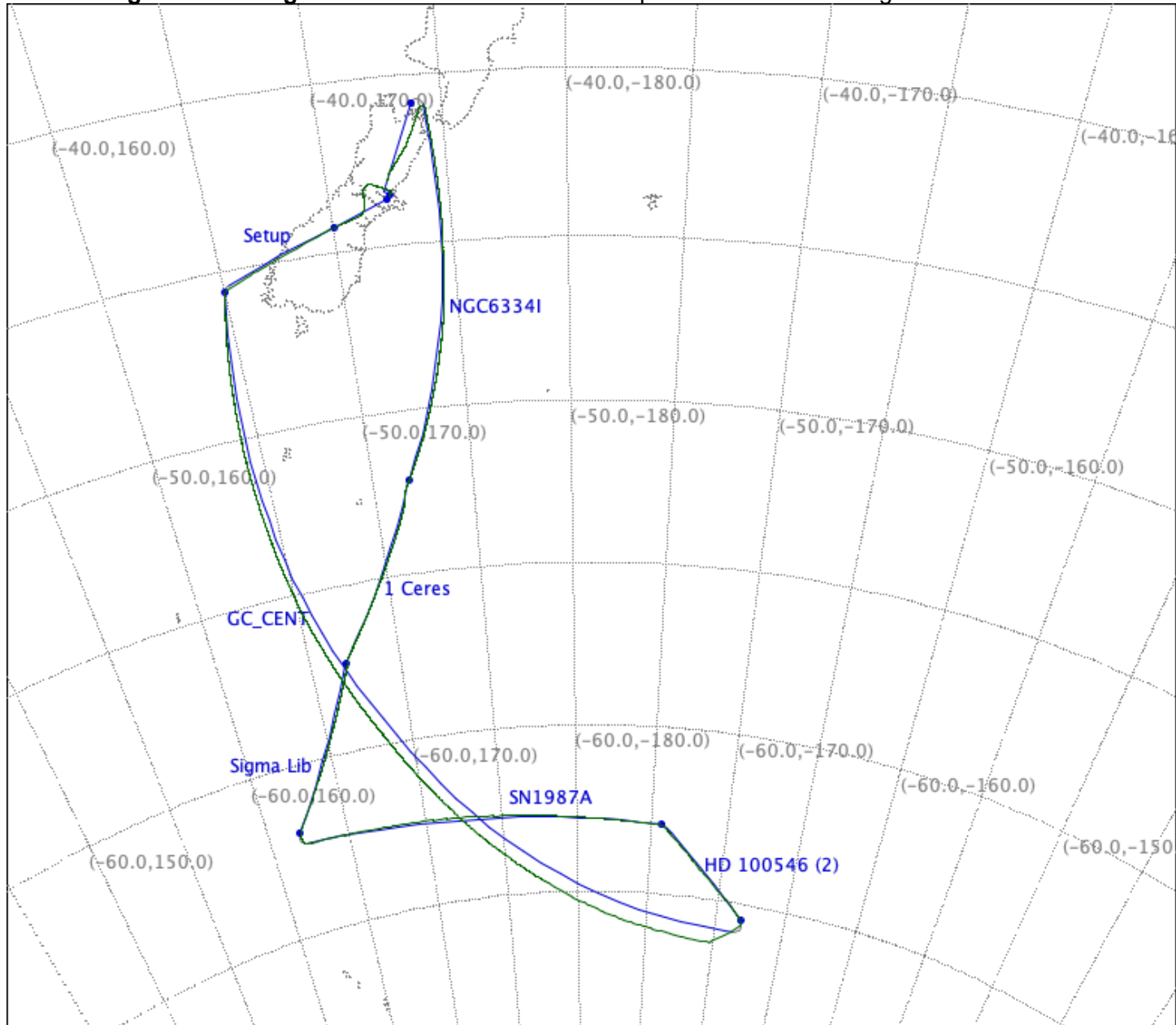
MISSION ID: 2019-07-09_FO_F593

Date: 2019-07-09 UT Instrument: FORCAST

Flight #: 593 Flight Series: OC7D

blue = planned route

green = flown route

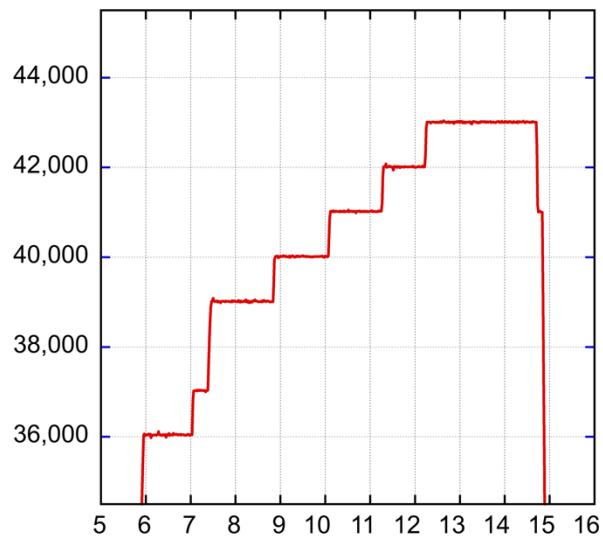


Flight notes: No irregularities.

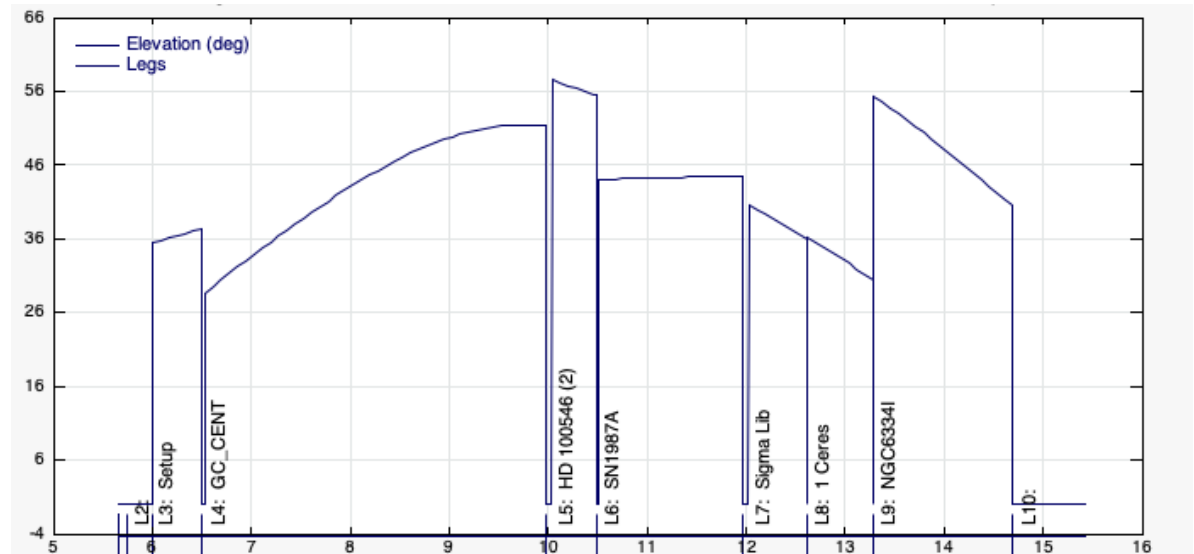
Flight 593 Mission ID 2019-07-09_FO_F593
 Christchurch-Christchurch Take off date UTC: 09-JUL-2019
 Departure UTC: 05:30 Arrival UTC: 15:18

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 98495	20h00m35.55s	-72d54m37.8s	6:00	30	
4	07_0189	Hankins	Galactic Center	17h46m03.30s	-28d52m32.9s	6:31	207	
5	07_0049	Shuping	HD 100546 (2)	11h33m25.40s	-70d11m41.0s	10:02	27	Target acquisition issues led to a 10min loss.
6	07_0064	Matsuura	SN1987A	05h35m28.02s	-69d16m11.1s	10:30	88	Bright aurora causing guiding issues.
7	90_0068	Calibration	Sigma Lib	15h04m04.22s	-25d16m55.1s	12:01	35	
8	90_0048	Calibration	1 Ceres	15h54m13.36s	-19d04m06.0s	12:37	40	
9	07_0156	Brogan	NGC6334I	17h20m53.50s	-35d47m00.0s	13:17	84	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



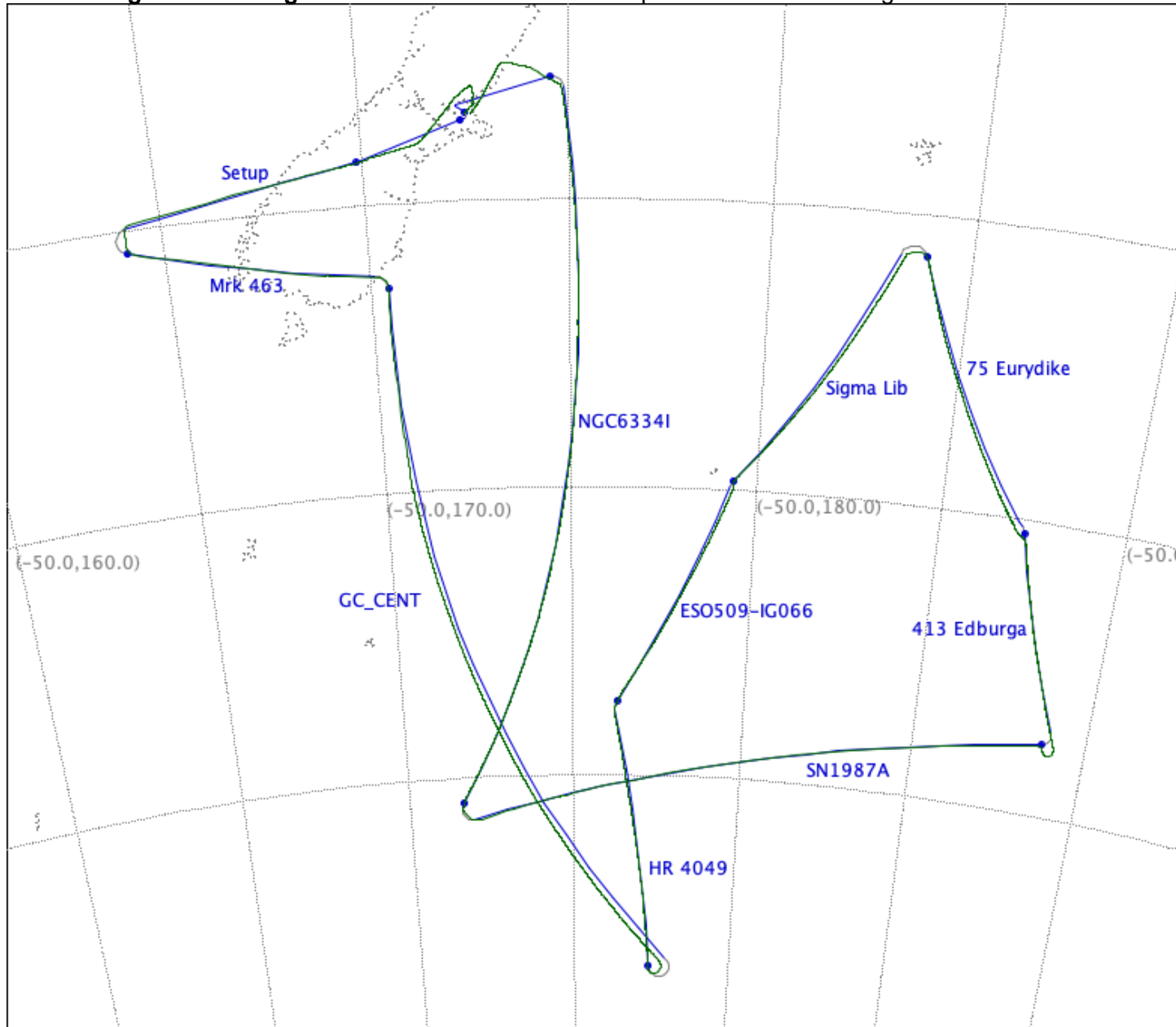
MISSION ID: 2019-07-10_FO_F594

Date: 2019-07-10 UT Instrument: FORCAST

Flight #: 594 Flight Series: OC7D

blue = planned route

green = flown route

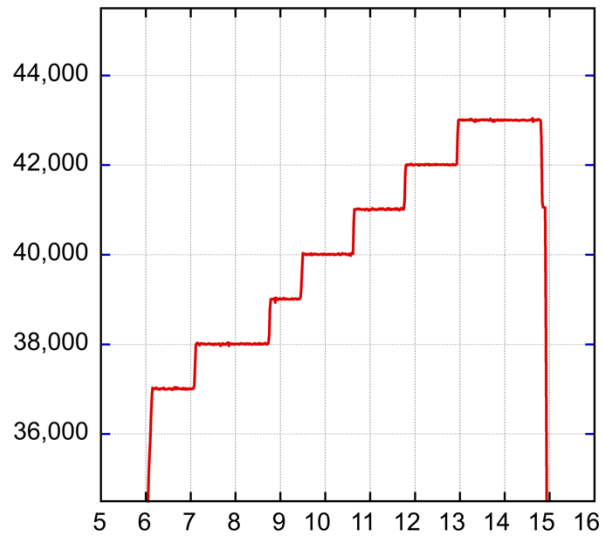


Flight notes: No irregularities.

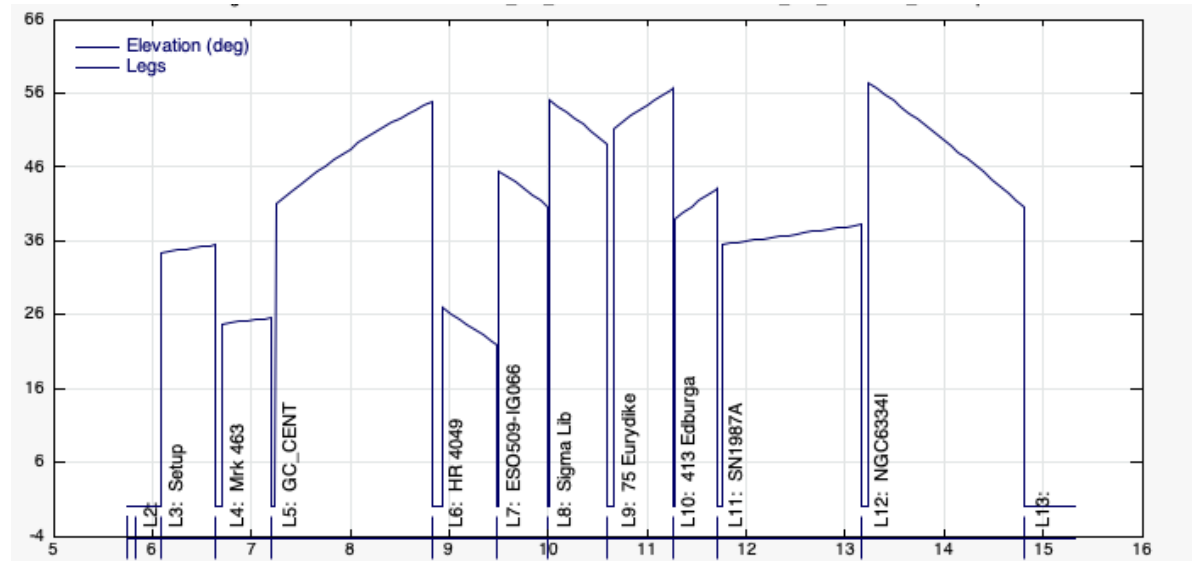
Flight 594 Mission ID 2019-07-10_FO_F594
 Christchurch-Christchurch Take off date UTC: 10-JUL-2019
 Departure UTC: 05:34 Arrival UTC: 15:17

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 107089	21h41m28.65s	-77d23m24.2s	6:05	33	
4	06_0211	Muller-Sanchez	Mrk 463	13h56m02.90s	18d22m18.5s	6:42	30	
5	07_0189	Hankins	Galactic Center	17h46m03.30s	-28d52m32.9s	7:14	95	
6	06_0100	Kraemer	HR 4049	10h18m07.59s	-28d59m31.2s	8:55	33	
7	06_0211	Muller-Sanchez	ESO509-IG066	13h34m39.64s	-23d26m47.5s	9:29	30	
8	90_0068	Calibration	Sigma Lib	15h04m04.22s	-25d16m55.1s	10:00	35	
9	07_0165	Landsman	75 Eurydike	20h57m47.93s	-26d13m20.3s	10:39	36	
10	07_0165	Landsman	413 Edburga	22h51m20.54s	-24d41m47.6s	11:16	26	
11	07_0064	Matsuura	SN1987A	05h35m28.02s	-69d16m11.1s	11:45	85	
12	07_0156	Brogan	NGC6334I	17h20m53.50s	-35d47m00.0s	13:13	95	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



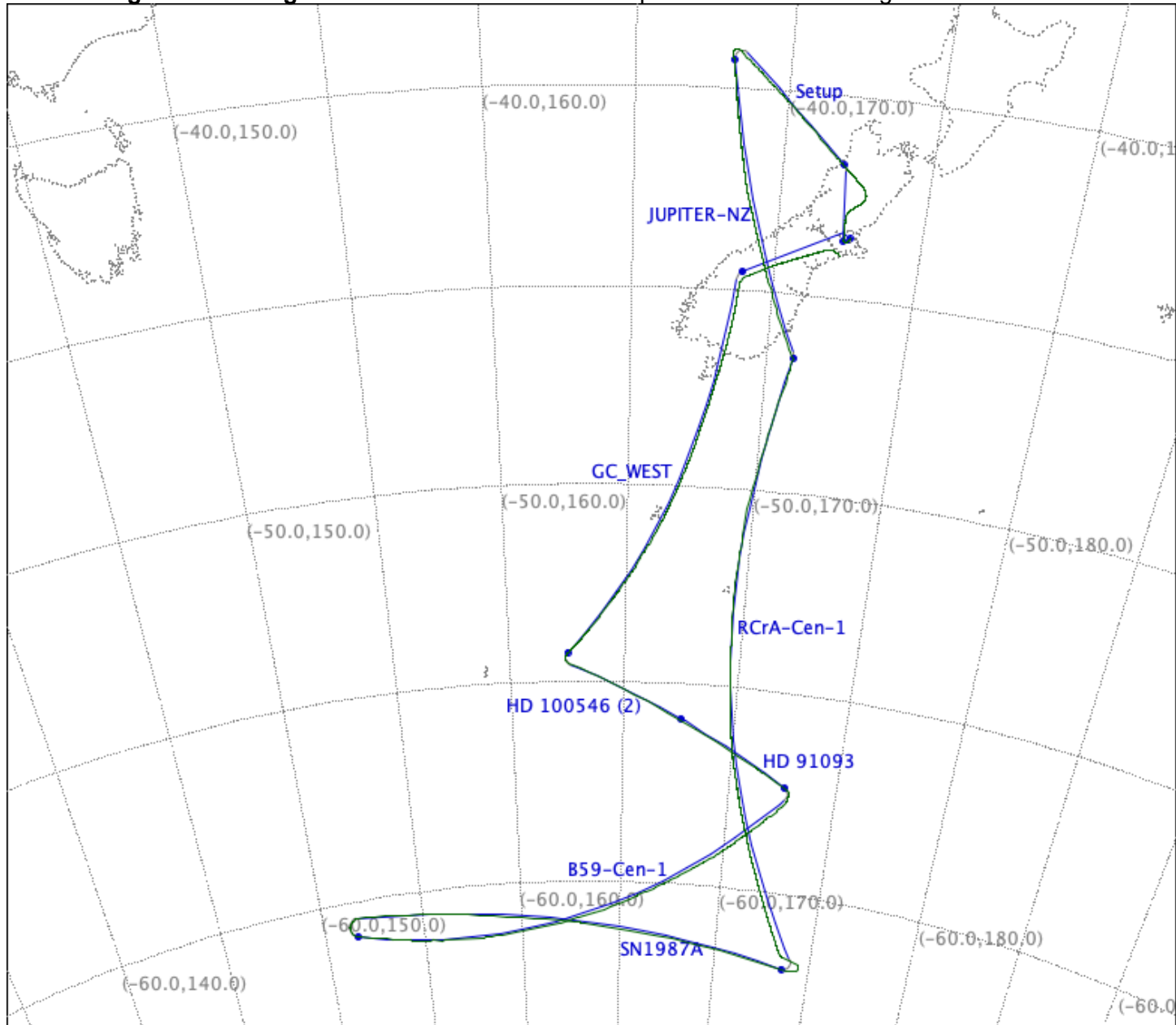
MISSION ID: 2019-07-11_FO_F595

Date: 2019-07-11 UT Instrument: FORCAST

Flight #: 595 Flight Series: OC7D

blue = planned route

green = flown route



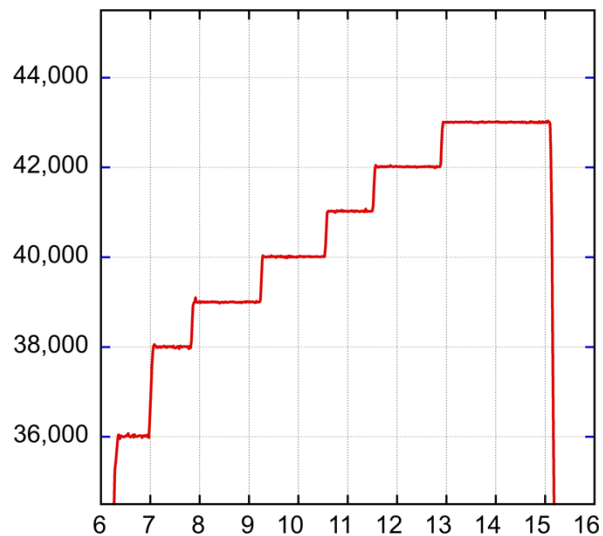
Flight notes:

Unknown issue creating elongated images for observations with large (>100") chop throws.

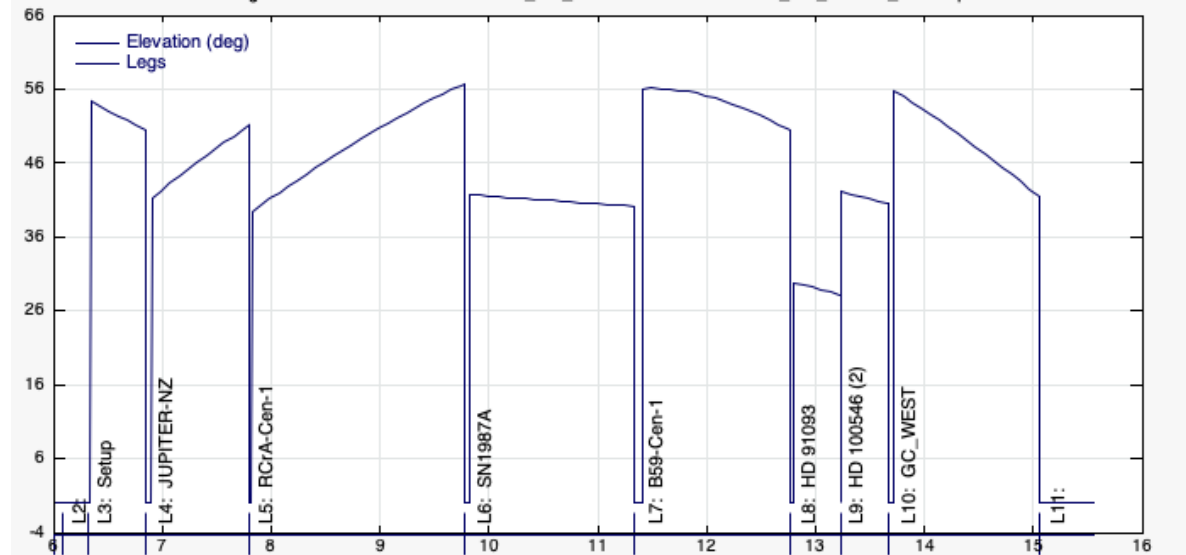
Flight 595 Mission ID 2019-07-11_FO_F595
 Christchurch-Christchurch Take off date UTC: 11-JUL-2019
 Departure UTC: 05:53 Arrival UTC: 15:34

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 47854	09h45m14.81s	-62d30m28.5s	6:20	30	
4	06_0009	de Pater	JUPITER	16h58m06.02s	-22d10m07.6s	6:54	54	
5	07_0045	Reipurth	RCrA-Cen	19h01m53.30s	-36d57m25.0s	7:49	117	
6	07_0064	Matsuura	SN1987A	05h35m28.02s	-69d16m11.1s	9:49	90	
7	07_0045	Reipurth	B59-Cen	17h11m22.90s	-27d24m57.4s	11:24	81	Bright aurora causing guiding issues; lost 20mins having to reacquire
8	07_0149	Levesque	HD 91093	10h29m35.37s	-57d57m59.0s	12:48	26	
9	07_0049	Shuping	HD 100546 (2)	11h33m25.40s	-70d11m41.0s	13:14	26	
10	07_0189	Hankins	Galactic Center	17h44m48.64s	-29d19m34.7s	13:43	80	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



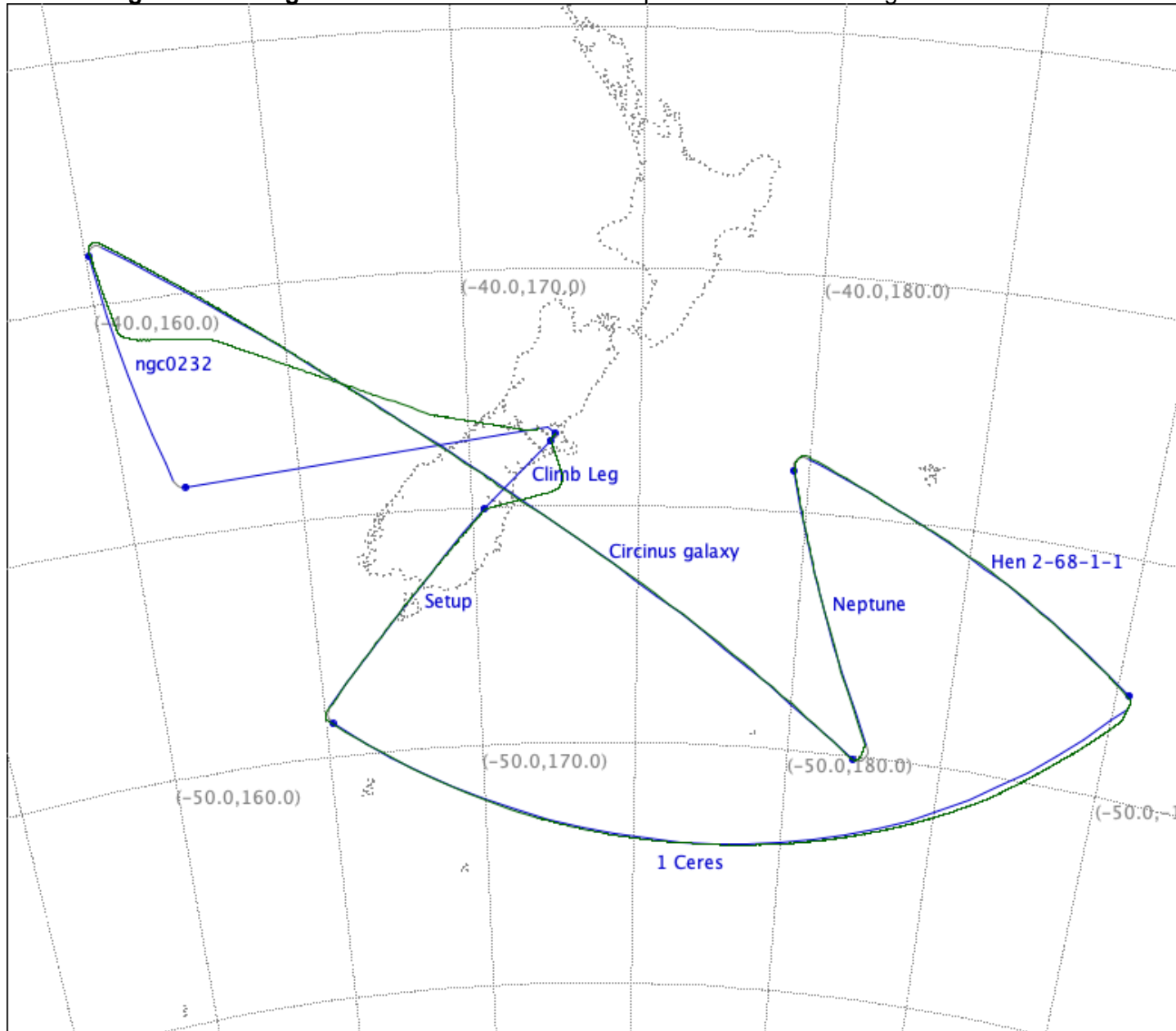
MISSION ID: 2019-07-16_HA_F596

Date: 2019-07-16 UT Instrument: HAWC+

Flight #: 596 Flight Series: OC7E

blue = planned route

green = flown route



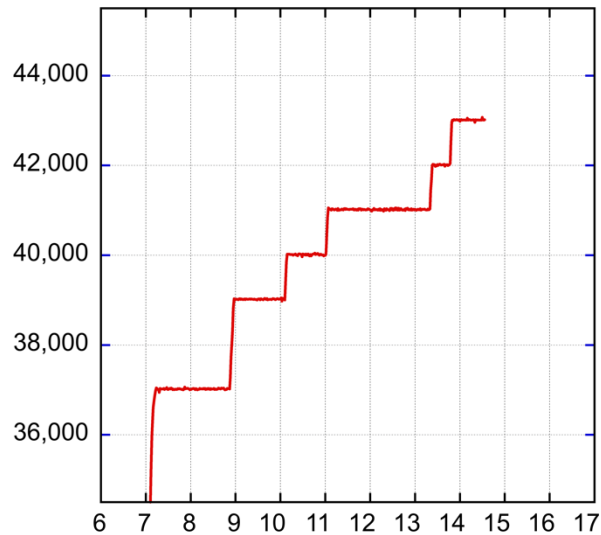
Flight notes:

Rain forecast for original landing time at Christchurch base required early Return to Base.

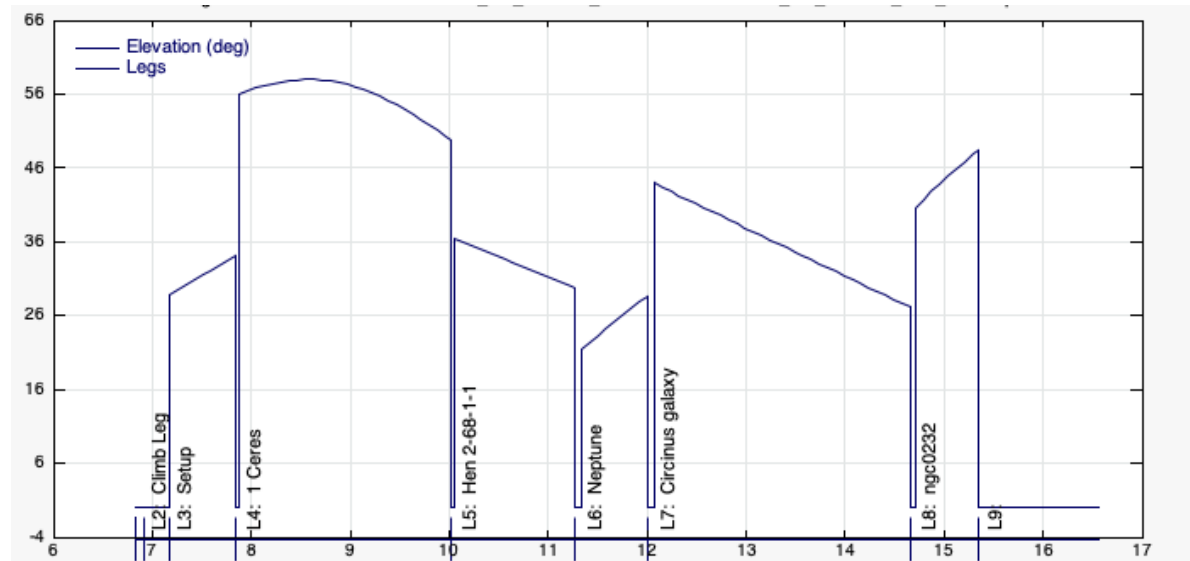
Flight 596 Mission ID 2019-07-16_HA_F596
 Christchurch-Christchurch Take off date UTC: 16-JUL-2019
 Departure UTC: 06:41 Arrival UTC: 16:12

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 102333	20h44m02.33s	-51d55m15.5s	7:10	40	
4	90_0086	Calibration	1 Ceres	15h53m02.31s	-19d24m37.3s	7:53	128	
5	07_0175	Cami	Hen 2-68	11h31m45.46s	-65d58m14.2s	10:03	73	
6	90_0083	Calibration	Neptune	23h18m33.07s	-05d34m58.8s	11:20	40	
7	07_0032	Lopez-Rodriguez	Circinus galaxy	14h13m09.91s	-65d20m20.5s	12:04	155	
8	07_0135	Casey	ngc0232	00h42m45.82s	-23d33m40.9s	14:42	38	Early return to Christchurch base; no data collected

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



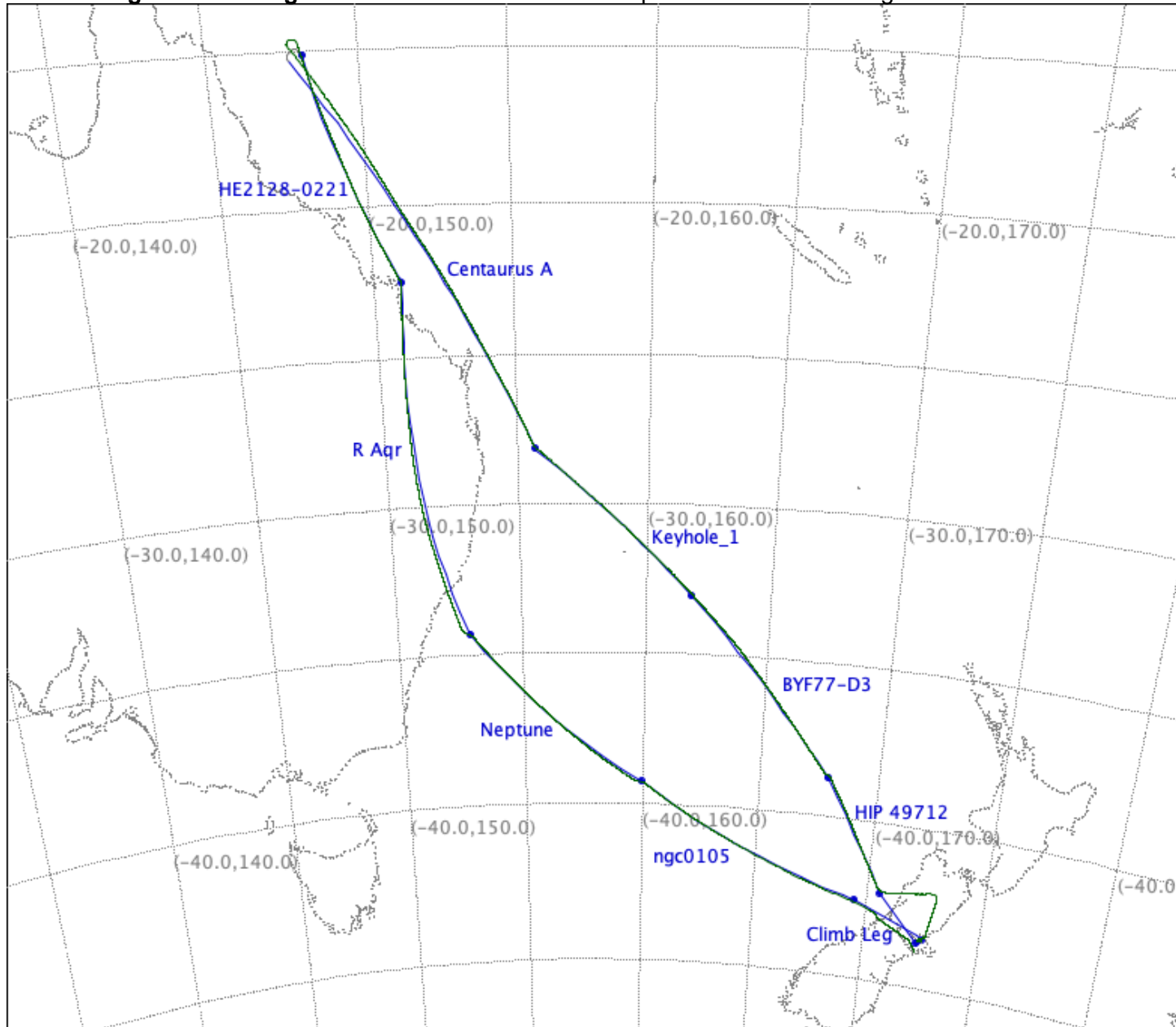
MISSION ID: 2019-07-17_HA_F597

Date: 2019-07-17 UT Instrument: HAWC+

Flight #: 597 Flight Series: OC7E

blue = planned route

green = flown route

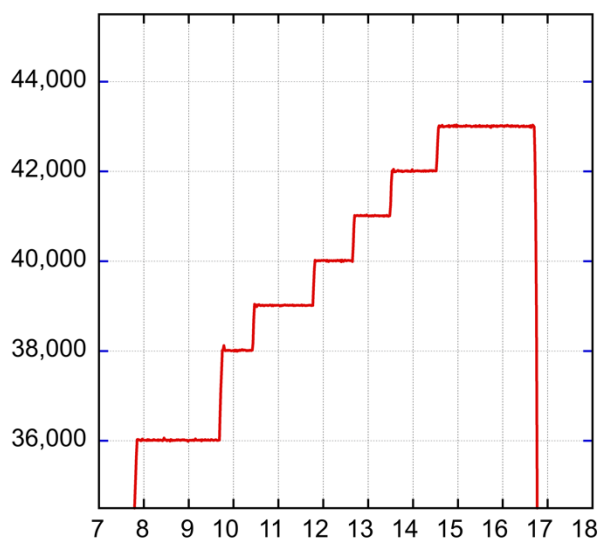


Flight notes: No irregularities.

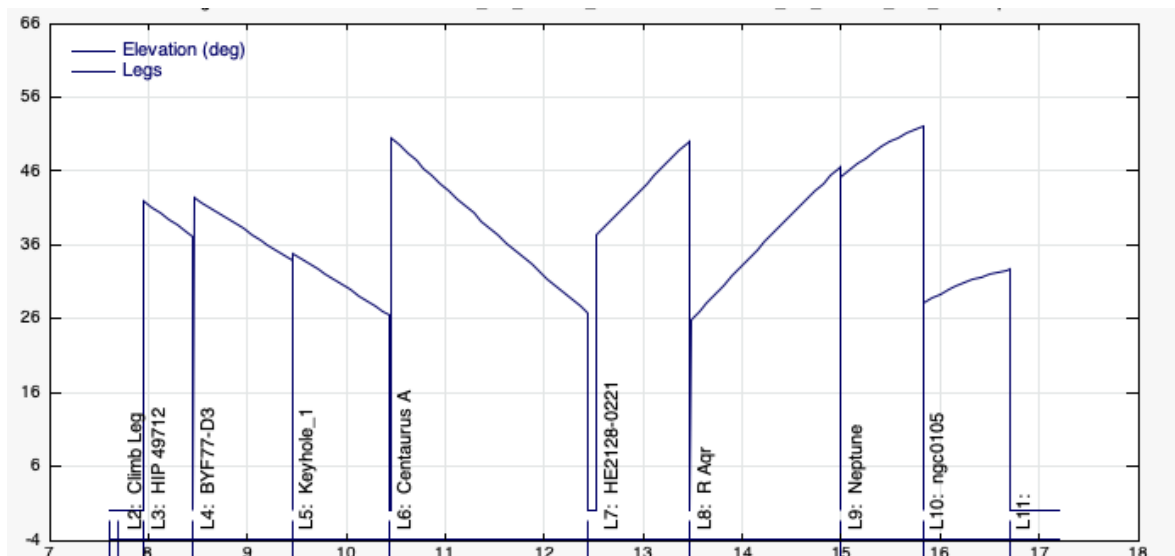
Flight 597 Mission ID 2019-07-17_HA_F597
 Christchurch-Christchurch Take off date UTC: 17-JUL-2019
 Departure UTC: 07:22 Arrival UTC: 17:09

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 49712	10h08m56.24s	-51d48m40.5s	7:57	30	
4	07_0089	Barnes	BYF77-D3	10h37m43.24s	-58d46m18.4s	8:27	60	
5	07_0081	Dowell	Eta Car	10h45m25.05s	-59d36m58.6s	9:27	59	
6	07_0032	Lopez-Rodriguez	Centaurus A	13h25m27.62s	-43d01m08.8s	10:27	119	Some pointing issues.
7	07_0193	Husemann	HE2128-0221	21h30m49.94s	-02d08m14.5s	12:32	56	
8	07_0097	Omelian	R Aqr	23h43m49.46s	-15d17m04.1s	13:29	90.4	
9	90_0083	Calibration	Neptune	23h18m29.84s	-05d35m22.1s	14:59	50	
10	07_0135	Casey	ngc0105	00h25m16.60s	12d53m22.0s	15:50	52	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



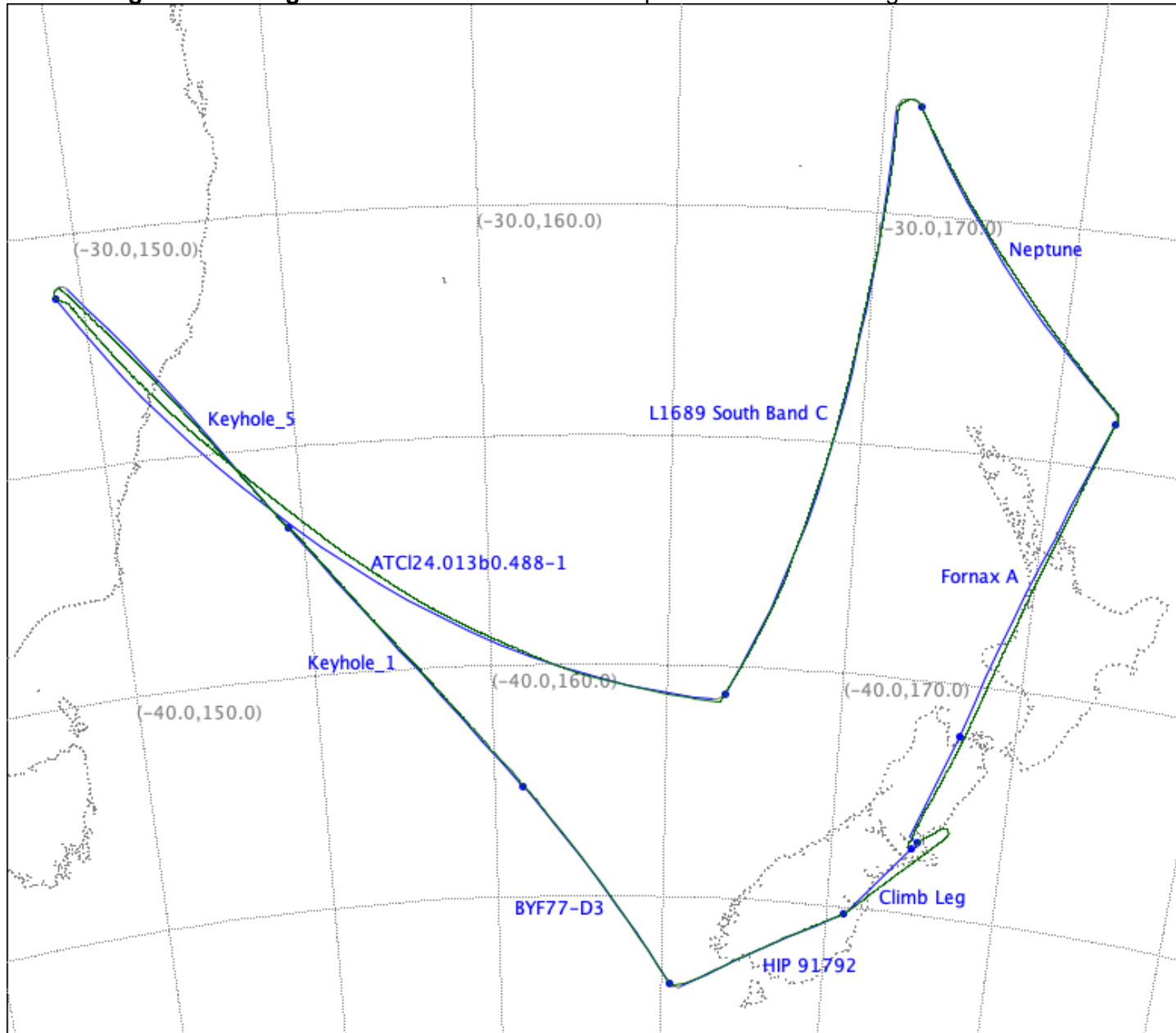
MISSION ID: 2019-07-18_HA_F598

Date: 2019-07-18 UT Instrument: HAWC+

Flight #: 598 Flight Series: OC7E

blue = planned route

green = flown route

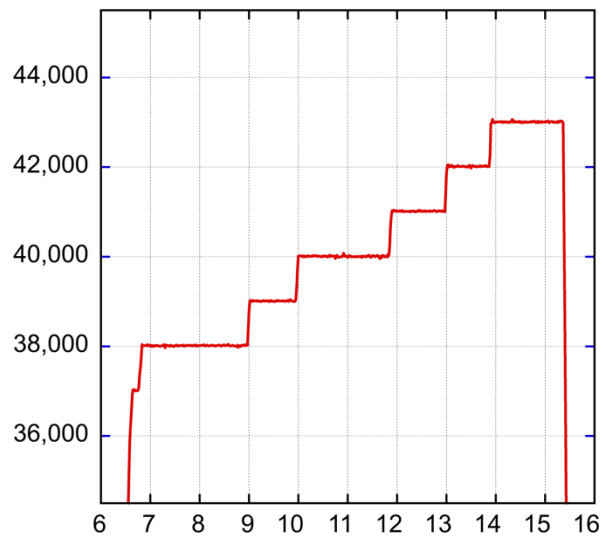


Flight notes: No irregularities.

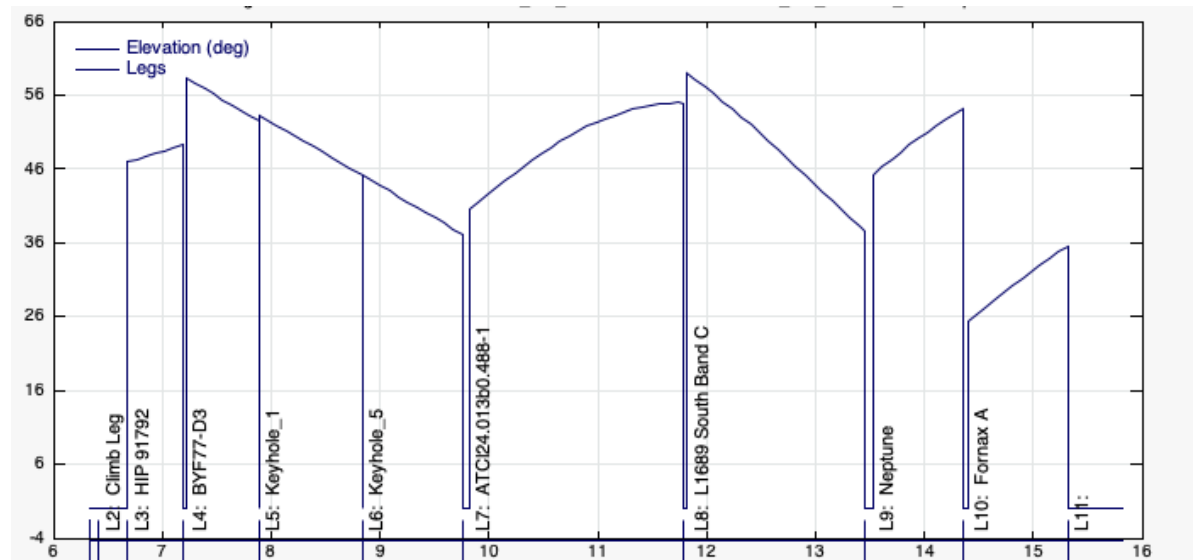
Flight 598 Mission ID 2019-07-18_HA_F598
 Christchurch-Christchurch Take off date UTC: 18-JUL-2019
 Departure UTC: 06:07 Arrival UTC: 15:47

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 91792	18h43m02.14s	-71d25m41.2s	6:40	30	
4	07_0089	Barnes	BYF77-D3	10h37m43.24s	-58d46m18.4s	7:13	40	
5	07_0081	Dowell	Keyhole_1	10h44m19.18s	-59d41m29.4s	7:53	57	
6	07_0081	Dowell	Keyhole_2	10h44m38.32s	-59d36m35.9s	8:50	55	
7	07_0129	Soler	ATCI24.013b0.488	18h33m18.69s	-07d42m33.9s	9:49	118	
8	07_0147	Novak	L1689 South Band C	16h32m00.76s	-24d56m43.7s	11:49	98	Trouble guiding due to faintness of available guide stars; 50% of planned data collected
9	90_0083	Calibration	Neptune	23h18m26.99s	-05d35m42.5s	13:31	50	
10	07_0032	Lopez-Rodriguez	Fornax A	03h22m41.79s	-37d12m29.5s	14:24	55	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



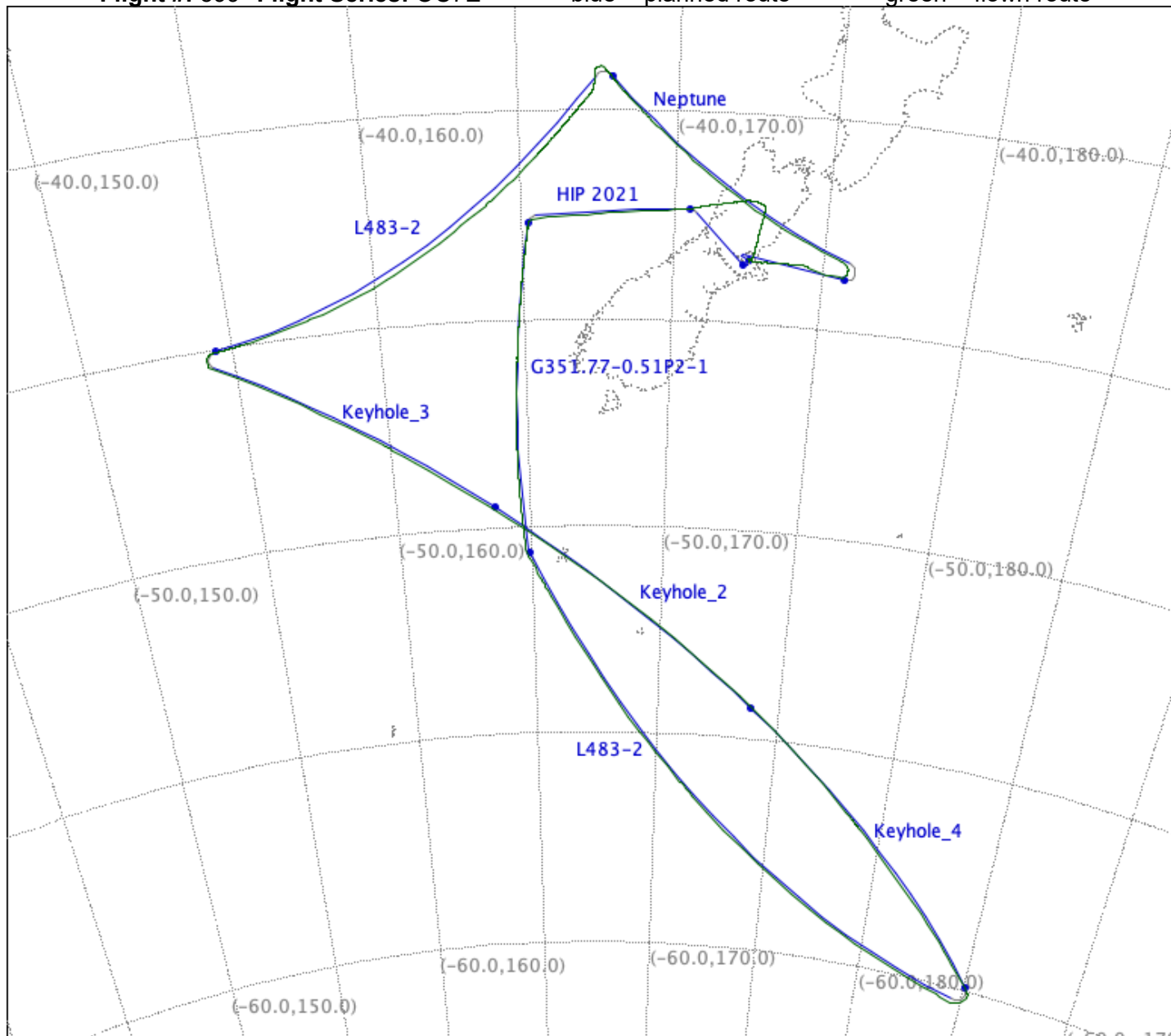
MISSION ID: 2019-07-22_HA_F599

Date: 2019-07-22 UT Instrument: HAWC+

Flight #: 599 Flight Series: OC7E

blue = planned route

green = flown route

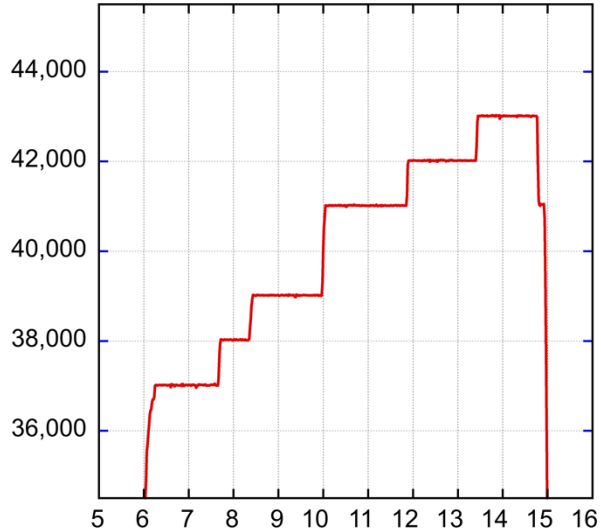


Flight notes: No irregularities.

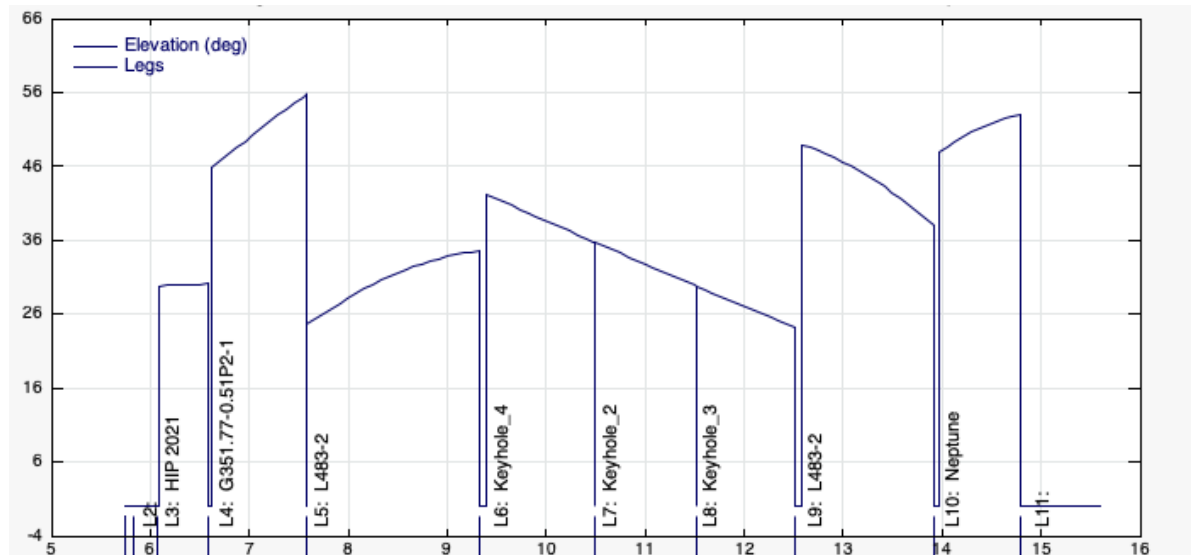
Flight 599 Mission ID 2019-07-22_HA_F599
 Christchurch-Christchurch Take off date UTC: 22-JUL-2019
 Departure UTC: 05:35 Arrival UTC: 15:21

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 2021	00h25m45.07s	-77d15m15.3s	6:05	30	
4	07_0238	Pillai	G351.77-0.51P2	17h26m36.42s	-36d07m17.4s	6:37	57.1	
5	07_0184	Sadavoy	L483	18h17m30.30s	-04d39m05.0s	7:34	105	Minor guiding issues.
6	07_0081	Dowell	Keyhole_4	10h44m53.51s	-59d36m38.0s	9:23	66	
7	07_0081	Dowell	Keyhole_2	10h45m08.46s	-59d38m00.5s	10:29	61	
8	07_0081	Dowell	Keyhole_3	10h44m52.01s	-59d39m16.4s	11:30	60	
9	07_0184	Sadavoy	L483	18h17m30.30s	-04d39m05.0s	12:34	80	
10	90_0083	Calibration	Neptune	23h18m14.08s	-05d37m14.1s	13:57	50	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



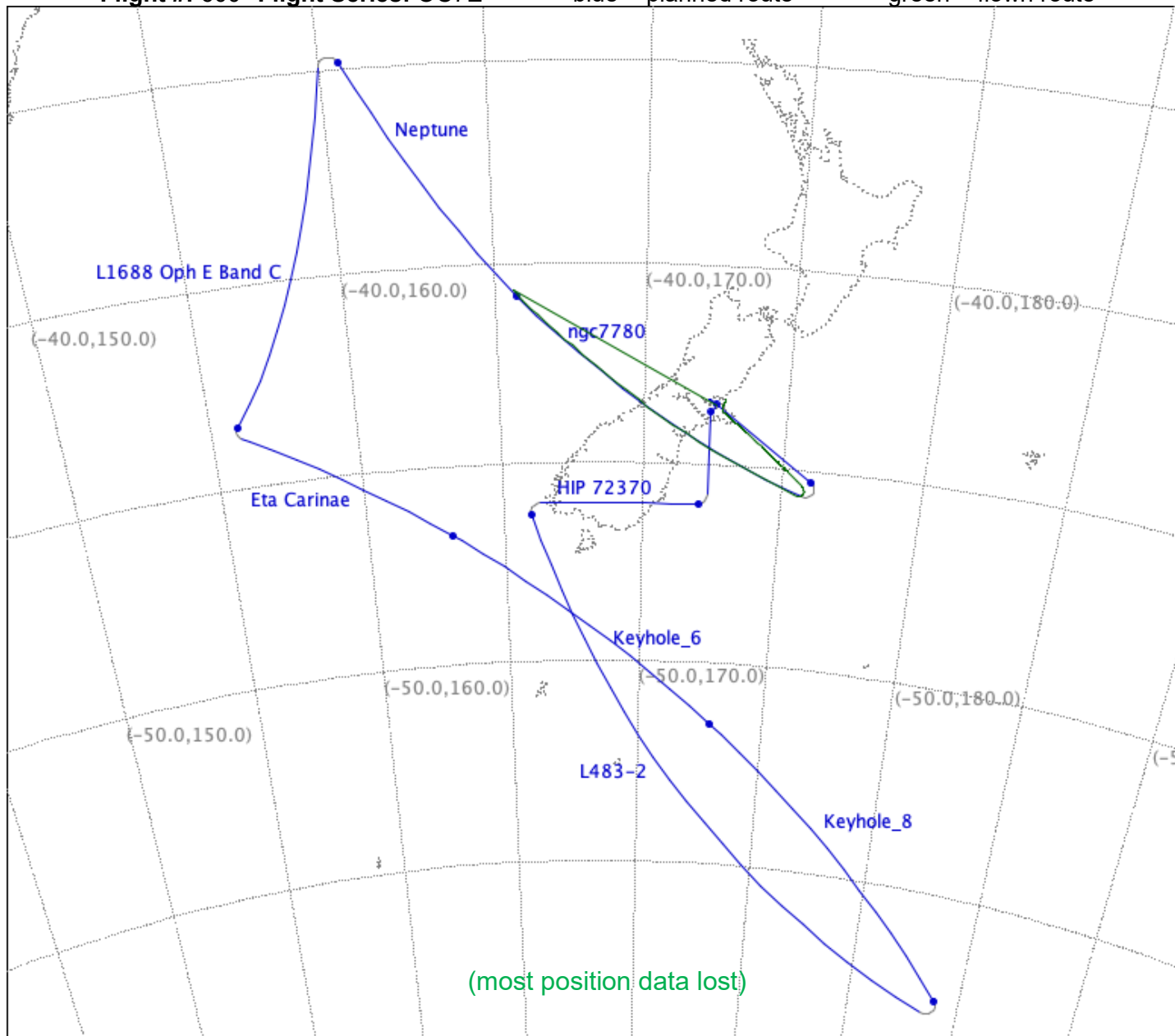
MISSION ID: 2019-07-23_HA_F600

Date: 2019-07-23 UT Instrument: HAWC+

Flight #: 600 Flight Series: OC7E

blue = planned route

green = flown route

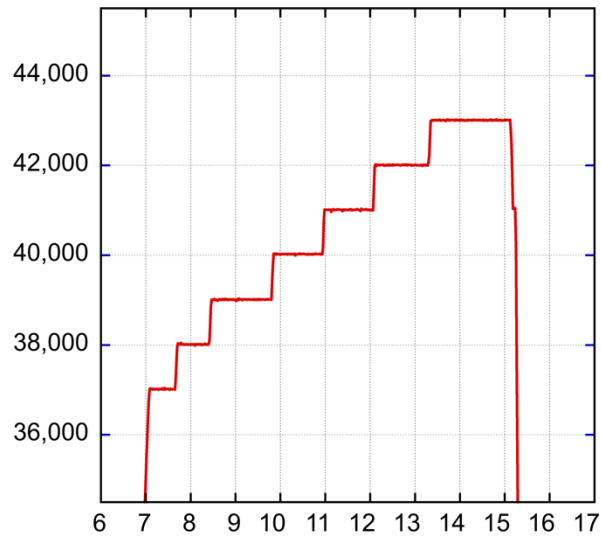


Flight notes: Slightly late departure.

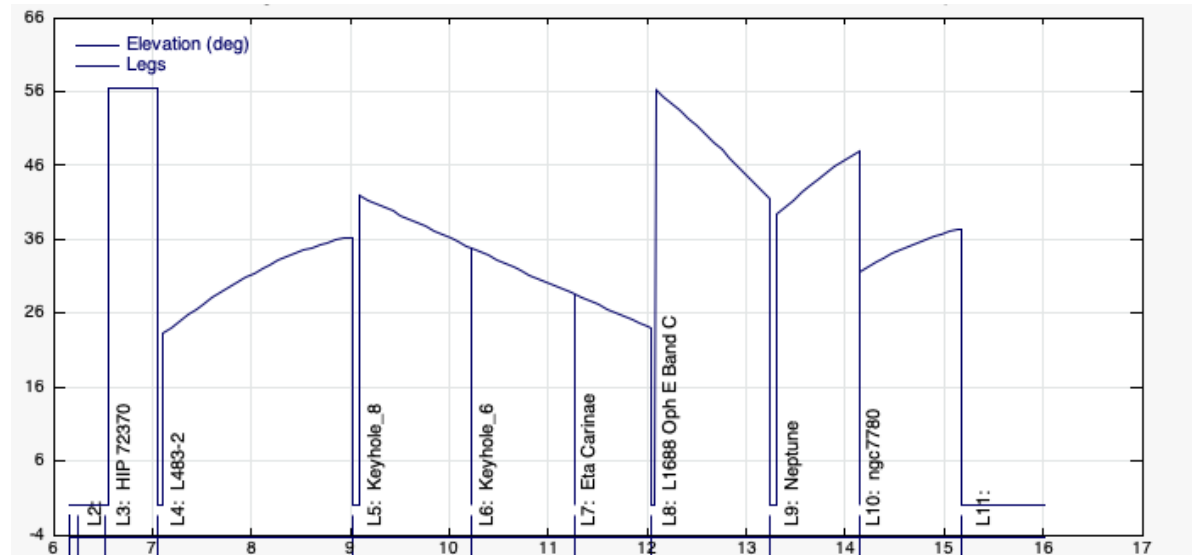
Flight 600 Mission ID 2019-07-23_HA_F600
 Christchurch-Christchurch Take off date UTC: 23-JUL-2019
 Departure UTC: 06:36 Arrival UTC: 15:44

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 72370	14h47m51.71s	-79d02m41.1s	6:33	30	
4	07_0184	Sadavoy	L483	18h17m30.30s	-04d39m05.0s	7:06	115	First 10min lost due to late take-off
5	07_0081	Dowell	Keyhole_8	10h44m34.35s	-59d41m52.3s	9:05	68	Lost 20min due to troubles acquiring and guiding.
6	07_0081	Dowell	Keyhole_6	10h44m36.48s	-59d39m15.3s	10:13	62	
7	07_0081	Dowell	Eta Carinae	10h45m03.54s	-59d41m04.1s	11:15	47	
8	07_0147	Novak	L1688 Oph E Band C	16h27m07.41s	-24d37m24.2s	12:05	69	
9	90_0083	Calibration	Neptune	23h18m10.61s	-05d37m38.5s	13:18	50	
10	07_0135	Casey	ngc7780	23h53m32.17s	08d07m05.3s	14:08	62	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



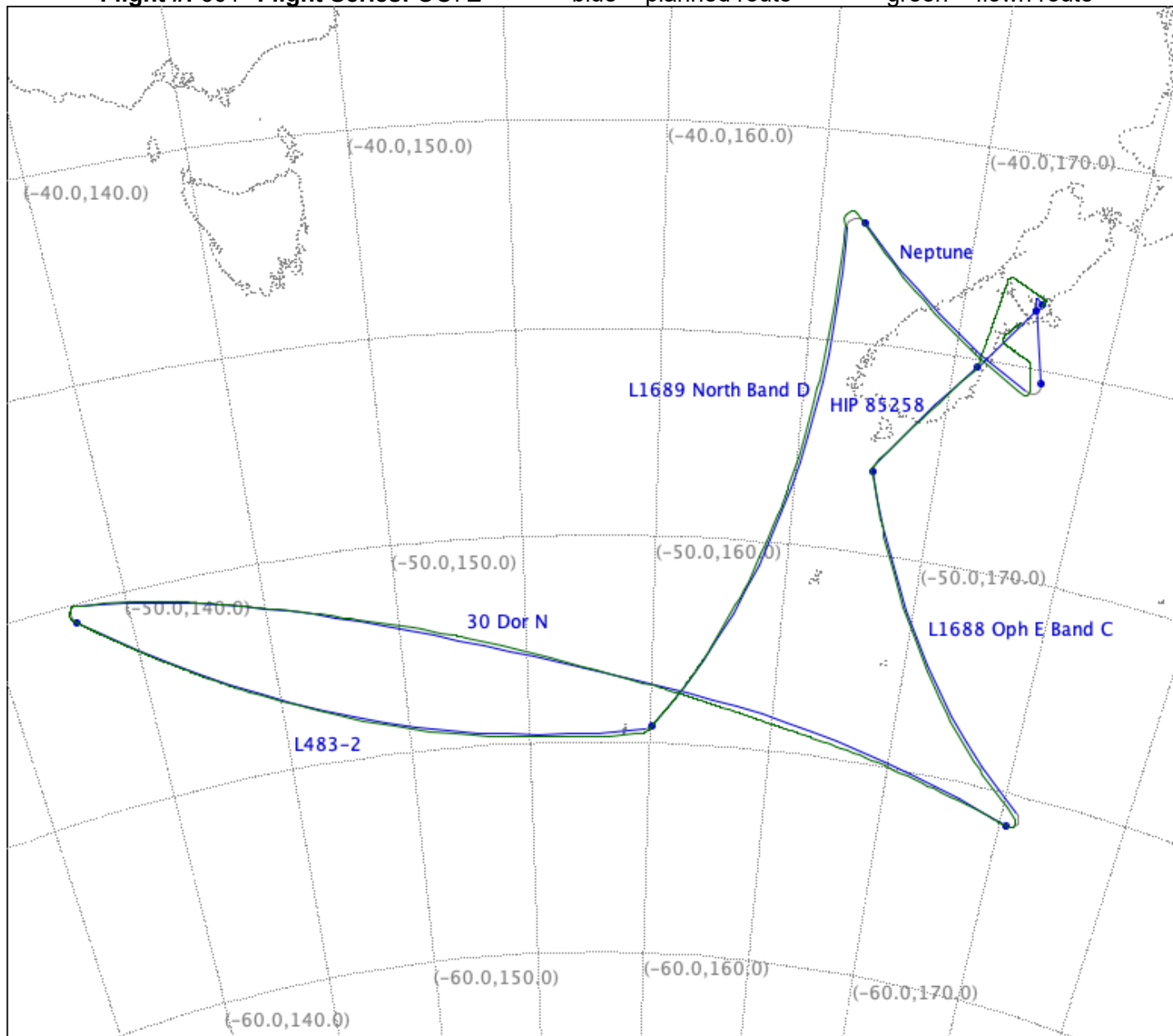
MISSION ID: 2019-07-24_HA_F601

Date: 2019-07-24 UT Instrument: HAWC+

Flight #: 601 Flight Series: OC7E

blue = planned route

green = flown route

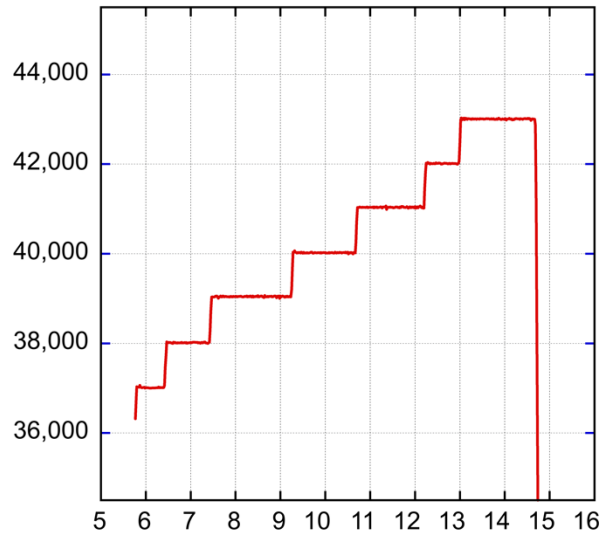


Flight notes:
No irregularities.

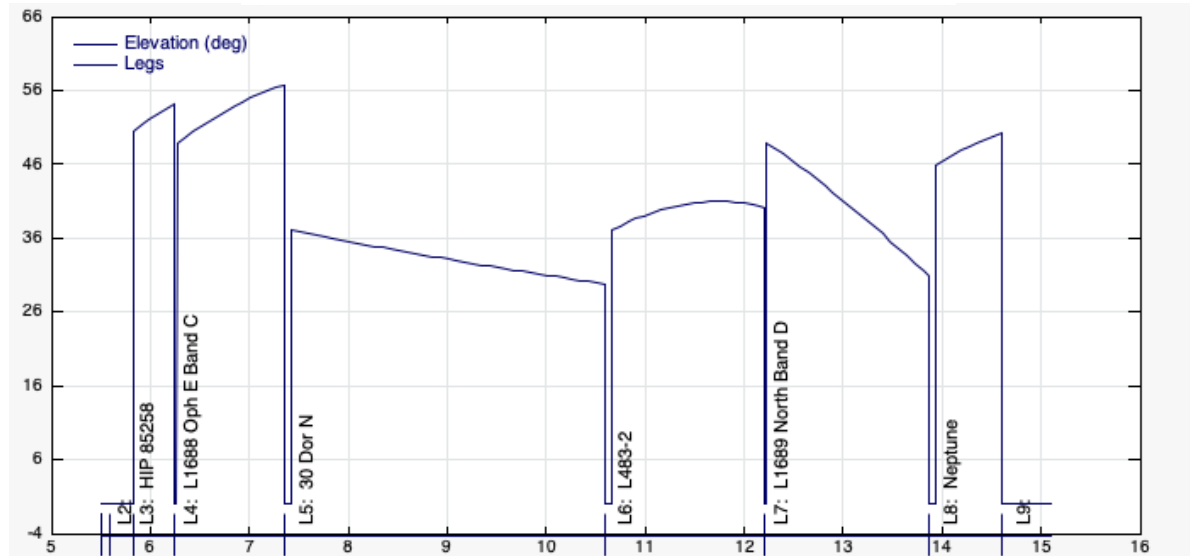
Flight 601 Mission ID 2019-07-24_HA_F601
 Christchurch-Christchurch Take off date UTC: 24-JUL-2019
 Departure UTC: 05:16 Arrival UTC: 15:05

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			HIP 85258	17h25m17.99s	-55d31m47.6s	5:49	25	
4	07_0147	Novak	L1688 Oph E	16h27m07.41s	-24d37m24.2s	6:16	65	10min lost due to telescope control software error.
5	76_0001	Yorke	30 Dor N	05h38m44.42s	-69d04m46.2s	7:25	190	
6	07_0184	Sadavoy	L483	18h17m30.30s	-04d39m05.0s	10:39	93	
7	07_0147	Novak	L1688 Oph E	16h32m21.92s	-24d28m30.6s	12:13	98.3	Image quality seems elongated; could be related to faint guide stars
8	90_0083	Calibration	Neptune	23h18m07.04s	-05d38m03.5s	13:55	40	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



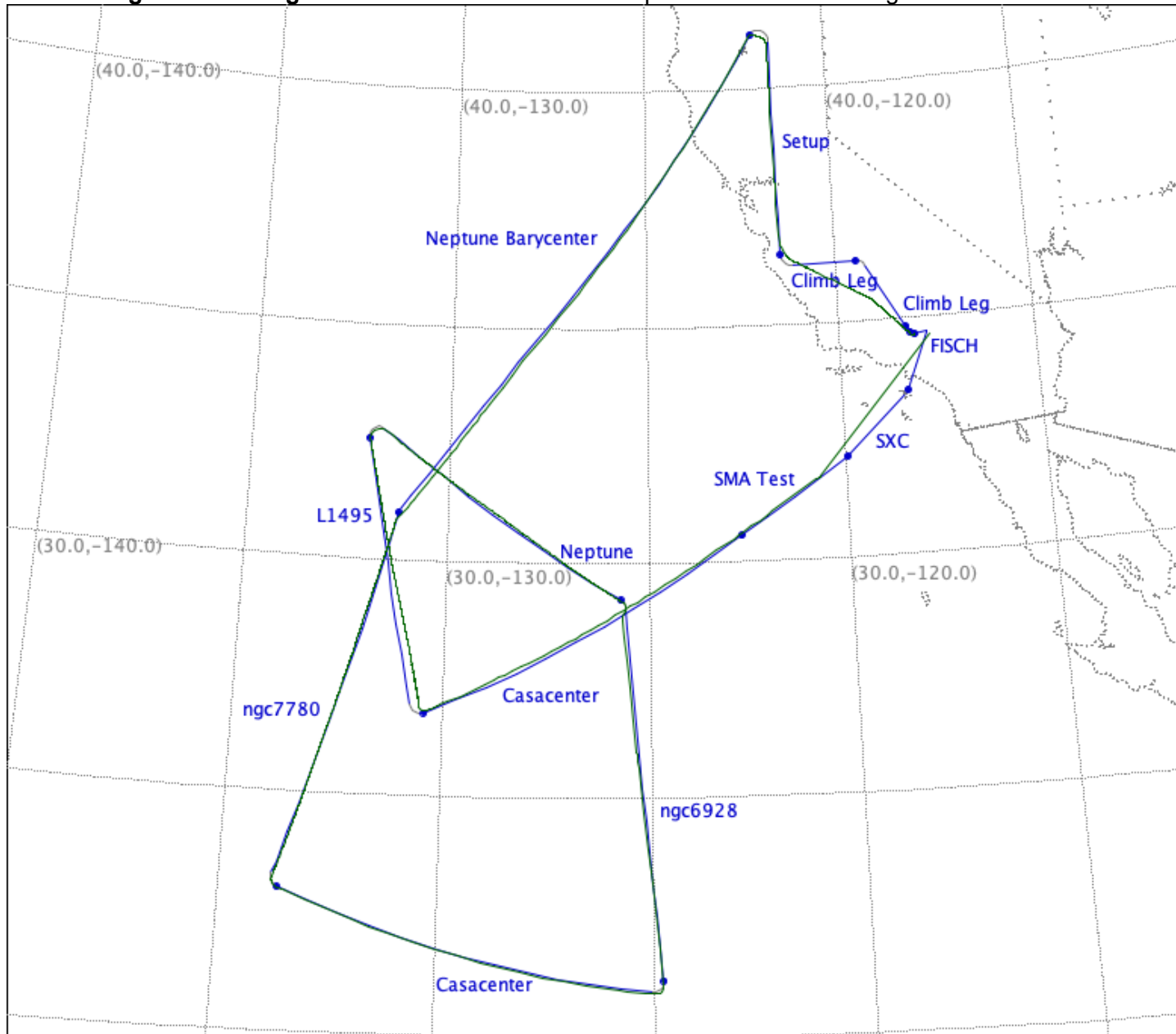
MISSION ID: 2019-09-04_HA_F605

Date: 2019-09-04 UT Instrument: HAWC+

Flight #: 605 Flight Series: OC7F

blue = planned route

green = flown route

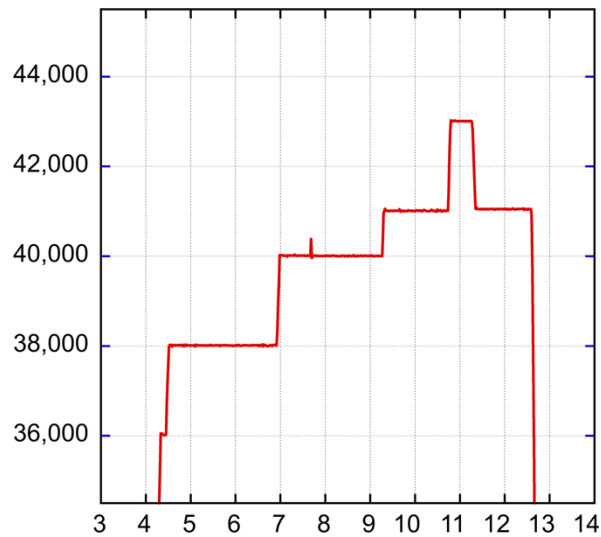


Flight notes: No irregularities.

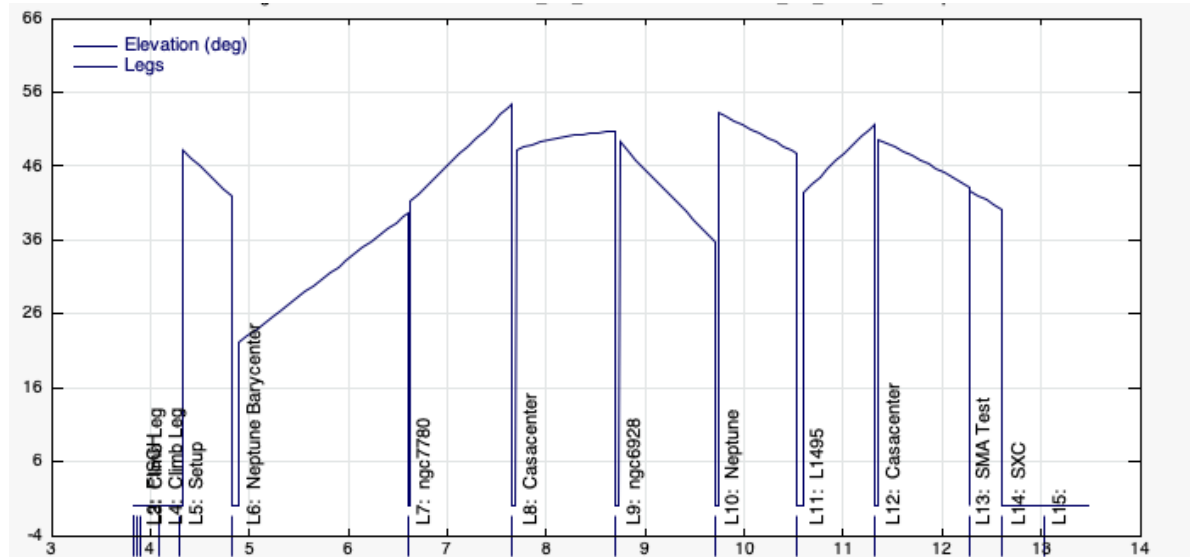
Flight 605 Mission ID 2019-09-04_HA_F605
 Palmdale to Palmdale Take off date UTC: 04-SEP-2019
 Departure UTC: 03:51 Arrival UTC: 13:07

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	16h02m17.69s	22d48m16.0s	4:19	30	
6	90_0086	Calibration	Neptune	23h14m33.86s	-06d01m41.3s	4:53	103	
7	07_0135	Casey	ngc7780	23h53m32.17s	08d07m05.3s	6:37	62	
8	07_0047	Rho	Cas A center	23h23m28.66s	58d48m53.1s	7:41	60	
9	07_0135	Casey	ngc6928	20h32m50.22s	09d55m35.1s	8:44	58	
10	90_0083	Calibration	Neptune	23h14m32.59s	-06d01m49.5s	9:44	48	
11	07_0017	Li	L1495	04h18m13.00s	27d32m29.4s	10:35	43	
12	07_0047	Rho	Cas A center	23h23m28.66s	58d48m53.1s	11:21	55	
13		engineering	HIP 115395	23h22m32.53s	60d08m00.5s	12:16	20	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



MISSION ID: 2019-09-05_HA_F606

Date: 2019-09-05 UT Instrument: HAWC+

Flight #: 606 Flight Series: OC7F

blue = planned route

green = flown route

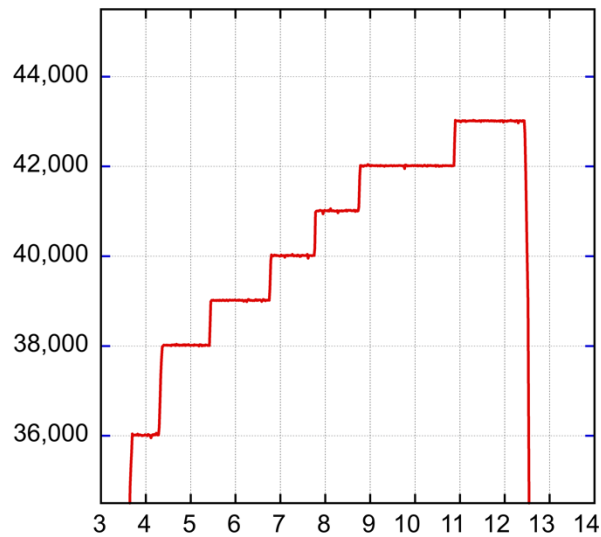


Flight notes: No irregularities.

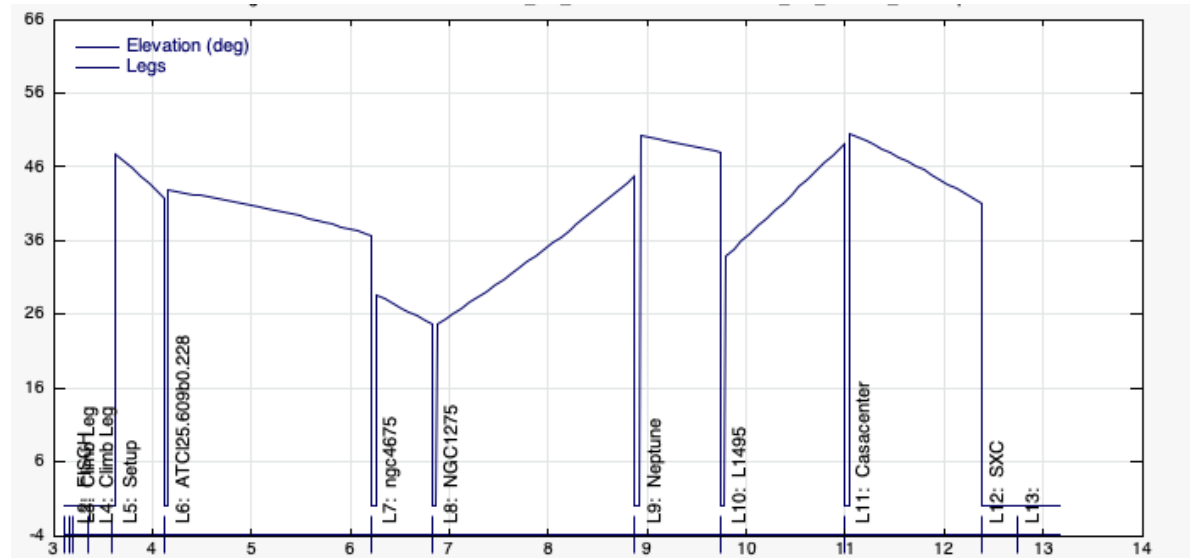
Flight 606 Mission ID 2019-09-05_HA_F606
 Palmdale to Palmdale Take off date UTC: 05-SEP-2019
 Departure UTC: 03:15 Arrival UTC: 12:58

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	15h46m11.26s	15d25m18.6s	3:37	30	
6	07_0129	Soler	ATCI25.609b0.228	18h37m10.76s	-06d23m40.2s	4:09	123	
7	07_0135	Casey	ngc4675	12h45m31.89s	54d44m15.4s	6:16	34	
8	07_0032	Lopez-Rodriguez	NGC1275	03h19m48.16s	41d30m42.1s	6:53	120	
9	90_0083	Calibration	Neptune	23h14m26.77s	-06d02m27.0s	8:56	48	
10	07_0017	Li	L1495	04h18m13.00s	27d32m29.4s	9:47	73	
11	07_0047	Rho	Casacenter	23h23m28.66s	58d48m53.1s	11:02	80	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



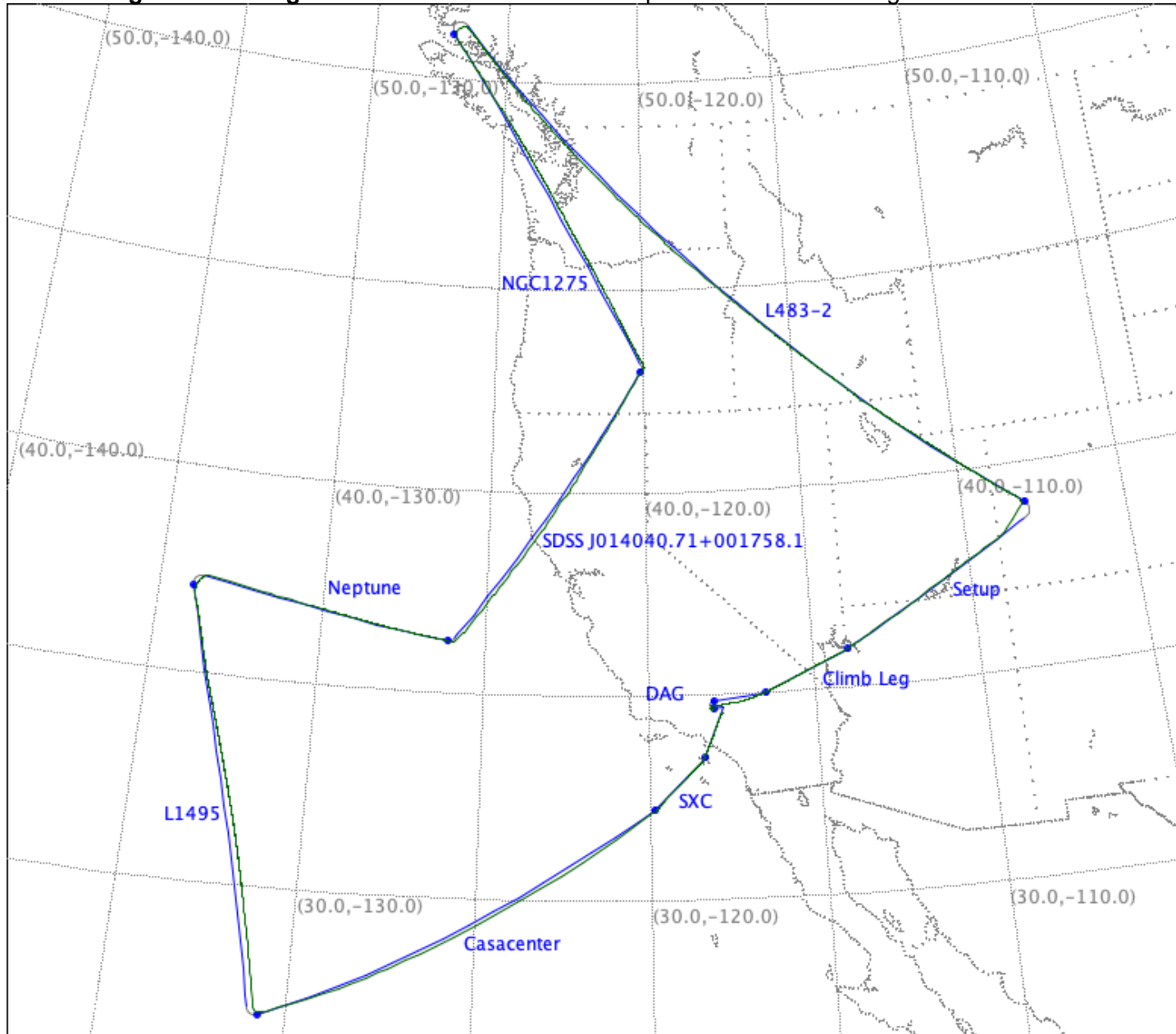
MISSION ID: 2019-09-07_HA_F607

Date: 2019-09-07 UT Instrument: HAWC+

Flight #: 607 Flight Series: OC7F

blue = planned route

green = flown route

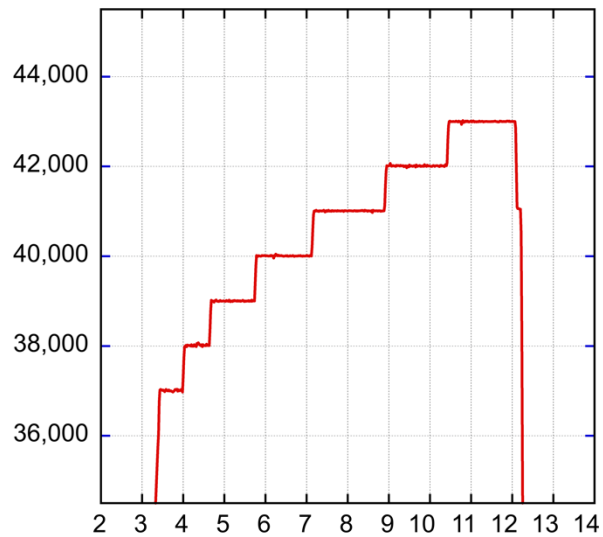


Flight notes: No irregularities.

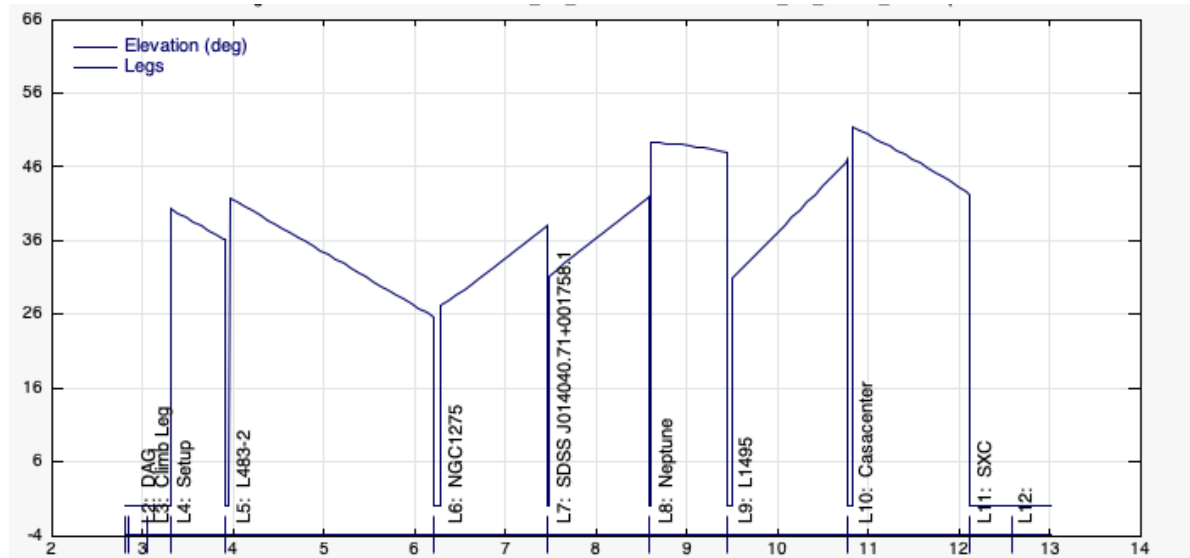
Flight 607 Mission ID 2019-09-07_HA_F607
 Palmdale to Palmdale Take off date UTC: 07-SEP-2019
 Departure UTC: 02:51 Arrival UTC: 12:41

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	14h04m23.35s	64d22m33.1s	3:18	36	
5	07_0184	Sadavoy	L483	18h17m30.30s	-04d39m05.0s	3:57	135	
6	07_0032	Lopez-Rodriguez	NGC1275	03h19m48.16s	41d30m42.1s	6:17	70	
7	07_0096	Kirkpatrick	SDSS J014040.71+001758.1	01h40m40.71s	00d17m58.2s	7:28	66	
8	90_0083	Calibration	Neptune	23h14m14.58s	-06d03m45.5s	8:36	50	
9	07_0017	Li	L1495	04h18m13.00s	27d32m29.4s	9:29	77	
10	07_0047	Rho	Cas A center	23h23m28.66s	58d48m53.1s	10:49	78	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



MISSION ID: 2019-09-10_HA_F608

Date: 2019-09-10 UT Instrument: HAWC+

Flight #: 608 Flight Series: OC7F

blue = planned route

green = flown route

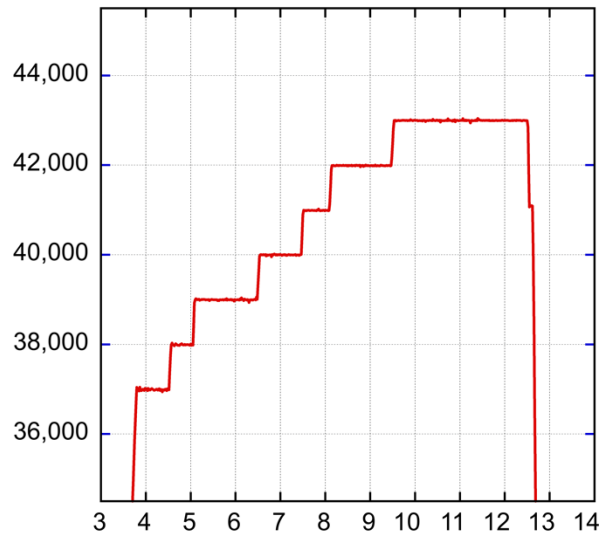


Flight notes: No irregularities.

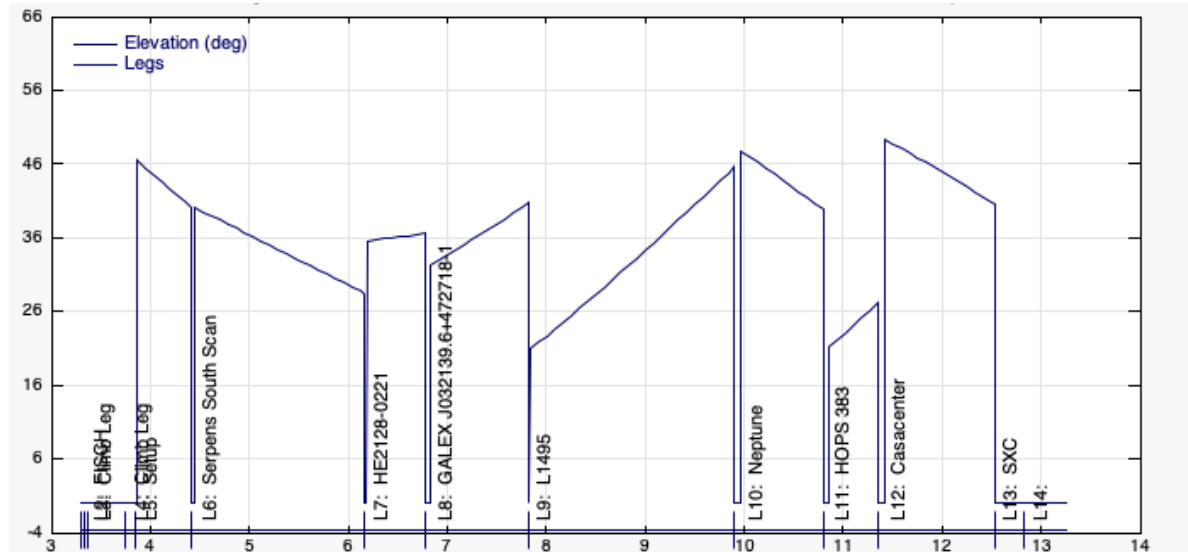
Flight 608 Mission ID 2019-09-10_HA_F608
 Palmdale to Palmdale Take off date UTC: 10-SEP-2019
 Departure UTC: 03:17 Arrival UTC: 13:07

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			HIP 75973	15h30m55.78s	40d49m58.8s	3:51	33	
6	07_0172	Winston	Serpens South Scan	18h29m56.50s	-02d00m36.3s	4:27	103	
7	07_0193	Husemann	HE2128-0221	21h30m49.94s	-02d08m14.5s	6:11	35	
8	07_0109	Vos	GALEX J032139.6+472718	03h21m39.63s	47d27m18.8s	6:49	60	
9	07_0017	Li	L1495	04h18m13.00s	27d32m29.4s	7:50	124	
10	90_0083	Calibration	Neptune	23h13m56.00s	-06d05m44.8s	9:58	50	
11	07_0200	Fischer	HOPS 383	05h35m29.84s	-04d59m51.0s	10:51	30	
12	07_0047	Rho	Cas A center	23h23m28.66s	58d48m53.1s	11:25	67	Some time (7m) lost due to guiding failures.

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



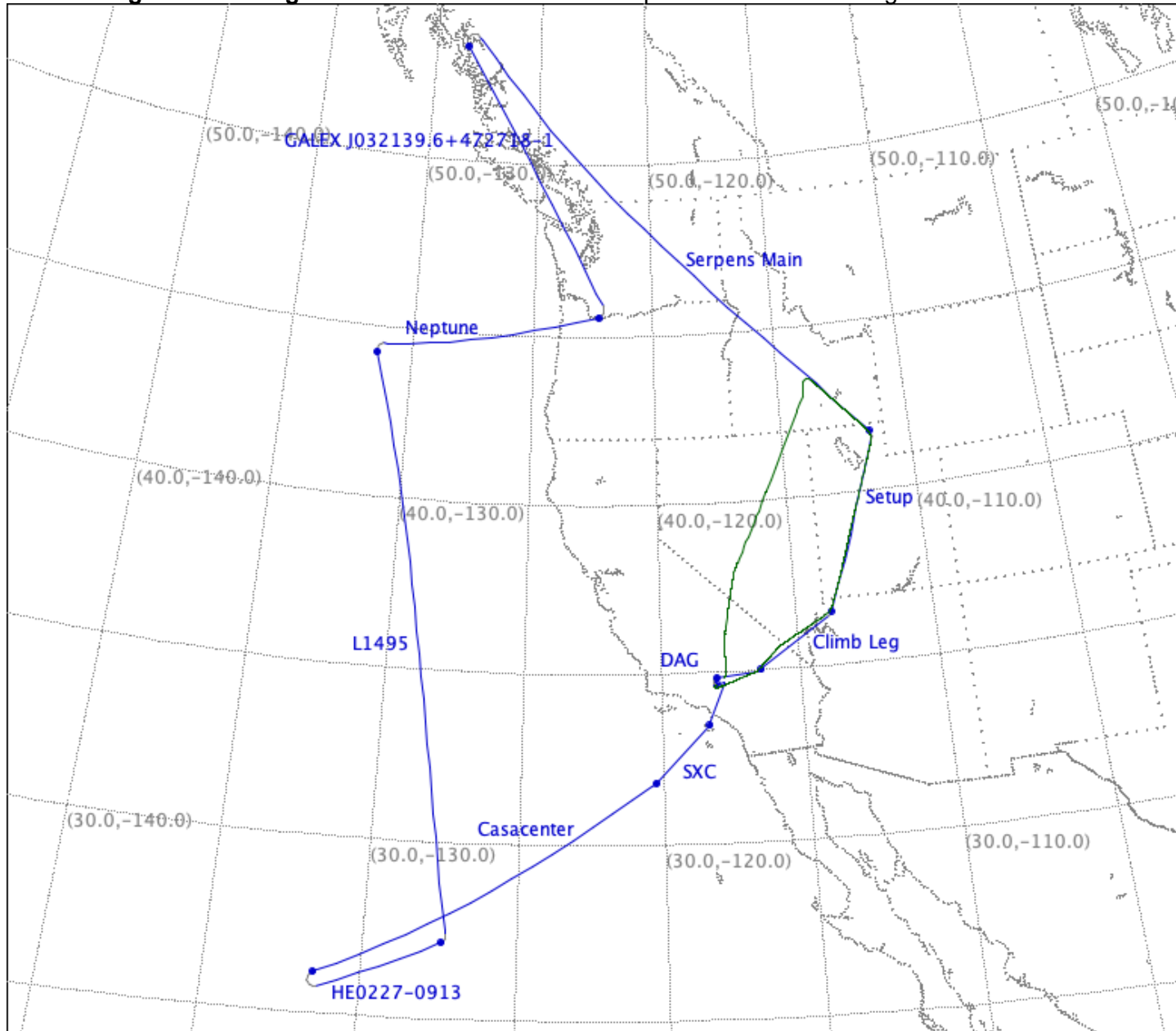
MISSION ID: 2019-09-10_HA_F609

Date: 2019-09-10 UT Instrument: HAWC+

Flight #: 609 Flight Series: OC7F

blue = planned route

green = flown route



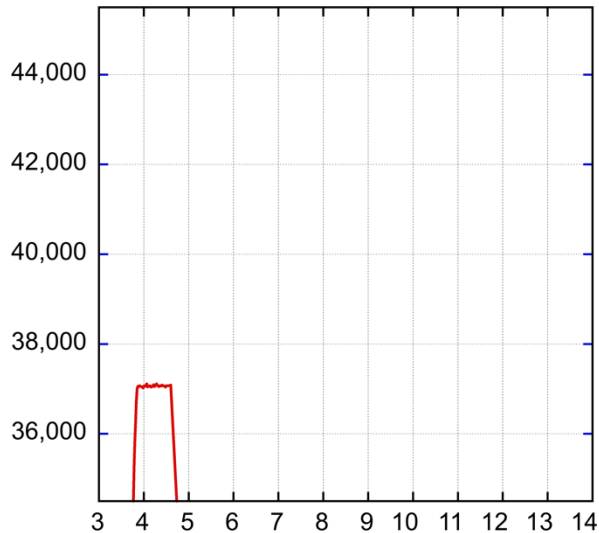
Flight notes:

Telescope malfunction shortly after take-off; early return to Palmdale base, no data collected.

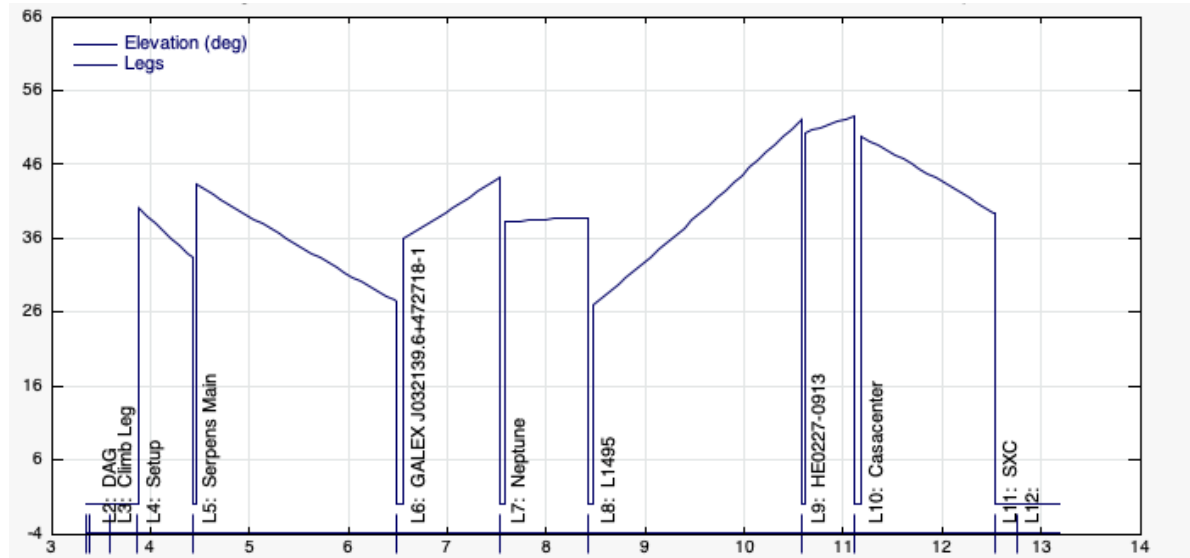
Flight 609 Mission ID 2019-09-10_HA_F609
 Palmdale to Palmdale Take off date UTC: 10-SEP-2019
 Departure UTC: HH:MM Arrival UTC: HH:MM

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	15h32m55.78s	31d21m32.9s	3:52	33	
5	07_0130	Fanciullo	Serpens Main	18h29m59.37s	01d12m52.0s	4:27	121	Early return to base; no data.
6	07_0109	Vos	GALEX J032139.6+472718	03h21m39.63s	47d27m18.8s	6:33	58	Leg not flown; early return to base
7	90_0083	Calibration	Neptune	23h13m50.40s	-06d06m20.7s	7:34	51	Leg not flown; early return to base
8	07_0017	Li	L1495	04h18m13.00s	27d32m29.4s	8:27	126	Leg not flown; early return to base
9	07_0193	Husemann	HE0227-0913	02h30m05.52s	-08d59m53.2s	10:35	30	Leg not flown; early return to base
10	07_0047	Rho	Casacenter	23h23m28.66s	58d48m53.1s	11:10	81	Leg not flown; early return to base

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)

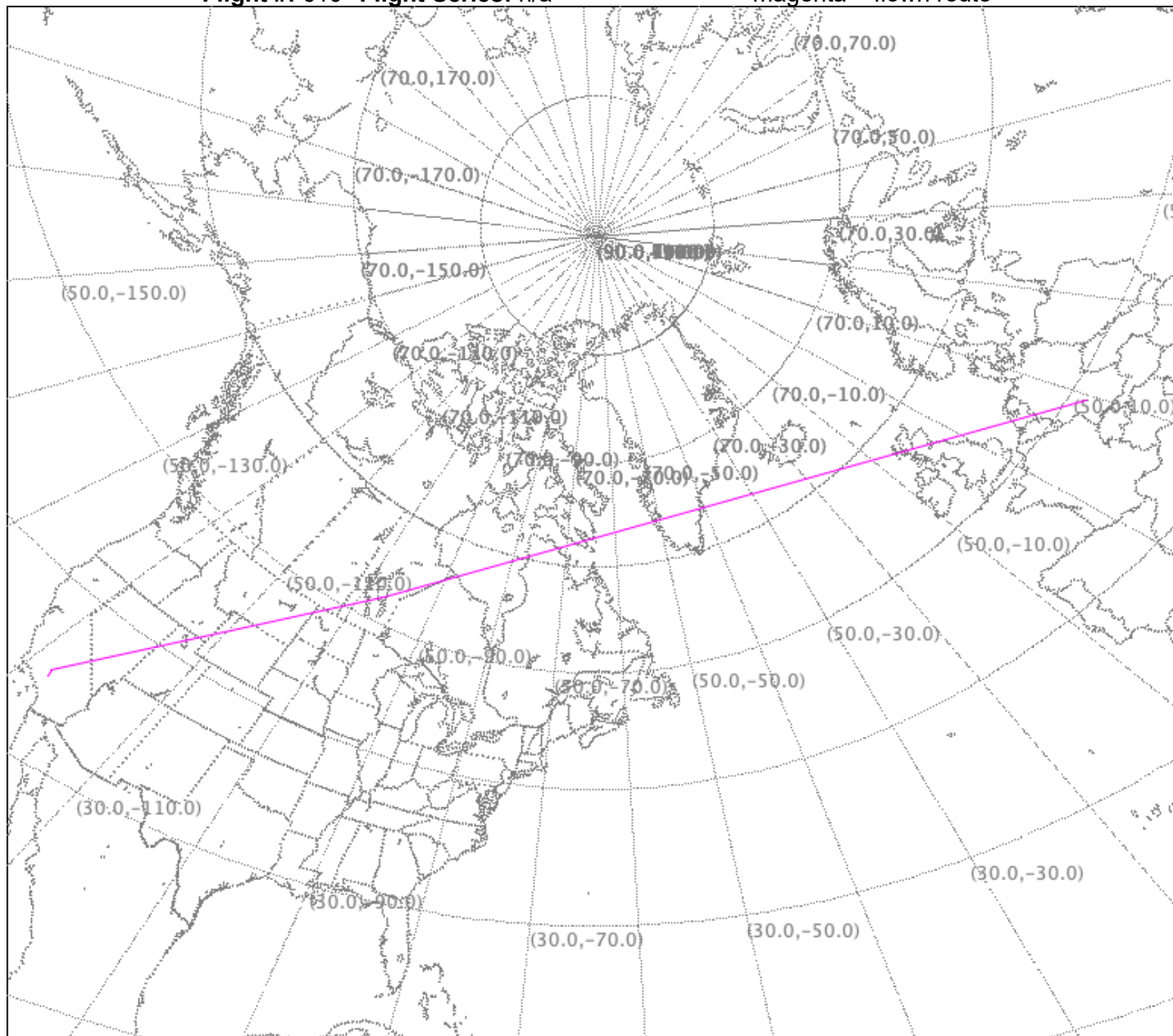


MISSION ID: 2019-09-15_NO_F610

Date: 2019-09-15 UT Instrument: n/a

Flight #: 610 Flight Series: n/a

magenta = flown route



Flight notes:

Ferry Flight from Palmdale, CA to Stuttgart, Germany (no science planned)

Flight 610
Palmdale to
Stuttgart

Mission ID 2019-09-15_NO_F610
Take off date UTC:
15-SEP-2019

Departure UTC: 16:06
Arrival UTC: 02:03

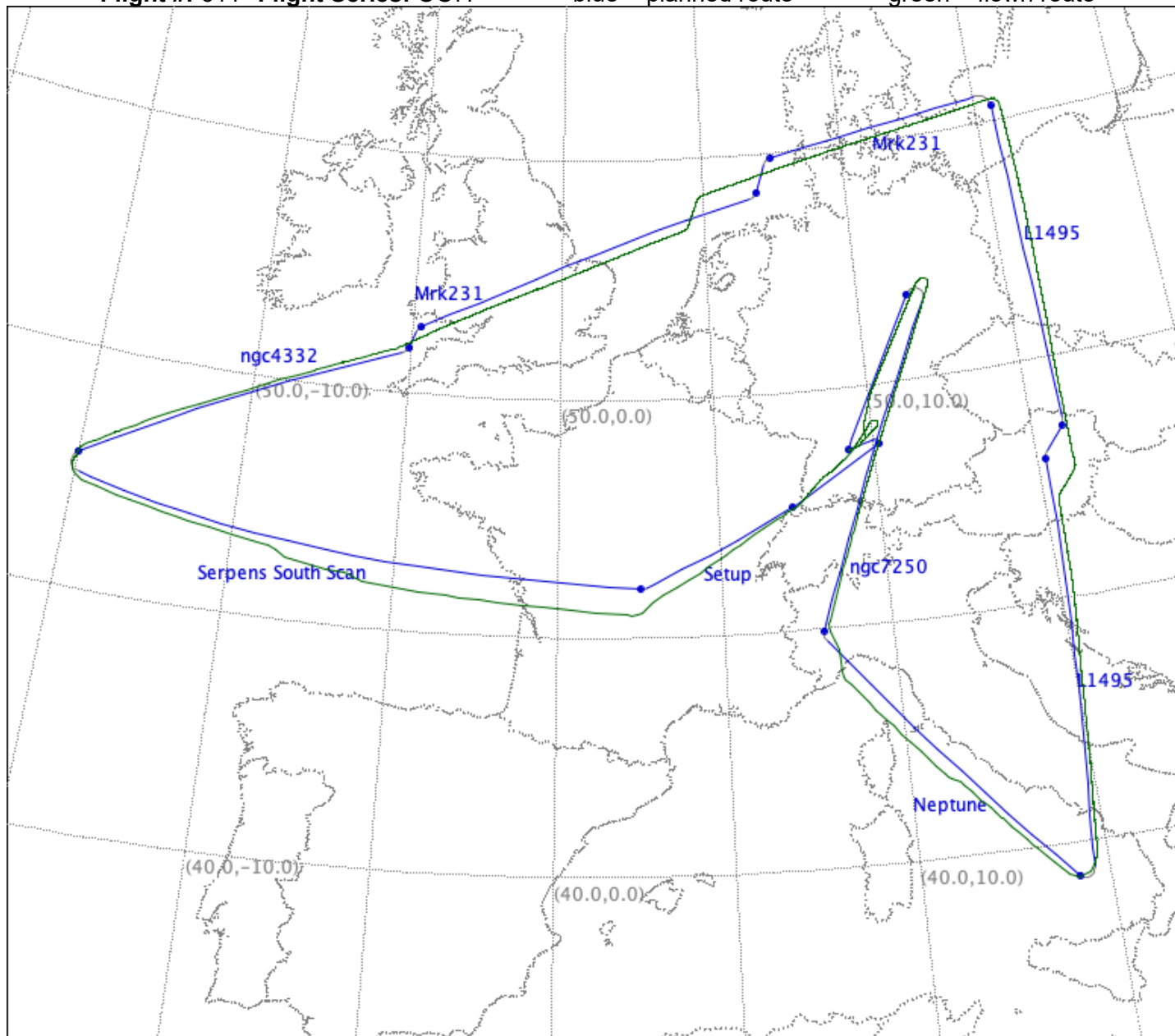
MISSION ID: 2019-09-18_HA_F611

Date: 2019-09-18 UT Instrument: HAWC+

Flight #: 611 Flight Series: OC7F

blue = planned route

green = flown route



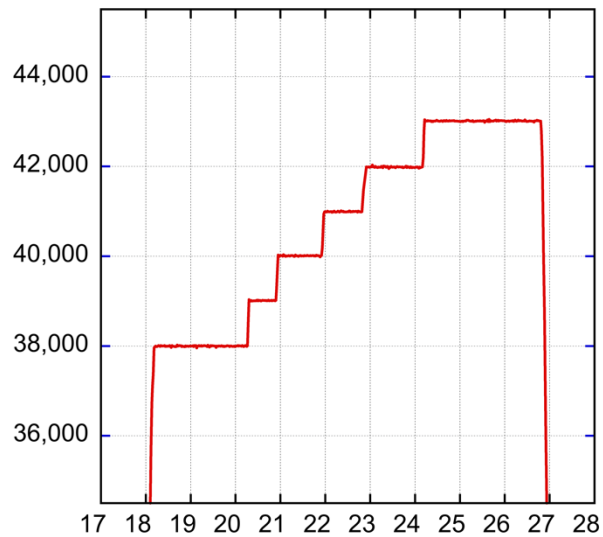
Flight notes:

Frequent course corrections required due to European Air Traffic Control constraints.

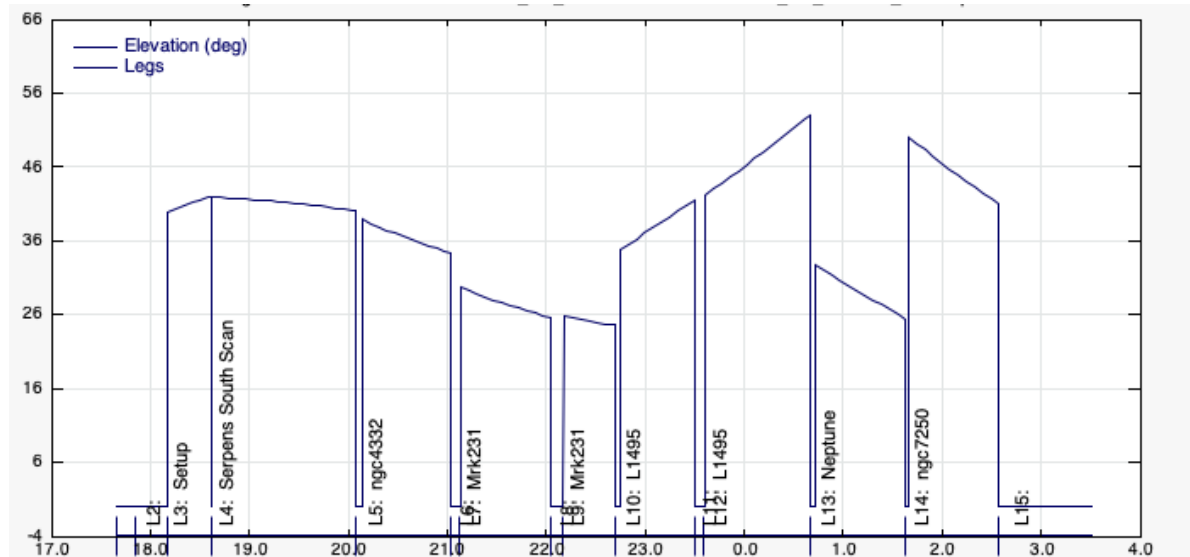
Flight 611 Mission ID 2019-09-18_HA_F611
 Stuttgart to Stuttgart Take off date UTC: 18-SEP-2019
 Departure UTC: 17:39 Arrival UTC: 03:17

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	19h52m28.37s	01d00m20.4s	18:12	27	
4	07_0172	Winston	Serpens South	18h29m56.50s	-02d00m36.3s	18:39	87	
5	07_0135	Casey	ngc4332	12h22m46.76s	65d50m37.6s	20:10	54	
7	07_0032	Lopez-Rodriguez	Mrk231	12h56m14.23s	56d52m25.2s	21:09	55	
9	07_0032	Lopez-Rodriguez	Mrk231	12h56m14.23s	56d52m25.2s	22:12	31	
10	07_0017	Li	L1495	04h18m13.00s	27d32m29.4s	22:46	45	Difficulties guiding.
12	07_0017	Li	L1495	04h18m13.00s	27d32m29.4s	23:38	63	Difficulties guiding.
13	90_0083	Calibration	Neptune	23h13m03.50s	-06d11m19.4s	0:45	55	
14	07_0135	Casey	ngc7250	22h18m17.80s	40d33m44.6s	1:41	55	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



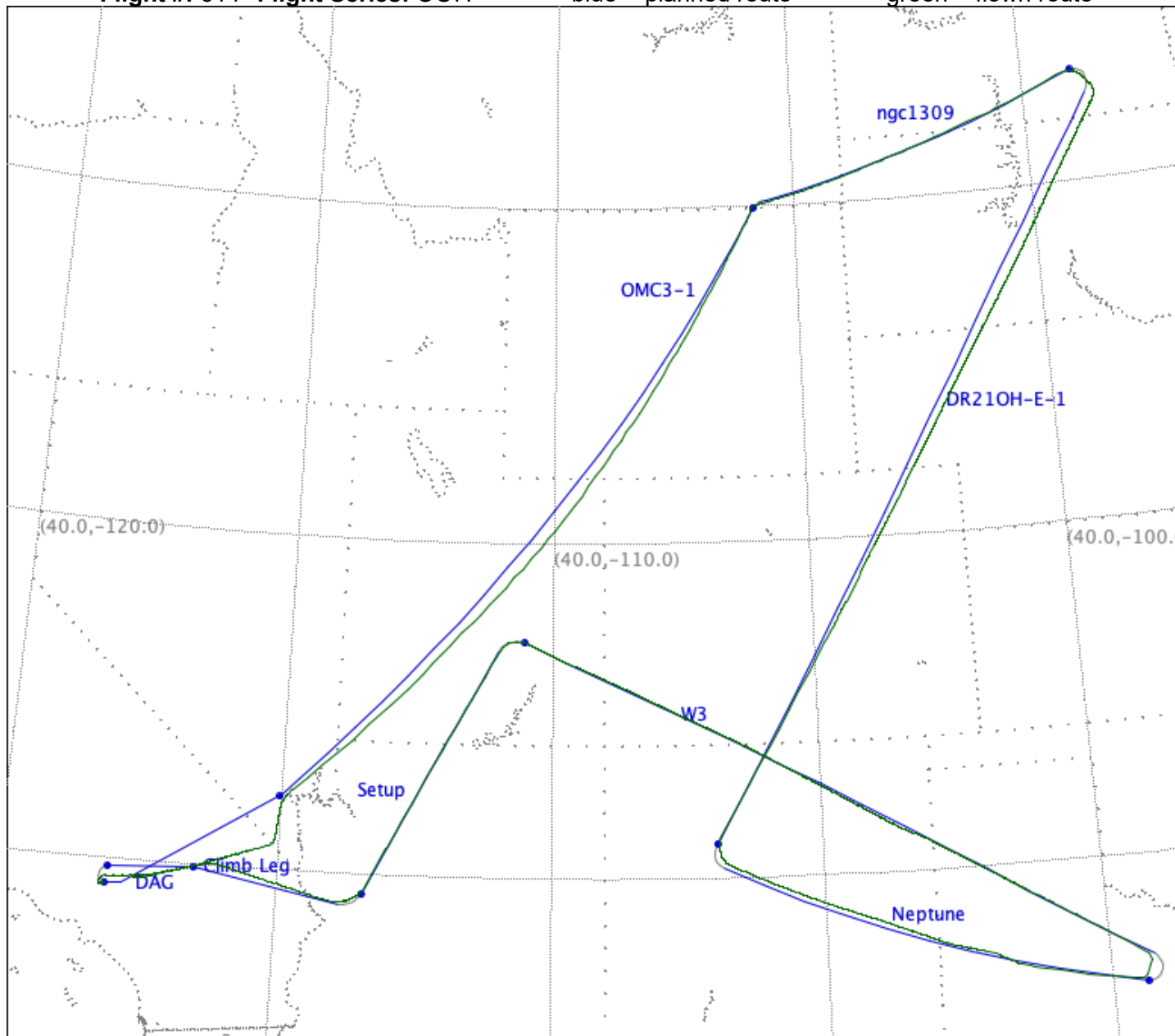
MISSION ID: 2019-10-01_HA_F614

Date: 2019-10-01 UT Instrument: HAWC+

Flight #: 614 Flight Series: OC7F

blue = planned route

green = flown route

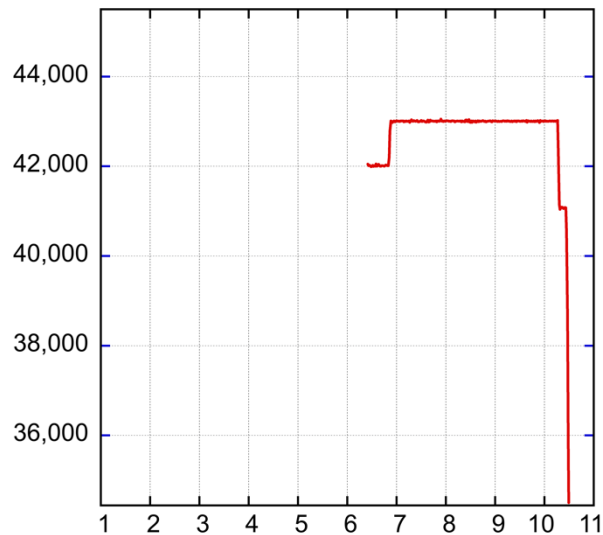


Flight notes: High clouds on first two legs.

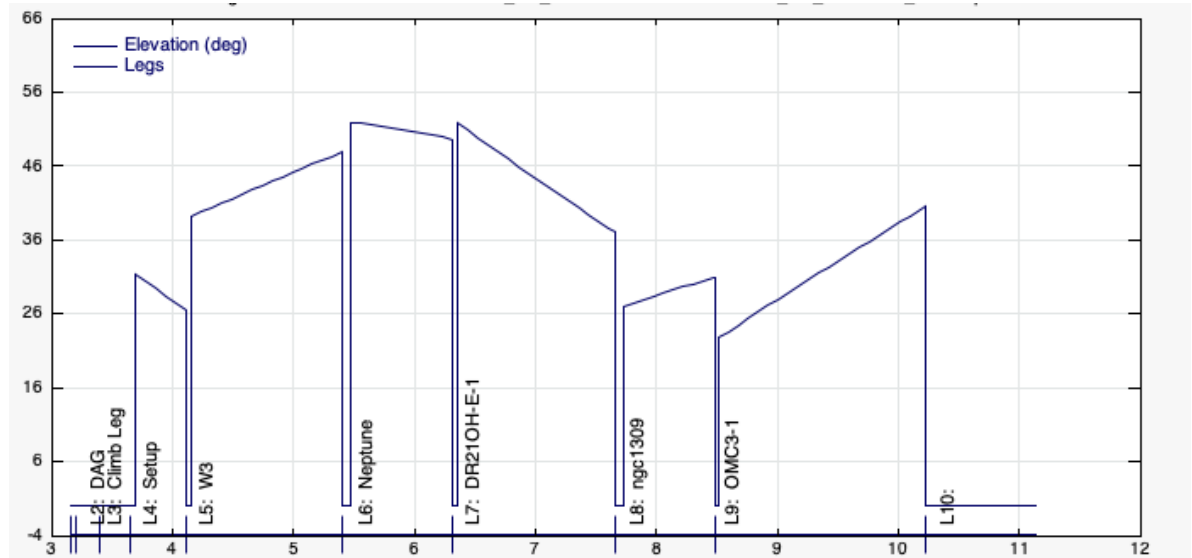
Flight 614 Mission ID 2019-10-01_HA_F614
 Palmdale to Palmdale Take off date UTC: 01-OCT-2019
 Departure UTC: 03:11 Arrival UTC: 10:55

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	15h51m13.93s	35d39m26.6s	3:41	25	
5	90_0086	Calibration	W3	02h26m07.71s	62d01m37.0s	4:09	75	Clouds; 65% of planned data obtained
6	90_0083	Calibration	Neptune	23h11m51.97s	-06d18m49.5s	5:28	50	Clouds; 25% of planned data obtained
7	07_0013	Clemens	DR21OH	20h39m00.70s	42d21m58.7s	6:21	78	
8	07_0135	Casey	ngc1309	03h22m06.56s	-15d24m00.2s	7:43	46	
9	07_0026	Heese	OMC3	05h35m20.00s	-05d01m00.0s	8:30	103	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



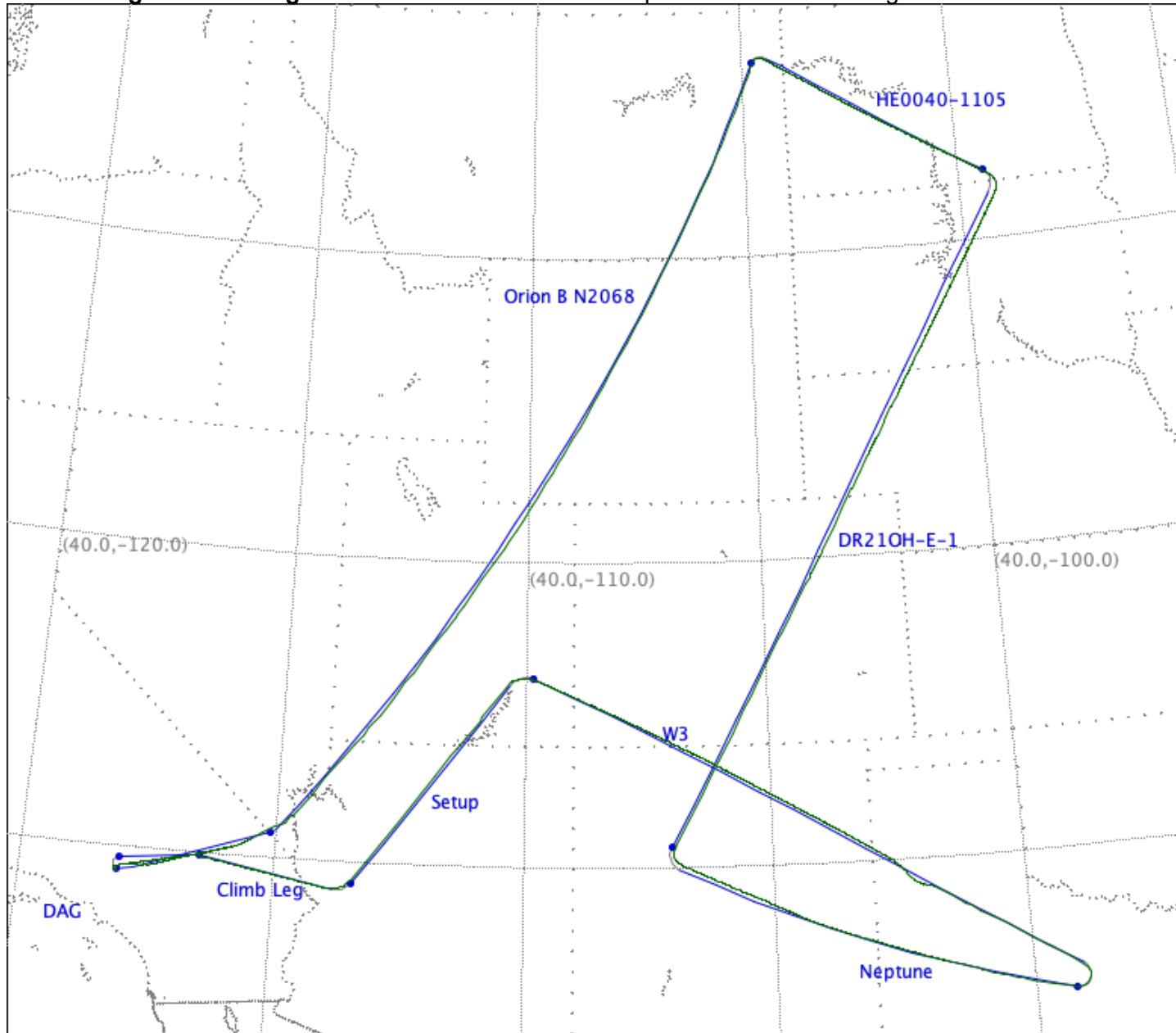
MISSION ID: 2019-10-02_HA_F615

Date: 2019-10-02 UT Instrument: HAWC+

Flight #: 615 Flight Series: OC7F

blue = planned route

green = flown route

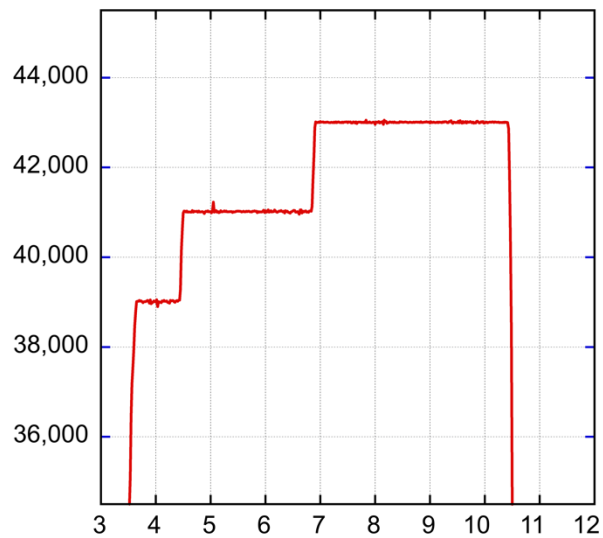


Flight notes: High clouds on first two legs.

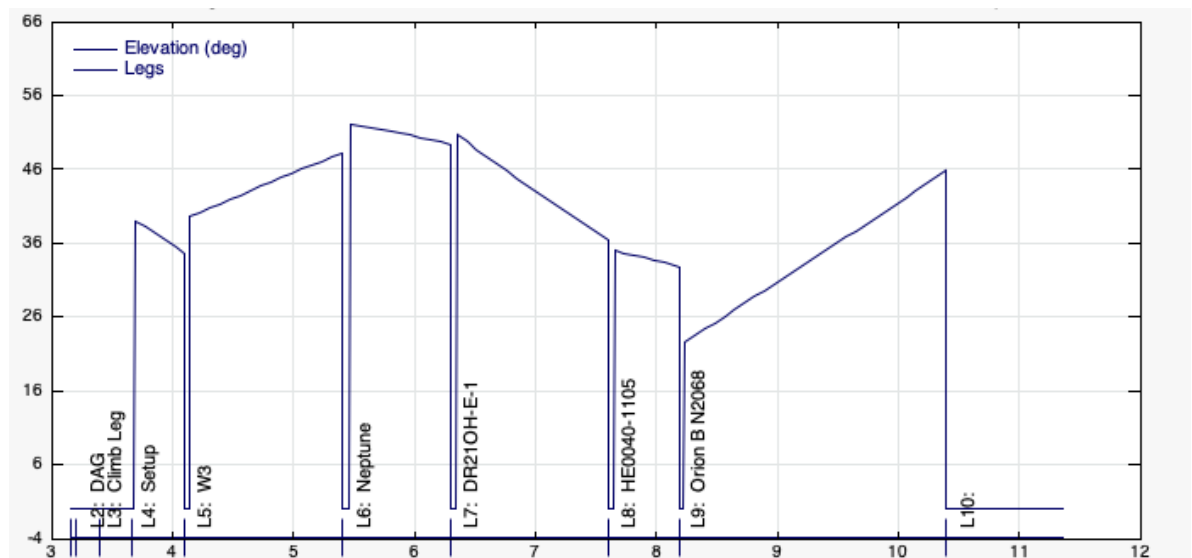
Flight 615 Mission ID 2019-10-02_HA_F615
 Palmdale to Palmdale Take off date UTC: 02-OCT-2019
 Departure UTC: 03:10 Arrival UTC: 10:54

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	16h19m44.44s	46d18m48.1s	3:40	25	
5	90_0086	Calibration	W3	02h26m07.71s	62d01m37.0s	4:08	75	Clouds; 65% of planned data collected
6	90_0083	Calibration	Neptune	23h11m46.37s	-06d19m24.5s	5:27	50	Clouds; 50% of planned data collected
7	07_0013	Clemens	DR21OH	20h39m00.70s	42d21m58.7s	6:20	75	
8	07_0193	Husemann	HE0040-1105	00h42m36.86s	-10d49m22.1s	7:38	32	
9	07_0130	Fanciullo	Orion B N2068	05h47m05.04s	00d21m51.7s	8:13	130	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



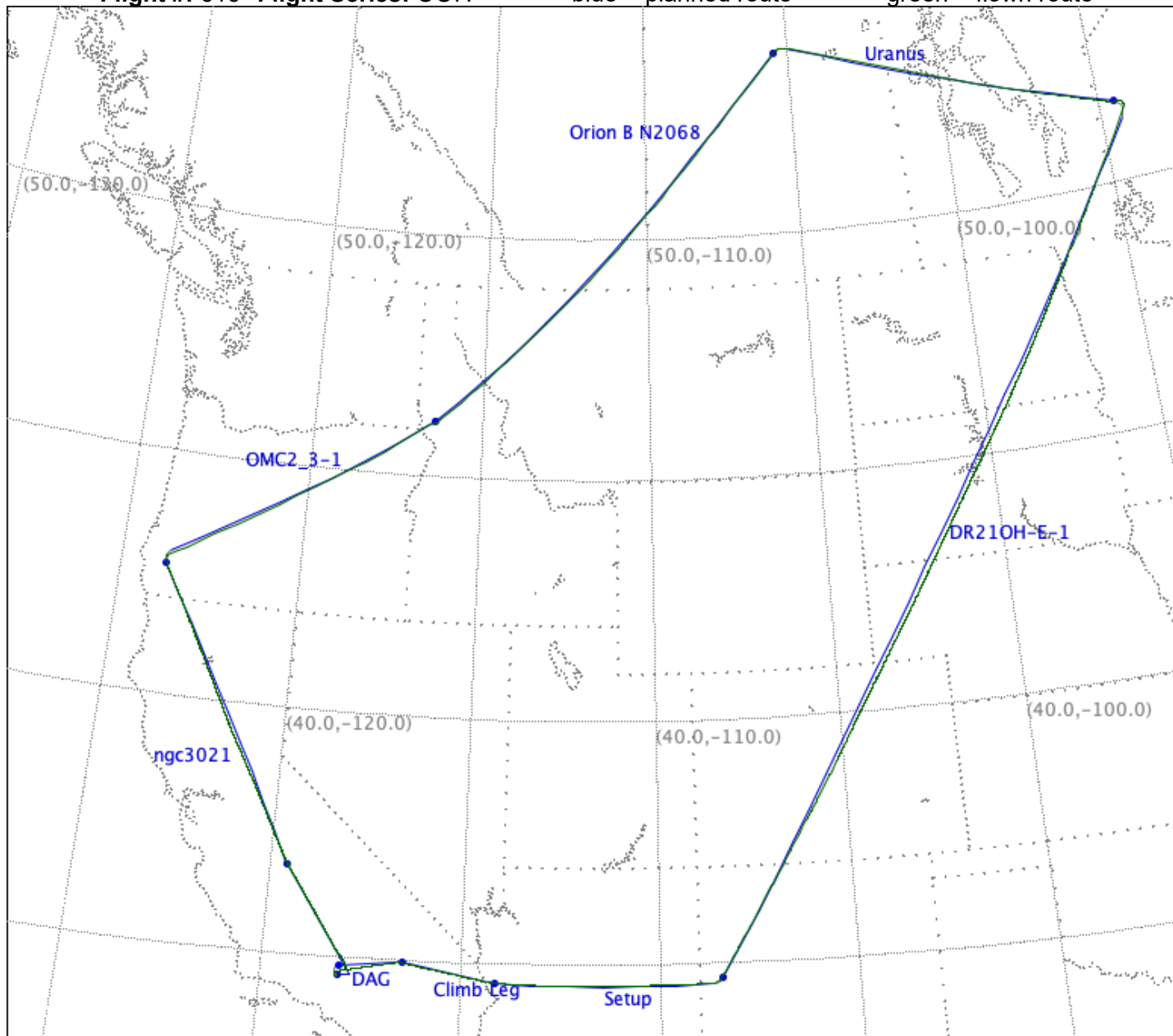
MISSION ID: 2019-10-03_HA_F616

Date: 2019-10-03 UT Instrument: HAWC+

Flight #: 616 Flight Series: OC7F

blue = planned route

green = flown route

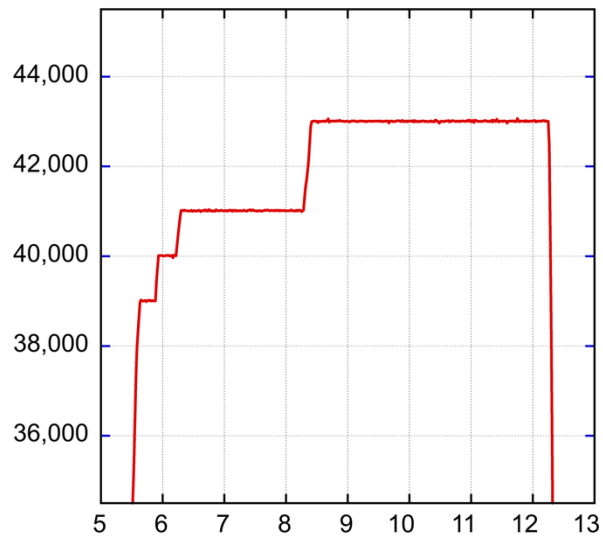


**Flight notes:
No irregularities.**

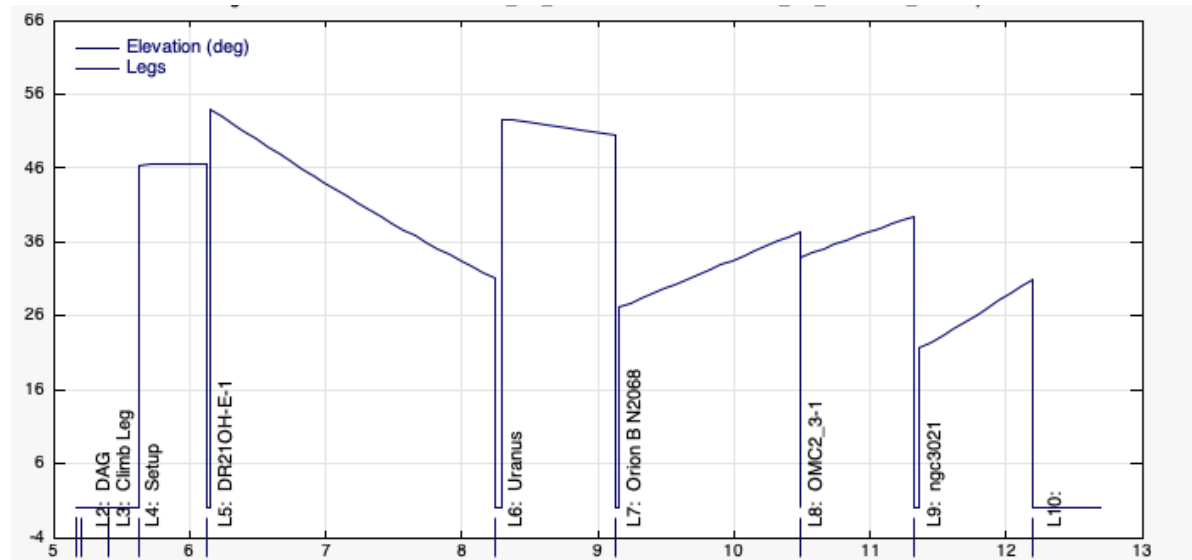
Flight 616 Mission ID 2019-10-03_HA_F616
 Palmdale to Palmdale Take off date UTC: 03-OCT-2019
 Departure UTC: 05:10 Arrival UTC: 12:38

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	23h39m20.85s	77d37m56.2s	5:37	30	
5	07_0013	Clemens	DR21OH	20h39m00.70s	42d21m58.7s	6:09	125	
6	90_0083	Calibration	Uranus	02h12m47.58s	12d48m12.2s	8:17	50	
7	07_0130	Fanciullo	Orion B N2068	05h47m05.04s	00d21m51.7s	9:09	80	
8	07_0237	Michail	OMC2	05h35m24.11s	-05d06m46.4s	10:29	50	
9	07_0135	Casey	ngc3021	09h50m57.15s	33d33m13.1s	11:21	50	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



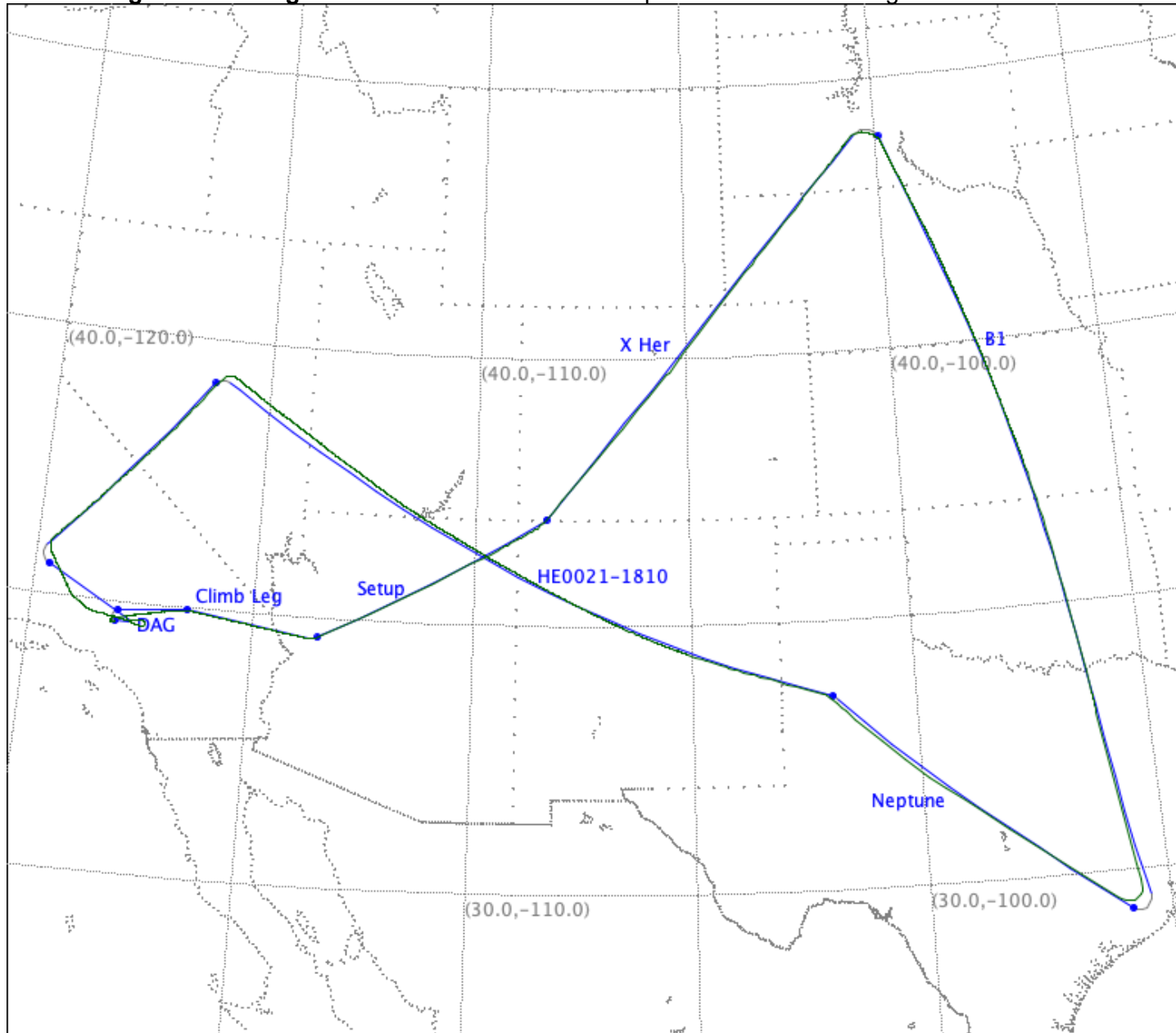
MISSION ID: 2019-10-04_HA_F617

Date: 2019-10-04 UT Instrument: HAWC+

Flight #: 617 Flight Series: OC7F

blue = planned route

green = flown route



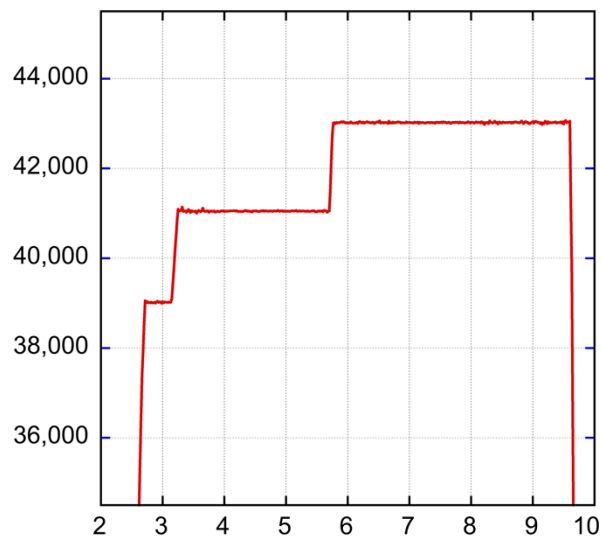
Flight notes:

Telescope issue leading to elongated images plagued most of flight.

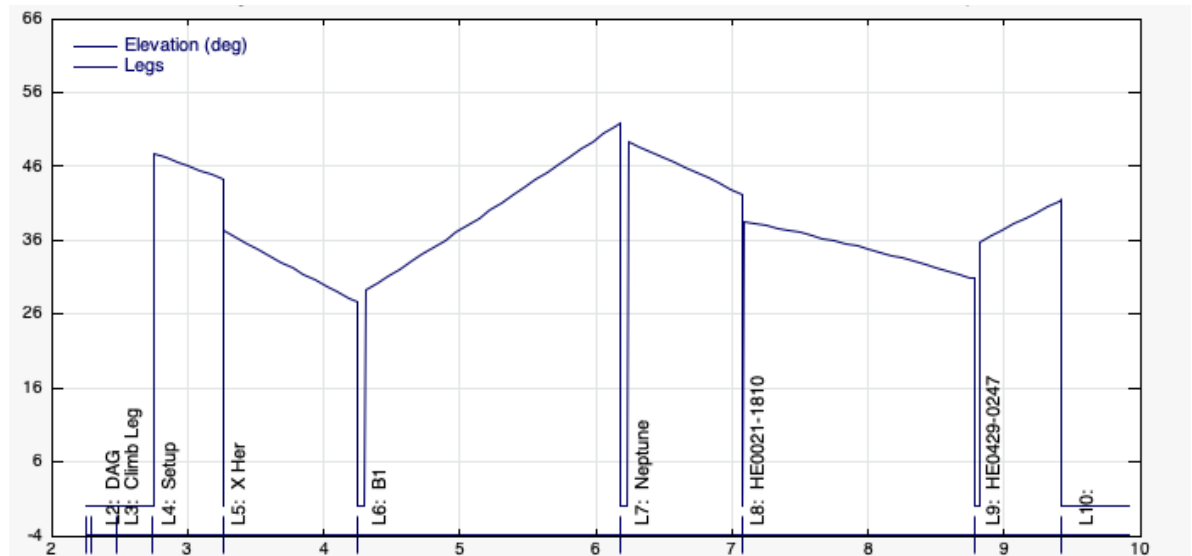
Flight 617 Mission ID 2019-10-04_HA_F617
 Palmdale to Palmdale Take off date UTC: 04-OCT-2019
 Departure UTC: 02:13 Arrival UTC: 09:59

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	16h40m55.12s	64d35m20.6s	2:44	30	
5	75_0039	Discretionary	X Her	16h02m39.17s	47d14m25.3s	3:15	59	Problems with image quality due to telescope issue; little data collected
6	07_0183	Sadavoy	B1	03h33m11.79s	31d07m20.7s	4:17	112	Time lost diagnosing image elongation issue; 60% of planned data collected
7	90_0083	Calibration	Neptune	23h11m35.10s	-06d20m34.7s	6:13	50	Time lost diagnosing image elongation issue; 50% of planned data collected
8	07_0193	Husemann	HE0021-1810	00h23m46.79s	-17d58m02.9s	7:04	102	
9	07_0193	Husemann	HE0429-0247	04h31m37.07s	-02d41m23.9s	8:48	36	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



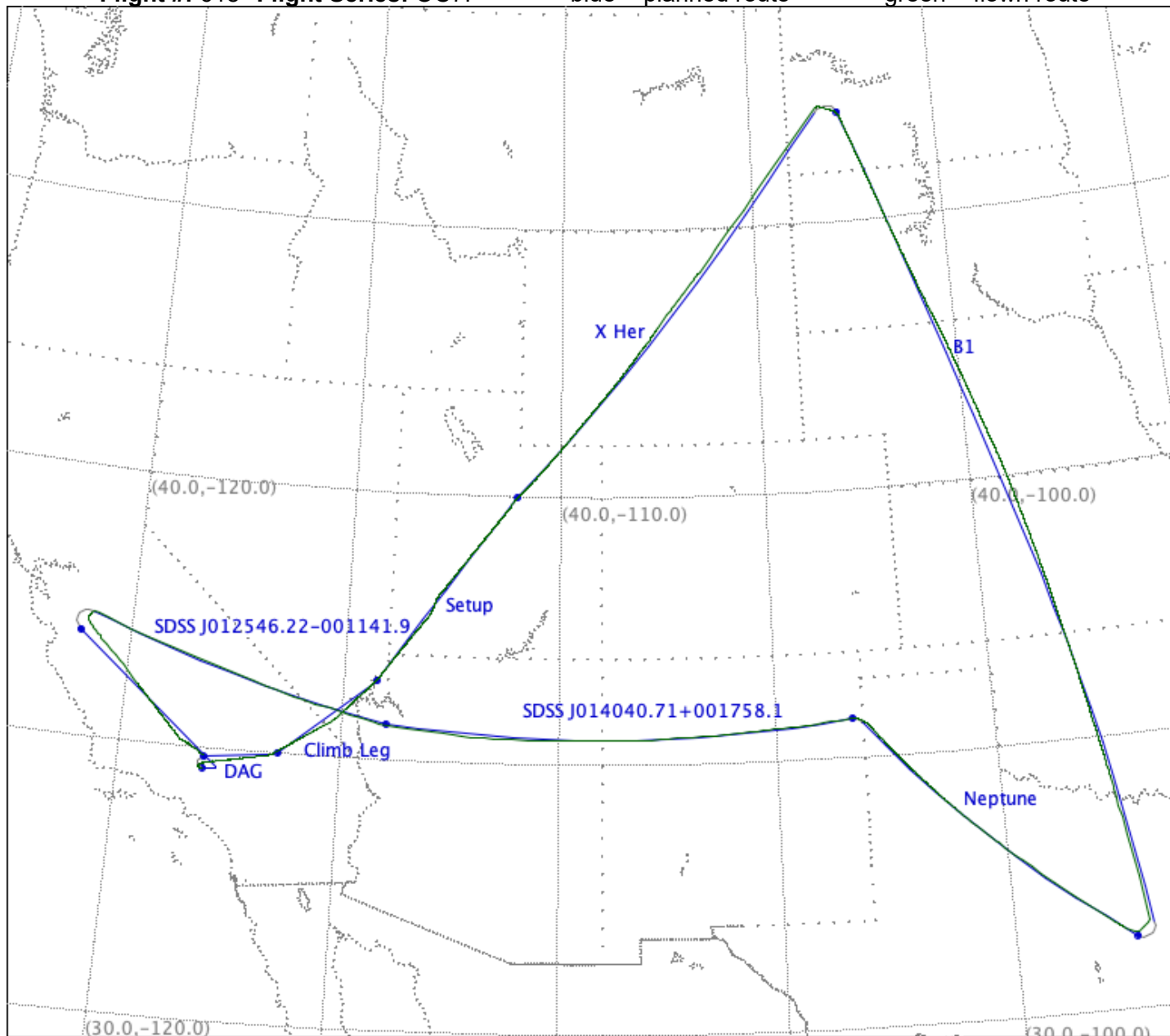
MISSION ID: 2019-10-05_HA_F618

Date: 2019-10-05 UT Instrument: HAWC+

Flight #: 618 Flight Series: OC7F

blue = planned route

green = flown route

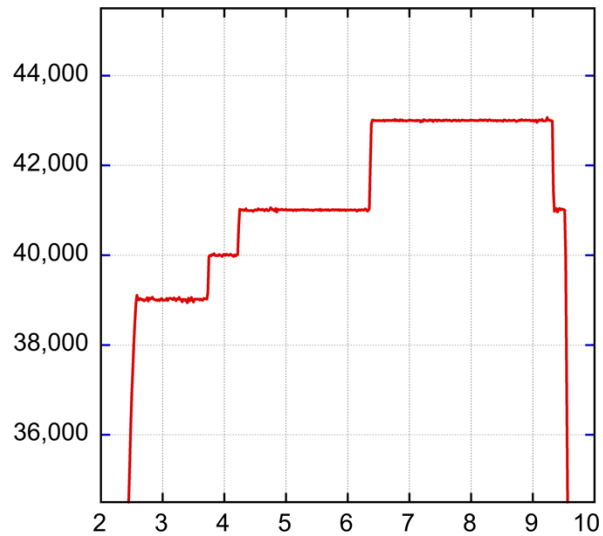


Flight notes:
No irregularities.

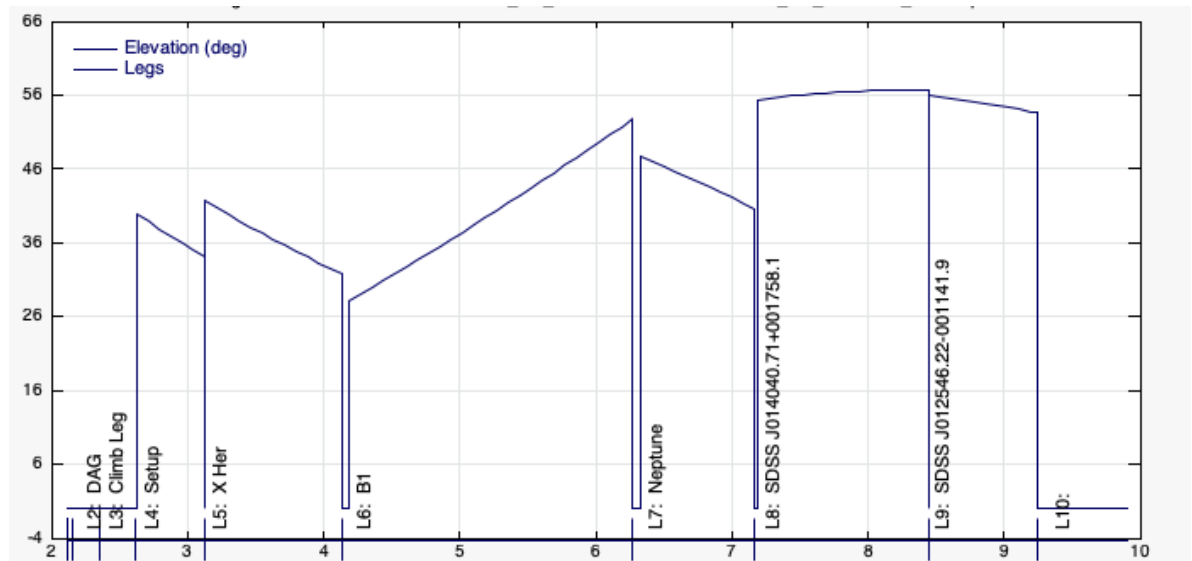
Flight 618 Mission ID 2019-10-05_HA_F618
 Palmdale to Palmdale Take off date UTC: 05-OCT-2019
 Departure UTC: 02:05 Arrival UTC: 09:55

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	15h31m46.98s	40d53m57.6s	2:37	30	
5	75_0039	Discretionary	X Her	16h02m39.17s	47d14m25.3s	3:07	60	
6	07_0183	Sadavoy	B1	03h33m11.79s	31d07m20.7s	4:11	125	
7	90_0083	Calibration	Neptune	23h11m29.66s	-06d21m08.4s	6:19	50	
8	07_0096	Kirkpatrick	SDSS J014040.71+001758.1	01h40m40.71s	00d17m58.2s	7:11	75	
9	07_0096	Kirkpatrick	SDSS J012546.22-001141.9	01h25m46.23s	-00d11m41.9s	8:26	48	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



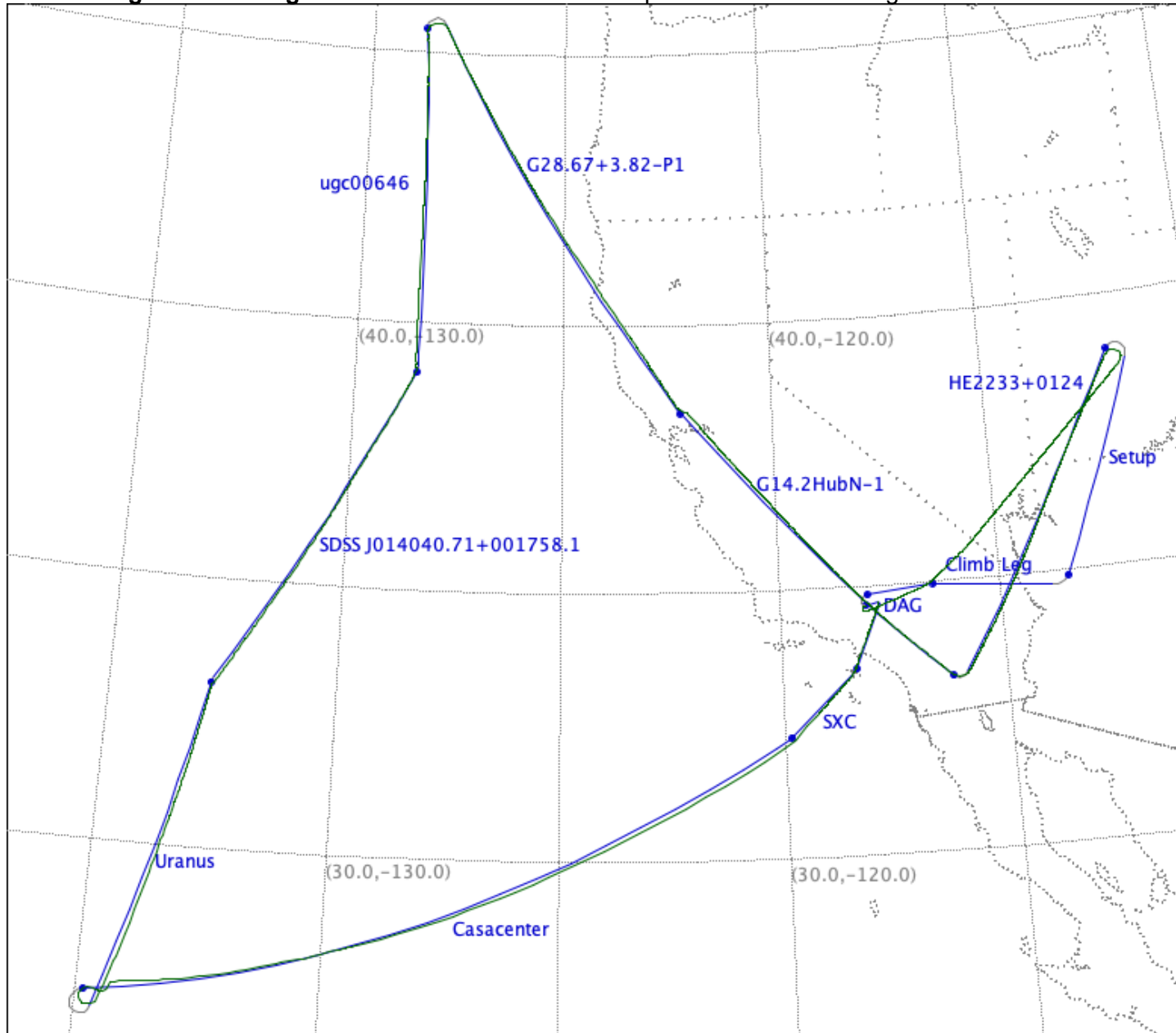
MISSION ID: 2019-10-08_HA_F619

Date: 2019-10-08 UT Instrument: HAWC+

Flight #: 619 Flight Series: OC7F

blue = planned route

green = flown route



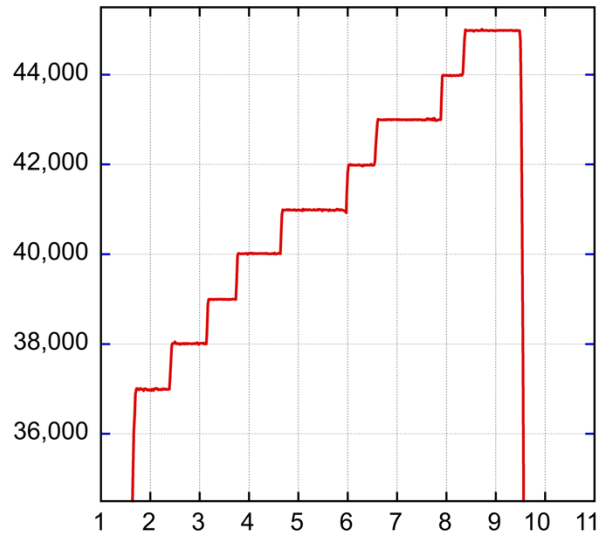
Flight notes:

Late departure; higher water vapor levels throughout flight.

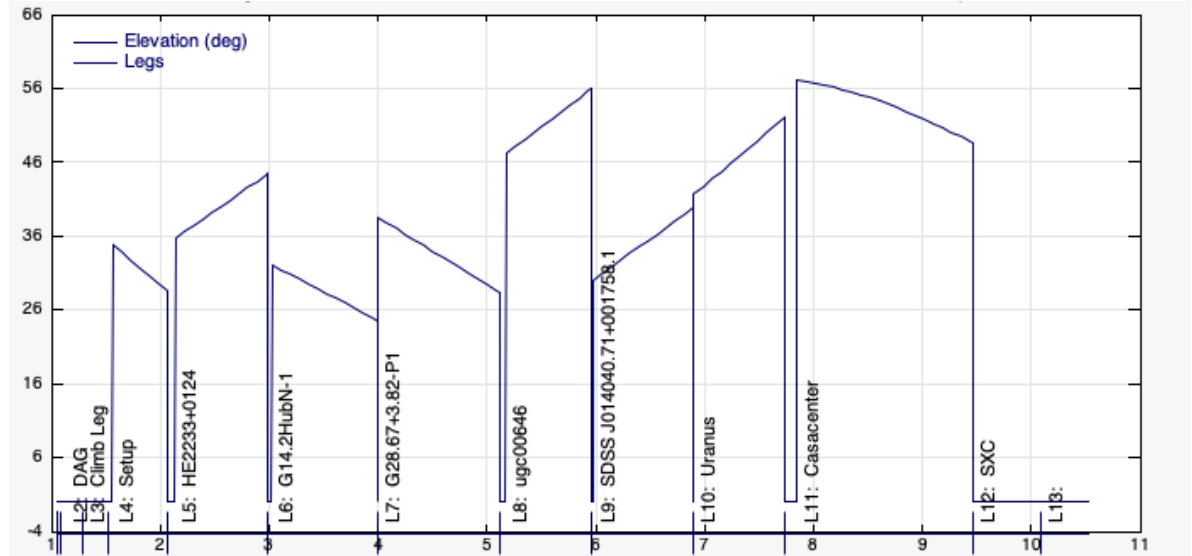
Flight 619 Mission ID 2019-10-08_HA_F619
 Palmdale to Palmdale Take off date UTC: 08-OCT-2019
 Departure UTC: 01:13 Arrival UTC: 09:58

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	14h44m59.22s	27d04m27.2s	1:32	30	
5	07_0193	Husemann	HE2233+0124	22h35m41.90s	01d39m33.6s	2:07	51	
6	07_0066	Santos	G14.2Hub N	18h18m12.56s	-16d54m00.8s	3:00	58	
7	07_0238	Pillai	G28.67+3.82	18h30m05.04s	-02d02m50.5s	3:59	67	
8	07_0135	Casey	ugc00646	01h03m26.39s	32d14m14.5s	5:09	47	
9	07_0096	Kirkpatrick	SDSS J014040.71+001758.1	01h40m40.71s	00d17m58.2s	5:57	55	
10	90_0083	Calibration	Uranus	02h12m05.69s	12d44m34.5s	6:53	50	
11	07_0047	Rho	Cas A center	23h23m28.66s	58d48m53.1s	7:50	97	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



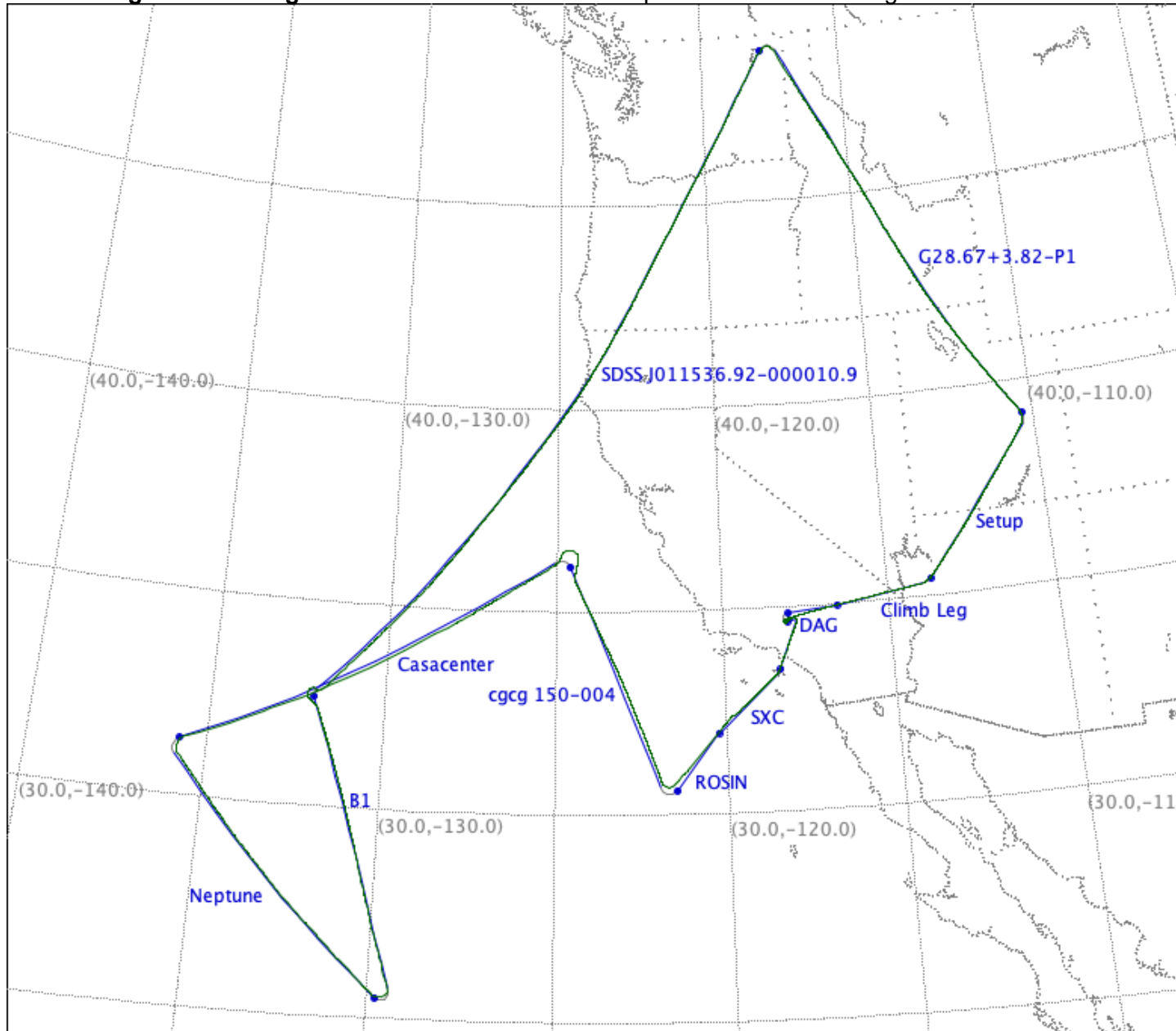
MISSION ID: 2019-10-09_HA_F620

Date: 2019-10-09 UT Instrument: HAWC+

Flight #: 620 Flight Series: OC7F

blue = planned route

green = flown route

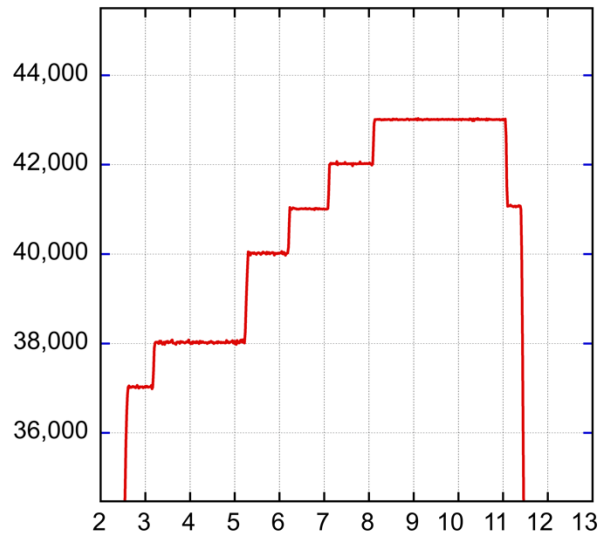


Flight notes: No irregularities.

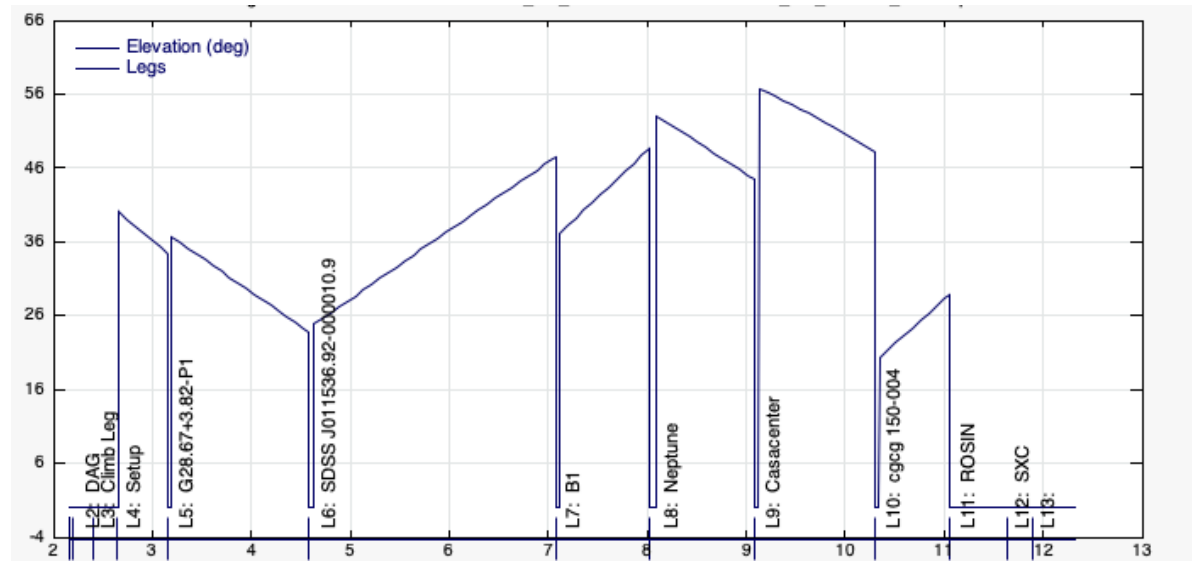
Flight 620 Mission ID 2019-10-09_HA_F620
 Palmdale to Palmdale Take off date UTC: 20-JUN-2019
 Departure UTC: 02:07 Arrival UTC: 12:01

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	15h52m40.54s	42d27m05.5s	2:38	30	
5	07_0238	Pillai	G28.67+3.82	18h30m05.04s	-02d02m50.5s	3:10	83	
6	07_0096	Kirkpatrick	SDSS J011536.92-000010.9	01h15m36.93s	-00d00m11.0s	4:37	147	
7	07_0183	Sadavoy	B1	03h33m11.79s	31d07m20.7s	7:05	55	Only 20% of planned data collected due to guiding difficulties (faint guide stars)
8	90_0083	Calibration	Neptune	23h11m08.08s	-06d23m22.1s	8:04	59	Only 20% of planned data collected due to telescope pointing issues
9	07_0047	Rho	Cas A center	23h23m28.66s	58d48m53.1s	9:06	70	
10	07_0135	Casey	cgcg 150-004	08h36m15.42s	28d03m37.3s	10:19	42	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



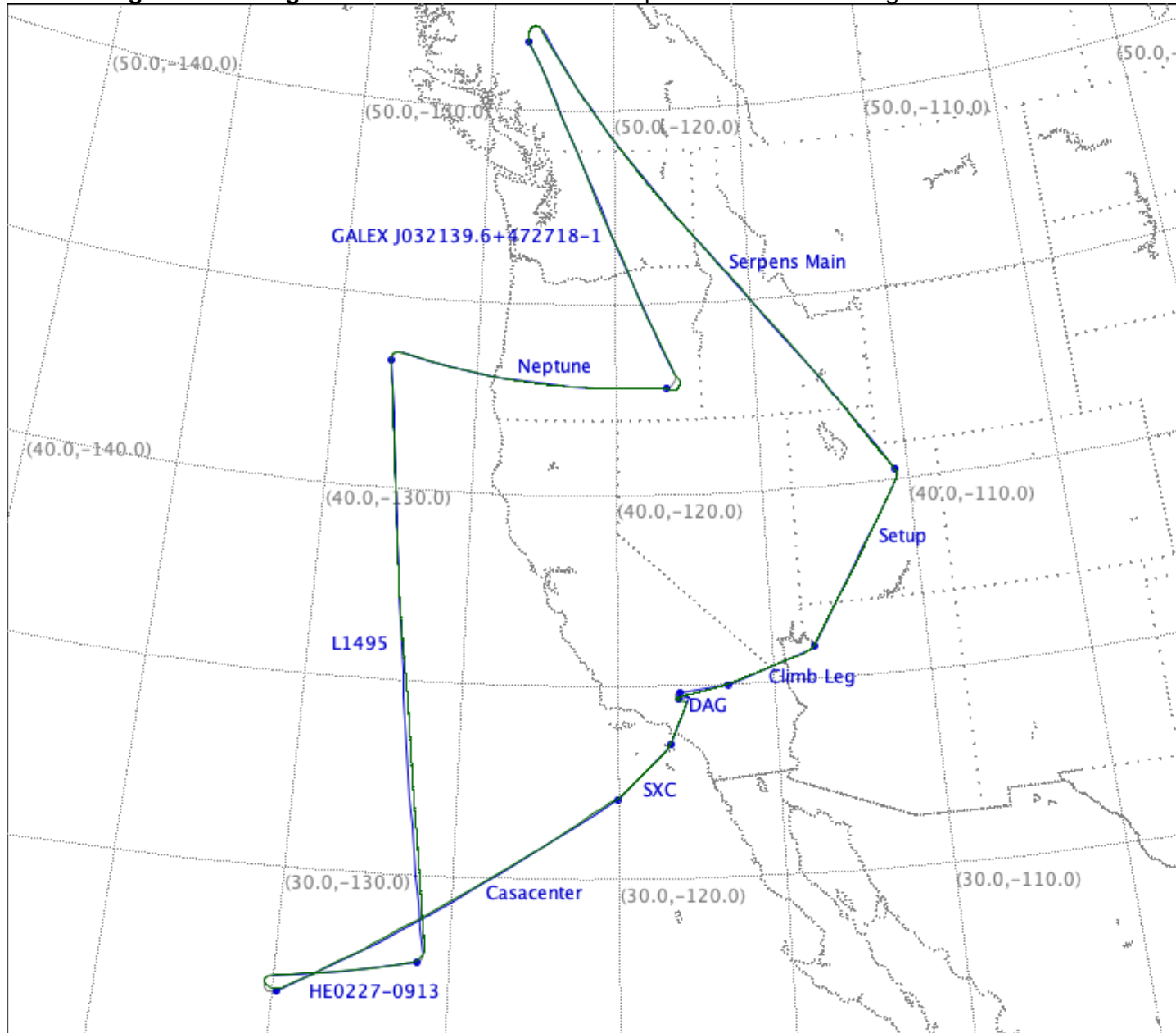
MISSION ID: 2019-10-10_HA_F621

Date: 2019-10-10 UT Instrument: HAWC+

Flight #: 621 Flight Series: OC7F

blue = planned route

green = flown route

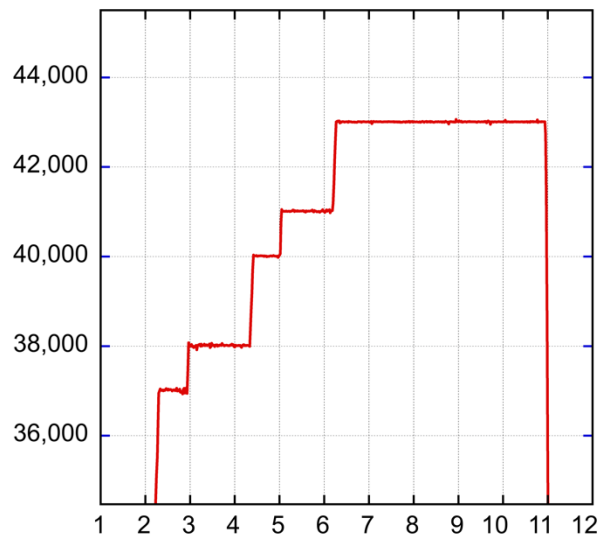


Flight notes: No irregularities.

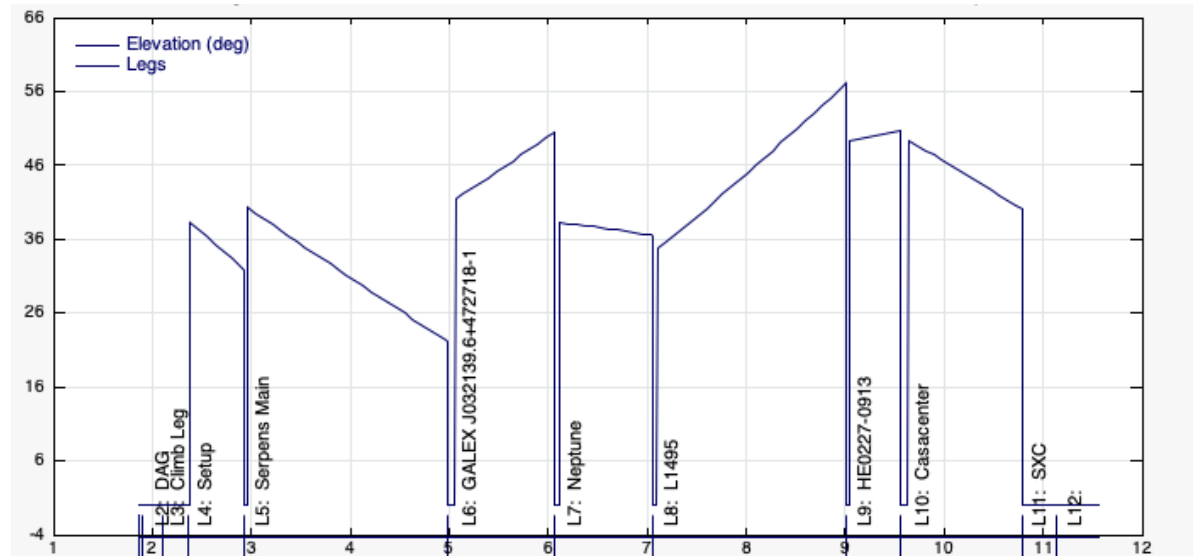
Flight 621 Mission ID 2019-10-10_HA_F621
 Palmdale to Palmdale Take off date UTC: 21-JUN-2021
 Departure UTC: 01:51 Arrival UTC: 11:18

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	15h39m22.67s	36d38m08.9s	2:22	33	
5	07_0130	Fanciullo	Serpens Main	18h29m59.37s	01d12m52.0s	2:56	121	
6	07_0109	Vos	GALEX J032139.6+472718	03h21m39.63s	47d27m18.8s	5:02	60	
7	90_0083	Calibration	Neptune	23h11m03.38s	-06d23m51.1s	6:06	56	
8	07_0017	Li	L1495	04h18m13.00s	27d32m29.4s	7:05	115	
9	07_0193	Husemann	HE0227-0913	02h30m05.52s	-08d59m53.2s	9:02	30	
10	07_0047	Rho	Cas A center	23h23m28.66s	58d48m53.1s	9:38	69	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



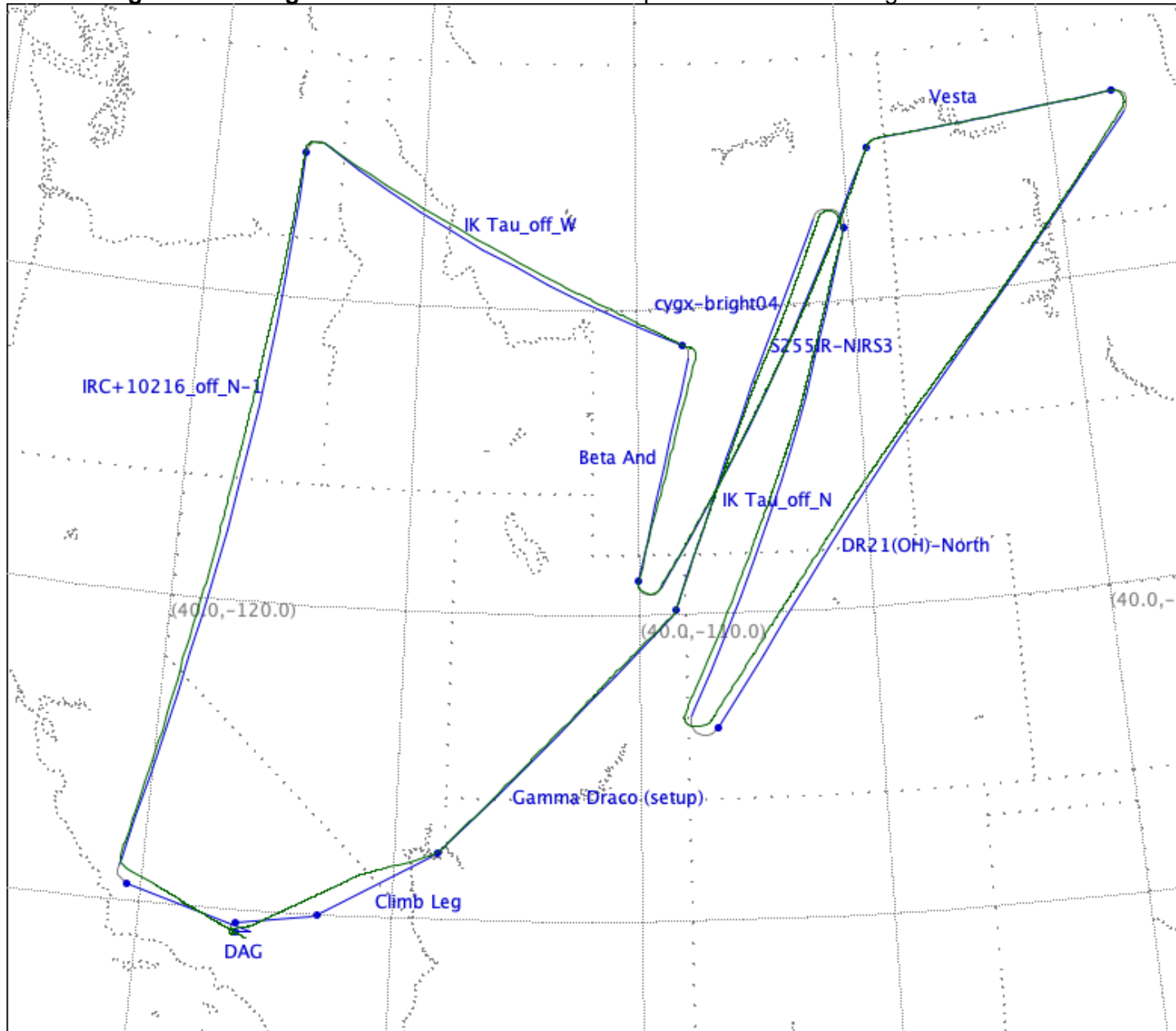
MISSION ID: 2019-10-15_FO_F622

Date: 2019-10-15 UT Instrument: FORCAST

Flight #: 622 Flight Series: OC7G

blue = planned route

green = flown route

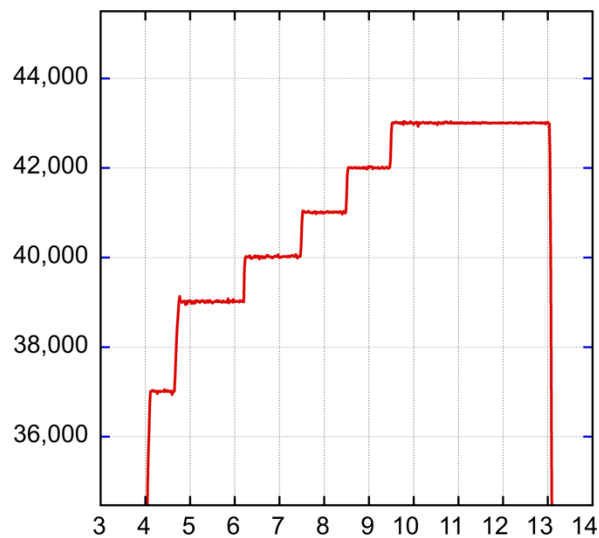


Flight notes: Guiding challenges on multiple legs.

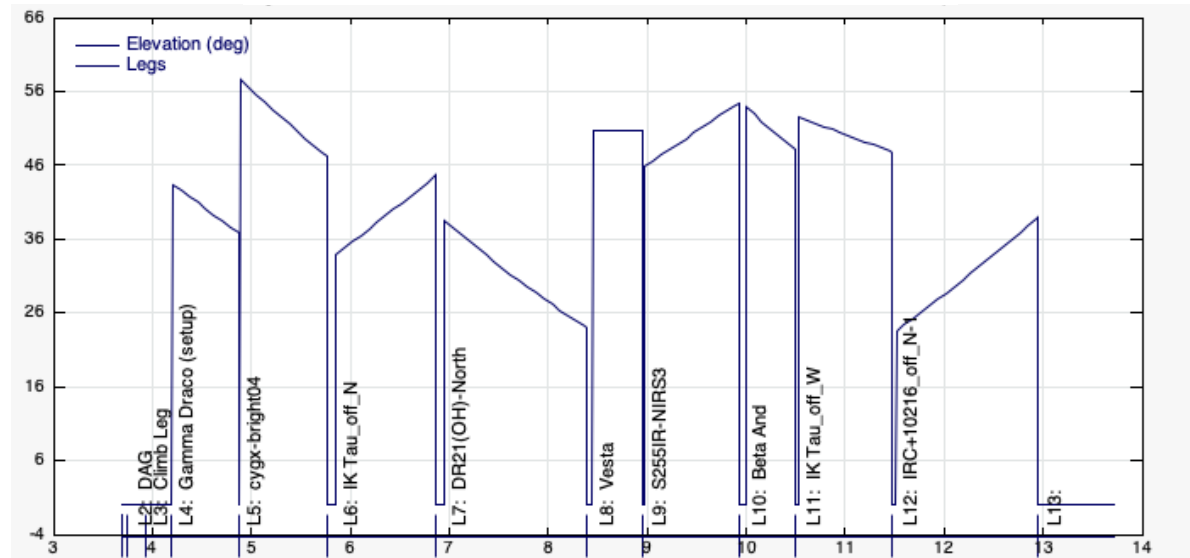
Flight 622 Mission ID 2019-10-15_FO_F622
 Palmdale to Palmdale Take off date UTC: 15-OCT-2019
 Departure UTC: 03:41 Arrival UTC: 13:34

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 87833	17h56m36.37s	51d29m20.0s	4:12	40	
5	07_0225	Gutermuth	Cyg X	20h20m39.00s	39d38m03.0s	4:52	53	Telescope door stuck at end of leg, some vignetting on last files taken
6	07_0188	Andersson	IK Tau	03h53m29.45s	11d25m57.0s	5:50	61	Acquisition/guiding difficult due to nearby Moon; 10min lost
7	07_0225	Gutermuth	DR21(OH)-North	20h39m03.00s	42d25m30.0s	6:56	86	
8	90_0072	Calibration	Vesta	03h42m42.98s	09d50m41.2s	8:26	30	Acquisition/guiding difficult due to nearby Moon; 7min lost
9	06_0182	Stecklum	S255IR-NIRS3	06h12m54.01s	17d59m23.1s	8:58	57	
10	90_0071	Calibration	Beta And	01h09m43.92s	35d37m14.0s	9:59	30	
11	07_0188	Andersson	IK Tau	03h53m21.87s	11d24m21.7s	10:31	56	Turbulence and pointing issues.
12	07_0188	Andersson	IRC+10216	09h47m57.41s	13d16m43.1s	11:31	86	Observation scripting errors led to loss of 20min

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



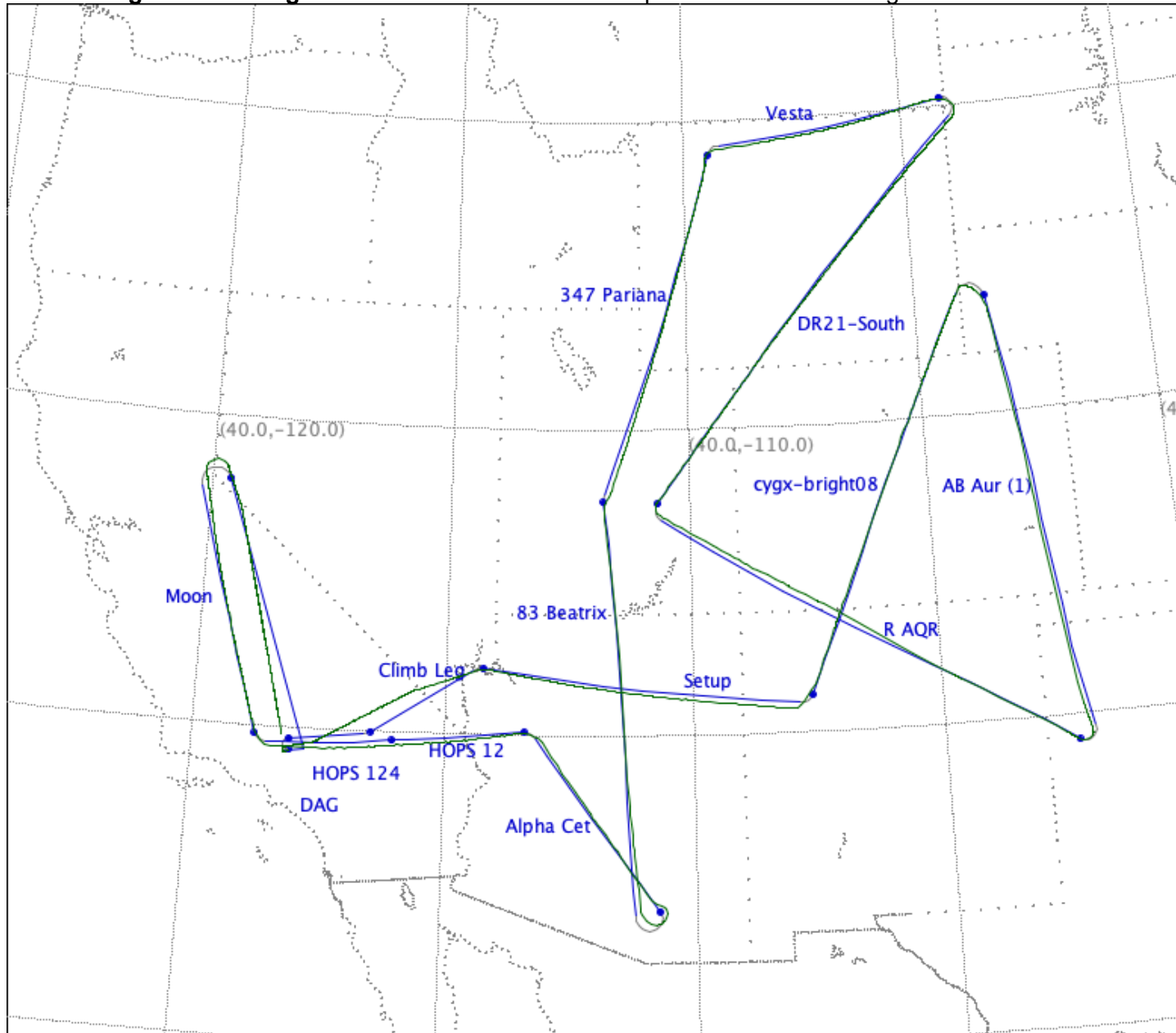
MISSION ID: 2019-10-16_FO_F623

Date: 2019-10-16 UT Instrument: FORCAST

Flight #: 623 Flight Series: OC7G

blue = planned route

green = flown route

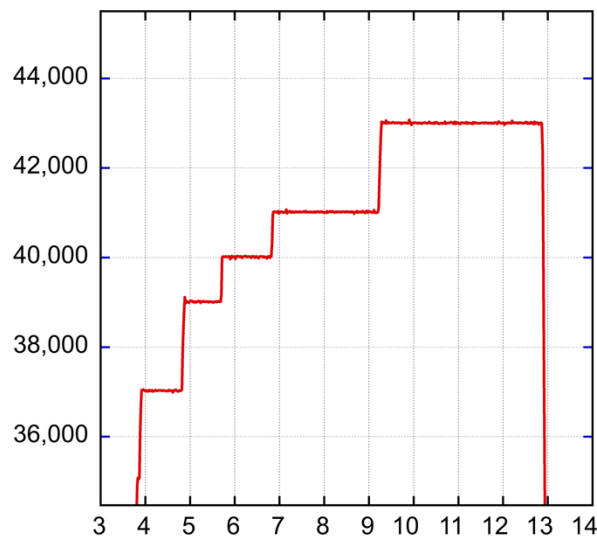


Flight notes: No irregularities.

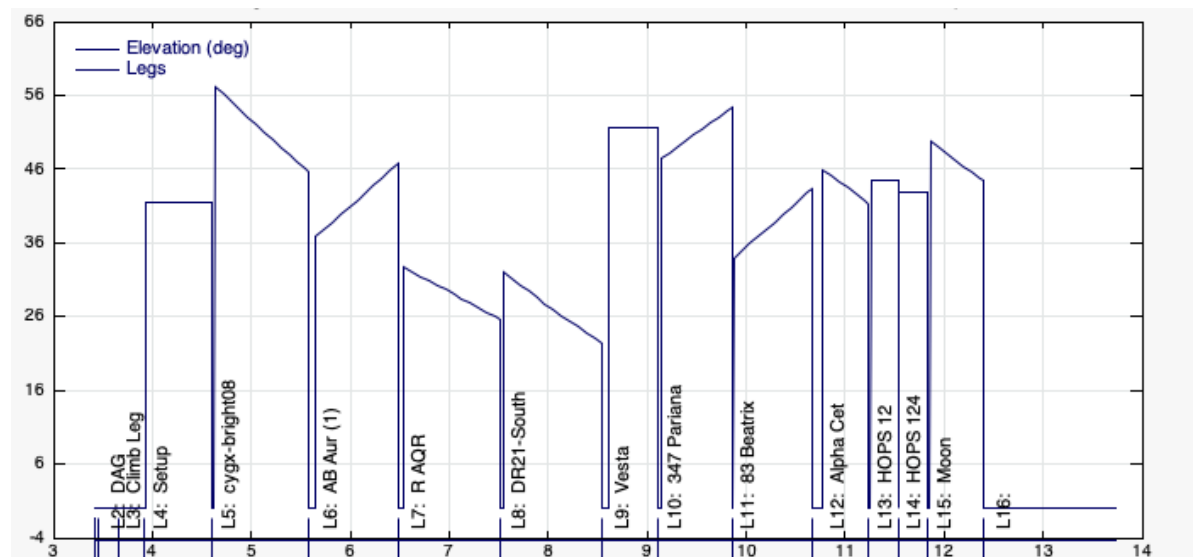
Flight 623 Mission ID 2019-10-16_FO_F623
 Palmdale to Palmdale Take off date UTC: 16-OCT-2019
 Departure UTC: 03:24 Arrival UTC: 13:16

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 113116	22h54m24.97s	84d20m46.2s	3:56	40	
5	07_0225	Gutermuth	Cyg X	20h22m22.00s	39d57m55.0s	4:38	57	
6	07_0049	Shuping	AB Aur	04h55m45.80s	30d33m04.0s	5:39	50	Strong turbulence mid-leg affecting image quality
7	07_0097	Omelian	R AQR	23h43m49.46s	-15d17m04.1s	6:32	58	
8	07_0225	Gutermuth	DR21-South	20h39m01.00s	42d19m30.0s	7:33	60	
9	90_0072	Calibration	Vesta	03h42m06.84s	09d47m29.4s	8:36	30	Acquisition/guiding difficult due to nearby Moon; 10min lost
10	07_0165	Landsman	347 Pariana	06h27m50.94s	20d36m38.6s	9:08	43	
11	07_0165	Landsman	83 Beatrix	08h34m30.81s	23d36m12.9s	9:52	48	
12	90_0071	Calibration	Alpha Cet	03h02m16.77s	04d05m23.1s	10:46	28	
13	07_0200	Fischer	HOPS 12	05h35m08.60s	-05d55m53.9s	11:16	17	
14	07_0200	Fischer	HOPS 124	05h39m19.98s	-07d26m11.2s	11:33	17	
15	07_0061	Lucey	Moon	03h23m00.04s	14d37m43.6s	11:52	32	Acquisition/guiding difficulties led to significant loss of observing time

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



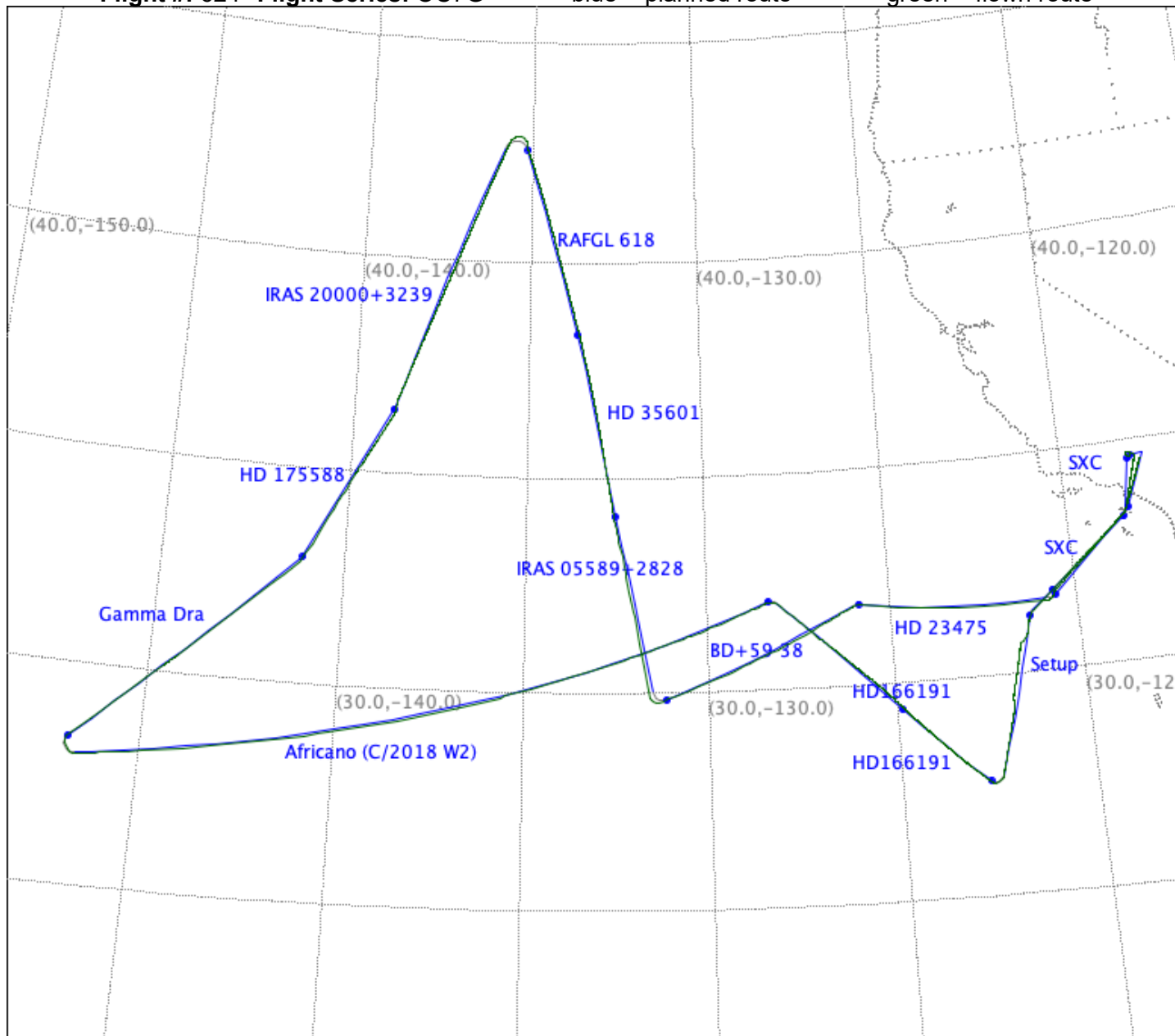
MISSION ID: 2019-10-17_FO_F624

Date: 2019-10-17 UT Instrument: FORCAST

Flight #: 624 Flight Series: OC7G

blue = planned route

green = flown route

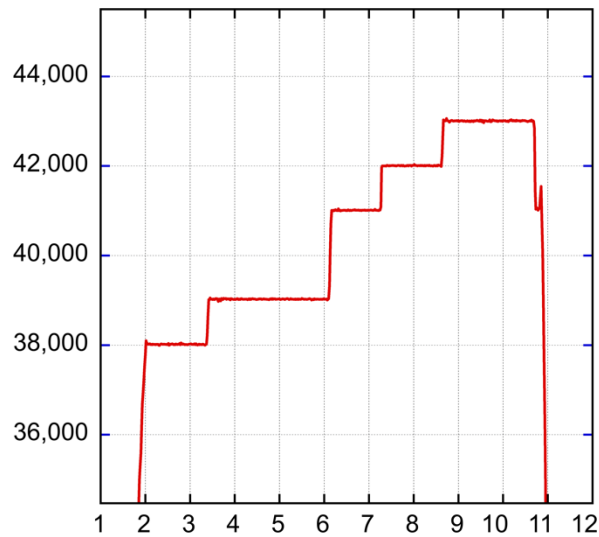


Flight notes: No irregularities.

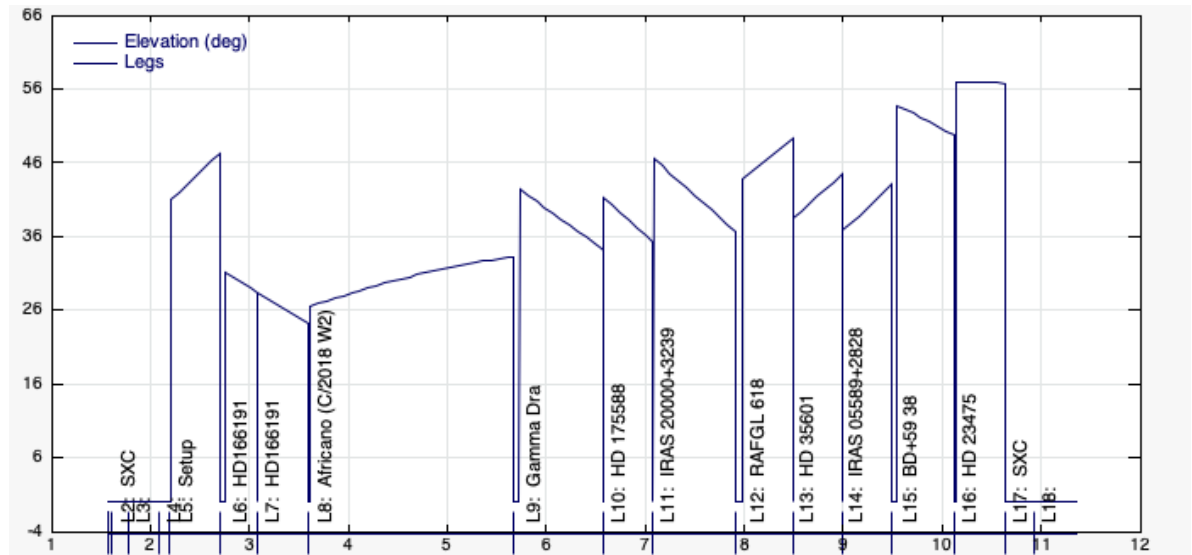
Flight 624 Mission ID 2019-10-17_FO_F624
 Palmdale to Palmdale Take off date UTC: 17-OCT-2019
 Departure UTC: 01:32 Arrival UTC: 11:20

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	22h55m13.67s	08d48m58.2s	2:14	30	
6	75_0040	Discretionary	HD166191	18h10m30.34s	-23d34m00.3s	2:47	20	
7	75_0040	Discretionary	HD166191	18h10m30.34s	-23d34m00.3s	3:07	30	
8	07_0031	Woodward	Africano (C/2018 W2)	22h10m34.12s	-28d30m14.8s	3:39	123	
9	90_0071	Calibration	Gamma Dra	17h56m36.37s	51d29m20.0s	5:46	50	
10	07_0149	Levesque	HD 175588	18h54m30.28s	36d53m55.0s	6:37	30	
11	06_0100	Kraemer	IRAS 20000+3239	20h01m59.52s	32d47m32.9s	7:07	50	
12	06_0100	Kraemer	RAFGL 618	04h42m53.64s	36d06m53.4s	8:01	30	
13	07_0149	Levesque	HD 35601	05h27m10.22s	29d55m15.8s	8:31	30	
14	06_0211	Muller-Sanchez	IRAS 05589+2828	06h02m10.48s	28d28m19.4s	9:02	30	Turbulence.
15	07_0149	Levesque	BD+59 38	00h21m24.29s	59d57m11.2s	9:34	35	Turbulence.
16	07_0149	Levesque	HD 23475	03h49m31.28s	65d31m33.6s	10:10	30	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



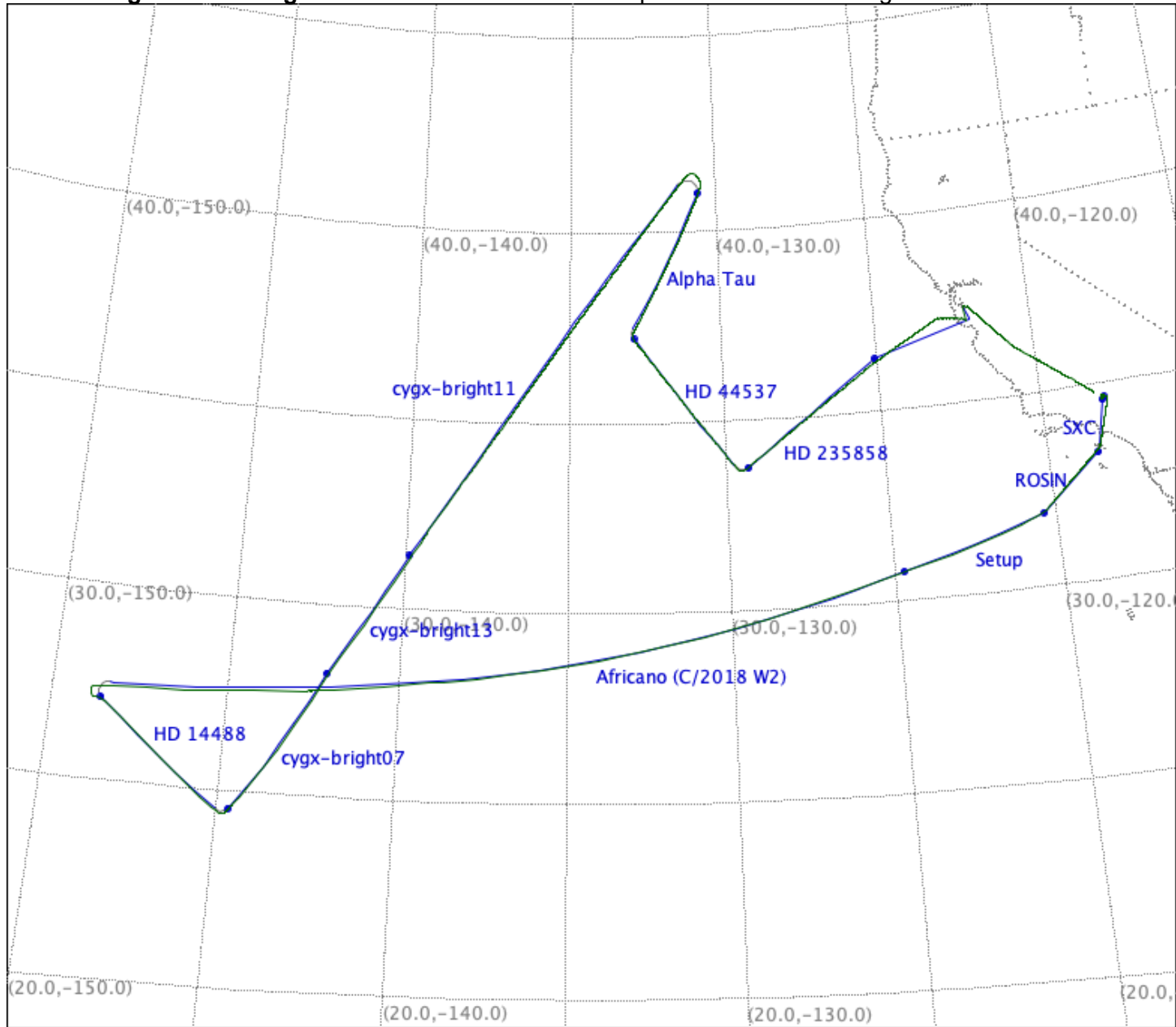
MISSION ID: 2019-10-18_FO_F625

Date: 2019-10-18 UT Instrument: FORCAST

Flight #: 625 Flight Series: OC7G

blue = planned route

green = flown route

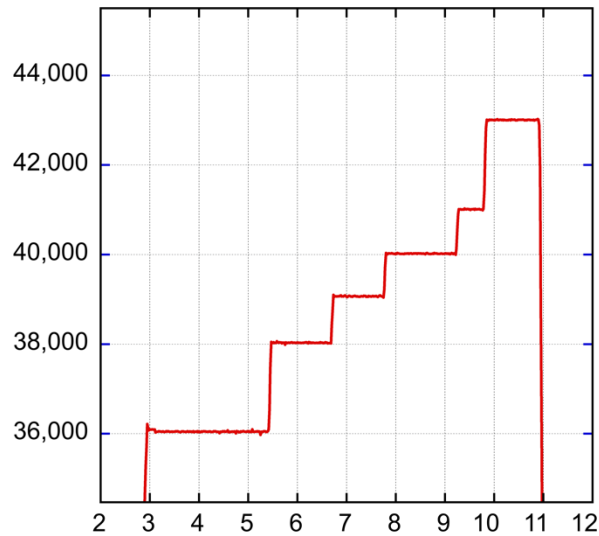


Flight notes: No irregularities.

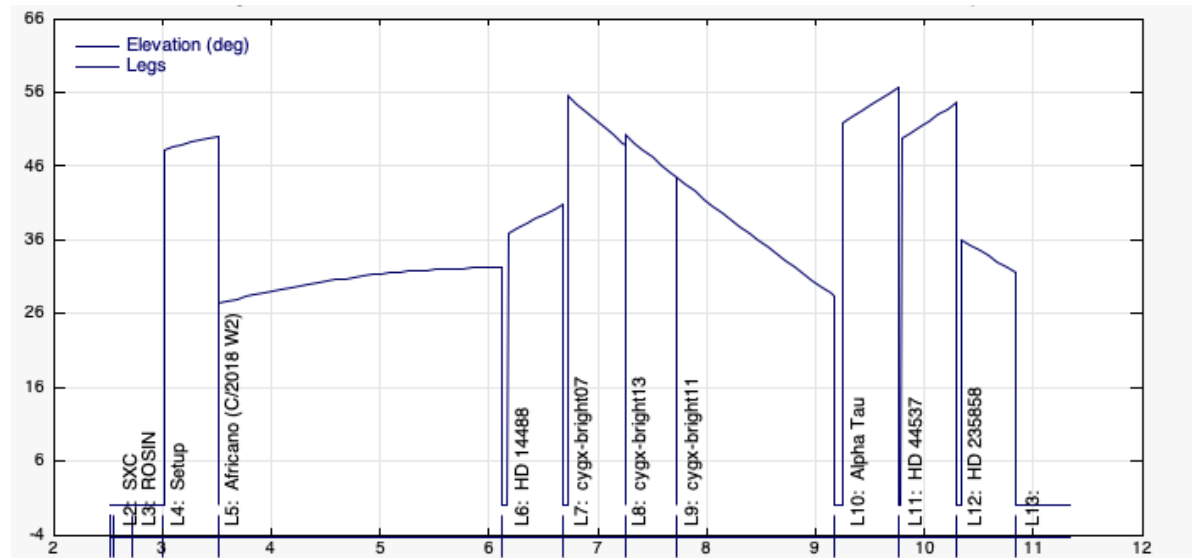
Flight 625 Mission ID 2019-10-18_FO_F625
 Palmdale to Take off date UTC: Departure UTC: Arrival UTC:
 Moffett Field 18-OCT-2019 02:24 11:24

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	21h37m45.11s	-07d51m15.1s	3:00	30	
5	07_0031	Woodward	Africano (C/2018 W2)	22h07m39.67s	-29d31m20.1s	3:30	156	
6	07_0149	Levesque	HD 14488	02h23m35.33s	57d14m22.3s	6:10	30	
7	07_0225	Gutermuth	Cyg X	20h24m24.00s	37d16m05.0s	6:42	32	
8	07_0225	Gutermuth	Cyg X	20h31m12.00s	40d03m15.0s	7:14	28	
9	07_0225	Gutermuth	Cyg X	20h30m29.00s	41d15m44.0s	7:43	87	
10	90_0071	Calibration	Alpha Tau	04h35m55.24s	16d30m33.5s	9:14	30	
11	07_0149	Levesque	HD 44537	06h24m53.90s	49d17m16.4s	9:47	30	
12	06_0100	Kraemer	HD 235858	22h29m10.37s	54d51m06.4s	10:19	30	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



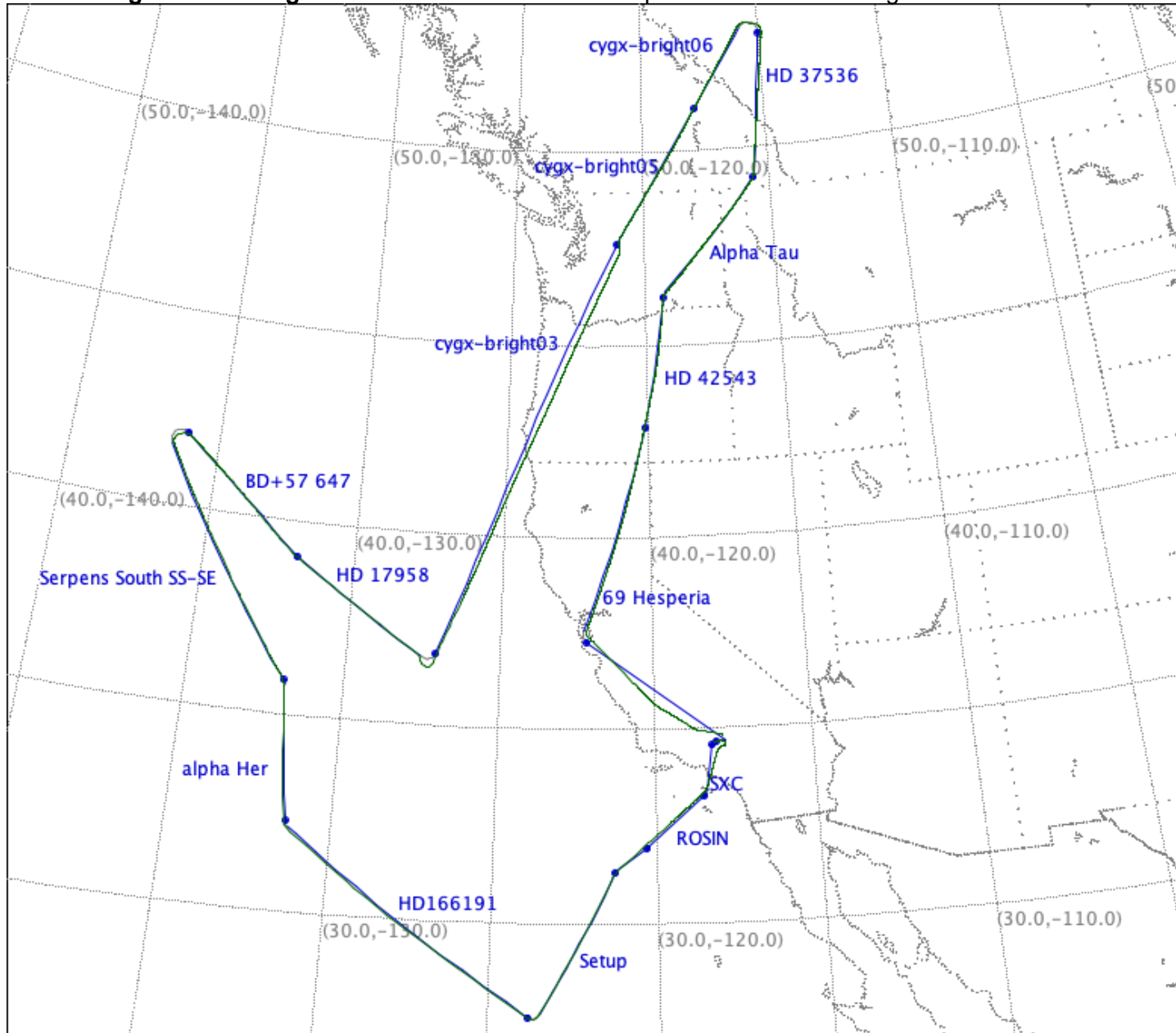
MISSION ID: 2019-10-22_FO_F627

Date: 2019-10-22 UT Instrument: FORCAST

Flight #: 627 Flight Series: OC7G

blue = planned route

green = flown route

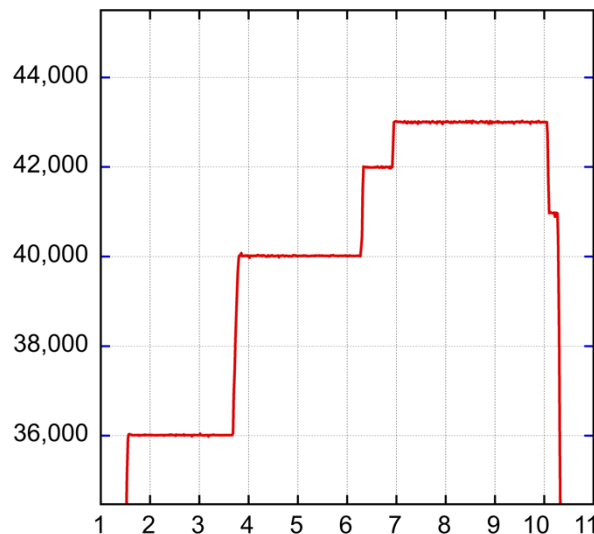


Flight notes: Mixed challenges.

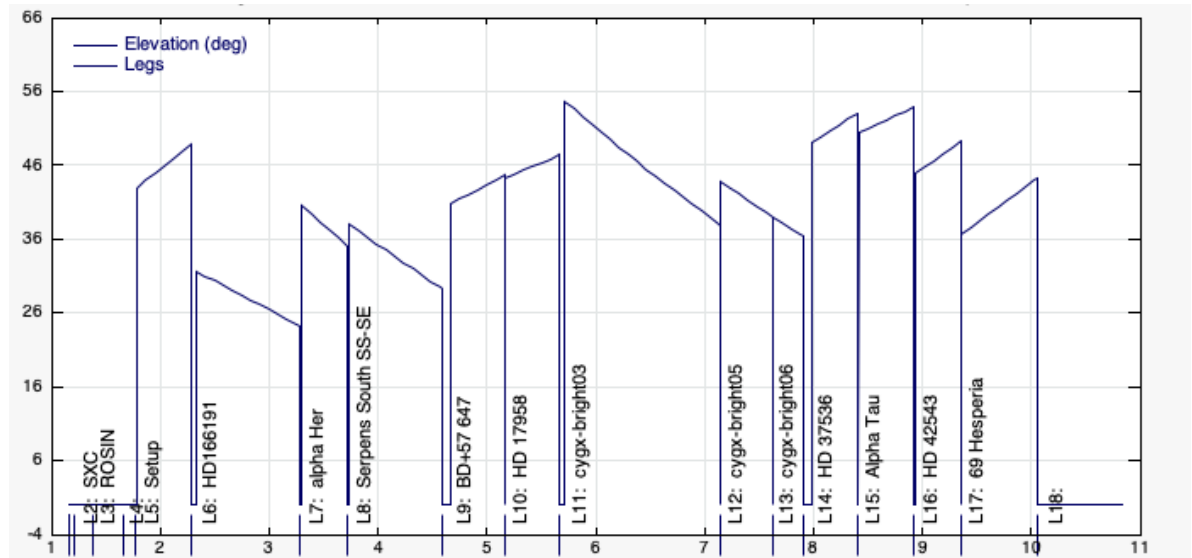
Flight 627 Mission ID 2019-10-22_FO_F627
 Palmdale to Palmdale Take off date UTC: 22-OCT-2019
 Departure UTC: 01:07 Arrival UTC: 10:50

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	22h27m51.52s	04d41m44.4s	1:46	30	
6	75_0040	Discretionary	HD166191	18h10m30.34s	-23d34m00.3s	2:18	57	Low altitude (36k ft).
7	07_0149	Levesque	alpha Her	17h14m38.86s	14d23m25.2s	3:17	25	Low altitude (36k ft).
8	07_0172	Winston	Serpens South SS-SE	18h30m26.90s	-02d11m15.0s	3:43	51	Low altitude (36k ft) at beginning of leg
9	07_0149	Levesque	BD+57 647	02h51m03.95s	57d51m19.9s	4:38	30	Target acquisition issues; source appears to be 20" offset; no data collected
10	07_0149	Levesque	HD 17958	02h56m24.65s	64d19m56.8s	5:09	30	
11	07_0225	Gutermuth	Cyg X	20h23m57.00s	37d37m40.0s	5:42	86	
12	07_0225	Gutermuth	Cyg X	20h43m28.00s	42d49m43.0s	7:08	29	
13	07_0225	Gutermuth	Cyg X	20h42m29.00s	42d57m03.0s	7:36	17	Some vignetting due to telescope door failure; 30% of planned data lost
14	07_0149	Levesque	HD 37536	05h40m42.05s	31d55m14.2s	7:58	25	
15	90_0071	Calibration	Alpha Tau	04h35m55.24s	16d30m33.5s	8:24	30	
16	07_0149	Levesque	HD 42543	06h12m19.10s	22d54m30.7s	8:55	25	
17	07_0165	Landsman	69 Hesperia	06h46m54.08s	12d47m35.5s	9:20	42	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



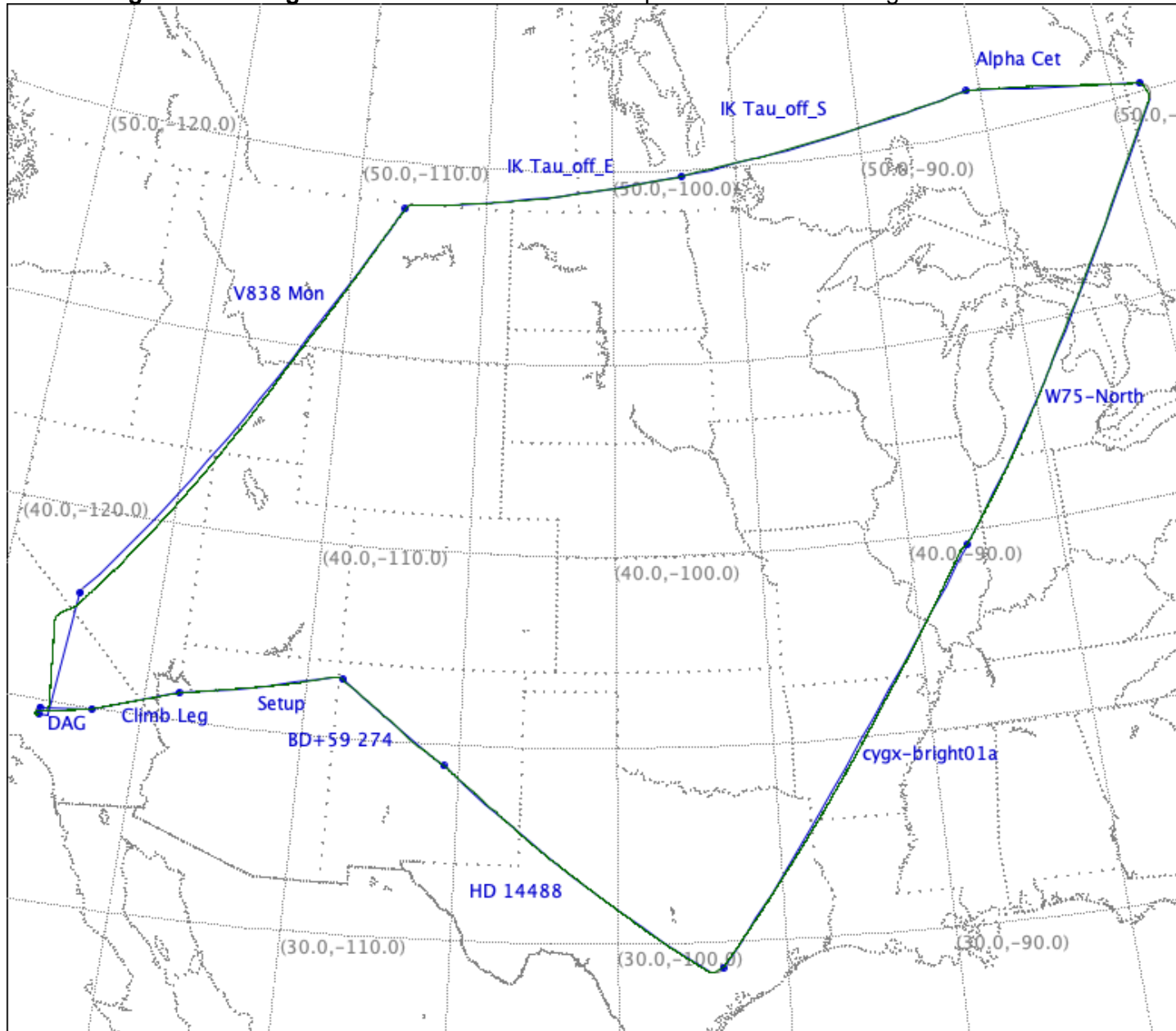
MISSION ID: 2019-10-23_FO_F628

Date: 2019-10-23 UT Instrument: FORCAST

Flight #: 628 Flight Series: OC7G

blue = planned route

green = flown route

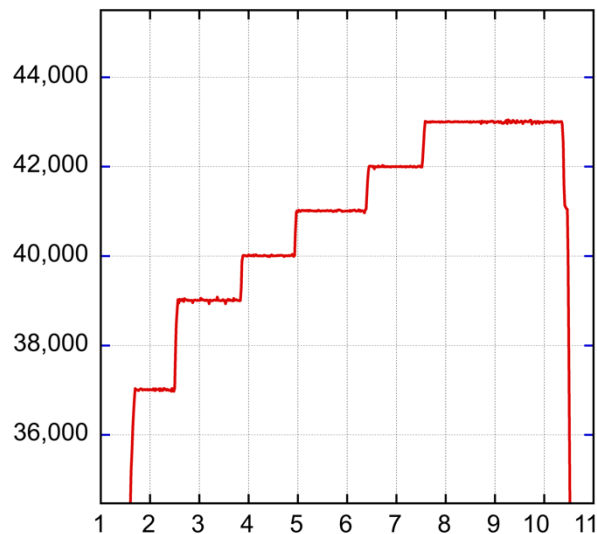


Flight notes: No irregularities.

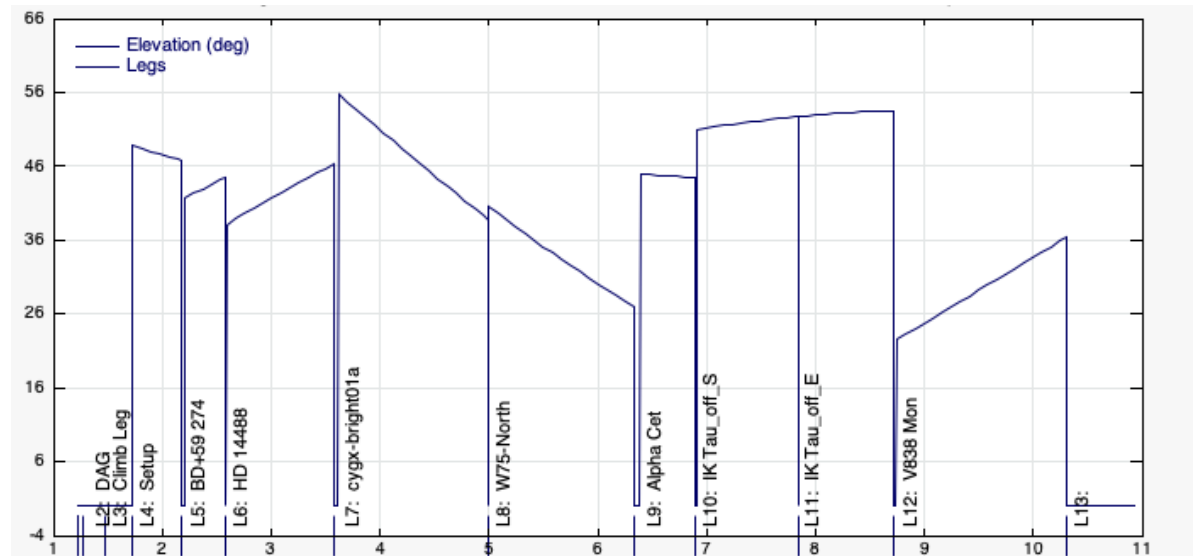
Flight 628 Mission ID 2019-10-23_FO_F628
 Palmdale to Palmdale Take off date UTC: 23-OCT-2019
 Departure UTC: 01:12 Arrival UTC: 10:55

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	17h41m56.36s	72d08m55.8s	1:43	27	
5	07_0149	Levesque	BD+59 274	01h33m29.21s	60d38m47.7s	2:12	23	
6	07_0149	Levesque	HD 14488	02h23m35.33s	57d14m22.3s	2:35	59	
7	07_0225	Gutermuth	CygX	20h32m25.00s	40d19m45.0s	3:37	83	Pointing appears off for some data.
8	07_0225	Gutermuth	W75-North	20h38m36.00s	42d40m00.0s	5:00	80	
9	90_0071	Calibration	Alpha Cet	03h02m16.77s	04d05m23.1s	6:23	30	
10	07_0188	Andersson	IK Tau	03h53m28.00s	11d22m39.7s	6:54	56	
11	07_0188	Andersson	IK Tau	03h53m35.87s	11d24m21.7s	7:50	53	
12	07_0027	Woodward	V838 Mon	07h04m04.82s	-03d50m50.6s	8:44	94	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



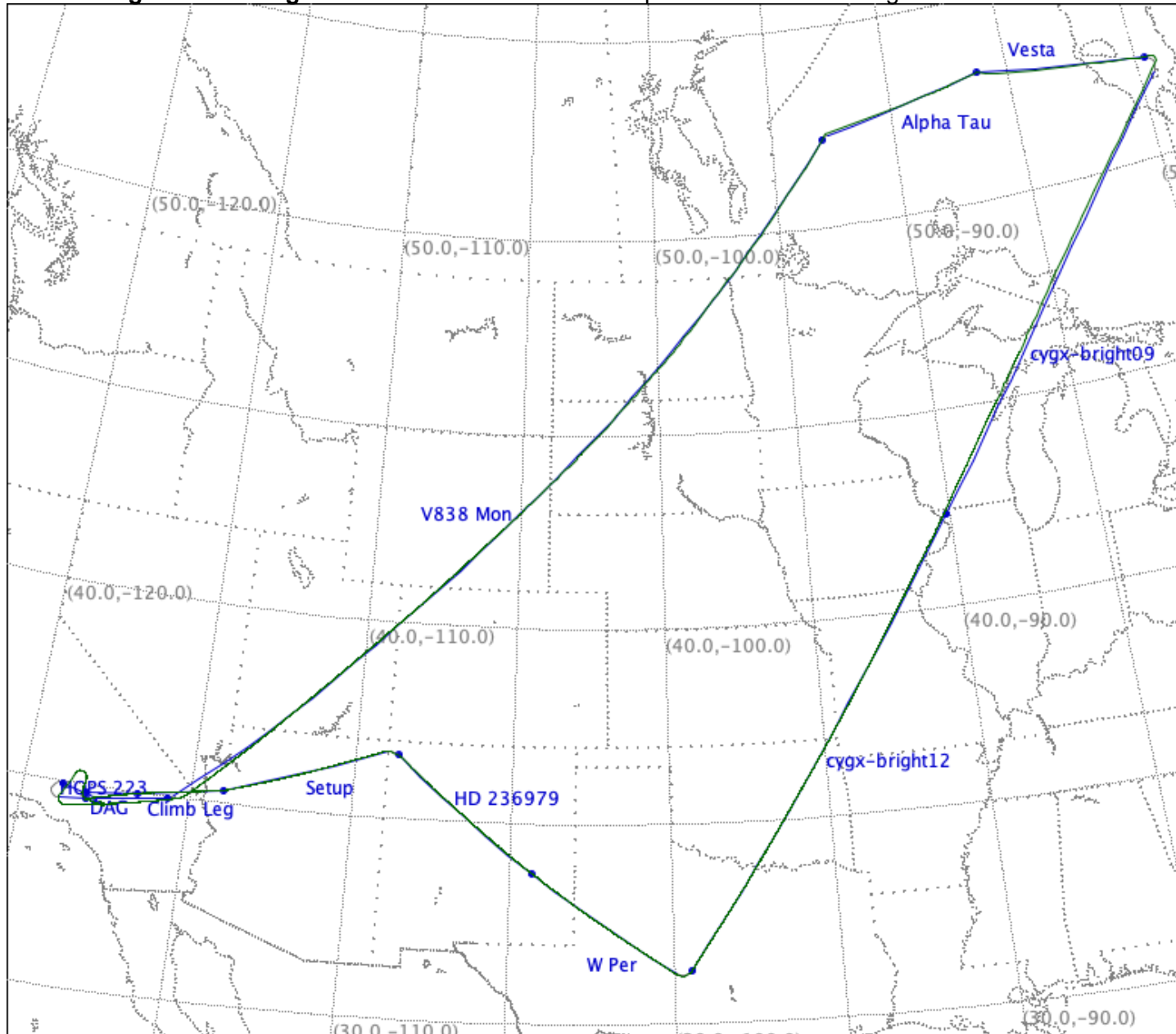
MISSION ID: 2019-10-24_FO_F629

Date: 2019-10-24 UT Instrument: FORCAST

Flight #: 629 Flight Series: OC7G

blue = planned route

green = flown route

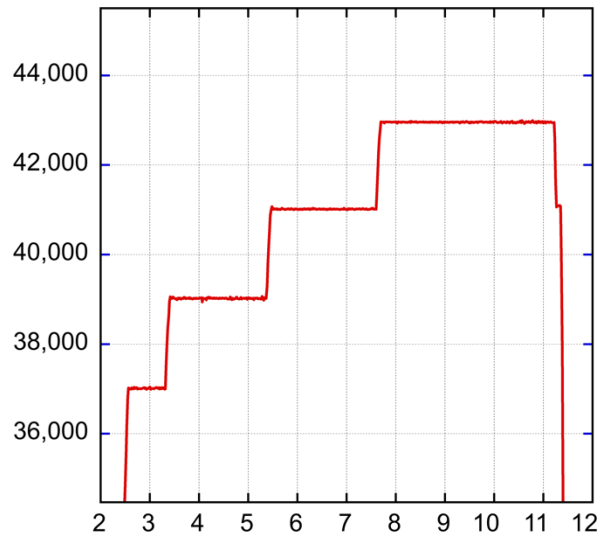


Flight notes: No irregularities.

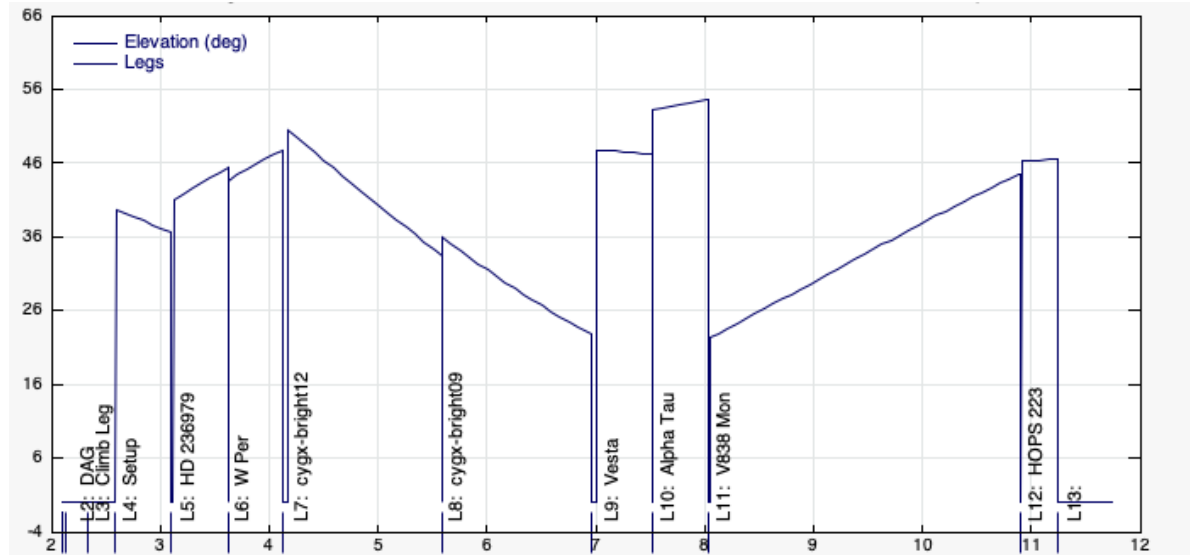
Flight 629 Mission ID 2019-10-24_FO_F629
 Palmdale to Palmdale Take off date UTC: 24-OCT-2019
 Departure UTC: 02:06 Arrival UTC: 11:45

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	16h27m59.01s	68d46m05.3s	2:36	30	
5	07_0149	Levesque	HD 236979	02h38m25.42s	57d02m46.2s	3:07	30	
6	07_0149	Levesque	W Per	02h50m37.89s	56d59m00.3s	3:37	30	
7	07_0225	Gutermuth	Cyg X	20h26m31.99s	39d57m17.0s	4:10	85	
8	07_0225	Gutermuth	Cyg X	20h36m05.00s	41d40m06.0s	5:35	82	
9	90_0072	Calibration	Vesta	03h36m24.43s	09d21m32.0s	7:01	30	
10	90_0071	Calibration	Alpha Tau	04h35m55.24s	16d30m33.5s	7:31	30	
11	07_0027	Woodward	V838 Mon	07h04m04.82s	-03d50m50.6s	8:03	171	
12	07_0200	Fischer	HOPS 223	05h42m48.49s	-08d16m34.7s	10:55	20	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



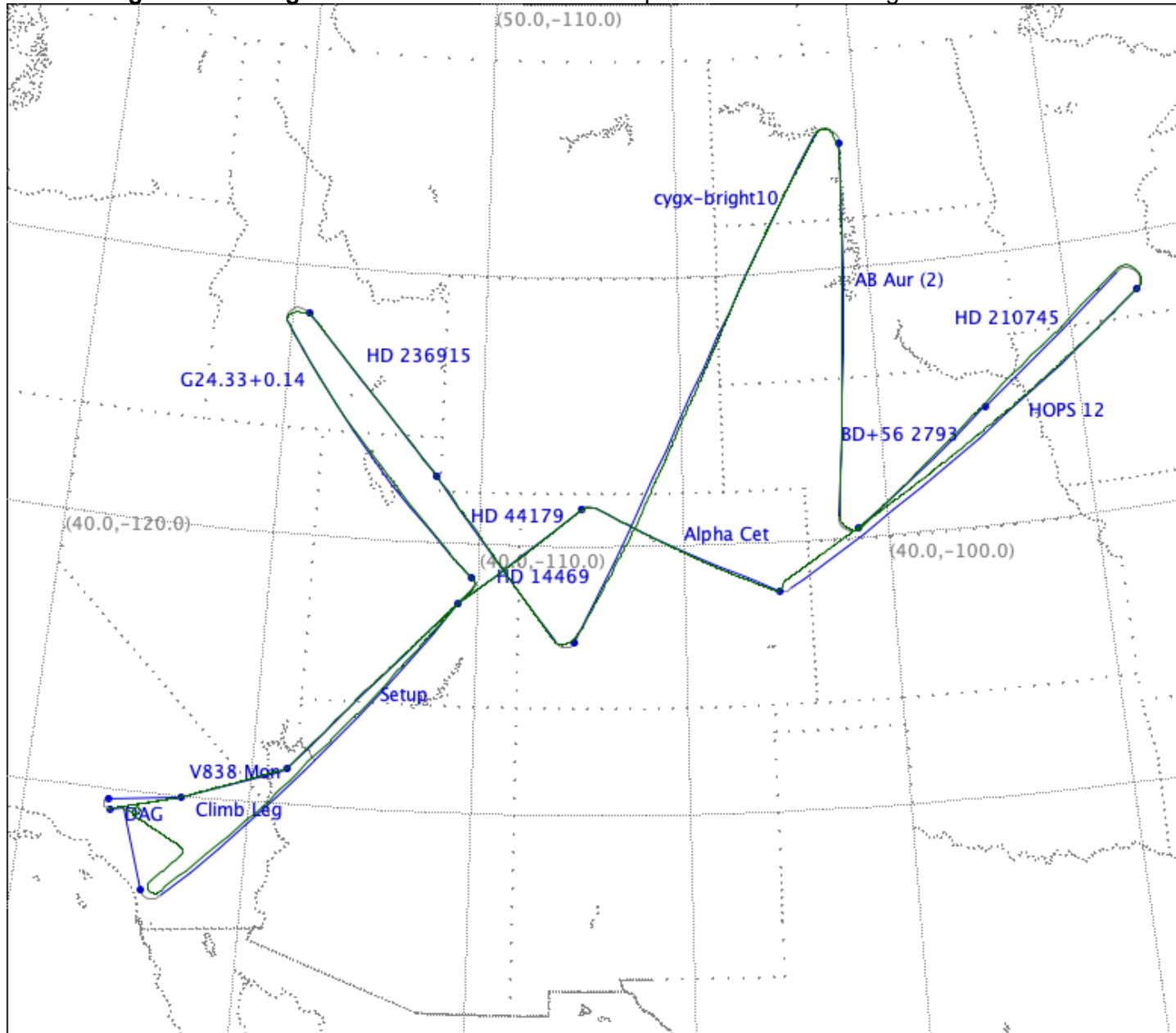
MISSION ID: 2019-10-25_FO_F630

Date: 2019-10-25 UT Instrument: FORCAST

Flight #: 630 Flight Series: OC7G

blue = planned route

green = flown route

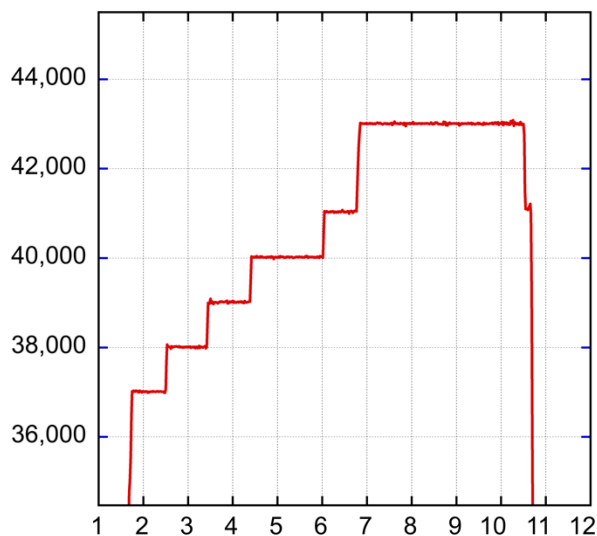


Flight notes: No irregularities.

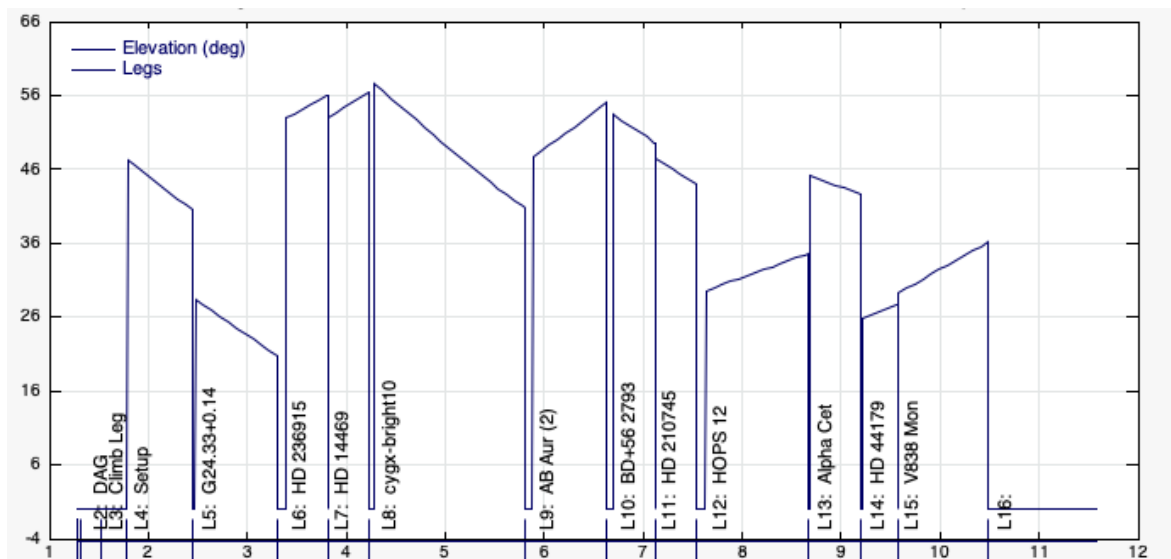
Flight 630 Mission ID 2019-10-25_FO_F630
 Palmdale to Palmdale Take off date UTC: 25-OCT-2019
 Departure UTC: 01:19 Arrival UTC: 11:04

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	16h38m44.85s	48d55m42.0s	1:48	39	
5	75_0042	Discretionary	G24.33+0.14	18h35m08.14s	-07d35m04.1s	2:29	50	
6	07_0149	Levesque	HD 236915	01h58m28.91s	59d16m08.8s	3:24	25	
7	07_0149	Levesque	HD 14469	02h22m06.89s	56d36m14.9s	3:50	25	
8	07_0225	Gutermuth	Cyg X	20h34m00.00s	41d22m15.0s	4:18	91	Turbulence began in middle of leg; telescope thrown into standby
9	07_0049	Shuping	AB Aur	04h55m45.80s	30d33m04.0s	5:53	45	Moderate turbulence throughout leg
10	07_0149	Levesque	BD+56 2793	22h30m10.74s	57d00m03.1s	6:42	25	
11	07_0149	Levesque	HD 210745	22h10m51.28s	58d12m04.5s	7:07	25	
12	07_0200	Fischer	HOPS 12	05h35m08.60s	-05d55m53.9s	7:38	62	Light to moderate turbulence.
13	90_0071	Calibration	Alpha Cet	03h02m16.77s	04d05m23.1s	8:41	30	
14	06_0100	Kraemer	HD 44179	06h19m58.22s	-10d38m14.7s	9:13	21	
15	07_0027	Woodward	V838 Mon	07h04m04.82s	-03d50m50.6s	9:35	55	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



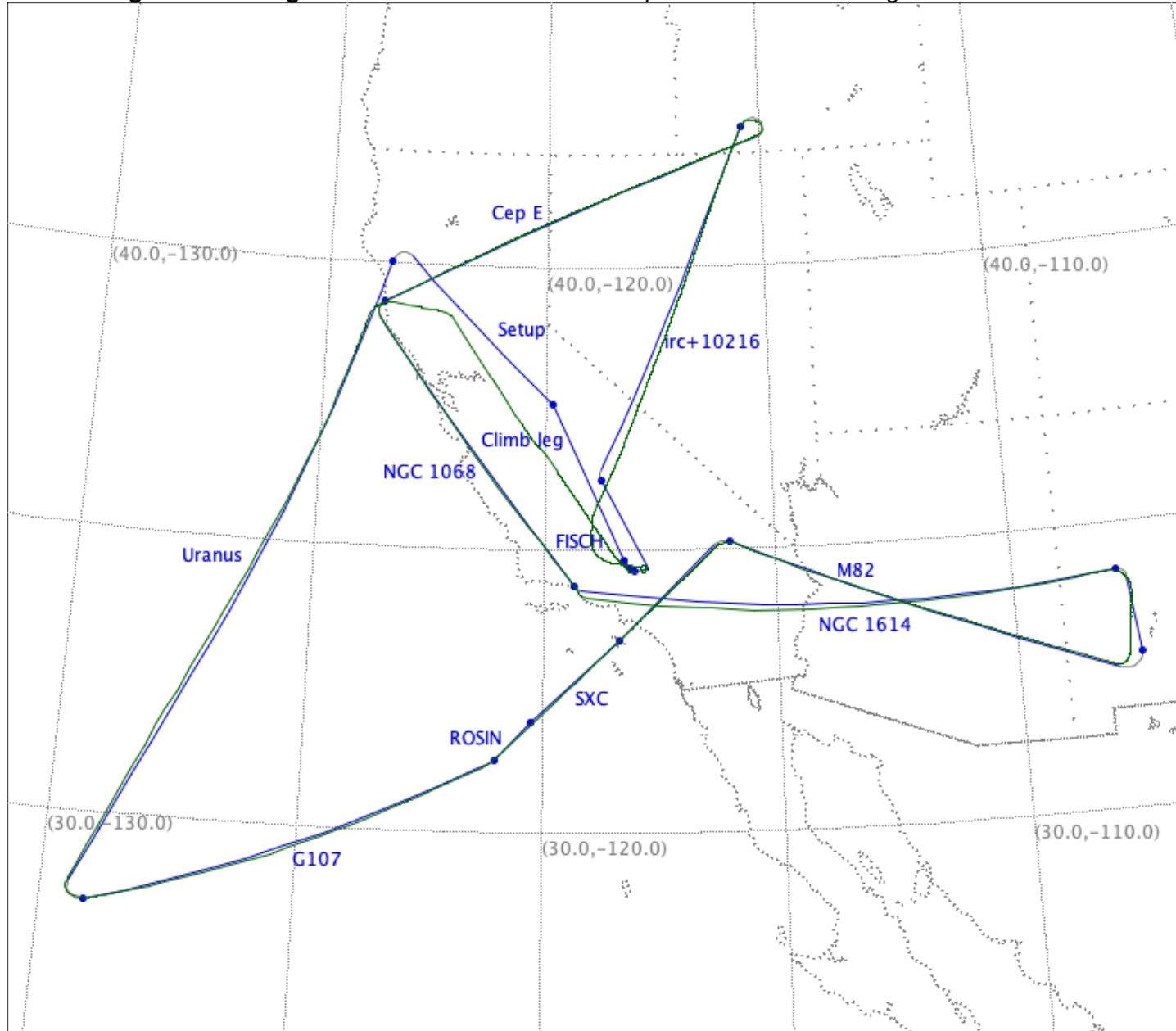
MISSION ID: 2019-10-30_FI_F631

Date: 2019-10-30 UT Instrument: FIFI-LS

Flight #: 631 Flight Series: OC7H

blue = planned route

green = flown route

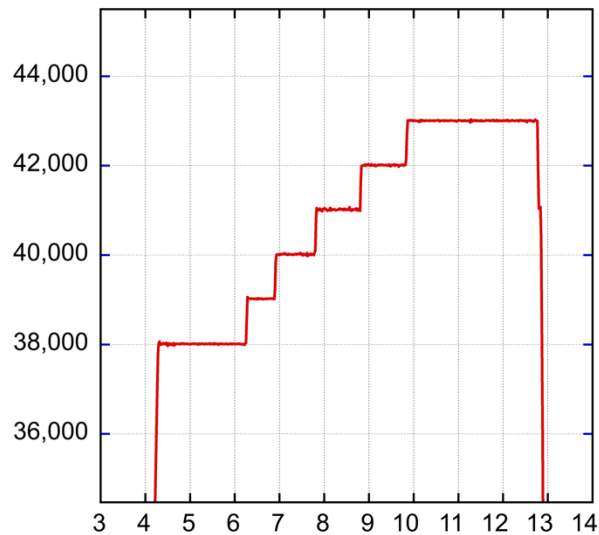


Flight notes: Late departure.

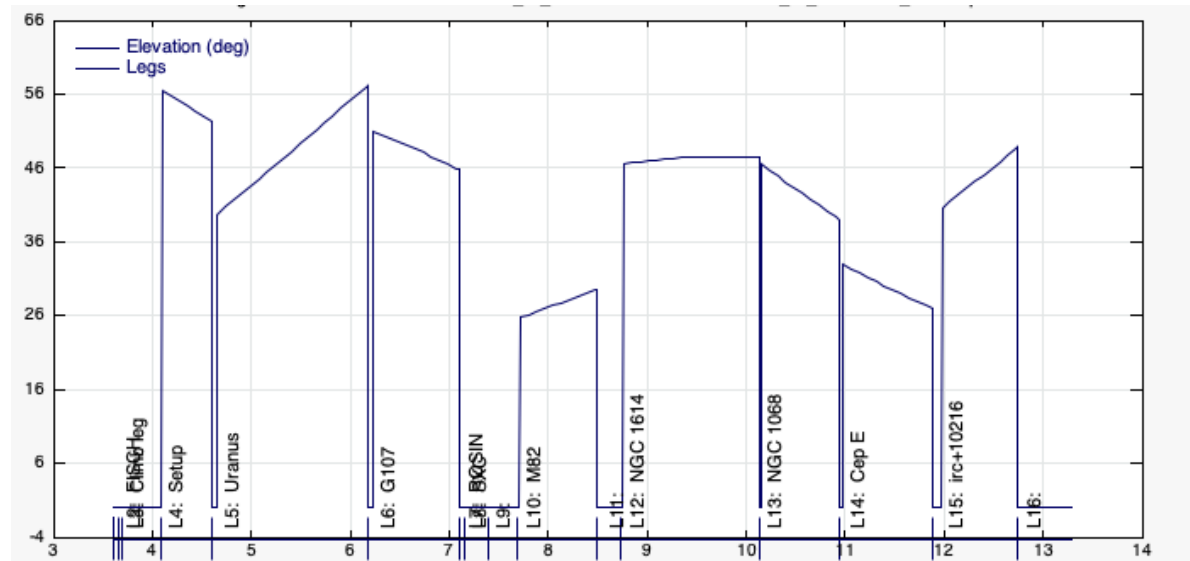
Flight 631 Mission ID 2019-10-30_FI_F631
 Palmdale to Palmdale Take off date UTC: 30-OCT-2019
 Departure UTC: 03:46 Arrival UTC: 13:15

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	21h14m28.82s	10d00m25.1s	4:06	30	
5	90_0032	Calibration	Uranus	02h08m42.25s	12d26m59.7s	4:39	91	On source 9min late due to late take-off
6	75_0043	Discretionary	G107	22h21m26.80s	63d51m37.0s	6:14	52	
10	07_0150	Spilker	M82	09h55m52.43s	69d40m46.9s	7:46	47	
12	07_0209	Stacey	NGC 1614	04h33m59.85s	-08d34m44.0s	8:49	82	
13	07_0209	Stacey	NGC 1068	02h42m40.71s	-00d00m47.8s	10:12	47	
14	03_0073	Eisloeffel	Cep E	23h03m13.10s	61d42m26.0s	11:02	54	
15	71_0024	Engineering	irc+10216	09h47m57.43s	13d16m43.6s	12:02	46	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



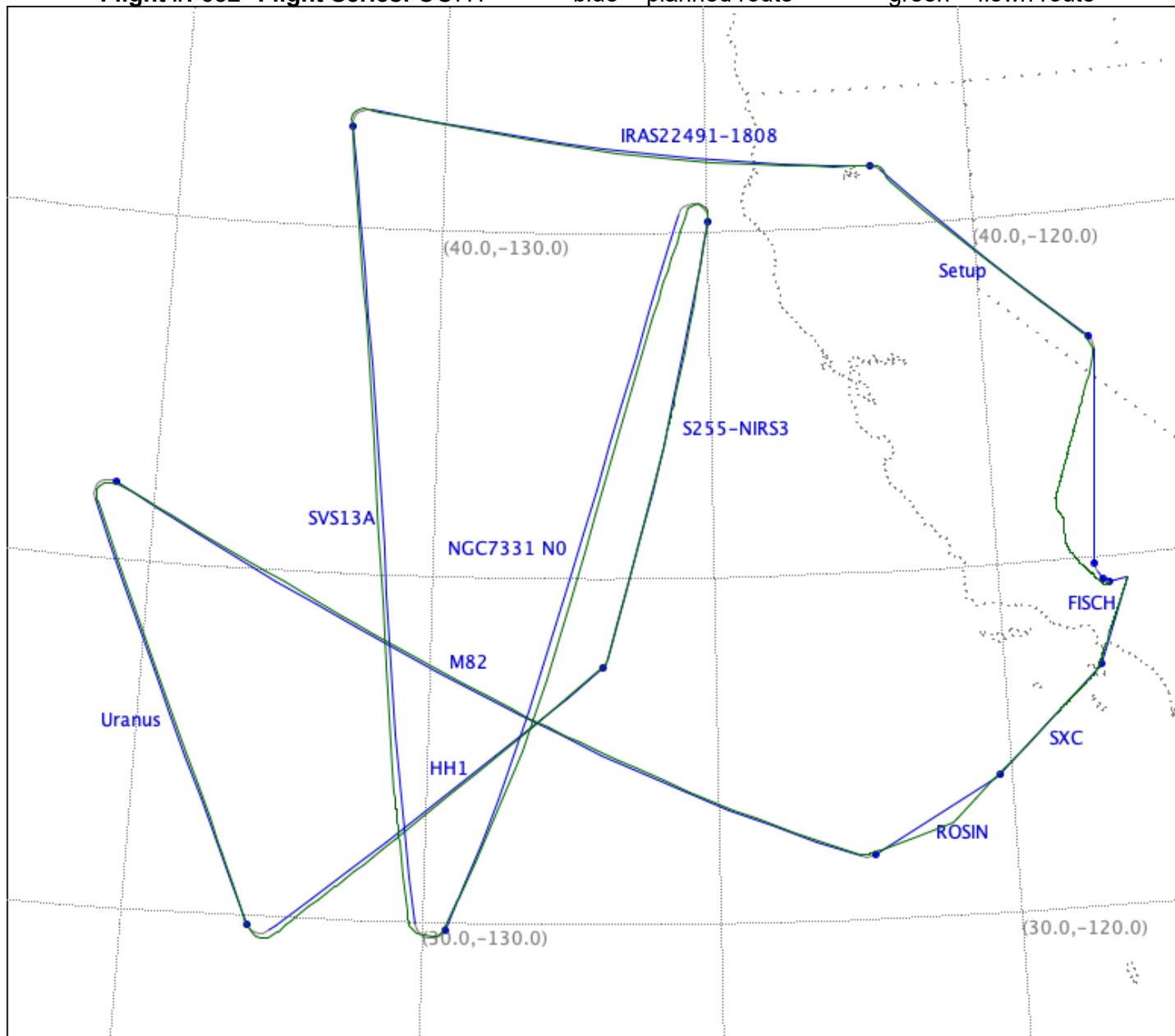
MISSION ID: 2019-10-31_FI_F632

Date: 2019-10-31 UT **Instrument:** FIFI-LS

Flight #: 632 **Flight Series:** OC7H

blue = planned route

green = flown route

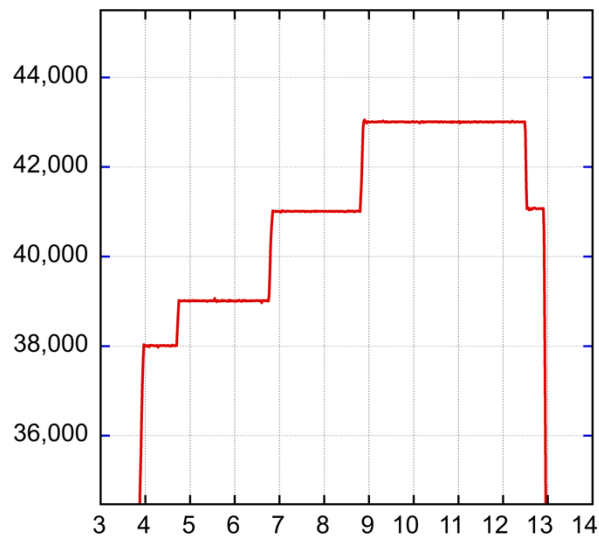


Flight notes: Late departure – no loss.

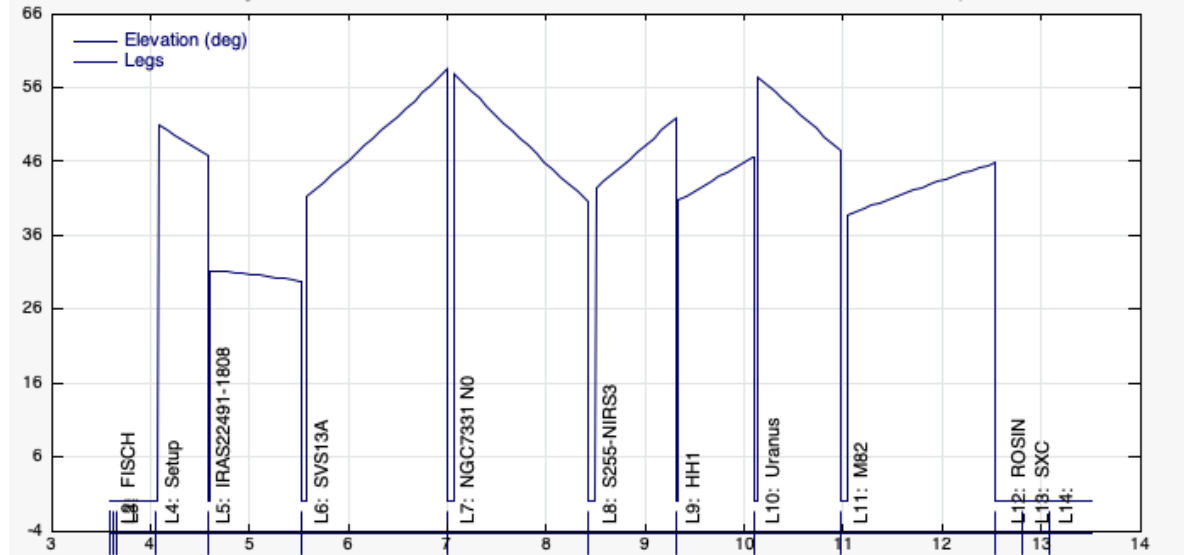
Flight 632 Mission ID 2019-10-31_FI_F632
 Palmdale to Palmdale Take off date UTC: 31-OCT-2019
 Departure UTC: 03:30 Arrival UTC: 13:24

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	21h15m49.43s	05d14m52.2s	4:04	30	
5	07_0080	Smith	IRAS22491-1808	22h51m49.26s	-17d52m23.4s	4:36	56	
6	07_0185	Tobin	SVS13A	03h29m06.47s	31d15m43.5s	5:34	85	
7	75_0045	Discretionary	NGC7331	22h37m04.96s	34d24m04.7s	7:04	81	
8	06_0182	Stecklum	S255-NIRS3	06h12m54.01s	17d59m23.1s	8:29	49	
9	07_0069	Sperling	HH1	05h36m22.90s	-06d46m11.3s	9:19	46	Telescope door failure caused vignetting near end of leg; 20% of planned data lost
10	90_0033	Calibration	Uranus	02h08m30.35s	12d25m58.1s	10:08	50	
11	07_0150	Spilker	M82	09h55m52.43s	69d40m46.9s	11:02	90	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



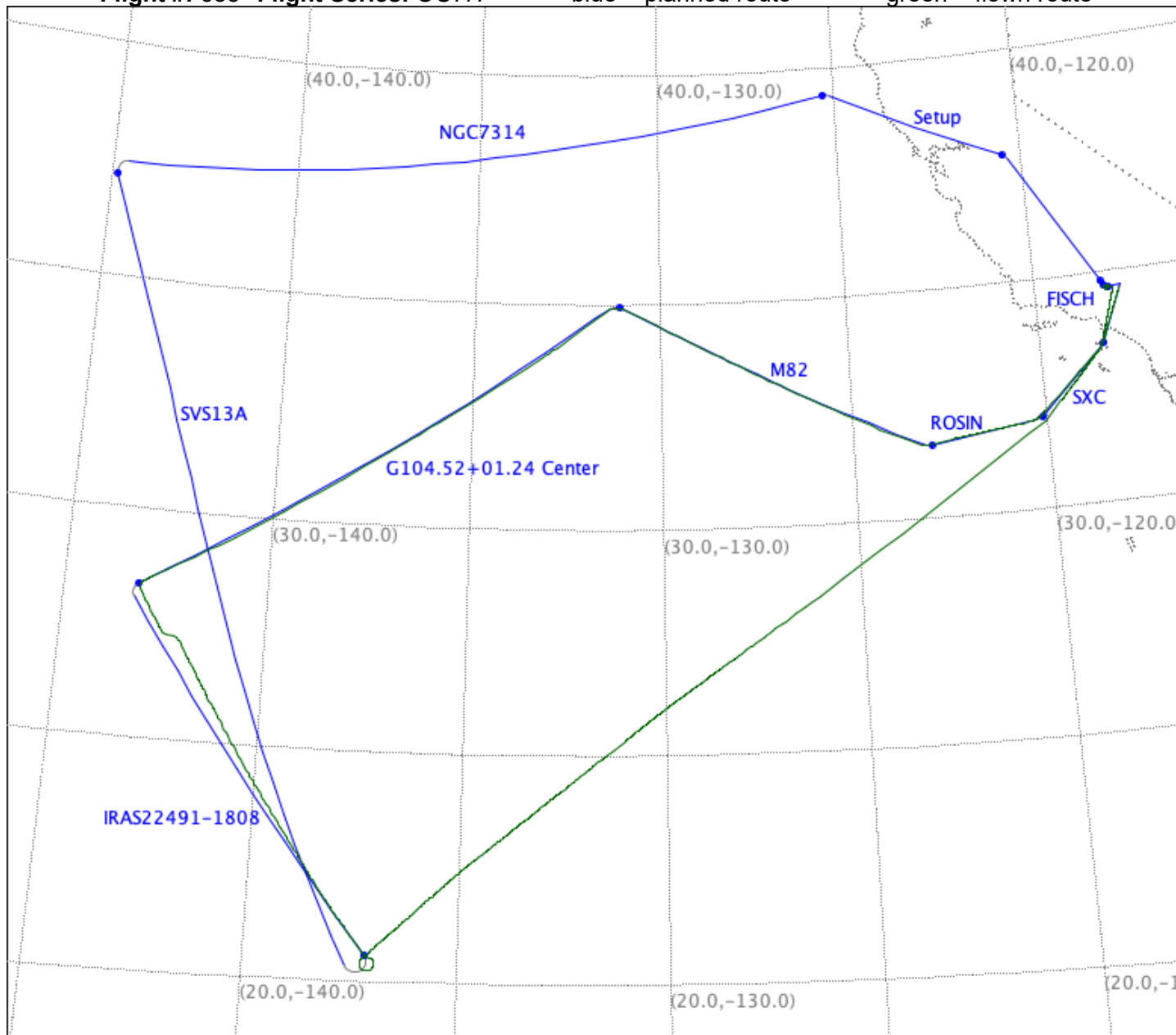
MISSION ID: 2019-11-01_FI_F633

Date: 2019-11-01 UT Instrument: FIFI-LS

Flight #: 633 Flight Series: OC7H

blue = planned route

green = flown route



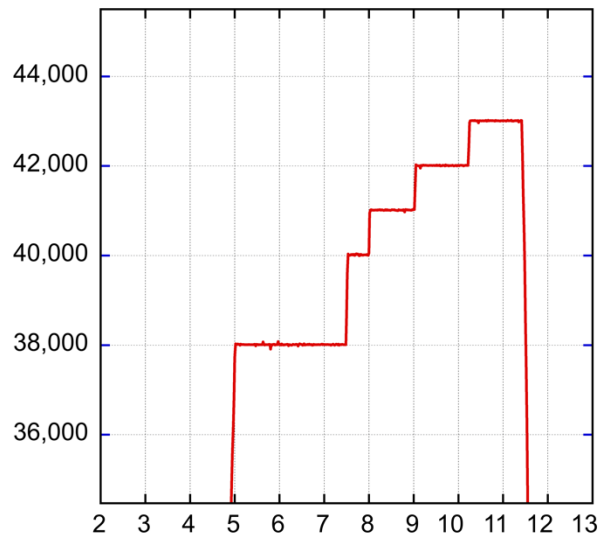
Flight notes:

Late departure led to loss of first two science legs.

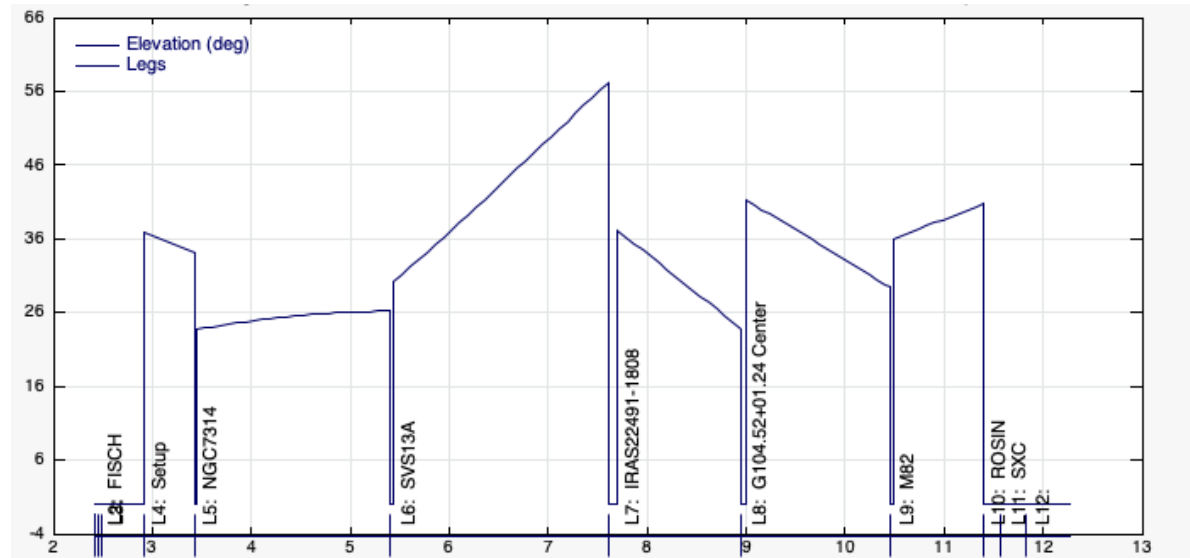
Flight 633 Mission ID 2019-11-01_FI_F633
 Palmdale to Palmdale Take off date UTC: 01-NOV-2019
 Departure UTC: 04:32 Arrival UTC: 12:22

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	20h20m39.82s	-12d45m32.7s	2:55	30	
5	07_0239	Malkan	NGC7314	22h35m46.19s	-26d03m01.7s	3:26	117	Late take-off; leg not flown
6	07_0185	Tobin	SVS13A	03h29m06.47s	31d15m43.5s	5:26	130	Late take-off; leg not flown
7	07_0080	Smith	IRAS22491-1808	22h51m49.26s	-17d52m23.4s	7:42	75	
8	75_0047	Discretionary	G104.52+01.24 Center	22h21m46.84s	58d44m29.0s	8:59	88	
9	07_0150	Spilker	M82	09h55m52.43s	69d40m46.9s	10:29	55	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



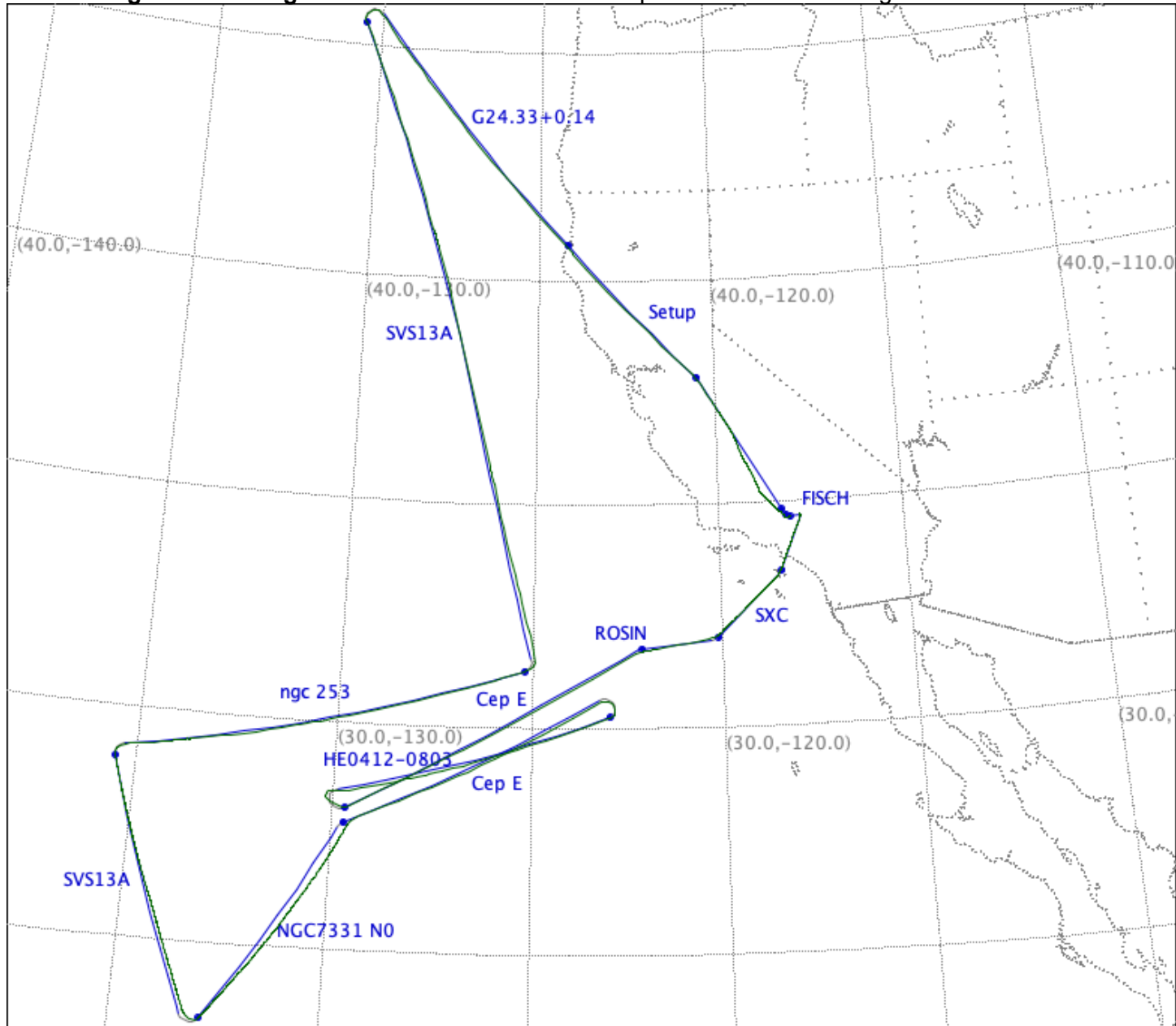
MISSION ID: 2019-11-02_FI_F634

Date: 2019-11-02 UT Instrument: FIFI-LS

Flight #: 634 Flight Series: OC7H

blue = planned route

green = flown route

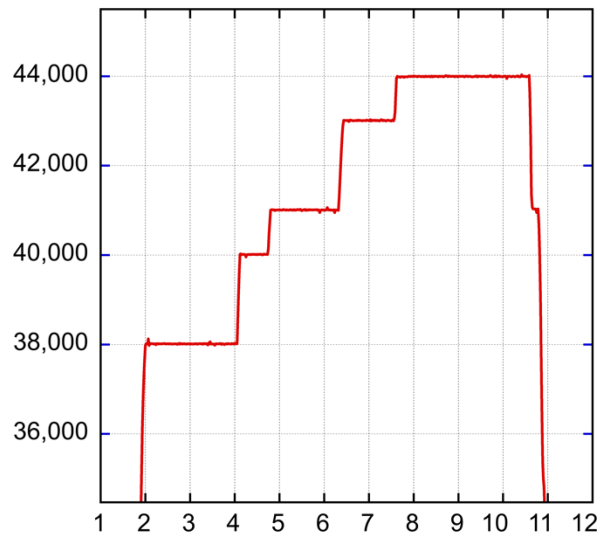


Flight notes: No irregularities.

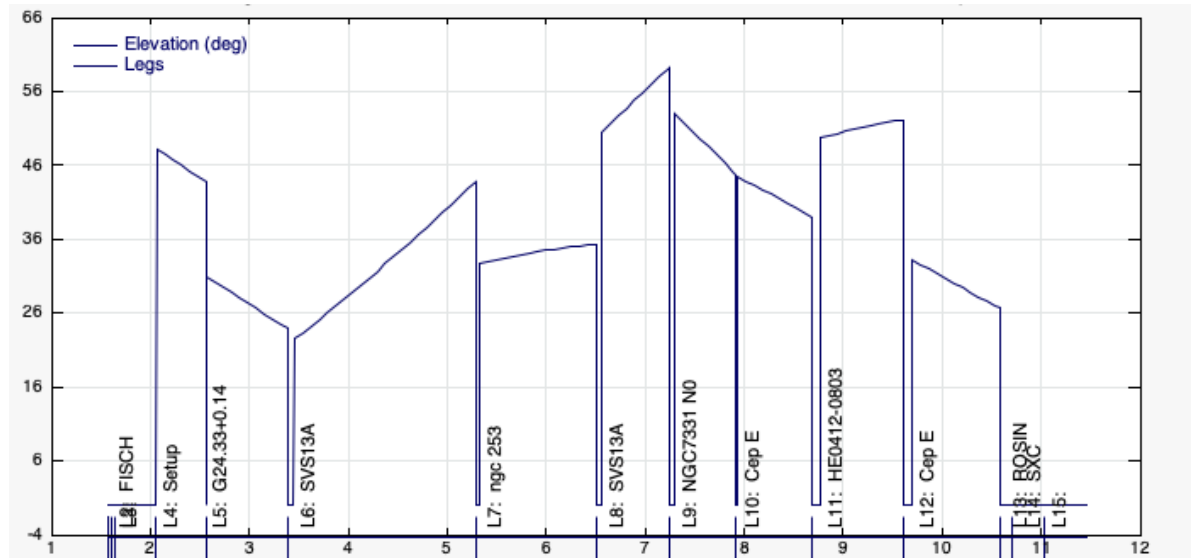
Flight 634 Mission ID 2019-11-02_FI_F634
 Palmdale to Palmdale Take off date UTC: 02-NOV-2019
 Departure UTC: 01:07 Arrival UTC: 10:45

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	18h56m14.64s	04d12m07.7s	2:03	30	
5	75_0042	Discretionary	G24.33+0.14	18h35m08.14s	-07d35m04.1s	2:34	49	
6	07_0185	Tobin	SVS13A	03h29m06.47s	31d15m43.5s	3:27	110	
7	70_0708	GTO	ngc 253	00h47m33.13s	-25d17m19.7s	5:19	71	
8	07_0185	Tobin	SVS13A	03h29m06.47s	31d15m43.5s	6:33	41	
9	75_0045	Discretionary	NGC7331	22h37m04.96s	34d24m04.7s	7:18	37	
10	03_0073	Eisloffel	Cep E	23h03m13.10s	61d42m26.0s	7:56	45	
11	07_0117	Smirnova-Pinchukova	HE0412-0803	04h14m52.66s	-07d55m39.7s	8:46	50	
12	03_0073	Eisloffel	Cep E	23h03m13.10s	61d42m26.0s	9:41	53	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



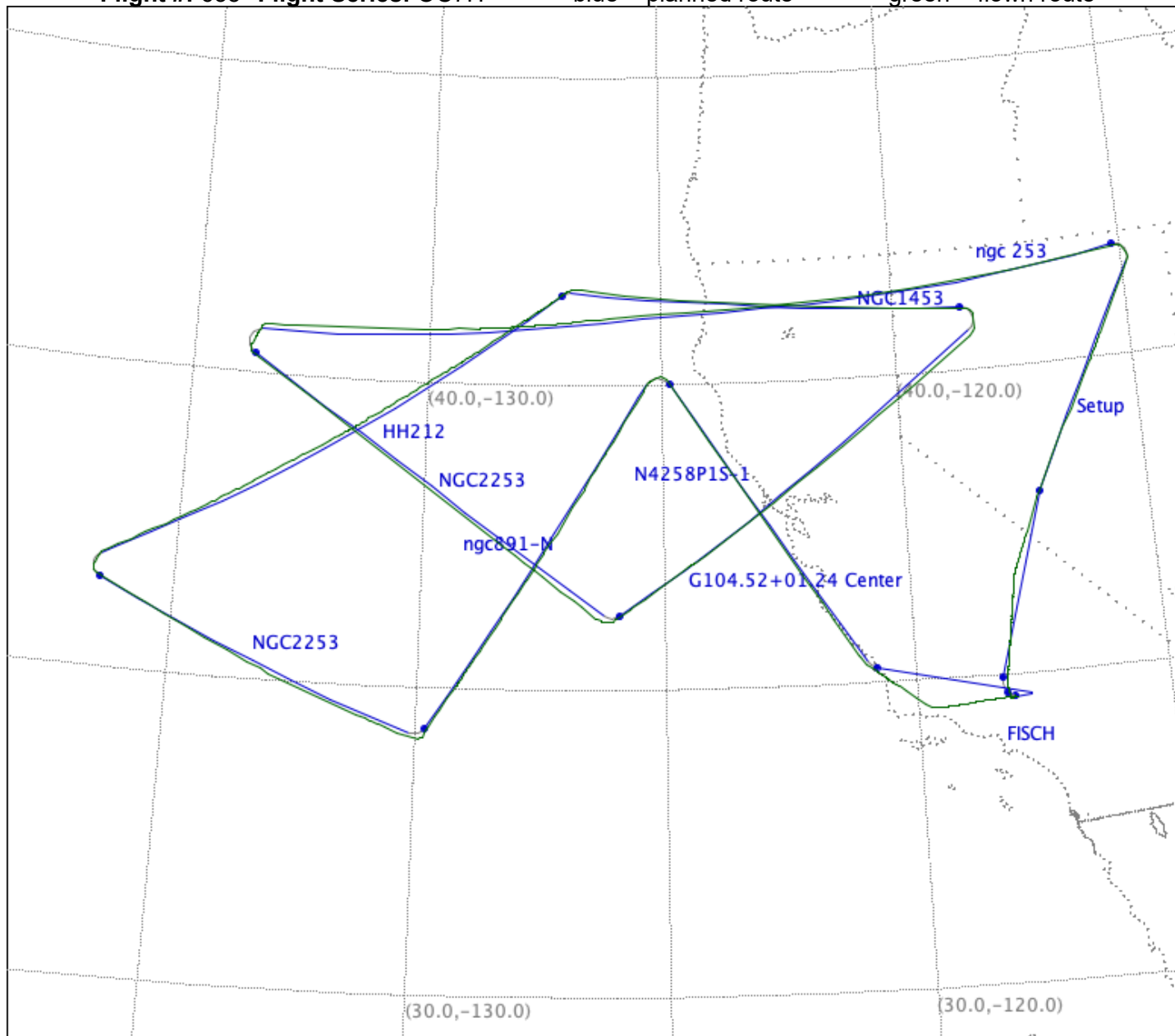
MISSION ID: 2019-11-05_FI_F635

Date: 2019-11-05 UT Instrument: FIFI-LS

Flight #: 635 Flight Series: OC7H

blue = planned route

green = flown route

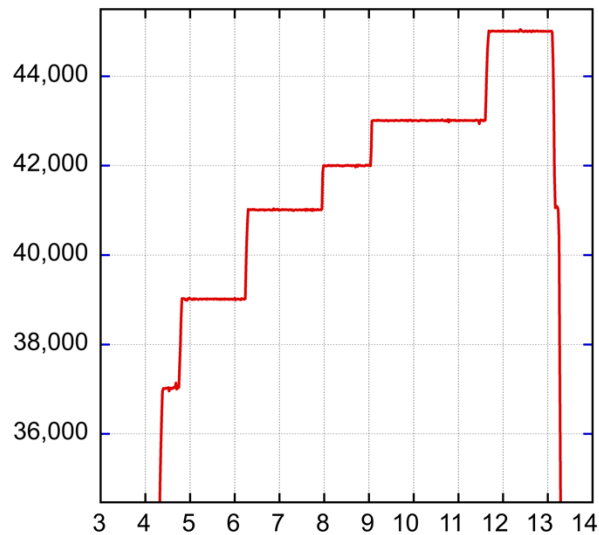


Flight notes: No irregularities.

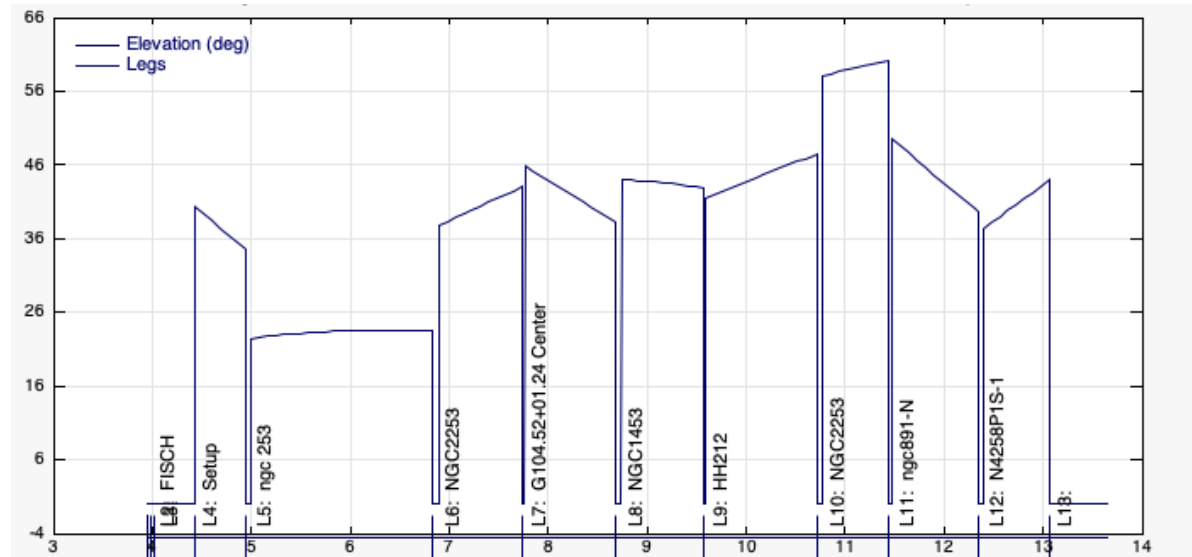
Flight 635 Mission ID 2019-11-05_FI_F635
 Palmdale to Palmdale Take off date UTC: 05-NOV-2019
 Departure UTC: 03:57 Arrival UTC: 13:36

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	19h13m45.49s	39d08m45.5s	4:25	30	
5	70_0708	GTO	ngc 253	00h47m33.13s	-25d17m19.7s	4:59	110	
6	75_0041	Discretionary	NGC2253	06h43m41.84s	65d12m22.6s	6:53	50	
7	75_0047	Discretionary	G104.52+01.24 Center	22h21m46.84s	58d44m29.0s	7:45	55	
8	07_0105	Temi	NGC1453	03h46m27.27s	-03d58m07.6s	8:44	50	
9	07_0069	Sperling	HH212	05h43m50.36s	-01d03m28.1s	9:35	67	
10	75_0041	Discretionary	NGC2253	06h43m41.84s	65d12m22.6s	10:45	40	
11	06_0010	Reach	ngc891-N	02h22m37.53s	42d22m46.4s	11:27	52	
12	07_0154	Appleton	NGC4258 P1S	12h18m58.77s	47d18m31.2s	12:23	40	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



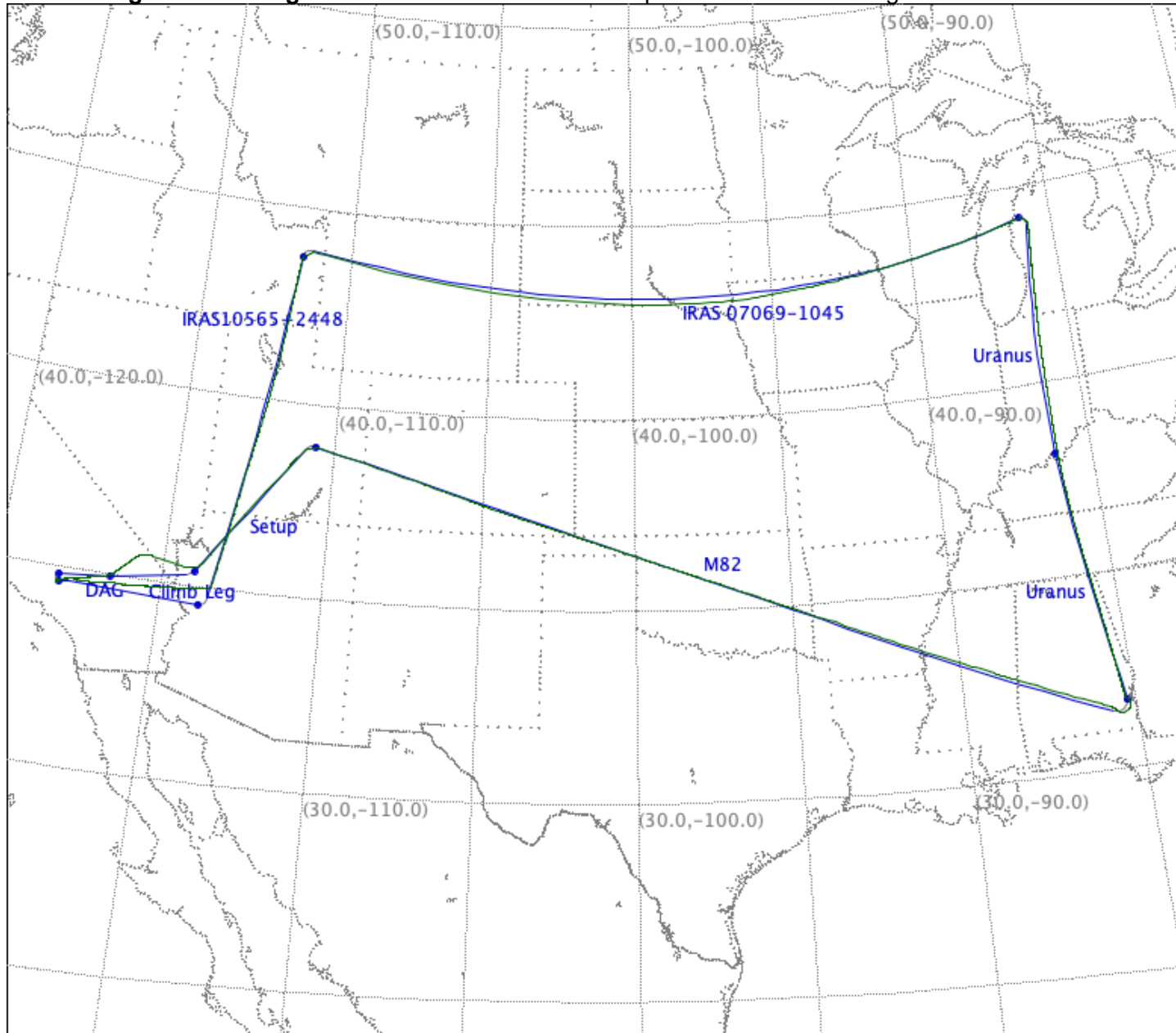
MISSION ID: 2019-11-06_FI_F636

Date: 2019-11-06 UT Instrument: FIFI-LS

Flight #: 636 Flight Series: OC7H

blue = planned route

green = flown route

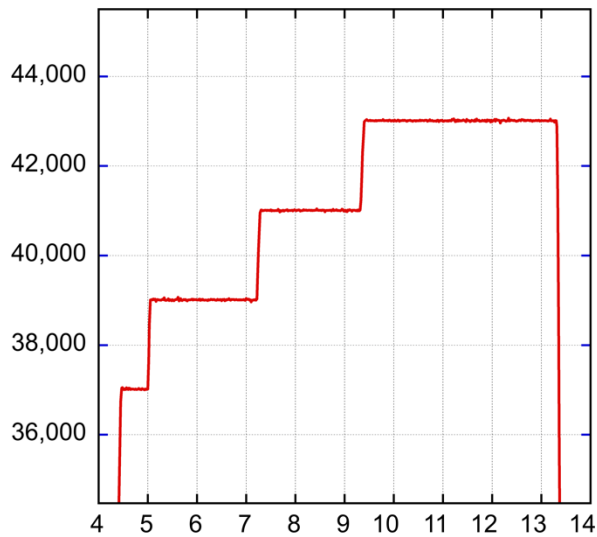


**Flight notes:
No irregularities.**

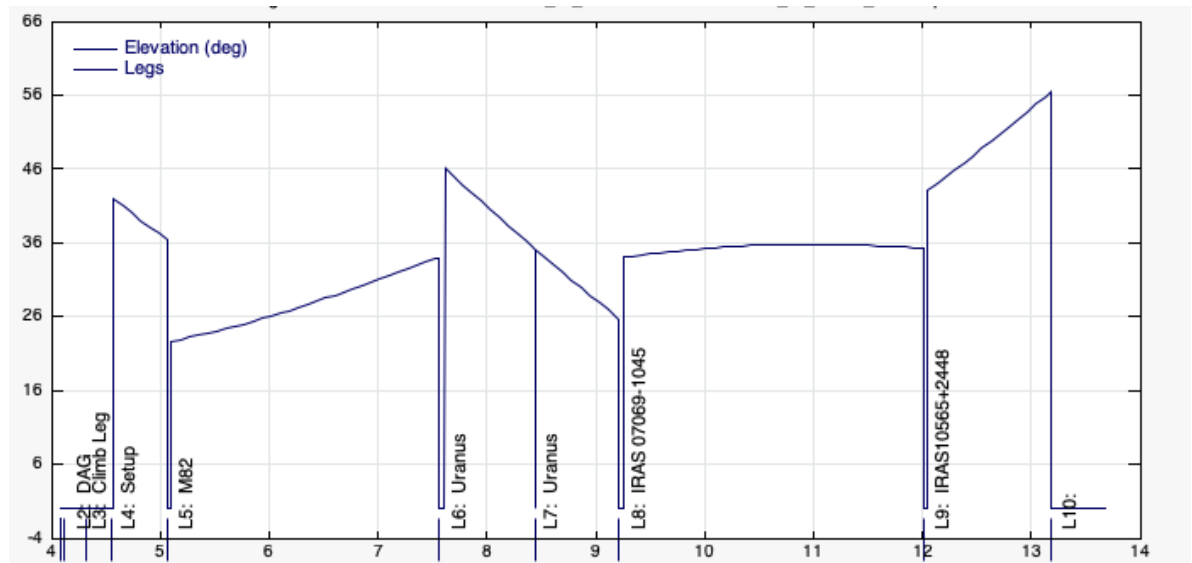
Flight 636 Mission ID 2019-11-06_FI_F636
 Palmdale to Palmdale Take off date UTC: 06-NOV-2019
 Departure UTC: 04:03 Arrival UTC: 13:49

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	19h44m58.48s	45d07m50.9s	4:35	30	
5	07_0217	Latzko	M82	09h55m52.43s	69d40m46.9s	5:07	147	
6	90_0033	Calibration	Uranus	02h07m34.87s	12d21m10.8s	7:37	50	
7	90_0090	Calibration	Uranus	02h07m34.48s	12d21m08.8s	8:27	46	
8	07_0157	Maja	IRAS 07069-1045	07h09m20.54s	-10d50m25.8s	9:16	165	
9	07_0080	Smith	IRAS10565+2448	10h59m18.12s	24d32m34.5s	12:03	68	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



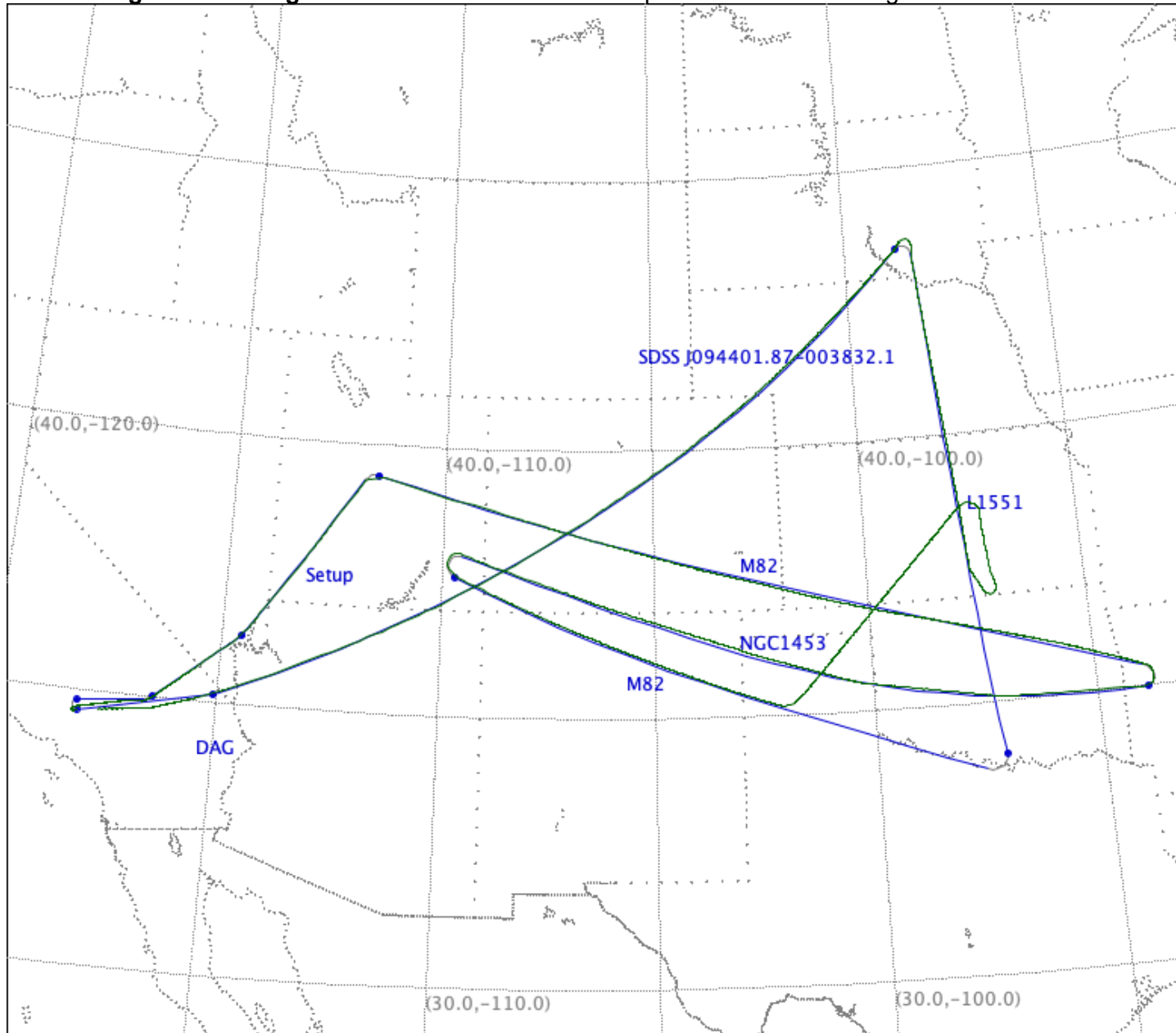
MISSION ID: 2019-11-07_FI_F637

Date: 2019-11-07 UT Instrument: FIFI-LS

Flight #: 637 Flight Series: OC7H

blue = planned route

green = flown route

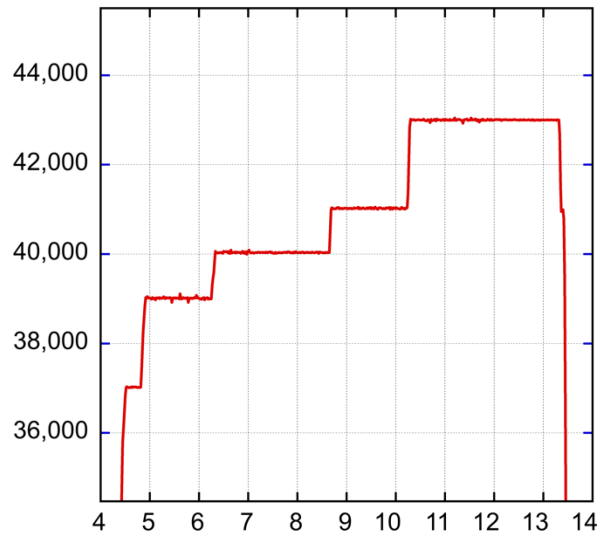


Flight notes: Losses due to clouds and rerouting around storms.

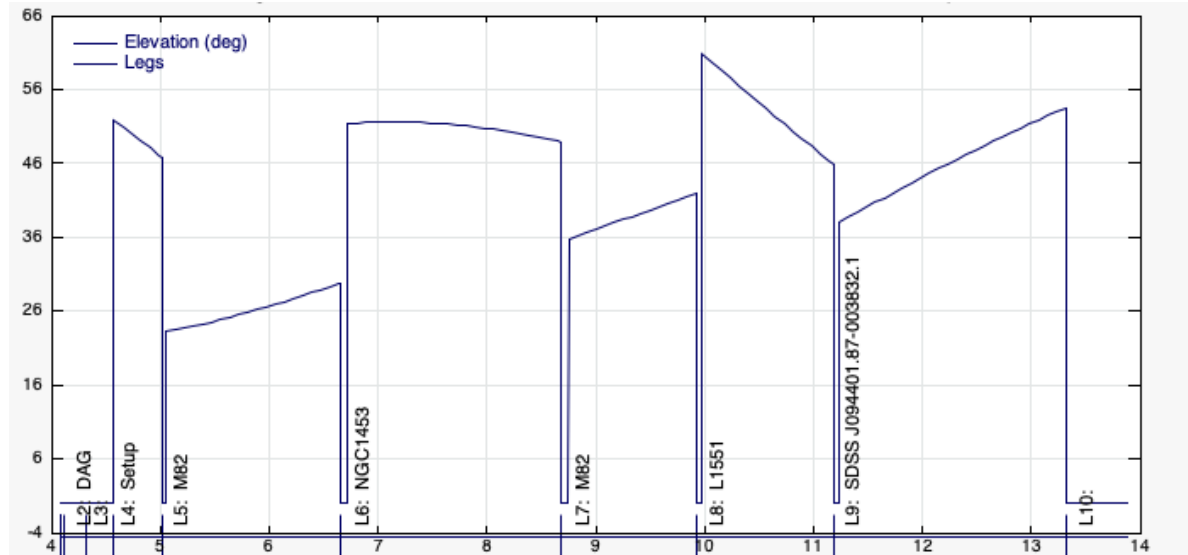
Flight 637 Mission ID 2019-11-07_FI_F637
 Palmdale to Palmdale Take off date UTC: 07-NOV-2019
 Departure UTC: 04:04 Arrival UTC: 13:51

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	20h41m25.91s	45d16m49.2s	4:34	27	
5	07_0217	Latzko	M82	09h55m52.43s	69d40m46.9s	5:03	96	30min lost due to clouds
6	07_0105	Temi	NGC1453	03h46m27.27s	-03d58m07.6s	6:43	117	65min lost due to clouds at beginning of leg
7	07_0217	Latzko	M82	09h55m52.43s	69d40m46.9s	8:45	70	40min into leg forced to reroute around storms
8	07_0069	Sperling	L1551	04h31m34.08s	18d08m04.9s	9:59	72	First 26min of leg lost due to rerouting around storms
9	07_0114	Weiner	SDSS J094401.87-003832.1	09h44m01.87s	-00d38m32.2s	11:14	125	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



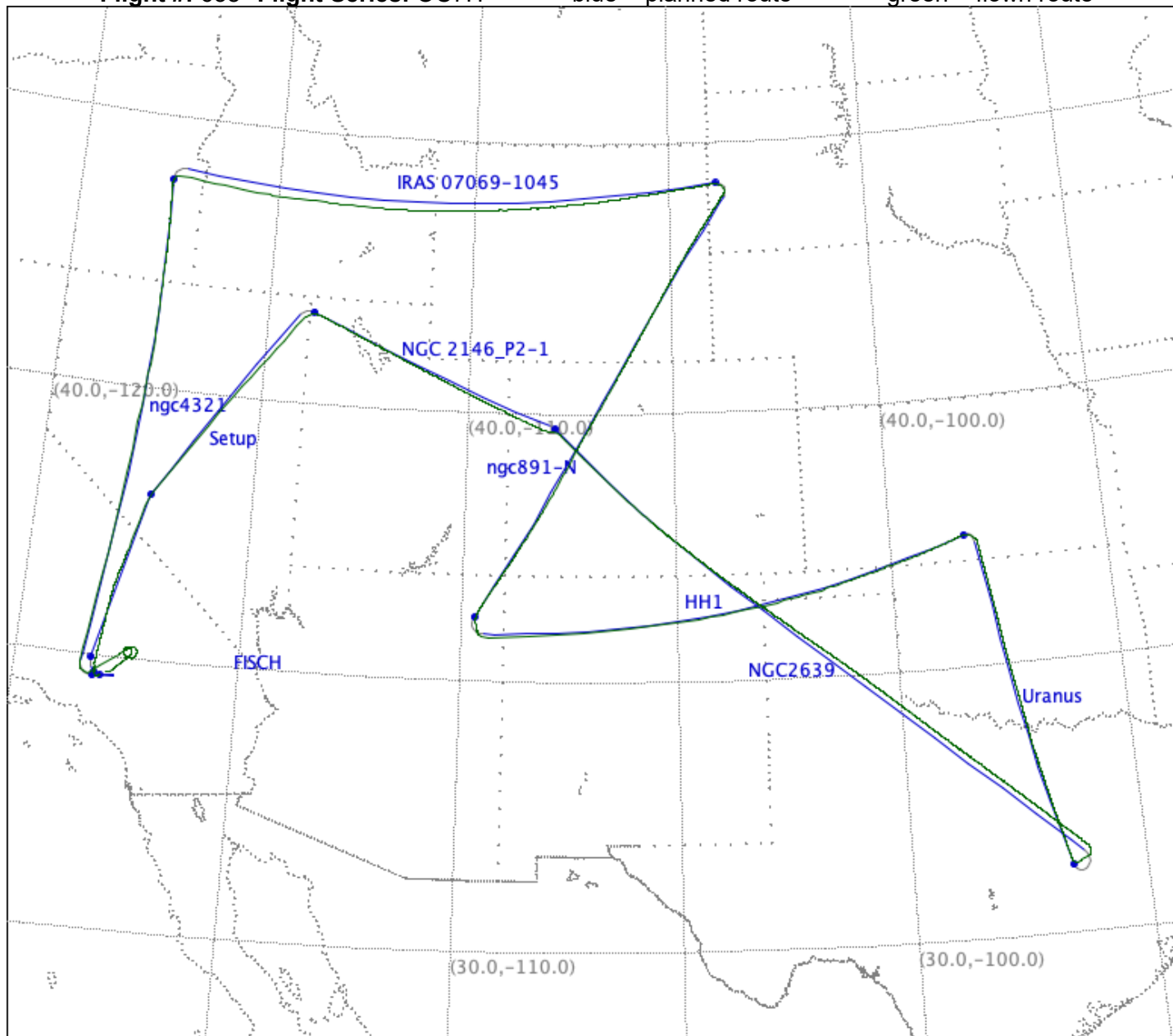
MISSION ID: 2019-11-08_FI_F638

Date: 2019-11-08 UT Instrument: FIFI-LS

Flight #: 638 Flight Series: OC7H

blue = planned route

green = flown route

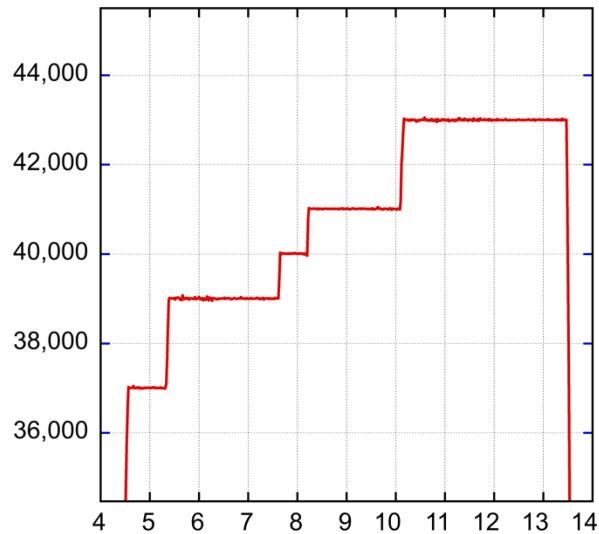


Flight notes: No irregularities.

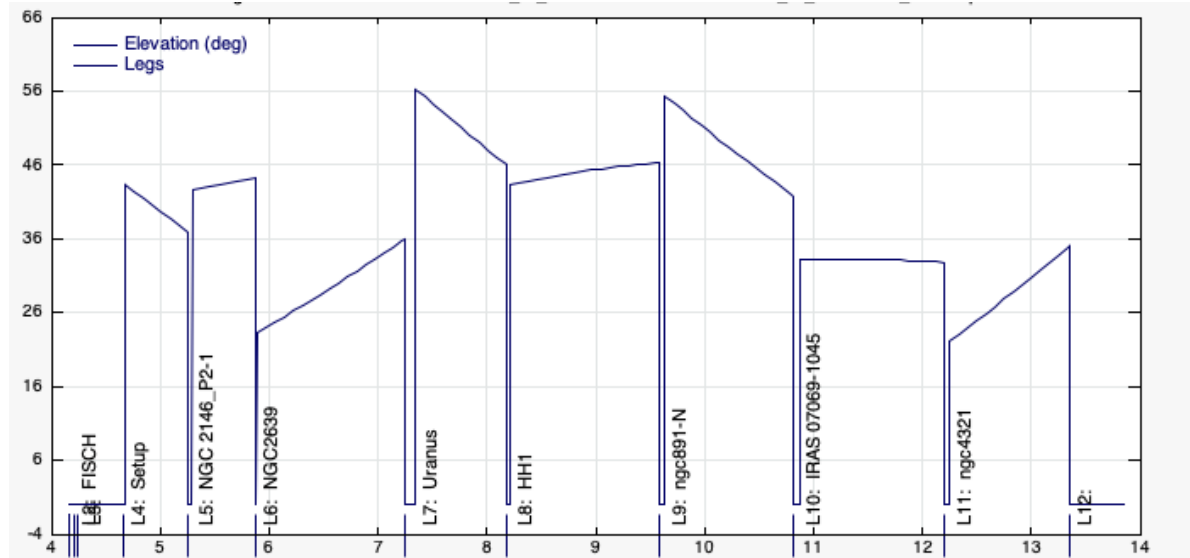
Flight 638 Mission ID 2019-11-08_FI_F638
 Palmdale to Palmdale Take off date UTC: 08-NOV-2019
 Departure UTC: 04:10 Arrival UTC: 13:48

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	19h44m58.48s	45d07m50.9s	4:40	35	
5	07_0106	Armus	NGC 2146_P2	06h18m43.80s	78d21m53.0s	5:17	35	
6	75_0041	Discretionary	NGC2639	08h43m38.08s	50d12m20.0s	5:52	82	Some vignetting by telescope door occurred on leg; water vapor high
7	90_0033	Calibration	Uranus	02h07m16.25s	12d19m34.5s	7:20	50	Water vapor high
8	07_0069	Sperling	HH1	05h36m22.90s	-06d46m11.3s	8:12	82	
9	06_0010	Reach	ngc891-N	02h22m37.53s	42d22m46.4s	9:37	71	
10	07_0157	Maja	IRAS 07069-1045	07h09m20.54s	-10d50m25.8s	10:52	80	
11	70_0708	GTO	ngc4321	12h22m54.93s	15d49m20.3s	12:14	66	Scripting issue related to object velocity led to 35% loss of planned data.

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



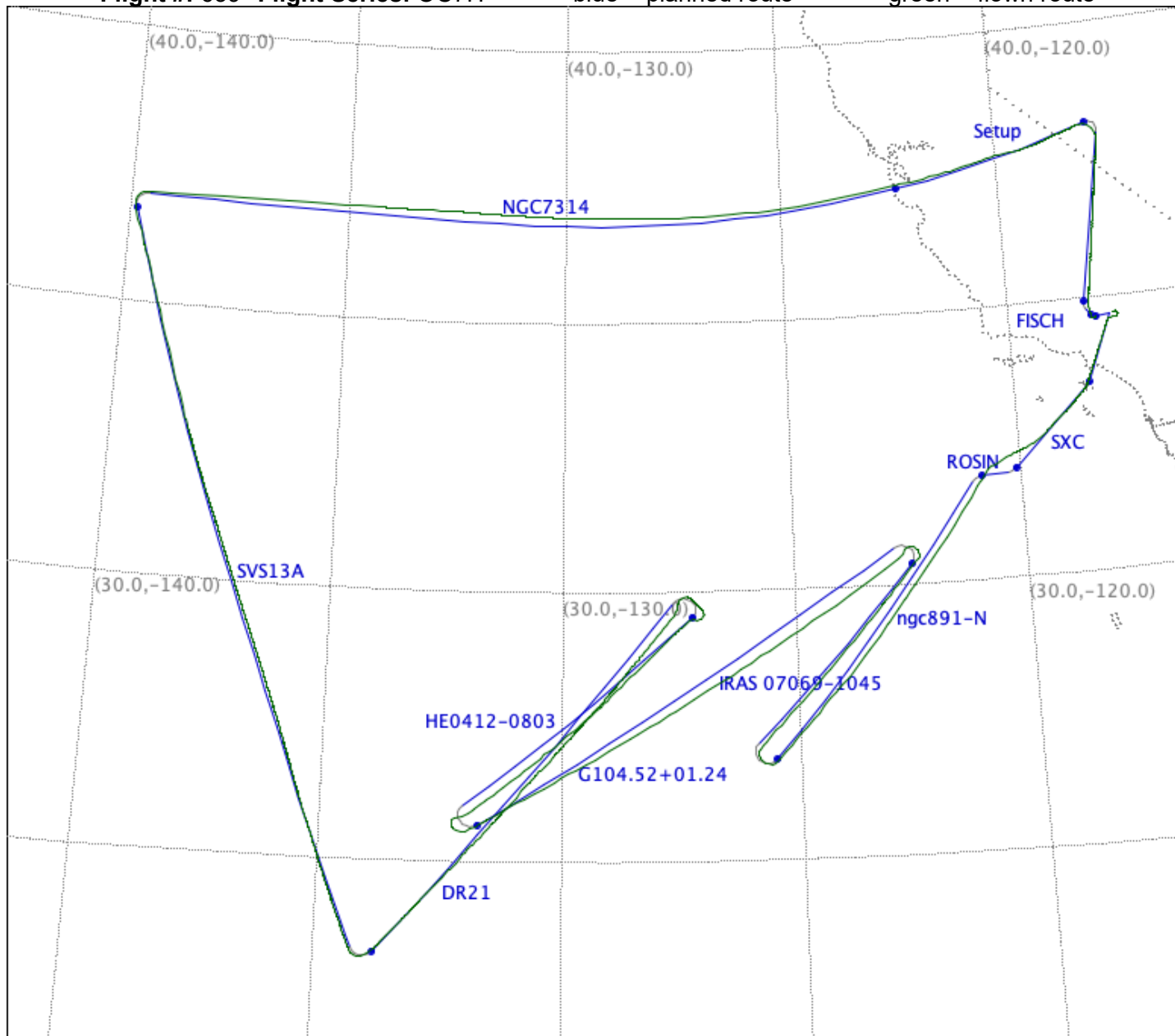
MISSION ID: 2019-11-13_FI_F639

Date: 2019-11-13 UT Instrument: FIFI-LS

Flight #: 639 Flight Series: OC7H

blue = planned route

green = flown route

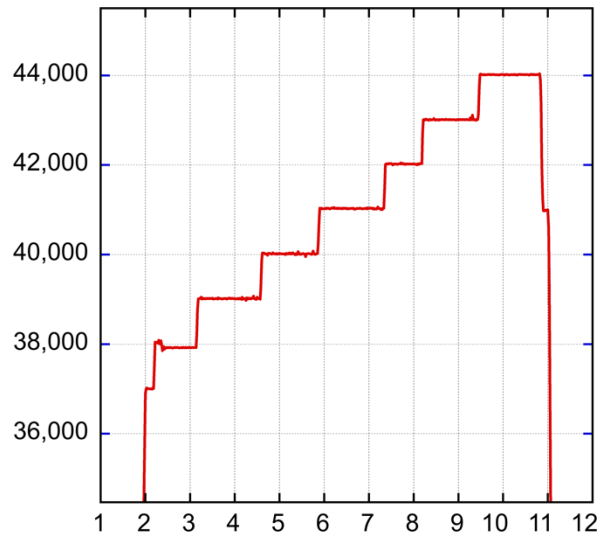


Flight notes: No irregularities.

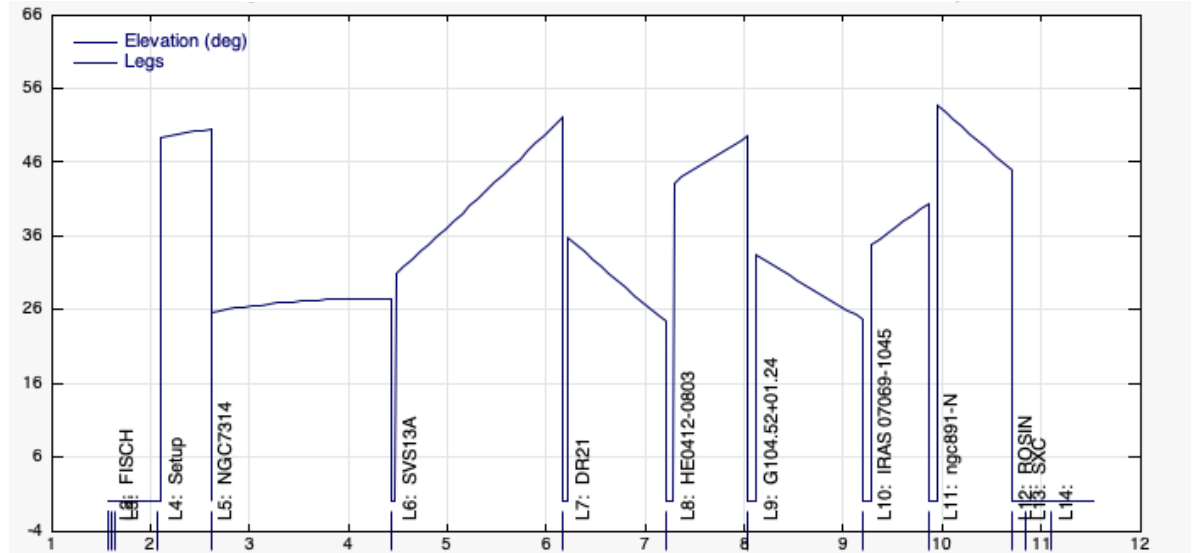
Flight 639 Mission ID 2019-11-13_FI_F639
 Palmdale to Palmdale Take off date UTC: 13-NOV-2019
 Departure UTC: 01:36 Arrival UTC: 11:27

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	22h21m39.38s	-01d23m14.4s	2:06	30	
5	07_0239	Malkan	NGC7314	22h35m46.19s	-26d03m01.7s	2:36	109	Low altitude (38k ft) at start of leg and high water vapor led to poor data quality
6	07_0185	Tobin	SVS13A	03h29m06.47s	31d15m43.5s	4:28	101	
7	75_0046	Discretionary	DR21	20h39m00.84s	42d19m47.7s	6:13	59	
8	07_0117	Smirnova-Pinchukova	HE0412-0803	04h14m52.66s	-07d55m39.7s	7:17	45	
9	75_0047	Discretionary	G104.52+01.24 Center	22h21m46.84s	58d44m29.0s	8:07	65	
10	07_0157	Maja	IRAS 07069-1045	07h09m20.54s	-10d50m25.8s	9:16	35	
11	06_0010	Reach	ngc891-N	02h22m37.53s	42d22m46.4s	9:57	45	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



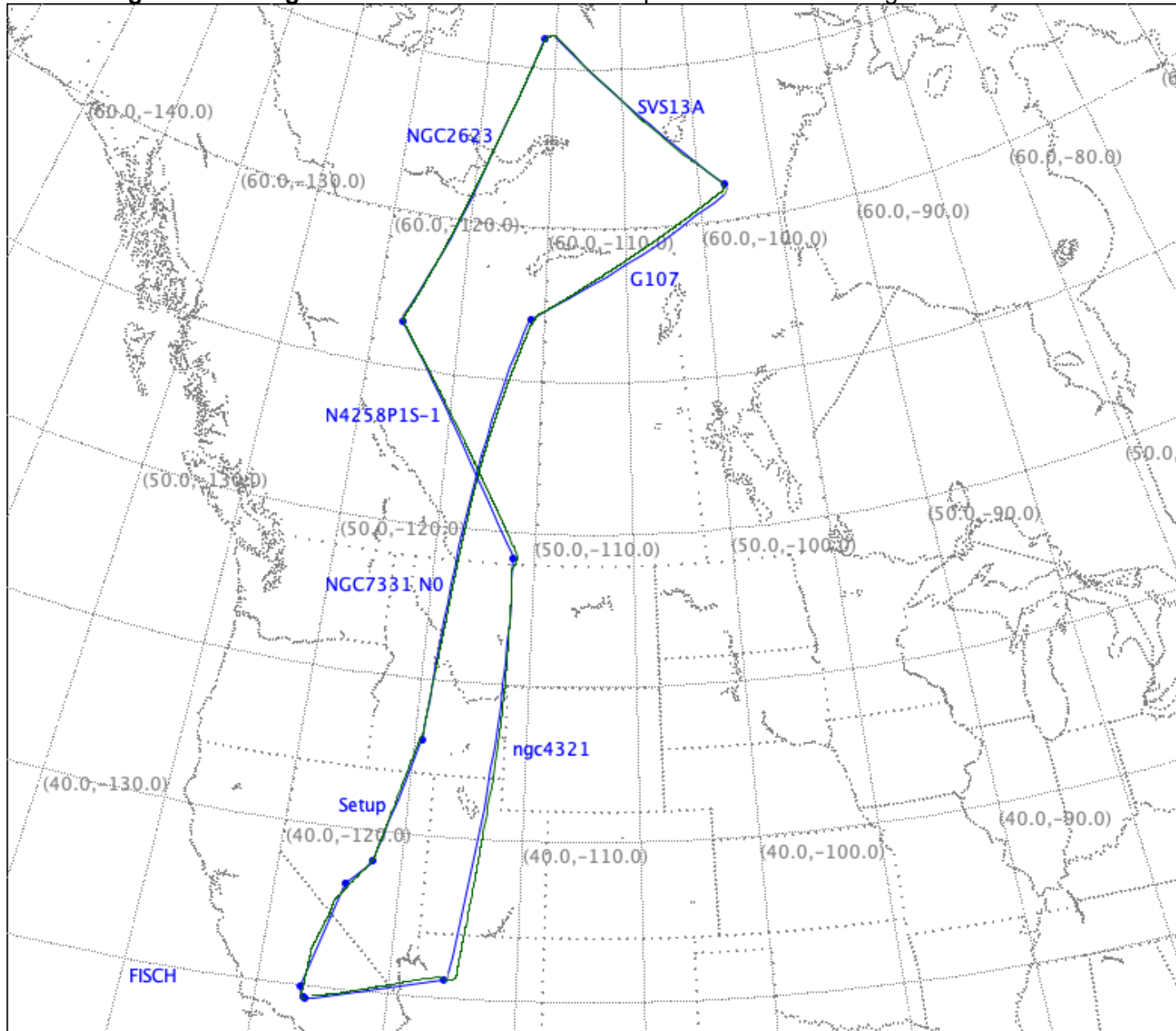
MISSION ID: 2019-11-14_FI_F640

Date: 2019-11-14 UT Instrument: FIFI-LS

Flight #: 640 Flight Series: OC7H

blue = planned route

green = flown route

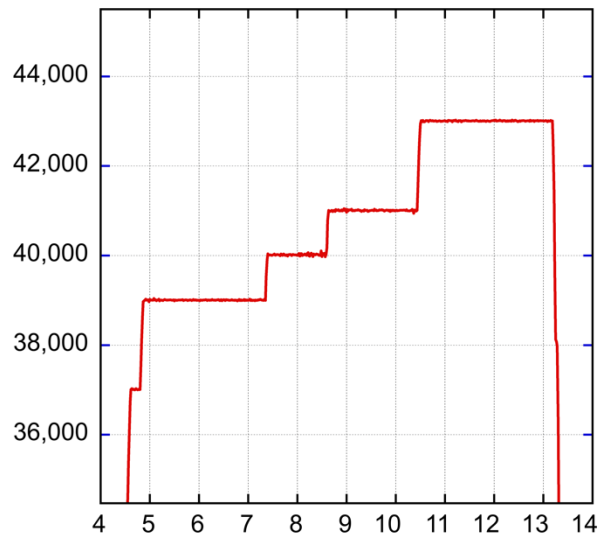


Flight notes: No irregularities.

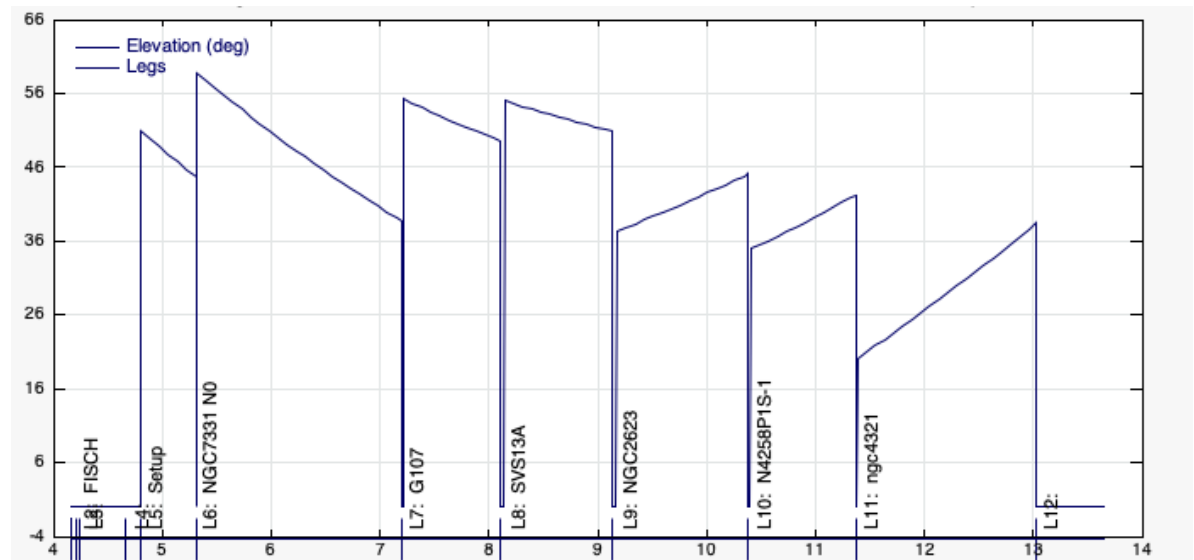
Flight 640 Mission ID 2019-11-14_FI_F640
 Palmdale to Palmdale Take off date UTC: 14-NOV-2019
 Departure UTC: 04:11 Arrival UTC: 13:48

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	21h17m55.08s	34d53m48.8s	4:48	30	
6	75_0045	Discretionary	NGC7331	22h37m04.96s	34d24m04.7s	5:18	113	
7	75_0043	Discretionary	G107	22h21m26.80s	63d51m37.0s	7:12	53	Turbulence.
8	07_0185	Tobin	SVS13A	03h29m06.47s	31d15m43.5s	8:08	59	
9	07_0080	Smith	NGC2623	08h38m24.08s	25d45m16.7s	9:10	72	
10	07_0154	Appleton	N4258P1S	12h18m58.77s	47d18m31.2s	10:24	58	
11	70_0708	GTO	ngc4321	12h22m54.93s	15d49m20.3s	11:23	99	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



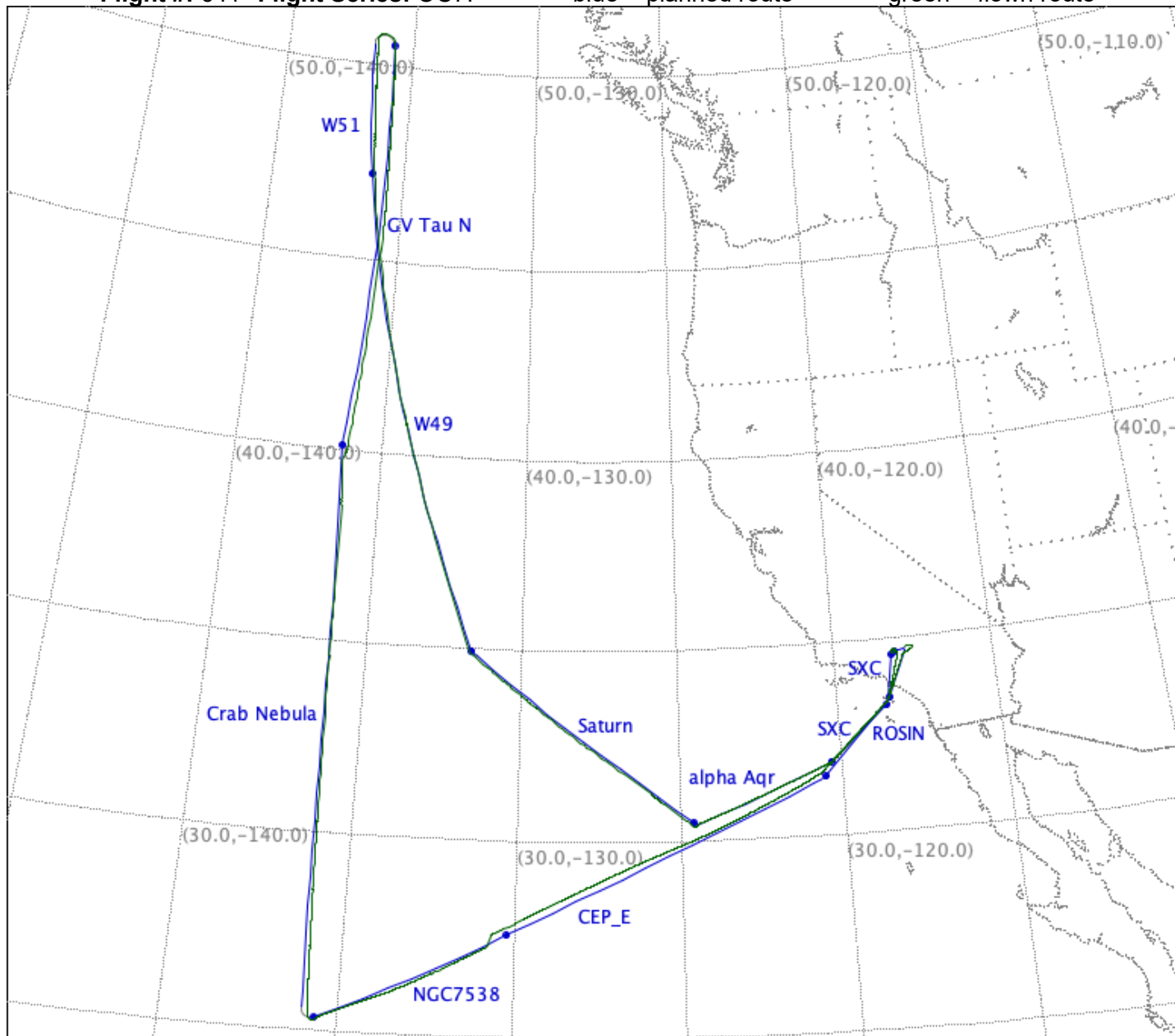
MISSION ID: 2019-11-20_GR_F641

Date: 2019-11-20 UT Instrument: GREAT

Flight #: 641 Flight Series: OC7I

blue = planned route

green = flown route

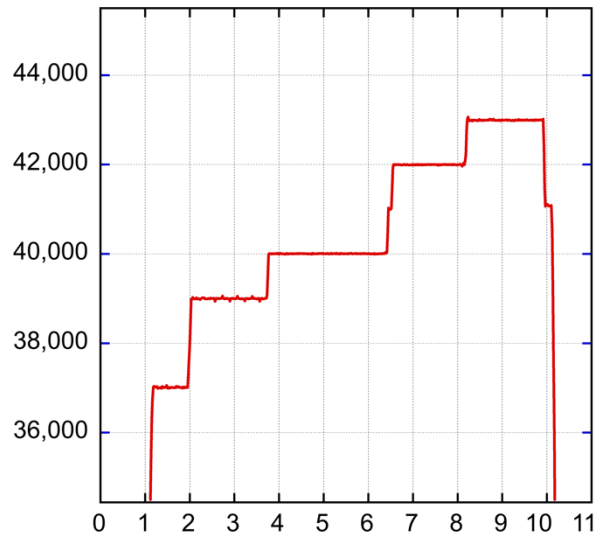


Flight notes: No irregularities.

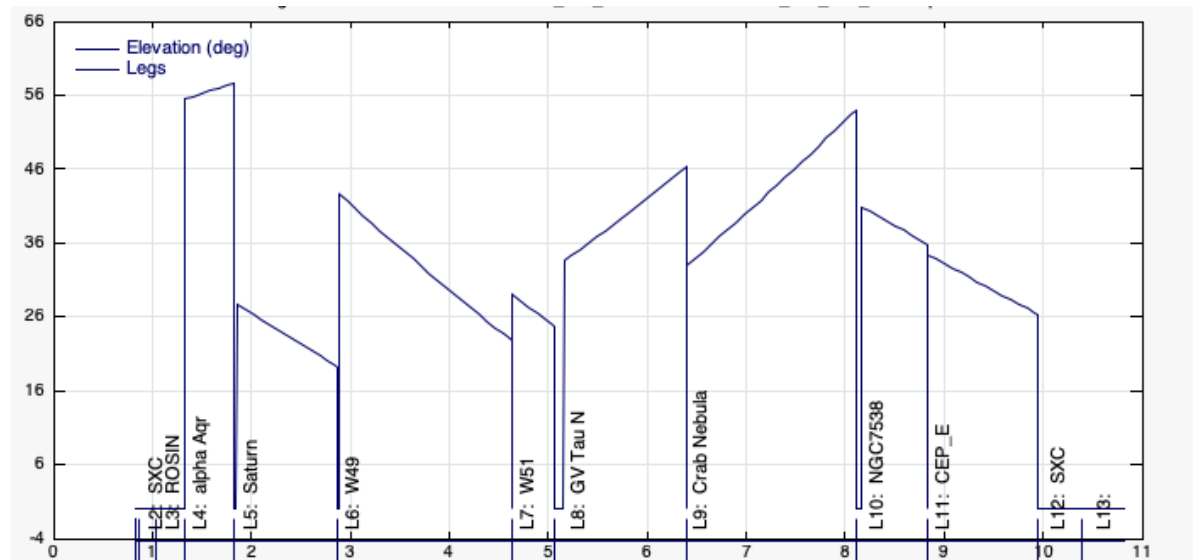
Flight 641 Mission ID 2019-11-20_GR_F641
 Palmdale to Palmdale Take off date UTC: 20-NOV-2019
 Departure UTC: 00:44 Arrival UTC: 10:40
 4G-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			alpha Aqr	22h05m47.04s	-00d19m11.5s	1:19	30	
5	90_0008	Calibration	Saturn	19h12m15.71s	-22d17m31.0s	1:51	61	Bright sky caused brief acquisition issues
6	07_0016	Goldsmith	W49	19h10m17.50s	09d05m58.6s	2:52	105	
7	07_0016	Goldsmith	W51	19h23m40.70s	14d30m22.0s	4:37	26	
8	07_0070	Goldsmith	GV Tau N	04h29m23.70s	24d32m57.6s	5:09	74	
9	07_0162	Menten	Crab Nebula	05h34m31.20s	21d59m45.3s	6:23	103	
10	07_0016	Goldsmith	NGC7538	23h14m31.35s	61d18m33.0s	8:09	40	
11	07_0161	Gusdorf	CEP E	23h03m12.78s	61d42m25.8s	8:49	67	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



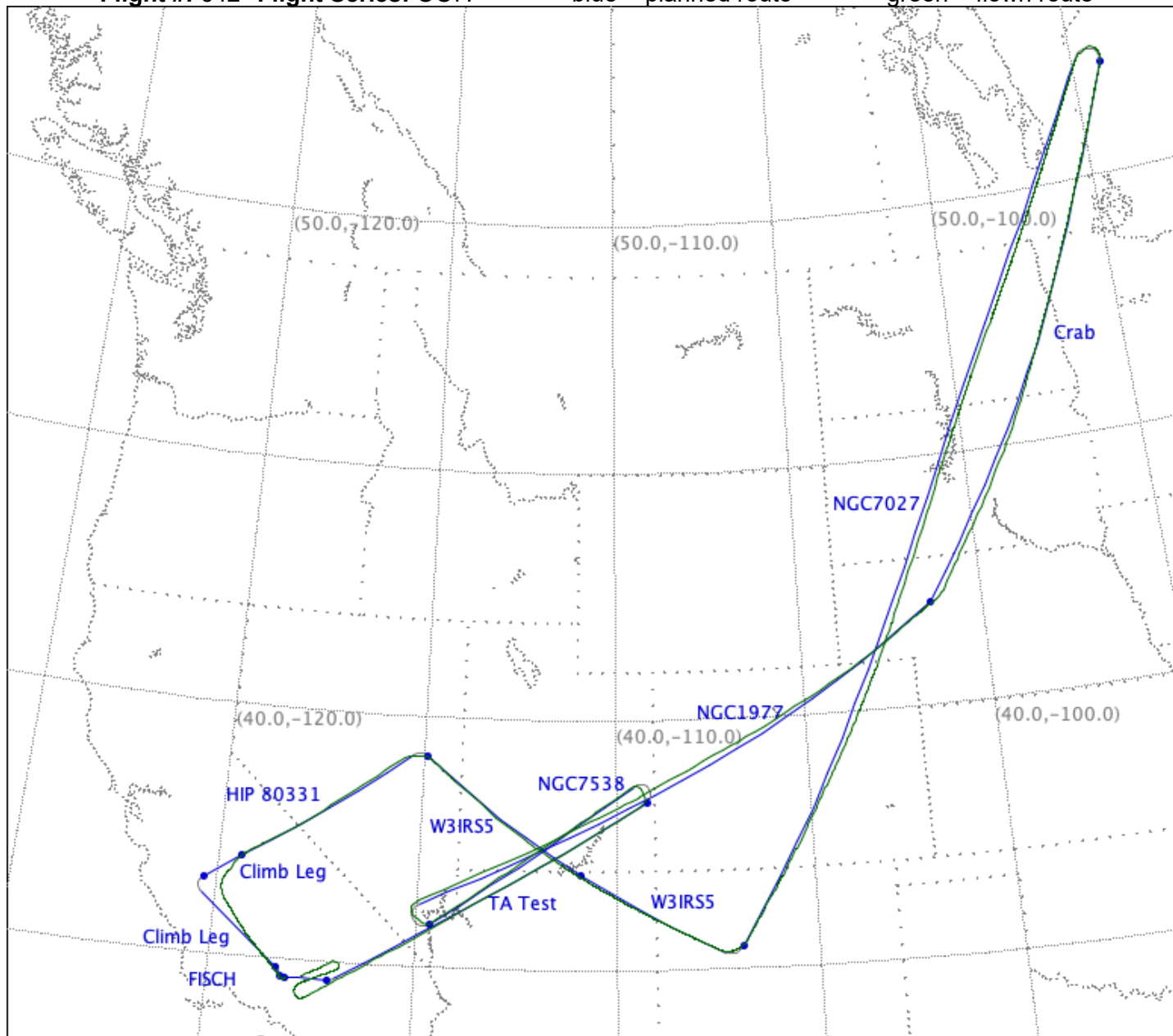
MISSION ID: 2019-11-21_GR_F642

Date: 2019-11-21 UT Instrument: GREAT

Flight #: 642 Flight Series: OC71

blue = planned route

green = flown route

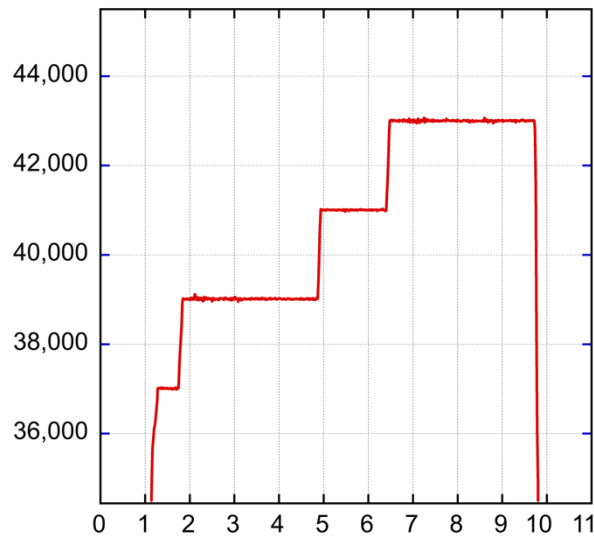


Flight notes: No irregularities.

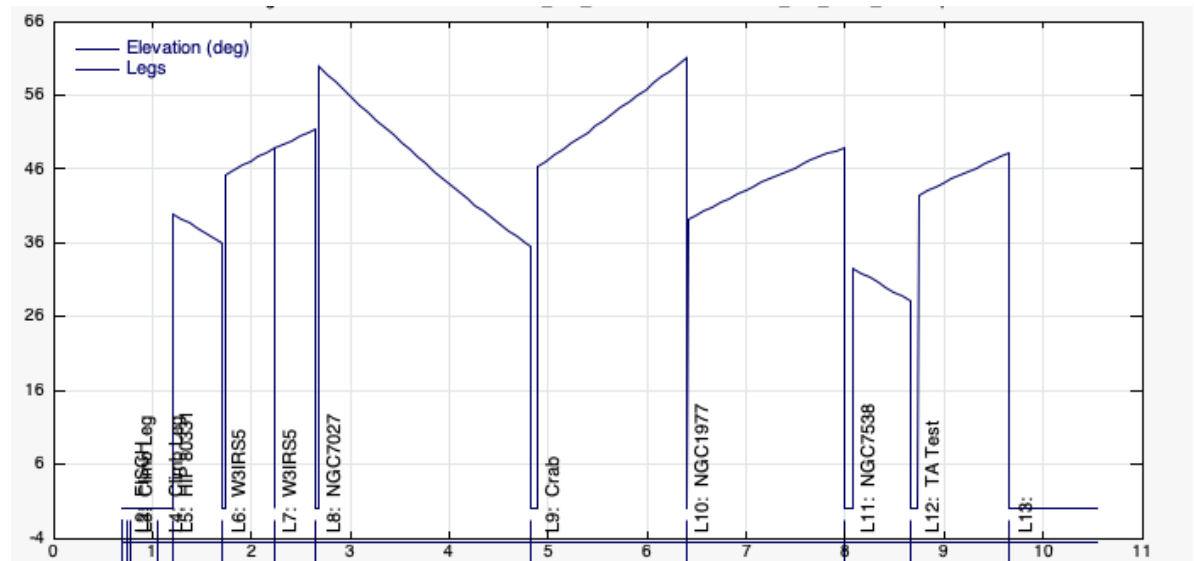
Flight 642 Mission ID 2019-11-21_GR_F642
 Palmdale to Palmdale Take off date UTC: 21-NOV-2019
 Departure UTC: 00:45 Arrival UTC: 10:21 Consortium flight 4G-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			HIP 80331	16h23m59.49s	61d30m51.2s	1:12	30	
6	90_0011	Calibration	W3IRS5	02h25m40.54s	62d05m51.4s	1:44	30	
7	83_0718	GREAT Consortium	W3IRS5	02h25m40.54s	62d05m51.4s	2:14	24	
8	83_0717	GREAT Consortium	NGC7027	21h07m01.59s	42d14m10.2s	2:41	128	
9	83_0716	GREAT Consortium	Crab	05h34m31.44s	21d59m49.2s	4:54	90	
10	83_0725	GREAT Consortium	NGC1977	05h35m16.41s	-04d55m19.7s	6:24	95	
11	83_0719	GREAT Consortium	NGC7538	23h13m16.37s	61d28m04.4s	8:04	35	
12			HIP 35301	07h17m31.66s	-06d40m48.0s	8:44	55	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



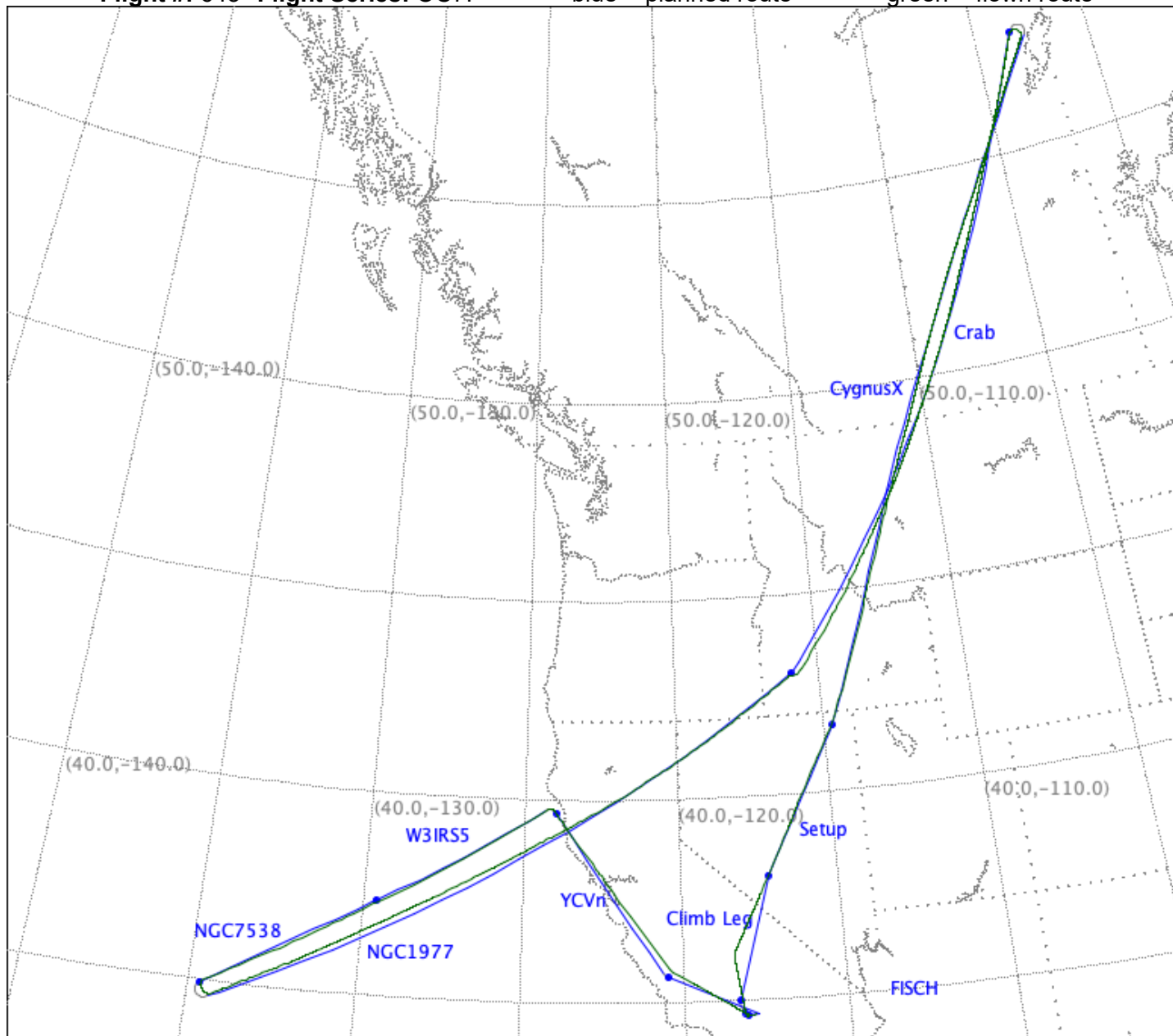
MISSION ID: 2019-11-23_GR_F643

Date: 2019-11-23 UT Instrument: GREAT

Flight #: 643 Flight Series: OC7I

blue = planned route

green = flown route

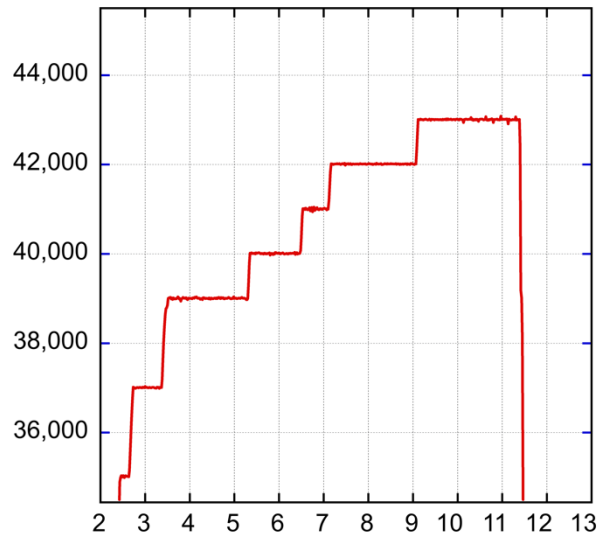


Flight notes: Some turbulence.

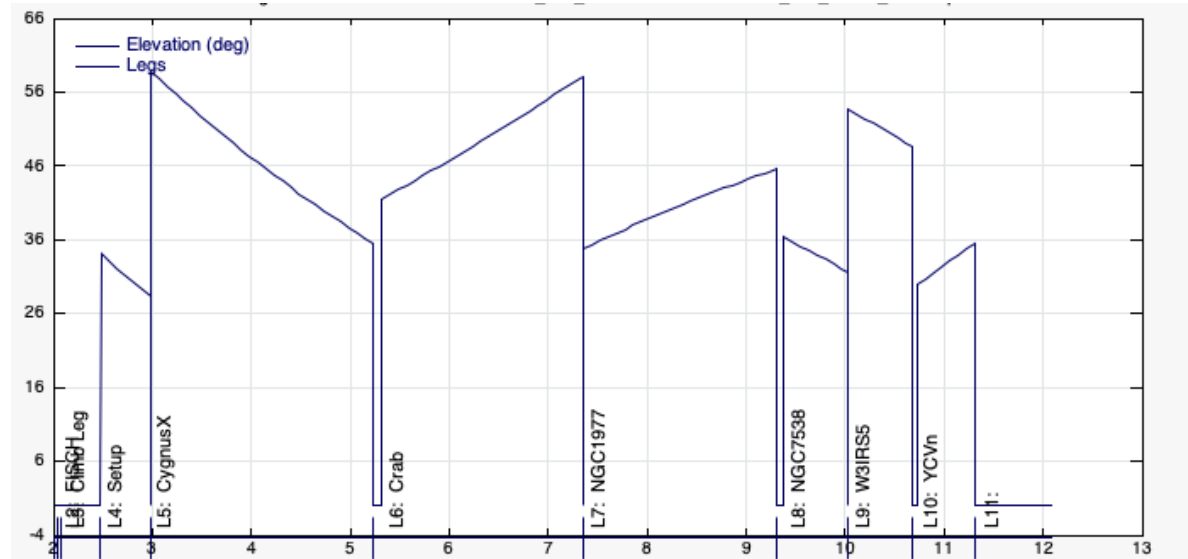
Flight 643 Mission ID 2019-11-23_GR_F643
 Palmdale to Palmdale Take off date UTC: 23-NOV-2019
 Departure UTC: 01:57 Arrival UTC: 11:46 Consortium flight 4G-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	17h56m15.18s	37d15m01.9s	2:28	30	
5	83_0719	GREAT Consortium	CygnusX	20h38m39.30s	42d20m39.3s	2:58	135	Turbulence.
6	83_0716	GREAT Consortium	Crab	05h34m31.85s	21d59m47.9s	5:18	122	
7	83_0725	GREAT Consortium	NGC1977	05h35m16.41s	-04d55m19.7s	7:21	117	Turbulence.
8	83_0718	GREAT Consortium	NGC7538	23h13m45.36s	61d28m10.6s	9:23	39	
9	83_0718	GREAT Consortium	W3IRS5	02h25m40.54s	62d05m51.4s	10:02	39	
10	83_0729	GREAT Consortium	YCVn	12h45m07.83s	45d26m24.9s	10:43	35	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



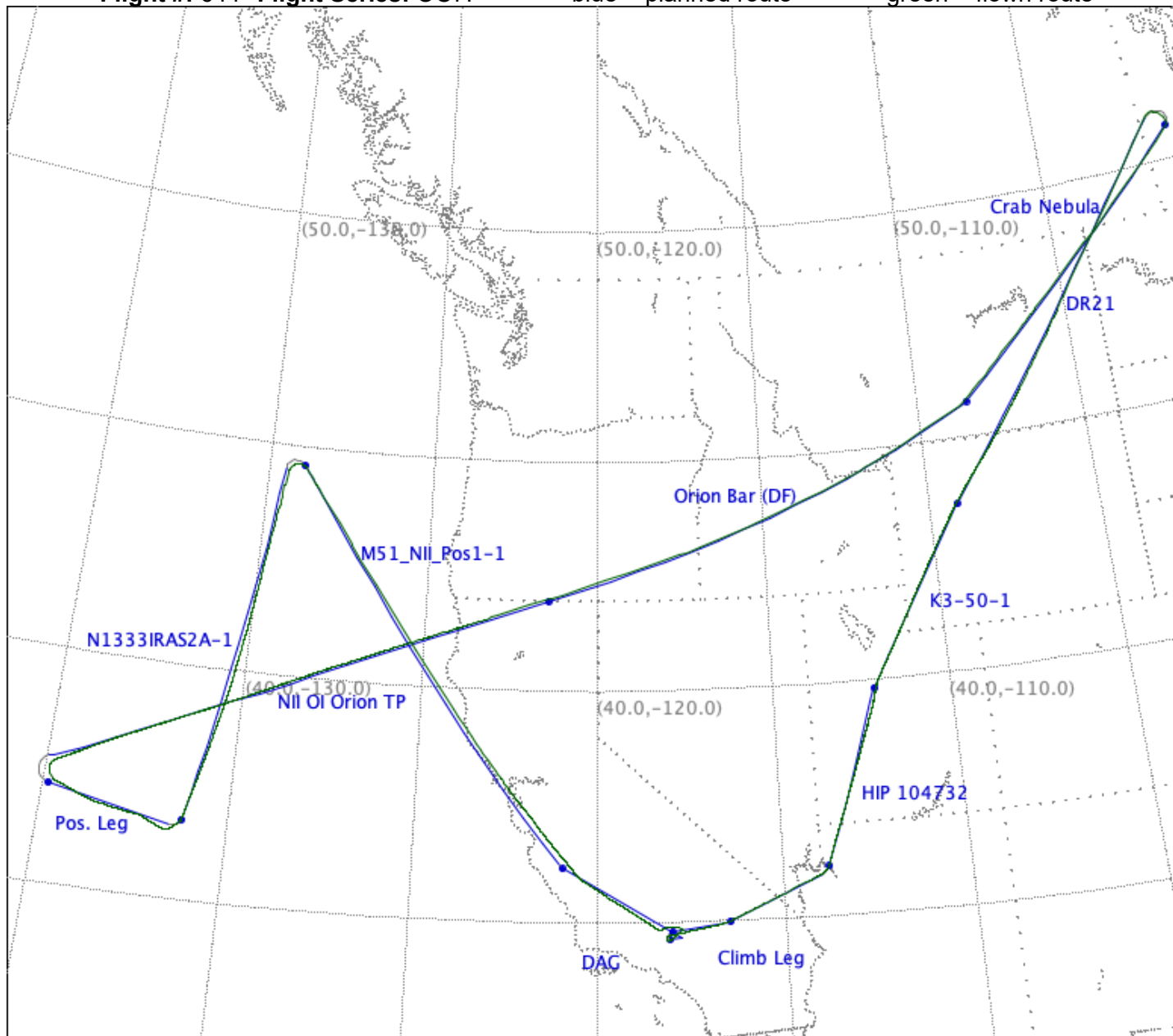
MISSION ID: 2019-11-27_GR_F644

Date: 2019-11-27 UT Instrument: GREAT

Flight #: 644 Flight Series: OC7I

blue = planned route

green = flown route

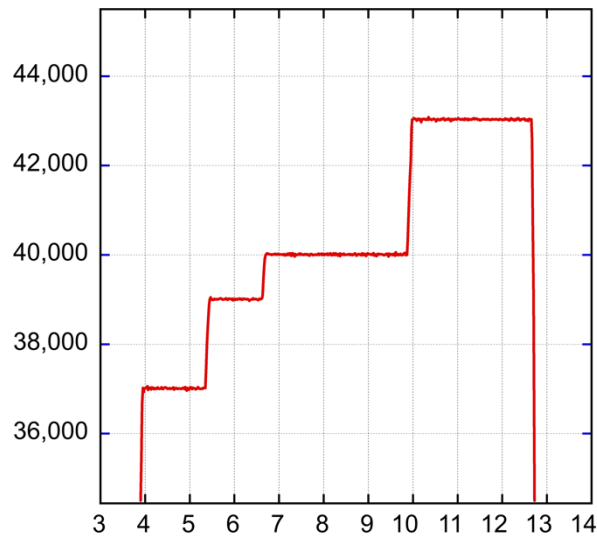


**Flight notes:
No irregularities.**

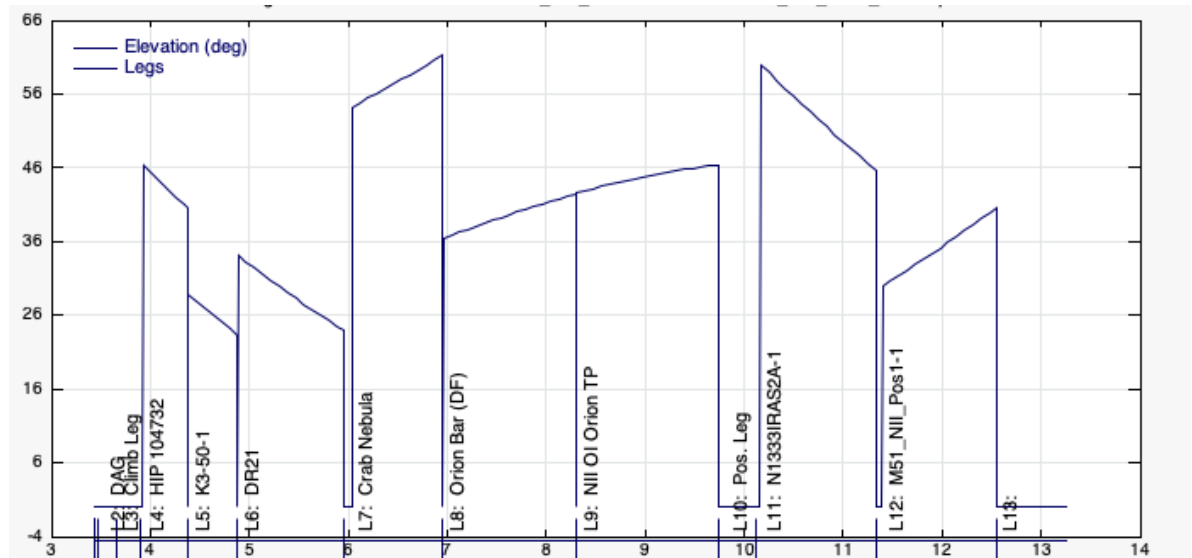
Flight 644 Mission ID 2019-11-27_GR_F644
 Palmdale to Palmdale Take off date UTC: 27-NOV-2019
 Departure UTC: 03:22 Arrival UTC: 13:03
 4G-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 104732	21h12m56.19s	30d13m36.9s	3:54	27	
5	07_0016	Goldsmith	K3-50	20h01m46.90s	33d33m05.1s	4:22	30	
6	07_0016	Goldsmith	DR21	20h39m00.90s	42d19m42.0s	4:52	64	
7	07_0162	Menten	Crab Nebula	05h34m31.20s	21d59m45.3s	6:01	55	
8	07_0115	Goicoechea	Orion Bar	05h35m20.80s	-05d25m17.0s	6:56	81	
9	07_0016	Goldsmith	NII OI Orion TP	05h35m15.40s	-05d23m28.0s	8:17	86	
11	07_0036	Caselli	N1333IRAS2A	03h28m55.90s	31d14m37.0s	10:09	70	
12	07_0173	Buchbender	M51 NII Pos1	13h29m59.33s	47d11m17.7s	11:22	69	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



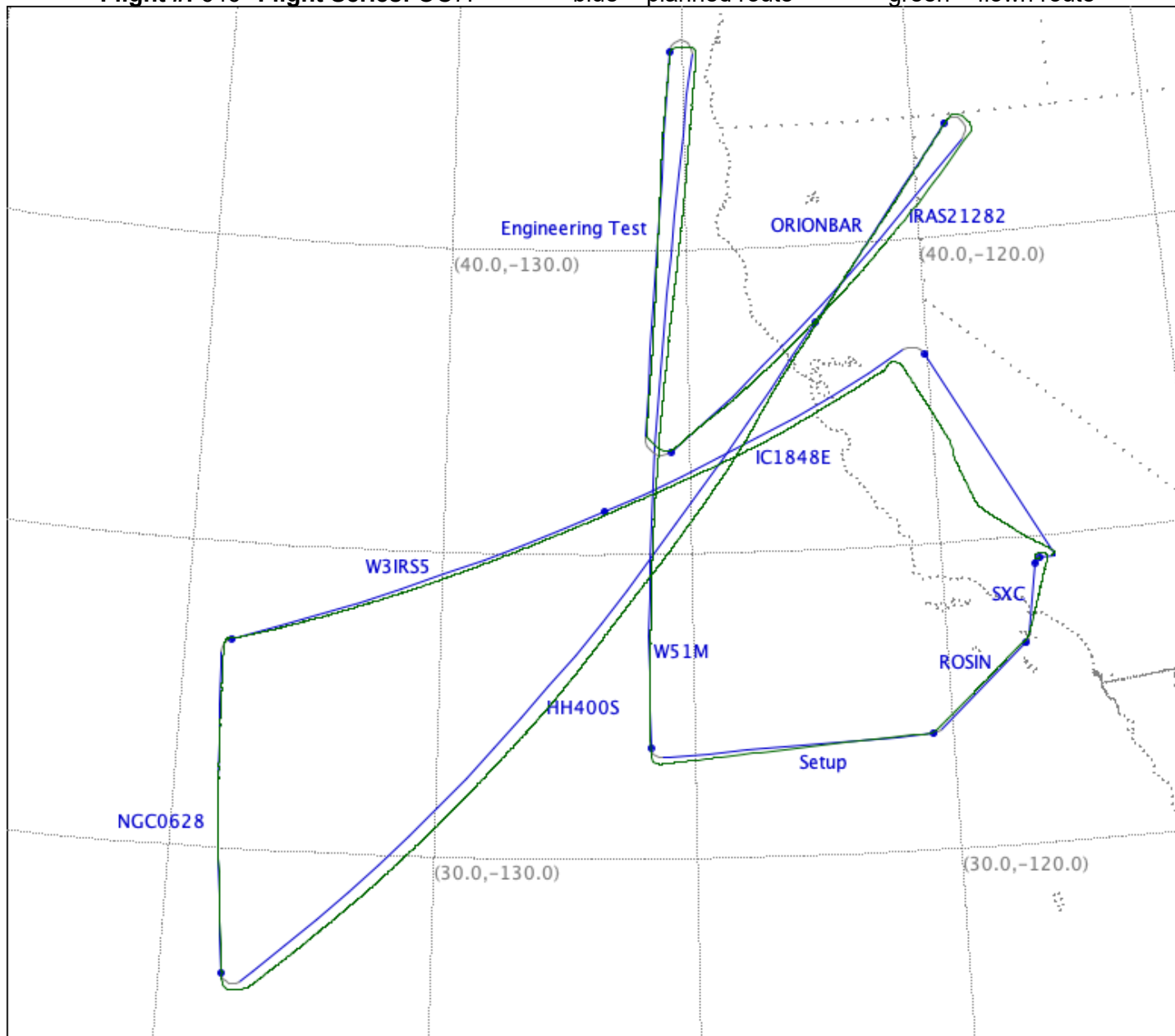
MISSION ID: 2019-12-11_GR_F646

Date: 2019-12-11 UT Instrument: GREAT

Flight #: 646 Flight Series: OC7I

blue = planned route

green = flown route

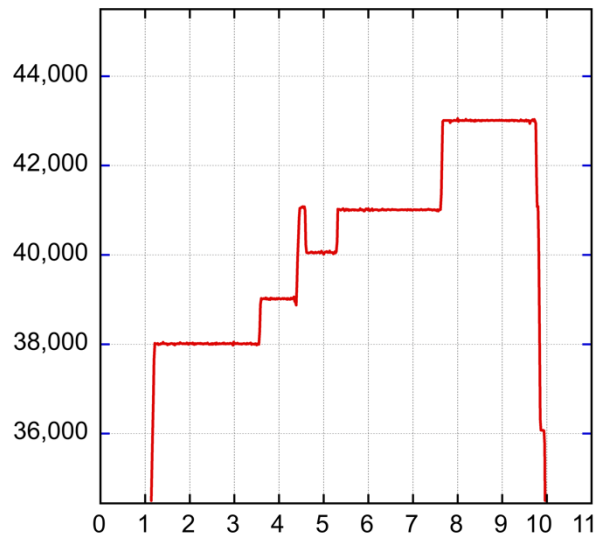


Flight notes: Repeated turbulence.

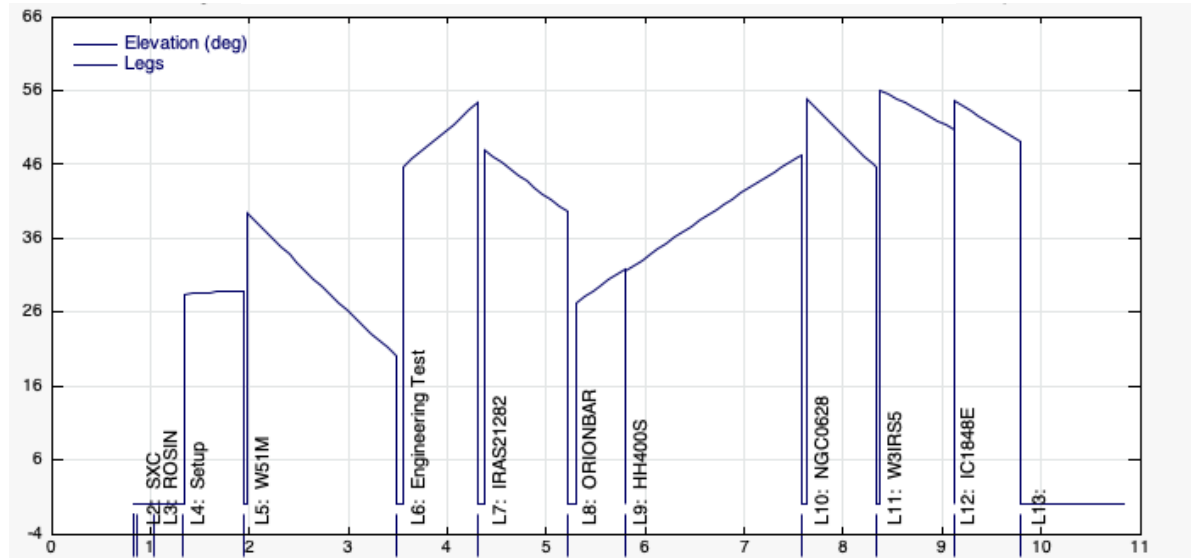
Flight 646 Mission ID 2019-12-11_GR_F646
 Palmdale to Palmdale Take off date UTC: 11-DEC-2019
 Departure UTC: 00:44 Arrival UTC: 10:23 Consortium flight HFA/LFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	22h57m39.05s	-29d37m20.1s	1:21	36	
5	83_0715	GREAT Consortium	W51M	19h23m42.00s	14d30m36.0s	1:59	90	
6	83_0729	GREAT Consortium	HIP17759	03h48m06.50s	24d59m17.8s	3:34	45	
7	83_0721	GREAT Consortium	IRAS21282	21h29m58.47s	51d04m00.3s	4:23	50	Turbulence – partial data.
8	90_0011	Calibration	ORIONBAR	05h35m20.80s	-05d25m17.0s	5:18	30	
9	83_0728	GREAT Consortium	HH400S	05h35m58.00s	-05d41m45.0s	5:48	107	Turbulence.
10	83_0729	GREAT Consortium	NGC0628	01h36m43.20s	15d47m17.7s	7:38	42	
11	90_0011	Calibration	W3IRS5	02h25m40.54s	62d05m51.4s	8:22	45	
12	83_0720	GREAT Consortium	IC1848E	03h00m08.00s	60d17m12.0s	9:07	40	Turbulence – partial data.

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



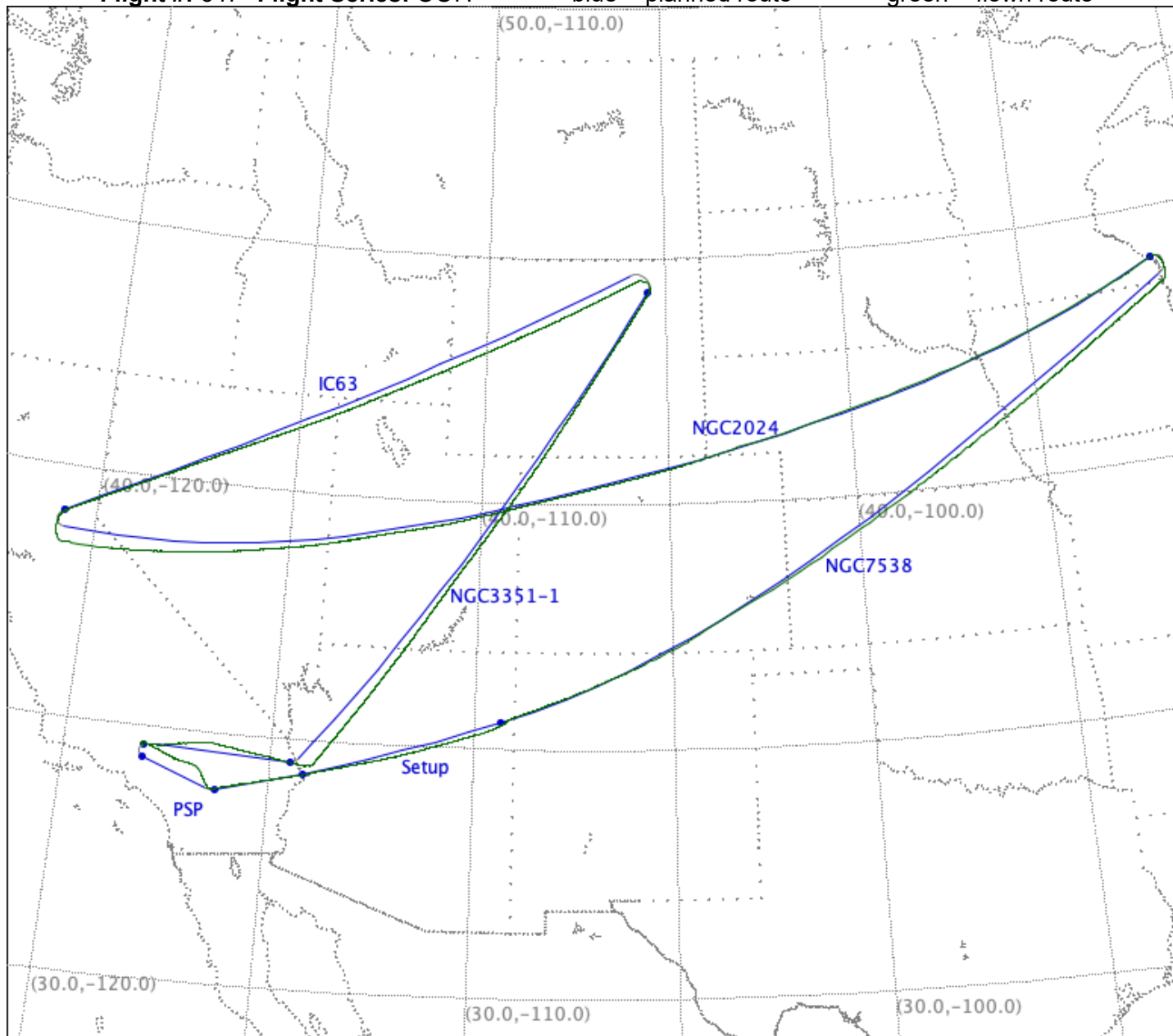
MISSION ID: 2019-12-12_GR_F647

Date: 2019-12-12 UT Instrument: GREAT

Flight #: 647 Flight Series: OC7I

blue = planned route

green = flown route



Flight notes: Intermittent turbulence.

Flight 647 Mission ID
Palmdale to
Palmdale

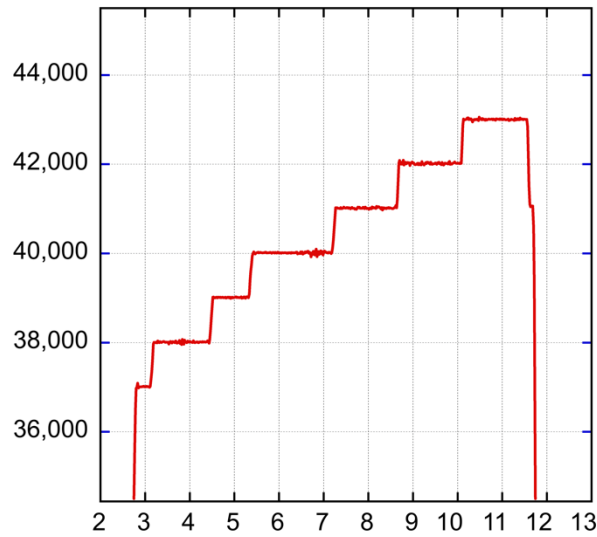
2019-12-12_GR_F647
Take off date UTC:
12-DEC-2019

Departure UTC: 02:19
Arrival UTC: 12:09

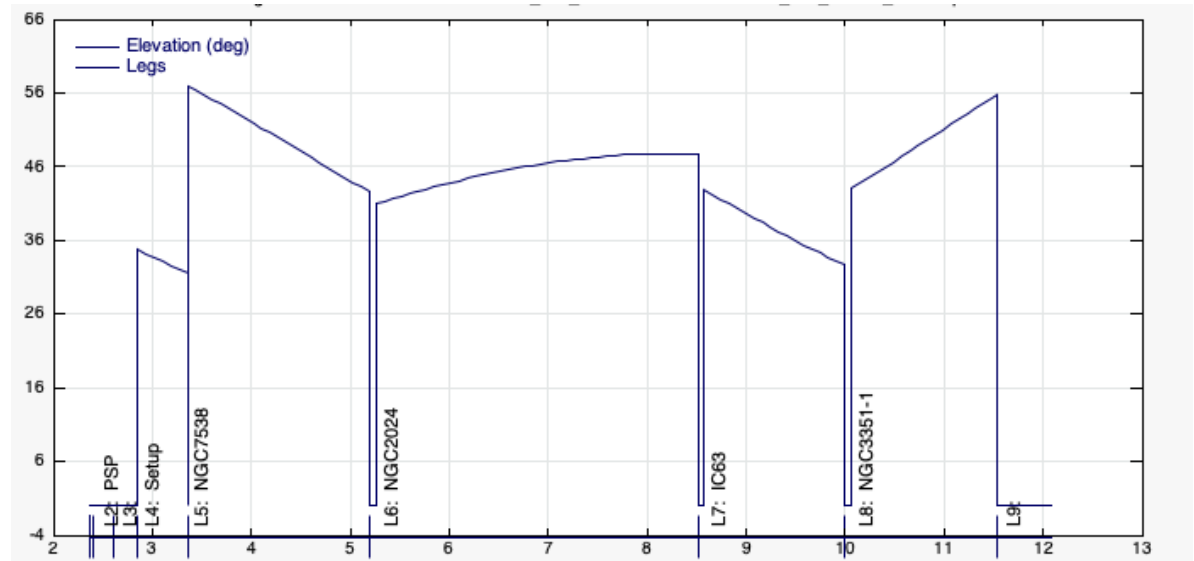
HFA/LFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	19h12m33.30s	67d39m41.5s	2:50	30	
5	07_0077	Tielens	NGC7538	23h13m08.68s	61d28m06.8s	3:20	110	
6	07_0132	Graf	NGC2024	05h41m45.20s	-01d55m45.0s	5:15	195	
7	07_0011	Andersson	IC63	00h58m20.25s	61d00m36.1s	8:34	85	
8	07_0126	Bolatto	NGC3351	10h43m57.70s	11d42m13.7s	10:03	88	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



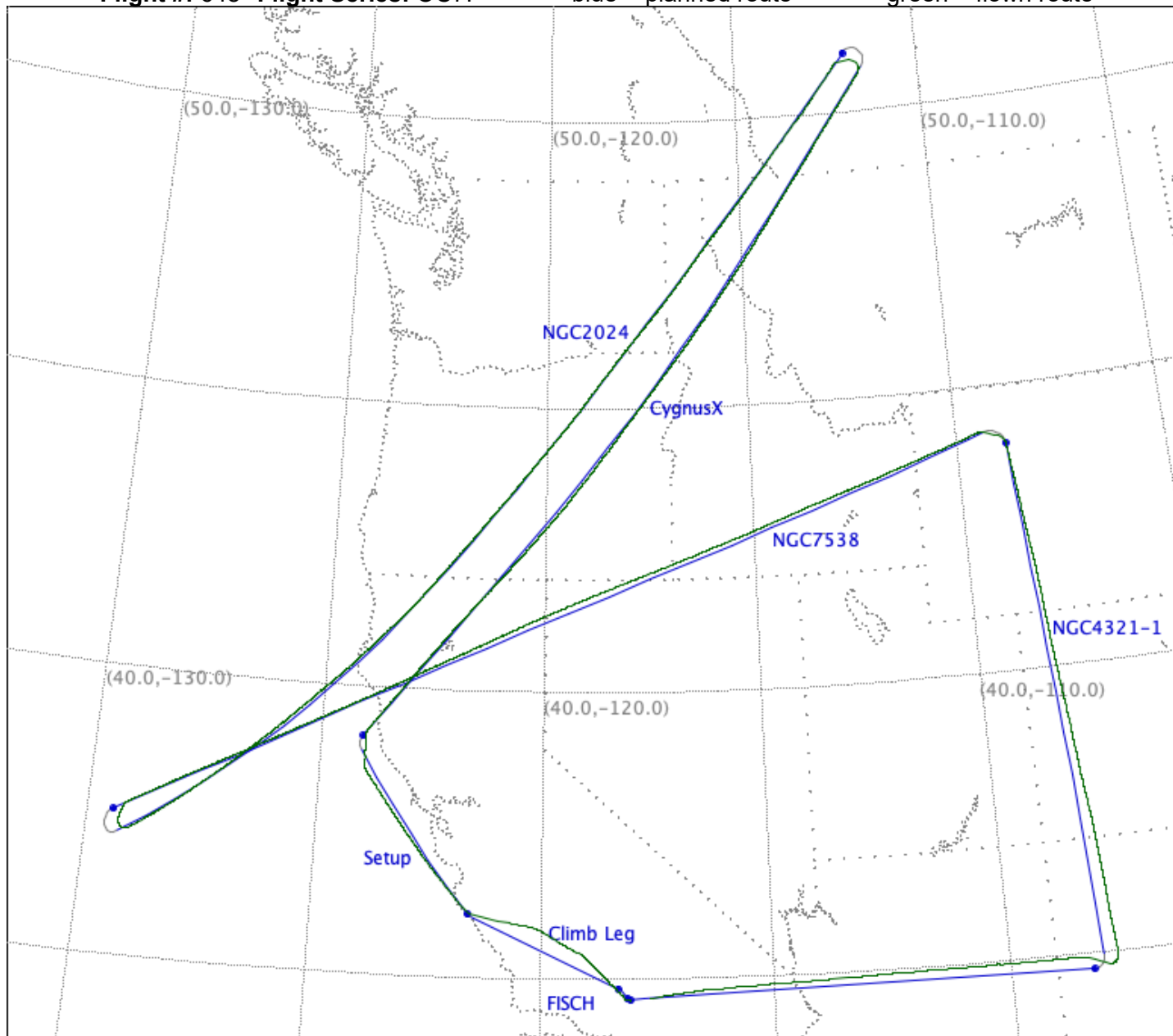
MISSION ID: 2019-12-13_GR_F648

Date: 2019-12-13 UT Instrument: GREAT

Flight #: 648 Flight Series: OC7I

blue = planned route

green = flown route



Flight notes: No irregularities.

Flight 648 Mission ID
Palmdale to Palmdale

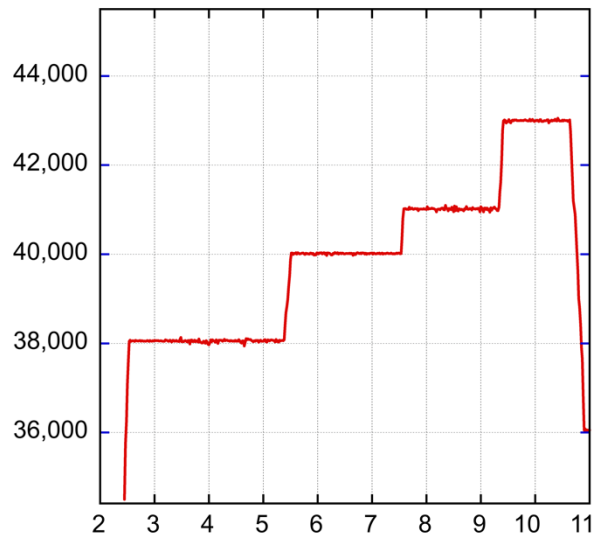
2019-12-13_GR_F648
Take off date UTC:
13-DEC-2019

Departure UTC: 02:06
Arrival UTC: 11:47

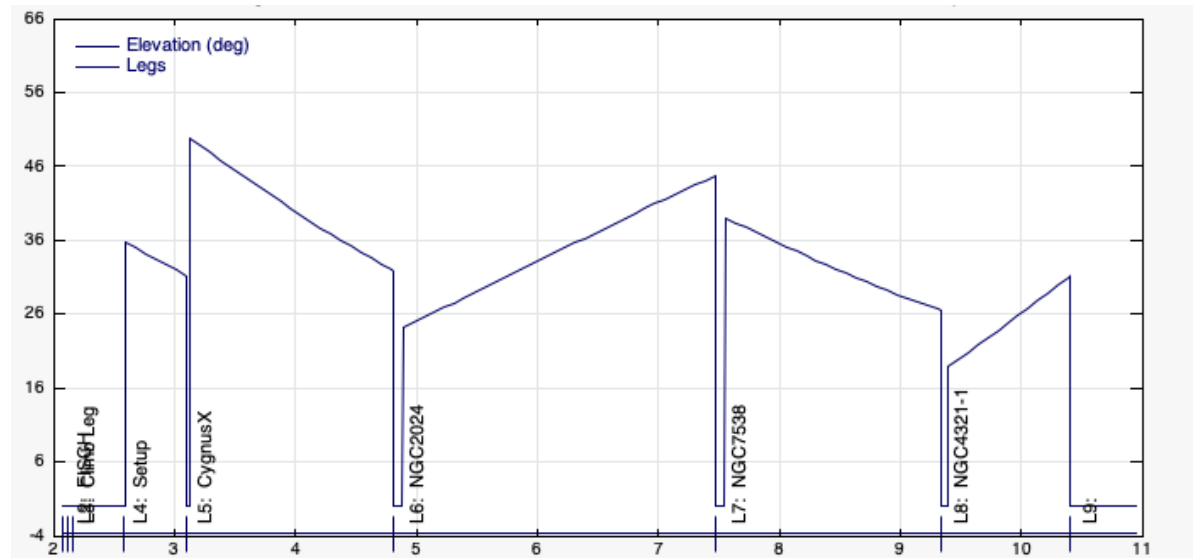
HFA/LFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	21h37m45.11s	-07d51m15.1s	2:35	30	
5	07_0077	Tielens	CygnusX	20h38m39.46s	42d20m44.5s	3:07	101	
6	07_0132	Graf	NGC2024	05h41m45.20s	-01d55m45.0s	4:53	155	
7	07_0077	Tielens	NGC7538	23h13m08.68s	61d28m06.8s	7:33	107	
8	07_0126	Bolatto	NGC4321	12h22m52.98s	15d49m27.5s	9:23	61	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



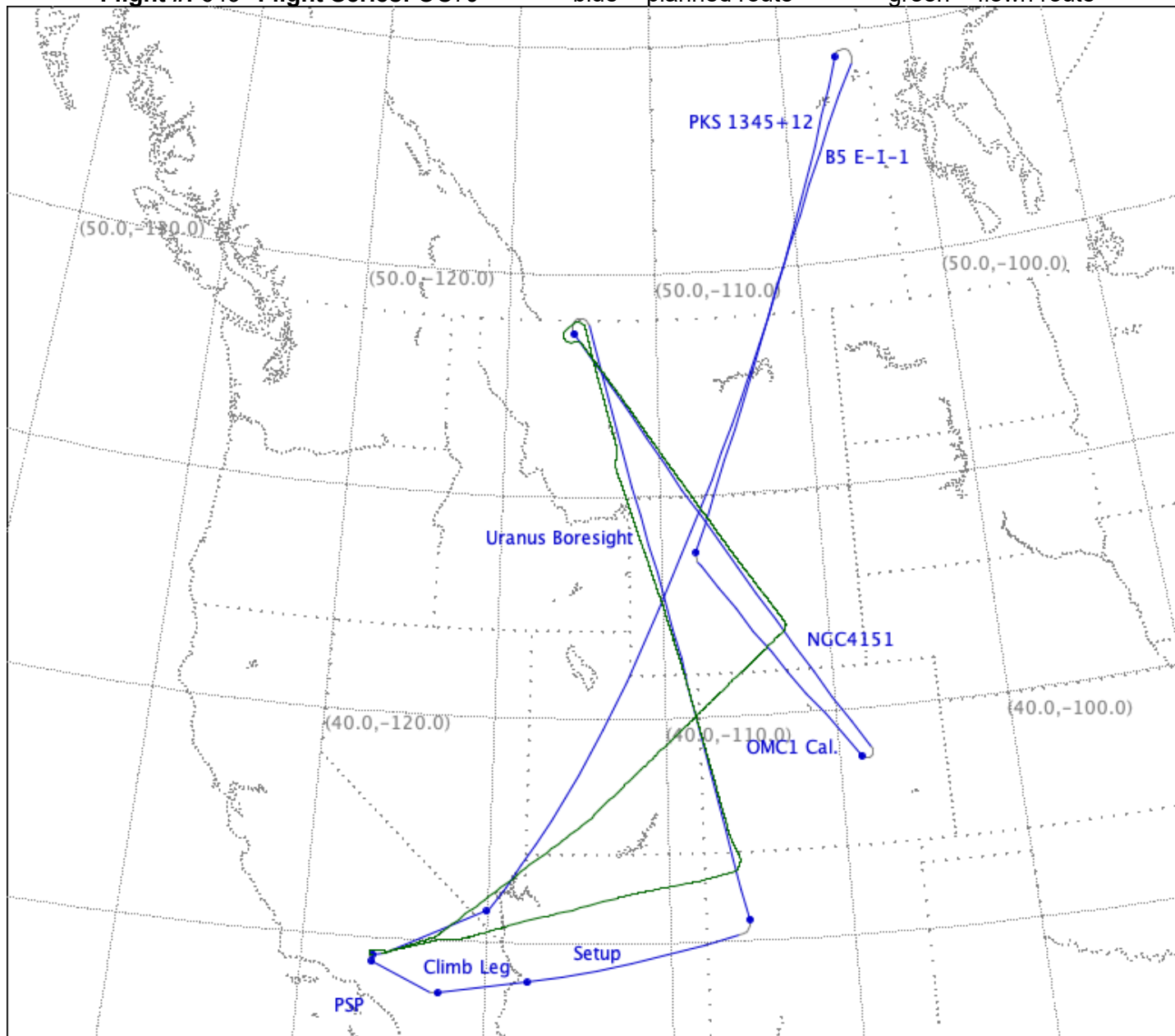
MISSION ID: 2020-01-15_HA_F649

Date: 2020-01-15 UT Instrument: HAWC+

Flight #: 649 Flight Series: OC7J

blue = planned route

green = flown route



Flight notes:

Late departure. Unresolvable problems with instrument focus led to early return to Palmdale base

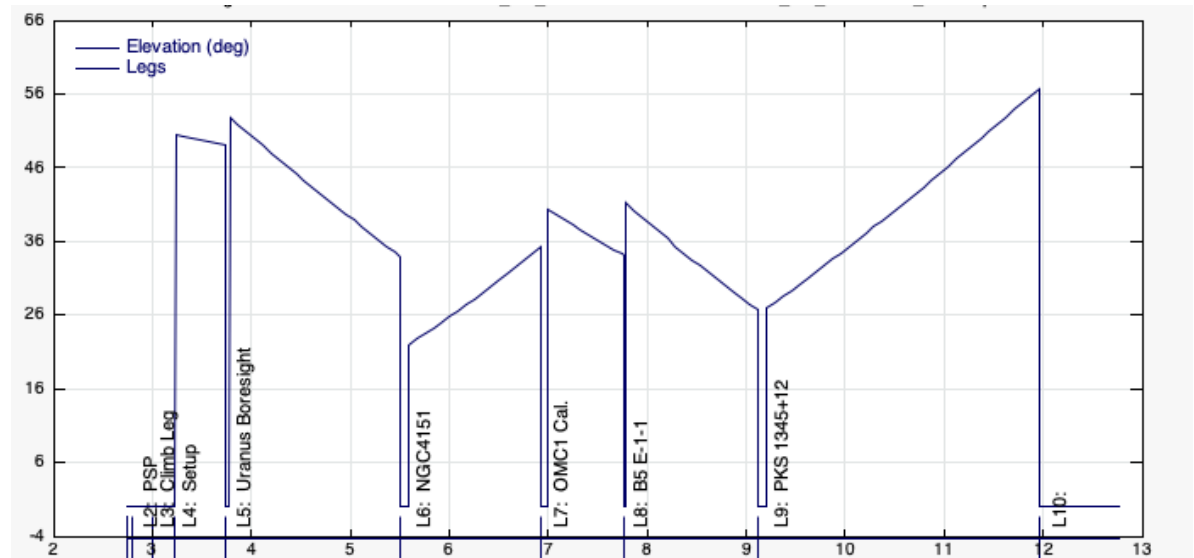
Flight 649 Mission ID 2020-01-15_HA_F649
 Palmdale to Palmdale Take off date UTC: 15-JAN-2020
 Departure UTC: 02:53 Arrival UTC: 08:19

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	02h03m26.11s	72d25m16.7s	3:14	30	
5	90_0086	Calibration	Uranus	02h01m27.10s	11d50m30.3s	3:47	103	Uranus very elongated (10"); troubleshooting issue failed; early return to base
6	07_0032	Lopez-Rodriguez	NGC4151	12h10m32.58s	39d24m21.1s	5:35	80	Leg not flown; early return to base
7	90_0086	Calibration	OMC1	05h35m15.12s	-05d22m22.8s	6:59	46	Leg not flown; early return to base
8	07_0012	Clemens	B5 E	03h47m43.49s	32d52m51.4s	7:47	80	Leg not flown; early return to base
9	07_0032	Lopez-Rodriguez	PKS 1345+12	13h47m33.36s	12d17m24.2s	9:12	165	Leg not flown; early return to base

Flown altitude (ft.) vs. time (UTC hrs.)

Planned target elevation (deg.) vs. time (UTC hrs.)

**Return to Base:
No telemetry data archived.**



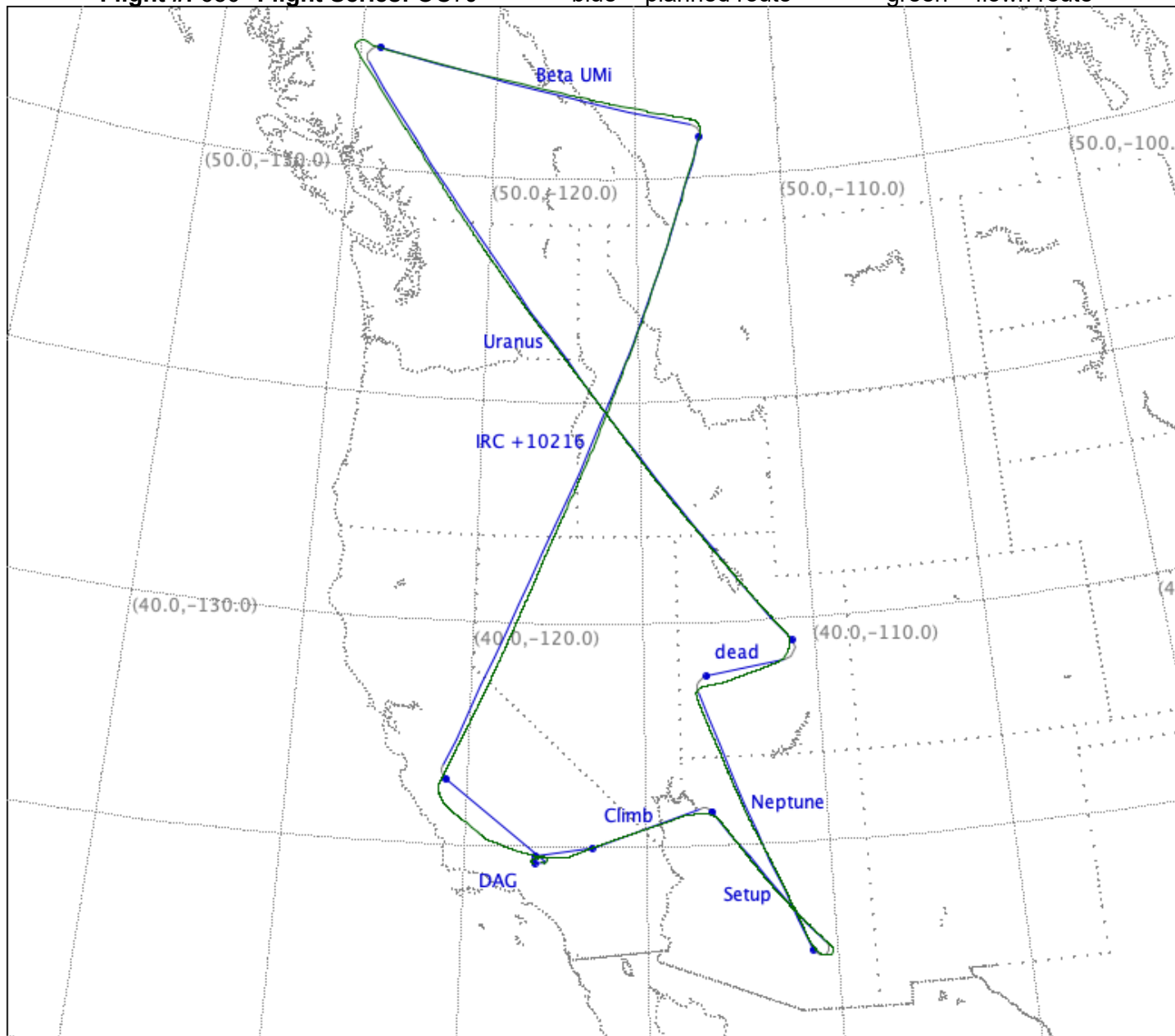
MISSION ID: 2020-01-17_HA_F650

Date: 2020-01-17 UT Instrument: HAWC+

Flight #: 650 Flight Series: OC7J

blue = planned route

green = flown route



Flight notes:

Mostly engineering flight (used to resolve focus problem). Good science data collected on last leg.

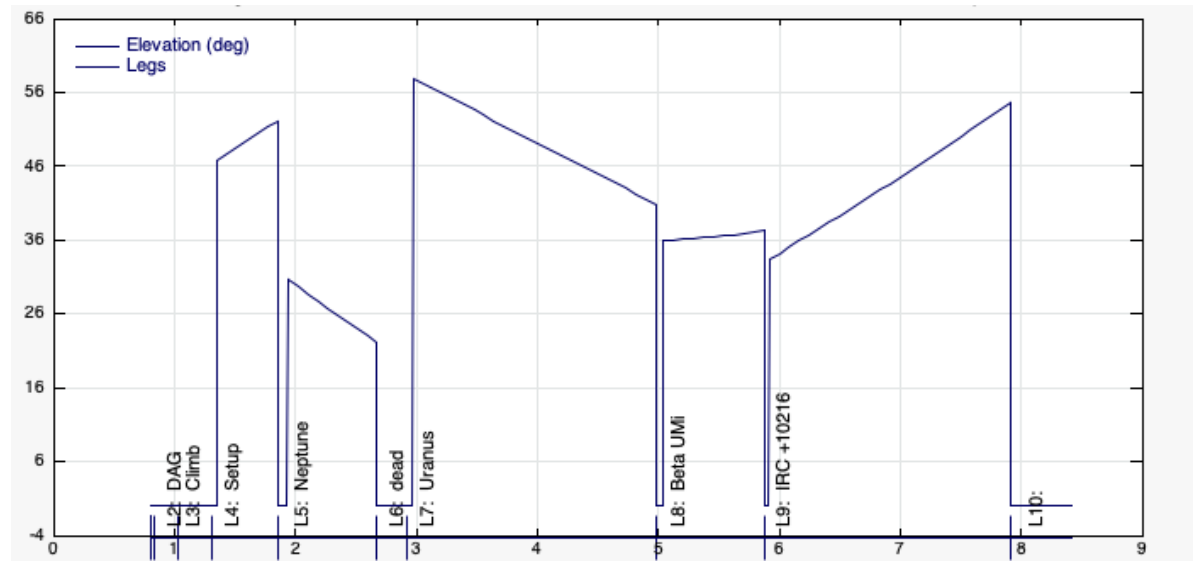
Flight 650 Mission ID 2020-01-17_HA_F650
 Palmdale to Palmdale Take off date UTC: 17-JAN-2020
 Departure UTC: 00:47 Arrival UTC: 08:32

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 24608	05h16m41.63s	45d59m43.9s	1:20	30	
5	90_0086	Calibration	Neptune	23h11m24.33s	-06d19m15.2s	1:55	44	Focus problem resolution.
7	90_0086	Calibration	Uranus	02h01m29.01s	11d50m44.7s	2:58	120	Focus problem resolution.
8	90_0086	Calibration	Beta UMi	14h50m42.33s	74d09m19.8s	5:02	50	Focus problem resolution.
9	90_0086	Calibration	IRC +10216	09h47m57.41s	13d16m43.6s	5:55	120	

Flown altitude (ft.) vs. time (UTC hrs.)

Planned target elevation (deg.) vs. time (UTC hrs.)

No telemetry data archived.



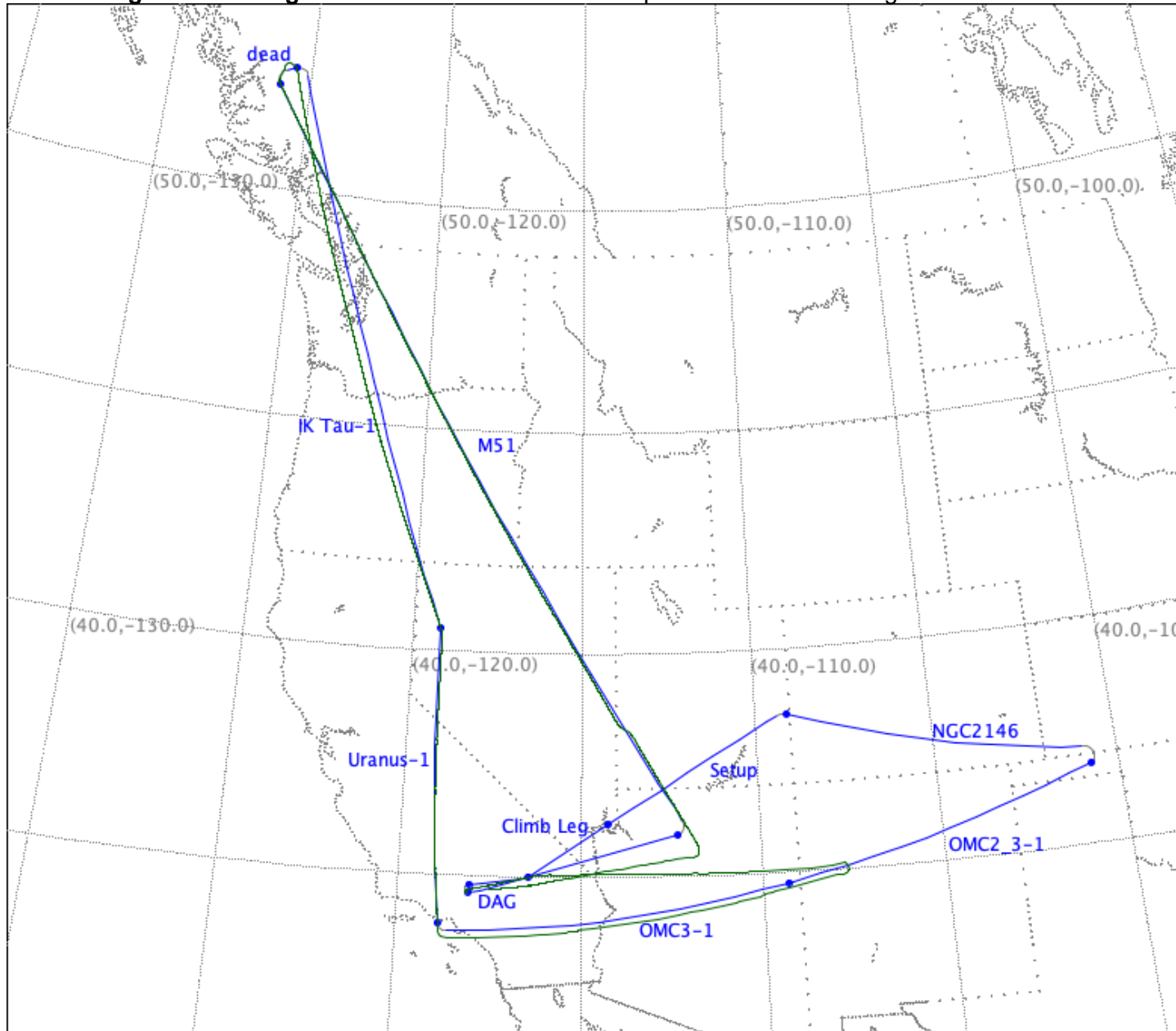
MISSION ID: 2020-01-18_HA_F651

Date: 2020-01-18 UT Instrument: HAWC+

Flight #: 651 Flight Series: OC7J

blue = planned route

green = flown route



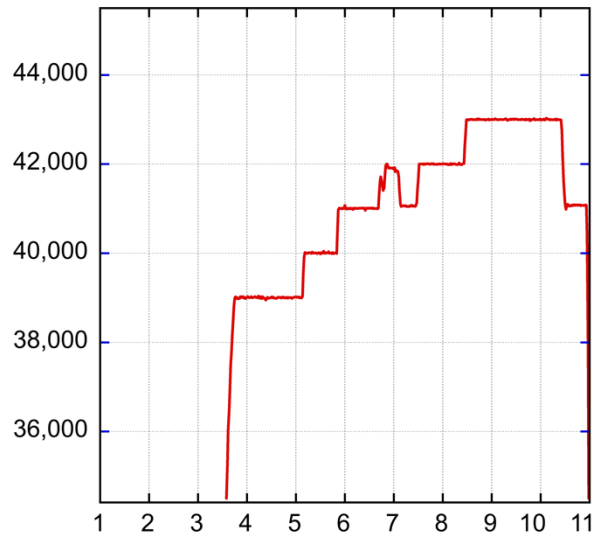
Flight notes:

Late departure and reroute for storms led to loss of first two science legs.

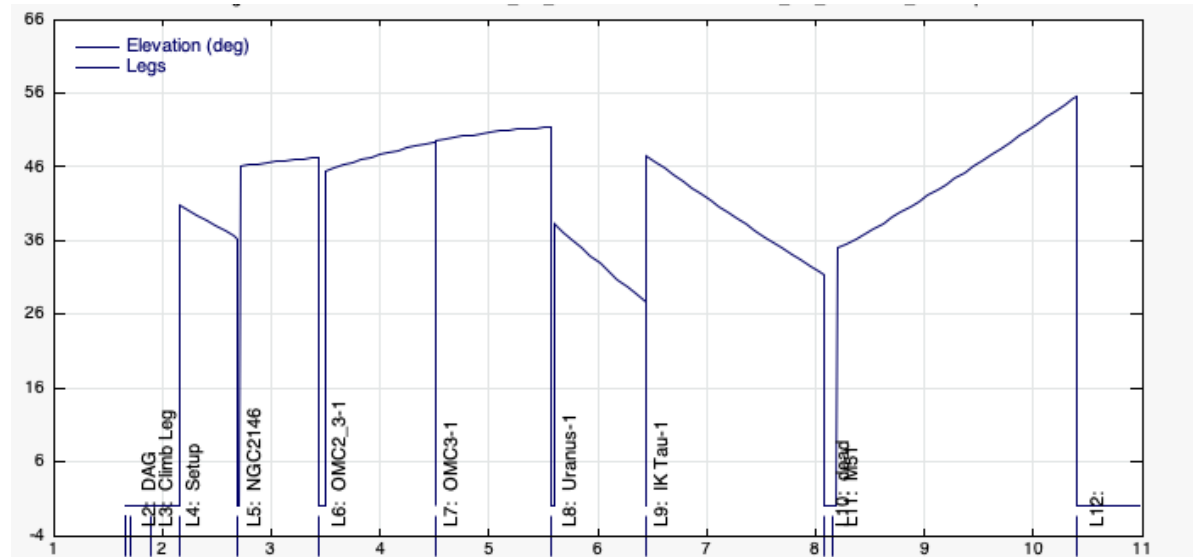
Flight 651 Mission ID 2020-01-18_HA_F651
 Palmdale to Palmdale Take off date UTC: 18-JAN-2020
 Departure UTC: 03:10 Arrival UTC: 11:22

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	21h43m30.46s	58d46m48.2s	2:09	32	
5	08_0012	Lopez-Rodriguez	NGC2146	06h18m37.71s	78d21m25.3s	2:43	43	Leg not flown due to late departure and reroute around storms.
6	07_0237	Michail	OMC2	05h35m24.11s	-05d06m46.4s	3:30	61	Due to late takeoff and reroute around storms only 25% of the planned data were collected
7	07_0026	Heese	OMC3	05h35m20.00s	-05d01m00.0s	4:31	63	
8	90_0082	Calibration	Uranus	02h01m30.46s	11d50m54.8s	5:36	50	
9	07_0188	Andersson	IK Tau	03h53m28.87s	11d24m21.7s	6:27	98	
11	08_0260	Dowell	M51_POS1	13h29m53.74s	47d12m12.4s	8:12	132	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



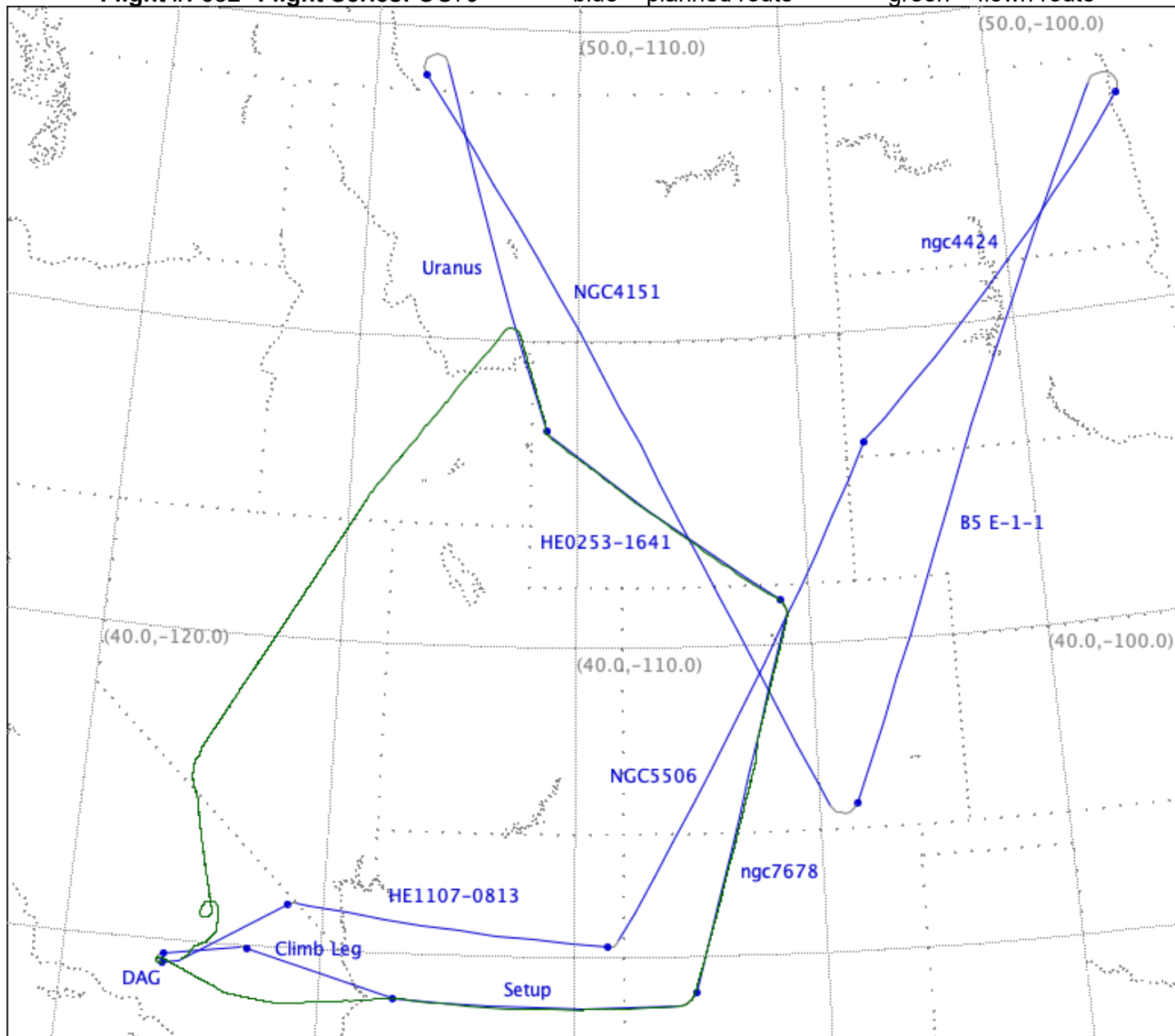
MISSION ID: 2020-01-22_HA_F652

Date: 2020-01-22 UT Instrument: HAWC+

Flight #: 652 Flight Series: OC7J

blue = planned route

green = flown route



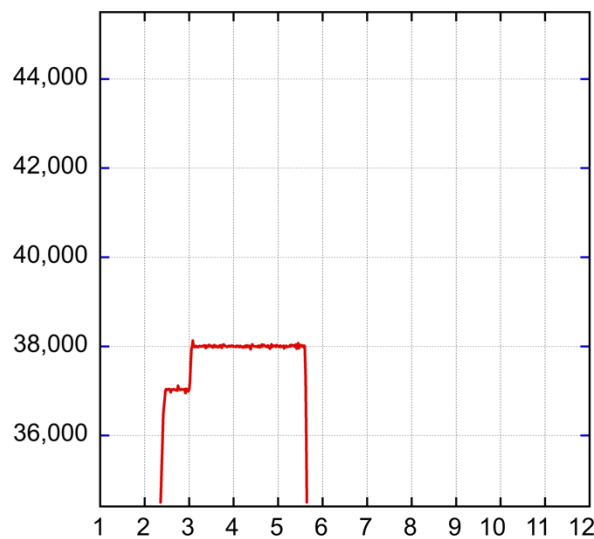
Flight notes:

Unresolvable telescope door control failure led to early return to Palmdale base

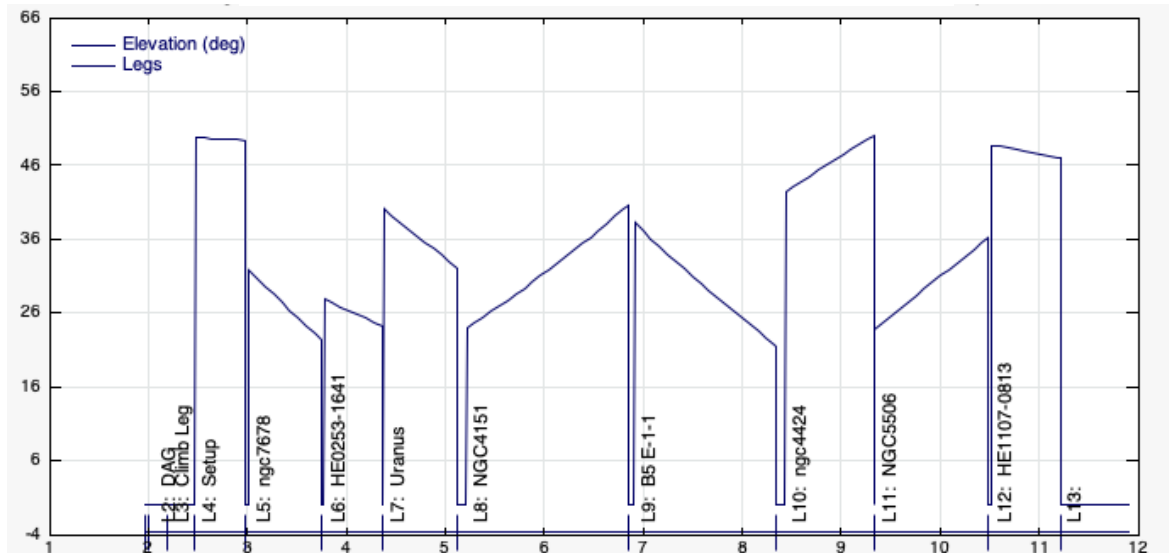
Flight 652 Mission ID 2020-01-22_HA_F652
 Palmdale to Palmdale Take off date UTC: 22-JAN-2020 Departure UTC: 01:57 Arrival UTC: 06:29

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	03h11m56.27s	74d23m37.2s	2:28	30	
5	07_0135	Casey	ngc7678	23h28m27.90s	22d25m16.3s	3:00	44	
6	07_0193	Husemann	HE0253-1641	02h56m02.65s	-16d29m15.5s	3:46	35	
7	90_0082	Calibration	Uranus	02h01m37.59s	11d51m41.1s	4:22	45	Unresolvable telescope door control failure; no data collected; early return to base
8	07_0032	Lopez-Rodriguez	NGC4151	12h10m32.58s	39d24m21.1s	5:13	98	Not flown; early return to base
9	07_0012	Clemens	B5 E	03h47m43.49s	32d52m51.4s	6:55	86	Not flown; early return to base
10	07_0135	Casey	ngc4424	12h27m11.61s	09d25m14.4s	8:26	54	Not flown; early return to base
11	07_0032	Lopez-Rodriguez	NGC5506	14h13m14.90s	-03d12m27.2s	9:20	69	Not flown; early return to base
12	07_0193	Husemann	HE1107-0813	11h09m48.50s	-08d30m15.0s	10:31	42	Not flown; early return to base

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



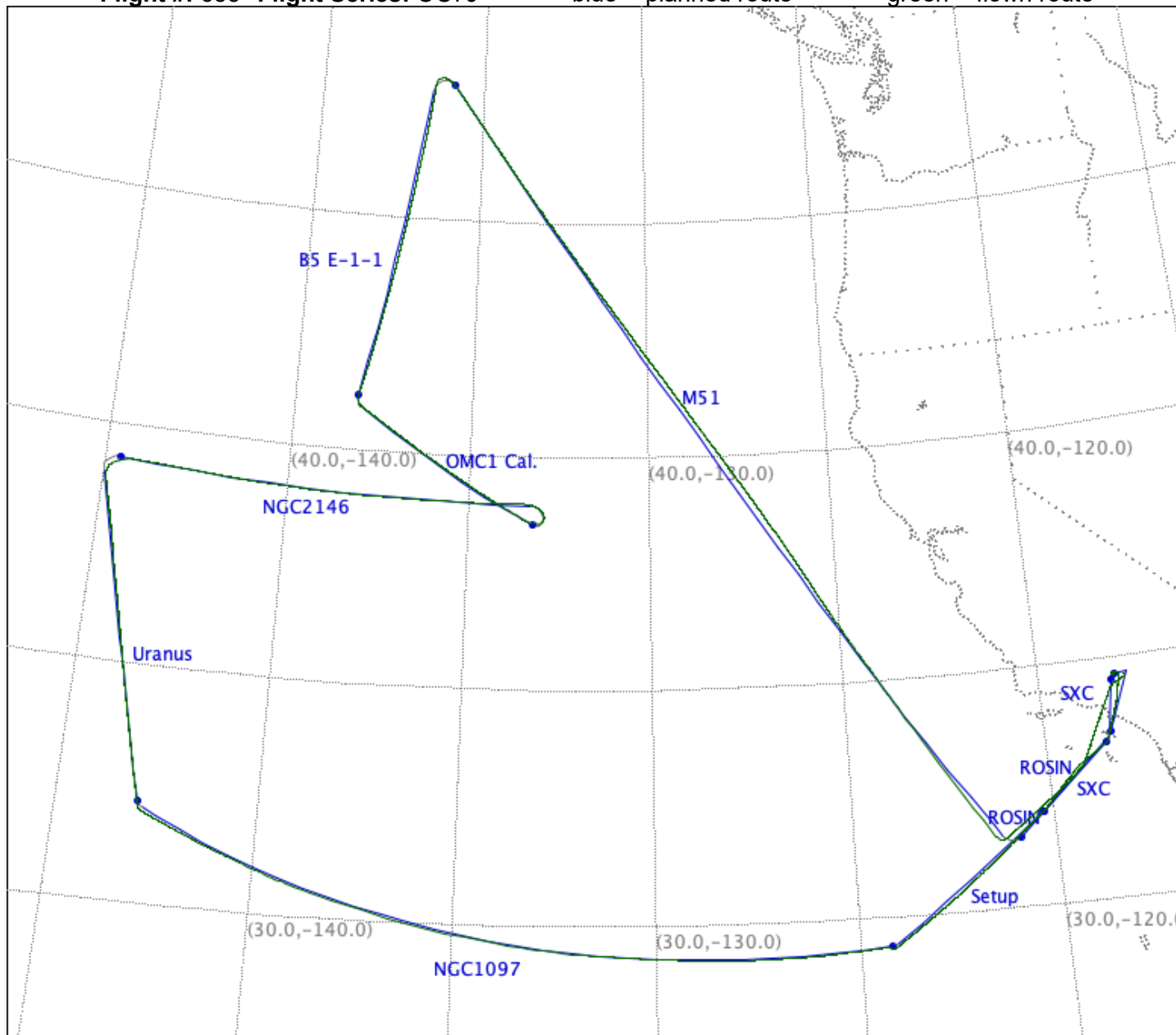
MISSION ID: 2020-01-25_HA_F653

Date: 2020-01-25 UT Instrument: HAWC+

Flight #: 653 Flight Series: OC7J

blue = planned route

green = flown route

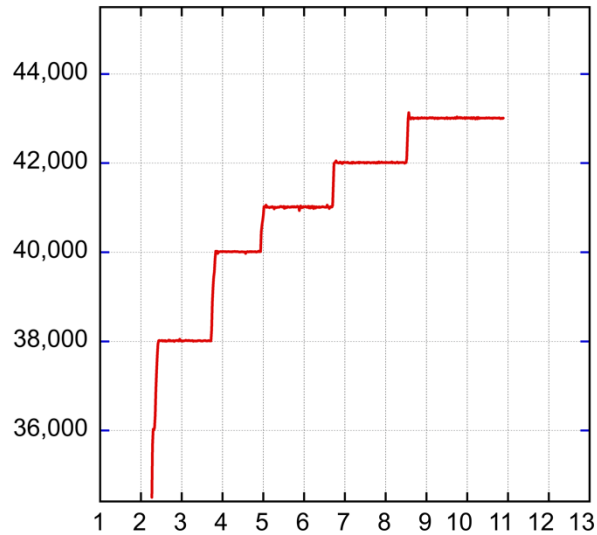


Flight notes: No irregularities.

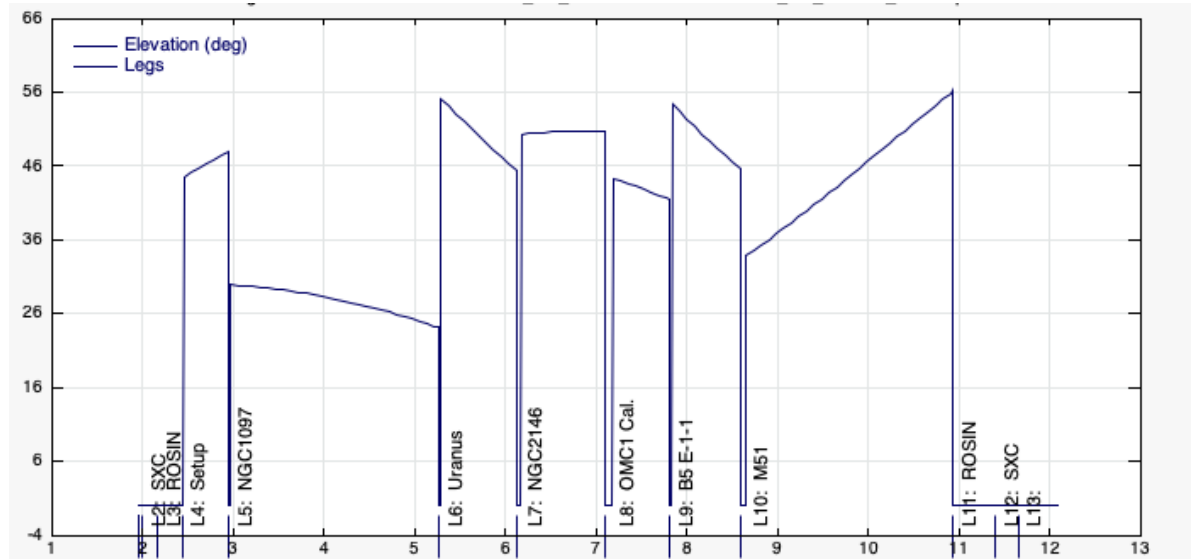
Flight 653 Mission ID 2020-01-25_HA_F653
 Palmdale to Palmdale Take off date UTC: 25-JAN-2020
 Departure UTC: 01:52 Arrival UTC: 11:41

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	04h15m16.32s	-07d39m10.3s	2:25	30	
5	07_0034	Lopez Rodriguez	NGC1097	02h46m19.06s	-30d16m29.7s	2:56	138	
6	90_0082	Calibration	Uranus	02h01m45.20s	11d52m28.2s	5:15	50	
7	08_0012	Lopez-Rodriguez	NGC2146	06h18m37.71s	78d21m25.3s	6:08	55	
8	90_0086	Calibration	OMC1	05h35m15.12s	-05d22m22.8s	7:09	37	
9	07_0012	Clemens	B5 E	03h47m43.49s	32d52m51.4s	7:48	45	
10	08_0260	Dowell	M51_POS1	13h29m53.74s	47d12m12.4s	8:37	137	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



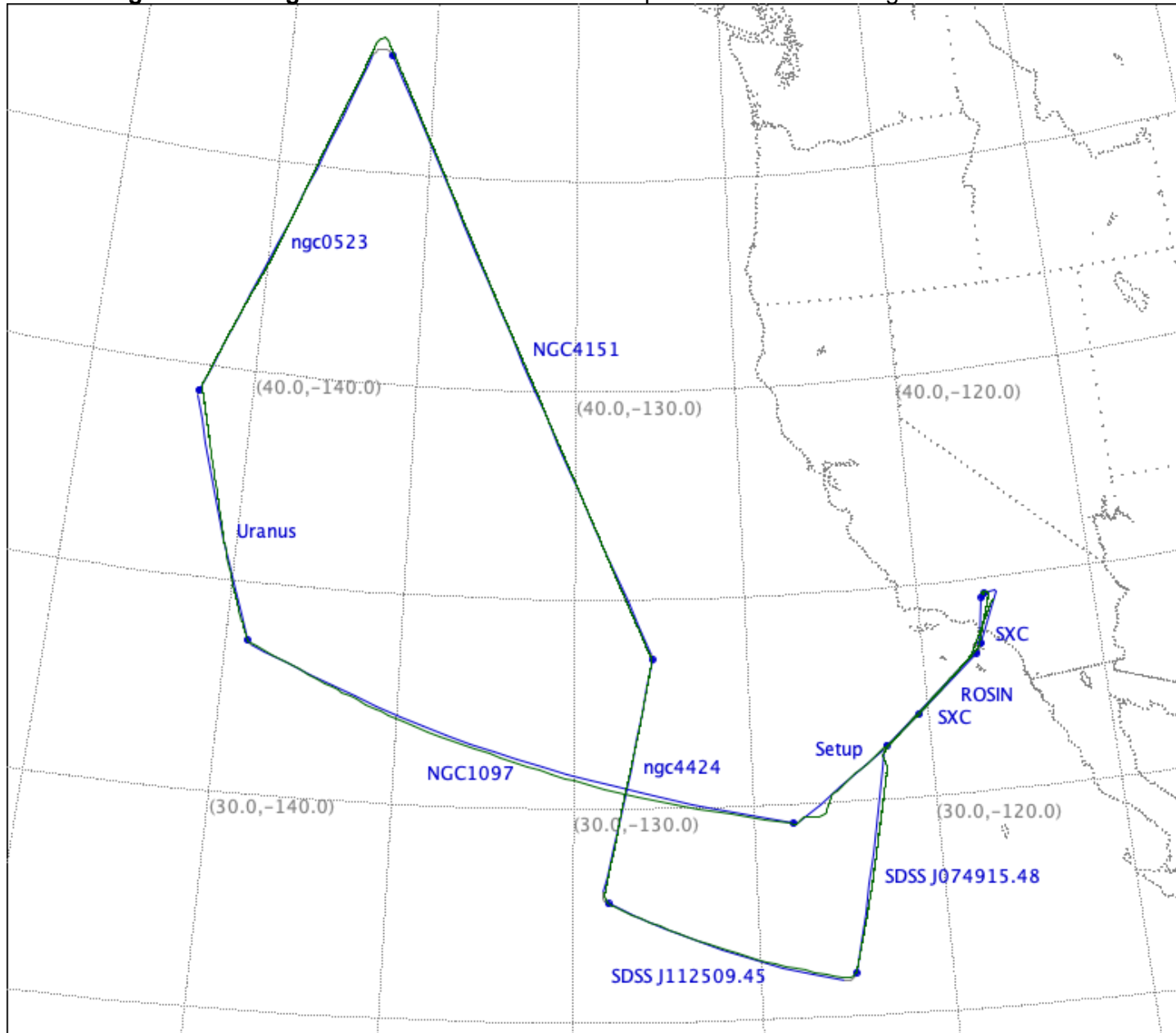
MISSION ID: 2020-01-28_HA_F654

Date: 2020-01-28 UT Instrument: HAWC+

Flight #: 654 Flight Series: OC7J

blue = planned route

green = flown route

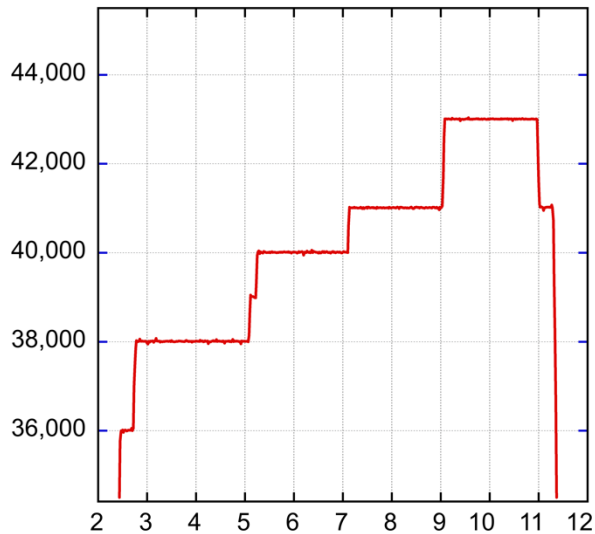


Flight notes: No irregularities.

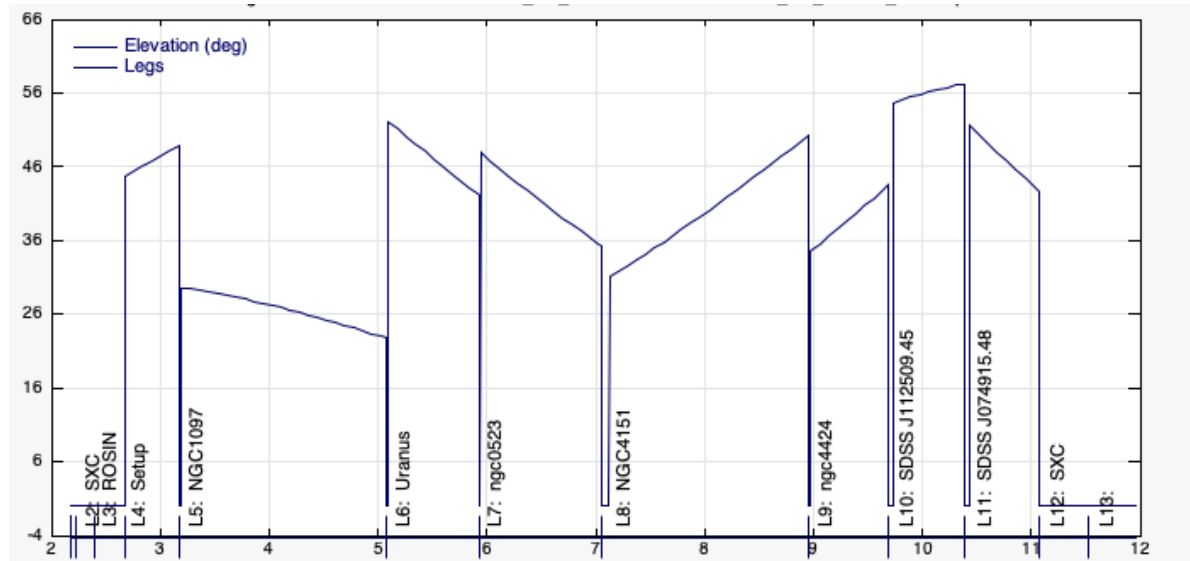
Flight 654 Mission ID 2020-01-28_HA_F654
 Palmdale to Palmdale Take off date UTC: 28-JAN-2020
 Departure UTC: 02:04 Arrival UTC: 11:45

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	04h52m53.67s	-05d27m09.7s	2:39	30	
5	07_0034	Lopez Rodriguez	NGC1097	02h46m19.06s	-30d16m29.7s	3:11	113	
6	90_0082	Calibration	Uranus	02h01m54.52s	11d53m24.2s	5:05	50	Observatory software failure; 17min lost rebooting
7	07_0135	Casey	ngc0523	01h25m20.73s	34d01m29.9s	5:56	67	
8	07_0032	Lopez-Rodriguez	NGC4151	12h10m32.58s	39d24m21.1s	7:07	110	Telescope software control errors led to 20min loss
9	07_0135	Casey	ngc4424	12h27m11.61s	09d25m14.4s	8:58	43	
10	08_0254	Eufrasio	SDSS J112509.45+584700.7	11h25m09.46s	58d47m00.8s	9:43	40	
11	08_0254	Eufrasio	SDSS J074915.48+225342.1	07h49m15.48s	22d53m42.2s	10:25	38	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



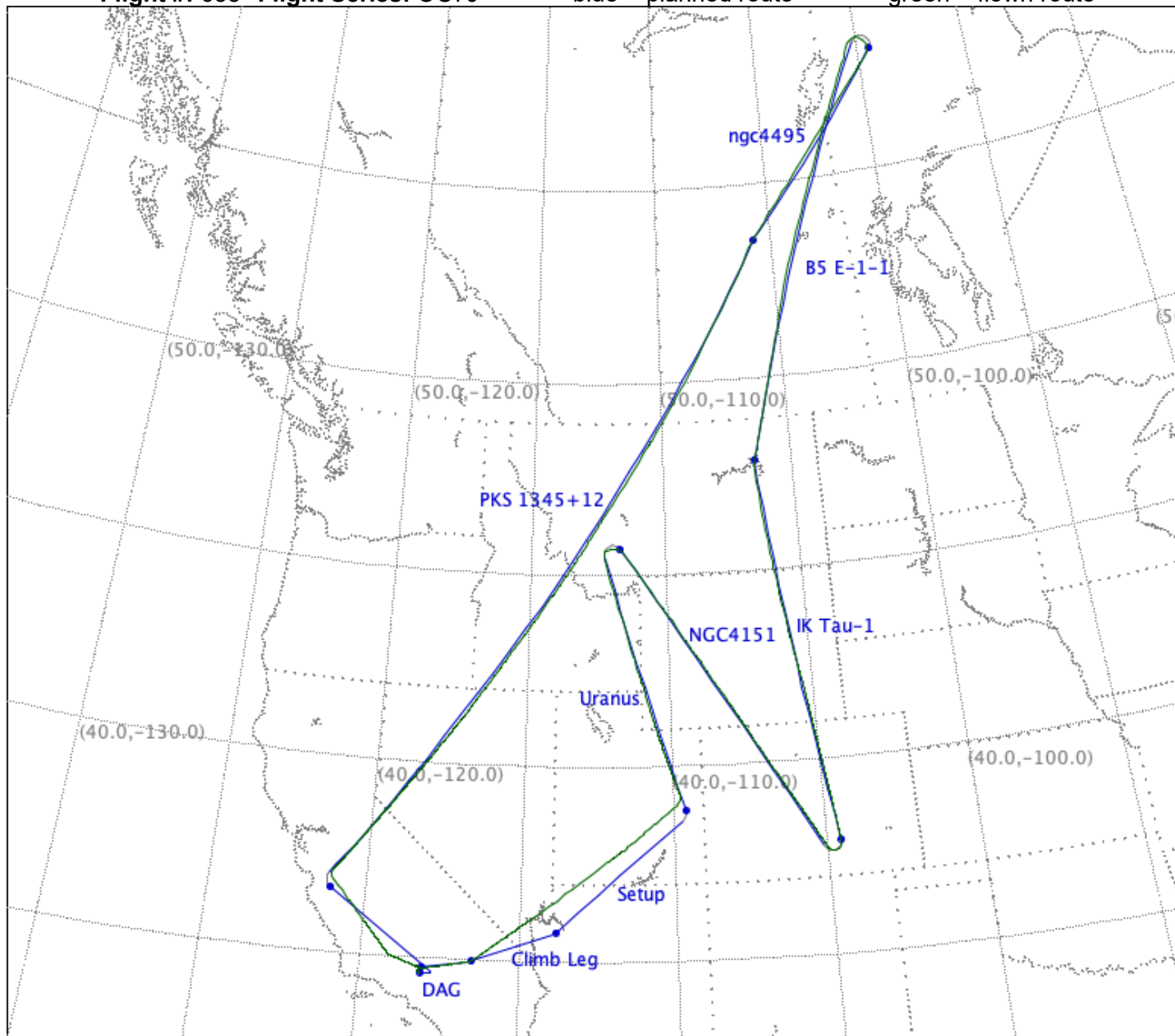
MISSION ID: 2020-01-29_HA_F655

Date: 2020-01-29 UT Instrument: HAWC+

Flight #: 655 Flight Series: OC7J

blue = planned route

green = flown route

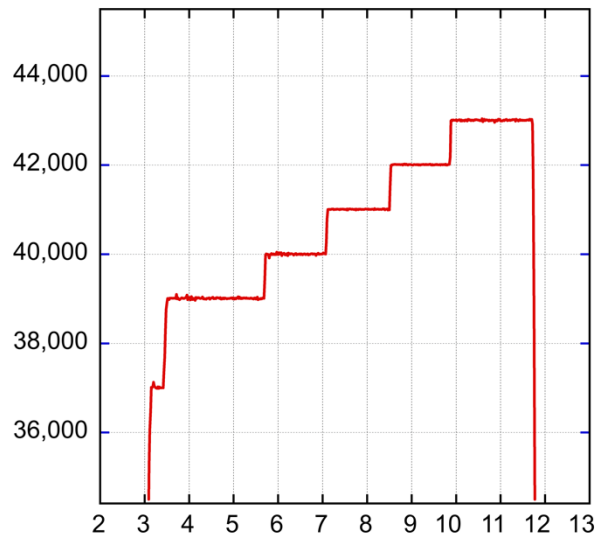


Flight notes: No irregularities.

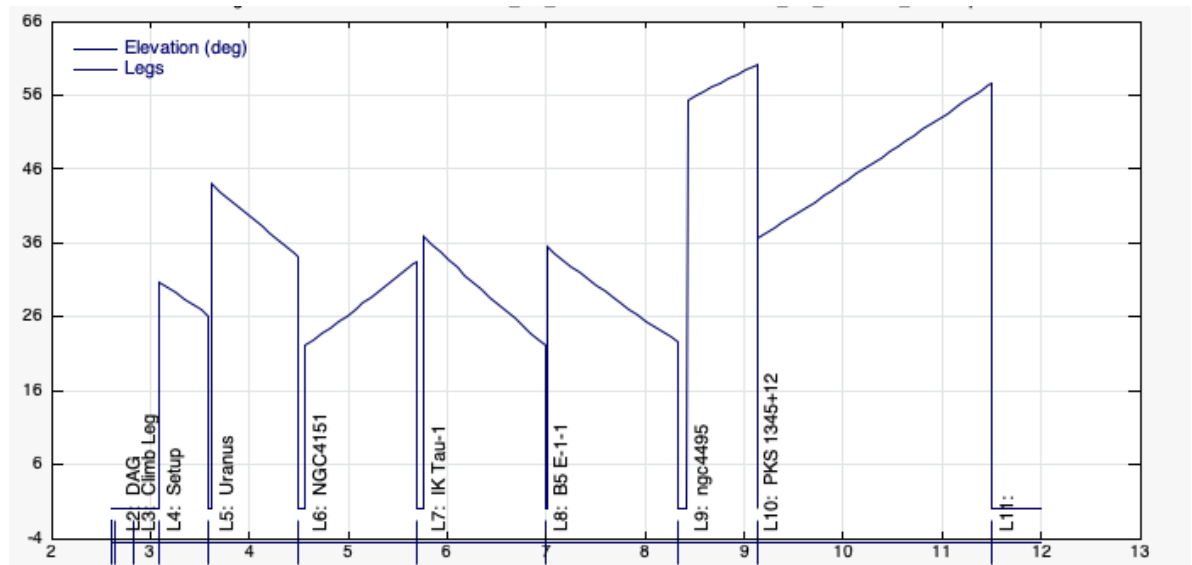
Flight 655 Mission ID 2020-01-29_HA_F655
 Palmdale to Palmdale Take off date UTC: 29-JAN-2020
 Departure UTC: 02:42 Arrival UTC: 12:08

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	22h23m33.62s	52d13m44.6s	3:05	30	
5	90_0082	Calibration	Uranus	02h01m57.72s	11d53m43.2s	3:37	52	
6	07_0032	Lopez-Rodriguez	NGC4151	12h10m32.58s	39d24m21.1s	4:34	67	
7	07_0188	Andersson	IK Tau	03h53m28.87s	11d24m21.7s	5:46	74	
8	07_0012	Clemens	B5 E	03h47m43.49s	32d52m51.4s	7:00	80	Telescope software reboot led to 30min loss
9	07_0135	Casey	ngc4495	12h31m22.88s	29d08m11.3s	8:26	42	
10	07_0032	Lopez-Rodriguez	PKS 1345+12	13h47m33.36s	12d17m24.2s	9:08	142	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



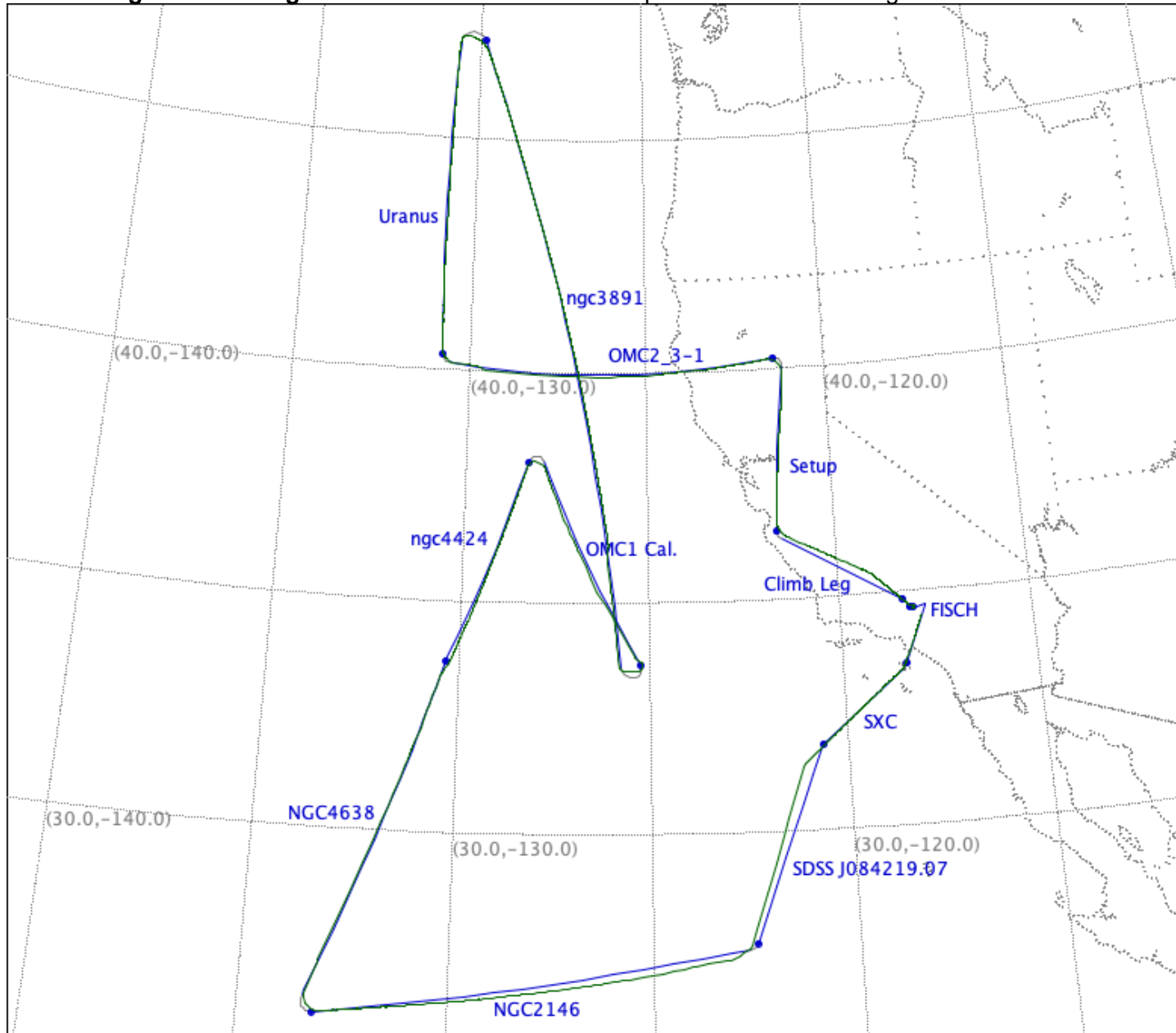
MISSION ID: 2020-01-30_HA_F656

Date: 2020-01-30 UT Instrument: HAWC+

Flight #: 656 Flight Series: OC7J

blue = planned route

green = flown route



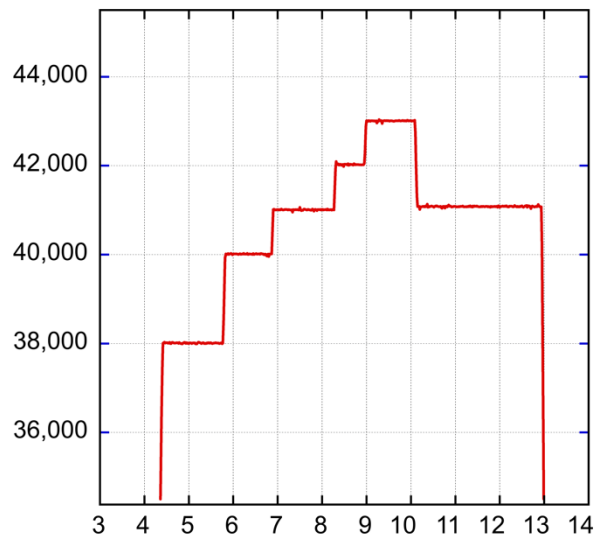
Flight notes:

Clouds throughout flight caused frequent interruptions; forced to descend late in flight due to very low air temperatures

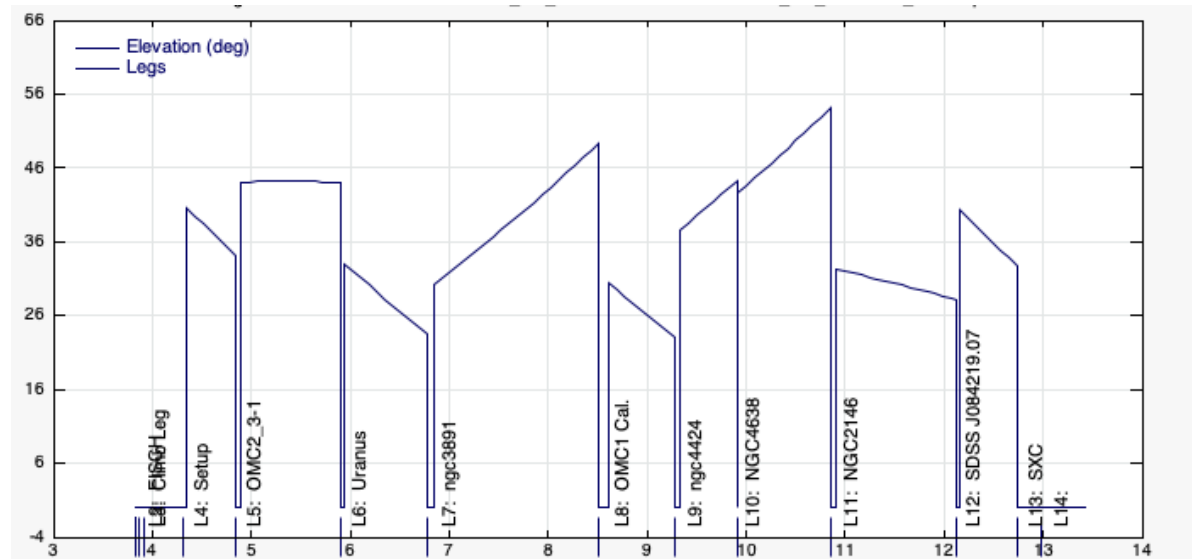
Flight 656 Mission ID 2020-01-30_HA_F656
 Palmdale to Palmdale Take off date UTC: 30-JAN-2020 Departure UTC: 03:49 Arrival UTC: 13:23

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 5571	01h11m27.22s	21d02m04.7s	4:20	30	
5	07_0237	Michail	OMC2	05h35m24.11s	-05d06m46.4s	4:53	61	10% loss due to clouds
6	90_0082	Calibration	Uranus	02h02m01.72s	11d54m06.8s	5:56	50	Clouds.
7	07_0135	Casey	ngc3891	11h48m03.36s	30d21m33.6s	6:51	99	
8	90_0086	Calibration	OMC1	05h35m15.12s	-05d22m22.8s	8:36	40	
9	07_0135	Casey	ngc4424	12h27m11.61s	09d25m14.4s	9:19	35	
10	08_0014	Lopez-Rodriguez	NGC4638	12h42m47.42s	11d26m33.0s	9:54	56	Clouds and forced to descend due to low air temp led to obtaining only 20% of planned data.
11	08_0012	Lopez-Rodriguez	NGC2146	06h18m37.71s	78d21m25.3s	10:54	73	No data on first 20min of leg due to clouds
12	08_0254	Eufrazio	SDSS J084219.07+300703.5	08h42m19.08s	30d07m03.6s	12:08	35	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



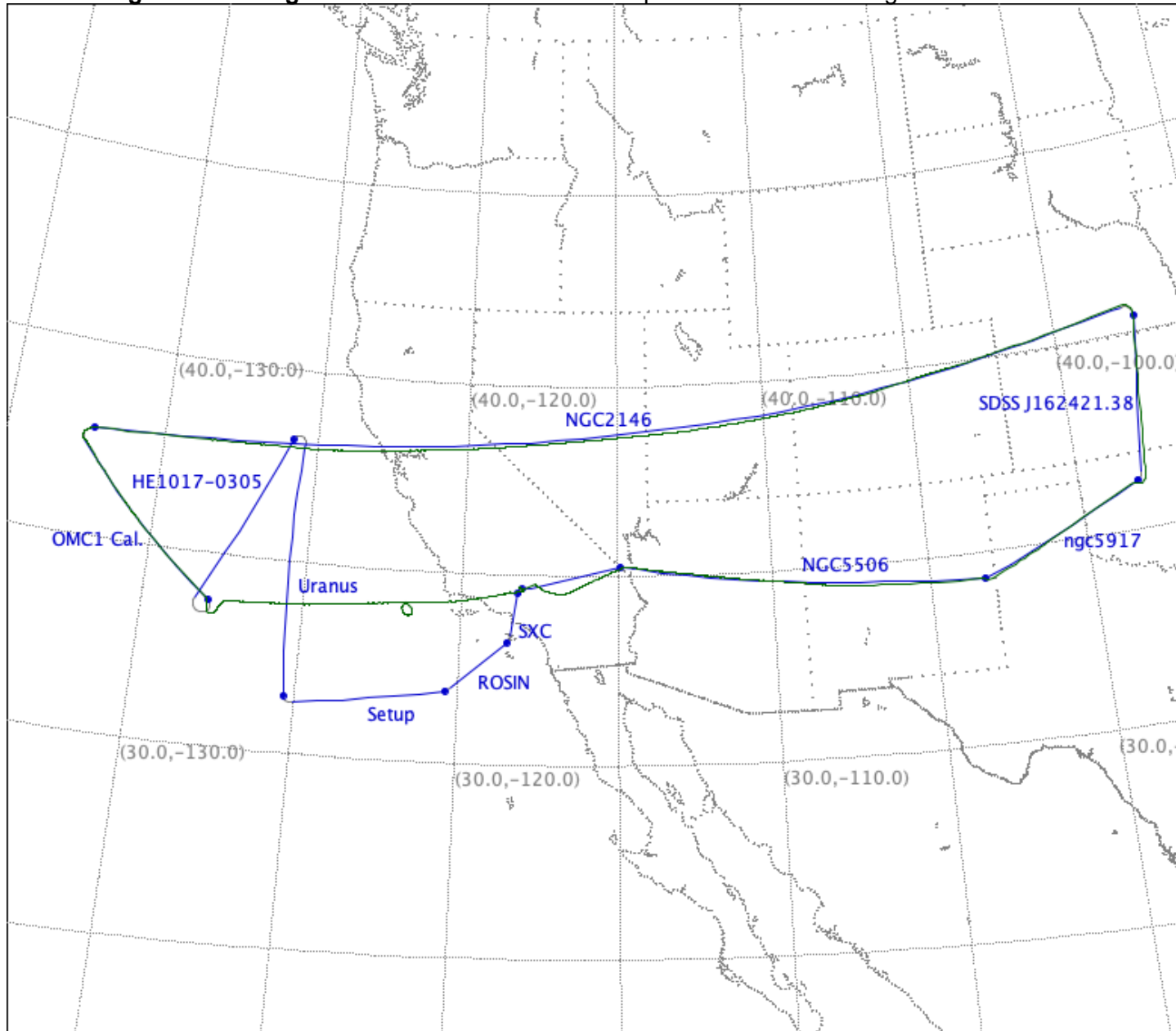
MISSION ID: 2020-01-31_HA_F657

Date: 2020-01-31 UT Instrument: HAWC+

Flight #: 657 Flight Series: OC7J

blue = planned route

green = flown route



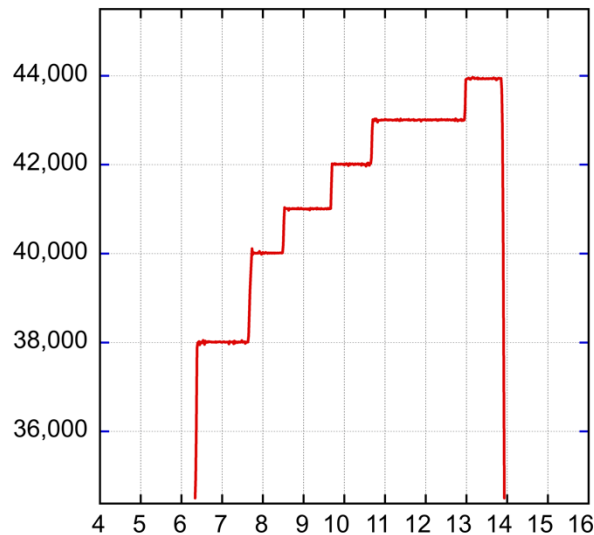
Flight notes:

First two science legs lost due to late departure.

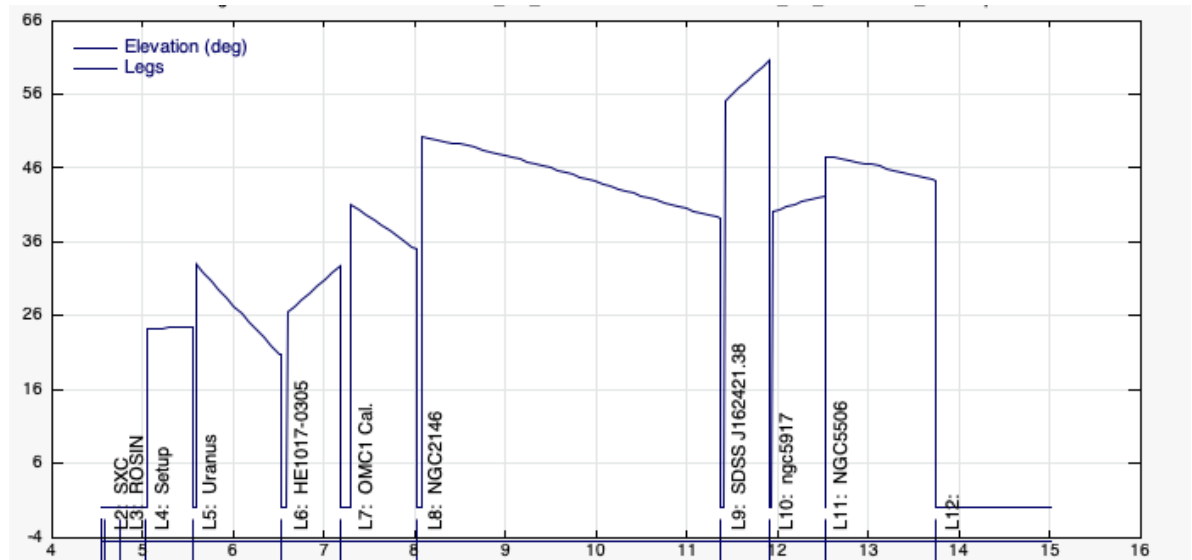
Flight 657 Mission ID 2020-01-31_HA_F657
 Palmdale to Palmdale Take off date UTC: 31-JAN-2020
 Departure UTC: 05:58 Arrival UTC: 14:12

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	05h53m06.88s	-33d48m04.9s	5:00	30	
5	90_0082	Calibration	Uranus	02h02m05.61s	11d54m29.6s	5:32	56	Leg not flown due to late take-off
6	07_0193	Husemann	HE1017-0305	10h19m32.87s	-03d20m14.8s	6:32	35	Leg not flown due to late take-off
7	90_0086	Calibration	OMC1	05h35m15.12s	-05d22m22.8s	7:15	43	
8	08_0012	Lopez-Rodriguez	NGC2146	06h18m37.71s	78d21m25.3s	8:01	197	Some minor guiding issues
9	08_0254	Eufrasio	SDSS J162421.38+270408.7	16h24m21.38s	27d04m08.7s	11:21	30	
10	07_0135	Casey	ngc5917	15h21m32.57s	-07d22m37.8s	11:53	35	
11	07_0032	Lopez-Rodriguez	NGC5506	14h13m14.90s	-03d12m27.2s	12:29	73	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



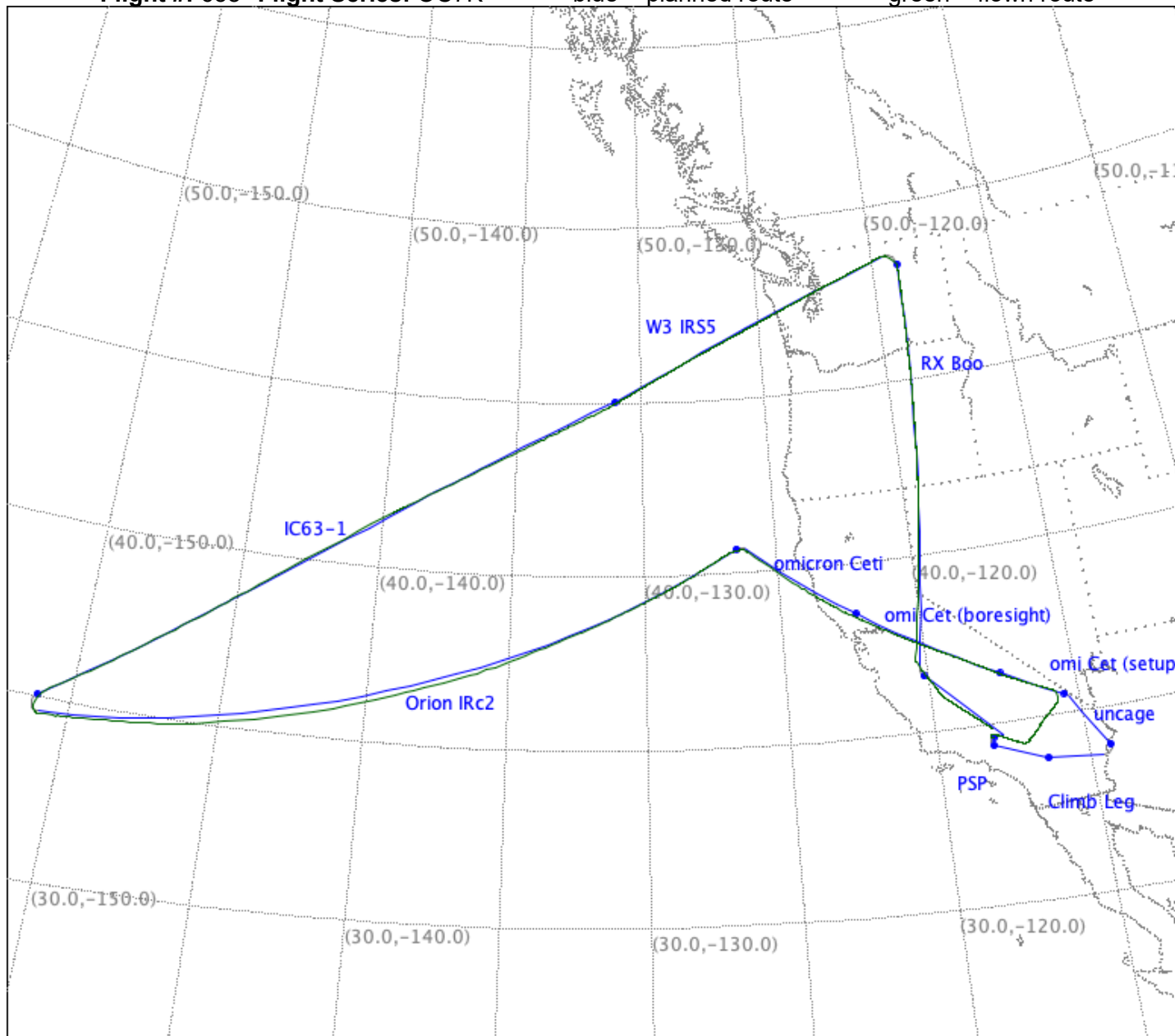
MISSION ID: 2020-02-06_EX_F658

Date: 2020-02-06 UT Instrument: EXES

Flight #: 658 Flight Series: OC7K

blue = planned route

green = flown route

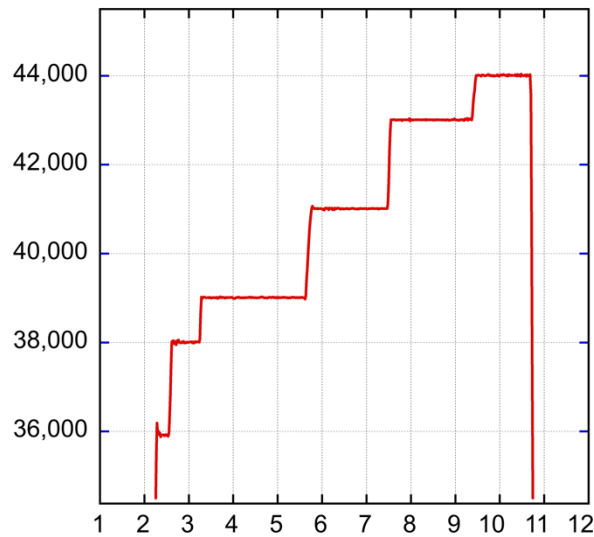


Flight notes: Late departure.

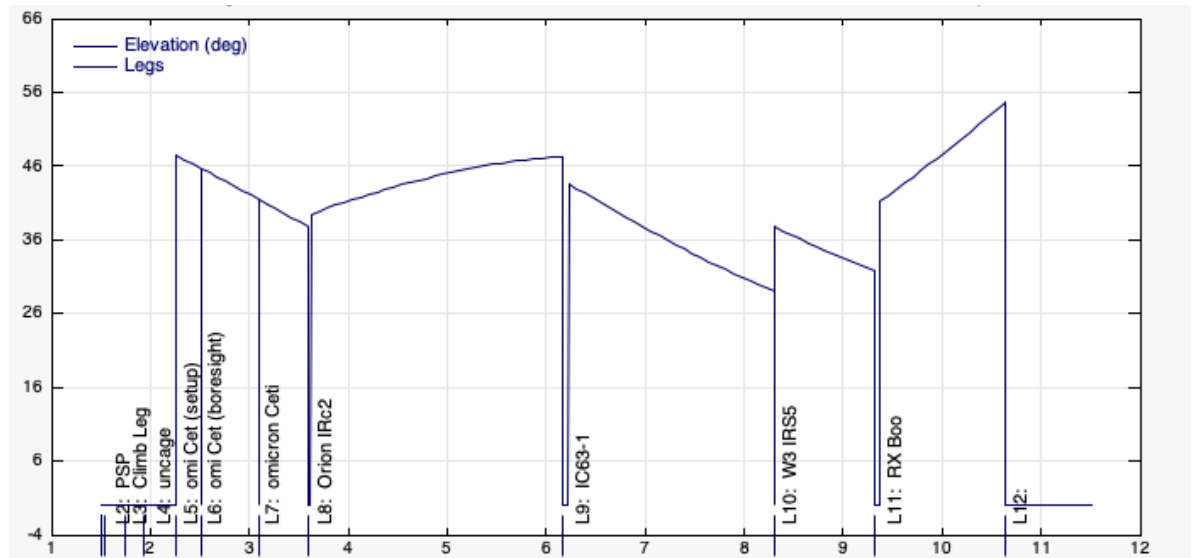
Flight 658 Mission ID 2020-02-06_EX_F658
 Palmdale to Palmdale Take off date UTC: 06-FEB-2020
 Departure UTC: 01:52 Arrival UTC: 11:06

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5	90_0089	Calibration	omicron Ceti	02h19m20.79s	-02d58m39.5s	2:16	15	
6	90_0089	Calibration	omicron Ceti	02h19m20.79s	-02d58m39.5s	2:31	35	
7	07_0014	Hinkle	omicron Ceti	02h19m20.79s	-02d58m39.5s	3:06	30	Late take-off and difficulties focusing led to small amount of data collected
8	06_0061	Rangwala	Orion IRc2	05h35m14.49s	-05d22m29.3s	3:37	152	
9	07_0040	Soam	IC63	00h58m59.60s	60d53m45.3s	6:14	125	Instrument software crash led to 10% loss of leg
10	07_0063	Tielens	W3 IRS5	02h25m40.00s	62d05m52.0s	8:19	60	
11	75_0048	Discretionary	RX Boo	14h24m11.62s	25d42m13.4s	9:22	76	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



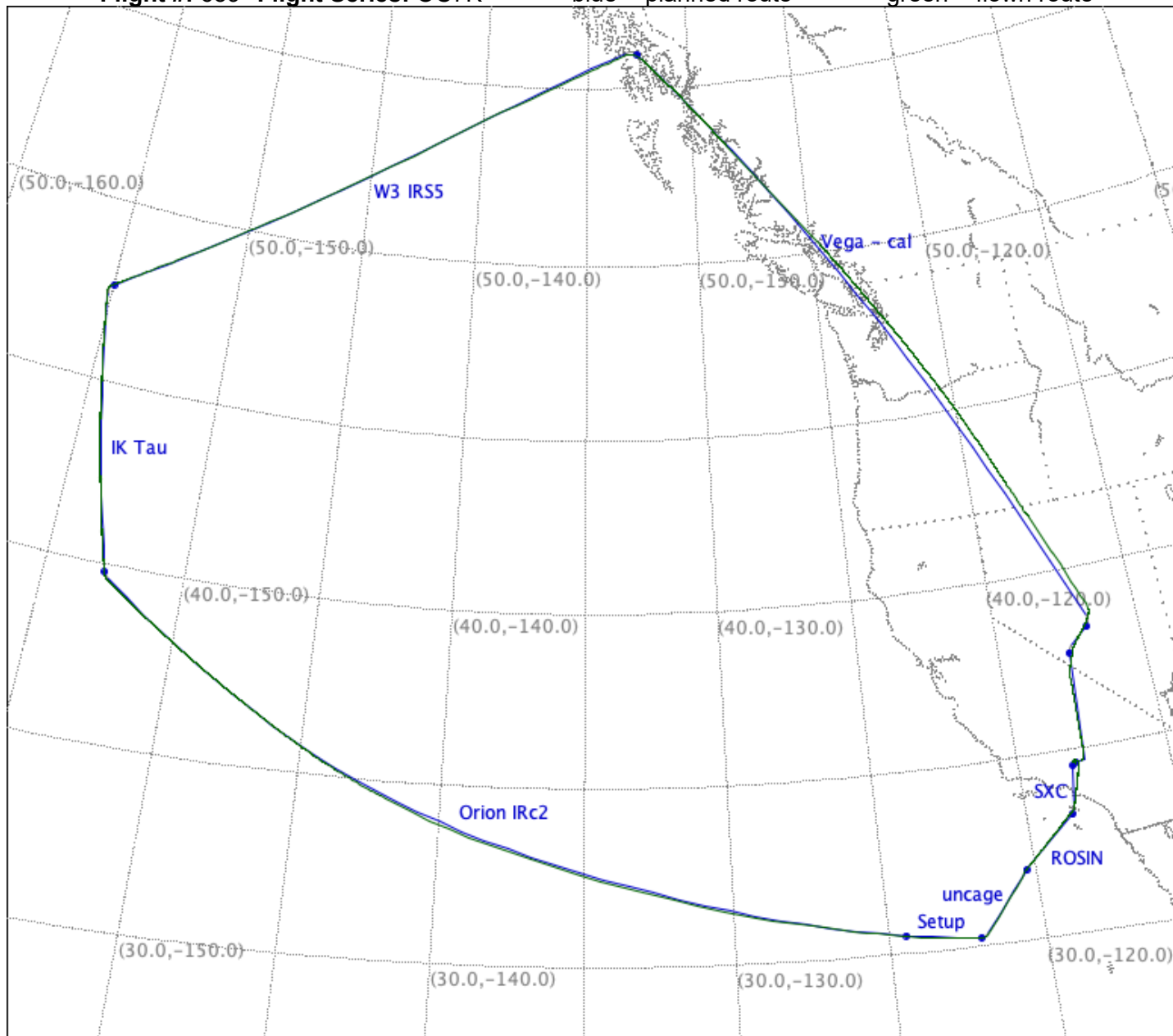
MISSION ID: 2020-02-07_EX_F659

Date: 2020-02-07 UT Instrument: EXES

Flight #: 659 Flight Series: OC7K

blue = planned route

green = flown route

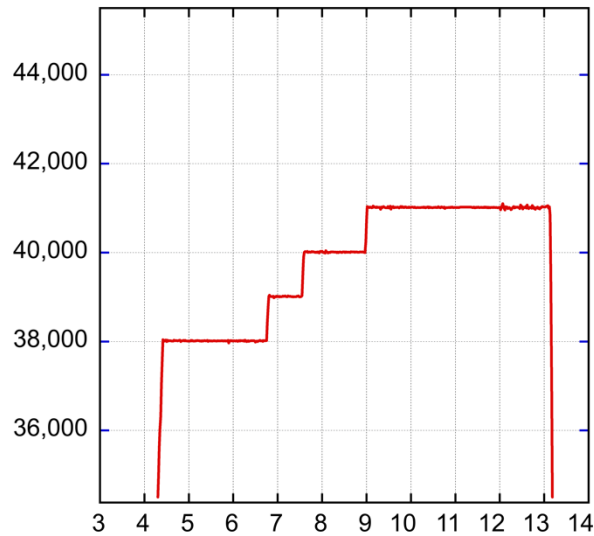


**Flight notes:
No irregularities.**

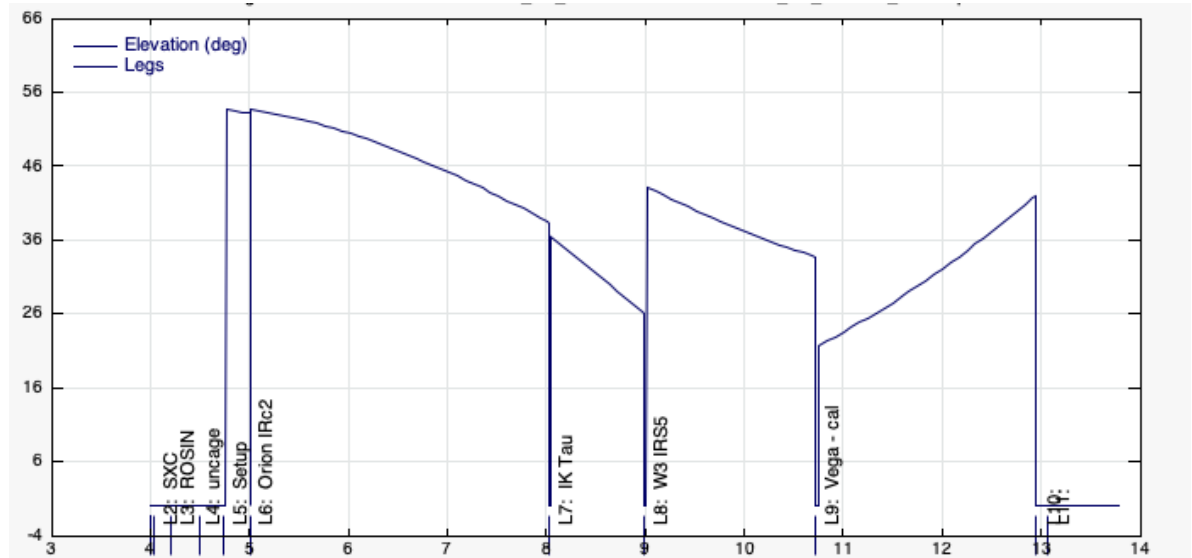
Flight 659 Mission ID 2020-02-07_EX_F659
 Palmdale to Palmdale Take off date UTC: 07-FEB-2020
 Departure UTC: 03:53 Arrival UTC: 13:34

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			HIP 26241	05h35m25.99s	-05d54m35.7s	4:44	15	
6	06_0061	Rangwala	Orion IRc2	05h35m14.49s	-05d22m29.3s	4:59	181	
7	06_0144	Montiel	IK Tau	03h53m28.87s	11d24m21.7s	8:01	56	
8	07_0063	Tielens	W3 IRS5	02h25m40.00s	62d05m52.0s	8:59	102	
9	07_0039	Kraemer	Vega	18h36m56.34s	38d47m01.3s	10:43	132	Observatory control software failure led to 30min loss

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)

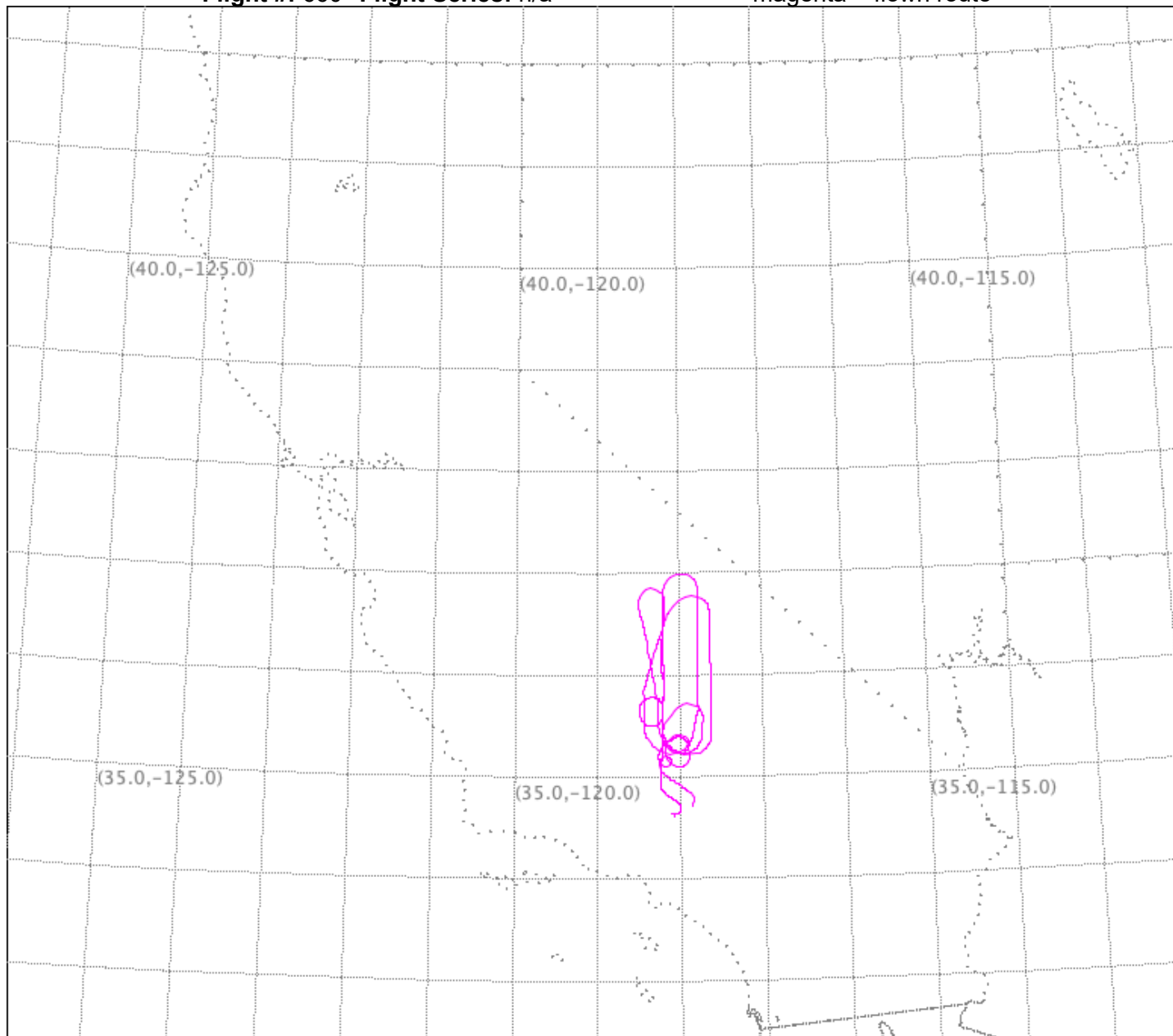


MISSION ID: 2020-02-12_NO_F660

Date: 2020-02-12 UT Instrument: n/a

Flight #: 660 Flight Series: n/a

magenta = flown route



Flight notes:
Engine check flight – no science.

Flight 660
Palmdale to
Palmdale

Mission ID 2020-02-12_NO_F660
Take off date UTC:
12-FEB-2020

Departure UTC: Arrival UTC:
HH:MM HH:MM

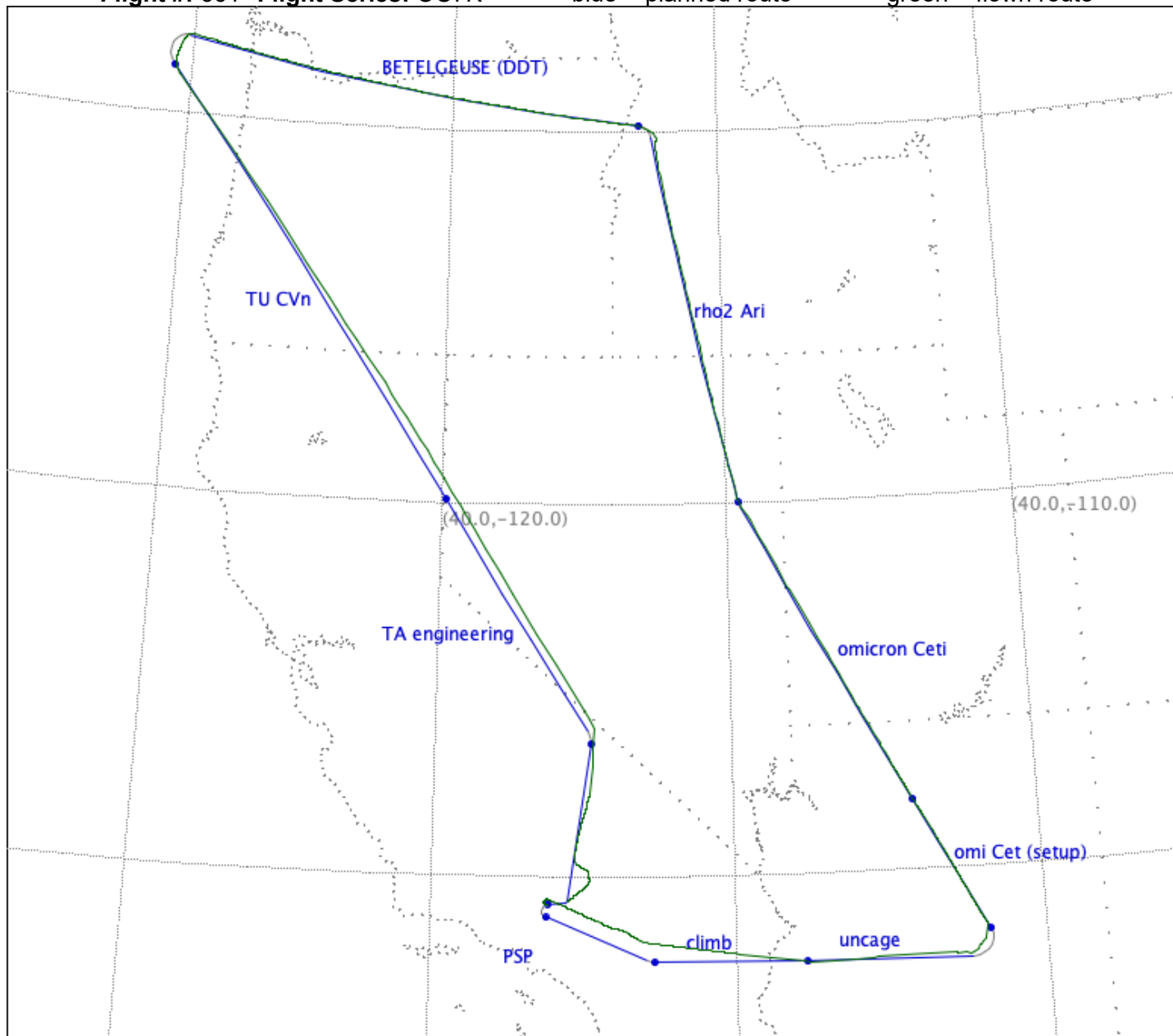
MISSION ID: 2020-02-15_EX_F661

Date: 2020-02-15 UT Instrument: EXES

Flight #: 661 Flight Series: OC7K

blue = planned route

green = flown route

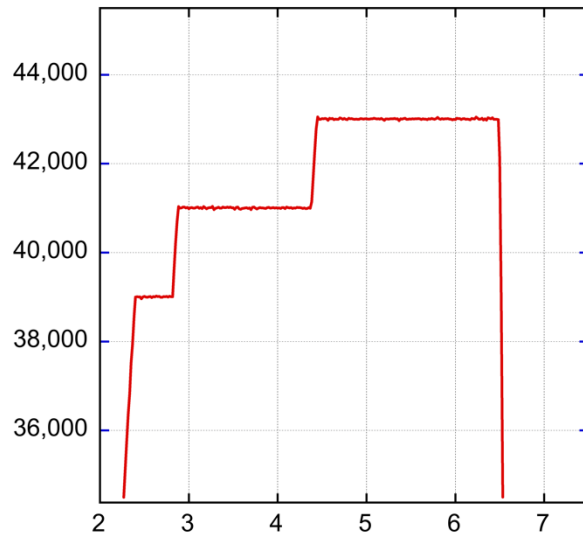


Flight notes: No irregularities.

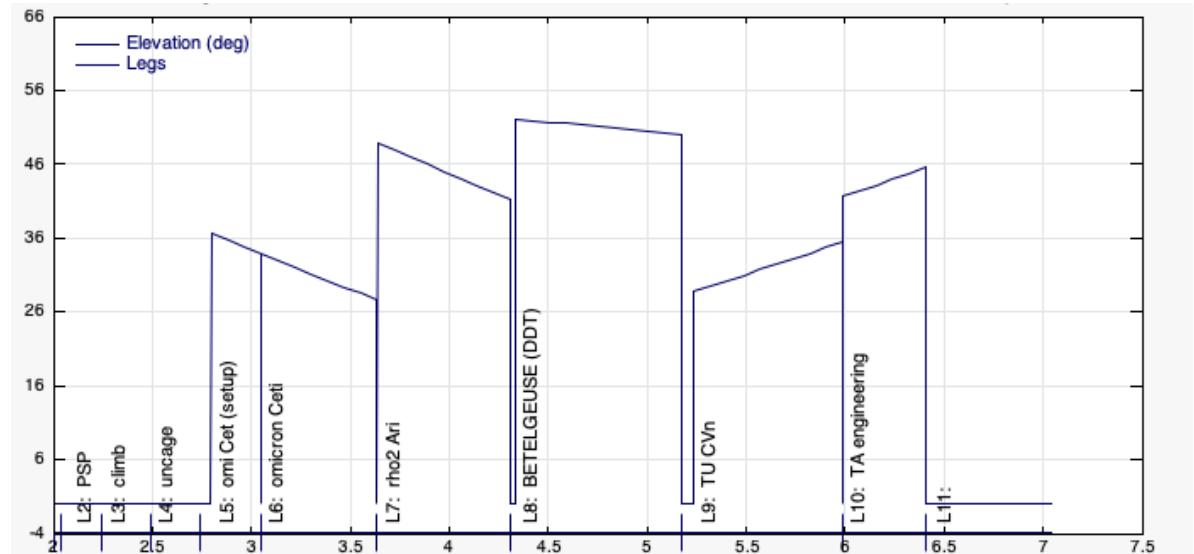
Flight 661 Mission ID 2020-02-15_EX_F661
 Palmdale to Palmdale Take off date UTC: 15-FEB-2020
 Departure UTC: 01:59 Arrival UTC: 06:52

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5	90_0089	Calibration	omicron Ceti	02h19m20.79s	-02d58m39.5s	2:48	15	
6	07_0014	Hinkle	omicron Ceti	02h19m20.79s	-02d58m39.5s	3:03	35	
7	07_0039	Kraemer	rho2 Ari	02h55m48.50s	18d19m53.9s	3:39	40	
8	75_0051	Discretionary	BETELGEUSE	05h55m10.31s	07d24m25.4s	4:21	50	Some issues commanding moves along spectral slit
9	07_0039	Kraemer	TU CVn	12h54m56.52s	47d11m48.2s	5:15	45	
10		engineering	HIP 60122	12h19m48.71s	48d59m02.9s	6:00	25	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



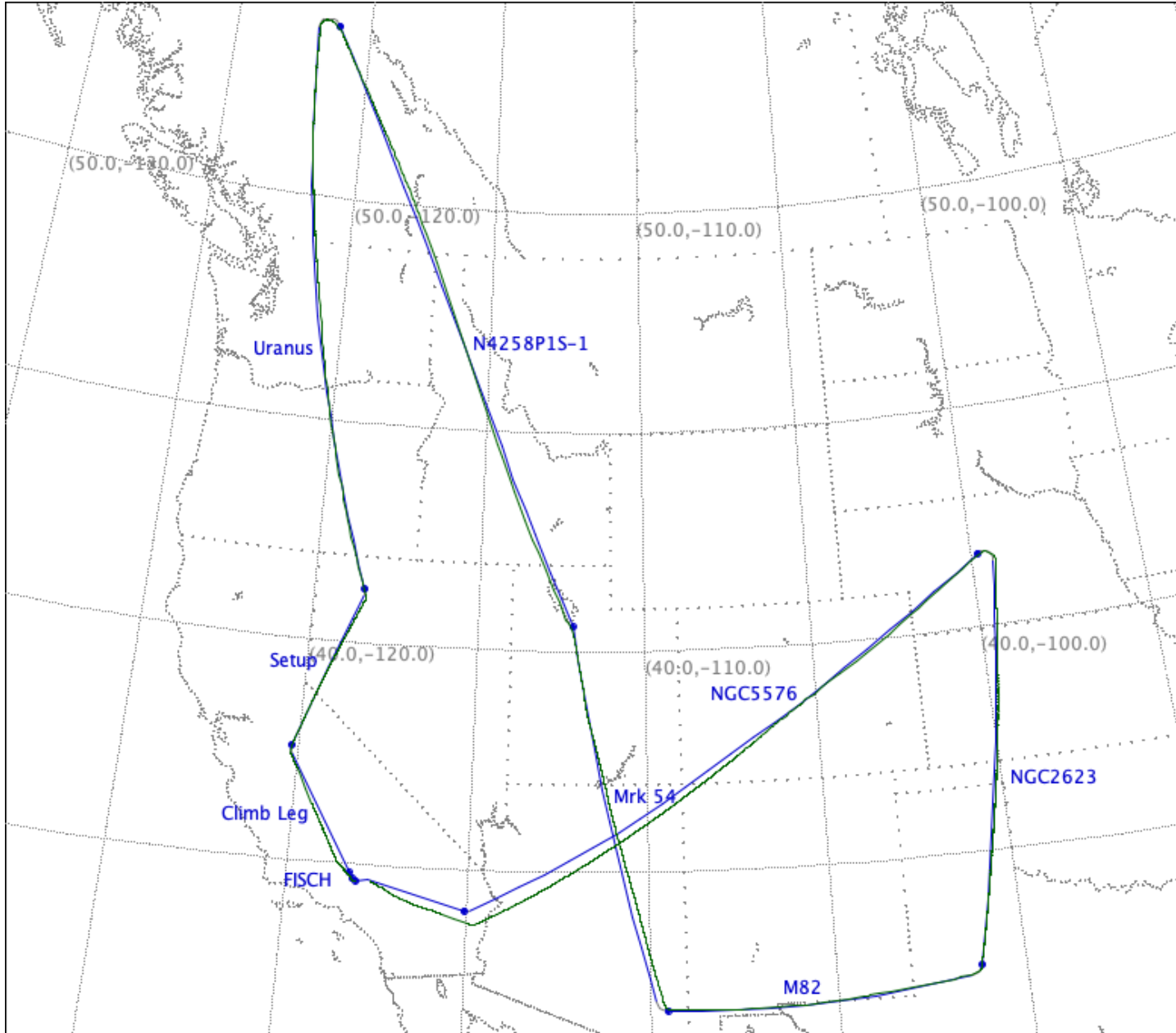
MISSION ID: 2020-02-25_FI_F662

Date: 2020-02-25 UT Instrument: FIFI-LS

Flight #: 662 Flight Series: OC7L

blue = planned route

green = flown route

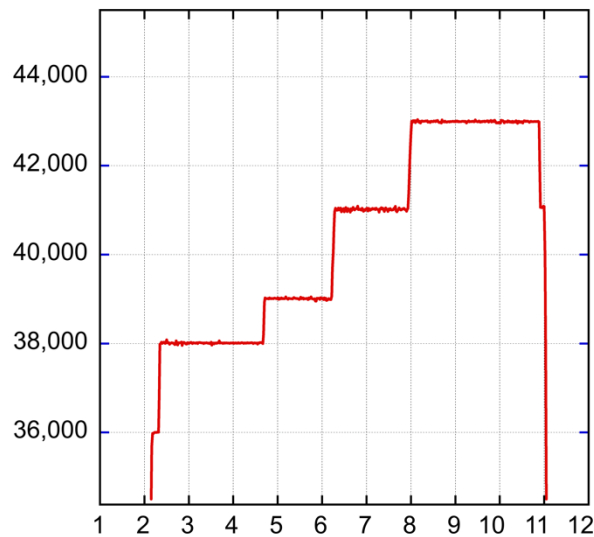


Flight notes: No irregularities.

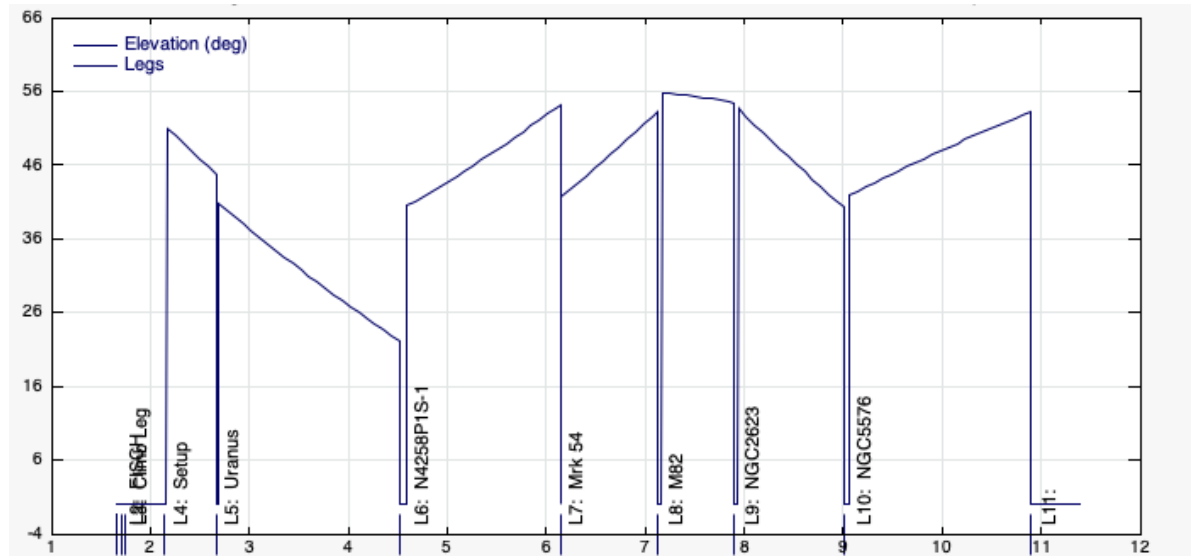
Flight 662 Mission ID 2020-02-25_FI_F662
 Palmdale to Palmdale Take off date UTC: 25-FEB-2020
 Departure UTC: 01:39 Arrival UTC: 11:29

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	01h09m43.92s	35d37m14.0s	2:10	30	
5	90_0032	Calibration	Uranus	02h04m41.30s	12d09m06.3s	2:41	110	
6	07_0154	Appleton	N4258P1S	12h18m59.49s	47d18m12.9s	4:35	93	
7	07_0108	Hashimoto	Mrk 54	12h56m55.64s	32d26m51.5s	6:08	59	
8	71_0024	Engineering	M82	09h55m52.43s	69d40m46.9s	7:09	44	
9	07_0080	Smith	NGC2623	08h38m24.08s	25d45m16.7s	7:55	64	
10	07_0105	Temi	NGC5576	14h21m03.69s	03d16m15.8s	9:03	110	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



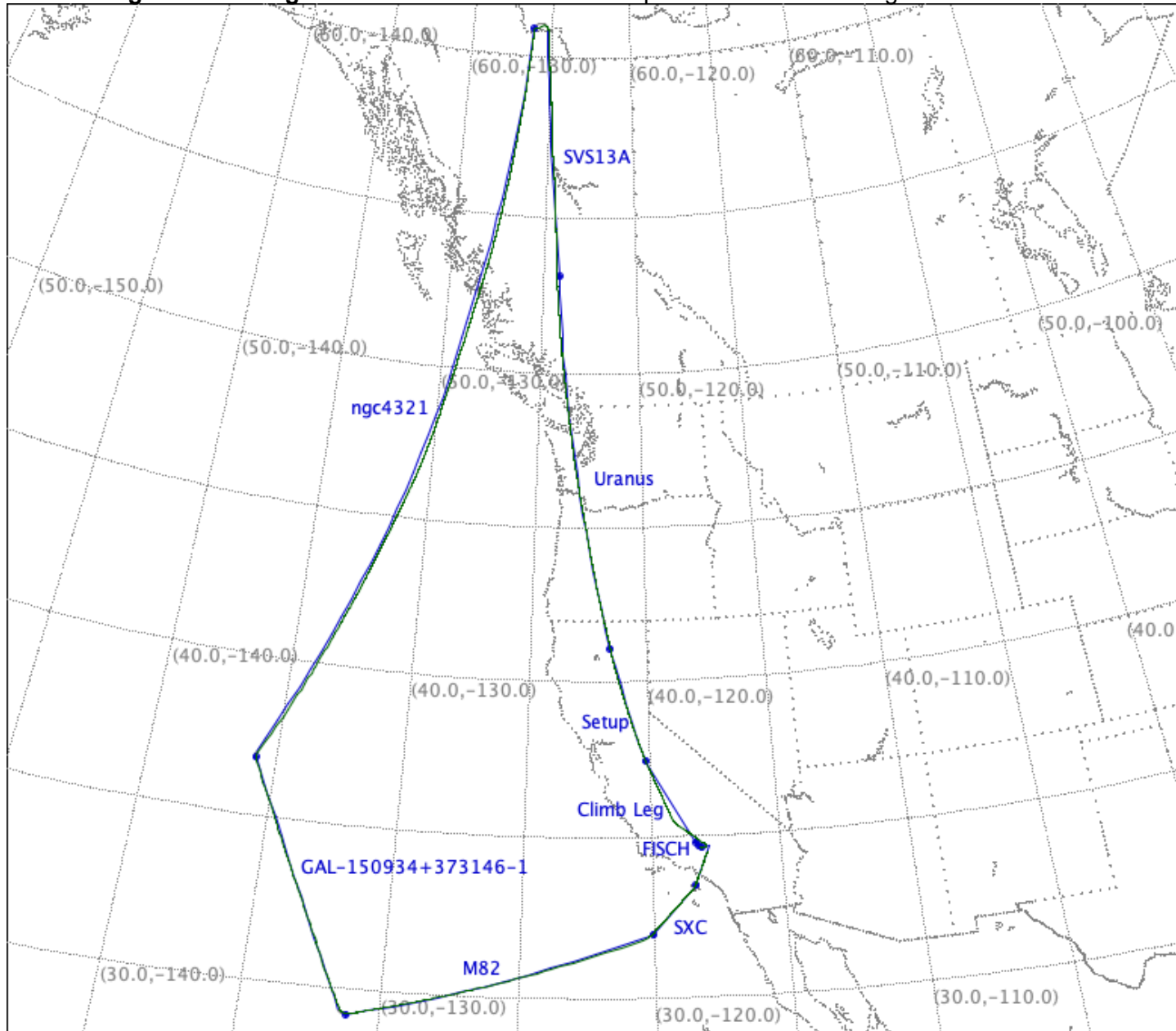
MISSION ID: 2020-02-26_FI_F663

Date: 2020-02-26 UT Instrument: FIFI-LS

Flight #: 663 Flight Series: OC7L

blue = planned route

green = flown route

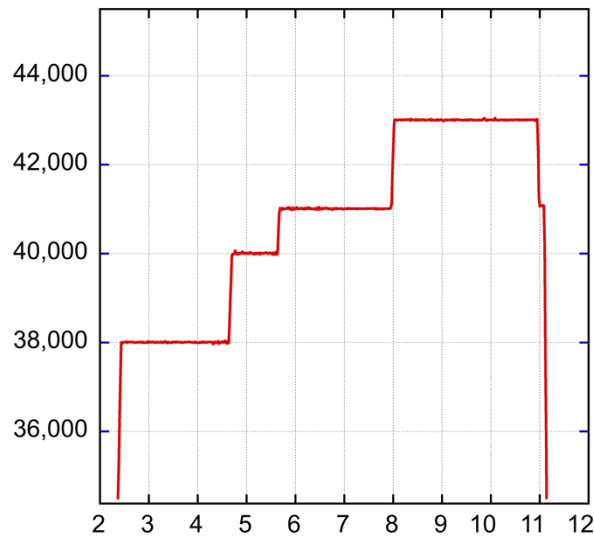


Flight notes: No irregularities.

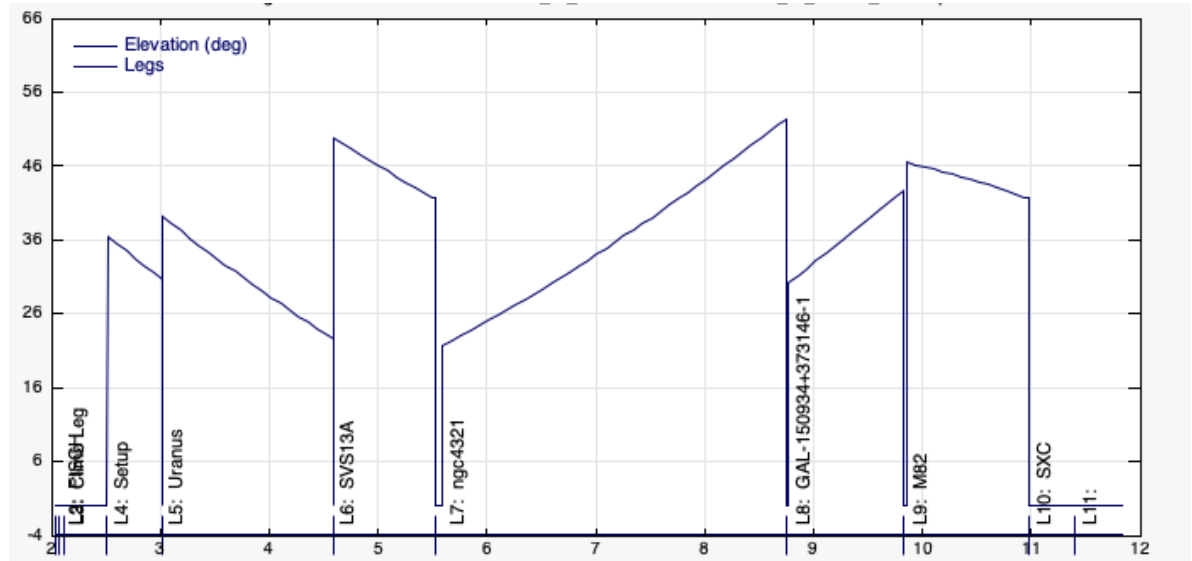
Flight 663 Mission ID 2020-02-26_FI_F663
 Palmdale to Palmdale Take off date UTC: 26-FEB-2020
 Departure UTC: 02:00 Arrival UTC: 11:31

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	01h41m25.89s	05d29m15.4s	2:31	30	
5	90_0033	Calibration	Uranus	02h04m50.10s	12d09m54.8s	3:01	94	
6	07_0185	Tobin	SVS13A	03h29m06.04s	31d15m46.9s	4:35	56	
7	70_0708	GTO	ngc4321	12h22m54.93s	15d49m20.3s	5:35	189	
8	07_0229	Malhotra	GAL-150934+373146	15h09m34.17s	37d31m46.1s	8:46	63	
9	07_0217	Latzko	M82	09h55m52.43s	69d40m46.9s	9:51	67	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



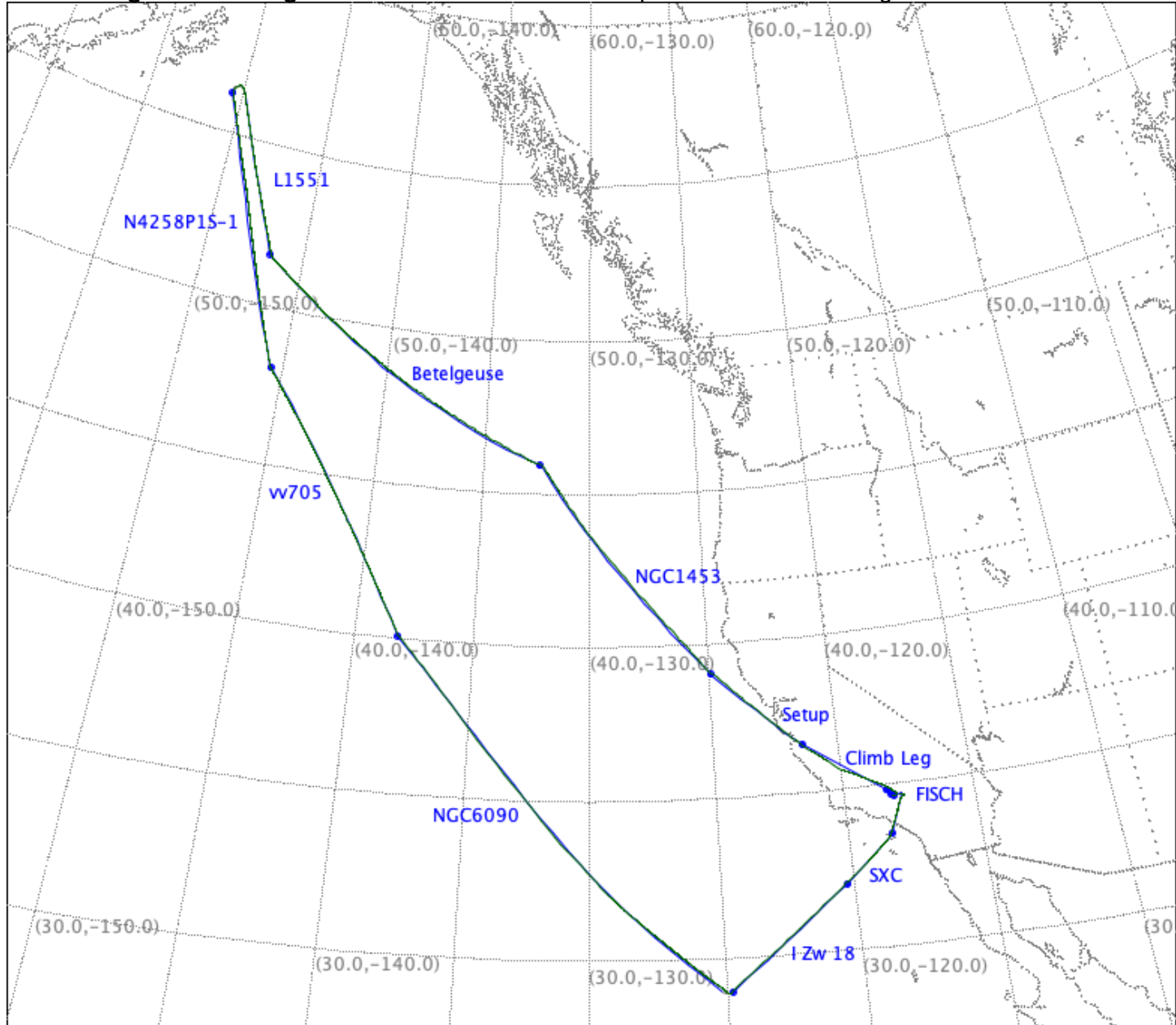
MISSION ID: 2020-02-27_FI_F664

Date: 2020-02-27 UT Instrument: FIFI-LS

Flight #: 664 Flight Series: OC7L

blue = planned route

green = flown route

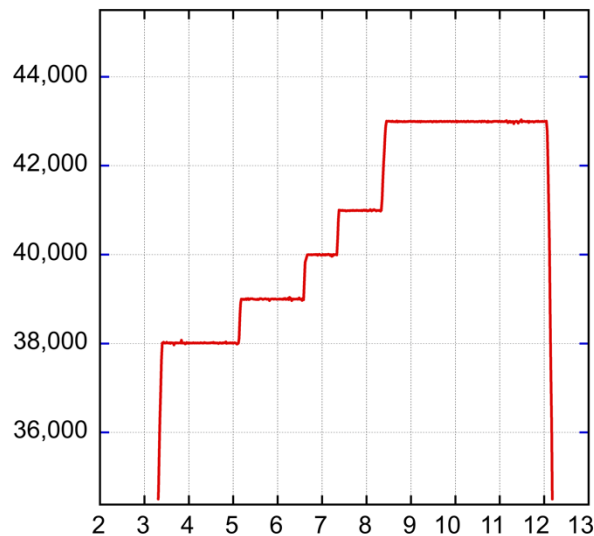


Flight notes: No irregularities.

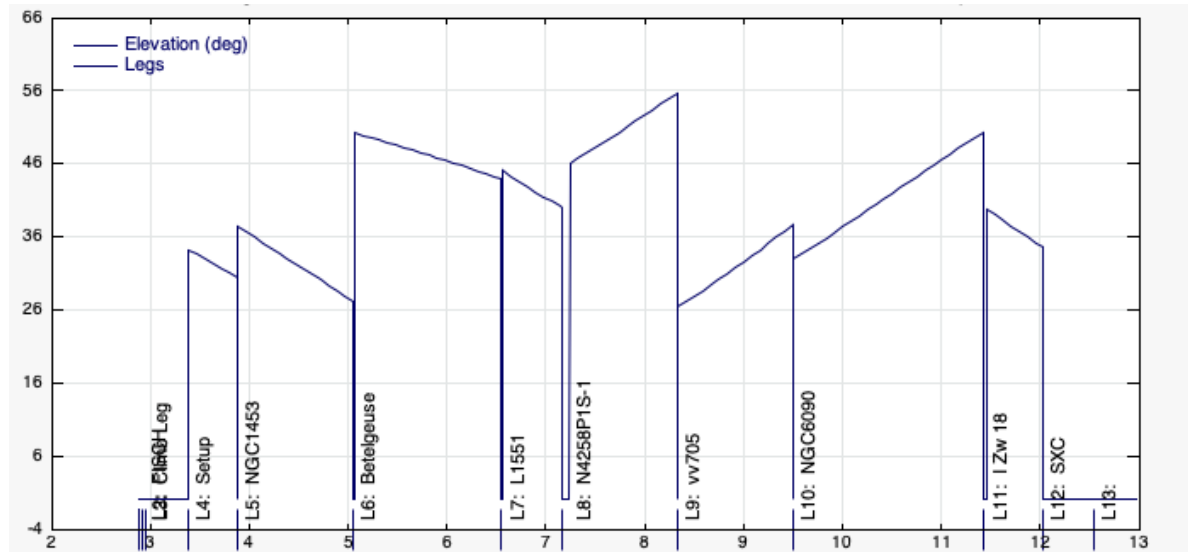
Flight 664 Mission ID 2020-02-27_FI_F664
 Palmdale to Palmdale Take off date UTC: 27-FEB-2020
 Departure UTC: 02:53 Arrival UTC: 12:30

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	03h46m08.54s	-12d06m05.7s	3:23	30	
5	07_0105	Temi	NGC1453	03h46m27.27s	-03d58m07.6s	3:53	70	
6	75_0052	Discretionary	Betelgeuse	05h55m10.31s	07d24m25.4s	5:04	89	Telescope control failure; last 14m of leg lost
7	07_0069	Sperling	L1551	04h31m34.08s	18d08m04.9s	6:33	36	First 10min of leg lost recovering from telescope control failure
8	07_0154	Appleton	N4258P1S	12h18m59.49s	47d18m12.9s	7:14	65	
9	07_0080	Smith	vv705	15h18m06.35s	42d44m36.7s	8:20	70	
10	07_0080	Smith	NGC6090	16h11m40.70s	52d27m24.0s	9:30	115	
11	08_0243	Diaz-Santos	I Zw 18	09h34m02.03s	55d14m28.1s	11:27	34	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



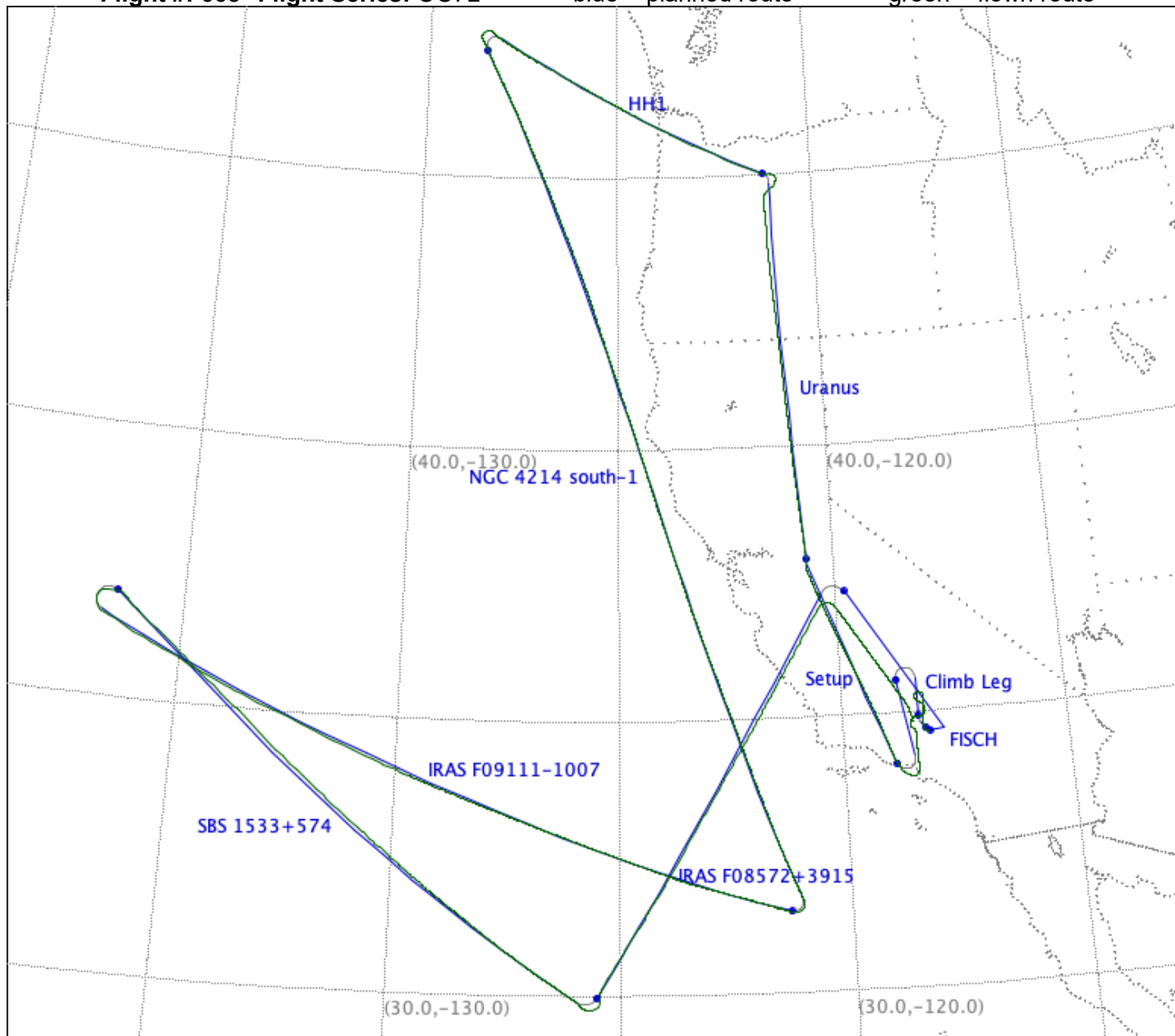
MISSION ID: 2020-02-28_FI_F665

Date: 2020-02-28 UT Instrument: FIFI-LS

Flight #: 665 Flight Series: OC7L

blue = planned route

green = flown route

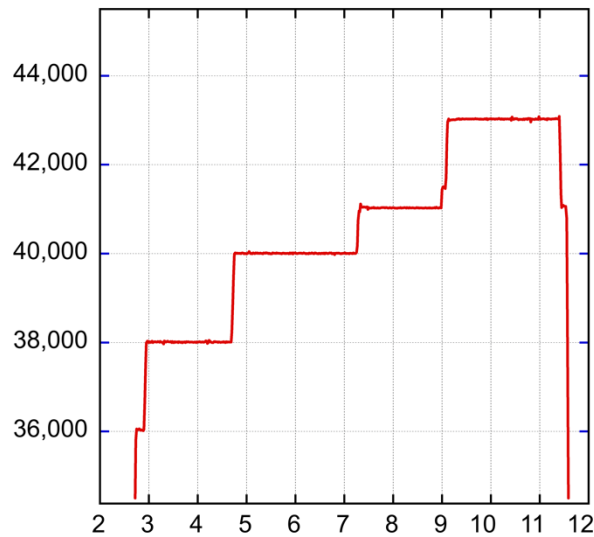


Flight notes: No irregularities.

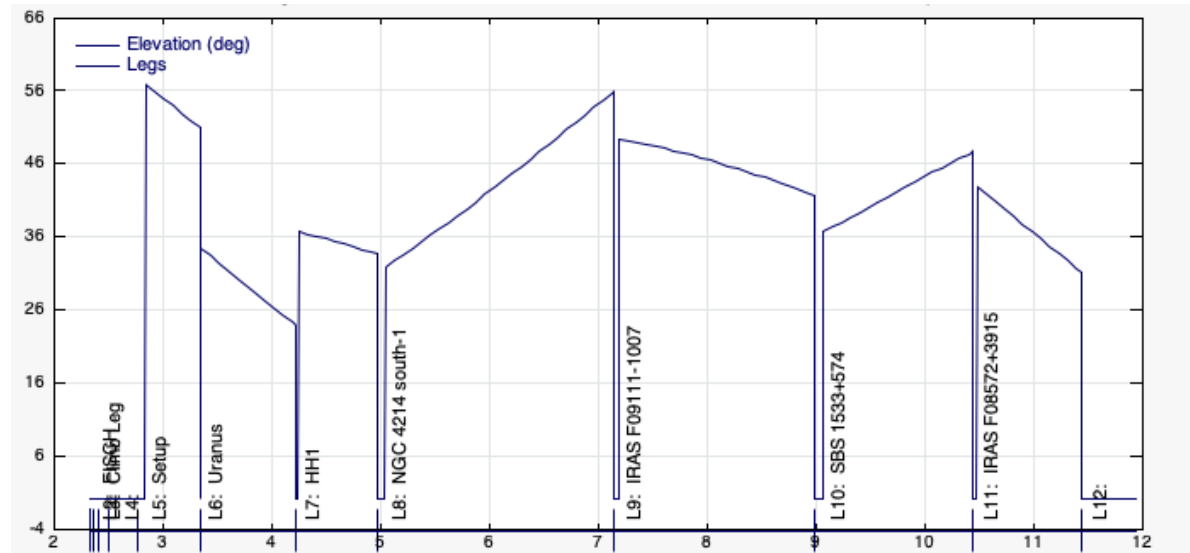
Flight 665 Mission ID 2020-02-28_FI_F665
 Palmdale to Palmdale Take off date UTC: 28-FEB-2020
 Departure UTC: ~02:20 Arrival UTC: 11:55

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	03h30m52.38s	12d56m12.0s	2:50	30	
6	90_0033	Calibration	Uranus	02h05m07.48s	12d11m30.3s	3:21	52	
7	07_0069	Sperling	HH1	05h36m22.96s	-06d46m12.9s	4:14	44	
8	08_0165	Stacey	NGC 4214 south	12h15m40.70s	36d19m05.0s	5:02	126	
9	08_0095	Ma	IRAS F09111-1007	09h13m36.46s	-10d19m29.9s	7:11	107	
10	08_0243	Diaz-Santos	SBS 1533+574	15h34m13.80s	57d17m06.0s	9:04	82	
11	08_0095	Ma	IRAS F08572+3915	09h00m25.66s	39d03m51.0s	10:29	58	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



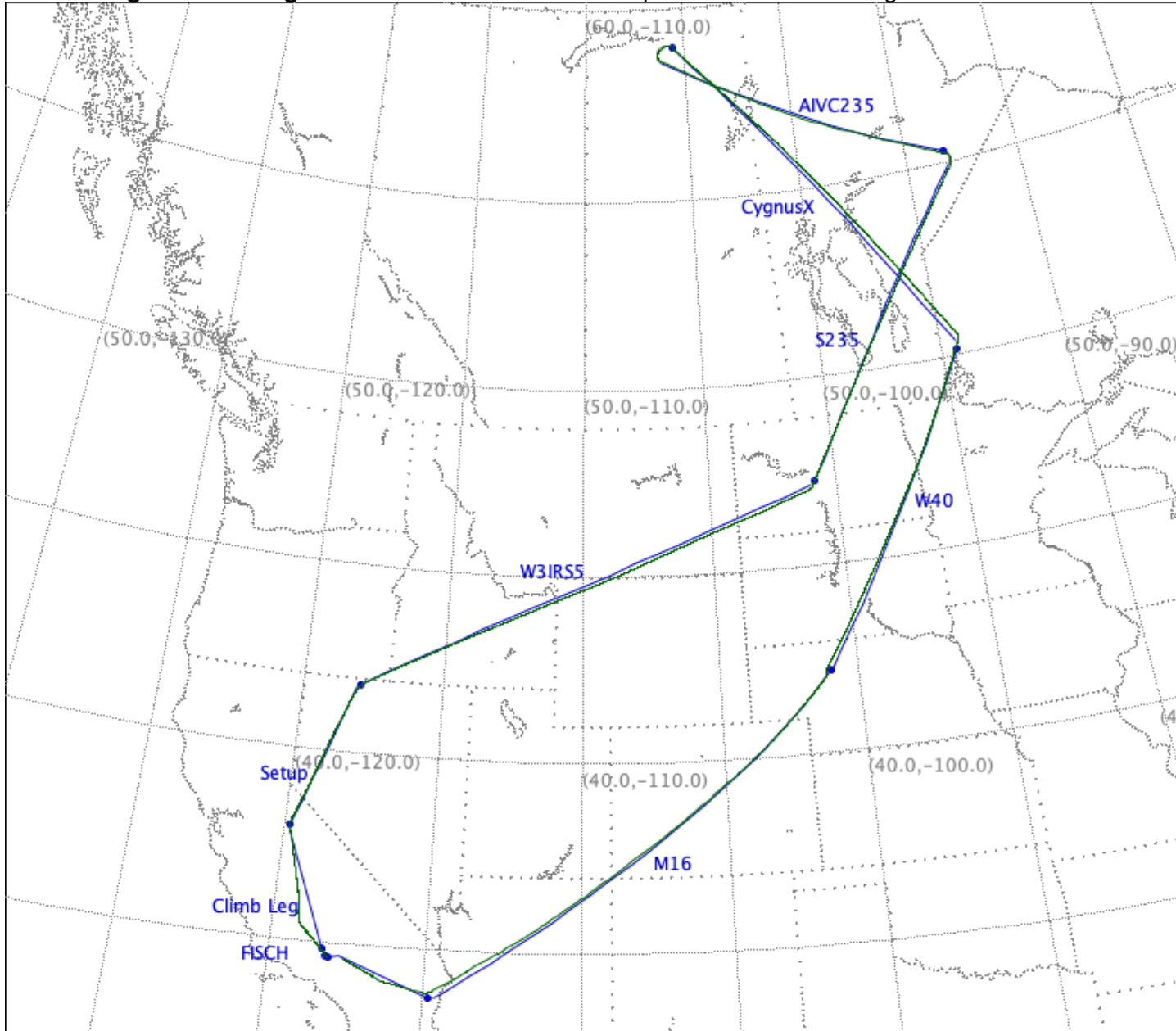
MISSION ID: 2020-03-04_FI_F666

Date: 2020-03-04 UT Instrument: GREAT

Flight #: 666 Flight Series: OC7M

blue = planned route

green = flown route



Flight notes: No irregularities.

Flight 666 Mission ID
Palmdale to Palmdale

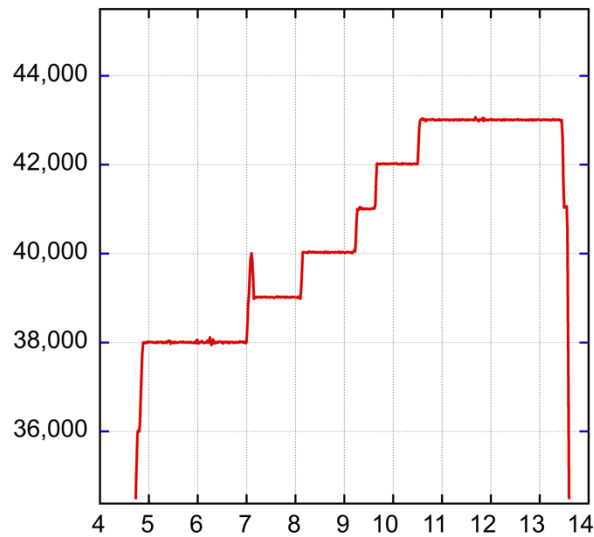
2020-03-04_FI_F666
Take off date UTC:
04-MAR-2020

Departure UTC: 04:22
Arrival UTC: 14:00

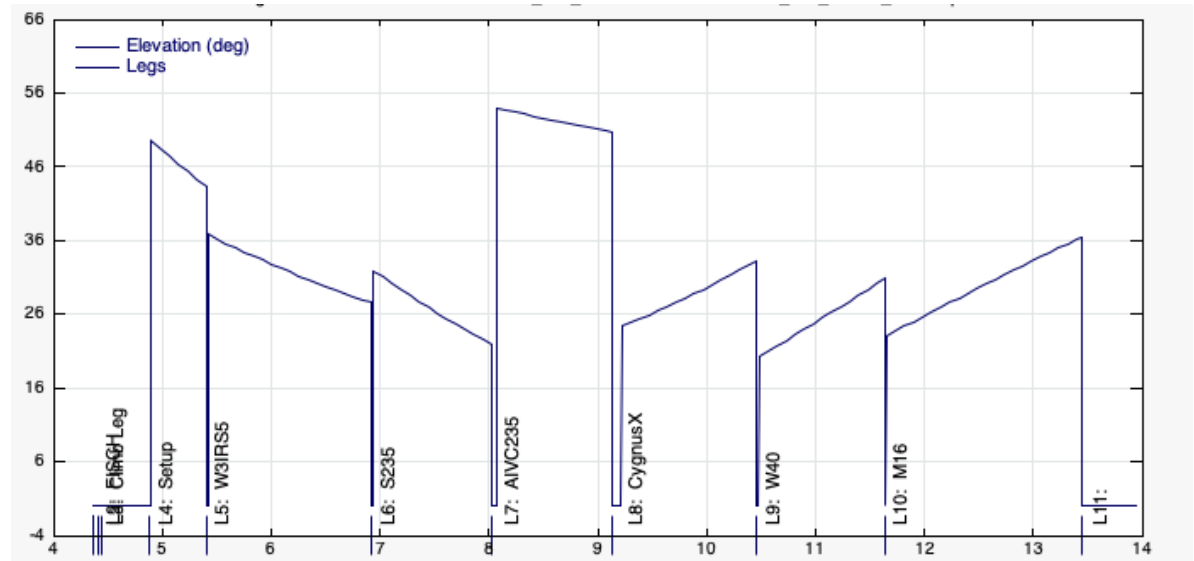
HFA-LFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	04h20m24.64s	34d34m00.2s	4:53	30	
5	90_0011	Calibration	W3IRS5	02h25m40.54s	62d05m51.4s	5:25	90	
6	07_0122	Kirsanova	S235	05h40m52.62s	35d41m00.8s	6:56	65	
7	07_0163	Kerp	AIVC235	11h54m57.54s	20d56m37.6s	8:04	63	
8	07_0077	Tielens	CygnusX	20h38m39.46s	42d20m44.5s	9:12	74	
9	07_0077	Tielens	W40	18h31m24.45s	-02d04m13.8s	10:28	70	
10	07_0077	Tielens	M16	18h18m23.99s	-13d41m26.4s	11:38	108	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



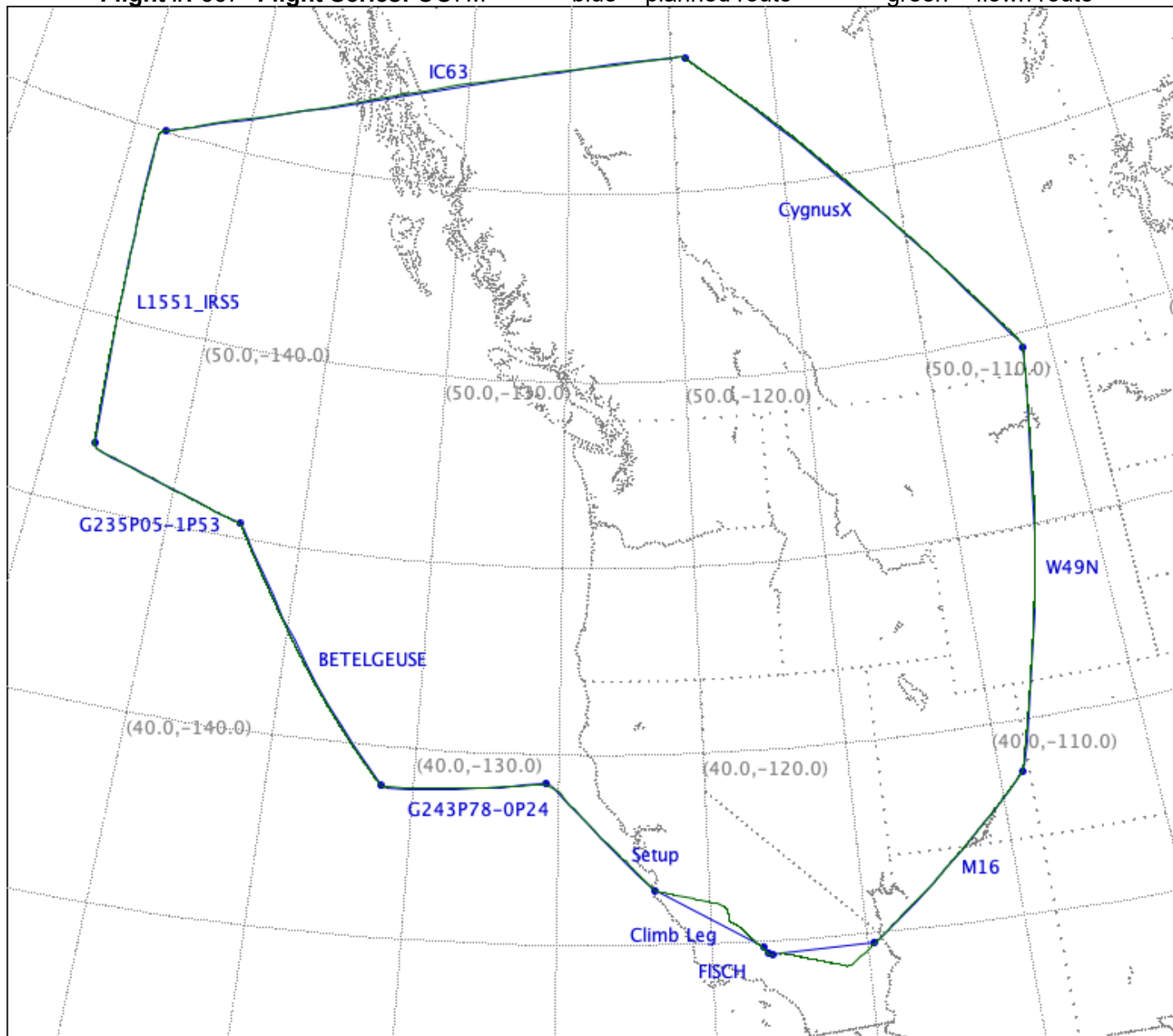
MISSION ID: 2020-03-05_FI_F667

Date: 2020-03-05 UT Instrument: GREAT

Flight #: 667 Flight Series: OC7M

blue = planned route

green = flown route



Flight notes: No irregularities.

Flight 667 Mission ID
Palmdale to Palmdale

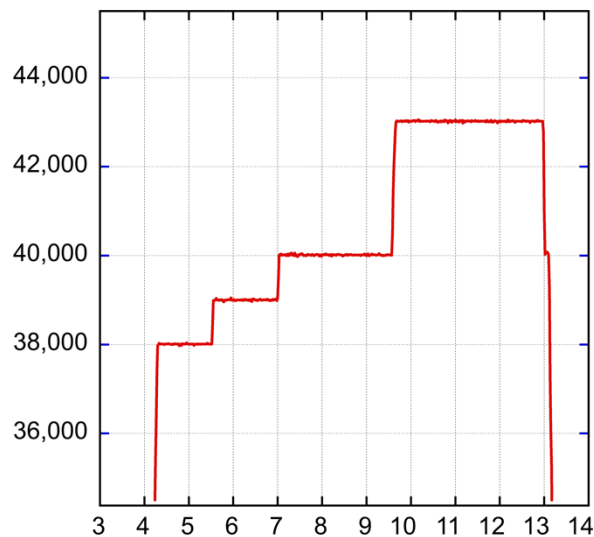
2020-03-05_FI_F667
Take off date UTC:
05-MAR-2020

Departure UTC: 03:46
Arrival UTC: 13:31

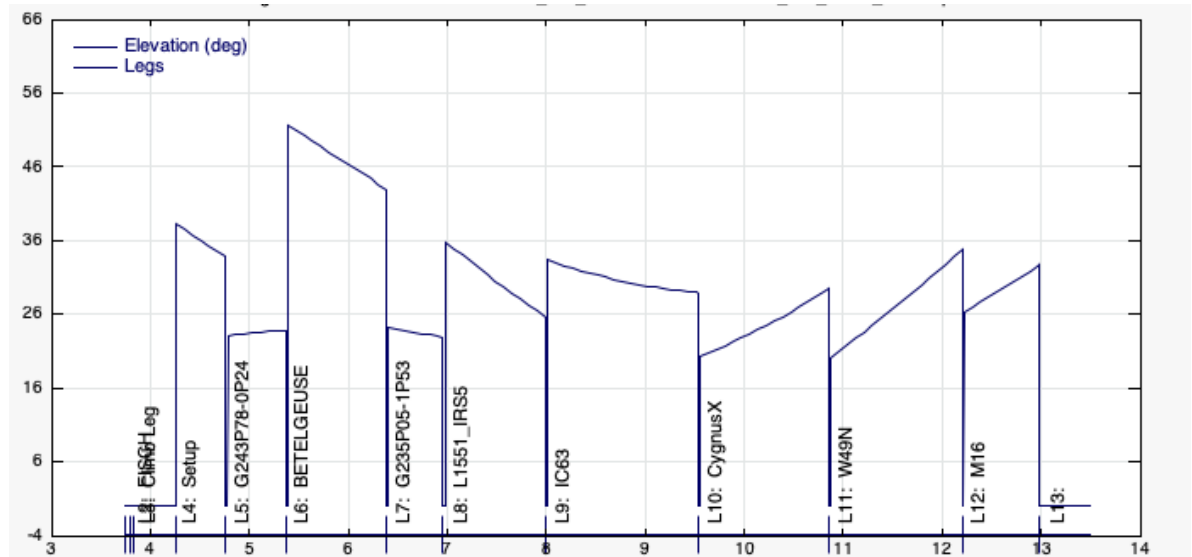
HFA-LFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	05h01m26.34s	-07d10m26.3s	4:15	30	
5	07_0136	Koenig	G243.78-0.24	07h51m26.87s	-27d16m29.4s	4:47	35	
6	75_0050	Discretionary	BETELGEUSE	05h55m10.31s	07d24m25.4s	5:23	60	
7	07_0136	Koenig	G235.05-1.53	07h27m43.41s	-20d18m47.3s	6:24	33	
8	06_0104	Yang	L1551_IRS5	04h31m34.08s	18d08m04.9s	6:59	60	
9	07_0011	Andersson	IC63	00h58m20.25s	61d00m36.1s	8:01	91	
10	07_0077	Tielens	CygnusX	20h38m39.46s	42d20m44.5s	9:33	78	
11	07_0148	Jacob	W49N	19h10m13.20s	09d06m11.9s	10:52	80	
12	07_0077	Tielens	M16	18h18m23.99s	-13d41m26.4s	12:13	46	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



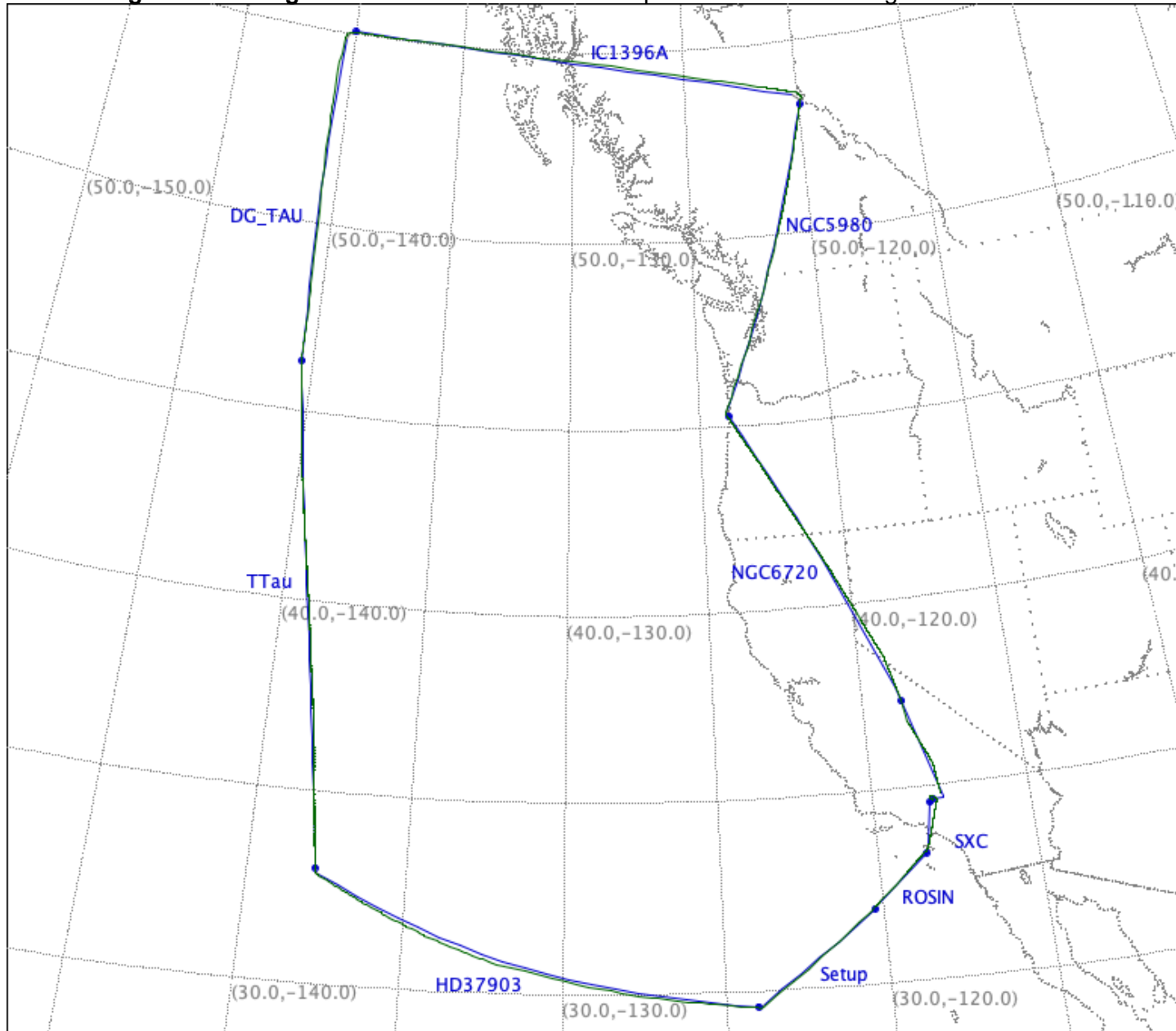
MISSION ID: 2020-03-06_FI_F668

Date: 2020-03-06 UT Instrument: GREAT

Flight #: 668 Flight Series: OC7M

blue = planned route

green = flown route

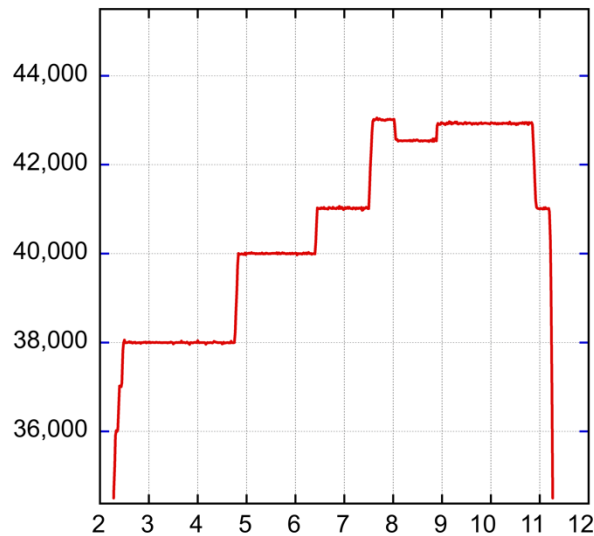


Flight notes: Early return to Palmdale base near end of flight.

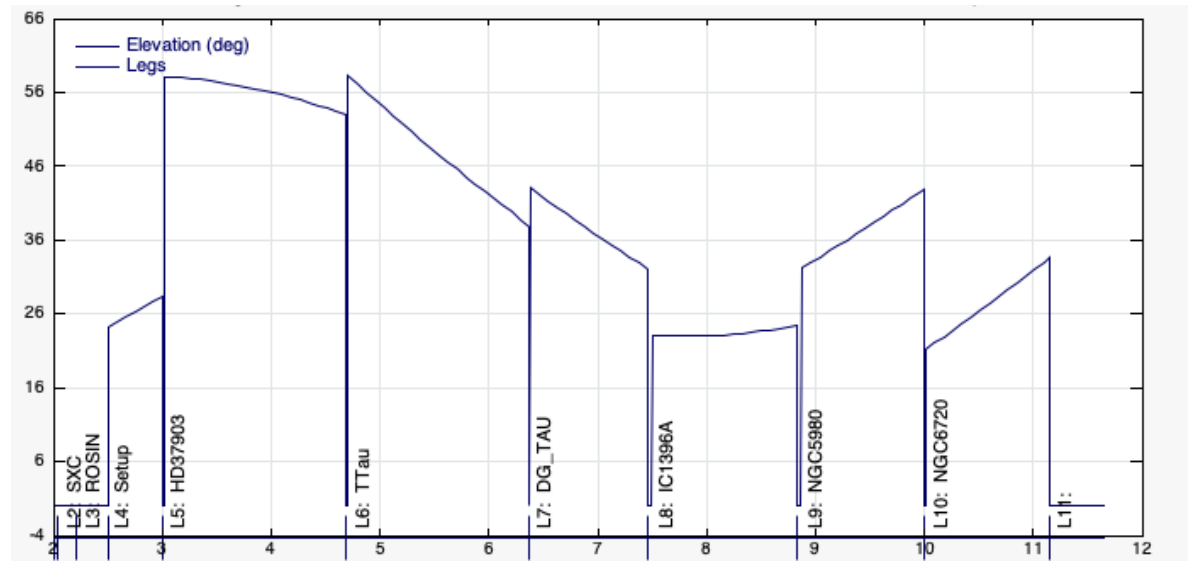
Flight 668 Mission ID 2020-03-05_FI_F668
 Palmdale to Palmdale Take off date UTC: 05-MAR-2020 Departure UTC: 01:56 Arrival UTC: 11:40 Consortium flight HFA-LFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	07h56m51.54s	-22d52m48.4s	2:29	30	
5	83_0731	GREAT Consortium	HD37903	05h41m38.39s	-02d15m32.5s	3:00	100	
6	83_0722	GREAT Consortium	TTau	04h21m59.43s	19d32m06.4s	4:42	100	
7	83_0732	GREAT Consortium	DG_TAU	04h27m04.70s	26d06m16.3s	6:22	65	
8	83_0427	GREAT Consortium	IC1396A	21h36m50.70s	57d31m10.0s	7:29	80	
9	07_0126	Bolatto	NGC5980	15h41m30.48s	15d47m15.7s	8:52	67	
10	83_0730	GREAT Consortium	NGC6720	18h53m35.10s	33d01m44.9s	10:00	68	GREAT Instrument lost power and did not recover; early return to base

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



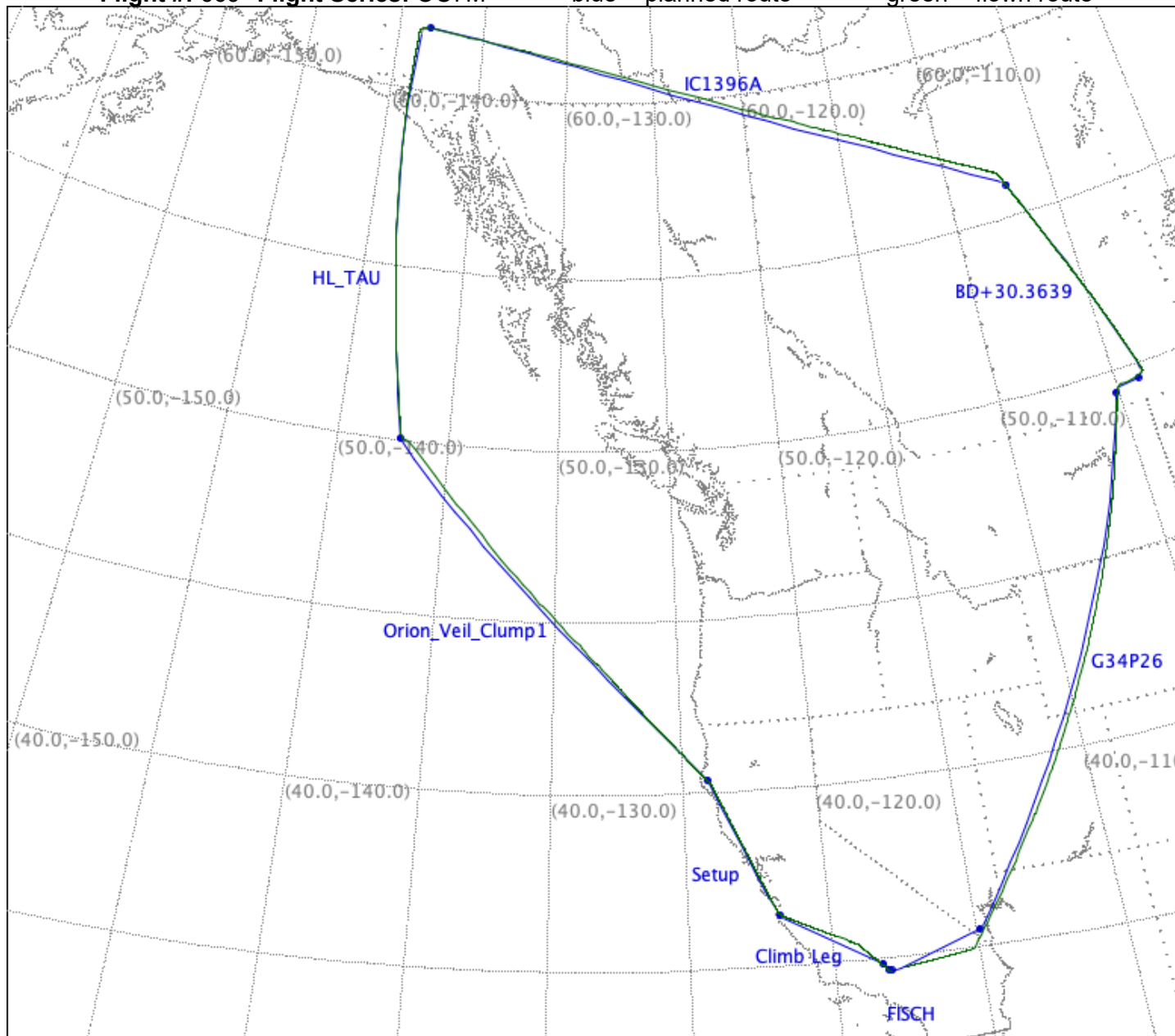
MISSION ID: 2020-03-07_FI_F669

Date: 2020-03-07 UT Instrument: GREAT

Flight #: 669 Flight Series: OC7M

blue = planned route

green = flown route

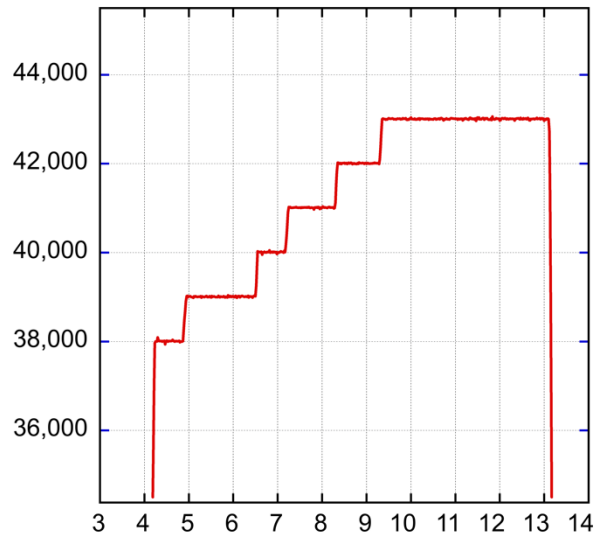


Flight notes: No irregularities.

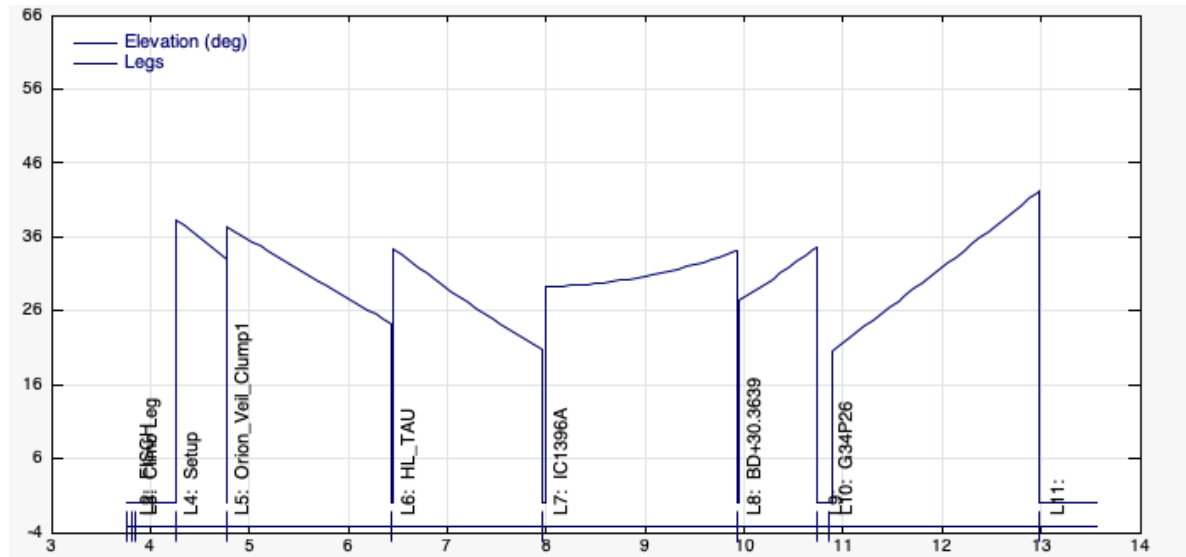
Flight 669 Mission ID 2020-03-07_FI_F669
 Palmdale to Palmdale Take off date UTC: 07-MAR-2020
 Departure UTC: 03:46 Arrival UTC: 13:36 Consortium flight HFA-LFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	04h31m52.67s	-00d02m38.4s	4:16	30	
5	83_0726	GREAT Consortium	Orion Veil Clump1	05h34m21.70s	-05d25m24.8s	4:46	100	
6	83_0732	GREAT Consortium	HL_TAU	04h31m38.44s	18d13m57.7s	6:27	90	
7	83_0427	GREAT Consortium	IC1396A	21h36m50.70s	57d31m10.0s	8:00	116	
8	83_0721	GREAT Consortium	BD+30.3639	19h34m45.23s	30d30m58.9s	9:57	47	
10	83_0715	GREAT Consortium	G34P26	18h53m18.49s	01d14m58.7s	10:53	126	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



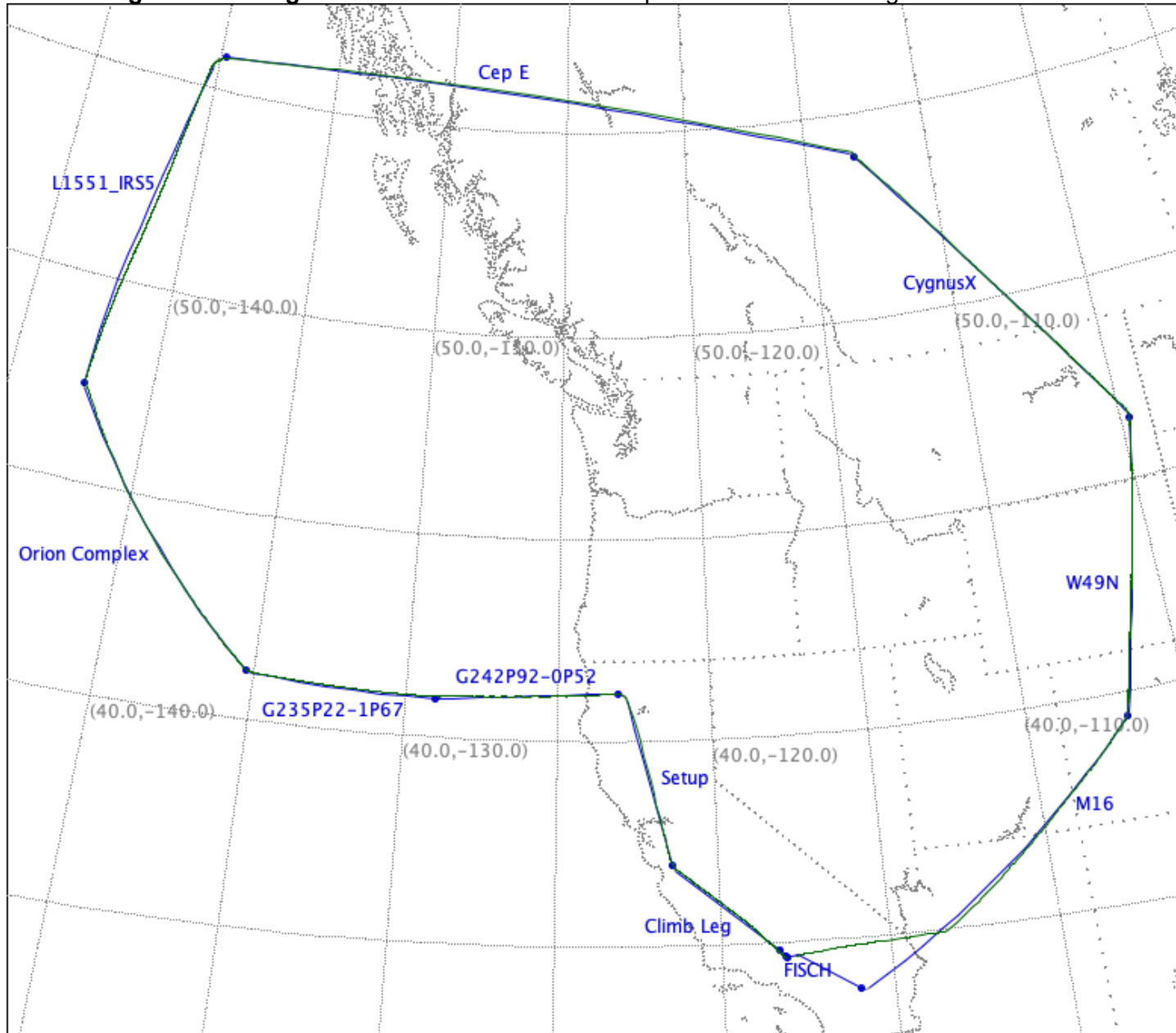
MISSION ID: 2020-03-10_FI_F670

Date: 2020-03-10 UT Instrument: GREAT

Flight #: 670 Flight Series: OC7M

blue = planned route

green = flown route



Flight notes: No irregularities.

Flight 670 Mission ID
Palmdale to Palmdale

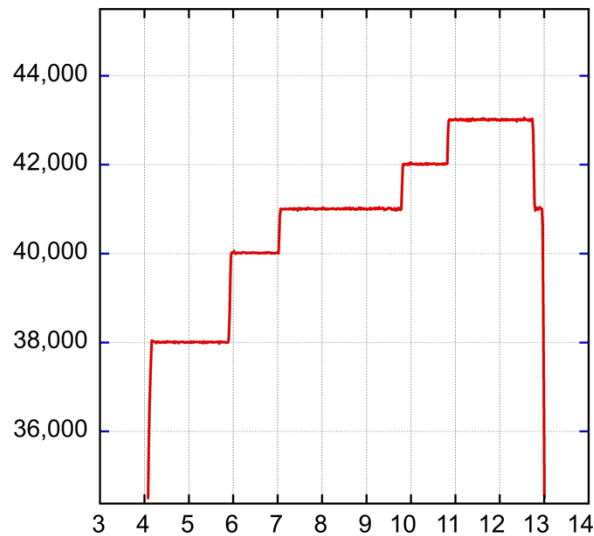
2020-03-10_FI_F670
Take off date UTC:
10-MAR-2020

Departure UTC: 03:42
Arrival UTC: 13:28

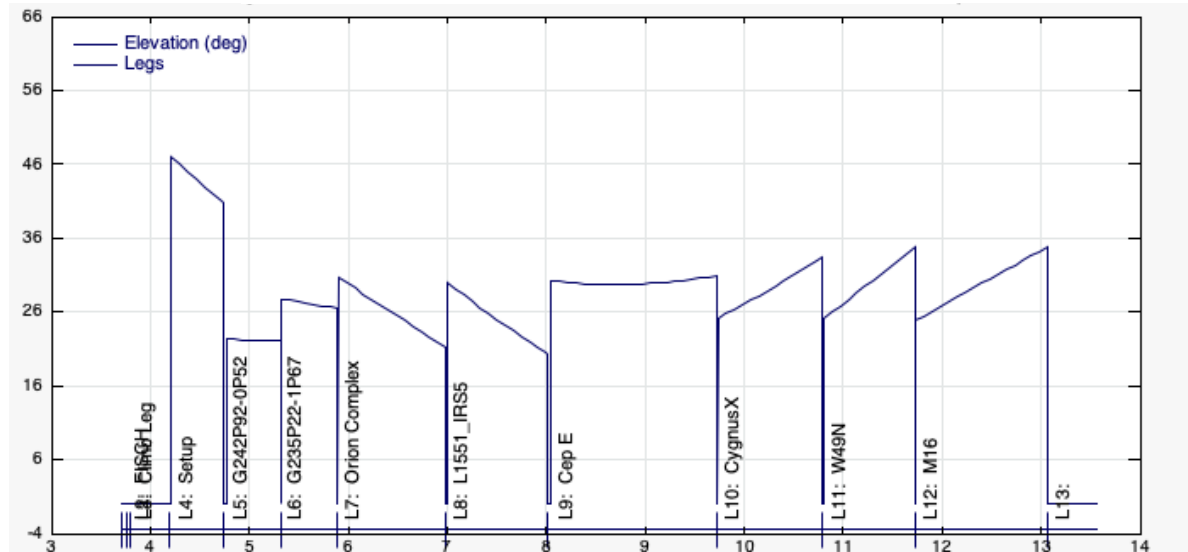
HFA-LFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	04h33m50.92s	14d50m39.9s	4:12	31	
5	07_0136	Koenig	G242.92-0.52	07h48m24.21s	-26d40m35.7s	4:45	33	
6	07_0136	Koenig	G235.22-1.67	07h27m32.62s	-20d31m45.3s	5:18	34	
7	07_0068	Kabanovic	Orion Complex	05h35m19.86s	-05d07m58.8s	5:53	65	
8	06_0104	Yang	L1551_IRS5	04h31m34.08s	18d08m04.9s	6:59	61	
9	07_0161	Gusdorf	Cep E	23h03m12.78s	61d42m25.8s	8:03	100	
10	07_0077	Tielens	CygnusX	20h38m39.46s	42d20m44.5s	9:43	63	Telescope dropped into standby; 6min lost
11	07_0148	Jacob	W49N	19h10m13.20s	09d06m11.9s	10:48	55	
12	07_0077	Tielens	M16	18h18m23.99s	-13d41m26.4s	11:43	80	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



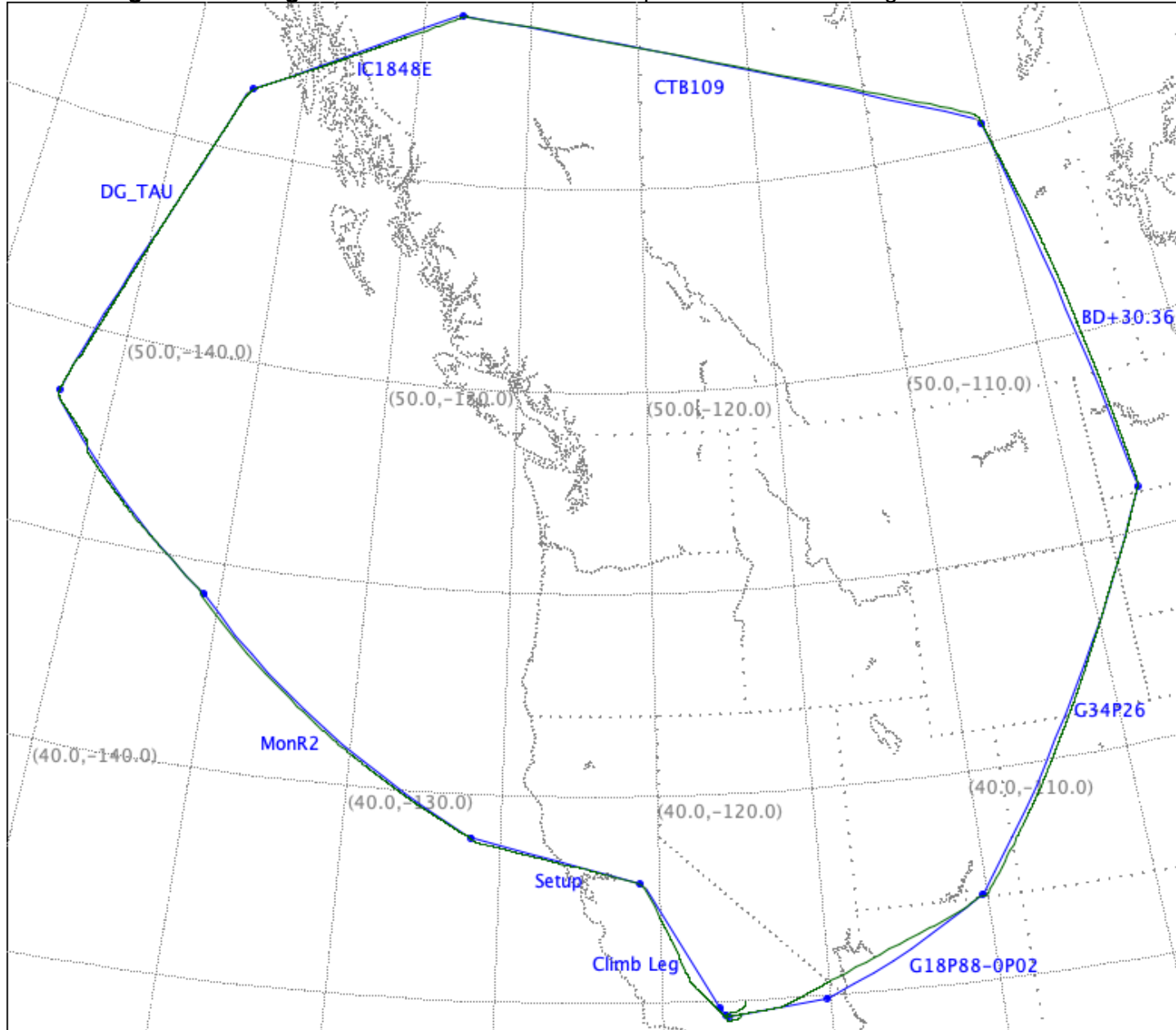
MISSION ID: 2020-03-11_FI_F671

Date: 2020-03-11 UT Instrument: GREAT

Flight #: 671 Flight Series: OC7M

blue = planned route

green = flown route

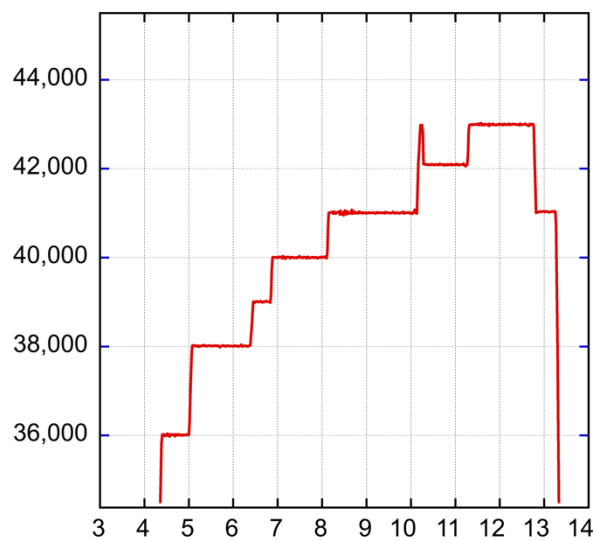


Flight notes:

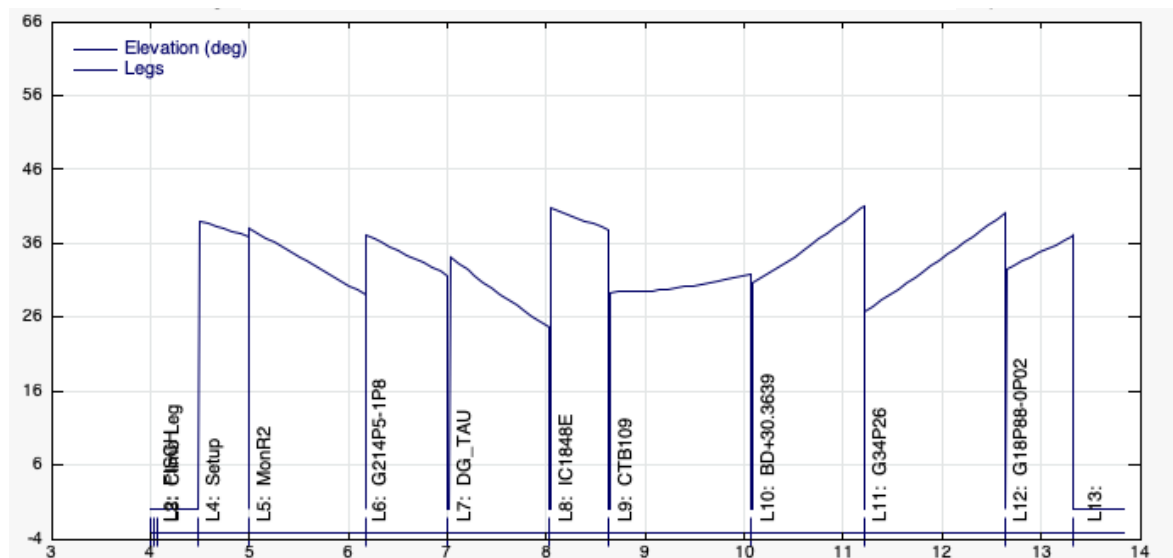
Some clouds led to data loss; landed at Edwards AFB due to poor visibility at Palmdale Airport

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
Flight 671 Mission ID Palmdale to Edwards			2020-03-11_FI_F671 Take off date UTC: 11-MAR-2020		Departure UTC: 03:57 Arrival UTC: ~13:49		Consortium flight HFA-LFA	
4			Setup	06h54m11.40s	-12d02m19.1s	4:29	30	
5	83_0628	GREAT Consortium	MonR2	06h07m46.20s	-06d23m08.0s	5:00	70	
6	83_0723	GREAT Consortium	G214.5-1.8	06h47m50.91s	-02d06m59.1s	6:10	50	Clouds led to 50% loss of data collection on leg
7	83_0732	GREAT Consortium	DG_TAU	04h27m04.70s	26d06m16.3s	7:02	60	Clouds led to 50% loss of data collection on leg
8	83_0720	GREAT Consortium	IC1848E	03h00m08.00s	60d17m12.0s	8:03	35	
9	83_0724	GREAT Consortium	CTB109	23h02m05.26s	58d57m53.0s	8:39	85	
10	83_0721	GREAT Consortium	BD+30.3639	19h34m45.23s	30d30m58.9s	10:05	67	
11	83_0715	GREAT Consortium	G34P26	18h53m18.49s	01d14m58.7s	11:13	85	
12	83_0733	GREAT Consortium	G18.88-0.02	18h25m26.00s	-12d28m17.0s	12:38	41	Not flown; tried to return to Palmdale base before adverse weather

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



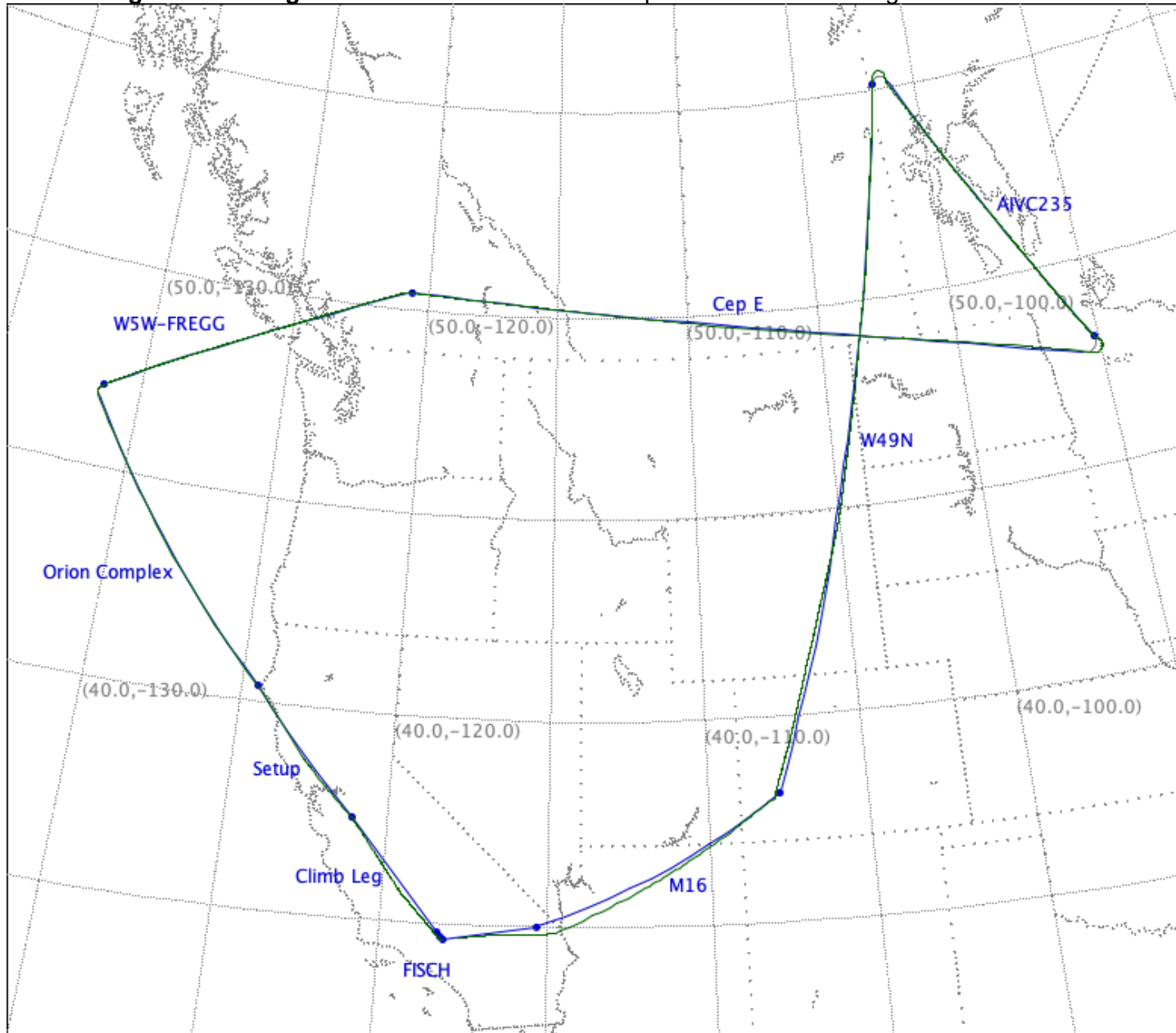
MISSION ID: 2020-03-12_FI_F673

Date: 2020-03-12 UT Instrument: GREAT

Flight #: 673 Flight Series: OC7M

blue = planned route

green = flown route



**Flight notes:
No irregularities.**

Flight 673 Mission ID
Palmdale to Palmdale

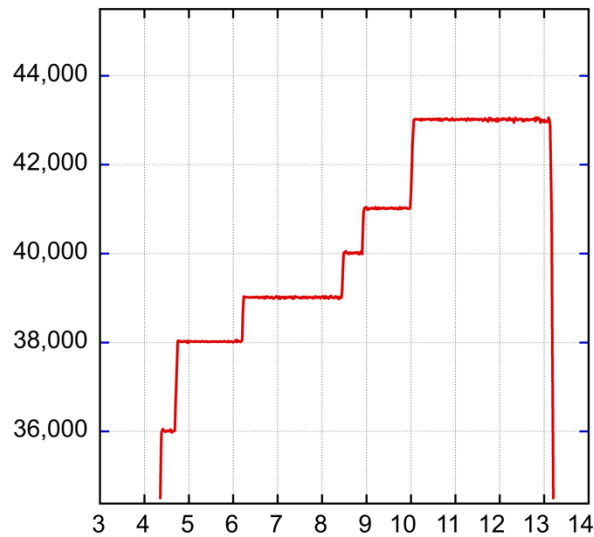
2020-03-12_FI_F673
Take off date UTC:
12-MAR-2020

Departure UTC: 03:59
Arrival UTC: 13:37

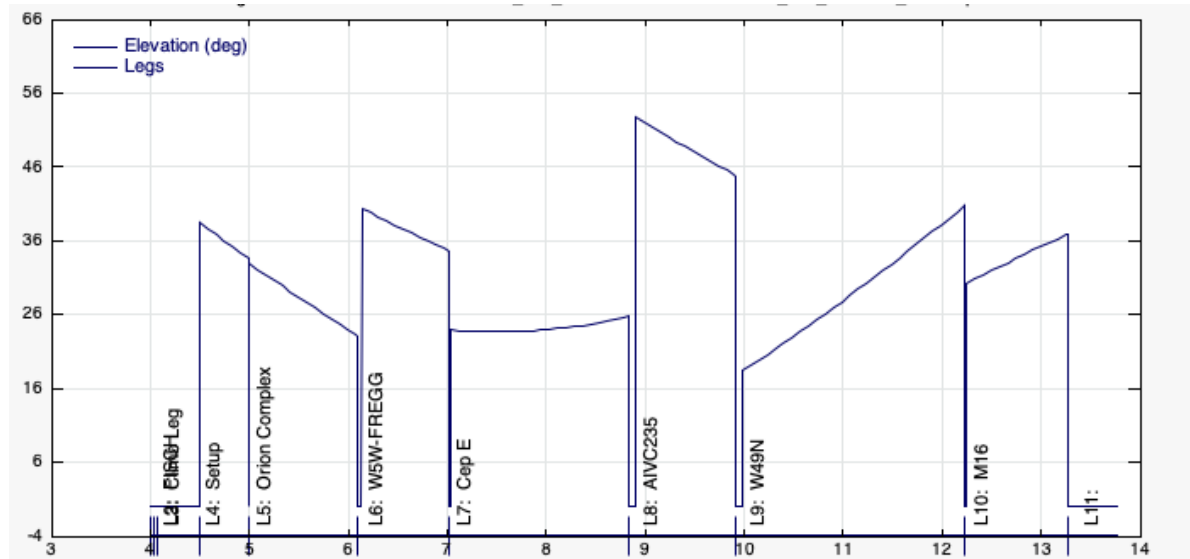
HFA-LFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	05h24m28.62s	-02d23m49.7s	4:29	30	
5	07_0068	Kabanovic	Orion Complex	05h35m19.86s	-05d07m58.8s	4:59	66	
6	07_0216	Sahai	W5W-FREGG	02h52m00.90s	60d15m32.2s	6:07	53	
7	07_0161	Gusdorf	Cep E	23h03m12.78s	61d42m25.8s	7:01	108	
8	07_0163	Kerp	AIVC235	11h54m57.54s	20d56m37.6s	8:53	61	
9	07_0148	Jacob	W49N	19h10m13.20s	09d06m11.9s	9:58	135	
10	07_0077	Tielens	M16	18h18m23.99s	-13d41m26.4s	12:14	61	

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)



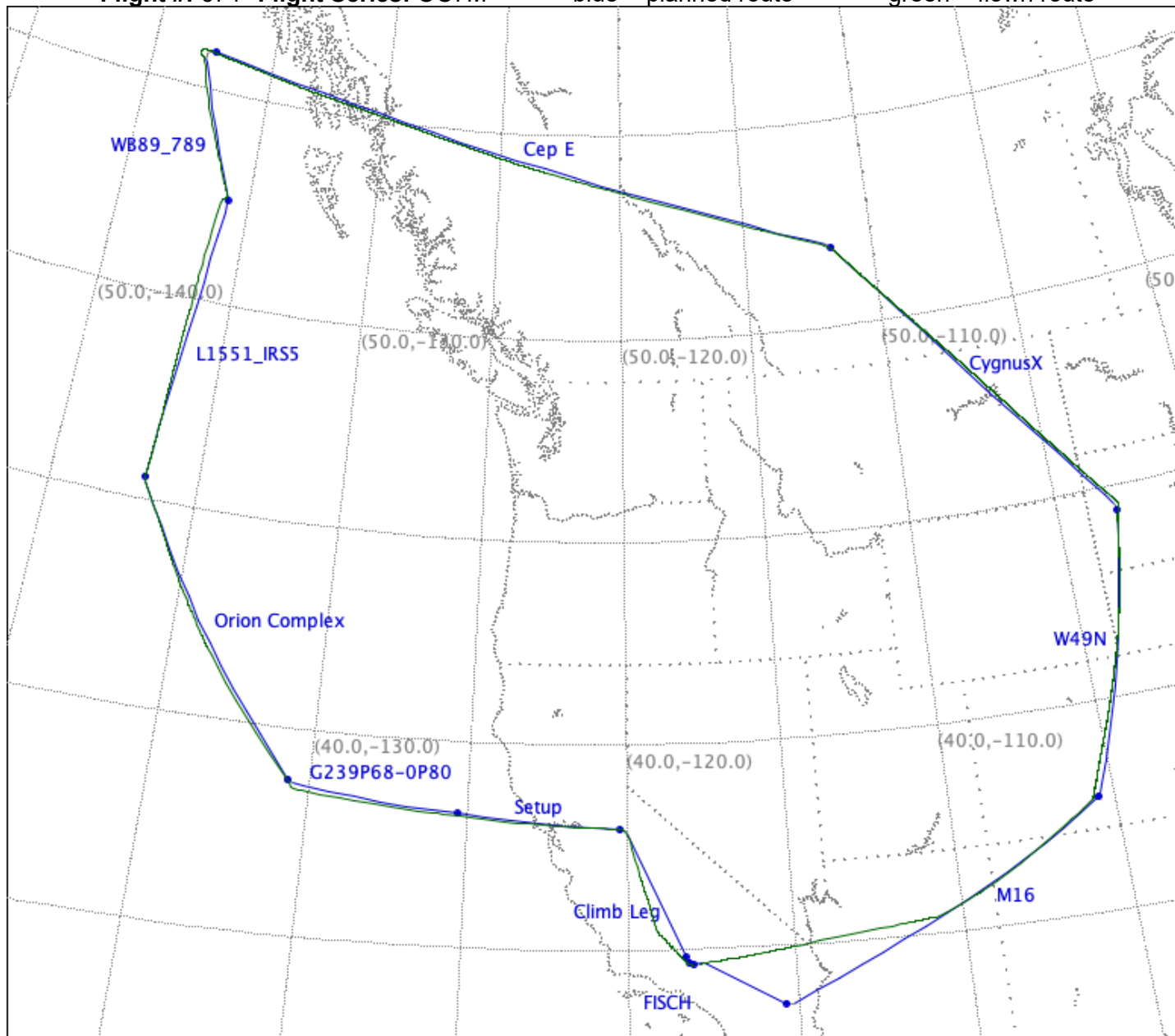
MISSION ID: 2020-03-13_FI_F674

Date: 2020-03-13 UT Instrument: GREAT

Flight #: 674 Flight Series: OC7M

blue = planned route

green = flown route

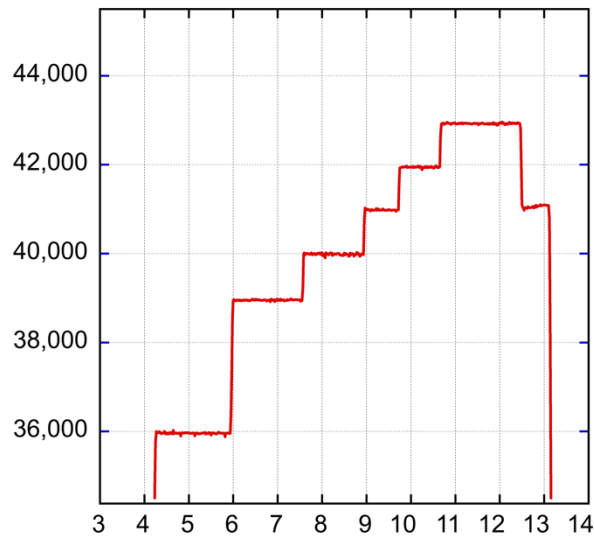


Flight notes:

Early return to Palmdale base due to predicted poor weather at scheduled landing time.

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	07h41m14.83s	-09d33m04.1s	4:26	30	
5	07_0136	Koenig	G239.68-0.80	07h40m10.20s	-24d00m33.1s	4:56	32	
6	07_0068	Kabanovic	Orion Complex	05h35m19.86s	-05d07m58.8s	5:29	65	
7	06_0104	Yang	L1551_IRS5	04h31m34.08s	18d08m04.9s	6:35	57	Turbulence exacerbated guiding issues; 15min lost
8	07_0136	Koenig	WB89_789	06h17m23.61s	14d54m40.0s	7:33	31	
9	07_0161	Gusdorf	Cep E	23h03m12.78s	61d42m25.8s	8:06	108	
10	07_0077	Tielens	CygnusX	20h38m39.46s	42d20m44.5s	9:55	62	
11	07_0148	Jacob	W49N	19h10m13.20s	09d06m11.9s	10:58	57	
12	07_0077	Tielens	M16	18h18m23.99s	-13d41m26.4s	11:56	75	Leg terminated early to return to Palmdale base before poor weather.

Flown altitude (ft.) vs. time (UTC hrs.)



Planned target elevation (deg.) vs. time (UTC hrs.)

