

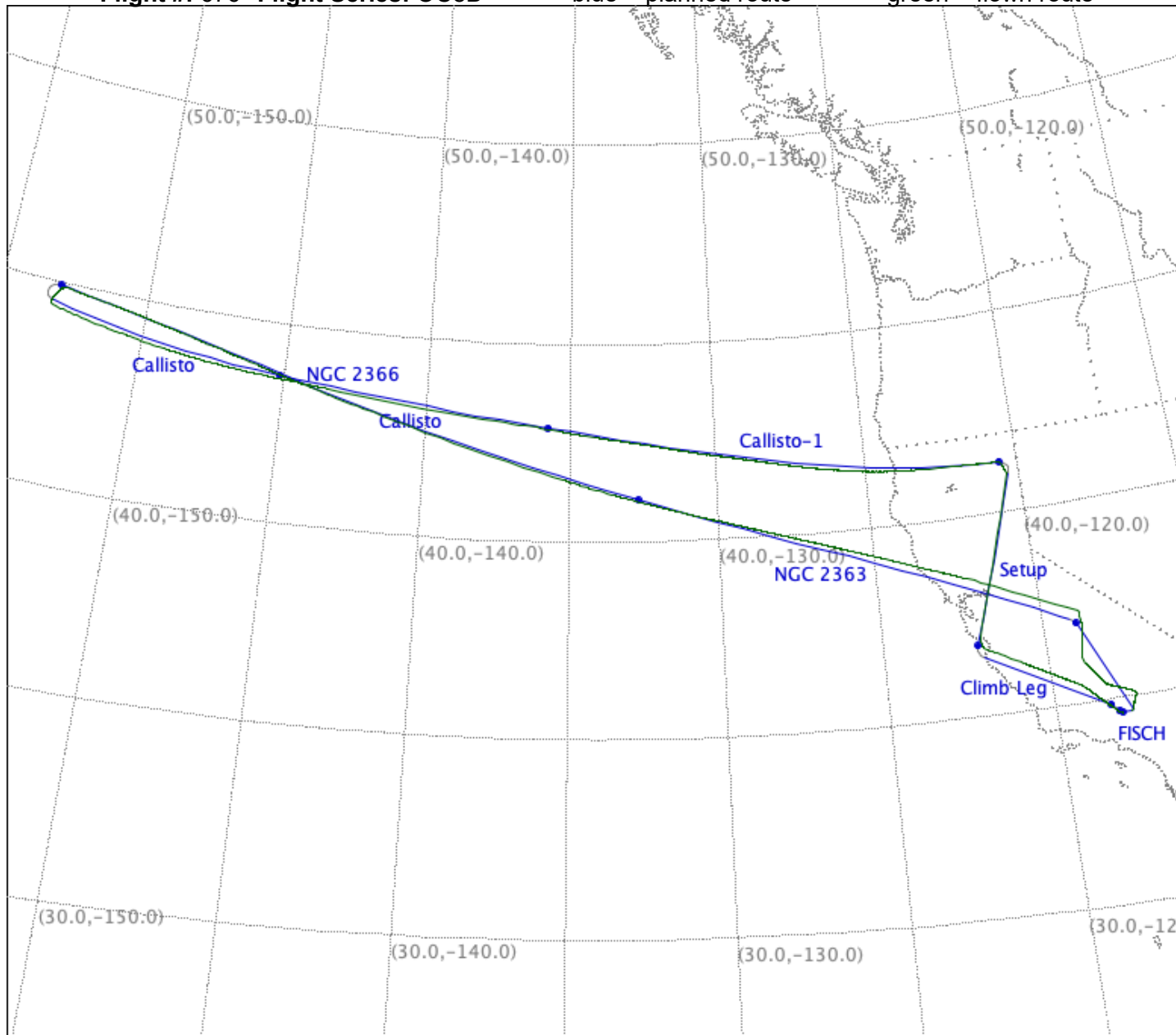
**MISSION ID: 2020-08-18\_FI\_F676**

**Date: 2020-08-18 UT Instrument: FIFI-LS**

**Flight #: 676 Flight Series: OC8B**

blue = planned route

green = flown route

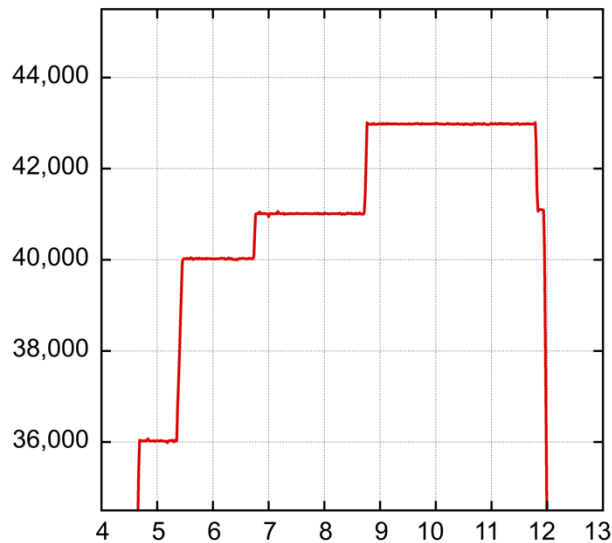


**Flight notes:  
No irregularities.**

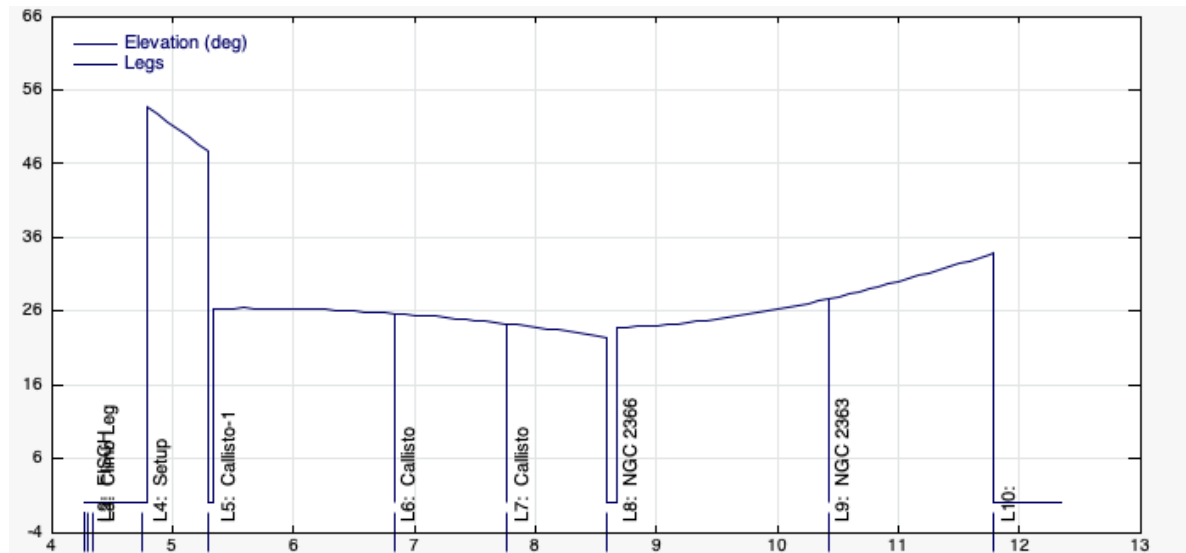
Flight 676 Mission ID 2020-08-18\_FI\_F676  
 Palmdale to Palmdale Take off date UTC: 18-AUG-2020  
 Departure UTC: 04:16 Arrival UTC: 12:20

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	15h24m29.43s	37d22m37.8s	4:47	30	
5	90_0032	Calibration	Callisto	19h18m28.14s	-22d36m48.1s	5:20	89.73	
6	90_0090	Calibration	Callisto	19h18m27.85s	-22d36m48.8s	6:50	55.8	
7	90_0033	Calibration	Callisto	19h18m27.56s	-22d36m49.5s	7:46	49.67	
8	08_0243	Diaz-Santos	NGC 2366	07h28m44.32s	69d11m22.9s	8:40	105	
9	08_0071	Jones	NGC 2363	07h28m42.70s	69d11m23.0s	10:25	82.2	

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



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



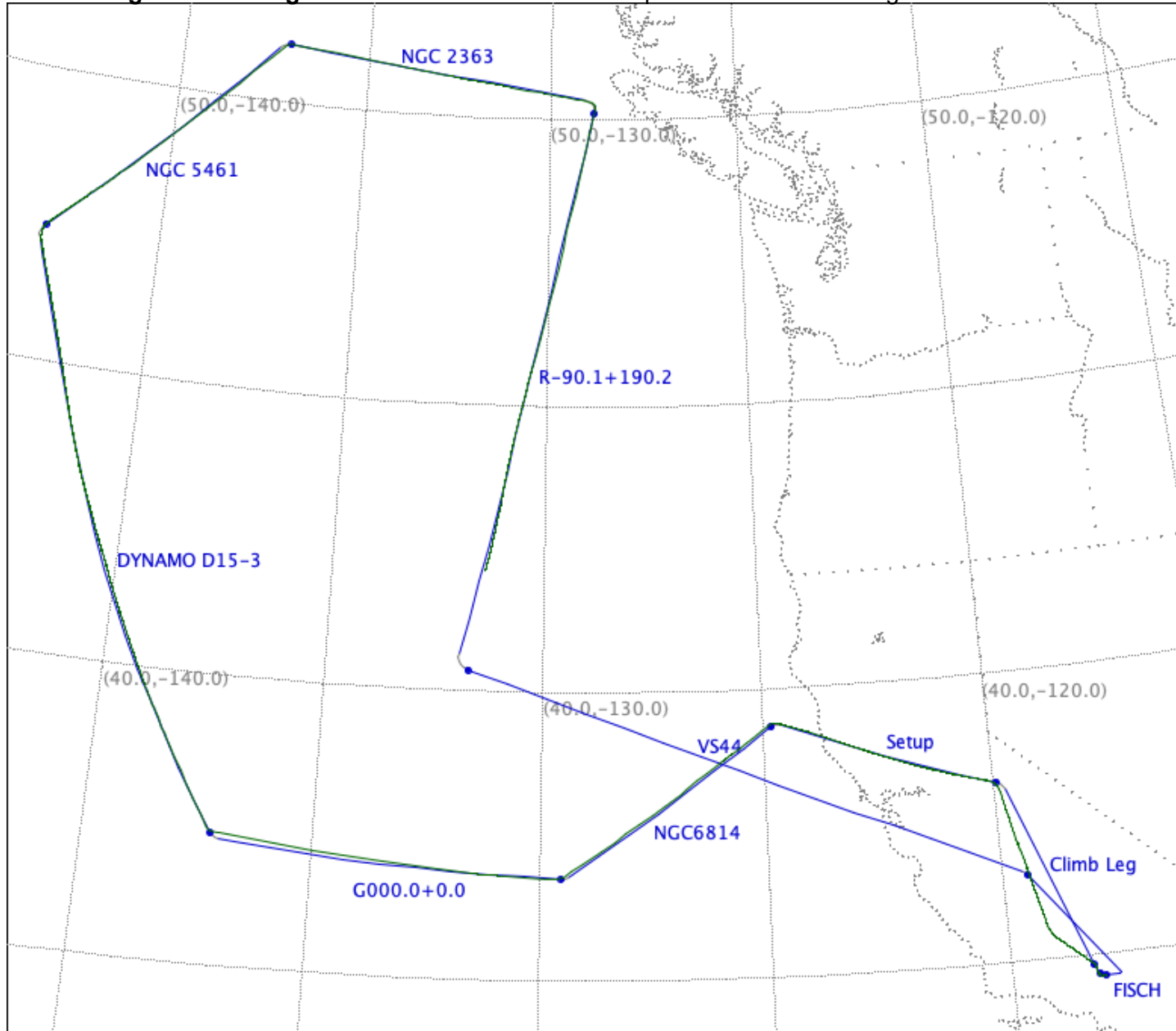
**MISSION ID: 2020-08-20\_FI\_F677**

**Date: 2020-08-20 UT Instrument: FIFI-LS**

**Flight #: 677 Flight Series: OC8B**

blue = planned route

green = flown route



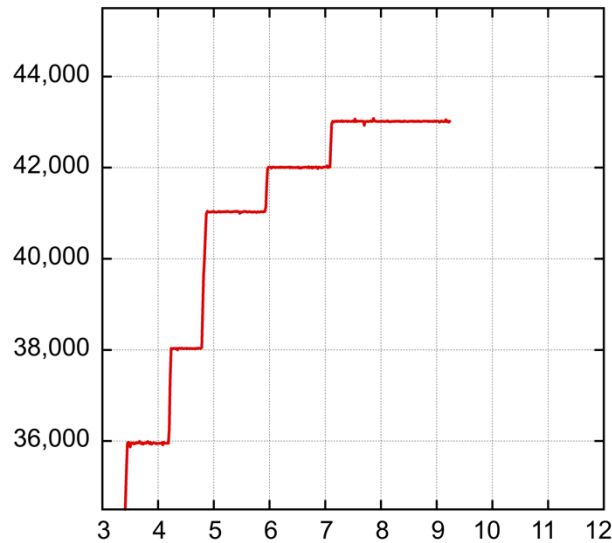
## Flight notes:

**Telescope error led to early return to Palmdale base after leg 10.**

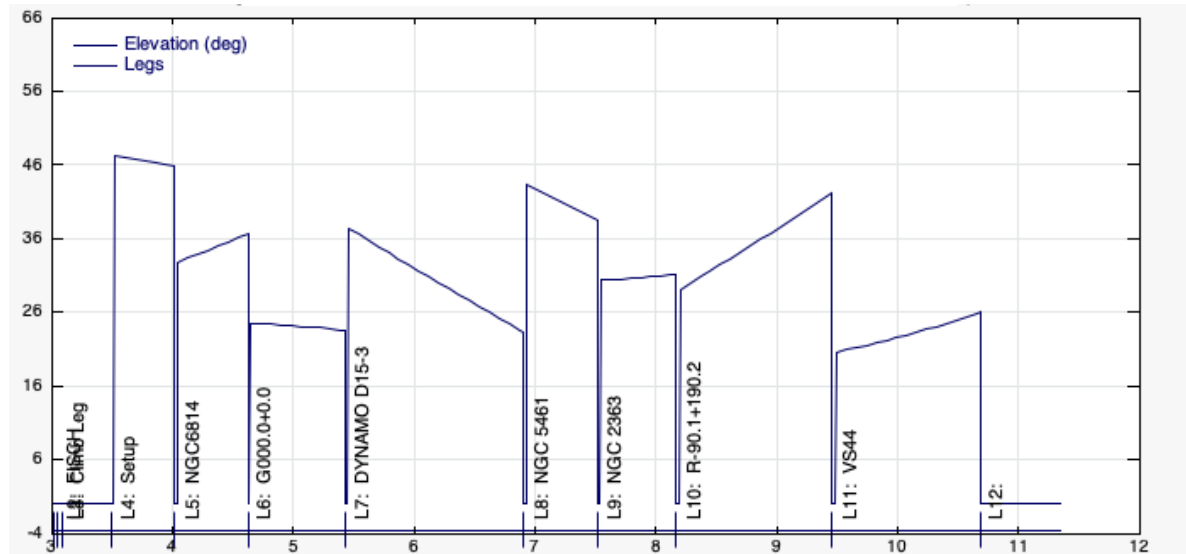
Flight 677 Mission ID 2020-08-20\_FI\_F677  
 Palmdale to Palmdale Take off date UTC: 20-AUG-2020 Departure UTC: 03:02 Arrival UTC: 11:12

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	17h01m03.60s	-04d13m21.5s	3:31	30	
5	08_0069	Smith	NGC6814	19h42m40.64s	-10d19m24.6s	4:02	35	Low altitude (38k ft) and high water vapor.
6	08_0023	Pineda	G000.0+0.0	17h45m37.22s	-28d56m10.2s	4:38	47.33	
7	08_0238	Lenkic	DYNAMO D15-3	15h34m35.40s	-00d28m44.6s	5:27	87	
8	08_0071	Jones	NGC 5461	14h03m41.30s	54d19m05.0s	6:56	35	
9	08_0071	Jones	NGC 2363	07h28m42.70s	69d11m23.0s	7:32	37	
10	08_0183	Smith	R-90.1+190.2	01h36m44.16s	15d47m31.7s	8:12	75	
11	08_0071	Jones	VS44	07h37m06.80s	65d36m40.0s	9:29	72	Unrecoverable telescope error; returned to Palmdale base; no data collected

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



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



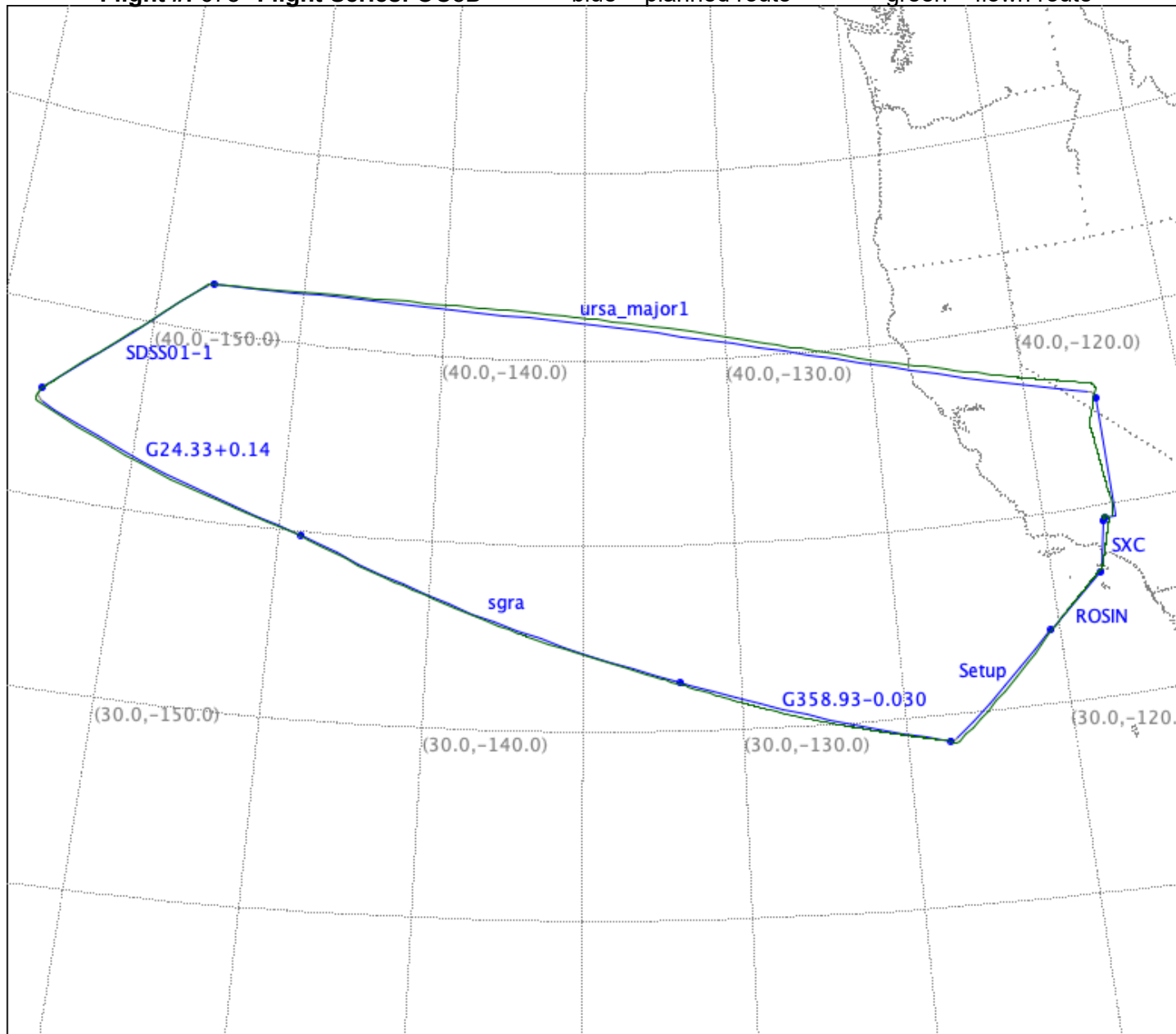
**MISSION ID: 2020-08-28\_FI\_F678**

**Date: 2020-08-28 UT Instrument: FIFI-LS**

**Flight #: 678 Flight Series: OC8B**

blue = planned route

green = flown route

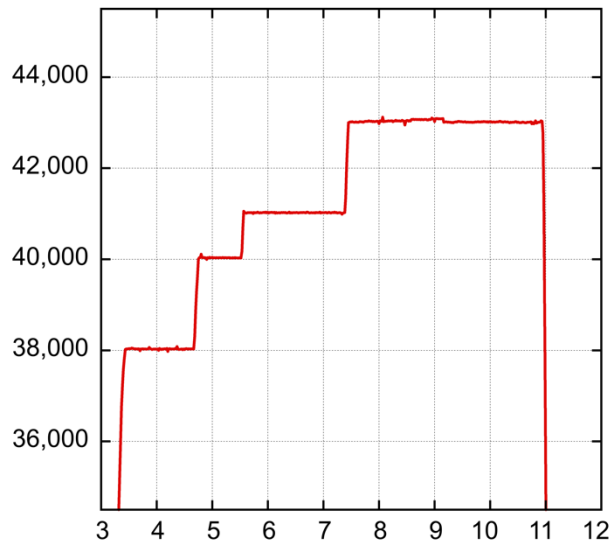


**Flight notes:  
No irregularities.**

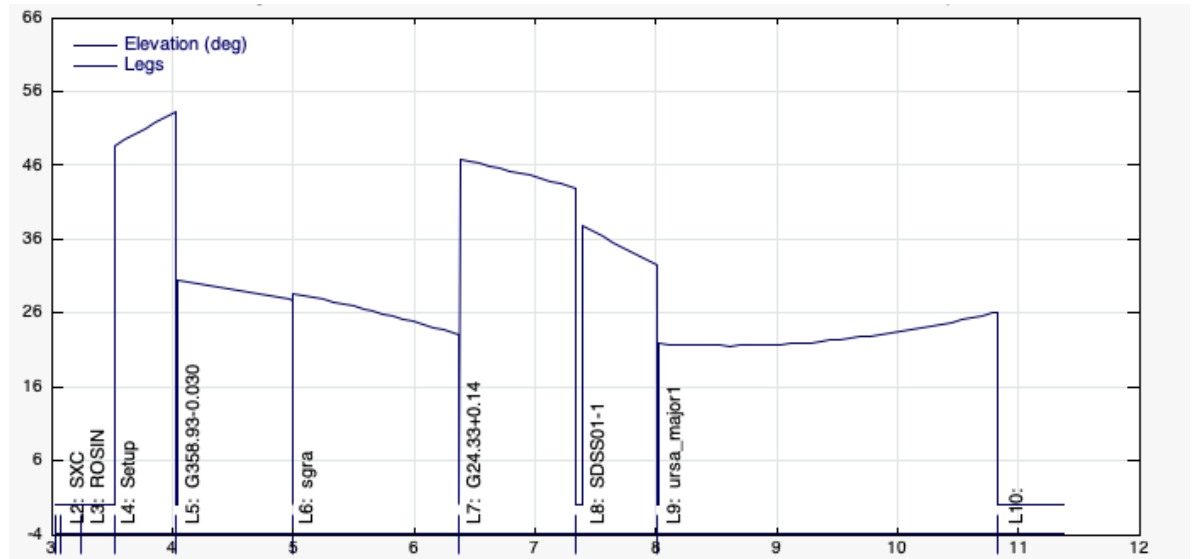
Flight 678 Mission ID 2020-08-28\_FI\_F678  
 Palmdale to Palmdale Take off date UTC: 28-AUG-2020  
 Departure UTC: 02:56 Arrival UTC: 11:28

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	19h52m28.37s	01d00m20.4s	3:31	30	
5	08_0163	Stecklum	G358.93-0.030	17h43m10.02s	-29d51m45.8s	4:03	56.9	
6	70_0808	GTO	sgra	17h45m55.44s	-28d52m26.4s	4:59	82.8	
7	08_0163	Stecklum	G24.33+0.14	18h35m08.14s	-07d35m04.1s	6:22	58	
8	08_0226	Petric	SDSS01	14h40m38.09s	53d30m15.0s	7:24	37	
9	08_0237	Panopoulou	ursa_major1	09h25m14.27s	70d33m40.3s	8:02	168	

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



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



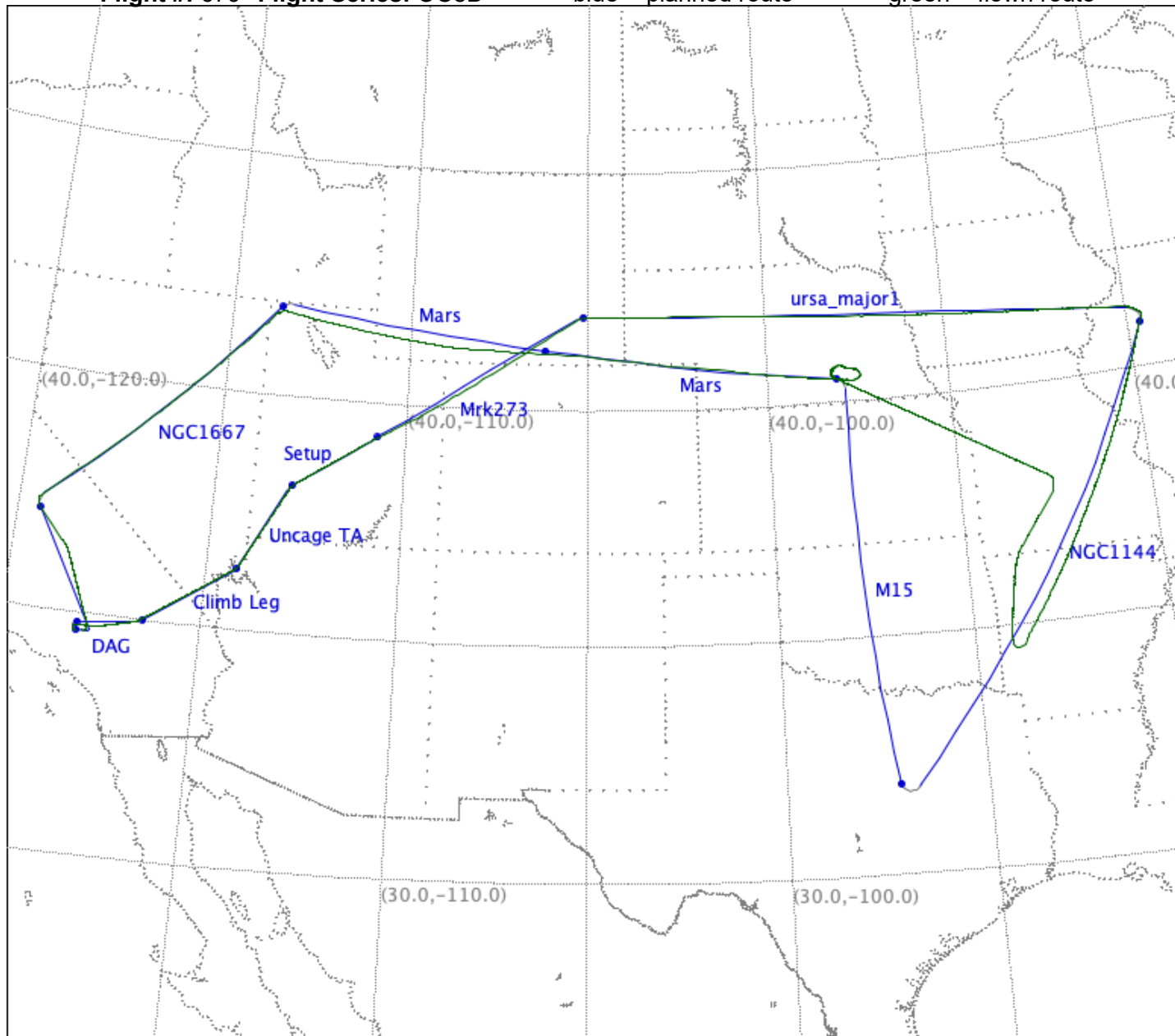
**MISSION ID: 2020-09-01\_FI\_F679**

**Date: 2020-09-01 UT Instrument: FIFI-LS**

**Flight #: 679 Flight Series: OC8B**

blue = planned route

green = flown route



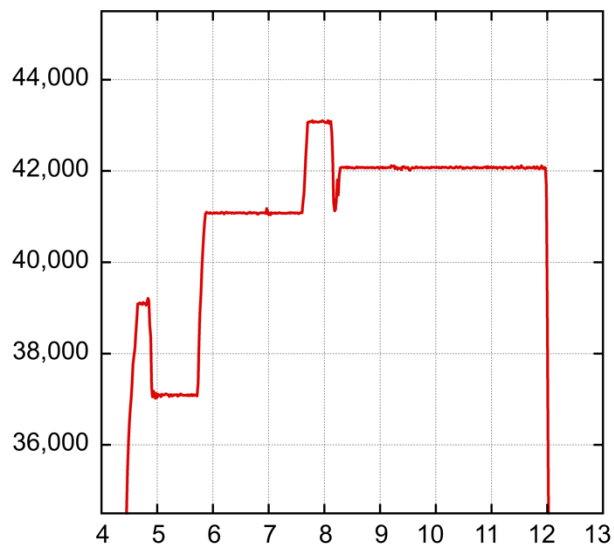
## Flight notes:

**Storms cells over TX, OK led to aircraft reroutes and loss of data collection time.**

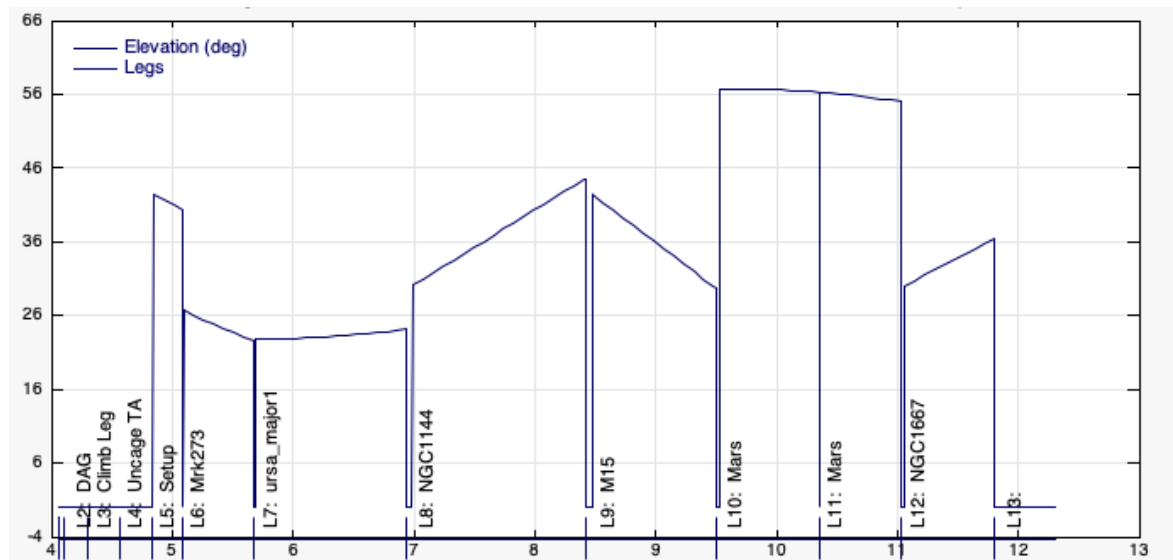
Flight 679 Mission ID 2020-09-01\_FI\_F679  
 Palmdale to Palmdale Take off date UTC: 01-SEP-2020 Departure UTC: 04:02 Arrival UTC: 12:24

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	15h24m55.77s	58d57m57.8s	4:34	15	
6	08_0095	Ma	Mrk273	13h44m42.11s	55d53m12.7s	4:50	35	Low altitude (37k ft), turbulence led to loss of 50% of leg
7	08_0237	Panopoulou	ursa_major1	09h25m14.27s	70d33m40.3s	5:05	75	
8	08_0069	Smith	NGC1144	02h55m12.20s	-00d11m00.8s	5:41	85.7	High clouds/water vapor at beginning of leg as well as guiding issues. Leg ended prematurely to reroute around storm cells.
9	08_0205	Gregg	M15	21h29m58.33s	12d10m01.2s	6:59	61	Leg lost due to rerouting around storms
10	90_0033	Calibration	Mars	01h47m38.34s	06d32m48.5s	8:28	49.7	
11	90_0033	Calibration	Mars	01h47m39.48s	06d32m54.5s	9:32	40	
12	08_0069	Smith	NGC1667	04h48m37.14s	-06d19m11.9s	10:21	45	

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



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





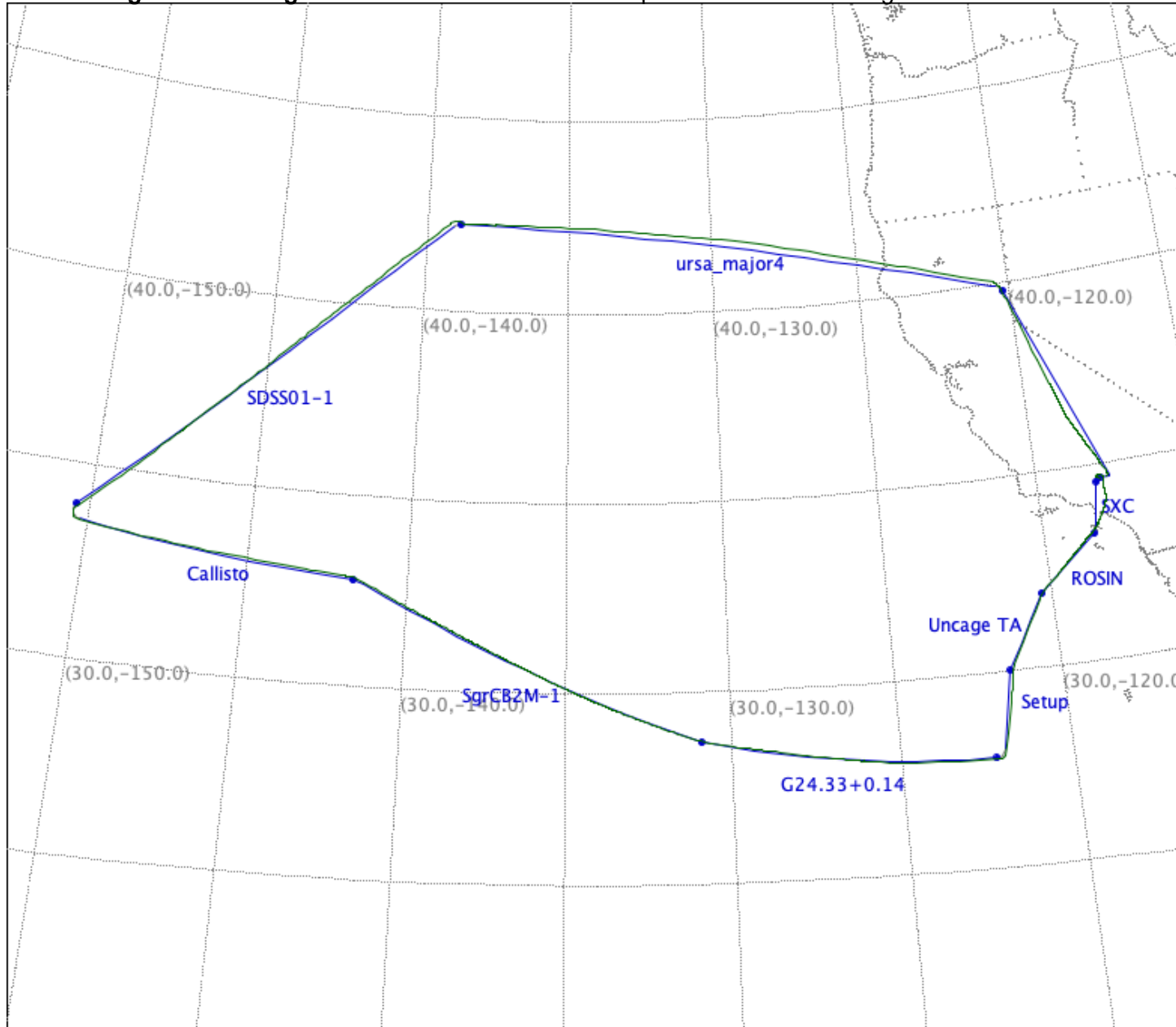
MISSION ID: 2020-09-02\_FI\_F680

Date: 2020-09-02 UT Instrument: FIFI-LS

Flight #: 680 Flight Series: OC8B

blue = planned route

green = flown route

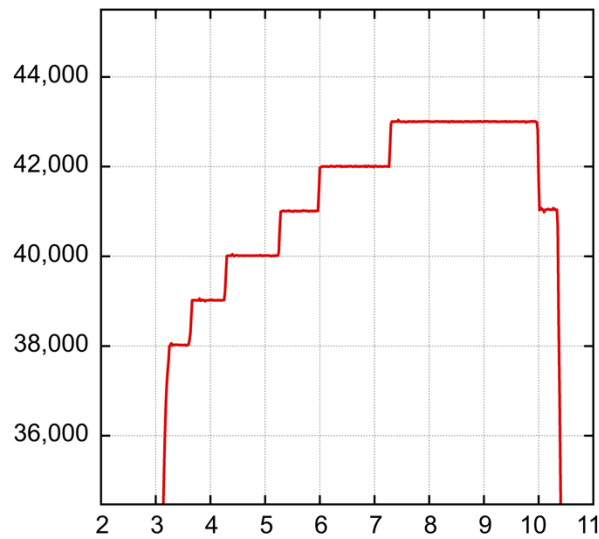


## Flight notes: No irregularities.

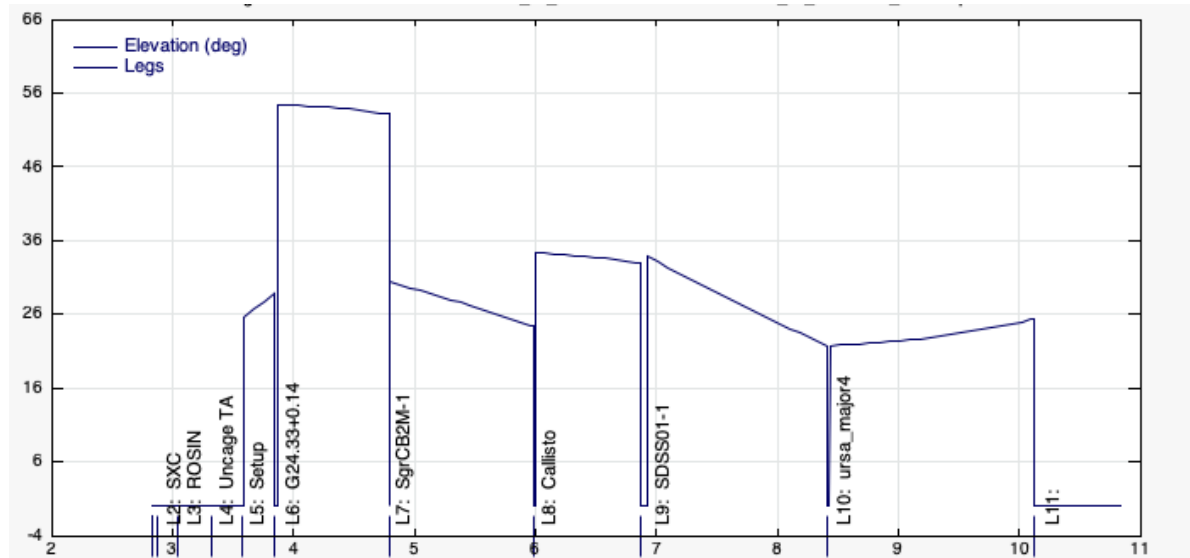
Flight 680 Mission ID 2020-09-02\_FI\_F680  
 Palmdale to Palmdale Take off date UTC: 02-SEP-2020  
 Departure UTC: 02:45 Arrival UTC: 10:53

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	22h27m51.52s	04d41m44.4s	3:18	15	
6	08_0163	Stecklum	G24.33+0.14	18h35m08.14s	-07d35m04.1s	3:33	54.9	
7	70_0808	GTO	SgrCB2M	17h47m03.58s	-28d26m46.0s	3:51	71.5	
8	90_0090	Calibration	Callisto	19h14m35.27s	-22d44m54.4s	4:46	52.8	
9	08_0226	Petric	SDSS01	14h40m38.09s	53d30m15.0s	5:58	89	
10	08_0237	Panopoulou	ursa_major4	09h31m03.92s	69d53m32.3s	6:54	101	

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



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



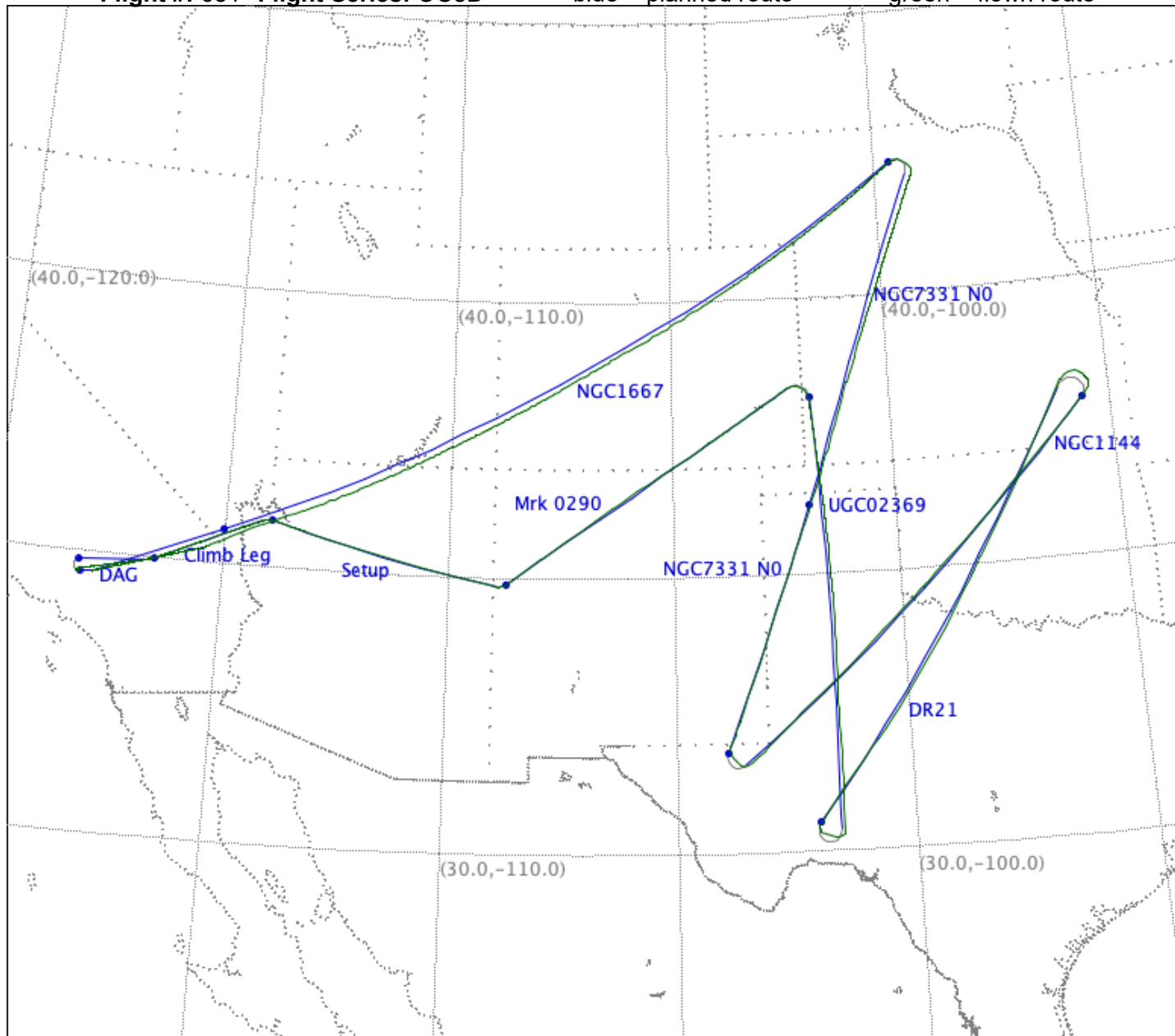
**MISSION ID: 2020-09-03\_FI\_F681**

**Date: 2020-09-03 UT Instrument: FIFI-LS**

**Flight #: 681 Flight Series: OC8B**

blue = planned route

green = flown route

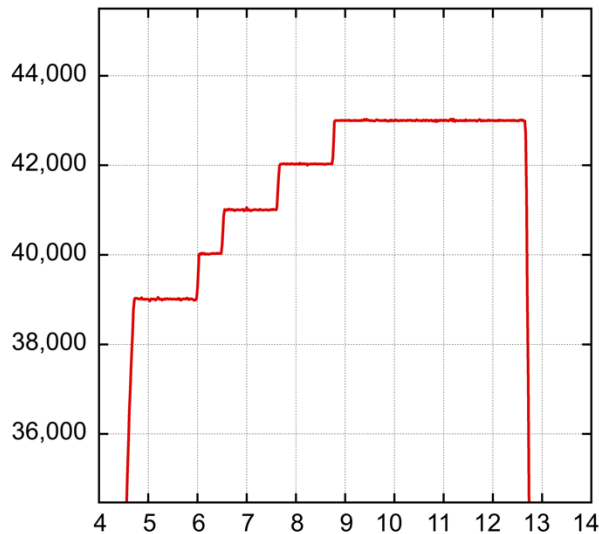


# Flight notes: No irregularities.

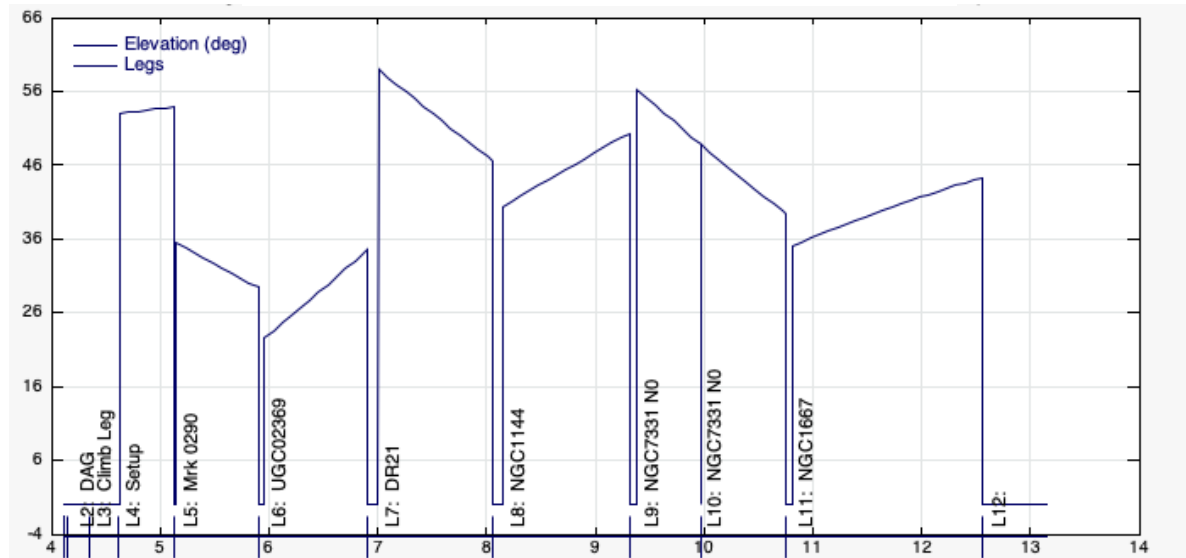
Flight 681 Mission ID 2020-09-03\_FI\_F681  
 Palmdale to Palmdale Take off date UTC: 03-SEP-2020  
 Departure UTC: 04:06 Arrival UTC: 13:05

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	21h28m39.60s	70d33m38.6s	4:38	30	
5	08_0226	Petric	Mrk 0290	15h35m52.36s	57d54m09.2s	5:09	45	High water vapor.
6	08_0069	Smith	UGC02369	02h54m01.79s	14d58m25.0s	5:58	57	High water vapor.
7	75_0046	Discretionary	DR21	20h39m00.84s	42d19m47.7s	7:01	63.33	
8	08_0069	Smith	NGC1144	02h55m12.20s	-00d11m00.8s	8:10	70	20min lost due to problems acquiring and communicating with telescope.
9	75_0045	Discretionary	NGC7331 N0	22h37m06.50s	34d25m05.0s	9:24	35	
10	75_0045	Discretionary	NGC7331 N0	22h37m04.93s	34d24m07.6s	9:59	46.9	
11	08_0069	Smith	NGC1667	04h48m37.14s	-06d19m11.9s	10:50	105	Bright skies during leg led to repeated loss of guiding before an early end to leg

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



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



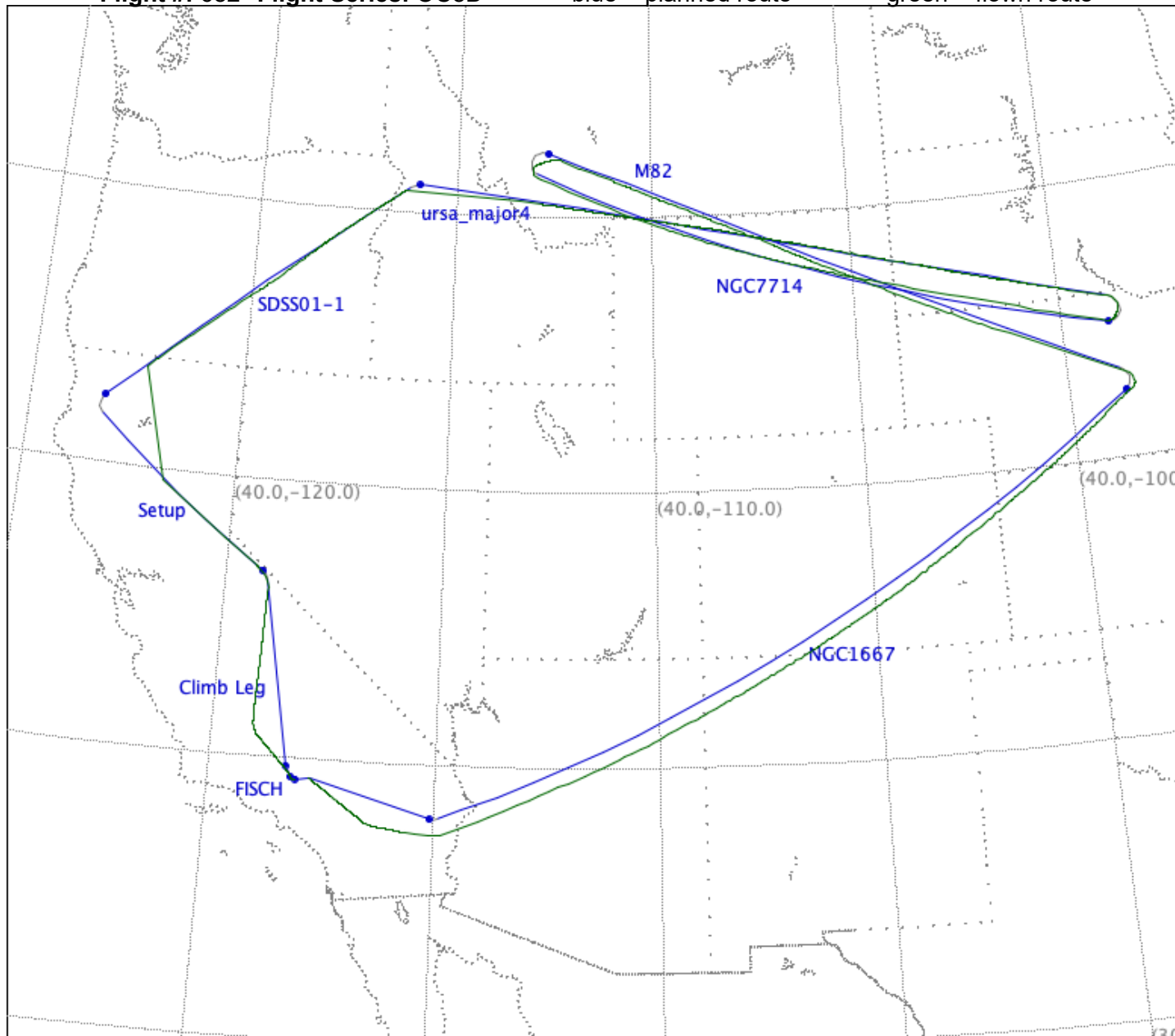
**MISSION ID: 2020-09-04\_FI\_F682**

**Date: 2020-09-04 UT Instrument: FIFI-LS**

**Flight #: 682 Flight Series: OC8B**

blue = planned route

green = flown route

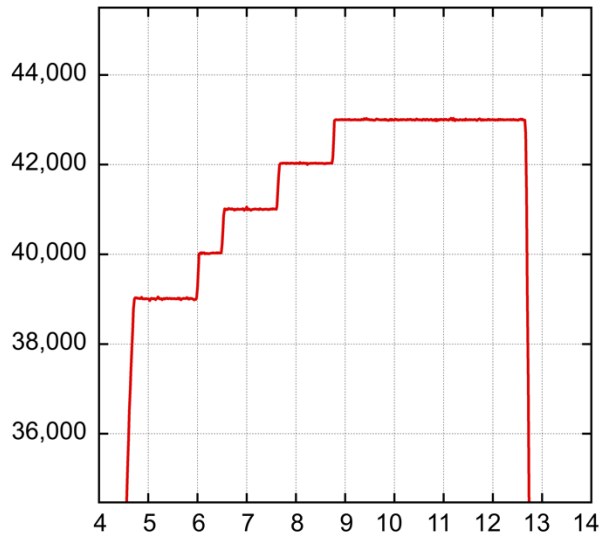


## Flight notes: No irregularities.

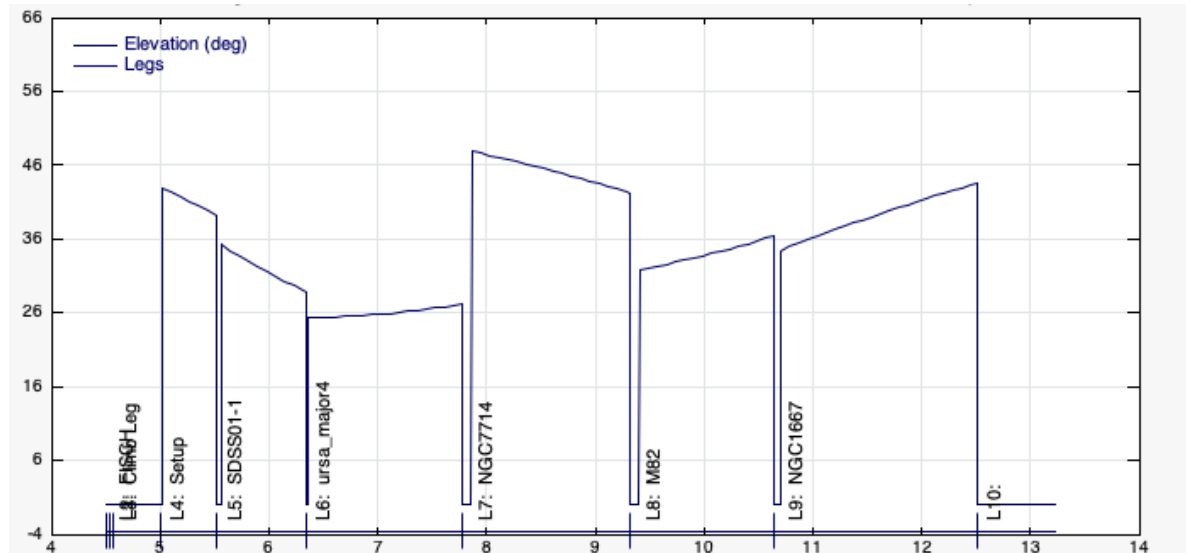
Flight 682 Mission ID 2020-09-04\_FI\_F682  
 Palmdale to Palmdale Take off date UTC: 04-SEP-2020  
 Departure UTC: 04:28 Arrival UTC: 13:00

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	18h21m18.60s	-02d53m55.8s	5:01	30	
5	08 0226	Petric	SDSS01	14h40m38.09s	53d30m15.0s	5:33	46.87	Telescope acquisition and guiding issues; no data taken
6	08 0237	Panopoulou	ursa_major4	09h31m03.92s	69d53m32.3s	6:22	85	30min lost at beginning of leg solving telescope guiding issues.
7	08 0069	Smith	NGC7714	23h36m14.10s	02d09m18.6s	7:51	87.7	
8	07 0217	Latzko	M82	09h55m52.43s	69d40m46.9s	9:24	74.67	
9	08 0069	Smith	NGC1667	04h48m37.14s	-06d19m11.9s	10:42	108.4	

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



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



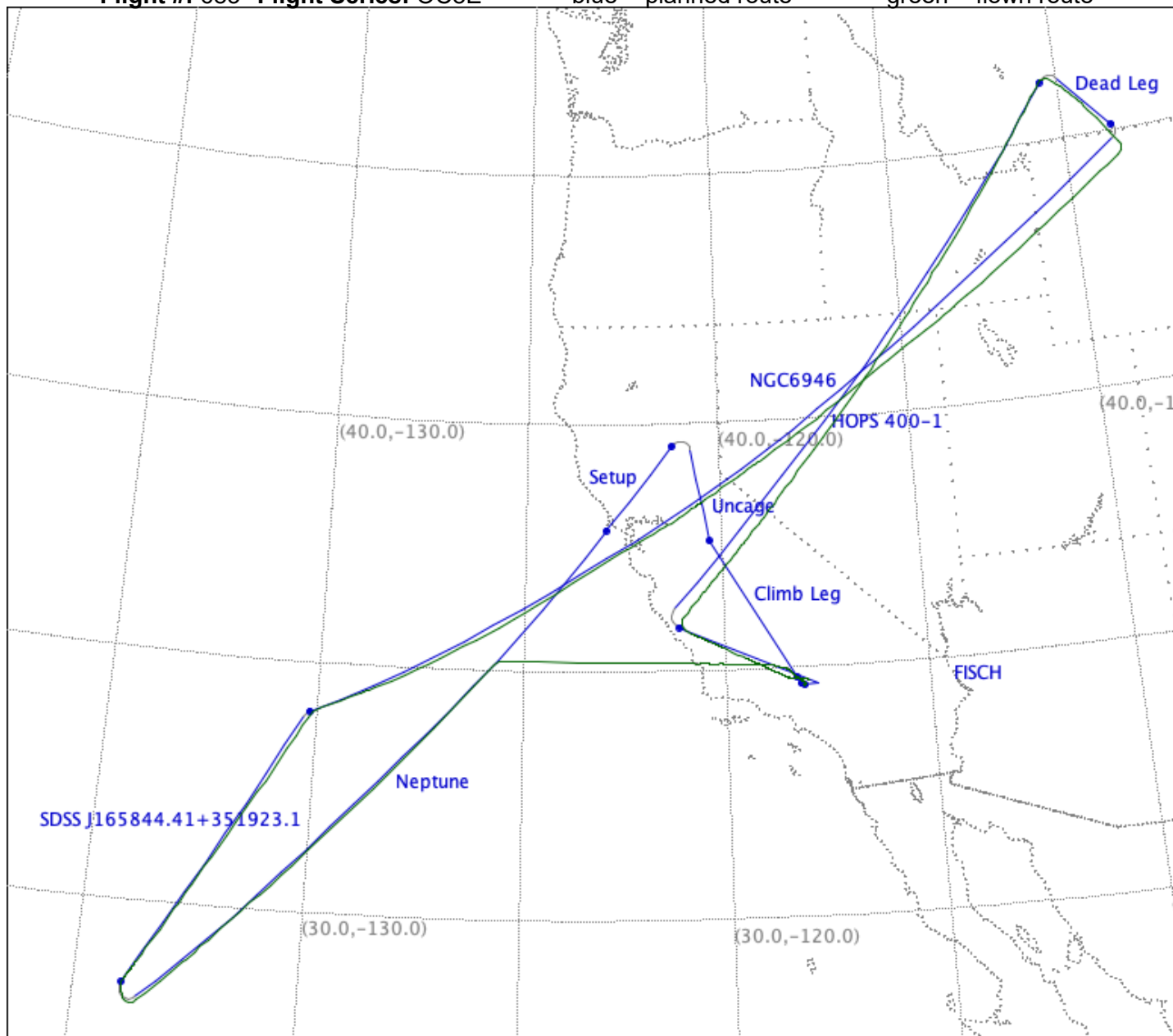
# MISSION ID: 2020-09-09\_HA\_F683

Date: 2020-09-09 UT Instrument: HAWC+

Flight #: 683 Flight Series: OC8E

blue = planned route

green = flown route

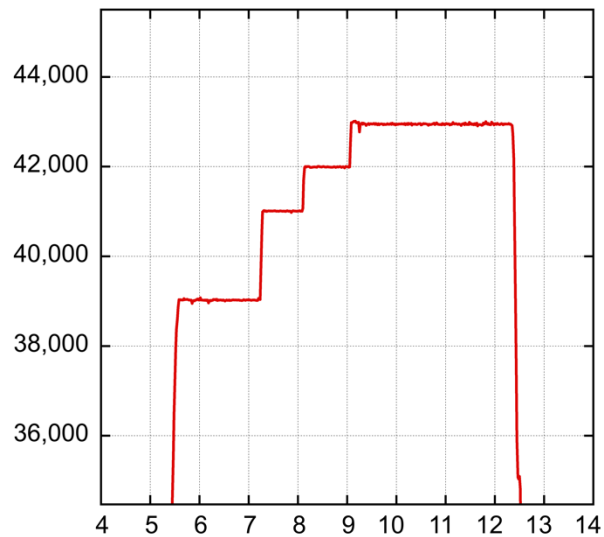


## Flight notes: Late departure but no loss of science.

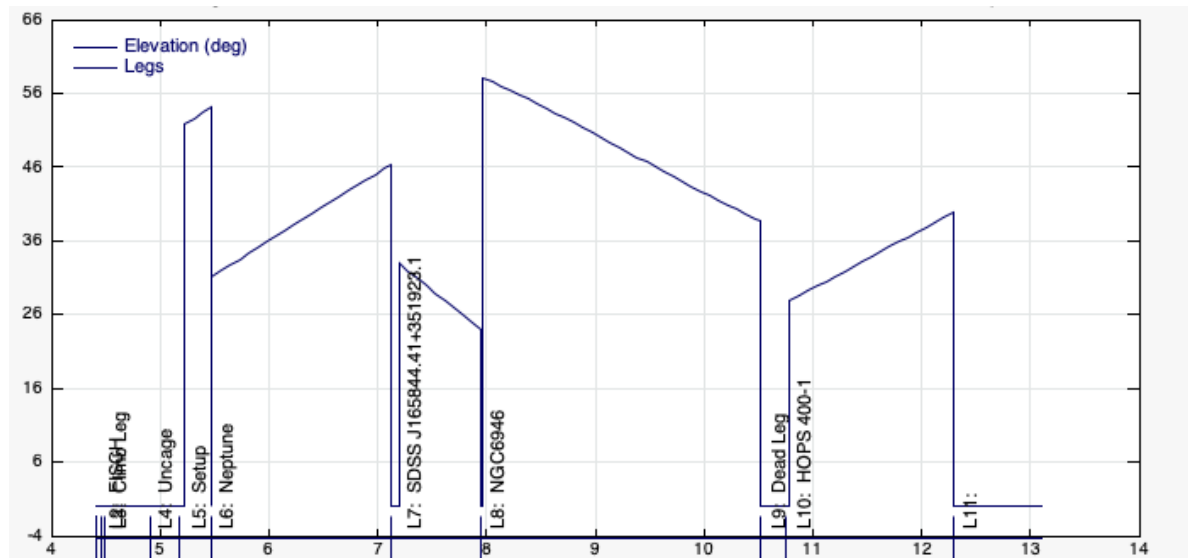
Flight 683 Mission ID 2020-09-09\_HA\_F683  
 Palmdale to Palmdale Take off date UTC: 09-SEP-2020  
 Departure UTC: 05:01 Arrival UTC: 12:50

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	22h21m31.08s	12d12m18.7s	4:55	15	
6	90_0083	Calibration	Neptune	23h22m31.01s	-05d14m58.7s	5:13	99	
7	08_0254	Eufrasio	SDSS J165844.41+351923.1	16h58m44.43s	35d19m23.2s	5:28	45	
8	08_0012	Lopez-Rodriguez	NGC6946	20h34m52.33s	60d09m13.2s	7:12	153	Pointing issue: Source seemed to drift in DEC during observation.
10	08_0211	Karnath	HOPS 400	05h42m45.20s	-01d16m14.2s	10:47	90	Pointing issue: Source seemed to drift during observation.

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



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





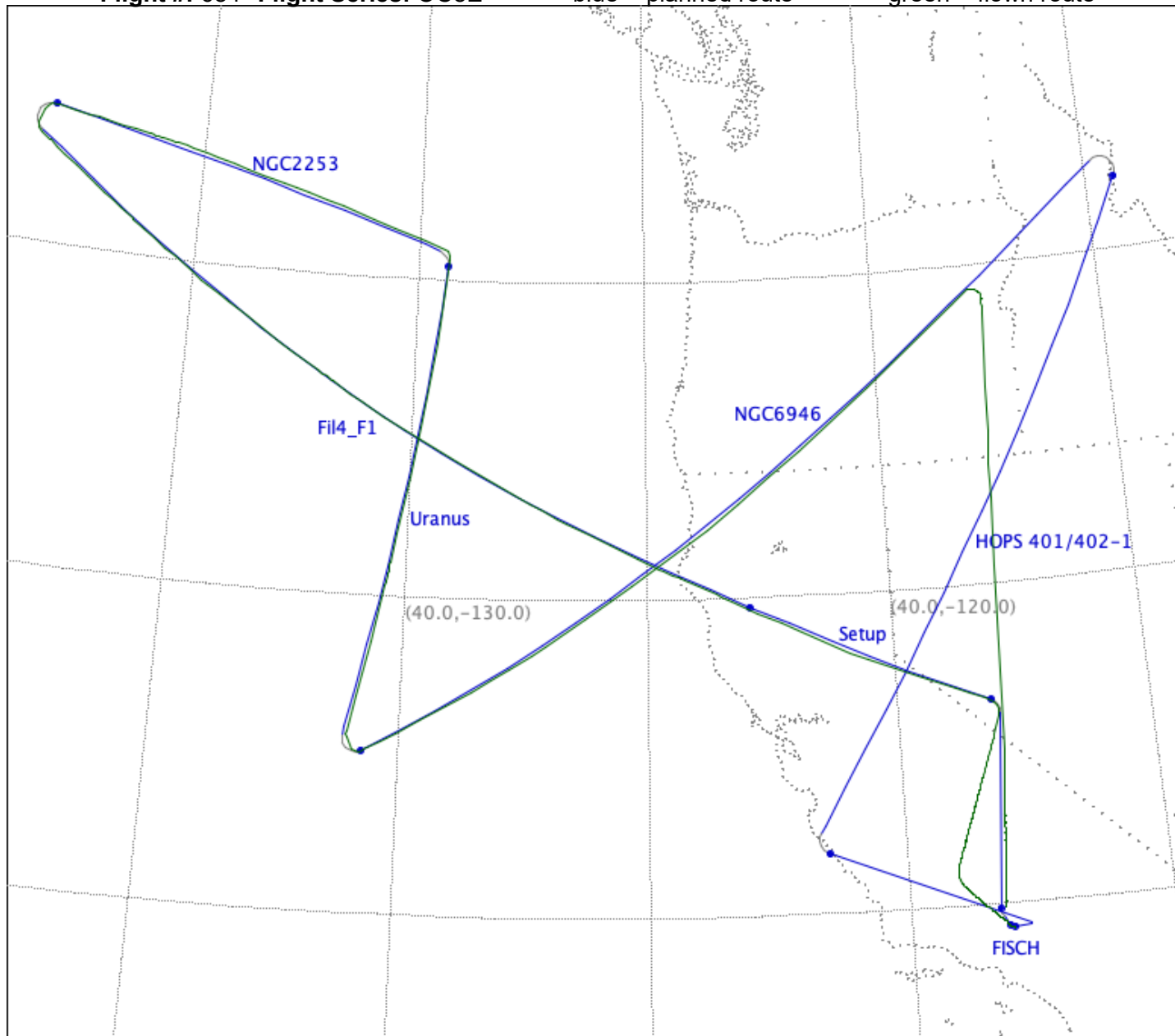
**MISSION ID: 2020-09-10\_HA\_F684**

**Date: 2020-09-10 UT Instrument: HAWC+**

**Flight #: 684 Flight Series: OC8E**

**blue = planned route**

**green = flown route**



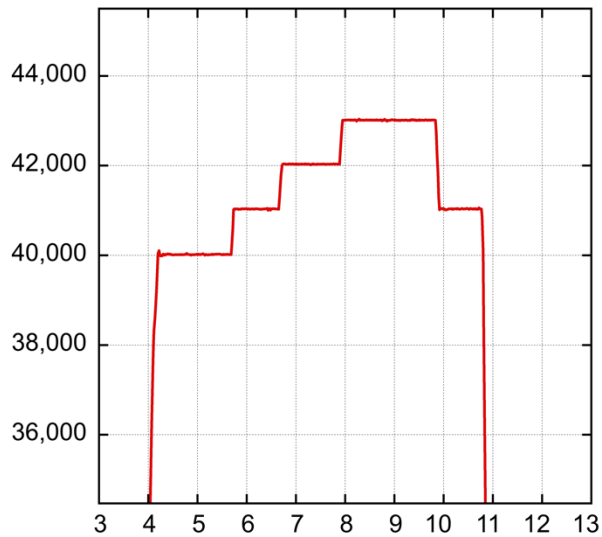
## Flight notes:

**Failure to command telescope chopping secondary led to early return to Palmdale base during leg 8.**

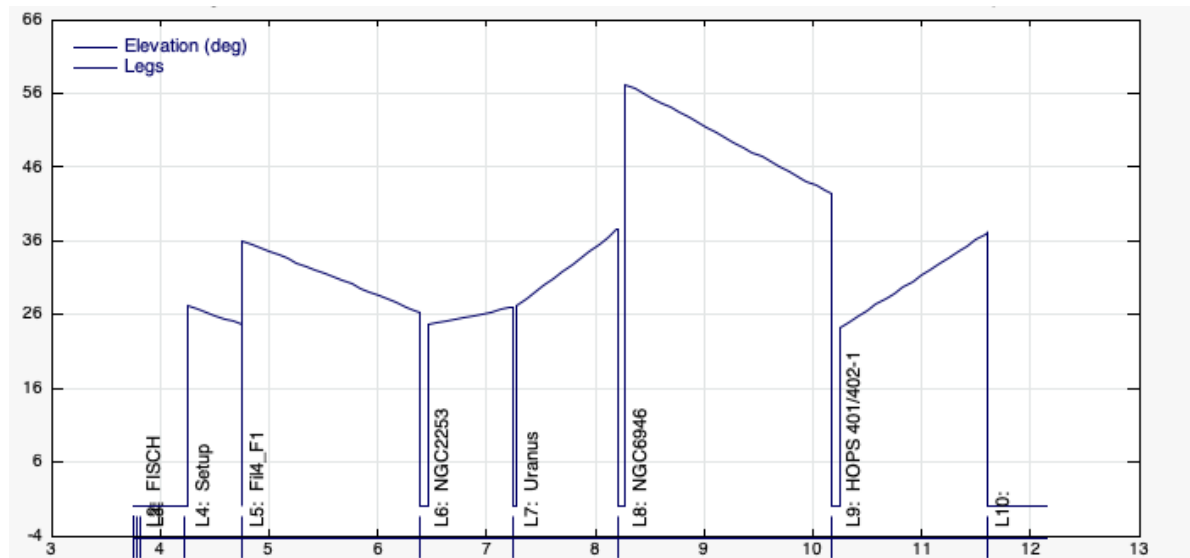
Flight 684 Mission ID 2020-09-10\_HA\_F684  
 Palmdale to Palmdale Take off date UTC: 10-SEP-2020  
 Departure UTC: 03:41 Arrival UTC: 11:14

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	18h13m45.81s	-21d03m31.8s	4:15	30	
5	08_0186	Stephens	Fil4	18h30m20.24s	-10d27m59.2s	4:45	98	
6	75_0041	Discretionary	NGC2253	06h43m41.84s	65d12m22.6s	6:28	47	Pointing issue: Source seemed to drift during observation.
7	90_0083	Calibration	Uranus	02h31m30.61s	14d24m36.5s	7:17	56	Chopper not working, no chop-nod calibrations taken.
8	08_0012	Lopez-Rodriguez	NGC6946	20h34m52.33s	60d09m13.2s	8:16	114	Chopper not working and cannot be resolved; early return to Palmdale base
9	08_0211	Karnath	HOPS 401/402	05h46m12.70s	-00d08m45.0s	10:14	81	Leg not flown; return to Palmdale base

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



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



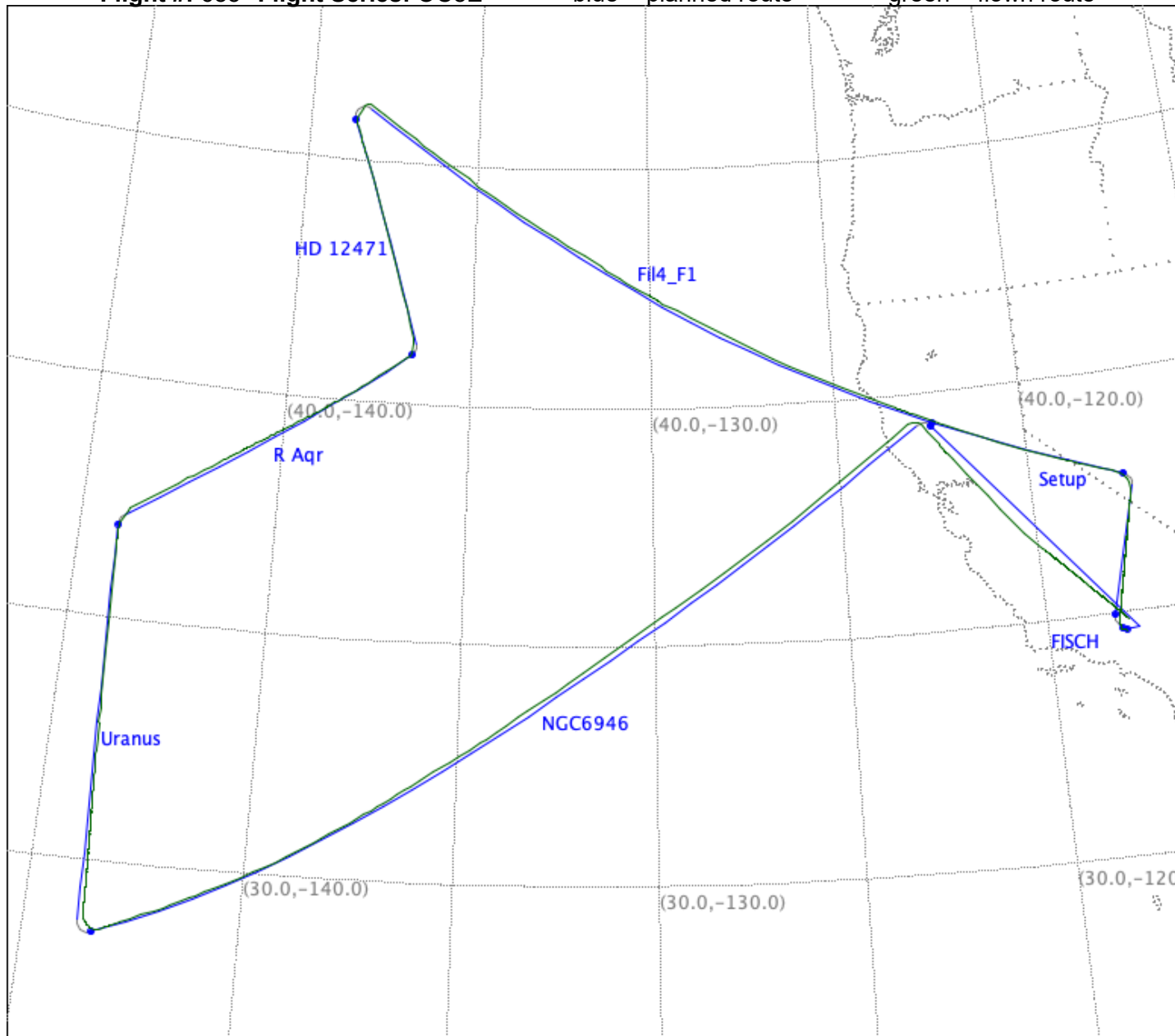
**MISSION ID: 2020-09-11\_HA\_F685**

**Date: 2020-09-11 UT Instrument: HAWC+**

**Flight #: 685 Flight Series: OC8E**

blue = planned route

green = flown route

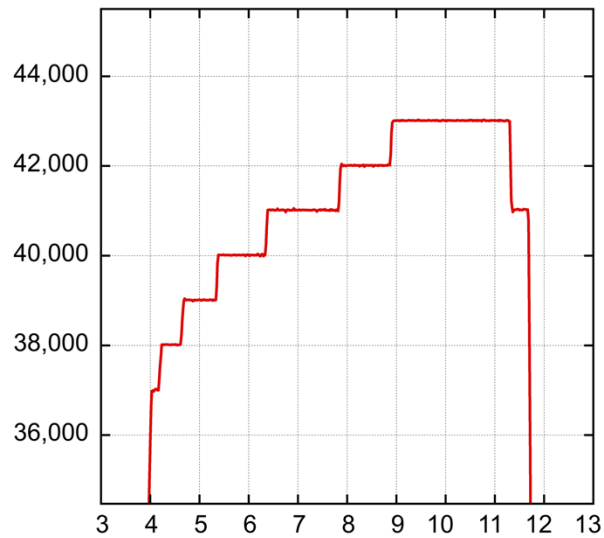


## Flight notes: No irregularities.

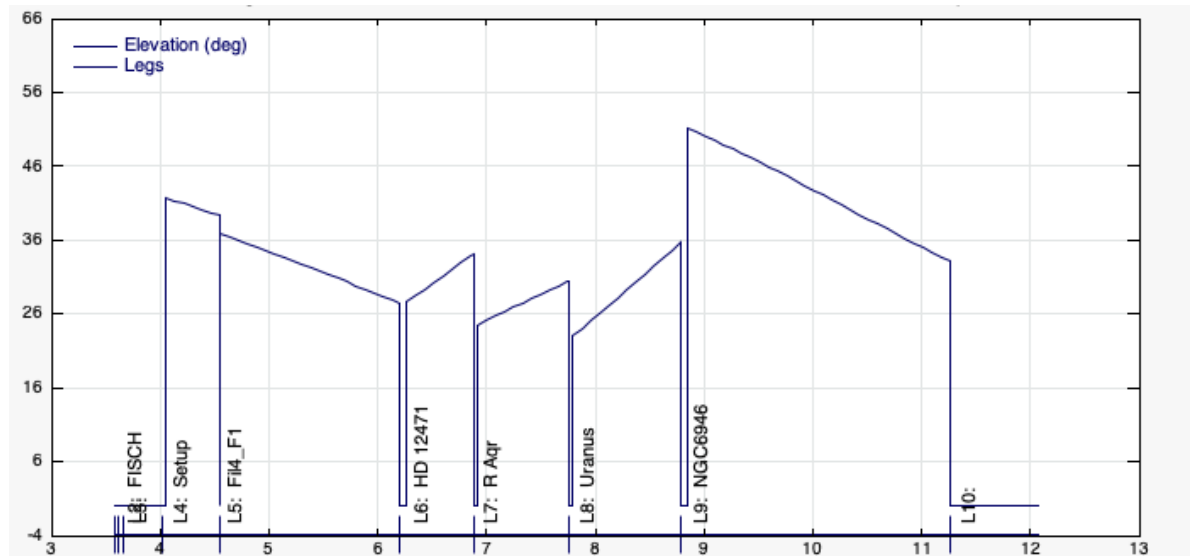
Flight 685 Mission ID 2020-09-11\_HA\_F685  
 Palmdale to Palmdale Take off date UTC: 11-SEP-2020  
 Departure UTC: 03:35 Arrival UTC: 12:08

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	18h35m12.43s	-08d14m38.7s	4:03	30	
5	08_0186	Stephens	Fil4	18h30m20.24s	-10d27m59.2s	4:33	99	
6	08_0201	Ballering	HD 12471	02h02m57.96s	33d17m02.9s	6:16	37	
7	08_0122	Omelian	R Aqr	23h43m49.46s	-15d17m04.1s	6:55	51	
8	90_0083	Calibration	Uranus	02h31m25.74s	14d24m12.3s	7:47	60	20min lost due to issues with cavity door
9	08_0012	Lopez-Rodriguez	NGC6946	20h34m52.33s	60d09m13.2s	8:50	145	

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



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



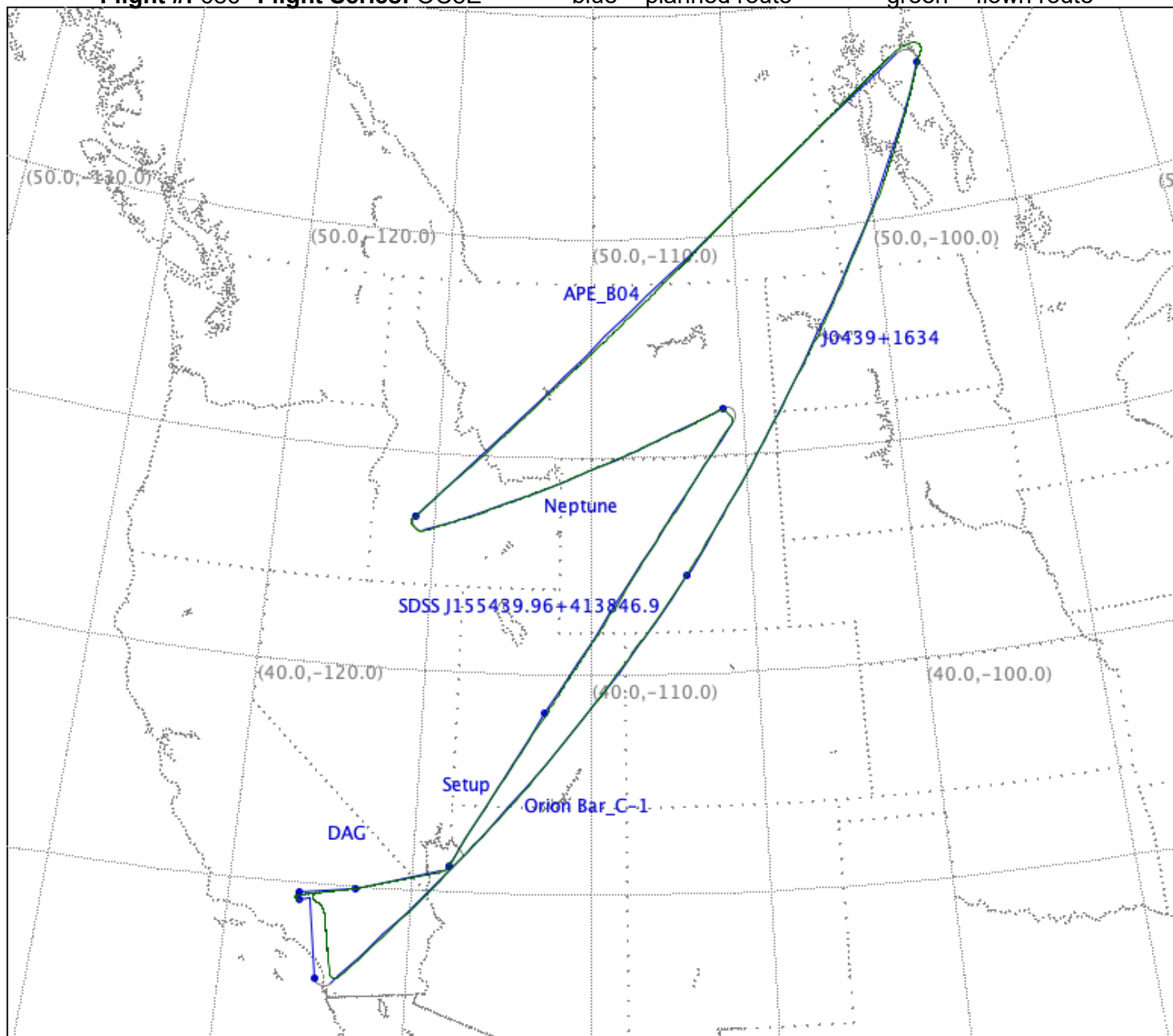
**MISSION ID: 2020-09-12\_HA\_F686**

**Date: 2020-09-12 UT Instrument: HAWC+**

**Flight #: 686 Flight Series: OC8E**

blue = planned route

green = flown route

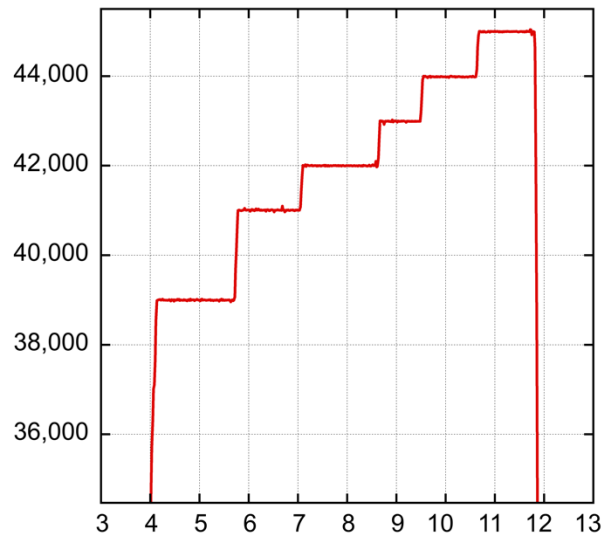


## Flight notes: No irregularities.

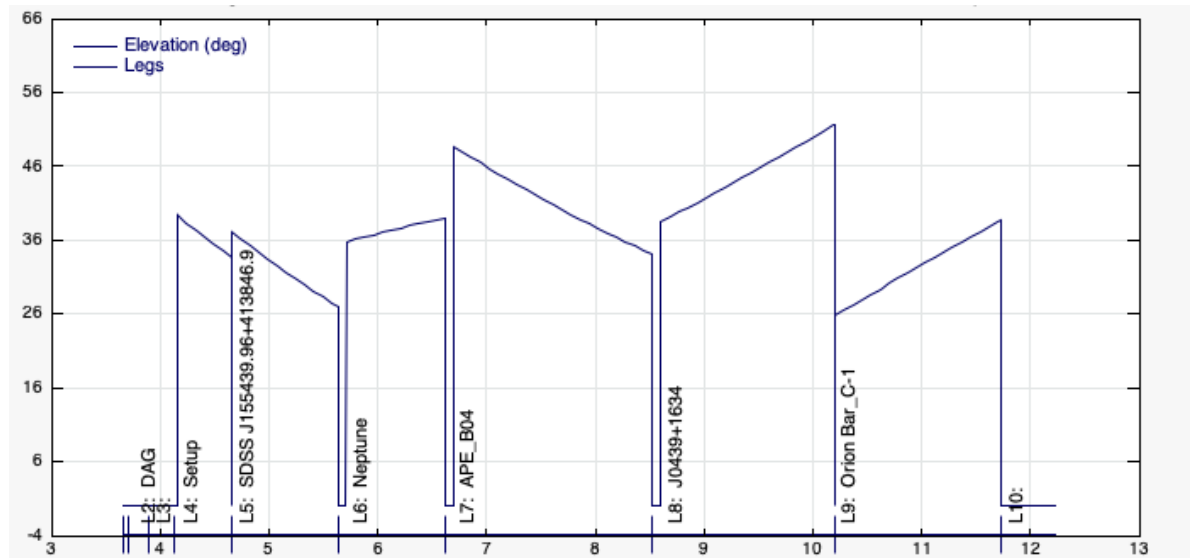
Flight 686 Mission ID 2020-09-12\_HA\_F686  
 Palmdale to Palmdale Take off date UTC: 12-SEP-2020  
 Departure UTC: 03:39 Arrival UTC: 12:11

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	15h37m49.60s	40d21m12.4s	4:09	30	
5	08_0254	Eufrazio	SDSS J155439.96+413846.9	15h54m39.96s	41d38m46.9s	4:39	59	
6	90_0083	Calibration	Neptune	23h22m12.71s	-05d16m57.2s	5:42	55	
7	08_0053	Yan	APE_B04	18h13m57.10s	54d53m42.6s	6:42	110	
8	08_0179	Yang	J0439+1634	04h39m47.10s	16d34m15.8s	8:36	96	
9	08_0209	Andersson	Orion Bar_C	05h35m24.80s	-05d26m01.0s	10:12	92	

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



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



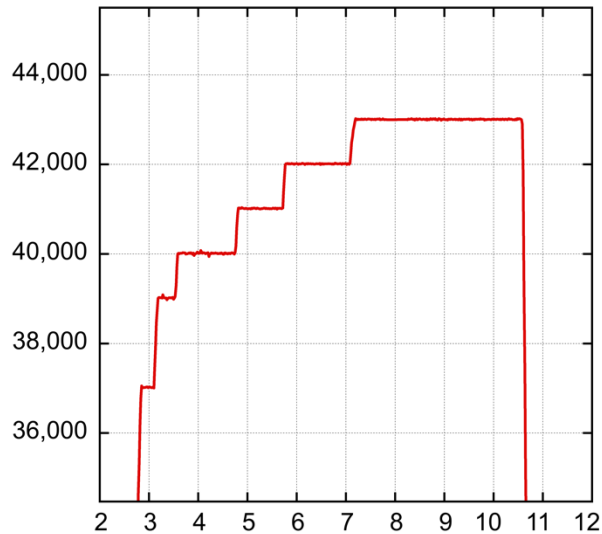


## Flight notes: Some losses due to acquisition and guiding issues.

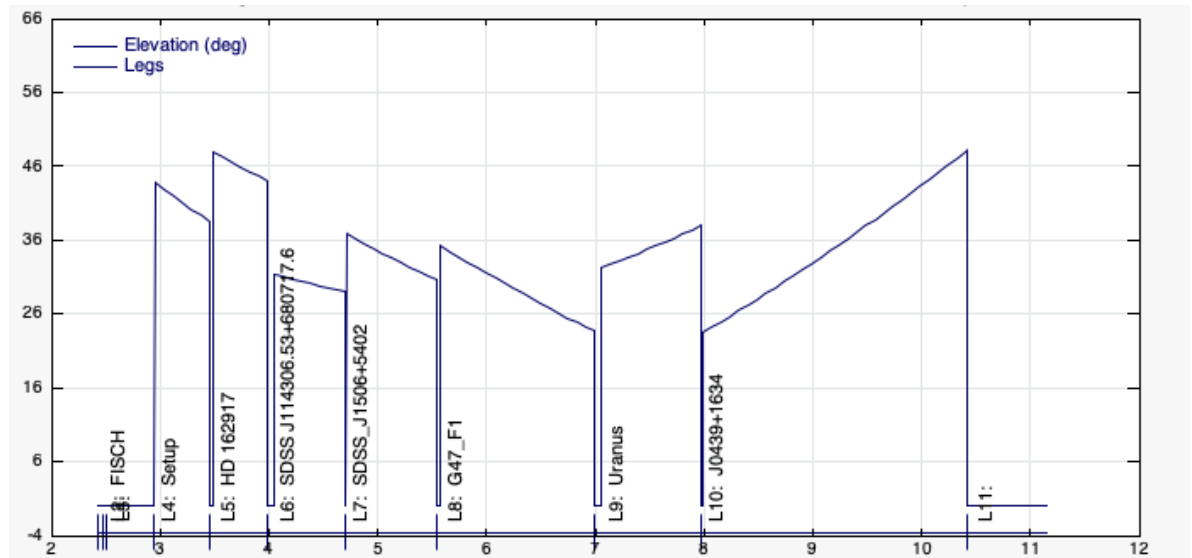
Flight 687 Mission ID 2020-09-15\_HA\_F687  
 Palmdale to Palmdale Take off date UTC: 15-SEP-2020  
 Departure UTC: 02:24 Arrival UTC: 11:06

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			HIP 71568	14h38m12.59s	43d38m31.7s	2:57	30	
5	08_0201	Ballering	HD 162917	17h53m14.19s	06d06m05.1s	3:29	30	
6	08_0254	Eufrasio	SDSS J114306.53+680717.6	11h43m06.54s	68d07m17.8s	4:02	39	Guiding issues led to loss of 50% of the leg
7	08_0086	Coil	SDSS_J1506+5402	15h06m36.30s	54d02m20.9s	4:42	50	
8	08_0186	Stephens	G47	19h16m42.22s	12d43m31.0s	5:34	85	
9	90_0083	Calibration	Uranus	02h31m04.57s	14d22m27.7s	7:03	55	Target acquisition issues led to 40% loss of leg.
10	08_0179	Yang	J0439+1634	04h39m47.10s	16d34m15.8s	7:59	146	Target acquisition issues led to loss of 30min of leg.

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



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







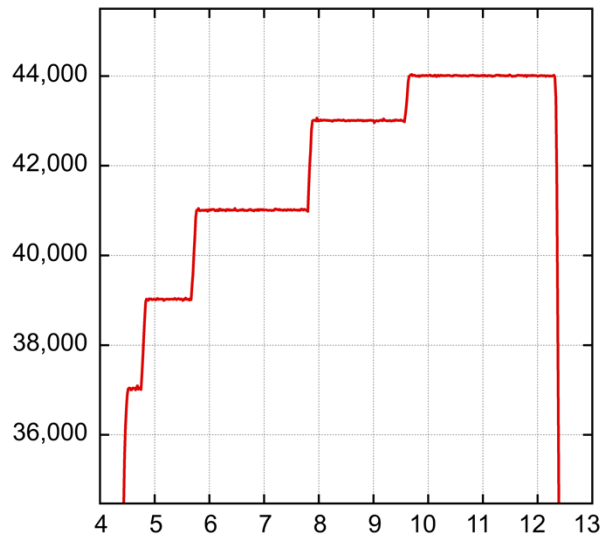
## Flight notes:

### HAWC+ detector temperature control issues at beginning of flight.

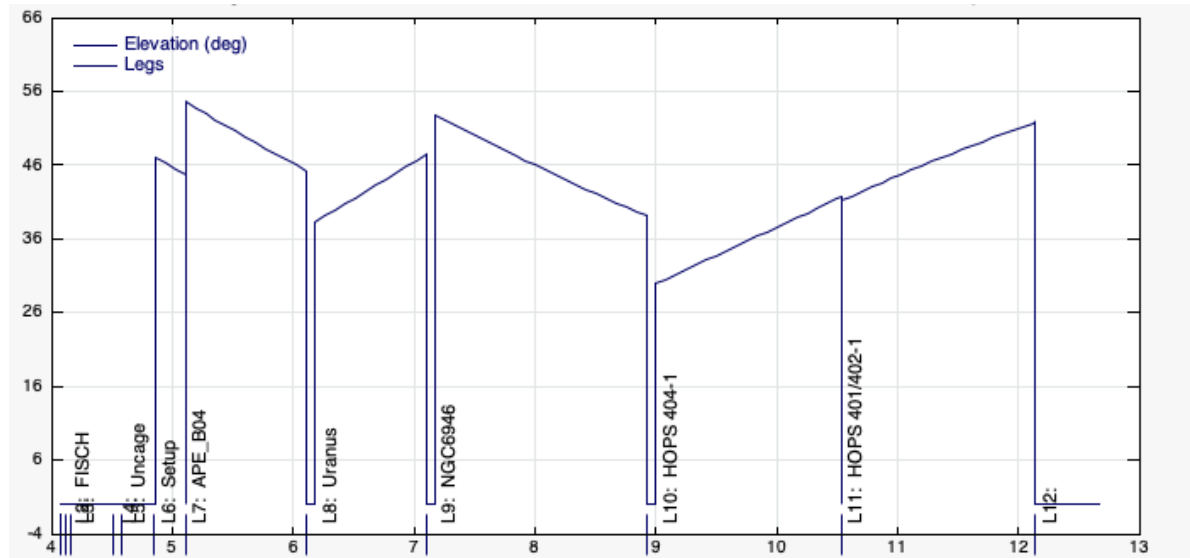
Flight 688 Mission ID 2020-09-22\_HA\_F688  
 Palmdale to Palmdale Take off date UTC: 22-SEP-2020 Departure UTC: 04:05 Arrival UTC: 12:42

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
6			Setup	17h05m20.12s	54d28m12.1s	4:51	15	
7	08_0053	Yan	APE_B04	18h13m57.10s	54d53m42.6s	5:06	60	Lost 15min due to loss of HAWC+ detector temperature control.
8	90_0083	Calibration	Uranus	02h30m21.74s	14d18m57.0s	6:11	55	No observations on leg to preserve HAWC+ cooling for rest of flight
9	08_0012	Lopez-Rodriguez	NGC6946	20h34m52.33s	60d09m13.2s	7:10	105	
10	08_0211	Karnath	HOPS 404	05h47m51.00s	00d35m18.0s	9:00		
11	08_0211	Karnath	HOPS 401/402	05h46m12.70s	-00d08m45.0s	10:32	96	

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



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



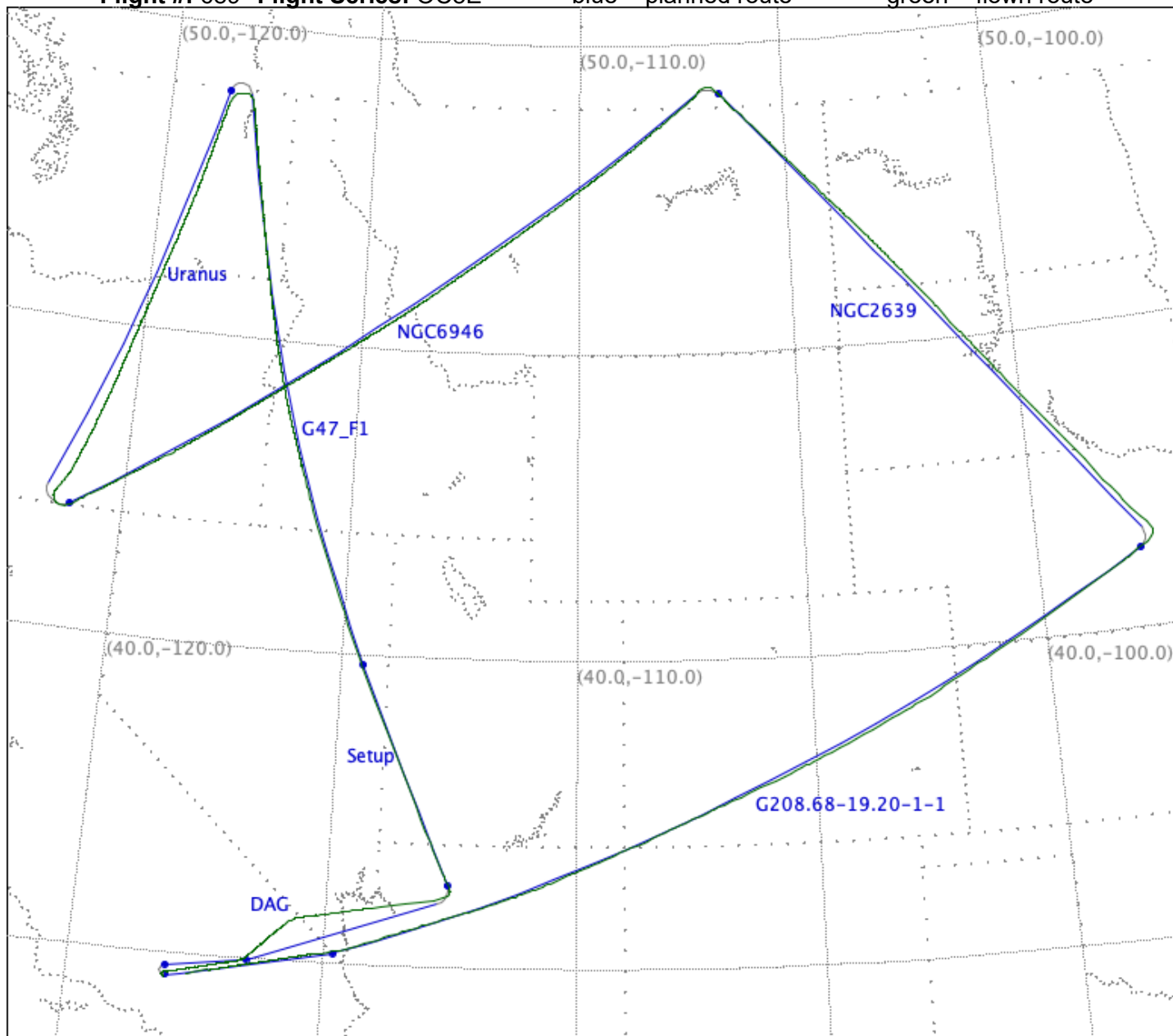
# MISSION ID: 2020-09-23\_HA\_F689

Date: 2020-09-23 UT Instrument: HAWC+

Flight #: 689 Flight Series: OC8E

blue = planned route

green = flown route

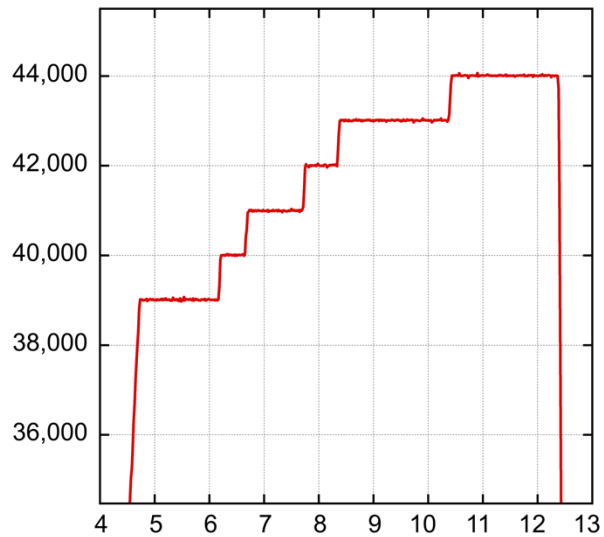


## Flight notes: Some light turbulence.

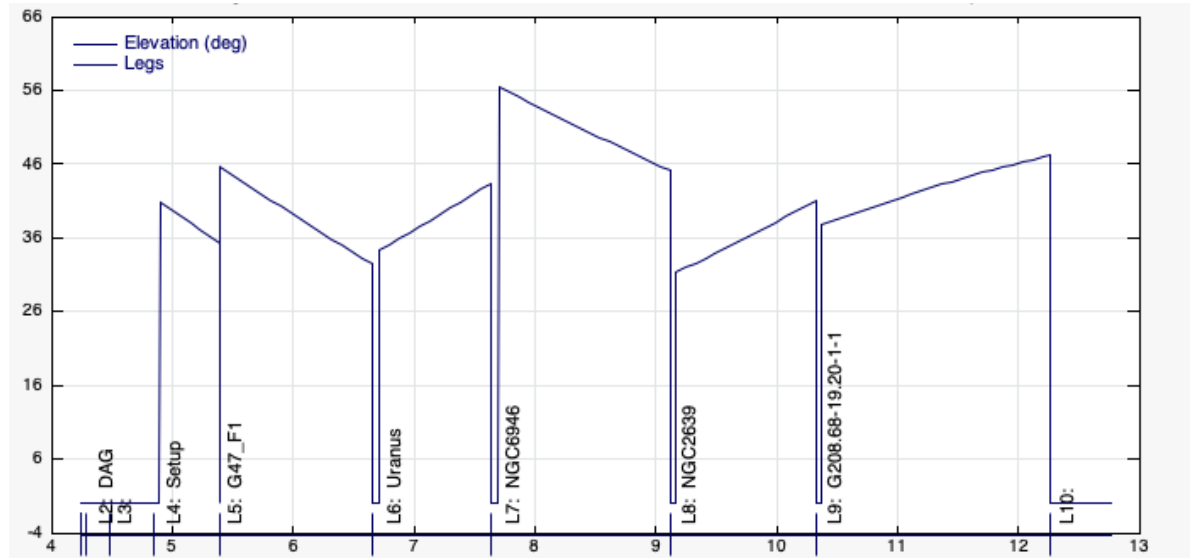
Flight 689 Mission ID 2020-09-23\_HA\_F689  
 Palmdale to Palmdale Take off date UTC: 23-SEP-2020  
 Departure UTC: 04:12 Arrival UTC: 12:52

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	18h45m28.36s	05d30m00.4s	4:54	30	
5	08_0186	Stephens	G47	19h16m42.22s	12d43m31.0s	5:24	75	
6	90_0083	Calibration	Uranus	02h30m15.00s	14d18m24.0s	6:43	55	Turbulence
7	08_0012	Lopez-Rodriguez	NGC6946	20h34m52.33s	60d09m13.2s	7:42	85	Turbulence.
8	75_0041	Discretionary	NGC2639	08h43m38.08s	50d12m20.0s	9:09	70	Light turbulence
9	08_0027	Li	G208.68-19.20	05h35m21.00s	-05d00m58.0s	10:22	114	

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



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



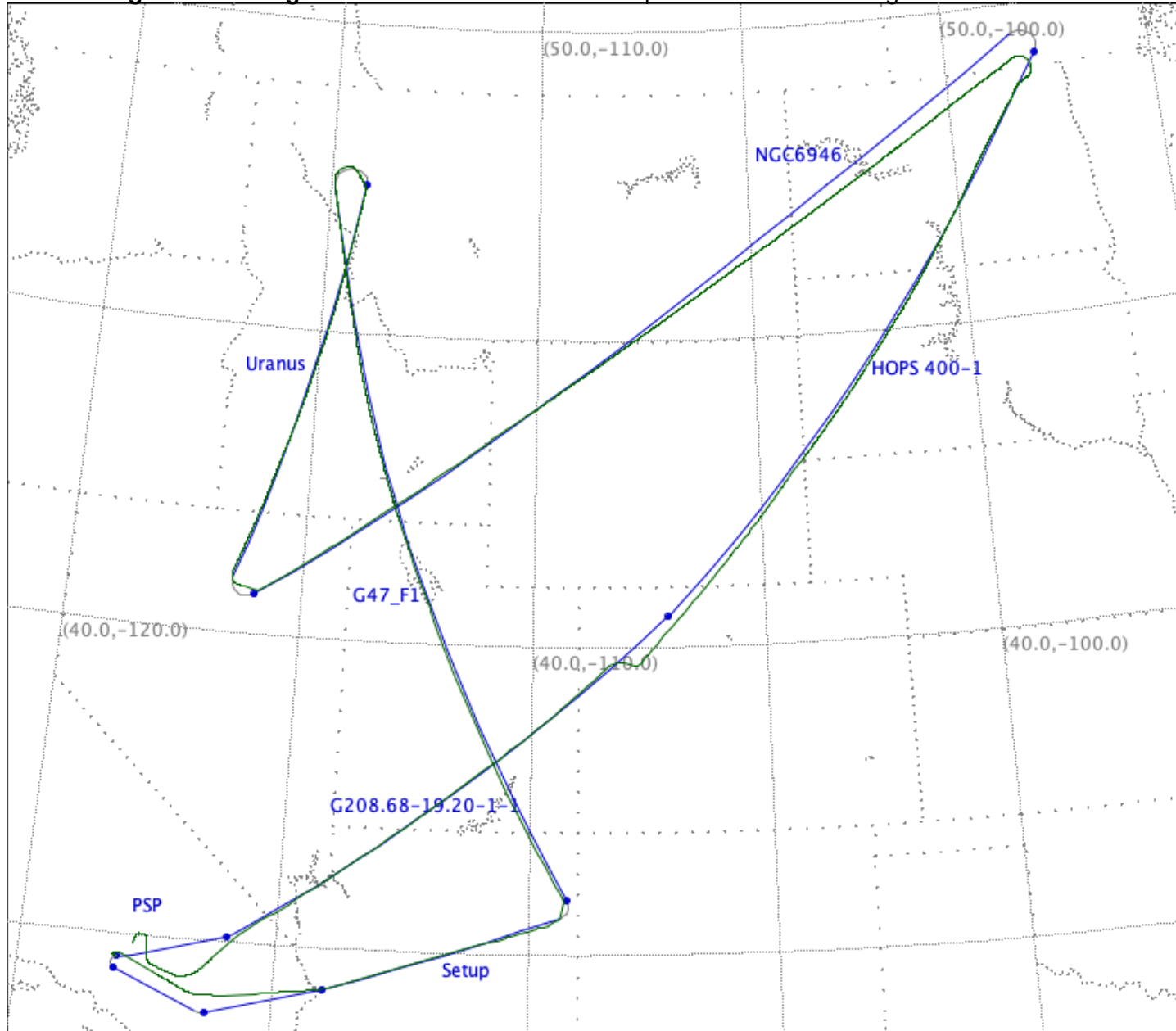
**MISSION ID: 2020-09-24\_HA\_F690**

**Date: 2020-09-24 UT Instrument: HAWC+**

**Flight #: 690 Flight Series: OC8E**

blue = planned route

green = flown route

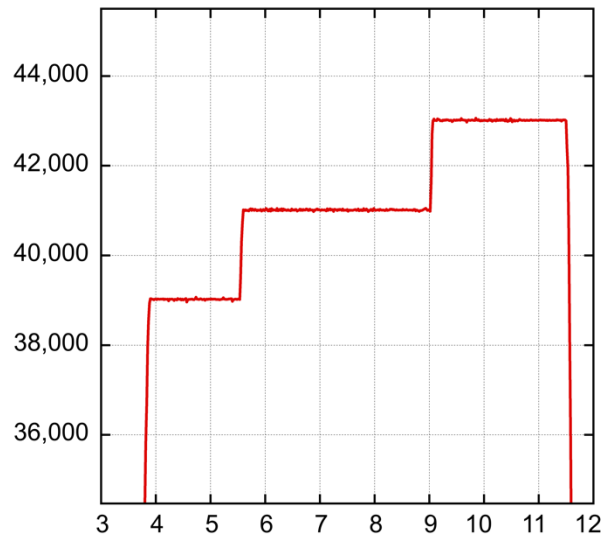


## Flight notes: Some turbulence throughout flight.

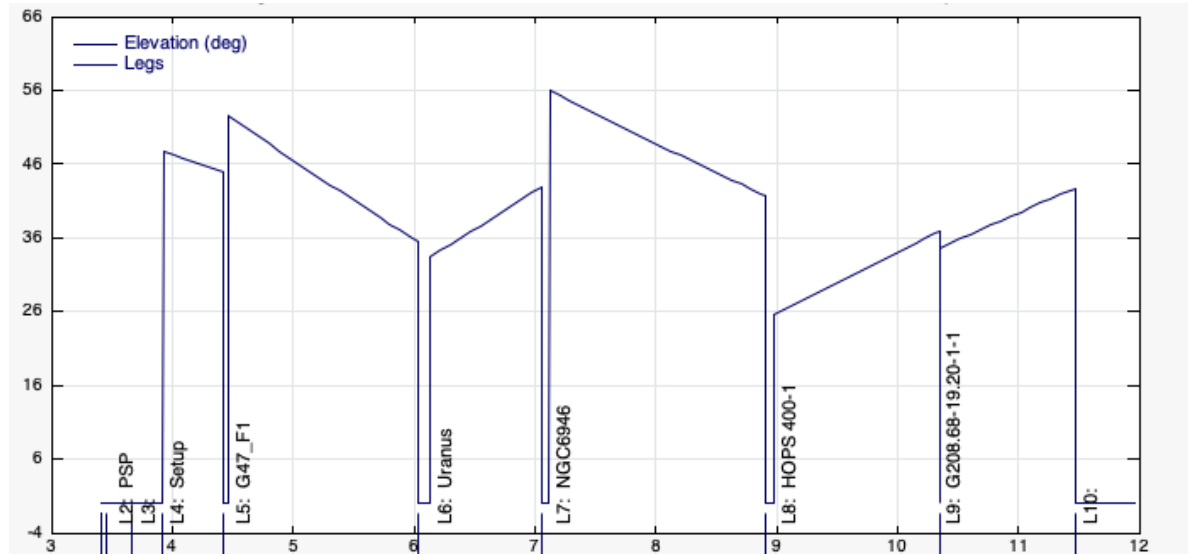
Flight 690 Mission ID 2020-09-24\_HA\_F690  
 Palmdale to Palmdale Take off date UTC: 24-SEP-2020  
 Departure UTC: 03:27 Arrival UTC: 11:55

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	17h36m57.09s	68d45m28.7s	3:56	30	
5	08_0186	Stephens	G47	19h16m42.22s	12d43m31.0s	4:28	94	Telescope issues led to a 25min loss
6	90_0083	Calibration	Uranus	02h30m08.12s	14d17m50.2s	6:08	55	
7	08_0012	Lopez-Rodriguez	NGC6946	20h34m52.33s	60d09m13.2s	7:07	107	
8	08_0211	Karnath	HOPS 400	05h42m45.20s	-01d16m14.2s	8:59	82	Turbulence too strong to acquire leading to 10min loss at beginning of leg
9	08_0027	Li	G208.68-19.20	05h35m21.00s	-05d00m58.0s	10:21	67	

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



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



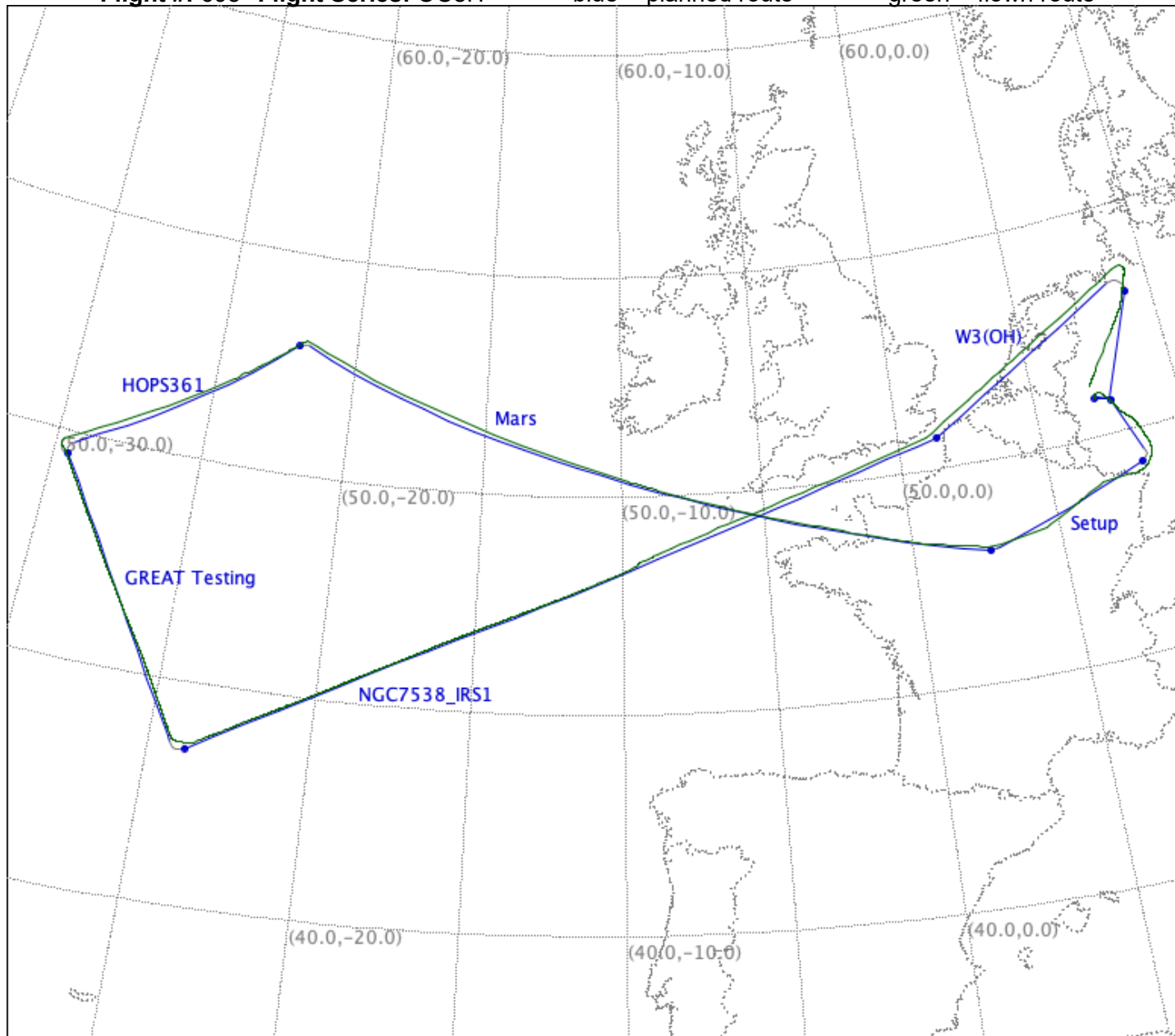
**MISSION ID: 2021-02-09\_GR\_F695**

**Date: 2021-02-09 UT Instrument: GREAT**

**Flight #: 695 Flight Series: OC8H**

blue = planned route

green = flown route



**Flight notes:  
No irregularities.**

Flight 695 Mission ID  
Cologne to Cologne

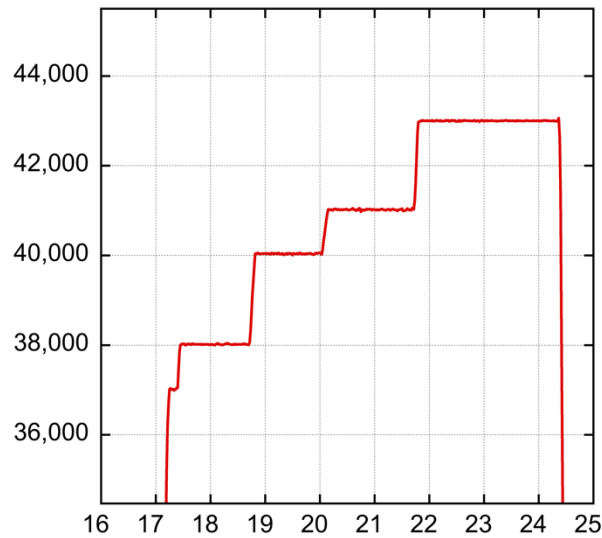
2021-02-09\_GR\_F695  
Take off date UTC:  
09-FEB-2021

Departure UTC: 16:48  
Arrival UTC: 01:00

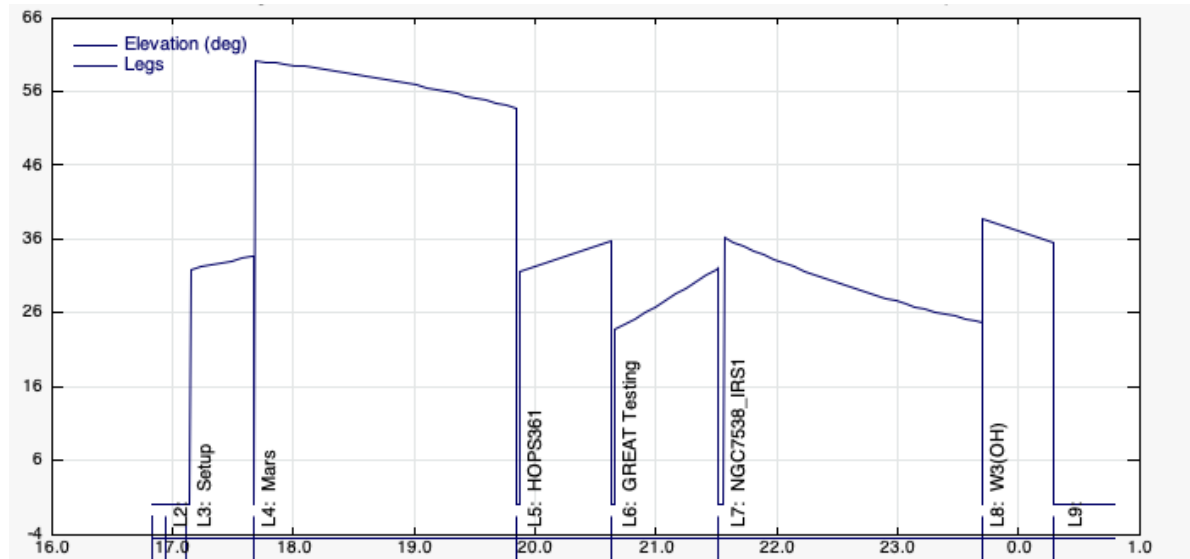
HFA-4G

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	04h11m51.94s	-06d50m15.3s	17:09	31	
4	90_0008	Calibration	Mars	02h56m33.96s	18d12m28.5s	17:41	130	
5	75_0056	Discretionary	HOPS361	05h47m04.11s	00d21m49.6s	19:52	45	
6			GREAT testing	10h27m53.00s	36d42m26.0s	20:40	51	
7	08_0038	Neufeld	NGC7538_IRS1	23h13m45.32s	61d28m11.7s	21:34	128	
8	08_0038	Neufeld	W3(OH)	02h27m04.10s	61d52m22.1s	23:42	35	

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



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





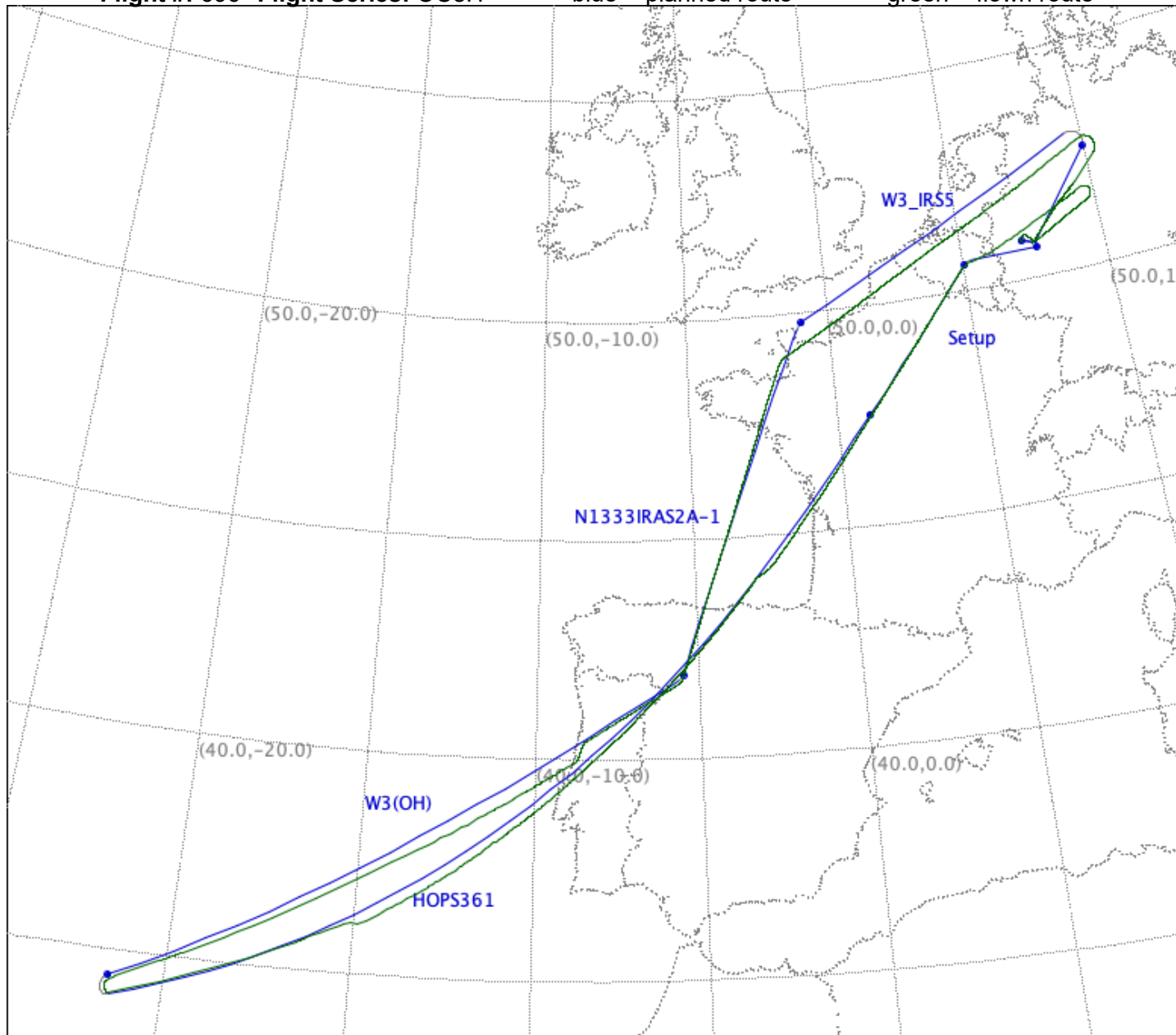
**MISSION ID: 2021-02-10\_GR\_F696**

**Date: 2021-02-10 UT Instrument: GREAT**

**Flight #: 696 Flight Series: OC8H**

blue = planned route

green = flown route

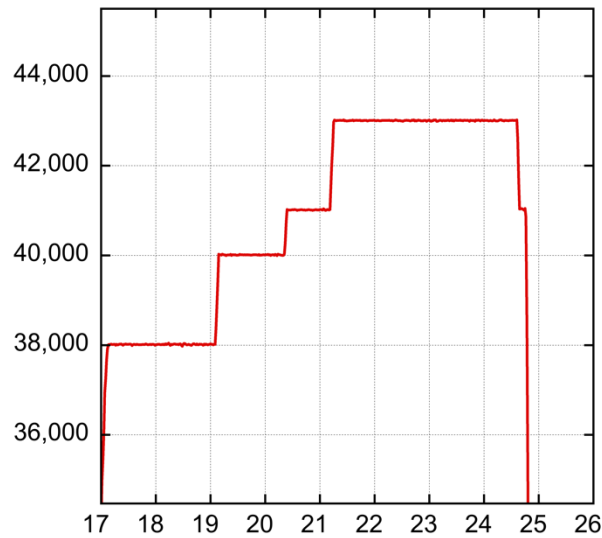


**Flight notes:**  
**No irregularities.**

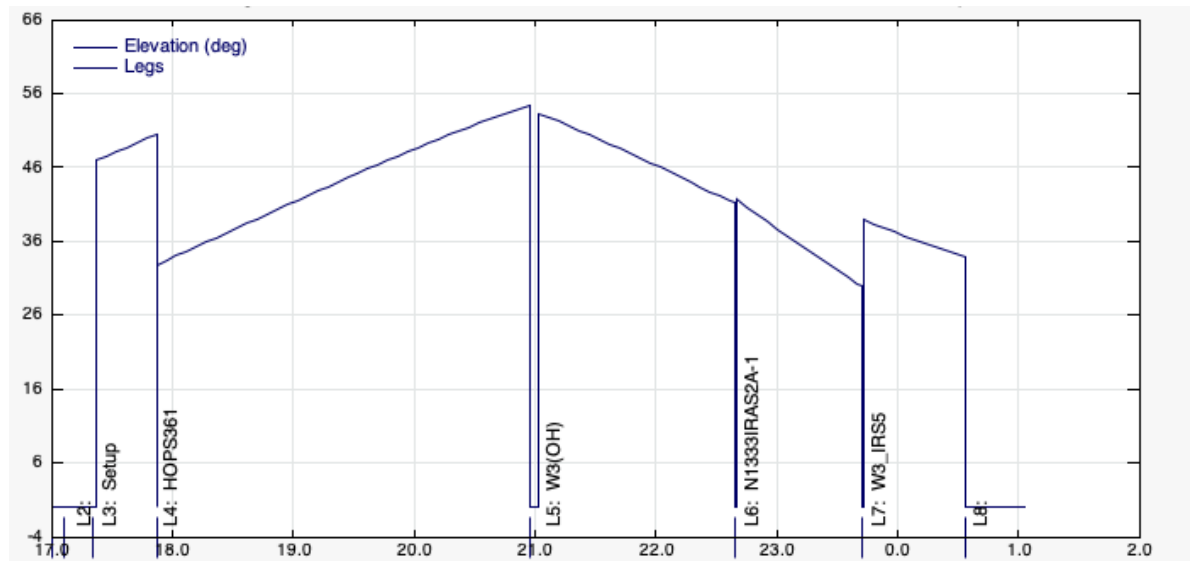
Flight 696 Mission ID 2021-02-10\_GR\_F696  
 Cologne to Cologne Take off date UTC: 10-FEB-2021  
 Departure UTC: 16:36 Arrival UTC: 01:10  
 HFA-4G

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	05h09m41.96s	15d35m50.0s	17:22	30	
4	75_0056	Discretionary	HOPS361	05h47m04.11s	00d21m49.6s	17:52	185	
5	08_0038	Neufeld	W3(OH)	02h27m04.10s	61d52m22.1s	21:02	97	
6	07_0036	Caselli	N1333IRAS2A	03h28m55.90s	31d14m37.0s	22:40	62	
7	08_0038	Neufeld	W3_IRS5	02h25m40.54s	62d05m51.4s	23:43	50	Unrecoverable telescope failure ended leg and flight early; 30% of data collection time lost

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



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



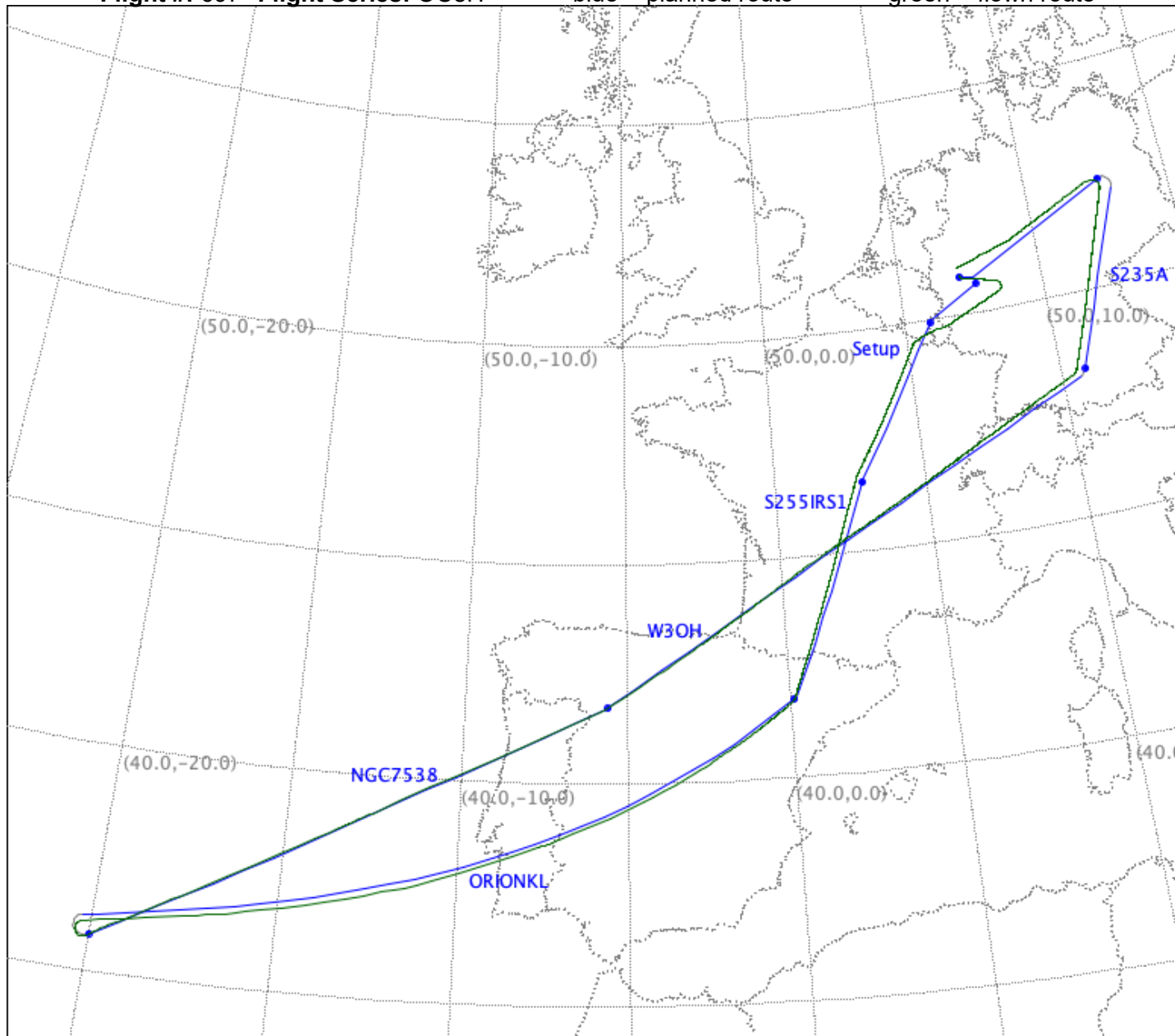
**MISSION ID: 2021-02-11\_GR\_F697**

**Date: 2021-02-11 UT Instrument: GREAT**

**Flight #: 697 Flight Series: OC8H**

blue = planned route

green = flown route

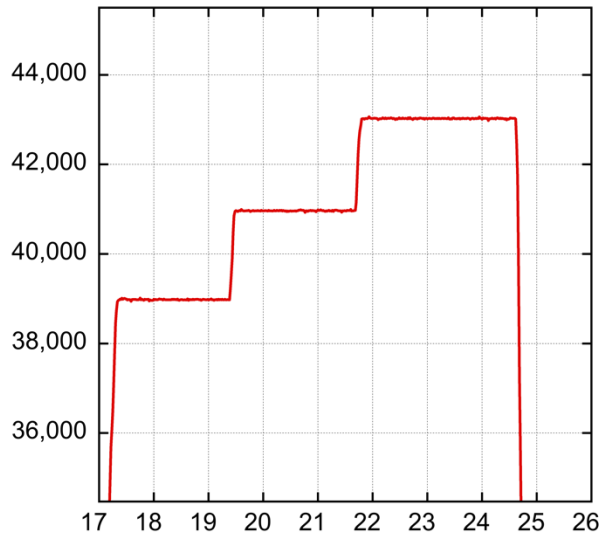


**Flight notes:**  
**No irregularities.**

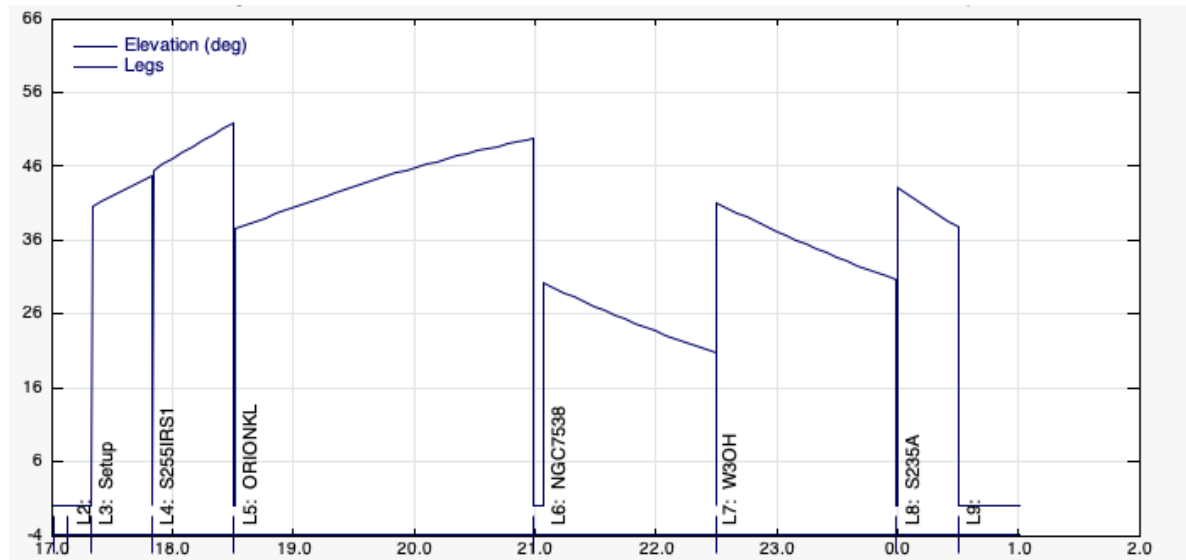
Flight 697 Mission ID 2021-02-11\_GR\_F697  
 Cologne to Cologne Take off date UTC: 11-FEB-2021  
 Departure UTC: 16:47 Arrival UTC: 01:09 Consortium flight HFA-4G

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	05h49m32.93s	12d39m04.8s	17:20	30	
4	83_0808	GREAT Consortium	S255	06h12m53.89s	17d59m22.6s	17:50	40	
5	83_0803	GREAT Consortium	Orion-HC	05h35m14.60s	-05d22m31.0s	18:31	148	
6	83_0719	GREAT Consortium	NGC7538	23h13m12.18s	61d28m05.8s	21:05	85	
7	83_0801	GREAT Consortium	W3OH	02h26m22.58s	61d59m08.9s	22:30	89	
8	83_0807	GREAT Consortium	S235A hidens	05h40m52.10s	35d41m16.4s	0:00	30	

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



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



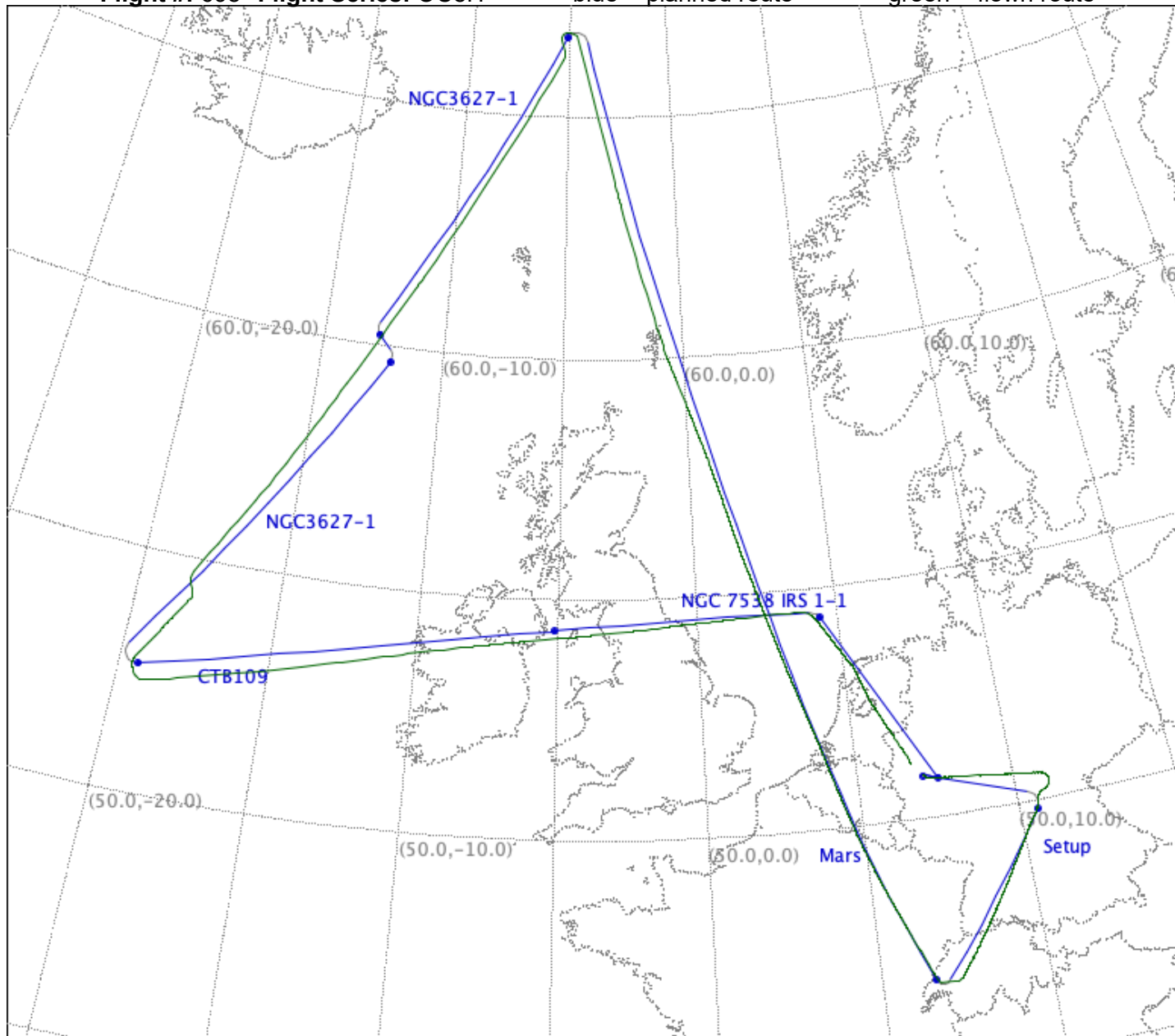
**MISSION ID: 2021-02-17\_GR\_F698**

**Date: 2021-02-17 UT Instrument: GREAT**

**Flight #: 698 Flight Series: OC8H**

blue = planned route

green = flown route



**Flight notes:  
No irregularities.**

Flight 698 Mission ID  
Cologne to Cologne

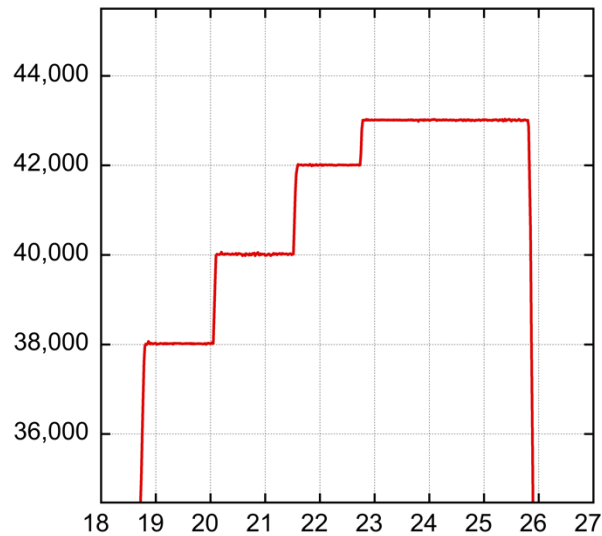
2021-02-17\_GR\_F698  
Take off date UTC:  
17-FEB-2021

Departure UTC: 18:21  
Arrival UTC: 02:22

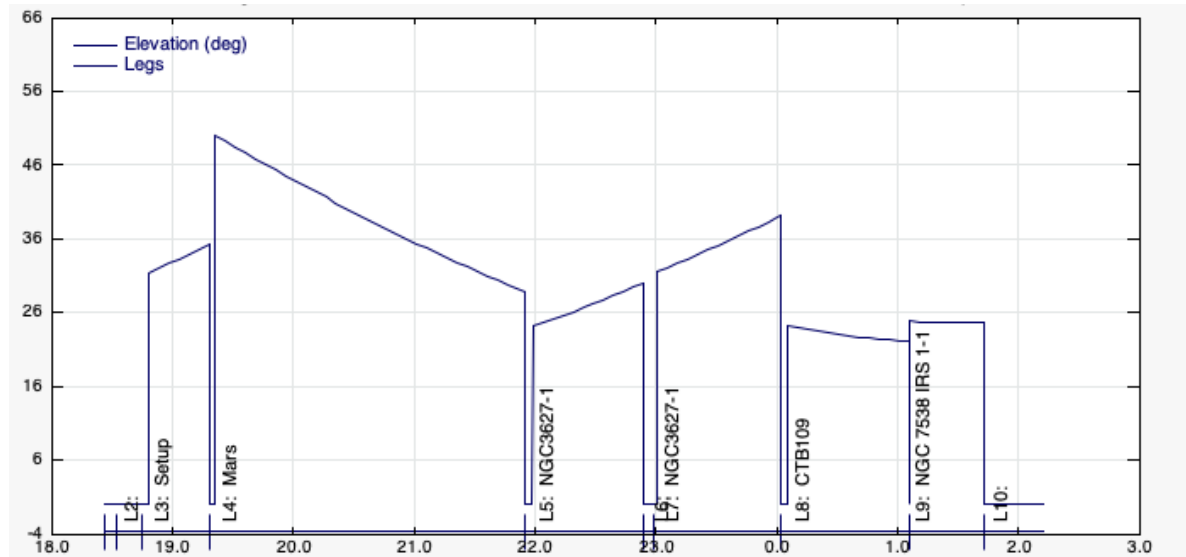
LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	08h02m15.94s	02d20m04.5s	18:48	30	
4	90_0008	Calibration	Mars	03h14m50.14s	19d29m15.1s	19:21	154	Telescope and instrument issues led to little data collected.
5	08_0066	Bolatto	NGC3627	11h20m16.44s	12d58m22.0s	21:59	55	
7	08_0066	Bolatto	NGC3627	11h20m16.44s	12d58m22.0s	21:59	61	
8	08_0099	Clarke	CTB109	23h02m18.31s	58d56m46.8s	23:00	60	
9	08_0038	Neufeld	NGC 7538 IRS 1	23h13m45.32s	61d28m11.7s	0:05	37	

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



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



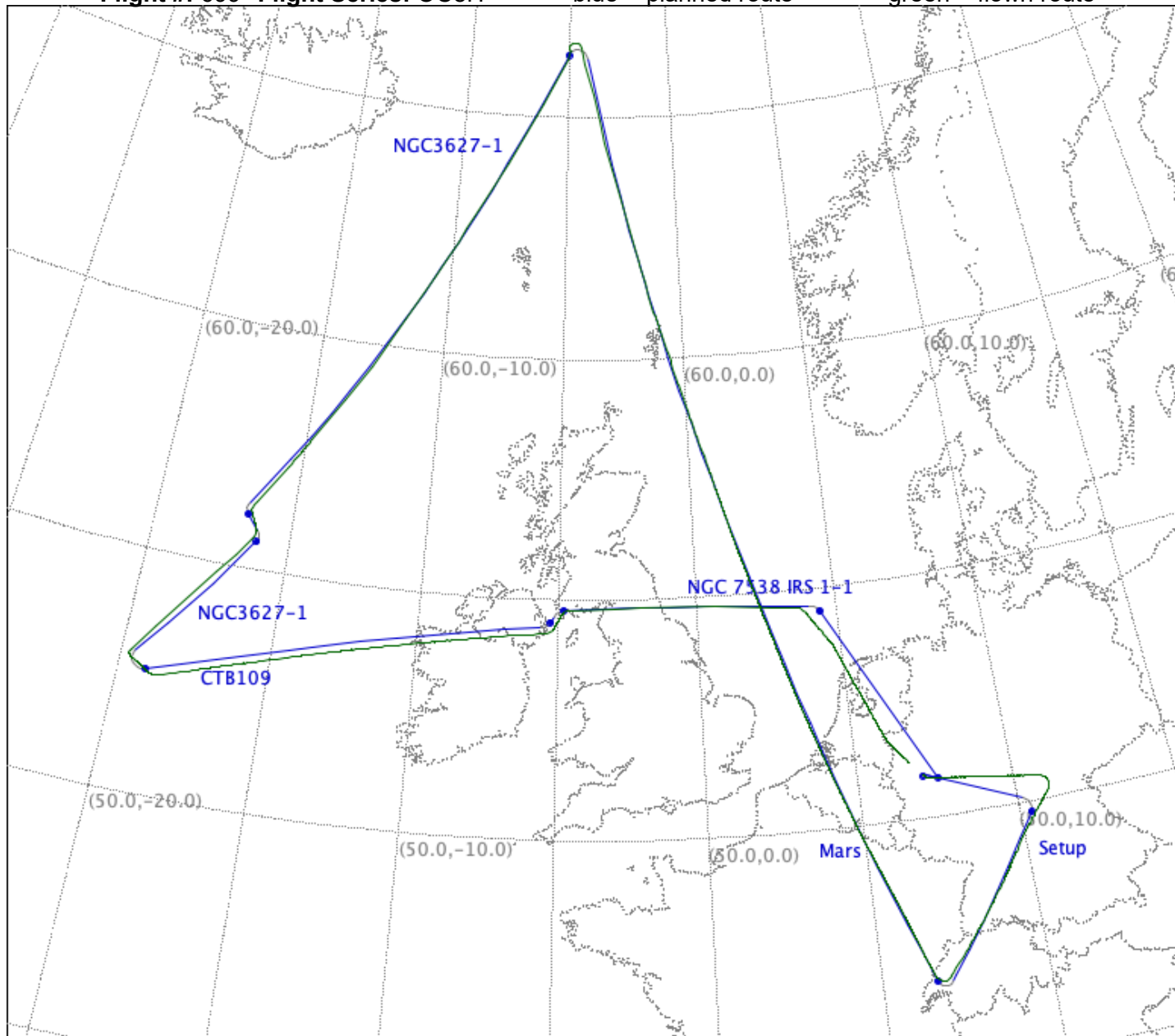
**MISSION ID: 2021-02-18\_GR\_F699**

**Date: 2021-02-18 UT Instrument: GREAT**

**Flight #: 699 Flight Series: OC8H**

blue = planned route

green = flown route

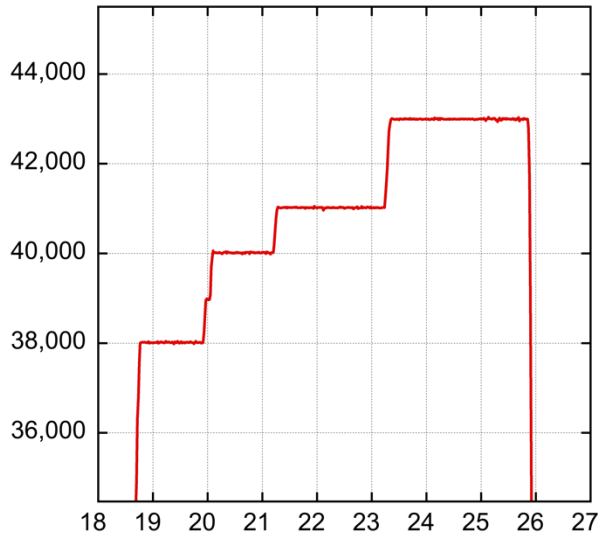


**Flight notes:  
No irregularities.**

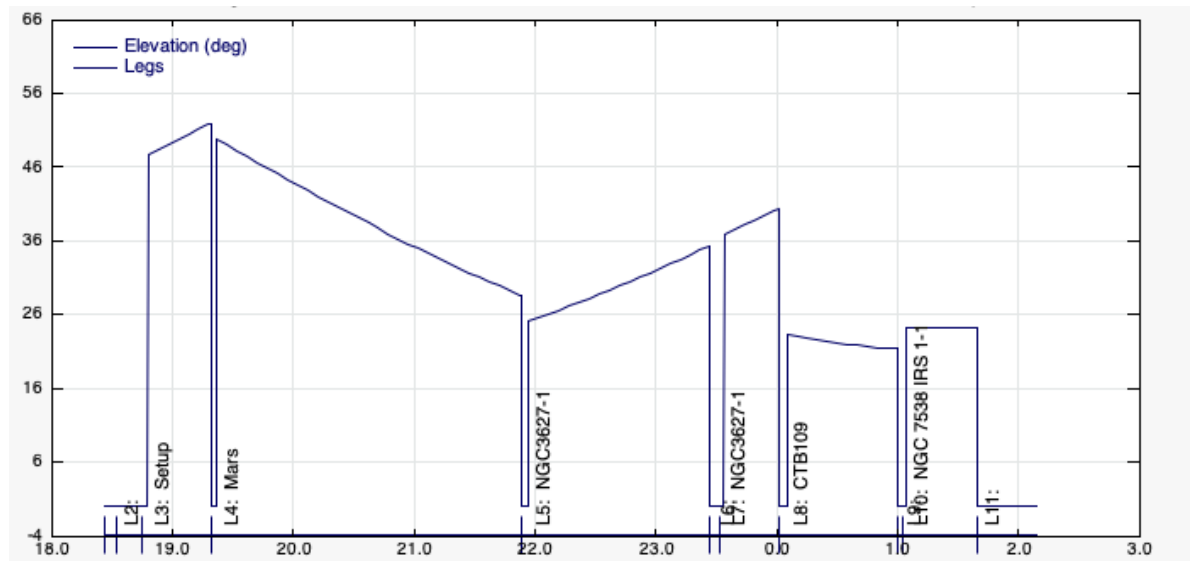
Flight 699 Mission ID 2021-02-18\_GR\_F699  
 Cologne to Cologne Take off date UTC: 18-FEB-2021 Departure UTC: 18:19 Arrival UTC: 02:21 LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	07h46m07.45s	18d30m36.2s	18:48	31	
4	90_0008	Calibration	Mars	03h17m08.59s	19d38m22.2s	19:22	151	Moon nearby
5	08_0066	Bolatto	NGC3627	11h20m16.44s	12d58m22.0s	21:57	90	
7	08_0066	Bolatto	NGC3627	11h20m16.44s	12d58m22.0s	23:33	27	
8	08_0099	Clarke	CTB109	23h02m18.31s	58d56m46.8s	0:05	55	
10	08_0038	Neufeld	NGC 7538 IRS 1	23h13m45.32s	61d28m11.7s	1:04	35	

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



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





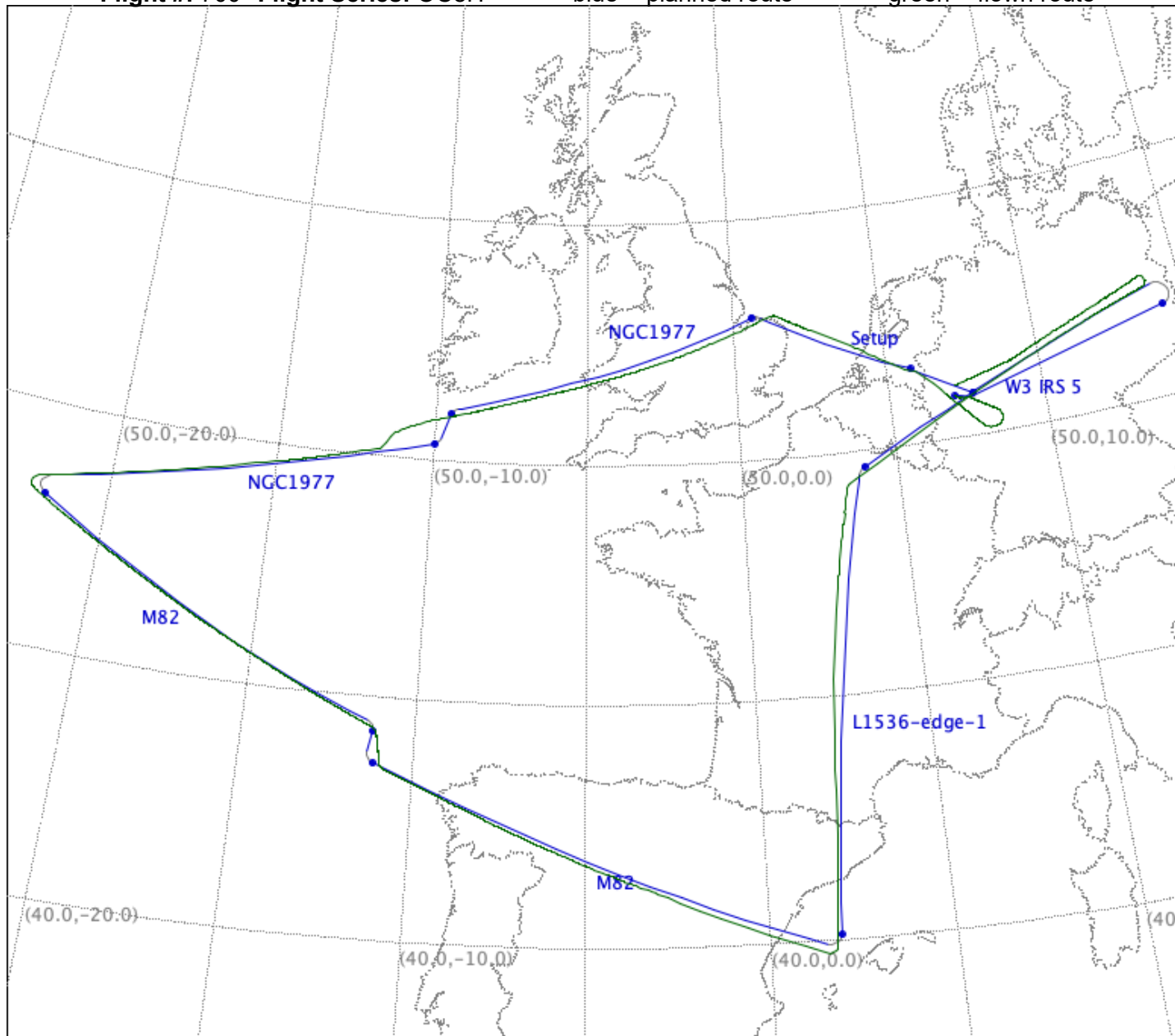
**MISSION ID: 2021-02-19\_GR\_F700**

**Date: 2021-02-19 UT Instrument: GREAT**

**Flight #: 700 Flight Series: OC8H**

blue = planned route

green = flown route

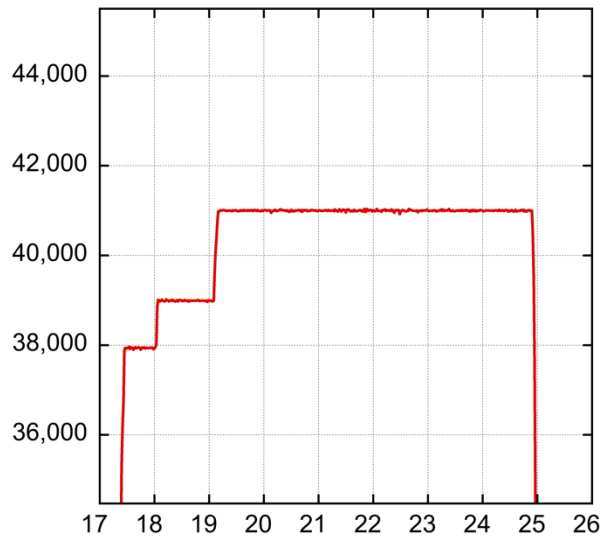


**Flight notes:**  
**Light turbulence across most of the flight.**

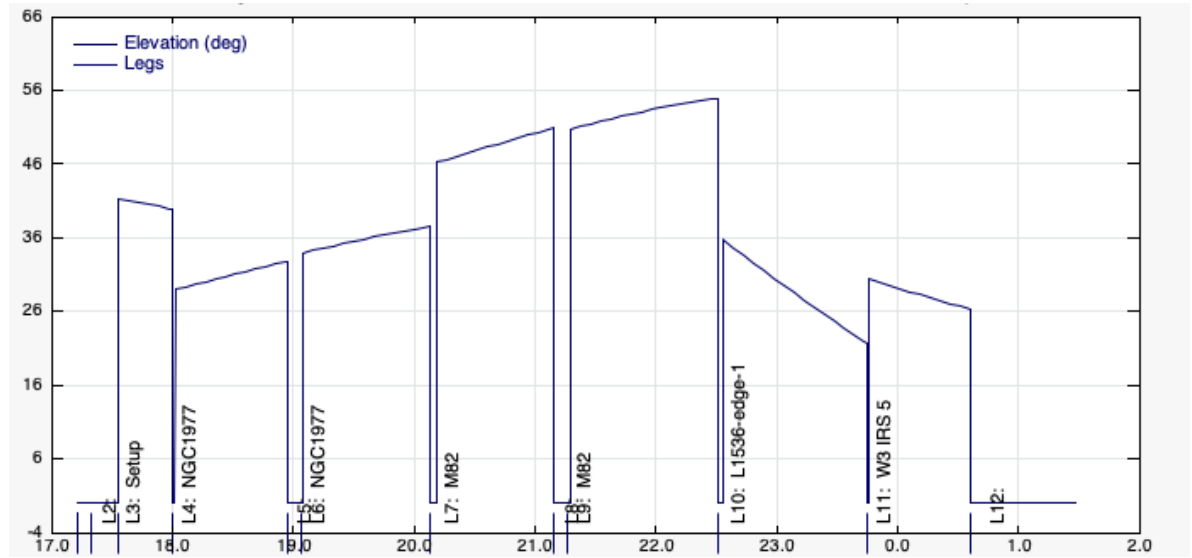
Flight 700 Mission ID 2021-02-19\_GR\_F700  
 Cologne to Cologne Take off date UTC: 19-FEB-2021 Departure UTC: 17:01 Arrival UTC: 01:23  
 LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	03h02m16.77s	04d05m23.0s	17:33	27	
4	08_0035	Guevara	NGC1977	05h35m12.18s	-04d55m18.8s	18:01	56	
6	08_0035	Guevara	NGC1977	05h35m12.18s	-04d55m18.8s	19:05	63	
7	08_0225	Levy	M82	09h55m52.72s	69d40m45.8s	20:12	58	
9	08_0225	Levy	M82	09h55m52.72s	69d40m45.8s	21:18	73	
10	08_0081	Walch	L1536-edge	04h33m03.27s	22d15m58.6s	22:34	71	
11	08_0038	Neufeld	W3 IRS 5	02h26m22.32s	61d59m06.7s	23:46	50	

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



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



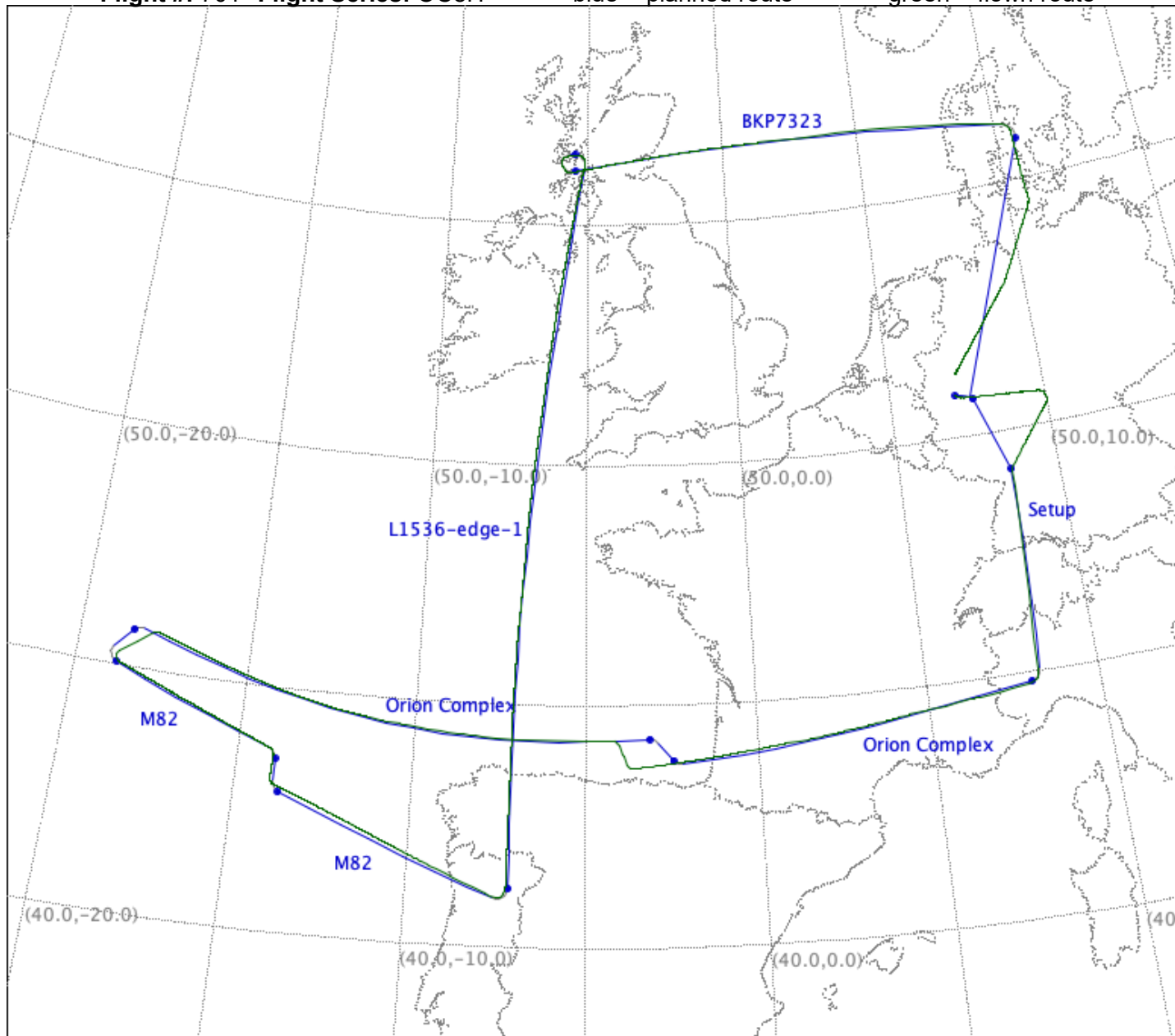
**MISSION ID: 2021-02-23\_GR\_F701**

**Date: 2021-02-23 UT Instrument: GREAT**

**Flight #: 701 Flight Series: OC8H**

blue = planned route

green = flown route



## Flight notes: No irregularities.

Flight 701 Mission ID  
Cologne to Cologne

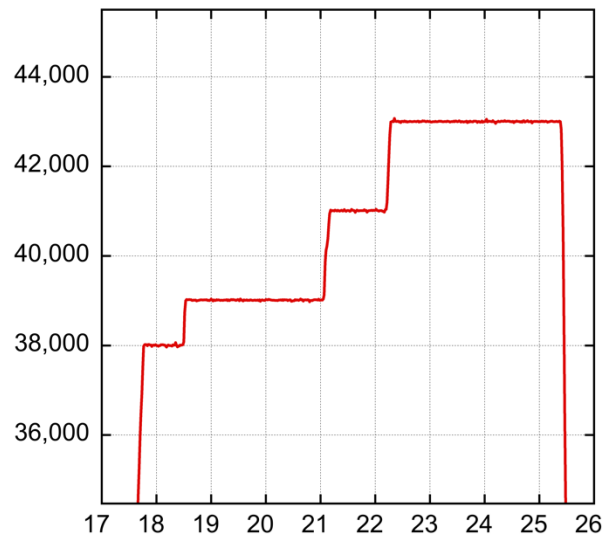
2021-02-23\_GR\_F701  
Take off date UTC:  
23-FEB-2021

Departure UTC: 17:18  
Arrival UTC: 01:55

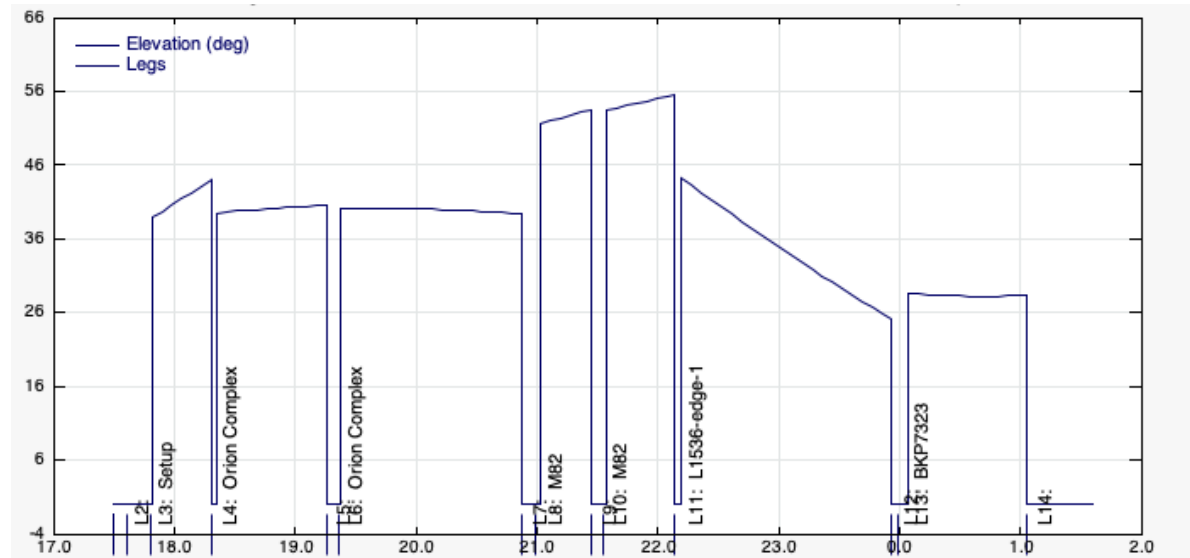
LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	08h46m41.82s	28d45m35.6s	17:48	30	
4	08_0042	Kabanovic	Orion Complex	05h35m23.36s	-05d10m46.5s	18:21	55	
6	08_0042	Kabanovic	Orion Complex	05h35m23.36s	-05d10m46.5s	19:22	90	
8	08_0225	Levy	M82	09h55m52.72s	69d40m45.8s	21:02	25	
10	08_0225	Levy	M82	09h55m52.72s	69d40m45.8s	21:35	34	
11	08_0081	Walch	L1536-edge	04h33m03.27s	22d15m58.6s	22:12	104	
13	08_0062	Heyer	G109.846+4.24	22h47m46.87s	63d56m29.6s	0:05	59	

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



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



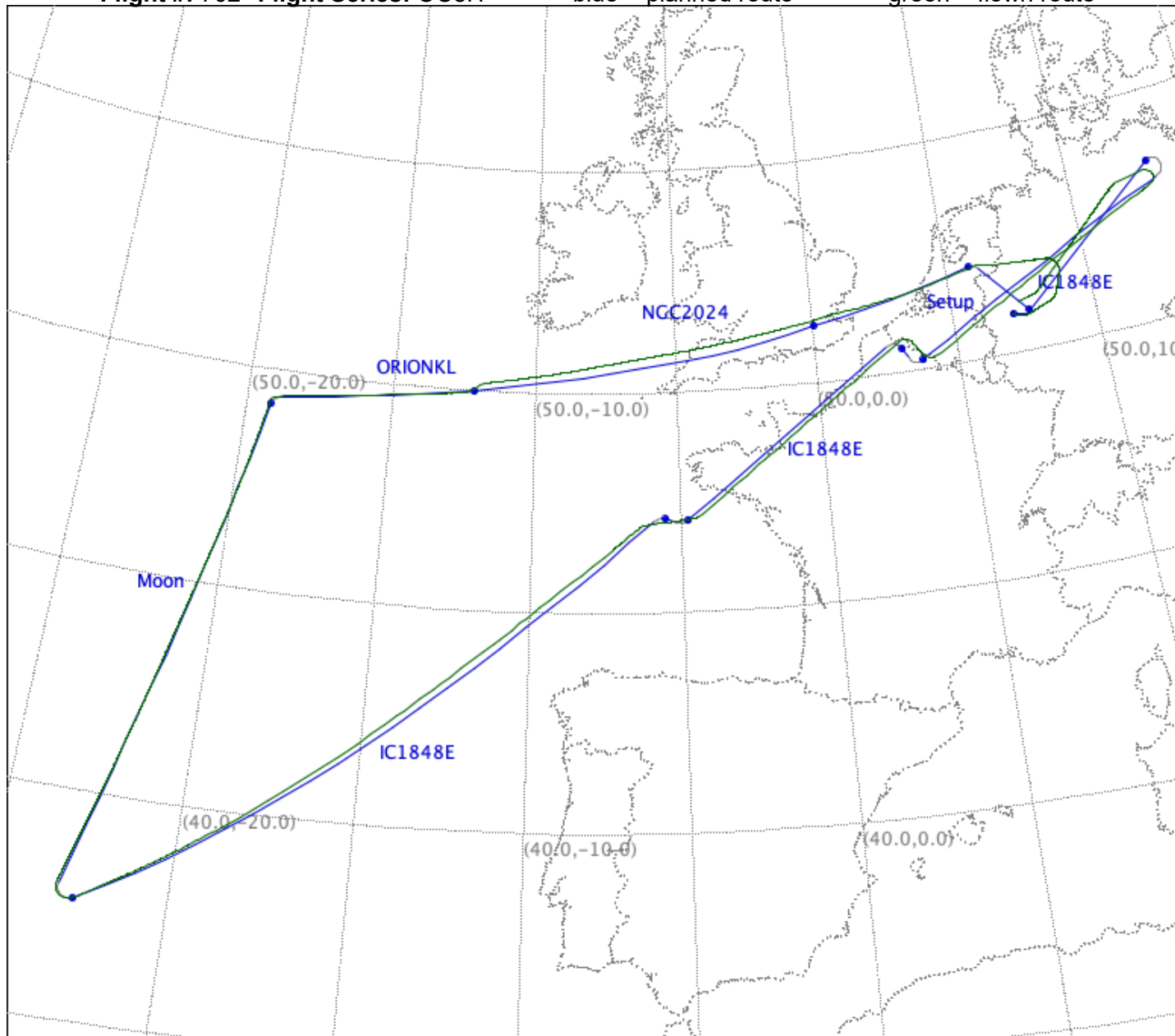
**MISSION ID: 2021-02-24\_GR\_F702**

**Date: 2021-02-24 UT Instrument: GREAT**

**Flight #: 702 Flight Series: OC8H**

blue = planned route

green = flown route

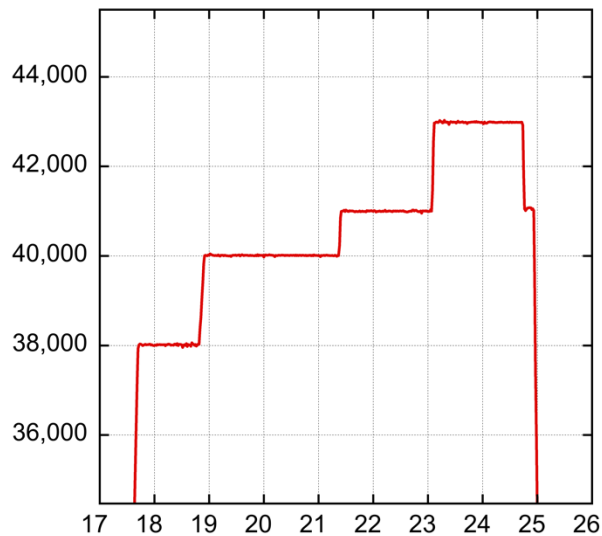


**Flight notes:**  
**No irregularities. (Flown in honor of Abraham Cheng.)**

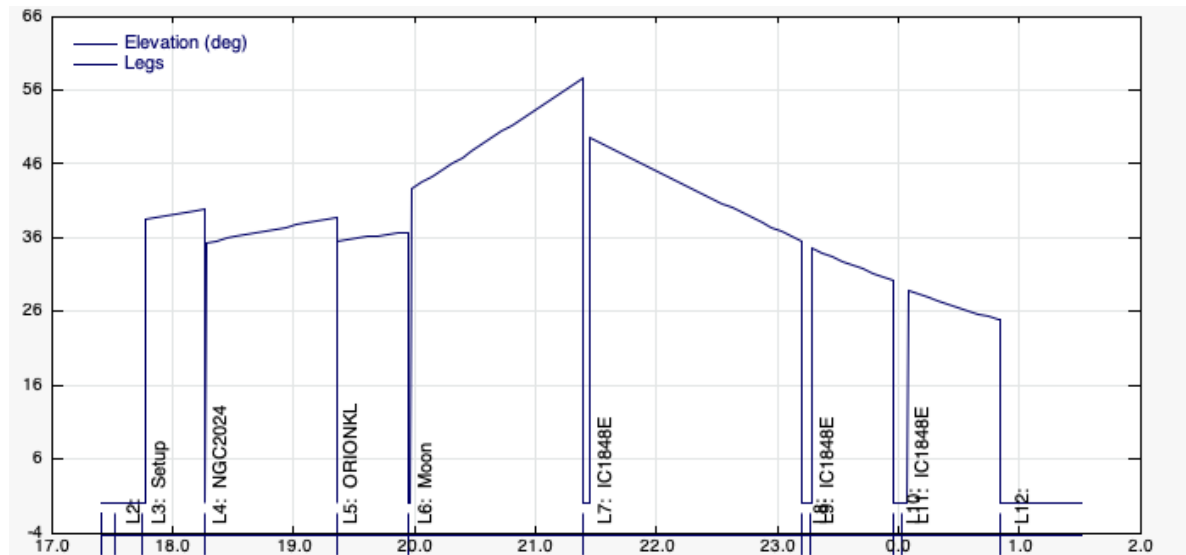
Flight 702 Mission ID 2021-02-24\_GR\_F702  
 Cologne to Cologne Take off date UTC: 24-FEB-2021 Departure UTC: 17:14 Arrival UTC: 01:45 Consortium flight LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	05h24m44.83s	01d50m47.2s	17:46	30	
4	83_0603	GREAT Consortium	NGC2024	05h41m45.20s	-01d55m45.0s	18:16	65	
5	83_0630	GREAT Consortium	ORIONKL	05h35m14.30s	-05d22m33.7s	19:21	35	
6	83_0804	GREAT Consortium	Moon	08h28m44.54s	22d53m05.3s	19:58	85	
7	83_0720	GREAT Consortium	IC1848E	02h55m45.40s	60d19m48.0s	21:27	105	
9	83_0720	GREAT Consortium	IC1848E	02h55m45.40s	60d19m48.0s	23:18	40	
11	83_0720	GREAT Consortium	IC1848E	02h55m45.40s	60d19m48.0s	0:05	46	

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



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



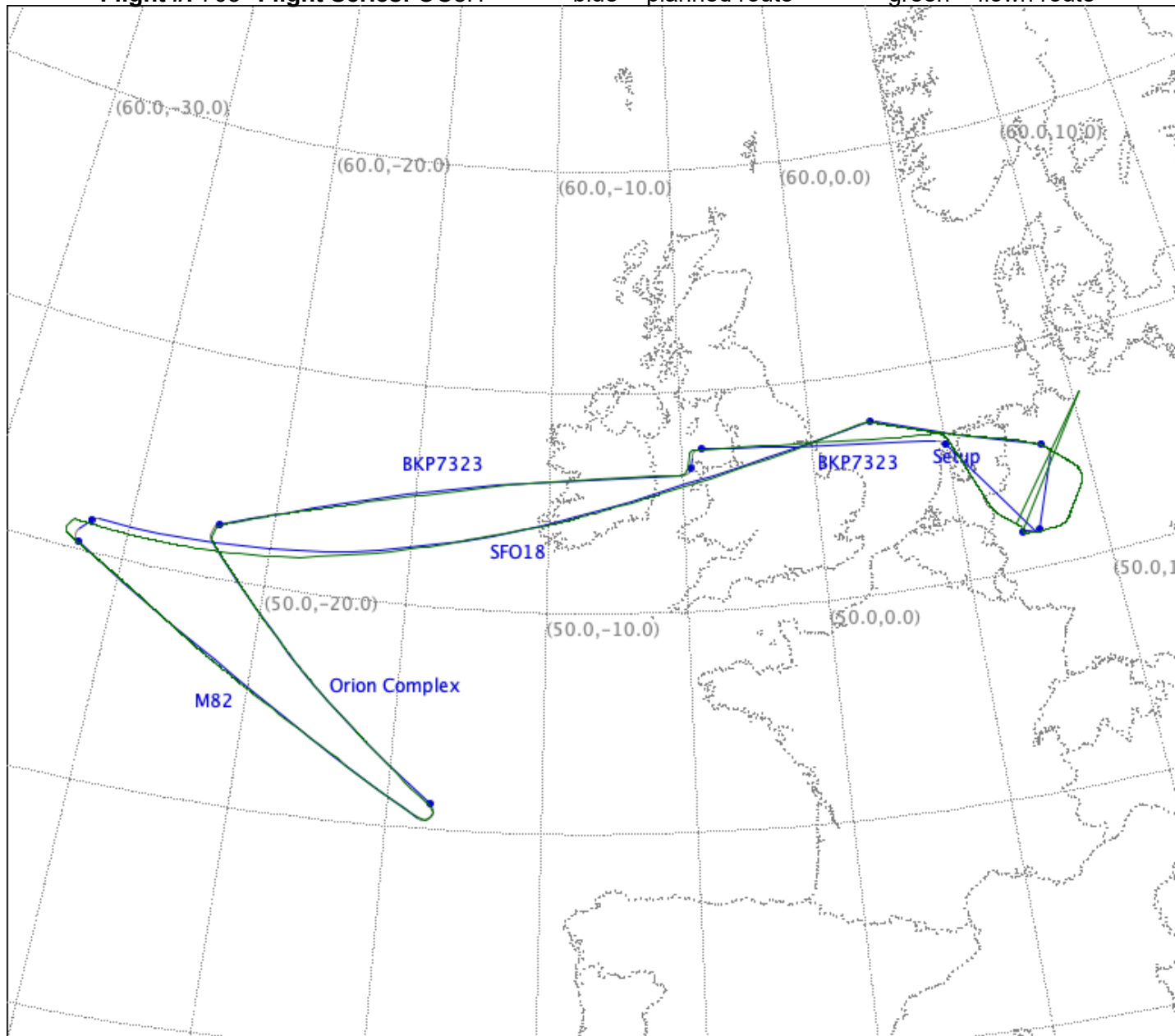
**MISSION ID: 2021-02-25\_GR\_F703**

**Date: 2021-02-25 UT Instrument: GREAT**

**Flight #: 703 Flight Series: OC8H**

blue = planned route

green = flown route



## Flight notes: No irregularities.

Flight 703 Mission ID  
Cologne to Cologne

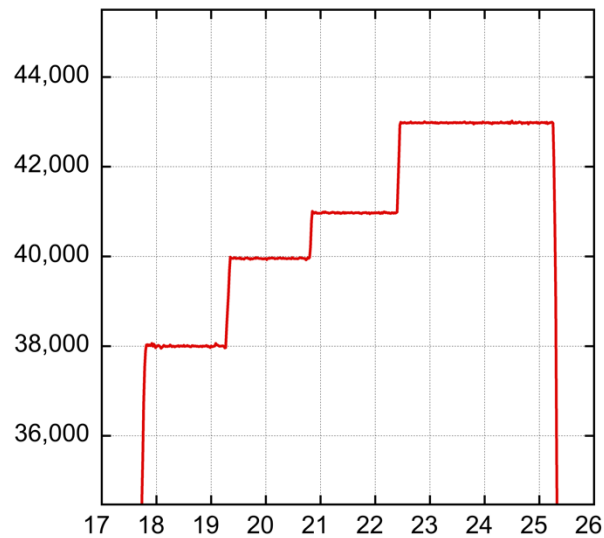
2021-02-25\_GR\_F703  
Take off date UTC:  
25-FEB-2021

Departure UTC: 17:22  
Arrival UTC: 01:43

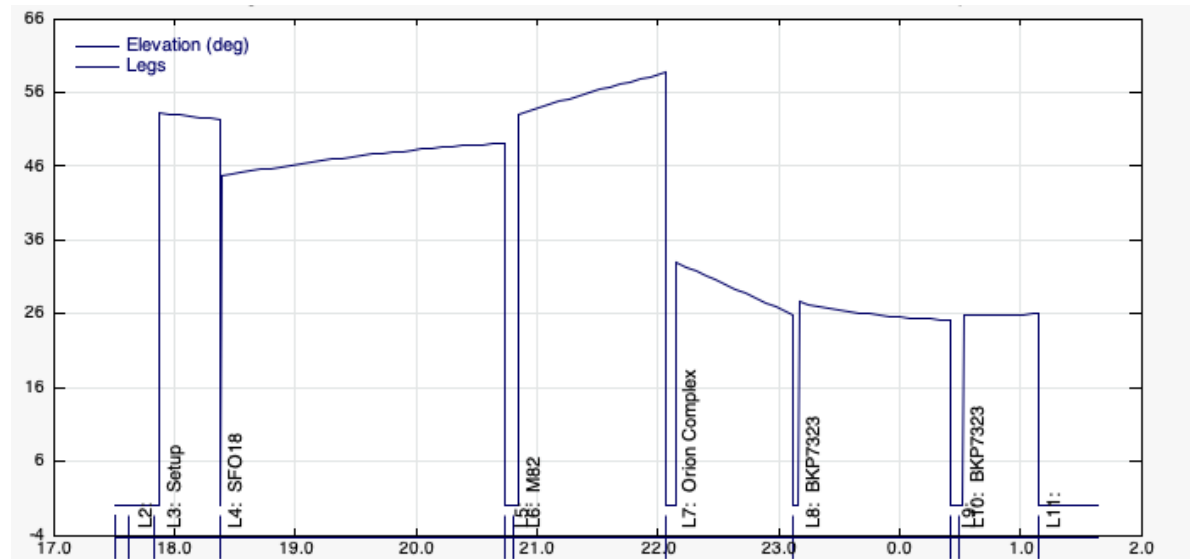
LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	04h28m39.74s	15d52m15.2s	17:52	30	
4	08_0074	Soam	SFO18	05h44m29.76s	09d08m53.9s	18:23	141	Technical issues led to a 20min loss on leg
6	08_0225	Levy	M82	09h55m52.72s	69d40m45.8s	20:51	73	
7	08_0042	Kabanovic	Orion Complex	05h35m23.36s	-05d10m46.5s	22:08	58	
8	08_0062	Heyer	G109.846+4.24	22h47m46.87s	63d56m29.6s	23:10	75	
10	08_0062	Heyer	G109.846+4.24	22h47m46.87s	63d56m29.6s	0:31	37	

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



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





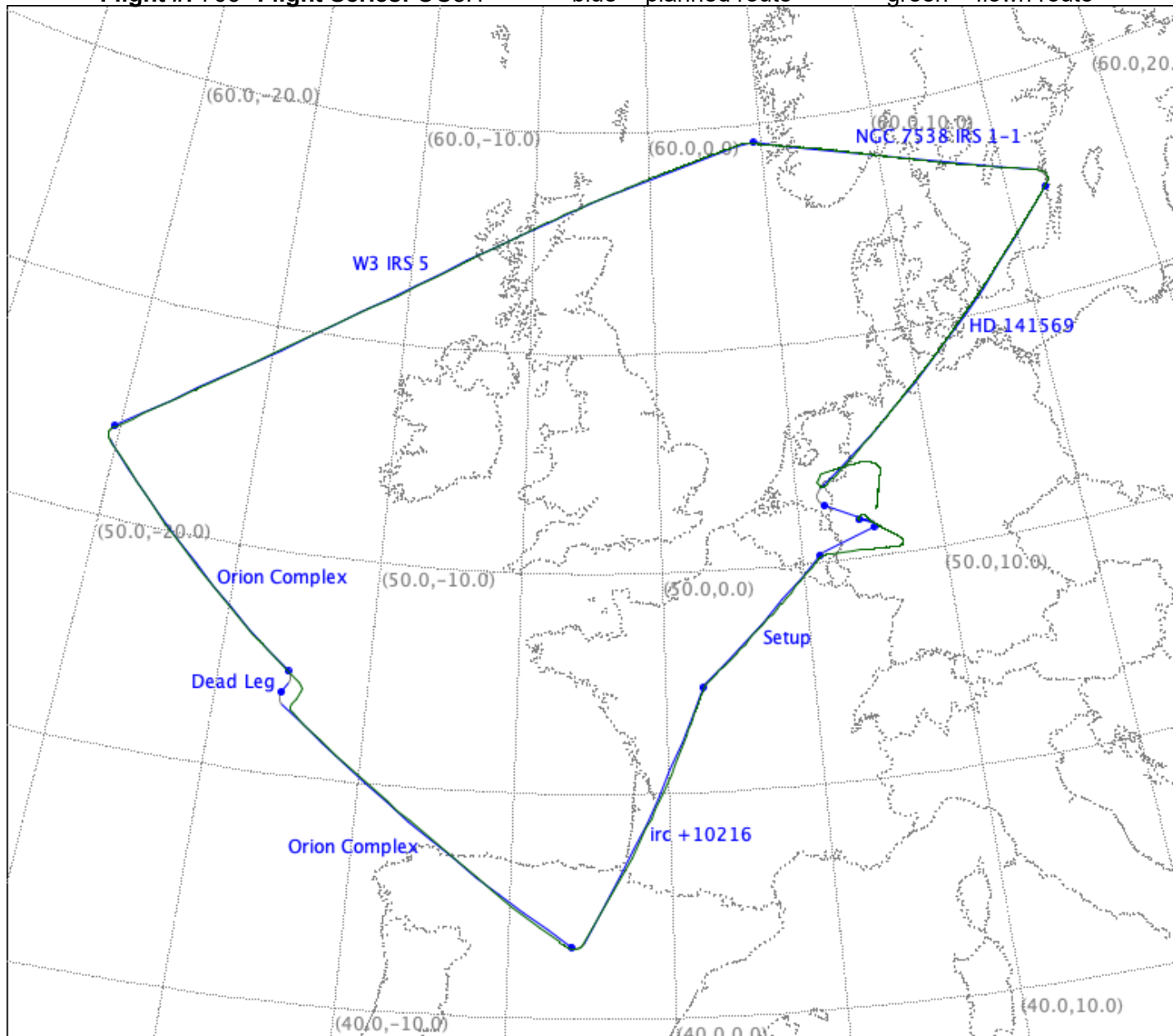
**MISSION ID: 2021-03-04\_GR\_F706**

**Date: 2021-03-04 UT Instrument: GREAT**

**Flight #: 706 Flight Series: OC8H**

blue = planned route

green = flown route



## Flight notes: No irregularities.

Flight 706 Mission ID  
Cologne to Cologne

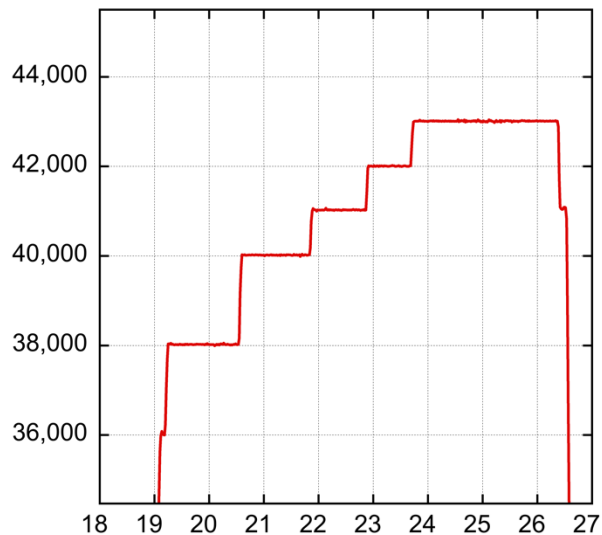
2021-03-04\_GR\_F706  
Take off date UTC:  
04-MAR-2021

Departure UTC: 18:44  
Arrival UTC: 02:57

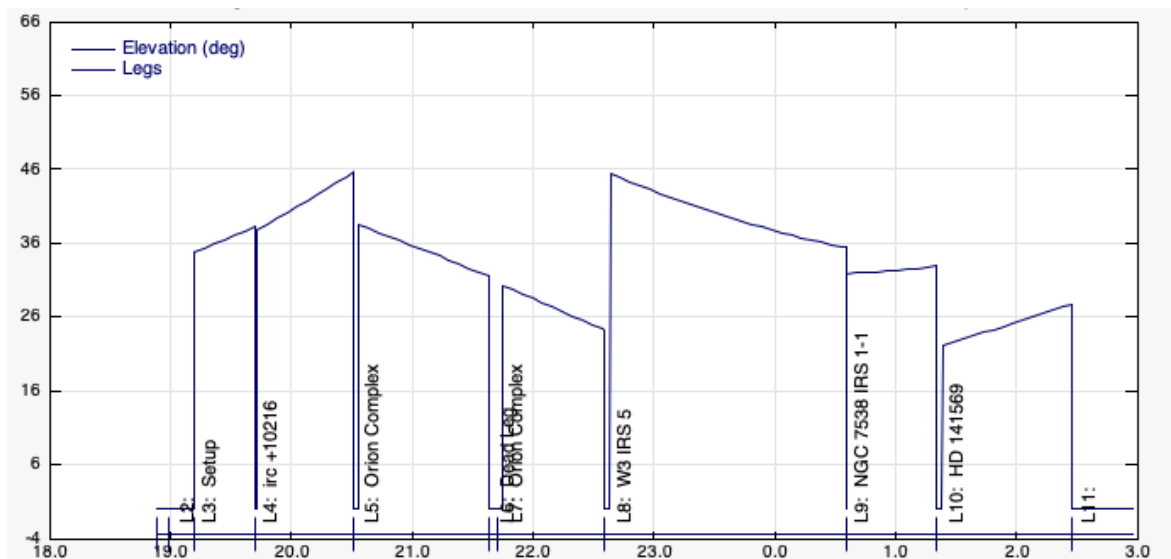
LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	08h43m13.48s	03d23m55.2s	19:12	30	
4	08_0007	Reach	irc +10216	09h48m07.99s	13d16m45.3s	19:42	48	15min loss due to scripting issue related to chop throw
5	08_0042	Kabanovic	Orion Complex	05h35m23.36s	-05d10m46.5s	20:33	65	
7	08_0042	Kabanovic	Orion Complex	05h35m23.36s	-05d10m46.5s	21:44	51	
8	08_0038	Neufeld	W3 IRS 5	02h26m22.32s	61d59m06.7s	22:38	117	
9	08_0038	Neufeld	NGC 7538 IRS 1	23h13m45.32s	61d28m11.7s	0:36	44	
10	08_0101	Balling	HD 141569	15h49m57.75s	-03d55m16.3s	1:23	64	

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



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



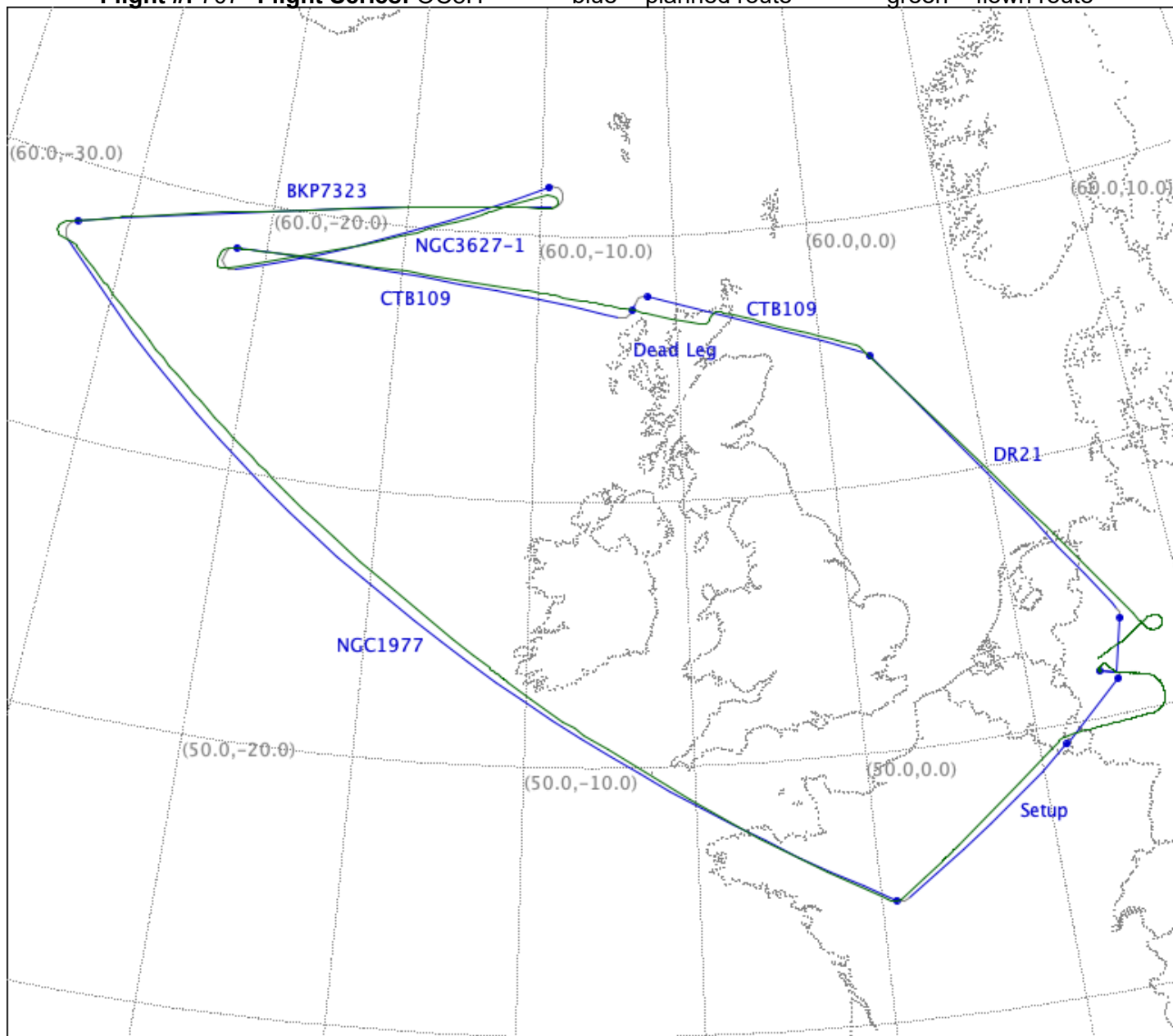
**MISSION ID: 2021-03-05\_GR\_F707**

**Date: 2021-03-05 UT Instrument: GREAT**

**Flight #: 707 Flight Series: OC8H**

blue = planned route

green = flown route



**Flight notes:**  
**No irregularities.**

Flight 707 Mission ID  
 Cologne to Cologne

2021-03-05\_GR\_F707  
 Take off date UTC:  
 05-MAR-2021

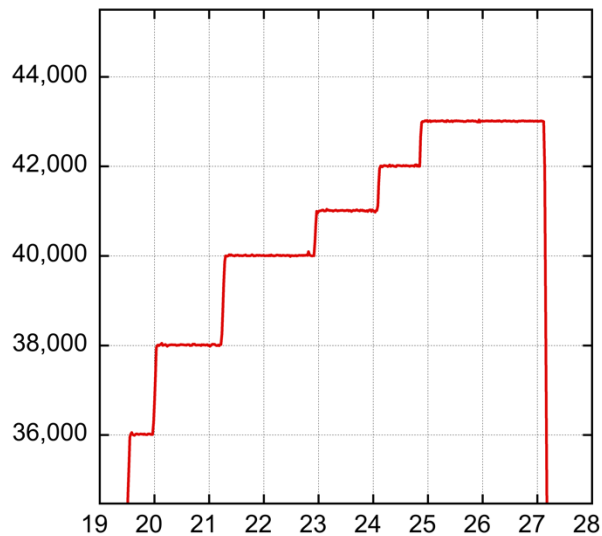
Departure UTC:  
 19:06

Arrival UTC:  
 03:37

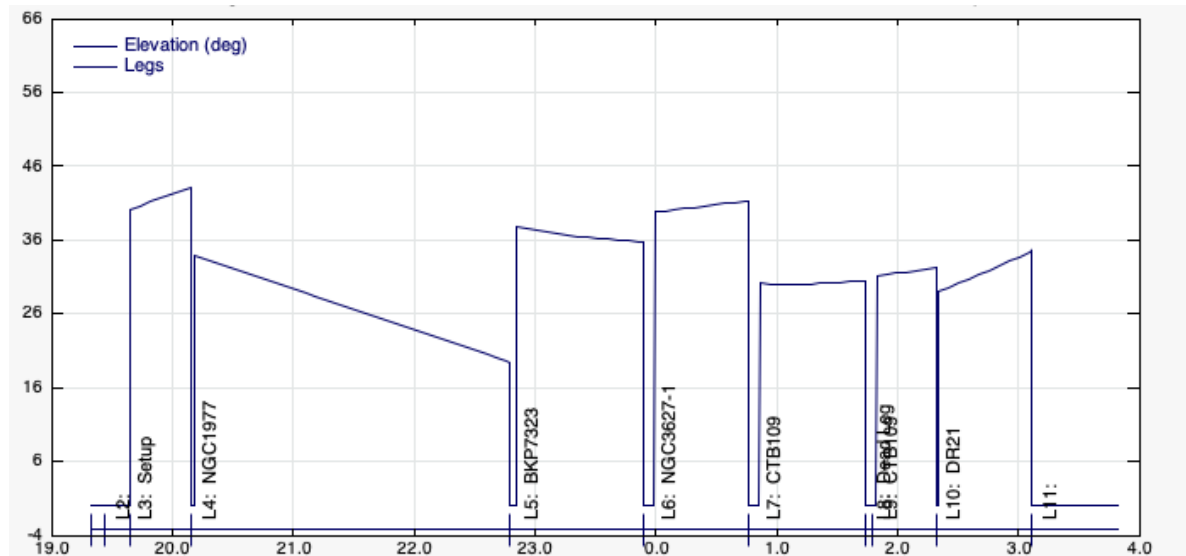
LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	08h48m25.97s	05d50m16.1s	19:39	30	
4	08_0035	Guevara	NGC1977	05h35m12.18s	-04d55m18.8s	20:11	156.5	
5	08_0062	Heyer	G109.846+4.24	22h47m46.87s	63d56m29.6s	22:51	63	
6	08_0066	Bolatto	NGC3627	11h20m16.44s	12d58m22.0s	23:59	47	
7	08_0099	Clarke	CTB109	23h02m18.31s	58d56m46.8s	0:51	52	
9	08_0099	Clarke	CTB109	23h02m18.31s	58d56m46.8s	1:49	30	
10	08_0038	Neufeld	DR21	20h39m01.61s	42d19m37.9s	2:20	46	

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



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

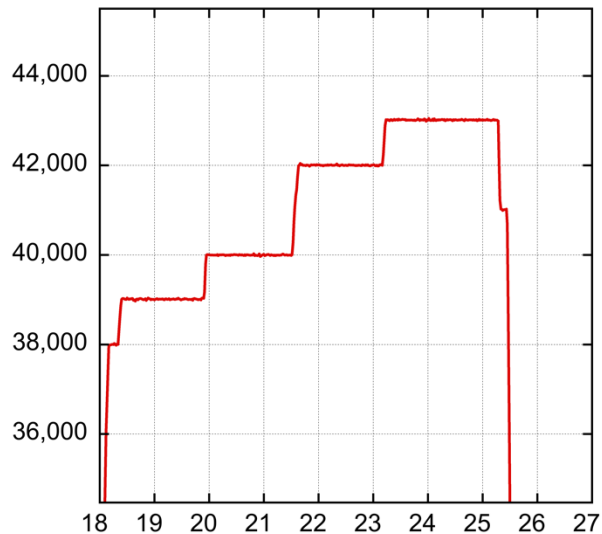




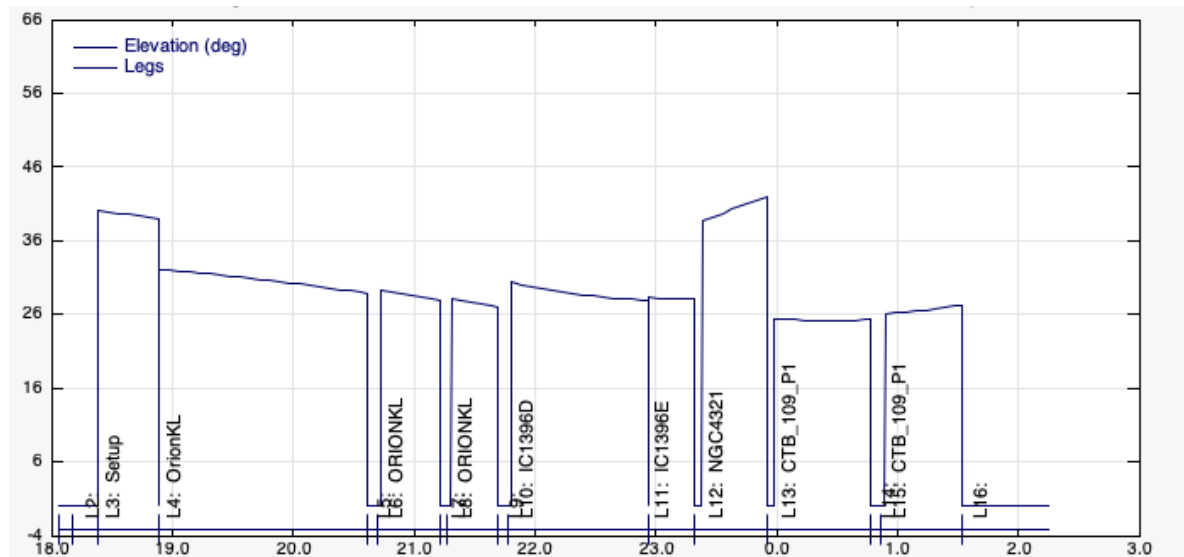
## Flight notes: HFA detector non-operational this flight.

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	05h24m44.83s	01d50m47.2s	18:23	30	
4	83_0806	GREAT Consortium	OrionKL	05h35m14.30s	-05d22m33.7s	18:53	103	
6	83_0630	GREAT Consortium	ORIONKL	05h35m14.30s	-05d22m33.7s	20:43	29	
8	83_0630	GREAT Consortium	ORIONKL	05h35m14.30s	-05d22m33.7s	21:18	23	
10	83_0809	GREAT Consortium	IC1396D	21h33m08.00s	57d59m30.0s	21:48	68	
11	83_0809	GREAT Consortium	IC1396E	21h40m39.00s	58d16m48.0s	22:56	23	
12	08_0066	Bolatto	NGC4321	12h22m52.98s	15d49m27.5s	23:22	32	Telescope power loss led to loss of 25% of data collection time.
13	83_0724	GREAT Consortium	CTB_109_P1	23h01m39.14s	58d56m49.9s	23:58	48	
15	83_0724	GREAT Consortium	CTB_109_P1	23h01m39.14s	58d56m49.9s	0:54	38	

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



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



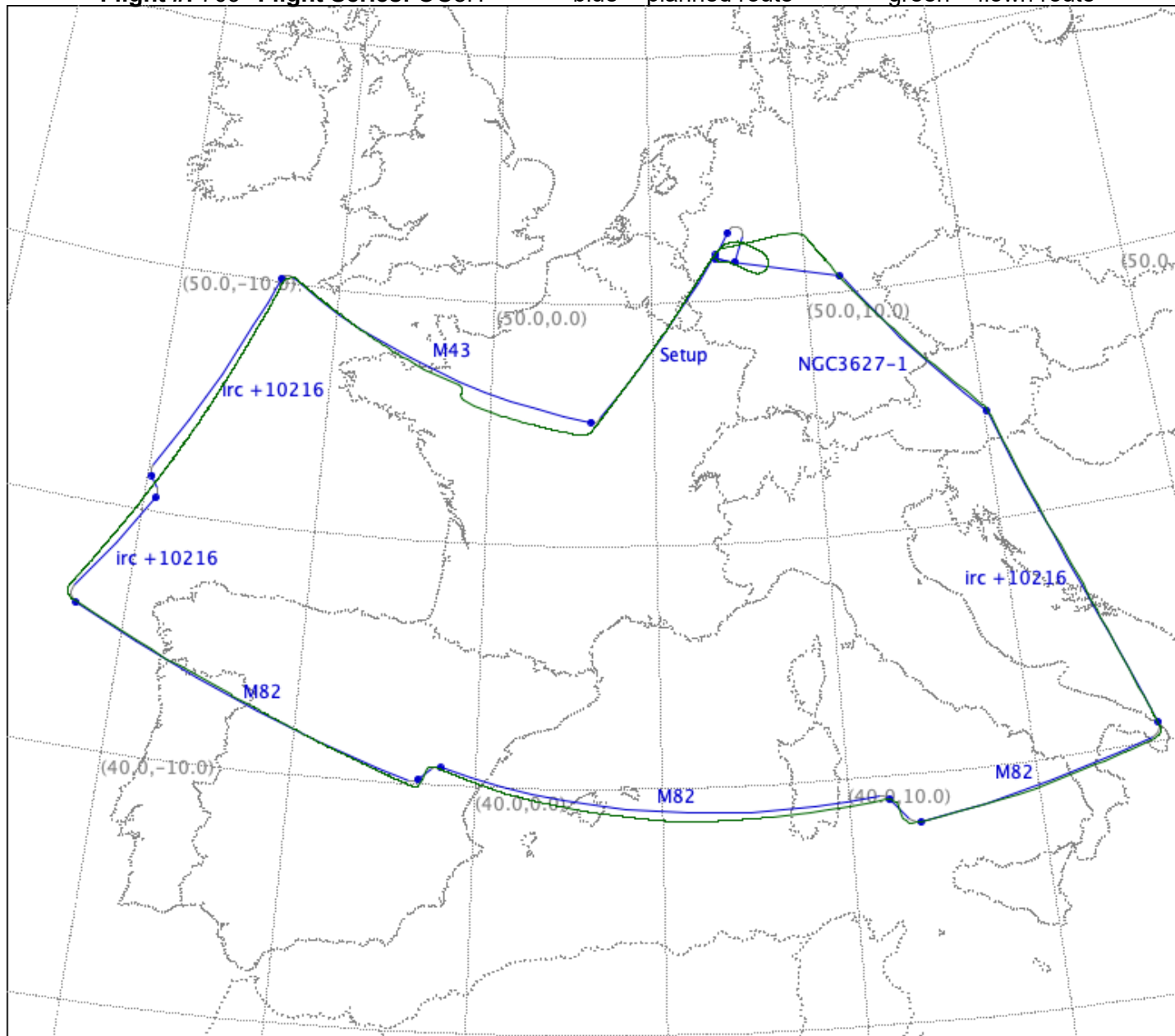
**MISSION ID: 2021-03-10\_GR\_F709**

**Date: 2021-03-10 UT Instrument: GREAT**

**Flight #: 709 Flight Series: OC8H**

blue = planned route

green = flown route

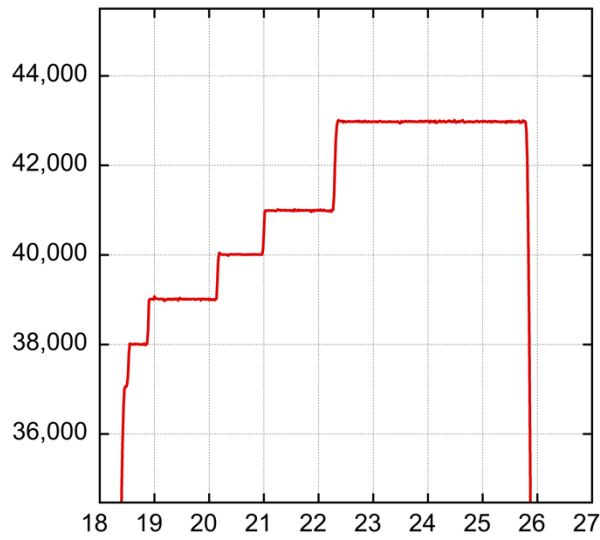


## Flight notes: Some weather led to minor losses of observing time.

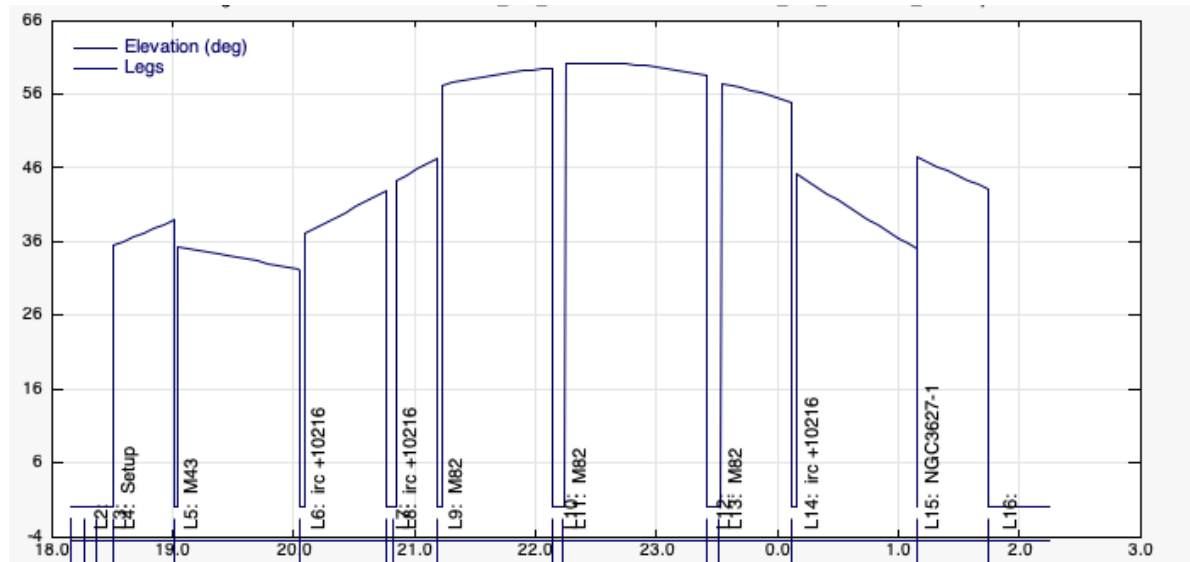
Flight 709 Mission ID 2021-03-10\_GR\_F709  
 Cologne to Cologne Take off date UTC: 10-MAR-2021  
 Departure UTC: 18:02 Arrival UTC: 02:27  
 LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	08h37m39.37s	05d42m13.6s	18:30	30	
5	08_0040	Guevara	M43	05h35m32.10s	-05d16m05.7s	19:01	61	Clouds/moisture led to delayed opening of telescope door; half of leg lost
6	08_0007	Reach	irc +10216	09h48m07.99s	13d16m45.3s	20:05	40	
8	08_0007	Reach	irc +10216	09h48m07.99s	13d16m45.3s	20:50	20	
9	08_0225	Levy	M82	09h55m52.72s	69d40m45.8s	21:13	55	
11	08_0225	Levy	M82	09h55m52.72s	69d40m45.8s	22:14	70	
13	08_0225	Levy	M82	09h55m52.72s	69d40m45.8s	23:31	35	
14	08_0007	Reach	irc +10216	09h48m07.99s	13d16m45.3s	0:09	59	
15	08_0066	Bolatto	NGC3627	11h20m16.44s	12d58m22.0s	1:08	35	Some turbulence at end of leg causing guiding failures

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



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





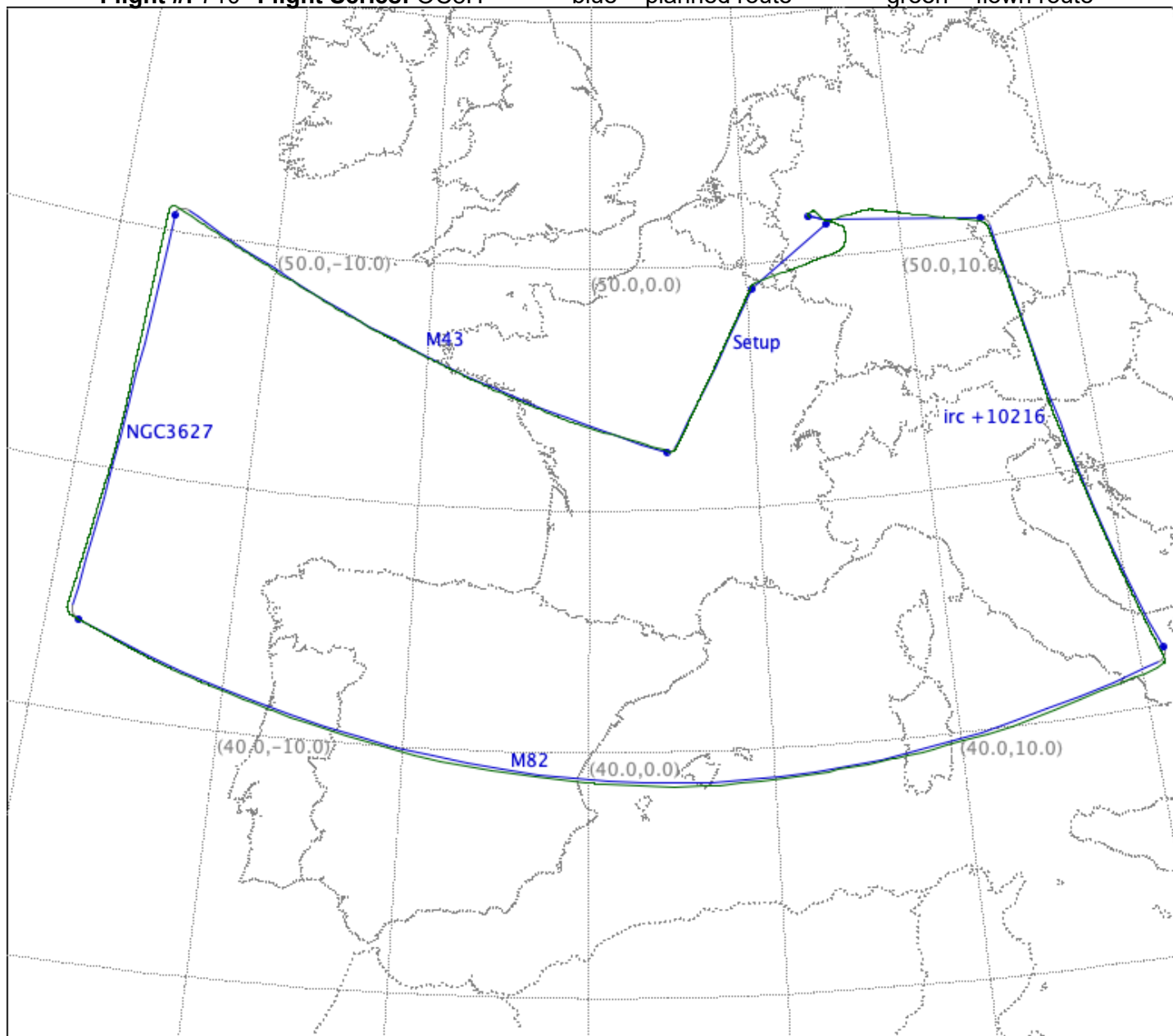
**MISSION ID: 2021-03-11\_GR\_F710**

**Date: 2021-03-11 UT Instrument: GREAT**

**Flight #: 710 Flight Series: OC8H**

blue = planned route

green = flown route



**Flight notes:  
No irregularities.**

Flight 710 Mission ID  
Cologne to Cologne

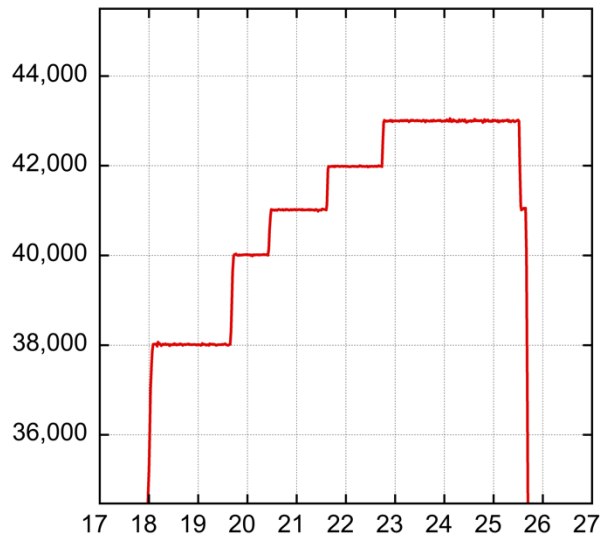
2021-03-11\_GR\_F710  
Take off date UTC:  
11-MAR-2021

Departure UTC: 17:36  
Arrival UTC: 02:08

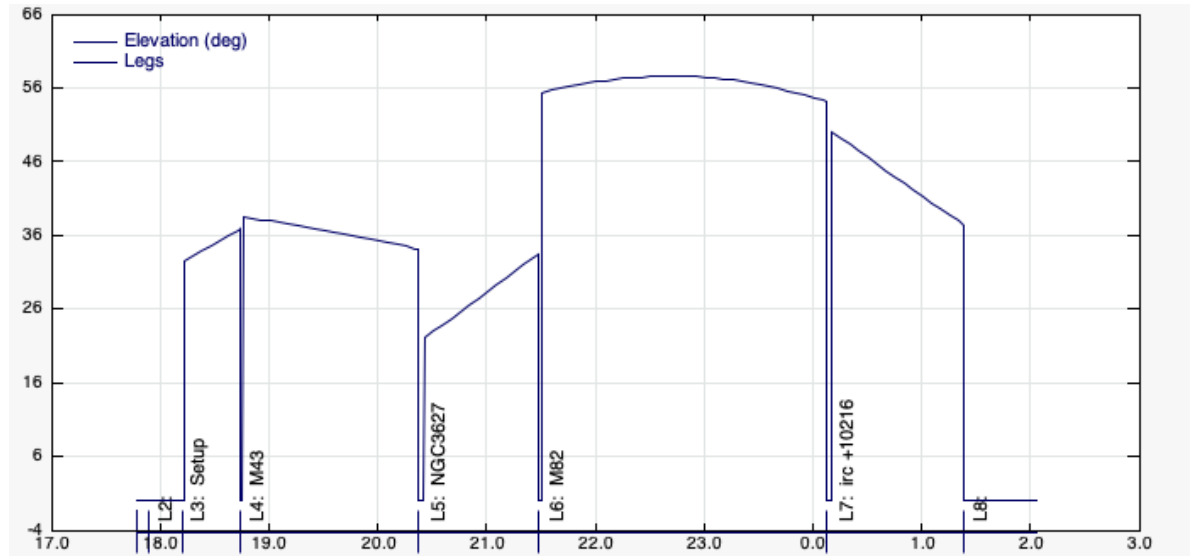
LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	08h48m25.97s	05d50m16.1s	18:12	31	
4	08_0040	Guevara	M43	05h35m32.10s	-05d16m05.7s	18:45	97	
5	08_0066	Bolatto	NGC3627	11h20m16.44s	12d58m22.0s	20:25	63	
6	08_0225	Levy	M82	09h55m52.72s	69d40m45.8s	21:30	157	
7	08_0007	Reach	irc +10216	09h48m07.99s	13d16m45.3s	0:10	73	

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



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



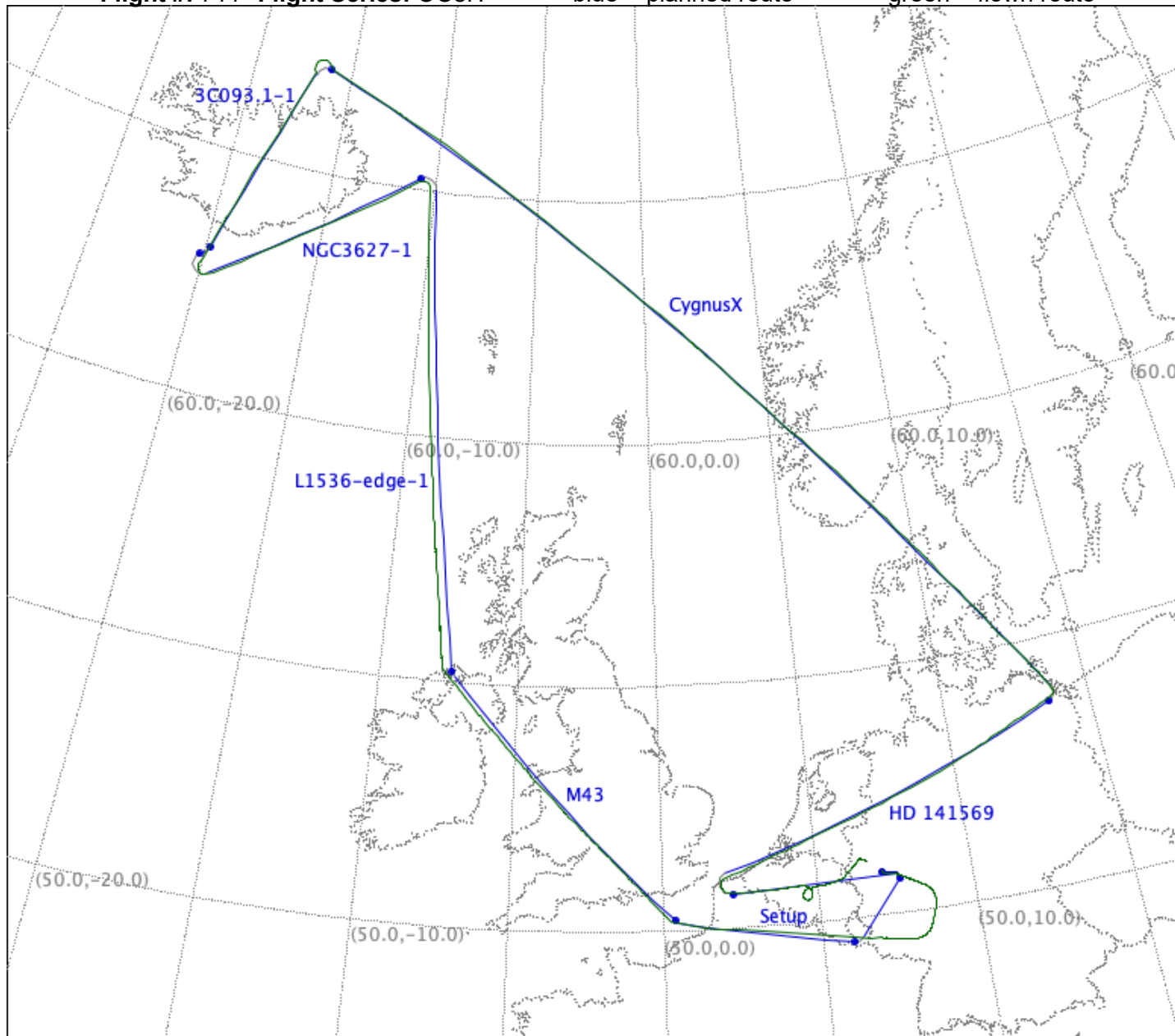
**MISSION ID: 2021-03-12\_GR\_F711**

**Date: 2021-03-12 UT Instrument: GREAT**

**Flight #: 711 Flight Series: OC8H**

blue = planned route

green = flown route



# Flight notes: No irregularities.

Flight 711 Mission ID  
Cologne to Cologne

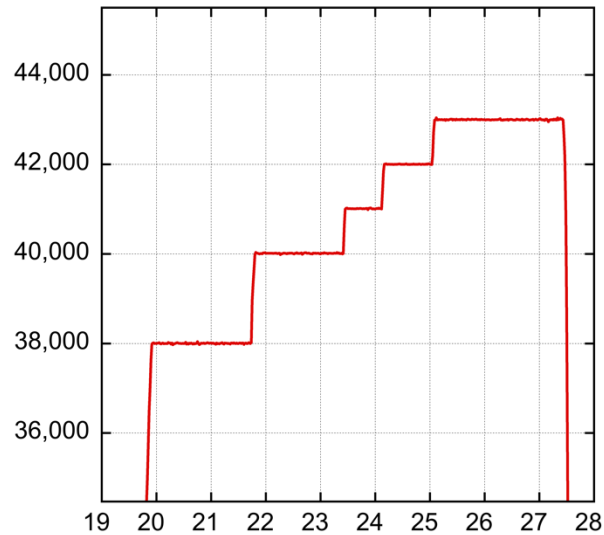
2021-03-12\_GR\_F711  
Take off date UTC:  
12-MAR-2021

Departure UTC: 19:27  
Arrival UTC: 03:59

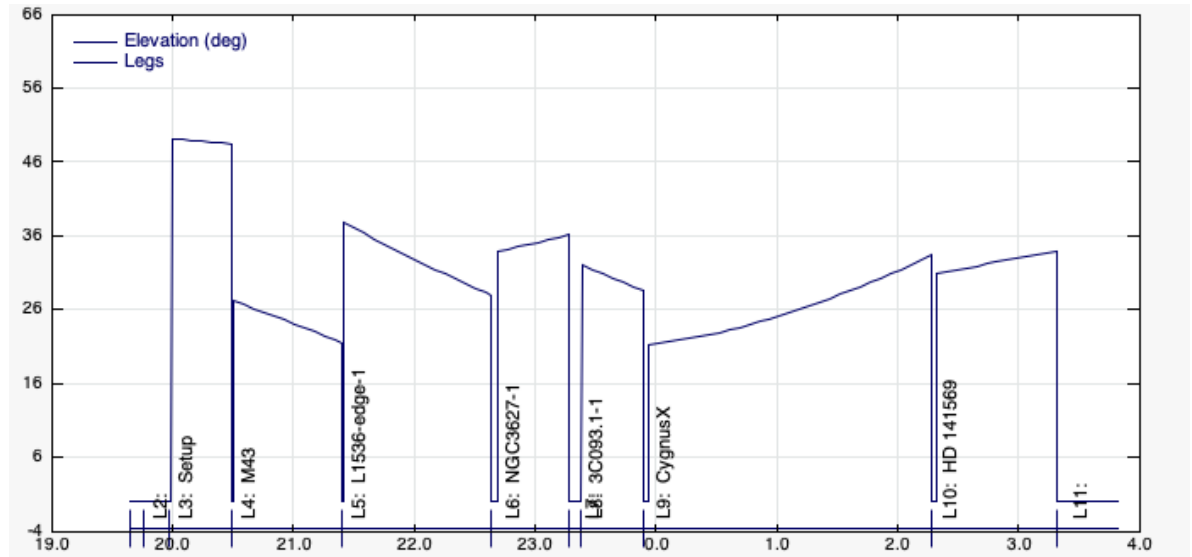
LFA-HFA

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
3			Setup	07h28m09.79s	08d55m31.9s	19:59	30	
4	08_0040	Guevara	M43	05h35m32.10s	-05d16m05.7s	20:30	54	
5	08_0081	Walch	L1536-edge	04h33m03.27s	22d15m58.6s	21:25	73	
6	08_0066	Bolatto	NGC3627	11h20m16.44s	12d58m22.0s	22:41	35	
8	08_0173	Stanimirovic	3C093.1	03h48m46.93s	33d53m15.4s	23:23	30.5	
9	07_0077	Tielens	CygnusX	20h38m39.46s	42d20m44.5s	23:56	140	
10	08_0101	Balling	HD 141569	15h49m57.75s	-03d55m16.3s	2:19	60	

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



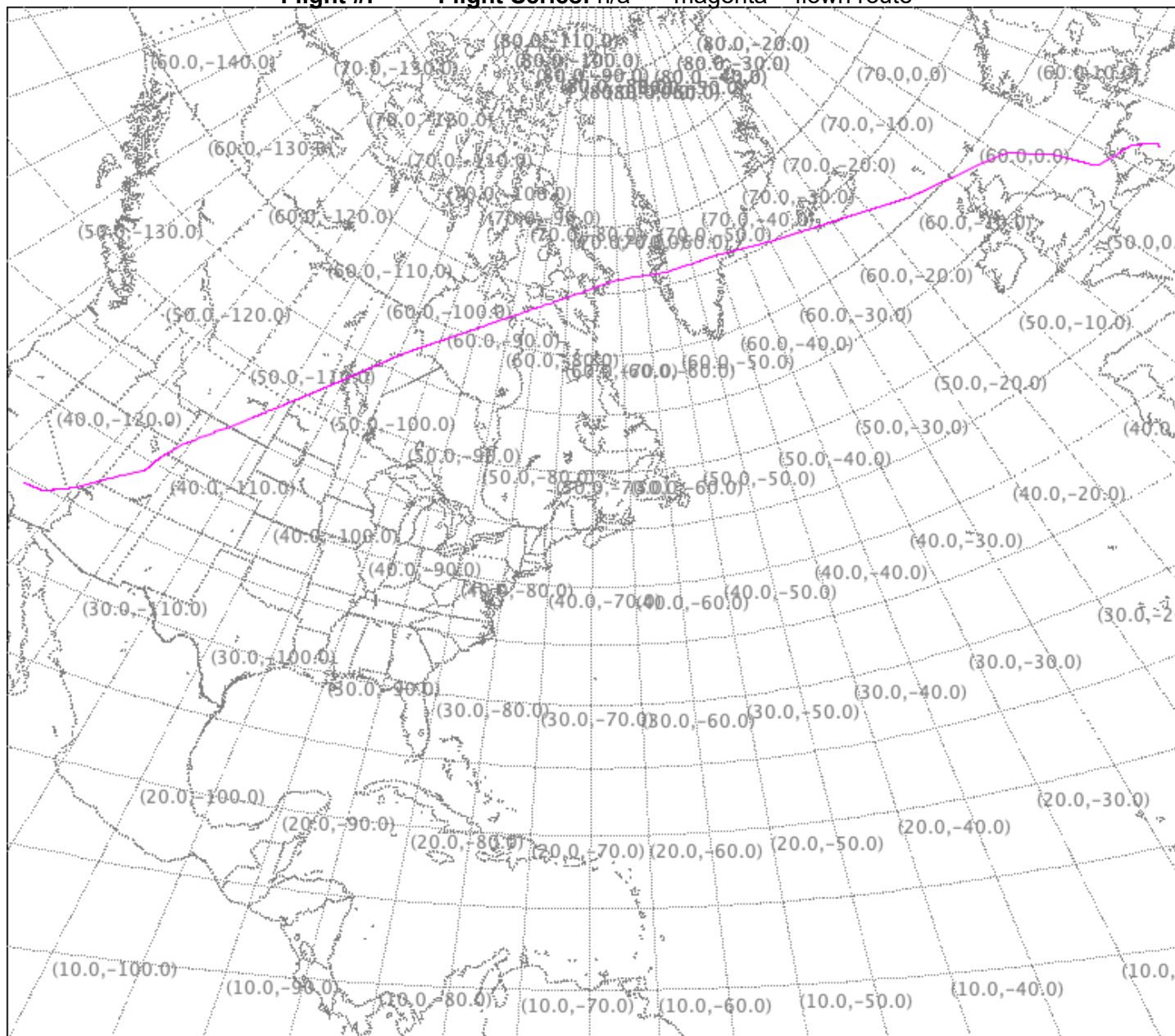
Planned target elevation (deg.) vs. time (UTC hrs.)



# MISSION ID: 2021-03-15\_NO\_F712

Date: 2021-03-15UT Instrument: n/a

Flight #: Flight Series: n/a magenta = flown route



**Flight notes:**

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

Flight 712  
Cologne to  
Palmdale

Mission ID 2021-03-15\_NO\_F712  
Take off date UTC:  
15-MAR-2021

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

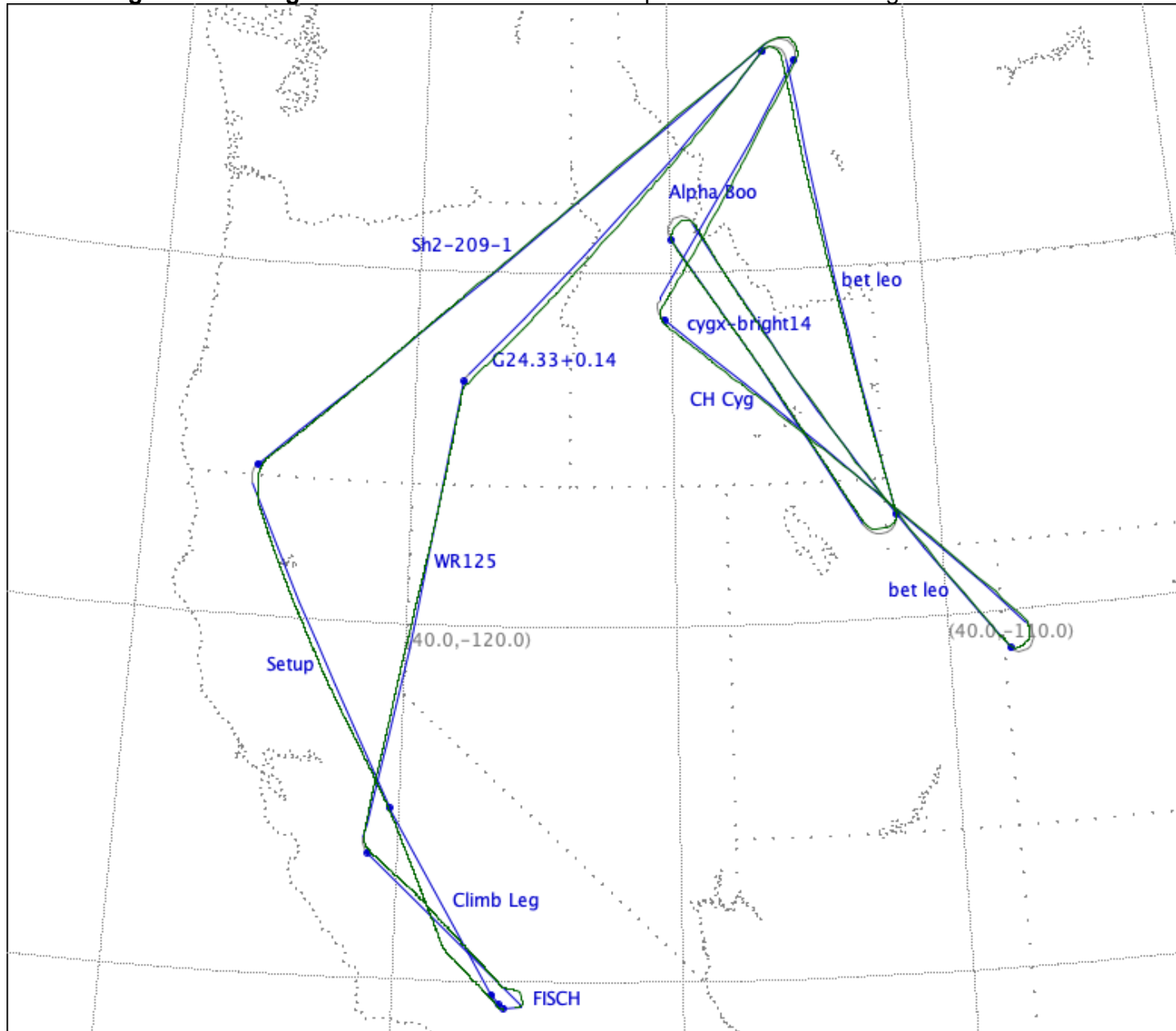
**MISSION ID: 2021-04-07\_FO\_F713**

**Date: 2021-04-07 UT Instrument: FORCAST**

**Flight #: 713 Flight Series: OC8I**

blue = planned route

green = flown route



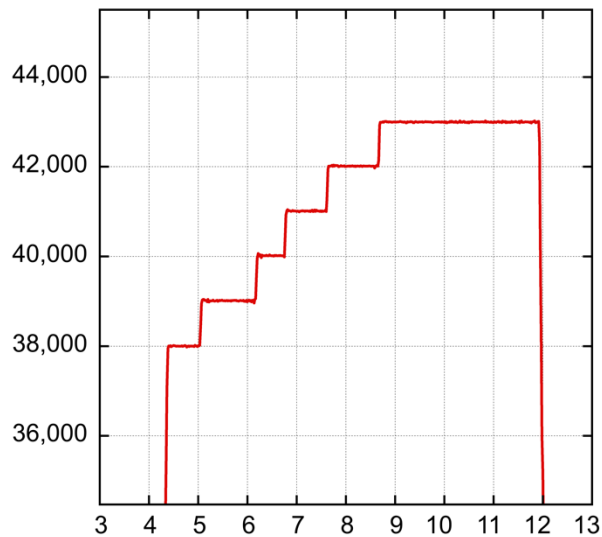
## Flight notes:

**Elongation and double sources for observations with chop/nod throws larger than 90 arcsec.**

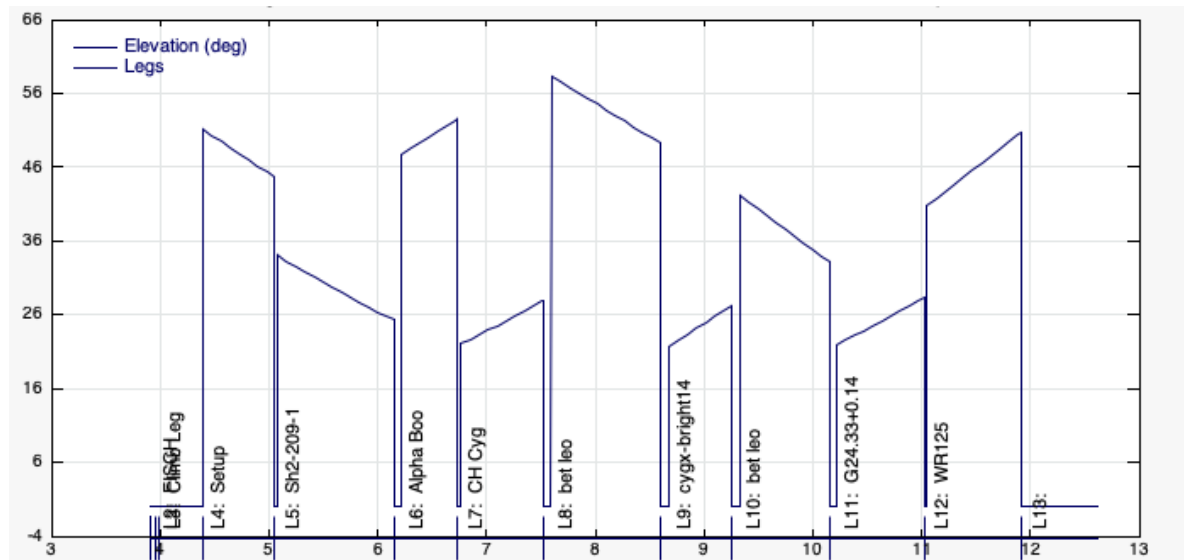
Flight 713 Mission ID 2021-04-07\_FO\_F713  
 Palmdale to Palmdale Take off date UTC: 07-APR-2021  
 Departure UTC: 03:56 Arrival UTC: 12:26

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	07h28m09.79s	08d55m31.9s	4:23	39	
5	08_0119	Lau	Sh2-209	04h11m09.00s	51d09m54.9s	5:04	64	
6	90_0060	Calibration	Alpha Boo	14h15m39.67s	19d10m56.7s	6:13	30.25	
7	08_0192	Sankrit	CH Cyg	19h24m33.07s	50d14m29.1s	6:46	45.27	
8	08_0154	Faramaz	bet leo	11h49m03.58s	14d34m19.4s	7:36	60	Dither scripting error led to 70% loss of data collection on leg.
9	08_0181	Gutermuth	Cyg X	20h23m23.00s	37d35m25.0s	8:41	34	Elongation and double sources for observations with chop/nod throws larger than 90 arcsec
10	08_0154	Faramaz	bet leo	11h49m03.58s	14d34m19.4s	9:19	50	
11	08_0163	Stecklum	G24.33+0.14	18h35m08.14s	-07d35m04.1s	10:13	49	Elongation and double sources for observations with chop/nod throws larger than 90 arcsec
12	08_0220	Richardson	WR125	19h28m15.61s	19d33m21.5s	11:03	51.63	

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



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





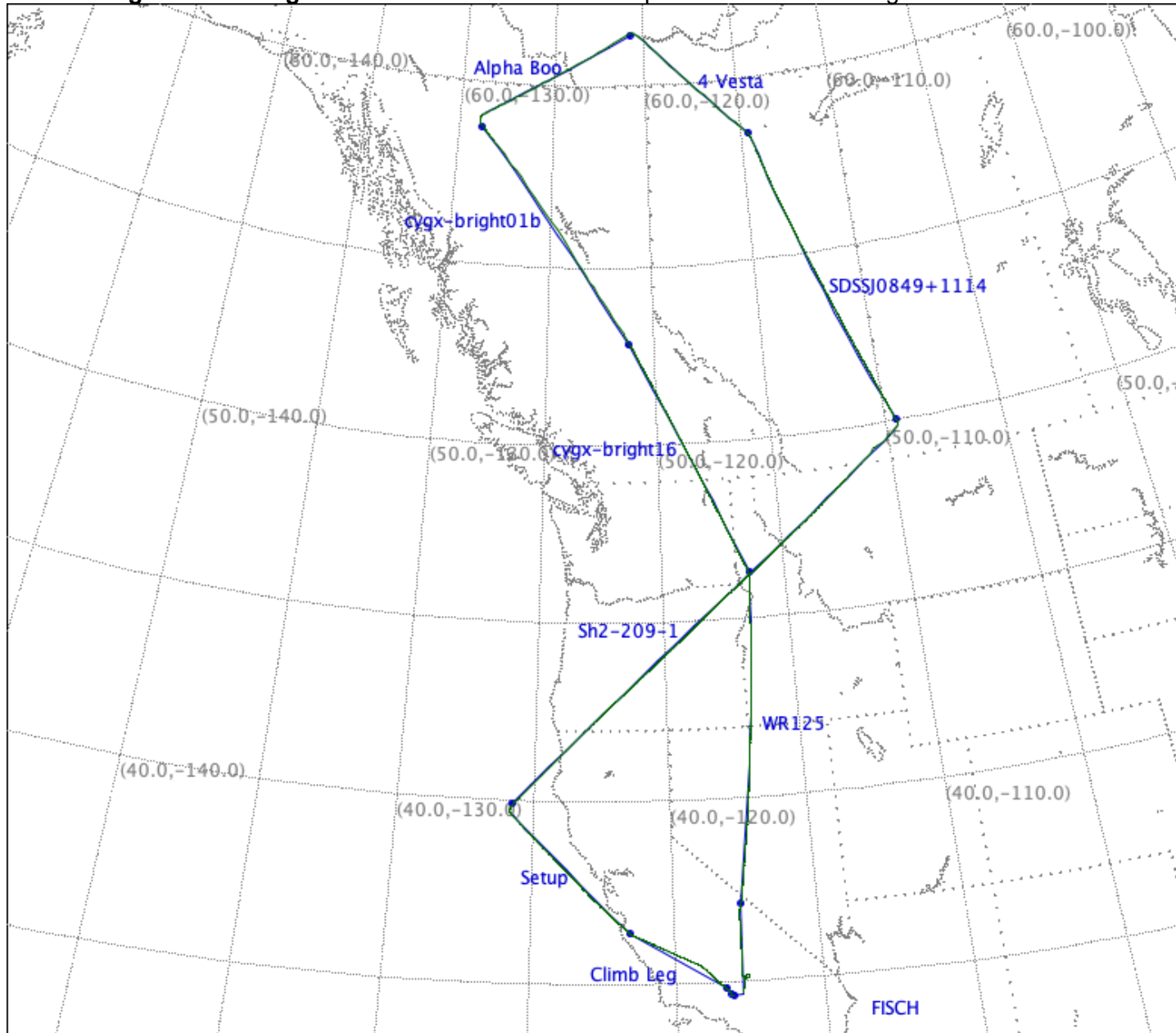
**MISSION ID: 2021-04-08\_FO\_F714**

**Date: 2021-04-08 UT Instrument: FORCAST**

**Flight #: 714 Flight Series: OC8I**

blue = planned route

green = flown route



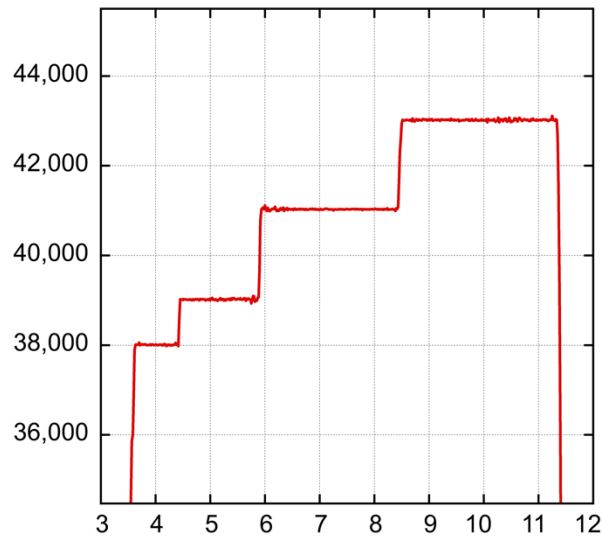
## Flight notes:

**Turbulence early in flight led to some data collection losses.**

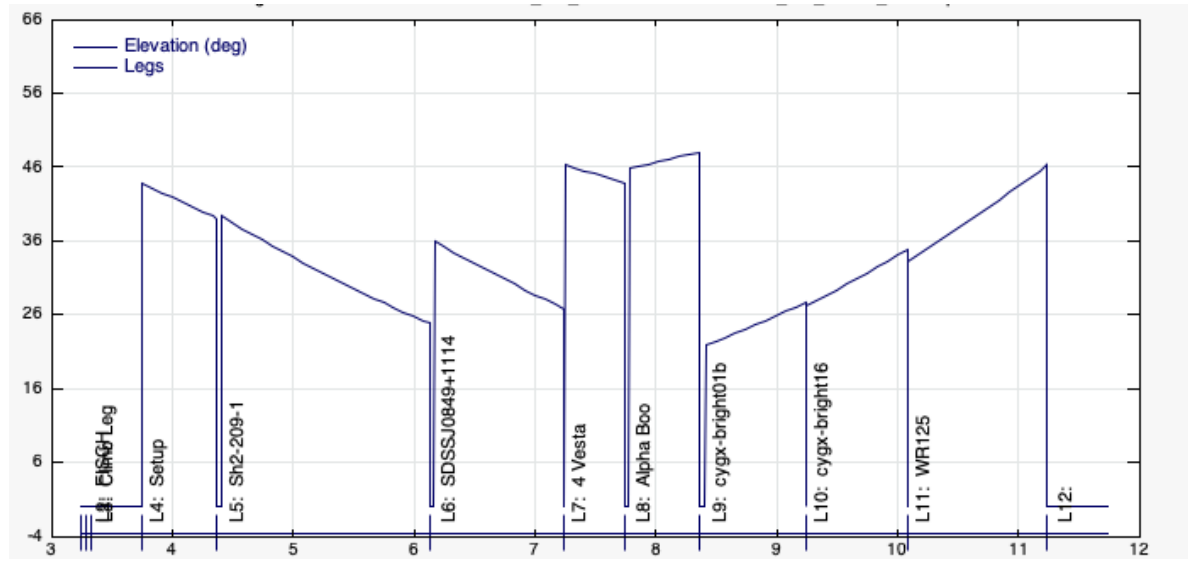
Flight 714 Mission ID 2021-04-08\_FO\_F714  
 Palmdale to Palmdale Take off date UTC: 08-APR-2021  
 Departure UTC: 03:14 Arrival UTC: 11:48

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	07h10m13.68s	-04d14m13.6s	3:45	37	
5	08_0119	Lau	Sh2-209	04h11m09.00s	51d09m54.9s	4:24	103	Turbulence put telescope in standby multiple times; data collection time lost in reacquiring target
6	08_0259	Liu	SDSSJ0849+1114	08h49m05.51s	11d14m47.2s	6:10	64	First 40% of leg lost due to turbulence putting telescope in standby
7	90_0050	Calibration	4 Vesta	10h51m18.22s	18d44m27.1s	7:14	30	
8	90_0060	Calibration	Alpha Boo	14h15m39.67s	19d10m56.7s	7:46	35	
9	08_0181	Gutermuth	Cyg X	20h32m33.00s	40d16m36.0s	8:24	50	
10	08_0181	Gutermuth	Cyg X	20h21m44.00s	37d30m42.0s	9:14	50	
11	08_0220	Richardson	WR125	19h28m15.61s	19d33m21.5s	10:05	69	

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



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



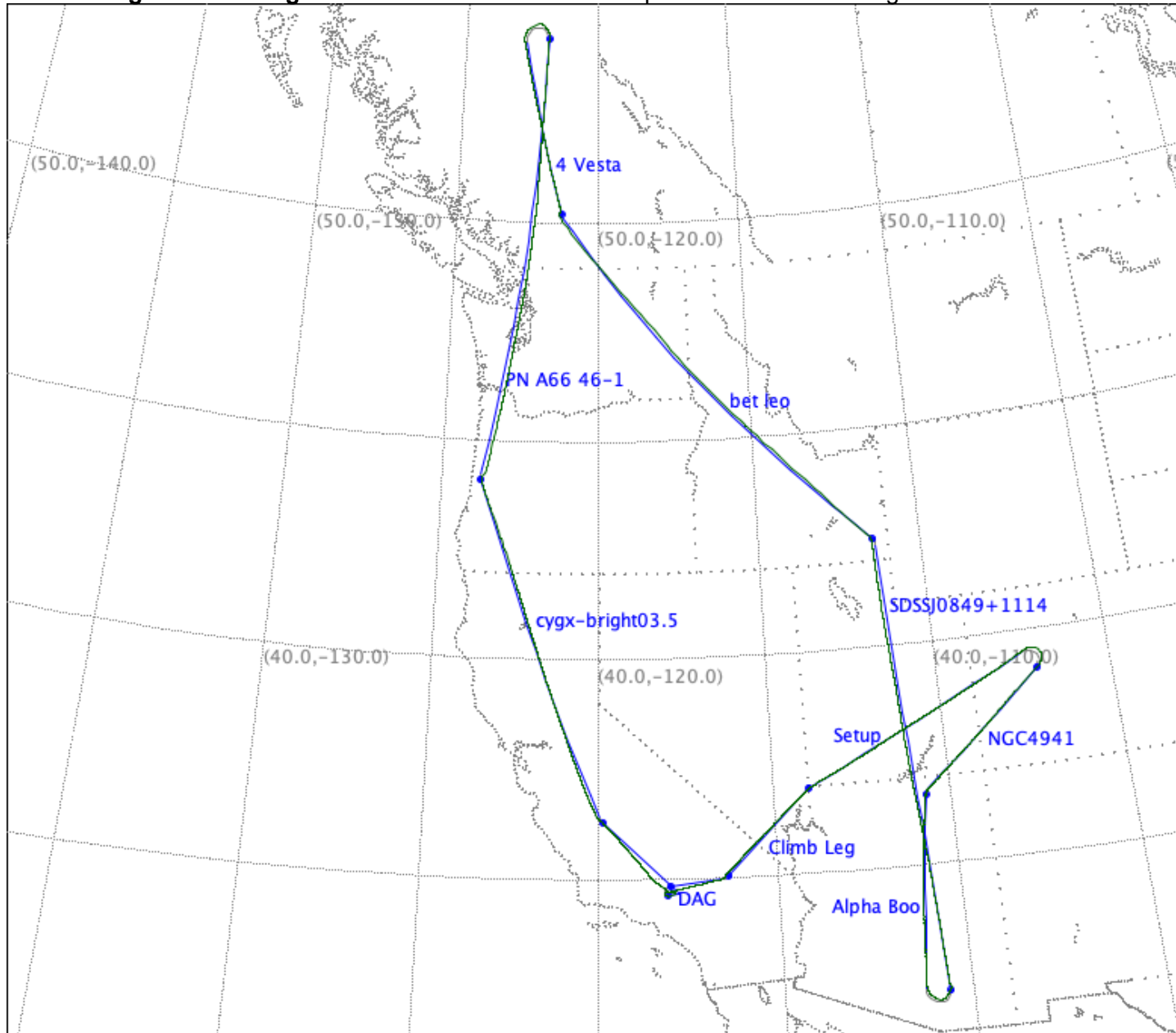
**MISSION ID: 2021-04-09\_FO\_F715**

**Date: 2021-04-09 UT Instrument: FORCAST**

**Flight #: 715 Flight Series: OC8I**

blue = planned route

green = flown route

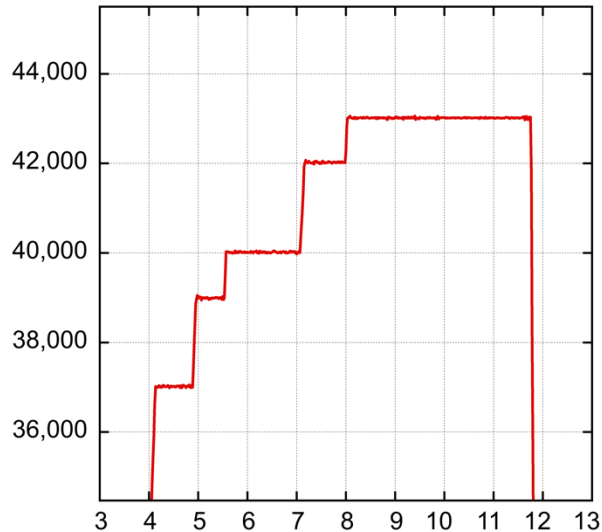


# Flight notes: No irregularities.

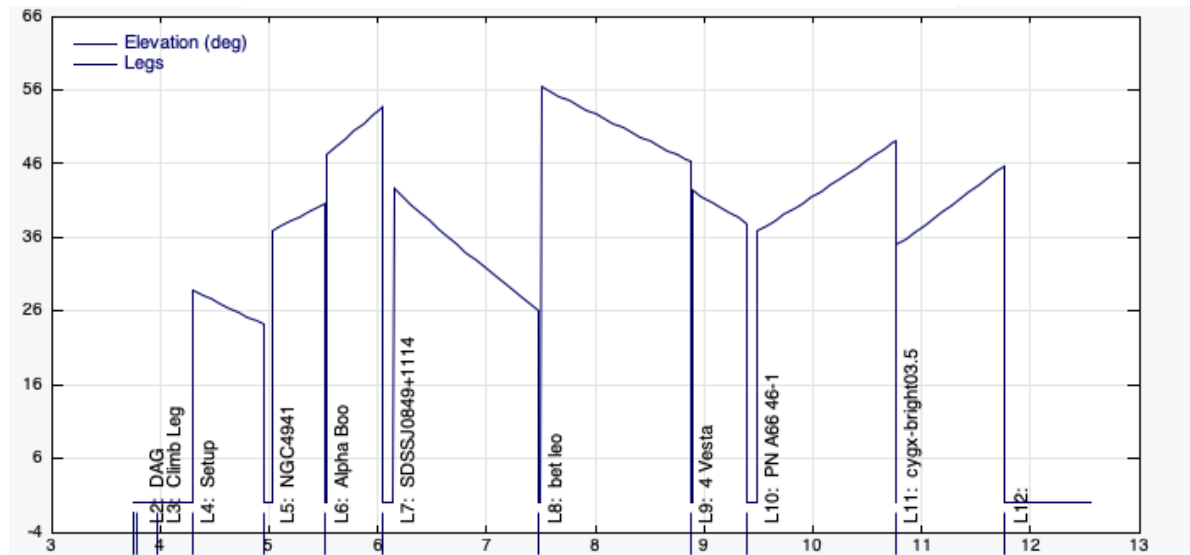
Flight 715 Mission ID 2021-04-09\_FO\_F715  
 Palmdale to Palmdale Take off date UTC: 09-APR-2021  
 Departure UTC: 03:40 Arrival UTC: 12:09

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	03h29m04.13s	59d56m25.2s	4:17	39	
5	08_0014	Lopez-Rodriguez	NGC4941	13h04m13.11s	-05d33m05.8s	5:01	29	
6	90_0060	Calibration	Alpha Boo	14h15m39.67s	19d10m56.7s	5:31	31	
7	08_0259	Liu	SDSSJ0849+1114	08h49m05.51s	11d14m47.2s	6:08	80	
8	08_0154	Faramaz	bet leo	11h49m03.58s	14d34m19.4s	7:29	83	
9	90_0050	Calibration	4 Vesta	10h50m52.14s	18d44m37.1s	8:53	30	
10	08_0161	Guzman-Ramirez	PN A66 46	18h31m18.29s	26d56m12.9s	9:28	76	Target too faint to be acquired properly.
11	08_0181	Gutermuth	Cyg X	20h27m20.00s	37d22m54.0s	10:45	59	

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



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



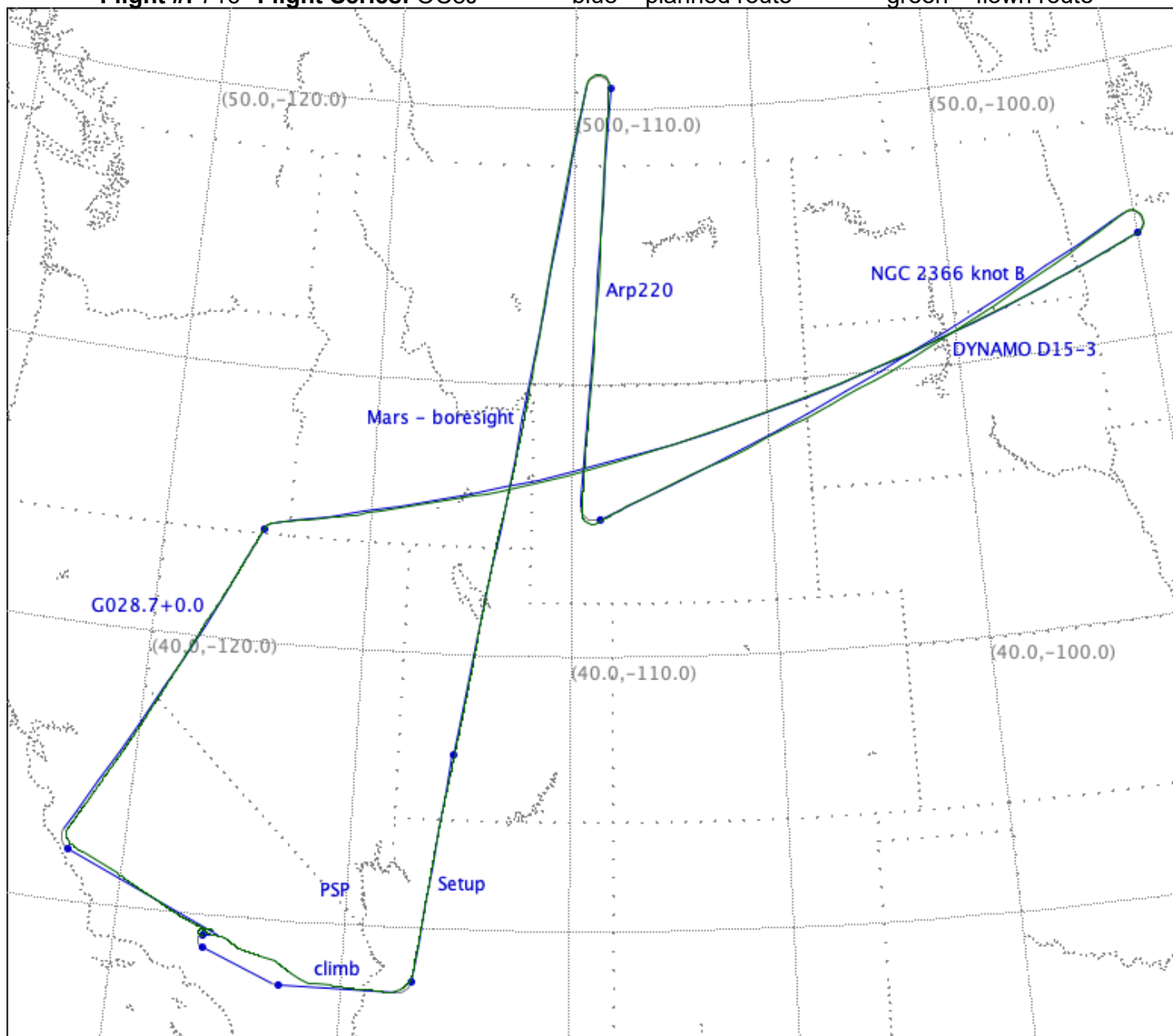
**MISSION ID: 2021-04-13\_FI\_F716**

**Date: 2021-04-13 UT Instrument: FIFI-LS**

**Flight #: 716 Flight Series: OC8J**

blue = planned route

green = flown route

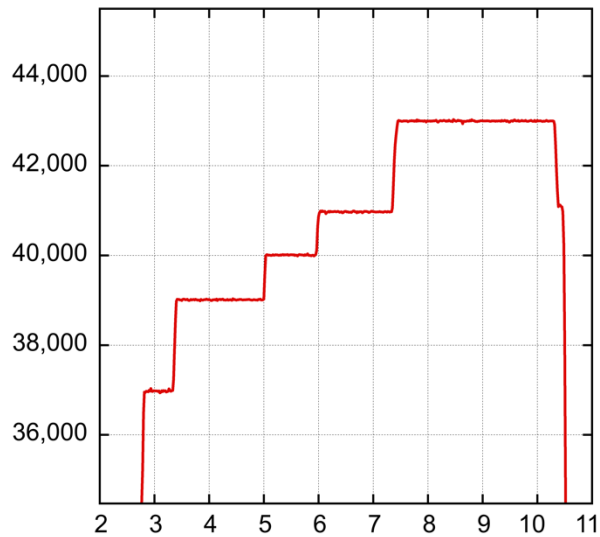


**Flight notes:**  
**No irregularities.**

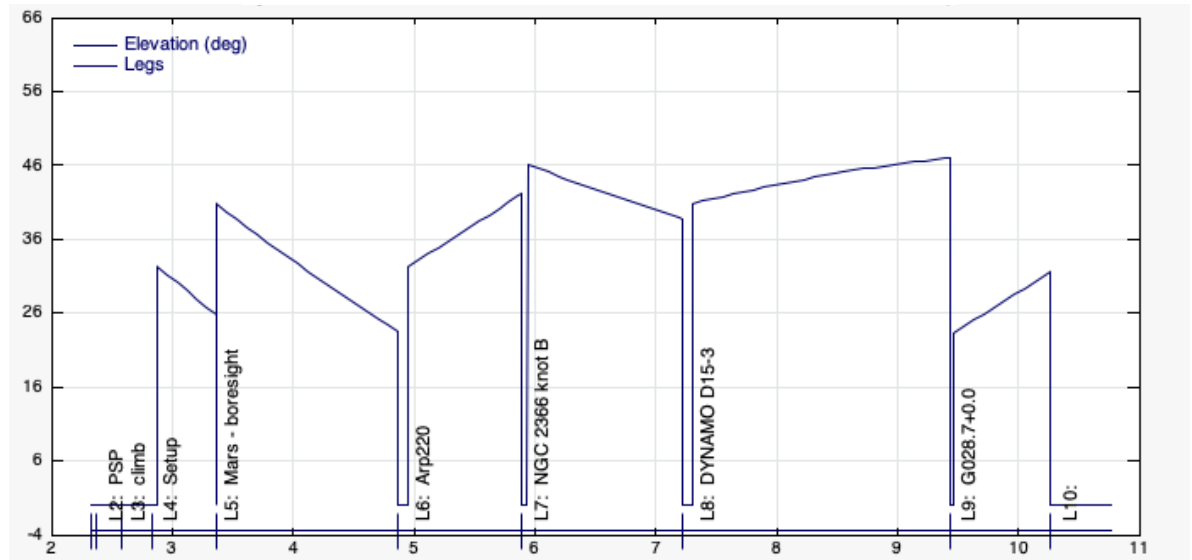
Flight 716 Mission ID 2021-04-13\_FI\_F716  
 Palmdale to Palmdale Take off date UTC: 13-APR-2021  
 Departure UTC: 02:18 Arrival UTC: 10:53

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	04h35m55.23s	16d30m33.5s	2:52	30	
5	90_0032	Calibration	Mars	05h31m12.57s	24d44m52.0s	3:22	90	
6	08_0095	Ma	Arp220	15h34m57.25s	23d30m11.3s	4:56	56	
7	08_0243	Diaz-Santos	NGC 2366 knot B	07h28m44.33s	69d11m22.9s	5:56	77	
8	08_0238	Lenkic	DYNAMO D15-3	15h34m35.40s	-00d28m44.6s	7:18	128	
9	08_0023	Pineda	G028.7+0.0	18h43m42.03s	-03d46m10.1s	9:28	48	

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



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



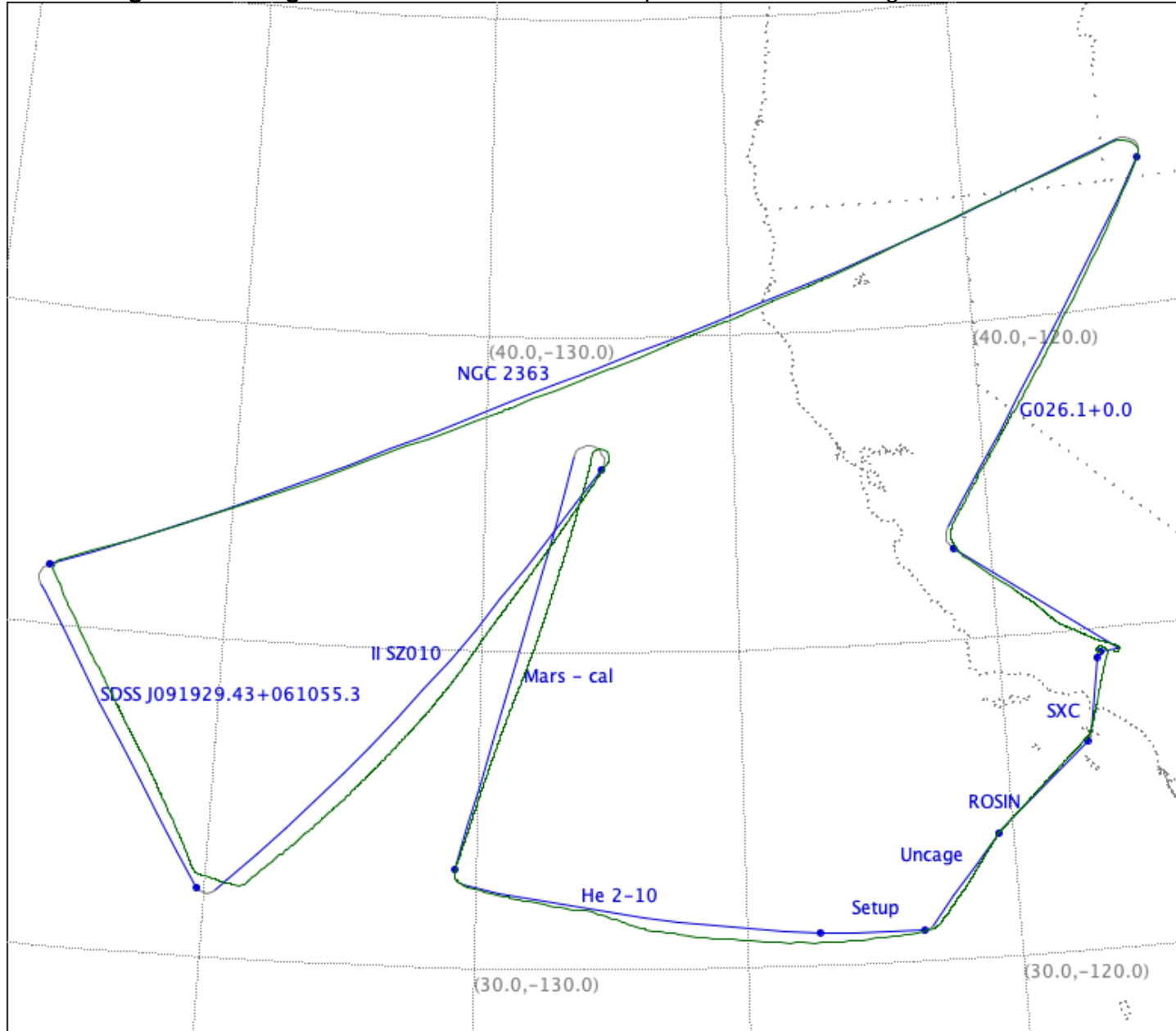
**MISSION ID: 2021-04-14\_FI\_F717**

**Date: 2021-04-14 UT Instrument: FIFI-LS**

**Flight #: 717 Flight Series: OC8J**

blue = planned route

green = flown route



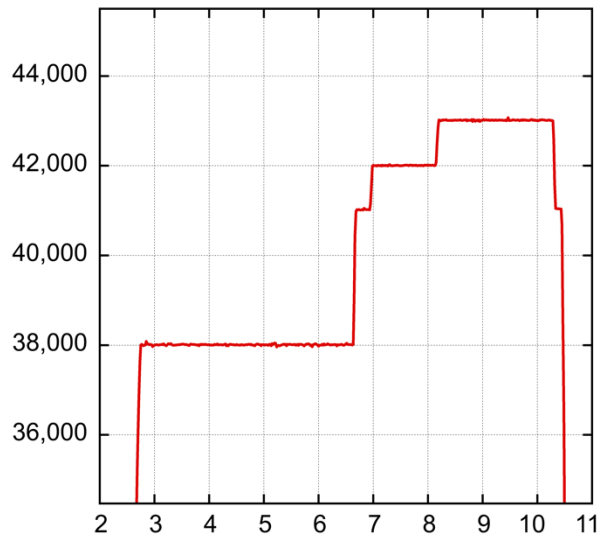
## Flight notes:

**Frequent turbulence and clouds; held to low altitude in first half of flight.**

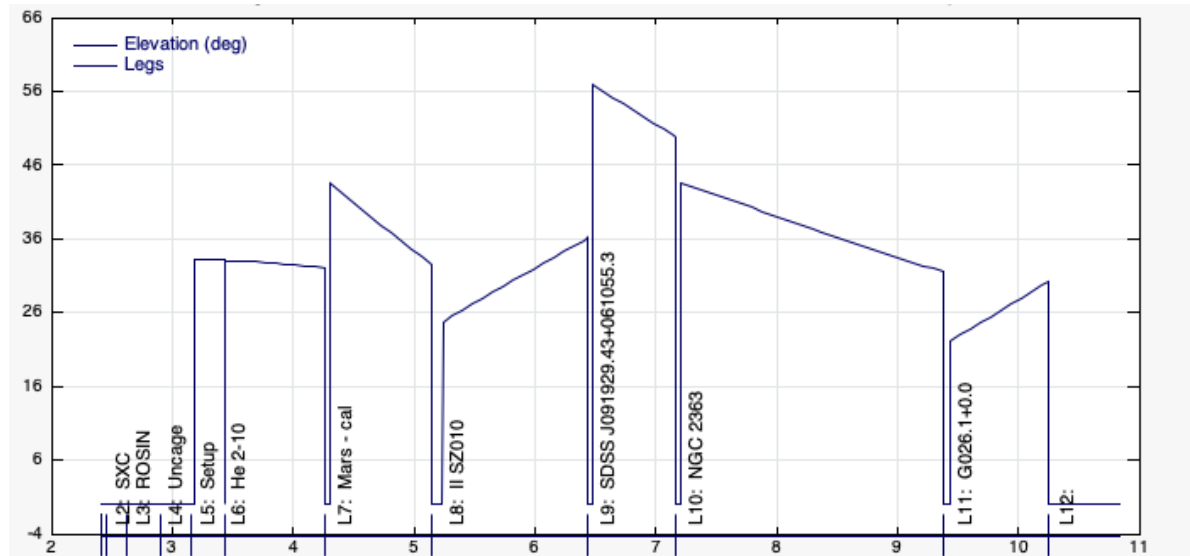
Flight 717 Mission ID 2021-04-14\_FI\_F717  
 Palmdale to Palmdale Take off date UTC: 14-APR-2021 Departure UTC: 02:20 Arrival UTC: 10:50

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	08h37m52.15s	-26d15m18.0s	3:11	15	
6	08_0117	Vacca	He 2-10	08h36m15.13s	-26d24m33.8s	3:26	50	Low altitude (38k ft); stopped data-taking for 16min because of clouds
7	90_0033	Calibration	Mars	05h33m58.49s	24d46m35.5s	4:18	50	Low altitude (38k ft); High water vapor.
8	08_0226	Petric	II SZ010	13h13m05.79s	-11d07m42.4s	5:14	72	Low altitude (38k ft); High water vapor.
9	08_0238	Lenkic	SDSS J091929.43+061055.3	09h19m29.44s	06d10m55.4s	6:29	41	
10	08_0071	Jones	NGC 2363	07h28m42.70s	69d11m23.0s	7:13	130	
11	08_0023	Pineda	G026.1+0.0	18h38m54.39s	-06d05m19.9s	9:27	48	

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



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





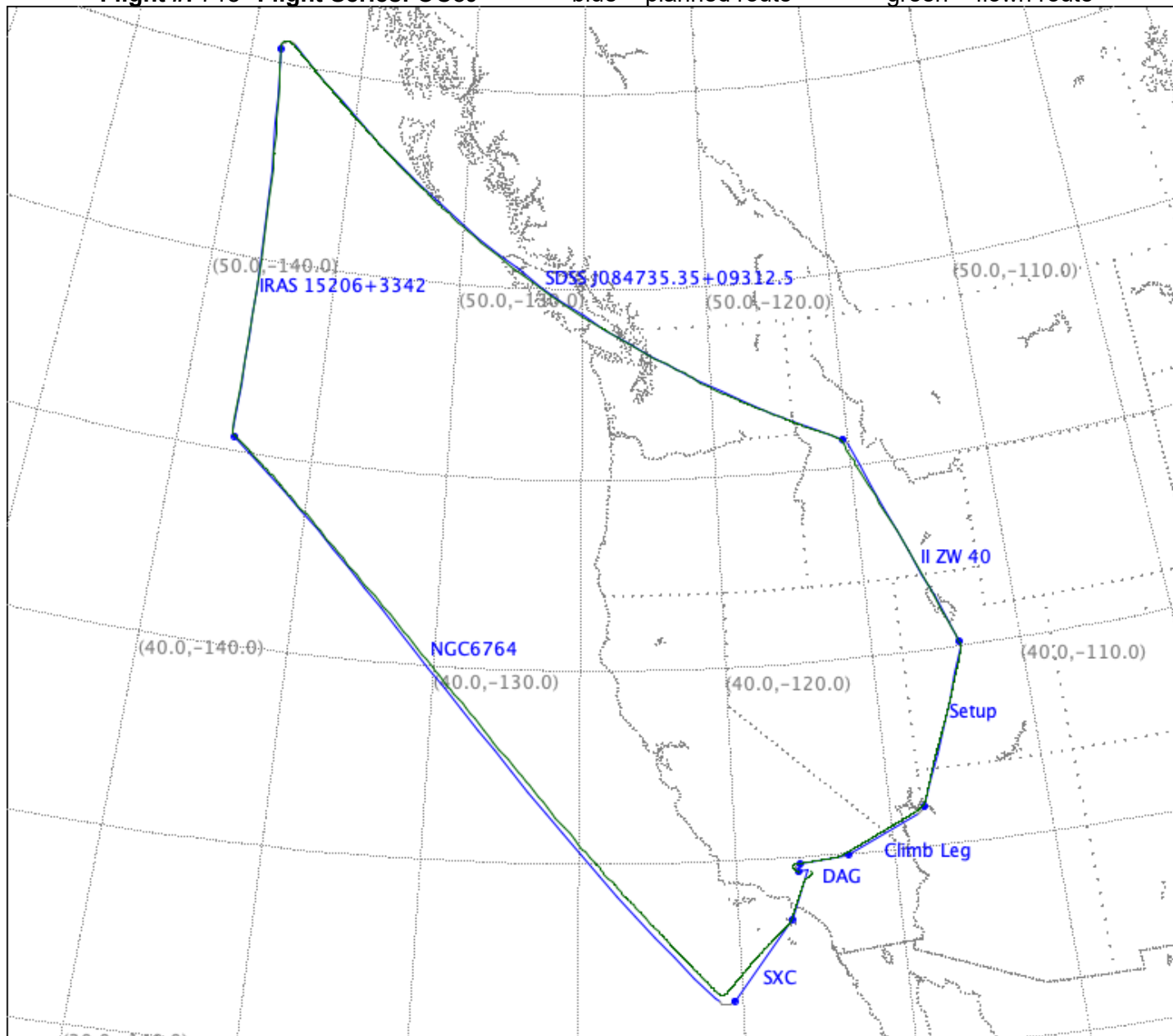
**MISSION ID: 2021-04-16\_FI\_F718**

**Date: 2021-04-16 UT Instrument: FIFI-LS**

**Flight #: 718 Flight Series: OC8J**

blue = planned route

green = flown route

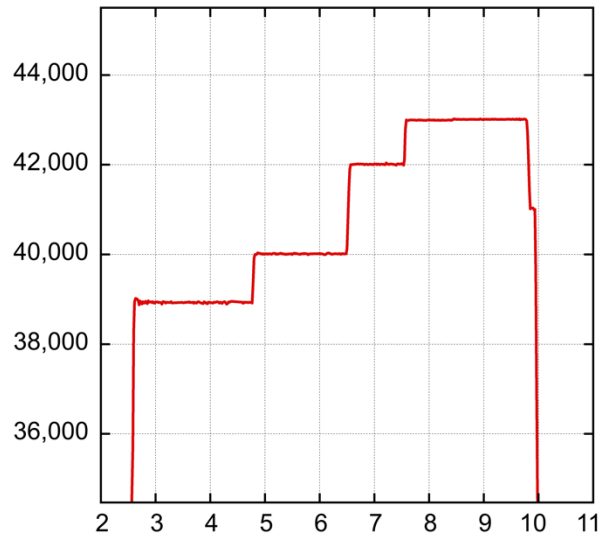


# Flight notes: No irregularities.

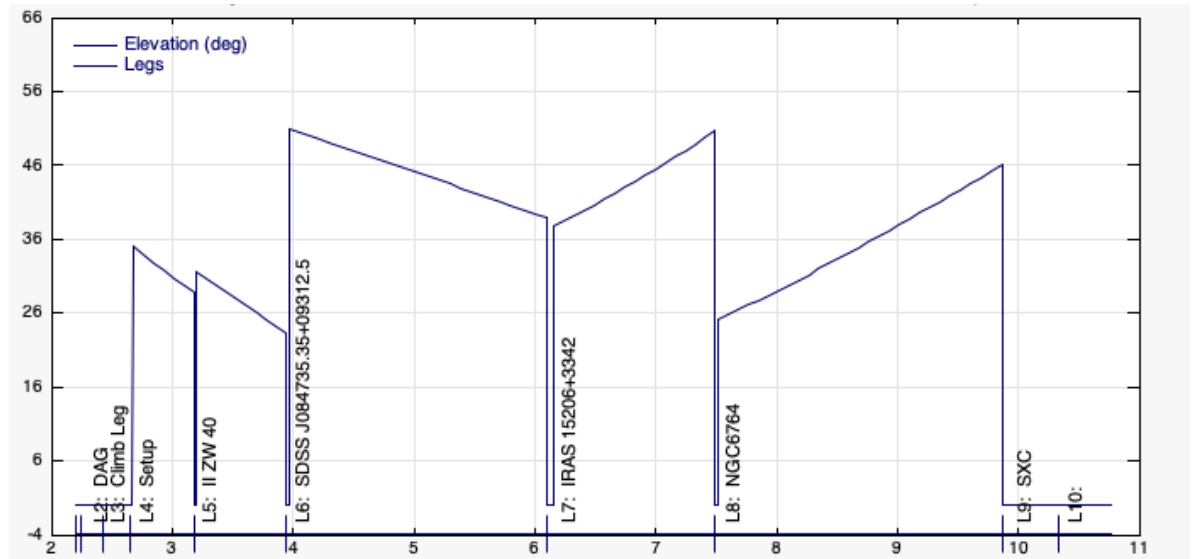
Flight 718 Mission ID 2021-04-16\_FI\_F718  
 Palmdale to Palmdale Take off date UTC: 16-APR-2021  
 Departure UTC: 02:11 Arrival UTC: 10:29

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	04h20m21.22s	27d21m02.7s	2:39	30	
5	08_0165	Stacey	II ZW 40	05h55m42.60s	03d23m32.0s	3:10	45	Telescope failure; no data.
6	08_0238	Lenkic	SDSS J084735.35+09312.5	08h47m35.36s	09d31m02.6s	3:57	128	
7	08_0095	Ma	IRAS 15206+3342	15h22m38.04s	33d31m35.9s	6:08	80	
8	08_0069	Smith	NGC6764	19h08m16.37s	50d55m59.6s	7:30	141	

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



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



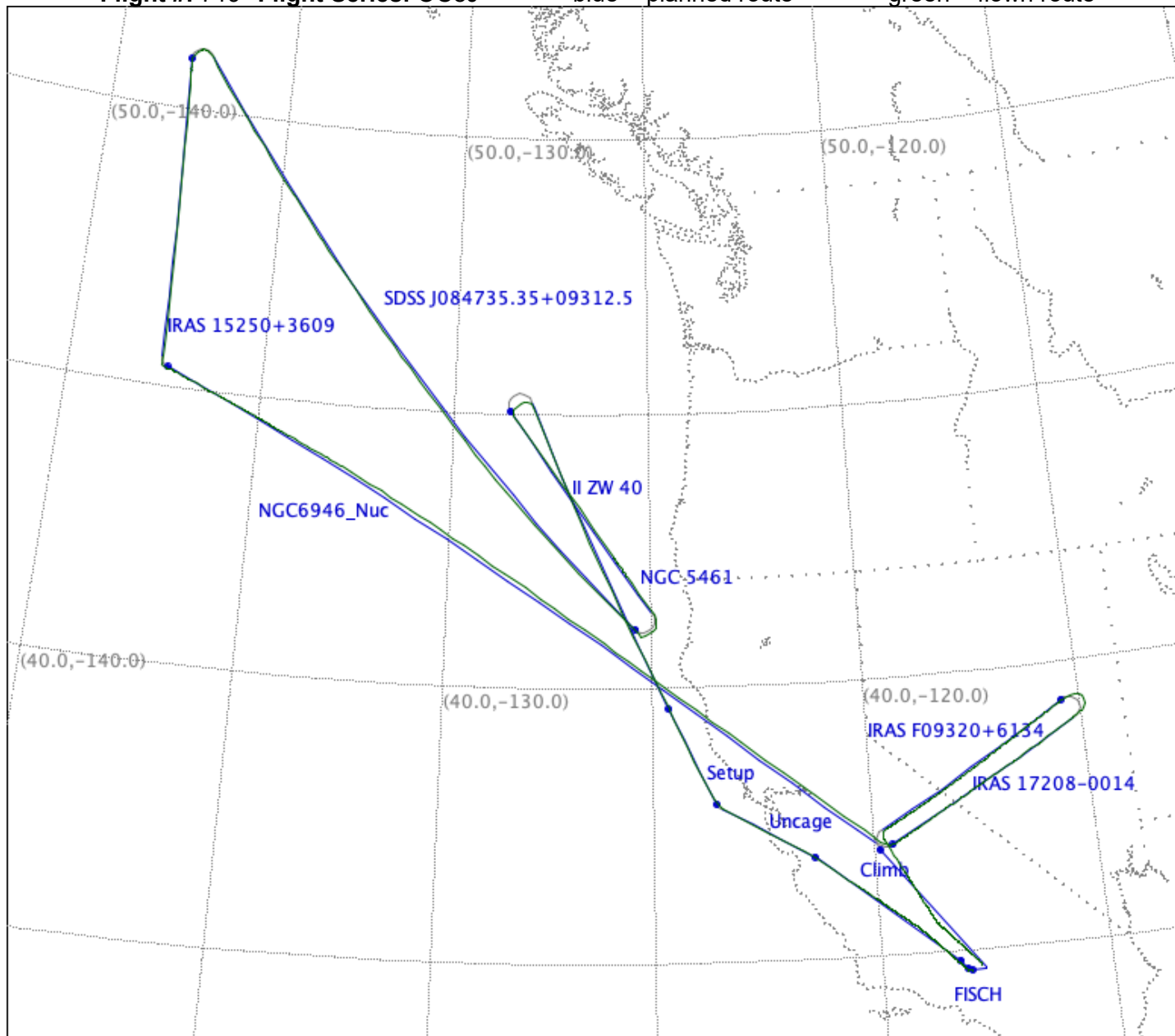
**MISSION ID: 2021-04-17\_FI\_F719**

**Date: 2021-04-17 UT Instrument: FIFI-LS**

**Flight #: 719 Flight Series: OC8J**

blue = planned route

green = flown route

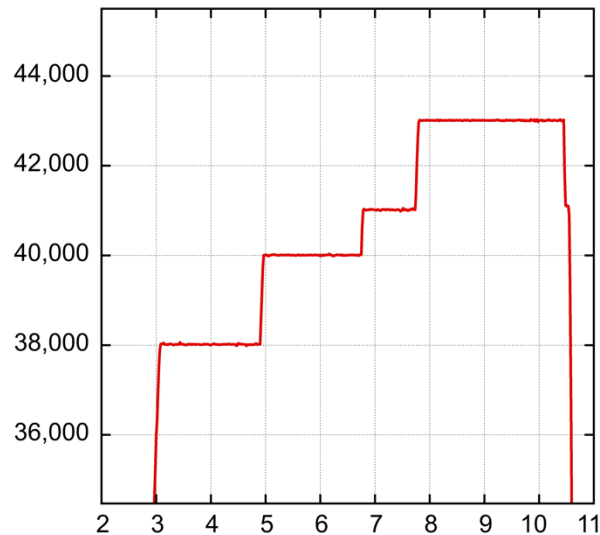


## Flight notes: Held to low altitudes early.

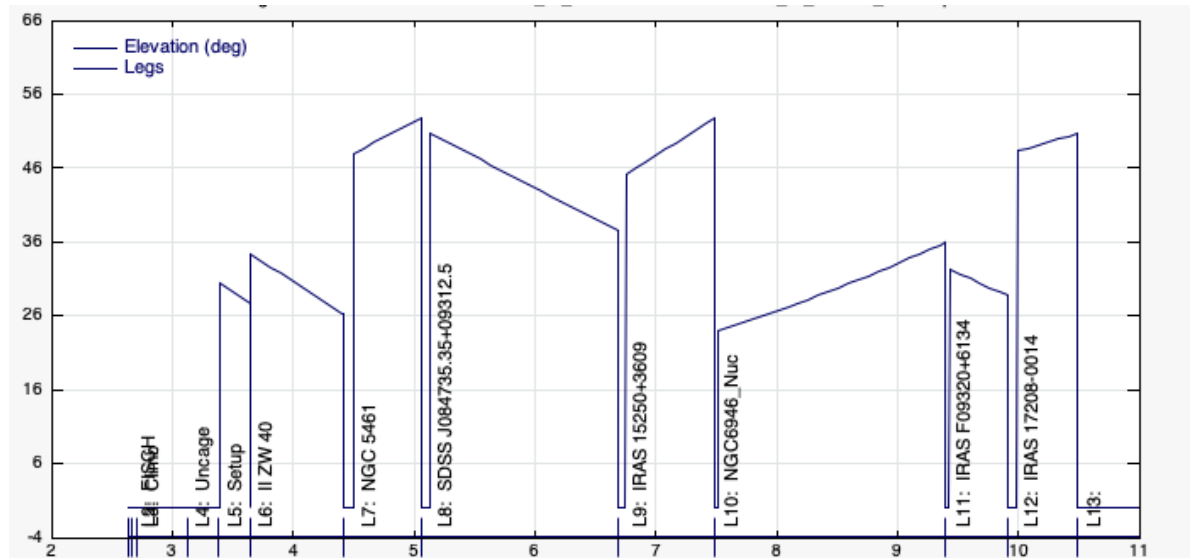
Flight 719 Mission ID 2021-04-17\_FI\_F719  
 Palmdale to Palmdale Take off date UTC: 17-APR-2021  
 Departure UTC: 02:38 Arrival UTC: 10:58

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			HIP 26311	05h36m12.81s	-01d12m06.9s	3:24	15	
6	08_0165	Stacey	II ZW 40	05h55m42.60s	03d23m32.0s	3:39	46	Low altitude (38K ft)
7	08_0071	Jones	NGC 5461	14h03m41.30s	54d19m05.0s	4:30	33	Low altitude (38K ft)
8	08_0238	Lenkic	SDSS J084735.35+09312.5	08h47m35.36s	09d31m02.6s	5:08	93	
9	08_0095	Ma	IRAS 15250+3609	15h26m59.80s	35d58m40.0s	6:45	44	
10	09_0198	Lamarche	NGC6946	20h34m59.37s	60d10m25.1s	7:30	113	
11	08_0095	Ma	IRAS F09320+6134	09h35m51.60s	61d21m11.4s	9:25	29	
12	08_0095	Ma	IRAS 17208-0014	17h23m21.96s	-00d17m00.9s	9:59	30	

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



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



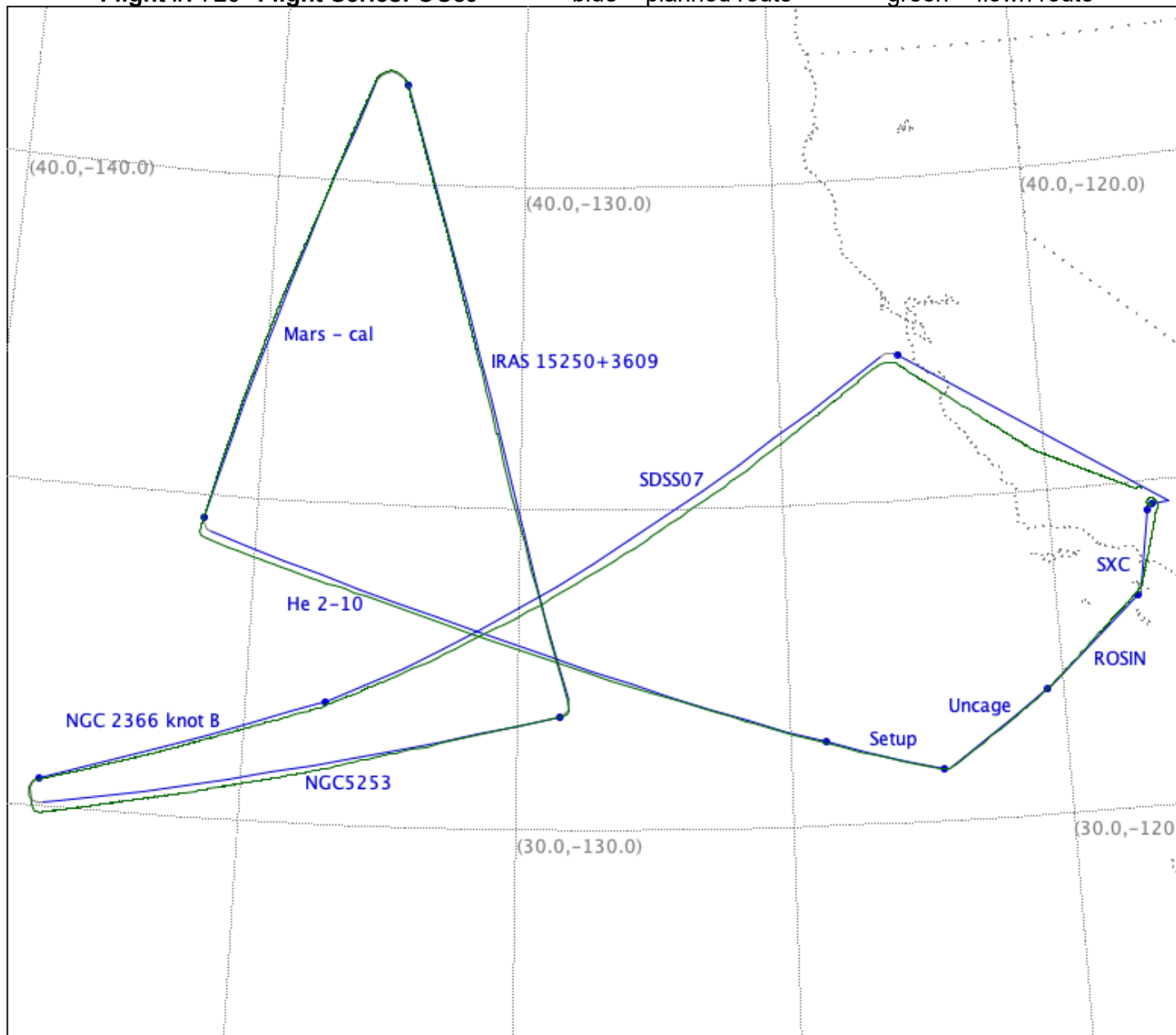
**MISSION ID: 2021-04-20\_FI\_F720**

**Date: 2021-04-20 UT Instrument: FIFI-LS**

**Flight #: 720 Flight Series: OC8J**

blue = planned route

green = flown route

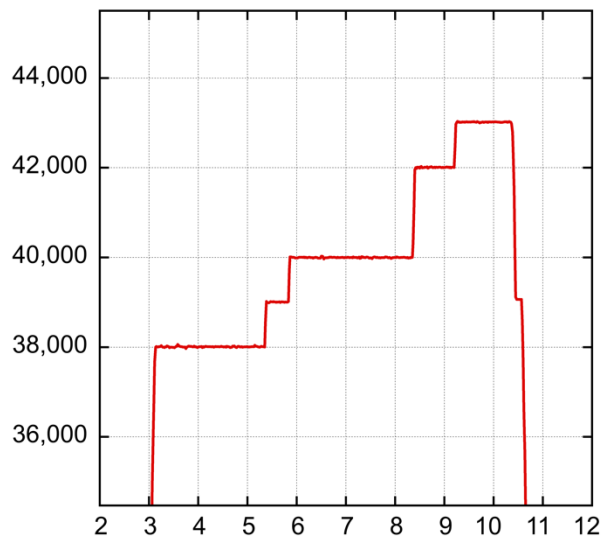


**Flight notes:  
No irregularities.**

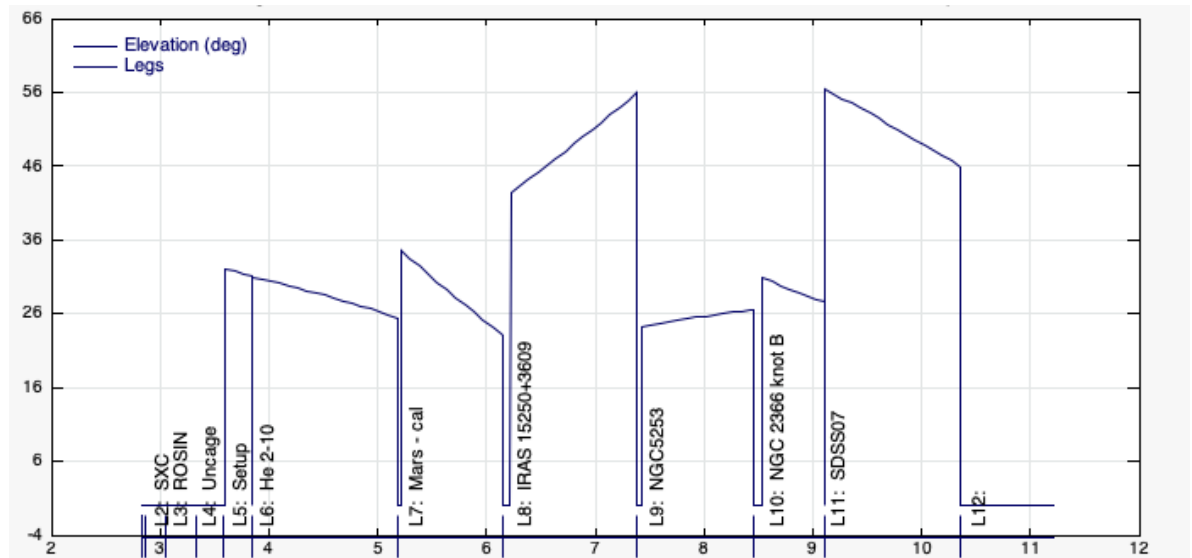
Flight 720 Mission ID 2021-04-20\_FI\_F720  
 Palmdale to Palmdale Take off date UTC: 20-APR-2021  
 Departure UTC: 02:45 Arrival UTC: 11:10

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	08h37m52.15s	-26d15m18.0s	3:35	15	
6	08_0117	Vacca	He 2-10	08h36m15.13s	-26d24m33.8s	3:50	80	Held at low altitude (38k ft) by air traffic control
7	90_0033	Calibration	Mars	05h50m03.78s	24d52m57.9s	5:12	56	
8	08_0095	Ma	IRAS 15250+3609	15h26m59.80s	35d58m40.0s	6:12	70	
9	08_0103	Turner	NGC5253	13h39m55.96s	-31d38m24.3s	7:25	62	Light turbulence.
10	08_0243	Diaz-Santos	NGC 2366 knot B	07h28m44.33s	69d11m22.9s	8:31	34	
11	08_0226	Petric	SDSS07	11h53m26.40s	58d06m43.2s	9:05	75	

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



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



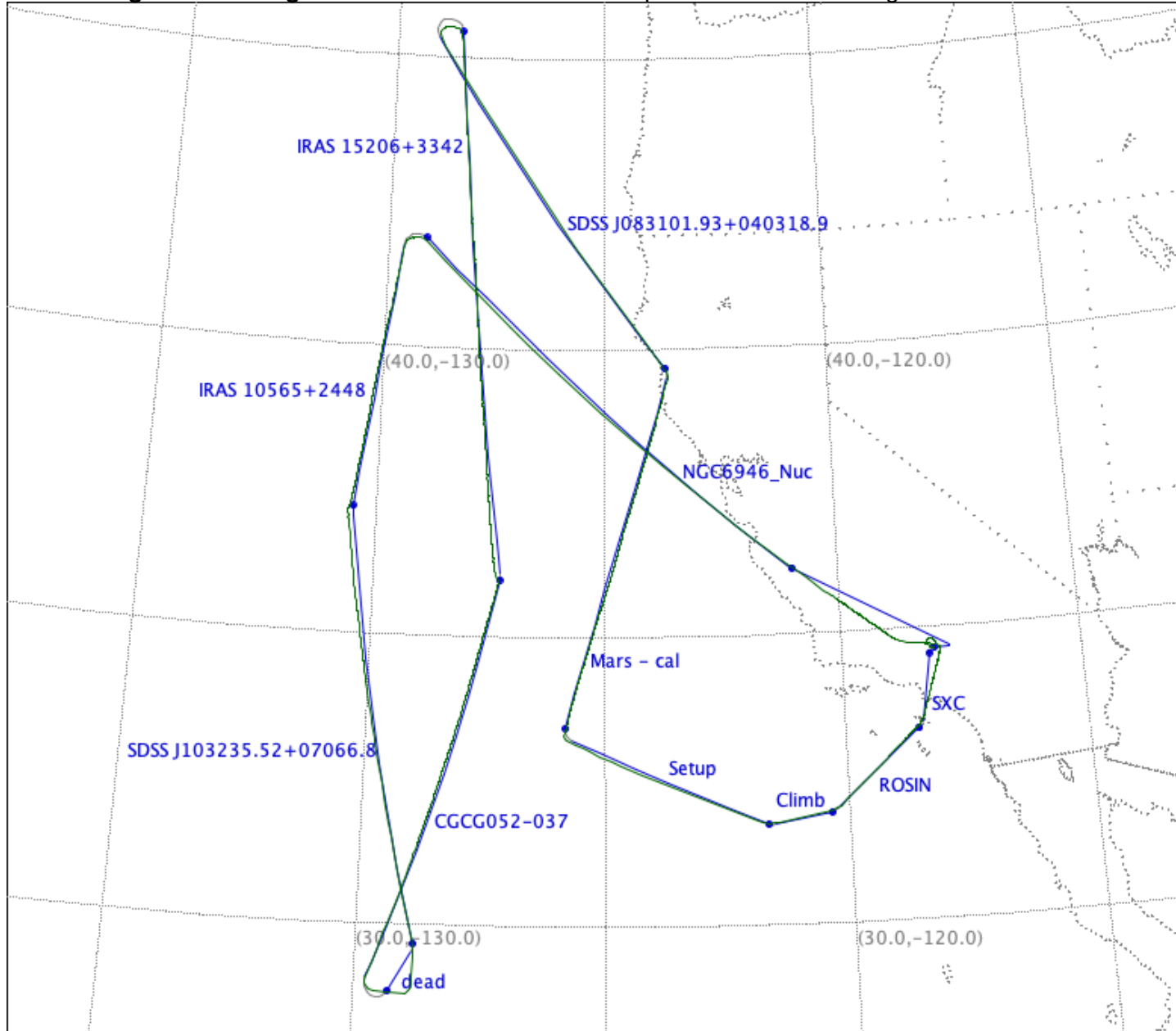
**MISSION ID: 2021-04-21\_FI\_F721**

**Date: 2021-04-21 UT Instrument: FIFI-LS**

**Flight #: 721 Flight Series: OC8J**

blue = planned route

green = flown route

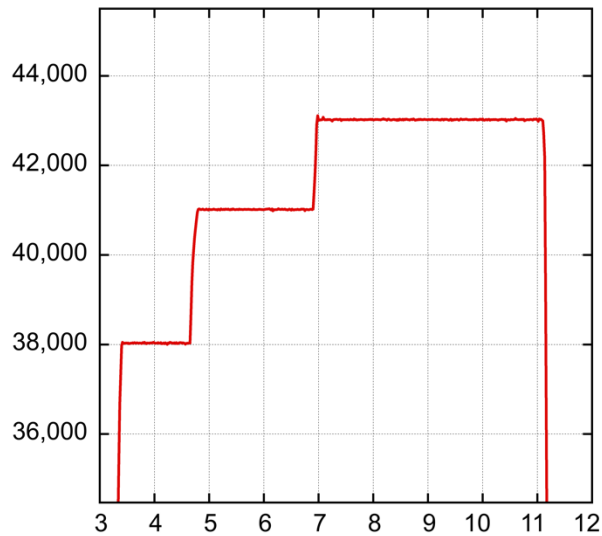


# Flight notes: No irregularities.

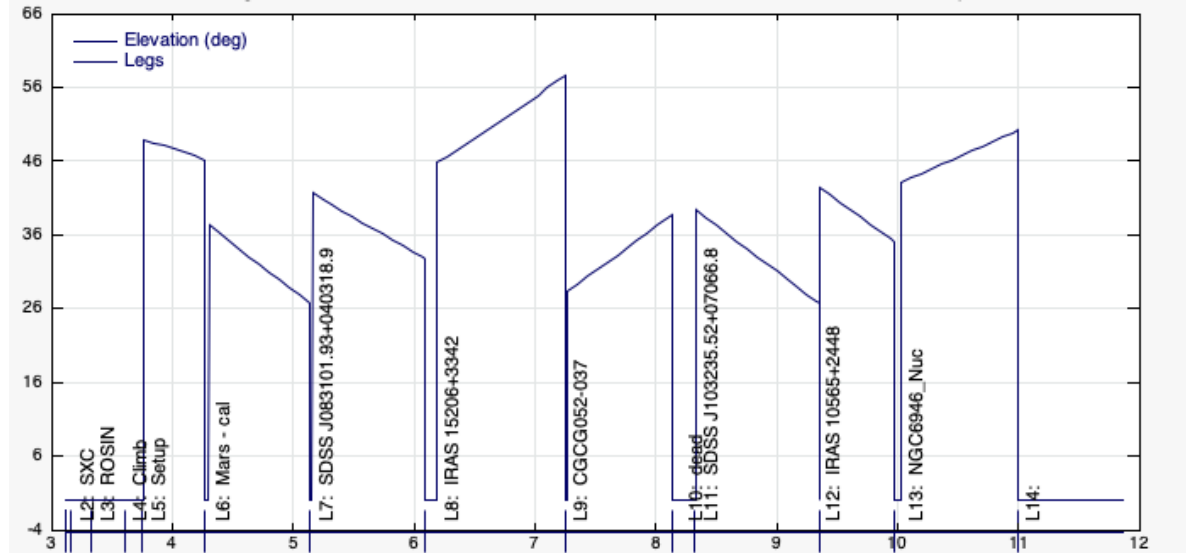
Flight 721 Mission ID 2021-04-21\_FI\_F721  
 Palmdale to Palmdale Take off date UTC: 21-APR-2021  
 Departure UTC: 03:01 Arrival UTC: 11:30

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	08h43m40.37s	-07d14m01.4s	3:46	30	
6	90_0033	Calibration	Mars	05h52m37.27s	24d53m24.2s	4:18	50	
7	08_0238	Lenkic	SDSS J083101.93+040318.9	08h31m01.93s	04d03m18.9s	5:09	56	
8	08_0095	Ma	IRAS 15206+3342	15h22m38.04s	33d31m35.9s	6:11	64	
9	08_0069	Smith	CGCG052-037	16h30m56.54s	04d04m58.4s	7:15	52	
11	08_0238	Lenkic	SDSS J103235.52+07066.8	10h32m35.52s	07d06m06.8s	8:19	61	
12	08_0095	Ma	IRAS 10565+2448	10h59m18.12s	24d32m34.5s	9:21	37	
13	09_0198	Lamarche	NGC6946	20h34m59.37s	60d10m25.1s	10:01	58	

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



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





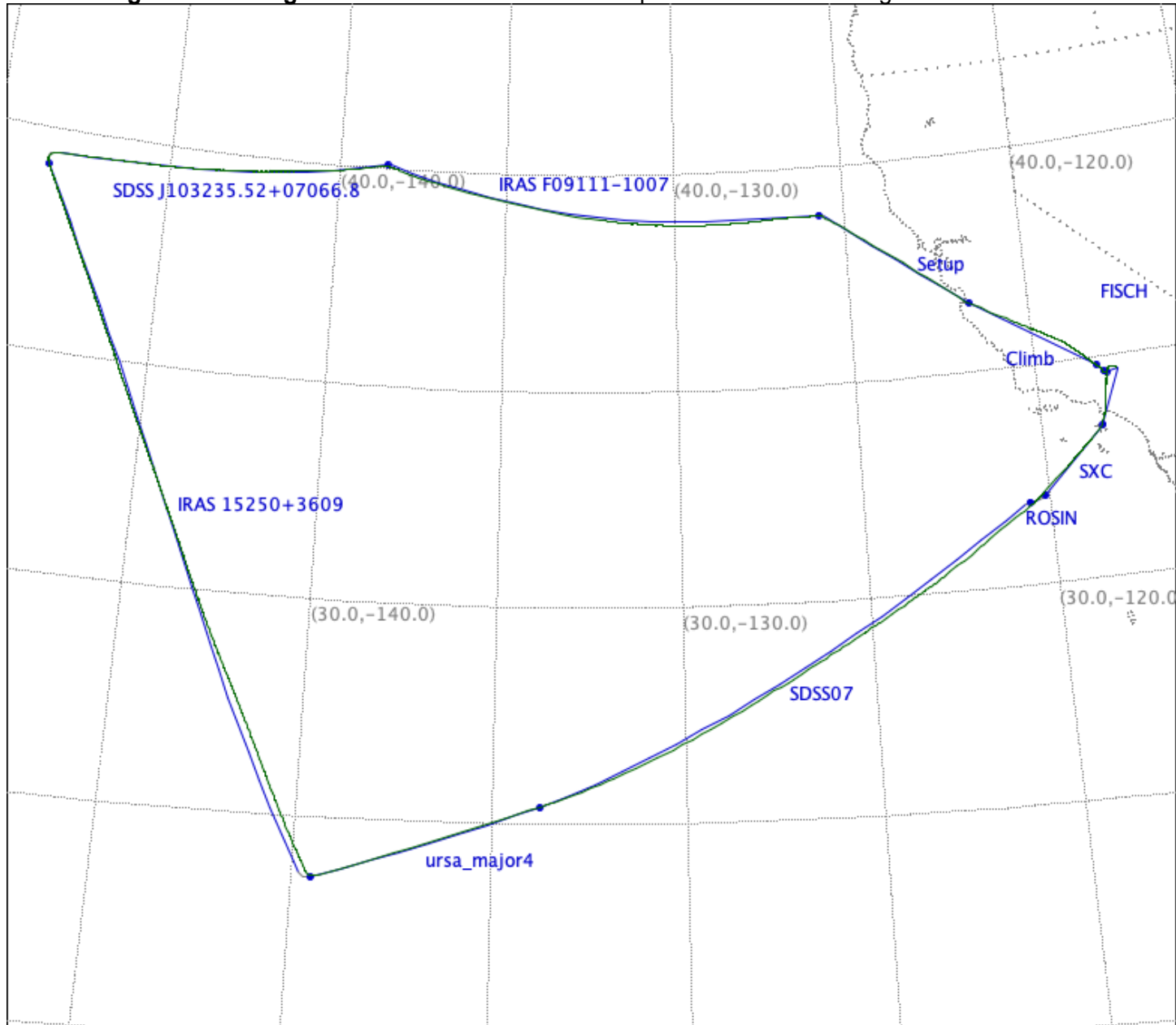
**MISSION ID: 2021-04-22\_FI\_F722**

**Date: 2021-04-22 UT Instrument: FIFI-LS**

**Flight #: 722 Flight Series: OC8J**

blue = planned route

green = flown route

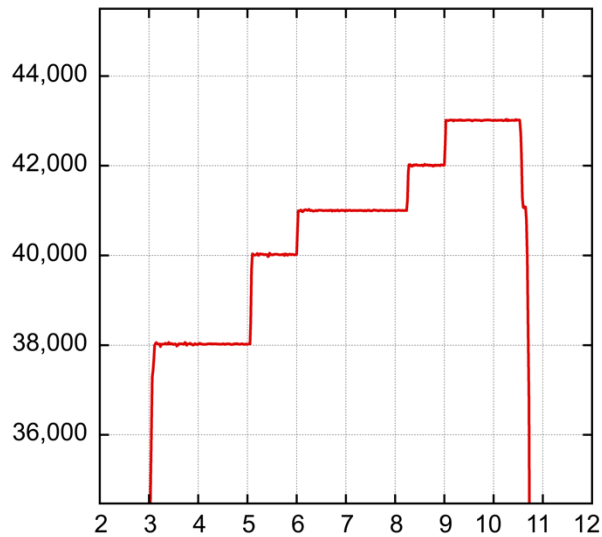


# Flight notes: No irregularities.

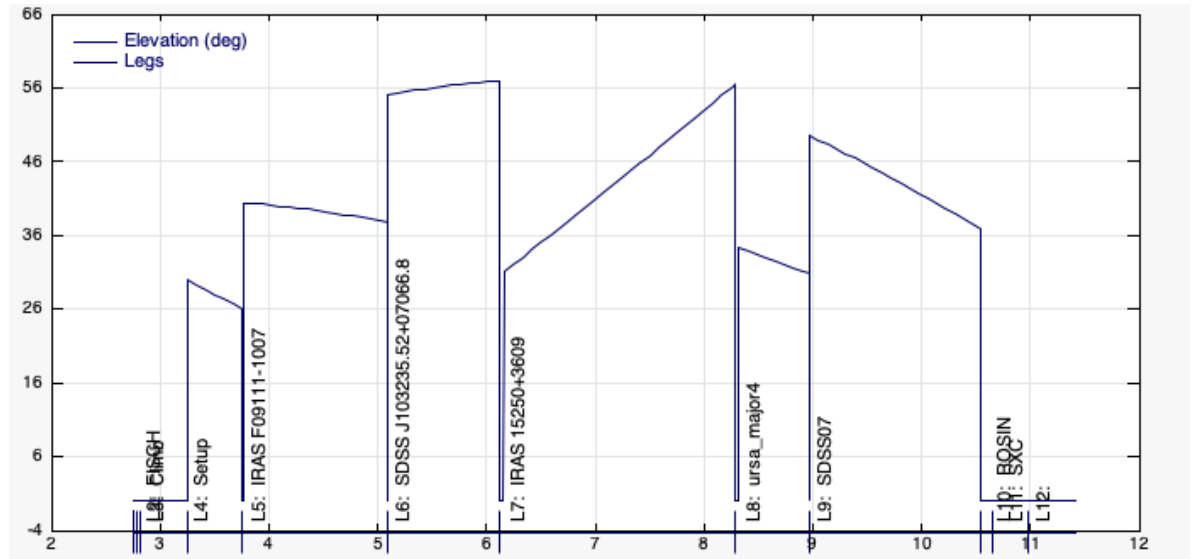
Flight 722 Mission ID 2021-04-22\_FI\_F722  
 Palmdale to Palmdale Take off date UTC: 22-APR-2021  
 Departure UTC: 02:44 Arrival UTC: 11:11

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	07h03m45.49s	-15d37m59.8s	3:15	30	
5	08_0095	Ma	IRAS F09111-1007	09h13m36.46s	-10d19m29.9s	3:46	79	
6	08_0238	Lenkic	SDSS J103235.52+07066.8	10h32m35.52s	07d06m06.8s	5:05	61	
7	08_0095	Ma	IRAS 15250+3609	15h26m59.80s	35d58m40.0s	6:09	127	Light turbulence.
8	08_0237	Panopoulou	ursa_major4	09h30m58.44s	69d52m06.2s	8:19	39	Light turbulence.
9	08_0226	Petric	SDSS07	11h53m26.40s	58d06m43.2s	8:58	94	

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



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



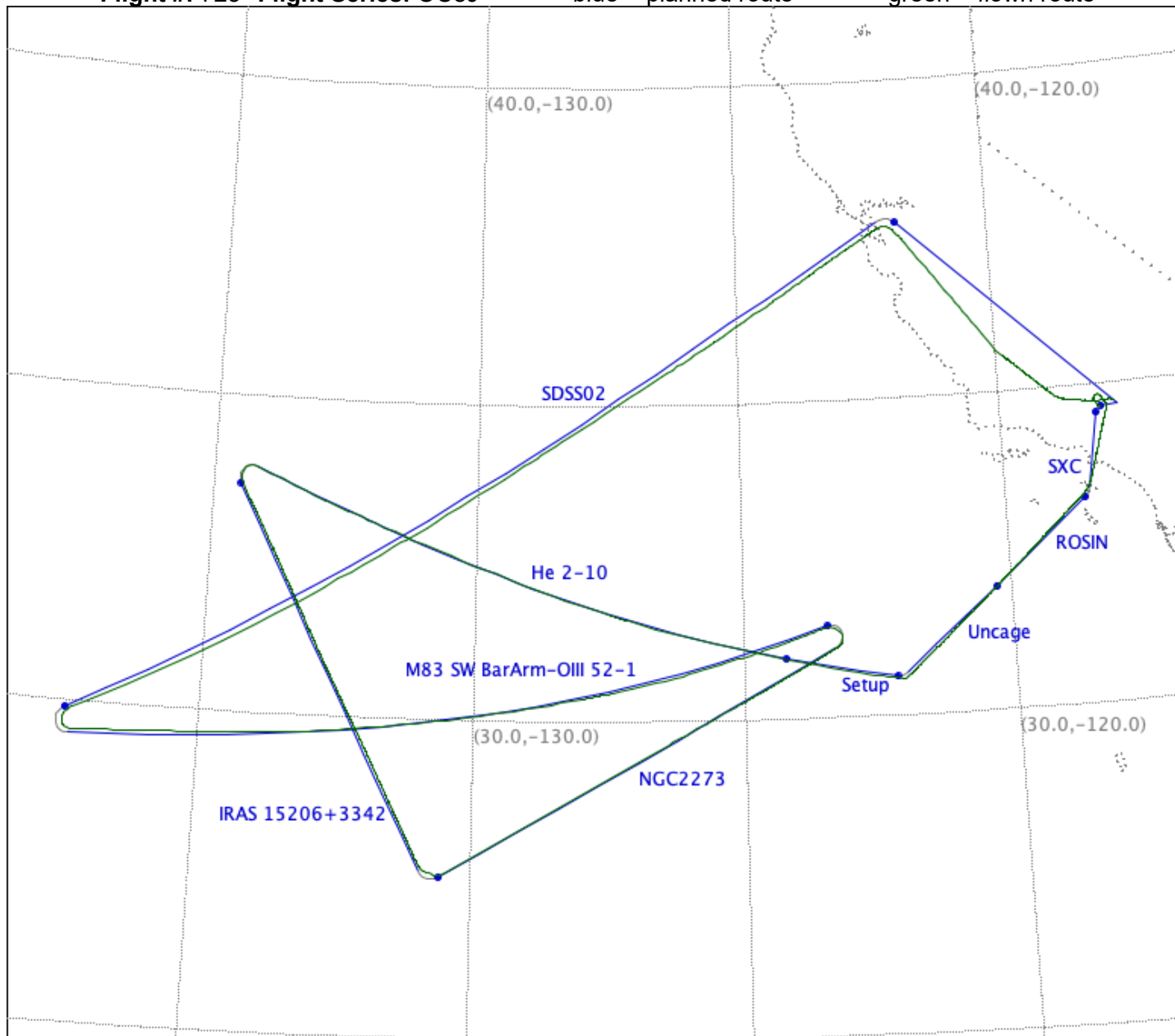
**MISSION ID: 2021-04-23\_FI\_F723**

**Date: 2021-04-23 UT Instrument: FIFI-LS**

**Flight #: 723 Flight Series: OC8J**

blue = planned route

green = flown route

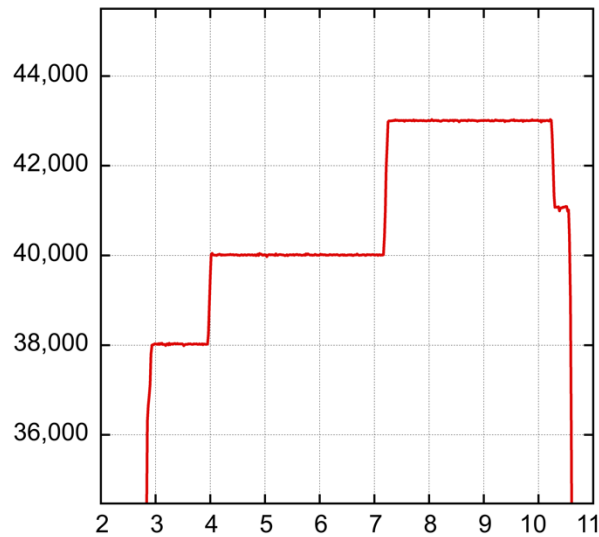


**Flight notes:**  
**No irregularities.**

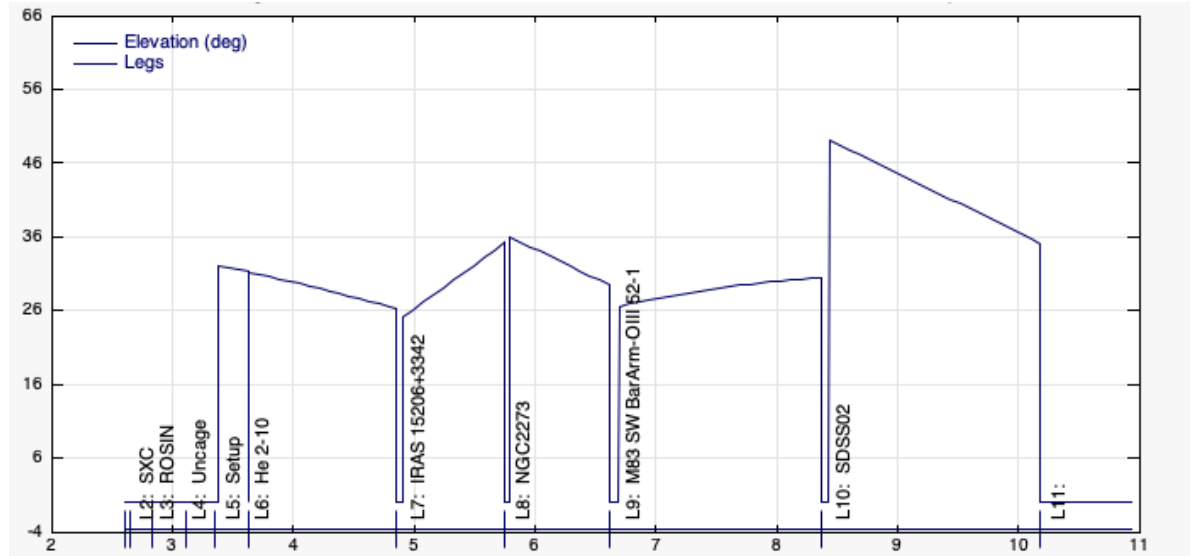
Flight 723 Mission ID 2021-04-23\_FI\_F723  
 Palmdale to Palmdale Take off date UTC: 23-APR-2021  
 Departure UTC: 02:31 Arrival UTC: 10:59

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			He 2-10	08h37m52.15s	-26d15m18.0s	3:20	15	
6	08_0117	Vacca	He 2-10	08h36m15.13s	-26d24m33.8s	3:35	73	All but last 8min of leg lost to FIFI-LS communication failure
7	08_0095	Ma	IRAS 15206+3342	15h22m38.04s	33d31m35.9s	4:52	50	
8	08_0069	Smith	NGC2273	06h50m08.66s	60d50m44.9s	5:44	50	
9	08_0165	Stacey	M83 SW BarArm-OIII 52	13h36m54.40s	-29d53m01.0s	6:39	100	
10	08_0226	Petric	SDSS02	10h34m08.64s	60d01m51.6s	8:23	105	

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



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



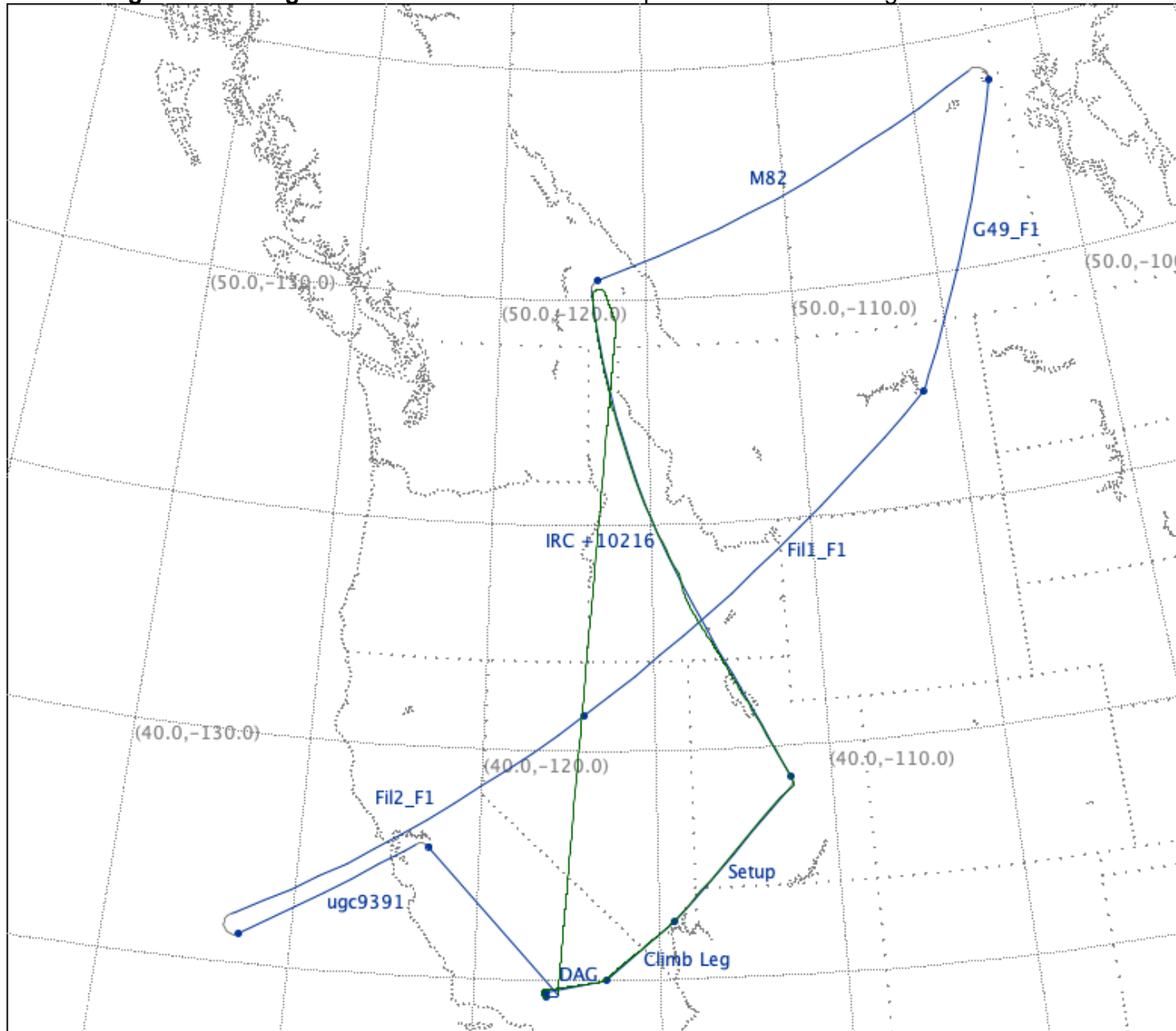
**MISSION ID: 2021-04-28\_HA\_F724**

**Date: 2021-04-28 UT Instrument: HAWC+**

**Flight #: 724 Flight Series: OC8K**

blue = planned route

green = flown route

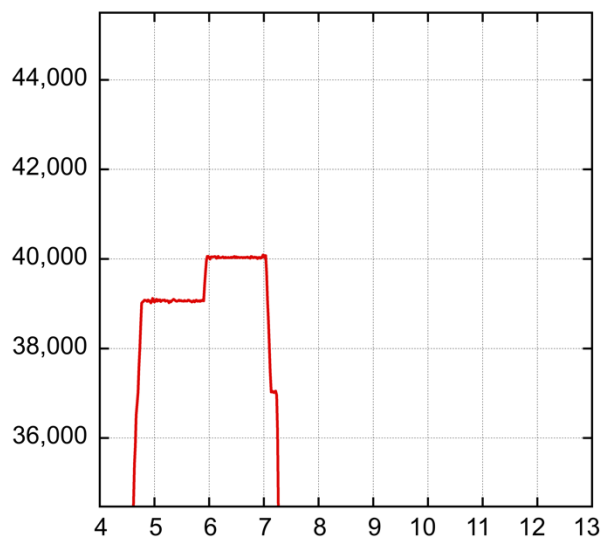


## Flight notes:

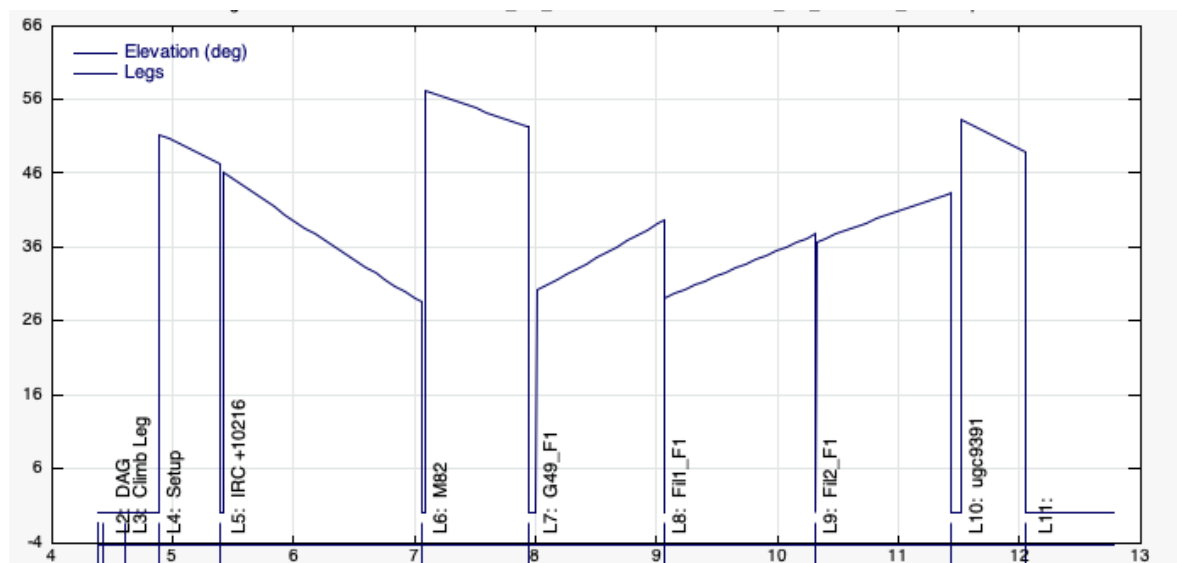
**HAWC+ software unable to run observing scripts; Early return to Palmdale base – no data collected.**

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	06h24m53.90s	49d17m16.4s	4:53	30	
5	90_0086	Calibration	IRC +10216	09h47m57.41s	13d16m43.6s	5:25	100	Unrecoverable HAWC+ observing software error; returned to base at end of leg
6	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	7:05	64	Leg not flown; return to Palmdale base
7	08_0186	Stephens	G49	19h22m38.84s	14d10m16.4s	8:00	52	Leg not flown; return to Palmdale base
8	08_0186	Stephens	Fil1	18h41m33.29s	-05d30m11.3s	9:04	75	Leg not flown; return to Palmdale base
9	08_0186	Stephens	Fil2	18h38m50.63s	-07d01m48.7s	10:19	66	Leg not flown; return to Palmdale base
10	08_0108	Casey	ugc9391	14h34m37.01s	59d20m16.2s	11:31	32	Leg not flown; return to Palmdale base

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



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



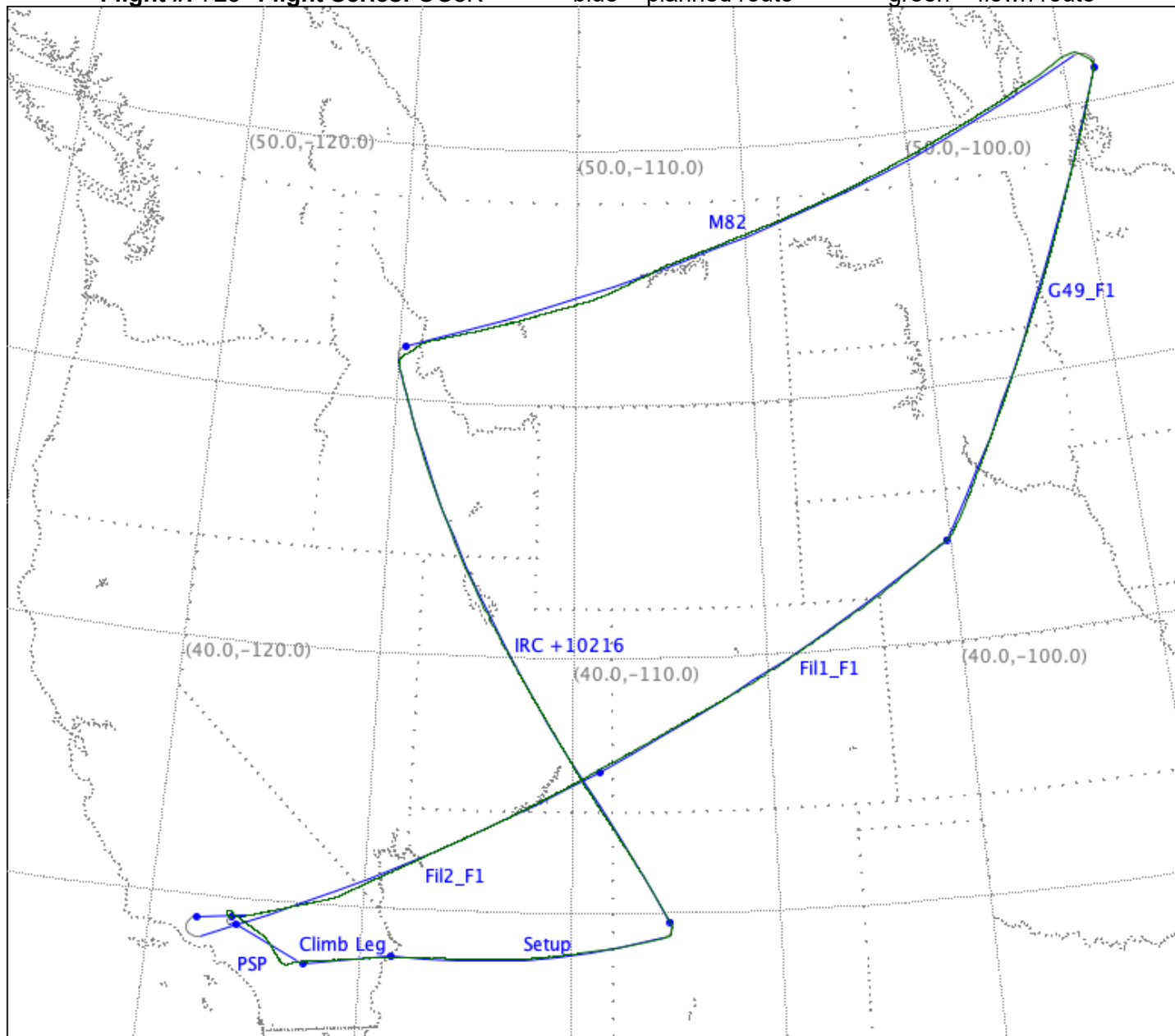
# MISSION ID: 2021-04-29\_HA\_F725

Date: 2021-04-29 UT Instrument: HAWC+

Flight #: 725 Flight Series: OC8K

blue = planned route

green = flown route



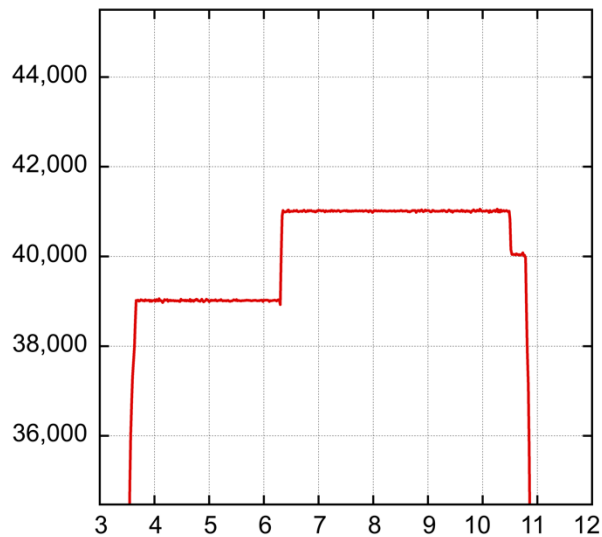
## Flight notes:

**HAWC+ encountered issues and spend the whole flight troubleshooting the cause – no data collected.**

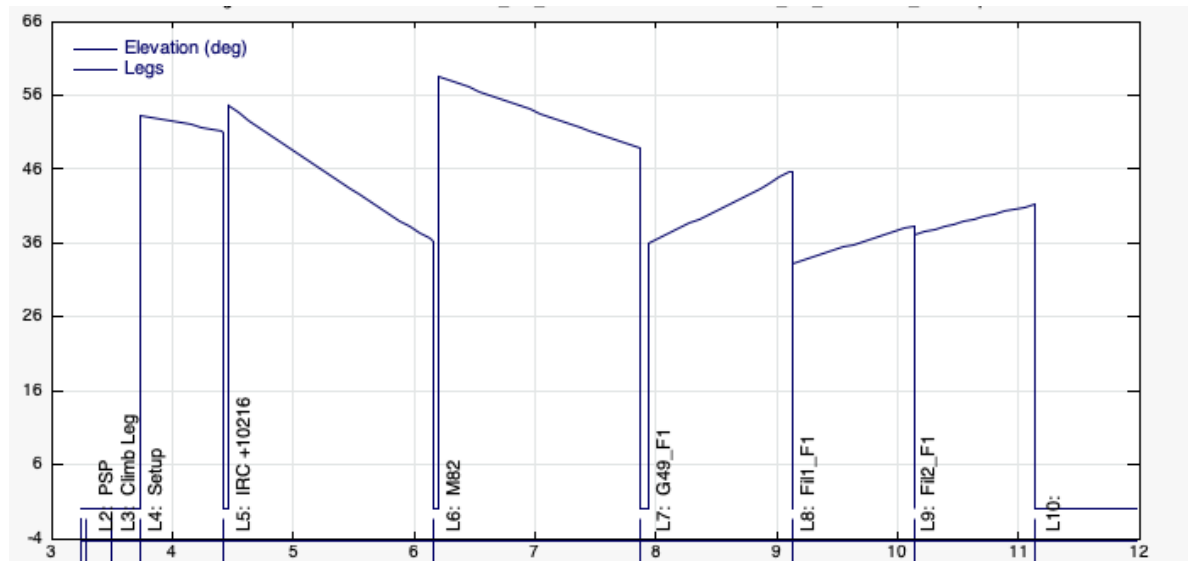
Flight 725 Mission ID 2021-04-29\_HA\_F725  
 Palmdale to Palmdale Take off date UTC: 29-APR-2021 Departure UTC: 03:12 Arrival UTC: 11:13

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	09h34m28.86s	69d49m49.2s	3:45	41	
5	90_0086	Calibration	IRC +10216	09h47m57.41s	13d16m43.6s	4:29	102	HAWC+ not functioning nominally; no data
6	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	6:14	100	No data.
7	08_0186	Stephens	G49	19h22m38.84s	14d10m16.4s	7:58	71	No data.
8	08_0186	Stephens	Fil1	18h41m33.29s	-05d30m11.3s	9:10	60	No data.
9	08_0186	Stephens	Fil2	18h38m48.97s	-07d04m08.1s	10:10	60	No data.

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



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





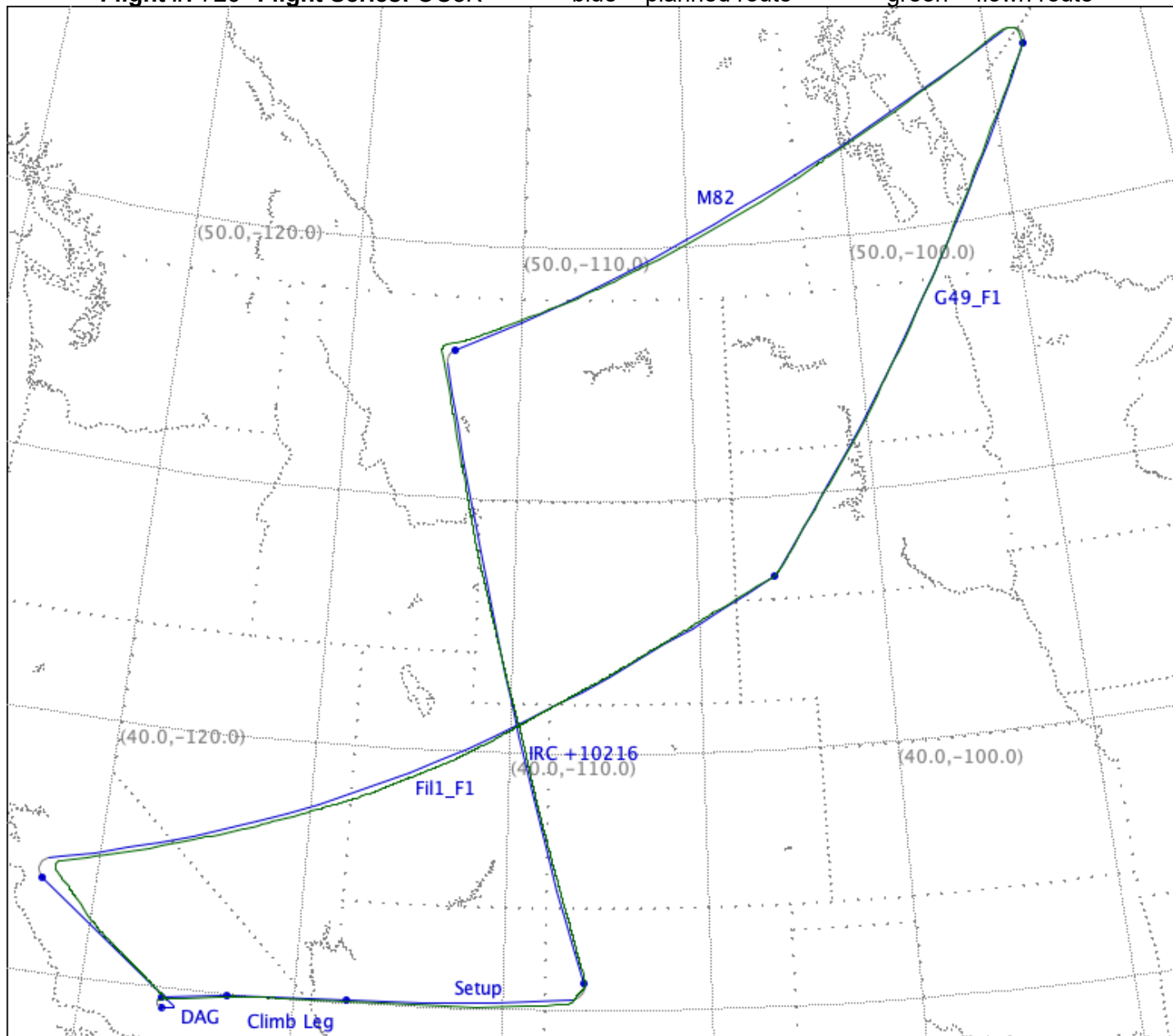
# MISSION ID: 2021-05-05\_HA\_F726

Date: 2021-05-05 UT Instrument: HAWC+

Flight #: 726 Flight Series: OC8K

blue = planned route

green = flown route

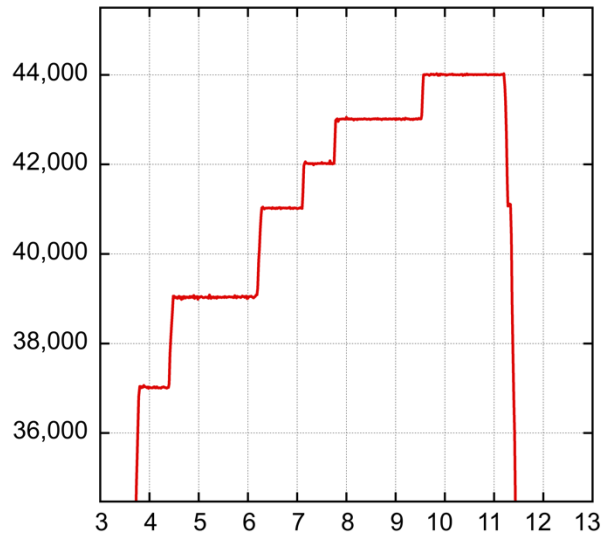


**Flight notes:**  
**No irregularities.**

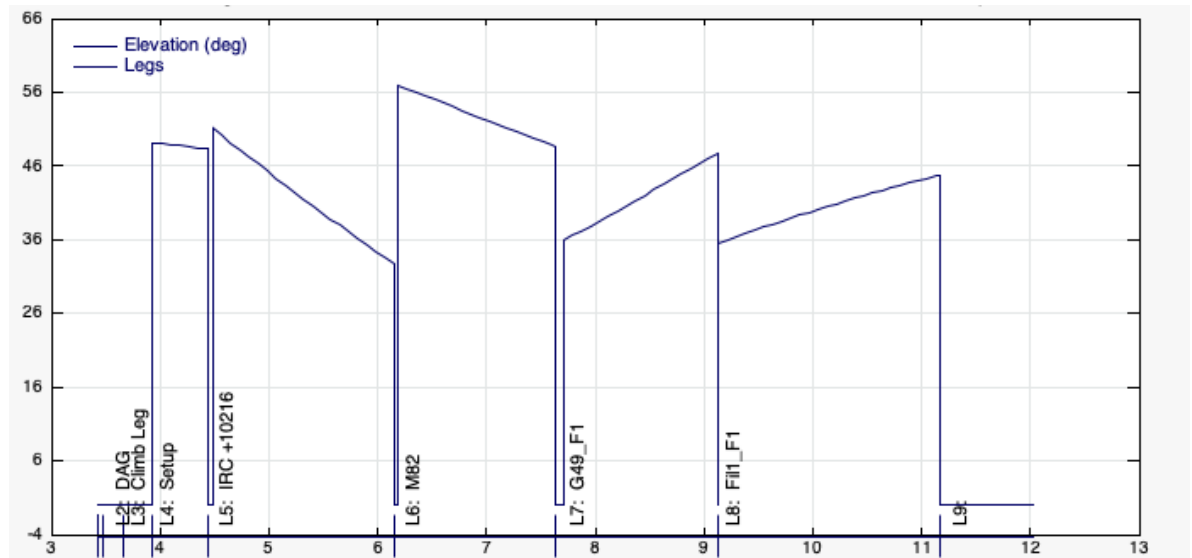
Flight 726 Mission ID 2021-05-05\_HA\_F726  
 Palmdale to Palmdale Take off date UTC: 05-MAY-2021  
 Departure UTC: 03:25 Arrival UTC: 11:47

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	10h35m05.48s	75d42m46.6s	3:56	30	
5	90_0086	Calibration	IRC +10216	09h47m57.41s	13d16m43.6s	4:29	100	
6	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	6:11	87	
7	08_0186	Stephens	G49	19h22m38.84s	14d10m16.4s	7:42	85	
8	08_0186	Stephens	Fil1	18h41m33.29s	-05d30m11.3s	9:08	122	

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



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



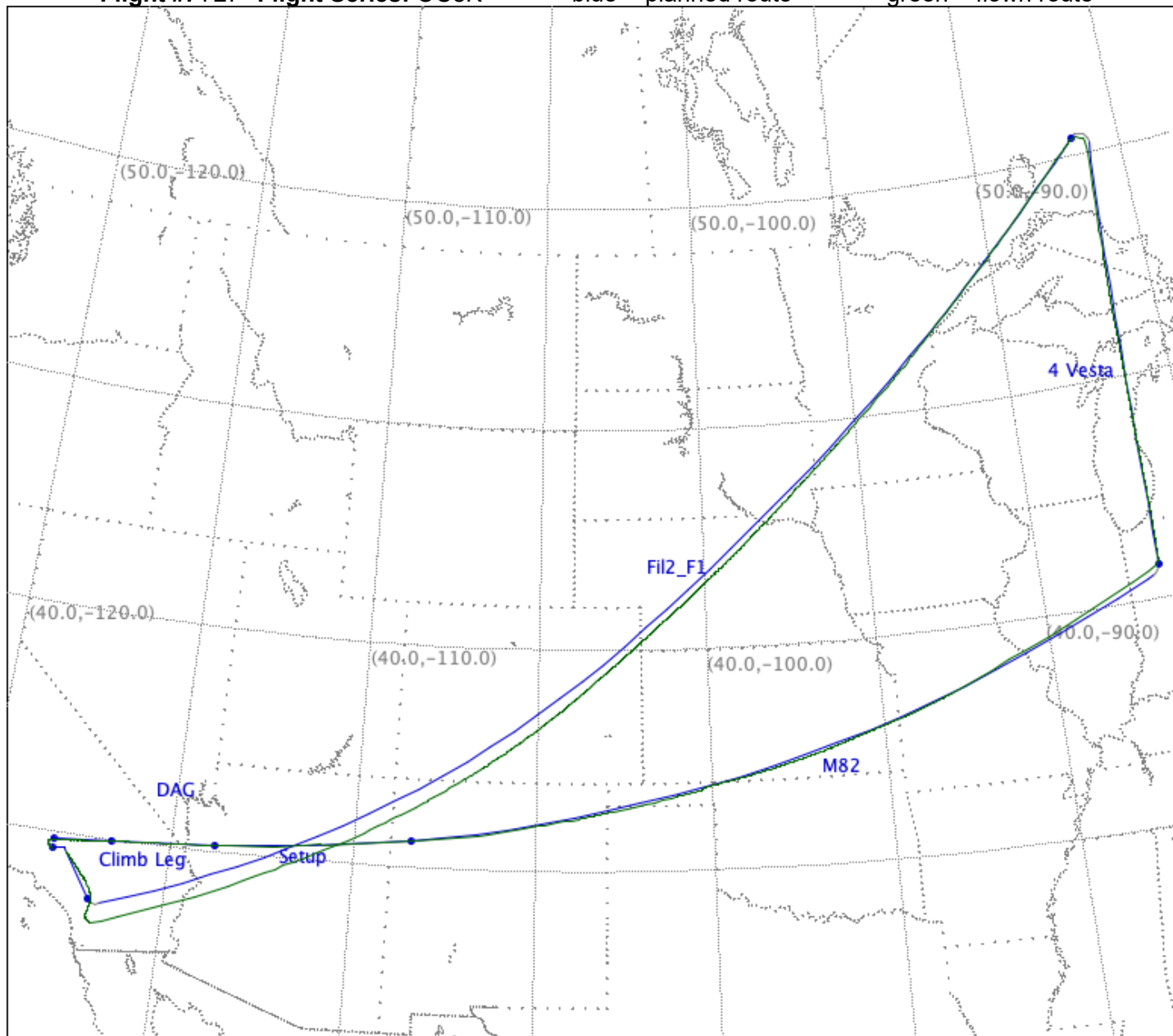
# MISSION ID: 2021-05-06\_HA\_F727

Date: 2021-05-06 UT Instrument: HAWC+

Flight #: 727 Flight Series: OC8K

blue = planned route

green = flown route

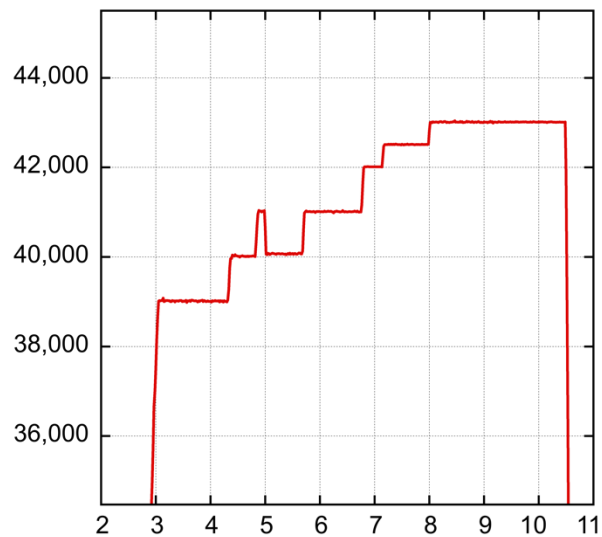


**Flight notes:  
No irregularities.**

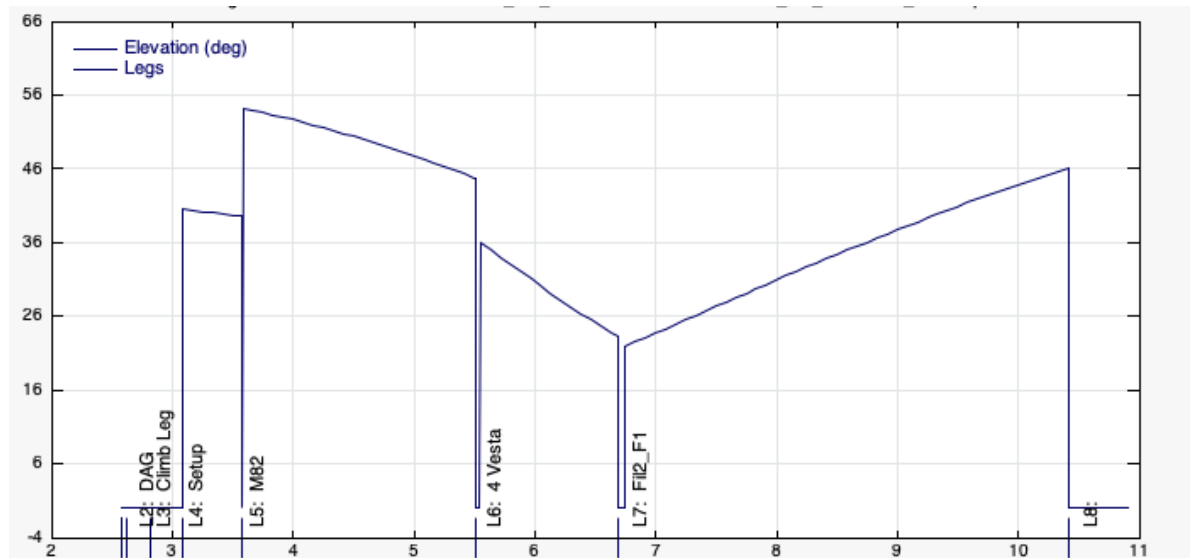
Flight 727 Mission ID 2021-05-06\_HA\_F727  
 Palmdale to Palmdale Take off date UTC: 06-MAY-2021  
 Departure UTC: 02:35 Arrival UTC: 10:53

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	07h31m04.46s	82d24m41.3s	3:05	30	
5	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	3:35	116	
6	90_0083	Calibration	4 Vesta	10h50m48.08s	17d26m24.2s	5:33	68	
7	08_0186	Stephens	Fil2	18h38m48.97s	-07d04m08.1s	6:45	220	

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



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



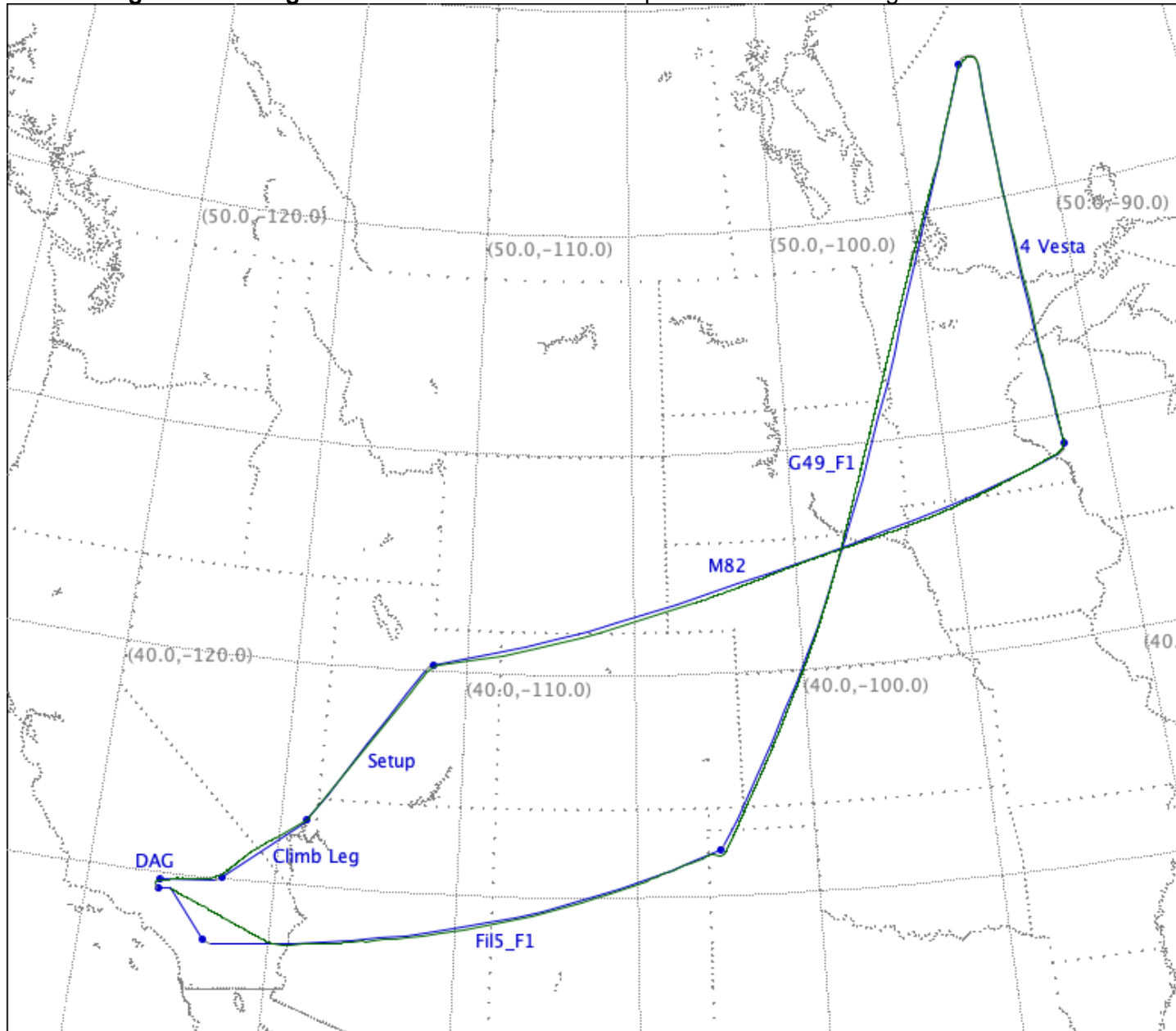
# MISSION ID: 2021-05-07\_HA\_F728

Date: 2021-05-07 UT Instrument: HAWC+

Flight #: 728 Flight Series: OC8K

blue = planned route

green = flown route

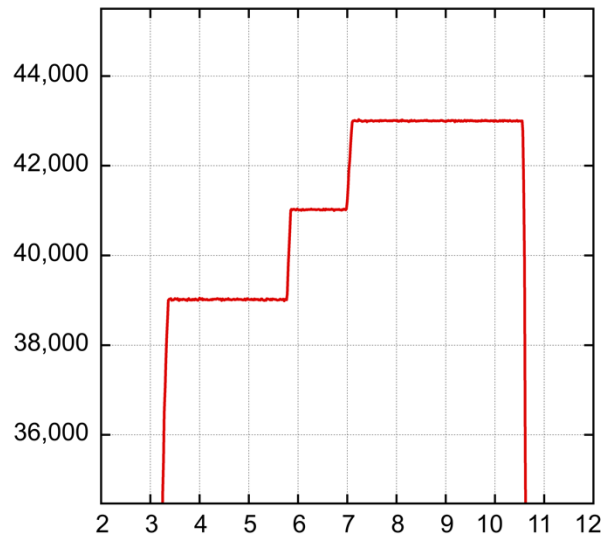


## Flight notes: No irregularities.

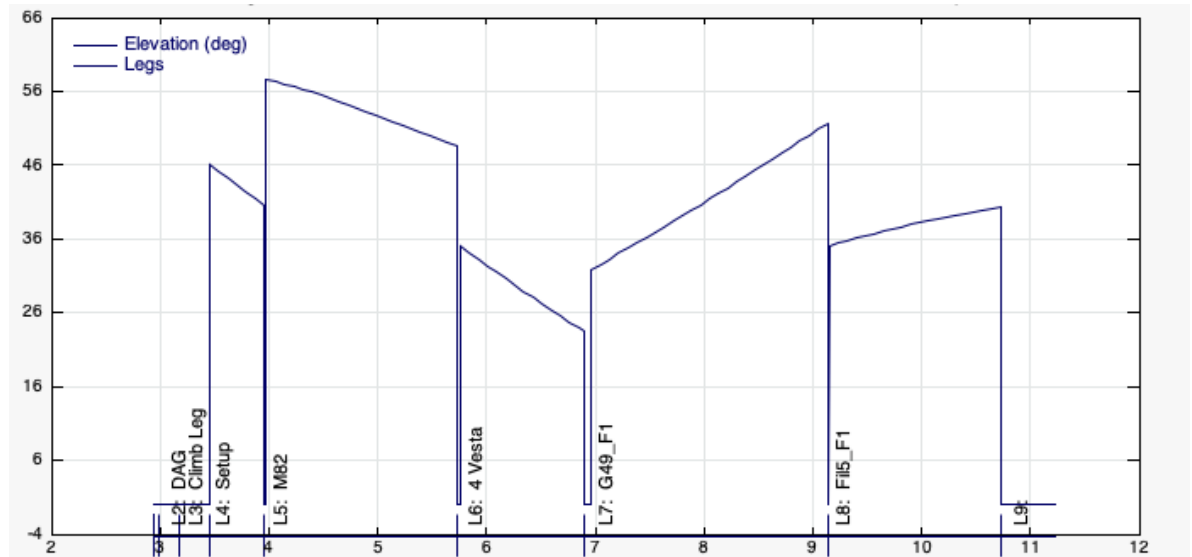
Flight 728 Mission ID 2021-05-07\_HA\_F728  
 Palmdale to Palmdale Take off date UTC: 07-MAY-2021  
 Departure UTC: 02:56 Arrival UTC: 11:05

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	06h57m37.11s	45d05m38.7s	3:27	30	
5	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	3:58	105	Solving large detector phase offsets in the HAWC+ instrument led to loss of entire leg.
6	90_0083	Calibration	4 Vesta	10h51m11.67s	17d20m53.1s	5:46	68	
7	08_0186	Stephens	G49	19h22m38.84s	14d10m16.4s	6:58	130	
8	08_0186	Stephens	Fil5	18h25m12.10s	-12d48m41.6s	9:09	95	HAWC+ cooling failed with 50min remaining on leg ending observations; early return to Palmdale base

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



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



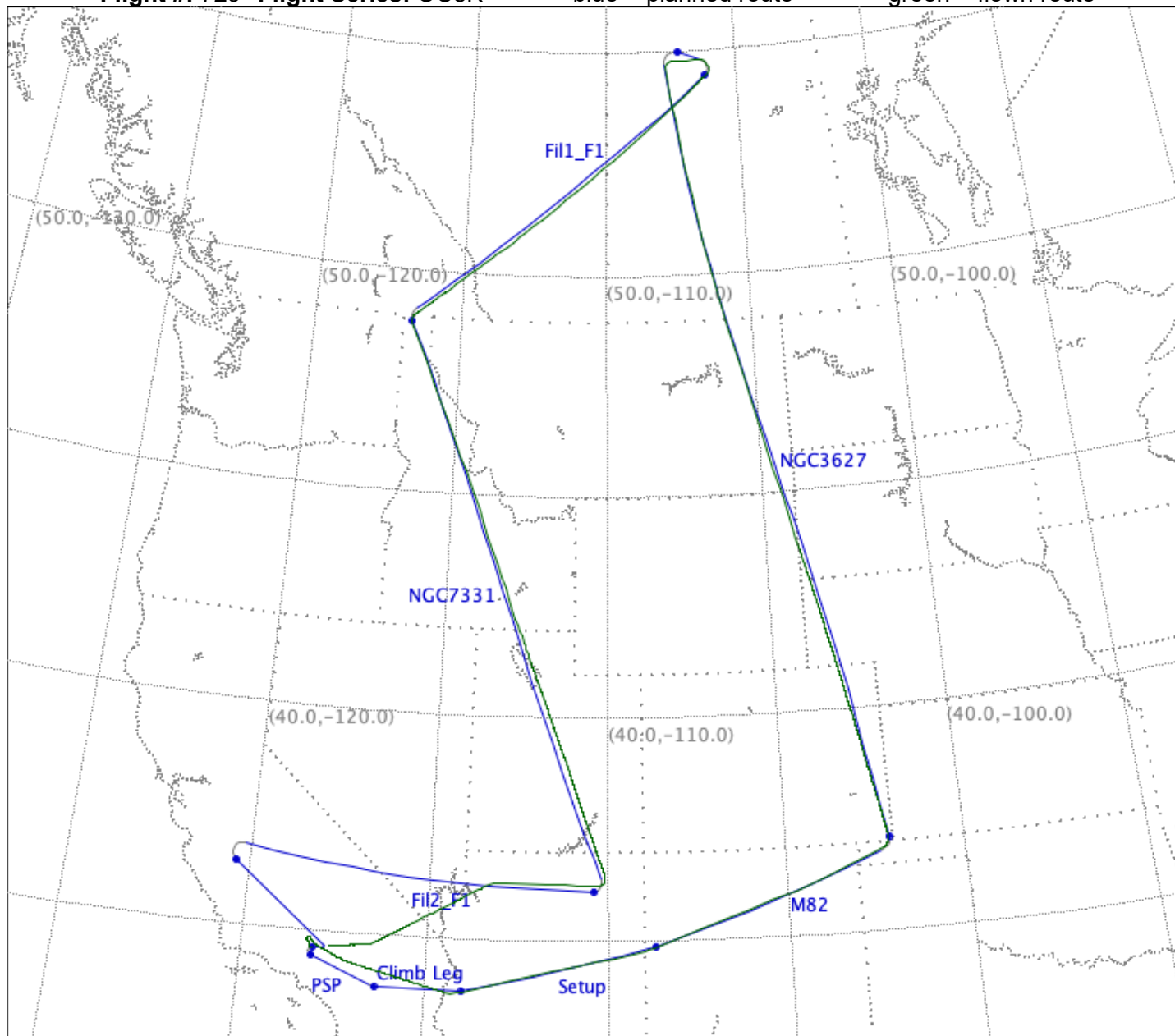
**MISSION ID: 2021-05-11\_HA\_F729**

**Date: 2021-05-11 UT Instrument: HAWC+**

**Flight #: 729 Flight Series: OC8K**

blue = planned route

green = flown route

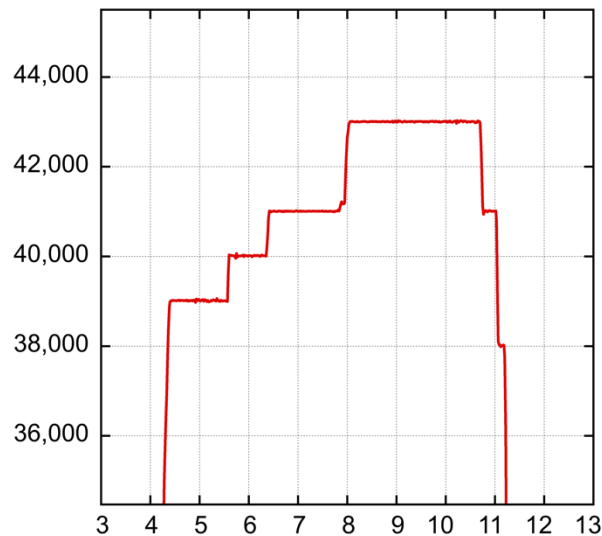


**Flight notes:  
No irregularities.**

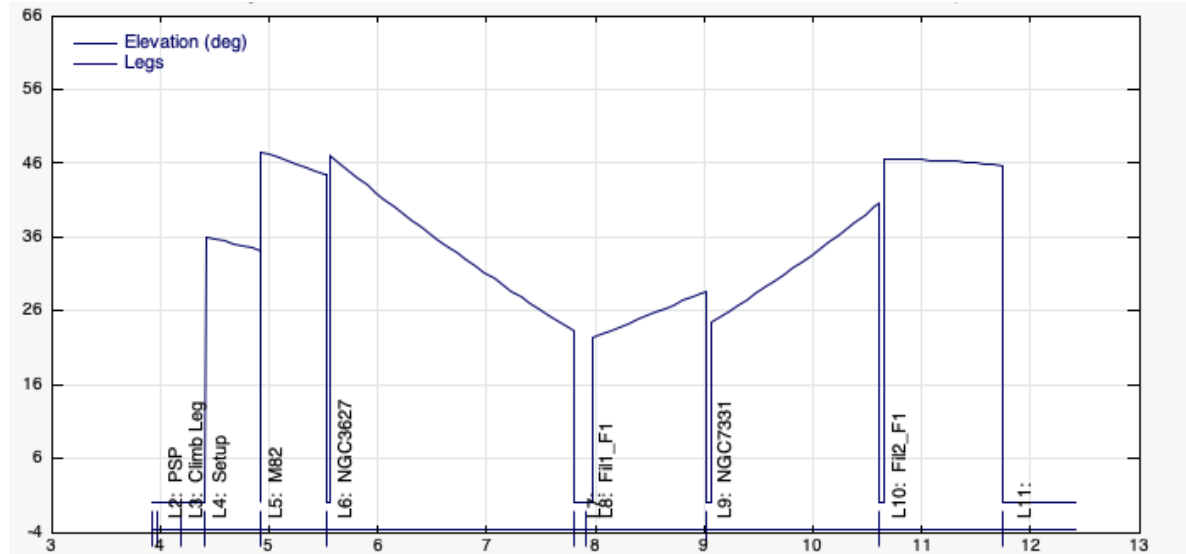
Flight 729 Mission ID 2021-05-11\_HA\_F729  
 Palmdale to Palmdale Take off date UTC: 11-MAY-2021  
 Departure UTC: 03:54 Arrival UTC: 11:37

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	07h00m04.04s	76d58m38.7s	4:25	30	
5	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	4:55	36	Solving large detector phase offsets in the HAWC+ instrument led to loss of first 45% of leg
6	08_0012	Lopez-Rodriguez	NGC3627	11h20m15.03s	12d59m28.6s	5:33	134	
8	08_0186	Stephens	Fil1	18h41m33.29s	-05d30m11.3s	7:58	63	
9	08_0012	Lopez-Rodriguez	NGC7331	22h37m04.10s	34d24m57.3s	9:03	93	
10	08_0186	Stephens	Fil2	18h38m48.97s	-07d04m08.1s	10:39	65	HAWC+ cooling failed at beginning of leg; return to Palmdale base early; no data collected

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



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





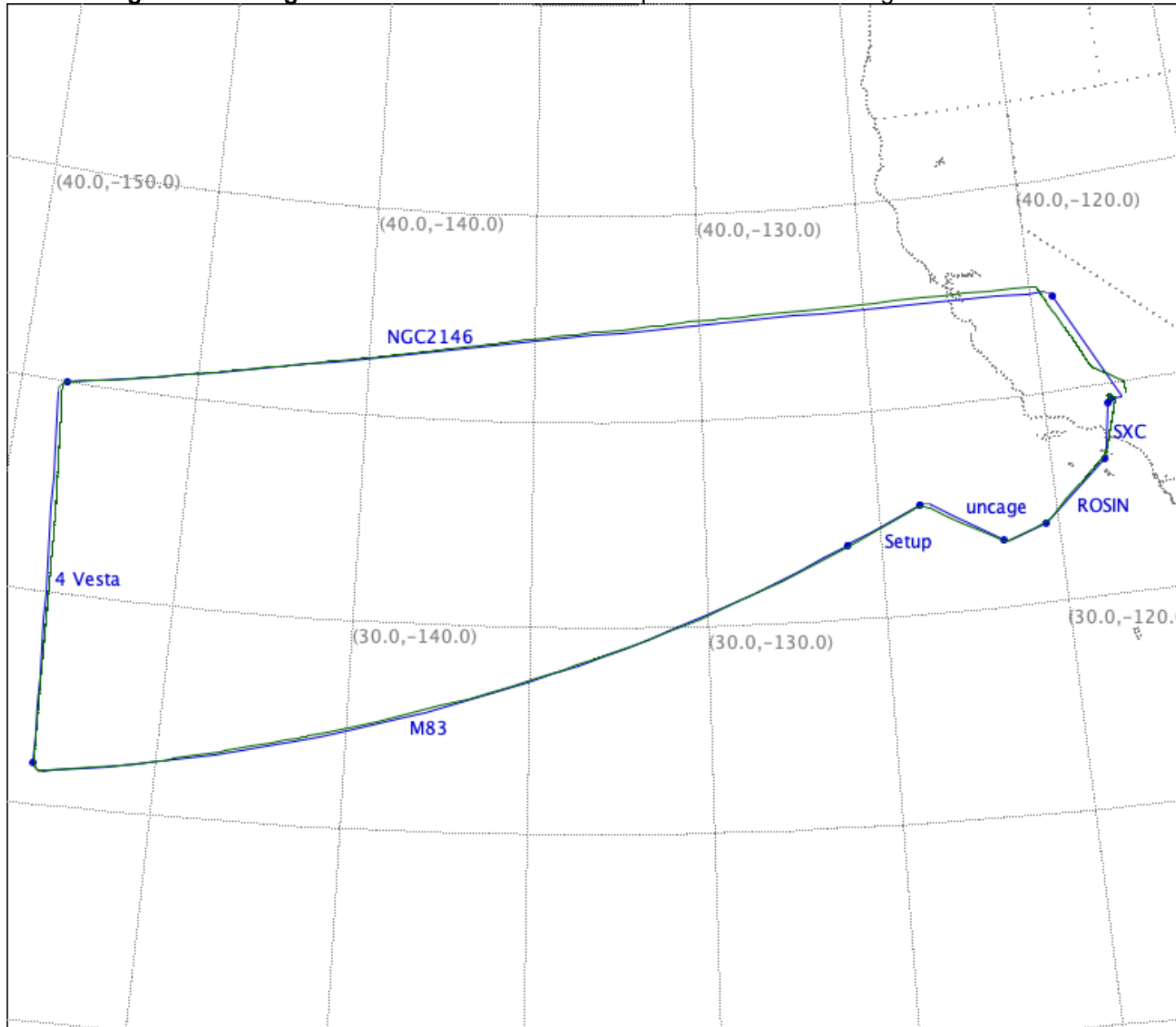
**MISSION ID: 2021-05-12\_HA\_F730**

**Date: 2021-05-12 UT Instrument: HAWC+**

**Flight #: 730 Flight Series: OC8K**

blue = planned route

green = flown route

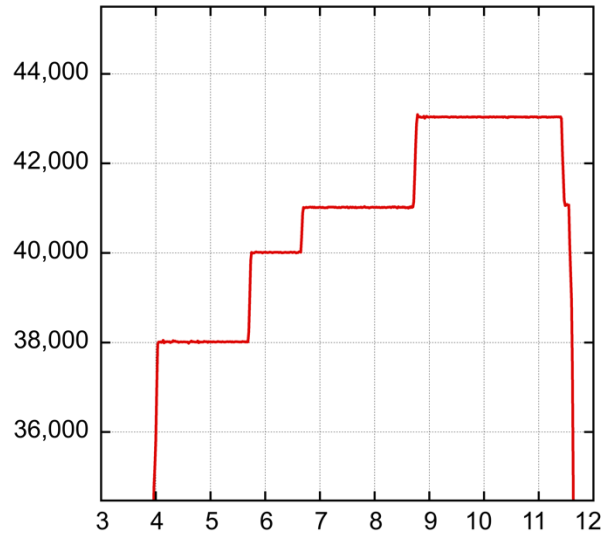


# Flight notes: No irregularities.

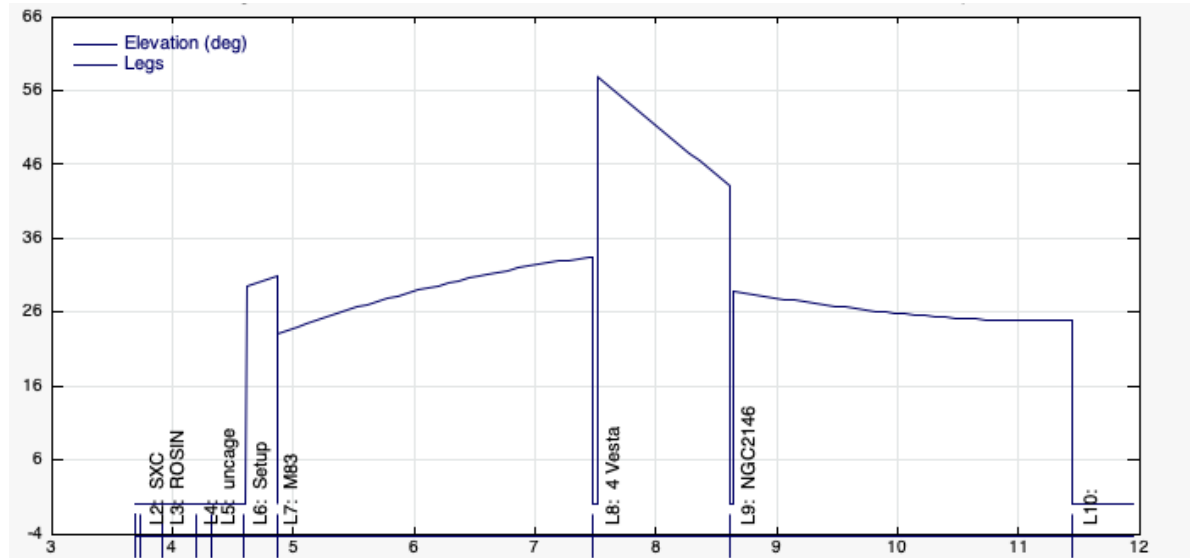
Flight 730 Mission ID 2021-05-12\_HA\_F730  
 Palmdale to Palmdale Take off date UTC: 12-MAY-2021  
 Departure UTC: 03:38 Arrival UTC: 12:01

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
6			Setup	13h18m55.30s	-23d10m17.4s	4:36	15	
7	08_0012	Lopez-Rodriguez	M83	13h37m00.92s	-29d51m56.7s	4:51	157	Air Traffic Control held aircraft at low altitude (38K ft) for first hour of leg
8	90_0083	Calibration	4 Vesta	10h53m35.28s	16d50m27.8s	7:30	65	
9	08_0012	Lopez-Rodriguez	NGC2146	06h18m37.71s	78d21m25.3s	8:38	168	

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



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



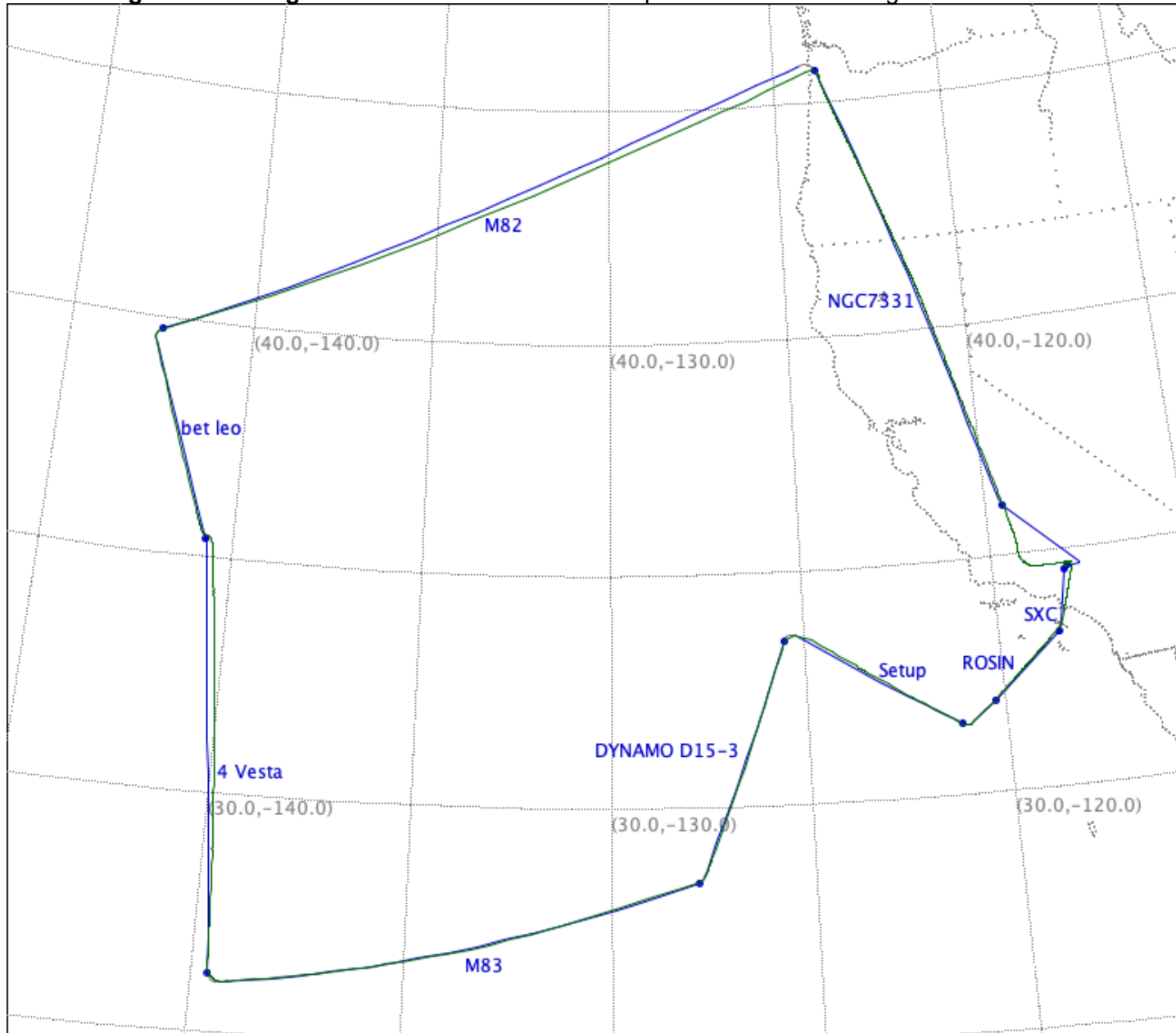
**MISSION ID: 2021-05-13\_HA\_F731**

**Date: 2021-05-13 UT Instrument: HAWC+**

**Flight #: 731 Flight Series: OC8K**

**blue = planned route**

**green = flown route**

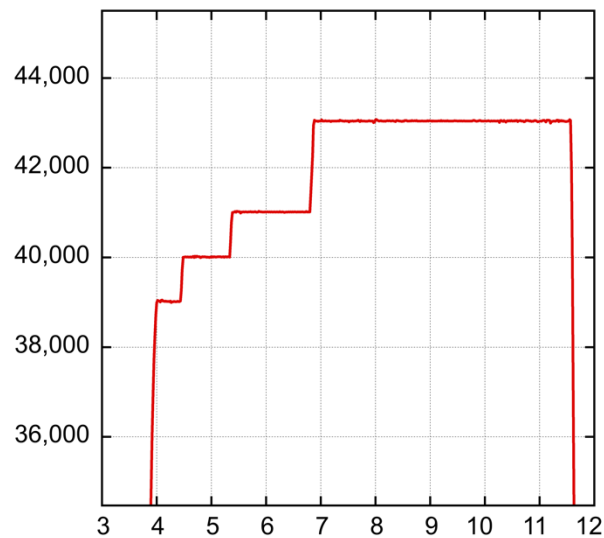


## Flight notes: No irregularities.

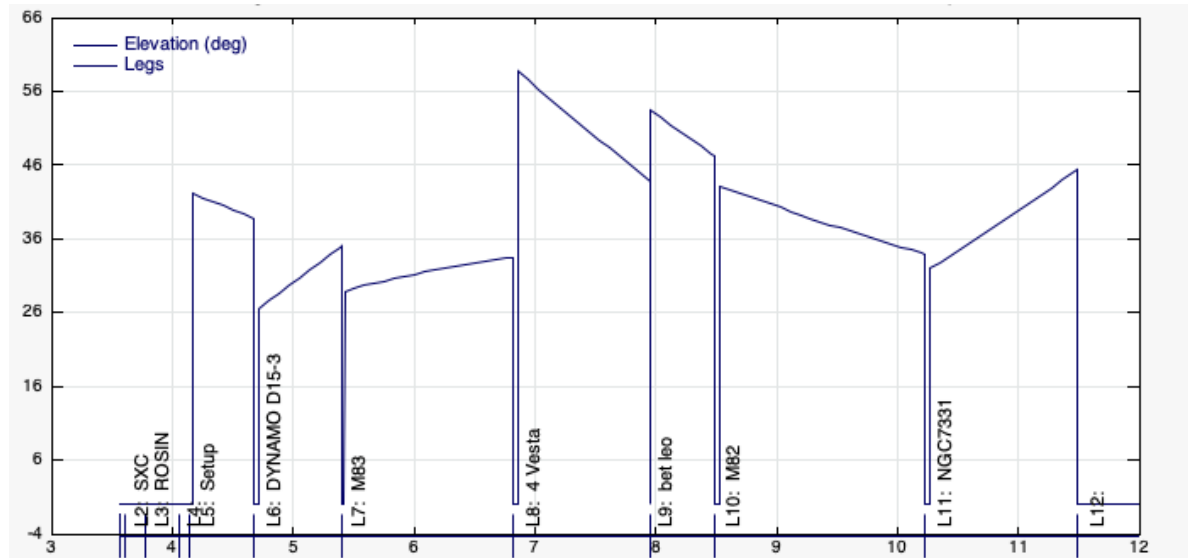
Flight 731 Mission ID 2021-05-13\_HA\_F731  
 Palmdale to Palmdale Take off date UTC: 13-MAY-2021  
 Departure UTC: 03:29 Arrival UTC: 12:01

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			HIP 49841	10h10m35.29s	-12d21m14.9s	4:09	30	
6	08_0238	Lenkic	DYNAMO D15-3	15h34m35.40s	-00d28m44.6s	4:42	41	
7	08_0012	Lopez-Rodriguez	M83	13h37m00.92s	-29d51m56.7s	5:24	84	
8	90_0083	Calibration	4 Vesta	10h54m06.66s	16d44m18.2s	6:51	65	
9	08_0154	Faramaz	bet leo	11h49m03.58s	14d34m19.4s	7:56	32	
10	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	8:31	102	
11	08_0012	Lopez-Rodriguez	NGC7331	22h37m04.10s	34d24m57.3s	10:15	73	

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



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



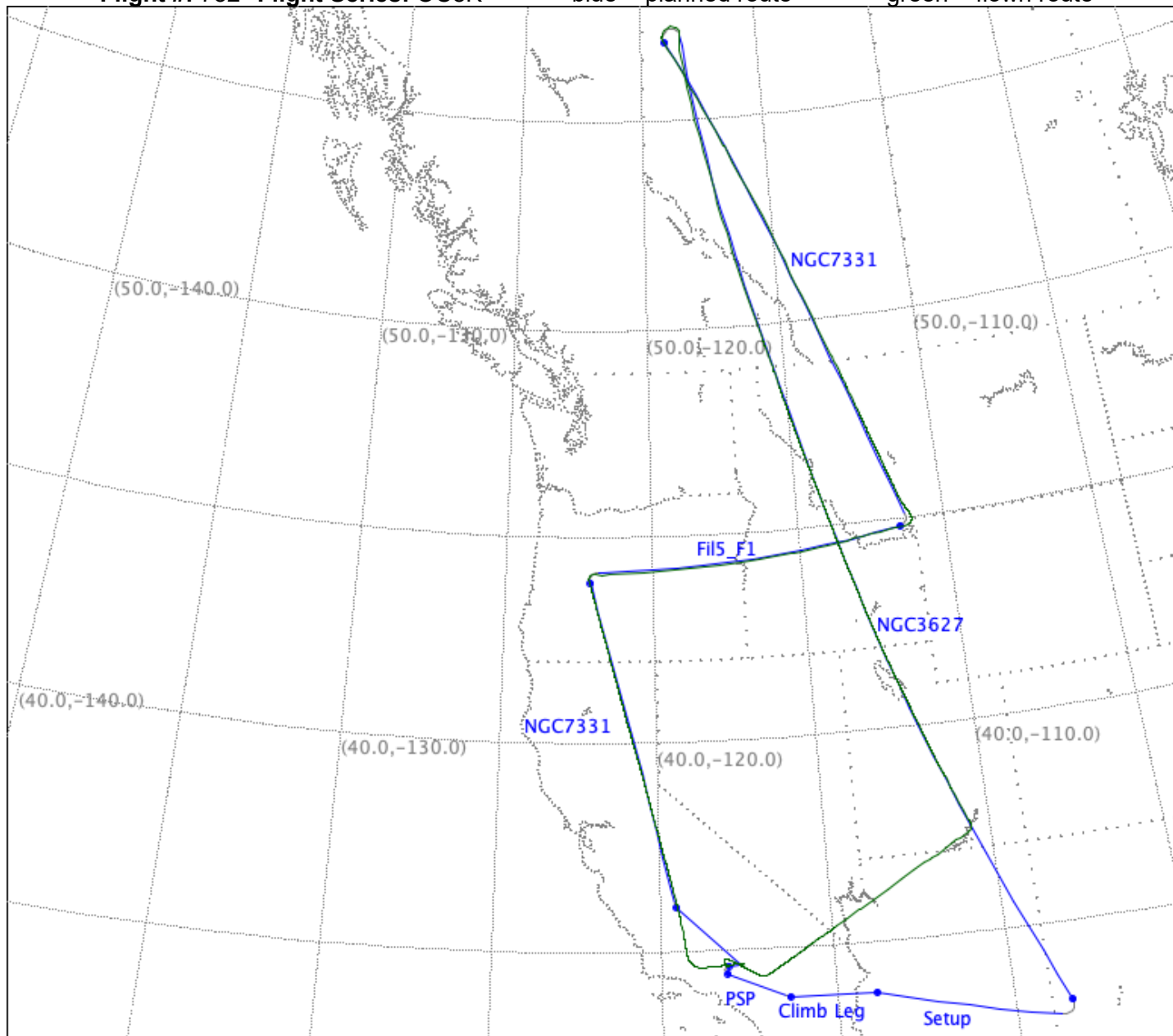
# MISSION ID: 2021-05-14\_HA\_F732

Date: 2021-05-14 UT Instrument: HAWC+

Flight #: 732 Flight Series: OC8K

blue = planned route

green = flown route

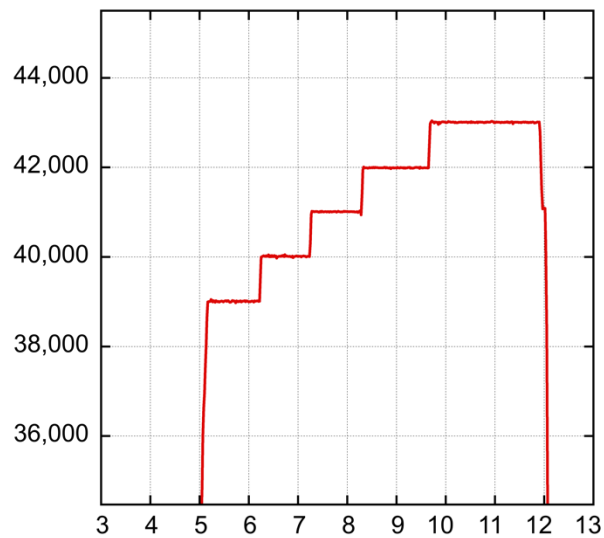


## Flight notes: Late departure.

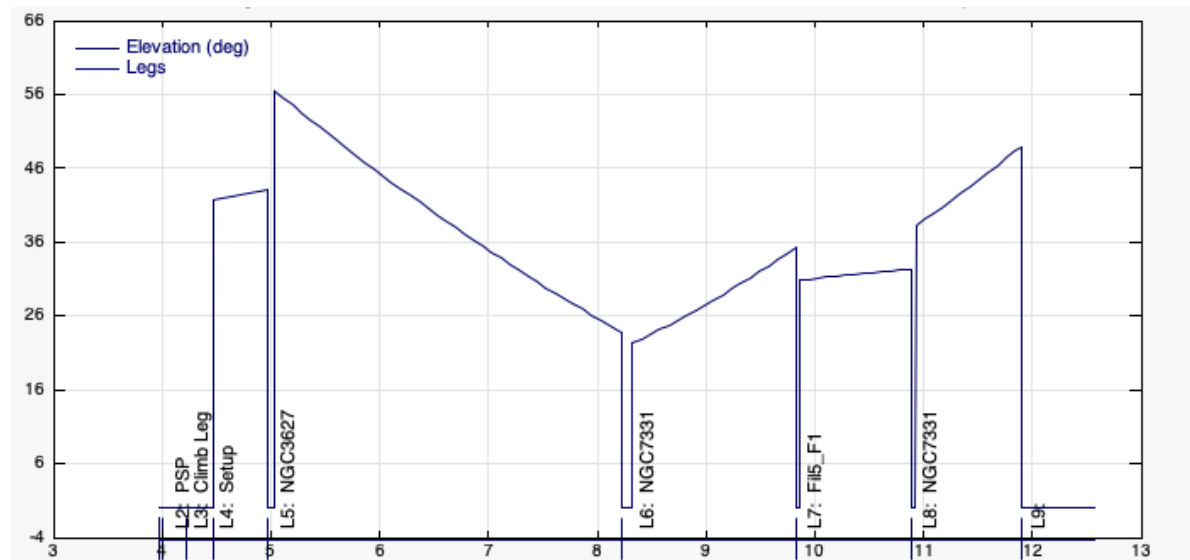
Flight 732 Mission ID 2021-05-14\_HA\_F732  
 Palmdale to Palmdale Take off date UTC: 14-MAY-2021  
 Departure UTC: 04:41 Arrival UTC: 12:29

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	15h31m24.93s	77d20m57.7s	4:28	30	
5	08_0012	Lopez-Rodriguez	NGC3627	11h20m15.03s	12d59m28.6s	5:02	192	First 30min of leg lost due to late takeoff.
6	08_0012	Lopez-Rodriguez	NGC7331	22h37m04.10s	34d24m57.3s	8:19	90	
7	08_0186	Stephens	Fil5	18h25m12.10s	-12d48m41.6s	9:52	61	
8	08_0012	Lopez-Rodriguez	NGC7331	22h37m04.10s	34d24m57.3s	10:56	58	

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



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



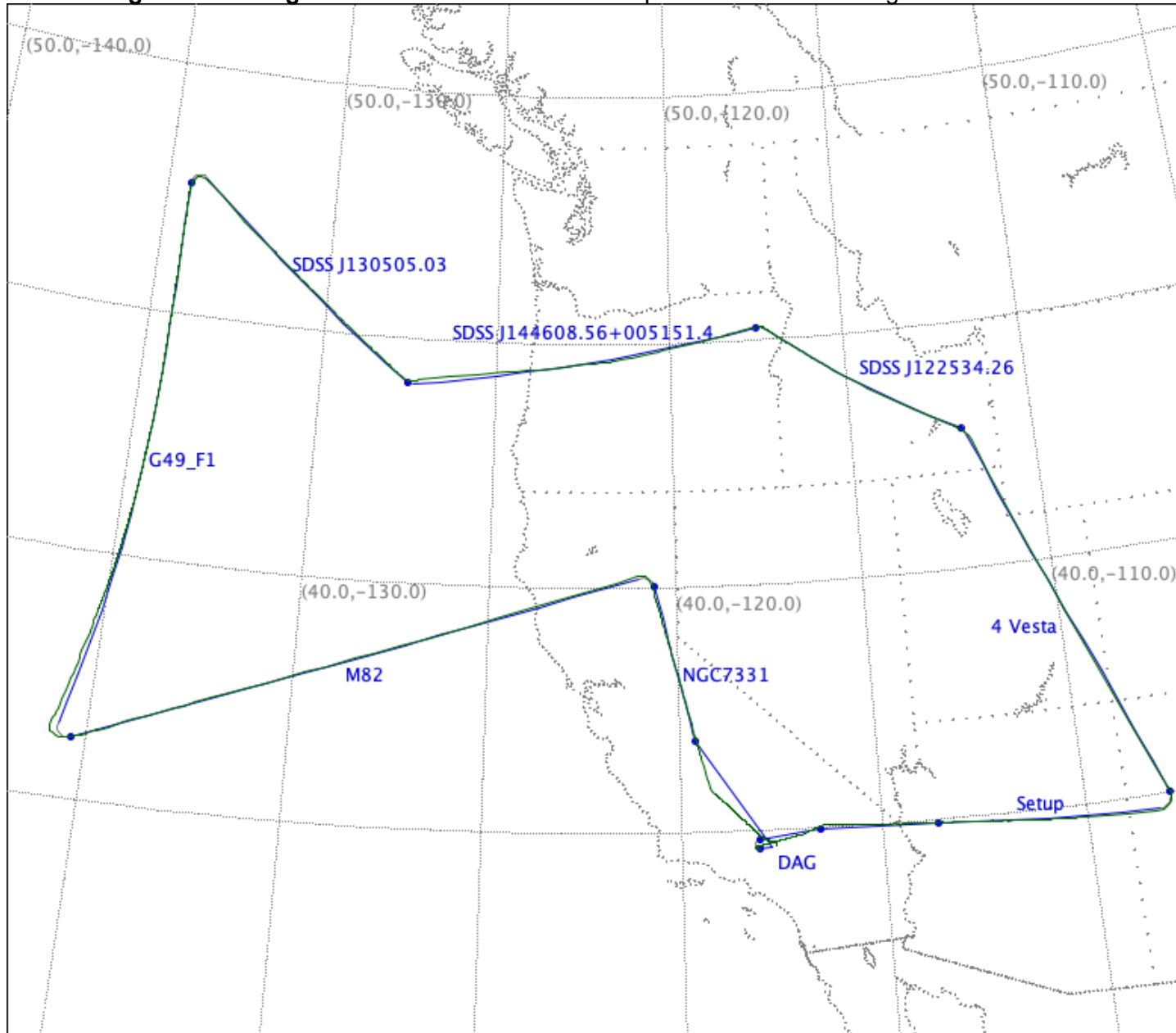
**MISSION ID: 2021-05-18\_HA\_F733**

**Date: 2021-05-18 UT Instrument: HAWC+**

**Flight #: 733 Flight Series: OC8K**

blue = planned route

green = flown route

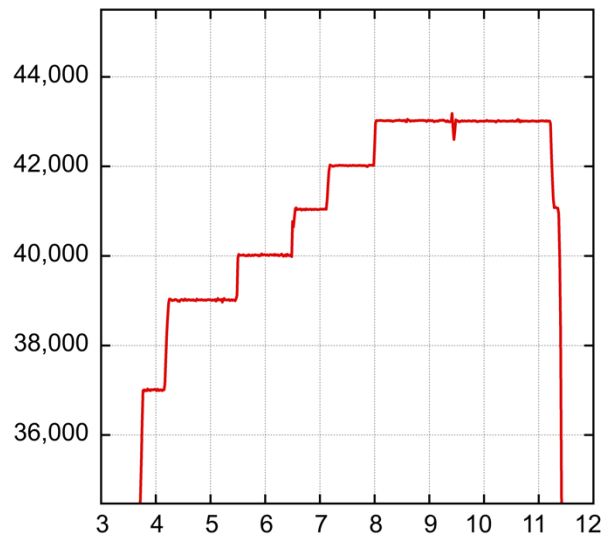


**Flight notes:**  
**No irregularities.**

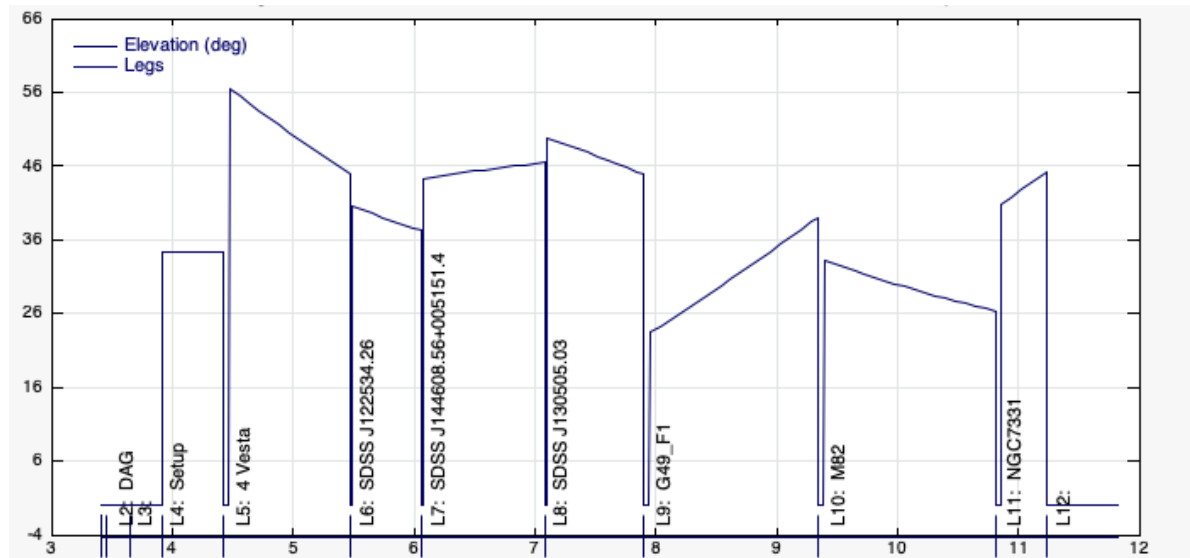
Flight 733 Mission ID 2021-05-18\_HA\_F733  
 Palmdale to Palmdale Take off date UTC: 18-MAY-2021  
 Departure UTC: 03:23 Arrival UTC: 11:43

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	02h31m49.08s	89d15m50.8s	3:55	30	
5	90_0083	Calibration	4 Vesta	10h57m07.95s	16d10m43.1s	4:28	60	
6	08_0238	Lenkic	SDSS J122534.26-025029.0	12h25m34.26s	-02d50m29.1s	5:29	34	
7	08_0238	Lenkic	SDSS J144608.56+005151.4	14h46m08.57s	00d51m51.6s	6:04	60	
8	08_0254	Eufrasio	SDSS J130505.03+071551.9	13h05m05.08s	07d15m52.0s	7:05	48	
9	08_0186	Stephens	G49	19h22m38.84s	14d10m16.4s	7:57	83	
10	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	9:23	85	
11	08_0012	Lopez-Rodriguez	NGC7331	22h37m04.10s	34d24m57.3s	10:51	23	

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



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





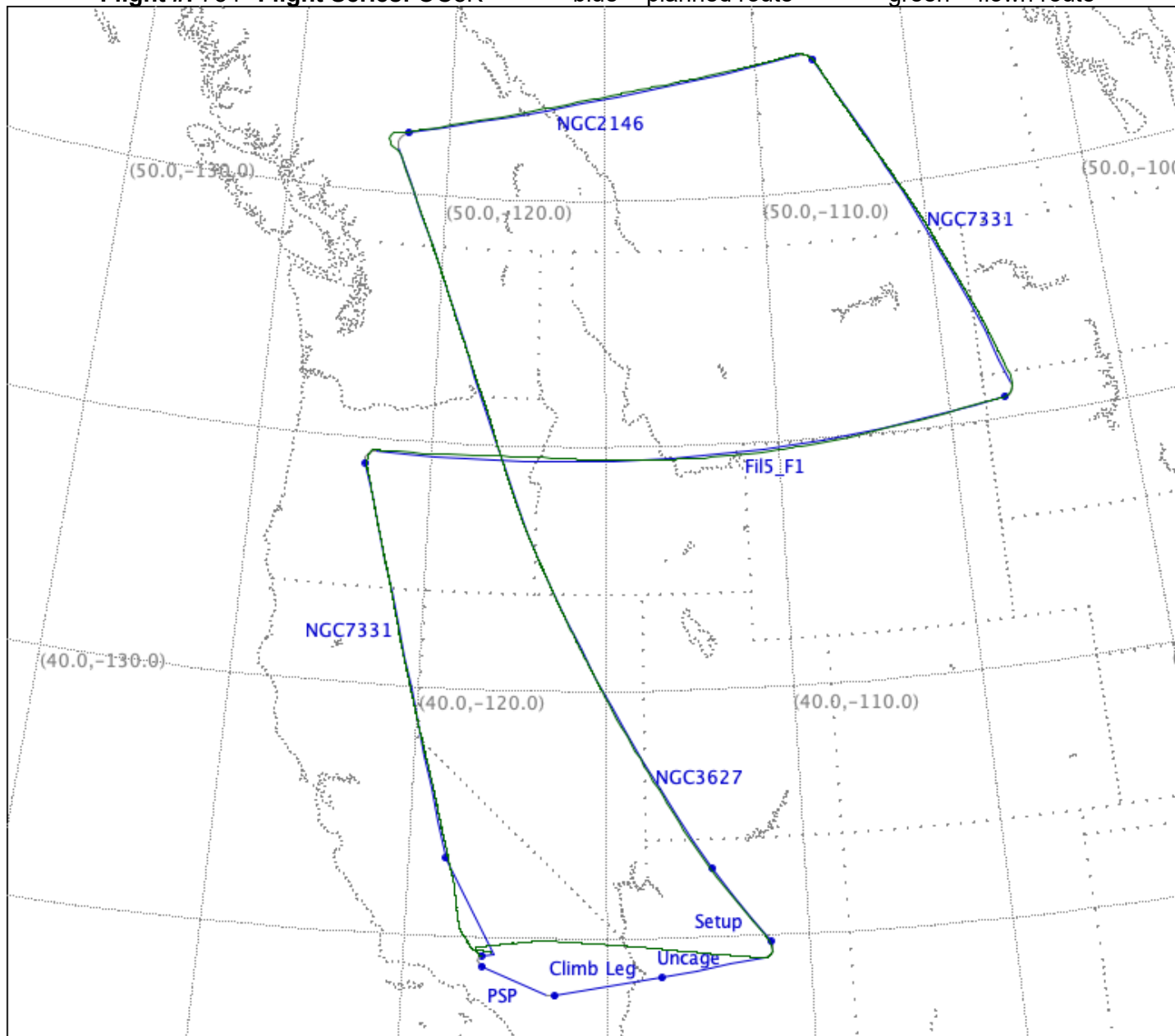
**MISSION ID: 2021-05-19\_HA\_F734**

**Date: 2021-05-19 UT Instrument: HAWC+**

**Flight #: 734 Flight Series: OC8K**

blue = planned route

green = flown route

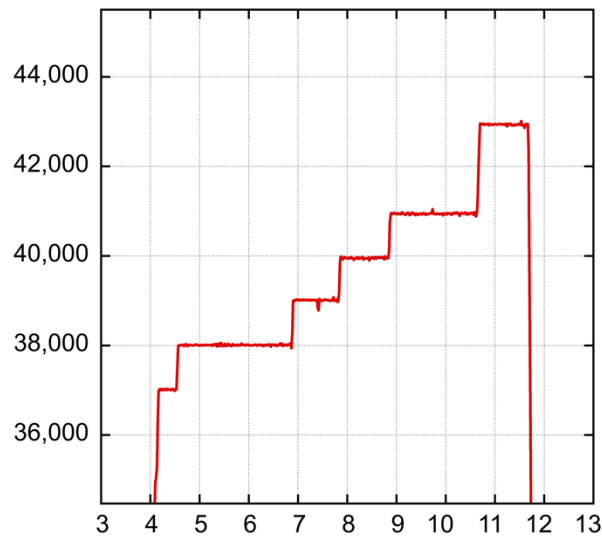


**Flight notes:  
No irregularities.**

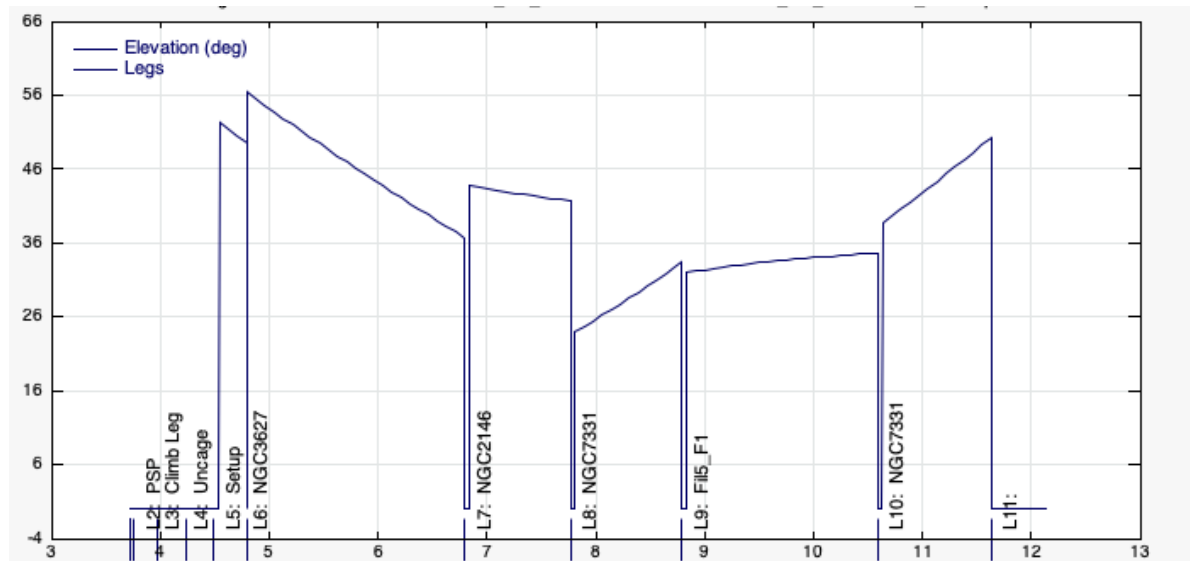
Flight 734 Mission ID 2021-05-19\_HA\_F734  
 Palmdale to Palmdale Take off date UTC: 19-MAY-2021  
 Departure UTC: 03:43 Arrival UTC: 12:04

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	11h05m01.03s	07d20m09.6s	4:31	15	
6	08_0012	Lopez-Rodriguez	NGC3627	11h20m15.03s	12d59m28.6s	4:46	120	
7	08_0012	Lopez-Rodriguez	NGC2146	06h18m37.71s	78d21m25.3s	6:49	56	Continuous light turbulence.
8	08_0012	Lopez-Rodriguez	NGC7331	22h37m04.10s	34d24m57.3s	7:47	59	
9	08_0186	Stephens	Fil5	18h25m12.10s	-12d48m41.6s	8:49	105	
10	08_0012	Lopez-Rodriguez	NGC7331	22h37m04.10s	34d24m57.3s	10:37	60	

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



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



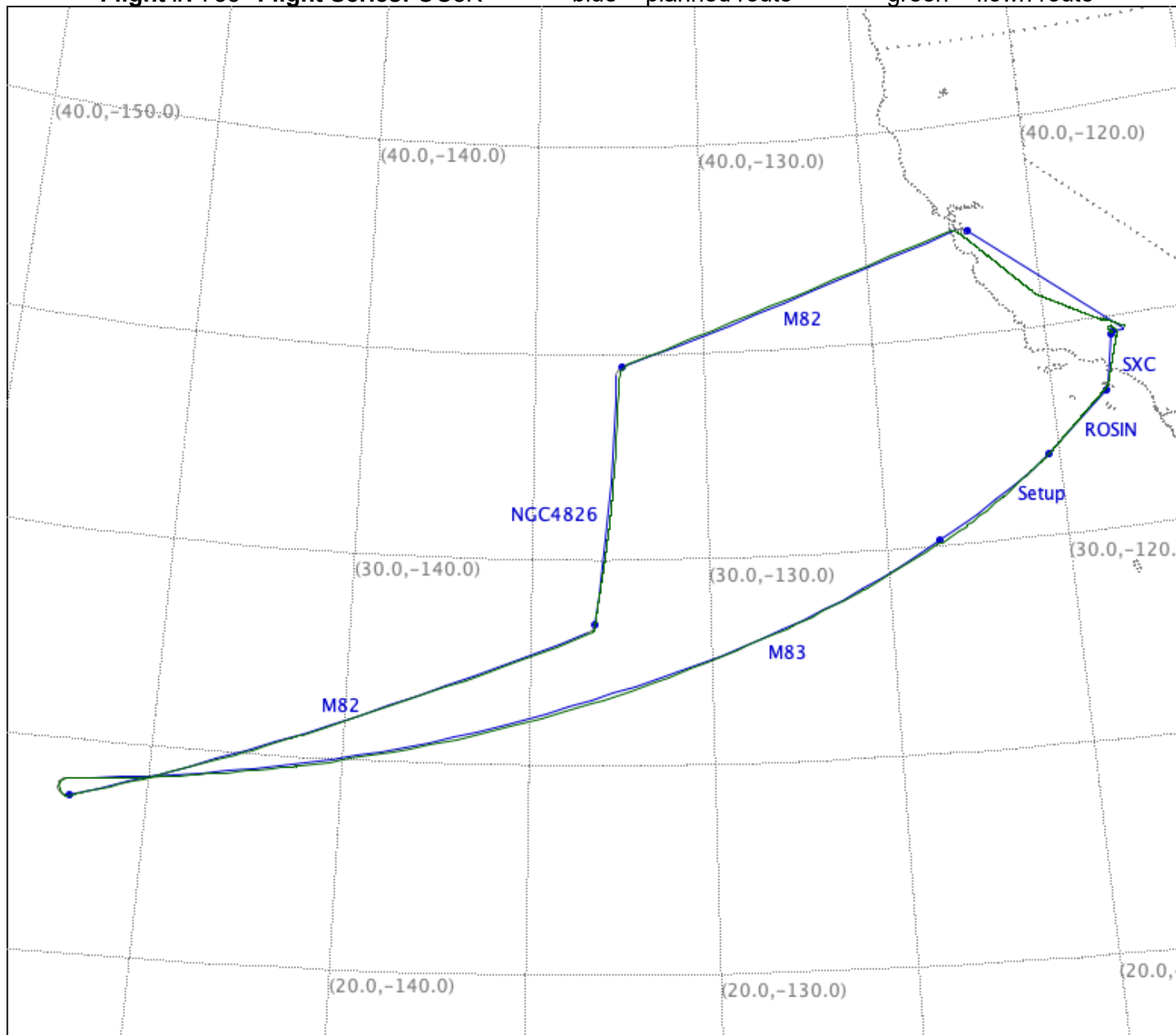
# MISSION ID: 2021-05-20\_HA\_F735

Date: 2021-05-20 UT Instrument: HAWC+

Flight #: 735 Flight Series: OC8K

blue = planned route

green = flown route

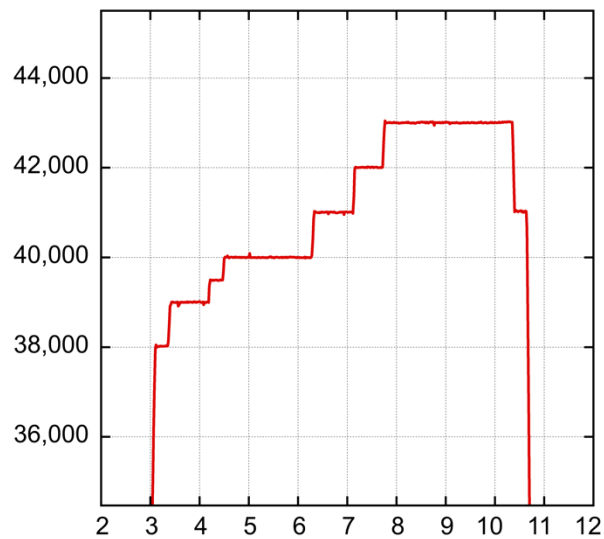


**Flight notes:**  
**No irregularities.**

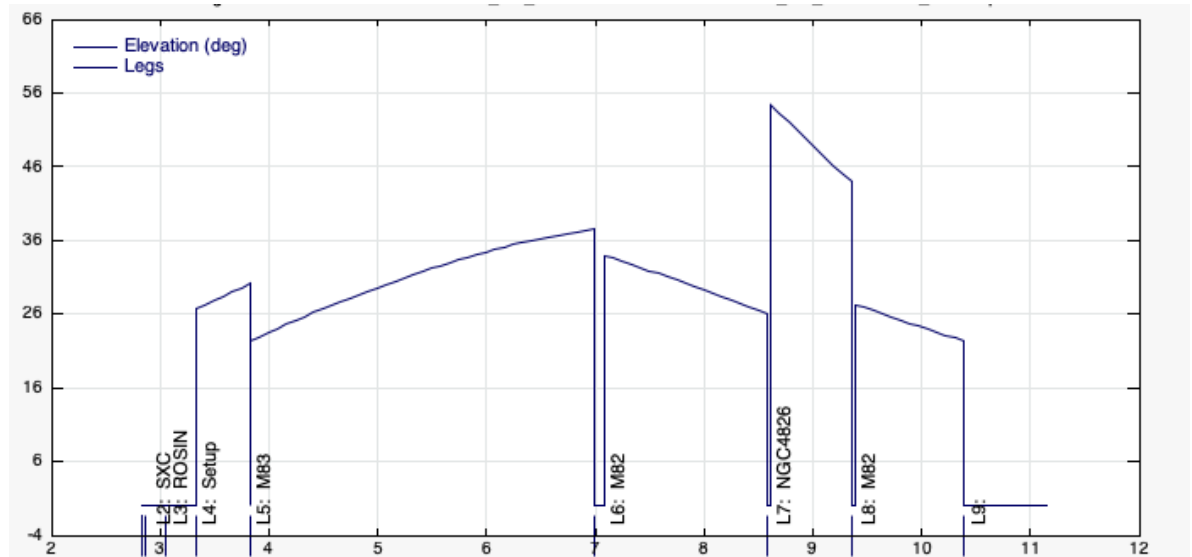
Flight 735 Mission ID 2021-05-20\_HA\_F735  
 Palmdale to Palmdale Take off date UTC: 20-MAY-2021  
 Departure UTC: 02:43 Arrival UTC: 11:04

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	13h18m55.30s	-23d10m17.4s	3:21	30	
5	08_0012	Lopez-Rodriguez	M83	13h37m00.92s	-29d51m56.7s	3:51	190	
6	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	7:07	90	
7	08_0012	Lopez-Rodriguez	NGC4826	12h56m43.70s	21d40m57.6s	8:38	45	
8	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	9:25	60	

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



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



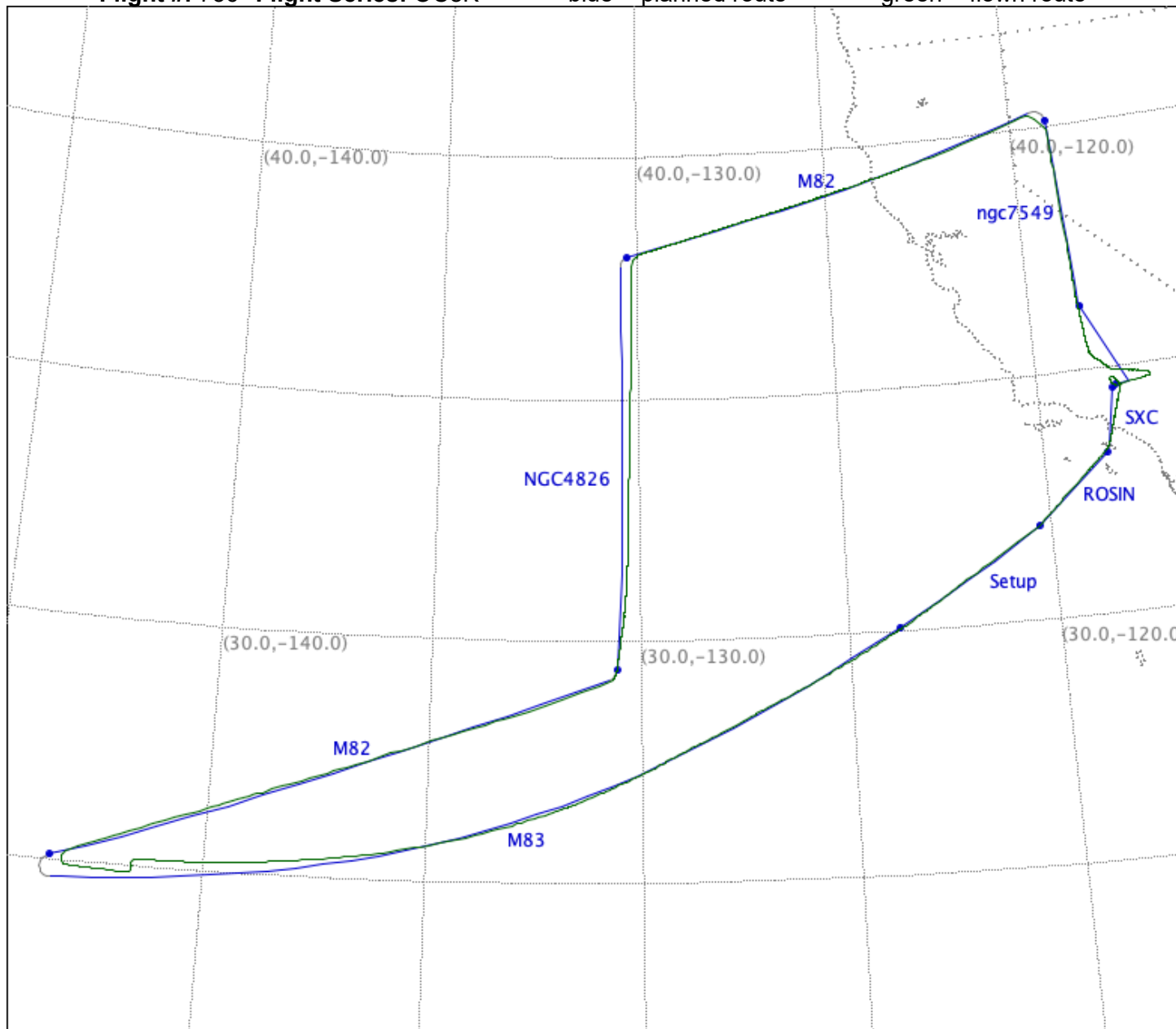
# MISSION ID: 2021-05-21\_HA\_F736

Date: 2021-05-21 UT Instrument: HAWC+

Flight #: 736 Flight Series: OC8K

blue = planned route

green = flown route

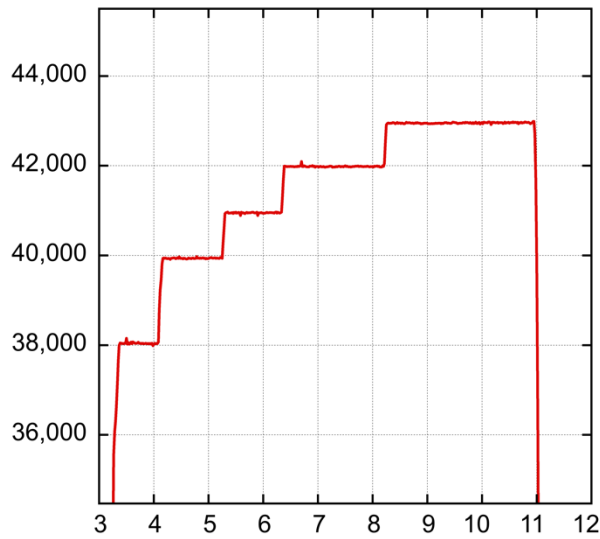


**Flight notes:  
Some weather effects.**

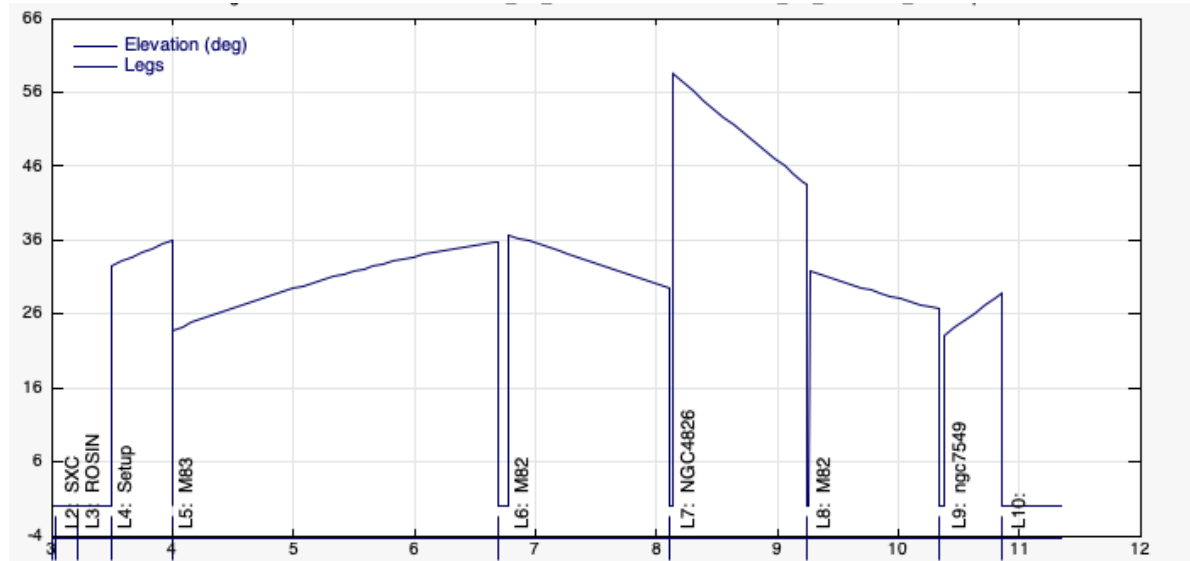
Flight 736 Mission ID 2021-05-21\_HA\_F736  
 Palmdale to Palmdale Take off date UTC: 21-MAY-2021  
 Departure UTC: 02:57 Arrival UTC: 11:29

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	13h18m24.31s	-18d18m40.3s	3:31	30	
5	08_0012	Lopez-Rodriguez	M83	13h37m00.92s	-29d51m56.7s	4:01	162	
6	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	6:48	80	30min lost to thick haze and clouds
7	08_0012	Lopez-Rodriguez	NGC4826	12h56m43.70s	21d40m57.6s	8:10	66	
8	08_0012	Lopez-Rodriguez	M82	09h55m52.43s	69d40m46.9s	9:18	64	
9	08_0108	Casey	ngc7549	23h15m17.23s	19d02m30.1s	10:25	28	

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



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



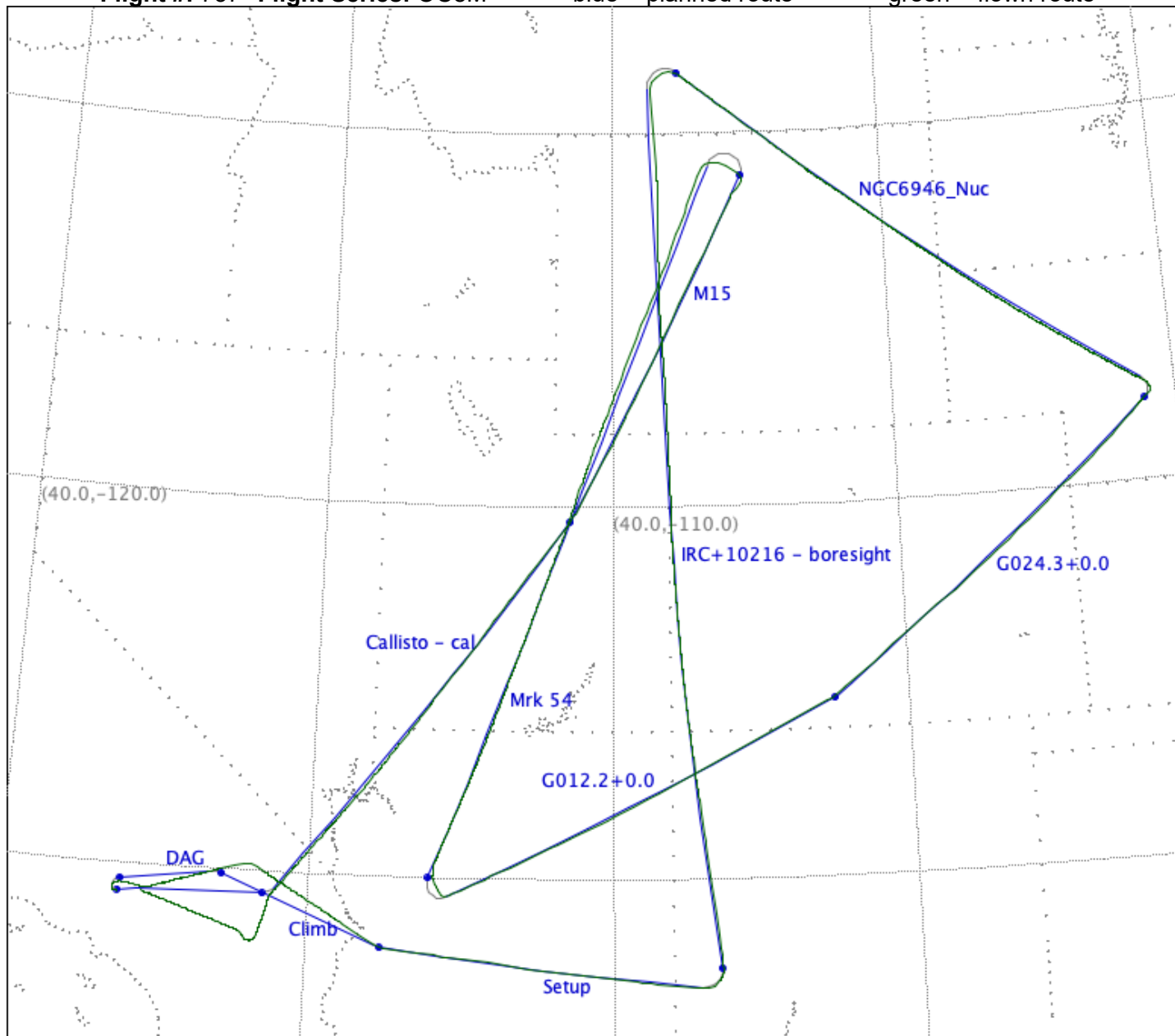
**MISSION ID: 2021-05-25\_FI\_F737**

**Date: 2021-05-25 UT Instrument: FIFI-LS**

**Flight #: 737 Flight Series: OC8M**

blue = planned route

green = flown route

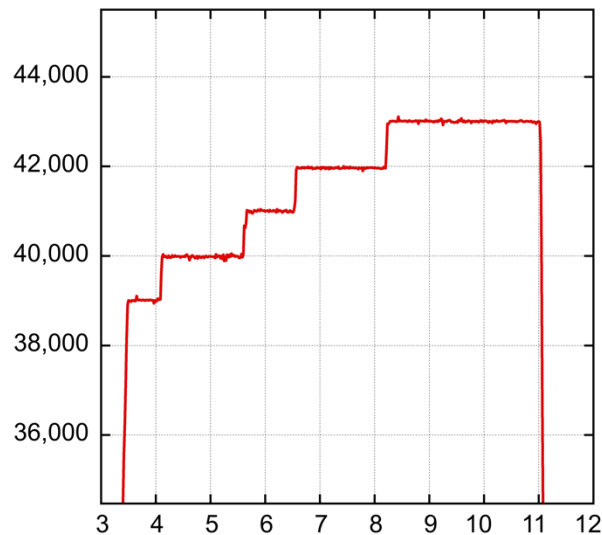


## Flight notes: Some inefficiencies due to turbulence.

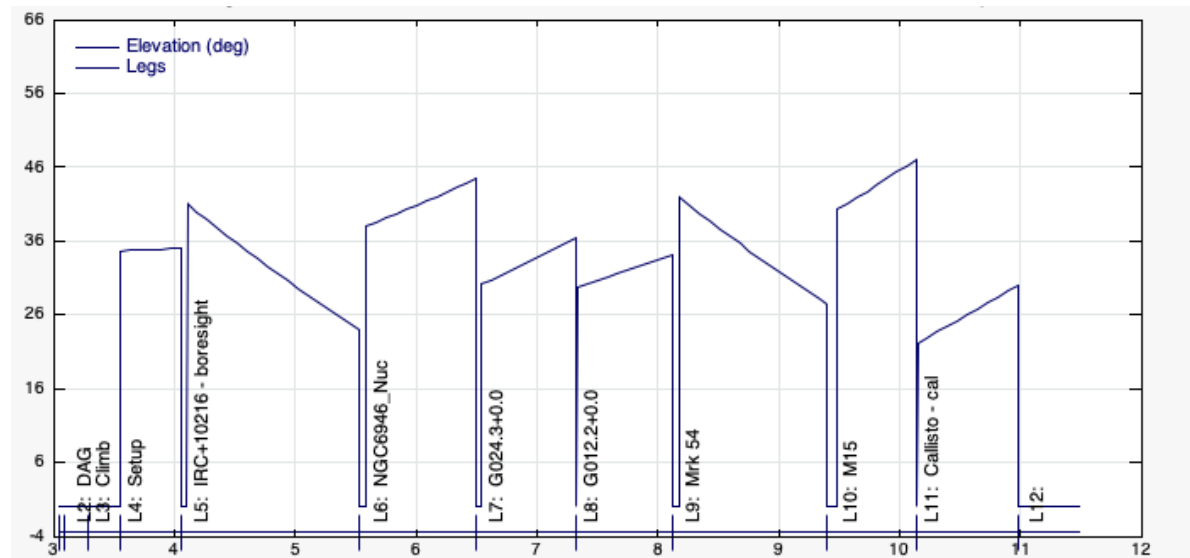
Flight 737 Mission ID 2021-05-25\_FI\_F737  
 Palmdale to Palmdale Take off date UTC: 25-MAY-2021  
 Departure UTC: 03:00 Arrival UTC: 11:28

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	17h32m13.00s	86d35m11.3s	3:32	30	
5	90_0032	Calibration	IRC+10216	09h47m57.41s	13d16m43.6s	4:05	85	
6	09_0198	Lamarche	NGC6946_Nuc	20h34m59.37s	60d10m25.1s	5:34	55	
7	08_0023	Pineda	G024.3+0.0	18h35m41.29s	-07d38m01.6s	6:32	47	
8	08_0023	Pineda	G012.2+0.0	18h12m12.97s	-18d23m12.7s	7:19	47	
9	08_0063	Hashimoto	Mrk 54	12h56m55.80s	32d26m56.0s	8:09	73	Turbulence caused short losses of guiding.
10	09_0151	Gregg	M15	21h29m58.38s	12d10m00.6s	9:28	40	Turbulence caused short losses of guiding.
11	90_0033	Calibration	Callisto	22h12m26.86s	-11d59m58.1s	10:08	50	Turbulence and close proximity to Jupiter caused short losses in guiding; Long acquisition led to some loss in observing time.

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



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





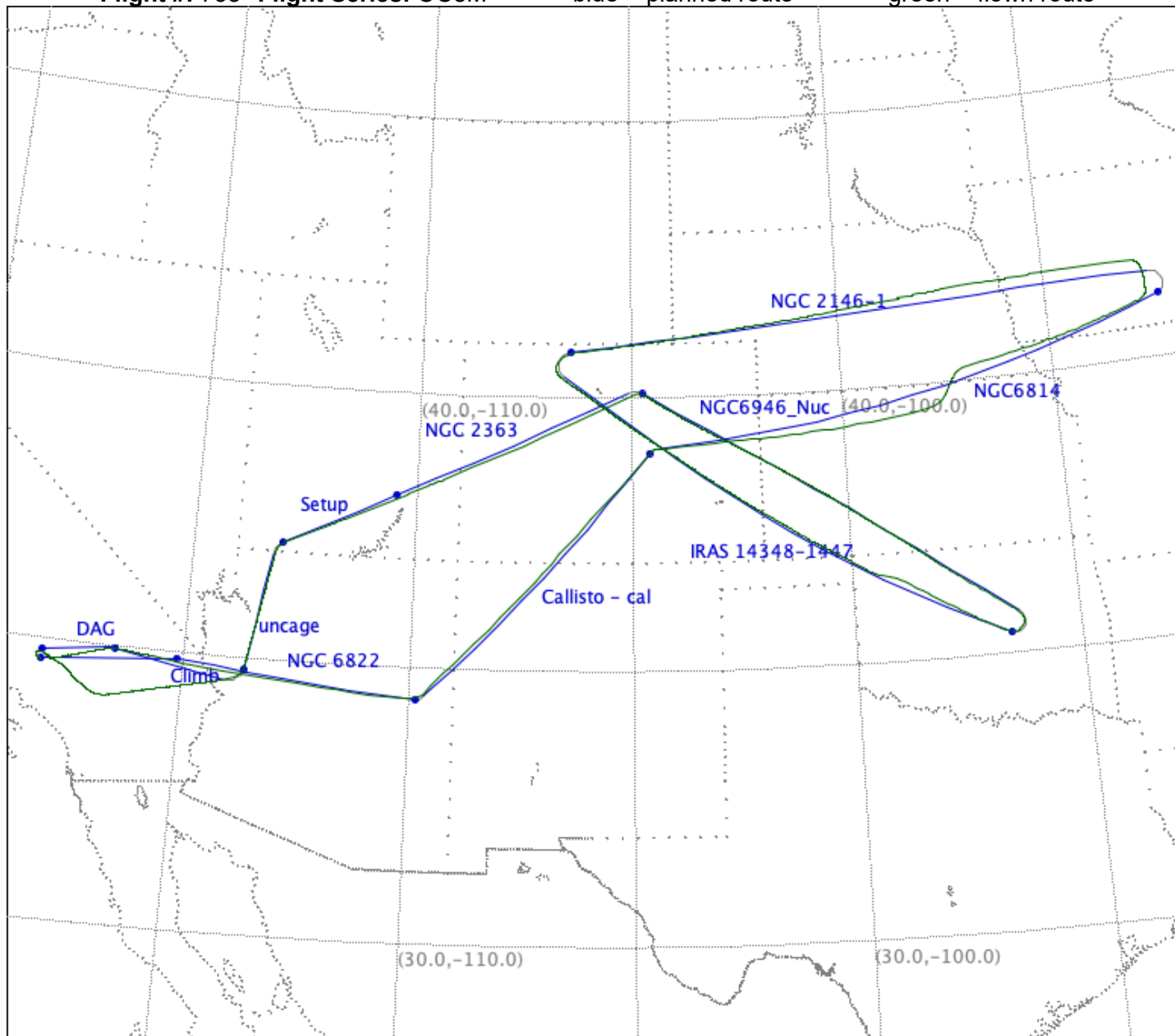
**MISSION ID: 2021-05-27\_FI\_F738**

**Date: 2021-05-27 UT Instrument: FIFI-LS**

**Flight #: 738 Flight Series: OC8M**

blue = planned route

green = flown route

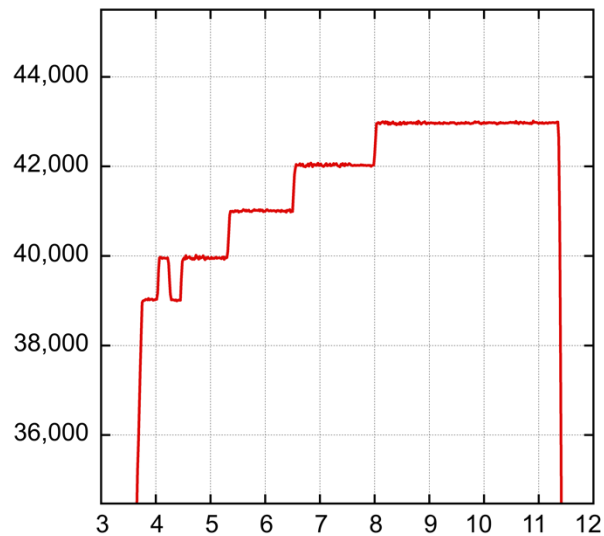


## Flight notes: Some time lost due to clouds.

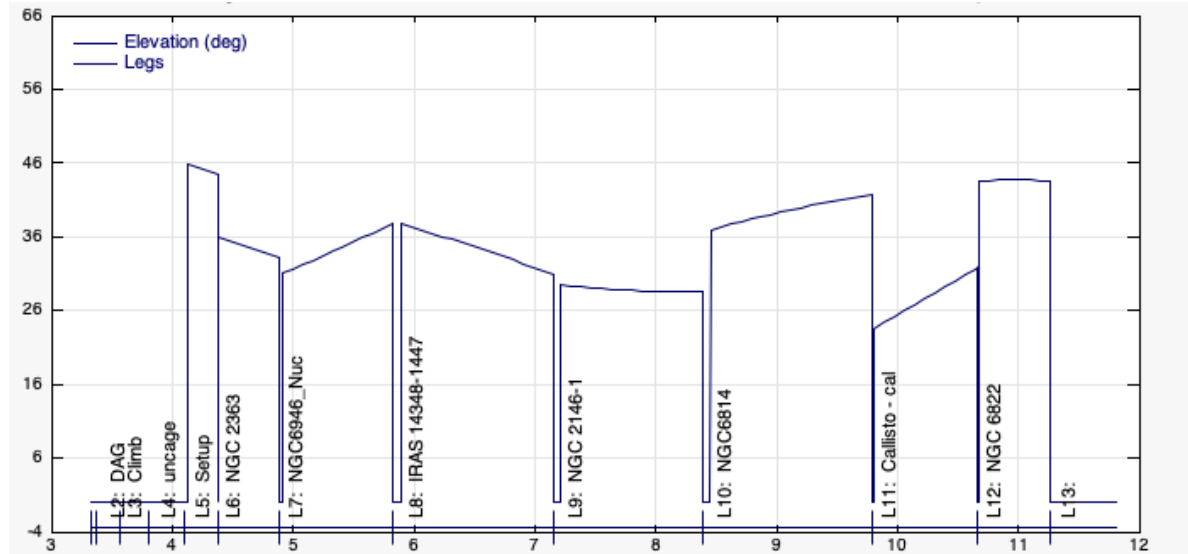
Flight 738 Mission ID 2021-05-27\_FI\_F738  
 Palmdale to Palmdale Take off date UTC: 27-MAY-2021  
 Departure UTC: 03:17 Arrival UTC: 11:46

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	09h02m32.69s	67d37m46.6s	4:07	15	
6	08_0071	Jones	NGC 2363	07h28m42.70s	69d11m23.0s	4:22	30	Started at 40k ft, but Air Traffic Control forced us to drop to 39k ft. due to air traffic.
7	09_0198	Lamarche	NGC6946_Nuc	20h34m59.37s	60d10m25.1s	4:54	55	At 05:30 telescope door was closed because of clouds and moisture
8	08_0095	Ma	IRAS 14348-1447	14h37m38.40s	-15d00m20.0s	5:54	75	Started leg with door closed due to clouds, reopened at 06:30.
9	09_0185	Stacey	NGC 2146	06h18m37.71s	78d21m25.3s	7:13	70	Light turbulence in second half of leg.
10	08_0069	Smith	NGC6814	19h42m40.64s	-10d19m24.6s	8:27	80	Intermittent haze.
11	90_0033	Calibration	Callisto	22h12m45.57s	-11d58m52.9s	9:48	51	Ganymede observed instead of Callisto by mistake.
12	09_0023	Jones	NGC 6822	19h44m52.40s	-14d43m13.0s	10:40	35	

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



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



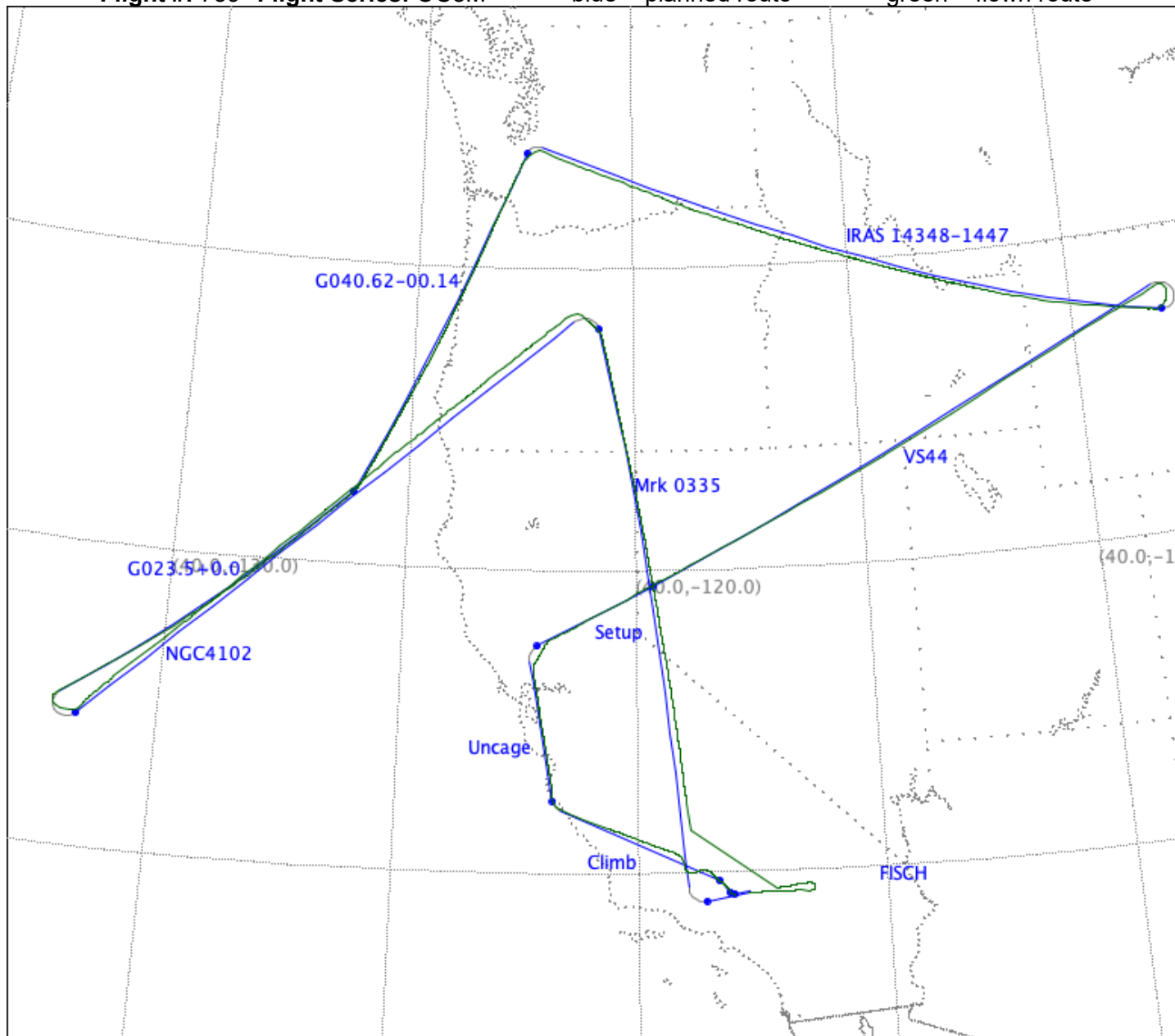
**MISSION ID: 2021-05-28\_FI\_F739**

**Date: 2021-05-28 UT Instrument: FIFI-LS**

**Flight #: 739 Flight Series: OC8M**

blue = planned route

green = flown route

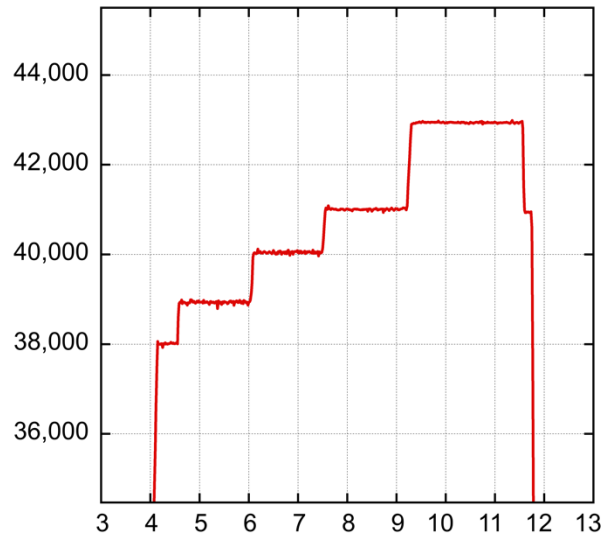


## Flight notes: No irregularities.

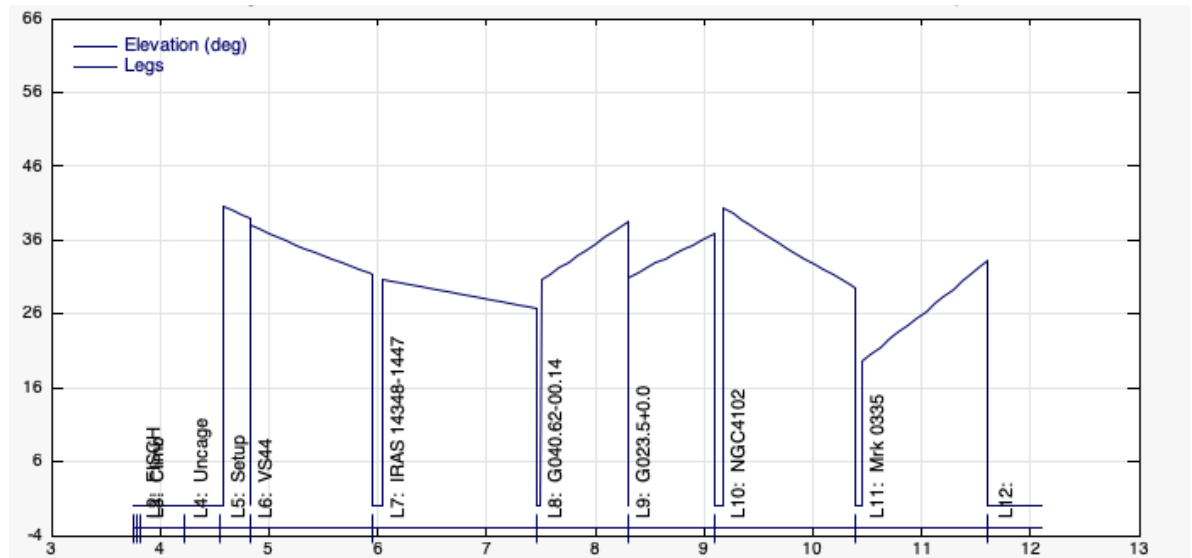
Flight 739 Mission ID 2021-05-28\_FI\_F739  
 Palmdale to Palmdale Take off date UTC: 28-MAY-2021  
 Departure UTC: 03:45 Arrival UTC: 12:11

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			HIP 37949	07h46m40.08s	65d27m20.4s	4:34	15	
6	08_0071	Jones	VS44	07h37m06.80s	65d36m40.0s	4:49	67	
7	08_0095	Ma	IRAS 14348-1447	14h37m38.40s	-15d00m20.0s	6:02	85	
8	09_0169	Yang	G040.62-00.14	19h06m01.63s	06d46m36.6s	7:30	48	
9	08_0023	Pineda	G023.5+0.0	18h34m04.24s	-08d24m20.1s	8:18	47	
10	08_0069	Smith	NGC4102	12h06m22.99s	52d42m39.9s	9:10	73	A few problems with positioning the grating in the blue channel.
11	08_0226	Petric	Mrk 0335	00h06m19.52s	20d12m10.5s	10:27	69	

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



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



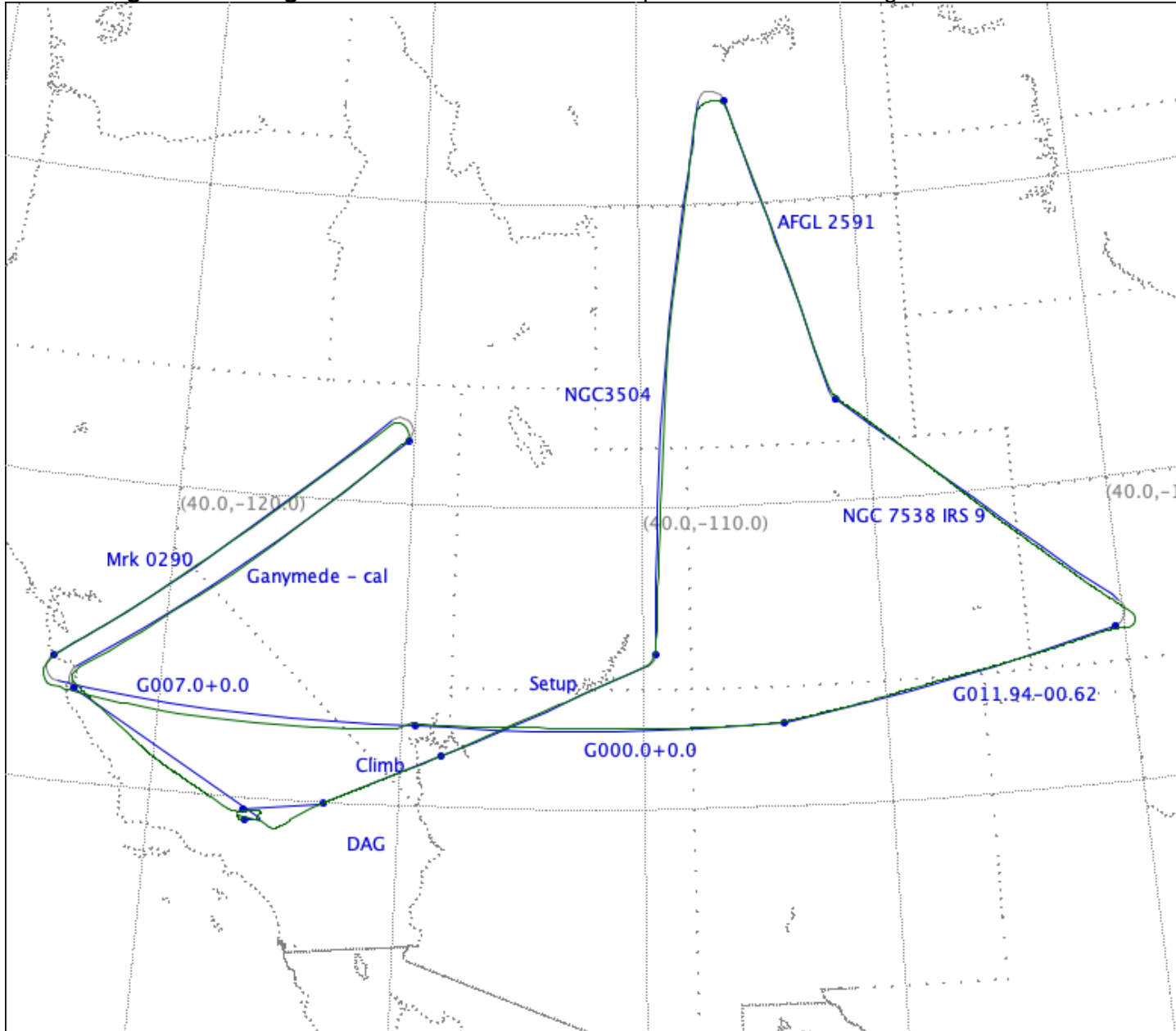
**MISSION ID: 2021-06-03\_FI\_F740**

**Date: 2021-06-03 UT Instrument: FIFI-LS**

**Flight #: 740 Flight Series: OC8M**

blue = planned route

green = flown route



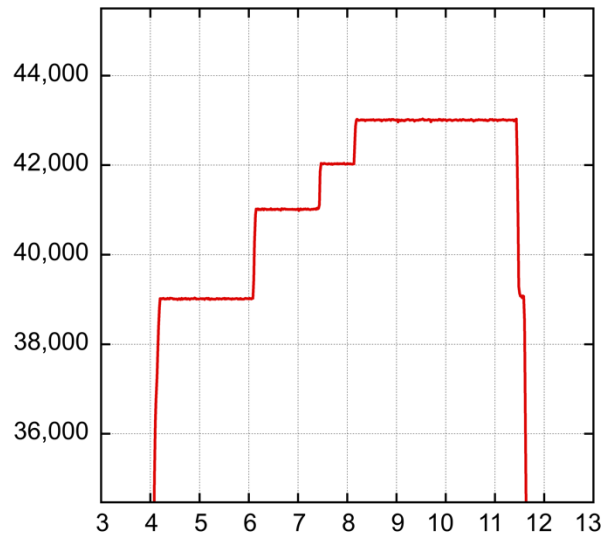
## Flight notes:

**Telescope issue rendered it inoperable early in flight.**

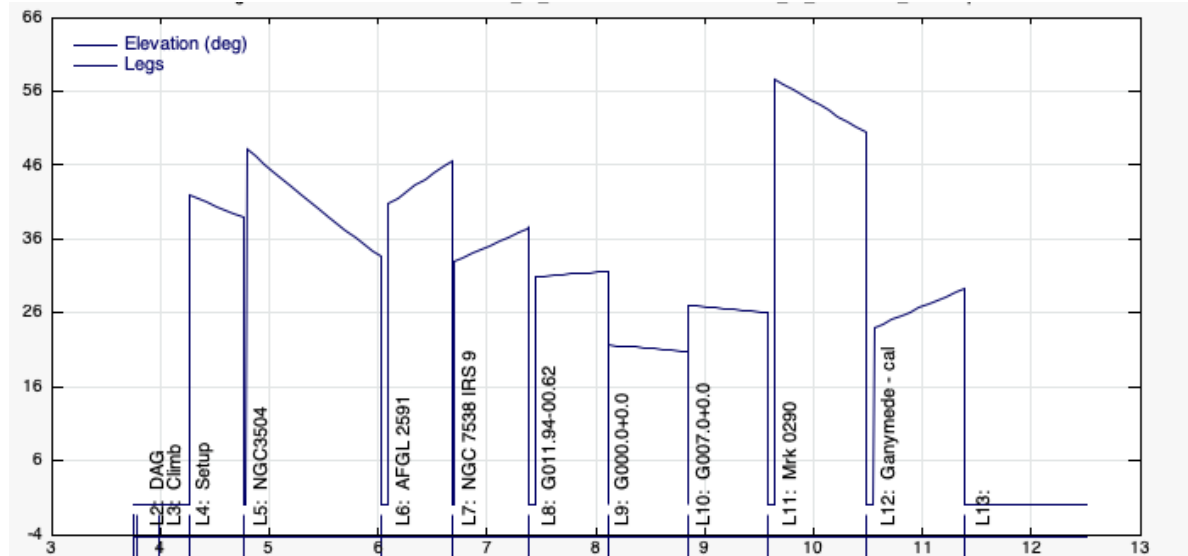
Flight 740 Mission ID 2021-06-03\_FI\_F740  
 Palmdale to Palmdale Take off date UTC: 03-JUN-2021  
 Departure UTC: 03:40 Arrival UTC: 12:08

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	09h02m32.69s	67d37m46.6s	4:16	30	
5	08_0069	Smith	NGC3504	11h03m11.21s	27d58m21.0s	4:48	74	Telescope oil temperature out of range; leg lost trying to cool
6	09_0169	Yang	AFGL 2591	20h29m25.04s	40d11m20.3s	6:06	35	Lost first 15min of leg to telescope temperature issue
7	09_0169	Yang	NGC 7538 IRS 9	23h14m01.63s	61d27m20.2s	6:42	41	
8	09_0169	Yang	G011.94-00.62	18h14m01.01s	-18d53m22.9s	7:27	40	
9	08_0023	Pineda	G000.0+0.0	17h45m37.22s	-28d56m10.2s	8:07	44	
10	08_0023	Pineda	G007.0+0.0	18h01m20.25s	-22d56m31.8s	8:51	44	
11	08_0226	Petric	Mrk 0290	15h35m52.36s	57d54m09.2s	9:39	50	
12	90_0033	Calibration	Ganymede	22h15m22.78s	-11d45m38.9s	10:34	50	Ganymede was too close to Callisto, so observed Europa instead

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



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



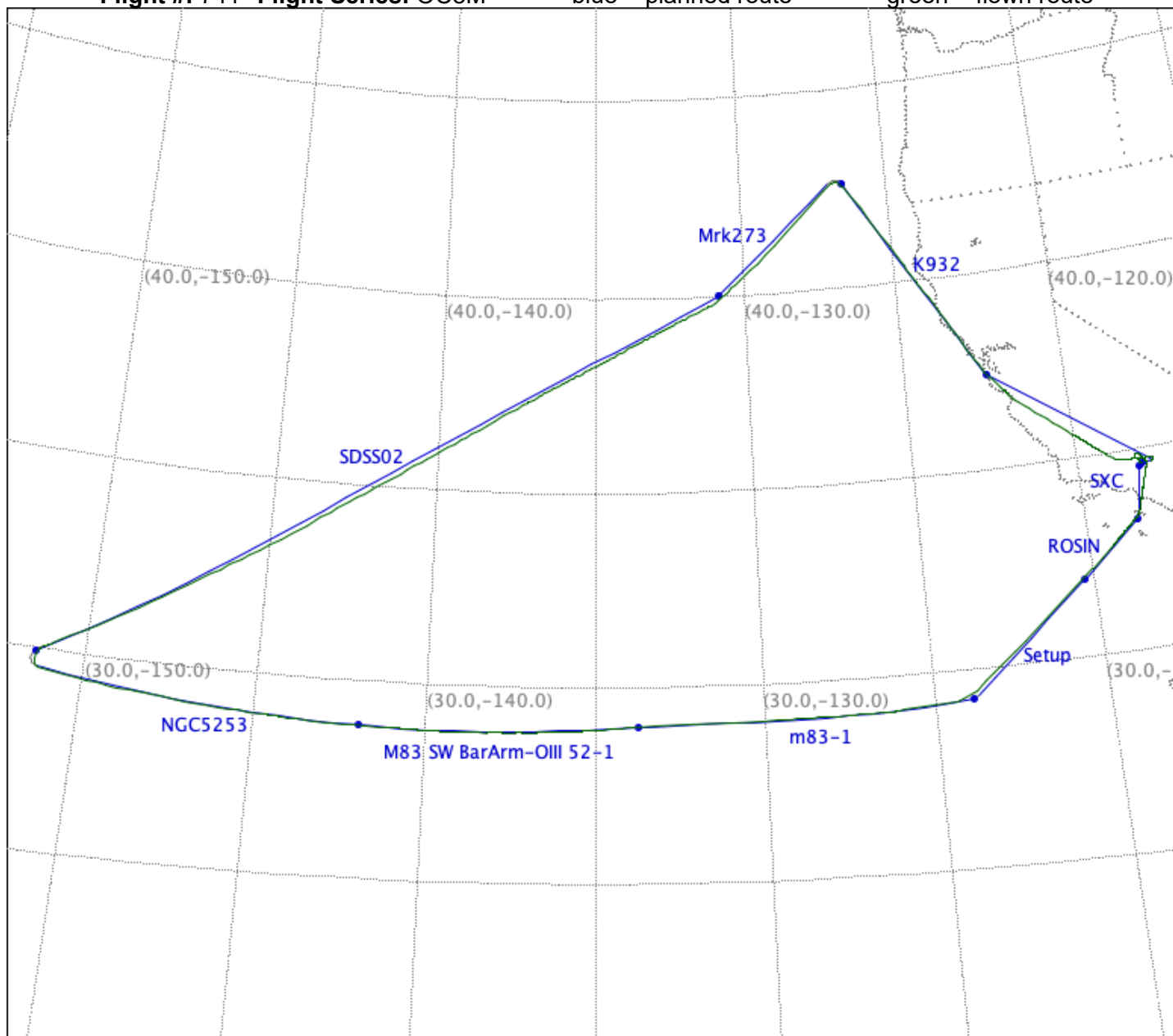
# MISSION ID: 2021-06-04\_FI\_F741

Date: 2021-06-04 UT Instrument: FIFI-LS

Flight #: 741 Flight Series: OC8M

blue = planned route

green = flown route

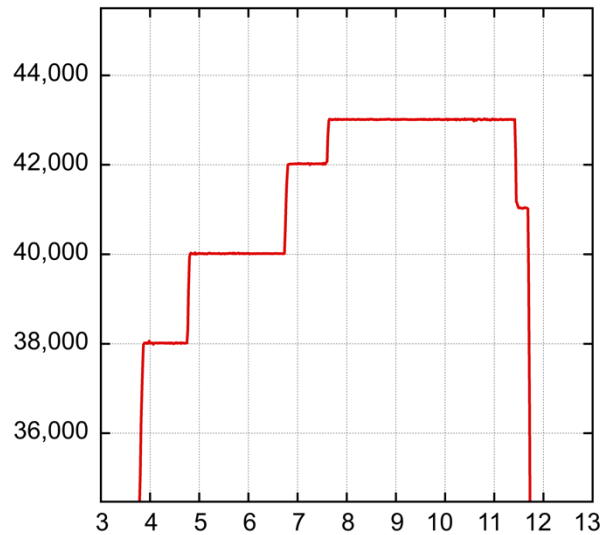


**Flight notes:**  
**No irregularities.**

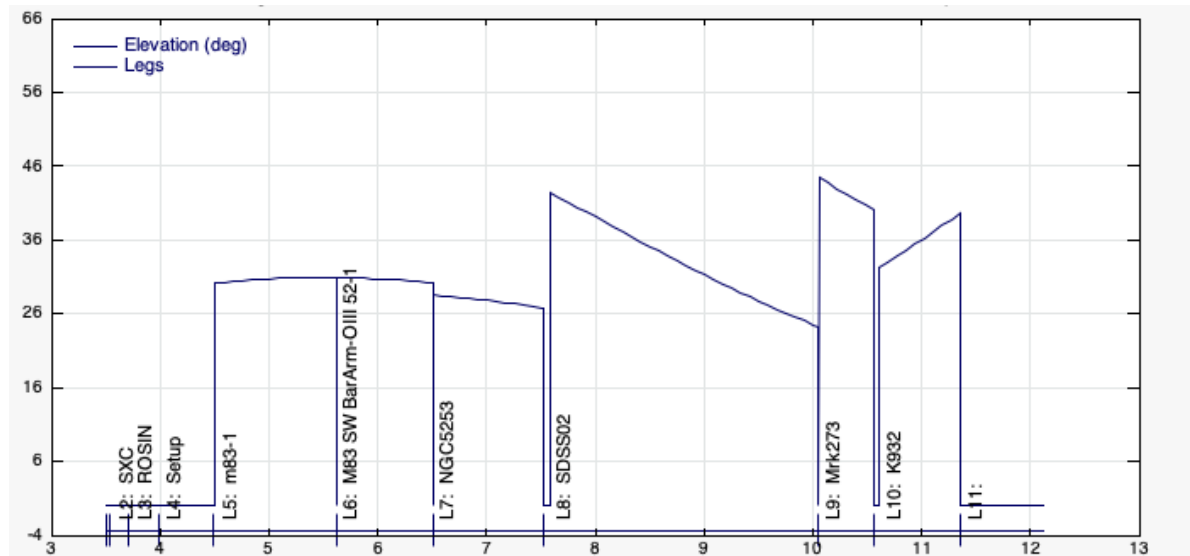
Flight 741 Mission ID 2021-06-04\_FI\_F741  
 Palmdale to Palmdale Take off date UTC: 04-JUN-2021  
 Departure UTC: 03:25 Arrival UTC: 12:10

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5	70_0808	GTO	m83	13h37m00.95s	-29d51m55.5s	4:29	67	
6	08_0165	Stacey	M83 SW BarArm-OIII 52	13h36m54.40s	-29d53m01.0s	5:36	53	
7	08_0103	Turner	NGC5253	13h39m55.96s	-31d38m24.3s	6:29	61	
8	08_0226	Petric	SDSS02	10h34m08.64s	60d01m51.6s	7:33	148	
9	08_0095	Ma	Mrk273	13h44m42.11s	55d53m12.7s	10:02	30	
10	08_0071	Jones	K932	00h46m34.30s	42d11m44.0s	10:35	45	

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



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





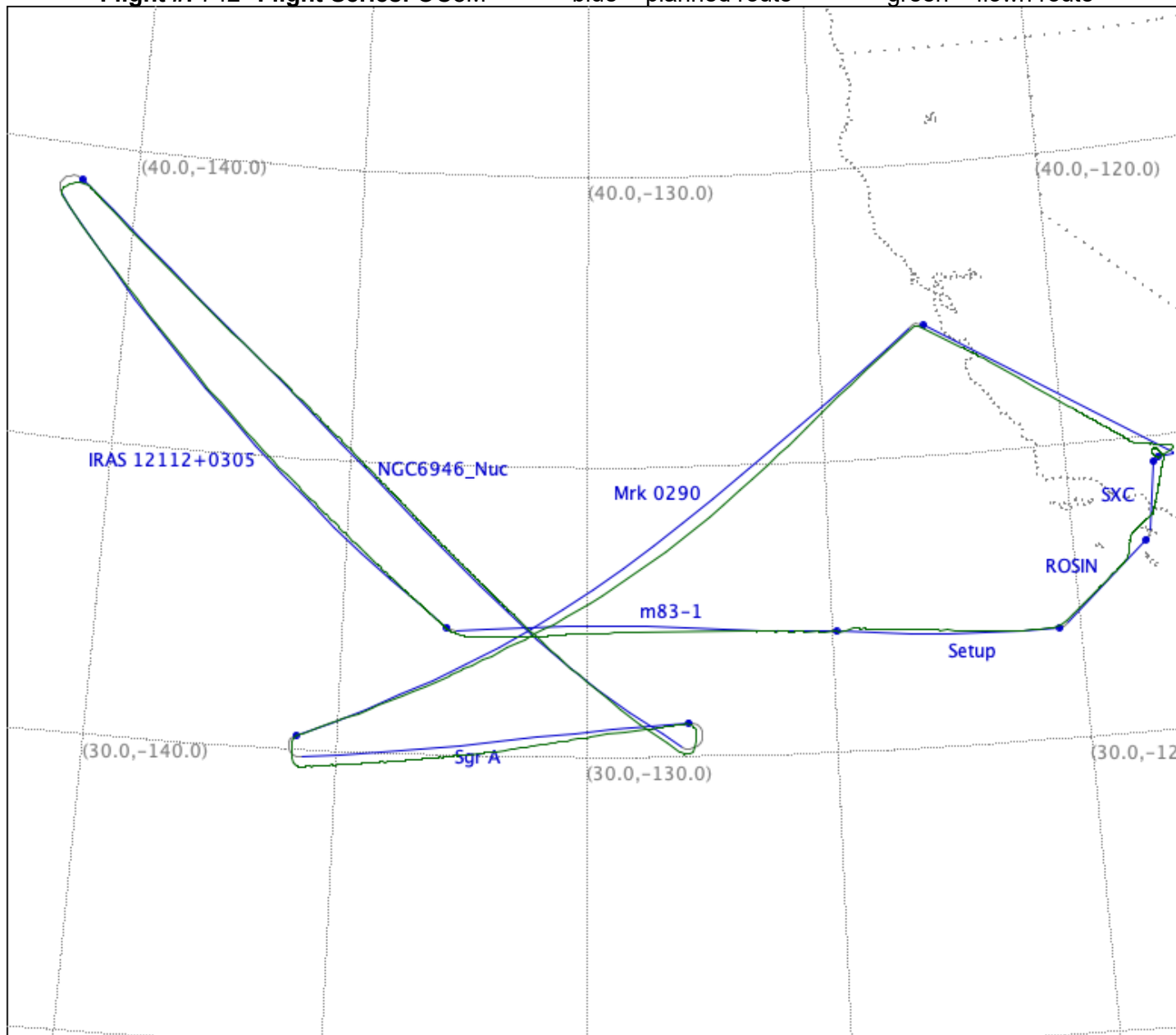
**MISSION ID: 2021-06-05\_FI\_F742**

**Date: 2021-06-05 UT Instrument: FIFI-LS**

**Flight #: 742 Flight Series: OC8M**

blue = planned route

green = flown route

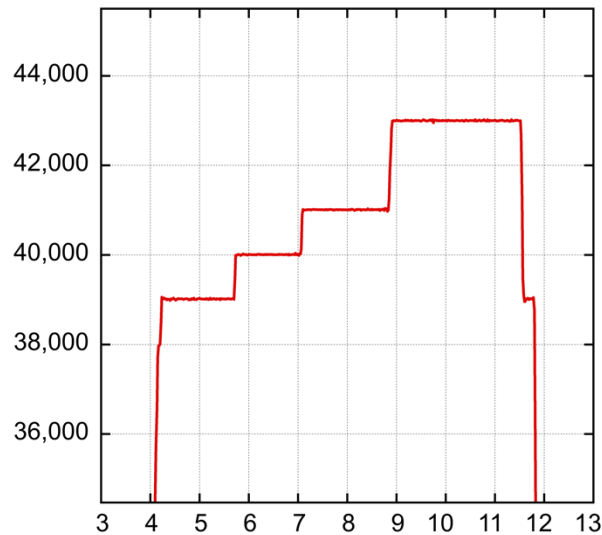


**Flight notes:  
No irregularities.**

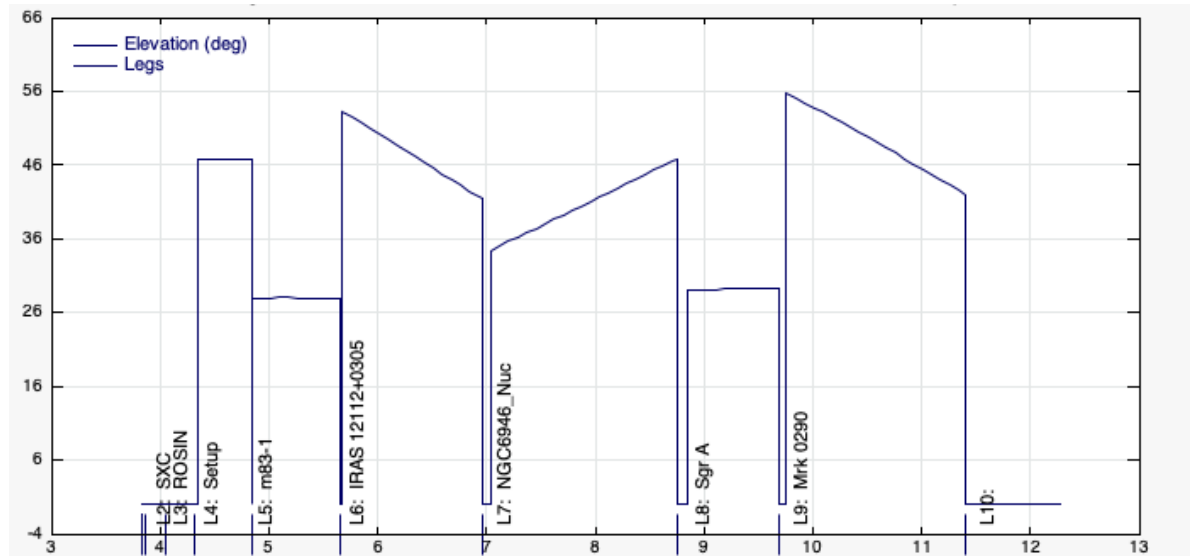
Flight 742 Mission ID 2021-06-05\_FI\_F742  
 Palmdale to Palmdale Take off date UTC: 05-JUN-2021  
 Departure UTC: 03:45 Arrival UTC: 12:14

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	13h25m11.58s	-11d09m40.8s	4:19	30	
5	70_0808	GTO	m83	13h37m00.95s	-29d51m55.5s	4:49	49	
6	08_0095	Ma	IRAS 12112+0305	12h13m46.00s	02d48m38.0s	5:40	77	
7	09_0198	Lamarche	NGC6946	20h34m59.37s	60d10m25.1s	7:01	103	Lost 10min to turbulence close to start of leg.
8	71_0024	Engineering	Sgr A	17h45m40.04s	-29d00m28.2s	8:50	50	
9	08_0226	Petric	Mrk 0290	15h35m52.36s	57d54m09.2s	9:45	99	

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



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



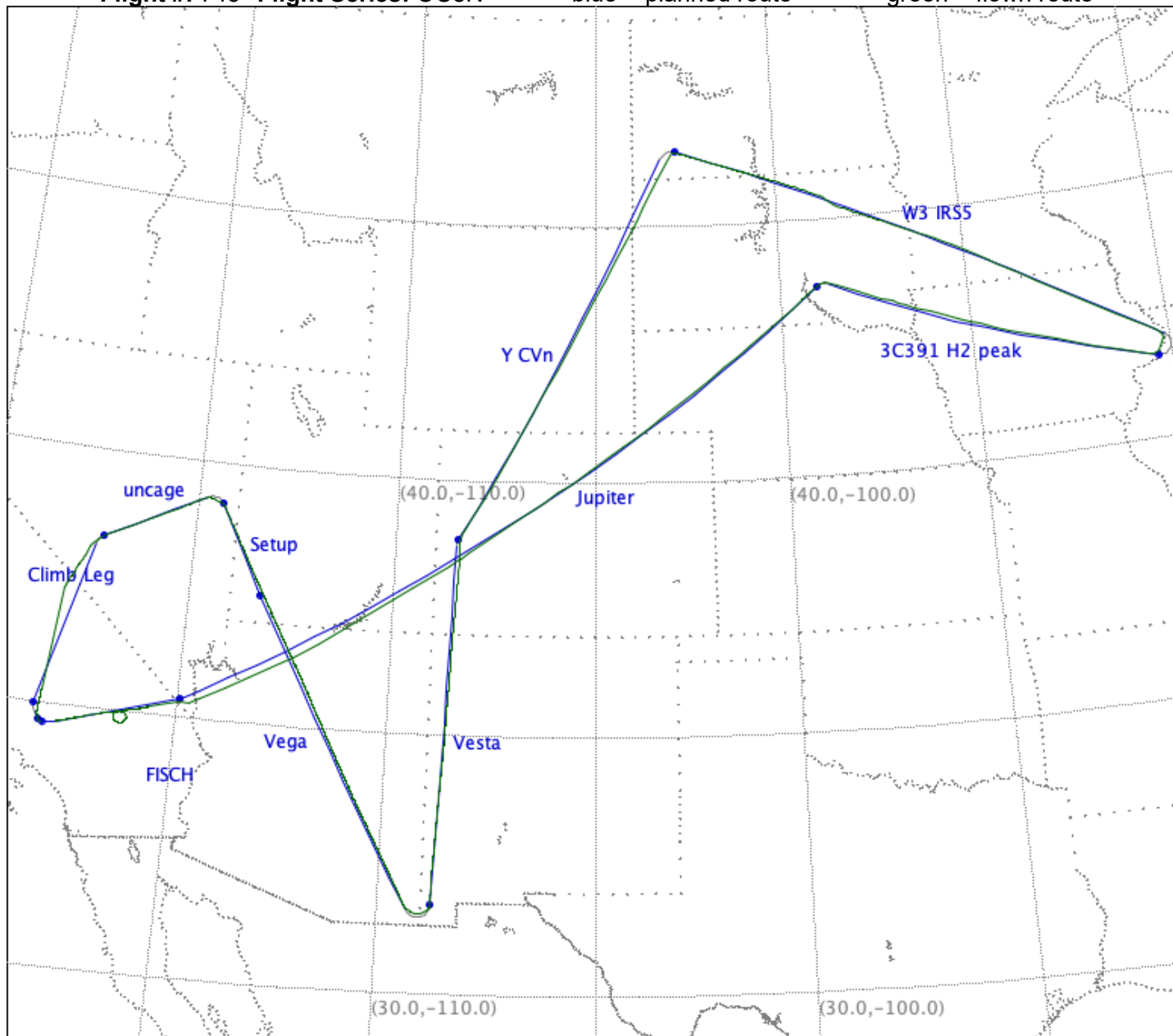
**MISSION ID: 2021-06-08\_EX\_F743**

**Date: 2021-06-08 UT Instrument: EXES**

**Flight #: 743 Flight Series: OC8N**

blue = planned route

green = flown route

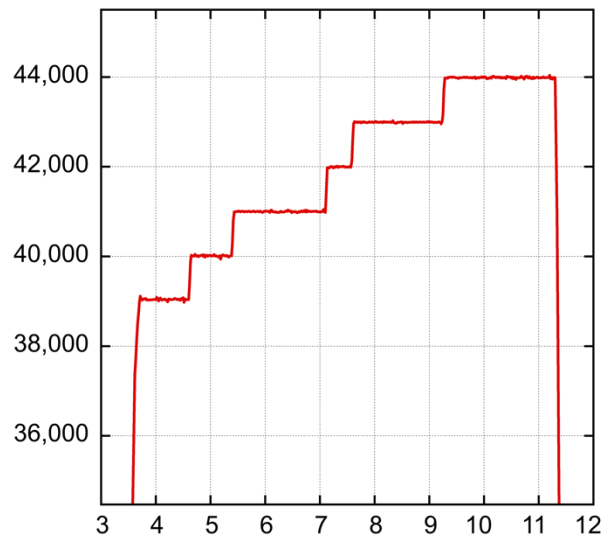


**Flight notes:**  
**Poor image quality (FWHM~3-4") throughout flight.**

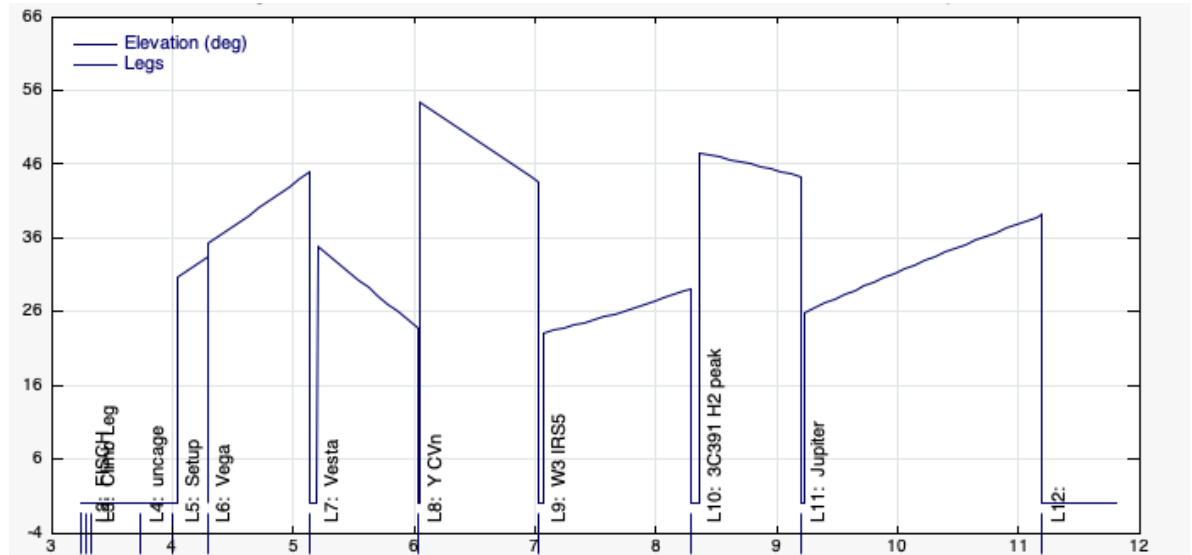
Flight 743 Mission ID 2021-06-08\_EX\_F743  
 Palmdale to Palmdale Take off date UTC: 08-JUN-2021  
 Departure UTC: 03:13 Arrival UTC: 11:51

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	18h44m46.36s	37d36m18.4s	4:02	15	
6	90_0089	Calibration	Vega	18h36m56.34s	38d47m01.3s	4:17	50	Focus and/or alignment issues discovered that cannot be corrected
7	08_0218	Montiel	4 Vesta	11h15m32.63s	13d15m23.3s	5:12	50	Some clouds caused loss of data; FWHM > 3"
8	08_0231	Fonfria	Y CVn	12h45m07.83s	45d26m24.9s	6:03	59	FWHM = 3.5-4"
9	08_0136	Tielens	W3 IRS5	02h25m40.00s	62d05m52.0s	7:04	73	
10	08_0029	Neufeld	3C391 H2 peak	18h49m22.56s	-00d57m17.3s	8:21	50	
11	07_0222	Sinclair	Jupiter	22h15m57.99s	-11d44m00.3s	9:13	118	Problems pointing to right part of Jupiter surface, led to 40% loss of data on leg

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



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



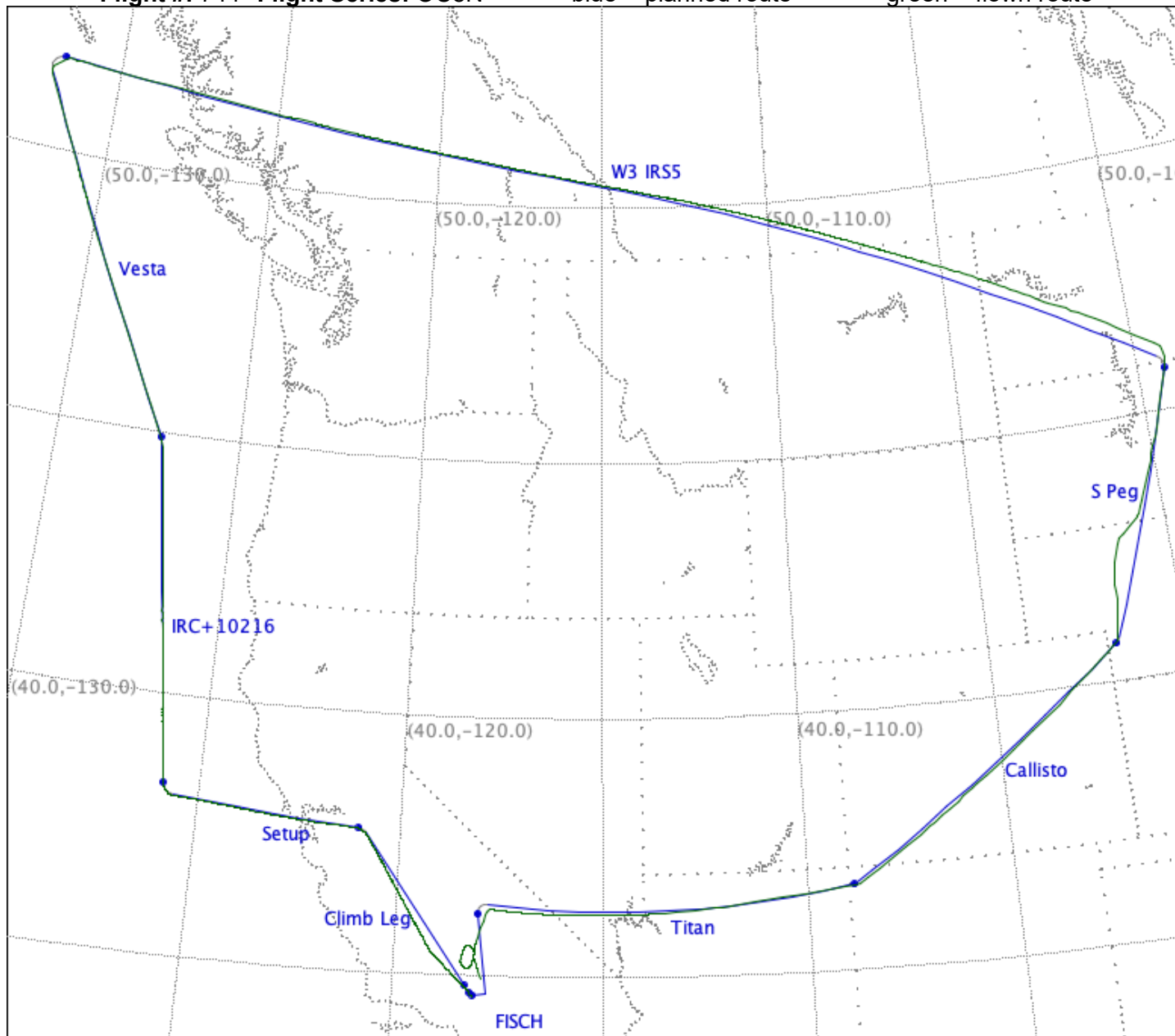
**MISSION ID: 2021-06-09\_EX\_F744**

**Date: 2021-06-09 UT Instrument: EXES**

**Flight #: 744 Flight Series: OC8N**

blue = planned route

green = flown route



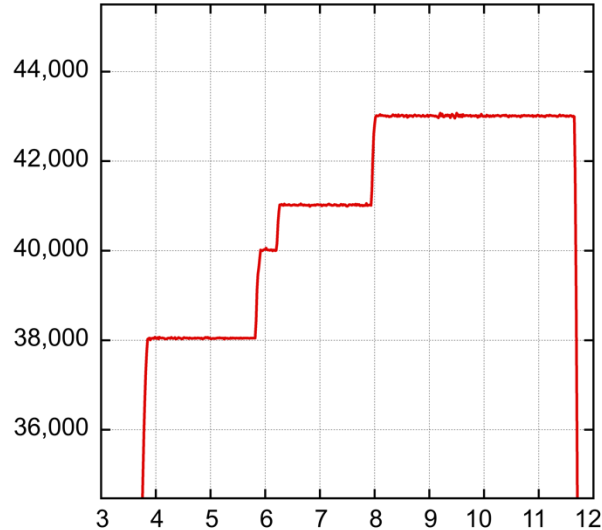
## Flight notes:

**Poor image quality (FWHM~3-4") due to focus/alignment issues throughout flight.**

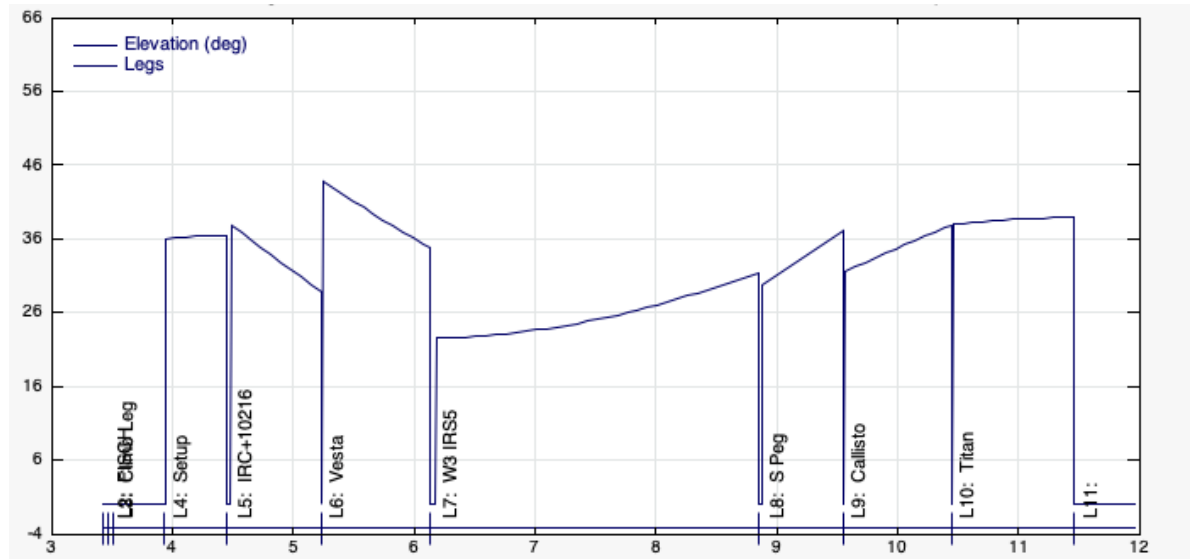
Flight 744 Mission ID 2021-06-09\_EX\_F744  
 Palmdale to Palmdale Take off date UTC: 09-JUN-2021 Departure UTC: 03:25 Arrival UTC: 12:07

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	13h27m27.16s	-15d58m24.9s	3:56	30	
5	08_0231	Fonfria	IRC+10216	09h47m57.41s	13d16m43.6s	4:29	45	
6	08_0203	Nixon	4 Vesta	11h16m36.44s	13d05m58.2s	5:14	53	
7	08_0136	Tielens	W3 IRS5	02h25m40.00s	62d05m52.0s	6:11	160	
8	08_0194	Creech-Eakman	S Peg	23h20m32.61s	08d55m08.2s	8:53	40	Storms and turbulence all leg; no data taken
9	08_0203	Nixon	Callisto	22h16m14.82s	-11d42m46.2s	9:33	53	
10	08_0203	Nixon	Titan	21h02m32.19s	-17d34m19.7s	10:27	60	

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



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



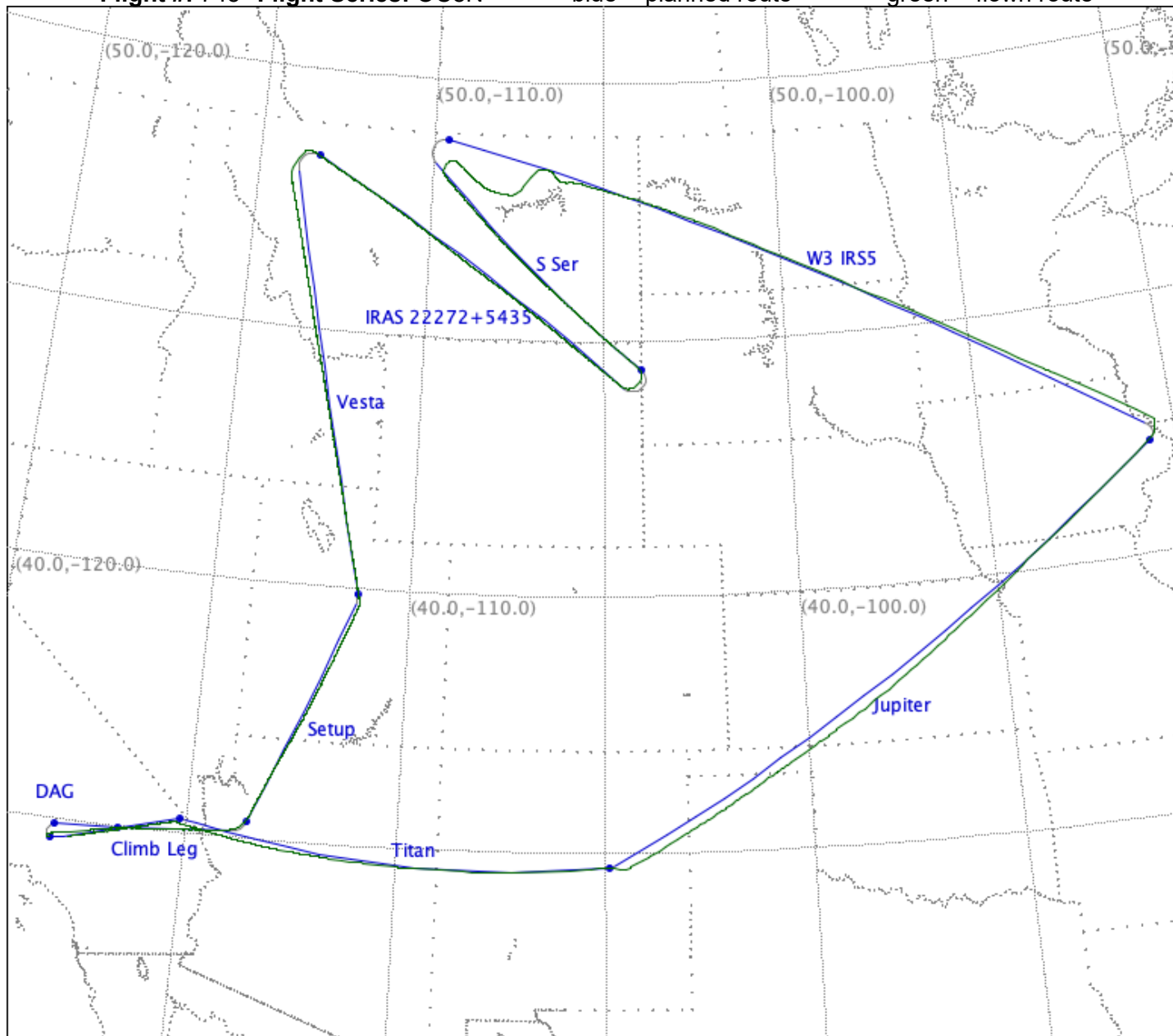
# MISSION ID: 2021-06-10\_EX\_F745

Date: 2021-06-10 UT Instrument: EXES

Flight #: 745 Flight Series: OC8N

blue = planned route

green = flown route



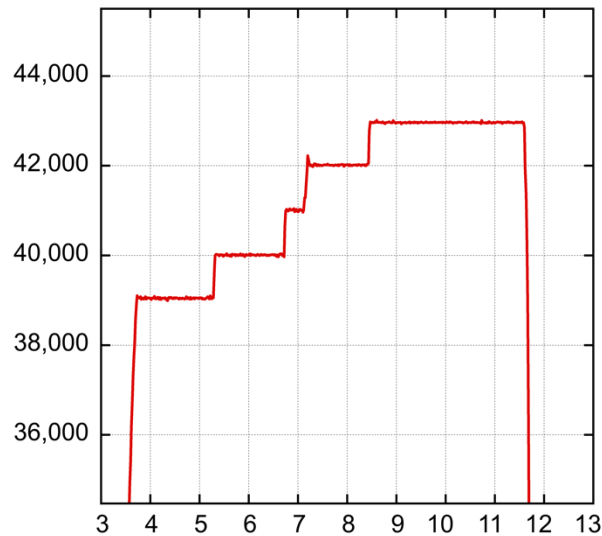
## Flight notes:

**Poor image quality (FWHM~3-4") due to focus/alignment issues throughout flight; weather issues.**

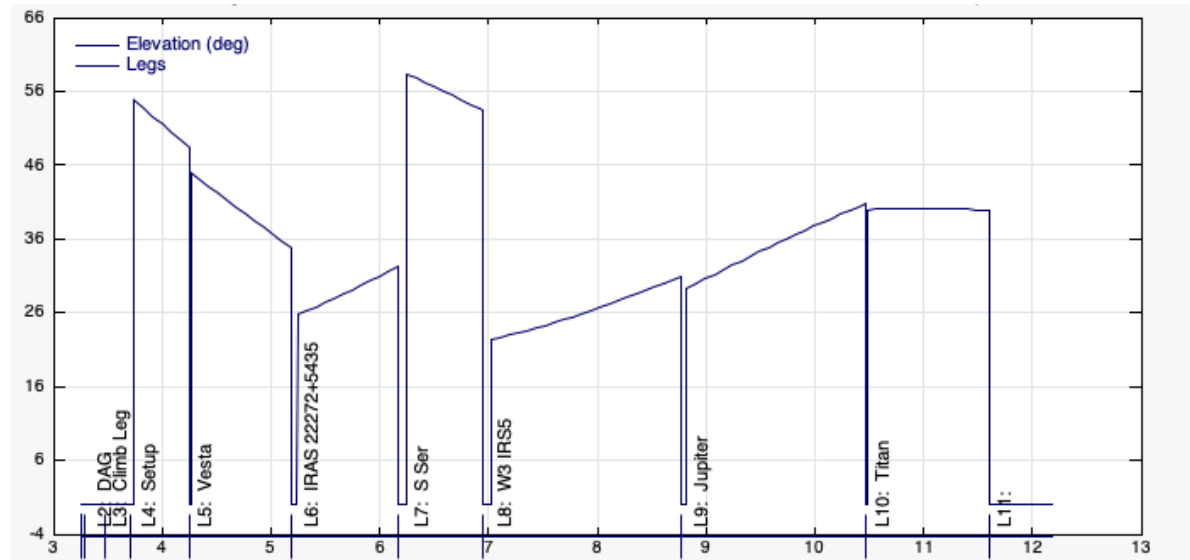
Flight 745 Mission ID 2021-06-10\_EX\_F745  
 Palmdale to Palmdale Take off date UTC: 10-JUN-2021  
 Departure UTC: 03:13 Arrival UTC: ~05:06

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	10h27m53.00s	36d42m26.0s	3:44	30	
5	08_0203	Nixon	4 Vesta	11h17m38.43s	12d56m51.7s	4:15	55	Difficulties acquiring target led to 50% loss of data collecting time
6	08_0216	Montiel	IRAS 22272+5435	22h29m10.38s	54d51m06.3s	5:14	55	
7	08_0194	Creech-Eakman	S Ser	15h21m39.53s	14d18m53.1s	6:15	42	
8	08_0136	Tielens	W3 IRS5	02h25m40.00s	62d05m52.0s	7:01	105	The last 25% of leg lost due diverting to avoid hail storm.
9	07_0222	Sinclair	Jupiter	22h16m14.77s	-11d43m00.3s	8:49	99	
10	08_0203	Nixon	Titan	21h02m21.44s	-17d34m40.5s	10:29	67	

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



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





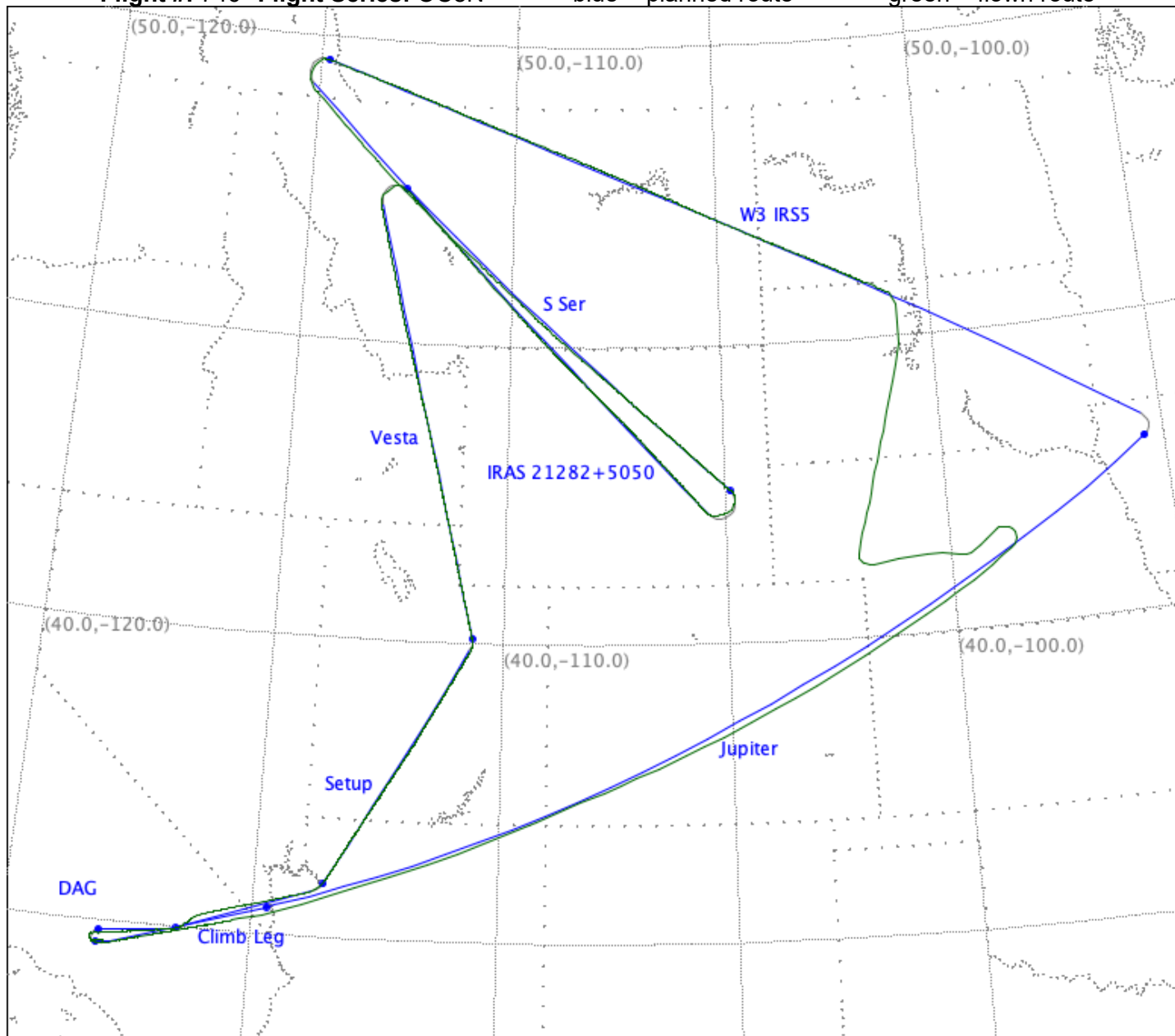
# MISSION ID: 2021-06-11\_EX\_F746

Date: 2021-06-11 UT Instrument: EXES

Flight #: 746 Flight Series: OC8N

blue = planned route

green = flown route



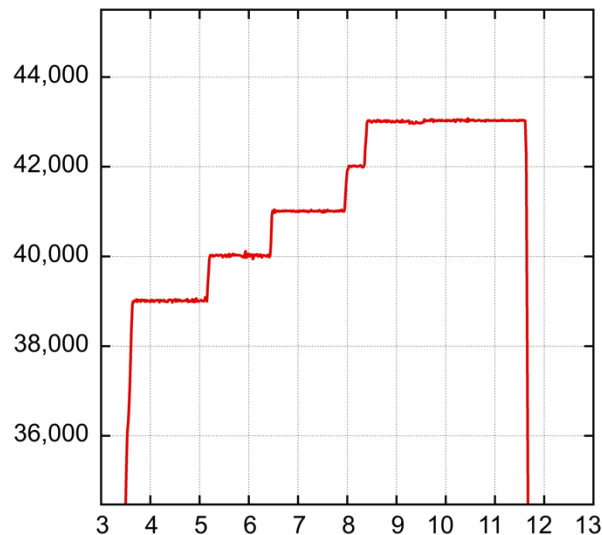
## Flight notes:

**Poor image quality (FWHM~3-4") due to focus/alignment issues throughout flight; weather issues.**

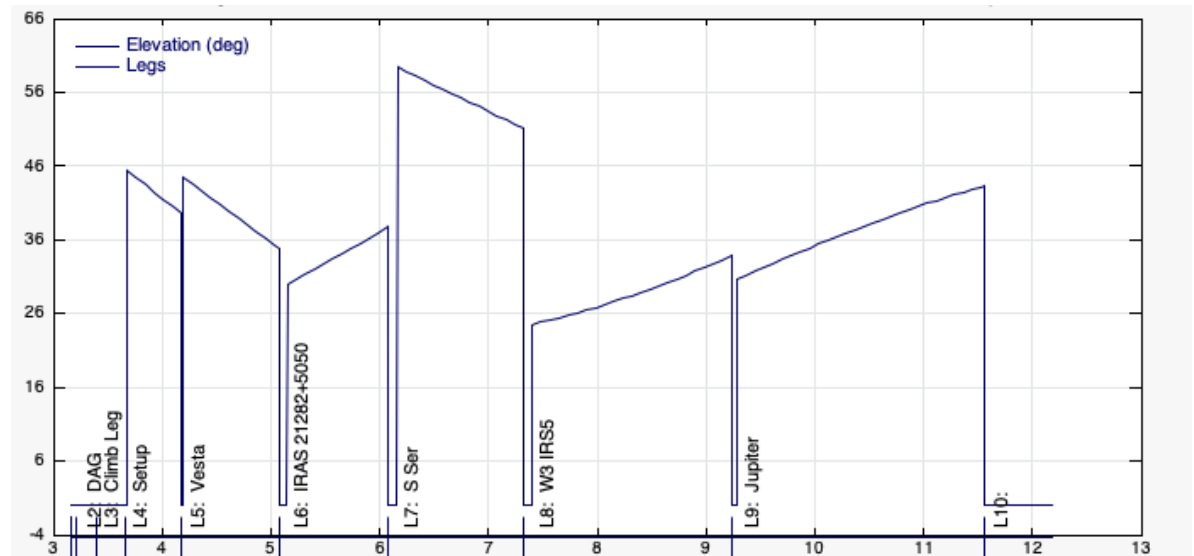
Flight 746 Mission ID 2021-06-11\_EX\_F746  
 Palmdale to Palmdale Take off date UTC: 11-JUN-2021  
 Departure UTC: 03:07 Arrival UTC: 12:23

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	09h35m03.83s	39d37m17.4s	3:40	30	
5	08_0203	Nixon	4 Vesta	11h18m43.99s	12d47m16.5s	4:11	53	Turbulence.
6	08_0216	Montiel	IRAS 21282+5050	21h29m58.47s	51d04m00.3s	5:09	55	
7	08_0194	Creech-Eakman	S Ser	15h21m39.53s	14d18m53.1s	6:09	70	Turbulence at beginning of leg.
8	08_0136	Tielens	W3 IRS5	02h25m40.00s	62d05m52.0s	7:24	110	Leg ended prematurely to divert aircraft around storms.
9	08_0219	Sinclair	Jupiter	22h16m22.56s	-11d42m34.7s	9:17	136	First 25min lost due to divert around storms.

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



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



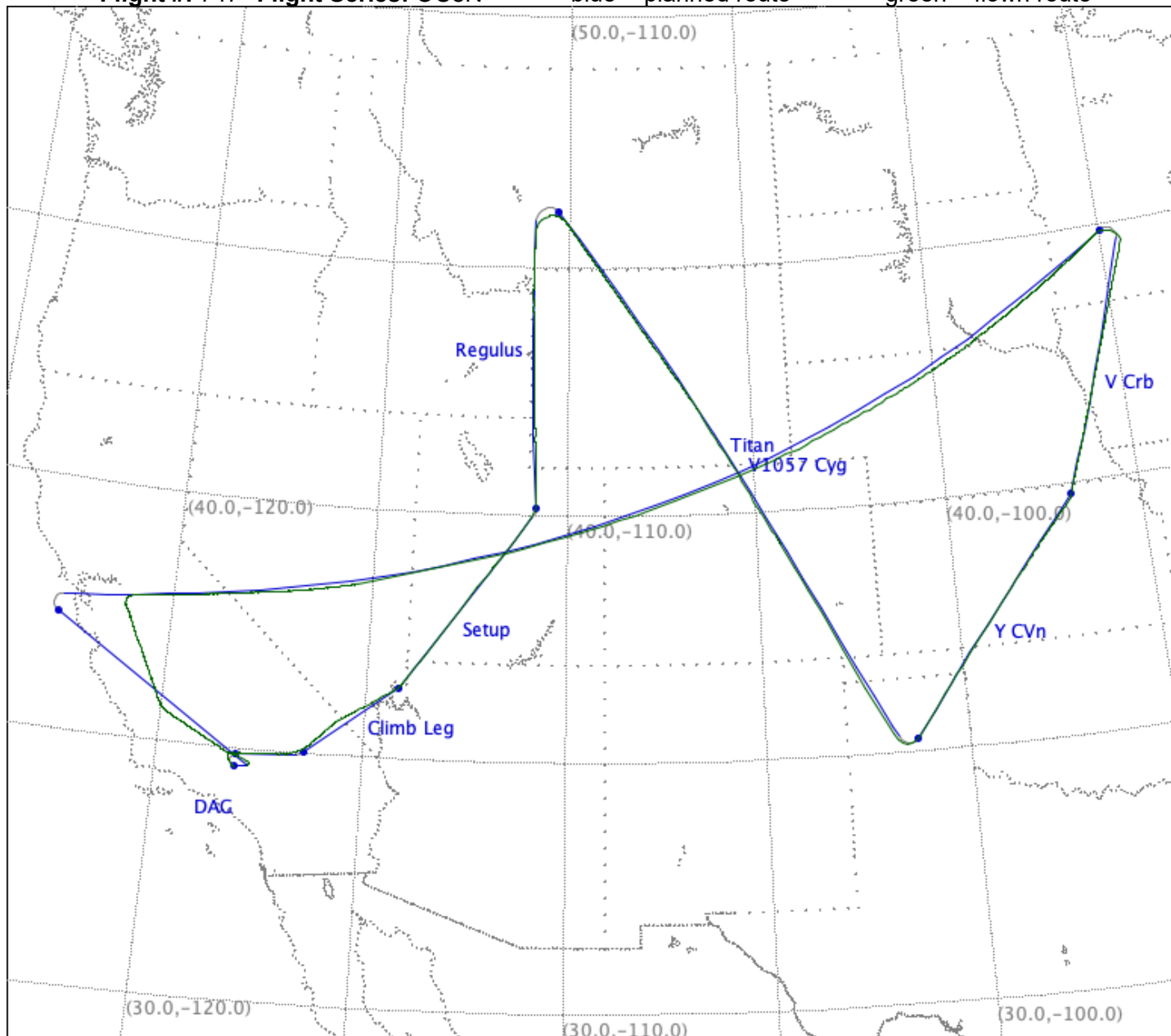
# MISSION ID: 2021-06-15\_EX\_F747

Date: 2021-06-15 UT Instrument: EXES

Flight #: 747 Flight Series: OC8N

blue = planned route

green = flown route



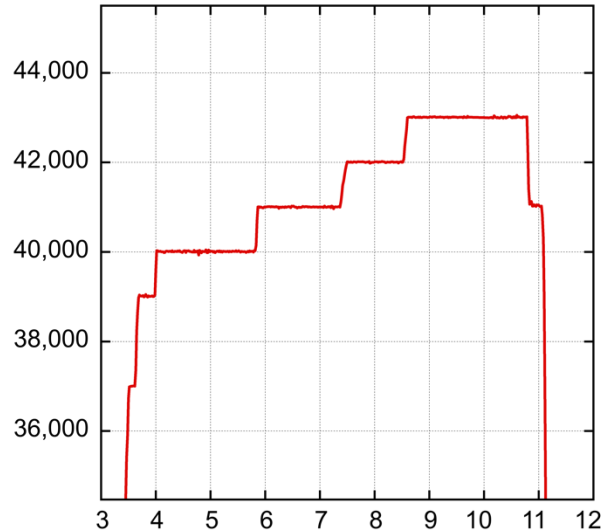
## Flight notes:

**Telescope issue rendered it inoperable early in flight.**

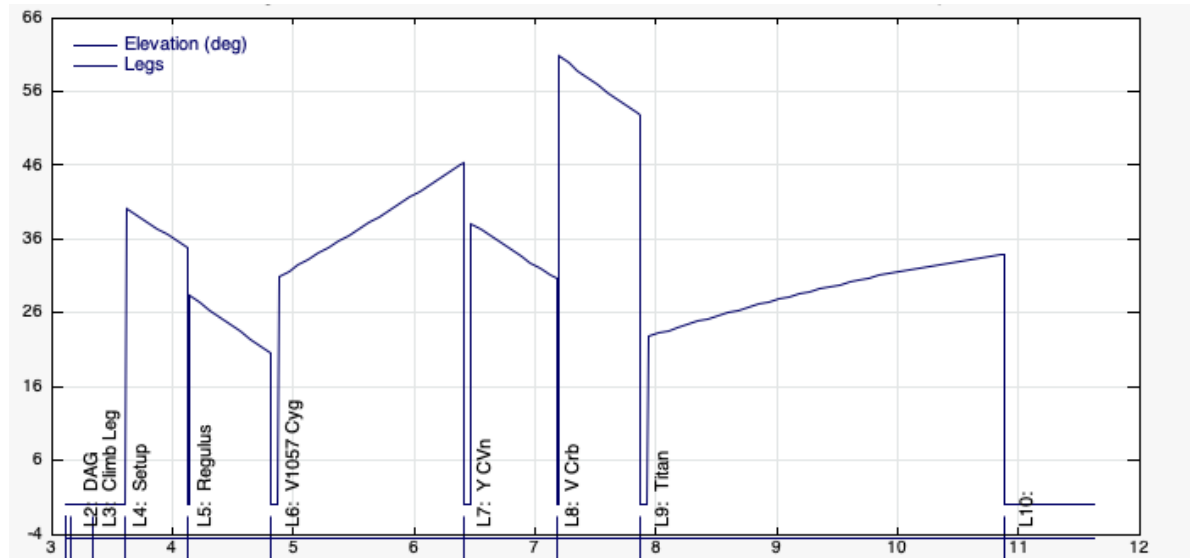
Flight 747 Mission ID 2021-06-15\_EX\_F747  
 Palmdale to Palmdale Take off date UTC: 15-JUN-2021  
 Departure UTC: 03:06 Arrival UTC: 11:36

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	09h03m37.53s	47d09m23.5s	3:37	30	
5	08_0028	DeWitt	Regulus	10h08m22.31s	11d58m02.0s	4:09	40	Telescope oil temperature out of range; leg lost trying to cool
6	08_0028	DeWitt	V1057 Cyg	20h58m53.72s	44d15m28.3s	4:53	92	Telescope oil temperature out of range; leg lost trying to cool
7	08_0218	Montiel	Y CVn	12h45m07.83s	45d26m24.9s	6:28	43	
8	08_0194	Creech-Eakman	V Crb	15h49m31.31s	39d34m17.9s	7:12	41	
9	08_0203	Nixon	Titan	21h01m45.95s	-17d36m38.7s	7:56	177	Telescope control software crash; 35min lost while recovering

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



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



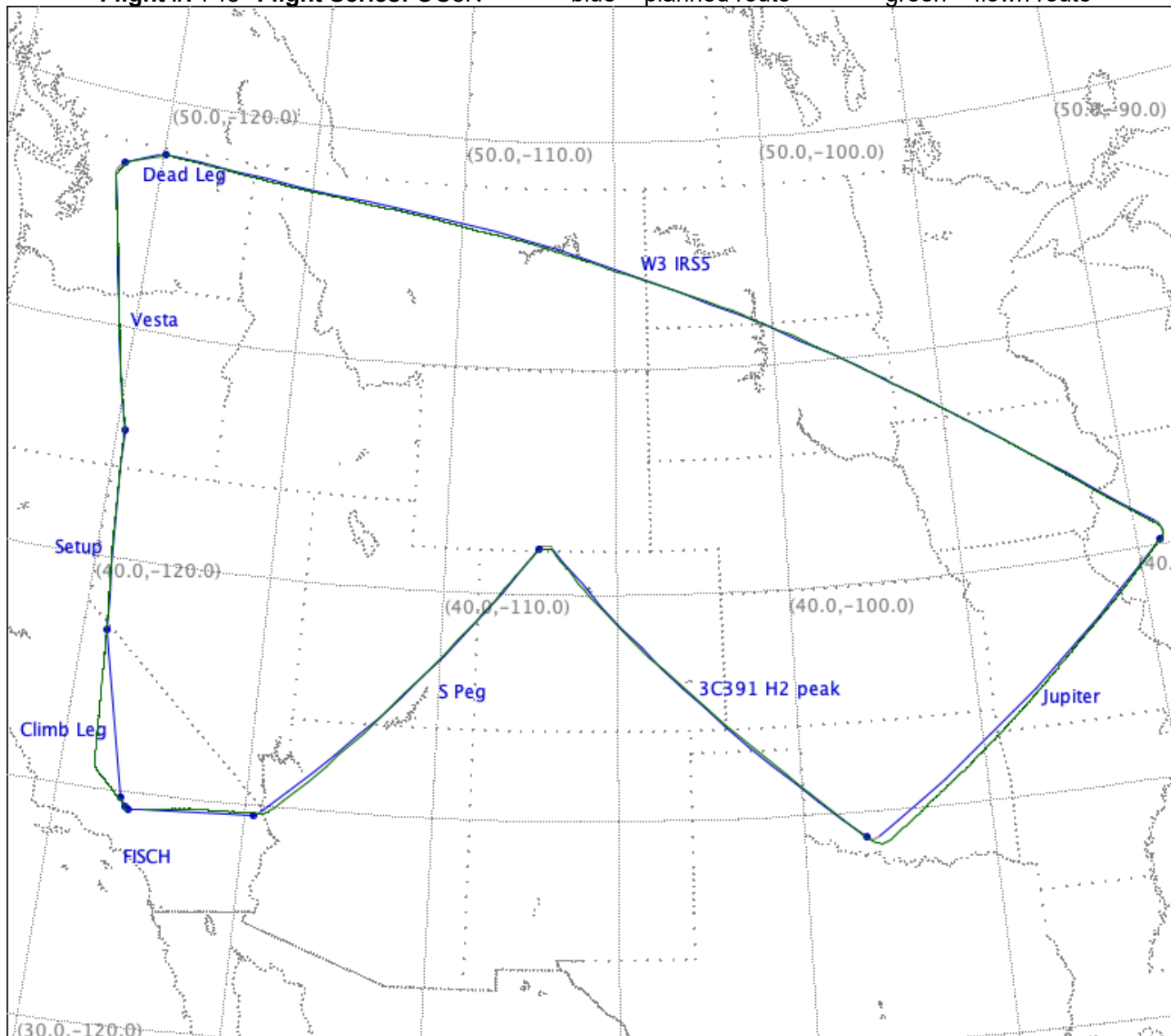
**MISSION ID: 2021-06-16\_EX\_F748**

**Date: 2021-06-16 UT Instrument: EXES**

**Flight #: 748 Flight Series: OC8N**

blue = planned route

green = flown route

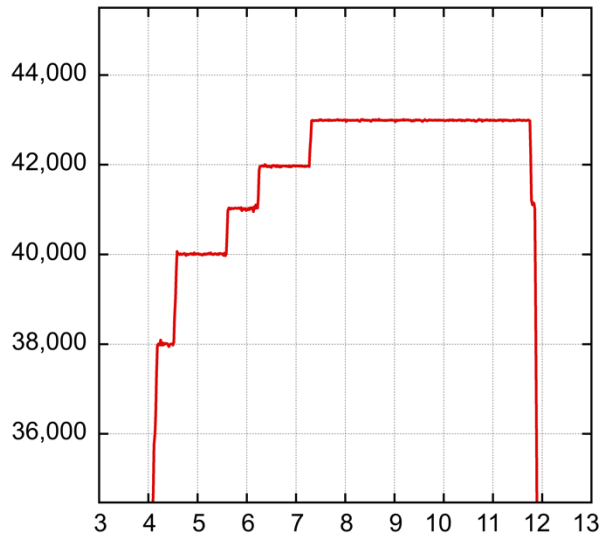


**Flight notes:**  
**No irregularities.**

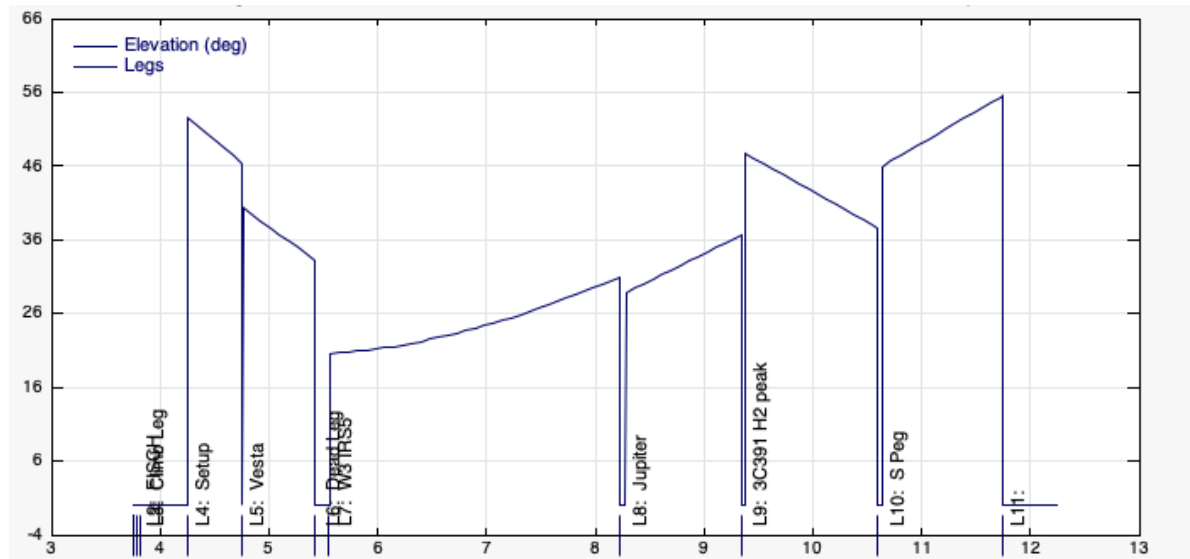
Flight 748 Mission ID 2021-06-16\_EX\_F748  
 Palmdale to Palmdale Take off date UTC: 16-JUN-2021  
 Departure UTC: 03:43 Arrival UTC: 12:14

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	11h15m12.23s	23d05m43.8s	4:15	30	
5	08_0203	Nixon	4 Vesta	11h24m24.41s	11d58m07.0s	4:45	40	
7	08_0136	Tielens	W3 IRS5	02h25m40.00s	62d05m52.0s	5:33	160	
8	08_0219	Sinclair	Jupiter	22h16m48.86s	-11d41m34.5s	8:16	64	
9	08_0029	Neufeld	3C391 H2 peak	18h49m22.56s	-00d57m17.3s	9:22	73	
10	08_0194	Creech-Eakman	S Peg	23h20m32.61s	08d55m08.2s	10:38	66	

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



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



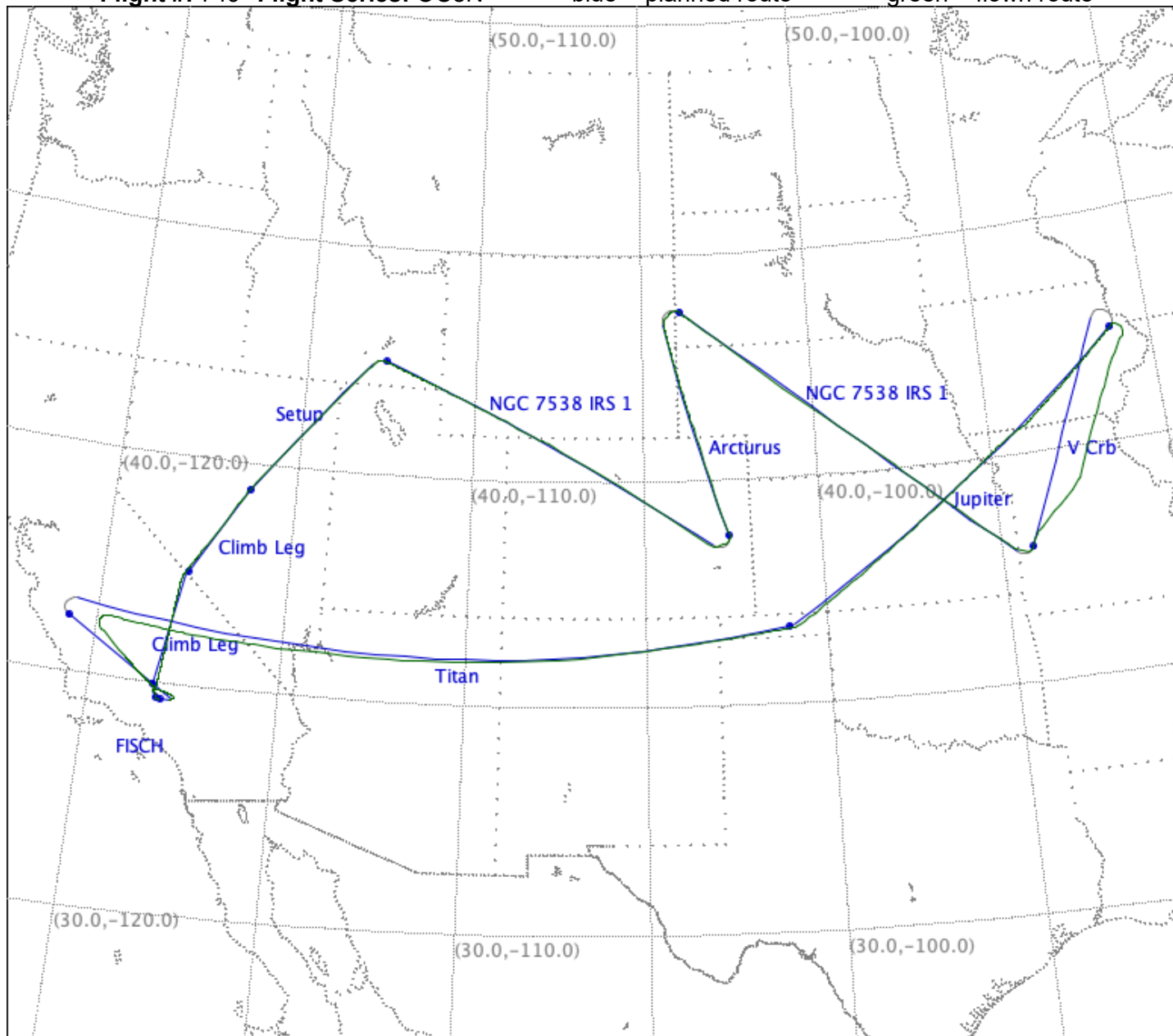
**MISSION ID: 2021-06-17\_EX\_F749**

**Date: 2021-06-17 UT Instrument: EXES**

**Flight #: 749 Flight Series: OC8N**

blue = planned route

green = flown route



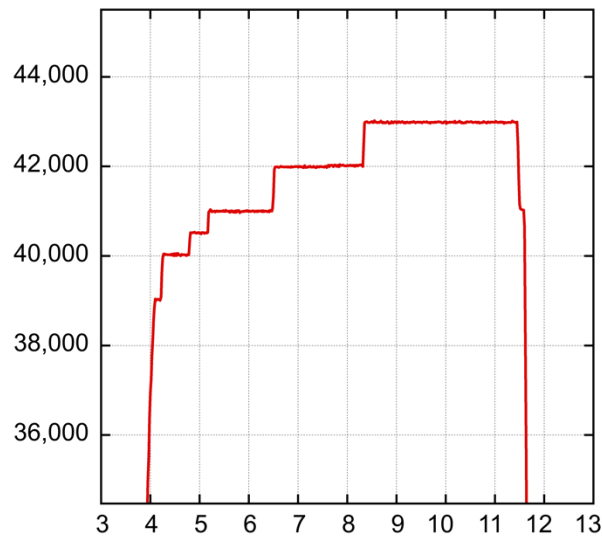
## Flight notes:

**Storms caused losses due to divers from planned route.**

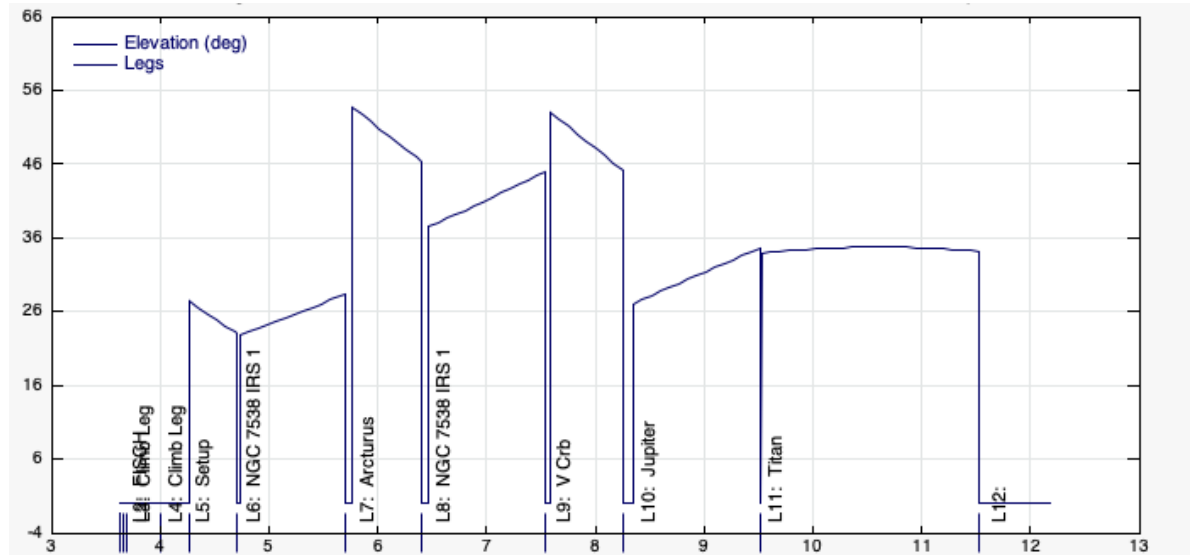
Flight 749 Mission ID 2021-06-17\_EX\_F749  
 Palmdale to Palmdale Take off date UTC: 17-JUN-2021  
 Departure UTC: 03:35 Arrival UTC: ~05:06

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	08h22m50.11s	43d11m17.3s	4:15	26	
6	09_0072	Tielens	NGC 7538 IRS 1	23h13m45.32s	61d28m11.7s	4:44	58	
7	75_0060	Discretionary	Arcturus	14h15m39.67s	19d10m56.7s	5:46	38	
8	09_0072	Tielens	NGC 7538 IRS 1	23h13m45.32s	61d28m11.7s	6:28	64	Focus looked off; time taken to correct this led to loss of 11min.
9	08_0194	Creech-Eakman	V Crb	15h49m31.31s	39d34m17.9s	7:35	40	Aircraft had to divert off course to fly around storms; no data collected.
10	08_0219	Sinclair	Jupiter	22h16m51.99s	-11d41m34.7s	8:20	70	Beginning of leg lost due to weather diversion.
11	08_0203	Nixon	Titan	21h01m37.77s	-17d38m24.9s	9:31	120	

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



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





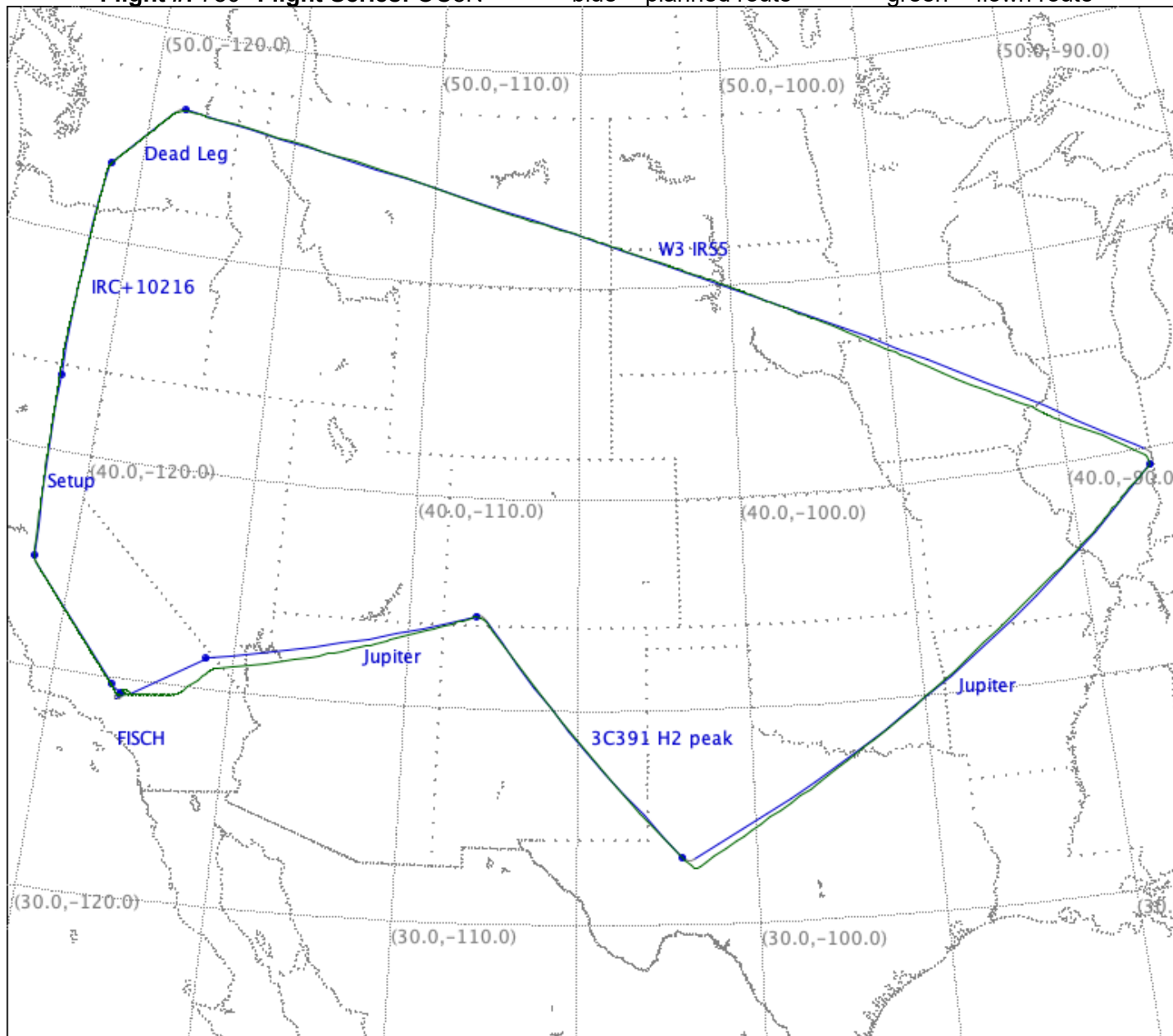
# MISSION ID: 2021-06-18\_EX\_F750

Date: 2021-06-18 UT Instrument: EXES

Flight #: 750 Flight Series: OC8N

blue = planned route

green = flown route



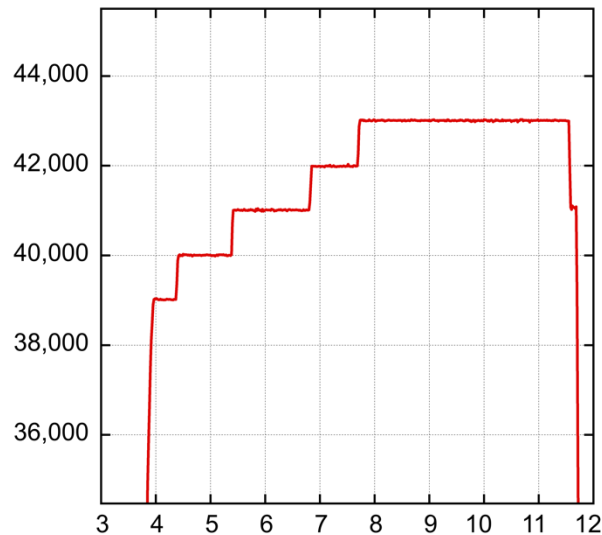
## Flight notes:

**Storms caused losses due to divers from planned route.**

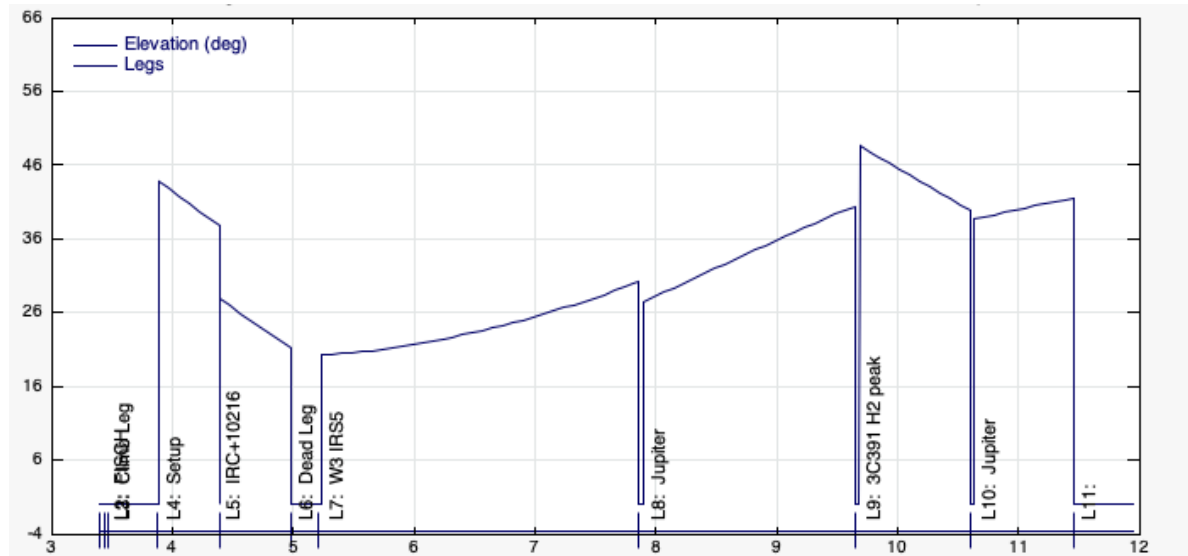
Flight 750 Mission ID 2021-06-18\_EX\_F750  
 Palmdale to Palmdale Take off date UTC: 18-JUN-2021  
 Departure UTC: 03:29 Arrival UTC: 12:05

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	10h19m44.17s	19d28m15.3s	3:59	30	
5	08_0231	Fonfria	IRC+10216	09h47m57.41s	13d16m43.6s	4:29	35	
7	08_0136	Tielens	W3 IRS5	02h25m40.00s	62d05m52.0s	5:20	157	Lost last 30min of leg due to pilots having to divert aircraft around storms
8	07_0222	Sinclair	Jupiter	22h16m54.39s	-11d41m39.0s	8:00	105	On target 10min late due to diverting aircraft around storms
9	08_0029	Neufeld	3C391 H2 peak	18h49m22.56s	-00d57m17.3s	9:47	55	
10	07_0222	Sinclair	Jupiter	22h16m54.55s	-11d41m39.6s	10:44	49	

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



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



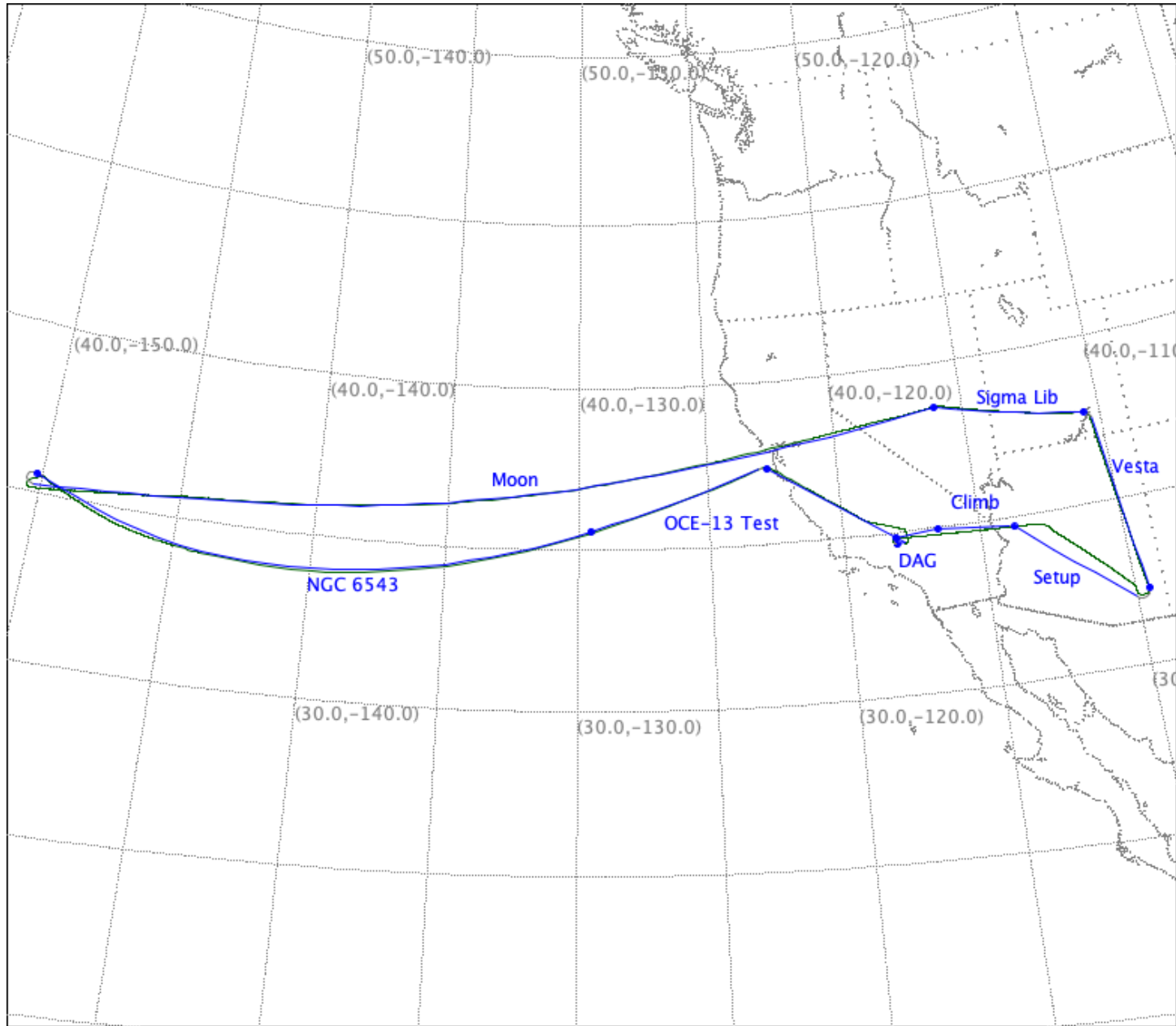
**MISSION ID: 2021-06-23\_FO\_F751**

**Date: 2021-06-23 UT Instrument: FORCAST**

**Flight #: 751 Flight Series: OC80**

blue = planned route

green = flown route

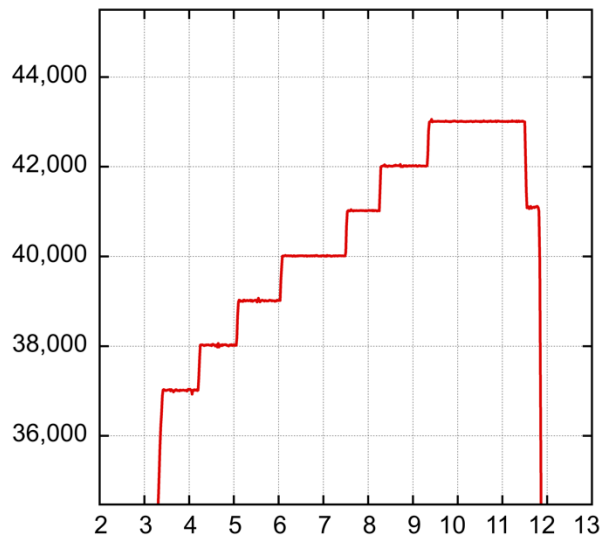


# Flight notes: No irregularities

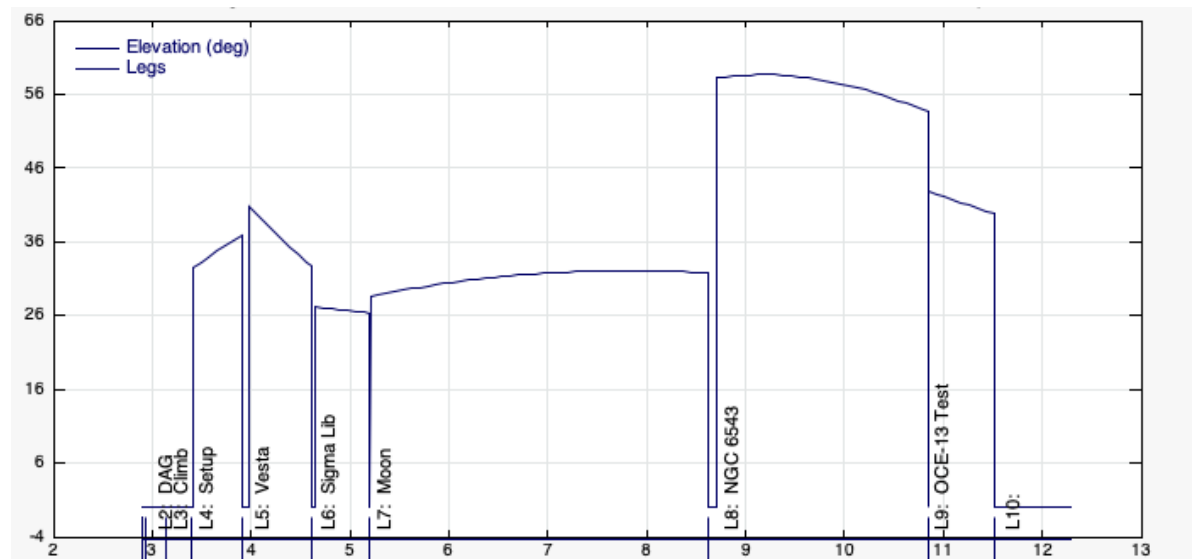
Flight 751 Mission ID 2021-06-23\_FO\_F751  
 Palmdale to Palmdale Take off date UTC: 23-JUN-2021  
 Departure UTC: 02:53 Arrival UTC: 12:22

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	19h17m06.17s	53d22m06.5s	3:24	30	
5	90_0050	Calibration	4 Vesta	11h32m50.37s	10d46m35.3s	3:58	38	Troubleshooting instrument array errors and software errors led to loss of entire leg
6	90_0068	Calibration	Sigma Lib	15h04m04.22s	-25d16m55.1s	4:38	33	
7	75_0054	Discretionary	Moon (Amundsen Crater)	16h34m51.88s	-21d59m19.3s	5:12	205	
8	75_0064	Discretionary	NGC 6543	17h58m33.40s	66d37m58.7s	8:42	128	
9			HIP 79601	16h14m33.44s	73d23m41.6s	10:50	40	

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



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



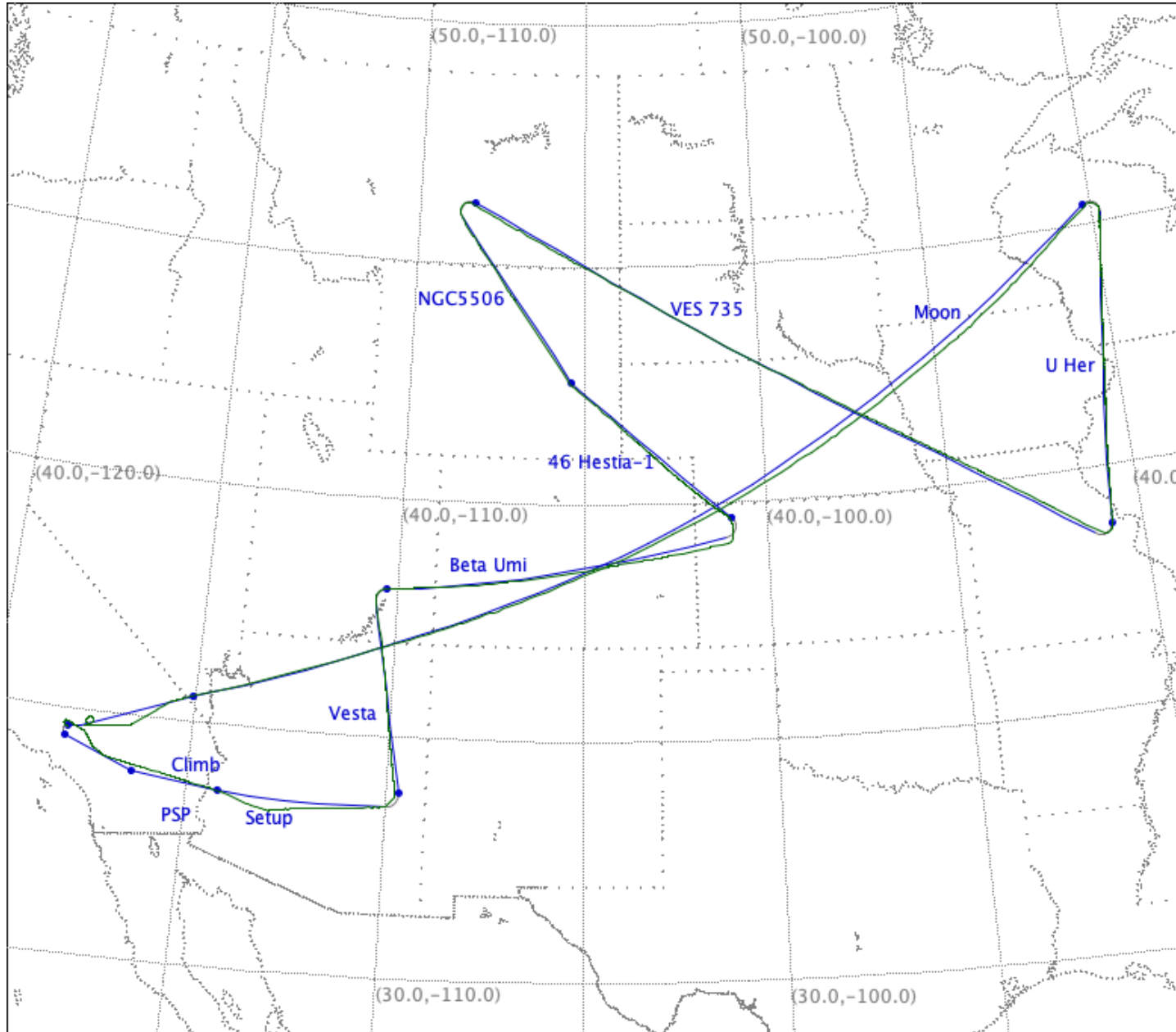
**MISSION ID: 2021-06-29\_FO\_F752**

**Date: 2021-06-29 UT Instrument: FORCAST**

**Flight #: 752 Flight Series: OC80**

**blue = planned route**

**green = flown route**



# Flight notes: No irregularities

Flight 752 Mission ID 2021-06-29\_FO\_F752

Palmdale to  
Palmdale

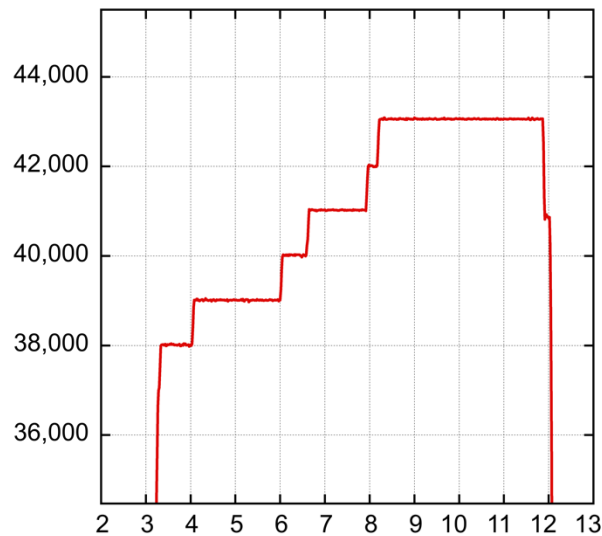
Take off date UTC:  
29-JUN-2021

Departure UTC:  
~02:50

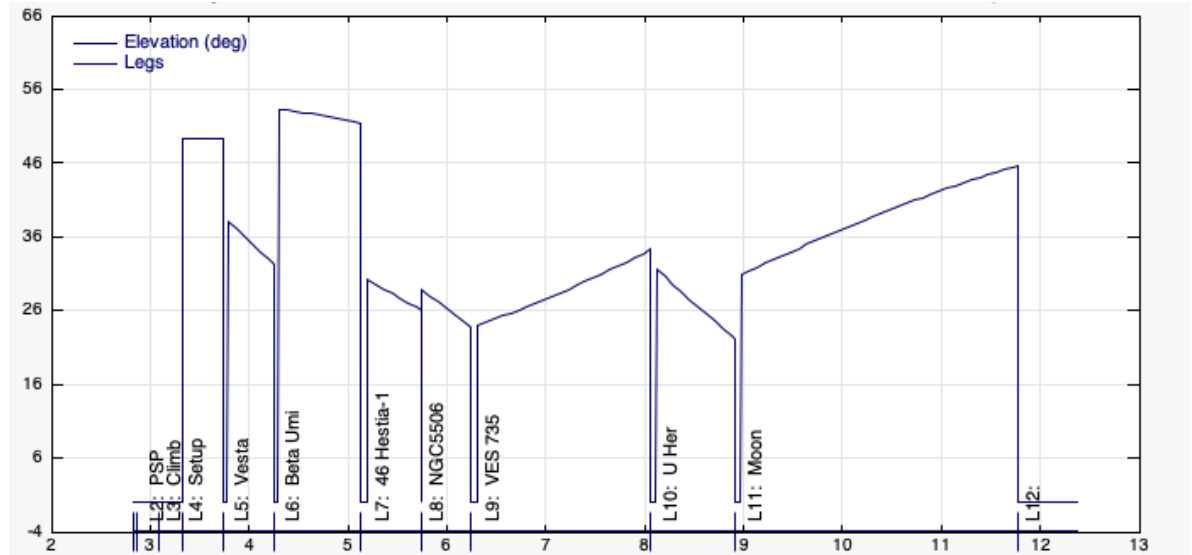
Arrival UTC:  
~12:16

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Beta Umi	14h50m42.33s	74d09m19.8s	3:19	25	
5	90_0050	Calibration	4 Vesta	11h41m52.75s	09d31m25.1s	3:47	28	Time lost tweaking instrument pointing; only 30% of planned data taken
6	90_0065	Calibration	Beta Umi	14h50m42.33s	74d09m19.8s	4:18	50	
7	08_0105	Humes	46 Hestia	15h02m13.25s	-14d07m11.2s	5:12	32.5	
8	08_0014	Lopez-Rodriguez	NGC5506	14h13m14.90s	-03d12m27.2s	5:45	30	
9	08_0245	Marshall	VES 735	02h20m07.17s	61d07m05.5s	6:19	105	
10	08_0192	Sankrit	U Her	16h25m47.47s	18d53m32.9s	8:07	47.6	
11	08_0132	Lucey	Moon	23h35m24.64s	-08d15m17.3s	8:58	168	

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



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



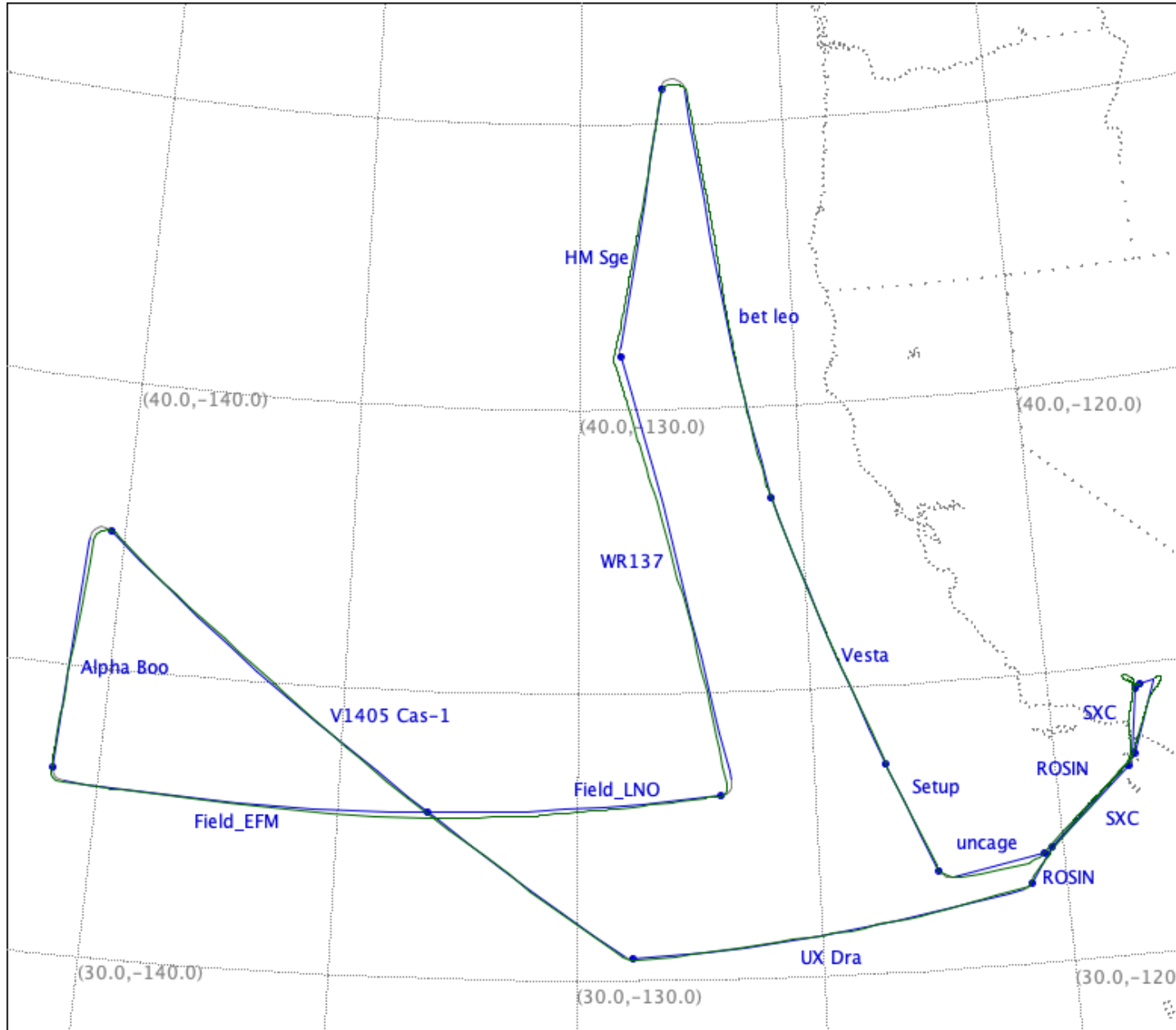
# MISSION ID: 2021-07-01\_FO\_F753

Date: 2021-07-01 UT Instrument: FORCAST

Flight #: 753 Flight Series: OC80

blue = planned route

green = flown route

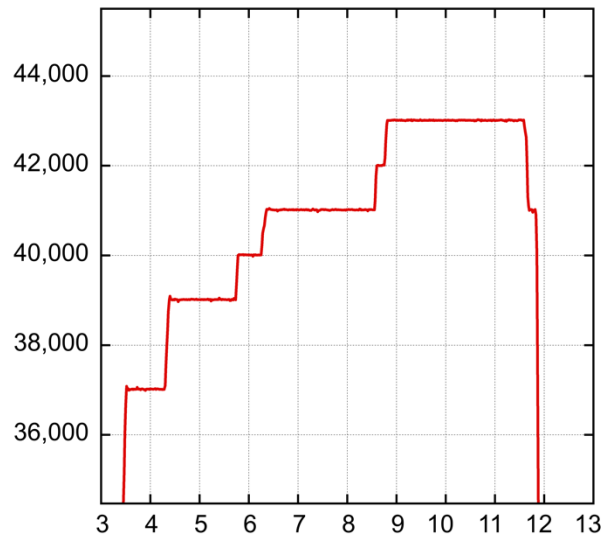


# Flight notes: No irregularities

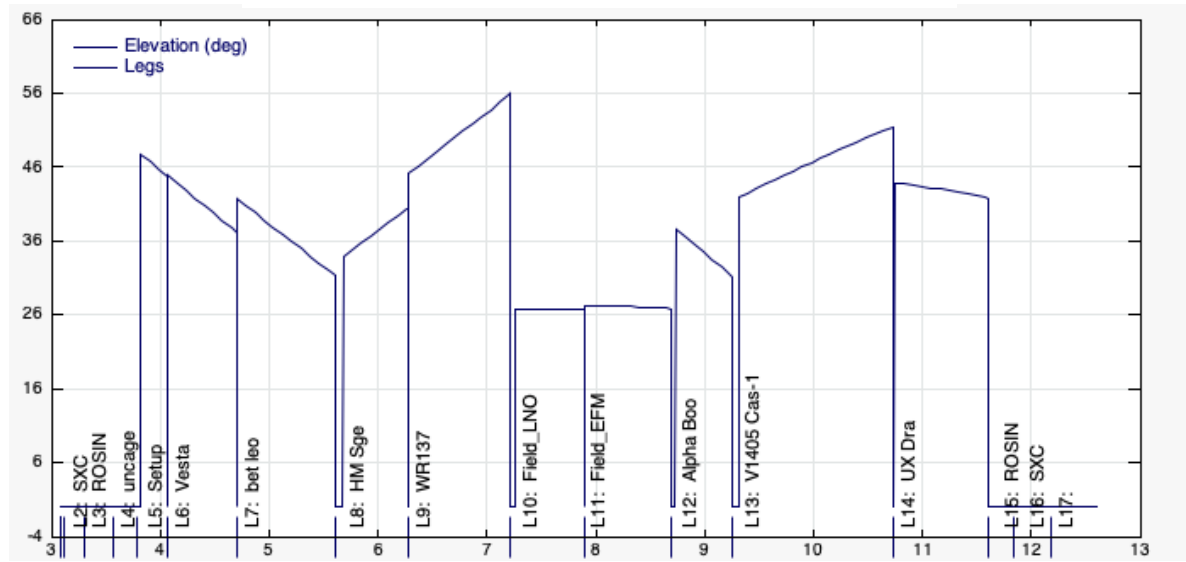
Flight 753 Mission ID 2021-07-01\_FO\_F753  
 Palmdale to Palmdale Take off date UTC: 01-JUL-2021  
 Departure UTC: 03:00 Arrival UTC: 12:18

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
5			Setup	11h45m17.04s	08d15m29.2s	3:48	15	
6	90_0050	Calibration	4 Vesta	11h43m16.10s	09d19m58.9s	4:03	38	
7	08_0154	Faramaz	bet leo	11h49m03.58s	14d34m19.4s	4:41	54	
8	75_0057	Discretionary	HM Sge	19h41m57.08s	16d44m39.9s	5:39	35.53	
9	09_0163	Richardson	WR137	20h14m31.77s	36d39m39.6s	6:16	56.08	
10	09_0216	Hankins	Galactic Center	17h44m24.93s	-29d25m54.5s	7:15	38	
11	09_0216	Hankins	Galactic Center	17h46m26.79s	-28d58m55.9s	7:53	48	
12	90_0060	Calibration	Alpha Boo	14h15m39.67s	19d10m56.7s	8:43	31	
13	08_0006	Gehrz	V1405 Cas	23h24m47.60s	61d11m14.8s	9:17	85	
14	09_0145	Sloan	UX Dra	19h21m35.52s	76d33m34.6s	10:43	52	

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



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





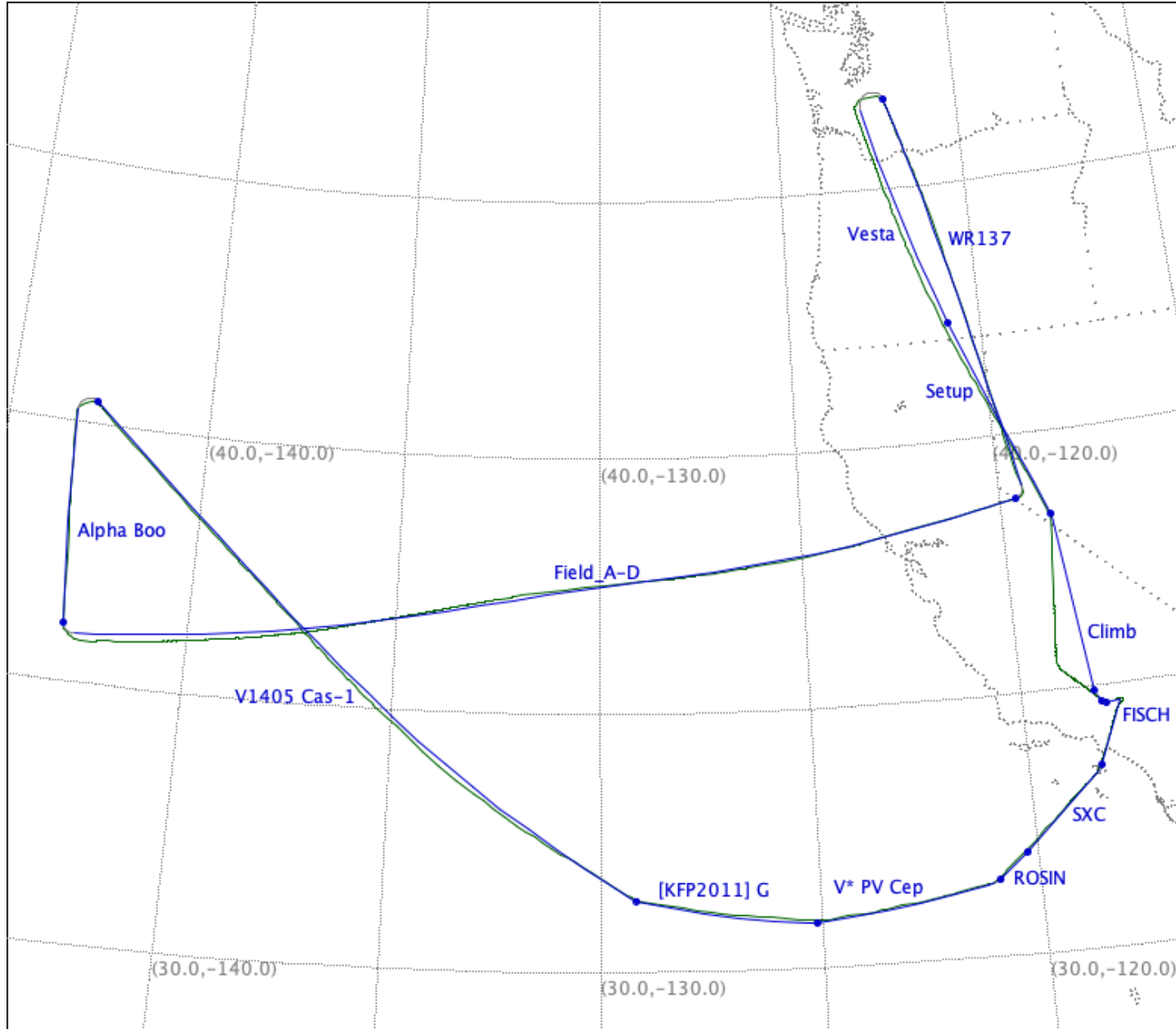
**MISSION ID: 2021-07-02\_FO\_F754**

**Date: 2021-07-02 UT Instrument: FORCAST**

**Flight #: 754 Flight Series: OC80**

blue = planned route

green = flown route



# Flight notes: No irregularities

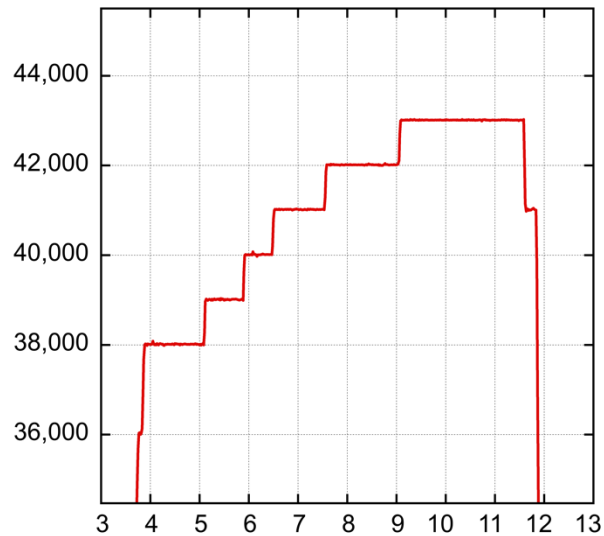
Flight 754  
Palmdale to  
Palmdale

Mission ID 2021-07-02\_FO\_F754  
Take off date UTC:  
02-JUL-2021

Departure UTC: 03:22  
Arrival UTC: 12:18

Leg	Plan ID	PI Name	Target Name	RA (2000)	Dec (2000)	Start time	Leg time	Leg notes
4			Setup	11h45m17.04s	08d15m29.2s	3:54	30	
5	90_0050	Calibration	4 Vesta	11h44m36.73s	09d08m56.5s	4:24	32	
6	09_0163	Richardson	WR137	20h14m31.77s	36d39m39.6s	5:01	60	
7	09_0216	Hankins	Galactic Center	17h46m42.33s	-28d36m51.4s	6:04	138	
8	90_0060	Calibration	Alpha Boo	14h15m39.67s	19d10m56.7s	8:24	32	Source positioning seemed to be off; time lost correcting; only 30% of planned data collected on leg
9	08_0006	Gehrz	V1405 Cas	23h24m47.60s	61d11m14.8s	9:00	103	
10	09_0006	Karnath	[KFP2011] G	21h43m06.67s	66d06m54.5s	10:43	26	
11	09_0006	Karnath	V* PV Cep	20h45m53.95s	67d57m38.7s	11:10	26	

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



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

