USN support of Sirius-FM7 from Hawaii

Sirius/XM Satellite Radio's Sirius-FM7 launches from the Kennedy Space Center on a SpaceX launch vehicle. Nominal lift-off time schedule is: August 1st, 2020 at 04:27:00 UTC. USN will support the Launch and Early Orbit (LEOP), orbit to parking raising followed by the In Orbit Testing (IOT) phases of the mission.

Sequence of events for support of Sirius-FM7 from USN-Hawaii:

Event	Date	Time
Launch	1-Aug	04:27:00 UTC
Separation	2-Aug	05:05:22 UTC
Hawaii AOS (pass#1)	2-Aug	07:36:28 UTC
Hawaii LOS (pass #14)	7-Aug	12:32:45 UTC
End of AMF#1 burn	7-Aug	17:39:32 UTC
Hawaii AOS (pass#15)	7-Aug	23:25:53 UTC
Hawaii LOS	8-Aug	10:48:42 UTC
End of AMF#2 burn	8-Aug	17:58:10 UTC
Hawaii AOS (pass#16)	9-Aug	16:27:58 UTC
FM7 in view from now until end of IOT	9-Aug	16:27:58 UTC
End of AMF#3 burn	10-Aug	02:31:05 UTC
End of AMF#4 burn	11-Aug	02:35:41 UTC
Spacecraft parked at 120.5 W for IOT	11-Aug	02:35:41 UTC
Commence IOT for 21 days	11-31-Aug	

Detailed pass support

USN will support Sirius-FM7 for a total of 18 passes starting 2-August thru 11-August 2020. Each pass time is from 11 hours to up to days in length. Not all possible visibility times will be supported. Actual support details and times for each pass are shown below.

Pass #1 thru #14

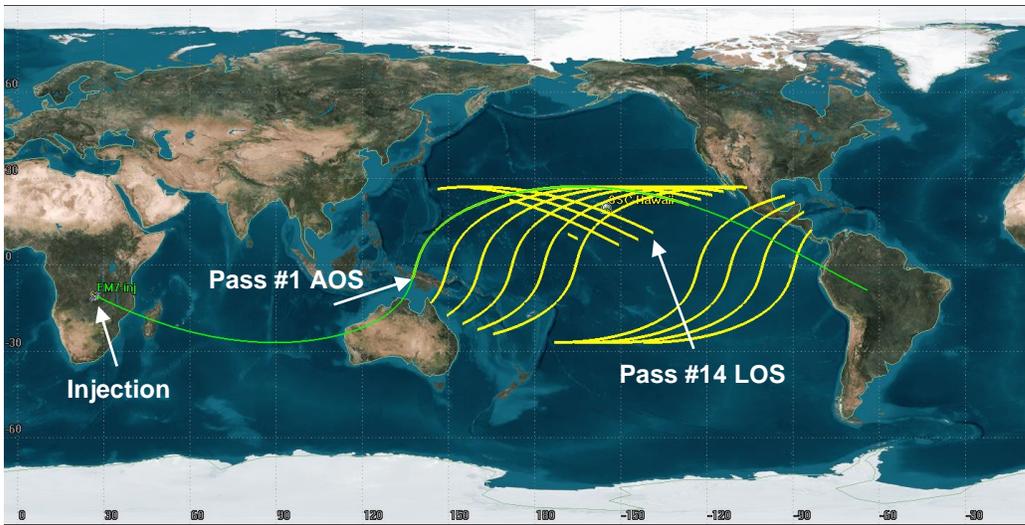Facility-Hawaii-Sensor-13m-To-Satellite-**Sirius-FM7-injection**: Access Summary Report

```
    PASS      Start Time (UTCG)         Stop Time (UTCG)
   ------    ------------------------  ------------------------
     1        2 Aug 2020 07:36:28       2 Aug 2020 10:37:15
     2        2 Aug 2020 22:50:36       3 Aug 2020 03:31:42
     3        3 Aug 2020 05:51:57       3 Aug 2020 09:47:51
     4        3 Aug 2020 22:00:47       4 Aug 2020 02:34:48
     5        4 Aug 2020 04:39:02       4 Aug 2020 08:58:16
```

```
 6           4 Aug 2020 14:56:05          4 Aug 2020 14:56:53
 7           4 Aug 2020 21:12:00          5 Aug 2020 01:32:14
 8           5 Aug 2020 03:36:25          5 Aug 2020 08:08:27
 9           5 Aug 2020 14:00:27          5 Aug 2020 14:10:11
10           5 Aug 2020 20:26:20          6 Aug 2020 00:12:08
11           6 Aug 2020 02:38:42          6 Aug 2020 07:18:20
12           6 Aug 2020 13:04:26          6 Aug 2020 13:21:38
13           7 Aug 2020 01:43:49          7 Aug 2020 06:27:49
14           7 Aug 2020 12:04:18          7 Aug 2020 12:32:45
```

Spacecraft Injection Orbital Elements:

Sirius XM 7 inj
1 28364U 04024A   20215.21206019 -.00000300 00000-0 10000-3 0   577
2 28364 27.0192 212.5318 5964966 174.5602   6.5925 4.13616189   835

USN Hawaii coverage of Sirius-FM7 Pass #1 thru #14.
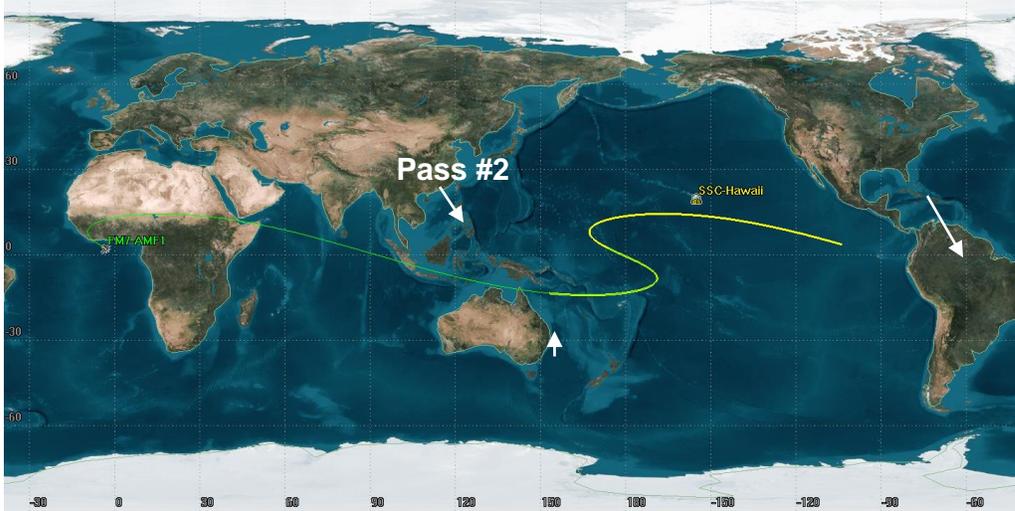
Pass #15 Post AMF1 burn
Facility-Hawaii-Sensor-13m-To-Satellite-**Sirius-FM7-post AMF1**: Access Summary Report

```
    PASS      Start Time (UTCG)           Stop Time (UTCG)
    ------    ------------------------    ------------------------
      1        7 Aug 2020 23:25:53         8 Aug 2020 10:48:42
```

Spacecraft Post AMF#1 Orbital Elements:

SXM7 Post AMF1
1 28364U 04024A 20220.73578889 -.00000300 00000-0 10000-3 0   577
2 28364 14.2909 209.7738 5677762 178.8073 209.9701 1.96992333   834

USN Hawaii coverage of Sirius-FM7 pass#15.
Note that AMF#2 burn will occur at the end of pass #15 over Africa and is out of view of Hawaii.
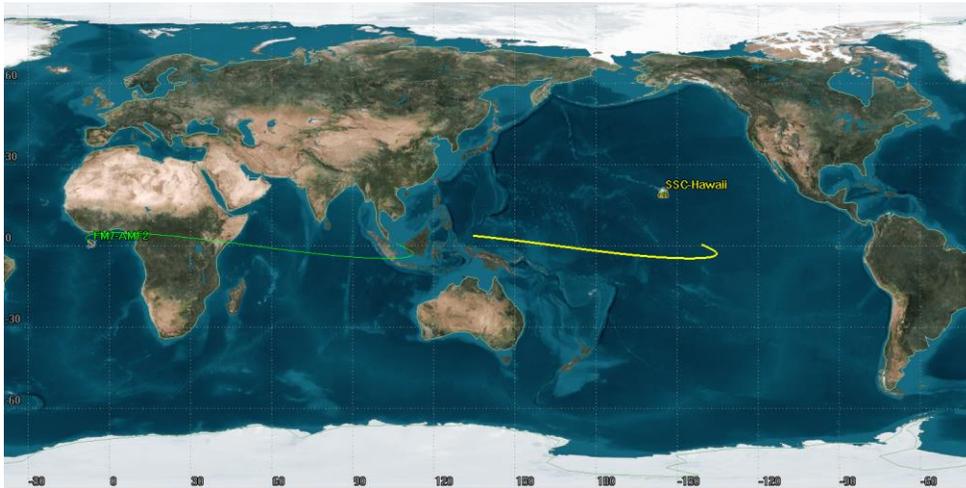
Pass #16

Facility-Hawaii-Sensor-13m-To-Satellite-**Sirius-FM7-post AMF2**: Access Summary Report

PASS	Start Time (UTCG)	Stop Time (UTCG)
16	9 Aug 2020 16:27:58	10 Aug 2020 02:31:05

Spacecraft Post AMF#2 Orbital Elements:

SXM7 Post AMF 2
1 28364U 04024A 20221.74872766 -.00000300 00000-0 10000-3 0   570
2 28364   4.7336 210.2321 2820178 178.4369 200.6513 1.45673802   839

USN Hawaii coverage of Sirius-FM7 pass#16.
Note that AMF#3 burn occurs in view of Hawaii without LOS and continue into pass #17.
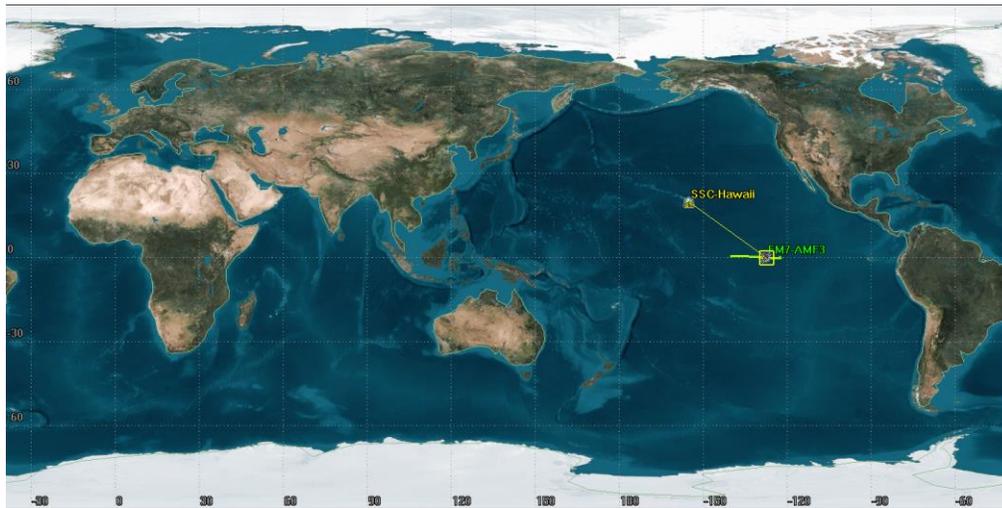
Pass #17

Facility-Hawaii-Sensor-13m-To-Satellite-**Sirius-FM7-post AMF3**: Access Summary Report

```
   PASS     Start Time (UTCG)          Stop Time (UTCG)
  ------    ------------------------   ------------------------
    17       10 Aug 2020 02:31:05       11 Aug 2020 02:35:41
```

Spacecraft Post AMF#3 Orbital Elements:

SXM7 Post AMF 3
1 28364U 04024A   20223.10492454 -.00000300 00000-0 10000-3 0   574
2 28364   0.4762 218.7000 0326192 170.0538 188.4164 1.05367998   830

USN Hawaii coverage of Sirius-FM7 pass#17.
Note that AMF#4 burn occurs in view of Hawaii without LOS and continue into pass #18.
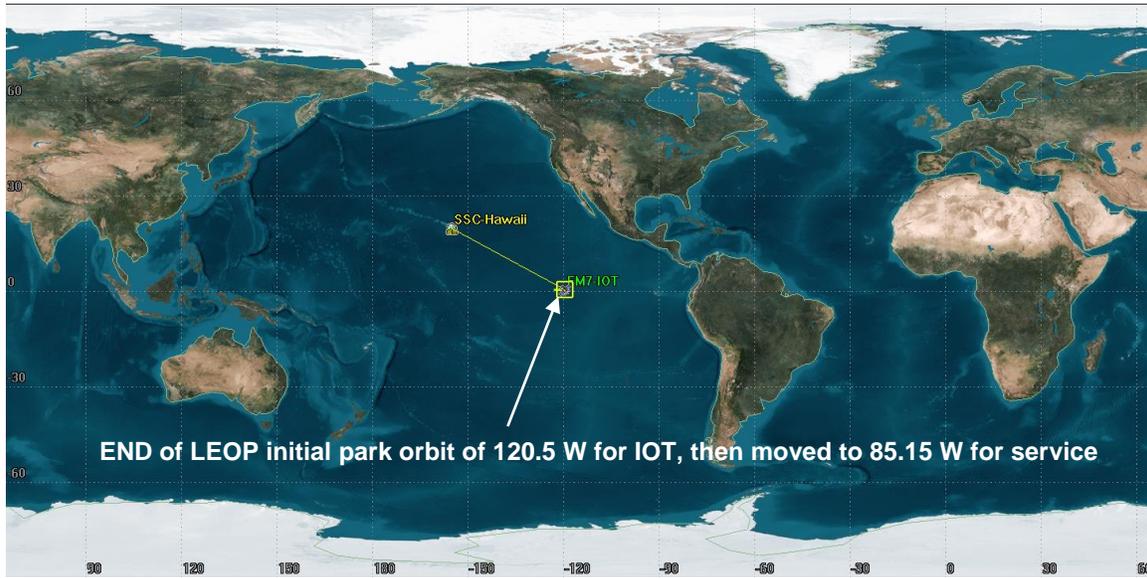
Pass #18

Facility-Hawaii-Sensor-13m-To-Satellite-**Sirius-FM7-post AMF4**: Access Summary Report

PASS	Start Time (UTCG)	Stop Time (UTCG)
18	In view 24/7	

Spacecraft Post AMF#3 Orbital Elements:

SXM7 Post AMF 4
1 28364U 04024A   20224.10811690 -.00000300 00000-0 10000-3 0   579
2 28364   0.0913 187.9024 0010083 182.6908 180.9361 1.00363555   832

END of LEOP initial park orbit of 120.5 W for IOT, then moved to 85.15 W for service

USN Hawaii coverage of Sirius-FM7 pass#4 and END of LEOP phase

USN now transitions into the IOT phase to support the in orbit testing and commissioning of the spacecraft for the next 21 days.