

CASE FILE 31 / 237UAP00539

# 237UAP00539

Multiple-witness public UAP report; score 64

NORMAL-OBJECT FAVORED

REPORT NO.	UAP-OM-31-237UAP00539	DISPOSITION	NORMAL-OBJECT FAVORED
PRIMARY CASE	237UAP00539	GENERATED	2026-05-20 18:32 UTC
REPORT TIME	2023-08-16T06:46:00+00:00	OBSERVER	34.43441, -86.75231
SOURCE CASE IDS	237UAP00539		

## Abstract

This case file evaluates a reported UAP sighting against the available orbital-object layer. No compact same-launch group fully identifies the file by itself. The final disposition is assigned under a normal-object favored standard, where ordinary aerospace/orbital explanations are preferred when they reasonably fit the report.

This is a standalone independent analysis prepared from public-source records and public orbital datasets. It is not an official government determination, classification marking, or agency-authored report.

# 1. Executive Summary

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237UAP00539 is assessed as normal-object favored because the available public evidence gives a case-specific ordinary-object candidate: historical Starlink object traffic at the report spacetime. Dense satellite presence alone is not treated as causation in this packet.

## 1.1 Key Findings

- Source score 64 based on: multiple aircraft/facility witnesses, negative official correlation, high-altitude report, UAP/UFO language.
- Report time used: 2023-08-16T06:46:00+00:00.
- External object layer used: Starlink.
- Disposition standard: NORMAL-OBJECT requires case-specific causal fit. Satellite density above the horizon is context only and cannot by itself resolve the report.
- Non-causal context / rejection screens: source language itself invokes satellite/space/launch context; substantial orbital-object sky background; context only, not causation.
- Remaining hard features: multiple witnesses/facilities.
- Objects above horizon: 209; at/above 10 deg: 79.
- No compact same-launch/designator group survived the report threshold.
- No explicit Starlink/balloon wording was found in the source excerpt used for ranking.

## 1.2 Bottom Line

**NORMAL-OBJECT FAVORED:** A case-specific ordinary-object candidate exists from source language, orbital geometry, launch-object context, or compact trajectory grouping. Dense ordinary sky traffic alone is not treated as causation.

# 2. Source Control

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The source-control table identifies the public report records reviewed for this case and lists public access links where available. The table is included so this PDF remains interpretable when distributed by itself.

CASE ID	REPORT DATE FIELD	FACILITY / TITLE	TEXT EXTRACT	PUBLIC PDF LINK
237UAP00539	8/16/2023 1:46:00 AM (-05 CDT)	AAL1397 UFO-UAP ACTIVITY 08-16-2023	text extract present	<a href="#">237UAP00539.pdf</a>

### 3. Original Report Evidence

PRIMARY EXCERPT USED FOR MATCHING	Washington Operations Center Date: 8/16/2023 1:46:00 AM (-05 CDT) Title: AAL1397 UFO-UAP ACTIVITY 08-16-2023 Latitude: 34.43441498 Latitude: -86.752305559999996 DESCRIPTION PRELIM INFO FROM FAA OPS: BIRMINGHAM, AL/UFO-UAP ACTIVITY/ 0100C/MEMPHIS ARTCC ADVISED AMERICAN 1397, B738, MIA - MCI, OBSERVED TWO BRIGHT LIGHTS ABOVE ACFT WHILE AT 20,000 FEET 60 N BHM . NO EVASIVE ACTION REPORTED. MULTIPLE ACFT HAVE REPORTED SAME TWO LIGHTS AT VARIOUS ALTITUDES (6,000 FEET UP TO "SATELLITE ALTITUDE"). BMH ATCT REPORTED LIGHTS AS WELL. THE LIGHTS HAVE BEEN REPORTED AS FAR NORTH AS BNA AND HSV. NO LEO NOTIFICATION REPORTED. WOC 7-3333 DJ/MO
REPORT TIME USED	2023-08-16T06:46:00+00:00
OBSERVER COORDINATE USED	34.43441, -86.75231
OBSERVER SOURCE BASIS	(public text extract 237UAP00539)

### 4. Methodology

- Spacetime extraction.** The report time and observer coordinate were extracted from the public text report and normalized to UTC. Aviation fixes/radials were resolved during earlier preprocessing where applicable.
- External object dataset.** The object layer used historical Space-Track/TLE-derived Starlink element rows. The analytic mode for this case is historical Starlink element propagation and same-launch/designator sky grouping.
- Propagation.** Orbital elements were propagated to the report minute and observer location. For launch-object checks, samples around the report minute were retained. For Starlink group checks, objects above the horizon were clustered by sky position and filtered for same-launch groupings.
- Comparison.** The output was compared against the report's count of lights, direction cue, motion language, altitude/radar language, and whether the file itself already suggested a satellite explanation.
- Causation standard.** Mere object presence above the horizon is treated as background context only. A normal-object disposition requires a case-specific causal fit, such as a named launch object, a compact same-launch trajectory group, or source language that directly supports that object class.
- Disposition assignment.** *Identified* means a specific normal object fits the report spacetime and the hard reported features do not materially conflict. *Normal-object favored* means a case-specific ordinary aerospace/orbital candidate exists, but it is not a full named identification. *Insufficient* means the file is too thin to carry high anomaly value. *High-value unresolved* is used when radar, video, rapid maneuver, or multi-witness features remain after reasonable normal-object checks.

## 5. External Object Evidence

### 5.1 Search Volume and Density

This table is a screening layer only. Objects above the horizon show background opportunity; they do not establish causation unless a specific object or compact trajectory group matches the reported behavior.

STARLINK CATALOG IDS CONSIDERED	4597	HISTORICAL ELEMENT ROWS	4391
ABOVE HORIZON AT REPORT MINUTE	209	AT/ABOVE 10 DEG	79
LARGEST SAME-SKY CLUSTER	53		

No compact same-launch/designator group survived the report threshold. In this condition, satellite density remains context only and cannot by itself resolve a report with hard features.

### 5.2 Same-Launch / Same-Designator Candidate Groups

#	LAUNCH DATE	COUNT	AZIMUTH SPAN	ELEVATION SPAN	MOTION LABELS	MEMBERS
No same-launch group identified.						

### 5.3 Primary Group Members

OBJECT	NORAD	LAUNCH	AZ	EL	RANGE KM	APPARENT MOTION	ELEMENT AGE H
No members available.							

### 5.4 Bright-Sky Context: Top Starlink Objects by Elevation

OBJECT	AZ	EL	RANGE KM	APPARENT MOTION	LAUNCH DATE
STARLINK-1448	84.37	67.91	588.81	westward, setting	2020-06-04
STARLINK-3460	6.88	65.21	591.99	eastward, setting	2022-02-21
STARLINK-3859	301.53	53.05	663.39	eastward, setting	2022-05-06
STARLINK-4771	154.9	51.05	678.66	westward, setting	2022-09-19
STARLINK-2009	108.2	43.89	760.16	westward, setting	2021-02-16
STARLINK-4448	33.37	43.8	786.49	westward, setting	2022-08-12
STARLINK-3386	193.35	40.79	788.27	westward, setting	2022-01-19
STARLINK-2042	171.02	39.53	816.25	westward, setting	2021-02-16
STARLINK-4297	230.54	37.71	833.51	eastward, rising	2022-08-19
STARLINK-1606	233.77	36.35	865.53	westward, setting	2020-08-18
STARLINK-1628	52.15	35.8	877.03	eastward, setting	2020-08-18
STARLINK-1846	288.47	35.79	876.34	westward, rising	2020-11-25

### 5.5 Largest Sky Clusters

#	COUNT	AZIMUTH SPAN	ELEVATION SPAN	MOTION LABELS
1	53	0.19-358.32 deg	10.2-43.8 deg	eastward, rising, eastward, setting, nearly fixed azimuth, setting, westward, rising, westward, setting
2	7	87.56-125.69 deg	14.17-27.5 deg	eastward, setting, westward, setting
3	5	142.39-169.21 deg	10.11-29.04 deg	westward, rising, westward, setting

#	COUNT	AZIMUTH SPAN	ELEVATION SPAN	MOTION LABELS
4	3	194.21-210.2 deg	14.2-20.49 deg	westward, rising, westward, setting
5	2	230.54-233.77 deg	36.35-37.71 deg	eastward, rising, westward, setting

### 5.6 Space-Track SATCAT Enrichment

Space-Track SATCAT metadata was pulled as a cached subset for NORAD catalog IDs appearing in this packet's evidence tables. This section adds owner/type/status context to the propagated object candidates.

<b>PACKET SATCAT SUBSET ROWS</b>	5370	<b>FETCHED</b>	2026-05-19T01:19:50+00:00
<b>THIS CASE NORAD IDS CHECKED</b>	30	<b>SATCAT ROWS MATCHED</b>	30
<b>TOP OWNERS</b>	US: 30		
<b>OBJECT TYPES</b>	PAYLOAD: 30		

### 5.7 Space-Track Metadata for Top Propagated Objects

NORAD	OBJECT NAME	TYPE	OWNER	LAUNCH DATE	DECAY DATE
45665	STARLINK-1448	PAYLOAD	US	2020-06-04	n/a
51755	STARLINK-3460	PAYLOAD	US	2022-02-21	n/a
52470	STARLINK-3859	PAYLOAD	US	2022-05-06	n/a
53833	STARLINK-4771	PAYLOAD	US	2022-09-19	n/a
47633	STARLINK-2009	PAYLOAD	US	2021-02-16	2025-04-07
53504	STARLINK-4448	PAYLOAD	US	2022-08-12	n/a
51126	STARLINK-3386	PAYLOAD	US	2022-01-19	n/a
47658	STARLINK-2042	PAYLOAD	US	2021-02-16	2025-02-13
53543	STARLINK-4297	PAYLOAD	US	2022-08-19	n/a
46144	STARLINK-1606	PAYLOAD	US	2020-08-18	n/a
46169	STARLINK-1628	PAYLOAD	US	2020-08-18	2025-10-29
47136	STARLINK-1846	PAYLOAD	US	2020-11-25	2025-02-22

### 5.9 NASA / NOAA / ADS-B Expansion Layer

NASA POWER/Horizons/DONKI batch context had not yet been written for this case at packet build time.

### 5.11 Free Source Availability and Remaining Work

LAYER	STATUS	CASE-SPECIFIC NOTE
<b>ADSB.LOL HISTORICAL RELEASE LISTING</b>	screened/present	planes-readsb-staging-0 1684.2 MiB; planes-readsb-prod-1 1684.2 MiB; planes-readsb-prod-0 1681.3 MiB
<b>ADSB TRACKS DOWNLOADED</b>	not yet exhausted	Requires targeted extraction from large daily history archives before claiming aircraft exhaustion.
<b>NOAA GOES IMAGERY</b>	not yet exhausted	Needed for cloud/lightning visual context.
<b>NOAA GOES ABI/GLM MANIFEST</b>	screened/present	Public S3 object availability for the report hour.
<b>NOAA NEXRAD WEATHER RADAR</b>	not yet exhausted	Weather radar only; not ATC radar.
<b>NOAA IGRA RADIOSONDE</b>	screened/present	Needed for balloon drift plausibility.
<b>ASOS/METAR WEATHER OBSERVATIONS</b>	screened/present	Nearest station surface observations around report time.

- ADSB.lol historical: extract aircraft traces from adsblol/globe\_history\_2023 for 2023-08-16, then filter +/-60 min and 250 nmi around 34.4344,-86.7523.

- NASA POWER/Horizons/DONKI: batch context for 237UAP00539 at 2023-08-16T06:46:00+00:00.
- NOAA GOES: pull nearest ABI/GLM products for the UTC hour and render cloud/lightning map.
- NOAA NEXRAD: select nearest radar stations and render Level-II/III weather radar sweep around event time.
- NOAA IGRA: find nearest radiosonde station launches bracketing the event and model wind drift for balloon-like descriptions.
- Space-Track gp\_history/decay: fetch exact historical element rows and decay/reentry status for top candidate NORAD IDs.

### 5.12 Weather, Imagery, and Balloon Query Plan

This plan identifies the concrete free sources needed for the next case-specific weather and balloon checks. These are not treated as completed exclusions until the data are downloaded and plotted.

GOES SATELLITE	GOES16
GOES ABI PREFIX	<a href="https://noaa-goes16.s3.amazonaws.com/ABI-L2-CMIPF/2023/228/06/">https://noaa-goes16.s3.amazonaws.com/ABI-L2-CMIPF/2023/228/06/</a>
GOES GLM LIGHTNING PREFIX	<a href="https://noaa-goes16.s3.amazonaws.com/GLM-L2-LCFA/2023/228/06/">https://noaa-goes16.s3.amazonaws.com/GLM-L2-LCFA/2023/228/06/</a>

### 5.13 Nearest Weather-Airport Candidates

STATION	NAME	DISTANCE KM	COORDINATE
KHSV	Huntsville International Airport	22.50	34.64, -86.77
KHUA	Redstone Army Air Field	27.90	34.68, -86.68
KMSL	Northwest Alabama Regional Airport	86.00	34.75, -87.61
KBHM	Birmingham-Shuttlesworth International Airport	96.90	33.56, -86.75
KANB	Anniston Regional Airport	125.10	33.59, -85.86

- KHSV: [IEM ASOS/METAR daily CSV query](#)
- KHUA: [IEM ASOS/METAR daily CSV query](#)
- KMSL: [IEM ASOS/METAR daily CSV query](#)

### 5.14 Nearest Radiosonde Stations

STATION	NAME	DISTANCE KM	COORDINATE
USM00072230	BIRMINGHAM; AL	139.60	33.18, -86.78
USM00072327	NASHVILLE/METROPOLITAN; TN.	200.90	36.23, -86.55
USM00072215	PEACHTREE CITY; GA.	234.60	33.36, -84.57
USM00072235	JACKSON/ALLEN C. THOMPSON FIEL	388.30	32.32, -90.08
USM00072221	VALPARAISO/EGLIN AFB; FL.	439.90	30.48, -86.52

### 5.15 ASOS/METAR Surface Weather Observations

surface visibility ranged 10-10 statute miles; no precipitation was reported in the retained observations; no low broken/overcast cloud ceiling was evident in the retained station observations. Surface ASOS/METAR observations describe airport-level weather and visibility; they do not by themselves prove conditions at the sighting altitude or line of sight.

STATION	DISTANCE KM	NEAREST OBS UTC	VIS SM	SKY	WIND DEG/KT	METAR
KHSV	22.50	2023-08-16T06:53:00+00:00	10.00	CLR, M, M, M	20.00 / 6.00	KHSV 160653Z AUTO 02006KT 10SM CLR 20/18 A3000 RMK AO2 SLP151 T02000183
KHUA	27.90	2023-08-16T06:55:00+00:00	10.00	CLR, M, M, M	30.00 / 5.00	KHUA 160655Z AUTO 03005KT 10SM CLR 19/19 A2999 RMK AO2

STATION	DISTANCE KM	NEAREST OBS UTC	VIS SM	SKY	WIND DEG/KT	METAR
						LTG DSNT S SLP150 T01940187
KMSL	86.00	2023-08-16T06:53:00 +00:00	10.00	CLR, M, M, M	360.00 / 5.00	KMSL 160653Z AUTO 36005KT 10SM CLR 21/18 A3002 RMK AO2 SLP158 T02060178

### 5.16 NOAA IGRA Radiosonde Wind Profile

Nearest sounding implies mean 0-12 km wind drift toward 239.7 deg at 2.6 m/s; a passive balloon could drift about 18.7 km in two hours under this crude layer-average model. Radiosonde winds are sparse station soundings; balloon drift remains approximate without launch time, ascent rate, object altitude, and exact line-of-sight bearing.

STATION	NAME	DISTANCE KM	SOUNDING UTC	MEAN DRIFT BEARING	MEAN SPEED M/S	2H DRIFT KM	MAX WIND
USM00072230	BIRMINGHAM; AL	139.60	2023-08-16T12:00 :00+00:00	239.70	2.60	18.70	36.00 at 174.00 m

### 5.17 NOAA GOES ABI/GLM Public File Manifest

GOES public S3 objects are listed for the report hour where available. This is an availability manifest, not yet a rendered satellite image.

SATELLITE	GOES16	BUCKET	noaa-goes16
ABI SAMPLE FILES	12	GLM SAMPLE FILES	12

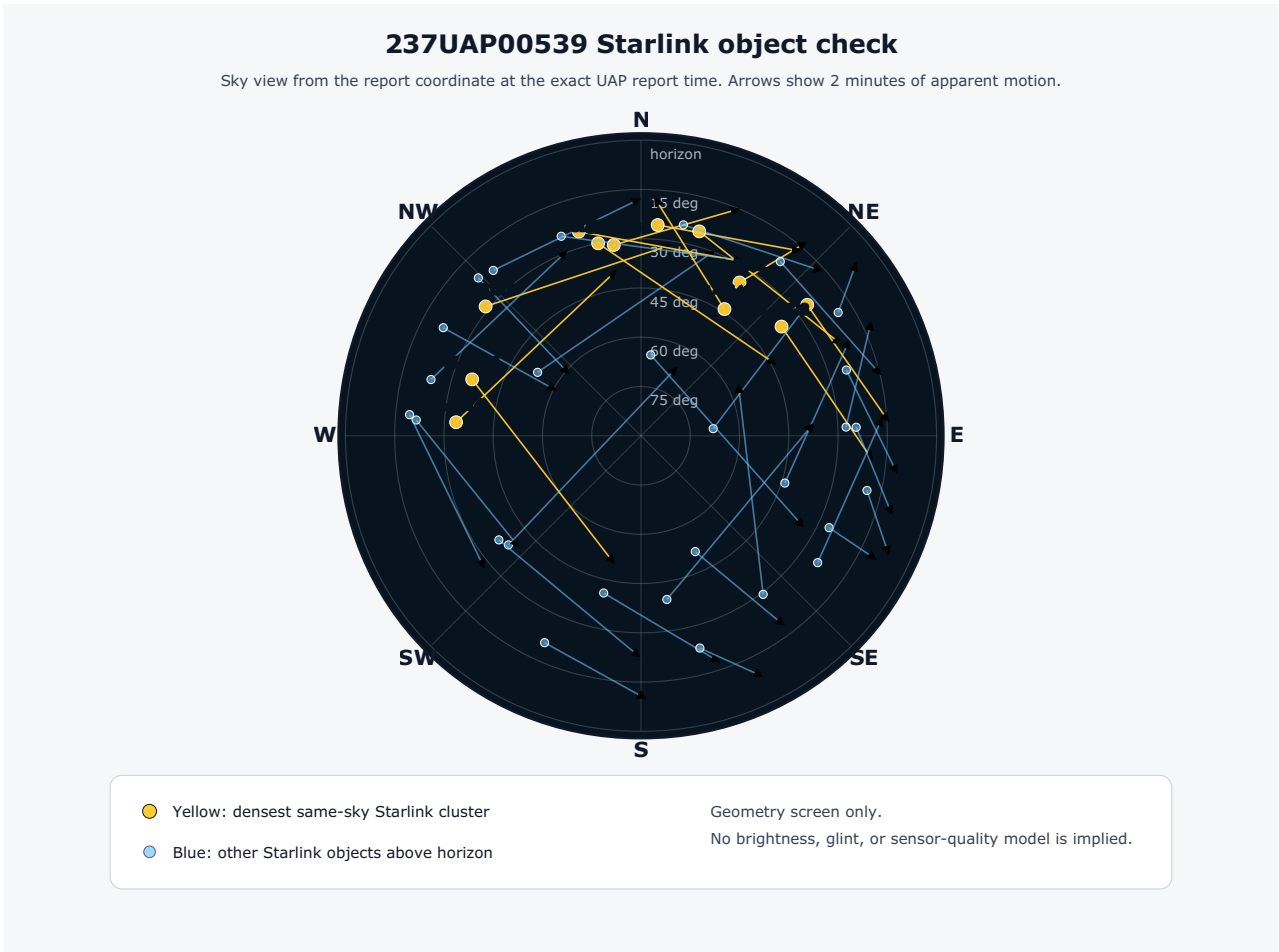
#### ABI sample objects:

- [ABI-L2-CMIPF/2023/228/06/OR\\_ABI-L2-CMIPF-M6C01\\_G16\\_s20232280600208\\_e20232280609516\\_c20232280609584.nc](#)
- [ABI-L2-CMIPF/2023/228/06/OR\\_ABI-L2-CMIPF-M6C01\\_G16\\_s20232280610208\\_e20232280619516\\_c20232280619582.nc](#)
- [ABI-L2-CMIPF/2023/228/06/OR\\_ABI-L2-CMIPF-M6C01\\_G16\\_s20232280620208\\_e20232280629516\\_c20232280629588.nc](#)
- [ABI-L2-CMIPF/2023/228/06/OR\\_ABI-L2-CMIPF-M6C01\\_G16\\_s20232280630208\\_e20232280639516\\_c20232280639579.nc](#)

#### GLM lightning sample objects:

- [GLM-L2-LCFA/2023/228/06/OR\\_GLM-L2-LCFA\\_G16\\_s20232280600000\\_e20232280600200\\_c20232280600218.nc](#)
- [GLM-L2-LCFA/2023/228/06/OR\\_GLM-L2-LCFA\\_G16\\_s20232280600200\\_e20232280600400\\_c20232280600422.nc](#)
- [GLM-L2-LCFA/2023/228/06/OR\\_GLM-L2-LCFA\\_G16\\_s20232280600400\\_e20232280601000\\_c20232280601018.nc](#)
- [GLM-L2-LCFA/2023/228/06/OR\\_GLM-L2-LCFA\\_G16\\_s20232280601000\\_e20232280601200\\_c20232280601219.nc](#)

6. Annotated Evidence Figure



Generated figure copied from the local evidence-plot output. It is included as an analytic visualization, not as original sensor imagery.



## 7. Analytic Comparison

CRITERION	REPORT EVIDENCE	ANALYTIC TREATMENT
TIME CONSTRAINT	2023-08-16T06:46:00+00:00	Directly used in propagation; this is a hard filter, not descriptive context.
LOCATION CONSTRAINT	34.43441, -86.75231	Directly used as observer point for azimuth/elevation/range computation.
COUNT / PATTERN	three-object/light language present	No compact same-launch count match; retained for unresolved report features.
MOTION LANGUAGE	not explicit	Apparent motion labels in the object table provide a plausible but not definitive comparison.
RADAR / OFFICIAL CHECK	not specified	No ATC radar return can be consistent with distant orbital objects or visual aircraft-light hypotheses, but it does not prove the match.
ANALYTIC DISPOSITION	normal-object	237UAP00539 is assessed as normal-object favored because the available public evidence gives a case-specific ordinary-object candidate: historical Starlink object traffic at the report spacetime. Dense satellite presence alone is not treated as causation in this packet.

## 8. Caveats, Limitations, and Collection Gaps

- No raw cockpit video, ATC replay, radar plot, or witness interview transcript was reviewed unless explicitly stated in the public source text.
- Aviation-derived coordinates can represent a nearby fix/radial or report point, not necessarily the actual line-of-sight intercept point.
- Starlink visibility depends on illumination, observer altitude, atmospheric conditions, and apparent brightness; this analysis tests geometry, not photometry. No brightness model is used unless explicitly stated elsewhere in the case file.
- TLE propagation is appropriate for screening and reconstruction but is not a substitute for authoritative operational ephemerides.
- When many satellites are above the horizon, generic presence is weak evidence and is not treated as causation. The report emphasizes named launch-object checks or compact same-launch trajectory groups.
- Normal-object favored is not the same as a perfect named-object identification; it requires a case-specific ordinary-object candidate stronger than simple object density.

Title: AAL1397 UFO-UAP ACTIVITY 08-16-2023

Latitude: 34.43441498      Latitude: -86.752305559999996

Latitude: -86.7523055599999996

## Appendix B. Computational Evidence Digest

This appendix preserves the principal computed values used in the assessment, shortened to the fields most relevant to audit and review.

```
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  "historical_starlink_element_rows": 4391,
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    "lon": -86.75230556,
    "source": "(public text extract 237UAP00539)"
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  "case_id": "237UAP00539",
  "starlink_above_horizon_at_report_time": 209,
  "starlink_catalog_ids_considered": 4597,
  "largest_same-sky_cluster_count": 53,
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      "elevation_plus_5m_deg": 3.77,
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      "subpoint_lon": -84.5395
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      "azimuth_plus_5m_deg": 129.31,
      "element_age_hours": 5.35,
      "element_epoch": "2023-08-16T01:24:50.164416+00:00",
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      "elevation_plus_2m_deg": 33.7,
      "elevation_plus_5m_deg": 6.75,
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      "ground_track_bearing_deg": 134.54,
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      "launch_date": "2022-02-21",
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      "azimuth_plus_5m_deg": 38.28,
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      "element_epoch": "2023-08-16T09:44:17.327904+00:00",
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      "elevation_plus_2m_deg": 29.91,
      "elevation_plus_5m_deg": 6.19,
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      "ground_track_bearing_deg": 45.75,
      "ground_track_label": "NE",
      "launch_date": "2022-05-06",
      "name": "STARLINK-3859",
      "norad_id": "52470",
      "range_km": 663.39,
      "sky_motion_label": "eastward, setting",
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  "elevation_plus_2m_deg": 18.15,
  "elevation_plus_5m_deg": 1.25,
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  "ground_track_label": "SE",
  "launch_date": "2022-09-19",
  "name": "STARLINK-4771",
  "norad_id": "53833",
  "range_km": 678.66,
  "sky_motion_label": "westward, setting",
  "subpoint_lat": 31.2094,
  "subpoint_lon": -85.0016
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  "azimuth_plus_5m_deg": 52.65,
  "element_age_hours": 3.0,
  "element_epoch": "2023-08-16T09:45:46.899648+00:00",
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  "launch_date": "2021-02-16",
  "name": "STARLINK-2009",
  "norad_id": "47633",
  "range_km": 760.16,
  "sky_motion_label": "westward, setting",
  "subpoint_lat": 32.9045,
  "subpoint_lon": -81.6228
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  "azimuth_deg": 33.37,
  "azimuth_plus_2m_deg": 3.46,
  "azimuth_plus_5m_deg": 354.72,
  "element_age_hours": 1.43,
  "element_epoch": "2023-08-16T08:11:42.626112+00:00",
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  "elevation_plus_5m_deg": 1.01,
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  "ground_track_bearing_deg": 347.68,
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  "launch_date": "2022-08-12",
  "name": "STARLINK-4448",
  "norad_id": "53504",
  "range_km": 786.49,
  "sky_motion_label": "westward, setting",
  "subpoint_lat": 38.3178,
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  "azimuth_deg": 193.35,
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  "element_epoch": "2023-08-16T01:22:14.338560+00:00",
  "elevation_deg": 40.79,
  "elevation_plus_2m_deg": 17.48,
  "elevation_plus_5m_deg": 1.32,
  "epoch_altitude_km": 546.02,
  "ground_track_bearing_deg": 139.44,
  "ground_track_label": "SE",
  "launch_date": "2022-01-19",
  "name": "STARLINK-3386",
  "norad_id": "51126",
  "range_km": 788.27,
  "sky_motion_label": "westward, setting",
  "subpoint_lat": 29.5957,
  "subpoint_lon": -88.0635
},
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  "azimuth_plus_2m_deg": 86.36,
  "azimuth_plus_5m_deg": 55.88,
  "element_age_hours": 3.02,
  "element_epoch": "2023-08-16T09:47:07.954080+00:00",
  "elevation_deg": 39.53,

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    "elevation_plus_2m_deg": 37.7,
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    "ground_track_bearing_deg": 41.08,
    "ground_track_label": "NE",
    "launch_date": "2021-02-16",
    "name": "STARLINK-2042",
    "norad_id": "47658",
    "range_km": 816.25,
    "sky_motion_label": "westward, setting",
    "subpoint_lat": 29.2609,
    "subpoint_lon": -85.8213
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    "azimuth_plus_2m_deg": 27.37,
    "azimuth_plus_5m_deg": 42.78,
    "element_age_hours": 8.12,
    "element_epoch": "2023-08-15T22:38:35.115936+00:00",
    "elevation_deg": 37.71,
    "elevation_plus_2m_deg": 66.93,
    "elevation_plus_5m_deg": 13.83,
    "epoch_altitude_km": 546.43,
    "ground_track_bearing_deg": 41.83,
    "ground_track_label": "NE",
    "launch_date": "2022-08-19",
    "name": "STARLINK-4297",
    "norad_id": "53543",
    "range_km": 833.51,
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    "subpoint_lat": 30.8471,
    "subpoint_lon": -91.6642
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    "azimuth_plus_2m_deg": 180.6,
    "azimuth_plus_5m_deg": 158.85,
    "element_age_hours": 0.62,
    "element_epoch": "2023-08-16T06:08:50.107200+00:00",
    "elevation_deg": 36.35,
    "elevation_plus_2m_deg": 22.93,
    "elevation_plus_5m_deg": 4.56,
    "epoch_altitude_km": 553.31,
    "ground_track_bearing_deg": 138.45,
    "ground_track_label": "SE",
    "launch_date": "2020-08-18",
    "name": "STARLINK-1606",
    "norad_id": "46144",
    "range_km": 865.53,
    "sky_motion_label": "westward, setting",
    "subpoint_lat": 30.8875,
    "subpoint_lon": -92.1764
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  {
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    "azimuth_plus_2m_deg": 95.63,
    "azimuth_plus_5m_deg": 113.79,
    "element_age_hours": 14.9,
    "element_epoch": "2023-08-15T15:51:42.086592+00:00",
    "elevation_deg": 35.8,
    "elevation_plus_2m_deg": 19.47,
    "elevation_plus_5m_deg": 2.94,
    "epoch_altitude_km": 553.45,
    "ground_track_bearing_deg": 132.97,
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    "name": "STARLINK-1628",
    "norad_id": "46169",
    "range_km": 877.03,
    "sky_motion_label": "eastward, setting",
    "subpoint_lat": 37.921,
    "subpoint_lon": -80.8598
  },
  {
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    "azimuth_plus_2m_deg": 192.35,
    "azimuth_plus_5m_deg": 151.39,
    "element_age_hours": 1.01,
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    "elevation_deg": 35.79,
    "elevation_plus_2m_deg": 50.57,
    "elevation_plus_5m_deg": 12.67,
    "epoch_altitude_km": 553.25,
    "ground_track_bearing_deg": 134.62,
    "ground_track_label": "SE",
    "launch_date": "2020-11-25",
    "name": "STARLINK-1846",
    "norad_id": "47136",

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    "range_km": 876.34,  
    "sky_motion_label": "westward, rising",  
    "subpoint_lat": 36.1121,  
    "subpoint_lon": -93.6647  
  }  
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## Appendix C. Source Exhaustion Checklist

This checklist records which source layers were actually applied to this individual report. It separates checked evidence from unexhausted collection gaps so the disposition is auditable when the PDF is read alone.

SOURCE LAYER	STATUS	CASE-SPECIFIC NOTE
NARA PUBLIC UAP/FAA REPORT	reviewed	Source IDs: 237UAP00539
TIME AND OBSERVER COORDINATE	extracted	2023-08-16T06:46:00+00:00 at 34.43441, -86.75231
ORBITAL OBJECT PROPAGATION	screened	Starlink
SPACE-TRACK SATCAT METADATA	screened	30 NORAD IDs checked; 30 matched in local SATCAT subset
LAUNCH-OBJECT/SUPGP LAYER	not applicable	not a launch-object case
NASA/JPL KNOWN SMALL-BODY LAYER	not selected	CAD/Horizons secondary screen included when this case had NEO-relevant timing/ geometry
NASA POWER/HORIZONS/DONKI CONTEXT	not exhausted	Hourly weather, sky geometry, and space-weather context where local JSON is present
AIRCRAFT/ADS-B LAYER	not exhausted	ADSB.lol historical release pattern is recorded separately; actual aircraft exhaustion requires targeted trace extraction
NOAA GOES IMAGERY LAYER	not exhausted	Cloud/lightning imagery layer for the report hour
NOAA GOES ABI/GLM MANIFEST	screened	Public S3 object listing for the report hour
NOAA/NEXRAD WEATHER RADAR LAYER	not exhausted	Weather radar only; not ATC/primary radar
NOAA IGRA RADIOSONDE LAYER	screened	Balloon drift plausibility layer
ASOS/METAR SURFACE WEATHER	screened	Nearest station visibility, cloud, wind, precipitation, and METAR observations
WEATHER/BALLOON SOURCE PLAN	planned	Nearest weather-airport, GOES, and radiosonde queries are listed where local plan JSON is present
FINAL ANALYTIC DISPOSITION	normal-object favored	Presence-only satellite density is context only; a stronger case-specific fit is required for normal-object disposition

## References and Source Links

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2. National Archives and Records Administration. *Record Group 615: Unidentified Anomalous Phenomena Records Collection*. <https://www.archives.gov/research/topics/uaps/rg-615>
3. National Archives and Records Administration. *Bulk Downloads for Records Related to Unidentified Anomalous Phenomena (UAPs)*. <https://www.archives.gov/research/catalog/catalog-bulk-downloads/uap-bulk-download>
4. National Archives Catalog. *Records from the Federal Aviation Administration Relating to Unidentified Anomalous Phenomena, National Archives Identifier 493468575*. <https://catalog.archives.gov/id/493468575>
5. National Archives direct digital object. *237UAP00539.pdf, FAA UAP report record copied from RG 615 bulk digital objects*. <https://s3.dualstack.us-east-1.amazonaws.com/NARAprodstorage/lz/electronic-records/rg-615/493468575/237UAP00539.pdf>
6. Hugging Face dataset. *oxzoid/space-track-tle-history: historical TLE archive used for Starlink screening*. <https://huggingface.co/datasets/oxzoid/space-track-tle-history>
7. Space-Track.org. *Public source for the underlying U.S. Space Surveillance Network TLE distribution referenced by the historical TLE archive*. <https://www.space-track.org/>
8. Space-Track.org. *API documentation for SATCAT and catalog metadata classes used for local enrichment*. <https://www.space-track.org/documentation#/api>
9. ADSB.lol. *Interactive API documentation and OpenAPI definition*. <https://api.adsb.lol/docs>
10. ADSB.lol. *Historical open-data release documentation*. <https://www.adsb.lol/docs/open-data/historical/>
11. OpenSky Network. *REST API documentation*. <https://openskynetwork.github.io/opensky-api/rest.html>
12. OpenSky Network. *Historical data via Trino documentation*. <https://openskynetwork.github.io/opensky-api/trino.html>
13. NASA GIBS. *Global Imagery Browse Services API documentation*. <https://nasa-gibs.github.io/gibs-api-docs/>
14. NASA Earthdata. *Common Metadata Repository search API documentation*. <https://cmr.earthdata.nasa.gov/search/site/docs/search/api.html>
15. NOAA / AWS Open Data. *GOES public dataset registry*. <https://registry.opendata.aws/noaa-goes/>
16. NOAA / AWS Open Data. *NEXRAD public dataset registry*. <https://registry.opendata.aws/noaa-nexrad/>
17. NOAA NCEI. *Integrated Global Radiosonde Archive*. <https://www.ncei.noaa.gov/products/weather-balloon/integrated-global-radiosonde-archive>
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19. Celestrak. *Spacetrack Report No. 3: Models for propagation of NORAD element sets*. <https://celestrak.org/NORAD/documentation/spacetrk.pdf>
20. Celestrak. *Supplemental GP element sets documentation and current endpoint index*. <https://celestrak.org/NORAD/elements/supplemental/>