

CASE FILE 68 / 237UAP00385

237UAP00385

Radar/correlation-focused public UAP report; score 52

NORMAL-OBJECT FAVORED

REPORT NO.	UAP-OM-68-237UAP00385	DISPOSITION	NORMAL-OBJECT FAVORED
PRIMARY CASE	237UAP00385	GENERATED	2026-05-20 18:32 UTC
REPORT TIME	2024-10-22T01:54:00+00:00	OBSERVER	38.85440, -78.20560
SOURCE CASE IDS	237UAP00385		

Abstract

This case file evaluates a reported UAP sighting against historical Starlink orbital elements. The primary external-object candidate is a 3-object same-launch group from 2021-04-07, spanning azimuth 334.96-356.89 deg and elevation 10.64-18.83 deg. The analysis distinguishes plausible geometric overlap from unresolved witness-language features.

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

237UAP00385 is assessed as normal-object favored because the available public evidence gives a case-specific ordinary-object candidate: strong ADS-B aircraft candidate N957NK A20N ad4fde at 0.5 km, azimuth 57.6 deg, elevation 86.57 deg, 6.87 min from report. Dense satellite presence alone is not treated as causation in this packet.

1.1 Key Findings

- Source score 52 based on: radar/primary-return language, high-altitude report, UAP/UFO language.
- Report time used: 2024-10-22T01:54:00+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.
- Case-specific ordinary-object evidence: strong ADS-B aircraft candidate N957NK A20N ad4fde at 0.5 km, azimuth 57.6 deg, elevation 86.57 deg, 6.87 min from report.
- Non-causal context / rejection screens: very dense orbital-object sky background; context only, not causation; NASA/JPL known-small-body rejection screen present.
- Objects above horizon: 325; at/above 10 deg: 149.
- Top compact same-launch/designator group: 3 objects from 2021-04-07.
- 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

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
237UAP00385	01:54 10/22/2024 Callsign: EDV4925 Origin: LGA	ZDC Operator: EDV Operator Type: Commercial	text extract present	237UAP00385.pdf

3. Original Report Evidence

PRIMARY EXCERPT USED FOR MATCHING	Aircraft reported an unidentified aerial phenomenon off the left side while SW bound at FL360, over LDN. The unknown phenomenon was bright white and yellow flashing lights, stationary at approximately FL500 to FL600. The UAP was not observed on ATC facility radar system.
REPORT TIME USED	2024-10-22T01:54:00+00:00
OBSERVER COORDINATE USED	38.85440, -78.20560
OBSERVER SOURCE BASIS	aviation_fix:over LDN (public text extract 237UAP00385)

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	6473	HISTORICAL ELEMENT ROWS	6452
ABOVE HORIZON AT REPORT MINUTE	325	AT/ABOVE 10 DEG	149
LARGEST SAME-SKY CLUSTER	120		

5.2 Same-Launch / Same-Designator Candidate Groups

#	LAUNCH DATE	COUNT	AZIMUTH SPAN	ELEVATION SPAN	MOTION LABELS	MEMBERS
1	2021-04-07	3	334.96-356.89 deg	10.64-18.83 deg	eastward, setting	STARLINK-2478, STARLINK-2476, STARLINK-2485

5.3 Primary Group Members

OBJECT	NORAD	LAUNCH	AZ	EL	RANGE KM	APPARENT MOTION	ELEMENT AGE H
STARLINK-2478	48135	2021-04-07	334.96	18.83	1344.07	eastward, setting	4.47
STARLINK-2476	48134	2021-04-07	356.89	15.06	1519.37	eastward, setting	2.85
STARLINK-2485	48142	2021-04-07	347.45	10.64	1778.94	eastward, setting	2.8

5.4 Bright-Sky Context: Top Starlink Objects by Elevation

OBJECT	AZ	EL	RANGE KM	APPARENT MOTION	LAUNCH DATE
STARLINK-30579	322.1	84.73	563.52	eastward, setting	2023-10-13
STARLINK-1559	251.15	83.19	553.24	westward, setting	2020-08-07
STARLINK-11240 [DTC]	267.9	81.43	366.15	eastward, setting	2024-08-31
STARLINK-2147	264.9	70.13	581.51	eastward, setting	2021-03-04
STARLINK-4253	204.21	69.15	576.73	westward, setting	2022-07-07
STARLINK-30525	92.61	62.63	625.97	westward, setting	2023-10-05
STARLINK-3807	306.04	62.42	605.73	eastward, setting	2022-04-29
STARLINK-31286	312.84	55.05	589.65	eastward, setting	2024-02-29
STARLINK-30399	1.65	51.5	598.51	eastward, setting	2023-09-25
STARLINK-5902	40.28	49.53	719.37	eastward, setting	2023-03-24
STARLINK-5952	234.88	48.75	725.51	westward, rising	2023-06-12
STARLINK-5698	195.24	47.09	741.3	westward, setting	2023-02-12

5.5 Largest Sky Clusters

#	COUNT	AZIMUTH SPAN	ELEVATION SPAN	MOTION LABELS
1	120	0.86-359.65 deg	10.09-42.12 deg	eastward, rising, eastward, setting, westward, rising, westward, setting
2	7	306.04-340.47 deg	38.75-62.42 deg	eastward, rising, eastward, setting
3	6	195.37-215.02 deg	14.65-33.05 deg	

#	COUNT	AZIMUTH SPAN	ELEVATION SPAN	MOTION LABELS
				westward, rising, westward, setting
4	4	251.15-322.1 deg	70.13-84.73 deg	eastward, setting, westward, setting
5	4	213.07-234.88 deg	33.78-48.75 deg	westward, rising

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.

PACKET SATCAT SUBSET ROWS	5370	FETCHED	2026-05-19T01:19:50+00:00
THIS CASE NORAD IDS CHECKED	33	SATCAT ROWS MATCHED	33
TOP OWNERS	US: 33		
OBJECT TYPES	PAYLOAD: 33		

5.7 Space-Track Metadata for Top Propagated Objects

NORAD	OBJECT NAME	TYPE	OWNER	LAUNCH DATE	DECAY DATE
58061	STARLINK-30579	PAYLOAD	US	2023-10-13	n/a
46077	STARLINK-1559	PAYLOAD	US	2020-08-07	n/a
60929	STARLINK-11240	PAYLOAD	US	2024-08-31	n/a
47736	STARLINK-2147	PAYLOAD	US	2021-03-04	n/a
53004	STARLINK-4253	PAYLOAD	US	2022-07-07	n/a
58012	STARLINK-30525	PAYLOAD	US	2023-10-05	n/a
52353	STARLINK-3807	PAYLOAD	US	2022-04-29	n/a
59082	STARLINK-31286	PAYLOAD	US	2024-02-29	n/a
57951	STARLINK-30399	PAYLOAD	US	2023-09-25	n/a
55998	STARLINK-5902	PAYLOAD	US	2023-03-24	n/a
56923	STARLINK-5952	PAYLOAD	US	2023-06-12	n/a
55623	STARLINK-5698	PAYLOAD	US	2023-02-12	n/a

5.6 NASA/JPL Near-Earth Object Screen

This secondary object screen checks NASA/JPL close-approach objects near the report date and propagates their observer geometry through Horizons at the report coordinate. It is a known-object rejection layer, not a generic astronomy backdrop.

NASA/JPL CAD WINDOW	event date +/- 1 day, dist-max 0.2 au	COORDINATE USED	38.85, -78.21
CLOSE-APPROACH OBJECTS	32	ABOVE HORIZON	25
BRIGHT-ISH ABOVE HORIZON	0 using apparent magnitude <= 10 screen		

5.7 NASA/JPL Objects Above Horizon

OBJECT	CLOSE APPROACH UTC	DIST AU	H	AZ	EL	APP MAG
450649	2024-Oct-22 15:11	0.0566728008298125	19.42	97.76	23.47	14.29
2024 UR	2024-Oct-22 03:18	0.0140980117925903	24.34	76.13	14.31	16.68
2024 US	2024-Oct-22 01:07	0.0024230720721463	27.96	168.34	1.77	17.15
2024 UG	2024-Oct-21 02:02	0.00700017176841631	26.92	126.69	52.69	17.49

OBJECT	CLOSE APPROACH UTC	DIST AU	H	AZ	EL	APP MAG
2024 UD1	2024-Oct-21 21:20	0.0027961973455394	29.39	126.89	68.62	17.95
2024 UL	2024-Oct-22 07:10	0.0852326875554867	23.27	118.98	15.62	19.20
2024 UK4	2024-Oct-21 00:29	0.0029278874222988 4	28.37	85.18	10.58	19.51
2024 US2	2024-Oct-21 04:21	0.0288021698176101	25.24	224.92	80.34	19.52
2024 UL4	2024-Oct-22 11:30	0.130111386494621	22.47	183.26	41.31	19.98
2024 SE4	2024-Oct-22 17:16	0.0177096946043223	27.68	97.92	7.76	20.38

5.8 NASA/JPL Bright-Candidate Result

OBJECT	AZ	EL	APP MAG
No above-horizon close-approach object met the apparent magnitude <= 10 screen.			

- NASA/JPL CAD listed 32 near-Earth close approaches in the event-date +/-1 day window within 0.2 au.
- Horizons placed 25 of those objects above the local horizon at the report coordinate/time.
- None of the above-horizon close-approach objects were remotely bright enough for naked-eye explanation using the mag<=10 screen.

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
ADSB.LOL HISTORICAL RELEASE LISTING	screened/present	planes-readsb-staging-0 2418.0 MiB; planes-readsb-prod-0 2419.0 MiB; planes-readsb-mlatonly-0 69.0 MiB
ADSB TRACKS DOWNLOADED	not yet exhausted	Requires targeted extraction from large daily history archives before claiming aircraft exhaustion.
NOAA GOES IMAGERY	not yet exhausted	Needed for cloud/lightning visual context.
NOAA GOES ABI/GLM MANIFEST	screened/present	Public S3 object availability for the report hour.
NOAA NEXRAD WEATHER RADAR	not yet exhausted	Weather radar only; not ATC radar.
NOAA IGRA RADIOSONDE	screened/present	Needed for balloon drift plausibility.
ASOS/METAR WEATHER OBSERVATIONS	screened/present	Nearest station surface observations around report time.

- ADSB.lol historical: extract aircraft traces from adsblol/globe_history_2024 for 2024-10-22, then filter +/-60 min and 250 nmi around 38.8544,-78.2056.
- NASA POWER/Horizons/DONKI: batch context for 237UAP00385 at 2024-10-22T01:54:00+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	https://noaa-goes16.s3.amazonaws.com/ABI-L2-CMIPF/2024/296/01/
GOES GLM LIGHTNING PREFIX	https://noaa-goes16.s3.amazonaws.com/GLM-L2-LCFA/2024/296/01/

5.13 Nearest Weather-Airport Candidates

STATION	NAME	DISTANCE KM	COORDINATE
KHEF	Manassas Regional Airport/Harry P. Davis Field	61.60	38.72, -77.52
KMRB	Eastern WV Regional Airport/Shepherd Field	63.80	39.40, -77.98
KIAD	Washington Dulles International Airport	65.70	38.94, -77.46
KCHO	Charlottesville Albemarle Airport	82.50	38.14, -78.45
KNYG	Quantico Marine Corps Airfield / Turner Field	87.40	38.50, -77.31

- KHEF: [IEM ASOS/METAR daily CSV query](#)
- KMRB: [IEM ASOS/METAR daily CSV query](#)
- KIAD: [IEM ASOS/METAR daily CSV query](#)

5.14 Nearest Radiosonde Stations

STATION	NAME	DISTANCE KM	COORDINATE
USM00072403	STERLING; VA.	63.70	38.98, -77.49
USM00072520	PITTSBURGH; PA.	253.80	40.53, -80.22
USM00072402	WALLOPS ISLAND; VA.	258.40	37.93, -75.48
USM00072318	BLACKSBURG; VA.	266.60	37.20, -80.41
USM00072317	GREENSBORO/G.-HIGH PT.; NC.	342.70	36.10, -79.94

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
KHEF	61.60	2024-10-22T01:56:00 +00:00	10.00	CLR, M, M, M	0.00 / 0.00	KHEF 220156Z 00000KT 10SM CLR 09/08 A3026 RMK AO2 SLP252 T00940078
KMRB	63.80	2024-10-22T01:53:00 +00:00	10.00	CLR, M, M, M	0.00 / 0.00	KMRB 220153Z 00000KT 10SM CLR 13/08 A3024 RMK AO2 SLP241 T01280078
KIAD	65.70	2024-10-22T01:52:00 +00:00	10.00	CLR, M, M, M	0.00 / 0.00	KIAD 220152Z 00000KT 10SM CLR 12/06 A3025 RMK AO2 SLP242 T01170061

5.16 NOAA IGRA Radiosonde Wind Profile

Nearest sounding implies mean 0-12 km wind drift toward 328.0 deg at 8.58 m/s; a passive balloon could drift about 61.8 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
USM00072403	STERLING; VA.	63.70		328.00	8.58	61.80	

STATION	NAME	DISTANCE KM	SOUNDING UTC	MEAN DRIFT BEARING	MEAN SPEED M/S	2H DRIFT KM	MAX WIND
			2024-10-22T00:00:00+00:00				35.50 at 2867.00 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/2024/296/01/OR_ABI-L2-CMIPF-M6C01_G16_s20242960100206_e20242960109514_c20242960109581.nc](#)
- [ABI-L2-CMIPF/2024/296/01/OR_ABI-L2-CMIPF-M6C01_G16_s20242960110206_e20242960119514_c20242960119575.nc](#)
- [ABI-L2-CMIPF/2024/296/01/OR_ABI-L2-CMIPF-M6C01_G16_s20242960120206_e20242960129514_c20242960129571.nc](#)
- [ABI-L2-CMIPF/2024/296/01/OR_ABI-L2-CMIPF-M6C01_G16_s20242960130206_e20242960139514_c20242960139580.nc](#)

GLM lightning sample objects:

- [GLM-L2-LCFA/2024/296/01/OR_GLM-L2-LCFA_G16_s20242960100000_e20242960100200_c20242960100218.nc](#)
- [GLM-L2-LCFA/2024/296/01/OR_GLM-L2-LCFA_G16_s20242960100200_e20242960100400_c20242960100421.nc](#)
- [GLM-L2-LCFA/2024/296/01/OR_GLM-L2-LCFA_G16_s20242960100400_e20242960101000_c20242960101022.nc](#)
- [GLM-L2-LCFA/2024/296/01/OR_GLM-L2-LCFA_G16_s20242960101000_e20242960101200_c20242960101220.nc](#)

5.18 ADSB.lol Historical Aircraft Track Extraction

This layer uses the downloaded ADSB.lol daily history archive to test actual aircraft tracks near the report coordinate and minute. It is not treated as a primary-radar substitute; it is a transponder/receiver-derived aircraft screen.

ARCHIVE WINDOW	2024-10-22T00:39:00+00:00 to 2024-10-22T03:09:00+00:00	RADIUS	300.00 nmi
TRACE FILES SCANNED	30869	TRACKS RETAINED	1200
SUPPORT STATUS	aircraft strong candidate present	BEST-CANDIDATE NOTE	ordinary-object favored if the report's count, color, direction, and motion can be reconciled with the candidate track(s).
STRONG CANDIDATES	33	PLAUSIBLE CANDIDATES	127
REPORTING-AIRCRAFT TRACKS EXCLUDED	4	WEAK CANDIDATES	147

5.19 Top ADS-B Candidate Tracks

AIRCRAFT	STATUS	SCORE	MIN DIST KM	NEAREST DT MIN	ALT FT	AZ	EL
N957NK A20N ad4fde	strong aircraft candidate	79.85	0.50	0.06	15425	57.60	86.57
N73RP GLF5 a9ca37	strong aircraft candidate	79.69	14.30	0.05	8325	180.80	10.04
N102HQ E75L a00ce0	strong aircraft candidate	74.21	61.20	0.07	30000	115.60	7.71
N589NN CRJ9 a79890	strong aircraft candidate	72.75	47.50	0.10	30275	5.60	10.91
N112HQ E75L a0345f	strong aircraft candidate	71.22	27.30	0.00	11325	102.00	4.92
N417YX E75L a4f05d	strong aircraft candidate	71.03	28.60	0.01	19000	353.10	9.07

AIRCRAFT	STATUS	SCORE	MIN DIST KM	NEAREST DT MIN	ALT FT	AZ	EL
N537AS B738 a6ca7f	strong aircraft candidate	67.65	28.60	0.02	9175	52.60	6.18
N706LU C172 a96be5	strong aircraft candidate	66.87	49.80	0.05	6175	151.30	1.74

7. Analytic Comparison

CRITERION	REPORT EVIDENCE	ANALYTIC TREATMENT
TIME CONSTRAINT	2024-10-22T01:54:00+00:00	Directly used in propagation; this is a hard filter, not descriptive context.
LOCATION CONSTRAINT	38.85440, -78.20560	Directly used as observer point for azimuth/elevation/range computation.
COUNT / PATTERN	not explicit	Primary same-launch group contains 3 propagated objects in a compact sky sector.
MOTION LANGUAGE	stationary	Apparent motion labels in the object table provide a plausible but not definitive comparison.
RADAR / OFFICIAL CHECK	not observed on ATC radar	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	237UAP00385 is assessed as normal-object favored because the available public evidence gives a case-specific ordinary-object candidate: strong ADS-B aircraft candidate N957NK A20N ad4fde at 0.5 km, azimuth 57.6 deg, elevation 86.57 deg, 6.87 min from report. 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.

Appendix A. Public Report Text Extracts

237UAP00385

SKYWATCH INCIDENT REPORT

PRIMARY CODE: UNIDENTIFIED AERIAL PHENOMENON

Date: 01:54 10/22/2024

Status: Closed

POD: DEN

Reporting Facility: ZDC

Callsign: EDV4925

Aircraft: CRJ9

Tail Number:

Operator: EDV

Origin: LGA

Destination: CHA

New Destination:

Operator Type: Commercial

Paged: YES

REMARKS

Aircraft reported an unidentified aerial phenomenon off the left side while SW bound at FL360, over LDN. The unknown phenomenon was bright white and yellow flashing lights, stationary at approximately FL500 to FL600. The UAP was not observed on ATC facility radar system.

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.

```
{
  "report_time_utc": "2024-10-22T01:54:00+00:00",
  "source_excerpt": "Aircraft reported an unidentified aerial phenomenon off the left side while SW bound at FL360, over LDN.
The unknown phenomenon was bright white and yellow flashing lights, stationary at approximately FL500 to FL600. The UAP was not
observed on ATC facility radar system.",
  "historical_starlink_element_rows": 6452,
  "observer": {
    "lat": 38.854400634765625,
    "lon": -78.20559692382812,
    "source": "aviation_fix:over LDN (public text extract 237UAP00385)"
  },
  "case_id": "237UAP00385",
  "starlink_above_horizon_at_report_time": 325,
  "starlink_catalog_ids_considered": 6473,
  "largest_same-sky_cluster_count": 120,
  "starlink_at_or_above_10_deg": 149,
  "same_launch_sky_groups": [
    {
      "azimuth_range_deg": [
        334.96,
        356.89
      ],
      "count": 3,
      "elevation_range_deg": [
        10.64,
        18.83
      ],
      "ground_track_labels": [
        "E",
        "ENE"
      ],
      "launch_date": "2021-04-07",
      "members": [
        {
          "azimuth_deg": 334.96,
          "azimuth_plus_2m_deg": 10.59,
          "azimuth_plus_5m_deg": 38.4,
          "element_age_hours": 4.47,
          "element_epoch": "2024-10-22T06:22:24.458304+00:00",
          "elevation_deg": 18.83,
          "elevation_plus_2m_deg": 14.57,
          "elevation_plus_5m_deg": 2.96,
          "epoch_altitude_km": 553.36,
          "ground_track_bearing_deg": 63.38,
          "ground_track_label": "ENE",
          "launch_date": "2021-04-07",
          "name": "STARLINK-2478",
          "norad_id": "48135",
          "range_km": 1344.07,
          "sky_motion_label": "eastward, setting",
          "subpoint_lat": 48.2794,
          "subpoint_lon": -84.8986
        },
        {
          "azimuth_deg": 356.89,
          "azimuth_plus_2m_deg": 23.86,
          "azimuth_plus_5m_deg": 44.89,
          "element_age_hours": 2.85,
          "element_epoch": "2024-10-22T04:44:52.067904+00:00",
          "elevation_deg": 15.06,
          "elevation_plus_2m_deg": 9.03,
          "elevation_plus_5m_deg": -0.91,
          "epoch_altitude_km": 553.24,
          "ground_track_bearing_deg": 72.06,
          "ground_track_label": "ENE",
          "launch_date": "2021-04-07",
          "name": "STARLINK-2476",
          "norad_id": "48134",
          "range_km": 1519.37,
          "sky_motion_label": "eastward, setting",
          "subpoint_lat": 51.0737,
          "subpoint_lon": -79.2517
        },
        {
          "azimuth_deg": 347.45,
          "azimuth_plus_2m_deg": 16.07,
          "azimuth_plus_5m_deg": 47.19,
          "element_age_hours": 2.8,
          "element_epoch": "2024-10-22T04:42:14.347296+00:00",
          "elevation_deg": 10.64,
```

```

        "elevation_plus_2m_deg": 10.12,
        "elevation_plus_5m_deg": 2.6,
        "epoch_altitude_km": 553.41,
        "ground_track_bearing_deg": 85.13,
        "ground_track_label": "E",
        "launch_date": "2021-04-07",
        "name": "STARLINK-2485",
        "norad_id": "48142",
        "range_km": 1778.94,
        "sky_motion_label": "eastward, setting",
        "subpoint_lat": 53.0365,
        "subpoint_lon": -83.4257
    }
],
    "motion_labels": [
        "eastward, setting"
    ]
}
],
"top_starlinks": [
    {
        "azimuth_deg": 322.1,
        "azimuth_plus_2m_deg": 109.42,
        "azimuth_plus_5m_deg": 111.02,
        "element_age_hours": 2.69,
        "element_epoch": "2024-10-22T04:35:32.972640+00:00",
        "elevation_deg": 84.73,
        "elevation_plus_2m_deg": 31.97,
        "elevation_plus_5m_deg": 6.5,
        "epoch_altitude_km": 565.31,
        "ground_track_bearing_deg": 111.13,
        "ground_track_label": "ESE",
        "launch_date": "2023-10-13",
        "name": "STARLINK-30579",
        "norad_id": "58061",
        "range_km": 563.52,
        "sky_motion_label": "eastward, setting",
        "subpoint_lat": 39.1917,
        "subpoint_lon": -78.5437
    },
    {
        "azimuth_deg": 251.15,
        "azimuth_plus_2m_deg": 136.4,
        "azimuth_plus_5m_deg": 134.41,
        "element_age_hours": 1.02,
        "element_epoch": "2024-10-22T02:55:24.261312+00:00",
        "elevation_deg": 83.19,
        "elevation_plus_2m_deg": 30.51,
        "elevation_plus_5m_deg": 5.75,
        "epoch_altitude_km": 552.98,
        "ground_track_bearing_deg": 132.22,
        "ground_track_label": "SE",
        "launch_date": "2020-08-07",
        "name": "STARLINK-1559",
        "norad_id": "46077",
        "range_km": 553.24,
        "sky_motion_label": "westward, setting",
        "subpoint_lat": 38.6768,
        "subpoint_lon": -78.8626
    },
    {
        "azimuth_deg": 267.9,
        "azimuth_plus_2m_deg": 46.66,
        "azimuth_plus_5m_deg": 48.64,
        "element_age_hours": 1.75,
        "element_epoch": "2024-10-22T00:09:15.374016+00:00",
        "elevation_deg": 81.43,
        "elevation_plus_2m_deg": 20.16,
        "elevation_plus_5m_deg": 0.41,
        "epoch_altitude_km": 366.05,
        "ground_track_bearing_deg": 48.49,
        "ground_track_label": "NE",
        "launch_date": "2024-08-31",
        "name": "STARLINK-11240 [DTC]",
        "norad_id": "60929",
        "range_km": 366.15,
        "sky_motion_label": "eastward, setting",
        "subpoint_lat": 38.8358,
        "subpoint_lon": -78.7998
    },
    {
        "azimuth_deg": 264.9,
        "azimuth_plus_2m_deg": 40.84,
        "azimuth_plus_5m_deg": 47.31,
        "element_age_hours": 2.96,
        "element_epoch": "2024-10-22T04:51:30.293280+00:00",
        "elevation_deg": 70.13,
        "elevation_plus_2m_deg": 35.44,

```

```
"elevation_plus_5m_deg": 7.34,  
"epoch_altitude_km": 553.52,  
"ground_track_bearing_deg": 48.44,  
"ground_track_label": "NE",  
"launch_date": "2021-03-04",  
"name": "STARLINK-2147",  
"norad_id": "47736",  
"range_km": 581.51,  
"sky_motion_label": "eastward, setting",  
"subpoint_lat": 38.6899,  
"subpoint_lon": -80.2899  
},  
{  
  "azimuth_deg": 204.21,  
  "azimuth_plus_2m_deg": 145.69,  
  "azimuth_plus_5m_deg": 139.32,  
  "element_age_hours": 1.01,  
  "element_epoch": "2024-10-22T02:54:42.186240+00:00",  
  "elevation_deg": 69.15,  
  "elevation_plus_2m_deg": 26.21,  
  "elevation_plus_5m_deg": 4.37,  
  "epoch_altitude_km": 545.9,  
  "ground_track_bearing_deg": 133.81,  
  "ground_track_label": "SE",  
  "launch_date": "2022-07-07",  
  "name": "STARLINK-4253",  
  "norad_id": "53004",  
  "range_km": 576.73,  
  "sky_motion_label": "westward, setting",  
  "subpoint_lat": 37.2964,  
  "subpoint_lon": -79.081  
},  
{  
  "azimuth_deg": 92.61,  
  "azimuth_plus_2m_deg": 72.93,  
  "azimuth_plus_5m_deg": 69.89,  
  "element_age_hours": 9.28,  
  "element_epoch": "2024-10-22T11:10:49.099584+00:00",  
  "elevation_deg": 62.63,  
  "elevation_plus_2m_deg": 22.66,  
  "elevation_plus_5m_deg": 3.43,  
  "epoch_altitude_km": 565.21,  
  "ground_track_bearing_deg": 68.39,  
  "ground_track_label": "ENE",  
  "launch_date": "2023-10-05",  
  "name": "STARLINK-30525",  
  "norad_id": "58012",  
  "range_km": 625.97,  
  "sky_motion_label": "westward, setting",  
  "subpoint_lat": 38.7065,  
  "subpoint_lon": -75.1668  
},  
{  
  "azimuth_deg": 306.04,  
  "azimuth_plus_2m_deg": 32.9,  
  "azimuth_plus_5m_deg": 44.96,  
  "element_age_hours": 2.94,  
  "element_epoch": "2024-10-22T04:50:37.572864+00:00",  
  "elevation_deg": 62.42,  
  "elevation_plus_2m_deg": 30.25,  
  "elevation_plus_5m_deg": 5.99,  
  "epoch_altitude_km": 545.8,  
  "ground_track_bearing_deg": 49.8,  
  "ground_track_label": "NE",  
  "launch_date": "2022-04-29",  
  "name": "STARLINK-3807",  
  "norad_id": "52353",  
  "range_km": 605.73,  
  "sky_motion_label": "eastward, setting",  
  "subpoint_lat": 40.1986,  
  "subpoint_lon": -80.6611  
},  
{  
  "azimuth_deg": 312.84,  
  "azimuth_plus_2m_deg": 53.3,  
  "azimuth_plus_5m_deg": 68.34,  
  "element_age_hours": 3.46,  
  "element_epoch": "2024-10-21T22:26:30.086016+00:00",  
  "elevation_deg": 55.05,  
  "elevation_plus_2m_deg": 31.31,  
  "elevation_plus_5m_deg": 5.76,  
  "epoch_altitude_km": 494.27,  
  "ground_track_bearing_deg": 73.84,  
  "ground_track_label": "ENE",  
  "launch_date": "2024-02-29",  
  "name": "STARLINK-31286",  
  "norad_id": "59082",  
  "range_km": 589.65,
```

```
"sky_motion_label": "eastward, setting",
"subpoint_lat": 40.7441,
"subpoint_lon": -80.93
},
{
  "azimuth_deg": 1.65,
  "azimuth_plus_2m_deg": 104.1,
  "azimuth_plus_5m_deg": 120.6,
  "element_age_hours": 2.6,
  "element_epoch": "2024-10-22T04:29:51.568224+00:00",
  "elevation_deg": 51.5,
  "elevation_plus_2m_deg": 31.4,
  "elevation_plus_5m_deg": 5.43,
  "epoch_altitude_km": 481.66,
  "ground_track_bearing_deg": 128.6,
  "ground_track_label": "SE",
  "launch_date": "2023-09-25",
  "nam
```

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: 237UAP00385
TIME AND OBSERVER COORDINATE	extracted	2024-10-22T01:54:00+00:00 at 38.85440, -78.20560
ORBITAL OBJECT PROPAGATION	screened	Starlink
SPACE-TRACK SATCAT METADATA	screened	33 NORAD IDs checked; 33 matched in local SATCAT subset
LAUNCH-OBJECT/SUPGP LAYER	not applicable	not a launch-object case
NASA/JPL KNOWN SMALL-BODY LAYER	screened	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	screened	30869 trace files scanned; 1200 tracks retained; aircraft strong candidate present
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

1. National Archives and Records Administration. *Records Related to Unidentified Flying Objects (UFOs) and Unidentified Anomalous Phenomena (UAPs) at the National Archives*. <https://www.archives.gov/research/topics/uaps>
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. *237UAP00385.pdf, FAA UAP report record copied from RG 615 bulk digital objects*. <https://s3.dualstack.us-east-1.amazonaws.com/NARAprdstorage/lz/electronic-records/rg-615/493468575/237UAP00385.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. NASA/JPL Solar System Dynamics. *Close-Approach Data API documentation for known small-body encounter screening*. <https://ssd-api.jpl.nasa.gov/doc/cad.html>
10. NASA/JPL Solar System Dynamics. *Horizons API documentation for observer geometry and apparent magnitude queries*. <https://ssd-api.jpl.nasa.gov/doc/horizons.html>
11. ADSB.lol. *Interactive API documentation and OpenAPI definition*. <https://api.adsb.lol/docs>
12. ADSB.lol. *Historical open-data release documentation*. <https://www.adsb.lol/docs/open-data/historical/>
13. OpenSky Network. *REST API documentation*. <https://openskynetwork.github.io/opensky-api/rest.html>
14. OpenSky Network. *Historical data via Trino documentation*. <https://openskynetwork.github.io/opensky-api/trino.html>
15. NASA GIBS. *Global Imagery Browse Services API documentation*. <https://nasa-gibs.github.io/gibs-api-docs/>
16. NASA Earthdata. *Common Metadata Repository search API documentation*. <https://cmr.earthdata.nasa.gov/search/site/docs/search/api.html>
17. NOAA / AWS Open Data. *GOES public dataset registry*. <https://registry.opendata.aws/noaa-goes/>
18. NOAA / AWS Open Data. *NEXRAD public dataset registry*. <https://registry.opendata.aws/noaa-nexrad/>
19. NOAA NCEI. *Integrated Global Radiosonde Archive*. <https://www.ncei.noaa.gov/products/weather-balloon/integrated-global-radiosonde-archive>
20. Iowa Environmental Mesonet. *ASOS/AWOS/METAR data download service*. <https://mesonet.agron.iastate.edu/request/download.phtml>
21. Celestrak. *Spacetrack Report No. 3: Models for propagation of NORAD element sets*. <https://celestrak.org/NORAD/documentation/spacetrk.pdf>
22. Celestrak. *Supplemental GP element sets documentation and current endpoint index*. <https://celestrak.org/NORAD/elements/supplemental/>