

CASE FILE 28 / 237UAP00591

237UAP00591

Radar/correlation-focused public UAP report; score 66

NORMAL-OBJECT FAVORED

REPORT NO.	UAP-OM-28-237UAP00591	DISPOSITION	NORMAL-OBJECT FAVORED
PRIMARY CASE	237UAP00591	GENERATED	2026-05-20 18:32 UTC
REPORT TIME	2023-12-27T10:35:00+00:00	OBSERVER	39.42476, -97.62140
SOURCE CASE IDS	237UAP00591		

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 2021-02-16, spanning azimuth 3.08-353.1 deg and elevation 11.12-13.84 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

237UAP00591 is assessed as normal-object favored because the available public evidence gives a case-specific ordinary-object candidate: strong ADS-B aircraft candidate N777UA B772 aa84cb at 40.1 km, azimuth 146.6 deg, elevation 14.72 deg, 2.87 min from report. Dense satellite presence alone is not treated as causation in this packet.

1.1 Key Findings

- Source score 66 based on: radar/primary-return language, high-altitude report, maneuvering/motion anomaly, UAP/UFO language.
- Report time used: 2023-12-27T10:35:00+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 N777UA B772 aa84cb at 40.1 km, azimuth 146.6 deg, elevation 14.72 deg, 2.87 min from report.
- Non-causal context / rejection screens: substantial orbital-object sky background; context only, not causation.
- Remaining hard features: multiple witnesses/facilities; hard maneuver language.
- Objects above horizon: 281; at/above 10 deg: 137.
- Top compact same-launch/designator group: 3 objects from 2021-02-16.
- 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
237UAP00591	12/27/2023 4:35:00 AM (-06 CST)	SALINA, KS UFO-UAP ACTIVITY 12-27-2023	text extract present	237UAP00591.pdf

3. Original Report Evidence

PRIMARY EXCERPT USED FOR MATCHING	Washington Operations Center Date: 12/27/2023 4:35:00 AM (-06 CST) Title: SALINA, KS UFO-UAP ACTIVITY 12-27-2023 Latitude: 39.225508519999998 Longitude: -97.652222219999999 DESCRIPTION PRELIM INFO FROM FAA OPS: SALINA, KS/UFO-UAP ACTIVITY/ 0435C/KANSAS CITY ARTCC ADVISED MULTIPLE ACFT (SPIRIT 2804 AND AMERICAN 2014) REPORTING TWO WHITE LIGHTS CIRCLING EACH OTHER, COMING CLOSE TOGETHER, AND THEN MOVE AWAY FROM EACH OTHER. ACFT WERE OPERATING AT FL410 AND FL350. THE UAP WERE E OF THE ACFT 30 N SLN. UAP NOT OBSERVED BY ATC RADAR SYSTEMS. WOC 7-3333 DJ/RL
REPORT TIME USED	2023-12-27T10:35:00+00:00
OBSERVER COORDINATE USED	39.42476, -97.62140
OBSERVER SOURCE BASIS	aviation_offset:30 N SLN (public text extract 237UAP00591)

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	5247	HISTORICAL ELEMENT ROWS	5224
ABOVE HORIZON AT REPORT MINUTE	281	AT/ABOVE 10 DEG	137
LARGEST SAME-SKY CLUSTER	74		

5.2 Same-Launch / Same-Designator Candidate Groups

#	LAUNCH DATE	COUNT	AZIMUTH SPAN	ELEVATION SPAN	MOTION LABELS	MEMBERS
1	2021-02-16	3	3.08-353.1 deg	11.12-13.84 deg	eastward, rising, eastward, setting	STARLINK-2057, STARLINK-2038, STARLINK-2022

5.3 Primary Group Members

OBJECT	NORAD	LAUNCH	AZ	EL	RANGE KM	APPARENT MOTION	ELEMENT AGE H
STARLINK-2057	47666	2021-02-16	3.08	13.84	1584.73	eastward, setting	2.75
STARLINK-2038	47654	2021-02-16	353.1	13.26	1617.56	eastward, setting	1.23
STARLINK-2022	47643	2021-02-16	345.23	11.12	1747.66	eastward, rising	0.41

5.4 Bright-Sky Context: Top Starlink Objects by Elevation

OBJECT	AZ	EL	RANGE KM	APPARENT MOTION	LAUNCH DATE
STARLINK-5794	207.89	66.05	609.88	westward, setting	2023-03-24
STARLINK-3045	30.5	64.65	634.78	westward, setting	2021-09-14
STARLINK-30504	118.1	63.06	623.79	westward, setting	2023-09-30
STARLINK-30909	86.83	62.33	582.01	eastward, setting	2023-11-18
STARLINK-5243	36.42	60.36	616.57	eastward, setting	2022-10-28
STARLINK-5738	41.61	59.16	645.99	eastward, setting	2023-02-12
STARLINK-4532	60.05	59.03	624.45	westward, setting	2022-08-10
STARLINK-5610	14.59	50.67	708.91	eastward, setting	2023-07-07
STARLINK-3906	170.3	50.62	683.46	westward, setting	2022-05-13
STARLINK-5725	284.23	50.55	709.37	westward, rising	2023-02-12
STARLINK-1770	58.71	48.13	716.34	eastward, setting	2020-09-03
STARLINK-3548	125.86	44.24	746.7	eastward, setting	2022-03-03

5.5 Largest Sky Clusters

#	COUNT	AZIMUTH SPAN	ELEVATION SPAN	MOTION LABELS
1	74	0.35-359.5 deg	10.63-64.65 deg	eastward, level, eastward, rising, eastward, setting, nearly fixed azimuth, setting, westward, level, westward, setting
2	25	202.0-277.39 deg	10.84-41.05 deg	

#	COUNT	AZIMUTH SPAN	ELEVATION SPAN	MOTION LABELS
				eastward, rising, westward, rising, westward, setting
3	20	132.47-188.41 deg	10.11-50.62 deg	westward, rising, westward, setting
4	14	288.48-312.64 deg	10.54-40.48 deg	eastward, rising, eastward, setting, westward, rising
5	1	207.89-207.89 deg	66.05-66.05 deg	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.

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
56006	STARLINK-5794	PAYLOAD	US	2023-03-24	n/a
49173	STARLINK-3045	PAYLOAD	US	2021-09-14	n/a
57980	STARLINK-30504	PAYLOAD	US	2023-09-30	2026-03-17
58363	STARLINK-30909	PAYLOAD	US	2023-11-18	n/a
54167	STARLINK-5243	PAYLOAD	US	2022-10-28	n/a
55573	STARLINK-5738	PAYLOAD	US	2023-02-12	n/a
53424	STARLINK-4532	PAYLOAD	US	2022-08-10	n/a
57244	STARLINK-5610	PAYLOAD	US	2023-07-07	n/a
52585	STARLINK-3906	PAYLOAD	US	2022-05-13	n/a
55605	STARLINK-5725	PAYLOAD	US	2023-02-12	n/a
46383	STARLINK-1770	PAYLOAD	US	2020-09-03	n/a
51864	STARLINK-3548	PAYLOAD	US	2022-03-03	n/a

5.9 NASA / NOAA / ADS-B Expansion Layer

This source layer adds free NASA context that was previously missing from most packet cases. It is contextual evidence; it does not replace aircraft, satellite, balloon, or radar causation tests.

HOURLY UTC	2023122710
CLOUD AMOUNT	87.75%
PRECIPITATION	0.0 mm/hr
10 M WIND	5.94 m/s
TEMPERATURE	-4.62 C
RELATIVE HUMIDITY	91.97%
DONKI +/-1 DAY	CME: unavailable; FLR: unavailable; GST: unavailable; HSS: unavailable; IPS: unavailable; MPC: unavailable; RBE: unavailable; SEP: unavailable; WSAEnlilSimulations: unavailable

5.10 Horizons Sky Geometry Context

OBJECT	AZ	EL	APP MAG
Sun	91.60	-36.61	-26.78
Moon	273.27	42.74	-12.56
Venus	110.68	-2.52	-4.06
Mars	99.45	-27.26	1.42
Jupiter	301.54	-16.09	-2.63
Saturn	2.92	-62.53	0.94

- Sun elevation was -36.6 deg, so this was a dark-sky/nighttime sighting.
- Moon was above horizon at azimuth 273.3 deg / elevation 42.7 deg.
- No checked bright planets were above the horizon at the primary coordinate/time.
- NASA POWER cloud amount for the hour was 87.75%, with precipitation 0.0 mm/hr.

5.11 Free Source Availability and Remaining Work

LAYER	STATUS	CASE-SPECIFIC NOTE
ADSB.LOL HISTORICAL RELEASE LISTING	screened/present	planes-readsb-staging-0 1542.1 MiB; planes-readsb-prod-0 1543.0 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_2023 for 2023-12-27, then filter +/-60 min and 250 nmi around 39.4248,-97.6214.
- NASA POWER/Horizons/DONKI: batch context for 237UAP00591 at 2023-12-27T10:35:00+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/2023/361/10/
GOES GLM LIGHTNING PREFIX	https://noaa-goes16.s3.amazonaws.com/GLM-L2-LCFA/2023/361/10/

5.13 Nearest Weather-Airport Candidates

STATION	NAME	DISTANCE KM	COORDINATE
KSLN	Salina Municipal Airport	70.50	38.79, -97.65
KFRI	Marshall Army Air Field	84.60	39.05, -96.76
KMHK	Manhattan Regional Airport	87.70	39.14, -96.67
KRSL	Russell Municipal Airport	119.60	38.87, -98.81

STATION	NAME	DISTANCE KM	COORDINATE
KHUT	Hutchinson Municipal Airport	152.60	38.07, -97.86

- KSLN: [IEM ASOS/METAR daily CSV query](#)
- KFRI: [IEM ASOS/METAR daily CSV query](#)
- KMHK: [IEM ASOS/METAR daily CSV query](#)

5.14 Nearest Radiosonde Stations

STATION	NAME	DISTANCE KM	COORDINATE
USM00072456	TOPEKA/MUN.; KS.	175.90	39.07, -95.63
USM00072558	VALLEY; NE.	236.00	41.32, -96.37
USM00072451	DODGE CITY/MUN.; KS.	275.30	37.76, -99.97
USM00074646	LAMONT	314.30	36.60, -97.50
USM00072562	NORTH PLATTE/LEE BIRD; NE.	322.90	41.13, -100.70

5.15 ASOS/METAR Surface Weather Observations

surface visibility ranged 9-10 statute miles; no precipitation was reported in the retained observations; low/broken/overcast cloud layers were present in at least one observation. 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
KSLN	70.50	2023-12-27T10:53:00 +00:00	10.00	FEW01600, OVC04300, M, M	330.00 / 14.00	KSLN 271053Z AUTO 33014KT 10SM FEW016 OVC043 M02/M05 A2994 RMK AO2 SLP151 T10221050 \$
KFRI	84.60	2023-12-27T10:55:00 +00:00	10.00	OVC01200, M, M, M	320.00 / 8.00	KFRI 271055Z AUTO 32008KT 10SM OVC012 M01/ M03 A2990 RMK AO2 SLP134 T10081027
KMHK	87.70	2023-12-27T10:52:00 +00:00	10.00	OVC01100, M, M, M	340.00 / 6.00	KMHK 271052Z AUTO 34006G16KT 10SM OVC011 00/ M02 A2990 RMK AO2 SLP133 T00001022

5.16 NOAA IGRA Radiosonde Wind Profile

Nearest sounding implies mean 0-12 km wind drift toward 163.5 deg at 23.24 m/s; a passive balloon could drift about 167.4 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
USM00072456	TOPEKA/MUN.; KS.	175.90	2023-12-27T12:00 :00+00:00	163.50	23.24	167.40	36.00 at 2049.00 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
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ABI SAMPLE FILES	12	GLM SAMPLE FILES	12
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ABI sample objects:

- [ABI-L2-CMIPF/2023/361/10/OR_ABI-L2-CMIPF-M6C01_G16_s20233611000205_e20233611009513_c20233611009573.nc](#)
- [ABI-L2-CMIPF/2023/361/10/OR_ABI-L2-CMIPF-M6C01_G16_s20233611010205_e20233611019513_c20233611019573.nc](#)
- [ABI-L2-CMIPF/2023/361/10/OR_ABI-L2-CMIPF-M6C01_G16_s20233611020205_e20233611029513_c20233611029597.nc](#)
- [ABI-L2-CMIPF/2023/361/10/OR_ABI-L2-CMIPF-M6C01_G16_s20233611030205_e20233611039513_c20233611039582.nc](#)

GLM lightning sample objects:

- [GLM-L2-LCFA/2023/361/10/OR_GLM-L2-LCFA_G16_s20233611000000_e20233611000200_c20233611000223.nc](#)
- [GLM-L2-LCFA/2023/361/10/OR_GLM-L2-LCFA_G16_s20233611000200_e20233611000400_c20233611000420.nc](#)
- [GLM-L2-LCFA/2023/361/10/OR_GLM-L2-LCFA_G16_s20233611000400_e20233611001000_c20233611001021.nc](#)
- [GLM-L2-LCFA/2023/361/10/OR_GLM-L2-LCFA_G16_s20233611001000_e20233611001200_c20233611001220.nc](#)

5.18 ADSB.lol Historical Aircraft Track Extraction

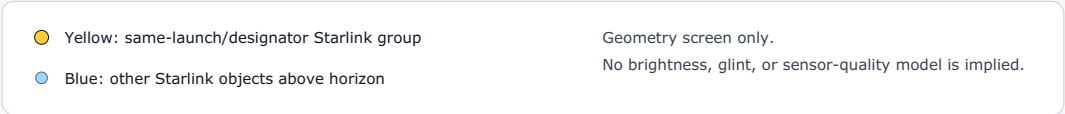
This layer uses the downloaded ADSB.lol daily history archive to test actual aircraft tracks near the report coordinate and minute. It is not treated as a primary-radar substitute; it is a transponder/receiver-derived aircraft screen.

ARCHIVE WINDOW	2023-12-27T09:05:00+00:00 to 2023-12-27T12:05:00+00:00	RADIUS	300.00 nmi
TRACE FILES SCANNED	44916	TRACKS RETAINED	371
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	7	PLAUSIBLE CANDIDATES	24
REPORTING-AIRCRAFT TRACKS EXCLUDED	1	WEAK CANDIDATES	31

5.19 Top ADS-B Candidate Tracks

AIRCRAFT	STATUS	SCORE	MIN DIST KM	NEAREST DT MIN	ALT FT	AZ	EL
N777UA B772 aa84cb	strong aircraft candidate	77.86	38.50	0.10	35000	146.60	14.72
N458AL A21N a58fdf	strong aircraft candidate	75.38	52.60	0.01	34975	184.20	10.29
N17329 B38M a12712	strong aircraft candidate	68.90	53.80	0.07	35000	333.30	9.93
N582FE MD11 a77dd8	strong aircraft candidate	67.27	39.40	0.12	37975	2.40	13.89
N184FE B763 a1500a	strong aircraft candidate	65.60	64.40	0.10	36025	317.80	7.62
N178FE B763 a13767	strong aircraft candidate	63.96	75.10	0.11	34000	340.50	7.07
N949FD B752 ad2f18	strong aircraft candidate	57.75	51.50	0.11	40000	163.90	8.62
N27908 B788 a2ca64	reporting aircraft track; excluded from support counts	88.90	5.20	0.02	40975	137.10	66.90

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	2023-12-27T10:35:00+00:00	Directly used in propagation; this is a hard filter, not descriptive context.
LOCATION CONSTRAINT	39.42476, -97.62140	Directly used as observer point for azimuth/elevation/range computation.
COUNT / PATTERN	three-object/light language present	Primary same-launch group contains 3 propagated objects in a compact sky sector.
MOTION LANGUAGE	circling	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	237UAP00591 is assessed as normal-object favored because the available public evidence gives a case-specific ordinary-object candidate: strong ADS-B aircraft candidate N777UA B772 aa84cb at 40.1 km, azimuth 146.6 deg, elevation 14.72 deg, 2.87 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

237UAP00591

Washington Operations Center

Date: 12/27/2023 4:35:00 AM (-06 CST)
Title: SALINA, KS UFO-UAP ACTIVITY 12-27-2023
Latitude: 39.225508519999998 Latitude: -97.652222219999999

DESCRIPTION

PRELIM INFO FROM FAA OPS: SALINA, KS/UFO-UAP ACTIVITY/0435C/KANSAS CITY ARTCC ADVISED MULTIPLE ACFT (SPIRIT 2804 AND AMERICAN 2014) REPORTING TWO WHITE LIGHTS CIRCLING EACH OTHER, COMING CLOSE TOGETHER, AND THEN MOVE AWAY FROM EACH OTHER. ACFT WERE OPERATING AT FL410 AND FL350. THE UAP WERE E OF THE ACFT 30 N SLN. UAP NOT OBSERVED BY ATC RADAR SYSTEMS. WOC 7-3333 DJ/RL

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": "2023-12-27T10:35:00+00:00",
  "source_excerpt": "Washington Operations Center\n\n\nDate: 12/27/2023 4:35:00 AM (-06 CST)\nTitle: SALINA, KS UFO-UAP\nACTIVITY 12-27-2023\nLatitude: 39.225508519999998\nLongitude: -97.652222219999999\n\nDESCRIPTION\nPRELIM INFO FROM FAA OPS: SALINA, KS/UFO-UAP ACTIVITY/0435C/KANSAS CITY ARTCC\nADVISED MULTIPLE\nACFT (SPIRIT 2804 AND AMERICAN 2014) REPORTING TWO WHITE LIGHTS CIRCLING EACH OTHER, COMING CLOSE\nTOGETHER,\nAND THEN MOVE AWAY FROM EACH OTHER. ACFT WERE OPERATING AT FL410 AND FL350. THE UAP\nWERE E OF THE ACFT 30 N SLN. UAP NOT\nOBSERVED BY ATC RADAR SYSTEMS. WOC 7-3333 DJ/RL",
  "historical_starlink_element_rows": 5224,
  "observer": {
    "lat": 39.424761473635364,
    "lon": -97.62139892578125,
    "source": "aviation_offset:30 N SLN (public text extract 237UAP00591)"
  },
  "case_id": "237UAP00591",
  "starlink_above_horizon_at_report_time": 281,
  "starlink_catalog_ids_considered": 5247,
  "largest_same-sky_cluster_count": 74,
  "starlink_at_or_above_10_deg": 137,
  "same_launch_sky_groups": [
    {
      "azimuth_range_deg": [
        3.08,
        353.1
      ],
      "count": 3,
      "elevation_range_deg": [
        11.12,
        13.84
      ],
      "ground_track_labels": [
        "E",
        "ESE"
      ],
      "launch_date": "2021-02-16",
      "members": [
        {
          "azimuth_deg": 3.08,
          "azimuth_plus_2m_deg": 34.8,
          "azimuth_plus_5m_deg": 65.35,
          "element_age_hours": 2.75,
          "element_epoch": "2023-12-27T13:19:47.894880+00:00",
          "elevation_deg": 13.84,
          "elevation_plus_2m_deg": 12.23,
          "elevation_plus_5m_deg": 2.96,
          "epoch_altitude_km": 553.17,
          "ground_track_bearing_deg": 102.88,
          "ground_track_label": "ESE",
          "launch_date": "2021-02-16",
          "name": "STARLINK-2057",
          "norad_id": "47666",
          "range_km": 1584.73,
          "sky_motion_label": "eastward, setting",
          "subpoint_lat": 52.2479,
          "subpoint_lon": -96.5084
        },
        {
          "azimuth_deg": 353.1,
          "azimuth_plus_2m_deg": 21.84,
          "azimuth_plus_5m_deg": 47.42,
          "element_age_hours": 1.23,
          "element_epoch": "2023-12-27T11:48:49.749408+00:00",
          "elevation_deg": 13.26,
          "elevation_plus_2m_deg": 9.73,
          "elevation_plus_5m_deg": 0.59,
          "epoch_altitude_km": 553.25,
          "ground_track_bearing_deg": 79.33,
          "ground_track_label": "E",
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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: 237UAP00591
TIME AND OBSERVER COORDINATE	extracted	2023-12-27T10:35:00+00:00 at 39.42476, -97.62140
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	not selected	CAD/Horizons secondary screen included when this case had NEO-relevant timing/geometry
NASA POWER/HORIZONS/DONKI CONTEXT	screened	Hourly weather, sky geometry, and space-weather context where local JSON is present
AIRCRAFT/ADS-B LAYER	screened	44916 trace files scanned; 371 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

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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. *237UAP00591.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-615/493468575/237UAP00591.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>
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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 POWER. *Hourly point API documentation for meteorological context*. <https://power.larc.nasa.gov/docs/services/api/temporal/hourly/>
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. NASA. *DONKI space weather API documentation*. <https://api.nasa.gov/>
12. ADSB.lol. *Interactive API documentation and OpenAPI definition*. <https://api.adsb.lol/docs>
13. ADSB.lol. *Historical open-data release documentation*. <https://www.adsb.lol/docs/open-data/historical/>
14. OpenSky Network. *REST API documentation*. <https://openskynetwork.github.io/opensky-api/rest.html>
15. OpenSky Network. *Historical data via Trino documentation*. <https://openskynetwork.github.io/opensky-api/trino.html>
16. NASA GIBS. *Global Imagery Browse Services API documentation*. <https://nasa-gibs.github.io/gibs-api-docs/>
17. NASA Earthdata. *Common Metadata Repository search API documentation*. <https://cmr.earthdata.nasa.gov/search/site/docs/search/api.html>
18. NOAA / AWS Open Data. *GOES public dataset registry*. <https://registry.opendata.aws/noaa-goes/>
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20. NOAA NCEI. *Integrated Global Radiosonde Archive*. <https://www.ncei.noaa.gov/products/weather-balloon/integrated-global-radiosonde-archive>
21. Iowa Environmental Mesonet. *ASOS/AWOS/METAR data download service*. <https://mesonet.agron.iastate.edu/request/download.phtml>
22. Celestrak. *Spacetrack Report No. 3: Models for propagation of NORAD element sets*. <https://celestrak.org/NORAD/documentation/spacetrk.pdf>
23. Celestrak. *Supplemental GP element sets documentation and current endpoint index*. <https://celestrak.org/NORAD/elements/supplemental/>