



# All-domain Anomaly Resolution Office

U.S. Department of Defense

**(U) Case: "Eglin UAP"**

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## (U) Case Background

(U) On 26 January 2023, a military pilot reported four potential unidentified anomalous phenomena (UAP) while operating in the Eglin Air Force Base training range off the coast of Florida. Through the onboard radar system, the pilot initially observed that the four objects were aloft between 16,000 – 18,000 feet and appeared to be flying in formation. However the pilot observed only one of the four objects visually and captured two images of the single object via the aircraft's electro-optical/infrared (EO/IR) sensor (see Figures 1A and 1B). The pilot could not record video of the event because the aircraft's video recording equipment was inoperable prior to and during the aircraft's flight. The pilot observed this single object aloft at 16,000 feet. The following case information is based on the pilot's initial report and a subsequent discussion that AARO held with the pilot to seek additional details about the pilot's observation of the reported object.

- (U) The pilot described the object as gray with a paneled surface and orange-red coloring at the center. The initial report did not provide the object's size and speed, but in the subsequent discussion with AARO, the pilot reported the object was about 12 feet in diameter and that it either moved very slowly or was potentially stationary.
- (U) In the initial report, the pilot described the bottom half of the object as being rounded, and the top half as a rounded, three-dimensional cone shape, similar to the shape of the

## (U) Case Essentials

(U) A military pilot reported the object due to its potential as a flight safety hazard and an incursion into a sensitive training range

(U) **Location:** Near Eglin Air Force Base, Florida

(U) **Date:** 26 January 2023

(U) **Altitude:** 16,000 feet

(U) **Shape:** Rounded, cone

(U) **Reporter:** Military personnel

(U) **Sensor:** Electro-optical, infrared, visual identification, and radar

(U) **Behavior:** No confirmed anomalous behavior

(U) **Case Status:** Resolved; very likely a lighter-than-air object, such as a large commercial lighting balloon

(U) **Confidence Level:** Moderate

"Apollo spacecraft" (see Figure 2). The pilot visually perceived a heat signature emanating from the rounded bottom portion, which they described as "blurry air."

- (U) During AARO's discussion with the pilot, the pilot stated that they thought they saw a vertically oriented engine affixed to the side of the object that was nearly the height of the object. This feature is not visible in the two still images taken by the EO/IR sensor, and the pilot did not include this description in the initial report. AARO has no additional data to corroborate whether the object may have had an engine.
- (U) The pilot reported that upon closing to within 4,000 feet of the object, the radar on the aircraft malfunctioned and remained disabled for the remainder of the training exercise. Post-mission review determined that a circuit breaker had tripped; technicians reported that the same circuit breaker on this particular aircraft had tripped three times in the prior months, but technicians could not conclusively diagnose the cause of the fault for this incident. Based on the previous tripping of this circuit, AARO assesses the malfunction likely was not caused by or associated with the object.
- (U) During the discussion with the pilot, they recounted that after the radar malfunctioned, the object descended into the cloud deck.
- (U) There was no EO/IR data for the other three reported objects initially observed on radar; therefore, AARO could not analyze those reported objects.

## (U) Key Findings

(U) AARO assesses the reported UAP very likely was an ordinary object and was not exhibiting anomalous or exceptional characteristics or flight behaviors. AARO has moderate confidence in this assessment due to the limited data provided.

- (U) AARO assesses the object was a lighter-than-air (LTA) object, such as a large form-factor balloon; a meteorological balloon; a large Mylar balloon; or a large, commercial, outdoor, helium-filled, lighting balloon. AARO has moderate confidence in its identification of the object. AARO bases this assessment on a thorough review of the data collected, official pilot accounts of the object's description and behavior, laboratory testing of a commercial lighting balloon determined to have similar physical characteristics to the object described in the pilot's report, a reconstruction of the flight geometry, and the sun angle at the time of the observation.
- (U) No anomalous flight characteristics, behaviors, or capabilities were confirmed. AARO assesses the circuit breaker trip that caused the radar to fail was coincidental and likely due to a pre-existing, undiagnosed technical problem with the system.
- (U) The physical description of the UAP was generally consistent with an LTA object held aloft and carried by the wind; its direction and reported slow speed are consistent with the wind direction and speed at the time and the altitude of the observation.

- (U) The “blurry air” observation could have been a visual misperception due to environmental conditions and potentially resulted from a tether hanging below the LTA object or motion-induced image blurring.

(U) Although the pilot described the object as uniformly gray in the visible spectrum (it appears uniformly black from the viewing angle in the EO image), the magnified infrared image shows the object had a strong contrasting signature in the infrared spectrum. This contrast suggests either a temperature/emissivity difference or a reflectivity difference between its two hemispheres. AARO identified a commercial lighting balloon (see Figure 1C), which is a close visual match to the object in the zoomed-in infrared image (see Figure 1A). Commercial helium balloons such as these are often large and available in many shapes — including ellipses, spheres, and cylinders — and are used for outdoor lighting at special events, construction sites, and movie sets. Although these balloons are available in solid colors, some models have distinct black and white hemispheres. The upper black hemisphere is lined with reflective material to direct the light downward through the white hemisphere. AARO conducted extensive testing using one of these balloons and found it could replicate some aspects of the pilot’s account.

- (U) The balloon’s hemispheres have seams resembling the ribbed fabric panels of an umbrella, which an observer could perceive as “paneling.”
- (U) These balloons are publicly available to rent or buy. Although the balloons are powered by corded alternating current (AC), during its testing, AARO determined that they can be converted to direct current or AC battery power.

(U) Beyond these commercial lighting balloons, the object’s description correlates with any large-form balloon that might be made of two different materials, or the same material of different colors, with distinct infrared reflective or emissive properties. It is also plausible that the sun angle at the time of day of the event, when plotted with the EO/IR sensor’s viewing angle, illuminated the bottom half of the balloon — from the pilot’s perspective — while the top would appear dark, shaded, and cold (See Figure 3).

- (U) Due to the angle of the sun and the altitude of the object, a meteorological or Mylar balloon likely would also present in a similar fashion on an EO/IR image. The highly reflective surface of a Mylar balloon in infrared would exaggerate the perceived illumination effect.

(U) AARO submitted the case for review to an Intelligence Community (IC) component and a science and technology (S&T) partner; these two partners independently reached high confidence assessments that the object did not exhibit anomalous characteristics or behaviors and, therefore, was an ordinary object. Both partners independently determined that the object very likely was some form of balloon.

## (U) **Intelligence Assessment**

(U) AARO's IC partner on this case assesses with high confidence that the object was not exhibiting anomalous characteristics based on the available data and its reconstruction of the event. Available data included the altitude, geocoordinates of the object, the aircraft viewing angle and heading, as well as the sun geometry at the time of the observation.

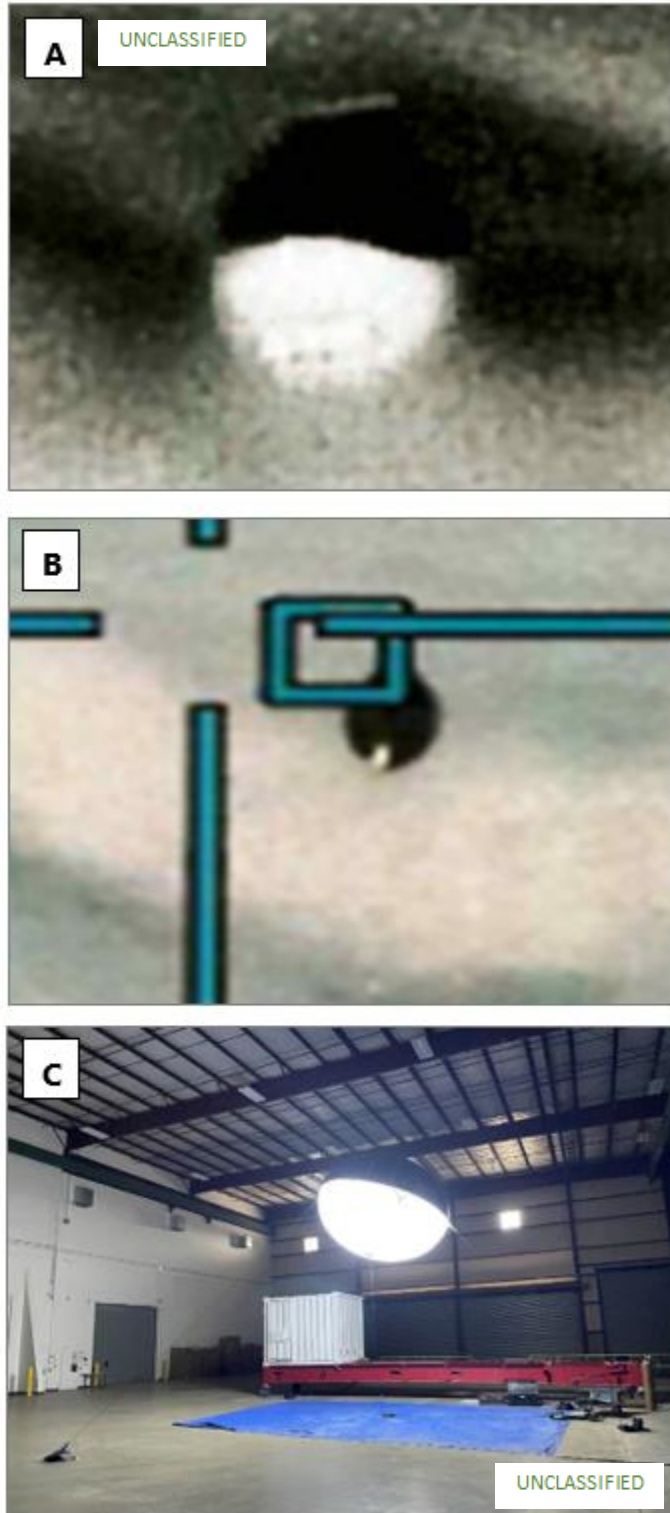
- (U) Based on reconstruction of the event, to include the viewing angle of the EO/IR sensor that took the zoomed-in image, the sun would have illuminated the bottom hemisphere in a manner consistent with the IR image (see Figure 3). The orange-red color at the center of the bottom half of the object could be explained by the sun glint off the object as the pilot observed it, thus causing the appearance of the orange-red colors on the balloon.

## (U) **Science & Technology Assessment**

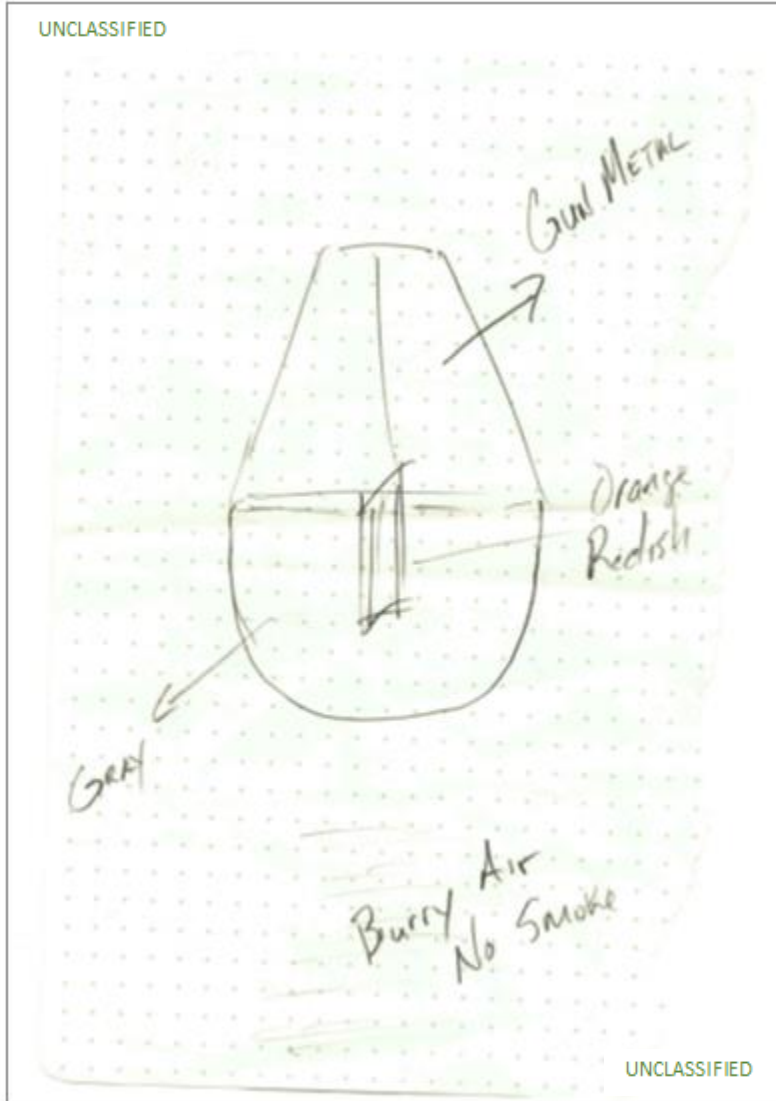
(U) AARO's S&T partner independently came to the same general conclusions based on the available data and its deconfliction of military and commercial radar tracks in the vicinity of the sighting. The partner assesses with high confidence that the object was not anomalous and very likely was some kind of balloon.

- (U) The S&T partner assesses that the image is consistent with a Mylar balloon as viewed from above where the bottom is illuminated with light reflected from the clouds or the earth. This effect is known as "Earth shine."
- (U) The partner notes that many larger balloons have red-colored tether points around the circumference of the balloon which could account for the orange-red color the pilot reported observing near the center.

(U) Figure 1: Comparison of reported UAP (A: Infrared image of reported object, B: Electro-optical image of reported object, and C: Image of a commercial LTA lighting system) (Photo credit: AARO)



(U) Figure 2: Pilot's drawing of the reported object



(U) Figure 3: The below is a visualization of the pilot's point of view of the object based on the position and altitudes of the aircraft and object, the look angle of the sensor, and the sun geometry

