

Israel Aerospace Industries (IAI) – High Availability Aerostat System (HAAS) – Tal Shamaim (Sky Dew)

Peter Lobner, 19 June 2023

1. Introduction

Israel's High Availability Aerostat System (HAAS) was developed by the Elta division of Israel Aerospace Industries (IAI) in cooperation with the Israeli Air Force (IAF), the Israel Missile Defense



Organization (IMDO), and the U.S. Missile Defense Agency (MDA). HAAS is designed to provide advance warning of low-flying threats, such as cruise missiles, weaponized drones, and other aerial threats. It is functionally similar to the U.S. JLENS (Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System) aerostat system, which was cancelled in 2017.



*HAAS aerostat at its mooring platform with the airborne radar installed.
Source: The Defense Post (2022)*

2. General description of HAAS

The HAAS aerostat, with an overall length of 117 meters (384 ft), is one of the world's largest aerostats. It was developed and manufactured by the U.S. firm TCOM as their model 117M strategic aerostat. It is substantially larger than TCOM's 74M (74-meter / 242.8-ft) strategic aerostat used in the similar U.S. JLENS aerostat program. In the JLENS role, the 74M aerostat could carry a 3,175 kg (7,000 lb) payload to an operational altitude of 3,048 meters (10,000 ft). The 117M aerostat can carry a much larger payload to a higher operating altitude.

General characteristics of the TCOM 117M aerostat

Parameter	TCOM 117M
Length	117 meters (384 ft)
Nominal operating altitude	4,877 meters (16,000 ft)
Line of sight to the horizon	249 km (155 miles) at operating altitude
Payload	Long-range radars, active and passive communications & electronics intelligence (COMINT/ELINT) systems
Payload weight	8,165 kg (18,000 lb)
Wind speed limits	<ul style="list-style-type: none">Operational: 80 knotsSurvival: 90 knots
Available payload power	130 kVA
Endurance	60 days

Source: TCOM

The primary sensor on the HAAS aerostat is the Sky Dew advanced radar system. The radar antenna, related electronics and communications systems are installed inside a large, inflatable fabric windscreen under the aerostat's pressure-stabilized gas envelope. The aerostat's pressure control systems separately manage the pressures in the gas envelope and in the inflatable windscreen.

Details of the Sky Dew radar system are not available. As a point of comparison, a pair of U.S. JLENS aerostats were designed to work together, with one carrying a VHF-band surveillance radar and the other carrying an X-band fire control radar for feeding precision targeting data to air defense systems.

The HAAS aerostat has a powered tether with fiber optic data cables. A ground-based generator provides power to aerostat and payload system. Data communication between the aerostat and its ground station are conducted over secure fiber optic data links. It's likely that a backup radio communications link is installed.

In November 2021, the IAF inflated the aerostat's gas envelope for a public "unveiling" prior to installation of the windscreen for the radar.



HAAS aerostat at its mooring platform before installation of the windscreen (radome) and inflation of the tail fins.

Source: Times of Israel (2021)



HAAS aerostat at its mooring platform before installation of the Windscreen. Source: Ministry of Defense, Israel

The first fully assembled HAAS platform was delivered to the IAF on 22 March 2022.



*HAAS aerostat at its mooring platform at that IAF delivery ceremony.
Source: The Defense Post (22 March 2022)*



*HAAS aerostat aloft, above its mooring platform.
Source: Screenshot from TCOM video (2022)*

3. For more information

- “117M Aerostat System,” TCOM spec sheet:
https://tcomlp.com/wp-content/uploads/2023/04/TCOM-117M-aerostat_2023.pdf
- Arie Egozi, “Israel MOD Commences Inflation of HAAS and Initial Testing of ES System for Deployment,” Anirveda, 3 November 2021: <https://raksha-anirveda.com/israel-mod-commences-inflation-of-haas-and-initial-testing-of-es-system-for-deployment/>
- Yaakov Lappin, “Israel deploys new aerostat radar,” Janes, 4 November 2021: <https://www.janes.com/defence-news/news-detail/israel-deploys-new-aerostat-radar>
- Thomas Newdick, “Israel Begins Testing Giant Radar Blimp For Spotting Low-Flying Missiles,” The Drive, 4 November 2021: <https://www.thedrive.com/the-war-zone/43001/israel-begins-testing-giant-radar-blimp-for-spotting-low-flying-missiles>
- “Israeli Air Force Receives Its Tal Shamaim High Availability Aerostat System (HAAS),” Military Leak, 23 March 2022: <https://militaryleak.com/2022/03/23/israeli-air-force-receives-its-tal-shamaim-high-availability-aerostat-system-haas/>

Videos

- “Israel Aerospace Industries - High Availability Aerostat System – HAAS,” (2:04 min), posted by defesanet, 3 November 2021: <https://www.youtube.com/watch?v=D8D5IVL00sE>
- “Israel unveils SkyDew Early Warning aerostat - largest in the world!” (8:44 min), posted by Defense Updates, 6 November 2021: <https://www.youtube.com/watch?v=YUSSxYCjlkU>
- “IAI-ELTA Systems Ltd.'s Strategic Air Defence Radar Systems,” (7:00 min), posted by ELTA Systems Ltd., 25 January 2022: <https://www.youtube.com/watch?v=A1K8Jb9SRKA>
- “TCOM's Aerostat for Missile Defense In Northern Israel,” (1:43 min), posted by TCOM, 27 March 2022: <https://www.facebook.com/TCOMLP/videos/341109004727210>

Other *Modern Airships* articles

- *Modern Airships - Part 1*: <https://lynceans.org/all-posts/modern-airships-part-1/>
 - Lockheed Martin - Persistent Threat Detection System (PTDS) aerostat system
 - Raytheon - JLENS aerostat system
- *Modern Airships - Part 2*: <https://lynceans.org/all-posts/modern-airships-part-2/>
- *Modern Airships - Part 3*: <https://lynceans.org/all-posts/modern-airships-part-3/>