Starlink Report: Introduction & Core Subsystems

What is Starlink?

Starlink is a satellite internet constellation by SpaceX, designed to provide global high-speed, low-latency broadband, especially to remote and underserved areas.

Core Subsystems

Power Subsystem

Generates and stores power. A single, large solar array converts sunlight, while internal batteries provide power during orbital night.

Communication Subsystem

Handles all data. Advanced phased-array antennas communicate with ground users, while inter-satellite laser links (on newer models) create a high-speed mesh network in space.

Payload (Transceiver)

The satellite's "brain" and router. Consists of sophisticated transceivers and processors that manage and direct all internet data traffic.

Starlink Report: Utility Subsystems & Diagram

Utility & Support

Attitude Control (ADCS)

Orients the satellite. Uses star trackers (to see), reaction wheels (to turn), and Hall-effect thrusters (to move).

Thermal Subsystem

Manages extreme temperatures in space using heat pipes, radiators, and specialized thermal coatings to protect electronics.

Structure Subsystem

The physical flat-panel framework and chassis that holds all components together and includes deployment mechanisms.

Labeled Satellite Diagram

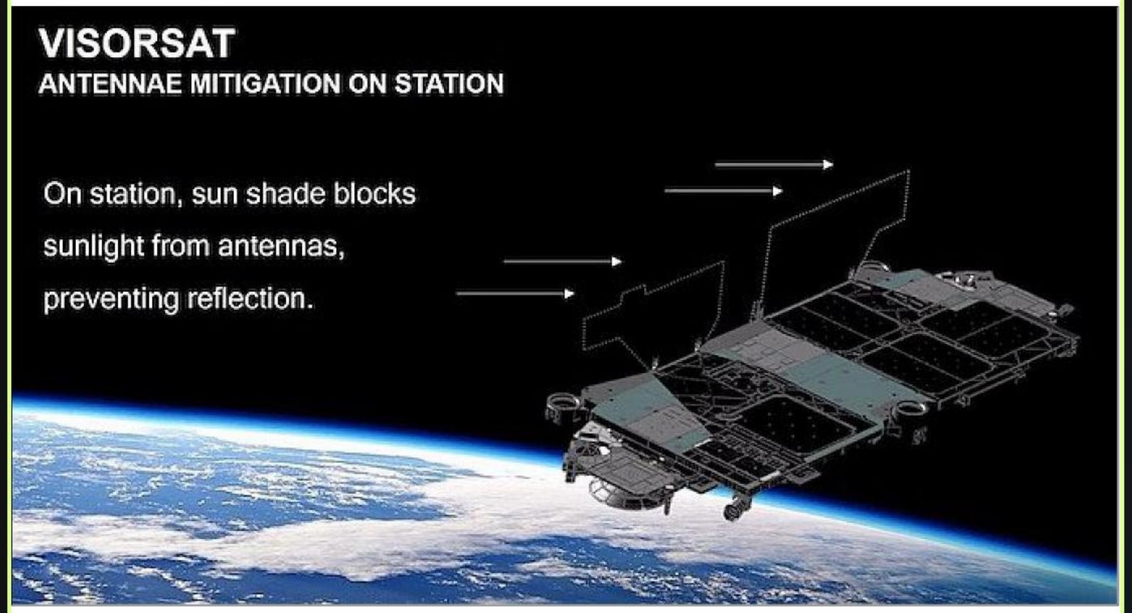

Image Sources

https://www.dlr.de/en/images/2020/2/strings-of-pearls-in-the-night-sky/@@images/image-1000-a376d811c0780b114972221fd4c274a1.jpeg

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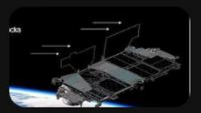

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