MISSILE DEFENSE AGENCY

Fact Sheet

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Long Range Discrimination Radar (LRDR), Clear Space Force Station (CSFS), Alaska

LRDR is designed to provide the warfighter advanced ground sensor capabilities supporting the range of requirements from missile warning, through tracking and discrimination, to space domain awareness. LRDR provides an unparalleled ability to simultaneously search, track and discriminate multiple small objects, at very long ranges, 24/7/365. LRDR combines proven solid-state radar technologies with proven ballistic missile defense algorithms, all based upon an open architecture platform capable of meeting future growth. LRDR utilizes a unique approach to accurately identify threats in a dense operating space, setting it apart from current ground-based sensors. Dual monostatic arrays, each measuring 60 feet high and 60 feet wide, and gallium nitride technology combine for a more powerful, more capable radar. This technology is designed to be:
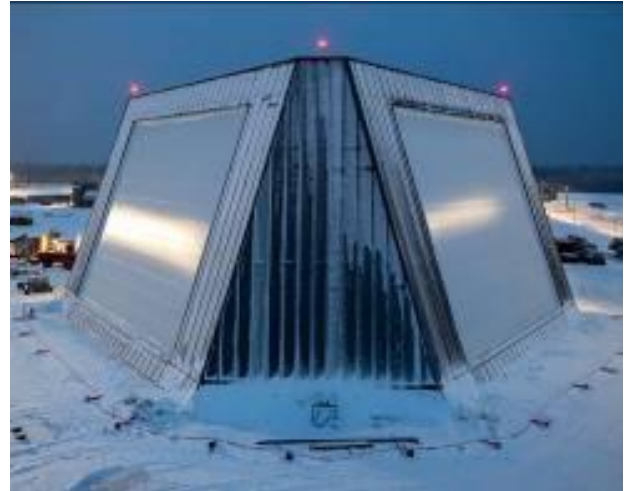
- Multi-mission capable: LRDR is a multi-mission, multi-face radar capable of conducting integrated missile defense and space domain awareness (SDA) missions through a wide field of view. LRDR tracks and discriminates multiple threats simultaneously, providing precision track, discrimination, and hit assessment data to the Missile Defense System firing units such as the Ground-Based Midcourse Defense (GMD) System. LRDR can monitor satellites orbiting the earth, detecting, tracking, and identifying active/inactive satellites, spent rocket bodies, and debris, in support of the SDA mission.
- Adaptable for Future Threats: The radar can be scaled and extended to adapt to new threat sets, such as hypersonic threats, through software enhancements, without changing the hardware design. Dual monostatic arrays provide the full multi-mission capability throughout the extensive field of view, covering a vast volume against threats originating from various regions around the globe.
- Efficient and Reliable: Scalable and modular gallium nitride based "subarray" radar building blocks provide advanced performance and increased efficiency and reliability.
- Persistent: The unique maintain-while-operate capability provides very high operational availability and enables continuous track and discrimination.

Overview: LRDR provides persistent, long-range midcourse discrimination, precision tracking, and hit assessment to support the Homeland Defense Capability against missile threats to the homeland and in the Pacific theater.

- The LRDR operates in S-band frequencies featuring a scalable, open systems architecture to mitigate evolving threats. The LRDR is integrated into the Missile Defense System through the Command and Control, Battle Management and Communications (C2BMC) element.
- LRDR's improved discrimination capability in the Pacific architecture increases the defensive capacity of the homeland defense interceptor inventory by conserving the number of Ground-Based Interceptors required for threat engagement.

Maturity, Testing & Fielding: The core technology has already been declared Technical Readiness Level 7 by the U.S. Government – which means LRDR demonstrated its system prototype in an operational environment.

- Missile Defense System ground test activities are ongoing for LRDR. These Missile Defense System ground tests certify the operational capability of the Missile Defense System software. The Missile Defense System ground tests consist of test cases comprised of operationally realistic raids of complex ballistic missile threats, interceptors, and space objects. The tests use accredited modeling and simulation (M&S) to drive end-item deployed systems, using a hardware-in-the-loop (HWIL) system. These test cases exercise significant Missile Defense System element capability with raid size, threat complexity, launch/impact locations, and interceptor density combinations impossible to replicate in a live flight test.
- LRDR has demonstrated system maturity and capability by successfully tracking Resident Space Objects (RSOs) and a Medium Range Ballistic Missile (MRBM) target. Live Radiate test demonstrated LRDR and Command & Control Battle Management Communications (C2BMC)'s ability to perform the SDA mission. In Flight Test Other (FTX)-49, LRDR demonstrated its first track and discrimination of a Medium Range Ballistic Missile target.
- LRDR is collaborating with the United States Space Force and United States Space Command to provide SDA capability to the Warfighter in Fiscal Year 2024 prior to the Operational Capability Baseline milestone.

LRDR North Array with Denali in Background
16 March 2023