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U.S. Army's Patriot Air and Missile Defense System

Updated November 23, 2026

The Patriot air and missile defense (AMD) system (see **Figure 1**) is an Army ground-based mobile system designed to detect, track, and engage aircraft, uncrewed aerial vehicles (UAVs), cruise missiles, and short-range or tactical ballistic missiles. Some Members of Congress have expressed interest in the cost, availability, and production of Patriot systems and interceptors, particularly in view of conflicts in Iran and Ukraine.

Background

Patriot is an acronym for Phased Array Tracking Radar to Intercept on Target. Beginning development in the 1960s, the first Patriot battalion was activated in May 1982. Originally designed to defend against high-performance aircraft, according to the Army, in January 1991, "Patriot successfully intercepted and destroyed an Iraqi SCUD missile fired at Saudi Arabia. This was the first combat use of the Patriot, and the first time an air defense system destroyed a hostile tactical ballistic missile."

Figure 1. Patriot AMD Launcher and Transport



Source: Janes, *Land Warfare Platforms: Artillery & Air Defence*, updated January 21, 2026, via CRS electronic subscription.

Patriot Components and Capabilities

According to the Missile Defense Advocacy Alliance (MDAA) and information from *Land Warfare Platforms: Artillery & Air Defence* (accessed by CRS via electronic subscription) by Janes, an unclassified defense intelligence company,

- the Patriot system generally consists of the following components: a radar set, engagement control station (ECS), missile launchers, and Patriot missiles. The radar set is made up of an AN/MPQ-53/65 C-band, multifunction phased array radar system that is remotely controlled by the AN/MSQ-104 ECS. RTX (formerly Raytheon) is the prime contractor for the system; Lockheed Martin makes a new type of interceptor missile.
- The radar can detect, track, and prioritize more than 100 potential targets and has a range of over 100 kilometers (km). The ECS is the only crewed element of a Patriot unit (typically by three operators) and is designed to communicate with the launching stations and other Patriot units and higher headquarters. To power the radar and ECS, each Patriot unit has a truck equipped with two 150-kilowatt generators.
- Each vehicle-transported missile launcher can accommodate 4-16 interceptors (depending on missile variant). The missile launcher can be located separately from the radar, and ECS and can be ready to fire a missile in less than 9 seconds. Once launched, the interceptor transmits data to the radar station, which tracks and helps guide the missile to its target.
- Patriot can operate in semiautomatic and automatic modes. Semiautomatic mode, according to Janes, provides "a high degree of computer-based engagement support, autonomously classifying and identifying tracks, automatically querying them for identification friend-or-foe (IFF) response, and then providing recommendations to the operators in the ECS. At this point, a human operator makes the go/no go decision to proceed with an engagement."
- In the automatic mode, all processes are carried out autonomously by the system. The automatic mode is no longer used by the Army because of past fratricide (friendly fire) incidents, although it remains in the system's capabilities.
- Patriot systems can operate independently but are primarily designed for point defense, meaning they can "protect a specific asset or location, and are best deployed as part of a layered missile defense system … Patriot systems [can] work with other missile defense systems such as THAAD [Terminal High Altitude Area Defense system] to form a multi-tier, integrated, overlapping defense," MDAA states.

Patriot Interceptor Missiles

While the radars, ECS, launchers, and other supporting components have been modernized and improved since Patriot's inception, according to Janes, "the most significant developments to the system since initial fielding have been to its missiles." Patriot employs the MIM-104 series missile, of which there are 12 main variants. Janes notes the following:

> The missile family is divided into two broad subfamilies: the MIM-104A to MIM-104E (including PAC-1, PAC-2, PAC-2 GEM and derivative missiles), which operate on a blast/fragmentation principle for engagement of aircraft and limited engagement of tactical ballistic missiles; and the MIM-104F (including the PAC-3 and PAC-3 MSE missiles), which are much smaller munitions designed specifically for engaging ballistic missiles, with a limited capability for engaging aircraft.

Patriot employs a variety of missile variants. One example reportedly is the older Raytheon-produced PAC-2 GEM (Guidance Enhanced Missile) variant that explodes near its target and is used against aircraft and cruise missiles. The Army is currently procuring the PAC-3 Missile Segment Enhancement (MSE) interceptor (produced by Lockheed Martin), described as

> a high velocity hit-to-kill, surface-to-air missile capable of intercepting tactical ballistic missiles, air breathing threats, cruise missiles, and unmanned aerial systems. The MSE represents the current generation PAC-3 missile which provides expanded battlespace performance against evolving threats and has been fully integrated into the Patriot system (US and international partners) … and the [THAAD] system (US only).

Reportedly, the Army is working to develop and acquire newer, more capable and cost-effective Patriot interceptor variants.

Patriot Foreign Military Sales

According to Defense Security Cooperation Agency (DSCA) and State Department Bureau of Political-Military Affairs congressional notification releases from 2001 through August 18, 2026, the State Department notified Congress of proposed foreign military sales (FMS) for the Patriot systems to the foreign governments listed below. Some of the listed foreign governments have received Patriot systems; others are awaiting delivery. Information provided by DSCA and the State Department does not differentiate between delivered or pending delivery status. Foreign governments that reportedly acquired the Patriot system prior to 2001 were identified in *Land Warfare Platforms: Artillery & Air Defence* and are marked with an asterisk.

Bahrain, Turkey, Egypt*, Germany, Greece*, Israel, Japan, Kuwait, The Netherlands, Poland, Qatar, Romania, Saudi Arabia, South Korea, Spain, Sweden, Switzerland, Taiwan, and The United Arab Emirates

In September 2025, Denmark reportedly canceled its August 2025 Patriot FMS request and opted instead to acquire the French/Italian-developed SAMP/T system, in part because of shorter delivery times. In March 2026, per press accounts, Switzerland reportedly was considering acquiring a European alternative for Patriot systems previously requested through FMS, in part because of potential delivery delays of four to five years.

Integrating PAC-3 Missiles on Aegis Guided-Missile Destroyers

The Navy reportedly plans to integrate PAC-3 MSE missiles on some of its Aegis guided-missile destroyers. Reportedly, software changes to the Aegis system and the PAC-3 MSE will be required. The developer, Lockheed Martin, reportedly anticipates an initial land-based test in early 2027 and initial operational capability (IOC) in 2028.

Patriot Force Structure

According to information provided to CRS by the Army, 15 Patriot battalions are currently in the Active Component with plans for three additional battalions: one battalion each year from FY2029 to FY2031. A four-battery Patriot battalion, equipped with the Integrated Battle Command System (IBCS) and the Lower Tier Air and Missile Defense Sensor (LTAMDS) costs an estimated $1.792 billion (procurement).

First IBCS Certified Patriot Unit

In November 2026, D Battery, 6th Battalion, 52nd Air Defense Artillery Regiment stationed in the Republic of Korea, successfully completed certification on the IBCS, becoming the first operational Patriot battery to achieve this milestone. According to U.S. Pacific Command this enables the decoupling of sensors and launchers from fire control units, enabling dispersion of resources, thereby "optimizing best sensor-best shooter capability."

Patriot and the Golden Dome Program

The Golden Dome program is an integrated homeland AMD system being developed by the Department of Defense (DOD), which is "using a secondary Department of War designation" under Executive Order 14347, dated September 5, 2025. DOD plans to combine a range of capabilities to create a "system of systems" to protect the United States from "aerial attacks from any foe." While formal Patriot unit requirements are not thought to have been officially requested, Patriot has reportedly been mentioned as a possible component of Golden Dome.

Potential Issues for Congress

Congress may consider several potential oversight questions.

- What are the current Combatant Command Contingency Plan (CONPLAN) requirements for the Patriot system? Does the Army currently have enough ready systems, munitions, and personnel to meet these requirements?
- What is the current DOD force posture and manning guidance for Patriot units? Are current deployments of U.S. Patriot systems leaving other theater operational areas unprotected? If so, how is DOD mitigating this risk?
- What supply chain bottlenecks are inhibiting the production of Patriot systems and munitions? What other systems rely on the same critical materials? How does DOD prioritize/influence the distribution of such materials to manufacturers? What is the desired DOD production rate for Patriot systems and munitions? How might Congress facilitate DOD in achieving desired production rates?
- How many Patriot systems are under contract for production through FMS, under agreement to be provided, or temporarily employed to defend foreign nations? What are the total requirements for foreign Patriot systems?
- How many nations are authorized to coproduce Patriot systems, components, or munitions? What authorities or agreements does the United States have to utilize foreign production lines? How could the United States utilize foreign production lines or additional/new production lines or agreements to supplement the U.S. manufacturing base?
- To what extent are Patriot systems postured against enemy threats that the system was not designed to counter (e.g., low-cost drones)? What is the cost-benefit analysis of this posture? How might other systems be utilized against such threats?

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IF13299

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