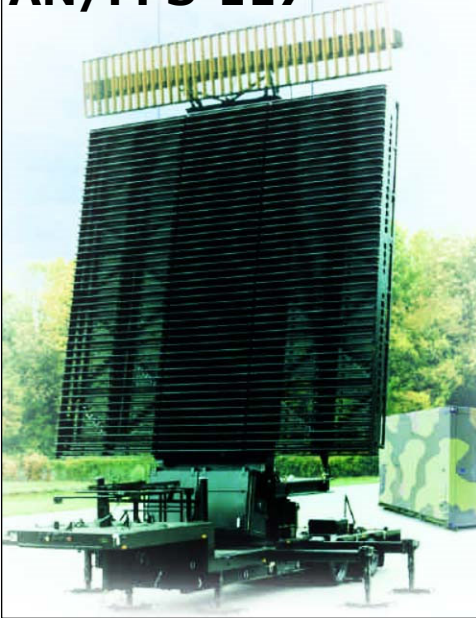


AN/FPS-117



The **AN/FPS-117** is an L-band active electronically scanned array (AESA) 3-dimensional air search radar that was first produced by GE Aerospace in Syracuse, NY in 1980, and now produced by Lockheed Martin. The system offers instrumented detection at ranges on the order of 200 to 250 nautical miles (370 to 460 km; 230 to 290 mi) and has a wide variety of interference and clutter rejection systems. The system was originally developed as part of the "Seek Igloo/Seek Frost" program to replace the older vacuum tube radar systems on the **DEW Line** with designs that could be controlled remotely and required much less maintenance. The joint American-Canadian **North Warning System** using **FPS-117** radars resulted in a reduction in operations and maintenance spending by up to 50% compared to previous systems.

GE made a number of modifications to the original **FPS-117** design to tailor it to different roles. To fill a need for the US Marine Corps, GE developed the transportable **AN/TPS-59**, and later combined design elements to produce the smaller **AN/TPS-77** which is even more mobile, requiring only one prime mover in some deployment scenarios. **FPS-117s**, modified with input from Siemens for German service are known as the **RRP-117**, while the **TPS-77s** in service with the Royal Air Force are known as the **AMES Type 92**. An even smaller version was introduced by Lockheed Martin as the **TPS-77 MRR**.

Aegis - "The Shield of the Fleet"

The world's most capable combat system, the **Aegis Combat System** is the U.S. Navy's and six International Allies' **Surface Combat System**. It is the most capable multi-mission combat system deployed in the world today. Aegis integrates a broad range of sensors and weapons to provide simultaneous Integrated Air and Missile Defense capability.

The **Aegis Combat System** was originally developed by RCA's **Missile and Surface Radar Division** in Moorestown, NJ. Now

part of **Lockheed Martin**, the Moorestown facility is the prime contractor for the **Aegis Combat System** and is responsible for the design, development, integration, and testing of the system. The **Aegis Combat System** is an integrated naval weapons system that uses computers and radars to track and guide multiple weapons. Raytheon is a major subcontractor for the radar that "illuminates" an incoming threat to allow the Navy's Standard Missile to home in on and destroy the threat. **GE's Ordnance Systems** in Pittsfield MA (now part of General Dynamics) produces the 3-axis positioning mounts for Raytheon. **GE's Armament Systems** in Burlington, VT (now part of General Dynamics Ordnance and Tactical Systems) produces the **GAU-8/A Avenger** "Gatling Gun" that fires 3,000 rounds/minute to destroy incoming threats.



VADR - Training System



The U.S. Air Force **Advanced Range Threat System Variant 3 Program Office** awarded Lockheed Martin in Syracuse an initial \$276M contract, which includes production options, to develop and produce the **Variable Aperture Digital Radar (VADR) Training System**. VADR will leverage both X-band and C-band radars to train aircrew for engagements against advanced adversarial threats.

“VADR enhances our product line and demonstrates that we are continuing to lead the way in next generation radar capability,” said Chandra Marshall, Vice President of Lockheed Martin Radar and Sensor Systems. “Our radar technology directly contributes to the overall strength of the U.S. military. It continues to be our top priority to focus on 21st Century Security, to include training our troops with the most advanced systems to best protect our homeland.”

AN/TPQ-53



Multi-Mission, Rapidly Deployable, Proven Performance

The AN/TPQ-53 radar system has a long, rich history protecting the U.S. Army for more than a decade. The Q-53 has proven experience detecting mortars, rockets and artillery and is responsible for keeping troops protected, ensuring a safe return home to their families.

The solid-state phased array AN/TPQ-53 radar system, or, Q-53, detects, classifies, tracks and determines the location of enemy indirect fire in either 360 or 90 degree modes. The Q-53 replaced the legacy AN/TPQ-36 and AN/TPQ-37 medium-range radars in the U.S. Army’s inventory. Compared to the Q-36 and Q-37, the Q-53 provides enhanced performance, including greater mobility, increased reliability and supportability, lower life-cycle cost, and reduced crew size.

The Q-53’s active electronically scanned array (AESA) provides the foundation for multi-mission capabilities. The Q-53 has demonstrated the ability to identify and track unmanned aerial systems (UAS), showing the capacity to incorporate air surveillance simultaneously with counter target acquisition in a single sensor. In 2017, the U.S. Army awarded Lockheed Martin an order-dependent contract for additional Q-53 systems. Since Lockheed Martin won the development contract for the Q-53 radar in 2007, the company has delivered more than 200 radar systems.

Sentinel A4



Sentinel A4 Is the World's Premier Air and Missile Defense Radar

Sentinel A4 is a high-performance replacement of the legacy Sentinel A3 (AN/MPQ-64A3) air and missile defense radar that will provide significant improvements to the existing Sentinel capability against cruise missiles, unmanned aerial systems, rotary wing and fixed wing threats. The **Sentinel A4** will add the ability to detect Rocket, Artillery, and Mortar (RAM) threats, providing RAM Point of Origin and Point of Impact locations, while also providing added protection against electronic threats.

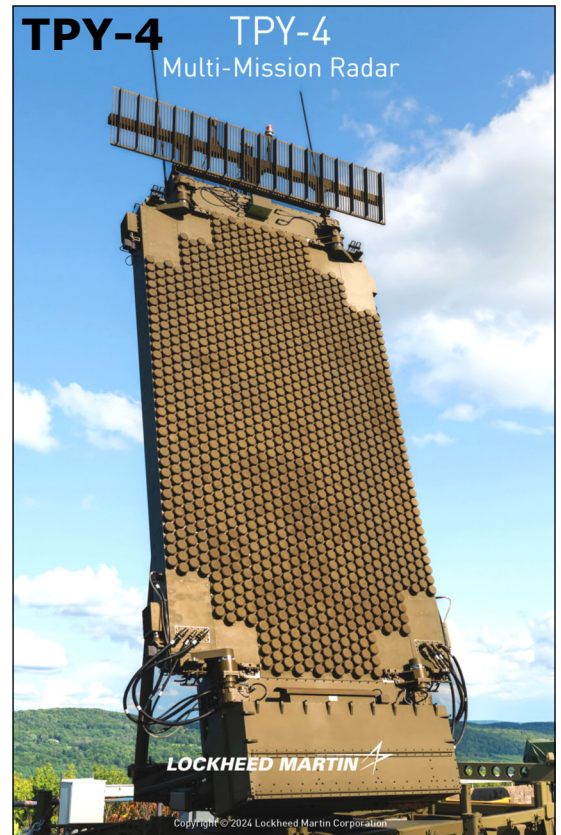
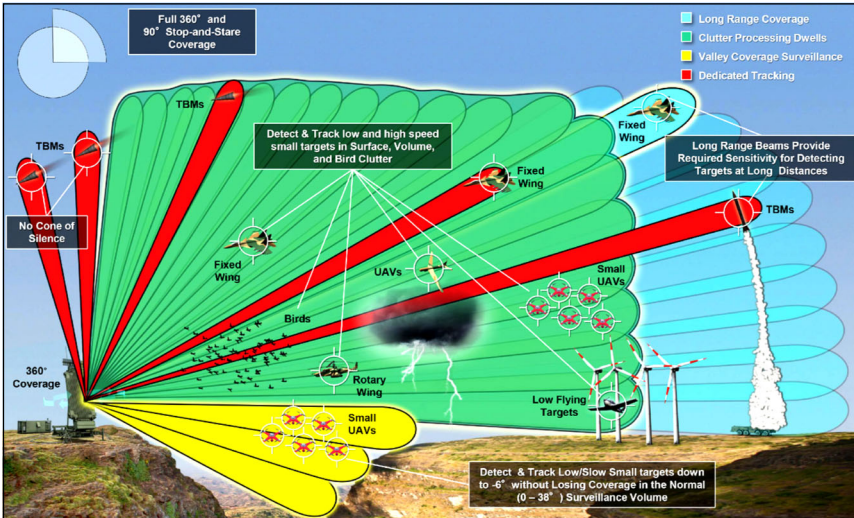
Proven Performance, Now Available in a Tactically Transportable Package

21st century Expeditionary Aerospace Forces need high performance, reliable radar systems that are easy to transport, easy to deploy and ready to operate immediately. To meet these demanding requirements, Lockheed Martin is now producing the AN/TPS-77 3D, long range air surveillance radar - the latest offering in the company's proven line of all solid-state radars. The AN/TPS-77 leverages 15 years of Lockheed Martin investment in the continuous improvement of radar technology and combines it with the company's experience in designing transportable radars for customers worldwide.

The result is a new radar that places the best of the **FPS-117's** performance, reliability and low cost of ownership in a package that is now tactically transportable by C-130 aircraft. Field commanders can count on accurate data on all targets at ranges up to 250 nautical miles and elevations up to 100,000 feet from a radar that can operate 24 hours a day - even with no on-site personnel. The AN/TPS-77 is in production in Syracuse, NY and ready now for deployment around the globe.



Lockheed Martin's TPY-4 is a multi-mission, ground-based radar, produced in Syracuse, NY, for air defense surveillance that can operate in contested electromagnetic environments and provides the warfighter an ability to detect and track current and emerging threats. Gallium Nitride (GaN) technology in the system also provides greater efficiency and improved reliability as compared to legacy systems.



Lockheed Martin's AN/APY-9 radar enhances the US Navy's ascendancy in information warfare. Lockheed Martin, under contract to Northrop Grumman, has delivered the 75th AN/APY-9 radar for the E-2D Advanced Hawkeye aircraft

The APY-9 radar is an integral part of the Advanced Hawkeye program for the United States Navy's Surveillance and Theatre Air and Missile Defense (TAMD) missions. The APY-9 provides enhanced airborne command and control, and expanded surveillance for the Navy's E-2D aircraft. The radar is an all-weather, airborne early warning radar designed to detect small, highly maneuverable targets in the dense littoral and overland environments.

- APY-9 features both mechanical and electronic scanning modes, providing the warfighter with full range 360° situational awareness and the ability to augment with electronic scanning to dedicate extra resources to challenging targets or 90° sectors, in any direction.
- The APY-9 detects both air and sea surface targets simultaneously. The APY-9's unique STAP architecture suppresses clutter, jamming, and other sources of electromagnetic interference, focusing on the target.
- APY-9 operates at UHF which is ideal for long range detection of stressing targets. High Power Solid-State transmitter electronics increases reliability and sensitivity. Advanced Processing enables flexible beam management and enhanced target processing.

Lockheed Martin's airborne radars were initially produced in **Utica, NY**. When that facility closed, airborne radars were moved to **Electronics Park in Syracuse, NY**. Portions of the APY-9 are produced at **Lockheed Martin Energy in Andover, MA**.