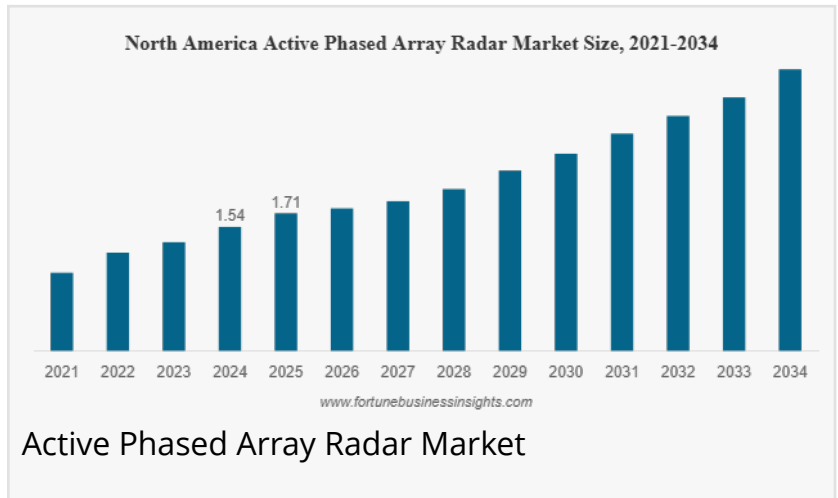


Global Active Phased Array Radar Market Forecast to Reach USD 10.63 Billion by 2034

Market expected to grow from USD 5.05B in 2026 to USD 10.63B at a 9.76% CAGR.

PUNE, MAHARASHTRA, INDIA, February 8, 2026 /EINPresswire.com/ --

The global [active phased array radar market](#) is poised for strong growth through the next decade, driven by defense modernization programs, rising geopolitical tensions, and expanding demand for advanced surveillance technology, according to a new research report published by Fortune Business Insights™. The market was valued at USD 4.84 billion in 2025 and is projected to grow from USD 5.05 billion in 2026 to USD 10.63 billion by 2034, exhibiting a compound annual growth rate (CAGR) of 9.76% during the forecast period.



Active phased array radar systems are central to modern defense architecture, capabilities and rapid, electronic beam steering that enhance threat detection and response across domains.”

Fortune Business Insights

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Active phased array radar (APAR) systems represent a modern generation of radar architecture that uses a large array of transmit/receive (T/R) modules to enable electronic beam steering without moving parts. These radar systems perform critical tasks such as detection, tracking, scanning, and missile guidance, and are integral to modern military and civilian infrastructure.

Market Drivers and Growth Factors

The primary driver of the APAR market is ongoing defense modernization efforts around the world. Governments are increasingly investing in advanced radar systems to counter evolving threats, including hypersonic missiles, unmanned aerial vehicles, and sophisticated electronic warfare environments. These systems offer superior performance and faster reaction times

compared with legacy mechanically steered radars, making them a strategic priority for national defense programs.

Rising geopolitical tensions — particularly across Asia Pacific, Europe, and the Middle East — are fueling defense procurement, with many nations upgrading their airborne, ground, and naval radar capabilities to enhance early warning, airspace security, and force protection.

In addition to defense demand, APAR technology is finding civil applications in advanced weather monitoring and air traffic control systems. Governments recognize the value of electronically steered radars for collecting detailed atmospheric data and improving accuracy in high-traffic airspace and severe weather warning systems.

Market Challenges

Despite strong prospects, the market faces challenges related to thermal management and system integration complexities. APAR systems generate high power densities that can create thermal hotspots, particularly in densely packed arrays, complicating cooling and reliability. Integrating APAR hardware with broader defense command and control systems also requires interoperability, standardized interfaces, and extensive testing to ensure seamless operation.

Another notable constraint is the shortage of specialized engineering talent, especially in advanced signal processing, RF engineering, and machine learning — skills that are critical for developing next-generation APAR systems. This talent gap can slow development and increase dependence on established defense contractors.

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Market Trends

A key technological trend shaping the APAR market is the shift toward software-defined radar architectures and cognitive radar solutions. These approaches allow adaptive beamforming, real-time algorithm tuning, and multi-mission capability — enabling radar systems to respond more effectively to dynamic threat environments. For example, digitally enabled radar platforms are being tested that can execute radar, communications, and electronic warfare functions concurrently.

Another trend is the increasing adoption of gallium nitride (GaN) technology, which offers higher power density and improved efficiency compared with traditional gallium arsenide (GaAs) components. GaN-based modules are gaining traction as designers seek more compact, high-performance radar solutions.

Market Segmentation

The active phased array radar market is segmented across multiple categories that reflect technological preferences and use cases.

By Component

Transmit/Receive (T/R) Modules dominate due to their foundational role in radar performance.

Processors are projected to grow rapidly as the need for AI and real-time signal processing increases.

By Frequency Band

X-band holds the largest share, driven by defense and surveillance requirements.

VHF/UHF bands are among the fastest-growing due to synthetic aperture radar use cases.

By Technology

GaN technology is expected to grow fastest, reflecting a shift toward higher power density and performance.

GaAs technology remains significant due to its established base.

By Array Architecture

Active electronically scanned array (AESA) segments dominate, with superior operational performance and redundancy advantages.

By Installation Type

Fixed installations hold the largest share.

Portable systems are the fastest-growing as defense forces seek deployable, lightweight radar solutions.

By Waveform

Pulse-Doppler leads the market.

Frequency-modulated continuous wave (FMCW) is among the fastest-growing due to autonomous and advanced sensing requirements.

By Cooling Mechanism

Liquid-cooled systems currently dominate due to performance needs.

Air-cooled systems are rapidly growing for mobile and expeditionary platforms.

By Application

Surveillance held the largest share in 2025.

Fire control is projected to grow strongly as radar integration on fighter aircraft and naval vessels increases.

By Platform

Ground-based radar held the largest share.

Space-based APAR is among the fastest-growing segments due to satellite constellation investments.

By End-User

Defense accounts for the dominant share due to extensive military procurement.

Civil government systems — including weather and air traffic control — are also expanding.

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Regional Insights

North America held the largest share of the active phased array radar market in 2025, supported by substantial defense modernization budgets and extensive deployments of advanced radar systems across naval, airborne, and ground platforms. U.S. Department of Defense investments, including contracts for advanced AESA systems on naval vessels and fighter aircraft, have reinforced regional leadership.

The Asia Pacific region is projected to exhibit the fastest growth during the forecast period, driven by geopolitical tensions, indigenous defense technology development, and increased military procurement — especially notable in countries such as India and China.

Europe continues steady expansion with collaborative defense initiatives and multinational programs focused on next-generation radar systems and sensor networks. The Middle East & Africa and Latin America regions are also showing moderate growth as countries invest in air

defense modernization and coastal surveillance capabilities.

Competitive Landscape

The active phased array radar market is highly competitive and dominated by major global defense contractors with established expertise in radar systems, sensors, and integration technologies. Key players profiled in the report include RTX Corporation (Raytheon Technologies), Lockheed Martin, BAE Systems, Thales Group, Leonardo S.p.A., Saab AB, HENSOLDT AG, Israel Aerospace Industries Ltd., ASELSAN A.Ş., CEA Technologies Pty Limited, Bharat Electronics Limited, Mitsubishi Electric, Hanwha Systems Co., Ltd., Indra Sistemas S.A., and Northrop Grumman Corporation.

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