

Atomic Clock - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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Abstracts

The Atomic Clock Market size is estimated at USD 499.37 million in 2024, and is expected to reach USD 684.82 million by 2029, growing at a CAGR of 6.52% during the forecast period (2024-2029).

The atomic clock market's growth is attributed to the increasing need for high-precision atomic clocks in the aerospace and military sectors. Atomic clocks guarantee accurate one-way range measurements, ensuring the user maintains the transmitted GPS signal's phase precision. Developments in quantum computing and quantum communication are expected to create better opportunities for the market.

The expansion of global navigation and positioning systems and the rise of atomic clock applications in GPS and GNSS systems are also fueling the growth of the atomic clock market. However, the high cost of deployment and maintenance may hinder the market's growth during the forecast period.

Atomic Clock Market Trends

Defense to Dominate Market Share During the Forecast Period

The atomic clocks are in huge demand from defense end-users as the global armed forces look to modernize their aging fleet by integrating new and accurate position and navigation systems. Most current-generation aircraft utilize GNSS (GPS) and TACAN positioning and navigation systems, and the demand for new aircraft would also generate parallel demand for atomic clocks during the forecast period.

On this note, in December 2018, the US Air Force announced the fleet-wide integration

of next-generation GPS receivers to enhance the quality of navigation and positioning measurements. The US Air Force Life Cycle Management Center selected Rockwell Collins to provide its latest-generation Digital GPS Anti-Jam Receiver (DIGAR) for its fleet of F-16 aircraft. Similar initiatives from various armed forces are anticipated to propel the segment's growth during the forecast period.

Many countries, such as the United States, Germany, India, Australia, the United Arab Emirates, and China, are investing in modernizing their existing fleet of military aircraft rather than acquiring entirely new platforms. For instance, in December 2018, the US Air Force announced that their fighter aircraft would be fitted with next-generation GPS receivers to enhance the quality of navigation and positioning measurements. Under this initiative, the US Air Force Life Cycle Management Center selected Rockwell Collins to provide its latest-generation Digital GPS Anti-Jam Receiver (DIGAR) for its fleet of F-16 aircraft. Similar initiatives from various armed forces are anticipated to propel the segment's growth during the forecast period.

The anticipated advancement of navigational aids for aircraft is expected to create new market opportunities for companies. For instance, Northrop Grumman Corporation's All Source Adaptive Fusion (ASAF) software allows military aircraft and airborne weapon systems to guide them without using Global Positioning System (GPS) satellite signals. Such software, when used with advanced sensor systems, is anticipated to improve the operational efficiencies of the air platforms.

North America is Expected to Have the Largest Market Share During the Forecast Period

The world defense expenditure crossed over USD 2 trillion in 2022, with significant military powers such as the US surging their defense budgets in 2022, according to the Stockholm International Peace Research Institute (SIPRI). US defense spending increased by USD 71 billion from 2021 to 2022, which comprised nearly 40% of global defense expenditures.

The US Air Force continues developing and procuring next-generation aircraft to meet the demands of great power conflicts with Russia and China. The US Air Force comprises 13,247 aircraft that are part of an operational, reserve, and out-of-service fleet. The country's diplomatic and military relations with nations such as Japan and Taiwan have compelled it to drive significant investments into increasing the fleet of

aircraft to counter any provocative military action from China successfully.

Furthermore, the US involvement in the military conflict in the Middle Eastern region majorly drove its procurement of attack aircraft and transport aircraft. The Department of Air Force proposed a budget request of USD 194 billion for FY2023, a USD 20.2 billion or 11.7% increase from the FY2022 budget request. A major chunk of this budget will be channeled toward the procurement of new aircraft and research and development of new technologies that can aid the military actions undertaken by the country. Also, the rising expenditure on the space sector, increasing number of satellite launches for commercial and defense applications, and growing space exploration activities from NASA and SpaceX are significant boosters for the US market, which drives the atomic clock market in the North American region.

Atomic Clock Industry Overview

The atomic clock market is semi-consolidated, with a handful of players operating globally. Thermo Fisher Scientific Inc., Oscilloquartz (Adtran Networks SE), Microchip Technology Inc., Leonardo SpA, and Safran are some of the major market players. The market is highly competitive, with players competing to gain the largest market share.

Market players compete, leveraging their in-house manufacturing capabilities, global network footprint, product offerings, research and development investments, and robust client base. Technical capabilities and product features at definite price points are also key market parameters. The increasing demand for accurate positioning and navigation capabilities drives the market players to broaden their product portfolio. With a moderate threat of new entrants, the market's competitive landscape is projected to intensify due to heightened product/service extensions and technological innovations.

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