



ATLA

Acquisition, Technology &
Logistics Agency



Acquisition, Technology & Logistics Agency (ATLA)

<https://www.mod.go.jp/atla/en/index.html>

ATLA

Acquisition,
Technology & Logistics
Agency

Research and Development

Going forward with innovation

The Acquisition, Technology & Logistics Agency (ATLA) was established as an extra-ministerial bureau of the Japan Ministry of Defense with numerous missions. The range of missions includes, 1) enhancing Japan's industrial base to carry out research, development, and production of defense equipment, 2) appropriately and efficiently implementing research and development, procurement, supply, and management, and 3) promoting international cooperation. This brochure focuses on the research and development undertaken by ATLA.

Missions of ATLA

- 1 Ensuring technological superiority and responding to operational needs smoothly and quickly
- 2 Efficient acquisition of defense equipment (project management)
- 3 Strengthening of defense equipment and technology cooperation with other countries
- 4 Maintain and strengthen defense production and technological bases
- 5 Cost reduction efforts and strengthening of inspection and audit functions

LASER



Future Capabilities Development Center

The Research on High-Energy Lasers

We are conducting research on high-energy laser systems that can shoot a high-energy laser onto a target to cause instant damage. Powered by electricity, this system has the advantage of being able to fire continuously as long as power is supplied, and is also low-cost. The research is undertaken to enable these systems to target mortar shells and small Uncrewed Aerial Vehicles (UAVs), with the future goal of targeting drones and missiles.



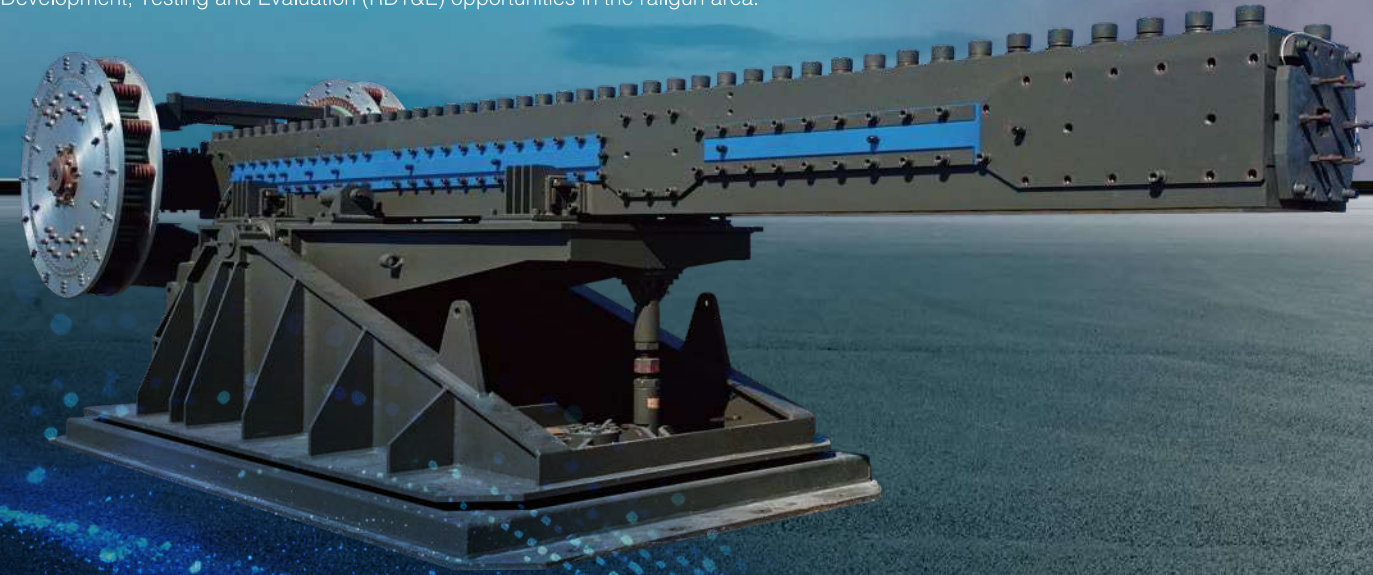
Ground Systems Development Division

Vehicle-Mounted High-Energy Laser System

We are developing a prototype of a vehicle-mounted high-energy laser system with rapid deployment capability, aiming to establish technology that enables countermeasures against attacks using multiple coordinated small UAVs, which have become an increasingly serious threat in recent years.

The Research on Electromagnetic Railgun

An electromagnetic railgun can accelerate and launch projectile by using electrical energy. Moreover, it can launch projectile in extremely high muzzle velocity compared with conventional guns using energy of gunpowder, and is expected to realize greater penetration power and longer shooting range. In May 2024, ATLA signed Terms of Reference (TOR) for the cooperation on railgun technologies among France, Germany, and the French-German Research Institute of Saint-Louis, to facilitate the information exchange of railgun technologies and to explore the possibility of cooperative Research, Development, Testing and Evaluation (RDT&E) opportunities in the railgun area.



The Development of the Next-Generation Fighter Aircraft

Currently, Japan, the UK, and Italy are jointly developing the next-generation fighter aircraft. This is to bring together the technologies of the three countries to develop a superior fighter aircraft that will ensure future air superiority, while sharing costs and other technical resources among the three countries. It is important that the next-generation fighter aircraft possesses excellent air-to-air capabilities that can intercept attacks as far out over the sea and as remotely as possible, specifically:

- Sensing technology to better understand threats using radar, cameras, and other equipment;
- Stealth performance to make it difficult to be discovered by the threat; and
- In terms of network combat that enables coordinated combat operations by sharing information on the location of threats and allies via communications.

In addition to high capabilities of the above, cruising range and other factors are also crucial.





Future Capabilities Development Center

The Research on High-Power Microwave (HPM)

In order to defend against UAV swarm attacks, etc., we aim to establish a technology to target these kinds of attacks using high-power microwaves instead of conventional live ammunition. This technology is expected to be a low-cost solution compared to live ammunition. Moreover, the technology contributes to realize manpower savings and uncrewed operation. From July 2024, we have been conducting joint research with the United States.



Air Systems Research Center

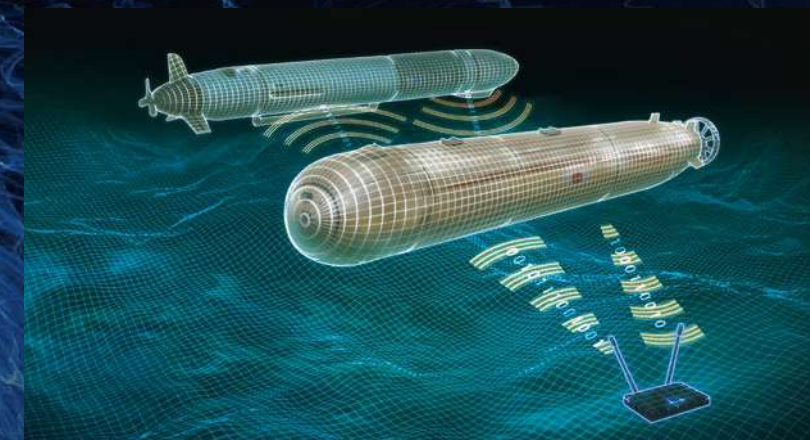
The Research on AI Technology for Uncrewed Aerial Vehicles

In order to realize UAVs that carry out missions with other aircraft such as the next-generation fighter aircraft, the first of which are scheduled to be deployed by FY 2035, we are conducting research on artificial intelligence (AI)-related technologies for decision-making and situational awareness, as well as research on the technologies necessary for effective crewed-uncrewed teaming. The Joint research with the United States to apply AI technologies to decision-making in UAVs has been ongoing since December 2023.

Naval Systems Research Center

Japan-Australia Joint Research on Evaluation Techniques for Underwater Acoustic Communications

The research aims to obtain a method to establish evaluation indices for underwater acoustic communication by connecting UUV test and evaluation simulators in both countries, bringing together underwater acoustic communication models and marine environment information from both countries to conduct simulations under a variety of scenarios. The results of this joint research are expected to be used for future UUV interoperability between Australia and Japan.



Ground Systems Research Center

The Research on UGV Technology

We are advancing research on the development of Uncrewed Ground Vehicles (UGVs) intended for use in reconnaissance, surveillance, cargo transport, and other applications. We aim to establish technologies for self-position estimation, environmental recognition, and the coordination of multiple UGVs to enable continued operations even on unpaved and uneven terrain, in situations where maps cannot be used, and when Global Navigation Satellite System (GNSS), such as GPS is unavailable. We have been conducting joint research into autonomous technology for multiple uncrewed vehicles with Australia since May 2021.





Naval Ship Design Division

Construction of the New FFM (frigate)

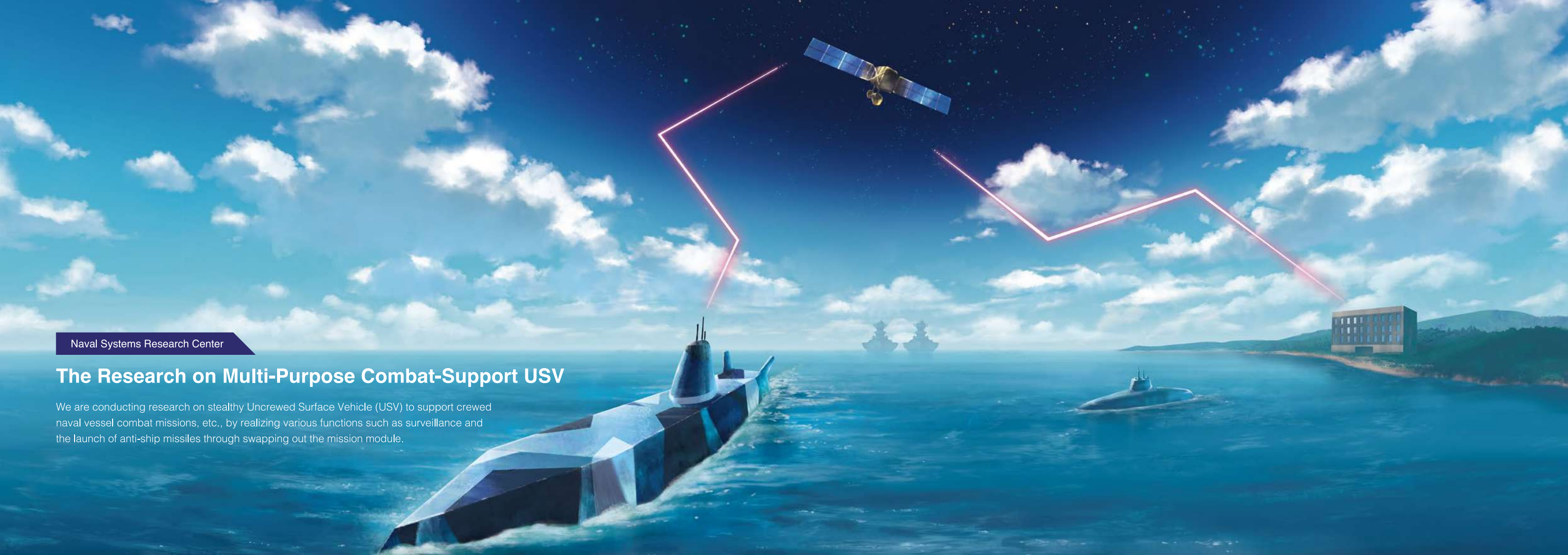
In addition to the various functions equipped in the "Mogami" class frigates, the new FFM has enhanced its capabilities for the increasing needs for peacetime warning and surveillance, as well as strengthened its abilities relevant to various types of combat, such as anti-air and anti-submarine warfare, etc., in times of military contingency, through several approaches, including the incorporation of a missile control function, the installation of long-range missiles, and the adoption of a sonar system with improved detective capabilities compared to previous models.

Naval Systems Research Center

The Research on Long Endurance UUV

We are conducting research on and prototyping a modular Uncrewed Underwater Vehicle (UUV) that can be used for a variety of missions, such as surveillance and ocean observation, which are expected for future UUVs, as well as researching long-term operational technologies and modularization technologies for reconfiguring UUV components.





Naval Systems Research Center

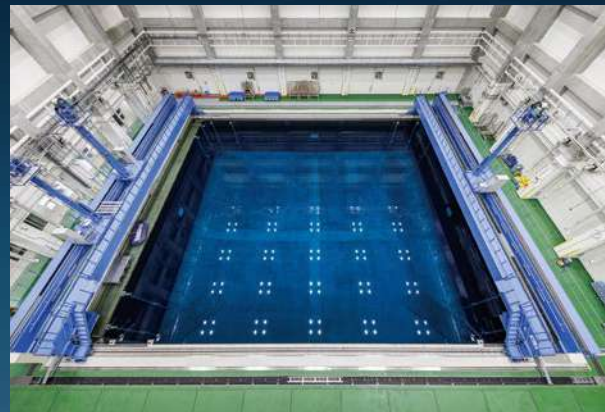
The Research on Multi-Purpose Combat-Support USV

We are conducting research on stealthy Uncrewed Surface Vehicle (USV) to support crewed naval vessel combat missions, etc., by realizing various functions such as surveillance and the launch of anti-ship missiles through swapping out the mission module.

Naval Systems Research Center

Iwakuni Maritime Environment Test & Evaluation Satellite (IMETS)

In IMETS, simulations can be performed repeatedly under various conditions using digital models that simulate the performance and specifications of UUVs. This allows us to evaluate and improve the autonomy and reliability of UUVs and their functions, and apply the results to real UUVs for more efficient and effective testing and evaluation, including test conditions that were previously difficult to conduct in the real field.



Naval Systems Development Division

The Research on UUV Control Technology

In order to advance UUV-related technologies step by step through testing on the sea surface, we have acquired a controlled test UUV with basic performance that can be used for testing on the sea surface. By making use of the test UUV, we are conducting research to gain operational knowledge of sonar-related, position control, and navigation-related technologies.

Naval Systems Research Center

The Research on UUV Underwater Communication

We conduct research to develop underwater communication technology that enables communication between UUVs, leading to the realization of high-speed, underwater communication between them and an underwater communication network necessary for swarm control. The project aims to further develop underwater communication research that has been conducted by the Ministry of Defense, private sectors, and so on, to establish high-speed underwater communication between UUVs and an underwater communication network.



Air Systems Research Center

The Research on Hypersonic Guided Missiles

A hypersonic guided missile can fly from outside the target's threat zone and it is difficult to intercept as it travels at hypersonic speeds*. Countries are conducting research and development to enable the practical use of hypersonic guided missiles, so ATLA also accelerates research to realize such equipment as early as possible.

*These missiles fly at five times the speed of sound (Mach 5) or more: 100 km or more per minute.



Joint Systems Development Division

The Research on Hyper Velocity Gliding Projectiles

We aim to develop hyper velocity gliding projectile at the earliest possible time for use in ground attacks between islands, by establishing elemental technologies which is such as those of hypersonic gliding at high altitudes to avoid intercept, and guiding to targets with high precision.





Aerial Systems Development Division

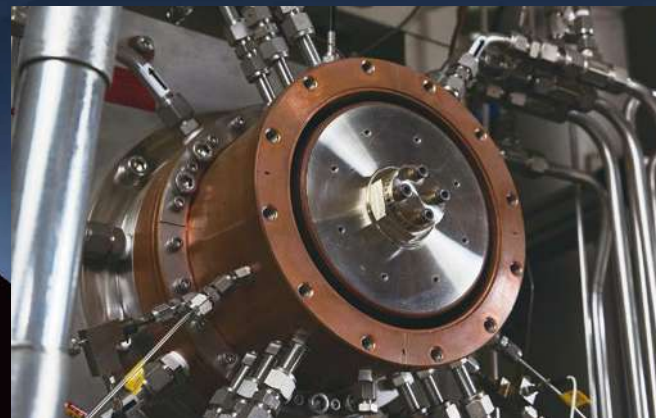
The Development of Electronic Warfare Aircraft

In order to secure superiority in the electromagnetic domain and ensure operational superiority of the Self-Defense Forces, it is essential to improve electronic intelligence gathering capabilities, which form the core of cross-domain operations. For the sake of accurate response to the quality and quantity of the electromagnetic equipment of neighboring countries, we aim to develop an electronic warfare aircraft with highly automated functions to enable constant spherical monitoring, detection, tracking, and identification.

Air Systems Research Center

Rotating Detonation Engine Test Specimen

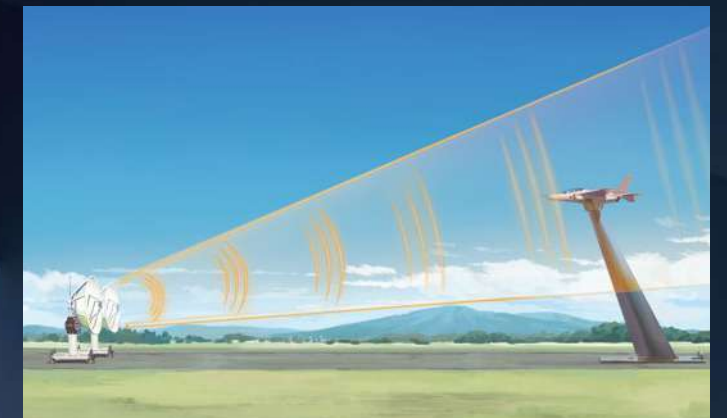
Research is expected to achieve a more compact and fuel-efficient propulsion system by utilizing detonation, a form of combustion that also produces a shock wave, resulting in a theoretical thermal efficiency that is approximately 20% higher compared to existing aviation propulsion systems. We aim to apply this engine as a new technology for aviation propulsion systems.



Future Capabilities Development Center

Follow-Up on Stealth Evaluation System

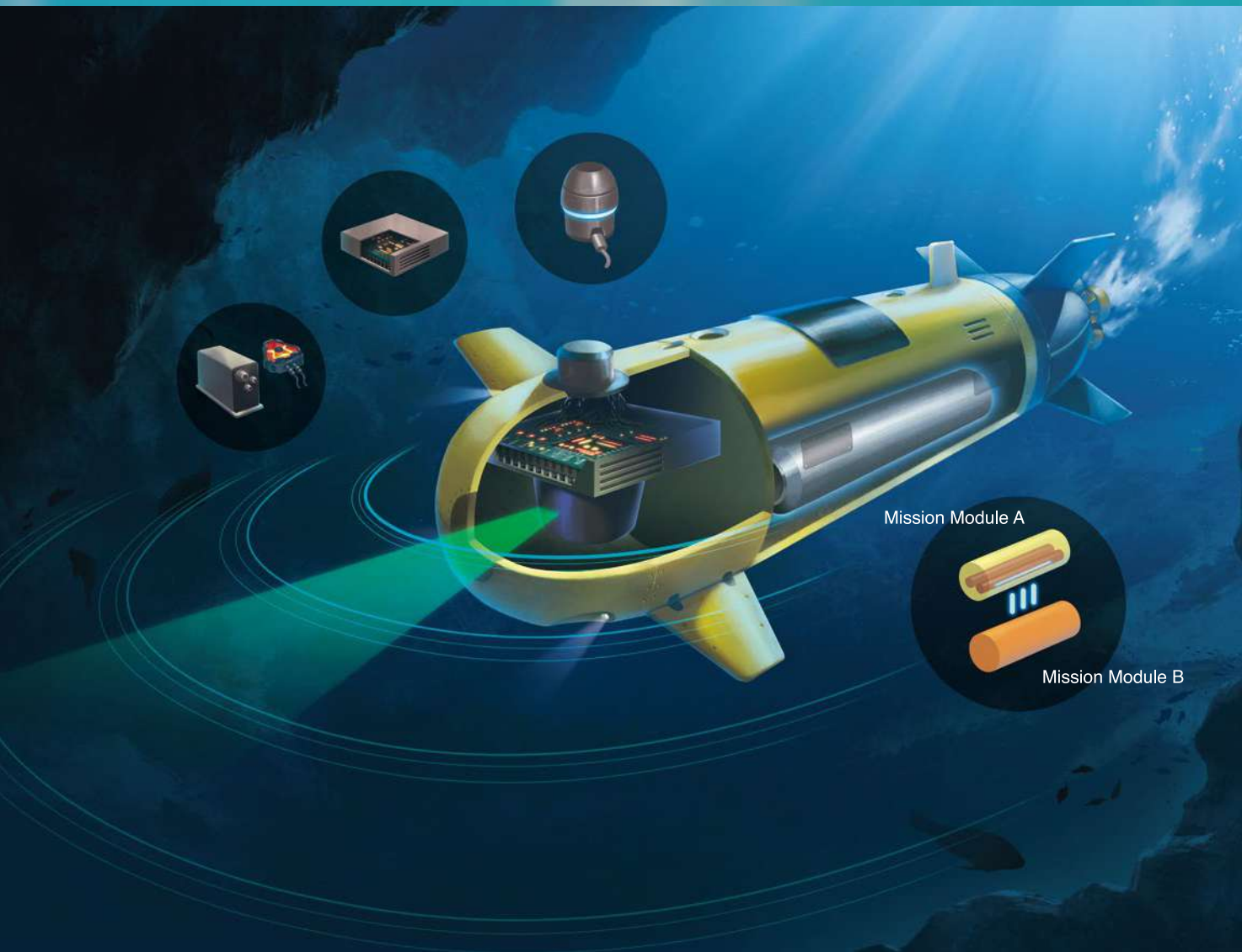
In order to further enhance the stealth capabilities of equipment, it is important to improve design and evaluation techniques for stealth performance during development. For this reason, we are evaluating the stealth performance of various equipment using Radar Cross Section (RCS) measurement system for large equipment such as frigates and aircraft. We will continuously strive to improve our RCS measurement and evaluation technology.



ATLA Gallery

Domestic Technology Cooperation

Integrating cutting-edge commercial technologies into capabilities and deploying them at speed is essential, as those technologies can be a game-changer that fundamentally change warfare. To this end, we will drive the creation of defense innovation in Japan by collaborating with research institutes, universities, etc., that possess various technologies to mutually improve our technological capabilities.



Research Case Studies

Research Collaboration with Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

We have been exchanging technical information on the modularization, autonomy, reliability, and maritime environment test and evaluation of marine drone system. In the meanwhile, we have been collaborating on studies into underwater communication for UUVs.

Innovative Science and Technology Initiative for Security (ISTIS)

ISTIS is a program aimed at contributing to future research and development in the defense sector, through the public solicitation and funding of advanced basic research. Under this program, we hope that research results can be widely utilized in non-defense areas, and through the free publication and dissemination of research results, we hope to further promote research in non-defense areas.



Precision Human Digital-Twin System

A research project is conducting basic research aimed at constructing a system that can reproduce human biological information in a digital space and sense and control minute changes within the body. (This research project is undertaken by Advanced Telecommunications Research Institute International.)



Breakthrough Research



Disruptive Breakthrough Research

We establish ambitious goals, take risks to discover and nurture innovative and groundbreaking science and technology, and conduct unprecedented research to develop new functions and technologies that are not simply extensions of the past.

Spin-on Based Breakthrough Research

We conduct research to develop the functions and capabilities needed for future warfare as soon as possible by integrating various technologies possessed by enterprises and other organizations.



Defense Innovation Science and Technology Institute

Through the implementation of Breakthrough Research and the promotion of the ISTIS program, etc., the institute is working to explore the various possibilities of science and technology, make breakthroughs that defy conventional knowledge, and rapidly utilize science and technology, in collaboration with entities outside the ministry, to promote initiatives that will lead to defense innovation.



Advanced Technology Bridging Research

We have been conducting research to enhance the maturity of technologies in order to bring together innovative and emerging advanced technologies, such as the advanced technologies rapidly advancing in the private sector and the results of the government's investment on science and technology, including the ISTIS program, to the eventual deployment as equipment. We prioritize advanced technologies, taking into account the latest domestic and overseas technologies, and work to further promote research into cutting-age technologies quickly and flexibly.

Defense Equipment Deployed to Date

Since the time of the Technical Research and Development Institute, the predecessor of ATLA, we have been developing domestically produced defense equipment in response to the requirements of the Japan Self-Defense Forces. Especially since the 1980s, as Japan's technological capabilities have improved, we have been deploying high-performance defense equipment.

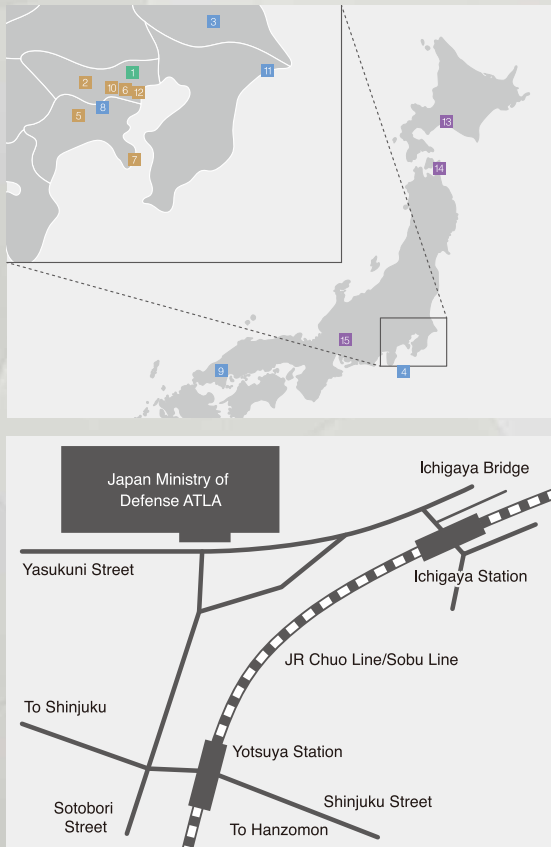


Organization of ATLA



As of October 1, 2024

Location



- Internal Departments
 - Research Centers, etc.
 - Branches
 - and Test Centers
- Internal Departments of the Acquisition, Technology & Logistics Agency (ATLA)**
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 - Kurihama District**
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 - Kawasaki Branch**
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