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KOREA AEROSPACE RESEARCH INSTITUTE

ANNUAL REPORT

2025

CONTENTS

Preface	06
Highlights of the Year	08
R&D Activities	20
Education & Public Outreach	40
 About KARI	
Overview	52
History	54
Organizational Chart	56
Facilities	58
 Appendix	
	62

Korea's Leading Aerospace Research Institute

KOREA AEROSPACE RESEARCH INSTITUTE





President's Greetings

한국항공우주연구원의 2025년 영문 연차보고서를 발간하게 되어 매우 뜻깊게 생각합니다. 이번 보고서는 지난 1년간 우리 연구원이 대한민국 항공우주 발전과 국가 우주 경제 시대를 향해 심 없이 달려온 도전의 발자취이자, 핵심 연구개발의 성과를 담은 기록입니다. 그간 헌신해 주신 항우연 가족과 관계자 여러분께 깊은 감사를 전합니다.

한국항공우주연구원은 2025년에도 도전적인 연구개발을 수행하며 항공우주 기술의 새로운 지평을 열고, 산·학·연·관 협력을 통해 산업 생태계 기반을 강화하였습니다. 특히 누리호 4차 발사 성공은 한국형발사체의 신뢰성을 다시 한번 입증한 성과이자, 민간 체계종합기업이 누리호 제작 전 과정을 주관한 첫 사례로서 우주 발사체 기술의 민간 중심 전환을 보여준 중요한 이정표였습니다. 또한 다목적실용위성 7호를 성공적으로 발사하고, 6호와 7A호의 발사 준비, 정지궤도공공복합통신위성, KPS 위성 1호기, 달착륙선 개발도 차질 없이 추진하였습니다. 항공 분야에서는 재난 감시용 드론의 성층권 비행 가능성을 확인하고, 다수·이종 무인이동체 운용 시험을 수행하였습니다. 아울러 ICG 제19차 연례회의를 성공적으로 개최하며 KPS 기술력을 알리고 국제협력을 강화하였습니다.

이 모든 값진 성과는 국민 여러분의 변함없는 성원과 지지가 있었기에 가능했습니다. 한국항공우주연구원은 2026년에도 국민이 체감할 수 있는 실질적인 성과로 보답하고, ‘우주항공 5대 강국 진입’이라는 국가적 목표 실현을 향해 전 임직원이 한마음으로 정진하겠습니다.

감사합니다.

It is with great honor that we publish the 2025 Annual Report of the Korea Aerospace Research Institute (KARI). This report captures the journey of challenges and achievements that our institute has relentlessly pursued over the past year toward advancing Korea's aerospace capabilities and entering the era of the national space economy. I would like to express my sincere gratitude to all members of KARI and our partners for their dedication and contributions.

In 2025, KARI continued to undertake ambitious research and development, opening new frontiers in aerospace technology while strengthening the industrial ecosystem through industry-university-research institute-government collaboration. In particular, the successful fourth launch of Nuri (KSLV-II) once again demonstrated the reliability of Korea's launch vehicle. It also marked a significant milestone as the first instance of a private-sector system integrator leading the entire production process of Nuri, highlighting the transition toward a private-sector-driven space launch vehicle industry. In addition, we successfully launched Arirang 7 (Korea Multi-Purpose Satellite 7, KOMPSAT-7), while steadily advancing preparations for the launches of Arirang 6 and 7A, as well as the development of Cheollian 3 (Geostationary Earth Orbit Korea Multi-Purpose Satellite, GEO-KOMPSAT-3), KPS-1 (Korean Positioning System Satellite 1), and KPLL (Korea Pathfinder Lunar Lander). In the aviation sector, we verified the feasibility of stratospheric flight for disaster monitoring drones and conducted operational tests of multiple heterogeneous unmanned systems. Furthermore, we successfully organized the 19th Annual Meeting of the International Committee on Global Navigation Satellite Systems (ICG), showcasing KPS technologies and strengthening international cooperation.

All of these meaningful achievements have been made possible thanks to the unwavering support and encouragement of the Korean people. In 2026, KARI will continue to deliver tangible outcomes that the public can experience, and all our employees will work together with a shared commitment to achieve the national goal of becoming one of the world's top five aerospace powers.

Thank you.

한국항공우주연구원장 이 상 철

Sangchul Lee President of the Korea Aerospace Research Institute

HIGHLIGHTS OF THE YEAR

누리호 4차 발사 성공

Successful Fourth Launch of Nuri (KSLV-II)

다목적실용위성(아리랑위성) 7호 발사 성공

Successful Launch of KOMPSAT-7 (Arirang 7)

제19차 유엔 국제위성항법위원회(UN ICG) 총회 개최

Hosting of the 19th United Nations International Committee on GNSS (UN ICG) Meeting

국내 산업체와 함께 차세대중형위성 시리즈 개발

Development of the Compact Advanced Satellite Series in Collaboration with Domestic Industry

화재현장 실내수색 무인이동체 시스템 실내 수색 드론 개발

Development of an Indoor Search Drone for Indoor Fire Site Search Unmanned Vehicle Systems

제5차 한불우주포럼 개최

Hosting of the 5th Korea–France Space Forum



누리호 4차 발사 성공

2025년 11월 27일 누리호(KSLV-II) 4차 발사 성공을 통해 한국형 발사체의 안정적 발사 능력을 입증하였다. 누리호는 국내 독자 기술로 개발된 3단형 발사체로, 1단과 2단에는 각각 75톤급 액체로켓엔진 4기와 1기가, 3단에는 7톤급 액체로켓엔진 1기가 적용된다. 누리호 고도화사업은 한국형발사체 경쟁력 강화와 발사체 산업 생태계 역량 강화를 목표로 추진되고 있다.

이번 누리호 4차 발사에는 차세대 중형위성 3호 등이 탑재되었으며, 나로우주센터는 고흥, 제주 및 팔라우를 포함한 레인지 시스템 추적/계측자원을 활용하여 성공적으로 발사체 추적 정보를 제공하였다.

발사 후 목표고도 600km, 목표 투입속도 7.56km/s에 정상 궤도투입을 확인하였고 임무종료 신호 수신에 중단되기까지 총 1,102초 동안 추적/계측 임무를 수행하였다. 특히 추적레이더는 발사대 기준 사선거리 약 2,700km까지 성공적으로 추적임무를 수행하였으며, 고속카메라시스템을 이용하여 발사체 이륙순간에 엠티리칼(Umbilical)장치 분리 및 발사체 지상고정장치(Vehicle Holding Device) 분리 순간 등의 영상자료를 확보하였다.

발사 임무가 수행되는 동안 국민들은 생방송을 통해 실시간으로 이를 확인할 수 있었으며 발사 성공의 순간을 함께하였다.

아울러 2026년 누리호 5차 발사를 위해 비행모델 5호기 제작·조립과 발사 운용 준비를 추진하는 한편, 누리호 기술 이전도 병행하여 임무 완수를 위해 만전을 기하고 있다.

앞으로도 누리호 추가 발사에 대비하여 우주항공청, 체계종합기업 등과 긴밀히 협력함으로써 우리 기술로 개발한 누리호의 지속적인 활용을 도모할 계획이다.

Successful Fourth Launch of Nuri (KSLV-II)

On November 27, 2025, the successful fourth launch of Nuri (KSLV-II) demonstrated the stable launch capability of Korea's indigenous launch vehicle. Nuri is a three-stage launch vehicle developed with domestic technology. The first and second stages are equipped with four and one 75-ton-class liquid rocket engines, respectively, while the third stage is powered by a single 7-ton-class liquid rocket engine. The Nuri Enhancement Program is being pursued with the goal of strengthening the competitiveness of Korea's launch vehicle and advancing the capabilities of the launch vehicle industry ecosystem.

For this fourth launch, payloads including the Next-Generation Medium-Sized Satellite 3 (CAS500-3) were on board Nuri. The Naro Space Center provided reliable launch vehicle tracking information by utilizing range system tracking and telemetry assets located in Goheung, Jeju, and Palau.

Following liftoff, successful orbital insertion was confirmed at the target altitude of 600 km and the target injection velocity of 7.56 km/s. Tracking and telemetry operations were carried out for a total of 1,102 seconds, until the signal at the end of the mission was no longer received. In particular, the tracking radar maintained stable tracking performance up to an approximate slant range of 2,700 km from the launch site. In addition, key visual data were secured through the high-speed camera system, including footage of the separation of the umbilical system and the Vehicle Holding Device (VHD) at the moment of liftoff.

Throughout the launch mission, the Korean public was able to watch the event in real time via live broadcast and share in the moment of success.

In preparation for the fifth launch of Nuri in 2026, the manufacturing and assembly of Flight Model No. 5 are underway, along with preparations for launch operations. In parallel, technology transfer activities are being carried out to ensure mission success.

Looking ahead, close collaboration with Korea AeroSpace Administration and system integrators will continue to support future Nuri launches and promote the sustained utilization of Korea's domestically developed launch vehicle.



25.11. 누리호 4차발사 당시 MDC#1
MDC#1 during the Fourth Launch of Nuri, November 2025



누리호 4차 발사 이륙순간 엠티리칼 장치 분리 장면 #1
Separation of the Umbilical System at Liftoff during the Nuri 4th Launch #1



누리호 4호기 발사 운용
Launch Operations of Nuri (KSLV-II) 4th Vehicle

다목적실용위성(아리랑위성) 7호 발사 성공

한국항공우주연구원은 고해상도 광학 카메라 및 적외선 센서를 탑재한 다목적실용위성 7호(KOMPSAT-7)를 2025년 12월 2일 02:21(한국 시각) 성공적으로 발사하였다.

발사 약 44분 후 발사체로부터 분리되었고, 남극 트롤지상국 및 북극 스발바르(Svalbard) 지상국과의 교신을 통해 초기 위성 상태를 점검하고 목표 궤도에 정상적으로 안착되었음을 확인하였으며, 13시 40분경에는 대전 항우연 지상국과의 첫 교신에 성공하였다.

이로써 대한민국은 전 세계에서 극소수의 국가만이 보유한 0.3m급 고해상도 지상관측 영상 제공이 가능한 위성을 확보하게 되었다. 다목적실용위성 7호는 우리나라가 독자적으로 구축해 온 정밀 지구관측 능력을 한 단계 고도화시키는 위성으로, 재난·재해 감시, 국토관리 등 국내 관측영상 정보 수집 능력의 향상을 통하여 신속하고 정확한 정보제공이 가능할 것으로 기대된다.

한국항공우주연구원은 한반도 정밀 관측과 국가 영상수요 충족을 위해 다목적실용위성(KOMPSAT) 시리즈를 개발하고 있다. 이번에 발사에 성공한 다목적실용위성 7호에 이어, 전천후 지상·해양 관측을 위한 고성능 영상레이더(SAR, Synthetic Aperture Radar)를 탑재한 다목적실용위성 6호가 발사를 준비 중이며, 정밀 관측 효율성 향상을 위해 다목적실용위성 7호의 성능을 개량한 다목적실용위성 7A호 또한 계획에 따라 순조롭게 개발되고 있다.

Successful Launch of KOMPSAT-7 (Arirang 7)

On December 2, 2025, at 02:21 (KST), KARI successfully launched Korea Multi-Purpose Satellite 7 (KOMPSAT-7), equipped with a high-resolution optical camera and an infrared sensor.

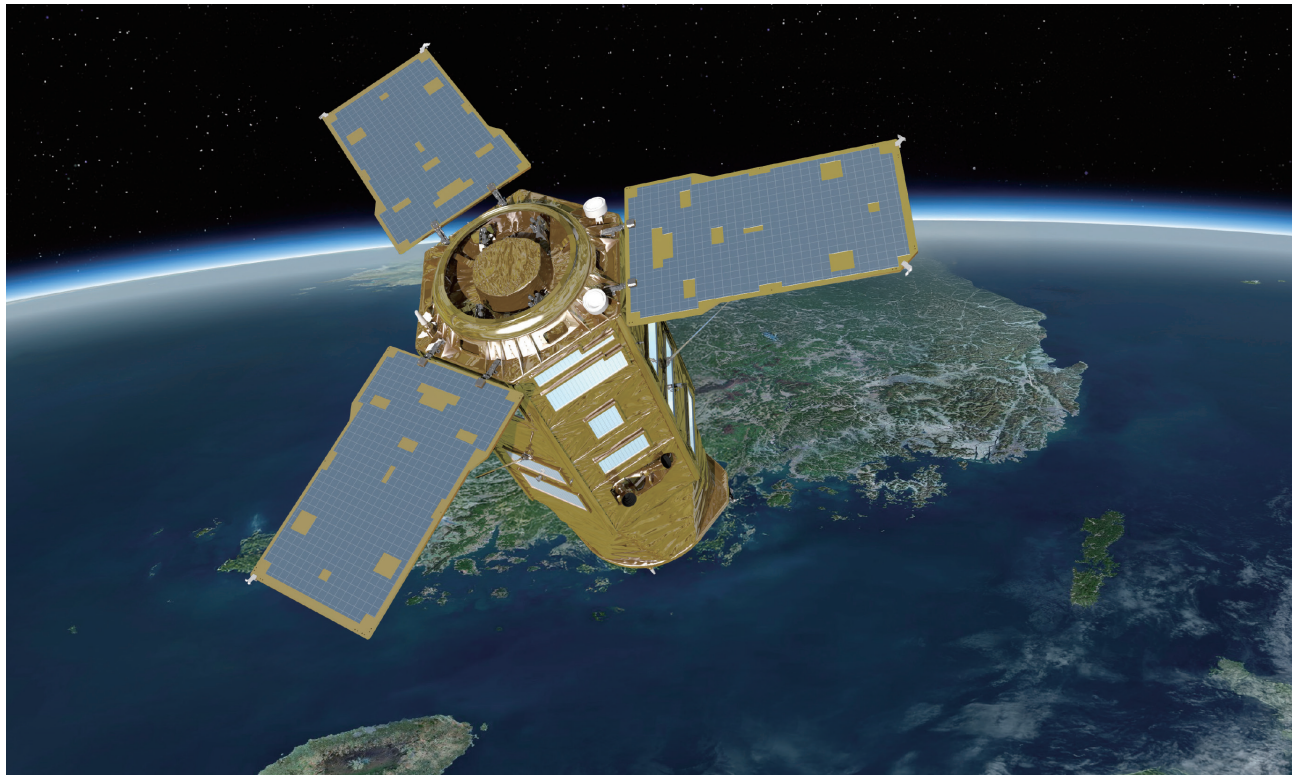
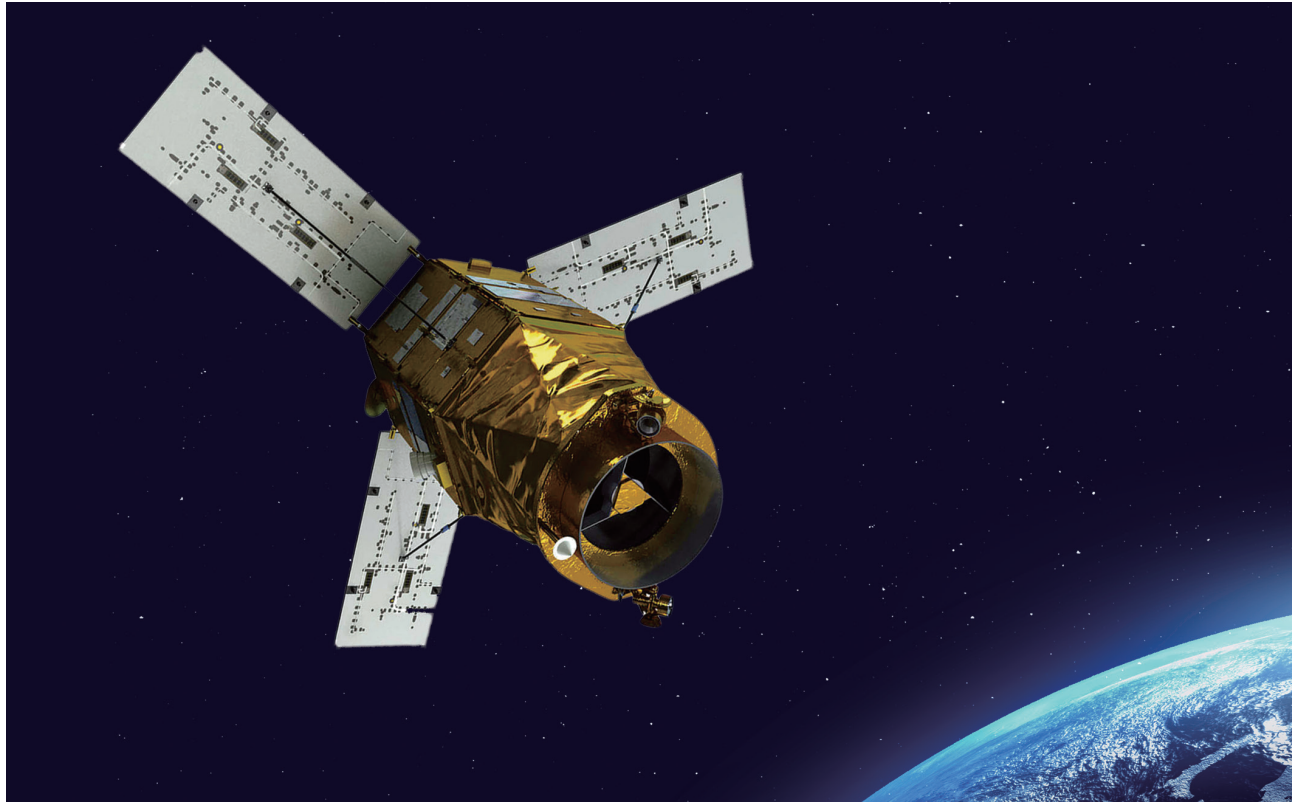
Approximately 44 minutes after launch, the satellite was successfully separated from the launch vehicle. Initial satellite status was verified through communication with the Troll ground station in Antarctica and the Svalbard ground station in the Arctic, confirming its successful insertion into the target orbit. At approximately 13:40 (KST), the first contact was successfully established with the KARI ground station in Daejeon, Korea.

With this achievement, Korea has secured a satellite capable of providing high-resolution Earth observation imagery at the 0.3-meter level, a capability possessed by only a few countries worldwide. KOMPSAT-7 represents a significant advancement in Korea's independently developed precision Earth observation capabilities and is expected to enhance the nation's ability to collect observation data for applications such as disaster monitoring and national land management, enabling the provision of timely and accurate information.

KARI is developing the Korea Multi-Purpose Satellite (KOMPSAT) series to enable high-resolution observation of the Korean Peninsula and to meet national demand for satellite imagery. Following the successful launch of KOMPSAT-7, KOMPSAT-6, equipped with a high-performance Synthetic Aperture Radar (SAR) for all-weather land and maritime observation, is currently being prepared for launch. In addition, KOMPSAT-7A, an enhanced version of KOMPSAT-7 designed to improve observation efficiency, is also being developed steadily in accordance with the planned schedule.



다목적실용위성 6호 X대역 안테나 장치 전개시험
Deployment Test of the KOMPSAT-6 X-band Antenna



다목적실용위성 7호 비행 상상도
Conceptual Illustration of KOMPSAT-7 in Orbit

제19차 유엔 국제위성항법위원회(UN ICG) 총회 개최

KPS개발사업본부는 2025년 10월 19일부터 24일까지 대한민국 부산에서 개최된 제19차 유엔 국제위성항법위원회(UN ICG) 연례회의의 준비와 운영을 주관하였다. 이번 회의는 2022년 아부다비에서 열린 제16차 ICG 연례회의에서 한국 대표단이 유치한 것으로, 미국, 일본, 중국, 유럽연합, 인도 등 UN ICG 회원국 대표 약 200명이 참가하였다.

참가자들은 본회의(plenary session)와 작업반(WG, working group) 회의에 참석하여 위성항법시스템 간 공존성과 상호운용성, 달 항법(Lunar PNT), 저궤도 항법(LEO PNT), 우주 서비스 영역, 고정밀서비스(Precise Point Positioning) 등에 대해 논의하였다. 특히 이번 연례회의에서는 'GPS의 아버지'로 알려진 Bradford Parkinson 교수의 세미나와 달 위성항법 시스템 구축을 위한 WG-L의 첫 회의가 개최되어 그 의미를 더하였다. 아울러 양·다자간 실무회의를 통해 KPS 개발을 위한 국제협력도 강화하였다.

Hosting of the 19th United Nations International Committee on GNSS (UN ICG) Meeting

The Korean Positioning System (KPS) R&D Directorate of KARI organized the 19th Annual Meeting of the United Nations International Committee on GNSS (UN ICG), held in Busan, Republic of Korea, from October 19 to 24, 2025. This meeting was secured by the Korean delegation at the 16th ICG Annual Meeting held in Abu Dhabi in 2022, and was attended by approximately 200 representatives from UN ICG member entities, including the United States, Japan, China, the European Union, and India.

Participants attended plenary sessions and working group (WG) meetings, where they discussed key topics such as interoperability and compatibility among global navigation satellite systems, lunar PNT, Low Earth Orbit (LEO) PNT, space service volume, and Precise Point Positioning (PPP).

A highlight of the meeting was a special seminar led by Professor Bradford Parkinson, widely recognized as the "father of GPS". The event also marked the inaugural meeting of Working Group L (WG-L), which focuses on the development of a lunar navigation system, further underscoring the event's significance. In addition, bilateral and multilateral working-level meetings were held to strengthen international cooperation for the development of KPS.



국내 산업체와 함께 차세대중형위성 시리즈 개발

국가 연구개발 정책에 따라 국내 산업체가 항공우주연구원으로부터 이전받은 기술을 활용하여 총 4기의 차세대중형위성(Compact Advanced Satellite 500, CAS500 series)을 주관 개발하고 있으며, 한국항공우주연구원은 탑재체 개발과 지상국 개발, 기술관리·감독 분야에 참여하고 있다.

2025년 하반기에는 차세대중형위성 3호(CAS500-3)가 누리호 4차 발사의 주탑재위성으로 성공적으로 발사되어 첫 결실을 거두었다.

차세대중형위성 2호(CAS500-2)의 국토관측용 정밀 전자광학 탑재체는 국내 산업체가 제작한 본체와의 조립이 완료되어 발사 준비가 진행 중이며, 차세대중형위성 4호(CAS500-4)의 농·산림 상황 관측용 광역 전자광학 탑재체는 위성체 시스템 총조립시험(System Integration & Test)을 지원하고 있다. 또한 차세대중형위성 5호(CAS500-5)의 수자원 감시용 C밴드 영상레이더는 상세설계(Critical Design)가 진행 중이다.

아울러 국내 산업체 주도로 개발 중인 차세대중형위성 시리즈의 시스템 및 본체 개발 부문에 대해 기술관리·감독(Technical Management·Supervision)을 수행하고 있으며, 위성 운용과 영상 감·보정을 위한 지상국 개발도 담당하고 있다.

Development of the Compact Advanced Satellite Series in Collaboration with Domestic Industry

In accordance with the national R&D policy, domestic industries are leading the development of a total of four Next-Generation Medium-Sized Satellites (Compact Advanced Satellite 500, CAS500 series) by utilizing technologies transferred from KARI. KARI is contributing to payload development, ground system development, as well as technology management and oversight.

In the second half of 2025, CAS500-3 was successfully launched as the primary payload aboard the fourth launch of Nuri (KSLV-II), marking the program's first major milestone.

For CAS500-2, the precision electro-optical payload for land observation has been fully assembled with the domestically manufactured satellite bus and is currently undergoing launch preparations. For CAS500-4, the wide-swath electro-optical payload for agricultural and forestry monitoring is being supported through system-level integration and testing (System Integration & Test).

In addition, the C-band Synthetic Aperture Radar (SAR) for water resource monitoring on CAS500-5 is currently in the Critical Design phase. KARI is also responsible for technical management and supervision of the system and satellite bus development for the CAS500 series led by domestic industry, as well as for the development of ground systems for satellite operations and image calibration and validation.



CAS500-3



CAS500-2 payload



CAS500-2 payload and satellite bus assembly #1



CAS500-2 payload and satellite bus assembly #2

화재현장 실내수색 무인이동체 시스템 실내 수색 드론 개발

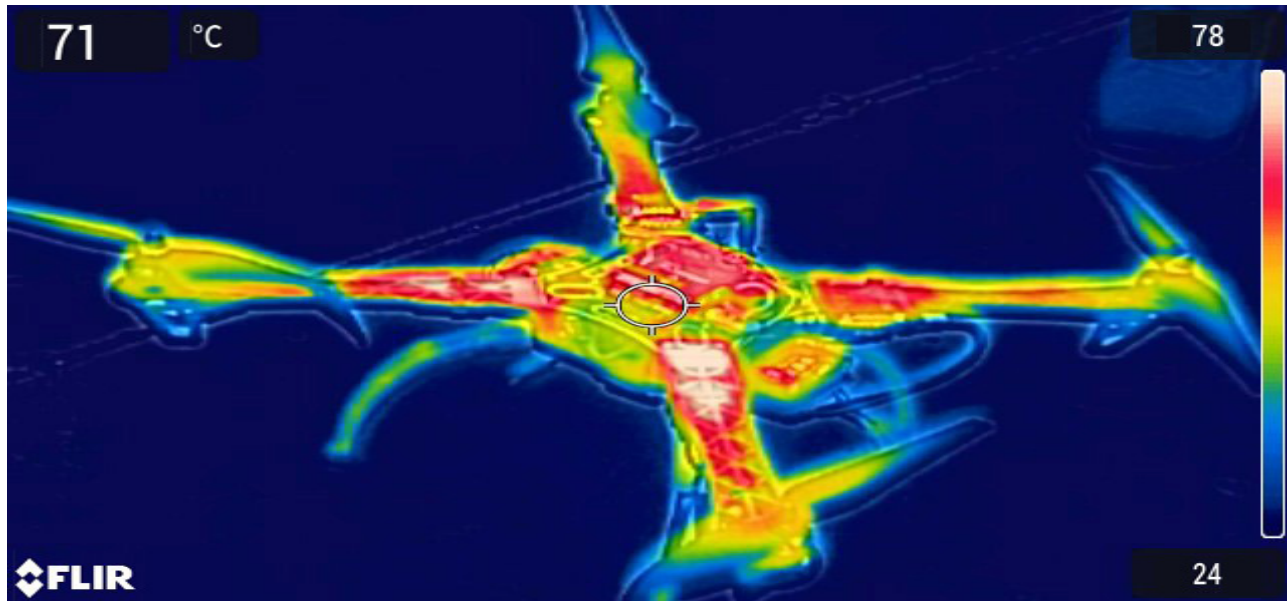
화재 현장 실내 수색 무인이동체는 구조 골든타임 확보와 현장 대원의 안전성 강화를 목적으로 개발되었다. 본 시스템은 초기 진압 이후 소방대원 투입 전에 드론과 지상로봇(UGV)의 협력 운용을 통한 실내 수색을 목표로 하며, 한국항공우주연구원은 이 가운데 실내 수색 드론의 연구개발을 전담하여 주관하고 있다.

실내 수색 드론은 복사열 200℃, 주변온도 80℃, 가시거리 1m, 100% 포화수증기, Non-GNSS 환경 등 극한 임무 조건에서 UGV와 협업하여 약 20분간 실내 수색 임무를 수행하는 것을 목표로 연구가 진행되고 있다. 이를 위해 내열 성능 확보를 위한 독자적인 냉각시스템 설계와 Non-GNSS 및 저시정 환경에서도 안정적으로 비행하기 위한 복합센서 항법시스템 설계·개발을 수행하였다.

현재는 실내 수색 드론의 신뢰성 검증을 위해 냉각시스템 열공력 해석, 복사열 차폐 성능 실험, 실화재 내열 성능 실험, 배터리 성능 실험, 추진계통 성능 실험 등 다양한 해석과 실험을 수행하고 있으며, 2026년에는 시제기 개발과 단독 임무 수행 능력 입증을 추진할 계획이다. 2027년 이후에는 UGV 및 지상관제시스템(GCS)과의 통합 운용 실증을 통해 시스템 완성도를 단계적으로 확보할 예정이다.



실내수색 드론 실화재 시험
Real-Fire Test of the Indoor Search Drone



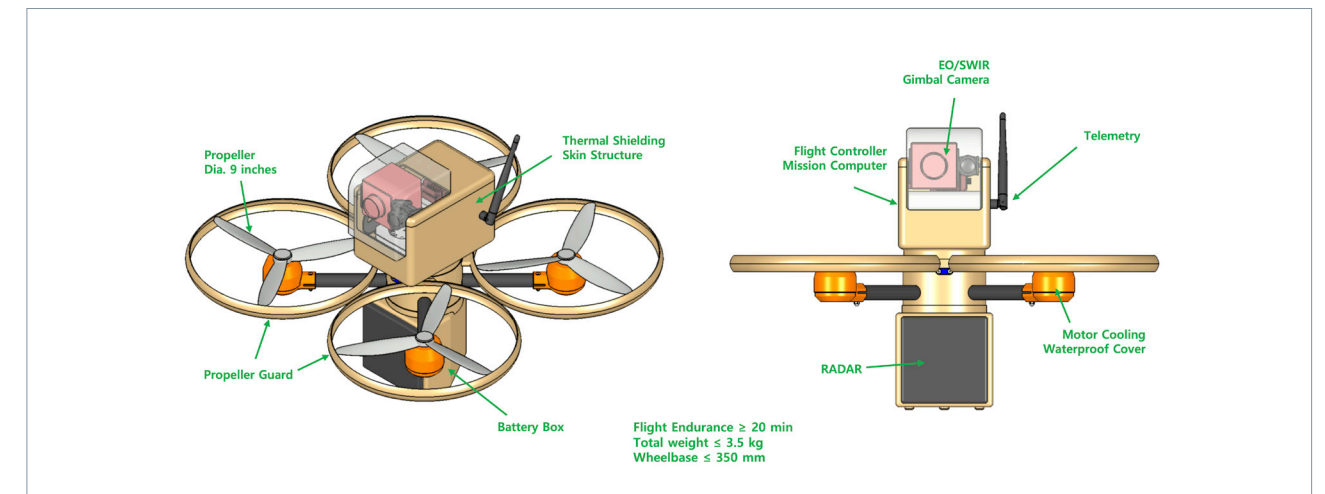
실화재시험 후 실내수색 드론 온도 분포-영상상기메라 촬영
Thermal Distribution of the Indoor Search Drone after the Real-Fire Test

Development of an Indoor Search Drone for Indoor Fire Site Search Unmanned Vehicle Systems

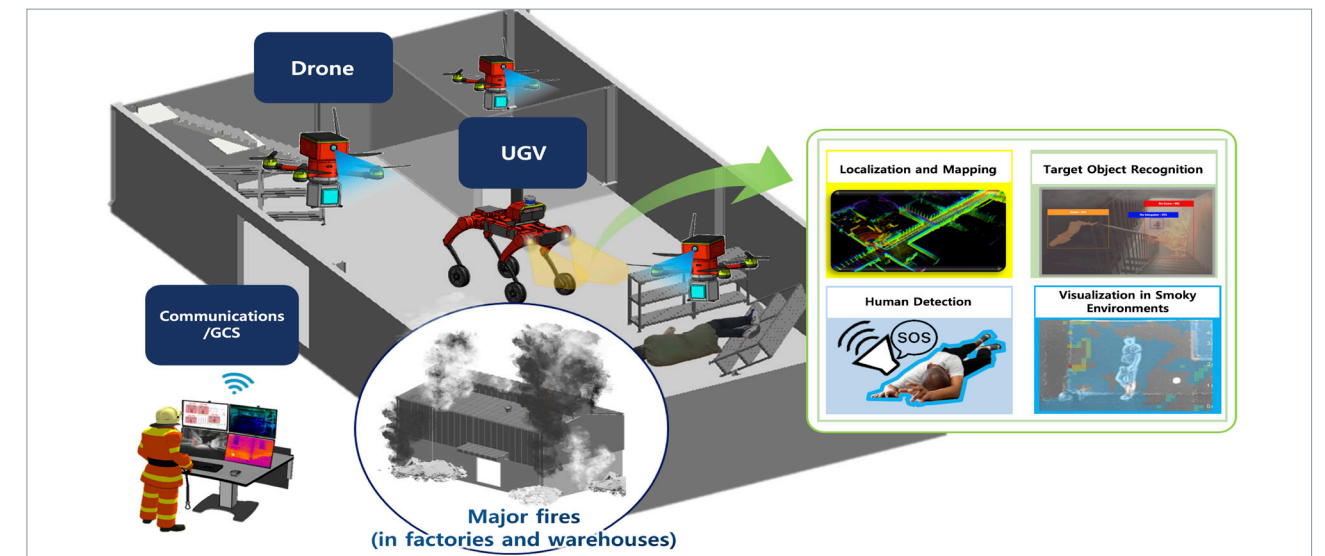
The indoor fire site search unmanned vehicle has been developed to secure the golden time for rescue and enhance the safety of on-site responders. The system is designed to conduct indoor search missions through the cooperative operation of a drone and an Unmanned Ground Vehicle (UGV) prior to the deployment of firefighters after initial fire suppression. KARI is leading the research and development of the indoor search drone component.

The indoor search drone is being developed to operate in extreme mission environments, including radiant heat of up to 200°C, ambient temperatures of 80°C, visibility of 1 meter, fully saturated water vapor conditions (100% humidity), and GNSS-denied environments. The system aims to perform indoor search missions for approximately 20 minutes in cooperation with a UGV. To achieve this, KARI has designed a proprietary cooling system to ensure thermal resistance and developed a multi-sensor fusion navigation system capable of stable flight under Non-GNSS and low-visibility conditions.

Currently, to verify the reliability of the indoor search drone, various analyses and tests are being conducted, including aerothermal analysis of the cooling system, radiant heat shielding performance tests, real-fire thermal performance tests, battery performance tests, and propulsion system performance tests. In 2026, KARI plans to develop a prototype and demonstrate independent mission capabilities. From 2027 onward, the system will undergo integrated operation demonstrations with UGVs and the Ground Control System (GCS) to progressively enhance system maturity.



실내수색 드론
Indoor Search Drone



소방과제 개요도
Overview of the Fireground Indoor Search Unmanned System

제5차 한불우주포럼 개최

한국항공우주연구원은 2025년 10월 27일 우주항공청(KASA) 및 프랑스 국립우주연구원(CNES)과 함께 제5차 한불우주포럼을 주관·개최하였다.

한불우주포럼은 2015년 한불 수교 130주년 기념 정상회담에서 논의된 양국 우주협력 강화의 후속 조치로 마련된 협력 플랫폼으로, 양국 우주기관과 산업계가 우주 정책과 산업 동향을 공유하고 협력 기회를 모색하는 자리이다.

이번 포럼은 “지평을 넓히다: 우주 자립성, 회복력 및 지속가능한 성장을 위한 한-불 대화”를 주제로 진행되었으며, 전략적 우주 자립성, 우주탐사, 차세대 궤도 역량, 우주 서비스, 상업 우주 등에 대한 발표와 패널토론이 이루어졌다. 또한 B2B 미팅을 통해 한국 기업 15개사와 프랑스 기업 17개사가 참여하여 다양한 분야에서의 협력 가능성을 모색하였다.

포럼 다음 날에는 연구원 본원에서 프랑스 8개 우주기업과 KARI 연구진이 참여한 기술 워크숍을 개최하여 양측의 연구개발 현황을 공유하고 향후 협력 가능 분야에 대해 논의하였다.

Hosting of the 5th Korea–France Space Forum

On October 27, 2025, the Korea Aerospace Research Institute (KARI), in collaboration with the Korea AeroSpace Administration (KASA) and the French National Centre for Space Studies (CNES), co-hosted the 5th Korea–France Space Forum.

The Korea–France Space Forum serves as a platform for bilateral cooperation, established as a follow-up measure to the 2015 Korea–France summit commemorating the 130th anniversary of diplomatic relations. It provides an opportunity for space agencies and industry stakeholders from both countries to share space policies and industry trends, and to explore avenues for cooperation.

This year’s forum was held under the theme, “Expanding Horizons: Korea-France Dialogue for Space Autonomy, Resilience and Sustainable Growth.” The program featured presentations and panel discussions on strategic space autonomy in Korea and France, Space exploration, New generation orbital capabilities, Services from Space, and Commercial Space. In addition, B2B meetings were held with the participation of 15 Korean companies and 17 French companies, exploring potential cooperation across various fields.

On the following day, a technical workshop was held at KARI headquarters, bringing together eight French space companies and KARI researchers. The workshop provided a platform to share the current status of R&D activities and to discuss potential areas for future collaboration.



R&D Activities

한국형 위성항법시스템(KPS) 체계 예비설계검토회의(PDR, Preliminary Design Review) 개최
Preliminary Design Review (PDR) of the Korean Positioning System (KPS) Conducted

달 착륙선 시스템요구사항검토회의 수행
System Requirements Review (SRR) for the Korea Pathfinder Lunar Lander Conducted

정지궤도공공복합통신위성(천리안 3호) 조립준비검토회의 수행
Integration Readiness Review (IRR) for the GEO-KOMPSAT-3 (Cheollian 3) Conducted

차세대발사체개발사업 사업계획 변경 행정절차 통과, 시스템 요구조건 및 설계 검토회의 수행
Approval of Revised Program Plan and Completion of System Requirements and Design Review for the Korea Space Launch Vehicle-III (KSLV-III) Development Program

소형발사체 상단 핵심 기술 개발 및 임무 확장 연구
Development of Core Upper-Stage Technologies for Small Launch Vehicles and Mission Extension Research

VEGA-C 발사체(아리랑위성 7호 탑재) 발사지원
Launch Support for the VEGA-C Launch Vehicle (Carrying Arirang 7)

육공분리합체형 무인이동체 복합체계 수직이착륙형 무인기 개발
Development of a VTOL Unmanned Vehicle, Using Combined UAV-UGV Docking-Undocking Modular Unmanned Vehicle

우주중점기술 16개 중 5개 개발 종료('24년 1개, '25년 4개 종료)
Completion of 5 out of 16 Core Space Technologies (1 in 2024, 4 in 2025)

초소형군집위성 활용시스템 개발
Development of an Application System Utilizing NEONSAT

초소형위성체계 활용시스템 개발
Development of an Application System for SAR Satellite Constellations

고흥 검보정 시범 타겟 통합 현장 시연
Integrated On-site Demonstration of Goheung Calibration and Validation Pilot Targets

해외 안테나 구축 후보지 상세 조사 완료
Completion of Detailed Site Survey for KARI Overseas Antenna Stations



한국형 위성항법시스템(KPS) 체계 예비설계검토회의(PDR, Preliminary Design Review) 개최

KPS개발사업본부는 한국형 위성항법시스템 체계 구축을 위한 핵심 마일스톤인 예비설계검토회의(Preliminary Design Review, PDR)를 2025년 11월 27일부터 28일까지 성공적으로 개최하였다.

체계 예비설계검토회의를 통해 시스템 아키텍처, 운영개념, 요구사항 등을 점검하고, 본격적인 상세설계(CDR)를 위한 체계 개발규격을 확정함으로써 향후 성공적인 체계 구축을 위한 기술적 기반을 마련하였다. 또한 회의 결과에 따라 체계 개발규격 및 예비설계 문서의 최종본을 배포하였으며, 회의 중 협의된 후속 조치는 PDR 이후 모두 이행 완료하였다.

Preliminary Design Review (PDR) of the Korean Positioning System (KPS) Conducted

The Korean Positioning System (KPS) R&D Directorate successfully conducted the Preliminary Design Review (PDR), a key milestone for the development of the KPS system, from November 27 to 28, 2025.

Through the system-level PDR, key elements such as system architecture, operational concepts, and requirements were thoroughly reviewed. The system development specifications were finalized to support the subsequent Critical Design Review (CDR), thereby establishing a solid technical foundation for the successful implementation of the KPS system. In addition, the final versions of the system development specifications and preliminary design documents were distributed based on the review results, and all follow-up actions agreed upon during the meeting were fully completed after the PDR.



달 착륙선 시스템요구사항검토회의의 수행

한국항공우주연구원은 2025년에 달착륙선(KPLL, Korea Pathfinder Lunar Lander) 시스템요구사항검토회의(SRR, System Requirement Review)를 수행하였다.

또한 달착륙선 추진시스템의 개발 방안을 확정하고, 핵심기술(추진, 항법, 착륙장치)의 본격적인 설계에 착수하였다.

System Requirements Review (SRR) for the Korea Pathfinder Lunar Lander Conducted

In 2025, KARI conducted the System Requirements Review (SRR) for the Korea Pathfinder Lunar Lander (KPLL).

In addition, the development approach for the lunar lander propulsion system was finalized, and full-scale design activities for key technologies-including propulsion, navigation, and landing systems-were initiated.



정지궤도공공복합통신위성(천리안 3호) 조립준비검토회의 수행

한국항공우주연구원은 2025년 상반기 정지궤도공공복합통신위성(GEO-KOMPSAT-3) 조립준비검토회의(IRR, Integration Readiness Review)를 수행하고, 위성체 수준의 총조립 시험에 본격 착수하였다. 아울러 시스템 환경시험 준비와 위성-발사체 간 접속 준비도 병행하여 추진하였다.

정지궤도공공복합통신위성은 재난·안전 대응을 위한 공공통신 서비스 제공과 해양영토 수호·관리를 목적으로 플렉서블 광대역 통신탑재체(FBCS, Flexible Broadband Communication System), 하천·댐 등 수자원 정보 수집을 위한 위성정보수집탑재체(DCS, Data Collection System), 정밀 항법보정정보 제공을 위한 위성항법보정탑재체(SBAS, Satellite Based Augmentation System) 등 총 3개의 탑재체를 운용할 계획이다.

이를 통해 위성을 활용한 차세대 통신 패러다임 전환에 대비하고, 재난·재해 대응을 위한 긴급 서비스와 정밀 항법보정서비스를 제공할 예정이다.

Integration Readiness Review (IRR) for the GEO-KOMPSAT-3 (Cheollian 3) Conducted

In the first half of 2025, KARI conducted the Integration Readiness Review (IRR) for the Geostationary Earth Orbit Korea Multi-Purpose Satellite (GEO-KOMPSAT-3). Following the review, full-scale system-level assembly, integration, and test (AIT) activities were initiated. In parallel, preparations for system environmental testing and satellite-to-launch vehicle interface readiness were also carried out.

GEO-KOMPSAT-3 is designed to provide public communication services for disaster and safety response, as well as to support the protection and management of maritime territories. It is planned to operate three payloads: the Flexible Broadband Communication System (FBCS), the Data Collection System (DCS) for gathering water resource information such as rivers and dams, and the Satellite-Based Augmentation System (SBAS) for delivering precise navigation correction services.

Through these capabilities, the satellite is expected to support the transition to next-generation satellite-based communication paradigms, while providing emergency communication services for disaster response and high-precision navigation augmentation services.



Rendering of GEO-KOMPSAT-3

차세대발사체개발사업 사업계획 변경 행정절차 통과, 시스템 요구조건 및 설계 검토회의 수행

2025년 5월, 한국항공우주연구원은 국가 우주개발 수요에 대한 선제적 대응과 자주적 우주탐사 역량 강화를 위해 차세대발사체개발사업의 개발 방향을 재정립하고, 소모성 발사체를 재사용 발사체 체계로 전환하기 위한 '사업계획 적정성 재검토'에 착수하였다.

기존 계획을 메탄 기반 1단부 재사용이 가능한 발사체 개발계획으로 변경함으로써, 저비용·고빈도 발사체 체계 확보의 기반을 마련하고 국제 발사서비스 시장 경쟁력 강화와 장기적 우주수송 비용 절감을 도모하고 있다.

같은 해 12월에는 기획재정부 재정사업평가위원회의 심의·의결을 통해 사업계획 변경이 확정됨에 따라, 변경된 사업 목표와 범위에 대한 요구조건을 재정립 하고 설계 결과의 적합성 확인을 위한 시스템 요구조건 및 설계 검토회의를 수행하였다.

Approval of Revised Program Plan and Completion of System Requirements and Design Review for the Korea Space Launch Vehicle-III (KSLV-III) Development Program

In May 2025, KARI redefined the development direction of the Korea Space Launch Vehicle-III (KSLV-III) Development Program to proactively respond to national space development demands and to strengthen Korea's independent space exploration capabilities. As part of this effort, KARI initiated a feasibility reassessment of the program to transition from an expendable launch vehicle to a reusable launch vehicle system.

By revising the existing plan to develop a launch vehicle with a methane-based reusable first stage, the program aims to establish a foundation for a low-cost, high-frequency launch system, enhance competitiveness in the global launch service market, and achieve long-term reductions in space transportation costs.

In December of the same year, the revised program plan was approved through deliberation by the Fiscal Project Evaluation Committee of the Ministry of Economy and Finance. Accordingly, system requirements were redefined in line with the updated objectives and scope, and system requirements and design review meeting was conducted to verify the adequacy of the design.



차세대발사체개발사업 사업계획 변경 기획자문회의, 시스템 요구조건 및 설계검토회의 수행
Program Plan Revision Advisory Meeting, System Requirements and Design Review for KSLV-III Development Program

소형발사체 상단 핵심 기술 개발 및 임무 확장 연구

위성 수요가 급증하고 있는 소형위성 서비스 시장에서의 국가 경쟁력 강화를 위해 소형발사체 상단에 필요한 핵심기술 개발사업(소형발사체 개발역량 지원사업, 스페이스 파이오니어사업 발사체 과제)을 수행하고 있다. 각 사업을 통해 핵심기술 개발을 주도하는 한편, 우주 산업화를 촉진하기 위해 민간기업의 역량 강화를 위한 자문과 사업 체계 관리도 지원하고 있다.

* 스페이스 파이오니어사업 발사체 과제: 공통격벽 추진제 탱크, 단간 연결 엄빌리컬, 통합 에비오닉스

또한 소형발사체의 경쟁력 강화와 활용성 증대를 위해 임무 확장 연구를 수행하고 있으며, 발사체 임무확장 플랫폼(궤도수송선) 연구도 병행하고 있다.

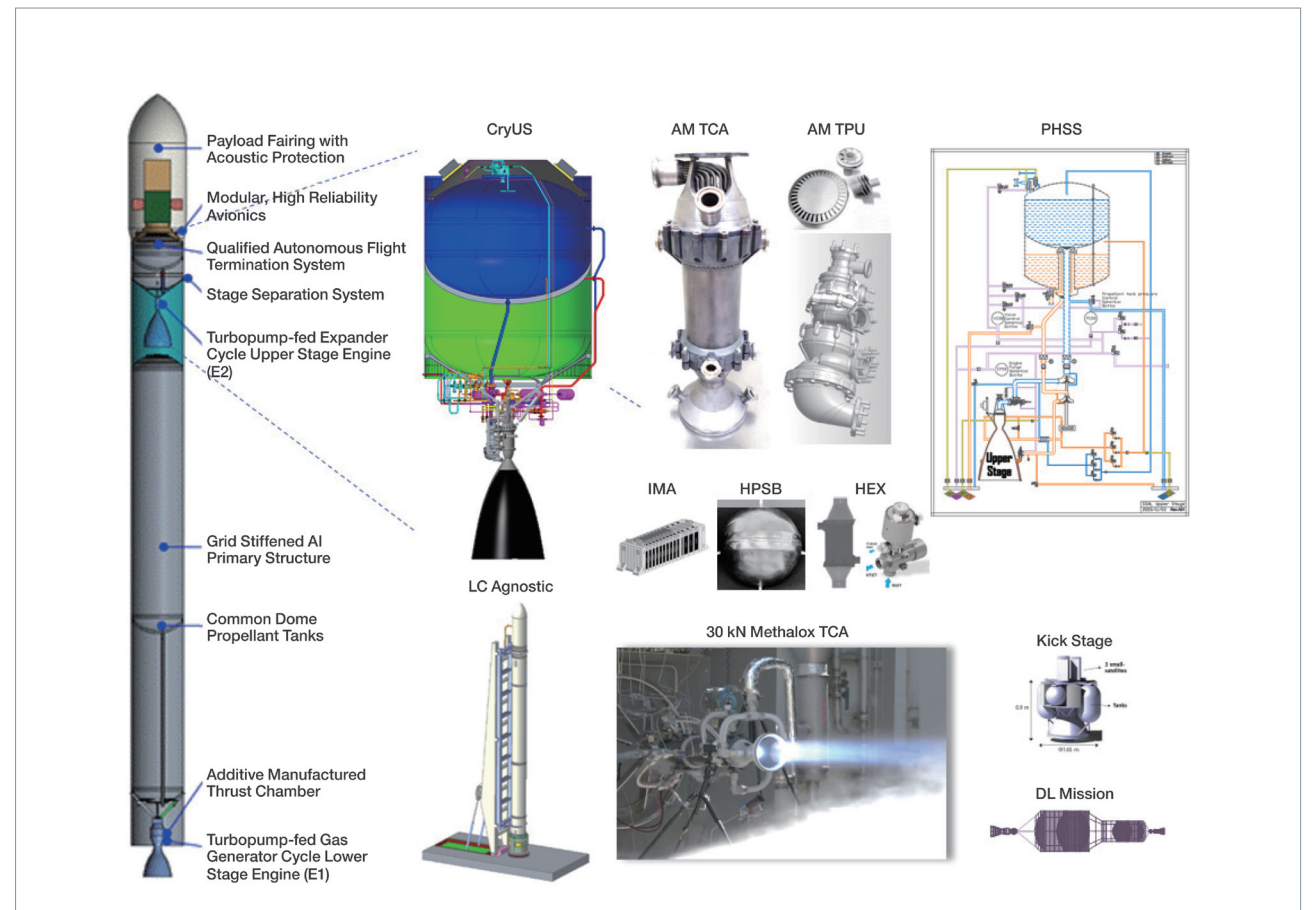
Development of Core Upper-Stage Technologies for Small Launch Vehicles and Mission Extension Research

To strengthen national competitiveness in the rapidly growing small satellite service market, KARI is carrying out core technology development projects for the upper stage of small launch vehicles, including the Industry-Competencies Fostering Project for Smallsats Launch Vehicle Development and the Launch vehicle related projects within the Space Pioneer Program.

Through these projects, KARI is leading the development of key technologies while also providing consulting to enhance private-sector capabilities and managing the project framework to promote space industrialization.

* Key technologies under the Launch vehicle related projects within the Space Pioneer Program include a common bulkhead propellant tank, interstage umbilical systems, and integrated avionics.

In addition, to enhance the competitiveness and versatility of small launch vehicles, KARI is conducting mission extension research, alongside research on a launch vehicle mission extension platform (orbital transfer vehicle).



VEGA-C 발사체(아리랑위성 7호 탑재) 발사지원

한국의 다목적실용위성 아리랑 7호(KOMPSAT-7)는 프랑스령 기아나 발사장에서 VEGA-C(W28) 발사체를 이용하여 태양동기궤도(SSO)에 안착하였다(2025년 12월 1일 17시 21분, UTC).

이를 위해 1월 기아나우주센터를 방문하여 W28 발사 임무 관련 업무 협의를 진행하였으며, 9월부터 약 3개월간 나로우주센터 제주추적소에서 장비 설치와 기아나우주센터와의 연동 시험 등 준비를 거쳐 12월 발사 임무를 수행하였다. 나로우주센터 제주추적소는 텔레메트리 장비를 운용하여 전체 발사 구간 중 위성(KOMPSAT-7) 분리 전후 구간에 대한 실시간 발사체 추적 및 텔레메트리 데이터 수신을 성공적으로 수행하였고, 해당 데이터를 CNES에 실시간으로 제공하였다.

나로우주센터 제주추적소는 ESA/CNES와의 발사 임무 협력을 위해 2011년 MOU를 체결한 이후 이번까지 총 7회의 발사 지원을 모두 성공적으로 수행함으로써 국제 발사 임무 수행 역량에 대한 신뢰도를 제고하였으며, 이를 바탕으로 후속 발사 임무 협력을 강화하였다.

Launch Support for the VEGA-C Launch Vehicle (Carrying Arirang 7)

Arirang 7 (Korea Multi-Purpose Satellite 7, KOMPSAT-7) was successfully inserted into a Sun-synchronous orbit (SSO) using the VEGA-C (W28) launch vehicle from the Guiana Space Centre on December 1, 2025, at 17:21 (UTC).

In preparation for the launch, KARI visited the Guiana Space Centre in January to coordinate activities related to the W28 mission. From September, approximately three months of preparation were carried out, including equipment installation at the Jeju Tracking Station of the Naro Space Center and interface tests with the Guiana Space Centre, leading up to the successful execution of the launch mission in December. During the mission, the Jeju Tracking Station operated telemetry equipment to successfully perform real-time launch vehicle tracking and telemetry data acquisition during the critical phases before and after the separation of KOMPSAT-7, and provided the data to CNES in real time.

Since signing a Memorandum of Understanding (MOU) with ESA/CNES in 2011 for launch cooperation, the Jeju Tracking Station of the Naro Space Center has successfully supported a total of seven launch missions, further enhancing its credibility in international launch operations and strengthening future cooperation for subsequent missions.



W28 발사 당일 제주추적소 텔레메트리 운용(2025. 12)
Telemetry Operations at the Jeju Tracking Station on the W28 Launch Day (Dec. 2025)



ESA/CNES/Arianespace/Optique du vidéo du CSG-S. Martin

육공분리합체형 무인이동체 복합체계 수직이착륙형 무인기 개발

육공분리합체형 무인이동체 복합체계는 무인이동체원천기술개발사업의 통합운용 기술실증기로 개발 중인 공중·지상 무인이동체 협동체계이다. 해당 체계에서 한국항공우주 연구원은 수직이착륙이 가능한 최대이륙중량 150kg급 Lift & Cruise 방식의 공중 무인이동체(UAV) 연구개발을 주관하고 있다.

공중 무인이동체는 총 6개의 수직이착륙용 프로펠러와 1개의 추진용 프로펠러를 갖는 탠덤 날개 형상의 기체로, 동일 사업을 통해 자체 개발한 국산 무인가용 모터-인버터를 적용하였다. 탑재된 모터-인버터는 일반 BLDC 모터와 달리 6상 제어 방식을 채택하여 신뢰성과 안전성을 향상시켰다. 비행제어시스템은 오픈소스 PX4 펌웨어를 기반으로 자체 개발한 천이비행 알고리즘을 적용하였으며, 지난 5년간 개발한 50kg급 Lift & Cruise형 무인기를 통해 제어 성능과 비행 안정성을 검증하였다.

현재 공중 무인이동체는 추진계통 성능 확인을 위한 안전출 시험을 완료한 후, 제자리 비행 등 본격적인 비행성능 검증 시험을 수행하고 있으며, 천이비행 시험을 포함한 최종 목표인 공중·지상 무인이동체 협동 임무 실증은 2026년부터 추진될 예정이다.

특히 장시간 비행을 위해 수소연료전지-배터리 하이브리드 동력원 시스템을 탑재한 실증 시험도 준비 중이며, 향후 무인이동체원천기술개발사업에서 개발된 다양한 연구성과의 시험·검증을 위한 실증기로 활용될 예정이다.

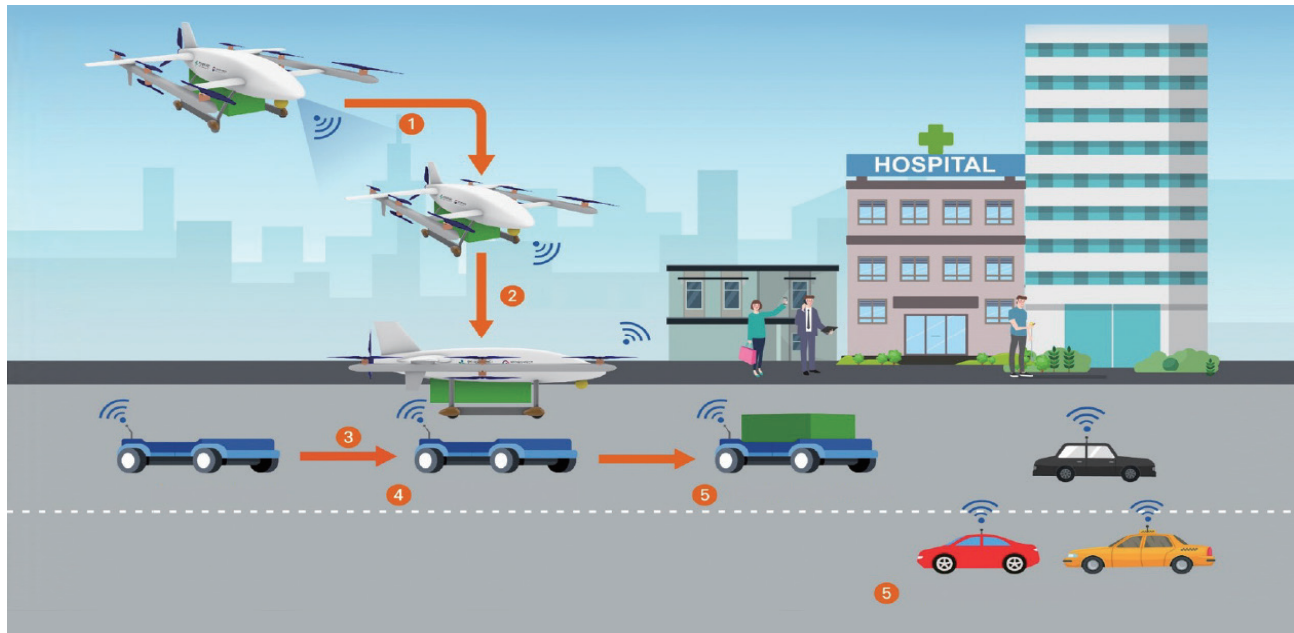
Development of a VTOL Unmanned Vehicle, Using Combined UAV-UGV Docking-Undocking Modular Unmanned Vehicle

The combined UAV-UGV, docking-undocking modular unmanned vehicle is a cooperative aerial and ground unmanned system being developed as a technology demonstrator under the Unmanned Vehicle Advanced Research Program. Within this system, KARI is leading the research and development of a vertical takeoff and landing (VTOL) aerial UAV based on a lift-and-cruise configuration with a maximum takeoff weight of 150 kg.

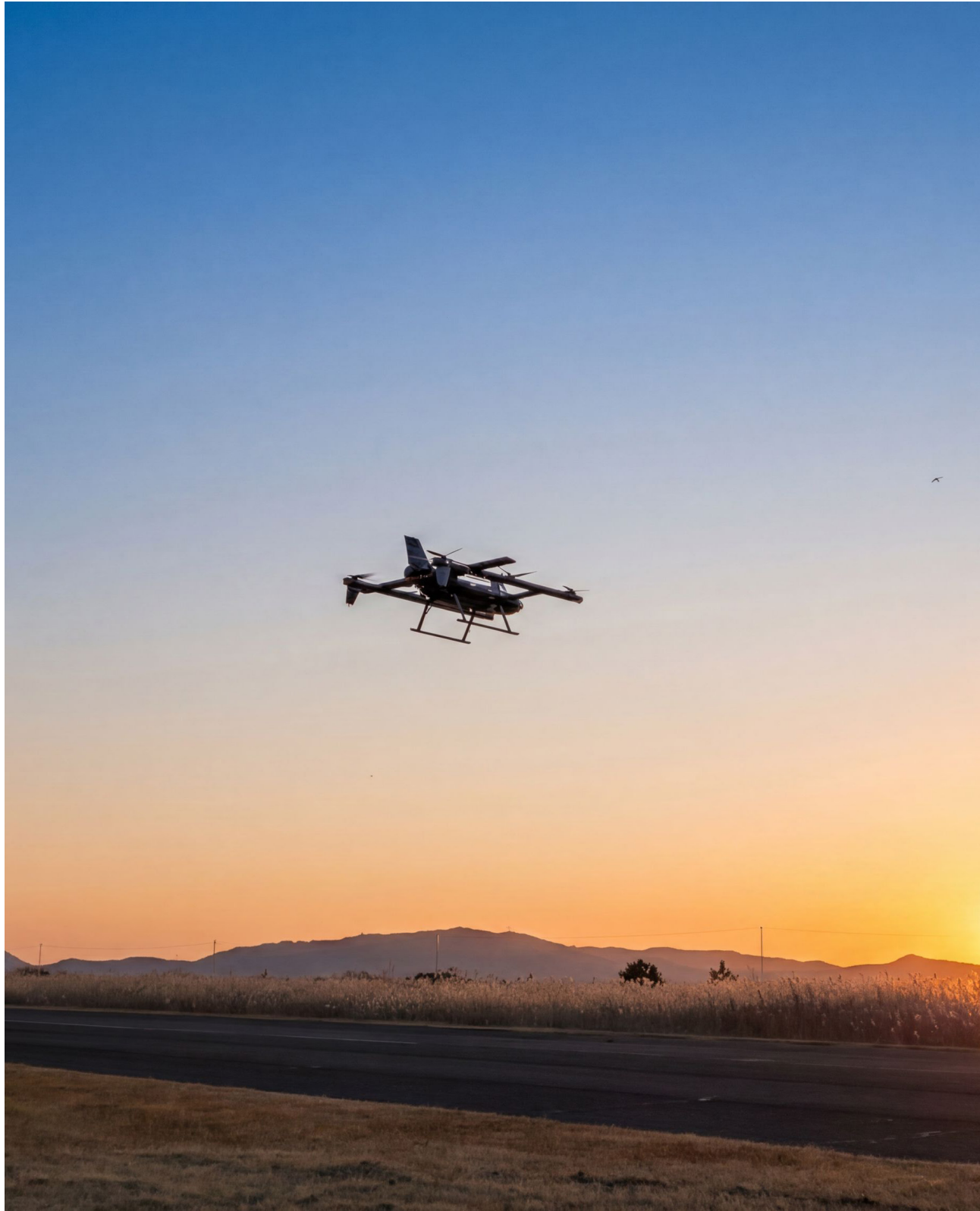
The UAV features a tandem-wing configuration equipped with six propellers for vertical takeoff and landing and one propeller for forward propulsion. It incorporates domestically developed motors and inverters specifically designed for unmanned aerial systems. Unlike conventional Brushless Direct Current (BLDC) motors, the integrated motor–inverter system adopts a six-phase control method to enhance reliability and safety. The flight control system is based on open-source PX4 firmware and applies a proprietary transition flight algorithm. The control performance and flight stability have been validated through a previously developed 50 kg-class Lift & Cruise UAV over the past five years.

Currently, the UAV has completed tethered flight tests to verify propulsion system performance and is undergoing full-scale flight performance tests, including hovering. Demonstration of cooperative missions between aerial and ground unmanned systems, including transition flight tests, is scheduled to begin in 2026.

In particular, demonstration tests equipped with a hydrogen fuel cell–battery hybrid power system are also being prepared to enable long-endurance flight. The UAV is expected to serve as a testbed for validating various research outcomes developed under the Unmanned Vehicle Advanced Research Program.



육공분리합체형 무인이동체 복합체계 운용 개념도
Concept of Operations in Combined UAV-UGV Docking-Undocking Modular Unmanned Vehicle



수직이착륙형 무인기 비행시험
UAV Flight Test

우주중점기술 16개 중 5개 개발 종료('24년 1개, '25년 4개 종료)

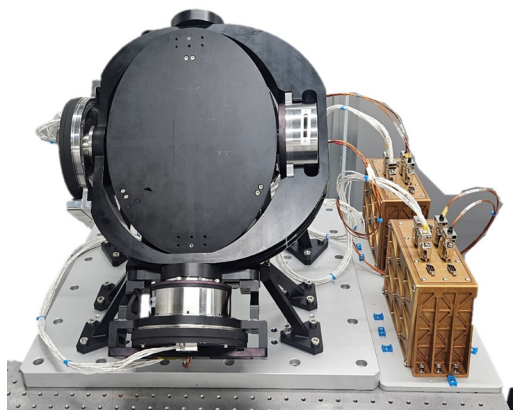
스페이스파이오니어사업은 「우주전략기술 자립을 통한 핵심부품 국산화, 수요 맞춤형 기술개발을 통한 성과 활용 확대, 국가 우주기술 역량 향상 및 우주개발 생태계 선순환 구조 조성 기반 마련」을 목적으로, 총사업비 2,115억 원을 투입하여 산·학·연 컨소시엄을 구성한 산업체 중심으로 발사체 분야(3개), 위성본체 분야(7개), 위성탑재체 분야(6개)의 국가 우주중점기술(총 16개)을 개발하는 프로그램이다.

2024년 '정지궤도 위성용 GNSS 수신기' 개발을 성공적으로 완료한 데 이어, 2025년에는 '전자광학 탑재체용 구동부', '실용급 위성 다중 광학머리 별추적기', '실용위성급 광학형 자이로', 'Ka밴드 송신기 및 Ka밴드 능동형 어레이 안테나' 개발을 성공적으로 완료하였다.

Completion of 5 out of 16 Core Space Technologies (1 in 2024, 4 in 2025)

The Space Pioneer Program is designed to promote the localization of key components through the development of strategic space technologies, expand the utilization of R&D outcomes through demand-driven technology development, and enhance national space technology capabilities, while establishing a virtuous cycle within the space development ecosystem. With a total budget of KRW 211.5 billion, the program supports industry-led consortia comprising industry, academia, and research institutes to develop 16 national core space technologies across three areas: launch vehicles (3 projects), satellite buses (7 projects), and satellite payloads (6 projects).

Following the successful completion of the "Multi-GNSS Receiver for GEO Satellites" in 2024, four additional technologies were successfully developed in 2025: the "OAM & TAM for Electro-Optical Payload," the "Multiple Optical Head Star Tracker for Operational Satellite," the "Fiber Optic Gyroscope for Practical Satellites," and the "Ka-band Transmitter and Ka-band Active Phased Array Antenna."



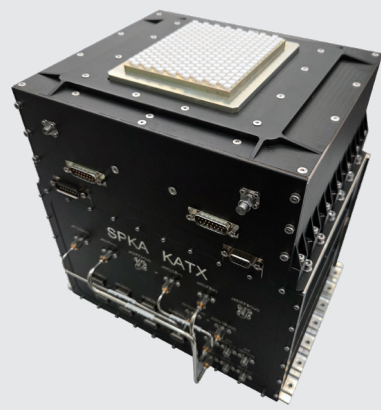
전자광학 탑재체용 구동부
OAM & TAM for Electro-Optical Payload



실용급 위성 다중 광학머리 별추적기
Multiple Optical Head Star Tracker for Operational Satellite



실용위성급 광학형 자이로
Fiber Optic Gyroscope for practical satellites



Ka밴드 송신기 및 Ka밴드 능동형 어레이 안테나
Ka-band Transmitter and Ka-band Active Phased Array Antenna



정지궤도 위성용 GNSS 수신기
Multi-GNSS Receiver for GEO Satellites

초소형군집위성 활용시스템 개발

2027년까지 총 11기의 고해상도 광학카메라 탑재 위성이 지구관측 임무를 수행하게 되는 초소형위성 군집시스템(NEONSAT)의 시제기 위성은 2024년 4월 발사되어 HW/SW 성능시험과 안정적 운영시험이 지속적으로 수행되고 있다.

2026년 양산기의 본격적인 생산·발사·운영에 앞서 NEONSAT 위성영상에 대한 사용자 평가와 활용도 제고를 위한 의견 수렴을 목적으로 시범활용 전문가그룹을 구성하여 표준 영상과 산출물을 제공하고, 그 초기 결과를 공유하는 제4차 초소형군집활용워크숍이 2025년 9월 18일 제주에서 개최되었다.

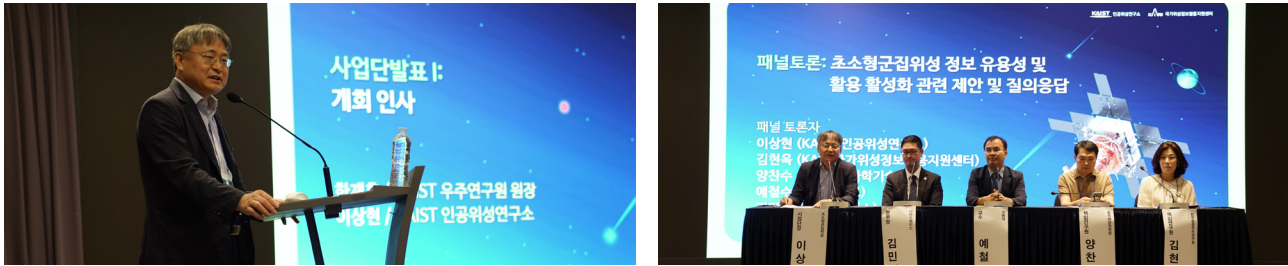
시범활용에 참여한 13개 기관이 수요를 제기한 해외지역 신규 촬영을 지원하였으며, 시제기 위성영상의 품질 평가부터 재난·재해 대응, 물동량 모니터링 등 다양한 분야에서 활용성을 검토한 결과가 공유되었다. 이러한 사용자 피드백은 초소형위성 군집시스템 기반 분석산출물서비스시스템(APISS: Analysis Product Intelligence Service System) 개발에 반영될 예정이며, 2026년에는 공개형 플랫폼으로서의 시범운영을 계획하고 있다.

Development of an Application System Utilizing NEONSAT

The prototype satellite of the micro-satellite constellation system (NEONSAT), which will consist of a total of 11 satellites equipped with high-resolution optical cameras for Earth observation missions by 2027, was launched in April 2024. Since then, hardware and software performance tests, as well as stable operation tests, have been continuously conducted.

Ahead of the full-scale production, launch, and operation of the flight models in 2026, the 4th NEONSAT Utilization Workshop was held in Jeju on September 18, 2025. The workshop aimed to gather user feedback and enhance the utilization of NEONSAT imagery by forming a pilot user expert group, providing standard imagery and derived products, and sharing initial results.

A total of 13 participating organizations requested new image acquisitions over overseas regions, which were successfully supported. The workshop also shared the results of evaluations on the prototype satellite imagery, including quality assessment and its applicability across various fields such as disaster response and logistics monitoring. This user feedback will be reflected in the development of the Analysis Product Intelligence Service System (APISS) based on the micro-satellite constellation system. In 2026, a pilot operation of APISS as an open platform is planned.



제4회 초소형위성 군집시스템 활용 워크숍 프로그램
Program of the 4th Nano-Satellite Constellation Utilization Workshop



제4회 초소형위성 군집시스템 활용 워크숍 개최
The 4th Workshop on Nano-Satellite Constellation System Utilization

초소형위성체계 활용시스템 개발

정부는 수십 기 이상의 SAR(Synthetic Aperture Radar) 위성을 군집 형태로 운영하는 초소형위성체계 사업을 추진하고 있다. 초소형위성체계 사업은 신속하게 획득된 위성영상 정보를 활용하여 한반도 및 주변 해역의 위기상황 감시와 해양 안보, 치안, 재난 대응 등에 활용될 예정이다.

한국항공우주연구원은 다수의 위성으로부터 수신한 SAR 위성정보와 AIS(Automatic Identification System) 정보를 기반으로, 한반도 주변 해역의 해양안보, 해양재난, 해양 치안 대응을 위한 활용시스템 개발을 수행하고 있다. 2025년에는 활용시스템 상세설계, KOMPSAT-5 및 ICEYE 등 유사 데이터 기반 주요 활용기술의 요구사항 확정을 위한 성능분석, 상세설계 검증에 위한 활용시스템 개발을 수행하였다.

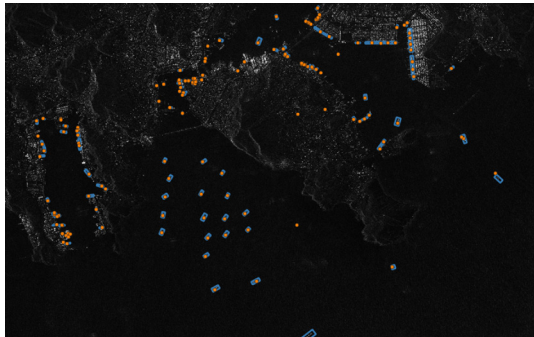
2026년에는 상반기 활용시스템 상세설계검토회의를 개최하고, 하반기에는 활용시스템 예비통합시험을 수행할 예정이다.

Development of an Application System for SAR Satellite Constellations

The government is promoting a satellite constellation program that operates dozens of Synthetic Aperture Radar (SAR) satellites in a clustered configuration. This program is expected to utilize rapidly acquired satellite imagery to support surveillance of crisis situations in and around the Korean Peninsula, as well as applications in maritime security, public safety, and disaster response.

KARI is developing an application system for maritime security, disaster response, and law enforcement in the waters surrounding the Korean Peninsula, based on SAR satellite data received from multiple satellites and Automatic Identification System (AIS) data. In 2025, KARI conducted detailed design of the application system, performed performance analyses to define key requirements based on comparable datasets such as KOMPSAT-5 and ICEYE, and developed the system to verify the detailed design.

In 2026, KARI plans to hold a Critical Design Review (CDR) for the application system in the first half of the year and to conduct preliminary integration testing in the second half.



SAR/AIS 매칭 결과(ICEYE)
SAR/AIS Matching Results (ICEYE)



고흥 검보정 시범 타겟 통합 현장 시연

2025년 11월 5일 전라남도 고흥항공센터에서 광학·적외선·레이더 검보정 시범 타겟의 운영 적용성을 검증하고 국가 위성 검보정 인프라 고도화를 지원하기 위한 통합 현장 시연을 수행하였다.

광학 분야에서는 실제 관측 환경에서 검보정 시범 타겟과 장비를 시범 운영하여 설계 적합성을 검증하고, 유지관리 절차 개선과 통합 처리시스템을 활용한 데이터 신뢰성 확인을 수행하였다.

적외선 분야에서는 초기 및 정규 위성 운영 지원을 위한 표준 검보정 타겟과 지상 기준자료 획득체계를 구축하였다. 주요 내용으로는 검보정 인프라 구축, 복합 복사율 타겟 개발, 중적외선 복사계 및 관측타워 제작, 원격 운영과 장기 유지관리 방안 수립이 포함된다.

레이더 분야에서는 능동형 트랜스ponder와 코너 리플렉터를 활용한 현장 시범 운영을 통해 다중 대역 및 다중 위성 조건에서의 성능을 검증하였으며, 이를 통해 장비의 안정성을 확인하고 향후 설계 고도화를 위한 기반을 마련하였다.

Integrated On-site Demonstration of Goheung Calibration and Validation Pilot Targets

An integrated on-site demonstration of calibration and validation (Cal/Val) pilot targets was conducted on November 5, 2025, at the Goheung Aviation Center, Jeollanam-do, to evaluate the operational applicability of optical, infrared, and radar calibration systems and to support the advancement of national satellite Cal/Val infrastructure.

For optical calibration, pilot operations were carried out to validate target and instrument designs under real observation conditions, improve maintenance procedures, and verify data reliability through an integrated processing system.

In the infrared domain, standard calibration targets and ground reference data acquisition systems were developed to support both initial and routine satellite operations. Key activities included infrastructure construction, development of composite emissivity targets, fabrication of mid-wave infrared radiometers, and establishment of remote operation and long-term maintenance strategies.

Radar calibration activities focused on the pilot operation of an active transponder and a corner reflector. Performance verification under multi-band and multi-satellite scenarios confirmed system stability and provided a foundation for further design refinement.



적외선 타겟/장비 현장 시연
Field Demonstration of Infrared Target and Equipment



레이더 타겟(삼면판 반사기) 현장 시연
Field Demonstration of Radar Target (Trihedral Corner Reflector)

해외 안테나 구축 후보지 상세 조사 완료

초소형위성체계 운영을 위한 해외 안테나 구축 후보지에 대한 상세조사를 완료하였다. 대상 후보지는 호주 Nangetty, 남아프리카공화국 Pretoria 및 Krugersdorp, 스페인 Puertollano이며, 상세조사는 8월 27일부터 9월 11일까지 수행되었다. 조사는 총 7개 분야(category), 80여 개 항목에 대해 현지 호스팅 기관(호주: CAPRICORN SPACE, 남아공: PINKMATTER, SANSА, 스페인: INDRA DEIMOS)과의 협의와 위성 운영 주파수 대역에서의 혼신 발생 여부 측정 등을 포함하여 진행하였다.

후보지 상세조사 결과는 9월 중간보고회와 12월 최종보고회를 통해 검토가 완료되었으며, 11월 자문회의를 거쳐 최종적으로 1·2순위 사이트가 각각 호주 CAPRICORN SPACE와 남아공 SANSА로 선정되었다.

2026년에는 선정된 두 사이트에 대한 호스팅 서비스 계약을 체결하고, 호주에 1차 안테나를 설치하여 2026년 12월까지 On-site Acceptance Test를 완료할 계획이다.



Completion of Detailed Site Survey for KARI Overseas Antenna Stations

A detailed survey of overseas antenna sites has been completed for candidate sites to operate Korea Small Imaging Satellite system. The candidate sites include Nangetty, Australia; Pretoria and Krugersdorp, Republic of South Africa; and Puertollano, Spain. The on-site surveys were conducted from 27 August to 11 September. The survey covered over 80 items across seven categories and was carried out through close consultations with local hosting organizations—CAPRICORN SPACE (Australia), PINKMATTER and SANSА (South Africa), and INDRA DEIMOS (Spain)—as well as through on-site measurements to assess potential RF interference within the satellite operation frequency bands.

The results of the detailed site surveys were reviewed and finalized through an interim review meeting in September and a final review meeting in December. In addition, through an advisory meeting held in November, Site #1 and #2 were selected as the CAPRICORN SPACE site in Australia and the SANSА site in the Republic of South Africa, respectively. In 2026, hosting service agreements will be executed for the two selected sites, followed by the deployment of the first overseas antenna in Australia. The project aims to complete the On-site Acceptance Test (OSAT) by December 2026.



EDUCATION & PUBLIC OUTREACH

인터내셔널 차터 기반 국내외 재난 위성영상·분석 지원

Satellite Imagery and Analysis Support for Domestic and International Disasters under the International Charter

위성활용콘퍼런스 2025 개최

Hosting of Satellite Application Conference 2025

국가종합비행성능시험장 비행모니터링 시스템 및 타워 구축홍보

Promotion of the Flight Monitoring System and Control Tower for the National Aviation Test Center

스페이스파이오니어사업 연구성과 체계연계를 위한 노력

Efforts to Integrate Research Outcomes of the Space Pioneer Program into System-Level Applications

NGRC(National GNSS Research Center) 워크숍 개최

Hosting of the NGRC (National GNSS Research Center) Workshop

국제우주대회(IAC, ISEB) 대학생 논문 발표 및 국제교류 지원

Support for Student Paper Presentations and International Exchange at the International Astronautical Congress (IAC, ISEB)

한국항공우주연구원-캐나다 CRIAQ 공동 워크숍 개최

Hosting of the KARI-CRIAQ Joint Workshop

멕시코 발사장 구축 공동 타당성 조사 수행 및 보고서 발간

Joint Feasibility Study on the Establishment of a Spaceport in Mexico and Publication of the Final Report



인터내셔널 차터 기반 국내외 재난 위성영상·분석 지원

한국항공우주연구원은 인터내셔널 차터 정회원기관(member)으로서 글로벌 재난 대응을 위한 위성영상 지원과 공동운영에 참여하고 있다. 2025년에는 ISRO 주관 제53차 및 CNES 주관 제54차 정기이사회(Board Meeting)를 포함한 월간 회의에 지속적으로 참석하여 차터의 정책 수립과 운영에 기여하였으며, 차터 설립 25주년과 통산 1,000번째 재난 대응(Activation)을 함께 기념함으로써 한국 위성자산의 국제적 위상을 강화하였다.

2025년 한 해 동안 아리랑 위성 시리즈와 차세대중형위성 1호를 활용하여 약 850장의 고해상도 영상을 제공하고, 총 41건의 글로벌 재난 대응을 지원하였다. 또한 7월 국내 홍수 발생 시 차터를 가동하여 RCM 등 해외 위성영상 약 920장을 확보하고, 이를 수자원공사(K-water)와 국립재난안전연구원(NDMI) 등 유관기관에 제공하는 한편 분석에도 참여하여 신속한 상황 파악과 대응 의사결정을 지원함으로써 국내 재난 관리 역량 강화에 기여하였다.

이울러 인터내셔널 차터와 ESA가 공동 주관한 'EO4AI Challenge: AI for Earthquake Response'에서 국내 기업 Telepix가 1위를 차지함으로써, 위성 데이터와 한국의 AI 기술을 결합한 재난 분석 역량을 국제적으로 입증하였다.

Satellite Imagery and Analysis Support for Domestic and International Disasters under the International Charter

As a member of the International Charter: Space and Major Disasters, KARI actively participates in the joint operation of satellite-based disaster response and provides satellite imagery support for global disaster events. In 2025, KARI continuously contributed to the Charter's policy development and operations by participating in monthly meetings, including the 53rd Board Meeting hosted by ISRO and the 54th Board Meeting hosted by CNES. KARI also took part in commemorating the 25th anniversary of the Charter and its 1,000th activation, further enhancing the international standing of Korea's satellite assets.

Throughout 2025, KARI provided approximately 850 high-resolution images using the KOMPSAT satellite series and CAS500-1, supporting a total of 41 global disaster response activities. In addition, during the domestic flood event in July, KARI activated the Charter to secure approximately 920 satellite images from international sources, including RCM. These images were provided to relevant agencies such as K-water and the National Disaster Management Research Institute (NDMI), and KARI also participated in the analysis, supporting rapid situational awareness and decision-making, thereby strengthening national disaster management capabilities.

Furthermore, in the "EO4AI Challenge: AI for Earthquake Response," jointly organized by the International Charter and ESA, the Korean company Telepix won first place, demonstrating the global competitiveness of Korea's disaster analysis capabilities by integrating satellite data with advanced AI technologies.



제53차 인터내셔널 차터 정기이사회
53rd International Charter Board Meetin



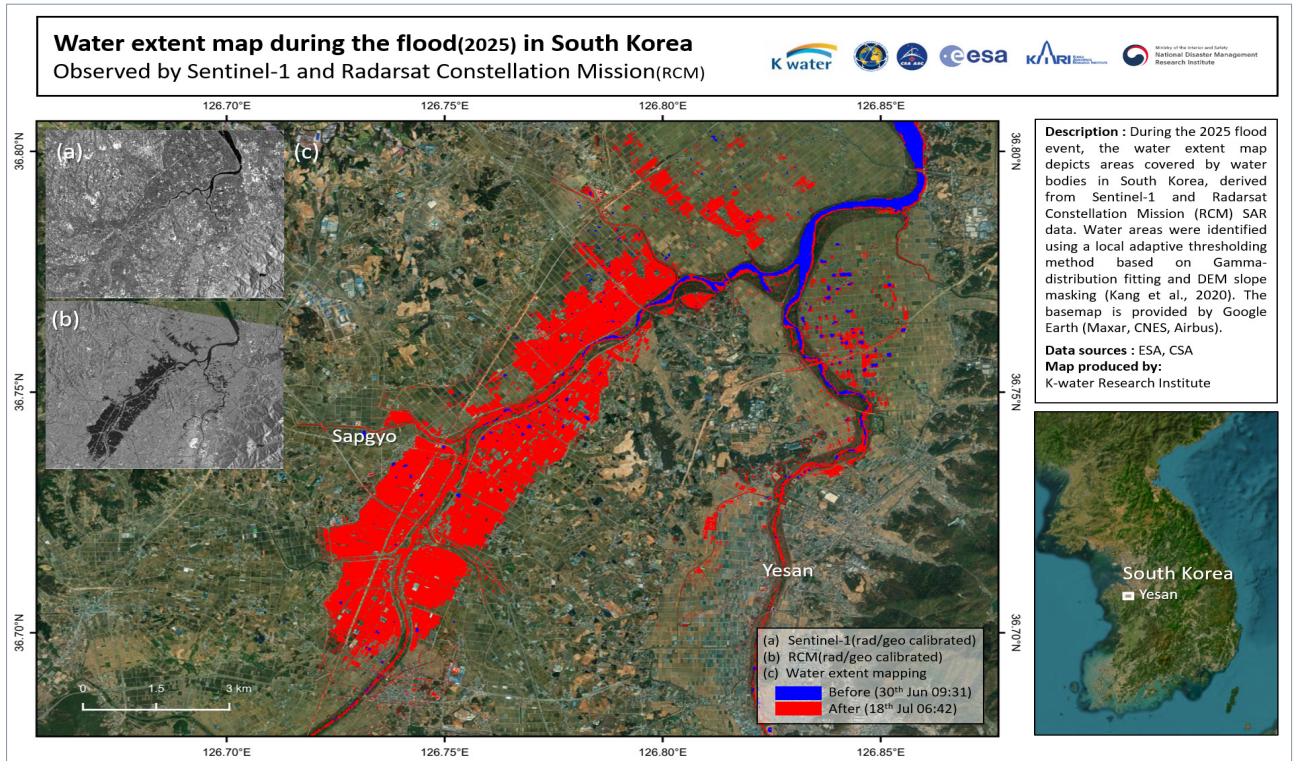
제54차 인터내셔널 차터 정기이사회 1
54th Board Meeting of the International Charter: Space and Major Disasters #1



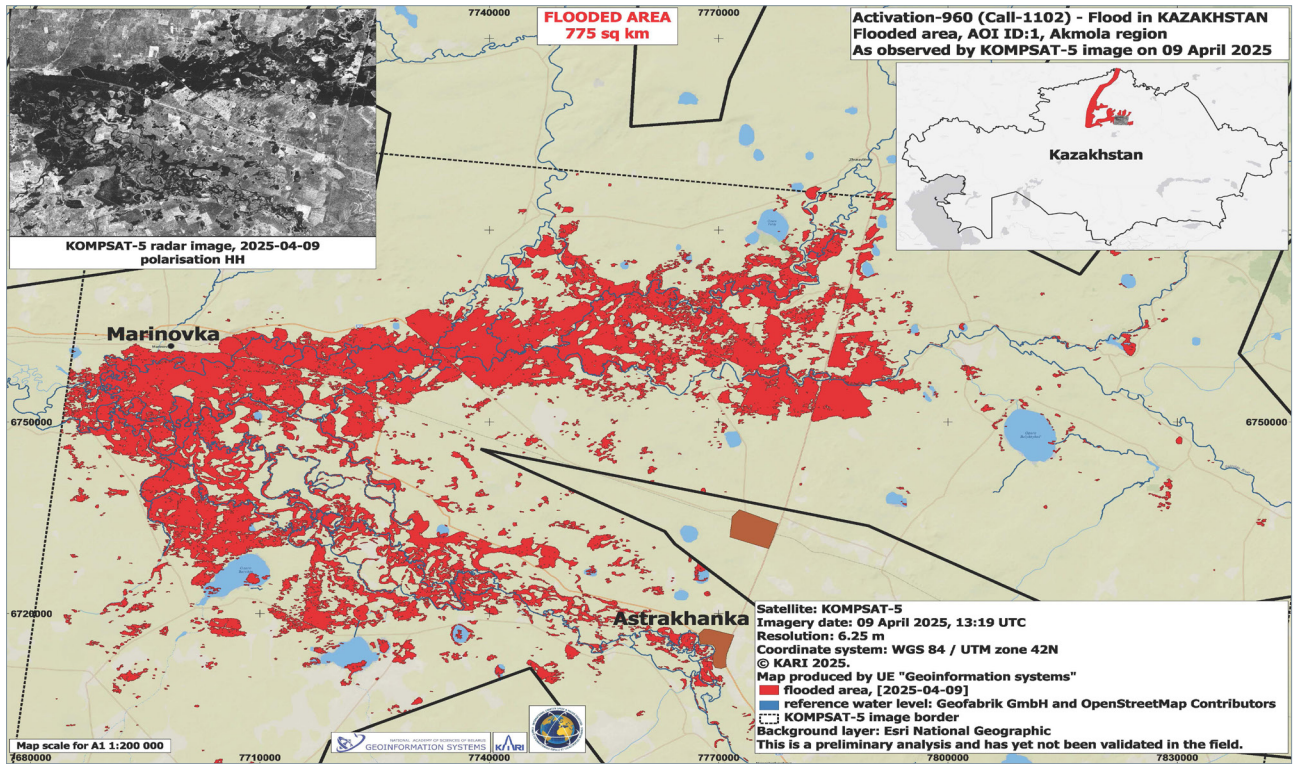
EO4AI Challenge: AI for Earthquake Response 1위 수상기업 Telepix와 차터 정회원기관 CNES&KARI
Telepix, Winner of the EO4AI Challenge: AI for Earthquake Response,
with Charter Members CNES and KARI



제54차 인터내셔널 차터 정기이사회 2
54th Board Meeting of the International Charter: Space and Major Disasters #2



차터를 통해 제공받은 RCM 영상을 활용하여 수자원공사가 분석한 7월 국내 홍수 피해
Analysis of July Domestic Flood Damage by K-water Using RCM Imagery Provided through the International Charter



다목적실용위성 5호 영상(4월)으로 분석된 카자흐스탄 홍수 피해
Flood Damage in Kazakhstan Analyzed Using KOMPSAT-5 Imagery (April)

위성활용콘퍼런스 2025 개최

국가 위성자산의 증대와 위성정보 활용 중요성에 발맞춰 산·학·연·관의 협력과 정보 교류를 활성화하기 위한 '위성활용콘퍼런스 2025'가 개최되었다. 국가정보원과 우주항공청이 주최하고 한국항공우주연구원이 주관한 이번 행사는 '위성정보와 미래기술 융합'을 주제로 2025년 9월 2일부터 3일까지 서울 코엑스 마곡 컨벤션센터에서 진행되었다.

이번 콘퍼런스에는 Palantir, Airbus D&S, Maxar 등 글로벌 선도기업 임원진과 국내외 관계자 918명이 참석하였다. 현장에서는 최신 기술을 선보인 28개 국내외 기업 홍보 부스가 운영되었으며, 총 10개 세션에서 54건의 주제 발표가 진행되어 위성정보와 첨단기술의 융합 방안이 심도 있게 논의되었다. 본 행사는 국내외 위성산업의 최신 동향을 공유하고 실질적인 협력 네트워크를 강화하는 장으로서 성황리에 마무리되었다.

Hosting of Satellite Application Conference 2025

In line with the growing national satellite assets and the increasing importance of satellite data utilization, the Satellite Application Conference 2025 was held to promote collaboration and information exchange among industry, academia, research institutes, and government.

Hosted by the National Intelligence Service and the Korea AeroSpace Administration (KASA), and organized by KARI, the conference was held under the theme "Integration of Satellite Information and Future Technologies" from September 2 to 3, 2025, at the COEX Magok Convention Center in Seoul.

The conference was attended by 918 participants, including executives from leading global companies such as Palantir, Airbus Defence and Space, and Maxar, as well as domestic and international stakeholders. A total of 28 exhibition booths were operated by domestic and international companies showcasing the latest technologies, while 54 presentations were delivered across 10 sessions, providing in-depth discussions on the integration of satellite data and advanced technologies. The conference successfully served as a platform for sharing the latest trends in the global satellite industry and strengthening practical collaboration networks.



위성활용콘퍼런스 2025
Overview of Satellite Application Conference 2025

국가종합비행성능시험장 비행모니터링 시스템 및 타워 구축홍보

한국항공우주연구원 항공혁신연구소 국가종합비행성능시험센터는 2025년 7월 코엑스에서 개최된 무인이동체산업엑스포에 참가하여 고흥 국가종합비행성능시험장의 미래 항공교통(AAM) 시대를 대비한 핵심 인프라를 홍보하였다. 전시에서는 첨단 비행 모니터링시스템과 관제타워 구축 계획을 소개하고, 복수 활주로 운영, 다중 항공기 동시 비행 시험, 원격 모니터링 등 안전하고 효율적인 비행시험 환경 제공 역량을 강조하였다.

특히 증가하는 비행시험 수요와 군 활주로 제한 등 국가적 과제 해결에 기여할 수 있는 시험장의 역량을 중점적으로 소개하였다. 또한 실시간 비행 상황 관제를 위한 모니터링 장비, 기존 시스템 연동 장비, 원격 모니터링 데이터 네트워크, 비행체 감시용 광학 장비, 음성통신 제어 장비, 전파 간섭 감지를 위한 주파수 스펙트럼 분석 장비 등 구축 환경을 전시하여 관람객의 높은 관심을 받았다.

항공혁신연구소 국가종합비행성능시험센터는 이번 전시를 통해 향후 비행시험 과정에서 발생할 수 있는 기술적 문제 해결과 전문적인 기술 자문 및 컨설팅을 제공함으로써 국내 항공산업 발전에 적극 기여할 것으로 기대된다고 밝혔다.

Promotion of the Flight Monitoring System and Control Tower for the National Aviation Test Center

In July 2025, the National Aviation Test Center of the Aeronautics Innovation Research Directorate at KARI participated in the Unmanned system World Congress (UWC) held at COEX, where it promoted the key infrastructure of the Goheung National Aviation Test Center in preparation for the Advanced Air Mobility (AAM) era.

At the exhibition, KARI introduced its advanced flight monitoring system and the plan for constructing a control tower, highlighting its capabilities to provide a safe and efficient flight test environment. These capabilities include multi-runway operations, simultaneous flight testing of multiple aircraft, and remote monitoring.

In particular, the center emphasized its ability to address national challenges such as increasing demand for flight testing and limited access to military runways. The exhibition also showcased the planned infrastructure, including real-time flight monitoring equipment, system integration devices, remote monitoring data networks, optical surveillance systems for aircraft tracking, voice communication control systems, and frequency spectrum analysis equipment for detecting radio interference, attracting significant attention from visitors.

Through this exhibition, the National Aviation Test Center expressed its commitment to actively contributing to the advancement of the domestic aviation industry by providing technical solutions to potential issues arising during flight testing, as well as offering professional technical advisory and consulting services.



2025 국가종합비행성능시험장 비행모니터링 시스템 구축 및 타워 구축 홍보
Promotion of the Flight Monitoring System and Control Tower for the National Aviation Test Center

스페이스파이오니어사업 연구성과 체계연계를 위한 노력

스페이스파이오니어사업단은 14개 우주기술 핵심부품 개발에 참여하고 있는 산업체를 중심으로 SPPO 통합워크숍, 한-호주 우주기술 워크숍, 우주중점기술 네트워크 구축 워크숍 등을 개최하여 참여 기관 간 국내외 우주 분야 협력 네트워크를 구축하고, 국내외 체계 연계를 위한 기반을 마련하였다.

또한 한국항공우주학회, 항공우주시스템공학회 등 항공우주 관련 학회와 드론쇼코리아(DSK) 2025, 2025 국제융합학술대회(BIEN), 제76회 국제우주대회 (AC), 2025 서울 국제 항공우주 및 방위산업 전시회(ADEX) 등에 연구성과물을 전시하여 국내외 우주분야 체계연계를 위한 기회 제공을 위해 노력하고 있다.

Efforts to Integrate Research Outcomes of the Space Pioneer Program into System-Level Applications

The Space Pioneer Program Office (SPPO) organized various workshops, including the SPPO Integrated Workshop, the Korea–Australia Space Technology Workshop, and the Core Space Technology Networking Workshop, with a focus on participating industries involved in the development of 14 key space technology components. Through these activities, SPPO established both domestic and international collaboration networks among participating organizations and laid the foundation for system-level integration at home and abroad.

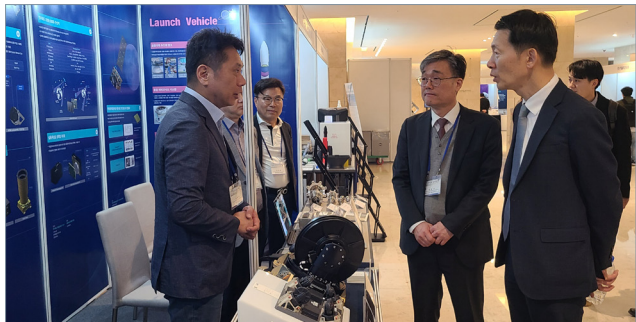
In addition, research outcomes were showcased at major aerospace-related academic societies, such as the Korean Society for Aeronautical and Space Sciences and the Korean Society for Aerospace Systems Engineering, as well as at major exhibitions and conferences including Drone Show Korea (DSK) 2025, the 2025 International Conference on Convergence (BIEN), the 76th International Astronautical Congress (IAC), and the 2025 Seoul International Aerospace and Defense Exhibition (ADEX). Through these efforts, SPPO continues to facilitate integration between domestic and international space system.



'25.10.20~24, 2025년 서울 국제 항공우주 및 방위산업 전시회
Seoul International Aerospace and Defense Exhibition (ADEX) 2025, Oct. 20~24, 2025



'25.2.26~28, 드론쇼코리아 2025
Drone Show Korea 2025 (Feb. 26~28, 2025)



'25.4.2~4, 한국항공우주학회
The Korean Society for Aeronautical and Space Sciences (Apr. 2~4, 2025)



'25.5.21, 'SPPO 통합워크숍'
SPPO Integrated Workshop (May 21, 2025)



'25.5.21~23, 항공우주시스템공학회
Korean Society for Aerospace System Engineering (May 21~23, 2025)



'25.8.20~22, 2025국제융합학술대회
2025 International Conference for Women in Science and Technology/Aug. 20-22, 2025)



'25.9.25~26, 한-호주 우주기술 워크숍
Korea-Australia Space Technology Workshop (Sep. 25-26, 2025)



'25.9.31~10.3, 제76회 국제우주대회(IAC)
76th International Astronautical Congress (IAC), Sep. 31~Oct. 3, 2025



'25.12.16~17, 우주중점기술 네트워크 구축 워크숍
Core Space Technology Networking Workshop (Dec. 16~17, 2025)

NGRC(National GNSS Research Center) 워크숍 개최

KPS개발사업본부는 외부 전문가와의 협력(기술응역)을 통해 2025년 11월 7일 제주에서 한·중·일 위성항법 공동연구와 기술 교류를 위한 NGRC 워크숍을 기획·개최하였다.

워크숍에 초청된 한·중·일 위성항법 전문가들은 KPS, BeiDou(BDS), QZSS 개발 현황과 GNSS 기술 연구 동향을 발표하고 협력 방안에 대해 논의하였다. 그 결과 워크숍 개최 이후 한·중·일 위성항법 전문가 간 지속적인 연구 협력을 위한 양해각서(MoU)가 체결되었다. 이를 통해 글로벌 기술 동향에 부합하는 국제 연구 네트워크 구축의 계기를 마련하였다.

Hosting of the NGRC (National GNSS Research Center) Workshop

The Korean Positioning System (KPS) R&D Directorate organized and hosted the NGRC (National GNSS Research Center) Workshop in Jeju on November 7, 2025, in collaboration with external expert organizations through technical service agreements. The workshop aimed to promote joint research and technology exchange on satellite navigation among Korea, China, and Japan.

Invited GNSS experts from the three countries presented the development status of KPS, BeiDou (BDS), and Quasi-Zenith Satellite System (QZSS). They also discussed recent research trends in GNSS technologies and explored potential areas for cooperation. As a result of the workshop, a Memorandum of Understanding (MoU) was signed to facilitate continued research collaboration among GNSS experts from Korea, China, and Japan. This initiative laid the foundation for establishing an international research network aligned with global technological trends.



NGRC 워크숍 개최('25.11)
NGRC Workshop Hosted (Nov. 2025)

국제우주대회(IAC, ISEB) 대학생 논문 발표 및 국제교류 지원

국제우주대회에 참가할 대학생 및 대학원생 총 8명을 사전에 선발하여 교육과 논문 지도를 실시하였다. 2025년 9월 25일부터 10월 3일까지 오스트레일리아 시드니에서 열린 국제 청년우주회의(Space Generation Congress, SGC)에 참가하여 청년 우주전문가들과 교류하고, 국제우주대회에 참석하여 논문 발표와 최신 우주개발기술 동향 습득을 지원하였다.

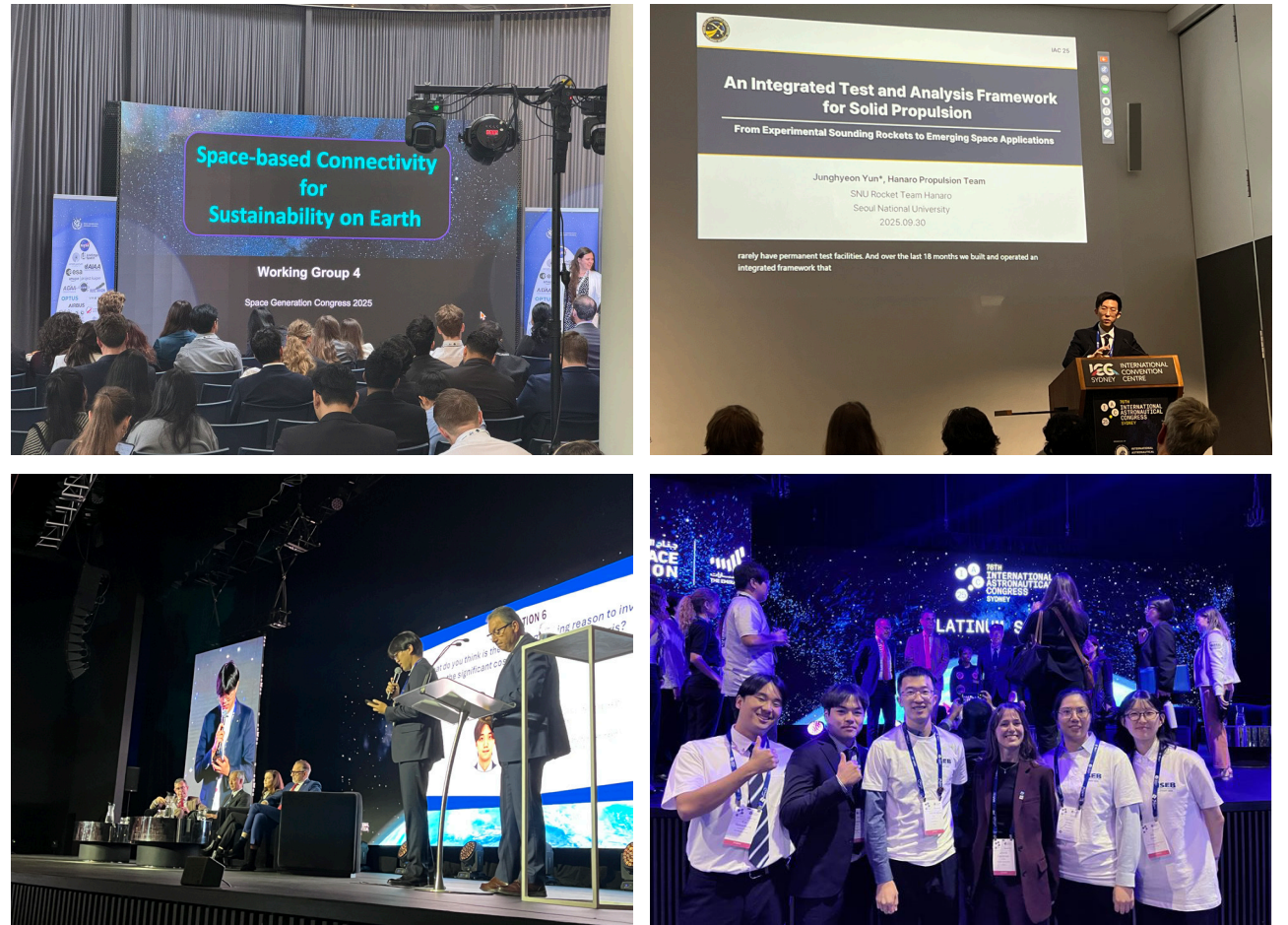
특히 국제우주대회 참가 학생들은 국제우주교육위원회(International Space Education Board, ISEB) 프로그램에도 참여하여 국제 네트워크를 형성함으로써 향후 글로벌 항공 우주 분야 인재 양성에 기여하였다.

Support for Student Paper Presentations and International Exchange at the International Astronautical Congress (IAC, ISEB)

A total of eight undergraduate and graduate students were selected in advance to participate in the International Astronautical Congress (IAC), and were provided with training and academic guidance for their research papers.

From September 25 to October 3, 2025, the students participated in the Space Generation Congress (SGC) held in Sydney, Australia, where they engaged with young space professionals and expanded their global networks. They also attended the IAC, where they presented their research papers and gained insights into the latest trends in space development technologies.

In particular, the participating students took part in programs organized by the International Space Education Board (ISEB), further strengthening their international networks and contributing to the cultivation of future global aerospace talent.



SGC 워킹그룹 토의 참가 및 ISEB 교류 활동
Participation in SGC Working Group Discussions and ISEB Networking Activities

한국항공우주연구원-캐나다 CRIAQ 공동 워크숍 개최

2025년 7월 한국항공우주연구원은 캐나다 몬트리올에서 개최된 한-캐나다 과학기술대회(Canada-Korea Conference on S&T, CKC)에 참가하였다. CKC는 과학기술 및 혁신 분야의 최신 이슈를 논의하고 양국 간 협력 방안을 모색하기 위해 학계, 산업계, 연구기관, 정부 등 다양한 분야의 전문가와 리더가 참여하는 다학제 학술대회이다.

이를 계기로 한국항공우주연구원은 캐나다 CRIAQ(Consortium for Research and Innovation in Aerospace in Quebec)와 함께 양 기관의 주요 관심 분야를 중심으로 공동 워크숍을 개최하였다. 워크숍에서는 신개념 항공기 개발, 지속가능한 에너지 및 대체연료, 도심항공교통(UAM) 인프라, 디지털·A 기반 항공우주기술 등을 주요 의제로 논의하였다.

본 워크숍에는 양 기관을 비롯하여 한국과 캐나다의 항공우주 분야 연구기관, 대학, 산업체 관계자들이 참여하여 각 기관의 연구개발 현황과 기술 동향을 공유하고, 향후 공동 연구 및 협력 확대 가능성에 대해 폭넓은 논의를 진행하였다.

Hosting of the KARI–CRIAQ Joint Workshop

In July 2025, KARI participated in the Canada–Korea Conference on Science and Technology (CKC) held in Montreal, Canada. CKC is a multidisciplinary conference that brings together experts and leaders from academia, industry, research institutes, and government to discuss key issues in science, technology, and innovation, and to explore opportunities for bilateral cooperation.

On this occasion, KARI co-hosted a joint workshop with the Consortium for Research and Innovation in Aerospace in Quebec (CRIAQ), focusing on areas of mutual interest. The workshop covered key topics such as next-generation aircraft development, sustainable energy and alternative fuels, urban air mobility (UAM) infrastructure, and digital and AI-based aerospace technologies.

The workshop was attended by representatives from KARI and CRIAQ, as well as research institutes, universities, and industry stakeholders from both Korea and Canada. Participants shared their respective R&D activities and technological trends, and engaged in in-depth discussions on potential areas for future joint research and expanded collaboration.



멕시코 발사장 구축 공동 타당성 조사 수행 및 보고서 발간

한국항공우주연구원과 멕시코 통신교통부 산하 우주청AEM, Agencia Espacial Mexicana)은 2024년 6월 14일 멕시코시티에서 '멕시코 발사장 구축 공동 타당성 조사' 수행을 위한 협력약정을 체결하였다. 본 약정은 멕시코 정부가 수립한 우주산업 로드맵(Obit Plan 2.0)의 일환으로, 한국의 발사장 구축 경험을 활용하고자 한 멕 시코 정부의 요청에 따라 이루어졌다.

협력약정 체결 이후 항우연과 멕시코 우주청 전문가들은 4개 분야의 워킹그룹(① 우주시장 및 개발동향 ② 발사장 입지 및 발사체 유형 선정 ③ 발사 허가 및 안전관리체계 ④ 발사서비스 시장 및 멕시코 경제기회)을 구성하여 과업을 수행하고, 멕시코 현지 기술세미나 개최 등을 통해 2025년 11월 최종보고서를 발간하였다. 2026년에는 영문 보고서 발간과 멕시코 현지에서 '멕시코 발사장 구축 공동 타당성 조사' 원로 기념행사를 추진할 계획이다.

본 타당성 조사를 통해 국내 개발 발사체의 해외 발사장 활용, 발사장 인프라 수출 기회 확대, 국내 우주산업체의 중남미 진출 등에 기여할 것으로 기대된다.

Joint Feasibility Study on the Establishment of a Spaceport in Mexico and Publication of the Final Report

On June 14, 2024, in Mexico City, KARI and the Mexican Space Agency (AEM, Agencia Espacial Mexicana), under the Ministry of Communications and Transportation of Mexico, signed a cooperation agreement to conduct a joint feasibility study on the establishment of a spaceport in Mexico. This agreement was established at the request of the Mexican government as part of its national space industry roadmap, Orbit Plan 2.0, with the aim of leveraging Korea's experience in launch site development.

Following the agreement, experts from KARI and AEM formed four working groups to carry out the study: (1) space market and development trends, (2) launch site location and launch vehicle selection, (3) launch licensing and safety management systems, and (4) launch service market and economic opportunities in Mexico. Through these activities, including technical seminars held in Mexico, the final report was published in November 2025. In 2026, KARI plans to publish the English version of the report and hold a commemorative event in Mexico to mark the completion of the joint feasibility study.

This feasibility study is expected to contribute to the utilization of overseas launch sites for domestically developed launch vehicles, expand opportunities for exporting launch site infrastructure, and support the entry of Korean space industry companies into the Latin American market.



멕시코 우주청에서의 협력 요청 서한(2024.4.25.)
Letter of Request for Cooperation from the Mexican Space Agency (Apr 25, 2024)



국내 언론
Korean Media



멕시코 언론
Mexican Media

OVERVIEW

Vision

A world-class research institute realizing Korea's dream toward the sky and space.

Mission

Contribution to solid development of the national economy and improving people's lives through new exploration, technology advancement, development and dissemination in the field of aerospace science and technology.

Major Function

Research and development of aircraft, satellites,
and space launch vehicle systems

Support for the establishment of national aerospace development policies
and distribution of information on aerospace technology

Joint utilization of testing and evaluation facilities, collaboration with industries,
and industrialization of technology

R&D cooperation with the government, private sector, corporate bodies
and other organizations. Nurturing professional manpower in key areas



HISTORY

1900's

1989. 10

Establishment of KARI under Korea Institute of Machinery & Materials (KIMM)



1990. 12

Ground-breaking ceremony for the building of the institute



1992. 10

Building Completing Ceremony



1993. 04

Development of experimental aircraft



1993. 06/09

Launch of single-stage sounding rocket (KSR-I)



2000's

2001. 09

Development of canard aircraft



2002. 11

Launch of Korea's 1st liquidpropellant rocket (KSR-III)



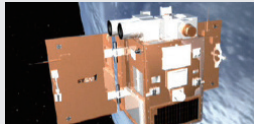
2003. 08

Ground-breaking ceremony for the space center



2003. 09

Launch of STSAT-1



2010's

2010. 06

Launch of COMS (CHEOLLIAN-1)



2011. 11

Development of Smart UAV



2012. 05

Launch of KOMPSAT-3 (KOMPSAT-3)



2012. 06

Development of dual-use core components for Korea Utility Helicopter (Surion)



2014. 05

Development of OPV



2015. 03

Launch of KOMPSAT-3A (KOMPSAT-3A)



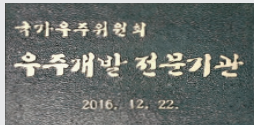
2015. 12

Completion of building of KSLV-II engine propulsion system testing facilities



2016. 12

KARI designated as national organization for space development in Korea



2020's

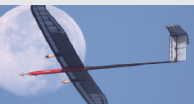
2020. 02

Launch of GEOKOMPSAT- 2B (CHEOLLIAN-2B)



2020. 08

Successful 53 straight hour flight of stratosphere solar-powered unmanned Electrical Aerial Vehicle-3 (EAV-3)



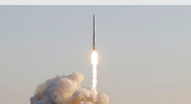
2021. 03

Launch of CAS 500-1



2021. 10

The 1st launch of KSLV-II (NURI)



2022. 06

The 2nd launch of KSLV-II (NURI)



1993. 09

Development of EXPO unmanned airship



1996. 11

Incorporation of KARI



1997. 03

Development of twin-engine composite aircraft



1998. 06

Launch of two-stage sounding rocket (KSR-II)



1999. 12

Launch of KOMPSAT-1 (KOMPSAT-1)



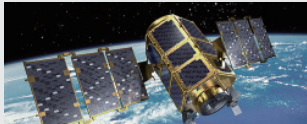
2003. 10

Development of multi-purpose stratosphere unmanned airship



2006. 07

Launch of KOMPSAT-2 (KOMPSAT-2)



2008. 04/12

The first Korean astronaut, Development of medium aerostat



2009. 06

Completion of NARO Space Center



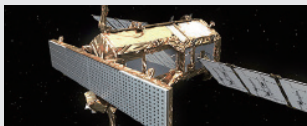
2013. 01

The 3rd launch of Korea's first space launch vehicle (KSLV-I)



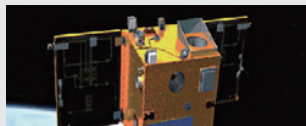
2013. 08

Launch of KOMPSAT-5 (KOMPSAT-5)



2013. 11

Launch of STSAT-3



2013. 12

Development of KC-100



2018. 11

Launch of test launch vehicle (NURI TLV)



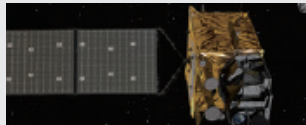
2018. 12

Success in automatic transition flight of QTP-UAV



2018. 12

Launch of GEOKOMPSAT- 2A (CHEOLLIAN-2A)



2022. 08

Launch of KPLO (Danuri)



2023. 05

The 3rd launch of KSLV-II (NURI)



2024. 11

Launch of the Second KASS Satellite



2025. 11

The 4th launch of KSLV-II (NURI)

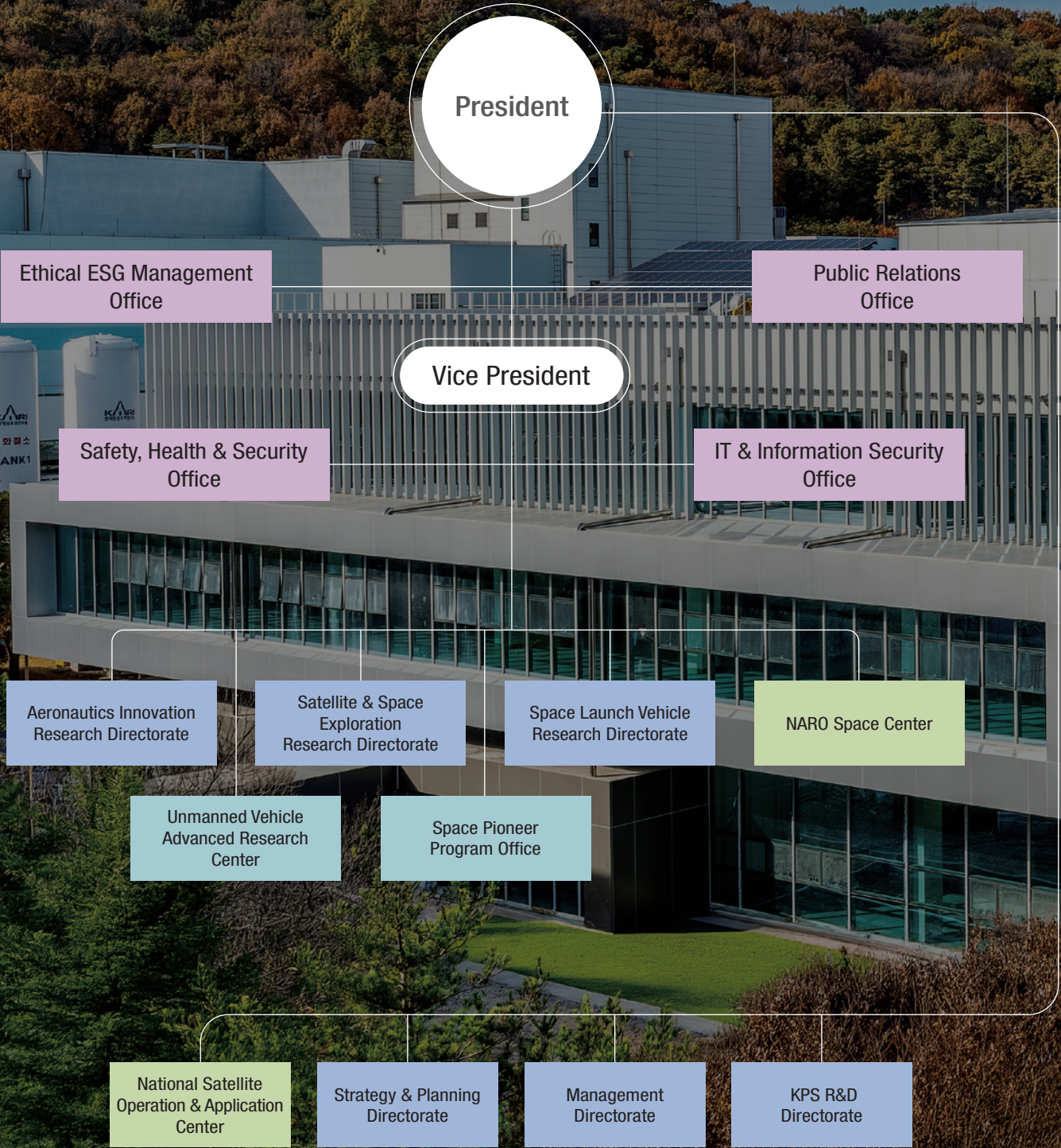


2025. 12

Launch of KOMPSAT-7 (KOMPSAT-7)

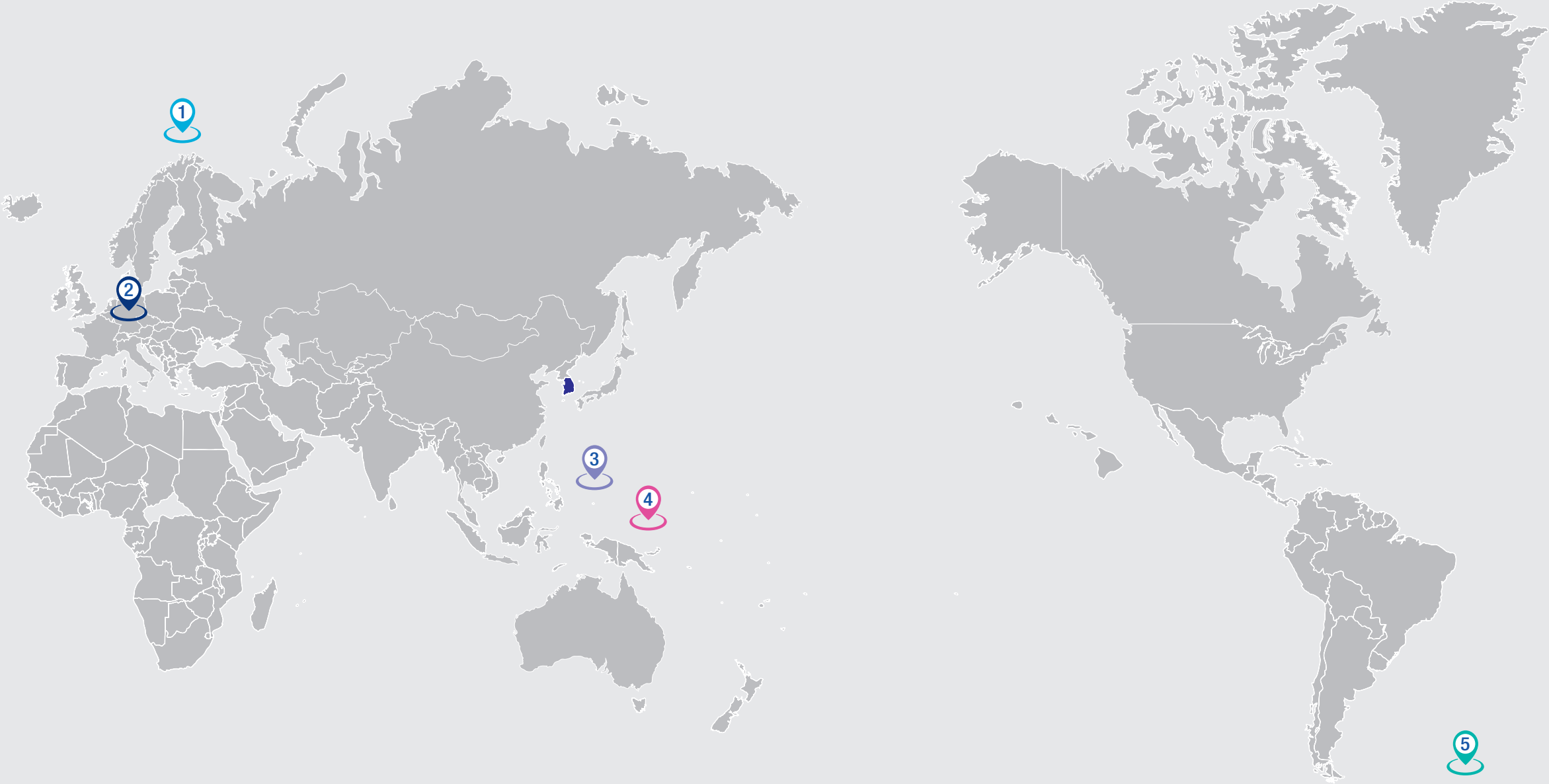


ORGANIZATIONAL CHART



FACILITIES

-  Unmanned Operation
-  S-Band Down/Uplink
-  X-Band Downlink



❶ Svalbard Island



❷ Neustrelitz



❸ Palau Tracking Station



❹ Micronesia



❺ Antarctic



FACILITIES



Site area (㎡) : 317,942 / Facility area (㎡) : 111,603

- Satellite Test Center
- Ground Combustion Test Center
- Satellite Ground station
- Full-Scale Airframe Static Test Facility
- Rotary Wing Aircraft Test Center
- Wind Tunnel Test Center



Site area (㎡) : 5,374,686 / Facility area (㎡) : 83,232

- KSLV Launch Site
- Mission Operation Center
- Tracking Radar



Site area (㎡) : 1,025,445 / Facility area (㎡) : 8,021

- Aircraft Test Center
- Helicopter Whirl Tower Test Facility



35 M Antenna / 750 ton

- S-Band up/downlink, X-Band downlink

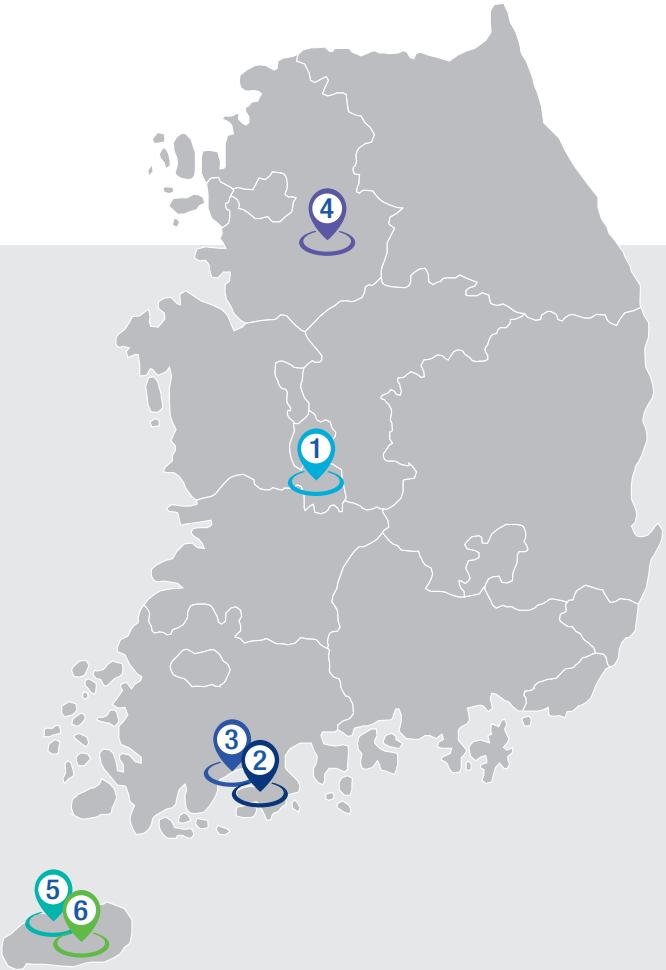


Site area (㎡) : 61,166 / Facility area (㎡) : 4,408

- Operation of LEO satellites



Site area (㎡) : 114,811 / Facility area (㎡) : 2,031



Internationally Registered Patents in 2025

Control surface load simulation apparatus having reaction force providing structure

Country	Date of Patent	Patent Number	Abstract
US	2025-01-07	12188849	Provided is a control surface load simulation apparatus including a reaction force providing structure. The control surface load simulation apparatus includes a first support surface, a second support surface apart from the first support surface in a height direction, a control surface located between the first support surface and the second support surface, an actuator connected to the second support surface and configured to apply a certain load to the control surface, and a reaction force providing structure connected to the first support surface and the control surface to be movable relative to the first support surface and the control surface, the reaction force providing structure being configured to apply a reaction force corresponding to the load to the control surface.

SATELLITE ORBIT PROPAGATOR USING SHIP AUTOMATIC IDENTIFICATION SYSTEM DATA AND CONTROL METHOD THEREOF

Country	Date of Patent	Patent Number	Abstract
EP	2025-01-15	3955018	The present disclosure relates to a satellite orbit propagator using ship automatic identification information and a control method thereof, including acquiring automatic identification system (AIS) data during a predetermined period of time, performing a validation test on the AIS data acquired during the predetermined period of time, converting the AIS data determined to be suitable through the validation test, from an earth coordinate system into an inertial coordinate system, and estimating a position and a velocity of a satellite by using the AIS data converted into the inertial coordinate system and a predetermined orbit propagator model. According to the present disclosure, there is an advantage in that the orbit can be determined using the AIS data when a satellite-mounted GPS receiver malfunctions or a GPS satellite signal reception rate decreases. In particular, while the precision is lower than that of the existing GPS-based orbit propagator, there is an advantage that it is useful for determining the initial orbit after launching a satellite.

Storage station for unmanned VTOL aircrafts

Country	Date of Patent	Patent Number	Abstract
US	2025-02-18	12227320	A storage station for unmanned vertical take-off and landing (VTOL) aircrafts includes a storage case (110) for accommodating an unmanned VTOL aircraft therein, a first coupling member (120) having one end pivotably coupled to an inner upper surface of the storage case and the other end protruding out of the storage case by a pivoting operation, and a second coupling member (130) provided at the other end of the first coupling member, in which one end of a main body of the unmanned VTOL aircraft is coupled to the second coupling member, and the second coupling member is rotatable about a rotation axis in a longitudinal direction of the first coupling member, whereby it is possible to provide an advantageous effect of simultaneously storing and charging multiple drones on sides, and it is particularly possible to provide an advantageous effect of charging and storing a large number of drones used in swarm flight technology, which has recently become increasingly useful.

System for controlling propeller and rotor RPM of aerial vehicle having multiple power devices

Country	Date of Patent	Patent Number	Abstract
US	2025-02-25	12234005	Provided is a system for controlling an RPM of a propeller and a rotor of a flight vehicle having multiple power units including: a collective pitch angle command generating unit generating a collective pitch angle command upon receiving a thrust control command from a pilot or an automatic controller; a disturbance factor compensating unit for generating an RPM compensation electronic speed control (ESC) command for compensating for an RPM error, and an electronic speed adjustment command generating unit generating a final ESC command upon receiving a collective command input or derived in the process of generating the collective pitch angle command by the collective pitch angle command generating unit and the RPM compensation ESC command generated by the disturbance factor compensating unit. RPMs of motors of a flight vehicle having a plurality of propellers and rotors may be maintained to be the same.

High-efficiency integrated power circuit with reduced number of semiconductor elements and multiple output ports

Country	Date of Patent	Patent Number	Abstract
US	2025-02-25	12237759	Disclosed are a high-efficiency integrated power circuit with a reduced number of semiconductor elements and a control method thereof. A high-efficiency integrated power circuit of an integrated converter includes an input port, which is a first port, to which power for driving the integrated converter is input, a non-isolated port, which is a second port, for outputting, to outside the high-efficiency integrated power circuit, an allowable amount of power generated when power input through the input port passes through an inductor, and an isolated port, which is a third port, for conducting remaining power excepting power output through the non-isolated port and for maintaining the conducted remaining power inside the high-efficiency integrated power circuit.

AIRCRAFT CONTROL INPUT DEVICE AND COMMAND INPUT METHOD USING THE SAME

Country	Date of Patent	Patent Number	Abstract
EP	2025-03-19	4190690	The present invention relates to a control input device (100) applicable to an eVTOL aircraft, which is an electric-powered vertical take-off and landing aircraft, and more particularly, to an aircraft control input device that may replace a cyclic control stick, a tall rotor control pedal, and a collective control stick used for flight control of a conventional aircraft, which is simpler in configuration and easier to operate than conventional control devices and may improve pilot convenience and stability of flight operation through simple and accurate flight manipulation, and a command input method using the same.

Textiles winding apparatus

Country	Date of Patent	Patent Number	Abstract
JP	2025-04-15	7667873	The spool assembly which a plurality of bobbins are provided in the direction of the circumference, and forms a spool side in the surroundings of a wire with a spiral textiles winding apparatus by one example; the guide ring provided in the spool side and the direction of slant at the front part of the center of the above-mentioned spool assembly; It reaches, Wire transport unit; made to transport so that the above-mentioned spiral wire may pass the above-mentioned guide ring is included, A wire is arranged so that the center of the above-mentioned guide ring may be penetrated right-angled, It is a textiles winding apparatus which the above-mentioned spool assembly is arranged in the direction of slant at a wire, and textiles roll round from said plurality of bobbins on the above-mentioned spiral wire along with the above-mentioned guide ring, In arranging a plurality of above-mentioned textiles winding apparatus in order along with the above-mentioned spiral wire, one spiral wire can be followed in order and the textiles of how many layers can roll round.

Internationally Registered Patents in 2025

OFFSET-APPLIED MOMENTUM DUMP METHOD FOR SATELLITE REACTION WHEEL

Country	Date of Patent	Patent Number	Abstract
EP	2025-04-16	4129835	The present disclosure relates to an offset-applied momentum dump method for a satellite reaction wheel. The purpose of the present disclosure is to provide an offset-applied momentum dump method for a satellite reaction wheel, in which an appropriate offset is applied to an originally designed momentum dump to enable safer and more efficient operation of a satellite.

Leaf spring type landing gear

Country	Date of Patent	Patent Number	Abstract
US	2025-04-22	12280867	The present disclosure relates to a leaf spring type landing gear mounted on a lower portion of a fuselage of an aircraft, and more particularly, to a leaf spring type landing gear having improved performance for mitigation and absorption of shocks, including: a first frame connected to the fuselage and bent to have a circle center below; a second frame connected to the first frame; and a third frame connected to the second frame and at least partially bent to have a circle center below, wherein the second frame includes a 2-1st frame and a 2-2nd frame having circle centers formed in opposite directions and is formed to be bent in an S shape.

Safe landing point search device for searching for safe landing point by using contour line information with respect to terrain map, and safe landing point search method

Country	Date of Patent	Patent Number	Abstract
US	2025-05-06	12291356	A safe landing point search device for searching for a safe landing point of an unmanned exploration device that lands on and explores a celestial body, includes a terrain map obtaining unit configured to obtain a terrain map, a contour line generating unit configured to generate contour lines based on a reference minimum height value and a height interval value by using the terrain map, a largest empty circle (LEC) searching unit configured to search for one or more LECs having a radius greater than or equal to a lower-limit radius in a contour line map including the contour lines, and a safe landing point outputting unit configured to output a safe landing point having a largest radius among the one or more LECs and transmit the safe landing point to the unmanned exploration device.

DC-DC conversion device having coupling inductor

Country	Date of Patent	Patent Number	Abstract
US	2025.05.27	12316222	According to the present invention, an output inductor, rather than being composed of a separate inductor element, is magnetically coupled to a third inductor and a fourth inductor constituting a second transformer. Thus, compared to the case in which the output inductor is composed of the separate inductor element independently of the third inductor and the fourth inductor, the cost as well as the volume of the DC-DC conversion device can be reduced.

Multi-band image generation system and method using deep-learning network

Country	Date of Patent	Patent Number	Abstract
US	2025-07-15	12361665	The present invention relates to a multi-band image generation system and method using a deep-learning network, and to a technology of generating a multi-band image based on an image of a panchromatic band by analyzing a nonlinear relationship between the panchromatic band and each multi-band using a deep-learning network.

FILTER MANUFACTURING METHOD AND FILTER MANUFACTURED BY THE METHOD

Country	Date of Patent	Patent Number	Abstract
EP	2025-07-16	4175059	A filter manufacturing method and a filter manufactured by the filter manufacturing method are disclosed. The filter manufacturing method includes designating a use mode in a resonator to a first resonance mode, in response to designating to the first resonance mode, setting a band selected from a designated first frequency band to a passband in the resonator, switching the use mode in the resonator from the first resonance mode to a second resonator mode, in response to switching to the second resonance mode, setting a band selected from the first frequency band except for the passband to a stopband in the resonator, and manufacturing a primary filter including the resonator to which the passband and the stopband are set.

Method of calculating power level reflectance of object on ground using SAR image

Country	Date of Patent	Patent Number	Abstract
US	2025-08-05	12379486	A method of calculating power level reflectance σ_0 of an object on the ground using synthetic aperture radar (SAR) image includes receiving the SAR image composed of pixels each having a complex value ($IDN+jQDN$), local incidence angle data including local incidence angle values respectively corresponding to the pixels of the SAR image and a reflection coefficient K_2 of the SAR image, calculating power level reflectance β_0 on a slant range domain of a first object corresponding to a first pixel based on the complex value ($IDN+jQDN$) of the first pixel in the SAR image and the reflection coefficient K_2 , and calculating, using an equation that $\sigma_0=\beta_0\cdot(\sin \theta_i)^2$, power level reflectance σ_0 of the first object on the ground based on the power level reflectance β_0 of the first object on the slant range domain and the local incidence angle value θ_i corresponding to the first pixel.

Method for estimating bit error probability using error rate ratio of frame synchronization word

Country	Date of Patent	Patent Number	Abstract
US	2025-08-05	12381666	The present invention relates to a method for estimating a bit error probability using an error rate ratio of a frame synchronization word. The method comprises the steps of a) defining error rate ratios of frame synchronization words, b) setting a cost function $f(pe)$ in a weighted least squares (WLS) form, c) obtaining a value of χ , and d) deriving an estimated bit error probability value.

Internationally Registered Patents in 2025

Method of controlling tilt rotor, apparatus for controlling tilt rotor, and aircraft including the apparatus

Country	Date of Patent	Patent Number	Abstract
US	2025-08-19	12391363	An apparatus for controlling a tilt rotor is provided. The apparatus includes a thrust command generator configured to generate a first collective pitch angle based on a throttle command, a rotation speed compensator configured to generate a compensation value based on a rotation speed of the motor, a compensation weight generator configured to generate weight values according to a flight speed, a collective pitch angle command generator configured to generate a collective pitch angle adjustment command of the rotor blade of the motor, based on the first collective pitch angle and a first compensation value being obtained by multiplying the compensation value by a preset conversion ratio and a first weight value, and a motor controller configured to generate a motor control command based on a second compensation value being obtained by multiplying the compensation value by a second weight value and the first collective pitch angle.

Apparatus, method, and computer program for measuring spatial resolution of electro-optical system

Country	Date of Patent	Patent Number	Abstract
US	2025-09-09	12412277	Provided are an apparatus, method, and computer program for measuring spatial resolution of electro-optical system, by which the influence of edge spread function (ESF) by micro-vibrations is mitigated by using deep learning techniques. The method of measuring spatial resolution of electro-optical system includes obtaining raw ESF data from an edge image obtained by using the electro-optical system, obtaining a corrected ESF curve by inputting the raw ESF data to a deep learning model, obtaining a line spread function (LSF) curve by differentiating the corrected ESF curve, obtaining a modulation transfer function (MTF) curve by Fourier-transforming the LSF curve; and obtaining a MTF value from the MTF curve.

Method, system, and apparatus for generating optimal imaging sequence for plurality of satellites

Country	Date of Patent	Patent Number	Abstract
US	2025-09-09	12413690	Provided are a method, a system, and an apparatus for generating an optimal imaging sequence for a plurality of satellites. More particularly, provided are a method, a system, and an apparatus for generating an optimal imaging sequence for establishing an efficient imaging mission plan for a ground target imaging mission by using a plurality of earth observation satellites.

Hybrid engine system and method of controlling the same

Country	Date of Patent	Patent Number	Abstract
US	2025-09-16	12415498	A hybrid engine system includes: an engine; a generator driven by the engine to output electrical energy; a battery configured to store electrical energy produced by the generator or supply electrical energy together with the generator; and a controller configured to control the engine, wherein the controller includes a torque meter for measuring torque of an output shaft of the engine and a current meter for measuring output current of the generator, and is further configured to change a control mode of the engine when a reduction rate of at least one of the torque and the current is greater than a set value while the engine is operating in a fly mode.

Tilt prop aircraft

Country	Date of Patent	Patent Number	Abstract
US	2025-10-07	12434829	A tilt prop aircraft is provided, including a first longitudinal support member and a second longitudinal support member capable of tilting relatively to each other, a tilt actuator disposed on the second longitudinal support member, a first power transmission member rotated by the tilt actuator, a second power transmission member fixed to the first longitudinal support member and coupled to the first power transmission member to transmit a rotational movement of the first power transmission member by turning 90 degrees in different planes, a crank fixed to the second longitudinal support member and extending through a slot in the first longitudinal support member and protruding inwardly from the first longitudinal support member, and a connecting rod connected to the crank so as to be relatively rotatable to the crank, and connected to the pitch control rod.

Dual motor actuator and method of controlling the same

Country	Date of Patent	Patent Number	Abstract
US	2025-10-07	12438418	A dual motor actuator according to an embodiment includes a main motor actuator outputting torque to a main output shaft by including a main motor and a main reduction gear, an auxiliary motor actuator outputting torque to an auxiliary output shaft by including an auxiliary motor and an auxiliary reduction gear, and a clutch connecting the main output shaft and the auxiliary output shaft to each other, wherein the clutch includes a fixed clutch connected to the main output shaft and a movable clutch coupled to or released from the fixed clutch and connected to the auxiliary output shaft, and the dual motor actuator further includes an output unit connected to the movable clutch and transmitting an output from the main motor actuator or the auxiliary motor actuator.

METHOD AND APPARATUS FOR GROUND TARGET PRECISION ORIENTATION FOR SATELLITE IMAGE ACQUISITION

Country	Date of Patent	Patent Number	Abstract
EP	2025-10-08	4332003	Provided are a method and apparatus for ground target precision orientation for satellite image acquisition, in which the method includes: receiving a desired satellite position (P) for imaging from a ground station, and receiving a ground plan imaging time (T) or an algorithm execution time (TA) from the ground station, in which the ground plan imaging time (T) is calculated according to the desired satellite position (P) for imaging at a ground-based orbit propagator, and the algorithm execution time (TA) is set to be earlier than the ground plan imaging time (T) by a predetermined amount of time; and determining, based on a position error (E) calculated by using a difference between the desired satellite position (P) for imaging and the predicted satellite position (Q) output from the satellite-based orbit propagator, a closest satellite position (QC) and a closest satellite time (TC) corresponding to when the satellite is closest to the desired satellite position (P) for imaging, and determining a corrected maneuvering attitude (e, θ) for orienting the line-of-sight vector of an image capturing payload of the satellite to a ground target at the closest satellite position (QC).

Electric aircraft

Country	Date of Patent	Patent Number	Abstract
US	2025-10-21	12451556	An electric aircraft according to an embodiment of the present invention comprises: a fuselage equipped with a power means, a front spar and a rear spar extending from the fuselage to an end of a wing, and a plurality of ribs extending from the rear spar to the front spar and coupled to the front spar and the rear spar, in which a plurality of solid state batteries are mounted in a plurality of individual spaces partitioned by the front spar, the rear spar, and the plurality of ribs, respectively, and the front spar and the rear spar are used as members for serial connection of the plurality of solid state batteries, and the plurality of ribs are used as members for parallel connection of the plurality of solid state batteries.

Internationally Registered Patents in 2025

METHOD AND DEVICE FOR CORRECTING IMAGE SENSOR MISALIGNMENT BY USING SHIP IDENTIFICATION INFORMATION

Country	Date of Patent	Patent Number	Abstract
EP	2025-10-22	3876202	Disclosed are a method and a device for correcting image sensor misalignment. A method for correcting image sensor misalignment according to an example embodiment of the present disclosure may include: acquiring a ship image from an image sensor; acquiring ship identification information from an automatic identification system (AIS); and correcting a misalignment value of the image sensor using first coordinates of a ship, which is calculated from the ship image, and second coordinates of the ship, which is calculated from the ship identification information.

METHOD AND APPARATUS FOR CONTROLLING TILT ROTOR, AND AIRCRAFT INCLUDING THE APPARATUS

Country	Date of Patent	Patent Number	Abstract
EP	2025-10-22	4371884	An apparatus for controlling a tilt rotor is provided. The apparatus includes a thrust command generator (100) configured to generate a first collective pitch angle based on a throttle command, a rotation speed compensator (200) configured to generate a compensation value based on a target rotation speed and a current rotation speed of the motor, a compensation weight generator (300) configured to generate weight values according to a flight speed, a collective pitch angle command generator (400) configured to generate a collective pitch angle adjustment command of the rotor blade of the motor, based on a first compensation value and the first collective pitch angle, the first compensation value being obtained by multiplying the compensation value by a preset conversion ratio and a first weight value, and a motor controller (500) configured to generate a motor control command based on a second compensation value being obtained by multiplying the compensation value by a second weight value and the first collective pitch angle.

Power unit

Country	Date of Patent	Patent Number	Abstract
US	2025-11-11	12466567	A power unit includes an engine including a driving shaft, a power generator provided on the driving shaft and configured to supply electric energy to a flight vehicle, and a thrust generator provided on an outer side of the power generator and configured to provide a propulsion force to the flight vehicle. When a temperature of the power generator is greater than or equal to a first temperature, the power generator and the thrust generator are decoupled from each other, and the power generator is driven by an output of the engine and supplies the electric energy to the flight vehicle. When the temperature of the power generator is less than the first temperature, the power generator and the thrust generator are coupled to each other, and the thrust generator is driven by the output of the engine and provides the propulsion force to the flight vehicle.

Aircraft control input device and command input method using the same

Country	Date of Patent	Patent Number	Abstract
US	2025-11-18	12473075	The present invention relates to a control input device applicable to an eVTOL aircraft, which is an electric-powered vertical take-off and landing aircraft, and more particularly, to an aircraft control input device that may replace a cyclic control stick, a tail rotor control pedal, and a collective control stick used for flight control of a conventional aircraft, which is simpler in configuration and easier to operate than conventional control devices and may improve pilot convenience and stability of flight operation through simple and accurate flight manipulation, and a command input method using the same.

Diagnostic system of launch vehicle

Country	Date of Patent	Patent Number	Abstract
US	2025-11-18	12475745	The present disclosure relates to a diagnostic system of a launch vehicle, and more particularly, to a technology capable of accurately estimating a change in attitude and volume of the launch vehicle by generating a three-dimensional shape of the launch vehicle and comparing the three-dimensional shape with reference shape information using a light detection and ranging (LIDAR) sensor to calculate state information of the launch vehicle.

Sandwich panel type antenna integrated lattice core

Country	Date of Patent	Patent Number	Abstract
US	2025-12-30	12512594	Provided is an antenna integrated structure in which an antenna is inserted into ground vehicle, marine ship and aircraft structure, and more particularly, a sandwich panel type antenna integrated latticecore having a structure for improving communication performance of an antenna module.

Multiple data transmission method and multiple data transmission system

Country	Date of Patent	Patent Number	Abstract
US	2025-12-30	12513082	A multiple data transmission method and a multiple data transmission system are disclosed. A multiple data transmission system, according to one embodiment of the present invention, comprises: an identification unit for identifying, from among a plurality of separated networks, a first network to which a transmission device requesting data transmission belongs; a generation unit for generating a data packet by adding a destination address set for the first network as a header to data transmitted from the transmission device; and a transmission unit for transmitting the data packet to a reception device identified by the destination address, through a transmission path which connects the first network and a second network to which the reception device belongs.

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