Media Release

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FOR IMMEDIATE RELEASE

CAAS, OSTIN, SITA AND STARTICAL TO TRIAL SATELLITE COMMUNICATION BETWEEN PILOTS AND AIR TRAFFIC CONTROLLERS

The pioneering solution will make flying safer, more efficient and sustainable

The Civil Aviation Authority of Singapore (CAAS), the Economic Development Board's Office for Space Technology and Industry (OSTIn), SITA and Startical, an Indra and Enaire company, have signed a Memorandum of Understanding (MOU) to perform a proof-of-concept on the use of space-based Very High Frequency (VHF) voice for communication between pilots and air traffic controllers for air traffic management. The proof of concept will demonstrate the feasibility of the new technology and its benefits over ground-based VHF voice communications, and collect the data needed for global evaluation, standards setting and adoption. The MOU was signed by the four parties on the sidelines of the World Air Traffic Management Congress in Madrid, Spain on 21 June 2022.

2 Currently, VHF voice communications is used by pilots and air traffic controllers to communicate with each other, for example, for pilots to request, and air traffic controllers to clear aircraft to ascend or descend, or to change flight paths in response to weather or turbulence. To ensure safe and efficient air traffic management, particularly in crowded airspaces and during abnormal and emergency situations, the communication needs to be reliable, direct and instantaneous.

3 As current VHF stations are ground-based, there is limited or no VHF voice communications coverage over oceanic, mountainous or remote areas beyond the range of ground-based stations which constrains operation. Space-based VHF voice communications will have more comprehensive coverage, which helps to enhance the safety and efficiency of air traffic management.

4 The development and adoption of space-based VHF voice communications require technical feasibility studies and evaluation, and standard setting by the International Civil Aviation Organization (ICAO) and the International Telecommunications Union (ITU) before they can be adopted for safe operations. While there have been previous technical studies, the CAAS-OSTIn-SITA-Startical proof of concept is the first study where a purpose-built satellite will be deployed to space to carry VHF communications equipment for such a trial. The purpose of the trial is to demonstrate interoperability of space-based communications with aircraft equipment and existing ground radio stations, with similar voice quality, latency and other criteria compared to ground-based voice communications. In particular, the trial will demonstrate the feasibility of space-based voice communications for the equatorial region, where scintillation effect that affects VHF voice communications quality is known to be more severe. The proof of concept will commence in 2023 and will take one year to complete, following which CAAS will present the results and data to the ICAO and ITU for consideration and discussion.

5 The CAAS-OSTIn-SITA-Startical collaboration brings together strong complementary capabilities amongst the four parties involved. CAAS, a leading air navigation service operator at the forefront of technology development and adoption, will provide the testbed for the trial. OSTIn, Singapore's national space office, will support the effort by looking at the development and application of space capabilities to aviation and the building of a space eco-system. Startical is a pioneer in space-based VHF for air traffic management and will deploy the satellite. SITA is a leading communications and information technology company for air transport and will provide the communications infrastructure and hardware.

6 Mr Han Kok Juan, Director-General of the CAAS, said, "As global and regional air traffic continues to grow, CAAS is committed to leveraging new technologies to

enhance air traffic management to improve efficiency and reduce carbon emissions, and to being a pathfinder and convenor of the public-private partnership needed to drive development and global adoption of such technologies. Space-based VHF communications technology could be transformative; it could boost safety and efficiency and make aviation more sustainable, while increasing capacity to meet rising air travel demand. This proof of concept if successful will be a significant step forward towards global endorsement and adoption."

7 Mr David Tan, Executive Director of OSTIn, said, "This collaboration is in line with OSTIn's strategy of exploring the development of space capabilities to support critical domains such as aviation, maritime, sustainability and digital resilience. Singapore players working on space-based technologies will also have the opportunity to collaborate with international partners to build and further strengthen capabilities within our local space ecosystem."

8 Mr Yann Cabaret, CEO, SITA FOR AIRCRAFT, said, "We are delighted to be working with the Civil Aviation Authority of Singapore and Startical to support operational improvements in air traffic management over oceanic and remote continental areas. This trial aims to demonstrate that the use of satellite-based VHF communications is a viable solution to mitigate coverage issues and loss of communication in these areas, supporting safer operations, optimising air traffic in our congested skies, and reducing emissions."

9 Mr Fernando García Martínez-Peñalver, Managing Director of Startical, emphasised that "this demonstration will open the door to more efficient global air traffic management, putting an end to the restrictions and bottlenecks that still exist on routes crossing oceans and remote areas of the planet. At Startical, we're working on deploying a constellation of 200+ satellites that will provide communication and surveillance infrastructure to air navigation service providers around the world."

About the Civil Aviation Authority of Singapore (CAAS)

The mission of the Civil Aviation Authority of Singapore (CAAS) is to grow a safe, vibrant air hub and civil aviation system, making a key contribution to Singapore's success. CAAS' roles are to oversee and promote safety in the aviation industry, develop the air hub and aviation industry, provide air navigation services, provide aviation training for human resource development, and contribute to the development of international civil aviation.

About the Office for Space Technology & Industry (OSTIn), Singapore

OSTIn is Singapore's national space office. Hosted within the Singapore Economic Development Board (EDB) as an autonomous office, it is responsible for nurturing the development of space technologies to serve national imperatives, growing a globally competitive space industry in Singapore and fostering an enabling regulatory environment for Singapore's space activities. To support these objectives, OSTIn also seeks to build international partnerships and contribute to the development of multilateral norms on space. In addition, OSTIn also supports the development of Singapore's future workforce through space-based STEM outreach.

About SITA

SITA is the air transport industry's IT provider, delivering solutions for airlines, airports, aircraft and governments. SITA's solutions drive operational efficiencies while delivering the promise of the connected aircraft to customers of 17,000 aircraft globally. Its communications network connects every corner of the globe and bridges 60% of the air transport community's data exchange. For more information, visit www.sita.aero

About Startical

STARTICAL is a recently-created company by ENAIRE, the national air navigation manager in Spain, and Indra, a world leader in the development of air traffic, management systems that will launch a constellation of 200+ satellites, specifically designed for air traffic management (ATM), that will provide global coverage of communications VHF AMS(R) and surveillance ADS-B services. Startical will own the constellation which will translate into controlled costs, the possibility to offer integrated Communication and Surveillance services and new services such as ADS-B data integrated verification using multilateration techniques. Startical services will not

require any change in avionics or to existing installations. For more information, visit www.startical.com.

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