SmartSat unveils CHORUS prototype terminal for faster, safer military communications

Adelaide, 9 May 2023 – SmartSat Cooperative Research Centre (CRC), Australia's leading space research centre, has unveiled the Compact Hybrid Optical-RF User Segment (CHORUS) prototype terminal to create more stable and secured military satellite communications at the 15th Australian Space Forum.

Funded by SmartSat CRC, the world-leading technology embedded in this prototype has been entirely developed in Australia by the Defence Science and Technology Group (DSTG), and industry and academic partners, EOS Space Systems and EM Solutions, Lyrebird Antenna Research, Shoal Group, Australian National University and University of South Australia, following three years of research.

Satellite optical communications links offer significantly higher data rates and a lower interception probability than standard civilian and military radio frequency (RF) satellite communications, which are vulnerable to electronic warfare, such as jamming, geo-location and interception. CHORUS aims to address the several limitations of satellite-based optical communications technology and open viable commercialisation pathways for new SATCOM capabilities.

The new CHORUS Terminal is a hybrid optical/RF system, integrating an RF antenna and an optical telescope into a system called the AntennaScope™. This ensures users have reliable communications all the time and much higher data rates when optical communication is possible.

A recent VIP demonstration day at the Department of Defence Edinburgh base showcased the successful completion of testing and marked the practical conclusion of the two phases of the SmartSat CRC co-funded project. The unveiling of the CHORUS Terminal at the Australian Space Forum is the first opportunity for the space community to see the prototype and discuss its capabilities and potential commercial pathways with members of the R&D project team.

The project drew on impressive efforts by DSTG to support testing at their LASER range, including designing and building a 'pseudo-satellite' to prove the hybrid RF-Optical aperture worked as designed. The availability of an EM Solutions provided Cobra maritime SATCOM terminal* allowed the project to manufacture possibly the world's first coaxial hybrid RF-Optical aperture, the AntennaScope™.

*https://www.emsolutions.com.au/products-and-solutions/sotm/satcom-on-the-move-cobra/

Professor Andy Koronios, CEO, SmartSat CRC, says CHORUS is a ground-breaking technology that will transform Australia's military communications.

"By combining RF communications with the more secure optical communication technology, CHORUS has enabled the development of an entirely new class of satellite communications terminal. Existing military systems could be retrofitted with this new technology, eliminating much of the cost of replacing terminals across military vehicles and ships," Professor Koronios says.

"CHORUS has the potential to position Australia as a leader in developing and delivering an entirely new class of military satellite communications service for the Australian Defence Force and its allies. This includes developing optical communications to provide higher bandwidth, lower observability, and more secure communications than current RF-only technologies for tactical communications between maritime, aircraft, and land vehicles. We believe this technology has additional commercial applications, such as commercial shipping and cruise liners. CHORUS is a testament that Australia can achieve world-first outcomes in advanced research, development and manufacturing."

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ABOUT THE SMARTSAT CRC

The SmartSat Cooperative Research Centre brings together over 100 national and international partners who have invested over $190 million, along with $55 million in Federal Government funding under its Cooperative Research Centres Program, in a $245 million research effort over seven years. Working closely with the Australian Space Agency & Department of Defence, SmartSat is making a strong contribution to the Australian Government's goal of tripling the size of the space sector to $12 billion and creating up to 20,000 jobs by 2030. Priority industry sectors for SmartSat include telecommunications, agriculture and natural resources, and defence and national security. https://smartsatcrc.com/

*https://www.emsolutions.com.au/products-and-solutions/sotm/satcom-on-the-move-cobra/