

IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)  
Advances in Space-based Communication Systems and Services, Part 2 (2)

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DEVELOPMENT OF A MINIATURIZED LASER-COMMUNICATION TERMINAL FOR SMALL  
SATELLITES**Abstract**

Free-space optical communication is becoming a mature technology that has been demonstrated in space a number of times in the last few years. The Japanese National Institute of Information and Communications Technology (NICT) has carried out some of the most-significant in-orbit demonstrations over the last three decades. However, this technology has not reached a wide commercial adoption yet. For this reason, NICT is currently working towards the development of a miniaturized laser-communication terminal that can be installed in very-small satellites, while also compatible with a variety of other different platforms, meeting a wide span of bandwidth requirements. The strategy adopted in this design has been to create a versatile lasercom terminal that can operate in a multiple scenarios and platforms without the need of extensive customization. This manuscript describes the current efforts in NICT towards the development of this terminal, and it shows the prototype that has been already developed for the preliminary tests, which are described as well. The first tests will include the performance verification using High-Altitude Platform Systems (HAPS) to carry out communication links between HAPS and ground, and later between HAPS and the Geostationary (GEO) orbit, covering this way a wide range of operating conditions. For these tests, in the former case the counter terminal is a transportable ground station, and in the latter case the counter terminal is the GEO satellite ETS-IX, foreseen to be launched by NICT in 2023.