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THE NEW USER FRIENDLY BIDIRECTIONAL COMMUNICATION VIA KU COMM. UNIT

Abstract

Japan Aerospace Exploration Agency (JAXA) has been operating Japanese Experiment Module (JEM) since 2008, which is a part of the International Space Station. Its mission control room is located in Tsukuba-city of Ibaraki Prefecture in Japan, and it is named as Space Station Integration and Promotion Center (SSIPC). JAXA Flight Control Team (JFCT) uses two communication paths between SSIPC and JEM for sending commands and monitoring telemetry data. One is the way through NASA and its Tracking and Data Relay Satellite System (TDRSS) using Ku-band and S-band. The other is the direct way through JAXA Data Relay Test Satellite (DRTS) and the Inter-orbit Communication System (ICS) using Ka-band. JAXA also has been operating Ku bidirectional space-to-ground communication as new way from last year via Ku Comm. Unit boarded on the U.S. on-orbit segment (USOS). By using Ku bidirectional communication, it provides easier operation for flight controller to handle several Laptop Computer Terminals in JEM since it does not need to send commands old fashioned system, Mil-Std-1553B. This paper presents new bidirectional communication way, that is quite user friendly system. It has used in following three ways in recent mission, (1) Remote desktop: It is possible for ground operators to access and login to a laptop in JEM and monitor and control its display. (2) Direct file transmission via LAN: It is possible for ground operators to send files to and obtain data from a laptop in JEM. (3) TV conference: JFCT and JAXA astronaut Koichi Wakata, who is in the ISS, hold a SSIPC conference once a week by a JEM laptop connected to Ku bidirectional communication to exchange their opinions for successful missions.