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FROM EARTH TO MARS - THE DEEP SPACE NETWORK SERVICES FOR NASA'S  
PERSEVERANCE ROVER, UAE'S HOPE, AND ESA'S EXOMARS ROVER SURFACE PLATFORM  
MISSIONS

**Abstract**

NASA's Deep Space Network (DSN) provides space communication services that include initial acquisition, tracking, telemetry, command, and delivery of science data over the terrestrial link to mission operation centers. This paper describes the services, especially for critical events, recently provided from launch to Entry, Descent and Landing (EDL) and surface operations of the NASA/JPL Mars 2020 Perseverance Rover, as well as, the launch and Mars Orbit Insertion (MOI) for the UAE's Hope (Emirates Mars Mission). To bring data down to the DSN, Perseverance was aided by the Mars Reconnaissance Orbiter (MRO) & Mars Atmosphere and Volatile EvolutioN (MAVEN) for EDL, and by Odyssey & ExoMars Trace Gas Orbiter (TGO) as the first NASA & ESA Mars relay respectively, for early surface operations. Lessons-learned will be applied to the support of future Mars mission using the DSN such as, the ExoMars Rover Surface Platform (RSP).