

Abstract Notes

Length: 362 words

Content: (1) CSP Awards + Demos, (2) wideband update + demos [for the paper: (1) CSP awards + Demos, (2) wideband update + demos, (3) 3GPP + Lunar 5G, (4) NSN/NexTEra]

Due: April 30, 2022

Abstract

The National Aeronautics and Space Administration (NASA) Space Communications and Navigation (SCaN) Program is continuing to forge a path toward programmatic and operational transformation enabling commercialization of communications and navigation services to the greatest extent possible for near Earth users. National Space Policy is driving government agencies to incorporate commercial offerings and services to the maximum extent possible. As such, NASA has no plans to build or deploy Tracking and Data Relay Satellites, but will seek to fill NASA mission space-relay capability needs using commercial satellite communications (SATCOM) providers and services. The goal is to support an approach that is both flexible to commercial service constructs and provides continuity of support with current assets as long as required. Progress toward commercialization is advancing in two key areas: (1) awards have been made for demonstrations of SATCOM services, and (2) development of wideband and multilingual user terminals has advanced to the flight demonstration phase.

The Communications Services Project (CSP) at Glenn Research Center (GRC), has awarded Funded Space Act Agreements (FSAA) to six industry vendors. Inmarsat Government Inc., Kuiper Government Solutions (KGS) LLC, SES Government Solutions, Space Exploration Technologies, Telesat U.S. Services LLC, and Viasat Incorporated received a combined \$278.5 million to complete technology development and in-space demonstrations over the next several years. The end-to-end service capabilities being targeted are based on existing NASA mission operational needs. Accordingly, each company has proposed a technical approach to lower costs, increase flexibility, and improve performance for a broad range of missions.

In the current market, industry vendors operate at a range of different frequencies and use variable, sometime proprietary, coding and modulations schemes. As NASA strives for a network comprised of services provided by multiple distinct suppliers, interoperability is a fitting solution to unify the network. Wideband and multi-lingual user terminals are being developed to bridge differences in industry services. Building on ground demonstrations completed in 2021, the Johns Hopkins Applied Physics Lab (APL) will be flight testing a multi-lingual wideband terminal (payload) and demonstrating connectivity to both government and commercial relay services.

This paper provides a discussion of the progress toward NASA's commercial space communications goals and consideration of key challenges and next steps.