

COMMENTARY

SPACE

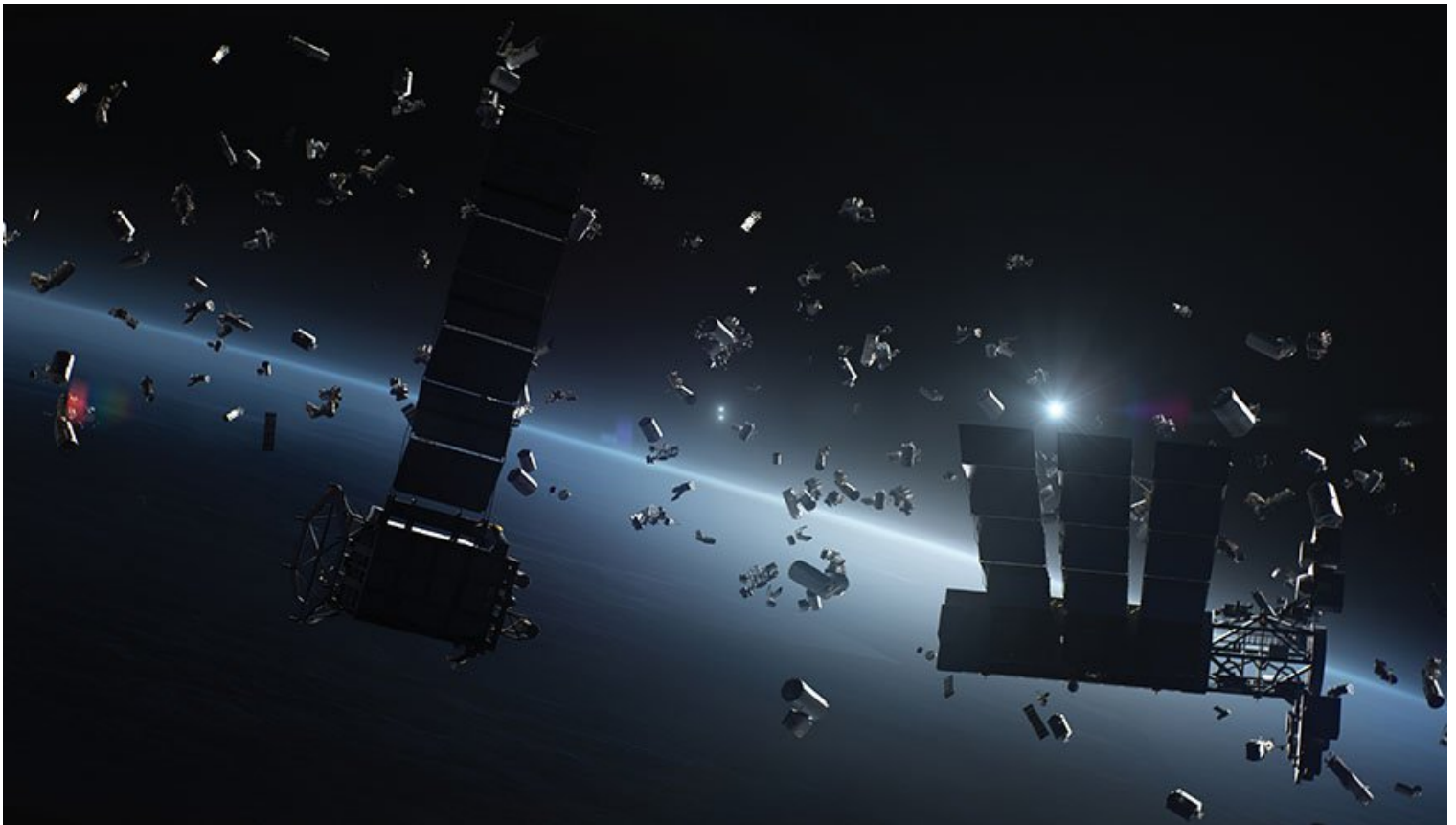
Civilian Space Tracking Program Key for Sector Growth

10/21/2022

By Christian Zur

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In keeping with the pace of the commercial space sector, the Biden administration is advancing a long-anticipated policy initiative to transfer responsibility for tracking objects in Earth's orbit from the U.S. military to the civilian National Oceanic and Atmospheric Administration.

To make this move happen, the president proposed an increase in fiscal year 2023 of \$78 million to develop a publicly available database that companies and countries can use to avoid collisions in space. Recently, Congressional appropriations committees passed bills largely supportive of this budget request.

The origin of space surveillance goes back to the earliest days of the Cold War. By the 1980s, the Air Force operated a network of more than 20 ground-based electro-optical telescopes and cameras, passive radio frequency sensors and phased array radar stations located predominately in the Northern Hemisphere to provide an early warning of over-the-Arctic ballistic missiles threats.

After the 2009 collision between Iridium and Cosmos satellites, the U.S. military was authorized to share cursory conjunction analysis with commercial companies and foreign governments.

By 2010, the Air Force program expanded to include space-based surveillance systems orbiting at 627 kilometers above sea level and able to monitor altitudes where most commercial satellites operate.

Today, these sensors collectively detect, track, identify and catalog all human made objects orbiting the Earth and serve as the baseline information for a tracking program known as the U.S. Space Surveillance Network, which is managed by the Combined Space Operations Center at Vandenberg Air Force Base.

Collectively, the network's world-wide ground stations and space-based sensors perform approximately 100,000 satellite observations per day and track objects around 10 centimeters and potentially as small as five centimeters at lower altitudes and highly inclined orbits which are easier to observe.

Currently, the catalog contains approximately 47,000 items and is used for object identification, notification of satellite flyover and space treaty compliance, as well as scientific and technical intelligence gathering. The center releases this data publicly on SpaceTrack.org.

However, such data has limited value for purposes of predicting and avoiding satellite conjunctions. SpaceTrack.org modeling largely relies on a range of two-line element inputs which specify object location along a limited timeframe. Thus, this orbital data can only convey a generalized picture of risk, at times up to several kilometers of variance with the actual location of an object.

Because of the limitations of baseline data, the center has entered into agreements with companies to share more precise orbital modeling, which includes two-line element as well as ephemeris data while adjusting for atmospheric drag and gravitational influences, among others.

However, even that degree of detail is insufficient for the complexity of space operations. Indeed, a study conducted by the National Academy of Public Administrators in 2020 stated, "Commercial operators increasingly view today's DoD surveillance and warning system as inadequate to achieve safe operations in today's commercial space environment."

The study further asserted that "as the space economy expands and new pressures confront the orbital environment, DoD is facing challenges in providing up-to-date surveillance and warning services for the non-national security-related sector. That sector requires much more precise information than the DoD system was designed for. Also, the DoD system is not scalable to meet the demands of a growing number of objects in space and to deal with an increasing number of space operators."

The beginning of a policy solution was sought in 2018 with the promulgation of Space Policy Directive 3, or SPD-3, which directed the Defense Department to transition functional responsibility of space tracking to the National Oceanic and Atmospheric Administration within the Department of Commerce.

However, implementation was slow due to inadequate funding to fulfill the mission authority granted to NOAA. With the Biden Administration's 2023 budget increase, NOAA is now moving quickly to develop an open architecture data depository, which will integrate existing network information with commercially acquired sensor and analytical data into a robust space tracking system as a free service for companies and governments to use to support accurate risk assessment and collision avoidance maneuvers.

According to the Department of Commerce, the funding is necessary to support NOAA's efforts to accelerate the development of the depository from a pilot demonstration to an initial operating capability no later than fiscal year 2024, with full operational capability expected by 2025.

Notably, NOAA plans to rely on commercial companies for cloud services, data and infrastructure in the program's execution.

No different than sea and air domains, space must be governed by safe and transparent operating standards. The Biden administration's open architecture data depository proposal to leverage public and private sectors is a significant step toward sustainable use of space for the benefit of all — citizen, country, and company alike.

Christian Zur is vice president for policy at the Commercial Space Initiative, a non-partisan think tank dedicated to sustainable growth of the space economy.

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Re: Commentary: Civilian Space Tracking Program Key for Sector Growth

I totally agree with all that was said.

Robert Bugg at 8:57 PM

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