



Highlights of [GAO-10-55](#), a report to the Chairman, Subcommittee on Defense, Committee on Appropriations, House of Representatives

Why GAO Did This Study

The Department of Defense (DOD) expects to spend more than \$50 billion to develop and procure eight major space systems. Typically, the systems have two main components: satellites and ground control systems. Some also have a third component—user terminals—that can allow access from remote locations. If the delivery of these three components is not synchronized, there can be delays in providing full capabilities to the warfighter, and satellites on orbit can remain underutilized for years. Given preliminary indication of uncoordinated deployment, GAO was asked to examine (1) the extent to which satellite, ground control, and user terminal deployments are aligned; (2) the reasons deployments have not always been well coordinated; (3) actions being taken to enhance coordination; and (4) whether enhancements to ground systems could optimize the government's investment. To accomplish this, GAO analyzed plans for all major DOD satellite acquisitions and interviewed key officials.

What GAO Recommends

GAO recommends that the Secretary of Defense take a variety of actions to help ensure that DOD space systems provide more capability to the warfighter through better alignment and increased commonality, and to provide increased insight into ground asset costs. DOD generally agreed with these recommendations. Previous GAO recommendations have focused on improving acquisition problems.

View [GAO-10-55](#) or [key components](#). For more information, contact Cristina Chaplain at (202) 512-4841 or chaplainc@gao.gov.

DEFENSE ACQUISITIONS

Challenges in Aligning Space System Components

What GAO Found

Satellites, ground control systems, and user terminals in most of DOD's major space system acquisitions are not optimally aligned, leading to underutilized satellites and limited capability provided to the warfighter. Of the eight major space system acquisitions we studied, three systems anticipated that their satellites will be launched well before their associated ground control systems are fully capable of operating on-orbit capabilities. Furthermore, for five of the eight major space systems GAO reviewed, user terminals were to become operational after their associated satellites reach initial capability—in some cases, years after. When the deployments of satellites, ground control systems, and user terminals are not well synchronized, problems arise that can affect both the warfighter and the space systems themselves. When capabilities are delayed because of lack of alignment between satellite and ground control systems or user terminals, the warfighter may develop short-term solutions, often at diminished capability and added cost. In addition, according to DOD testing officials, when the deployment of space system components is not properly timed, components may be ready for system testing at different times. This means that the space system may not be tested as a whole, connected system.

DOD has inherent challenges in aligning its satellite and ground control systems. However, long-standing acquisition problems, a tendency to shift funds from ground control system development to satellite development when satellite development problems arise and the underestimation of software complexity on several major space systems have exacerbated the problem. The primary cause for user terminals not being well synchronized with their associated space systems is that user terminal development programs are typically managed by different military acquisition organizations than those managing the satellites and ground control systems.

DOD does have several efforts in place to help achieve better synchronization. The Air Force has also made some attempts to improve acquisition management and increase oversight of contractors by separating the acquisition of satellites and their ground control systems. However, the outcomes of these efforts are still pending. Moreover, there is a lack of guidance needed to help plan for and coordinate the development of satellite and ground systems and a lack of transparency into costs for ground control systems and user terminals.

DOD representatives in the satellite acquisition community agree that opportunities exist for DOD to transition to a more common type of architecture for satellite ground control systems in order to achieve additional efficiencies, capabilities, and a higher degree of information sharing among space systems, ultimately resulting in increased capability to the warfighter. All of the officials GAO spoke with agreed that ground control systems can be developed to provide data and information to other systems, and expect the same in return, to potentially enhance the flow and timeliness of information and better exploit satellite capabilities.