

THE FY22 DEFENSE SPACE BUDGET REQUEST ANALYSIS

Russell Rumbaugh

The United States Space Force grew more than any other military service in the fiscal year 2022 budget request. This growth not only represents organic growth but also transfers budget from the other services. The Space Force continues to consolidate defense space activities, though several defense agencies still have independent space efforts. Classified spending makes up more than a quarter of the Space Force budget and has grown faster than the overall budget despite continued efforts by senior leaders to declassify more of the Space Force’s activities. The fiscal year 2022 budget reflects the continued importance of space to the U.S. military.

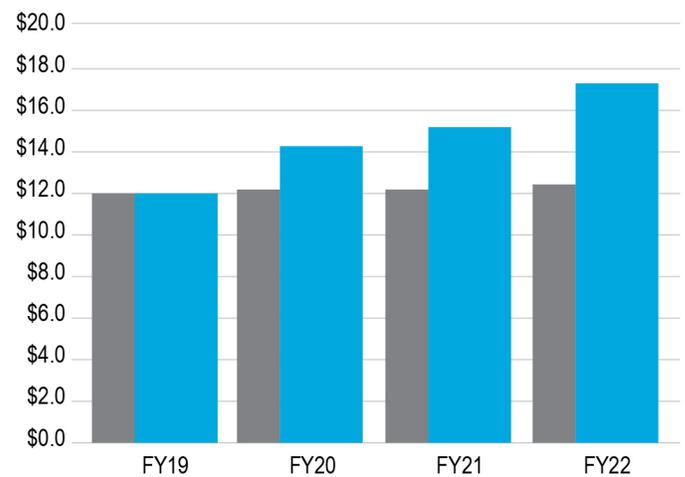
Introduction

The Space Force continues to grow in the fiscal year 2022 (FY22) budget request. The administration requested \$17.5 billion for the Space Force, a 13 percent increase over FY21’s enacted number. And FY21 itself grew 6 percent over the year before it, which had also grown over the year before it. All of this growth occurred over a period where the overall DOD topline has only grown 4 percent in nominal terms.

That growth reflects the importance of space to the U.S. military, though, even with the creation of the Space Force, the defense space budget still displays many of the same hallmarks: high levels of classified information and budget concentrated in a few large programs. Nevertheless, the FY22 budget request shows a continuing commitment to defense space, exemplified by the growing Space Force.

Space Force Budget Growth

in the billions of dollars



■ DOD topline growth indexed to FY19 USSF budget

Source: DOD budget document; FY19 USSF budget calculated from FY20 growth announcement

Consolidation...Sort Of

FY22 will be the Space Force’s third fiscal year in existence and the budget request reflects the Space Force’s continued consolidation of DOD space activity. The request transfers \$943 million from the Navy, Army, and Air Force into the Space Force. While not new funding for FY22, it is new to the Space Force and reflects real growth for the new service as it takes on more of the space missions and tasks from across DOD.

The most notable transfer is the Navy’s Mobile User Objective System (MUOS), a narrowband communications satellite constellation, which will be acquired and operated by the Space Force from FY22 onward. That mission transfer also transfers \$43 million worth of procurement, \$112 million worth of RDT&E, and \$79 million in operations and maintenance from Navy to the Space Force.

Transfers From	Navy	Army	USAF
O&M	\$79,119	\$63,730	\$469,139
RDT&E	\$112,012	\$0	\$174,366
Procurement	\$45,371	\$0	\$0
To Space Force	\$236,502	\$63,730	\$643,505

In thousands

The Army also transferred \$64 million in operations and maintenance to the Space Force. This funding comes from the Army’s theater-level assets and service-wide communications budget accounts. While not yet announced, it likely reflects the transfer of civilian pay and operations costs for the 53rd Signal Battalion, which conducts payload and transmission control of the Wideband Global Satellite and remaining Defense Satellite Communications System constellations for wideband satellite communications.

The bulk of the transfer comes from the Air Force, moving dedicated space funding to the Space Force. These transfers capture three big functions. First, the transfer of space-focused science and technology efforts, which includes the transfer of \$174 million in research, development, test, and evaluation (RDT&E) funding and

another \$14 million in operations and maintenance funding. These funds are transferred into new space lines, including one for test and evaluation and a budget activity line for advanced technology development. It also captures components of broader research efforts now owned by the Space Force. Much of these lines come from the transfers from the Air Force Research Laboratory (AFRL), which will remain an Air Force unit but support the Space Force, including dedicated funding owned by the Space Force.

Second, the transfer of intelligence funding, to include the establishment of a dedicated National Space Intelligence Center (NSIC). Out of a total of \$32 million, \$20 million will be directly for NSIC. NSIC will remain affiliated with the National Air and Space Intelligence Center at Wright Patterson Air Force Base but also have its own reporting chain through the Space Force to the director of National Intelligence as a part of the Space Force component to the Intelligence Community. The rest of the funding transfers captures other intelligence units and training transferring over.

The third and largest Air Force funding transfer is to support facilities, base security, garrison support, and information technology. This transfer is almost \$400 million worth of operations and maintenance. The most visible sign of this funding has been the renaming of bases as Space Force bases, run by a Space Force garrison unit though still supported by Air Force units and personnel.

Beyond funding transfers, the Space Force is also gaining people from the other services as well as growing organically. While almost 80 percent come from the Air Force, some are transferring from the Army and Navy. And some are transferring this year: about 25 from the Army and 20 from the Navy. More are expected to transfer in FY22: 300 Army soldiers and not quite 20 Navy sailors. These transfers are augmented by direct accessions: more than 400 officers and 850 enlisted joining the Space Force directly in the two years without having first served in another service. Altogether, the Space Force will grow to be 8,400 guardians by the end of FY22, another sign of the Space Force maturing.

Fiscal Year	Transfer from Air Force		Transfer from Army		Transfer from Navy		Direct Accession		Added Each Year
	Officer	Enlisted	Officer	Enlisted	Officer	Enlisted	Officer	Enlisted	
FY20	84	1	0	0	0	0	0	0	85
FY21	2,332	3,301	15	10	14	5	306	376	6,349*
FY22	827	73	11	291	17	0	262	485	1,966
Total	3,243	3,375	26	301	31	5	568	861	8,400

*This value reflects 10 people departing the Space Force in FY21.

In all, the Space Force accounts for \$970 million in personnel costs in FY22, though this funding is still included in Air Force accounts and not as part of the separate Space Force budget.

Even with this growth, the Space Force still sees more room to grow, including in FY22. The Space Force also submitted to Congress an unfunded priority list—those items not included in the president’s budget but might be executed in FY22. These lists are required by Congress annually. The Space Force sees an additional \$832 million worth of funding to execute. If the Space Force were to receive all of its original request and this additional funding, it would grow a total of 19 percent over FY21, though Congress is unlikely to ratify the entire request completely.

Other Space Accounts. The Space Force has not yet taken responsibility for all DOD space funding. Three defense agencies still have significant space funding in the FY22 request and differing relationships to the Space Force.

The Space Development Agency (SDA) has requested \$937 million for FY22. That represents a threefold increase on SDA’s FY21 enacted funding, an increase that was projected in last year’s budget request at roughly that scale. But it’s noteworthy that the increase stayed, especially as there has been a change of administration. SDA also realigned its budget project descriptions to better fit its organizational construct. SDA uses what it calls “layers” to organize itself. Its first priority is the transport layer, which seeks to create a satellite communications mesh network in a proliferated low Earth orbit (LEO). SDA requested \$260 million in RDT&E funding for this layer. Its second layer is tracking, which seeks to launch eight infrared sensing satellites in the

budget year and for which SDA requested \$287 million. The remainder of the RDT&E funds is for a battle management system to control the two layers.

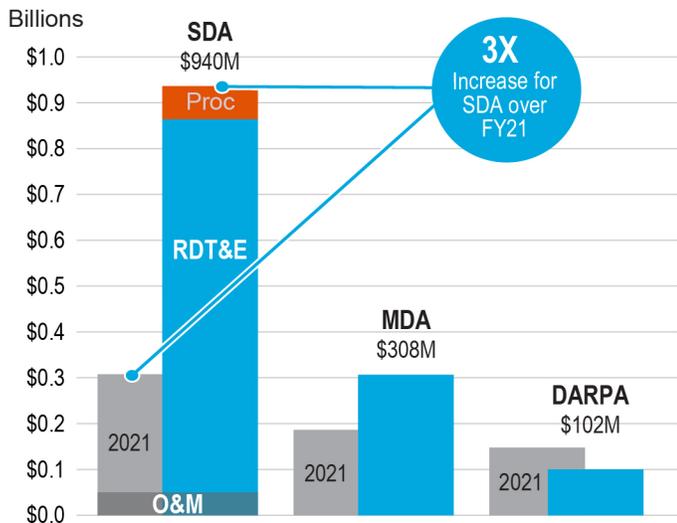
Besides RDT&E, SDA also requested \$54 million in operations and maintenance, about a 10 percent increase from FY21, and \$74 million in procurement. This was the first procurement funding SDA has requested and is tabbed for launch services.

SDA is set by statute to transfer to the Space Force at the start of FY23 and the budget documents even note a new budget line has been established within the Space Force for FY23 and beyond, though those lines are not reported in this year’s budget request. No outyear numbers* were provided anywhere in the FY22 budget request, a not uncommon approach for a new administration.

The Missile Defense Agency (MDA) also maintains a significant space-based research and development program. Unlike in last year’s request, this program is in addition to SDA’s request. In last year’s FY21 request, DOD transferred MDA’s main satellite research effort to SDA, but Congress rejected that, restoring the program with funding to MDA. In this year’s FY22 request, both MDA and SDA have their own programs funded.

MDA’s main satellite program is the Hypersonic and Ballistic Tracking Space Sensor (HBTSS), to track hypersonics and boosting ballistic missiles using infrared sensors. MDA says the key difference between its effort and other infrared projects, like SDA’s and the Space Force’s, is the ability “to provide fire-control quality tracking data.” Eighty-three percent of MDA’s \$308 million in space-focused funding is dedicated to this effort.

*The FY23 to FY26 projection, known as the FYDP.



The second largest program is an effort to assess whether attempts to intercept incoming missiles succeed. MDA is requesting \$30 million for FY22 to place many small, infrared sensors on commercial satellites. The final piece is the winding down of the Space Tracking and Surveillance System (SSTS), whose FY22 funding request is halved to \$15 million from FY21’s amount. Thus ends a program that began 20 years earlier when it was formally started in 2002 and launched two satellites in 2009.

MDA’s programs are separate from both the Space Force and SDA programs, fulfilling MDA’s specific mission. But the budget documents go out of their way to present all of the infrared sensor programs holistically: “MDA is collaborating with the U.S. Space Force, under the leadership of the Chief of Space Operations, and the Space Development Agency to deploy HBTSS as an element within the larger Overhead Persistent Infrared Enterprise Architecture.”

Finally, the Defense Advanced Research Projects Agency (DARPA) also maintains its own separate space projects, compiled in one budget line of \$102 million in FY22. The largest single project at \$42 million is Blackjack, the experiment in proliferated LEO architecture, which has presaged and made possible the programs the Space Force, SDA, and MDA are pursuing. Blackjack’s requested funding is half its funding from just two years ago in FY20 as DARPA defers to the other organizations for continuing systems, as it is chartered to. The second largest project is \$37 million for nuclear thermal propulsion, titled Demonstration Rocket for Agile

Cislunar Operations (DRACO), aimed at maneuvering in cislunar space, the volume between the earth and the moon. Finally, DARPA continues to explore robotic servicing of satellites in geosynchronous orbit.

DARPA pursues its own projects in its typical fashion of demonstrating technology but not fielding or operating systems. DARPA’s projects are both well integrated into the Space Force efforts to operationalize the technology demonstrated and simultaneously remain separate as DARPA’s role ends when the Space Force picks up the technology. This partnership is a particular success for the DARPA model.

In FY22, the Space Force will further consolidate defense space efforts and personnel. However, several programs will remain separate with unique relationships to the Space Force.

Classification and Big Programs

The Space Force continues to grow and consolidate, but it still exhibits several long-standing features of defense space: high classification levels and large programs.

Of the Space Force budget, 27 percent is classified. This itself is actually a step toward transparency as it was only last year in FY21 that the total classified spending on space was revealed. Before FY21, it was buried in other classified topline. Because of that new transparency, the Space Force’s continued growth is obvious. Classified Space Force RDT&E increases by 22 percent over FY21, a larger growth even than the Space Force’s total growth. Classified procurement almost doubles from \$78 million to \$142 million. And for the first time there is a classified Space Force operations and maintenance line of \$173 million. While some of these increases may reflect transfers from elsewhere in DOD as with the unclassified funding, those increases are nevertheless real increases in the Space Force’s authority and control of resources.

This increased transparency aligns with senior Space Force leaders’ efforts to declassify more of what happens in defense space. In a March 2021 speech, the chief of space operations, General Jay Raymond, announced that the Space Force was developing a declassification strategy to expose more of the details of what the Space Force does.¹ In May, General Raymond unveiled a previously

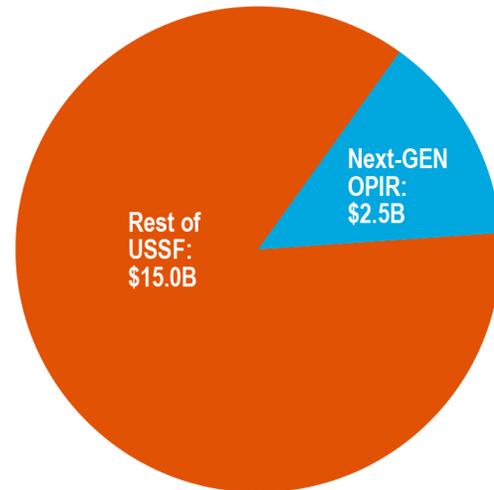
classified program to develop space-based radars to track targets moving on the ground.² The vice chairman of the Joint Chiefs of Staff, General John Hyten, has made declassification of space activities one of his main efforts for years.³

Despite these efforts, however, much of what the Space Force maintains as classified is highlighted by the large share of its budget that cannot be discussed. All services have classified programs, and the Air Force has about the same amount of its RDT&E classified as the Space Force: 40 percent. But the Navy only has 8 percent of its RDT&E classified, and the Army has just a small fraction of a percent. Some of that comes from the Space Force's disproportionate focus on hardware because of the nature of space operations. However, the heavily classified activities make it difficult for the Space Force leaders to explain what they do—including to adversaries.

Similarly, the Space Force is still disproportionately composed of large programs. The Space Force's largest single budget item is the research and development of the Next Generation Overhead Persistent Infrared system (Next-Gen OPIR) at \$2.5 billion, or 14 percent of the Space Force's entire budget. Next-Gen OPIR is the follow-on system to the missile warning constellations currently on orbit that underpin U.S. nuclear deterrence and have proven themselves useful tactically as well, including alerting U.S. forces to Iranian missile attacks in the past year. Unlike MDA's or SDA's infrared systems, Next-Gen OPIR will be fundamental to the most basic aspects of U.S. national security. However, that comes at a price as the single largest program.

It is not unusual for individual programs to be so large. The Air Force has the B-21 bomber, which is \$2.9 billion in FY22 alone, and the Ground-Based Strategic Deterrent, which is also \$2.5 billion. As with Next-Gen OPIR, both these programs are parts of U.S. nuclear deterrence though it is not only mission area that drives such large programs. In FY22, the Navy's conventional prompt global strike is \$1.4 billion, and the Army's rotary wing research effort is \$1.1 billion. Also, the Air Force's Next-Generation Air Dominance program, which is developing the Air Force's next fighter, is requested at \$1.5 billion in FY22.

The difference is not the size of program but the scale relative to the rest of the service. All of those programs are



less than 1 percent of their service's budget in contrast to Next-Gen OPIR's 14 percent of the Space Force budget. Nor is Next-Gen OPIR's scale unique for the Space Force. The next largest budget item is National Security Space Launch at \$1.3 billion, or 7 percent. Four other programs have about \$500 million in one-year funding. The closest parallel may be Missile Defense Agency. Its FY22 request for the next-generation interceptor for its national missile defense system is 10.4 percent of its total FY22 budget request. That said, because so much of the Space Force budget is classified, those portions may be composed of smaller programs, making Next-Gen OPIR more of any outlier.

Much of this dependence on large programs is driven by the Space Force's size relative to the other services and to its greater reliance on hardware because of the highly engineered nature of space. Space Force modernization makes up 80 percent of its budget. Even if military personnel costs were factored in, modernization would make up 76 percent. This share compares to about 45 percent of the Air Force's and Navy's budgets being modernization and the Army's only 20 percent. This emphasis on hardware has long been a characteristic of space programs. Moreover, the Space Force was always intended to be small relative to the other services; a challenge Space Force leaders have emphasized is also an opportunity to be different, capitalizing on being the first military service of the twenty-first century.

Conclusion

The Space Force's growth in the FY22 budget demonstrates the continued importance of space to the U.S. military. It also reflects the structural changes from introducing a military service dedicated to space. Not surprisingly, such a service has a budget structure distinct from the other services. While still a work in progress, the Space Force is making strides in consolidating defense space and establishing itself as a critical resource for the nation.

Acknowledgments

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References

- ¹Nathan Strout, "Space Force chief says he's working on a declassification strategy, but offers scant details," *CAISRNet*, March 3, 2021.
- ²Theresa Hitchens, "Raymond Unveils Classified Target Tracking Space Radar Effort," *Breaking Defense*, May 12, 2021.
- ³Phillip Swarts, "Declassification and partnerships needed for better space defense, Hyten says," *SpaceNews*, April 6, 2017.

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