



**ORGANIZING FOR DEFENSE SPACE:  
BALANCING SUPPORT FOR THE JOINT FORCE  
AND INDEPENDENT SPACE OPERATIONS**

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The United States Space Force is arguably the largest restructure of U.S. defense space organizations since 1960. The reorganization also includes United States Space Command (USSPACECOM), the Assistant Secretary of the Air Force for Space Acquisition and Integration, and other new organizations. Being new, these organizations face many challenges—and how they address these challenges will define the tools that are available to senior political and military leaders for years to come. Despite the historic nature of the moment, there are lessons to be learned from these organizations' predecessors. Those lessons highlight that the greatest tension these organizations will face is how to balance the space-based needs of the joint force against independent military operations in, to, and through space.

### **Introduction**

The U. S. Space Force is the first new military service created in 70 years and is arguably an even larger restructuring of national security space than the creation of a separate agency for satellite reconnaissance in 1960. While the biggest, this reorganization is not the first and likely will not be the last. Most of these reorganizations have sought to balance the needs of the joint force, which relies on space to achieve the military effectiveness it enjoys today, against the value of a domain-focused organization for developing independent military options in, to, and possibly even from space. In the next few years, that tension is likely to come to a head as the new space organizations define their doctrine, role, and organization.

The United States leverages space for military, commercial, and societal advantages.<sup>1</sup> As space becomes ever more democratized yet contested, everyone in the United States should care how the new organizations shift the balance between supporting the joint force and pursuing independent options. Once military organizations are settled into their ways, senior political and military leaders can find their tools—no matter how polished and refined—do not achieve the ends national leaders seek.<sup>2</sup> The new space organizations are building and establishing their priorities now and in so doing, inevitably will favor some missions over others. Thus, the next few years will be critical for the new space organizations to truly define what they are and what they do for the country.

**U.S. Space Force.** Despite its historic creation, the U. S. Space Force still faces challenges, some of which may be informed by how its antecedents dealt with similar tensions. Drawing from those experiences, the U. S. Space Force will be successful if it can build a cohesive single organization dedicated to space that meets the needs of military space's many users, effectively balancing requirements for force enhancement and space control.

The clearest predecessor of the U.S. Space Force is Air Force Space Command (AFSPC), created in 1982.<sup>3</sup> The Air Force had become the military service responsible for most military space programs by the early 1960s.<sup>4</sup> Most of these programs were secret research and development efforts and the Air Force considered air and space a single operational area doctrinally.<sup>5</sup> As a result, space efforts then were not organized around space as a separate domain, but instead were owned by multiple commands in a more functionally aligned way. With the demise of Air Defense Command in 1977, the growth of military space capabilities created an opportunity with the creation of AFSPC to organize space in one place separate from the research and development community.<sup>6</sup> For the first time, AFSPC was focused on the space domain, not any particular function.

Those supported by space did not accept the separation of space capabilities easily. It took more than a decade to consolidate space activities under AFSPC. AFSPC inherited Air Defense Command's early warning radars.<sup>7</sup> Then, AFSPC took over Strategic Air Command's weather satellites in 1983; in 1985, the Satellite Test Facility from Systems Command; in 1987, the ground-based satellite control network; in 1990, launch systems; and in 1991, the Air Force's astronaut program was transferred to AFSPC.<sup>8</sup> By the early 1990s, space itself seemed a mission with an organization dedicated to it. No longer was it a supporting capability spread throughout the force.

The end of the Cold War stalled that refocus on space as a domain for action itself. The first Gulf War showed how much the joint force could leverage space to be the most effective military force in the world and possibly in history.<sup>9</sup> Once proven, everyone in the DOD wanted space to provide "force enhancement" and saw AFSPC's role as providing that support.<sup>10</sup>

Additionally, AFSPC took responsibility for the ground-based intercontinental ballistic missiles (ICBMs) that had belonged to Strategic Air Command. This merger gave two small communities a scale equivalent to other Air Force communities, including providing the two career fields a better promotion pyramid.<sup>11</sup> To some, it was also a consolidation of missions in response to the argument that ICBMs belonged in a space organization because they transited space.<sup>12</sup>

But the merger never quite brought the cultures, let alone missions, together.<sup>13</sup> Instead it blurred whether space could achieve decisive effects itself, while being perceived as simultaneously diluting sufficient focus on safe nuclear operations.<sup>14</sup> The Rumsfeld Commission report of 2001 restarted the conversation by recommending sharper delineation of space organization, though it stopped short of recommending a separate service.<sup>15</sup> When the commission's chairman, Donald Rumsfeld, became Secretary of Defense, AFSPC took control of building as well as operating satellites with the transfer of Space and Missile Systems Center from Air Force Materiel Command.<sup>16</sup> Finalizing this era, in 2008 the ICBMs were organizationally split back out from space activities, once again leaving the space domain as AFSPC's mission.<sup>17</sup>

The next decade sharpened the focus on the space domain, eventually leading to the U.S. Space Force as an independent service. First, a distinct space budget was mandated in law—virtually in 2008 and completely in 2015.<sup>18</sup> Then in 2017, the House Armed Services Committee proposed a Space Corps within the Air Force.<sup>19</sup> After more negotiations on how to best organize defense space, the U.S. Space Force was formally established within the Department of the Air Force in 2019.

Embedded in the sixty years of evolution described in the last few paragraphs is a running fight about whether space should be organized separately to focus on a fight in space itself or whether space capabilities' main purpose is to support the rest of the joint force, as discussed in the previous section.<sup>20</sup> The U.S. Space Force will now have the dominant role in allocating how dollars are invested for space. Will it favor those capabilities focused on military action in space independent of other efforts or those capabilities that support the joint force? Will the other military services trust the Space Force to provide capabilities on which they depend? Or will they develop their own space-based capabilities, just as the U.S. Navy always maintained its own ultra-high frequency satellite program to support its submarines, or even non-space-based alternatives, or just as the U.S. Army developed attack helicopters when it feared it could not depend on the Air Force to provide it air support?

Now that the Space Force is independent, it will be successful if it can address this tension and achieve a cohesive culture and mission that also serves the many parts of the U.S. military—and even U.S. society—that are dependent on space.

**U.S. Space Command.** SPACECOM has clearer antecedents than the Space Force but also faces the core tension the Space Force faces. SPACECOM will be successful if it can provide independent strategic options in space while remaining a critical part of U.S. global operations.

A unified space command has long been one option to focusing on space while still weighing joint force equities. In the late 1950s, the Chief of Naval Operations, Admiral Arleigh Burke, proposed such a command to address intense interservice rivalry between the Army and Air Force.<sup>21</sup> When the Air Force was planning to create AFSPC in the 1980s, some of the concerns and equities the other services had regarding space roles and responsibilities were reawakened. Some of the original planners for AFSPC expected it would become a specified command—an operational command responsible for DOD-wide operations but controlled and manned by only one service.<sup>22</sup> Recognizing space's wider value, the services insisted on creating a command for all joint operations, which led to the creation of the unified U.S. Space Command in 1985.<sup>23</sup>

Independent space operations remained subordinate for the next couple of decades. When the Gulf War highlighted what capabilities space could provide, the joint force sought to better leverage space, which was reflected in giving command of SPACECOM to General Chuck Horner, a fighter pilot who had overseen the air campaign in the Gulf War.<sup>24</sup> Ironically, Secretary Rumsfeld's ascension worked against independent space options despite his heading the Rumsfeld Commission. The September 11th attacks drove a need for a greater homeland defense mission, which in 2002 resulted in the separation of North American Aerospace Defense Command from SPACECOM to form U.S. Northern Command (NORTHCOM).<sup>25</sup> The space mission was merged into U.S. Strategic Command (STRATCOM) in Omaha as NORTHCOM stayed in Colorado Springs.

In the last few years, despite being submerged in STRATCOM, independent space operations gained ground. Operational command was reenergized as the Combined Space Operations Center (CSpOC) in 2018.<sup>26</sup> In 2015 the Joint Interagency Combined Space Operations Center was created to better interface with intelligence community space operations and was later renamed the National Space Defense Center (NSDC).<sup>27</sup> In 2017, AFSPC was dual-hatted as the Joint Force Space Component Command to direct both the CSpOC and NSDC.<sup>28</sup>

Ironically, all of these changes may have culminated in the creation of the U.S. Space Force. In contrast, SPACECOM's main focus may be on supporting the joint force rather than independent space operations.<sup>29</sup> Despite the likelihood that the Space Force will provide nearly all of DOD's capabilities that operate 100 kilometers above the Earth, which is designated as SPACECOM's geographic domain, SPACECOM has been kept as a separate organization and SPACECOM is to draw forces from *all* the services, not just the Space Force.<sup>30</sup> An Army general—not a Space Force general—is the first non-dual-hatted SPACECOM commander.<sup>31</sup>

Will SPACECOM become the organization that champions space's support of the joint force? What will be the relationship between the two four-star generals—the SPACECOM commander and the Space Force's Chief of Space Operations? Will it become adversarial as each becomes the champion for competing visions of what space should do? How will SPACECOM support the joint force if the Space Force focuses ever more on capabilities to conduct independent activities in space? Will SPACECOM serve as a champion for space as STRATCOM serves as one for nuclear weapons? Will the resourcing process within DOD respond to these calls? Will Congress? Will the other geographic combatant commands see SPACECOM's support as critical or will they feel they should have direct control of space assets?

As with the Space Force itself, SPACECOM must balance the demands of providing options in space independent of other military forces and enhancing the joint force's lethality. SPACECOM will have to do so even as it relies for most of its capabilities on a single service—the U.S. Space Force.

***Assistant Secretary of the Air Force for Space Acquisition and Integration.*** Along with the Space Force, the fiscal year 2020 defense authorization bill also created the position of assistant secretary of the Air Force for Space Acquisition and Integration (SA&I).<sup>32</sup> The individual confirmed for this new position is to be responsible for all architecture and integration of the Air Force for space systems and programs, chair the Space Force Acquisition Council (more on this below), become the Department of the Air Force service acquisition executive with responsibility for space systems and programs by October 1, 2022, and oversee and direct the Space Rapid Capabilities Office, the Space and Missile Systems Center, and the Space Development Agency. Just as the Space Force and SPACECOM must balance the dual roles of space (independent missions and missions to support the joint force), SA&I will be successful if he or she can serve as a locus for DOD-wide space efforts while also being an integral partner of the Space Force.

SA&I has 30 years of clear precedent that shows how difficult it is to serve as a single authority over the institutional side of space. While the Goldwater-Nichols Reform Act of 1986 successfully made DOD operationally more joint, the DOD has never been as successful in coordinating the acquisition and institutional side.<sup>33</sup> Space has long been one of the clearest examples of this dynamic.<sup>34</sup> Every part of DOD depends on space but organizational seams keep many programs and responsibilities fragmented, particularly those for programming space budgets, prioritizing between air and space programs, and synchronizing deployment of space, ground, and service-procured user equipment.<sup>35</sup>

The DOD tried to create just such an organization in the 1990s. Facing congressional frustration with several major space programs, the department created the deputy under secretary of defense for space and the related space architect in 1995.<sup>36</sup> Tasked to integrate space policy, architecture, and acquisition, these offices found that, despite their high-level tasking, they could not force other department components to conform, usually resulting in guidance that was unobjectionable to all stakeholders at the expense of clarity.<sup>37</sup> Worse, the deputy under secretary position did not survive the 1990s budget downturn that saw the office dissolved as an efficiency measure.<sup>38</sup>

In 2004, the Air Force tried again by implementing several major recommendations from the Rumsfeld Space Commission by establishing a National Security Space Office to staff the architect and integration roles.<sup>39</sup> This office lasted until 2010, when the executive agent for space staff was transferred from OSD back into the Air Force secretariat and a new Defense Space Council was created as a forum where the principals of each stakeholder could come together to make coordinated decisions.<sup>40</sup> In 2015, a new position, the principal DOD space advisor, was created with enhanced authorities, a more robust staff, and the intent to provide more centralized direction and oversight of DOD's newly mandated dedicated space budget.<sup>41</sup> But by 2017, the commander of STRATCOM recommended doing away with all these organizations and Congress did so in the fiscal year 2018 defense bill.<sup>42</sup>

Embedded in each of these organizational changes is the challenge of balancing support for the joint force against independent space operations. When SA&I's predecessors sought to prioritize space as an independent area for action, the other military services and other oversight bodies used their authorities to undermine centralized control of space.<sup>43</sup> When SA&I's predecessors sought to represent the joint force's equities, the space organizations saw them as interlopers.<sup>44</sup>

How will SA&I balance these tensions? Will SA&I use its service acquisition executive authority to prioritize independent space capabilities or support for the joint force? Will SA&I become the civilian spokesperson for independent space capabilities including as chair of the Space Acquisition Council? Or will SA&I become the DOD's point person in emphasizing space's critical supporting role using the Space Acquisition Council to force the space-focused organizations to incorporate needed support functions?

SA&I will be successful if it is seen both as a civilian champion of independent space capabilities and as the representative of the rest of the DOD in ensuring space's role supporting the joint force. In doing so, SA&I will in turn shape how the Space Force and SPACECOM see their role in maintaining the balance between these two missions.

**Other Organizations.** The fiscal year 2020 defense bill also created an assistant secretary of defense for space policy (ASD(SP)) and DOD created a Space Development Agency (SDA), while all the reorganizations have left the intelligence space agencies outside of Space Force. These organizations, too, represent enduring tensions in overseeing and balancing between independent space options and supporting the joint force, while also providing strategic intelligence.

ASD(SP), like SA&I, builds on the many efforts to create a civilian to oversee and deconflict competing needs for defense space. DOD currently has a deputy assistant secretary of defense for space policy, one level down from the new statutory position.<sup>45</sup> Because ASD(SP) is not part of the Department of the Air Force but part of the Office of the Secretary of Defense (OSD), it might represent the joint force perspective even more than SA&I.<sup>46</sup> Alternatively, it might come to be the champion of independent space options throughout DOD, potentially even goading Space Force and SPACECOM into greater independent options. The emphasis on maintaining space superiority in the Defense Space Strategy Summary released in June 2020 may indicate OSD is leaning slightly more toward independent options than support to the joint force.<sup>47</sup>

SDA represents the fruition of one solution to the defense space organization problem. Many have proposed a defense agency over the years to capture the joint nature of space.<sup>48</sup> Usually, these proposals have presumed a supporting role like the Defense Logistics Agency though some imagine it more like the Missile Defense Agency.<sup>49</sup> The Missile Defense Agency and its predecessors are defense agencies, but with an operational focus. Though sometimes seen as a place to acquire space equipment differently, SDA has primarily taken on a distinct mission from Space Force and SPACECOM, focusing on tracking long-range missiles on the ground and in the air, and on creating a space-based communications network fast enough to make that data actionable.<sup>50</sup> SDA is slated to become part of the U.S. Space Force no later than fiscal year 2023 and—depending partly on whether it has proven the military capability it is pursuing—may remain semi-independent, may revert to a distinct approach to acquisitions, or may be subsumed completely within other Space Force organizations.

Finally, the recent changes reaffirmed a formal split between defense and intelligence space. The presidential directive explicitly exempted intelligence space agencies from being part of Space Force.<sup>51</sup> While that decision maintains the status quo, it also leaves intact a perennial challenge: how to balance the different missions of defense and intelligence space against the value from integrating the architecture and programs of all national security space programs.<sup>52</sup> Keeping intelligence and defense space separate means the balance will stay tipped toward differentiation even as the intelligence community and Space Force work to better ensure unity of effort, particularly in times of conflict in space.<sup>53</sup> While the manner in which scarce resources are allocated between strategic intelligence and intelligence support for military operations will always require balancing, this organizational differentiation emphasizes that the focus of the next few years will likely be on balancing support for the joint force and independent space missions.

## Conclusion

The U.S. Space Force and its related organizations are the greatest changes to defense space institutions in half a century. These new organizations have advantages many of their predecessors did not have. They are more unitary, more senior, and created at a time when space enjoys high-level support and attention. Each of these new organizations faces the central challenge of balancing support for the joint force against independent space options. How each seeks to address this balance will depend on how and where the other new space organizations also seek to achieve that balance.

While their creation alone is significant, they remain nascent organizations that will face many of the same challenges their predecessors faced, and their success is not guaranteed. By learning lessons from past efforts to address the tension between

independent space operations and supporting the joint force, senior leadership can potentially improve the coherence and effectiveness of U.S. space capabilities for the coming decades. If the leadership of the country does not watch how the new organizations develop, they may find the organizations have chosen paths at odds with leadership's goals for space.

## References

- <sup>1</sup> Robert Wilson, Michael Gleason, Samira Patel, and Luc Riesbeck, "The Value of Space," The Aerospace Corporation, May 2020.
- <sup>2</sup> Adam Grissom, "The Future of Military Innovation Studies," *Journal of Strategic Studies*, Vol. 29, No. 5, 2006.
- <sup>3</sup> Earl Van Inwegen, "The Air Force Develops an Operational Organization for Space," in R. Cargill Hill and Jacob Neueld, *The U.S. Air Force in Space: 1945 to the Twenty-First Century*, (USAF History and Museums Program: 1998).
- <sup>4</sup> David Spires, "The Air Force and Military Space Missions: The Critical Years, 1957-1961), in R. Cargill Hill and Jacob Neueld, ed. *The U.S. Air Force in Space: 1945 to the Twenty-First Century*, (USAF History and Museums Program: 1998).
- <sup>5</sup> David Bradburn, "Evolution of Military Space Systems," in R. Cargill Hill and Jacob Neueld, *The U.S. Air Force in Space: 1945 to the Twenty-First Century*, (USAF History and Museums Program: 1998) and Frank W. Jennings, "Genesis of the Aerospace Concept," *Air Power History*, vol. 48, no. 1, 2001.
- <sup>6</sup> Rick Sturdevant, "The United States Air Force Organizes for Space: The Operational Quest," in Roger B. Launius, ed. *Organizing for the Use of Space: Historical Perspectives on a Persistent Issue*, (American Astronautical Society History Series, Vol 18: 1995).
- <sup>7</sup> Joshua Boehm with Craig Baker, "A History of United States National Security Space Management and Organization," Prepared for the Commission to Assess United States National Security Management and Organization, 2000.
- <sup>8</sup> Tony Tunyavongs, "A Political History of the Establishment of Air Force Space Command," *Quest*, Vol. 9, Issue 1, 2001, p. 39-40.
- <sup>9</sup> David Spires, *Beyond Horizons: A Half Century of Air Force Space Leadership*, (Air Force Space Command: 1998), p. 243-270).
- <sup>10</sup> Frank Gallegos, "After the Gulf War: Balancing Space Power's Development," in Bruce DeBlois, ed. *Beyond the Paths of Heaven: The Emergence of Space Power Thought*, (Air University Press: 1999).
- <sup>11</sup> Kevin McLaughlin, "Military Space Culture," Prepared for the Commission to Assess United States National Security Management and Organization, 2000 and Georges Vernez, "Improving the Development and Utilization of Air Force Space and Missile Officers," (RAND: 2006).
- <sup>12</sup> Jamie Varni et al, "Space Operations: Through the Looking Glass (Global Area Strike System)," A Research Paper presented to Air Force 2025, August 1996, p. 14-15.
- <sup>13</sup> Thomas Deppe, "Why American Needs ICBMs Contributing to Air and Space Power and Strategic Deterrence," *High Frontier*, Vol. 2, No. 4, August 2006.
- <sup>14</sup> Adam Hebert, "Strike Command Steps Up," *Air Force Magazine*, June 1, 2010.
- <sup>15</sup> Benjamin Lambeth, *Mastering the Ultimate High Ground*, (RAND: 2001), p. 67-71.
- <sup>16</sup> "Historical Overview of the Space and Missile Systems Center," Space and Missile Systems Center Historical Office, 2003, p. 5-6.
- <sup>17</sup> Amaani Lyle, "Air Force stands up Global Strike Command," Air Force Public Affairs, August 7, 2009.
- <sup>18</sup> Michael B. Donley, "The Challenges of Space Management and Organization," Remarks at the National Space Symposium, Colorado Springs, Colo., April 13, 2010.
- <sup>19</sup> House Report 115-200 to accompany National Defense Authorization Act for Fiscal Year 2018, p. 267.
- <sup>20</sup> David E. Lupton, *On Space Warfare: A Space Power Doctrine* (Air University Press, 1988) and R. Russell Rumbaugh, *What Place for Space: Competing Schools of Operational Thought in Space* (The Aerospace Corporation: 2019).
- <sup>21</sup> David Spires, "The Air Force and Military Space Missions: The Critical Years, 1957-1961), in R. Cargill Hill and Jacob Neueld, ed. *The U.S. Air Force in Space: 1945 to the Twenty-First Century*, (USAF History and Museums Program: 1998), p. 40.
- <sup>22</sup> Earl Van Inwegen, "The Air Force Develops an Operational Organization for Space," in R. Cargill Hill and Jacob Neueld, *The U.S. Air Force in Space: 1945 to the Twenty-First Century*, (USAF History and Museums Program: 1998), p. 142-3.
- <sup>23</sup> Tony Tunyavongs, "A Political History of the Establishment of Air Force Space Command," *Quest*, Vol. 9, Issue 1, 2001, p. 39-40.
- <sup>24</sup> David Spires, *Beyond Horizons: A Half Century of Air Force Space Leadership*, (Air Force Space Command: 1998), p. 243-284.
- <sup>25</sup> Edward Drea et al, *History of the Unified Command Plan: 1946-2012*, Office of the Chairman of the Joint Chiefs of Staff Joint History Office, 2013, p. 81-87.
- <sup>26</sup> "Combined Space Operations Center established at Vandenberg AFB," Joint Force Space Component Command Public Affairs, July 19, 2018.
- <sup>27</sup> Phillip Swarts, "The JICSpOC is dead; Long live the National Space Defense Center," *Space News*, April 4, 2017.
- <sup>28</sup> John Raymond, "Fiscal Year 2019 Priorities and Posture of the National Security Space Enterprise," Testimony before the House Armed Services Committee Strategic Forces Subcommittee, March 15, 2018.

29 Rachel Cohen, "Army General Auditions for Top SPACECOM Job," *Air Force Magazine*, July 28, 2020.

30 Theresa Hitchens, "Milley to OK New Unified Command Plan; Defines SPACECOM's Roles," *Breaking Defense*, August 26, 2020.

31 Terri Moon Cronk, "Space Command Leadership Changes Hands," DOD News, August 21, 2020.

32 P.L. 116-92, National Defense Authorization Act for Fiscal Year 2020, Sec. 956.

33 James R. Locher III, "Has It Worked?—The Goldwater-Nichols Reorganization Act," *Naval War College Review*, Vol. 54 (2001), No. 4.

34 James Jay Carafano, "America's Joint Force and the Domains of Warfare," Heritage, October 4, 2017.

35 "Defense Space Acquisitions: Too Early to Determine If Recent Changes Will Resolve Persistent Fragmentation in Management and Oversight," Government Accountability Office, GAO-16-529R, July 27, 2016.

36 Joshua Boehm with Craig Baker, "A History of United States National Security Space Management and Organization," Prepared for the Commission to Assess United States National Security Management and Organization, 2000.

37 Joan Johnson-Freese and Roger Handberg, "Searching for Policy Coherence: The DOD Space Architect as an Experiment," *Joint Force Quarterly*, Summer 1997.

38 "Organizational Changes Initiated, but Further Management Actions Needed," General Accounting Office, GAO-03-379, April 2003.

39 Michael Donley, "The Challenges of Space Management and Organization," Remarks at the National Space Symposium, Colorado Springs, Colo., April 13, 2010.

40 "FACT SHEET: National Security Space Strategy DOD Initiatives," Department of Defense, 2011.

41 Deputy Secretary of Defense Memorandum, "Designation of the Principal. DoD Space Advisor," October 5, 2015.

42 John Hyten, "Thoughts on National Security Space Organization," January 2017 and Public Law 115-91, National Defense Authorization Act for FY2018, sec. 1601.

43 Government Accountability Office, "Challenges in Aligning Space System Components," GAO-10-55, October 2009.

44 James B. Armor, Jr., "The Air Force's other blind spot," *The Space Review*, September 15, 2008.

45 "Remarks by Vice President Pence on the Future of the U.S. Military in Space," August 9, 2018.

46 Senate Report 116-48 to accompany the National Defense Authorization Act for Fiscal Year 2020, p. 298.

47 Office of the Secretary of Defense, "Defense Space Strategy Summary," June 2020.

48 Kevin Kruse et al, "United States Space Management and Organization: Evaluating Organizational Options," Prepared for the Commission to Assess United States National Security Management and Organization, 2000, p. 181.

49 Christina Chaplin, "Defense Space Acquisitions: Too Early to Determine If Recent Changes Will Resolve Persistent Fragmentation in Management and Oversight," Government Accountability Office, GAO-16-592R, July 27, 2016, p. 57.

50 Sandra Erwin, "Space Development Agency wants to demonstrate hardware before merging with Space Force," *Space News*, June 18, 2020.

51 Space Policy Directive-4: Establishment of the United States Space Force, February 19, 2019.

52 "Report of the Commission to Assess United States National Security Space Management and Organization," January 11, 2001, p. 90-94.

53 Space Policy Directive 4: Establishment of the United States Space Force, February 19, 2019.

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