

Can Air Forces Survive Without Space?

**Professor Alexandros Kolovos,
Hellenic Air Force Academy, Brigadier General HAF (ret)¹**

Citation: Dr. Alexandros Kolovos, Professor Hellenic Air Force Academy, Brig. General HAF (ret.). (2025). *Can Air Forces Survive Without Space?* Hellenic Air Force Review, 134 <https://doi.org/10.5281/zenodo.15170068>

"We are now transitioning from an air force into an air and space force on an evolutionary path to a space and air force (Department of the U.S. Air Force, 1997)"²

Abstract

This article emphasizes the strategic importance of integrating space capabilities within air forces for national security. It reviews historical context and current trends among global players like the U.S., China, Russia, and Europe. The Hellenic Air Force pioneered this integration by creating a space center in 1977 and incorporating space into its ISR capabilities over 30 years. The analysis advocates for HAF to regain authority over ISR space-based assets, aligning with airpower theory and European trends. This approach enhances the precision and effectiveness of air and space operations, maintaining a competitive edge in modern military challenges.

Keywords

Air Power; Space Power, Hellenic Air Force; Space Integration; ISR Capabilities; National Security; Strategic Evolution

Prologue

President Donald Trump's selection of Dr. Troy Meink, Principal Deputy Di-

rector of the National Reconnaissance Office (NRO), as the next Secretary of the Air Force, underscores the strategic importance of integrating space and air capabilities within the United States Air Force (USAF). The NRO, part of the U.S. Intelligence Community and Department of Defence, manages reconnaissance satellites. Dr. Meink's experience with space-based collections is pivotal for this integration.

The nomination of Matthew Lohmeier, a former Space Force lieutenant colonel, as Under Secretary of the Air Force, further highlights the critical role of space in modern military operations and the need for cohesive space and air strategies within the Air Force.

The integration of space with air gained prominence after the First Gulf War (1991), often called 'the first space war,' which showcased the utility of space-based technologies like GPS for navigation and precision targeting. This success highlighted the strategic importance of space in warfare and spurred discussions on incorporating space capabilities into air forces.

In 1995, an article in Joint Force Quarterly argued that the Air Force needed to evolve into a space force to remain relevant.³ This foresight was realised when President Trump signed the National Defense Authorization Act on 20 December 2019, creating the U.S. Space Force as the sixth branch of the

U.S. Armed Forces, tasked with ensuring American space superiority. This new branch was tasked with ensuring American space superiority through the organisation, training, and equipping of space personnel.⁴

The revival of U.S. Space Command in August 2019, after a 17-year hiatus, reflects a parallel commitment. SPACECOM’s global space operations integrate with other combatant commands, reinforcing the centrality of space in military strategy.”⁵ It should be noted that the difference between the Space Command, and the Space Force (USSF), is that the first is the combatant command, while the latter is the military service (Table 1).⁶

The U.S. Air and Space Nexus

The USAF was established on 18 September 1947 with the National Security Act. It covered all U.S. photoreconnaissance needs until a U-2 crash in 1960 ended overflights over the USSR.⁷ The first space image from Discoverer-14 on 19 August 1960 began the era of space imagery intelligence, convincing President Eisenhower there was no “missile gap”, which meant that the USSR did not have missile superiority over the USA.⁸ The National Reconnaissance Office (NRO) was founded on 25 August 1960. Both institutions have been crucial in U.S. defence and intelligence, focusing on air and space capabilities.

Entity	Role and Responsibilities	Relationship
Secretary of Defence	The principal defence policymaker and advisor to the U.S. President.	Oversees the entire Department of Defense, including the DAF and SPACECOM.
Department of the Air Force (DAF)	Oversees both the USAF and USSF. Provides overall administrative and policy framework. Reports to the Secretary of Defence.	The parent organization for both the USAF and USSF.
United States Air Force (USAF)	Organizes, trains, and equips air forces. Conducts air operations.	A branch under the DAF. Focuses on air domain operations.
United States Space Force (USSF)	Organizes, trains, and equips space forces. Develops space capabilities.	A branch under the DAF for administrative purposes. Operationally, it supports SPACECOM and other combatant commands.
United States Space Command (SPACECOM)	Conducts space operations. Integrates space capabilities into broader military strategy. Reports directly to the Secretary of Defense for operational control.	A unified combatant command that utilizes resources and personnel from the USSF.

Table 1: Roles, Responsibilities, and Relationships of U.S. Air Force and Space Entities

The Air Force has historically engaged with aerospace technologies like satellites and missile defence. The term ‘aerospace’ was introduced by General White in 1958 and widely adopted until

tioned from leading the NRO to serving as Secretaries of the Air Force, highlighting the integration of space and air expertise (Table 2). This pattern underscores the close relationship between

Name	NRO Director Tenure	Secretary of the Air Force Tenure
Dr. John L. McLucas	March 17, 1969 - December 20, 1973	July 19, 1973 - November 23, 1975
Mr. Thomas C. Reed	August 9, 1976 - April 7, 1977	January 2, 1976 - April 6, 1977
Dr. Hans Mark	August 3, 1977 - October 8, 1979	July 26, 1979 - February 9, 1981
Mr. Edward C. Aldridge Jr.	August 3, 1981 - December 16, 1988	June 9, 1986 - December 16, 1988

Table 2: Transition of NRO Directors to Secretaries of the Air Force

the 1990s.⁹ Initially focused on air superiority and reconnaissance, the Air Force’s role expanded as space became a vital domain, requiring dedicated resources and strategic planning.

The USAF’s extension to space operations made it well-suited to manage and develop space capabilities. Many space-based assets, such as satellites for ISR, communication, and navigation, are integrated with air operations. The Air Force’s control of airspace and aerial missions logically extends to managing space assets. ‘Outer space’ is contiguous to ‘air space,’ with the lower limit of ‘outer space’ being the upper limit of ‘air space.’¹⁰

Several individuals have transi-

tioned from leading the NRO to serving as Secretaries of the Air Force, with NRO leadership experience being valuable for the strategic oversight required as Secretary of the Air Force.

In 1990, USAF Chief of Staff General McPeak renamed ‘aerospace’ to ‘air and space’ to reflect the distinct cultures and principles of these domains. This transition was driven by several factors, including the increasing reliance on space-based assets for communication, navigation, and ISR, making space crucial for national security.¹¹ The threat of space-based conflicts and the need to protect space assets highlighted the importance of space security. Integrating space capabilities into military operations required

specialised knowledge and skills, making education in space security and defence vital. The global trend towards space militarisation also underscored the need for international cooperation. However, in 1997, General Ryan reinstated the term ‘aerospace’. In 2002, the USAF replaced ‘aerospace’ with ‘air and space power’ to acknowledge the distinct culture and principles of space (Table 3).

and Russia, have also recognized the importance of integrating space capabilities into their military operations. However, while the U.S. has established a separate Space Force, and a Space Command, China and Russia have taken different approaches.

In 2015, the Chinese People’s Liberation Army (PLA) established the Strategic Support Force (PLASSF) to oversee space, cyber, and electronic

Time Frame	Terminology Used	Description
1958 - 1990	Aerospace	The term "aerospace" was first introduced by Gen Thomas D. White in August 1958 and was used throughout the Air Force.
1990 - 1997	Air and Space	Gen Merrill A. McPeak became Chief of Staff in 1990 and renamed the term used by the Air Force to " air and space", to better reflect the distinct cultures and principles of air and space domains.
1997 - 2002	Aerospace	General Ryan took over in 1997 and the term USAF used was "aerospace ".
2002 - Present	Air and Space Power	From 2002, the Air Force uses the term "air and space power." This change was made to respect the fact that space is its own culture with its own principles. This shift was part of a broader effort to acknowledge the distinct nature of space operations within the Air Force.

Table 3. Evolution of Air Force Terminology over Time 12

Responses from Major Competitors and European Allies

This strategic shift is not unique to the United States. Other countries have also recognized the importance of this integration.

Major Competitors

Other major players, such as China

warfare efforts. This was part of broader reforms aimed at centralizing control over these crucial domains within the PLA. However, President Xi Jinping’s vision for China to become a great space power by the early 2020s has driven aggressive investments and policies in space technology, aligning military and civilian efforts to ensure space superiority.¹³ On April 19, 2024, the PLASSF was dissolved, and its func-

tions were redistributed across the PLA's other branches. Concurrently, the PLA established the Aerospace Force, consolidating all space-based systems and assets under a unified command. This restructuring is seen as a move to integrate China's space capabilities more closely with its overall military goals.¹⁴ The establishment of the Aerospace Force enhances China's ability to synchronize space operations with air and missile defence strategies, with an eye on regional and global military influence.

Similarly, Russia on August 1, 2015, has established the Russian Aerospace Forces (VKS), which combines the Air Force, Air Defence Forces, and Space Forces. This structure enables Russia to coordinate its air and space operations more effectively, ensuring a unified approach to national defence.

European Allies

In Europe, the trend is also gaining momentum. France and Spain have re-named their air forces to include the space domain. The French Air Force was renamed Armée de l’Air et de l’E-space (Air and Space Force) on September 10, 2020. The French Space Command (Commandement de l’E-space, CDE) was created on 3 September 2019 to enhance the operational effectiveness and governance of space within the French Ministry of Armed Forces. It is a French Air and Space Force command but also a joint forces organization, including members from the Air and Space Force, Army, Navy, Defence Procurement Agency, and joint forces logistics department. Functionally, the CDE is under the French Chief of Defence Staff for military operations and space policy, while organically it is

Country	Belongs To	Space Operations Managed By	Details
China	People's Liberation Army	Aerospace Force	Established on April 19, 2024. The Aerospace Force will focus on supporting and achieving China's space policy goals and will directly report to the CMC. It will develop military space capacities, ensuring China's access, use, and control of space, and enhancing Chinese space power.
Russia	Russian Armed Forces	Russian Aerospace Forces (VKS)	Established on August 1, 2015. Combines the Air Force, Air Defence Forces, and Space Forces. The VKS was created to improve efficiency and logistical support, and it plays a crucial role in aerial warfare, space warfare, and missile defence.

Table 4: Comparison of Aerospace Forces in China and Russia

under the Chief of Staff of the French Air and Space Force.

The Spanish Air Force was renamed Ejército del Aire y del Espacio (Air and Space Force) on June 27, 2022. It includes a Space Command consisting of personnel from the air force. Spain’s investments in space are focused on developing its space capabilities and ensuring the security of its space assets.¹⁵ⁱ Both countries renamed also their Military Academies too.

Country	Original Name	Renamed Name	Renaming Date
France	Armée de l’Air	Armée de l’Air et de l’Espace	September 10, 2020
Spain	Ejército del Aire	Ejército del Aire y del Espacio	June 27, 2022

Table 5: Renamed European Air Forces to include Space in their names

Other countries preferred to establish only a space command, most under the auspices of their Air Force. These changes reflect the growing recognition of space as a critical domain for military operations and the need for air forces to incorporate space capabilities into their strategic frameworks.

- The United Kingdom Royal Air Force oversees the U.K. Space Command, which is a joint command established on April 1, 2021. It includes personnel from the Royal Navy, British Army, Royal Air Force, and the Civil Service. The U.K. has made significant investments in space capabilities, reflecting its strategic importance

in national defence.¹⁶

- The German Air Force (Luftwaffe) oversees the German Space Command (Weltraumkommando), which was established on July 13, 2021. It consists of personnel from the Luftwaffe and focuses on protecting Germany’s space assets and enhancing its space situational awareness. Germany’s investments in space are aimed at strengthening its de-

fense and technological capabilities.¹⁷

- The Italian Defence General Staff, oversees the Italian Space Operations Command (Comando delle Operazioni Spaziali), a joint command that includes personnel from all branches of the military. It was established on June 30, 2020, to coordinate Italy’s military space activities and enhance its space defence capabilities.¹⁸

Lessons Learned from the Organisational Structure Followed

Countries discussed above have structured their military organizations to

Country	Space Command Name	Belongs To	All Branches	Establishment Date
France	French Space Command (Commandement de l'Espace, CDE)	French Air and Space Force	Yes	September 3, 2019
Italy	Italian Space Operations Command (Comando delle Operazioni Spaziali)	Italian Defence General Staff	Yes	June 30, 2020
United Kingdom	United Kingdom Space Command.	Royal Air Force. UKSC headquarters is at RAF High Wycombe co-located with Air Command	Yes	April 1, 2021
Germany	German Space Command (Weltraumkommando)	German Air Force (Luftwaffe)	No	July 13, 2021
Spain	Mando del Espacio: MESPA	Spanish Air and Space Force	No	January 9, 2024

Table 6: European Countries with Space Commands

align with their strategic interests. Nations with global ambitions, such as the United States, have recognised the importance of space for achieving security and power projection. In contrast, countries with more regional or national interests have different options, which are analysed below.

**Space as a Separate Domain:
The US Approach**

The United States, as currently the only space super-power, has invested heavily in both its Air Force and Space Force, with the latter now part of the Department of the Air Force (DAF). While the Air Force did not merge with the Space Force, the creation of the latter as it is documented by the 2020 Defense Space Strategy, underscores the growing complexity of space operations, necessitating dedicated focus and re-

sources.¹⁹ According to the Strategy, DAF will grow its spacepower capacity over the next 10 years to ensure space superiority and secure the Nation's vital interests.

The USAF continues to play a vital role in national defence, but the formation of the Space Force reflects the recognition that space has become too significant and intricate to remain a subordinate function within another branch. This separation allows both branches to specialise and excel in their respective domains, ensuring comprehensive coverage of both air and space operations.²⁰

**The Integrated Approach:
Aerospace Forces of China
and Russia**

In contrast, nations with more regional strategic focuses, such as the great space-powers China and Russia,

have adapted their space and aerospace structures to address national interests. China's recent military restructuring, particularly the creation of the PLA Aerospace Force in 2024, mirrors the Russian model. In 2015, Russia consolidated its Air Force, Anti-Missile Defence Forces, and Space Forces under the Russian Aerospace Forces (VKS), positioning itself for long-term strategic competition. This integrated structure enables Russia to coordinate air and space operations more effectively, strengthening its national defence and broader strategic objectives. China's recent Aerospace Force reflects a similar approach, aligning its space forces with its overarching defence strategy, which is influenced by the Russian example. Both nations aim to optimise their military structures by embedding space as a core component of their regional power projection.

These developments underscore the interconnectedness of air and space operations, where space is not simply an isolated domain but a crucial enabler of military objectives. Russia has integrated its space assets into the VKS to support strategic needs across Europe and Central Asia, while China's emphasis on the Indo-Pacific has driven substantial investments in space systems.

Space Command Within Existing Structures: The Medium - Power Approach

In nations with limited global ambitions and regional security interests, the establishment of a Space Command often depends on resource constraints, strategic priorities, and organisational efficiency. These countries typically lack the scale or necessity to create an independent space force. Instead, they incorporate their space operations within existing structures, such as the, the Ministry of Defence as a specific command or the Air Force.

Space Command under the Ministry of Defence: A Joint Command Approach

Some countries choose to place Space Commands directly under their Ministry of Defence as joint commands involving all branches. The Italian Space Operations Command provides a notable example. It operates under the Italian Defence General Staff, emphasizing a joint approach to space operations across all branches of the Italian military. This approach reflects a broader vision of space as a cross-domain enabler rather than a specialized domain linked solely to the air force. Joint commands, may facilitate integration across land, sea, air, and cyber domains, ensuring that space operations

are aligned with the overall strategic objectives of the armed forces.

While this model promotes inter-service collaboration, it can also introduce complexity in decision-making and coordination, especially in nations with limited resources. The traditional hierarchical mindset can lead to delays in the dissemination of critical information, especially in wartime situations. A characteristic example is the Gulf War in 1991 when the CIA employs first informed their leadership in the U.S. about the findings and then sent the results to General Norman Schwarzkopf, who was the Allied Forces tactical commander and who needed those most.²¹

Space Command within the Air Force: Leveraging Existing Expertise

Alternative, embedding the space command within the air force is also a common choice, reflecting historical, operational, and technological synergies. The air force is often selected as the home for a space command because of its inherent expertise in domains that intersect with space operations.

The air force's long-standing experience in managing advanced technologies, such as radar systems, satellite communications, and aerial reconnaissance, provides a natural foundation for developing space capabilities. Another

reason for situating a space command within the air force is the continuity of command structures and mission objectives. Air forces oversee high-altitude operations, including missile defence and aerial support systems, which serve as stepping stones to space-related missions. The Air Forces is the only branch that has the ability to quickly deploy and redeploy assets across long distances, which is essential for maintaining situational awareness of the area of interest and responding to threats. By integrating space command within the air force, nations can ensure a seamless transition between air and space domains, creating a unified chain of command that simplifies coordination and enhances operational readiness.

France and Spain provide strong examples of this trend. The creation of the 'Armée de l'Air et de l'Espace' in France and the renaming of the Spanish Air Force to include 'Space' (Table 5), demonstrate a clear commitment to integrating space operations within the existing Air Force structure. Furthermore, the establishment of the 'Commandement de l'Espace' within the French Air and Space Force and the creation of the 'Mando del Espacio' within the Spanish Air and Space Force (Table 6) further solidify this integration, leveraging existing expertise and infrastructure. The United Kingdom also exemplifies this approach. The UK

Space Command is co-located with Air Command within the Royal Air Force, while the German Space Command belongs to the German Air Force (Luftwaffe), highlighting the close operational relationship and utilisation of existing resources.

One critical issue for all Air Forces' missions is targeting. Targeting is at the heart of airpower theory. According to Giulio Douhet (1869-1930), a pioneering air power theorist often called the father of strategic air power due to his influential ideas on the use of aircraft in warfare, "the choice of enemy targets is the most delicate operation of aerial warfare."²²

All Air Forces have the capability to strike targets with precision and effectiveness, utilizing Air Power. They can engage a wide range of deep targets, including strategic centers of gravity, critical infrastructure, and mobile targets, both in the air, at sea, and on the ground. To achieve this, all Air Forces require intelligence, especially for remote areas of interest. As Owens stated, "Air power is targeting, and targeting is intelligence." For these deep targets, intelligence is provided via space-based ISR systems.²³

Also, Air Forces can strike a significantly larger number of targets than all other branches. The targeting by the Air Forces differs internationally from the targeting by other branches of the Armed Forces. The Air Force can strike

targets at much greater distances due to the range and speed of aircraft, allowing for operations in geographically remote areas that other branches cannot reach.

The target development process, which involves creating and updating a list of entities of interest supported by intelligence, is crucial during crises or war. During such times, targets known from peacetime may relocate, or new mobile targets may emerge. Time, information transmission networks, and analysts' experience are critical factors. Challenges arise when image analysts from other branches, who may not fully understand the Air Force's specific needs and operational context, analyse its targets. Cultural differences and varying priorities can lead to misinterpretation, with analysts selecting and analysing data that is not relevant or critical for air operations. This lack of understanding can hinder the Air Force's ability to make timely and informed decisions. In urgent situations, this misalignment becomes even more critical, as the Air Force relies on rapid and accurate analysis to respond to threats and execute missions effectively. Any delay or error in target selection due to cultural misunderstandings or differing operational priorities can have serious consequences, impacting mission success and personnel safety.

Hellenic Air Force and Space

The unified Hellenic Air Force was established as an independent branch of the Armed Forces with Law 5121 «On the Organisation of the Air Force» on 10 July 1931. In 1952, Greece became a member of NATO, leading to the reorganisation and restructuring of the Hellenic Air Force in line with NATO standards, with support from the United States. Consequently, due to the close relationship between the two air forces, the HAF was able to stay informed about developments in the United States Air Force, including those related to space.

This is evident as the term «aerospace» was included as one of the topics of interest for which «Air Force Review», the official magazine of the Air Force, accepted articles for publication. Notably, from the first issue of Air Force Review (January - June 1972), the term «aerospace» was mentioned and specialised in topics concerning the achievements of the two superpowers, the development of strategy and tactics of flying objects, and the future of aircraft in light of space achievements.

In 1977, the HAF established the National Space Research Center (NSRC). The mission of the NSRC was to support National Defence and the National Economy through space technology. This included informing the Air Force, Armed Forces, and Public Serv-

ices about space science activities, processing satellite imagery, and representing these entities in space-related fields. By evolving into an «aerospace force», HAF could leverage advanced technologies that operate seamlessly across both air and space domains.

The history of the HAF's involvement with Space has been detailed in the Air Force Review (Issue 127).²⁴ However, certain topics that are relevant to the content of the present article are reiterated or further specialised in this text.

In 1995, the Council of Chiefs of General Staff (SAGE) redefined the name and the mission of the NSRC to the National Center for Space Applications (NCSA). The NCSA was tasked for supporting the operational work of the General Staffs and other national entities in the collection and processing of satellite images and was subordinated to the A' Branch of the Hellenic Air Force General Staff (HAFGS).

While the HAF was instrumental in establishing the NCSA and proposed the Space Policy for the Ministry of Defence (1995), the Space Policy of the Western European Union (1998), and the EU Council decision 'ESDP and Space' (2004)²⁵, as well as the creation of a 'Space Office' within the Ministry of Defence in 2006, this progress was halted. In 2007, the HAF experienced a separation from the ISR space capabilities after proposing participation in the Helios II programme. Despite initial

challenges, the political leadership's acceptance of the proposal brought the issue of control over Helios II to the forefront.

In November 2006, the Council of Chiefs of the General Staffs decided initially to transfer the NCSA to the Hellenic National Defence General Staff. Then, on 9 July 2007, the new Minister of National Defence decided to abolish the NCSA once the Helios II ISR 'Ground Satellite Station' became operational. The station was installed at the 114 Combat Wing (Tanagra Air Base) and became operational in 2010. Consequently, the NCSA closed after 30 years of successful work.

Currently, the Hellenic Ministry of Defence has two overarching space-related entities: the 'Space Office' at the General Directorate of National Defence Policy and International Relations of the Ministry of National Defence (proposed by HAF in 2006), and the 2021 'Space Directorate' at the Hellenic National Defence General Staff, which, among other responsibilities, oversees the Tanagra Air Base 'Ground Satellite Station'.

The abolishment of HAF's NCSA might explain why the 2014 HAF Doctrine made only a single reference to the term «space.» It stated that air power, utilising the third dimension with characteristics such as speed, flexibility, precision, rate, and effectiveness of its weapons, operates in both air and

space.²⁶

In contrast, 2023 HAF Doctrine, in a dedicated subsection on 'Air Power and Space,' integrates space as a crucial element of air power, recognizing it as a natural extension of the air domain.²⁷ It acknowledges that space exploitation provides new capabilities, adding Space Power as an additional dimension to Air Power. Space offers broad geographic coverage and long duration, enhancing military capabilities.

Given that the 2023 HAF Doctrine states, 'the unique characteristics of Air Power and Air Forces necessitate their command by a single Air Commander with the necessary knowledge and experience,' should the Air Force advocate for regaining authority over ISR space-based assets?

The emphasis on ISR systems arises from their distinct nature compared to other tactical decentralized systems (such as telecommunications, positioning, and navigation). ISR products require processing and analysis, which takes time to render them useful. The fact that the Air Force targets a greater number of locations of interest than the other two branches combined, due to the specific geographical configuration of the operational environment, was taken into account in 1995. For this reason, the responsibility for the relevant infrastructure was given to the Air Force, as it is directly related to the effectiveness of its mission. It is esti-

mated that the same reasons still apply today.”

This approach aligns with Douhet’s emphasis on targeting and air superiority, mitigates delays and misinterpretations from hierarchical communication barriers, and ensures timely dissemination of critical information. Centralizing command under an experienced Air Commander would align with European trends and enhance the precision and effectiveness of air operations by optimally utilising ISR capabilities.

Epilogue

The integration of space and air capabilities is essential for national security and military effectiveness. This evolution is no longer a mere aspiration but a strategic imperative, as demonstrated by U.S., European, and global trends. Currently, the organization for space matters of the Hellenic Ministry of Defence is not yet on par with those of other countries, with Greece having been in the same space club in the past by entering into the Helios II programme.

The HAF’s pioneering role in incorporating space into its targeting capabilities underscores the necessity of regaining authority over ISR space-based assets. This corroborates perfectly with airpower theory and European trends, enhancing the precision and effectiveness of air and space

operations. The continued relevance of air forces without space integration appears increasingly tenuous. The HAF’s return to an ‘aerospace force’ is a natural progression, necessitating organizational reforms. By addressing internal challenges, HAF can strengthen national security and maintain its operational relevance in an increasingly space-centric military landscape.

This aligns also with recent study of the U.S. Department of the Air Force, including both the USAF and Space Force, for 2050.²⁸ DAF envisions seamless integration of air and space operations to enhance mission effectiveness and maintain strategic superiority. By leveraging advanced technologies like AI, autonomous systems, and advanced propulsion, the DAF aims to ensure dominance in both domains. The HAF’s historical ties with the U.S. and French Air Forces position it advantageously to adopt best practices and reinforce its air power capabilities through space integration.

Ultimately, embedding again space-based ISR infrastructure under HAF’s command stems from pragmatic considerations. Smaller nations must balance their ambitions with their available resources, and the air force’s existing infrastructure and expertise make it a logical and cost-effective choice. While alternative models offer their own advantages, the air force-centric approach remains particularly appealing for na-

tions seeking to leverage their existing strengths while navigating the challenges of the increasingly critical space domain.

References

- ¹ A. Kolovos, Professor at the Hellenic Air Force Academy, Brigadier-General, Hellenic Air Force
- ² Department of the Air Force. (1997, January 1). *Global Engagement: A Vision for the 21st Century Air Force* (Accession No. ADA318235). Defense Technical Information Center. Retrieved from https://archive.org/details/DTIC_ADA318235
- ³ Szafranski, R. When Waves Collide: Future Conflict. *Joint Force Quarterly*, Spring 1995, 79. Retrieved from <https://apps.dtic.mil/sti/pdfs/ADA528918.pdf>
- ⁴ U.S. Department of Defense. Trump Signs Law Establishing U.S. Space Force. U.S. Department of Defense. December 20, 2019, Retrieved from <https://www.defense.gov/News/News-Stories/Article/Article/2046035/trump-signs-law-establishing-us-space-force/>
- ⁵ United States Code. 10 U.S.C. § 9081: The United States Space Force. In Title 10 - Armed Forces, Subtitle D - Air Force, Part I - Organization, Chapter 908 - The Space Force. 2019. U.S. Government Publishing Office. Retrieved from <https://www.govinfo.gov/content/pkg/USCODE-2019-title10/html/USCODE-2019-title10-subtitleD-partI-chap908-sec9081.htm>
- ⁶ United States Department of State, «The Space Force's Critical Role in National Security,» [Online]. Retrieved from: <https://2021-2025.state.gov/briefings-foreign-press-centers/the-space-forces-critical-role-in-national-security>. [Accessed: 25-Jan-2025]
- ⁷ F. G. Powers and C. Gentry, *Operation Overflight: The U-2 Spy Pilot Tells His Story for the First Time*. New York, NY, USA: Holt, Rinehart and Winston, 1970.
- ⁸ Central Intelligence Agency, «CORONA: America's First Imaging Satellite Program,» [Online]. Available: <https://www.cia.gov/legacy/museum/exhibit/corona-america-s-first-imaging-satellite-program/>. [Accessed: 25-Jan-2025]
- ⁹ Air Force Magazine 41, no. 8 (August 1958): 36.
- ¹⁰ National Security Council: U.S. Policy on Outer Space, NSC 5814," June 20, 1958, document #345, declassified 1992 NSC, DDRS.
- ¹¹ Agrawal, R., & Brooks, A. One Team, One Fight: The Department of the

- Air and Space Forces. *Air & Space Operations Review*, 1(1), Spring 2022.
- ¹² Jennings, F. W. New doctrine demands changes in the aerospace force. *Air Power Journal*, 13(1), AFRP 10-1. 1999.
- ¹³ Zhao, L. Xi: Build 'great space power'. *China Daily*. April 25, 2020. Retrieved from <https://www.chinadaily.com.cn/a/202004/25/WS5ea23e86a3105d50a3d1884e.html>
- ¹⁴ Pollpeter, K. L., Chase, M. S., & Heginbotham, E. *The creation of the PLA Strategic Support Force and its implications for Chinese military space operations* (RR-2058). RAND Corporation. 2017. Retrieved from https://www.rand.org/pubs/research_reports/RR2058.html
- ¹⁵ Aviacionline, "The Spanish Air Force is now a Space Force too," Aviacionline, June 27, 2022. [Online]. Available: <https://www.aviacionline.com/2022/06/the-spanish-air-force-is-now-a-space-force-too>. [Accessed: 01-Feb-2025].
- ¹⁶ Royal Air Force. (n.d.). UK Space Command. <https://www.raf.mod.uk/what-we-do/uk-space-command/>
- ¹⁷ Machi, V. Germany establishes new military space command. Defense News. July 13, 2021. Retrieved from <https://www.defensenews.com/space/2021/07/13/germany-establishes-new-military-space-command/>
- ¹⁸ Ministero della Difesa. (n.d.). Il Comando delle Operazioni Spaziali (COS). Retrieved January 23, 2025, from <https://www.difesa.it/smd/covi/cos/index/25457.html>
- ¹⁹ U.S. Department of Defense, 2020 Defense Space Strategy: Spacepower as a Force Multiplier, 2020. Retrieved from: https://media.defense.gov/2020/Jun/17/2002317391/-1/-1/1/2020_defense_space_strategy_summary.pdf [Accessed: Jan. 25, 2025]
- ²⁰ United States Department of State, «The Space Force's Critical Role in National Security,» [Online]. Available: <https://2021-2025.state.gov/briefings-foreign-press-centers/the-space-forces-critical-role-in-national-security>. [Accessed: 25-Jan-2025].
- ²¹ A. Kolovos, "Persian Gulf War: The First Space War. A Critical Assessment of Space Systems," translated from the original 1992 publication, Aerospace Management and Control Laboratory, OCCASIONAL PAPER NO. 2, Automatic Control, Aerospace Technology, Defence Systems and Operations Di-

vision, Hellenic Air Force Academy, 2017.

- ²² G. Douhet, *The Command of the Air*. New York: Coward-McCann. 1942

- ²³ G. Valentino. Using the space domain: An intelligence, surveillance and reconnaissance perspective. The Joint Air Power Competence Centre. NATO, 2020. Retrieved from The Joint Air Power Competence Centre.

- ²⁴ A. Kolovos, K. Hellenic Air Force and Space: From the Past to the Future. *Air Force Review*, (127), April 2023.

- ²⁵ Council of the European Union, *European space policy: ESDP and space*, 11616/3/04 REV 3. Brussels. Available at: <http://register.consilium.europa.eu/pdf/en/04/st11/st11616-re03.en04.pdf>. November 16, 2004

- ²⁶ Hellenic Air Force. *Basic Doctrine of the Hellenic Air Force*. General Staff of the Air Force, Branch A - Directorate A1, Section 1, January 2014. Retrieved from https://www.haf.gr/wp-content/uploads/2015/01/basiko_dogma_pa_2014.pdf

- ²⁷ Hellenic Air Force. *Basic Doctrine of the Hellenic Air Force*. General Staff of the Air Force, Branch A - Directorate A1, Section 1, March 2023. Retrieved from

<https://www.haf.gr/wp-content/uploads/2023/05/ΒΑΣΙΚΟ-ΔΟΓΜΑ-ΠΑ.pdf>

- ²⁸ Department of the Air Force, "Report to Congressional Committees: The Department of the Air Force in 2050," December 2024. [Online]. Retrieved from: www.af.mil/Portals/1/AirForcePriorities/DAF_2050_Final_30_Dec.pdf. [Accessed: 01-Feb-2025].

Short Biography



Dr. Alexandros Kolovos, Professor of Space Technology at the Hellenic Air Force Academy (HAFA), graduated in 1980 and has been active in the Hellenic Air Force (HAF) for 49 continuous years.

He resigned as a Brigadier General in 2008 and then became a professor at HAFA, a part of HAF. He holds a Law degree from the University of Athens (1987) and a PhD in space-related international relations from Panteion University (2002). He led the National Centre for Space Applications (1991-2006) under HAF's Intelligence Directorate. Apart from his operational work, he proposed inter alia the 1995 Space Policy, the participation to Helios II and MUSIS Earth Observation programmes, and the establishment of the Space Office (2006) for the Ministry of Defence.

During two Hellenic Presidencies, he proposed the WEU's Space Policy (1998) and EU's ESDP and Space (2002-03), both adopted by their respective Councils. He represented Greece at the EU Satellite Centre (1995-2006) and served in UN, NATO, WEU and EU space committees. Prof. Kolovos authored 4 books, 5 monographs, 9 book chapters, and numerous articles on space.