## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disclaimer</td>
<td>ii</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>iii</td>
</tr>
<tr>
<td>Change of Space Environment: From the Importance of Space in the Cold War to Access to the Space Domain 2012 and Beyond</td>
<td>1</td>
</tr>
<tr>
<td>NATO and Space</td>
<td>4</td>
</tr>
<tr>
<td>Schriever Wargame 2012 International Summary</td>
<td>6</td>
</tr>
<tr>
<td>Insights and Take-Aways</td>
<td>15</td>
</tr>
<tr>
<td>Way Ahead for NATO in Space</td>
<td>38</td>
</tr>
<tr>
<td>Annexes</td>
<td></td>
</tr>
<tr>
<td>Schriever Wargame 2012 International Documentation</td>
<td>A-1</td>
</tr>
<tr>
<td>Schriever Wargame 2012 International Workshops</td>
<td>B-1</td>
</tr>
<tr>
<td>Acronyms</td>
<td>C-1</td>
</tr>
<tr>
<td>References</td>
<td>D-1</td>
</tr>
</tbody>
</table>
Disclaimer

Opinions, conclusions, and recommendations expressed or implied within are solely those of HQ SACT and do not necessarily represent the views of the North Atlantic Treaty Organization or the nations that participated in the event.
Executive Summary

Space is a congested, contested, and competitive domain. In the coming decade, as the number of space systems and capabilities continue to multiply, so will the vulnerabilities. As an Alliance enabled by space, NATO relies on national and commercial space capabilities to support its missions and operations. The wargame highlighted the strategic advantage that space capabilities provide to NATO-led operations.

The first Schriever Wargame 2012 International (SW12I) was conducted at Nellis AFB, NV from 20-26 April 2012 and emulated a notional NATO operation with reliance on space-based capabilities provided by member nations. The wargame included participants from nine NATO nations and Australia, six NATO groups, nine US organizations, as well as Commercial Space Industry. The game was conducted at the operational level with notional headquarters guidance that provided sufficient latitude for game play.

The scenario and results of the SW12I serves as a meaningful example of Space-related threats and challenges for NATO-led operations in the Twenty-first century.

The key take-aways, based on observations outlined in this report cover several issues relevant for the Alliance in terms of Space and assured access to the domain:

- Vulnerabilities to Space Capabilities Supporting NATO Operations;
- Optimizing Space Efforts: Challenges to NATO’s Organizational Structure;
- Operational Challenges and Support for the Warfighter;
- International and Private Sector Cooperation: Sharing Space Situational Awareness;
- Education and Training of Space SMEs and Research on Space;
- Space Engagement and Partnerships;
- Legal Aspects: International Law and Norms;
- NATO Policy Challenges;
- Domain Interrelationship.

Key take-aways:
1. “Space Systems“ include the satellites in Space, but also the networks, nodes, data links, ground-based infrastructure, and the unique expertise of space-related personnel. Space protection and security encompass all these elements. Where space systems are concerned, a small joint operation (SJO) that is regionally focused can, with the right tactical event, have global impact.

2. The wargame showed that NATO should develop appropriate doctrine to set requirements for coordination and cooperation mechanisms that set standards and guidelines for the conduct of Space Situational Awareness. Included in this guidance, NATO should ensure it has appropriate concepts, organizational structure and mechanisms in place for enhanced coordination. The challenge of developing the right channels of cooperation during an on-going operation is time sensitive and risky.
At a minimum, NATO needs to elaborate how Commanders request the enabling assets and information derived from Space to support the warfighter.

3. NATO should continue to explore the different organizational models developed in the context of the Schriever Wargame. Doing so will require an investment in time and effort to identify measures that can be used to overcome obstacles to dialogue, cooperation and information exchange.

4. The issue of information sharing, especially timely and accurate Space Situational Awareness (SSA) was highlighted as critical to effective Space-related combined operations. As the number and variety of international players (to include commercial) grows, the importance of such capabilities to successful combined operations in Space became more critical. High among the essential elements of effective Space operations are mechanisms, agreements, and interoperable systems that provide data and information.

5. In the NATO context, education and training of both the military and political leadership, as well as Space SMEs, is fragmented and must be improved. This may be achieved best by a two-pronged process. First, nations who have individuals trained in Space operations need to ensure they are available in sufficient quantity to support Space operations and the conduct of appropriate training. At the same time, NATO should explore ways to educate political and military leadership at the Alliance level (top down) and train NATO Space SMEs in collaboration with the nations (bottom up). These NATO Space SMEs should be capable of integrating available space and cyber capabilities and requirements into NATO’s operational plans and be capable of working seamlessly with national SMEs.

6. The scope of any combined Space operation that NATO forces engage in will be driven by civil, military, and commercial players working together to protect the Space commons for peaceful use.

7. The United States relies on multiple partnerships, specifically in terms of Space resilience. The same is true for NATO. In a global environment, coordinated efforts across the Alliance, including partners, will be required if NATO is to identify hostile forces, attribute action and respond rapidly to threats.

8. To ensure that the game did not become mired in legal issues, extensive work was done prior to the game on Rules of Engagement (ROE). NATO not only needs agreed ROE, which usually invokes national caveats, for its operations, but also must ensure that its space strategy is in compliance with international law. Similar to cyber-attacks, the possibility of space-related attacks on members of the Alliance raises the question of how NATO would react in case of a threat to one or more of its Member States. Do the Articles of the Washington Treaty cover space-related threats?

9. Preparations for Schriever Wargame 2012 International demonstrated the need for clear political guidance on Space. This includes how NATO will develop doctrine, capabilities, and partnerships that will enable the effective use of Space during operations by NATO forces.
10. Schriever Wargame 2012 International reaffirmed that the Land, Air, Maritime, Cyber, and Space domains cannot be viewed as separate and independent operating areas. Simultaneous incidents in the Maritime, Air, Space, and Cyber domains identified the complex interdependence of these domains. Allied missions and operations in the future will require that NATO adopts a comprehensive response to this complex issue. Moreover, this complexity will only increase over the coming decade which will require dedicated training, education, doctrine, and capabilities that are interoperable and connected. Doing so will ensure continued access to and use of these important domains.
Change of Space Environment: From the Importance of Space in the Cold War to Access to the Space Domain 2012 and Beyond

When the Soviet Union launched Sputnik as the first satellite in October 1957, this small steel sphere could be seen and heard by populations and governments around the world. The so-called “Sputnik shock” aggressively expanded the horizon and view of the world, invoking a “Space Race” which was integral to further Cold War escalation.

The launch of Sputnik had immediate implications for U.S. political and military leaders. Aware of the Soviet ability to launch a satellite, they also feared the Soviet ability to launch atomic bombs against the United States.¹ In a 1959 assessment analysis, the U.S. Information Agency attempted to assess the effect on the world and U.S. opinion, stating that:

“Sensitivity to military implications is marked, and has produced strong concern over the possibility that the USSR now enjoys military superiority over the West, and a belief in some quarters that this is a fact. The U.S. and the USSR Space programs are generally assessed as competitive efforts, and there is notable concern regarding the need to limit the dangers seen in this rivalry. Soviet successes in space have produced a major revision in the image of the USSR and to some degree of the Soviet system, and lent greatly enhanced credibility to Soviet propaganda claims.”²

The Soviet achievement of access to Space endangered U.S. and Western military superiority and the political-economic system. It became the driving force behind the efforts of the United States to improve, revise, and revolutionize Western access to Space. In 1958, as one of four factors which gave urgency to advancement of space technology, the President’s Science Advisory Committee, identified, “the defense objective for the development of space technology. We wish to be sure that Space is not used to endanger our security. If Space is to be used for military purposes, we must be prepared to use Space to defend ourselves.”³ Space served not only as another dramatic arena of Cold War competition, but was finally added as an essential domain to the security and prosperity of the Western world and the Alliance. During the Cold War, Space remained a private reserve for the two superpowers, an unshared domain for NATO to support collective defence, and a new, “high” frontier in the history of the United States.

² USIA Office of Research Analysis IMPACT OF US AND SOVIET SPACE PROGRAMS ON WORLD OPINION. A Summary Assessment July 7, 1959; Source: U.S. Information Agency, Office of Research and Analysis, 7 July 1959, U.S. President’s Committee on Information Activities Abroad (Sprague Committee) Records, 1959-1961, Box 6, A83-10, Dwight D. Eisenhower Library, Abilene, Kansas. URL: http://www.nebraskastudies.org/0900/stories/0901_0105_05.html
As General Robert Kehler, head of US Air Force Space Command in 2008, stated, "Our space surveillance network was largely built during the Cold War, for the Cold War." US systems had focused for decades on tracking Soviet activity in Space. Space awareness was clearly pointed in one direction. With the revolution of the “internet age” in the 1990s and the changes in the balance of power in the international relations, Space became a shared domain, operated by more and more Space-faring nations. Immediately, space awareness had to change and expand accordingly. Space turned rapidly into a congested, contested, and competitive domain with over 1,100 active systems and an additional 21,000 pieces of debris in orbit. More than 9,000 satellite transponders will be in orbit by 2015, making radio frequency interference a significant concern for the future. Rising global players have demonstrated their ability to jam satellite signals numerous times over the last half decade, and currently more than 60 nations operate satellites.

As the number of space systems and capabilities has multiplied so have the vulnerabilities. The modern world depends extensively on space-based systems, from the public use of GPS, the use of space-based systems by industry, agriculture and civil governments, to military applications. With the beginning of the Gulf War, military operations increasingly have become dependent on space assets and the information they provide. A failure of space-based systems has implications for the success of a mission given the respective reliance placed upon them.

Directly linked with Cyber, four pillars of modern space capability can be identified as essential for planning and conducting military operations: Positioning, Navigation and Timing (PNT); Communications; Intelligence, Surveillance, and Reconnaissance (ISR); and Space Situational Awareness (SSA). In the past, development costs and security restrictions limited space capabilities to a few users; however, new technological advances and civilian demand have led to an expansion in the civil-sector development, specifically in the communications, imagery, and PNT. “Surveillance of the Earth from Space to gain intelligence was the earliest military driver for developing Space access.” In addition, current agricultural production and weather forecasting depend on Space for imagery of Earth resources and meteorological information. SSA is essential to both offensive and defensive space control and as part of appropriate defence and deterrence posture.

MNE defines vulnerability by a three-folded meaning: “(1) The susceptibility of a nation or military force to any action by any means through which its war potential or combat effectiveness may be reduced or its will to fight diminished. (2) The characteristics of a system that cause it to suffer a
definite degradation (inability to perform the designated mission) as a result of having been subjected to a certain level of effects in an unnatural (man-made) hostile environment. (3) A weakness in information system security design, procedures, implementation, or internal controls that could be exploited to gain unauthorized access to information or an information system.”

MNE 7 defines future threats as capabilities that produce negative effects with an intention to cause this effect(s). Space elements are vulnerable to destruction caused by radiation, collision (with space debris), hardware and software failures, as well as, together with ground elements, to kinetic, electronic, and computer network attacks. Ground elements are particularly exposed to terrestrial weather conditions, loss of supporting utilities and physical attacks. The actual list of threats and hazards identified during MNE7 are long, reflecting the quantity and certainty of Space vulnerabilities for both civil and military organizations. The MNE7 team, headed by HQ SACT, is also developing a deterrence concept for space which looks at the combination of national dependencies on space, the cost of protecting assets in space, and the fragile balance of the space environment. This combination may require that NATO and member nations act pre-emptively to protect the use of this contested domain. Consequently, nations will also need to consider the best deterrent (both kinetic and non-kinetic) action that ensures continued access to this important domain. Ensuring access to Space in the 21st Century is and will continue to be a complex and sometimes problematic endeavour. The scenario and story-line of SW12I can serve as a meaningful example of space-related threats and challenges for NATO-led operations in the 21st Century.

10 Ibid., Paragraph 402c.
11 Ibid., Paragraphs 403 to 405.
12 This paper is called the Multinational Experiment 7 – outcome 2 : deterrence primer.
NATO and Space

NATO is an Alliance enabled by Space. NATO has been active in Space since the 1960’s starting with its own communications satellites, weather and intelligence activities. The Alliance operated satellites in Space (NATO I, II, III, and IV communication satellites) and did so until their service life expired in 2004. Currently, NATO relies on national and commercial space capabilities to support its missions.\(^\text{13}\)

Operations by NATO forces depend on the strategic advantage that space capabilities provide to NATO-led operations. NATO’s membership comprises several of the most advanced space-faring nations in the world. NATO relies on its space-faring members and the commercial sector for services on an as-required basis, an arrangement that is likely to continue in the foreseeable future. Most surveillance, reconnaissance, and remote-sensing satellites are used by both by the military and civilian sectors and not considered to be common NATO assets.\(^\text{14}\)

Though NATO depends on Space to perform its tasks and missions, it does not have a policy, military space strategy, agreed doctrine that guide and direct tactics, techniques, and procedures (TTPs), nor experts for Space. ISAF forces, for example, are highly dependent on space for data, intelligence, and communications; however, without an organic capability to coordinate, commanders are forced to rely on ad-hoc national arrangements. Space capabilities allow commanders to make decisions, both before and after action, based on accurate and timely information. In Libya, satellites helped with precision targeting and strikes on critical targets. Maritime forces off the Horn of Africa utilize satellites to track shipping and support anti-piracy operations. Space support to operations is assumed in all current and future planning. However, there is little or no organizational structure to support integration of space into operations. Currently, operations rely on incidental space SMEs managing space integration on an ad-hoc basis with no structural support from NATO. For instance, in January 2011, the ISAF commander released a report stating shortfalls on Space support to the ISAF operation. This official report followed a bottom up process. To address this issue, COS ACT created a Space deliverable on Space support to NATO operations. In addition, an unofficial NATO Space IPT was created in February 2011 which is addressing the ISAF shortfalls and formalization of this working group is on-going.

Meanwhile, the Strategic Concept warns of developments that could impede the Alliance’s use of Space. A range of nations outside NATO are developing or have developed counter-space capabilities that range from jammers and lasers to anti-satellite missiles to offensive cyber. In addition, jammers and other technologies are becoming commercially available and easy for nations and non-state actors to acquire and operate. If NATO were to lose access to Space, its operational plan to defend itself or to deploy forward would be compromised, and the Alliance would have to revert to older, less effective capabilities. In some cases, e.g., precision-guided weapons and synchronized communications

\(^{13}\) JAPCC “NATO Space Operations Assessment”, Revised January 2009.

\(^{14}\) ACT Assured Access to the Global Commons, April 2011.
networks supported singularly by GPS, there is no alternative. The loss of GPS would have a significant impact on NATO’s ability to project power, execute command and control, and sustain a deployed force.
Schriever Wargame 2012 International (SW12I)
Overview

Why a Wargame?

Wargames can be summarized as follows:

- “Wargames are warfare models or simulations, not involving actual military forces, and in which the flow of events is affected by and, in turn, affects decisions made during the course of those events by players representing the opposing sides.”
- “Fundamentally, wargaming is an experiment in human interaction and is best used to investigate processes, not to calculate outcomes.”
- “Wargames revolve around human decisions. Learning from wargames comes both from the experience of making decisions and from the process of understanding why those decisions are made.”

Wargames provide a forum for senior leaders to explore specific issues that they may not be able to address elsewhere due to exercise constraints or political sensitivities. It provides players with an opportunity to enhance their operational planning skills and thought processes while allowing exploration of emerging concepts and challenges in the confines of a learning environment. Wargames do have limitations. Because there is no actual fighting or movement of real forces, wargames cannot capture many of the human elements of real combat or the unexpected second and third order effects of war. Wargames do not provide the level of detail required to evaluate or test new systems and cannot provide detailed analysis of alternatives.

Specifically, the Schriever Wargame was a seminar-style event with role-playing teams that focused on operational-to-strategic level Space problems. The wargame was a capstone event preceded by a series of lead-in planning and discussion events, and followed by postgame analysis. It was primarily human driven, but used models, simulations, and analytical tools to assist in the development of outcomes.

Schriever Wargames Background

For the past 10 years, the United States Air Force Space Command (AFSPC) has hosted the Schriever Wargame (SW), focused on the employment of space and cyber in a future conflict. Over the decade, the game has become more sophisticated, involving partners of the United States, e.g., Australia, Canada, and the United Kingdom. Expansion of participation to more nations through NATO was a logical next step to better appreciate the potential, and address the issues, of broader international operations in space.

Meanwhile, NATO’s operations, particularly in Afghanistan (ISAF) and Libya (OUP), have resulted in a growing number of space-related lessons identified and learned. Some of the key issues include how NATO could organize better in support of the Joint Force Commander, and the need for a strategic plan for space operations. At the request of General Mattis during his tenure as Supreme Allied Commander Transformation (SACT), the Joint Air Power Competence Center (JAPCC) developed and released a comprehensive space assessment for NATO in November 2009.\textsuperscript{16} That report, along with continuing lessons learned from NATO-led operations, stimulated discussion within the NATO International Staff and the NATO Air Defence Committee (ADC) about NATO’s approach to Space. In late 2010, Allied Command Transformation, working with the Chairman of the ADC, the U.S. Executive Agent for Space, and the USAF met to discuss how best to include NATO nations in the Schriever Wargame. In the summer of 2011, the host of the Schriever Wargame and Commander of U.S. Air Force Space, General Shelton, formally invited NATO’s Air Component Commander, General Welch, to participate in the Schriever Wargame and in so doing internationalised the Wargame. General Welch followed with a letter to SACT, General Abrial, who presented the invitation in September 2011 to the

\textsuperscript{16} JAPCC “NATO Space Operations Assessment”, Revised January 2009.
Chairman of the Military Committee and the Military Representatives. Attendance by Subject Matter Experts (SMEs) was agreed, resulting in an invitation to the 28 nations of the Alliance plus Australia to participate in SW12I.

**Participation**

SW12I was conducted from 20-26 April 2012 at Nellis AFB, NV, and included participants from ten nations to include Australia, Canada, Denmark, France, Germany, Italy, the Netherlands, Turkey, the United Kingdom, and the United States. Also represented were several NATO organizations such as the International Staff (IS), the International Military Staff (IMS), Allied Command Operations (ACO), Allied Command Transformation (ACT), Joint Force Commander Brunssum (JFC-B), and JAPCC. Other players from the United States included USSTRATCOM, USSOCOM, Department of Defense, Department of State, NASA, FAA, Joint Staff, and the Military Services. Commercial Space Industry was represented by both North American and European organizations.

**Overview**

SW12I emulated a notional NATO operation with reliance on space-based capabilities provided by member nations. The game was conducted at the operational level with notional headquarters guidance that provided sufficient latitude for game play. The addition of NATO nations added to the complexity of the games and allowed the exploration of space issues and the opportunity to work as part of a larger combined force.

**Objectives and Potential Outcomes**

**Objectives**

1. Explore how to optimize space efforts from participating allies and Australia in support of a notional NATO expeditionary operation.
2. Identify ways to increase the resilience of space capabilities in a contested environment through expanded international and private-sector cooperation and coordination.
3. Determine operational challenges associated with defence of space capabilities employed in support of the operation.
4. Examine the operational integration of Cyber into defence of the Space domain.
5. Expand understanding of the operational benefits of broader international participation in combined space operations.
NATO Potential Outcomes. Prior to the start of the wargame, ACT identified potential outcomes that might be achieved from the wargame. Many of these outcomes were identified during the conduct of the wargame and discussed by the players. These outcomes work to address the larger discussion about NATO’s role in Space.

1. Short Term (1 year)
   a. Enhanced space awareness and expertise in NATO.
   b. Increased national demand for the development of space expertise for NATO operations.
   c. Expanded scope of current NATO space training courses.
   d. Cooperation between Allies providing space capabilities or services to NATO.
   e. Coordination between the NATO entities involved in space-related matters based on clearly demarcated responsibilities.
   f. Identification of NATO’s current and future requirements and shortfalls.
   g. Identification of vulnerabilities to space capabilities supporting NATO operations.
   h. Development of risk management options.
   i. Education and training on alternative processes and procedures for operations in a degraded space environment.
   j. Improved understanding of space-related legal issues impacting NATO activities.

2. Long Term (3 years)
   a. Develop a concept for shared space situational awareness.
   b. Develop mechanisms to coordinate the application of national and privates assets in response to emerging needs.
   c. Develop deterrent methods for the preservation of access to Space to all member nations.
   d. Increase the number of space experts in NATO Command Structure organizations and Headquarters.
   e. Develop concepts and operational plans that establish alternatives when there is an interruption of space services.
   f. A comprehensive space policy based on a thorough understanding of NATO’s needs for access to Space, the consequences of the denial of that access, the capabilities of its members, and a realistic picture of the future space environment.
**Game Design and Execution**

SW12I was not designed as a traditional RED versus BLUE wargame. A single BLUE Team (friendly forces) and one neutral team (Industry) dealt with an unfolding scenario in which opposing forces were included in the adjudicated results of each move. RED (Opposing Forces), which represented a combination of pirates, terrorists, and translucent 3rd parties was played as part of the scenario rather than as a dynamic and autonomous cell within the wargame. BLUE was comprised of six cells: SHAPE, USSTRATCOM, USEUCOM, USSOCOM, NATO Joint Forces Command, and Interagency. Within BLUE, each participating nation provided a national cell to manage their space capabilities. Also, one neutral cell (Industry) represented the commercial sector.

![Diagram of Control and Blue Team vs Red Team](image)

*Figure 2. Broad game construct – the dynamics of BLUE versus RED*

Within Control there were three distinct groups. First, a group of senior mentors represented the senior decision-making processes within nations and NATO. They coordinated their guidance and direction by meeting routinely with the NATO cell played by Senior Representatives from the IS, IMS and ACT. They also ensured the wargame progressed in a logical manner that met the stated objectives and provided challenging problems for the players to address. Second, the Adjudication Team assessed inputs (presented as Move briefs by the different cells) against RED actions, adjusted the scenario accordingly, and briefed the results each morning. Finally, the Assessments Team collected insights, highlights, and recommendations to develop the SW12I Report as well as individual national and organizational reports.
Control provided an initial briefing on the operational situation for the first move. BLUE cells then used the strategic guidance set forth in the Initiating Instruction, operational plans, the Order of Battle (OOB), the scenario and background information to base their initial and subsequent Moves. At the end of the day, each cell submitted and briefed their consolidated Move to Adjudication. Each Move was adjudicated and provided the context for subsequent decisions and Move development by each cell.

Within the broad construct of the game, cells were encouraged to liaise and share information since all cells were co-located. Additional break-out rooms were available for off-line discussions of difficult issues.
**Scenario**

The scenario detailed a crisis in the Horn of Africa region in 2023. NATO, under a United Nations Security Council Resolution (UNSCR), provided military forces to ensure the safe passage of vessels transiting the area and to provide security for humanitarian relief efforts in the region. In addition, NATO forces conducted security and counter-piracy operations throughout the region. Key points of the scenario included:

- Al Shabaab, which began as an Al Qaeda affiliate, became the principal terrorist threat in the Horn of Africa region and were coordinating attacks on merchant shipping with pirates;
- Al Shabaab acquired a degree of space and counter-space capabilities through black market and 3rd party nations;
- Drought and famine in the region drove the need for a multinational relief effort;
- The North Atlantic Council (NAC) generated strategic guidance in the form of an Initiating Instruction in support of the UNSCR; and
- Various NATO nations and Australia deployed forces to the region to support the humanitarian aid (HA) efforts and to ensure Freedom of Navigation (FON).

Greater details regarding the scenario can be found in Annex A.
Summary of Game Events

Game Day 1 (10 August 2023):
1. As forces flowed into the Horn of Africa, an Egyptian satellite and a Brazilian satellite collided. The collision created a debris cloud in the LEO orbit.
2. As an unrelated event, a nation not supportive of the series of UNSCR resolutions continued satellite launch preparation on its rocket but did not fuel it.
3. Commercial imagery providers reported a surge in imagery requests for the regions, including requests from known front companies for al Shabaab.
4. NATO forces in the region experienced sporadic GPS and communications jamming.
5. A German satellite ground station at Usingen experienced a power outage and failure of its back-up power.
6. Task Group Four stopped a pirate attack and tracked pirates back to a port at Kismaayo, Somalia.

Game Day 2 (11-14 August 2023):
1. Communication and GPS jamming increased throughout the region but had minimal effect as forces executed mitigation measures.
2. The Iridium-2 satellite collided with debris from the earlier Egyptian-Brazilian collision.
3. Ground stations in France, Germany, and Italy are attacked via cyber and sabotage.
4. Al Shabaab operatives launched two Club-K missiles at Djibouti. The first missile missed and landed in the water. The second missile was intercepted by a Patriot missile battery.

Game Day 3 (15-20 August 2023):
1. To close capability gaps, Italy and the Netherlands launched microsatellites in support of the operation.
2. The Space Data Association\(^{17}\) (SDA) reported a suspected cyber-attack on their Space Situational Awareness (SSA) capabilities.
3. A Dutch satellite in GEO experiences problems when manoeuvring operations go astray.
4. Nations in conjunction with NATO coordinated cyber defences.
5. The JFC launched an assault against the pirates and Al Shabaab in Kismaayo resulting in the death or capture of 32 pirates.
6. Al Shabaab and pirates conducted a coordinated attack on the JFC headquarters in Djibouti resulting in the destruction of critical communications ground stations and fibre optic cables.

Game Day 4 (21-26 August 2023):
1. The JFC with coordination between SHAPE and the nations, replaced capabilities lost during the Djibouti attack.

\(^{17}\) http://www.Space-data.org/sda/
2. NEMOS, an Italian microsatellite, experienced communications problems. These problems directly affected the operation of other microsatellites supporting the operation.

3. French and United States Special Forces responded to distress calls by multinational relief effort workers. Darkness and the fog of war, compounded by communication and GPS jamming, resulted in a fratricide incident with Kenyan forces.

4. The non-supportive nation satellite launch failed five minutes into launch. The rocket impacted a remote area of Australia and with no loss of life or property.

Wrap Up (27-31 August 2023):

1. Computer Network Exploitation (CNE) combined with law enforcement efforts in various nations shut down al Shabaab funding and cyber support.

2. Passive measures by BLUE forces negated most of the impact of the GPS and communications jamming.

3. Active measures by BLUE forces began to eliminate the sources of GPS and communications jamming.

4. Al Shabaab goes into hiding in an attempt to preserve remaining infrastructure, property, people, money, and resources.

The game move briefs and morning adjudication briefs can be found in Annex A.
Insights and Take-Aways

SW12I was played within an environment that NATO forces might well operate in the future with a particular focus on people, processes, and decision-making in combined operations. The area of operations, essentially a Small Joint Operation (SJO), consisted of the combined Land, Maritime, Air, Space and Cyber domains with significant attention and priority paid to Space and Cyber. The biggest challenge for participating NATO nations and Australia was how to conduct combined space operations, taking into account Alliance and national constraints, and their planning and decision-making processes, especially when those efforts required close coordination with civilian agencies and industry representatives.

The wargame highlighted the need for structured and routine information sharing between a variety of actors in a dynamic space and cyber environment. In the context of SW12I, doing so required a process that national authorities could use to provide timely information to the operational commander in a NATO construct, since all space assets remained under national command and control. The wargame also showed that nations must evaluate how they share space and cyber information with organizations such as the Space Data Agency (SDA) and the European Space Agency. In conjunction, NATO needs to consider how it will develop doctrine that will guide collaboration and coordination with across NATO space to include commercial vendors and its partners in industry in support of operations.

The central question of the wargame therefore was, and remains, how best to support a combined military force operating in a congested and complex environment where key and essential capabilities are enabled by effective and resilient operations in space and cyber? Is a dedicated, supranational entity required to bring the main military and civilian actors together in order to ensure effective information sharing or is it sufficient to opt for a distributed organizational network of space expertise? Each of those organizational approaches would require cyber awareness and expertise as that domain is crucial for the operation of space-based assets and can be used by an adversary to disrupt or even destroy Space capabilities.

The wargame clearly showed that Allies must further explore how to conduct NATO operations in which assured access to Space is not guaranteed. This includes ensuring their space capabilities are sufficiently resilient and that they are adequately protected, which applies not only to the terrestrial and on orbit elements but also the communications links. For its part, SHAPE should explore the best construct for cooperation with nations to ensure it can provide the right level of support to the operational commander. This includes addressing the role of the Comprehensive Crisis Operations Management Centre (CCOMC), where the Space Coordination Authority (SCA) role should reside, and how the operational commander should request and coordinate space support.

In the following sections, this report will highlight the insights, problems, and key take-aways learned during the game.
Vulnerabilities to Space Capabilities Supporting NATO Operations

End-to-end space system security is necessary for all aspects of the space system from the ground sites, personnel, data, and networks to the satellites themselves. In the game, Al Shabaab tried to deny access to space systems, and as a result hinder NATO’s operation in the area. This resulted in a two pronged approach of harassing BLUE forces in the region while using interruptions of space support located outside the Joint Operating Area (JOA) as a way of upsetting NATO operations. To accomplish this goal, Al Shabaab conducted a variety of operations that included:

- Targeted a French ground station by physically poisoning the personnel and thus hampering the organization’s ability to process satellite data and information;
- Sabotaged power to German and Italian ground stations through coordinated cyber-attacks and the use of a fuel contaminate;
- Conducted SCADA cyber-attacks against French, German, Italian, and Turkish ground stations;
- Two pronged cyber-attack to first deny access to the SDA database and then corrupt the data and send erroneous collision warning messages to SDA clients;
- Hack into and take control of the Telemetry, Tracking, and Control (TTC) of a debris-mitigation satellite;
- Used a sympathetic insider to corrupt the Commercial On-Orbit Satellite Servicing Solutions (COSSS) ground site;
- Attempted to optimize chaos caused by debris-producing collisions and the Coronal Mass Ejection (CME);
- Used for-hire hackers to provide continuous distractions through intermittent outages/unreliability of systems;
- Localized communications and GPS jamming by pirates, militias, and locals; and
- Conducted physical attacks on in-theatre ground stations and fibre optic cables.

Due to the widespread, complex architecture of non-military space support, not all attack vectors were covered with respects to critical infrastructure protection. The combination of direct and asymmetric attacks forced the players to develop plans for both national and in-theatre security. Through coordination and information sharing, BLUE countered these threats using a combination of national law enforcement and cyber defence organizations; but, at times that conduction was chaotic and time late. Furthermore, the resiliency of the space systems was improved by providing space protection across the spectrum of networks, nodes, data links, ground-based infrastructure, manpower, and on-orbit assets.

**Key Take-Away:** “Space Systems” includes not merely the satellites in Space, but the networks, nodes, data links, ground-based infrastructure, and the unique expertise of space-related personnel. Space protection and security encompass all these elements.

**Key Take-Away:** Where space systems are concerned, a small joint operation (SJO) that is regionally focused can, with the right tactical event, have a global impact.
Optimizing Space Efforts: Challenges to NATO’s Organizational Structure

The biggest challenge for participating NATO nations and Australia was how to conduct combined space operations, taking into account Alliance and national constraints, as well as their planning and decision-making processes, combined with those of civilian agencies and industry representatives. The wargame highlighted the need for structured and routine information sharing between a variety of actors in a dynamic space and cyber environment. In the context of SW12I, doing so required a process that national authorities could use to provide timely information to the operational commander in a NATO construct. Since all space assets remained under national command and control, a requirement existed for coordination and cooperation, not the traditional command and control arrangements.

During the wargame per the draft AJP 3.3 (B), the Space Coordinating Authority (SCA) was tasked to the JFC and executed through the notional Space Coordination Working Group (SCWG). Two additional notional space coordination bodies included the Space Awareness Cell (SAC) and the Daily Assets Reconnaissance Board (DARB).

For wargame purposes, a special construct within the SHAPE CCOMC, the SAC, was developed to receive and assess Space situational awareness, enabling the JFC to gain and maintain Space Freedom of Action. Space Situational Awareness is defined as “the requisite current and predictive knowledge of space events, threats, activities, conditions, and space systems status, capabilities, constraints and employment to enable commanders, decision makers, planners and operators to gain and maintain freedom of action in Space through the spectrum of conflict.” It also provided coordination between the JFC and the nations in case the JFC required additional space services beyond those allocated to the operation. It was proposed that the SAC would obtain strategic SSA directly from the national Space Operations Centres.

**Figure 5. Proposed C2 structure for Combine Space Operations.**

**SAC**

For wargame purposes, a special construct within the SHAPE CCOMC, the SAC, was developed to receive and assess Space situational awareness, enabling the JFC to gain and maintain Space Freedom of Action. Space Situational Awareness is defined as “the requisite current and predictive knowledge of space events, threats, activities, conditions, and space systems status, capabilities, constraints and employment to enable commanders, decision makers, planners and operators to gain and maintain freedom of action in Space through the spectrum of conflict.” It also provided coordination between the JFC and the nations in case the JFC required additional space services beyond those allocated to the operation. It was proposed that the SAC would obtain strategic SSA directly from the national Space Operations Centres.
**DARB**

A Daily Asset Reconnaissance Board (DARB) within the JFC (led by J2) was used to coordinate request for space assets/services to mitigate ISR operational impacts. The DARB assessed what allocated space capabilities were available from national spaces assets, matched the capability against with the demand and identified the delta between the two (capability requirements gaps).

**SCWG**

As proposed in the current draft version AJP 3.3(B), within a regional operation, the JFC can designate or retain Space Coordinating Authority (SCA) to facilitate unity of effort with member-nation space operations and military component space capabilities. Based on the complexity and scope of the operation, the JFC can either retain authority or designate a Component Commander (CC) to coordinate and integrate space operations. The SCA is the single authority within a joint force to coordinate joint space operations and integrate space capabilities. SCA is an authority, not a person. As such, the commander with SCA serves as the focal point for gathering Space requirements from the JFC’s staff and each CC. This provides unity of effort for space operations in support of the JFC’s campaign. These requirements include requests for space forces, e.g., deployed space forces, requests for space capabilities and requests for implementation of specific command relationships. The commander with SCA must develop a prioritized list of space requirements for the joint force based on JFC objectives.

During the wargame, the JFC Commander chose to retain the SCA and executed the authority by developing a Space Coordination Working Group, comprised of representatives from ACC, MCC, LCC, SOCC, J5, J3, J2, J6, liaisons from SHAPE SAC, space capability providing nations, and industry. Chaired by a 2-star (J3), the SCWG would convene every 6 days (compressed under game play to once a day) to address larger planning issues that could not be met on a day to day basis. The intent of the SCWG was to identify challenges and opportunities for space support to the operation and enable the JFC Commander to determine, de-conflict and prioritize space requirements.

The output of the SCWG was a Joint Prioritized Space Effects List (JPSEL) which provided an order of priorities to member nations with information on requirements and priorities in terms of space assets/products, e.g., imagery, bandwidth, etcetera. The draft JPSEL would then be sent to the Joint Coordination Board (headed by COM JFC) for decision, guidance, and approval. The final JPSEL was passed to the national SpOC’s to provide space effects to the operation. If additional national space effects were included in the JPSEL but were not allocated to the operation, the SHAPE SAC would request the additional capabilities from the nations.
<table>
<thead>
<tr>
<th>Prioritized Space Requirements</th>
<th>LOO</th>
<th>Desired Effect</th>
<th>Additional Non-Allocated JFC Desired Effects</th>
<th>JPSEL Ranking (High/Med/Low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friendly Force Tracker for AU</td>
<td>HA</td>
<td>Fratricide mitigation</td>
<td>US approval to allow AU access</td>
<td>High</td>
</tr>
<tr>
<td>Protected Comm &amp; KU Comm</td>
<td>S&amp;C, BPC, FON, HA</td>
<td>Operate through jamming environment Find, Fix, ID, Track and Target Capability</td>
<td>Additional Protected Comm? More commercial protected bandwidth Canada</td>
<td>High</td>
</tr>
<tr>
<td>GPS Jammer Geolocation</td>
<td>HA</td>
<td>Overhead collect during Air ops intended to spur GPS Jammer activation</td>
<td>Additional capability? UK SIGINT</td>
<td>High</td>
</tr>
<tr>
<td>Remote detonation interdiction</td>
<td>FON</td>
<td>No boats blow-up</td>
<td>Additional Capability to ID &amp; locate comm source of detonator (C-IED)</td>
<td>High</td>
</tr>
<tr>
<td>Comm link monitoring</td>
<td>FON S&amp;C HA</td>
<td>SA on the EM threat environment and jammer location for possible targeting</td>
<td>- other EM Monitoring Capability besides RAIDRS - Sea-based RAIDRS for maritime?</td>
<td>High</td>
</tr>
</tbody>
</table>

*Figure 6. Example of the JPSEL.*
Key Take-Away: The wargame showed that NATO should develop appropriate doctrine to set requirements for coordination and cooperation mechanisms that set standards and guidelines for the conduct of Space Situational Awareness. Included in this guidance, NATO should ensure it has appropriate concepts, organizational structure and mechanisms in place for enhanced coordination. The challenge of developing the right channels of cooperation during an on-going operation is time sensitive and risky. At a minimum, NATO needs to elaborate how Commanders request the enabling assets and information derived from Space to support the warfighter.

Key Take-Away: Coordination and information exchange is essential. NATO should continue to explore the different organizational models developed in the context of the Schriever Wargame. Doing so will require an investment in time and effort to identify measures that can be used to overcome obstacles to dialogue, cooperation and information exchange.
Operational Challenges and Support for the Warfighter

Today’s military forces have an increasing dependence on the integration of space systems for coalition and expeditionary operations. SW12I was played at the operational level, but it left no doubt that NATO operations are dependent on space assets at every level of operations, from strategic to tactical. Space capabilities and effects are critical contributors to the operational success of an expeditionary, network-enabled Joint force.

The operational challenges to the warfighter as the decision maker (strategic/operational) derive from an ever-increasing reliance on communications and intelligence. To the warfighter at the tactical level, be it a ship conducting maritime interdiction, an armoured column or an individual soldier on a foot patrol, the modern theatre is non-functional without space delivered effects from assets such as, but not limited to, GPS, satellite communications, precision weapons and ISR. Forces must take advantage of available space capabilities to operate effectively, often without even realizing what or how these capabilities are being provided. The advantage that the modern warfighter has over adversaries exists in the technical realm; an adversary knows this and will work to deny, deter and exploit.

As NATO is unlikely to acquire space assets in the foreseeable future, any operation will be dependent upon what the nations of the Alliance allocate to the Joint Force Commander. If an asset is not government owned/operated, assets will require private sector allocation and coordination. In particular, communication and information systems must have common standards and be interoperable. This requires planning, coordination, and integration. In order to be effective, data and information derived from space systems must be managed, shared and exploited in order to support the warfighter and critical decision makers. Furthermore, member nations are developing organic space capabilities for national defence and security with little input on military space requirements from NATO. If NATO does not determine what its requirements for Space are, then nations will continue to duplicate efforts, field systems that are not interoperable, and retain stove-piped intelligence networks. With cooperation, coordination, and better planning, NATO can generate greater capability in essence by calling for “smart space systems.”

From the beginning of Move 1 and throughout the game, the biggest challenge for NATO and those nations participating was how to best support the operational commander. As discussed in the previous section, the big question was how to work best with its nations and partners. In addition to developing a structure for cooperation, information sharing becomes an issue. Within NATO there is a clear structure for how nations interact with the NATO command structure. For most issues, information flows from the nations to NATO HQ to SHAPE to the JFC. In a dynamic space and cyber environment, there may be a need to establish information sharing agreements so national organizations can provide timely information direct to the operational commander – this is especially critical in the case of missile defence. NATO must look at how it shares space and cyber information with other organizations such as SDA, the European Union (EU), and non-NATO nations. In conjunction, NATO needs to evaluate how to integrate commercial capabilities and commercial partners into the solution in an integrated manner. Clearly nations are both the primary integrators of
commercial space; but, is there also a plan for NATO as an organization to set guidelines for such an enterprise when used in support of combat operations?

Move Three highlighted the need for a Combined Space Operations effort to exchange data and information to increase situational awareness in Space and help detect and evaluate EMI. This effort involved data sharing between national, international, and industry space operations centres through various agreements and contractual relationships. The refined SSA picture that resulted from this coordination helped SHAPE SAC and the JFC to assess better the operational impacts for the warfighter. The discussion of this combined space operations construct continued into a series of constructive meetings. While this issue was not resolved in the wargame, the thinking process it engendered was constructive and useful.

Space Power is as vital to operations as Land, Maritime and Air Power. In fact, space capabilities are a key enabler to all operations in every domain: from a small ground operation, a naval engagement on the open ocean or a single aircraft flying a resupply mission. Space capabilities are used in all operations; big or small, near or far.

It is clear from the wargame that there is experience and expertise “hidden” in nations that goes untapped. Warfighters need capabilities provided by capabilities in Space. Many examples have already been listed from past operations to reflect this need. The important point is that space assets and space delivered effects were not contested in these operations. That will not be the case in real life. Without policy and a game plan, NATO will struggle to coordinate its response efforts to respond to adversarial actions that threaten operations in Space. Connecting the dots between national capabilities and NATO HQ, as well as military and political authorities, is a challenge all nations share. Participants repeatedly stressed the importance of building space-related education and knowledge, especially at the senior military and political levels. Doing so would help ensure that military and political leaders share a common understanding of the importance of Space as an enabler of NATO operations. In terms of NATO’s approach to Space, increasing space awareness of senior leaders in the Alliance is likely to advance the concept of combined space operations in support of NATO’s missions and operations.

**Key Take-Away:** NATO should continue to explore the different organizational models developed in the context of the Schriever Wargame. Doing so will require an investment in time and effort to identify measures that can be used to overcome obstacles to dialogue, cooperation and information exchange.
**International and Private Sector Cooperation: Sharing SSA**

Space Situational Awareness (SSA) is a subset of the larger issue of information and data sharing. Within the wargame, information and data sharing was conducted by cells talking to each other on the game floor. The sharing of information was artificial and did not represent the difficulty organizations and nations are faced with of providing coordinated data and information under the stress of incomplete, time-late requests and other higher priority requirements.

For SSA specifically, it is currently difficult to share information for three reasons:

1. Timeliness of operational SSA data requires before-the-fact negotiating of accesses, coordination, collaboration, and establishment of TTPs and systems, and pre-determined sharing of specific data sets associated with SSA.
2. Owners of data are widely distributed across the military, commercial/industry, civil, international, and academia sectors of the space enterprise, most often with a varying agenda.
3. A large portion of space-system-peculiar data is either highly proprietary or highly classified.

Several events in the game demonstrated the need to share accurate and timely SSA. The game began with a collision between two low earth orbit (LEO) satellites which caused a debris cloud comprised of more than 1500 pieces. The concern for the safety of satellite operating in LEO led to an increased demand from national SSA organizations to provide SSA data relative to the debris field. Consequently, when another satellite operating in the same orbit ceased operating, industry called for improved debris information collection capability.

Uncertainty and lack of confidence in the commercially available SSA information regarding the severity of the debris field prompted secondary effects such as the announcement by a leading insurance company that it would no longer insure satellites launched in that orbital regime. A tertiary effect was falling stock prices for companies who supported systems in that orbital regime.

As the only SSA organization in the wargame, USSTRATCOM focused on global space coordination issues, specifically the growing 700-800km issue of orbit debris. In a supporting role, USSTRATCOM established and coordinated an ad-hoc meeting of nations, industry and interagency organizations with SSA capabilities. The foundation of this group was based on an agreement that while the debris issue was not of operational importance to SHAPE or the JFC, it was of strategic concern for all space-faring nations.

The first meeting of this group included AUS, CAN, FRA, GBR, and USA organizations such as USSTRATCOM, DOS, and NASA. Agreement was quickly reached that the critical issue was how to prevent future collisions in the orbital region between 700 and 800km and thereby prevent a situation of cascading collisions, known as the Kessler Effect. Initially, a proposal of open sharing of all the various space catalogues was presented to prevent further collisions.

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18 Donald Kessler is an astrophysicist at the NASA’s Environmental Effects Office. “The term “Kessler Syndrome” is an orbital...
An agreement was reached that identified the requirements (virtual and physical) for debris cloud data sharing. Each nation would share whatever fidelity information it felt comfortable with as quickly as possible after the initial collision. After the initial collision, predictive models that established the debris cloud were pushed for public consumption. Requests for more information was answered as higher fidelity information become available, being disseminated according to a particular nation’s/organization’s policy.

As the information on the characterization of the debris was released the larger issue of uncertainty concerning vulnerability and satellite efficiency in such an environment:

1. Can nations require licensed satellites to manoeuvre out of the debris orbit path?
2. What is the ability of each nation to dictate satellite movement?
3. Would clearing of the orbital belt cause more problems by creating an ever increasing non-coordinated dynamic environment? and
4. Is it necessary to move satellites obviously not at risk?

Eventually the group decided that the best way to answer these questions was to have individual owner/operators do so. This information would then be incorporated into the next Move, providing debris information to the highest fidelity (within individual country/industry constraints). The owner/operators would then determine which manoeuvres were required.

These discussions highlighted the need for a coalition/combined face to space operations. Such a combined space operations working body was necessary to resolve (global) space issues outside the scope of short-term manoeuvres that only effected operations within the AOR. Additionally, SHAPE asked this body to provide a focal point for resolution of strategic/operational/tactical space issues considered as under the auspices of an inclusive body. This body included national, industry, and interagency representatives with capability AND/OR interest in helping to resolve the particular problems at hand. The major issue for such a body was determining the single POC/interface within such a diverse group.

By the end of the game, the need was addressed by the Global Space Operations Council (GSpOC); created as an ad hoc committee to explore how various global organizations could share information for the safety of space operations, much as is done for Air and Maritime. The GSpOC construct would serve as an alternative solution for an area where nations could maintain awareness and

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debris term that has become popular outside the professional orbital debris community without ever having a strict definition. The intended definition grew out of a 1978 Journal of Geophysical Research paper predicting that fragments from random collisions between catalogued objects in low Earth orbit would become an important source of small debris beginning in about the year 2000, and that afterwards, “...the debris flux will increase exponentially with time, even though a zero net input may be maintained.” [...] The result of all research to date confirms that we are now entering a time when the orbital debris environment will increasingly be controlled by random collisions. Without adequate collision avoidance capabilities, control of the future environment requires that we fully implement current mitigation guidelines by not leaving future payloads and rocket bodies in orbit after their useful life.” In: NASA Orbital Debris Quarterly News. Volume 14, Issue 12. April 2010. URL: http://orbitaldebris.jsc.nasa.gov/newsletter/pdfs/ODQNv14i12.pdf
understanding of the current issues and advances in space operations. If such a mechanism were established, it could be an additional mechanism to increase NATO’s awareness and understanding of issues related to space operations. As conceived, the GSpOC would not be acceptable as a solution during NATO operations; however, the council could serve as a peacetime forum for NATO to work with various global partners on space issues. This is a complex and important problem requiring structural change in NATO. Accomplishing these tasks will require urgency and will to develop, coordinate, and set requirements within a combined operation.

**Key Take-Away:** The issue of information sharing, especially timely and accurate SSA was highlighted as critical to effective Space-related combined operations. As the number and variety of international players (to include commercial) grows, the importance of such capabilities to successful combined operations in Space became more critical. High among the essential elements of effective Space operations are mechanisms, agreements, and interoperable systems that provide data and information.

**Key Take-Away:** Due to the fast pace of the game, SHAPE SAC requested that nations provide updates on status of collision avoidance, status of capabilities, loss of capabilities to support operations, and provide additional space assets as requested by the JFC. This suggests that SHAPE should have the capability to maintain some form of SSA for support to operations. The nature and extent of this awareness will need to be defined.
**Education and Training of Space SMEs and Research on Space**

SW12I showed that general knowledge and understanding of how to operate in the space environment is deficient across NATO. While small pockets of Space SME’s exist at various levels in the NATO Command Structure, more awareness, in depth training and education are required. Players noted that within NATO there is “coincidental space knowledge” as opposed to a deliberate plan to fill staffs with trained and educated personnel.

Several takeaways from SW12 concerning future steps to more space awareness in NATO:

1. Improve education and training of both military and political leadership by a two pronged process:
   a. Nations, having individuals trained in space operations need to ensure they are available in sufficient quantity to support space operations and conduct training in a NATO environment; and
   b. NATO should explore ways to educate its political and military leadership at the Alliance level (top down) and train NATO Space SMEs in collaboration with nations (bottom up).
2. Define NATO key concepts and communicate them in a simple yet compelling manner. Without an agreed terminology it will be difficult to engage senior leaders successfully.
3. Find ways to educate NATO Space SMEs in collaboration with the nations and train national experts on space operations specifics important to NATO. Doing so will ensure NATO has space personnel who are certified to fill billets within the NATO Command Structure. Develop a tracking system to maintain awareness of nation’s space personnel, required for effective integration of space support to NATO.
4. Incorporate space events into NATO exercises at all levels, e.g., NATO Response Force Certification exercise. Adopt war gaming as a no-risk opportunity to raise awareness and conceptual thought further on space support to NATO operations, e.g., Allied Reach. Raise broad awareness by incorporating academics normally specific to Space into existing courseware at the NATO School in Oberammergau and at the NATO Defense College.

**Key Take-Away:** In the NATO context, education and training of both the military and political leadership, as well as Space SMEs, is fragmented and must be improved. This may be achieved best by a two-pronged process. First, nations who have individuals trained in Space operations need to ensure they are available in sufficient quantity to support Space operations and the conduct of appropriate training. At the same time, NATO should explore ways to educate political and military leadership at the Alliance level (top down) and train NATO Space SMEs in collaboration with the nations (bottom up). These NATO Space SMEs should be capable of integrating available space and cyber capabilities and requirements into NATO’s operational plans and be capable of working seamlessly with national SMEs.
**Space Engagement and Partnerships**

During SW12I it was revealed that front companies for al Shabaab had requested imagery of the military build-up in Djibouti, Eritrea, and Kenya. Prior to the operations, commercial imagery providers readily sold ISR products of the Horn of Africa to all customers. In response, the NATO coalition incentivized commercial providers to restrict al Shabaab access to Commercial SAT products. In response, SACEUR asked for a Denied Parties Lists (DPL) which was used by nations and NATO at various times to impose “shutter control” on commercial users to deny products to its adversaries.

Participating nations (non-US) had a more integrated relationship between government and commercial space than is typical in the US. Normally, commercial providers deliver services, not space capabilities, to the JFC in a distributed and owner-controlled command and control construct. Each of the individual nations paid for COMSAT bandwidth and brought it to NATO as part of its apportionment of forces. While there was a NATO SATCOM Cell, it was only responsible for apportioning bandwidth after it is brought forward by the countries. At no point did any nation or commercial entity give the JFC or SHAPE command and control authority over its Space assets.

The Industry Team was concerned about the lack of coordination as to Space Situation Awareness across the board. Also, the Industry Team was uncertain about the degree to which, or how, it should disclose cyber-attacks and if so to whom.

Interesting was the Adjudication Team’s final presentation (“The 5 Minute War”) which concluded that the game was all about “links, nodes, infrastructure, and users.”

**Key Take-Away:** The scope of any combined Space operation that NATO forces engage in will be driven by civil, military, and commercial players working together to protect the Space commons for peaceful use.

**Key Take-Away:** The United States relies on multiple partnerships, specifically in terms of Space resilience. The same is true for NATO. In a global environment, coordinated efforts across the Alliance, including partners, will be required if NATO is to identify hostile forces, attribute action and respond rapidly to threats.
Legal Aspects: International Law and Norms

Although Space law is a relatively “young” subject in international law, and customary practice especially in the conduct of operations has yet to emerge fully, legal constraints exist, mostly treaty-based, resulting from or applying to military uses of Space. Since the beginning space activities were rooted in nation’s activities, with an increasing commercial and civil use of Space during the last few decades. The over-arching treaty on space activities is the Outer Space Treaty of 1967, extended through several conventions since that time. It applies to both military and civilian activities in Space. With almost a hundred nations, almost all space-faring nations, being signatories to this treaty in 2008, the treaty deals with key topics such as Weapons of Mass Destruction, testing of weapons, sovereignty and the peaceful use of Space for the benefit of all mankind. While neither the Treaty nor International Law specify the boundaries that differentiate space from the upper reaches of national airspace, a norm has developed that defines Space as the point above the Earth at which satellites stay in orbit.

In NATO operations, air and space operations are guided by Rules of Engagement (ROE) agreed by nations. Legal advice, through analysis of the circumstances, available options and timely advice, ensures that operations are conducted in the appropriate manner. Legal issues played an important role during SW12I. Significant legal work on framework ROE was established prior to the game.

Prior to SW12I, team of Legal Advisors from different NATO and US commands drafted the Rules of Engagement that would be utilized during the game. They used the Initiating Instruction, which simulated a North Atlantic Council (NAC) Initiating Directive, and a constructive United Nations Security Council Resolution, as described in the next subchapter. The following paragraphs introduce some of the essential questions raised during the conduct of the war game. They will be concluded by the composition of several key take-aways of special importance to the Alliance.

Legal framework for Schriever: NATO Rules of Engagement and Initiating Instruction

In any NATO-led operation, the operational commander needs to be aware of the political and legal constraints that govern NATO action in the Joint Area of Operations. Military actions are controlled by Rules of Engagement (ROE), which are authorized by the NAC for NATO/NATO-led operations on approval of the Operation Plan (OPLAN). ROE define the degree and manner in which force may be

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20 Four major provisions are included in the OST: Space will be used for peaceful purposes; no Weapons of Mass Destruction (WMD) will be placed in orbit around the Earth or on the Moon; all Space objects will be registered with the UN; all nations have free access to Space with liability for any damage caused.

21 The Fédération Aéronautique Internationale has proposed an altitude of 100 km, called the Karman Line, as a working boundary. UK Military Space Primer, June 2010. Space Fundamentals, Paragraph 104 and 203. URL: [http://www.mod.uk/NR/rdonlyres/03C168E9-3EF0-4F77-B184-A57865D52D59/0/SpacePrimerFinalWebVersion.pdf](http://www.mod.uk/NR/rdonlyres/03C168E9-3EF0-4F77-B184-A57865D52D59/0/SpacePrimerFinalWebVersion.pdf)
applied and are designed to ensure that such application of force is carefully controlled.\textsuperscript{22} To provide SW12I with appropriate ROE, a small group of legal experts developed a draft NATO Rules of Engagement for space-related operations.\textsuperscript{23} The ROE suited the requirements to conduct counter-piracy and counter-terrorism operations by NATO-led forces in the Horn of Africa region, in accordance with the war game scenario on a counter-piracy mission off Somalia.

The Rules provided definitions of the different kinds of space assets, their effects, and possible situations of interference, and clarified the status of involved personnel, e.g., Persons with Designated Special Status (PDSS). Moreover, ROE defined the (offensive and defensive) use of force and any restrictions to operations, as well as the use of further space-related measures such as electronic counter measures (ECM). Space-faring nations participating in Schriever responded to these NATO Rules with national caveats that defined their national limits, for example, the Netherlands had special restrictions on the use of Riot Control Agents and Italy required the prerequisite of government authorization for participation in an attack on on-orbit space assets belonging to national states.\textsuperscript{24}

Further legal and military-strategic documents were prepared for the conduct of the war game. The NAC-approved Initiating Instruction on security/counter-piracy efforts in the Horn of Africa 2023\textsuperscript{25} provided guidance on the military options, political limitations and constraints, the desired end-state, military objectives, resources and legal aspects for the operation. One part of the mentioned legal aspects refers to a United Nations Security Council Resolution, UNSCR 3328,\textsuperscript{26} as all actions taken by the Alliance were required to comply with international law. These documents helped during the war game to clarify the legal status of certain threats such as acts of terrorism and piracy, also with regard to the question of traditional neutrality versus internationally supported and mandated actions against non-state actors and states supporting such activities.

**Legal aspects covered during Schriever**

**Art. 4 and 5 Washington Treaty**

Important to the game was the question of the applicability of Article 4 and especially Article 5 of the Washington Treaty to attacks on space assets of member nations or other space-related attacks. Similar to cyber-attacks, NATO member nations were hesitant to apply the option of collective defence on first strike attacks on space-assets of a member State. Further discussion beyond Schriever should be considered regarding the extent of the Washington Treaty to provide an adequate legal framework for new challenges to the collective defence system of the Alliance in the Cyber and Space domains. If Articles are amended, and/or re-interpreted, they will need to include earlier NAC decisions as

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\textsuperscript{22} See Joint Air & Space Operations Doctrine, AJP 3.3 (A) 206, Rules of Engagement (ROE).

\textsuperscript{23} Attached document of NATO ROEs on Space. Found in Annex A.

\textsuperscript{24} Matrix of national caveats. Found in Annex A.

\textsuperscript{25} Initiating Instruction. Found in Annex A.

\textsuperscript{26} UNSCR 3328 (2023). Found in Annex A.
precedents or examples, protocols, etc., sufficient to show such an attack was a threat to the security of that nation.

**Outer Space Treaty (OST)**

The Outer Space Treaty, as well as one of its further conventions, the Liability Convention of 1974, were constraining factors during the war game. In one of the Requests for Information a participant asked a question about the Outer Space Treaty and its possible legal ground for a state to claim free collision avoidance services, e.g. from the U.S., as part of SSA Sharing. It was clarified by one Legal Advisor that the rationale in reality is that providing this service of free collision avoidance, when a possible on-orbit conjunction is predicted, serves mostly space flight safety in general, in compliance with the spirit of the OST. However, Article 5 paragraph 3 of that treaty would not imply legal obligations to a nation such as the US to provide this service when claimed. A related question was raised if, after the collision of Egypt Sat-1 and Brazil SCD-2 causing an Iridium 2-18 collision, a claim for compensation by both Egypt and Brazil could be exercised for the loss of Iridium 2-18 under the Liability Convention. To date, no Liability Convention claims have been submitted for damages resulting from an on-orbit collision, so that the probability of success for a claim of this type is unknown. However, the Convention establishes a “fault based” standard for liability, meaning that a nation would be required to prove fault by the other party in order to recover damages.

**Shutter Control**

Shutter control was one of the major legal issues of the war game. Countries like Germany, France, Canada, Italy, the UK and the U.S. have domestic shutter control legislation, restricting, denying or otherwise limiting access to commercial space imagery of certain listed countries for anyone besides a group of authorized personnel (members of intelligence agencies, for example) in order to preserve national security. In SW12I, commercial remote sensing companies had received AOO imagery requests from a terrorist affiliated organization, and participants inquired if the state of registry for these commercial satellites would be liable (as of the Registration Convention of 1974, a provision extending the Outer Space Treaty), or if further legislation would restrict companies to provide imagery to potential adversaries.

**State and non-state actors (U.S. National Space Policy) and norms of behaviour**

Norms of behaviour in Space are developed by nations and aimed at nation-state behaviour. They can be understood as behaviours and activities which demonstrate the principles of freedom of access to Space for all and good stewardship of the space environment.

Since RED during the gameplay was a non-state actor, they frequently performed acts inconsistent with what responsible nations would consider acceptable norms of behaviour. RED injected a variety of malicious efforts, such as sabotage, including the use of biological agents and cyber network attacks. Members of the BLUE team found such conduct clearly outside accepted norms, however, it was found

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27 For the U.S., for example, the Department of Commerce is the lead agency for implementing shutter control under 15 U.S.C. Sec. 5622.
that norms of behaviour for Space were not applicable to a non-state actor, and as such they were limited in this ability to deter through threat of sanctions or force such an aggressor.

The presence of a pre-coordinated and socialized set of rules framed NATO’s response options relative to the space and cyber event in which BLUE wanted to dazzle one of RED’s imagery satellites. NATO decided not to retaliate in kind because it assessed that doing so would escalate the crisis. The fact that NATO decided not to retaliate does not obviate the fact that having a pre-coordinated and legally validated ROE helped frame the discussion and reduced the time required to make a decision on the issue.

**Space Code of Conduct**

For scenario purposes it was assumed by the game lead and the Legal Advisors that by 2023 the international community would have adopted an International Code of Conduct for Outer Space Activities. This voluntary code to enhance the security, safety and sustainability of all outer space activities would endorse best practices, contribute to transparency by confidence-building measures and be complementary to the existing regulating framework.

Currently, the U.S. is pursuing formal negotiations with the European Union and other space-faring nations to develop an International Code of Conduct on Outer Space Activities to help maintain the long-term security of Space by establishing guidelines for a responsible use of Space. This Code could encourage responsible space behaviour, while reducing the risk of misunderstanding and misconduct.

**SSA Information Sharing**

Further questions of the participants were raised on the constraints of SSA Information Sharing, one of the main issues during the war game. They were answered by the Legal Advisors, for example, that SSA Information shared pursuant to combined military operations is not constrained by 10 U.S.C. Sec. 2274, i.e., the SSA sharing law requiring an agreement be in place before routine sharing of SSA information of services can occur with a commercial or foreign entity. In case of the broad aims of the fictional UNSCR 3328 (2023), SSA information sharing or other services may generally be shared without the respective U.S.C.-compliant agreement in place. Other national legislation applying to the sensitive question of sharing SSA information was not covered during the game.

**Space Traffic Management**

The status of Space Traffic Management (STM) in 2023 was important to some participants. Space-faring nations with SSA capabilities had to establish the domestic legal and regulatory framework necessary for a civil organization to provide STM to commercial, civil and also military satellite operators. Several participants suggested an ICAO (International Civil Aviation Organization)-type organization to regulate STM on a supranational level. Legal experts were of the opinion that was

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unlikely to occur. Rather, information sharing would be subject to agreements between nations and consistent with existing relationships and follow the lines of norms and best practices versus a formal organization.

**United Nations Resolutions and Rules of Engagement**

Each delegation of the participating nations at the Schriever Wargame 2012 also included one Legal Advisor as the legal support to this nation, but also as a member of the group of Legal Advisors which discussed legal issues during SW12I and provided legal advice in response to Requests for Information (RFI). Therefore, restrictive interpretations of international law (such as “demilitarization” of Space), political questions of power games in the international relations (space superiority), or related adjustments in international law within the United Nations’ legal framework while important to the intellectual cast of the game, they were not used by nations to obstruct the course of play.

During the war game, nations tried to formulate a United Nations Security Council Resolution, in reaction to the occurring threats given in the morning briefs, by building coalitions originating from an initiative by Germany and France. Similar to the Resolution released prior to the war game, the draft Resolution helped during the war game to clarify the legal status of certain threats such as acts of terrorism and piracy, also with regard to the question of traditional neutrality versus internationally supported and mandated actions against non-state actors and states supporting their activities.

Although the Rules of Engagement had been prepared prior to the war game to provide a realistic legal framework for the scenario, some were not fully applied during the actual game. For example, a targeting process, establishing a set of NAC-approved target categories necessary for the conduct of an operation, could not be fully played due to the nature of the game. Missions in reality, however, have shown that ROE are important part of the targeting process by setting a set of minimum standards for the evaluation of the use of force (excessive collateral damage etc.) which would apply as well for actions taken against space assets. As ROE cover different kinds of offensive use of force against on-orbit and terrestrial-based space assets, some game moves showed examples of this use of offensive force with possible permanent, non-reversible effects. Deeper insights into such ramifications of those effects were not exposed during the game.

**Key Take-away:** To ensure that the game did not become mired in legal issues, extensive work was done prior to the game on Rules of Engagement (ROE). NATO not only needs agreed ROE, which usually invokes national caveats, for its operations, but also must ensure that its space strategy is in compliance with international law. Similar to cyber-attacks, the possibility of space-related attacks on members of the Alliance raises the question of how NATO would react in case of a threat to one or more of its Member States. Do the Articles of the Washington Treaty cover space-related threats?

**Key Take-away:** Both space-faring and non-space-faring nations have to take into consideration that further use of the Space domain will imply the need for changes in national and international norms. Shutter Control must be evaluated fully with improved coordination of Space Traffic Management, SSA data sharing, and a full understanding of treaties such as the Outer Space Treaties and Amendments, customary law and the definition of the role of both state and non-state actors. This process will have
to take place on different complementary levels, national, regional, international and supranational, e.g., the European Union, to continue the use of and access to the peaceful use of Space.

**Key Take-away:** Prior to conflict, there needs to be a policy framework which includes understanding the norms of behaviour, standing ROE, and other legal considerations. The ability to accurately attribute hostile action in the Space/Cyber domain to specific actors in a timely manner is a crucial component to the success of a mission. NATO needs to ensure that it has robust ROE that address threats to space capabilities which affect NATO operations. Similar to cyber-attacks, the possibility of an attack on the space capabilities of an Allied nation raises the question of how NATO would react under such circumstances. The NATO ROE developed for war game purposes combined with the additional insights by the legal experts could be used as a starting point for a more detailed and developed set of ROE.

**Key Take-away:** NATO is an alliance enabled by access to and use of domains such as Space. All aspects of resilience, deterrence, collective defence and economic prosperity of the Alliance member states are closely connected with having a firm, clear and defensible legal framework that allows timely and effective response to threats.
**Challenges**

SW12I could be a seminal event in redefining how NATO will work together as an Alliance in support of space operations. It provided the opportunity to appraise an entirely new realm of warfare for the Alliance, with the added benefit of having all of the participating nations at a relatively common starting point. This is true because, unlike other areas of warfare, NATO does not have standardized procedures, concepts of operations, and other frameworks established for Space.

In order for the Alliance to succeed, it must address “alliance management.” The U.S., as a leader in space, must be fully engaged in espousing the message that it will work with NATO to improve coordination of capabilities in Space and Cyber to support combat operations. It is worth repeating that the other nations believe this is a common starting point and they are anxious to continue work on a space concept of operations that recognizes all contributions. They recognize that significant work must be done at the operational level for space in NATO, and it must be done in parallel with NATO strategic planning. The exuberance on the part of the military side of NATO for pursuing space operational initiatives, however, is slowed by the lack of agreement on the political side, making it all the more important for the U.S. to lead.

On a practical level, though, there is also a clear mandate for the Alliance to be realistic about its future prospects. In the coming decade, it will be increasingly difficult for any singular nation to win a war in space without partners NATO nations, as evidenced in this game, bring capability, technology innovation and other resources, with the expectation they will fight as a combined force and make a significant contribution. The increasing sophistication and growth of European space programs was clearly evidenced in this game, although all nations must continue to provide capabilities in Space which enable combat operations. NATO nations cannot expect to do what they did after the Cold War and lower their defence budgets, hoping someone else will provide the necessary capabilities.

During this game the United States included other NATO nations and international partners in the discussion on EUCOM and STRATCOM equities; it was noted and appreciated that this debate was held openly, building confidence that all were truly in on the ground floor and that the US was serious about transparency. This transparency and confidence building brings an obligation for the US to carry through on continuing this behaviour. It was shown that the US does not have all the answers (particularly the discussions on Combined Space Operations and Planning), and was willing to accept other solutions. Although the U.S. has been in the space business longer, there has been significant investment by several countries, and space offers opportunities for countries who may not be able to offer significant contributions in conventional forces. For instance, the possession of technology offered opportunities for countries to participate who have never been thought of as space-faring nations. In the game (2023) the Netherlands launched two planned microsats and the French demonstrated a responsive space capability.

Optimizing space efforts from participating allies in support of NATO played out in the effort to build a Combined Space Planning effort. Operating within this Alliance will require a re-evaluation of the NATO planning construct in support of space. As with other forces, NATO does not “own” the space resources of the member nations, but it has built a command and planning structure to execute
operations. Throughout the game, implementing Combined Space Planning capabilities in NATO was the dominant theme. New proposals were introduced by USSTRATCOM, however, the immediate concern was to fit into the NATO paradigm. Over the years, NATO has established standardization in doctrine and procedures, along with interoperability of systems, and exercised those on a regular basis. The extent to which this will be required for space is one of the next steps. We saw several instances of collaborative planning, in which the United States was not a participant. The participating German, Italian and French delegations took advantage of their MUSIS agreement to provide GEOINT backup when a French imaging satellite was taken out.

**Key Take-Away:** Preparations for SW121 demonstrated the need for clear political guidance on Space. This includes how NATO will develop doctrine, capabilities, and partnerships that will enable the effective use of Space during operations by NATO forces.
**Domain Interrelationship**

Space is another warfare domain. Within a NATO context, operationalizing this fact has not occurred. Nor within NATO has a relationship between Space and the other warfare domains been studied to better understand the effects on NATO operations. Within the game, the links between Space and land, air, and maritime were not surprising, nor problematic. However, the links between Space and cyber highlighted the importance of an integrated defence of this critical node.

Throughout the game, RED utilized counter-space such as jamming and dazzlers to hinder BLUE’s ISR, communications, and GPS capabilities for land, air, and maritime. In addition, they utilized physical attacks on critical infrastructure such as in-theatre ground stations and fibre optic cables to disrupt BLUE’s communications and information flow. In support of an attack on the headquarters in Djibouti, a dazzler was used to prevent BLUE intelligence collection.

Conversely, the links between Cyber and Space were much stronger than expected. As earlier discussed, RED also utilized a number of cyber-attacks on BLUE out-of-theatre ground and on orbit assets. BLUE responded with a series of national responses while keeping NATO informed of their mitigation measures.

![Diagram of SW12I Space-Cyber Relationship](image)

**Figure 8. SW12I Space-Cyber Relationship**

Cyber planning and coordination is critical to the defence of space capabilities due to the dependence of Space on the cyber domain to conduct space operations. BLUE came to the realization that “Cyber can fight without Space, but Space cannot fight without Cyber.” While not the focus of this wargame, cyber is a critical element of operations in all domains, and not uniquely paired with the Space domain from a cyber-perspective. It needs to be defended and protected.
**Key Take-Away:** SW12I reaffirmed that the Land, Air, Maritime, Cyber, and Space domains cannot be viewed as separate and independent operating areas. Simultaneous incidents in the Maritime, Air, Space, and Cyber domains identified the complex interdependence of these domains. Allied missions and operations in the future will require that NATO adopts a comprehensive response to this complex issue. Moreover, this complexity will only increase over the coming decade which will require dedicated training, education, doctrine, and capabilities that are interoperable and connected. Doing so will ensure continued access to and use of these important domains.
Way Ahead for NATO in Space

The wargame provided an excellent platform to discuss sensitive space issues, experiment with innovative organizational structures, and procedures with relevant and well-informed representatives from various nations and organizations. The results of the broader participation in their wargame exceeded U.S. expectations; however, it remains unclear whether future iterations of the wargame will use a similar approach. The wargame’s focus was operational and its conduct based on the assumption that all space assets will remain under national control. The broader international participation therefore resulted in a heightened awareness of the overall importance, as well as, the challenges of cooperation, coordination and information sharing among a wide variety of civilian (governmental and commercial) and military actors in combined space operations.

Five key recommendations were developed as a result of the wargame.

1. Consider updating NATO doctrine on Space, addressing requirements, functions, and coordinating authority and consider whether a broader conceptual framework should be developed.

2. Operations in Space have gone global. Correspondingly, nations should determine the best structure to ensure NATO has sufficient expertise in space to allow Joint Force Commanders to conduct operations at the behest of the Alliance. This should include expertise on legal issues, industry practices and norms, and coordination of capabilities between NATO and the Nations that provide national services.

3. Consider what level of SSA SHAPE and operational commander(s) need and how this should be provided.

4. More clearly define and elaborate how to conduct combined space operations. It should also identify requirements and functions at the strategic and operational level and identify any gaps and vulnerabilities that would affect its ability to access the space-based information and services it needs for operations.

5. After having developed the necessary conceptual framework and doctrine on Space (in order to ensure the appropriate information exchange and the coordination mechanisms) NATO should review its PE and CE structure to ensure operations have the necessary space expertise to support operations as follows:
   a. SHAPE should review the CCOMC structure and PE billets to define and develop the SAC function as an integral part of the CCOMC structure.
   b. JFC should review PE/CE structures to determine the right mix of NATO and VNC Space billets.

A coordinated NATO top down approach on Space (i.e., NATO policy on Space) is unlikely to be achieved in the near future. Thus, the current bottom up approach will be utilized to stimulate an
informed discussion at NATO HQ. ACT, led by DCOS SPP, has developed an Engagement Strategy for Space issues to facilitate these discussions.

The Bi-SC military Space working group, which will replace the current NATO Space IPT led by ACT, will exploit the findings from Schriever Wargame 2012 International to develop recommendations to improve the Space support to NATO operations.

Key leader engagement is critical and must be incorporated with the bottom up approach. It’s important that Leadership is educated on the space and cyber threats and vulnerabilities. Moreover, they must guide the discussion as the Alliance develops solutions that the nations will support. Space education and training has to reach other levels as well. A distributed network of space SMEs that work across the operational spectrum of NATO may be the right approach to improve space awareness and coordination within the Alliance. It’s important to note that the SecGen views space as a valid concern for future operations and will likely champion “Space” as part of a larger strategy like Smart Defence or Connected Forces Initiative (CFI), not as a stand-alone initiative.

In an effort to expand awareness, other documents related to SW12I should be reviewed, including the AFSPC Report, the IS/IMS Memo to the PO, the AJP 3.3 (A) and JAPCC’s NATO Space Operations Assessment. The AJP 3.3 (A) needs to be updated to include addressing Missile Defence and Cyber as related to Space. So far there is no official mandate for the NMA to update this document. This step has to go through the proper NATO process of creating an official Bi-SC task.

Capability development should be a priority when it comes to NATO operations, however, this does not mean NATO will create its own assets in space. Nations will clearly lead the effort and those with national space programmes, or ambitions in maintaining or developing future space capabilities, will continue to maintain and in some cases grow those capabilities. NATO should take the lead in encouraging nations to develop interoperable solutions and consult NATO as it develops the doctrine, coordinating instructions, and guidance that simplifies how to best coordinate capability and effects in support of the Joint Forces Commander.

In closing, NATO needs to raise awareness of space among decision-makers. The Schriever Wargame demonstrated the extent to which space enables our world. Space matters and is linked inexplicitly with cyber. How NATO responds to incidents like those witnessed and reported during SW12I is of critical importance to the Alliance.
ANNEXES
Annex A: Schriever Wargame 2012 International Documentation

Initiating Instruction
   Road to 2023
   NATO ROE
   USAFSPC Communications Plan
UNSCR 3328
End of Game Briefs

Note – Briefs will be added when declassified.
INITIATING INSTRUCTION
ON SECURITY/COUNTER-PIRACY EFFORTS IN THE HORN OF AFRICA 2023

References:
A. UNSCR 3328 (2023), 01 JUN 2023

1. Background.
   a. History. International counter-piracy operations through 2015 combined with efforts from the Transitional Federal Government (TFG) of Somalia significantly reduced piracy operations in the Horn of Africa (HoA). In addition, Al Shabaab terrorist activities were in decline due to internal dissension over the lack of employment and its inability to distribute food and medicine to the local populace, increasingly effective counter-terrorism efforts in the region by regional governments, and a lack of popular support. As a result, the international community reduced its counter-piracy and security sector reform efforts in the region.

   East Africa has continued to suffer from a severe drought which began in 2010, was most severe in 2017, and still affects the region. By 2016, famine was declared in Somalia, northeast Kenya, Ethiopia, and South Sudan. The severity and extent of the food crisis overwhelmed governments and non-governmental aid agencies in the region. The international community decided in 2017 to organize a multinational relief effort with a regional security program designed to protect the personnel and deliver supplies to the region.

   For a parallel effort, Sheikh Abdirahman Aw Mohamed commenced a hearts and minds program to establish himself as the central Muslim provider of relief and aid. Rising through the ranks of al Shabaab from humble beginnings he developed a plan to subvert external agencies and gain popular support through increased efforts to aid local populations. Outside the HoA, he further strengthened ties to the Wahabi who began providing additional funding and education. By 2021, Aw Mohamed has become the spiritual and military leader of al Shabaab and the organization had developed significant influence and capability across the region.

   In 2022, al Shabaab formed a clandestine alliance with a group of pirates operating in Somalia. Al Shabaab provided logistic support in exchange for a portion of the profits. As the alliance evolved, profits quadrupled, and by the end of the first year, al Shabaab has become responsible for selecting potential targets for the pirates.

   b. Current Situation. In May 2023, an Italian-flagged cargo ship was transporting humanitarian supplies and medical personnel to Kenya when it was attacked by pirates. The hijacking escalated when shots were fired. In the process, the pirates fired rocket propelled grenades at the ship significantly damaging it. The ship was scuttled and all personnel perished. The United Nations Security Council passed a resolution condemning the attack and called on states and regional organizations to redouble their efforts to combat piracy and armed robbery at sea. The UN peacekeeping forces in the region are increasingly under pressure, lacking the force or capacity to maintain security for relief efforts in light of the growing violence in the region. The UN asked NATO and Australia to conduct security operations in the area and assist in protecting those individuals responsible for providing relief efforts.

   c. NATO’s role. The North Atlantic Council (NAC) has agreed to provide military forces to ensure the safe passage of vessels transiting off the Horn of Africa and to provide security for humanitarian relief efforts in the region. In addition, in accordance with United Nations Security Council Resolution (UNSCR) 3328 (2023), NATO forces will conduct security operations and counter-piracy operations in the region.
d. **Possible additional roles.** Though not explicitly called for in UNSCR 3328 (2023), the UN Secretary General has discussed with the NATO Secretary General the potential for NATO forces to support the stability of legitimate regional governments through a comprehensive approach that contains training of regional militaries to include the implementation of defence reform as appropriate.

2. **Military Options.** Council agreed that NATO should expand its current approach to security and counter-piracy operations in response to increased pirate and terrorist activities, maximizing effectiveness by:

   a. **MRO 1** - Conducting regional capacity building activities within means and capabilities thus contributing to a comprehensive approach of this issue by the International Community.

   b. **MRO 2** - Protecting international shipping by mounting a deterrent military presence in selected shipping lanes and escorting ships upon request (this includes intervening in on-going attacks and conducting boardings).

   c. **MRO 3** – Protecting international humanitarian relief efforts by mounting a deterrent military presence supporting critical humanitarian relief nodes in the region.

   d. **MRO 4** - Supressing piracy at sea by neutralizing pirate vessels, preventing the use of mother ships and supporting hostage release operations.

   e. **MRO 5** - Preventing pirate activities ashore by interdicting their resupply from the sea by disabling pirate vessels, C2, and logistic build-up on the Somali beaches from the sea. Conduct limited strikes on key terrorist nodes (ashore and at sea) to disrupt the flow of funding and materials.

   f. **MRO 6** - Disabling pirate and terrorist infrastructure by military actions on land, by air, and in outer space. Conduct air and ground operations to destroy terrorist C2 nodes, logistic supply points, and operations by Special Forces to disrupt terrorist operations across the Area of Operations (AOO).

   These options are coherent, designed to support UNSCR 3328 (2023) and will enhance the effectiveness of NATO’s security and counter-piracy efforts. The associated military tasks are within the legal mandate of UNSCR 3328 (2023). The use of NATO forces to support these options is approved.

3. **NATO End-State.** Piracy and terrorist activity will be reduced and stabilised at a level which does not require permanent international presence and remains contained in the current Area of Operation, i.e., the levels of piracy activity in the region prior to 2020. NATO will have helped governments in the AOO develop the capacity to capture, arrest, detain, prosecute, and incarcerate all known pirates and terrorists. Merchant shipping will have regained the confidence to sail the waters of the Horn of Africa unaided by international military forces.

4. **Political Guidance and Limitations.**

   a. **Political Centre of Gravity.** NATO continues to demonstrate the resolve, capability, and commitment to confront piracy and terrorism in the Horn of Africa, as long as deemed necessary by the NAC, with an effective and value-added contribution, in coordination with other relevant nations and international organisations.

   b. **Political Constraints:**

      i. Any future NATO role, based on NAC decision, will be in support of wider international efforts and must satisfy the criteria of a demonstrated need, a sound legal basis, and wide regional support.
ii. Building upon existing arrangements and in accordance with relevant NATO procedures, NATO should be prepared to liaise with the International Community including the UN and legitimate governing authorities in the Horn of Africa region.

iii. NATO’s actions conducted in the immediate and short-term must take into account long-term considerations for regional security and stability and the relations we have with all NATO partners.

iv. NATO’s actions must take into account all considerations deemed necessary to operate safely in outer space.

v. Any geographical restrictions to NATO’s support will have to be taken into account.

c. Political Assumptions.

i. NATO will continue to conduct its counter-piracy and security activities in complementarity with other international presences operating in the area and contributions on a national basis, including from Australia.

ii. Security operations by NATO will be conducted on the basis of relevant UNSC Resolutions and taking into account any comprehensive strategies developed for the region.

iii. NATO will continue to seek ways to enhance formal coordination of all international forces operating in the Horn of Africa to optimize their cumulative impact.

iv. Nations will provide the necessary military capabilities for the conduct and sustainment of the operation, empowering them to act in a manner commensurate with the military response options identified in paragraph 2.

v. NATO will conduct ground operations to support the protection and security of humanitarian relief efforts in the region. NATO will not make plans to support a sustained military presence in the region.

vi. NATO will provide added value and complementarity through the deployment of appropriate capabilities in addition to ships that could support the fulfilment of the range and missions and tasks to be defined by the NMAs in the OPLAN.

vii. Djibouti, Eritrea, and Kenya will support and, where needed, facilitate NATO’s activities to counter piracy and terrorism. The Somali government will allow the conduct of additional military actions to disable pirate and terrorist infrastructures on land, if required. Other nations in the region are supportive of the international efforts but are restrictive in their support.

viii. Countries of the region and the African Union will be open to cooperation with NATO in regional capability-building efforts.

ix. NATO nations with significant ISR capabilities, both space and terrestrial, will provide the necessary support to the operation.


a. Mission Statement. When authorised by the NAC, SACEUR will empower COM JFC to direct the conduct of joint operations in order to contribute to international efforts to counter piracy and terrorism in the Joint Operations Area in the Horn of Africa.
b. **Role.** NATO will lead counter-piracy and security operations in the Horn of Africa region.

c. **Area of Interest.** The AOI consists of the nations listed in Annex A with a focus on Eritrea, Ethiopia, Djibouti, Somalia, Kenya, Yemen, the Red Sea, the Gulf of Aden, and the Indian Ocean.

d. **Military Objectives.**

   i. Protect and provide security for humanitarian relief efforts.

   ii. Disable and reduce to pre-2020 levels the capabilities of the pirates to interdict shipping and to conduct piracy.

   iii. Deny and disrupt the ability of terrorists to conduct operations.

e. **Supporting Objectives.**

   i. Scope and nature of NATO’s involvement is clearly communicated to the International Community and regional actors.

   ii. Delivery of humanitarian assistance is de-conflicted from all NATO military operations.

f. **Tasks.**

   i. Remain ready to protect, as required, merchants and other shipping under attack or threat of attack from pirates in accordance with the UNSCR 3328 (2023).

   ii. Monitor, by sea, air, and space, movements of terrorist and pirates, their equipment and vessels.

   iii. Establish the ability to communicate, coordinate, and de-conflict NATO actions with international monitoring, stabilization, and humanitarian efforts conducted by the UN or others, as appropriate.

   iv. Conduct counter-piracy and security operations in accordance with UNSCRs and NAC guidance.

6. **Legal Aspects.**

   a. As a priority, the Alliance will continue to ensure all its actions comply with international law. Pirates and terrorists captured in the AOO will be turned over to the International Criminal Tribunal for the Horn of Africa (ICTHA) and the International Detention Facility (IDF) as established in UNSCR 3328 (2018).

   b. All military response operations are in principle permissible under the terms of UNSCR 3328 (2023). However, as required in the MRO’s that address NATO forces participating in operations on foreign territory, those actions must be coordinated with the UN and regional governments.

   c. Council approved ROE is included in Annex B. The ROE provides the necessary guidelines for the commander to execute the mission. The ROE addresses the following:

      i. Entry into foreign territory for combat operations, personnel recovery, and hostage rescue operations.

      ii. Protection of civilians and non-governmental organizations and equipment conducting humanitarian operations in the AOO.

      iii. Compliant and Non-compliant maritime boarding of terrorist and pirate vessels.
iv. Escalation of force options and restrictions including actions in cyber and outer space.
v. Guidelines for actions in the space domain.

7. Resources. SACEUR has identified the common-funded resources needed for the operation in sufficient detail to allow the Resource Policy and Planning Board to advise Council on the resource implications. Based upon lessons learned in the past decade, the requests for outsourcing of Air and Space Intelligence, Surveillance and Reconnaissance (ISR) capability will be significant and are considered essential to mission success.

8. Participation of Non-NATO Contributing Nations. NATO will welcome the participation of Australia and other partners who wish to contribute by providing specific capabilities or practical support to the mission and by actively assisting the international efforts to disrupt pirate and terrorist activities.

9. Interaction with Non-NATO Actors.
   a. NATO will put greater emphasis on consultations with a broad range of actors who may be conducting operations in the AOO.
   b. In order to ensure synergy, NATO will strengthen and reinforce the arrangements already in place for exchange of information and coordination with other actors in the Joint Operations Area.
   c. NATO will establish points of contacts through appropriate institutional channels including for each government in the AOO, in order to better coordinate counter-piracy, security operations, and regional-capacity building activities in the region.

10. Strategic Communications. The public affairs posture will include NATO guidance and be developed in close cooperation with other appropriate actors. Appropriate public messages will be developed by the NATO Spokesperson’s office, in coordination with the military public affairs representatives. Information operations will be closely coordinated with other international and national actors. The International Strategic Communication Plan is included as Annex C and will serve as the strategic communications guidance for both the internal gameplay and external communications.

11. Coordinating Instructions. NATO will provide regular reports to the UN Secretary General and Security Council, and inform relevant international and regional organisations, and other stakeholders, as appropriate, on the operation during the planning, execution, and subsequent phases.

12. This NII serves as the strategic guidance for the operation and combines several key strategic NATO documents into a single source. It is intended to loosely follow the NATO Initiating Directive format and does not mimic the normal NATO strategic planning process. An OPLAN will be developed and will serve as the JFC OPLAN for the wargame.

ANNEX
A. Schriever Wargame 2012 International Timeline and Road to War 2023
B. Schriever Wargame 2012 International Rules of Engagement Implementation 001
Timeline

2011 – Most countries come through the global economic crisis relatively unscathed although austerity measures affected military capabilities in many countries. Major weapons upgrades were cancelled or delayed. New systems acquisition was reduced and/or delayed.

2011 – The “Arab Spring” continued to cause instability in the Middle East and Northern Africa for several years resulting in changes to several of the governments in that region. (See table at the end of this document.)

2011 – A severe drought in East Africa resulted in famine being declared in Somalia.

2012 – Defeats in Iraq, Afghanistan, and Southeast Asia result in a significant reduction in al Qaeda’s capabilities and influence. They are reduced to a few disorganized cells and no longer represent a significant global threat.

2015 – Due to the success of various counter-piracy operations in and around the Horn of Africa, and subsequent decline in acts of piracy, most countries reduce or cease their counter-piracy operations in that region.

2015 – Al Shabaab experiences a loss of popular support and funding due to numerous missteps including regional and global efforts against terrorism and internal dissension amongst its leadership.

2016 – As the drought continues throughout the Horn of Africa, famine spreads to Kenya, Ethiopia, and the southeast Sudan.

2017 – Drought conditions in Horn of Africa are at a historic worst. The severity and extent of the food crisis, combined with ongoing unrest in various regions, overwhelmed existing aid agencies. The African Union requests assistance from the United Nations to stem the increasing number of deaths. A multinational relief effort is formed to organize and protect the personnel and supplies being delivered to the Horn of Africa. This effort is broadly supported by the United Nations and the rest of the international community with the European Union as a key contributor.

2018 – Attacks on relief workers and attempts to steal supplies results in increased security in the air and sea ports of Eritrea, Djibouti, and Kenya where the bulk of the supplies for the relief effort arrive. These attacks are disorganized and relatively unsuccessful.

2020 - Sheikh Abdirahman Aw Mohamed begins a rise in the ranks of al Shabaab with his focus on regaining popular support. To do this he reduced anti-Sunni rhetoric and actions, increased efforts to aid the local population most affected by drought, strengthened his ties to Wahabi support outside the HoA. The Wahabi support provided al Shabaab a source of funds and education.

2021 - Sheikh Abdirahman Aw Mohamed is named both the spiritual and military leader of al Shabaab. He replaces the key leadership with his most trusted lieutenants. His efforts over the previous four years have driven an al Shabaab resurgence in the region, especially in Somalia. The organization has increased recruiting, increased local and foreign funding, and increased political influence in Somalia and parts of Ethiopia and Kenya. His top level leaders are better educated and more sophisticated than their past counterparts.

2021 - The multinational relief effort continues to provide food and medical supplies throughout the Horn of Africa. Primary distribution locations are the air and sea ports in Kenya, Djibouti, and Eritrea. Military forces from those countries as well as local police provide the security in those areas due to increased threats by criminals and al Shabaab.

2022 – Al Shabaab forms an alliance with a group of pirates operating primarily in Somalia. Al Shabaab provides the munitions, personnel, various seacraft, communications support, and intelligence while the pirates provide the muscle. Al Shabaab receives a portion of the profits from the pirates. Local warlords allied with al Shabaab supply sanctuary, logistics, weapons, communications support, and other aid to the pirates. Over the past year, al Shabaab has played a more active role in helping select potential targets for the pirates. Unconfirmed reports say that some countries may be paying “insurance” to al Shabaab to ensure their vessels are not targeted by the pirates.

2022 - Sheikh Abdirahman meets with leaders of Jemaah Islamiah (JI) and the Abu Sayyaf Group (ASG) at an unknown location. Meeting indicates a shift towards increased coordination and information sharing between these
groups. Some of the piracy activities off the Horn of Africa and Strait of Malacca are directly linked to al Shabaab within Somalia. The Australian government confirms that the actions of the pirates in both areas have directly affected Australian mineral exports.

2022 – Intelligence sources confirm that al Shabaab personnel have received training in countries outside the Horn of Africa. This training covers basic weaponry as well as more advanced weapons. There has also been evidence of training on a variety of technological capabilities including communications jamming and monitoring equipment, Global Positioning System (GPS) jammers, small remotely piloted aircraft, and net defense techniques as well as basic offensive cyber capabilities.

2022 – In July, al Shabaab forces attacked a train carrying supplies from Djibouti to Ethiopia. No one was injured but the bulk of the supplies were taken into Somalia. This was followed up later that month with a raid on a small airfield in northeast Kenya. Although there was a brief firefight, no one was injured but several aircraft were damaged. The attackers made off with some of the supplies but most were saved.

2022 – Al Shabaab forces attacked a convoy in southeast Ethiopia in mid-August taking three trucks filled with supplies. Several of the security forces with the convoy as well as some of the aid workers were beaten when they tried to resist but there were no fatalities.

2022 – Two convoys traveling from Kenya to Ethiopia were attacked by al Shabaab forces in September. Both attacks were successful and the attackers were able to return to Somalia with the supplies.

2022 – Al Shabaab forces raided a convoy that was transporting supplies from Djibouti into northwestern Somalia in mid-October. A firefight with the convoy security resulted in several injuries and the death of one of the security personnel.

2022 – A successful raid on a small convoy traveling in Ethiopia near the Somali border occurred in mid-November. Although several convoy personnel were beaten by the attackers, no fatalities were reported.

2022 – Kenyan military personnel and relief effort security fought off an attack on an airfield in northeast Kenya in early December. The attackers caused significant damage to the airfield and there was a total of six fatalities in the raid, four security personnel died and two al Shabaab raiders were killed. The attack failed to get away with any of the supplies. Relief workers reported that they were fortunate the additional Kenyan military personnel were there at the airport to fight off the attack. Kenyan officials said the military forces were there preparing to return to Nairobi and were not part of the normal security at the airport. Later that month, al Shabaab forces attacked a convoy traveling from Kenya into Ethiopia. The raiders opened fire first killing two of the security personnel. Although the remaining forces surrendered, several were severely beaten by the raiders who also injured some of the unarmed relief workers. The raiders were able to get away with several vehicles and the supplies.

2022 – By the end of the year there are clear indications that al Shabaab is attempting to increase its influence throughout the world. Aside from its efforts with Jemaah Islamiah and the Abu Sayaf Group, they have also absorbed some al Qaeda components into their organization. Additionally, they have made overtures to al-Qaeda in the Islamic Maghreb (AQIM) and other al Qaeda offshoots. Besides information sharing and coordination, al Shabaab appears to be looking for additional recruits with a special emphasis on those with technical backgrounds. Several intelligence sources have also reported that al Shabaab has been attempting to acquire radiological material for the past year but so far their efforts appear to be unsuccessful.

2023 – In late January, al Shabaab forces attacked a convoy as it was loading supplies off a train in eastern Ethiopia. Some shots were fired and a convoy worker and security personnel were injured but no one was killed. The raiders made off with most of the supplies. During this attack and most of the previous attacks, convoy personnel reported that the attackers appeared to have excellent intelligence regarding security arrangements and the supplies being transported. Additionally, they reported problems with their radios immediately before and during the attacks. Two Ethiopian rail yard personnel claimed they saw a miniature aircraft fly over the area half an hour before the attack.

2023 – The United Nations Security Council adopts a series of resolutions in response to the increasing viciousness of the attacks and requests for support by the countries involved in the relief effort. The resolutions created United Nation Missions to consolidate peace and security and to help establish conditions for development in Ethiopia, Somalia, and Sudan. Additionally, the resolutions provided support to existing forces in Djibouti, Eritrea, and Kenya to defend the air and sea ports being used in the relief efforts.
<table>
<thead>
<tr>
<th>Country, South</th>
<th>Government</th>
<th>Civil/Political Liberties</th>
<th>Muslim Brotherhood Influence</th>
<th>Allied/US Relations</th>
<th>Support to Counter-Piracy Counter-Terrorism Mission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>Islamic Republic</td>
<td>Partly Free</td>
<td>Moderate</td>
<td>Good</td>
<td>Supports with Restrictions</td>
</tr>
<tr>
<td>Djibouti</td>
<td>Republic</td>
<td>Partly Free</td>
<td>Weak</td>
<td>Excellent</td>
<td>Supports</td>
</tr>
<tr>
<td>Egypt</td>
<td>Islamic Republic</td>
<td>Not Free</td>
<td>Strong</td>
<td>Poor</td>
<td>Does not Support</td>
</tr>
<tr>
<td>Eritrea</td>
<td>Republic</td>
<td>Partly Free</td>
<td>Minor</td>
<td>Good</td>
<td>Supports</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Federal Republic</td>
<td>Partly Free</td>
<td>Minor</td>
<td>Good</td>
<td>Supports with Restrictions</td>
</tr>
<tr>
<td>India</td>
<td>Federal Republic</td>
<td>Free</td>
<td>Weak</td>
<td>Good</td>
<td>Does not Support</td>
</tr>
<tr>
<td>Iran</td>
<td>Islamic Republic</td>
<td>Not Free</td>
<td>Minor</td>
<td>Poor</td>
<td>Does not Support</td>
</tr>
<tr>
<td>Iraq</td>
<td>Parliamentary Democracy</td>
<td>Partly Free</td>
<td>Minor</td>
<td>Good</td>
<td>Supports with Restrictions</td>
</tr>
<tr>
<td>Kenya</td>
<td>Republic</td>
<td>Partly Free</td>
<td>Weak</td>
<td>Good</td>
<td>Supports</td>
</tr>
<tr>
<td>Libya</td>
<td>Islamic Republic</td>
<td>Not Free</td>
<td>Strong</td>
<td>Poor</td>
<td>Does Not Support</td>
</tr>
<tr>
<td>Morocco</td>
<td>Constitutional Monarchy</td>
<td>Partly Free</td>
<td>Minor</td>
<td>Good</td>
<td>Supports with Restrictions</td>
</tr>
<tr>
<td>Oman</td>
<td>Monarchy</td>
<td>Partly Free</td>
<td>Minor</td>
<td>Good</td>
<td>Supports with Restrictions</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Federal Republic</td>
<td>Partly Free</td>
<td>Moderate</td>
<td>Poor</td>
<td>Does not Support</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>Monarchy</td>
<td>Not Free</td>
<td>Minor</td>
<td>Good</td>
<td>Supports with Restrictions</td>
</tr>
<tr>
<td>Somalia</td>
<td>Transitional</td>
<td>Not Free</td>
<td>Moderate</td>
<td>Poor</td>
<td>Supports with Restrictions</td>
</tr>
<tr>
<td>Sudan</td>
<td>Republic</td>
<td>Not Free</td>
<td>Minor</td>
<td>Fair</td>
<td>Supports with Restrictions</td>
</tr>
<tr>
<td>Sudan, South</td>
<td>Republic</td>
<td>Not Free</td>
<td>Minor</td>
<td>Fair</td>
<td>Supports with Restrictions</td>
</tr>
<tr>
<td>Syria</td>
<td>Islamic Republic</td>
<td>Not Free</td>
<td>Minor</td>
<td>Poor</td>
<td>Does not Support</td>
</tr>
<tr>
<td>Tanzania</td>
<td>Republic</td>
<td>Partly Free</td>
<td>Minor</td>
<td>Fair</td>
<td>Supports with Restrictions</td>
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<tr>
<td>Tunisia</td>
<td>Republic</td>
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<tr>
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<td>Minor</td>
<td>Fair</td>
<td>Supports with Restrictions</td>
</tr>
</tbody>
</table>

**Government**

Constitutional monarchy - a system of government in which a monarch is guided by a constitution whereby his/her rights, duties, and responsibilities are spelled out in written law or by custom.
Federal republic - a state in which the powers of the central government are restricted and in which the component parts (states, colonies, or provinces) retain a degree of self-government; ultimate sovereign power rests with the voters who chose their governmental representatives.

Islamic republic - a particular form of government adopted by some Muslim states; although such a state is, in theory, a theocracy, it remains a republic, but its laws are required to be compatible with the laws of Islam.

Monarchy - a government in which the supreme power is lodged in the hands of a monarch who reigns over a state or territory, usually for life and by hereditary right; the monarch may be either a sole absolute ruler or a sovereign - such as a king, queen, or prince - with constitutionally limited authority.

Parliamentary democracy - a political system in which the legislature (parliament) selects the government - a prime minister, premier, or chancellor along with the cabinet ministers - according to party strength as expressed in elections; by this system, the government acquires a dual responsibility: to the people as well as to the parliament.

Republic - a representative democracy in which the people’s elected deputies (representatives), not the people themselves, vote on legislation.

Transitional – indicates the country does not yet have a form of government approved or that there is no established government recognized by other nations.

Civil / Political Liberties

Assesses a country’s freedom by examining its record in two areas: political rights and civil liberties. A country grants its citizens political rights when it permits them to form political parties that represent a significant range of voter choice and whose leaders can openly compete for and be elected to positions of power in government. A country upholds its citizens’ civil liberties when it respects and protects their religious, ethnic, economic, linguistic, and other rights, including gender and family rights, personal freedoms, and freedoms of the press, belief, and association.

“Free” countries are those with the most freedoms described above.

"Partly Free" countries are those who have some restrictions on their freedoms as described above.

"Not Free" countries are those with significant restrictions on the freedoms described above.

Muslim Brotherhood Influence

The Muslim Brotherhood (MB) is a movement whose goal is to reclaim Islam’s manifest destiny. Its principles are; 1) to introduce Islamic Shari’ah as the basis for controlling the affairs of state and society, and 2) to work to unify Islamic countries and states, and 3) liberate countries from foreign imperialism. The Brotherhood believes that Islam enjoins man to strive for social justice, the eradication of poverty and corruption, and political freedom to the extent allowed by the laws of Islam. Members have created political parties in several countries to support these goals but the individual parties are not centrally controlled.

“Strong” indicates the MB has major influence over the government and its policies, either by having a political party or parties in control of the government or controlling the parties in charge of the government.

“Moderate” indicates the MB has significant influence over the government and its policies, either by having a political party or parties within the government or directly influencing the parties in charge of the government.

“Minor” indicates the MB has some influence over the government and its policies, either by having a political party or parties within the government or some influence with the parties in charge of the government.

“Weak” indicates the MB has little or no influence over the government and its policies. The MB may still have a political party or parties represented within the government but they are a minority.

Allied/US Relations
This category describes the interactions between the country and the United States and its close Allies.

“Excellent” indicates strong ties between the country and the United States and its close Allies.

“Good” indicates some ties between the country and the United States and its close Allies.

“Fair” indicates few ties between the country and the United States and its close Allies.

“Poor” indicates no ties between the country and the United States and its close Allies.

Support to Counter-Piracy Counter-Terrorism Mission

This describes the level of support this country is willing to provide to the Counter-Piracy and Counter Terrorism Missions. Support may include information-sharing, permission to operate within the country’s borders, or permission to base forces and operate from within the country.

“Supports” indicates that the country fully backs the mission and may be involved in the planning and execution of these operations, particularly within its own borders.

“Supports with Restrictions” indicates that the country has placed some limitations on its cooperation with the operations. The specific restrictions are detailed below but include such things as being advised in advance of operations or giving permission to individual parts of the operation.

“Does Not Support” indicates the country has not given permission to operate from within or through the country’s borders and any incursion may result in an adversarial response by that country.

Specific country support to the NATO operation:

- Algeria has offered some support to base non-combat forces within their territory. They will not authorize any operations within their borders unless led by Algerian forces.
- Ethiopia will offer full, albeit limited, support to the NATO operation but requires advance notification of any operations within its borders (they are primarily concerned with collateral damage).
- Iraq has offered support to base forces within their territory (approval will be given based on what forces) and to share information as needed. They will not authorize any operations within their borders unless led by Iraqi forces.
- Morocco has offered some support to base non-combat forces within their territory. They will not authorize any operations within their borders unless led by Moroccan forces.
- Oman has offered support to base forces within their territory and to share information as needed. They will not authorize any operations within their borders unless led by Omani forces.
- Saudi Arabia has offered limited support to the operation primarily regarding sharing information as needed. No approval to base any forces within Saudi Arabia. They will not authorize any operations within their borders unless led by Saudi forces.
- Somalia will offer limited support to the NATO operation but requires advance notification of any operations within its borders. No permission to base forces within its borders but is willing to share information as needed.
- Sudan has offered some support to base non-combat forces within their territory. They will not authorize any operations within their borders unless led by Sudanese forces.
- South Sudan has offered some support to base non-combat forces within their territory. They will not authorize any operations within their borders unless led by Sudanese forces.
- Tanzania has offered support to base forces within their territory and to share information as needed. They will not authorize any operations within their borders unless led by Tanzanian forces.
- Tunisia has offered some support to base non-combat forces within their territory. They will not authorize any operations within their borders unless led by Tunisian forces.
- Yemen has offered support to base forces within their territory and to share information as needed. They will not authorize any operations within their borders unless led by Yemeni forces.
This ROEIMPL is developed IAW REFs A-C and suits the requirement to conduct counter-piracy operations and counter-terrorism operations by NATO-led forces in the horn of Africa region. These ROE are applicable in the JOA as defined in the Initiating Instruction (REF C).

NATO has agreed an overarching transfer agreements with the International Criminal Tribunal for the Horn of Africa (ICTHA) and the International Detention Facility (IDF) for the ICTHA for prosecution of pirates, armed robbery at sea and terrorists. Detained persons that may be brought before the court will be transferred in accordance with the agreements made.

A space asset is equipment that is or can be placed in orbit (e.g., a satellite or launch vehicle); terrestrially based equipment that directly supports a space activity (e.g., a satellite ground station); and satellite links and transmissions that directly supports a space activity. The following are not space assets:

--User terminals designed to transmit or receive data via satellite. Examples of user terminals include (but are not limited to) satellite telephones, PNT receivers, and direct broadcast satellite television or radio receivers.

--Objects, including weapons, which merely transit space but do not enter into orbit.

--Terrestrial based weapons that target space assets. Examples include (but are not limited to) ballistic missiles, satellite communications jammers, PNT jammers, dazzlers, and laser weapons.

"On-orbit space asset” is used to describe space assets that are in orbit in space (e.g., a satellite or launch vehicle), including space assets that have left a launch pad on their way to orbit.

"Terrestrial based space asset” is used to describe equipment used that directly supports a space activity (e.g., a satellite ground station) that is located on land, at sea, or aboard an aircraft or airship.

"Localized effects” are effects having a direct impact only within the JOA.

"Widespread effects” are effects having a direct impact outside the JOA.

COMJFC will designate Military Restricted Areas (MRA), Persons with Designated Special Status (PDSS), and Property with Designated Special Status (PRDSS). PRDSS can include humanitarian goods and supplies, space assets of States participating in this operation, and space assets belonging to non-participating States and commercial entities (provided those assets are leased or used by NATO led forces in support of this operation). This authority may be delegated to COMTF but not further.

Under these ROE, use of force is restricted to minimum force necessary to fulfill the mission. In any event, the use of force is governed by the principles of proportionality and necessity. Nothing in this ROE shall be construed as limiting the right of self defense as provided under national and international law. More
guidance on self-defense and use of force is in REF B. National contingents are to seek national guidance on self-defense and notify their position the NATO commander.

GENTEXT/10/ Use of minimum force against space assets is limited to actions that will not cause purposeful interference with a space asset unless: (1) the State of registry has consented to interference; or (2) the State of registry is unable or unwilling to exercise its responsibility and authority to prohibit the space asset from being used to effectively contribute to activity that threatens NATO led forces or property, PDSS, or PRDSS. In cases where a space asset has not been registered, use of minimum force against space assets is limited to actions that will not cause purposeful interference with a space asset unless: (1) the launching state has consented to interference; or (2) the launching state is unable or unwilling to exercise its responsibility and authority to prohibit the space asset from being used to effectively contribute to activity that threatens NATO led forces or property, PDSS, or PRDSS.

GENTEXT/11/ “Purposeful interference” is any intentional interference with a space asset.

GENTEXT/12/ Nations shall endeavor to minimize national caveats. All national caveats that nations may deem applicable to these ROE must be notified to SACEUR and the appropriate theatre commander.

GENTEXT/13/ Somalia, Djibouti, Ethiopia, Eritrea and Kenya have provided consent to conduct UN sanctioned military operations authorized by REF A within their sovereign territory, waters and airspace. Consent must be obtained of Sudan, South Sudan and Yemen to conduct military operations authorized by REF A within their sovereign territory, waters, and airspace. ROE 101A and 101B must be read in this context.

GENTEXT/14/ Political Policy Indicator (PPI) is YANKEE (maintain status quo).

GEOGRAPHICAL AND RELATIVE POSITIONING OF FORCES

ROE 101A/

Entry into the sovereign territory, waters and airspace of Somalia, Djibouti, Kenya, Ethiopia, and Eritrea is authorized for the purposes of repressing armed robbery at sea, conducting counter-piracy and counter-terrorism operations, and creating a safe and secure environment to facilitate the protection and delivery of humanitarian assistance.

ROE 101B/

Subject to the consent of Sudan, South Sudan and/or Yemen, entry into their sovereign territory, waters and airspace is authorized for the purposes of repressing armed robbery at sea, and conducting counter-piracy and counter-terrorism operations.

ROE 102A/

Entry into foreign sovereign territory, waters and airspace for personnel recovery operations is authorized.

ROE 102B/

Entry into the sovereign territory, waters and airspace of Somalia, Djibouti, Kenya, Ethiopia, and Eritrea is authorized for hostage rescue operations.
ROE 102C/
Subject to the consent of Sudan, South Sudan and/or Yemen, entry into their sovereign territory, waters and airspace is authorized for hostage rescue operations.

ROE 111/
Positioning of NATO-led forces relative to pirates, armed robbers, or terrorists is unrestricted.

ROE 112/
Positioning of NATO-led forces relative to vessels that are threatened by pirates, armed robbers, or terrorists is unrestricted.

ROE 113/
Positioning of NATO-led forces relative to warships of non NATO-led Forces is unrestricted.

PREVENTION OF BOARDING, DETENTION OR SEIZURE OF NATO LED OR CIVILIAN PROPERTY

ROE 133/
Use of minimum force to prevent boarding, detention or seizure of NATO led vessels, aircraft, vehicles, or property by pirates, armed robbers, or terrorists is authorized.

ROE 134/
Use of minimum force to prevent boarding, detention or seizure of NATO led forces, mission essential property, or property with special designated status by pirates, armed robbers, or terrorists is authorized.

WARNINGS

ROE 151/
Passing of warnings to pirates, armed robbers, or terrorists by any means, up to and including warning-shots, is authorized.

DIVERSIONS

ROE 161/
Ordering stopping and/or diverting persons, vessels, aircraft, and other vehicles when necessary for the purpose of mission execution is authorized.
ROE 162/

The use of minimum force to compel compliance with the ordering of stopping and/or diverting of persons, vessels, aircraft, and other vehicles when necessary for purposes of mission execution is authorized.

BOARDING

ROE 171/

If unopposed, boarding and searching of vessels suspected of piracy, armed robbery at sea or terrorism is authorized.

ROE 172/

If non-cooperative, use of minimum force to board and search vessels and vehicles of pirates, armed robbers, or terrorists is authorized.

ROE 173/

If opposed, use of minimum force to board and search vessels and vehicles of pirates, armed robbers, or terrorists is authorized.

ROE 174/

Use of minimum force to enter, including search, into civilian property for the purpose of mission execution is authorized.

DETENTION AND SEIZURE

ROE 181/

Seizure of vessels, vehicles, weapons, space assets, or any other material used in carrying out piracy, armed robbery at sea, or terrorist acts is authorized.

ROE 182A/

Use of minimum force to detain pirates, armed robbers at sea, or terrorists located within the JOA is authorized.

AMPL/Detention includes the right to search and disarm.

AMPL/Detention is a temporary measure until such time the detained persons is either released or handed over to the appropriate authorities.

ROE 182B/

Use of non-deadly force to detain persons who pose a threat to mission execution is authorized.

ROE 186/

Use of minimum force to seize vessels, vehicles, weapons, space assets, or any other material used in carrying out piracy, armed robbery at sea, or terrorist acts is authorized.
IDENTIFICATION OF POTENTIAL TARGETS PRIOR TO ENGAGEMENTS

ROE 231/

Prior to any engagement of a suspected pirate, armed robber at sea, or terrorist, positive identification is to be established visually or by one of the following means: IFF, electro optic, electronic support measures, track behavior, flight plan correlation, thermal imaging or acoustic intelligence.

USE OF RIOT CONTROL AGENTS

ROE 321/

Use of non-lethal riot control means including riot control agents to gain control over suspected pirates, armed robbers at sea, or terrorists is authorized.

USE OF FORCE IN DESIGNATED OPERATIONS

ROE 331/

Use of minimum force to prevent interference with NATO led personnel during the conduct of their mission is authorized.

ROE 333/

Use of minimum force to defend any vessel, aircraft, vehicle, space asset, mission essential property, or property with special designated status (PRDSS) threatened by a pirate, armed robber at sea, or terrorist is authorized.

ROE 334/

Use of minimum force to defend intrusion into military restricted areas (MRA) is authorized.

ROE 335/

The use of minimum force to prevent the escape of detained persons is authorized.

ROE 336/

Use of minimum force to recover vessels, aircraft, space assets or other vehicles hijacked by pirates, armed robbers, or terrorists, without hostages on board, is authorized.

ROE 337/

Use of minimum force to secure the release of vessels, aircraft, vehicles, space assets or persons taken by pirates, armed robbers, or terrorists is authorized.

ROE 339/

Close air support in support or defense of NATO led personnel or PDSS for mission accomplishment is authorized.
ROE 352/

Use of indirect fire and crew served weapons is authorized.

INFORMATION OPERATIONS

ROE 364/

Computer network defense against adversary computers or computer systems that have intruded into NATO led forces’ computers or computer networks, including actions that may result in intrusion into intermediary systems or networks, and cause damage to pirate, armed robbers at sea, or terrorist systems or networks is authorized.

ROE 366A/

Conduct of Computer Network Attack (CNA) against pirate, armed robber at sea, or terrorist computers or computer systems which are engaged in or make an effective contribution to activity that threatens NATO led forces or property is authorized.

ROE 366B/

Conduct of Computer Network Attack (CNA) against pirate, armed robber at sea, or terrorist computers or computer systems which are engaged in or make an effective contribution to activity that threatens PDSS or PRDSS are authorized.

USE OF ELECTRONIC COUNTER MEASURES (ECM)

ROE 372/

The use of ECM against communications or electronic systems used by persons preparing to commit, committing or having committed acts of piracy, armed robbery at sea, or terrorism is authorized.

ROE 373/

The use of ECM against satellite links and transmissions supporting acts of piracy, armed robbery at sea, or terrorism is authorized.

AMPL//Retained by COMJFC

OFFENSIVE USE OF FORCE

ROE 421/

Attack against individuals or groups demonstrating a hostile intent (not constituting an actual attack) against NATO-led forces is authorized.

ROE 422//
Attack against individuals or groups demonstrating a hostile act (not constituting an actual attack) against NATO-led forces is authorized.

ROE 423/

Attack against individuals or groups demonstrating hostile intent (not constituting an actual attack) against PDSS or PRDSS is authorized.

ROE 424A/

Attack against individuals or groups which commit or directly contribute to a hostile act (not constituting an actual attack) against PDSS or PRDSS is authorized.

ROE 424B/

Attack against individuals or groups which commit or directly contribute to a hostile act (not constituting an actual attack) against NATO led forces or property is authorized.

ROE 427A/

Attack on pirate, armed robber at sea, or terrorist installations, facilities, or equipment which are engaged in or make an effective contribution to activity that threatens NATO led forces or property is authorized provided any such attack is limited to localized, temporary, and reversible effects.

AMPL//Retained by COMJFC

ROE 427B/

Attack on pirate, armed robber at sea, or terrorist installations, facilities, or equipment which are engaged in or make an effective contribution to activity that threatens PDSS or PRDSS are authorized.

ROE 429A/

Attack on terrestrial-based space assets which are engaged in or make an effective contribution to activity that threatens NATO led forces or property is authorized provided any such attack is limited to localized, temporary, and reversible effects.

AMPL//Retained by COMJFC

ROE 429B/

Attack on terrestrial-based space assets which are engaged in or make an effective contribution to activity that threatens NATO led forces or property is authorized, including attacks that may result in widespread or permanent, nonreversible effects.

AMPL//Retained by SACEUR

ROE 429C/

Attack on terrestrial-based space assets which are engaged in or make an effective contribution to activity that threatens PDSS or PRDSS is authorized provided any such attack is limited to localized, temporary, and reversible effects.

AMPL//Retained by COMJFC
ROE 429D//
Attack on terrestrial-based space assets which are engaged in or make an effective contribution to activity that threatens PDSS or PRDSS is authorized, including attacks that may result in widespread or permanent, nonreversible effects.
AMPL//Retained by SACEUR

ROE 429E//
Attack on on-orbit space assets which are engaged in or make an effective contribution to activity that threatens NATO led forces or property is authorized, including attacks that may result in widespread or permanent, nonreversible effects.
AMPL//Retained by SACEUR

ROE 429F//
Attack on on-orbit space assets which are engaged in or make an effective contribution to activity that threatens PDSS or PRDSS is authorized, including attacks that may result in widespread or permanent, nonreversible effects.
AMPL//Retained by SACEUR

SCHRIEVER WARGAME 2012
INTERNATIONAL GAME

COMMUNICATION PLAN
1. PURPOSE:

This plan supports the SW12 IG and outlines coalition, joint and interagency public affairs actions for all levels in the areas of media relations, internal publicity, and community relations. While international partners have been involved in past games, this game marks the first time play is open to NATO countries.

For the United States, it is important to communicate the National Security Space position with one voice when describing the purpose of the wargame, including the interaction between DoD and other government agencies using space in warfare.

For NATO, it is important to communicate the wargame’s purpose and interaction between NATO, Australia, the U.S., and the other nations participating in the wargame.

2. OBJECTIVES:

a. US Objectives:

1) Build understanding across the National Security Space community on the continuing need to explore space policy, strategy, force structure, and warfighting capabilities.

2) Inform and educate key public audiences on the role and importance of space capabilities to the national defense.

3) Ensure all levels of Department of Defense (DoD) and participating government agency leadership jointly communicate the importance of space contributions to the warfighter. Ensure leadership uses consistent messages when speaking with elected officials, industry leaders, internal audiences, the media, and the general public on the need to examine the role of space in warfare.

4) Secure and maintain public trust that the U.S. is the leader in space technology and planning for the future role of space in diplomacy, economic, development, and international relations.

5) With the international focus of this wargame, ensure effective communications with Australia and NATO nations to reflect and reinforce the international relationship and mutually supportive role these nations have in U.S. space policy.

b. NATO Objectives:
1) Build understanding across the Alliance on the continuing need to explore space policy, strategy, force structure, and capabilities.

2) Inform and educate key public audiences on the role and importance of space capabilities to NATO operations.

3) Ensure all levels of the NATO command structure communicate the importance of space contributions to the warfighter.

4) Secure and maintain public trust that the Alliance is planning for the future role of space in diplomacy, common defence, economic development, and international relations.

c. Australian Objectives

1) Build an understanding of possible Australian space contributions to a wider coalition structure including NATO from a space perspective.

2) Inform and educate key public audiences on the role and importance of space capabilities to coalition operations.

3) Develop Australian space policy and legal experience in the coalition environment.

3. BACKGROUND:

The Schriever Wargame is a series of Air Force Space Command (AFSPC)-sponsored wargames designed to explore critical space issues in-depth, investigate military utility of new space systems, and integrate space support into air, land, space, and cyberspace doctrine. General Shelton envisions the Schriever Wargame series will provide information for future AFSPC requirements, examine organizational constructs, and provide a venue for advancement of space operational concepts. The Schriever Wargame series is at the forefront of investigating these concepts with NATO, interagency, DoD, Intelligence Community, private sector, and Allied nations.

The Space Warfare Center (SWC) at Schriever AFB, CO, hosted the first game in the Schriever Wargame series in January, 2001. The SWC conducted Schriever II in February, 2003, at the Joint National Integration Center at Schriever AFB. Schriever III was held in 2005 and was the first wargame to be held at Nellis AFB, NV. The SWC was redesignated the Space Innovation and Development Center (SIDC) in 2006 and conducted Schriever IV in March, 2007; Schriever V in March, 2009; and Schriever 2010 in May, 2010, all at Nellis AFB.

It is expected future Schriever Wargames will generate the high interest seen during previous Schriever Wargames because of the on-going attention received by space systems supporting overseas contingency operations and other worldwide missions, and the increasing concern for cyberspace security.
Many national and international air and space trade media are interested in the Schriever Wargame and are expected to request information about the wargame.

4. ASSUMPTIONS:

a. Elected officials and the public have a vested interest in the future of the military in space technologies and their applications in warfare.

b. Various media have an interest in the future use of space technologies in warfare and cyber operations and will request details of the wargame.

c. Media will want visuals to go with stories.

d. All audiences will be interested in the new NATO/international focus of this Schriever Wargame, and they will want details of the relationships and participation by international players.

5. TARGET AUDIENCES:

a. External audiences:

- Government leaders including key members of Congress; i.e., House and Senate Armed Services Committees
- Australian Government and Civilian Representatives
- NATO nations, leaders and members of the International Staff/International Military Staff, NATO strategic and operational commands, select NATO agencies.
- Colorado Springs, CO; Las Vegas, NV; and Omaha, NE community leaders, including AFSPC Commanders' Group and USSTRATCOM civic leaders
- Service and space/mission partner leadership; business and industry leadership
- General public in North America, Europe, and Australia

b. Internal audience:

- Leaders and members of the DoD, other government agencies, and Cabinet-level departments participating in the wargame.
- Press releases will be disseminated prior to the start of the wargame and immediately upon completion. (see Attachments 1 and 2 to this document)

6. COMMUNICATIONS POSTURE:

Communications posture is active to inform, educate, and build understanding of international relationships, the nation’s commitment to space and the need to defend our use of both. An active posture will meet the expected demand for information from the media. Specific media will be targeted.
Air Force Space Command Public Affairs will use media and community relations tactics to inform internal and external audiences of wargame activities and the importance of space to the warfighter.

7. KEY MESSAGES:

Commanders and Public Affairs offices involved in the wargame should take every opportunity to discuss their unique capabilities with internal audiences, news media representatives, local community leaders, and other critical audiences. The following messages provide short and memorable statements on participant's roles and missions:

a. Department of Defense:

- **Space role in global stability.** The Schriever Wargame series allows participants to examine the capabilities that must be employed in wartime to ensure global stability. Players will explore how to build the seamless integration of manned and unmanned space systems, support homeland defense and U.S. global and theater interests. These efforts include fully integrating combat, mobility, and space forces horizontally and vertically.

- **Space role in supporting freedom.** From communications to surveillance to intelligence, space assets provide the warfighter real-time information needed to fight today's asymmetrical threats. Space assets are in place before the warfighter arrives in theater, ready to support efforts to ensure freedom across the globe.

- **Space importance in warfare has increased.** Space systems used in Operation IRAQI FREEDOM (OIF) and Operation ENDURING FREEDOM (OEF) showed the role and value of space assets in military operations have increased dramatically. Recent contingency operations proven how space assets have increased accuracy through precision weapons, enabled rapid communications between troops and support forces, provided valuable intelligence and weather information, and enabled theater missile attack warnings to coalition governments worldwide.

- **The U.S. cannot maintain space superiority without Allied support in the space domain.** U.S. Allies provide space capabilities that support U.S. efforts to maintain and improve global stability, mitigate asymmetrical threats, and counter hostile intent and actions against the U.S. and her allies. Australia and NATO space-capable nations such as Canada, France, Germany, Italy, and the United Kingdom provide space capabilities that improve space situational awareness; bolster Intelligence, Surveillance, and Reconnaissance efforts; support environmental monitoring; and provide increased communications bandwidth.
• **Develop a team of space professionals.** The space role in warfare is a team effort. DoD needs the support of many other government agencies to successfully accomplish its mission through space.

b. **Air Force:**

• **Wargaming enhances space, cyberspace, and air integration.** Space, cyberspace, and air integration is the seamless weaving together of our space, air, and information capabilities as the Air Force delivers global vigilance, reach, and power in support of U.S. joint military operations around the globe. Exercising space and cyberspace capabilities results in effective and interoperable space, cyberspace, and air capabilities for the nation.

• **Schriever Wargame explores current and future space capabilities.** Our dominant space, cyberspace, and air forces have allowed the U.S. to move beyond the warfighting concepts it employed in the past. OIF demonstrated the true meaning of interoperable space, cyberspace, and air capabilities by shrinking the time of the ‘kill chain’ toward an ‘instantaneous attack’ capability. For example, through the integration of space, cyberspace, and air resources, troops on the ground can determine the GPS coordinates of a target and transmit that data directly to aircraft loaded with precision ordnance; this ordnance can then be placed on target within a matter of minutes.

• **Wargame Objectives.** SW12 IG, set 11 years in the future, will explore critical space issues in-depth and will investigate the military utility of new space systems in a coalition environment. The objectives of the wargame include:

  o Explore how to optimize space efforts from participating allies in support of a notional NATO expeditionary operation
  o Identify ways to increase the resilience of space capabilities in a contested environment through expanded international and private-sector cooperation and coordination
  o Determine operational challenges associated with defense of space capabilities employed in the operation
  o Examine the operational integration of cyber into defense of the space domain
  o Expand understanding of the operational benefits of broader international participation in combined space operations

• The SW 12 IG scenario depicts NATO counter-piracy operations around the Horn of Africa. Operation JOLLY ROGER is a notional NATO operation supporting a multi-national task force charged with finding and stopping Horn of Africa piracy operations. These piracy operations are supported by—and are supporting—al Shabaab, an al Qaeda affiliate in Africa. The countries involved in the counter-piracy operations include Australia, Canada, France, Germany, Italy, the United Kingdom, and the United States.
Air Force as executive agent for space. Space is critical to the warfighter of the 21st Century. As the DoD Executive Agent for Space, the Air Force is responsible for ensuring the nations' warfighters and national decision-makers have unparalleled space-based capabilities to meet emerging threats.

c. NATO

- Space role in global stability. The Schriever Wargame series allows participants to examine the capabilities that must be employed in wartime to protect and sustain global stability. Players will explore how to best integrate manned and unmanned space systems through a cooperative program that more effectively utilizes space capabilities during operations. These efforts include fully integrating combat, mobility, and space forces horizontally and vertically.

- NATO nations support each other in the space domain. NATO nations provide space capabilities that support NATO operations. NATO space-capable nations such as Canada, France, Germany, Italy, the United Kingdom, and the United States provide space capabilities that improve space situational awareness; bolster Intelligence, Surveillance, and Reconnaissance efforts; support environmental monitoring; and provide increased communications bandwidth.

- Develop a team of space professionals. The space role in warfare is a team effort. NATO needs the support of many nations to successfully accomplish its mission through space.

d. Australia

- Space role in global stability. The Schriever Wargame series allows participants to examine the capabilities that must be employed in wartime to protect and sustain global stability. Players will explore how to best integrate space systems, through a cooperative program that more effectively utilizes space capabilities during operations. These efforts include fully integrating combat, mobility, and space forces horizontally and vertically.

- Australia is developing space capabilities to contribute to coalition operations. Australia is developing space capabilities that improve space situational awareness; bolster Intelligence, Surveillance, and Reconnaissance efforts; support environmental monitoring; and provide increased communications bandwidth. Through developing these capabilities Australia will be able to act in the best interest of the country in space and contribute to coalition capability.

- Develop a team of space professionals. The space role in warfare is a team effort. Australia will need to participate in space in a cooperative manner to successfully accomplish its mission through space.
8. COMMUNICATION TACTICS:

a. External Media:

- AFSPC/PA will take the lead and respond to media queries, to include partnering with Australia and NATO Public Affairs representatives.

- Participating agencies may use the approved messages, news release and Q&A in this plan discuss their organization’s participation in the wargame, and tailor the information to their own media needs.

- NATO Public Affairs will emphasize the wargame as part of “Smart Defense”, linking it to the U.S. engagement plan for the NATO Summit in Chicago in May 2012.

b. Pre-Wargame:

- AFSPC/PA will send a news release and media availability notice (Attachment 1) to all targeted media two days prior to the wargame. Questions from the media will be answered by AFSPC/PA. Specific questions regarding NATO should be directed to NATO Public Affairs.

c. During the Wargame:

- During the wargame, AFSPC/PA will field media queries and work each on a case-by-case basis, using the approved news release and Q&A, and setting up interviews with approved spokespersons.

- AFSPC/PA will facilitate a media event involving a roundtable of U.S. and international participants and the game director. Media representatives will also visit the game floor at Nellis AFB and ask questions of U.S. and international participants and the game director.

d. Post-Wargame:

- AFSPC/PA will release a prepared public statement (Attachment 2) at the conclusion of the wargame.

- AFSPC/PA will provide all media products to the following services and agencies participating in Schriever Wargame:

  - DoD
  - USCENTCOM
  - USEUCOM
  - NRO
  - NGA
  - DCI
  - Australia
  - NATO nations
  - Dept. of Commerce
  - NATO HQ
  - NATO HQ
- USSTRATCOM - FEMA - ACO
- USSOUTHCOM - Dept. of Transportation - ACT
- USPACOM - Dept. of State - JFC Brunssum
- USSOCCOM - EA4SS - JFC Naples
- USNORTHCOM - FEMA - JWC
- USTRANSCOM - ACC - NC3A
- USAFRICOM - AFRL - NCSA
- NORAD - AFMC - JAPCC
- JCS - AFC2ISRC
- NASA - Office of Homeland Security
- NSA - U.S. Navy Organizations
- DISA - U.S. Army Organizations

e. Community/Legislative Relations:

- AFSPC/A8L will provide the pre-game news release to Colorado and Nevada congressional members and members of the House and Senate Armed Services Committees one day prior to public release.

- AFSPC/PA will provide pre-game news release to Colorado and Nevada state leaders, Colorado Springs and Las Vegas leaders, Air Warfare Center Commanders Group, civic leaders, and AF Space Command Commanders Group civic leaders one day prior to public release.

9. TIMELINE:

Information Action Timeline

a. Media training for designated spokespersons, as needed

b. News release sent to Congressional, Colorado, and Nevada leaders

c. News release sent to all targeted media

d. Media event during SW12 IG

e. Post-wargame statement provided to all targeted media

f. Wrap-up news release on results of the wargame sent to all targeted media after publication of Schriever Wargame Final Report

10. SPOKESPERSON:

AFSPC/A8XC: Lt Col Roger Bishop
11. PUBLIC AFFAIRS POINTS OF CONTACT:

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    CMCL: 703-614-7901

SAF/PA: Maj Tracy Bunko
        DSN: 671-2777
        CMCL: 703-571-2777

AFSPC/PA: Mr. Anthony Roake
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12. OPERATIONAL SECURITY (OPSEC):
Observe good OPSEC. Compiled unclassified information can often reveal sensitive information that can provide adversaries with insight into operations. All involved with Schriever Wargame must make it a priority to observe proper OPSEC and protect key information, both classified and sensitive, when communicating Schriever Wargame details to internal and external audiences.

13. WARGAME QUESTIONS AND ANSWERS:

The following questions and answers may be used to respond to media queries regarding the Schriever Wargame 2012 International Game. Any questions beyond this scope should be referred to AFSPC/PA for response.

Q1 Why is Schriever Wargame important to the Air Force?
A1 Today, the Air Force cannot fight precisely without space assets and without preparing for the potential disruption or denial of critical space systems used by U.S and allied forces. Schriever Wargame gives the Air Force and all space-mission partners a better idea of how to protect space assets from adversaries and how to better integrate space systems through our national security community.

Q2 What is the difference between an exercise and a wargame?
A2 Exercises are training events for existing forces using near-term scenarios at the tactical level. Wargames look to the future, primarily at the operational level and above, to identify future force planning requirements and systems integration.

Q3 Has there ever been a wargame like this before?
A3 Schriever 2001 was the first of a series of wargames designed as a key instrument to explore future space issues and integrate space capabilities throughout the national security community. Schriever II, III, IV, V, and 2010 continued the tradition, focusing on examining space and cyberspace policy, rules of engagement, and protection of space capabilities. SW12 IG is the first time this wargame has been open to NATO and NATO nations.

Q4 Which NATO, Australia and U.S. agencies are involved in SW12 IG?
A4 NATO organizations include the International Staff, the International Military Staff, Allied Command Operations, Allied Command Transformation, Joint Force Command Brunssum, Joint Force Command Naples, Joint Warfare Center, NATO Communication and Information Systems Services Agency, NATO Consultation, Command and Control Agency, and the Joint Air Power Competency Centre

Australian organizations include: Air Force Headquarters, Strategic Policy - Space and Missile Defence Policy, Defence Imagery and Geospatial Organisation.

U.S. agencies involved with Schriever Wargame include Air Force Space Command, Army Space and Missile Defense Command, Naval Network and Space Operations Command, National Reconnaissance Office, National Security Space Organization, Air Combat
A - 31


Q5 What is the level of participation of these agencies?
A5 Participation ranges from organizational leadership to action officers.

Q6 Are commercial organizations involved?
A6 Yes. Commercial space companies play an important role in U.S., Australian and European space operations, primarily in communications, imaging, and space launch. Military and commercial representatives work together daily to ensure the full integration of U.S. and European space assets. Their participation in Schriever Wargames serves to enhance the understanding between all involved and to integrate and solidify our ongoing partnership.

Q7 Are Allied nations represented?
A7 Yes. Representatives from Australia and the NATO nations of Canada, France, Germany, Italy, the United Kingdom, and potentially other NATO nations will participate.

Q8 How did the SIDC choose the personnel to participate in the exercise?
A8 Individuals are selected to participate in Schriever Wargame based upon their subject matter expertise, experience, and the needs of the game. The game was designed to examine space issues; however, the best way to examine those issues and their integration with terrestrial assets is to obtain a cross section of expertise from many different functional areas within the Army, Navy, Air Force, Marine Corps, and governmental agencies.

Q9 What exactly is Schriever Wargame?
A9 Schriever Wargame is a series of Air Force Space Command-sponsored wargames designed to explore critical space issues in depth, investigate military utility of new space systems, and evolve air, space, and cyberspace doctrine with a focus on deterrence and warfare through the utilization of space assets.

Q10 How long is the wargame?
A10 The wargame generally spans five days of actual game play.

Q11 What are the AFSPC objectives of Schriever Wargame?
A11 The AFSPC objectives of SW12 IG include exploring how to optimize space efforts from participating NATO allies and Australia in support of a notional NATO expeditionary operation; identifying ways to increase the resilience of space capabilities in a contested environment through expanded international and private-sector cooperation and coordination; determining operational challenges associated with defense of space.
capabilities employed in support of the operation; examining the operational integration of cyber into defense of the space domain; and expanding understanding of the operational benefits of broader international participation in combined space operations.

Q12 What is the cost of these wargames to the taxpayers?
A12 The budget for SW12 IG is approximately $3 million. International organizations incur no cost for game execution but do pay for their team member travel and incidental expenses.

Q13 What is the scenario being played in the wargame?
A13 The SW12 IG scenario depicts NATO counter-piracy operations around the Horn of Africa. Operation JOLLY ROGER is a national NATO operation supporting a multi-national task force charged with finding and stopping Horn of Africa piracy operations. These piracy operations are supported by—and are supporting—al Shabaab, an al Qaeda affiliate in Africa. The countries involved in the counter-piracy operation include Australia, Canada, France, Germany, Italy, the United Kingdom, and the United States.

Q14 Do the ‘Red’ forces represent a known adversary?
A14 In previous Schriever Wargames, ‘Red’ forces were created by calculating what the global geopolitical landscape might look like in 10 years with potential adversaries ranging from state to non-state actors. The SW12 IG scenario has identified Horn of Africa pirates and al Shabaab as non-nation-state adversaries.

Q15 Who will be briefed on the results of the wargame?
A15 The results of the game will be briefed to the Secretary and Chief of Staff of the Air Force, commanders of Air Force Space Command and U.S. Strategic Command, selected agencies within the U.S. Government, Australia, and NATO allies. Allied Command Transformation will brief national delegations to NATO, NATO Headquarters, Allied Command Operations, and select organizations within NATO.

Q16 When will results be available to the public?
A16 The wargame results are classified. However, an unclassified final report will be available in approximately six months. The results must be briefed within DoD and the participating agencies before results can be publically released. The unclassified NATO report will be made available once cleared for public release.

Q17 How will AFSPC implement lessons learned from Schriever Wargame?
A17 Wargames potentially generate more questions than answers. These questions then drive more in-depth studies of particular issues, such as how we protect our critical space assets. The results of the game will be published in a final, classified report that will be presented to the Secretary and Chief of Staff of the Air Force. In addition, the wargame will identify areas for more in-depth study that will be presented to HQ AFSPC and HQ USAF to prioritize and investigate.

Q18 How long did it take to plan and organize the wargame?
A18 Initial planning for this year’s Schriever Wargame began in June 2011. Normally, two years are allowed for planning and execution of the wargame and supporting events.

Q19 Will there be another wargame like this in the future?
A19 We look forward to a series of games that provide benefit to all services, agencies, and offices for full integration of space systems into coalition and joint operations in support of National Defense. Wargames such as Schriever Wargame help to develop a professional space cadre of military and civilians for all nations and organizations involved.

Q20 What importance is placed on wargames to develop military plans, doctrine, and tactics?
A20 Wargames are test beds to look at new concepts and doctrine and explore how they will integrate with future military operations.

Q21 Should there be a separate Space Force?
A21 The goal of the game is to explore military and commercial space issues in depth, investigate the military future and possible needs for new space systems, and provide a forum for evolving air and space doctrine. Air Force space operations are interdependent whether in the air, on the land, or at sea. The Air Force is an air, space, and cyberspace force.

Q22 Is this wargame a result of the recommendations of the space commission or 9/11 Commission Report?
A22 No. These series of wargames were planned independently.

Q23 Why is the emphasis this year on international participation? Did anything in particular drive the increased NATO focus/participation for this wargame?
A23 Previous iterations of the Schriever Wargame included participation by Australia, Canada, and the United Kingdom and SW12 IG is no different. Seeking to further engage and coordinate U.S. space policy and operations with our NATO allies, Secretary of the Air Force, Michael B. Donley, and Air Force Chief of Staff, General Norton A. Schwartz, directed the inclusion of NATO in this wargame. General William L. Shelton, AFSPC/CC, and General Mark A. Welsh, Director of NATO’s Joint Air Power Competence Centre, discussed how best to increase international participation in the Schriever Wargame, which resulted in an invitation being sent to NATO headquarters. To date the space-capable NATO nations of Canada, France, Germany, Italy, and the United Kingdom have accepted to date.

Q24 What types of space capabilities and systems are NATO countries providing/using in this wargame?
A24 NATO nations will provide systems and capabilities to boost space situational awareness; improve Intelligence, Surveillance, and Reconnaissance efforts; enhance environmental monitoring, and increase communications bandwidth.
Q25  Are senior advisors being used for these wargames? If so, what is the Air Force doing to comply with SECDEF guidance on senior advisors?

A25  Yes, one senior advisor will participate in the wargames. The advice, counseling, assistance and training provided a senior advisor based on his special expertise and work experience within the Department of Defense is invaluable to wargame participants. The SIDC has taken measures to ensure the senior advisors' participation in the wargame is consistent with the intent and purpose of the SECDEF's guidance.
NEWS RELEASE
AIR FORCE SPACE COMMAND  
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FOR IMMEDIATE RELEASE
Release Number: 12-04-XX
Date

SCHRIEVER WARGAME 2012 SET TO BEGIN
PETERSON AFB, Colo. -- The Space Innovation and Development Center will conduct the seventh Schriever Wargame at Nellis Air Force Base, Nev., starting April 20, 2012.

The Schriever Wargame, set in the year 2023, will explore critical space issues and investigate the integration activities of multiple agencies associated with space systems and services. Schriever Wargame 2012 International Game (SW12 IG) will include international partners from Australia, Canada, the United Kingdom, and for the first time in its history, country representatives within the NATO Alliance from France, Germany and Italy.

The objectives of the wargame will center on: 1) examining options of how to optimize space efforts from participating allies and Australia in support of a notional NATO expeditionary operation; 2) identifying ways to increase the resilience of space capabilities in a contested environment through expanded international and private-sector cooperation and coordination; 3) determining operational challenges associated with defense of space capabilities employed in support of the operation; 4) examining the operational integration of cyber into defense of the space domain; and 5) expanding understanding of the operational benefits of broader international participation in combined space operations.

The SW12 IG scenario depicts NATO counter-piracy operations around the Horn of Africa. Operation JOLLY ROGER is a notional NATO operation supporting a multi-national task force charged with finding and stopping Horn of Africa piracy operations. These piracy operations are supported by—and are supporting—al Shabaab, an al Qaeda affiliate in Africa.

The Space Innovation and Development Center will conduct this wargame on behalf of Air Force Space Command headquartered in Colorado Springs, Colo. Approximately 270 military and civilian experts from more than 30 agencies around the country as well as from Australia and NATO nations will participate in the wargame.

American Aerospace Defense Command, Defense Information Systems Agency, the National Geospatial Intelligence Agency, the National Security Agency, National Aeronautics and Space Administration, the Office of Homeland Security, Department of Transportation, Department of State, and the Department of Commerce.

A media roundtable will be held (date/time) at (location). The roundtable will include U.S. and international participants as well as the game director (list names and job titles if known). Media representatives will also be able to photograph and videotape the game floor. Media representatives will be able to call in to the roundtable if they cannot attend in person. Contact AFSPC/PA at 719-554-3731 to RSVP for the roundtable and receive additional instructions on how to attend or call in.

-30-
SCHRIEVER WARGAME CONCLUDES

NELLIS AFB, Nev. -- The seventh in a series of Air Force Space Command wargames concluded here today. Set in the year 2023, Schriever Wargame 2012 International Game (SW12 IG) explored critical space issues in depth and investigated the military utility of new space systems.

The objectives of the wargame centered on: 1) examining options of how to optimize space efforts from participating NATO allies and Australia in support of a notional NATO expeditionary operation; 2) identifying ways to increase the resilience of space capabilities in a contested environment through expanded international and private-sector cooperation and coordination; 3) determining operational challenges associated with defense of space capabilities employed in support of the operation; 4) examining the operational integration of cyber into defense of the space domain; and 5) expanding understanding of the operational benefits of broader international participation in combined space operations.

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Approximately 270 military and civilian experts from more than 30 agencies around the country as well as representatives from Australia, Canada, France, Italy, Germany, and the United Kingdom participated in the wargame.


-30-
UN SCR 3328 (1 June 2023)

The Security Council,

Recalling all previous resolutions on the situation the Horn of Africa region, in particular resolutions 2779 (2018), 3268 (2021), 3306 (2022), 3314 (2022), and 3321 (2023),

Expressing grave concern at the dire humanitarian situation in the Horn of Africa region, and its impact on the people in the region, in particular on women and children, and calling on all parties to ensure full and unhindered access for the timely delivery of humanitarian aid to persons in need of assistance throughout the Horn of Africa,

Continuing to be gravely concerned by the dramatic increase in coordination between terrorism, piracy and armed robbery at sea and by the threat that these activities pose to the safe and secure delivery of humanitarian aid in the region,

Reiterating its condemnation of all attacks on regional Government and military personnel and facilities; United Nations personnel and facilities; and the civilian population by armed opposition groups and foreign fighters, particularly Al Shabaab, and stressing that armed opposition groups and foreign fighters, particularly Al Shabaab, constitute a terrorist threat to the Horn of Africa, and the international community,

Noting Al Shabaab’s efforts to replace Al Qaeda, stressing that there should be no place for terrorism or violent extremism in the Horn of Africa region, and reiterating its call upon all opposition groups to lay down their arms,

Welcoming the fifth anniversary of the creation of the International Criminal Tribunal for the Horn of Africa (ICTHA) and the International Detention Facility (IDF) for the ICTHA for the prosecution and detention of terrorists, armed robbers at sea and pirates in the region, created by resolution 2779 (2018),

Noting the consent of Djibouti, Eritrea, Ethiopia, Kenya, and Somalia to conduct UN sanctioned military operations authorized in this resolution within their sovereign territory, waters and airspace,

Noting Sudan’s, South Sudan’s, and Yemen’s agreement to permit UN sanctioned military operations authorized in this resolution within their sovereign territory, waters, and airspace, with their prior consent,

Reaffirming its respect for the sovereignty, territorial integrity, political independence, and unity of Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Yemen and reiterating its commitment to a comprehensive and lasting settlement of the situation in the Horn of Africa Region,

Welcoming the letter from the Secretary General of the North Atlantic Treaty Organization, offering to lead an international military force consisting of NATO nations and Australia to address the increasing threat in the Horn of Africa region,

Determining that the incidents of piracy, armed robbery at sea and terrorism in the Horn of Africa region and the increased coordination between groups involved in these activities constitutes a threat to international peace and security,

Acting under Chapter VII of the Charter of the United Nations,

1. Condemns and deprecates all acts of piracy, armed robbery at sea and terrorism in the Horn of Africa region,
2. Urges all States to render assistance to vessels threatened by or under attack by pirates or armed robbers, in accordance with relevant international law,

3. Calls upon a NATO-led force to suppress piracy, armed robbery at sea and terrorism within the sovereign territory of Djibouti, Eritrea, Ethiopia, Kenya, Somalia; and also South Sudan, Sudan, and Yemen (with their prior consent); international waters in the Gulf of Aden, Gulf of Oman, and Indian Ocean (including the contiguous zone and exclusive economic zone (EEZ)); international airspace over the Gulf of Aden, Gulf of Oman, and Indian Ocean; and outer space, and to create a safe and secure environment to ensure the delivery of humanitarian aid throughout Djibouti, Eritrea, Ethiopia, Kenya, and Somalia,

4. Authorizes the Member States participating in the NATO-led military force to take all necessary measures to fulfill its mandate,

Decides to remain actively seized of the matter.
Final Outbriefs

Five Minute War:

(U) Road to 2023 and Scenario

- (U) Al Shabaab, was an al Qaeda affiliate, but is now the primary terrorist threat in the Horn of Africa (HoA) and beyond
- (U) Closely tied to the pirates in the region
- (U) Has advanced technology including space and counter-space capabilities
- (U) Drought and famine in HoA drive need for a multinational relief effort
- (U) Led by European Union with global support
- (U) Delivery of aid and relief effort personnel harassed by al Shabaab and pirates
- (U) North Atlantic Council generated Initiating Instruction based on UN Security Council Resolution to address these problems
  - (U) Key NATO countries offer forces
  - (U) Australia agrees to support effort and work with NATO forces

(U) Move One (10 August 2023)

- (U) As forces move into HoA, Egypt Sat-1 and Brazilian SCD-2 collide due to space environment, increased concerns in LEO
- (U) Commercial imagery providers report a surge of imagery requests for HoA region, includes al Shabaab front companies
- (U) NATO forces experience sporadic GPS and comm jamming
- (U) German satellite ground station at Usingen experienced a power outage and problems with its back-up power
- (U) Task Group Four stops a pirate attack and tracks pirates back to a port at Kismaayo, Somalia

(U) Move Two (11-14 August 2023)

- (U) Comm and GPS jamming increase but have minimal effect
- (U) Iridium-2 satellite collided with debris from earlier collision
- (U) NATO ground stations in France, Germany, and Italy are attacked via cyber and other methods
- (U) Al Shabaab operatives launch two Club-K missiles at Djibouti, one missed and one intercepted by a Patriot
(U) Move Three (15-20 August 2023)

- (U) Italy and Netherlands launched microsatellites to support Operation Jolly Roger
- (U) Space Data Association (SDA) reported a suspected cyber attack on their Space Situational Awareness (SSA) capabilities
- (U) Netherlands satellite in GEO experienced problems
- (U) NATO forces coordinated cyber defenses
- (U) JFC forces attacked pirates and al Shabaab in Kismaayo
  - (U) Eight pirates killed in the assault and twenty-four captured
  - (U) Attack overcame surface to air missiles and GPS/comms jamming
- (U) Al Shabaab and pirates conducted attacks on various NATO forces

(U) Move Four (21-26 August 2023)

- (U) NATO forces replaced capabilities lost in Djibouti attack
- (U) NEMOS, an Italian microsat, experienced comm problems, causing additional issues for other microsats
- (U) French and US Special Forces responded to distress calls by multinational relief effort workers
  - (U) Darkness and fog of war, compounded by comm and GPS jamming, resulted in fratricide incident

(U) Wrap Up (27-31 August 2023)

- (U) Computer Network Exploitation (CNE) combined with law enforcement efforts help shut down al Shabaab funding and cyber support
- (U) Passive measures by Blue forces negated most of the impact of the GPS and communications jamming
- (U) Active measures by Blue forces began to eliminate the sources of GPS and communications jamming
- (U) Al Shabaab goes into hiding in an attempt to preserve their remaining people, money, and other resources
- (U) Thanks to everyone for coming so prepared that the Blue players challenged Adjudication
- (U) Although a relatively small operation, it proved to be challenging to both space and cyber, not just regionally, but globally as well
  - (U) It is about links, nodes, infrastructure, and the users
SHAPE Observations

• **OBSERVATION 1:** No existing organizations, agencies, cells within the NATO command structure dedicated to Space.

• **TAKE AWAY 1:** At the highest level, NATO needs to provide clear policy and guidance that directs the establishment of a NATO space coordinating body, defines the architecture, and development of the necessary CONOPS, MOUs and command relationships.

SHAPE Observations

• **OBSERVATION 2:** OPS / LEGAD Aspects in Space / Cyber Environment

• **TAKE AWAY 2:** NATO’s supporting doctrine, especially in the legal environment, to Cyber and Space capabilities is underdeveloped. NATO ROE Doctrine (MC 362) contains only 5 ROEs which expressly address Cyber issues. There are no space ROEs. Additionally, NATO Targeting Doctrine does not expressly address cyber or space targeting.

SHAPE Observations

• **OBSERVATION 3:** Space Education, Training and Knowledge Development

• **TAKE AWAY 3:** By and large, general knowledge and understanding of how we operate in the space environment is deficient. There currently exists small pockets of Space subject matter expertise at various levels in the NATO Command Structure but more in depth training and education is required.
JFC:

**JFC in the NATO Command Structure**

- NATO HQ
- SHAPE
  - JFC Eremussum
  - JFC Naples
  - JFC Lisbon

JFC Team SW12:
- 5 JFCBS
- 24 VNC
- (30 people from 11 differentiations)

VNC – Voluntary National Contribution

**Wargame Objectives**

1. Explore...
2. Identify...
3. Determine...
4. Examine...
5. Expand...

#5: Understand operational-level benefits of broader international participation in combined Space operations

**Coordination**

JFC Space Coordination Working Group

Joint Prioritised Space Effects List (JPSEL)

**JFC Components**
- Nations
- Partners
- SHAPE

UNCLASSIFIED
JFC Battle Rhythm

WG/Boards

DARB

SCWGC

JCB

Chair COM JFC

Final

JPSEL

Decision & Guidance

JPSE

National Space

Ops Centers

or Combined Space

Ops Center

Taking For

EXECUTION

DARB – Daily Assets Reconnaissance Board
JCB – Joint Coordination Board
JPSEL – Joint Prioritized Space Effects List
JPSEP – Joint Prioritized Space Effects Plan
SCWGC – Space Coordination Working Group

Developing Space Knowledge

- Formalise Bi-SC Integrated Project Team – SACT led
- Future Wargame / Exercises / Training
  - Schriever Wargame 13 ??
  - NATO Response Force (NRF) certification exercises (JFC/JWC)
  - Professional education
  - Exploring Space Support Teams
  - NATO School (Oberammergau, DEU)
  - NATO Space Operational Planning Course

JWCC – Joint Warfare Center (Stavanger, Norway)

EUCOM:

EUCOM Takeaways

- U.S. Command Relationships
  - Define Supported / Supporting Relationships
  - Roles and Exchanges between GCC and USSTRATCOM
  - DRLAUTH between NATO and EUCOM

- Space and Cyber Cooperation
  - Global Space Operations Council / Combined Space Operations
  - GCCs lead regional and country-specific cooperation across all domains
  - Synchronize space/cyber coop with GCC coop
STRATCOM:

**Takeaways**

- Good opportunity for STRATCOM to exercise US national processes in support of a multi-national operation
- Balance between global space/cyber operations and space/cyber support to specific operations
- Benefit of coordination and collaboration among space organizations in areas of common interest and concern
- Rich environment for learning and building relationships

Interagency:

**Interagency Cell Observations**

- A framework for whole of government space responsibilities and relationships needs more intellectual development
- Starting with civil and defense, and growing to include whole of nation
- Tailored to support to specific operations
- Based on appropriate regulatory regimes, policy, and roles and functions (diplomatic, information, military, and economic)
- Must include and account for our extant and developing international partnerships (bilaterally and multilaterally)
- Mission assurance and resiliency in support of a NATO expeditionary operation requires:
  - Information sharing constructs
  - Synchronized space requirements
  - Coordinated national space capability provision
Industry:

Optimize Space Efforts

- Nations must present comprehensive capabilities, both government and commercial, to the operational commander
- Governments must track industrial capabilities and ideas
- Tasking, funding and legal arrangements must be in place
- Use industry to coordinate cross-national commercial capabilities
- Consider apportioning space assets to the operational commander
- Use industry’s capabilities to deliver actionable information resulting from all source fusion
- Industry supports Global Space Operations Council concept
- Involve commercial industry for specific issues

Resilience

- Source capabilities from multiple providers to achieve resilience
- Collectively, commercial industry has multiple systems and redundant space and ground infrastructure
- Security of space enterprise
  - Imperative to share space and cyber situational awareness, threats, indications and warnings between government and industry
  - Reduce debris by establishing international norms of behavior and legal arrangements – protected C2 centers, end-of-life mechanisms
  - Industry must have access to accurate and timely conjunction analysis
  - National protection of end-to-end critical industrial national infrastructure (cyber/physical)
Australia:

**Australian/NATO Relationships**

- **Observation:** Australia was able to explore how it can contribute its space capabilities in support of NATO operations.

- **Take Away:** Australia concluded it can positively contribute to NATO operations and was able to identify and establish relationships with NATO that would expand Australia's space resilience.

**Australian Participation**

- **Observation:** AUS and NATO do not always directly share areas of operational interest. Therefore, Australia assessed future involvement and operational benefits in participating in a NATO space wargames would be dependent on the scenario.

- **Take Away:** AUS will participate again in NATO space war games as long as the scenario remains relevant to AUS in order to maximise AUS involvement.

**Information Sharing**

- **Observation:** Need to develop a multi-national space information sharing environment is critical for the efficient and robust provision of space services.

- **Take Away:** Create a coordinating information sharing structure which allows passing of appropriate space information at differing classifications, between state and non-state space players, from multiple sources (military, commercial & civilian) is difficult, takes time to establish and is complex to achieve but will enable better fidelity of the space environment.
Global Operations

- **Observation:** Although the wargame was based in the Horn of Africa, the activity moved to a **global level** involving activities across the planet and players outside AOO, which is an accurate reflection of the nature of space operations.

- **Take Away:** Regardless of the AOO identified in the scenario any space wargame will go global and the players and wargame constructors should be in a position to include global events and effects.

Rules of Engagement

- **Observation:** National positions regarding the characterisation of operations as amounting to international armed conflict, non-international armed conflict, peacekeeping, or law enforcement activities, directly affect ROE development and legal / policy constraints applied to military forces.

- **Take-away:** Consultation and shared awareness among contributing nations regarding the legal regime should occur as part of operational planning and force contribution decisions. An appreciation of these national assessments is a pre-requisite to understanding assumptions underpinning ROE development, and individual caveats or amplifications.

Canada:

- **Space is everyone’s business**
  - Critical to all aspects of our modern life
  - Need to manage and encourage responsible behaviour by all nations

- **Space is part of an integrated fight**
  - Not all space capabilities or space effects need to be the direct concern of the traditional warfighter
  - Need to cooperate better with industry to ensure we consider their needs with those of the operation
Canada - Observations

- Space is its own operational domain
  - Must be treated like sea, land, and air operations
  - Doctrine must evolve to include space appropriate planning frameworks, tactics, techniques, and procedures

- Space capabilities and space effects
  - Need to develop a common understanding of what we mean by space effects and space capabilities
  - Command and control

France - Observations 1/2

Schrödinger Wargame 12 demonstrated that operations can be supported and are impacted by space capabilities

- NATO space operational organization
  - Observation: SAC support to JFC could be improved
    - Take Away: OPCON level needs strategic inputs from OPCOM level
    - Take Away: SAC mission inside SHAPE needs enhancement
  - Observation: SCA and SCWG have shown efficiency and relevance
    - Take Away: senior space COMJUCF advisor should be designated as SCWG leader, instead of J3
  - Observation: this operation simulated a single NATO operation
    - Take Away: this organization has to be experimented with multiple operations
Observation #1:

Participating in Regional Combined Space Operations Implies that

- National Ground Space Assets become a high value target and any attack on them has a direct impact on the operations.
- The use of space high technology “opens a gate” for enemy attack on national assets.

Take Away:

Security is paramount – Cyber, Sabotage and Anti-jamming defence

Observation #2:

Space debris, uncontrolled satellites and re-entry are a continuous threat.
Present Space Situation Awareness is fragmented

Take Away:

Space Situation Awareness (SSA) capability is important, but it is fundamental to create a common SSA
- **Observation #3:**
  
  Enemy uses commercial services against friendly forces (i.e. imagery, cell phones, GNSS, etc.)

- **Take Away:**
  
  Need for more robust, shared and common Shutter Control policy and rules

- **Observation #4:**
  
  For Combined Space Ops NATO structure is not optimized for integrating, coordinating and synchronizing Coalition Space Assets. Many options were considered but still need to be tested

- **Take Away:**
  
  For Combined Space Operations a new NATO structure at SHAPE and JFC level should be considered

- **Observation #5:**

  **Legal aspects:**

  In Combined Space Ops, Space becomes a new battlefield with no “ius in bello” (warfare legislation) established rules
  
  Space and Cyber domains are intimately connected

- **Take Away:**

  Need to set up National and NATO ROE for Combined Space Ops
  
  Need to improve a legal framework (ROE and national legislations) of Cyber Ops
Thanks

Final Observation:

It has been an honour and pleasure to be part of Schriever Wargame 12

Italian Delegation experienced an outstanding training for Combined Space Operations

Special thanks to USAF for hosting us!

Hope to see you at SW’13!!

Germany:

The Netherlands:

Netherlands Observations

- Relevance
- Timely
- Awareness
- Together
- Follow-up

Turkey:
Turkish Objectives

- Turkey is a role player in space
- Talk to other nations and learn about their experiences
- Challenge ourselves within the laboratory provided
- Feasibility of Combined Space Operations
- How to integrate space into battlefield operations

Lessons Learned

- Space is a collaborative effort
- We were not just an observant, but also a contributor
- SMEs are needed for the accomplishment of mission
- Combined Space Operations is a tough task
- A chance for emerging countries to learn from mistakes made before
- Create internal scenarios for future wargames
- Space is not only about acquiring images

UK Perspective

- Who are we?
  - UK (political, military, civil, commercial, academic)
  - NATO, EU, ESA, FDA, UN

- How do we work together?
  - Common terminology, data sets, communications
  - Shared awareness vs fratricide

- What next?
  - Awareness – Influence – resource and output
  - National contributions
  - If not us then who?
Annex B: Schriever Wargame 2012 International Workshops

**SW12I Concept Development Conference**

The Schriever Wargame Team Concept Development Conference was conducted in Fairfax, Virginia on 7-9 September 2011 and included action officers from the United States Air Force Space Command, Joint Air Power Competence Centre, and Allied Command Transformation. The conference set the foundation for SW12I and educated the Schriever Wargame team on NATO Space capabilities and NATO command structure.

**SW12I NATO Partnership Seminar**

The Schriever Wargame Team hosted the SW12I NATO Partnership Seminar at the Space Innovation and Development Center (SIDC), Schriever AFB, CO, on 4-6 October 2011. The purpose of the conference was to explore the integration of NATO partner capabilities in the Space domain. The seminar examined operational and strategic issues associated with using the Space domain, how to engage with individual Space capable nations for the purpose of matching capabilities to requirements, and captured NATO viewpoints and perspectives for incorporation into the SW12I wargame.

**SW12I ROE Workshop**

Allied Command Transformation hosted the SW12I ROE Workshop in Fairfax, Virginia on 30 November – 1 December 2011. The purpose of this event was to bring together NATO and participating nation experts in Space and international law to develop NATO ROE to support the SW 12 scenario. Lawyers from Allied Command Transformation, SHAPE, and JFC Naples drafted notional ROE, including Space ROE, using the MC 362 document as a guide.

**SW12I Strategic and Operational Workshops**

Allied Command Transformation and the JAPCC hosted a SW12I Strategic Workshop in Brussels, Belgium and an Operational Workshop at JFC Brunssum on 16-19 January 2012. The Strategic Workshop informed NATO organizations and nations about SW12I and finalized strategic documents required for the wargame. The Operational Workshop developed the background materials and processes needed for effective SW12I play at the operational level including a notional Space order of battle, OPLAN, Annex DD and manning requirements.
Annex C: Acronyms

A
ACC – Air Component Command (NATO)
ACO – Allied Command Operations (NATO). See also SHAPE.
ACT – Allied Command Transformation (NATO)
ADC – Air Defence Committee (NATO)
AFB – Air Force Base
AFSPC – Air Force Space Command (USA)
AJP – Allied Joint Publication
AOI – Area of Interest
AOO – Area of Operations
AU – African Union
AUS - Australia

B
BPC – Building Partnership Capacity

C
CAN – Canada
CC – Component Commander
CCOMC – Comprehensive Crisis Operations Management Cell (NATO)
CE – Crisis Establishment
C-IED – Counter Improvised Explosive Device
CMC – Chairman of the Military Committee (NATO)
CME – Coronal Mass Ejection
CNE – Computer Network Exploitation
CO - Colorado
COMSAT – Commercial Satellite
COSSS – Commercial On-Orbit Satellite Servicing Solutions

D
DARB – Daily Asset Reconnaissance Board
DEU – Federal Republic of Germany
DIRLAUTH – Direct Liaison Authority
DNK – Denmark
DPL – Denied Priority List
DOS – Department of State (USA)
E
ECM – Electronic Counter Measures
EM – Electro-magnetic
EU – European Union

F
FAA – Federal Aviation Administration (USA)
FON – Freedom of Navigation
FRA – France

G
GBR – the United Kingdom
GEO – Geosynchronous Earth Orbit
GPS – Global Positioning System
GSpOC – Global Space Operations Council

H
HA – Humanitarian Assistance
HoA – Horn of Africa

I
ICAO – International Civil Aviation Organization
ID - Identify
IMS – International Military Staff (NATO)
IS – International Staff (NATO)
ISAF – International Security Assistance Force
ISR – Intelligence, Surveillance, and Reconnaissance
ITA – Italy

J
JAPCC – Joint Air Power Competency Centre
JFC – Joint Force Command
JFC-B – Joint Force Command Brunssum (NATO)
JOA – Joint Operating Area

K

L
LCC – Land Component Command (NATO)
LEO – Low Earth Orbit
M
MC – Military Committee (NATO)
MCC – Maritime Component Command (NATO)
MD – Missile Defense
MILREP – Military Representative (NATO)

N
NAC – North Atlantic Council (NATO)
NASA – National Aeronautics and Space Administration (USA)
NATO – North Atlantic Treaty Organization
NATO HQ – North Atlantic Treaty Organization Headquarters
NLD – the Netherlands

O
OOB – Order of Battle
OPLAN – Operation Plan
OST – Outer Space Treaty

P
PE – Peacetime Establishment
PNT – Precision Navigation and Timing
POC – Point of Contact

Q
R
RAIDRS – Rapid Attack Identification, Detection and Reporting System
RFI – Request for Information
ROE – Rules of Engagement

S
S & C – Space and Cyber
SA – Situational Awareness
SAC – Space Awareness Cell (NATO)
SACT – Supreme Allied Commander Transformation
SCA – Space Coordination Authority
SCADA – Supervisory Control and Data Acquisition
SCWG – Space Coordination Working Group (NATO)
SDA – Space Data Agency
SHAPE – Supreme Headquarters Allied Powers, Europe (NATO)
SIDC – Space Innovation and Development Centre (USA)
SIGINT – Signals Intelligence
SJO – Small Joint Operation
SME – Subject Matter Expert
SOCC – Special Operations Component Command (NATO)
SSA – Space Situational Awareness
STM – Space Telemetry Management
SW – Schriever Wargame
SW12l – Schriever Wargame 2012 International

T
TTC – Tracking, Telemetry, and Control
TTP – Techniques, Tactics, and Procedures
TUR – Turkey

U
UAS – Unmanned Arial System
UK – The United Kingdom. See GBR.
UN – United Nations
UNSCR – United Nations Security Council Resolution
USA – United States of America
USSOCOM – United States Special Operations Command (USA)
USSTRATCOM – United States Strategic Command (USA)

V
VNC – Voluntary National Contribution

W
X
Y
Z
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